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Orkney Islands Council Harbour Authority

Application for a Ship-to-Ship Oil Transfer Licence for Scapa Flow

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NON TECHNICAL SUMMARY

INTRODUCTION

This document provides the application from Orkney Islands Council (OIC) Harbour Authority for an oil transfer licence (OTL) under the Merchant Shipping (Ship-to-Ship Transfers) Regulations 2010 and Merchant Shipping (Ship to Ship Transfers) (Amendment) 2012 amendments (here after referred to as “The Regulations”).

The licence is required for the transfer of oil from one ship (known as the mother vessel) to another ship (known as the daughter vessel) within Scapa Flow Harbour Area.

TECHNICAL DESCRIPTION

Location of Proposed Cargo Transfers

The proposed cargo transfers will be undertaken at Ship-to-Ship (STS) locations, as shown in Figure 3-1. All designated sites considered in the assessment are shown in Figure 5-3. The designated sites closest to the STS locations are:

- Waulkmill Site of Special Scientific Interest (SSSI) - 2.6 km.
- Orkney Mainland Moors Special Protection Area (SPA) - 3.9 km.
- Keelylang Hill and Swartaback Burn SSSI - 4.2 km.

There are, on average, 8,000 ships per annum within 25 miles of the Orkney coastline. Therefore, 36 STS cargo transfers per annum (estimation of 3 per month and 2 ships per operation) amount to 0.9% of ship movements around Orkney.

Substances to be transferred

The substances to be transferred will be:

- Clair Crude.
- Schiehallion Crude.
- Foinhaven Crude.
- Flotta pipeline crude oil.
- Gas condensate (predominately Russian in origin).
- Oil type 4: medium crude oil (as per Appendix B).

Maximum quantities

The maximum quantity to be transferred in a single operation is 180,000 tonnes. This equates to a maximum of 6,480,000 tonnes transferred per annum.

The anticipated quantities are based on historical data of STS operations from the past 14 years (see Table 1-1).

Frequencies

The frequency of the proposed cargo transfers is not expected to exceed an average of three per calendar month. Each proposed cargo transfer, on average, is likely to take up to 24 hours to complete.

The anticipated frequencies are based on historical data of STS operations from the past 14 years (see Table 1-1).

Types of ships

Typical vessel sizes are approximately 62,395 gross tonnage (gt) or 115,605 dead weight tonnage (dwt). However, the port has handled vessels as large as 164,373 gt or 311,690 dwt. Size of vessel will vary dependant on the cargo, market conditions and availability of co-loads. The proposed cargo transfer is always conducted with the mother vessel anchored at one of the designated STS locations.

ASSESSMENT METHODS EMPLOYED

Environment Assessment

A combined qualitative and quantitative approach was used in the assessment of effects. The main environmental risks identified are likely to be from the following project activities:

- Movement and presence of ships.
- Accidental oil spill.
- Discharge of ballast water during transfer process.

A qualitative assessment was undertaken of the effects of the movement and presence of ships. A combined qualitative and quantitative approach was used in the assessment of effects on the environment from an accidental oil spill. This involved consideration of historic oil spills and scientific research into the severity of effects and recovery times for various receptors. This information was used to inform the assessment of significance. The potential environmental effects that may arise from an accidental oil spill were assessed

against the environmental baseline to determine if they were likely to significantly affect the environment. The following were taken into account to assess this:

- The sensitivity or importance of the receiving environment or receptor.
- The likelihood of the effect occurring.
- The magnitude of the effect (incorporating scale, size and duration of the effect).

Numerical modelling was used to support the environmental assessment to help assess the impacts of accidental oil spill. Oil spills were modelled at the STS locations for light, medium and heavy oils; a variety of wind conditions derived from data collected at the Barrel of Butter, and for a full spring-neap tidal cycle. The modelling provided a quantitative assessment of potential impacts across the area and provided context for the magnitude of the potential impacts, likelihood of the impacts and overall significance.

Environmental assessment of the release of ballast water into Scapa Flow has been assessed as part of the Appropriate Assessment (AA) of OIC Ballast Water Management (BWM) Policy (Intertek, 2013b). Assessment of the environmental effects from discharge of ballast water during transfer process drew upon this analysis.

The available data was deemed adequate to undertake the assessment of potential effects.

Assessment of European sites

The possible risks to designated sites posed by a STS transfer operation were identified. The designated sites were screened to determine whether a proposed cargo transfer either on its own or in-combination with other plans or projects is likely to cause any significant effects.

Numerical modelling was used to support the screening process to help assess the potential impacts on the designated sites. This provided a quantitative assessment of potential impacts and enabled the extent of an accidental oil spill and time to impact at designated sites to be established.

Likelihood of an interaction between the oil spill and receptor was determined using information for the qualifying interest features, such as foraging distances, and determining whether the interest features could be impacted by an oil spill. The modelling results help to determine the magnitude and likelihood of a potential impact on designated sites and to determine if a significant effect is likely.

POTENTIAL ENVIRONMENTAL EFFECTS

This section assesses aspects of the environment likely to be affected by the proposed cargo transfers and concludes as to whether these are considered to be significant. The topics of soil and climate have been screened out of the assessment for the following reasons:

- **Soil** - The proposed cargo transfers will take place afloat in Scapa Flow and therefore will not have any significant impact on soils.
- **Climate** - Emissions of greenhouse gases from the proposed cargo transfer will be insignificant.

Human Beings

The proposed cargo transfers will not have any adverse effects on human health. The transfer procedures may lead to odour and fumes in the atmosphere. However, the transfer locations are located more than 2 km offshore, over this distance the fumes emissions and odour will be diluted and dispersed to insignificant levels and therefore will not cause a significant impact on human health.

In the unlikely event on an oil spill, seafood may become contaminated with oil. Following this, cultivation will be banned from human consumption. An oil spill would have indirect effects on income. Procedures are in place to prevent the accidental discharge of oil.

An increase to former levels of shipping activities associated with the proposed cargo transfers would have a positive effect on the local economy.

Fauna and Flora

Effects of disturbance of marine mammals and seabirds due to the proposed cargo transfer are considered to be insignificant, as the shipping industry and wildlife have co-existed for many years in Scapa Flow. The low frequency of the proposed cargo transfers (not exceeding an average of three per calendar month) is not considered to have a significant impact on seabed disturbance. Emissions of noise from engines, generators and pumps causing disturbance to marine mammals and seabirds are not considered significant.

The release of ballast water associated with the proposed cargo transfers will not cause a significant impact on fauna and flora in the area, as procedures are in place (i.e. OIC BWM Policy) for the control and discharge of ballast water and to prevent the introduction of harmful or alien species to the marine environment from ballast water.

In the unlikely event of an oil spill, in the absence of any mitigation measures, significant impacts may occur on birds, marine mammals, fish and shellfish within the area. Due to the

low energy environment within Scapa Flow it is considered that the shorelines may be adversely impacted by an accidental oil spill. Consequences of an oil spill on a number of receptors could be significant. However, procedures are in place to prevent the accidental discharge of oil and the risk of a significant impact is considered unlikely. Therefore, no residual effects are predicted. In the unlikely event of an oil spill, the OIC Oil Spill Contingency Plan (OSCP) will be enacted to contain and remove pollutant. A copy of this is included in Appendix E.

The potential impacts on the designated sites within 100 km of the proposed cargo transfer have been assessed and the findings are presented in the Habitats Regulations Assessment provided in Section 6.3.

Water

There will be operational releases of ballast water during the proposed cargo transfers. Procedures are in place for the control and discharge of ballast water (i.e. OIC BWM Policy) to ensure there are no significant effects on water quality. Procedures are also in place to prevent the accidental discharge of oil. In the unlikely event of an oil spill, the OIC OSCP will be enacted to contain and remove the pollutant.

Air

The main releases to the air from the proposed cargo transfers will be combustion products from engines and generators, and gases/vapours arising from the stored products during transfer operations. The main emissions to the air will be of carbon dioxide (CO₂), sulphur oxides (SO_x), nitrogen oxides (NO_x) and particulate matter (PM). As of 2006, there was a requirement for all ships in a port area for more than 2 hours to transfer to using marine gas oil rather than heavy fuel oil, thereby reducing emissions. As of 2015, all ships entering the emissions control area are required to burn low sulphur marine gas oil, thereby reducing emissions even further.

The low frequency of proposed cargo transfers (average of three per calendar month) will ensure the scale of the effect is small and will only occur during the proposed transfer operation. When planning a proposed cargo transfer, operators should include consideration of emissions of volatile organic compounds (VOCs), should seek to mitigate against such emissions and should consider the use of VOC recovery systems where available. It is considered that, with the application of International Maritime Organisation (IMO) guidelines for the control of VOC emissions during product transfer operations and other regulations in place to regulate air pollution, there will be no significant effects upon air quality.

Landscape

The proposed cargo transfers will take place afloat in Scapa Flow. The transfer will take place between ships operating within an existing operational port. The operations are no different from previous STS transfer operations, therefore landscape impacts are considered to be insignificant.

Material Assets

There are no significant changes required to onshore infrastructure to support the proposed cargo transfers. The proposed cargo transfers are no different from previous STS transfer operations. The proposed cargo transfers may lead to a small increase in the waste levels, however there are procedures in place to ensure all waste material is correctly collected and disposed of.

In the unlikely event of an oil spill there may be negative effects on a number of industries including: fishing, aquaculture, tourism and recreation. Procedures are in place to prevent the accidental discharge of oil. In the unlikely event of an oil spill the OIC OSCP will be enacted to contain and remove the pollutant. As a result effects on material assets are considered to be insignificant.

Cultural Heritage

The proposed cargo transfers will take place afloat in Scapa Flow. In the unlikely event of an oil spill, it may lead to reduced access to cultural heritage wrecks within the area. The cultural heritage sites themselves will not be directly impacted by the proposed cargo transfers. Therefore, impacts on cultural heritage are considered to be insignificant.

Use of Natural Resources

There will be no significant use of natural resources associated with the proposed cargo transfers. There is no requirement for construction to support the operations. On occasion, fresh water will be supplied from the shore to the ships for domestic use.

Emissions of Pollutants

The main emissions from the proposed cargo transfers will comprise of:

- Emissions to the air of combustion products from engines, pumps and generators (SO_x, NO_x and PM).
- Emissions to the air of greenhouse gasses (CO₂).
- Emissions of noise from engines, generators and pumps.
- Emissions of VOCs.

- Discharge of ballast water.

All emissions will be minimised and controlled in accordance with current best practice. None of the emissions to the air result in a significant change from previous shipping operations in Scapa Flow.

Discharge of ballast water will follow the OIC BWM Policy and ensure that, as a minimum, ballast water is exchanged with at least 95 % volumetric efficiency. Further to this, ballast water treatment will be undertaken prior to discharge whenever it is available on the ship. This will ensure that concentrations of non-native species (NNS) and presence of chemicals and metals within the ballast water are reduced and removed.

In the unlikely event of an accidental oil spill, contingency plans will ensure the pollutant is controlled and that the spill is minimised in its scale to prevent widespread impacts.

Creation of Nuisances

The proposed cargo transfers will be similar to previous shipping operations within Scapa Flow. The proposed cargo transfers will not create significant impacts in terms of visual intrusion, noise, odour and other potential sources of nuisance.

Elimination of Waste

The proposed cargo transfers will not generate significant amounts of waste. Ships engaging in transfer operations will transfer their waste into skips and this waste will be delivered to Scapa Pier or Stromness Harbour for appropriate disposal. The application of the Port Waste Management Plan and best practice will ensure that the disposal of waste does not pose a significant impact.

In the event of an oil spill, waste oil which has been contained or recovered from the spill will be delivered in leak proof containers to the licensed disposal facility on Orkney Mainland (Bossack hazardous waste transfer station WML/N/50019) for temporary storage in a secure containment area. After which it will be sent to a suitable licensed disposal facility on mainland Scotland.

In-Combination and Cumulative Effects

Other projects in the area which could give rise to in-combination effects include:

- Flotta Oil Terminal.
- Flotta oil pipeline.
- Royal Oak wreck.

- Development projects within the area include:
 - Construction of new hospital on the south side of Kirkwall (outline planning permissions granted June 2014);
 - Development of housing on the east side of Kirkwall (permitted but not started);
 - Development of housing on the west side of Kirkwall (pre-application);
 - Development of an industrial unit at Hatston Pier (pending decision), and
 - Development of an industrial unit at Lyness (pending decision).

It is not considered that potential effects from the proposed cargo transfer are likely to combine with effects from other local projects, existing or planned, to cause a significant effect on the environment.

ASSESSMENT OF EFFECTS ON EUROPEAN SITES

To determine whether the cargo transfers to be carried out are likely to have a significant effect on any European site, either individually or in-combination with other plans or projects, a screening assessment was carried out.

All designated sites within the Orkney Islands and Pentland Firth were considered in the assessment, as well as SPAs with seabirds within a distance of 100 km of the proposed cargo transfer locations. These sites were considered because seabirds are known to forage outside of their SPAs and these seabirds may travel to Scapa Flow and be impacted by an accidental oil spill.

Environmental assessment of the release of ballast water into Scapa Flow on designated sites has been assessed as part of the AA of BWM Policy (Intertek, 2013b). This AA concluded that the discharge of ballast water would have no adverse effect on the integrity of any designated sites.

Potential effects resulting from the presence of ships, airborne pollution and disturbance were considered not likely to have a significant effect on the designated sites. However, it was determined that water based pollution as a result of an accidental oil spill may affect designated sites and qualifying species.

Designated sites within the area were assessed to determine if the proposed cargo transfers were likely to have a significant effect on them. It was concluded that if a significant oil spill occurred then it would be likely to have a significant effect on a number of designated sites.

However, procedures are in place to prevent the accidental discharge of oil and the risk of a significant impact is considered unlikely. Therefore, no significant impacts on designated sites are predicted.

Screening determined that the proposed cargo transfers are not considered likely to have a significant effect on any European sites, either individually or in-combination with other plans or projects, as required under Schedule 1 (1) of The Regulations.

MITIGATION MEASURES

Mitigation measures applied in order to determine that there is no significant effects on the environment include the following:

- Application of best practice in proposed cargo transfer activities.
- Application of the OSCP (see Appendix E).
- Application of robust control procedures in place to minimise the likelihood and potential of an oil spill.
- Transfer between ships undertaken using industry standard certified hoses.
- Ships having trained and experienced crew to undertake transfer operations.
- Use of a qualified STS Superintendent to oversee transfer operation.
- Application of onsite spill response procedures and equipment being mobilised to ensure spill doesn't reach European sites.
- Positioning of fenders in a manner in which they create a barrier to contain any oil that may be spilt in the unlikely event of a hose failure.
- Comprehensive stock of oil spill containment equipment held at various sites ready for deployment in case of an incident.
- Back-up contractor for Tier 2 response.
- Availability of well trained staff to respond to oil spill.

Implementing the above mitigation measures will reduce risk of proposed cargo transfers having a significant effect on the environment. Therefore, no residual impacts are predicted.

In the event of an oil spill the location of the pollutant, type of oil, source, cause, extent and direction of movement will be reported to the Oil Pollution Officer. Depending on the tier of the spill, different response actions will be mobilised.

If an accidental oil spill was to take place then application of the OSCP would considerably reduce the environmental effects of a spill. It will minimise the scale and extent of an oil spill. Significant effects on the environment through marine pollution should be reduced to short-term manageable effects if the contingency plan can contain and minimise the scale of the spill and prevent any widespread impact.

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ACRONYMS

AA	Appropriate Assessment
ALARP	As low as reasonably practicable
BAP	Biodiversity Action Plan
BWM	Ballast Water Management
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CO₂	Carbon dioxide
Dwt	Dead weight tonnage
ECA	Emission Control Area
EMEC	European Marine Energy Centre
EPS	European Protected Species
Gt	Gross tonnage
HRA	Habitats Regulation Appraisal
IMO	International Maritime Organisation
Intertek	Intertek Energy & Water Consultancy Services
JNCC	Joint Nature Conservation Committee
Kg	Kilograms
Km	Kilometres
km²	Square kilometres
LNCS	Local Nature Conservation Sites
LNG	Liquefied Natural Gas
LPG	Liquid Propane Gas
M	Metres
m³	Cubic metres
MCA	Maritime and Coastguard Agency
MPA	Marine Protection Area
NAEI	National Atmospheric Emissions Inventory
NEC	National Emission Ceilings
Nm	Nautical miles
NO_x	Nitrogen oxides
NNS	Non-Native Species
OBRC	Orkney Biological Records Centre
OIC	Orkney Islands Council
OIMS	Orkney Islands Modelling System
OSCP	Oil Spill Contingency Plan
OTL	Oil Transfer Licence
PM	Particulate Matter
PMF	Priority Marine Features
pMPA	Proposed Marine Protected Area
RSPB	Royal Society for the Protection of Birds

SO_x	Sulphur oxides
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SPA	Special Protection Area
STS	Ship-to-Ship
SSSI	Site of Special Scientific Interest
VOC	Volatile Organic Compounds
VTs	Vessel Traffic Services
WDA	Waste Disposal Authority
WFD	Water Framework Directive

1 APPLICANT AND OPERATIONS DETAILS

1.1 INTRODUCTION

This document provides the application from Orkney Islands Council (OIC) Harbour Authority for an oil transfer licence (OTL) under the Merchant Shipping (Ship-to-Ship Transfers) Regulations 2010 and Merchant Shipping (Ship to Ship Transfers) (Amendment) 2012 amendments (here after referred to as "The Regulations").

The licence is required for the transfer of oil from one ship (known as the mother vessel) to another ship (known as the daughter vessel) within Scapa Flow Harbour Area.

1.2 APPLICANT DETAILS

The applicant is the statutory harbour authority for Scapa Flow, the application site.

Applicant Name: Orkney Islands Council Harbour Authority.

Applicant Address: Harbour Authority Building, Scapa, Orkney, KW15 1SD.

Contact Details:

David Sawkins – Deputy Harbour Master: Strategy & Support

Office: 01856 873636

Mobile: 07725 823616

Email: david.sawkins@orkney.gov.uk

1.3 BACKGROUND TO THE APPLICATION

Scapa Flow Harbour Area is under the jurisdiction of a Statutory Harbour Authority as set by the Orkney County Council Act 1974 and amendments. Scapa Flow is a semi-enclosed body of water surrounded by Orkney Mainland, Graemsay, Lambs Holm, Burray, South Ronaldsay and Hoy, with entrances to the south (sounds of Switha and Hoxa) and west (Hoy sound). The eastern entrances are blocked by the Churchill Barriers which were constructed in the 1940s. This has altered the tidal and sediment regime.

The Harbour Area ranges in depth from 5 metres (m) to 90 m, with an average of 32 m. The area is 320 square kilometres (km²) and has a volume of around 1 billion cubic metres (m³) of sea water (see Figure 3-1).

Scapa Flow is recognised as a sheltered anchorage and operating area for marine operations. For over thirty-five years Flotta Oil Terminal has been operated (by oil companies) on the southern edge of Scapa Flow. The Oil Terminal is located on the northern shore of Flotta island, covering approximately 400 acres (Talisman Energy, 2006).

Scapa Flow also has a long track record as a safe location for Ship-to-Ship (STS) transfers of oil. STS operations have been carried out within Scapa Flow for over twenty years, with the world's first Liquefied Natural Gas (LNG) STS transfer occurring in Scapa Flow in 2007. Since 1980, there have been more than 200 STS operations. Between 1980 and 1999 there were 43 operations.

Details on the number of STS operations and tonnage of cargo transferred between 2000 and 2011 are shown in Table 1-1. The maximum number of STS operations occurred in 2000, with 34 STS operations carried out.

Although LNG STS operations are undertaken in Scapa Flow, they are not covered by The Regulations and therefore not included in this OTL application. There have been three LNG STS operations between 2007 and 2014, the most recent being in August 2013.

The Orkney Islands are also recognised for their long history and pristine environmental conditions. The Islands are valued for the abundance of birds and marine wildlife that inhabit the islands throughout the year. The area contains a number of protected sites including Special Area of Conservation (SAC), Special Protection Area (SPAs), Ramsar sites and Site of Special Scientific Interest (SSSI).

Table 1-1: Ship-to-Ship transfers 2000-2013 (OIC Marine Services, 2014a)

Year	Number of STS Operations	Tonnes of Cargo transferred
2000	34	3,681,885
2001	19	1,812,085
2002	11	926,399
2003	4	575,184
2004	15	2,660,841
2005	17	1,746,715
2006	8	993,759
2007	7	930,136
2008	10	582,097
2009	27	2,599,461
2010	17	941,629
2011	5	282,708
2012	0	0
2013	0	0

1.4 GUIDANCE AND CONSULTATION

Guidance on the content and scope of this OTL application has been taken from consultation with the Maritime and Coastguard Agency (MCA), Scottish Natural Heritage (SNH), Scottish Environment Protection Agency (SEPA) and Royal Society for the Protection of Birds (RSPB).

Table 1-2 provides a summary of the pre-application consultation undertaken in support of the OTL.

Table 1-2: Record of pre-application consultation

Consultee	Date of Consultation	Summary
Maritime and Coastguard Agency (MCA)	16/12/2013	Intertek (Fiona Bell/Chris Mooij) had a phone conversation with the MCA (Stan Woznicki) to seek initial information on licence application requirements. MCA confirmed they are the final decision-maker on the OTL application and may require an Appropriate Assessment (AA) to be undertaken.
MCA	14/05/2014	Intertek (Fiona Bell/Chris Mooij) had a phone conversation with the MCA (Stan Woznicki) to seek further clarification on licence application requirements, once work had been awarded to Intertek to undertake OTL application for Orkney Islands Council (OIC). MCA confirmed that main consultees will be SNH, SEPA and Historical Scotland, and other important parties such as RSPB and local authorities.
Scottish Natural Heritage (SNH), Scottish Environment Protection Agency (SEPA)	15/05/2014	Email from Intertek (Fiona Bell) to SNH (Kate Thompson) and SEPA (Alan Dundas) confirming consultation period of 42 days.
SNH, SEPA and Royal Society for the Protection of Birds (RSPB)	26/05/2014	Initial stakeholder meeting between OIC (David Sawkins/Jenni Kakkonen), Intertek (Fiona Bell/Chris Mooij), SNH (Kate Thompson/Morven Carruthers), SEPA (Alan Dundas) and RSPB (Sarah Sankey). The meeting followed initial introductory emails to Kate, Alan and Sarah when at project commencement. Items discussed in the meeting include: background and introduction to the project, timescales and consultation process, and the approach to the assessment and sites included. Intertek confirmed that the MCA may require an Appropriate Assessment to be undertaken, if needed. Intertek confirmed LNG is not being looked at, as this does not fall within the OTL. SNH advised Intertek to assess which Natura sites have connectivity with birds. SEPA agreed to send some air quality data to Intertek to help with the environmental assessment. Constructive feedback was received and SNH, SEPA and RSPB were happy with the assessment approach.
MCA	03/06/2014	Conference call between OIC (David Sawkins), Intertek (Fiona Bell/Chris Mooij) and the MCA (Stan Woznicki) to get clarifications further to stakeholder meeting. Clarifications on consultation process and procedure following receipt of stakeholder comments on application.
SNH, SEPA and RSPB	04/06/2014	Clarifications email sent to SNH, SEPA and RSPB following call with MCA.

2 THE REQUIREMENT FOR AN OIL TRANSFER LICENCE (OTL)

STS transfers have been carried out in the Orkney Islands for many years; however, the per annum number of transfers and tonnage of cargo transferred has reduced in recent years. The Regulations require OIC Harbour Authority to apply for an OTL in order to undertake future STS transfers of oil.

2.1 LEGISLATION

2.1.1 Merchant Shipping (Ship-to-Ship Transfers) Regulations 2010 (and amendments)

The Regulations entered into force on 31 March 2012 and prohibit within the UK Territorial Sea the transfer between ships of cargoes consisting wholly or mainly of oil.

In order to undertake STS transfers within their jurisdictions, harbour authorities must obtain an OTL. This requires an environmental assessment to be carried out and an Environmental Statement to be produced which will be used in support of the OTL application. The environmental assessment is required in order to assess the likely significant effects of the proposed cargo transfers on the environment.

Schedule 2 of The Regulations sets out the procedure for the application of an OTL. This includes what information must be included within the application, a description of the required content of the Environmental Statement and details of the consultation process.

The Regulations implement the Habitat Directive in respect of STS transfers. The Regulations put in place a legislative regime for assessing and licensing harbour authorities which propose to allow STS transfers in their waters. The Regulations also set out requirements to undertake environmental assessment (Schedule 2) and, where appropriate, an assessment of the impacts on European Sites (Schedule 1). These Regulations reinforce the Habitats Directive and ensure that appropriate environmental considerations are undertaken.

Before an OTL can be granted, harbour authorities must determine, in accordance with the procedure in Schedule 1 of The Regulations, whether the proposed cargo transfers to be authorised would be likely to have a significant effect on any European Sites, either individually or in combination with other plans or projects.

2.1.2 Habitats Directive

The Habitats Directive (Council Directive 92/43/EC) and Birds Directive (Council Directive 2009/147/EC) enable European Union member states to work together within the same legislative framework to protect Europe's most valuable species and habitats, irrespective of political or administrative boundaries. At the heart of these Directives is the creation of a network of Europe's most valuable species and habitat sites known as Natura 2000.

In the UK, the Habitat and Bird Directives are transposed into national legislation by the Conservation of Habitats and Species Regulations 2010 (Habitats Regulations), which covers the terrestrial environment and marine waters up to the 12 nautical miles (nm) limit. In Scotland, the Habitats Directive is transposed through a combination of the Habitats Regulations 2010 (in relation to reserved matters) and the 1994 Habitats Regulations. The Directives are transposed with regards to the offshore marine environment by the Offshore Marine Conservation (Natural Habitats &c.) Regulations 2007.

The three tests set out under regulation 48 of the 1994 Habitats Regulations (or regulation 61 of the 2010 Habitats Regulations) to determine if a proposal will affect a Natura site are:

- 1) Is the proposal directly connected with or necessary for site management for nature conservation?
- 2) Is the proposal likely to have a significant effect on the site? (*this is the Screening Stage*)
- 3) Can it be ascertained that the proposal will not adversely affect the integrity of the site? (*this is the appropriate assessment stage*) (SNH, 2010).

The tests are known as the Habitats Regulation Appraisal (HRA) process.

The aim of the Natura 2000 network is to ensure the long-term survival of European threatened species and habitats. The network comprises SACs designated under the Habitats Directive, and SPAs designated under the Birds Directive. SPAs and SACs are designated by the individual member states.

Within the UK, all offshore Natura 2000 sites are identified by the Joint Nature Conservation Committee (JNCC), and all marine SACs/SPAs within national waters, are identified by the national nature organisation, e.g. SNH.

The Convention on Wetlands (Ramsar, Iran, 1971), known as the "Ramsar Convention" is an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their Wetlands of International Importance and to plan for the "wise use", or sustainable use, of all of the wetlands in their territories" (RAMSAR, 2011).

RAMSAR sites are also European sites and where the interest features of RAMSAR sites overlap with those of European sites, it is Scottish Government policy to afford them the same protection. Therefore, RAMSAR sites are included in this environmental assessment.

Under the Habitat and Birds Directives, it is mandatory to undertake an AA for any plan or project which individually, or in-combination with other plans/projects, are likely to have a significant effect on a Natura 2000 or RAMSAR site, (excluding the plans/projects which are directly connected with the conservation management of a Natura 2000 site).

Under Article 6(3) of the Habitats Directive an AA is "the process by which the potential effects of a plan/project upon a Natura 2000 site are assessed in the view of the site's conservation objectives in order to ascertain whether the plan/project will not adversely affect the integrity of the site". However, Article 6(3) states that if a plan or project is directly connected with the conservation management of a site then an AA is not required (European Communities, 2000).

3 LOCATIONS OF PROPOSED CARGO TRANSFERS

This Section of the application addresses the requirements of The Regulations – Schedule 2 – 1.(1)(a).

The proposed cargo transfers in Scapa Flow will take place at one of four designated STS locations – labelled STS 1 to 4 on United Kingdom Hydrographic Office Chart 35 – these being towards the north and eastern edge of Scapa Flow (see Figure 3-1). This provides a sheltered and relatively deep water area for the safe transfer of oil between ships. The proposed cargo transfer is undertaken once the mother vessel is securely anchored and the daughter vessel is moored alongside. Further information on the proposed cargo transfers is provided in this Section.

The STS locations are:

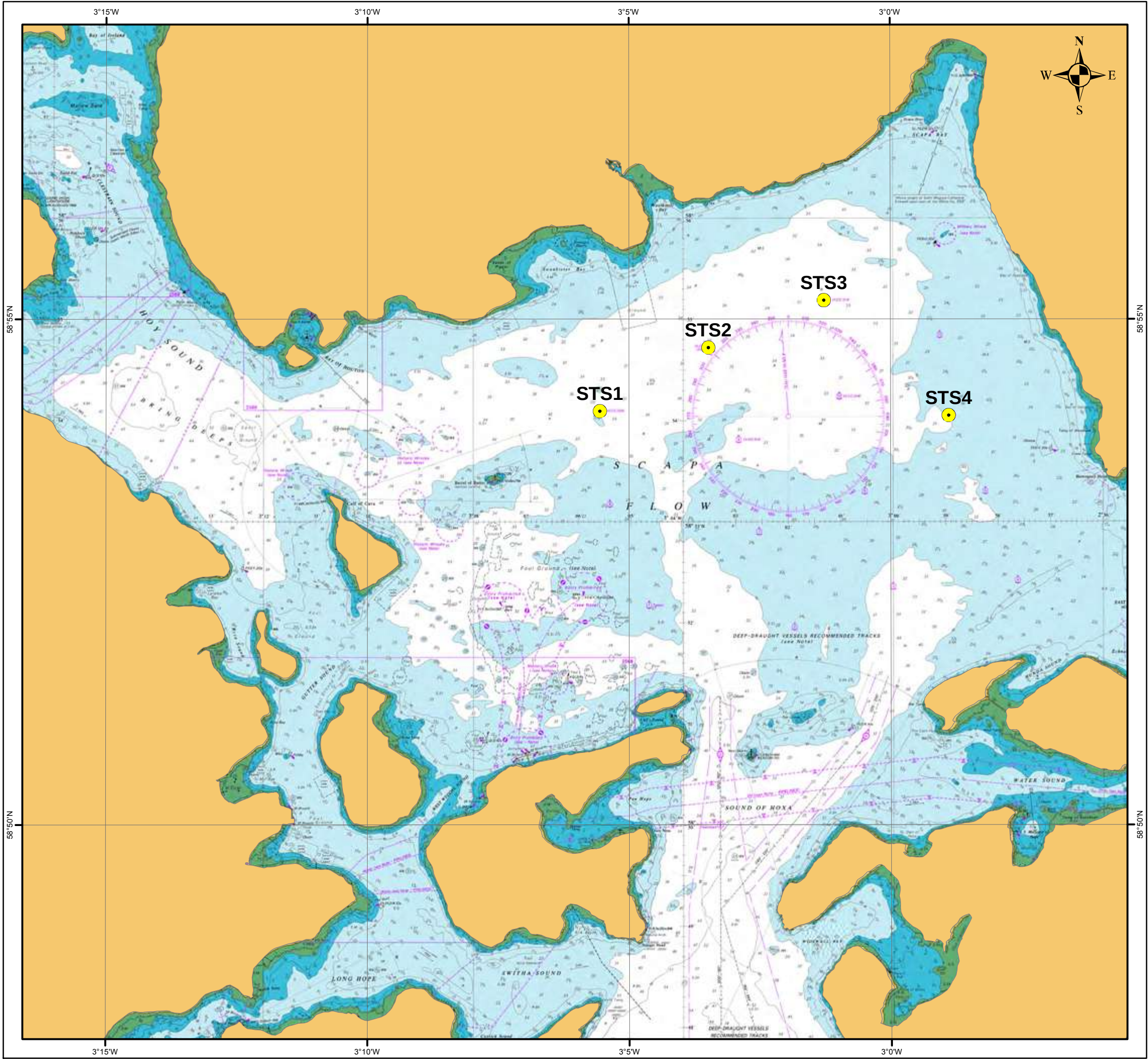
STS 1	58° 54.098'N	003° 05.559'W
STS 2	58° 54.727'N	003° 03.484'W
STS 3	58° 55.194'N	003° 01.271'W
STS 4	58° 54.054'N	002° 58.889'W

All designated sites considered in the assessment are shown in Figure 5-3. The designated sites closest to the STS locations are:

- Waulkmill SSSI.
- Orkney Mainland Moors SPA.
- Keelylang Hill and Swartaback Burn SSSI.

Only one STS location will be used at any given time and the choice of STS location will depend on many factors, such as:

- Size of ships.
- Weather forecast.
- Other expected shipping movements in Scapa Flow.
- Requirements of charter party.



ORKNEY ISLANDS COUNCIL

Oil Transfer Licence Application

Figure 3-1: Ship-to-Ship Transfer Locations

Legend

- Ship-to-Ship Transfer Location



NOTE: Not to be used for Navigation

Date	Wednesday, June 25, 2014 14:04:49
Projection	Transverse_Mercator_WGS84
Spheroid	WGS_1984
Datum	D_WGS_1984
Data Source	UKHO, OSOD
File Reference	J:\P1861\Mxd\ES_Report\STS_locations.mxd
Created By	Emma White
Reviewed By	Ian Charlton
Approved By	Fiona Bell



4 TECHNICAL DESCRIPTION

This section of the application addresses the requirements of The Regulations – Schedule 2 – 1.(1)(b) and provides a technical description of the operations to be carried out.

4.1 INTRODUCTION

The proposed cargo transfer to be authorised will entail the transfer of oil from one ship (known as the mother vessel) to another ship (known as the daughter vessel). This practice is known as “Ship-to-Ship transfer”.

STS transfer operations are undertaken by anchoring the mother vessel and berthing the daughter vessel alongside the mother vessel on completion of the anchoring. A transfer operation can involve more than one daughter vessel, but only one at any one time. The proposed cargo transfer is always conducted with the mother vessel anchored at one of the designated STS locations.

The frequency of the proposed cargo transfers is not expected to exceed an average of three per calendar month. The Harbour Authority will only allow one transfer at any given time in Scapa Flow i.e. one Flotta operation or one oil STS operation or one LNG operation.

Each proposed cargo transfer will involve numerous parties, including the following:

- Harbour Authority.
- The two ships and their Masters.
- Ship agent.
- Ship broker/charterer.
- Ship owners.
- STS agent.

4.2 DESCRIPTION OF THE PROPOSED CARGO TRANSFERS

4.2.1 Pre-STs Meeting

Prior to a transfer operation all relevant parties are involved in a pre-STs meeting to discuss and agree a STS plan. The meeting ensures all parties involved are fully briefed and in agreement on the following:

- Procedures relating to the operation.
- Indented sequence of events.
- Designated anchor position for the operation.
- Mooring configuration including fender positions.
- Tug deployment.
- Oil spill response.
- Notification to statutory bodies.
- Notification to national authority i.e. MCA.
- Communication procedures.

Prior to the transfer taking place the STS Superintendent (provided by the STS agent) must ensure briefings are provided for the Masters and crew of the mother and daughter vessels.

4.2.2 Transfer Process

Prior to the proposed cargo transfer, a risk assessment is undertaken by OIC Harbour Authority. The risk assessment considers weather conditions, ballast water quantity, wind and tide conditions and cargo load.

The transfer process is summarised as follows and can be seen in Figure 4-1:

- Anchoring of Mother vessel
 - Mother vessel is securely anchored before the daughter vessel arrives.
- Fendering of vessels
 - Fenders are secured in place, along the parallel body of one of the ships, to absorb energy as the vessels berth alongside each other.
- Manoeuvring of vessels
 - Daughter vessel approaches mother vessel and is moved into position by OIC tugs.
 - Mother vessel can be held in place or manoeuvred (weather vaned etc.) at discretion of the Master with assistance from the authorised Pilot to ensure that the berthing operation is completed in a safe manner.
- Transfer of cargo
 - Once the vessels are securely moored the transfer hoses are connected. Each end of the hose is secured to a ship's manifold using eight bolts. The connection is made in a catchment area so that any drips or minor spill arising during connection are collected onboard the ship and not released to the environment.
 - During the transfer process OIC tugs are on standby.
 - Once transfer is complete hoses are drained and blown through to clear them out and are then disconnected.
 - Each transfer operation, on average, is likely to take up to 24 hours to complete.
- Unmooring and Departure
 - OIC tugs assist with unmooring of vessels.
 - OIC tugs manoeuvre the vessels to ensure safe separation
 - OIC tugs escort the vessels out of the harbour waters, as per harbour regulations.

Figure 4-1: STS cargo transfer



4.2.3 Responsibilities

During the transfer process the STS Superintendent is in charge of coordinating the transfer operation. Superintendents ensure that the operation is conducted in a safe and controlled manner. They have the responsibility of ensuring the hoses are connected correctly and that safety devices are working properly.

The STS agent provides all the relevant STS equipment (including fenders and hoses). STS equipment (including hoses) must comply with regulations and guidelines and be declared fit for purpose prior to the transfer process. They are also inspected during the transfer and after the transfer is complete. All staff carrying out the operation will have adequate training to perform the operation.

Superintendents must ensure that the following safety checklists are completed at the appropriate times:

- Before operations commence safety checklist.
- Before run-in and mooring safety checklist.
- Per-transfer conference safety checklist.
- Pollutions avoidance checklist.
- Before cargo transfer safety checklist.
- Before unmooring safety checklist.

Both ship' Masters retain their statutory responsibilities for the safety of their ship and the cargo. They remain in control and command of their own ships.

OIC Harbour Authority is responsible to advise of limiting weather conditions. OIC regulations state that transfer operations must be suspended if the following operational constraints are reached:

- Wind speeds of over 27 knots.
- Sea / swell wave heights of over 2 metres.
- If mean wind strength exceeds 35 knots, cargo transfer operations shall cease. All cargo hoses shall be disconnected, and consideration given to unmooring the import and export vessels to separate anchorages until there is a moderation in the weather, when cargo operations can safely resume.

4.2.4 Types of substances to be transferred

This Section of the application addresses the requirements of The Regulations – Schedule 2 – 1.(1)(b)(i).

The substances to be transferred will be:

- Clair Crude.
- Schiehallion Crude.
- Foinhaven Crude.
- Flotta pipeline crude oil.
- Gas condensate (predominately Russian in origin).
- Oil type 4: medium crude oil as per Appendix B.

4.2.5 Maximum quantities of each substance to be transferred in any single operation and/or within any specified time period

This Section of the application addresses the requirements of The Regulations – Schedule 2 – 1.(1)(b)(ii).

The maximum quantity to be transferred in a single operation is 180,000 tonnes. This equates to a maximum of 6,480,000 tonnes transferred per annum.

The anticipated quantities are based on historical data of STS operations from the past 14 years (see Table 1-1).

4.2.6 The frequency of transfers

This Section of the application addresses the requirements of The Regulations – Schedule 2 – 1.(1)(b)(iii).

The frequency of the proposed cargo transfers is not expected to exceed an average of three per calendar month. This is an average based on historical data of STS operations from the past 14 years.

4.2.7 The types of ships to be used to carry out the proposed cargo transfers

This Section of the application addresses the requirements of The Regulations – Schedule 2 – 1.(1)(b)(iv).

Typical vessel sizes are approximately 62,395 gross tonnage (gt) or 115,605 dead weight tonnage (dwt). However, the port has handled vessels as large as 164,373 gt or 311,690 dwt. Size of vessel will vary dependant on the cargo, market conditions and availability of co-loads.

The mother vessel is securely anchored at the selected STS transfer locations before the daughter vessel arrives. Figure 4-2 below shows a typical vessel that would undertake a STS transfer.

Figure 4-2: Typical Vessel Size



5 ENVIRONMENTAL STATEMENT

This Section of the application addresses the requirements of The Regulations – Schedule 2-2.

5.1 ENVIRONMENTAL BASELINE

Baseline data were collected in order to identify and describe the existing environmental conditions of the area which could potentially be affected by the proposed cargo transfers.

Baseline data collected during the recent SEA of the Ballast Water Management (BWM) Policy (Intertek, 2013a) and AA of BWM Policy (Intertek, 2013b) were used where relevant and updated to ensure latest available data was considered. Further data were obtained where relevant to the OTL application.

The environmental baseline presents the current conditions of the environment. A review of the relevant environmental baseline was undertaken to establish a baseline and is included within Appendix A. This review covered aspects of the environment that could potentially be significantly affected by the proposed cargo transfers and included:

- European and Nationally Designated Sites.
- Protected Species.
- Benthic Ecology.
- Littoral Habitats.
- Water Quality.
- Marine Pollution.
- Air Quality.
- Fishing and Aquaculture Industries.
- Renewable Energy.
- Waste.
- Tourism.
- World Heritage Sites.
- Wrecks.

5.1.1 Environmental Context

In order to determine whether the environment could potentially be significantly affected by the proposed cargo transfers it is useful to consider the historical background and conditions in order to establish an environmental context for the assessment. Existing activities in the Orkney Islands considered in this section include Flotta Oil Terminal and historic STS transfer operations.

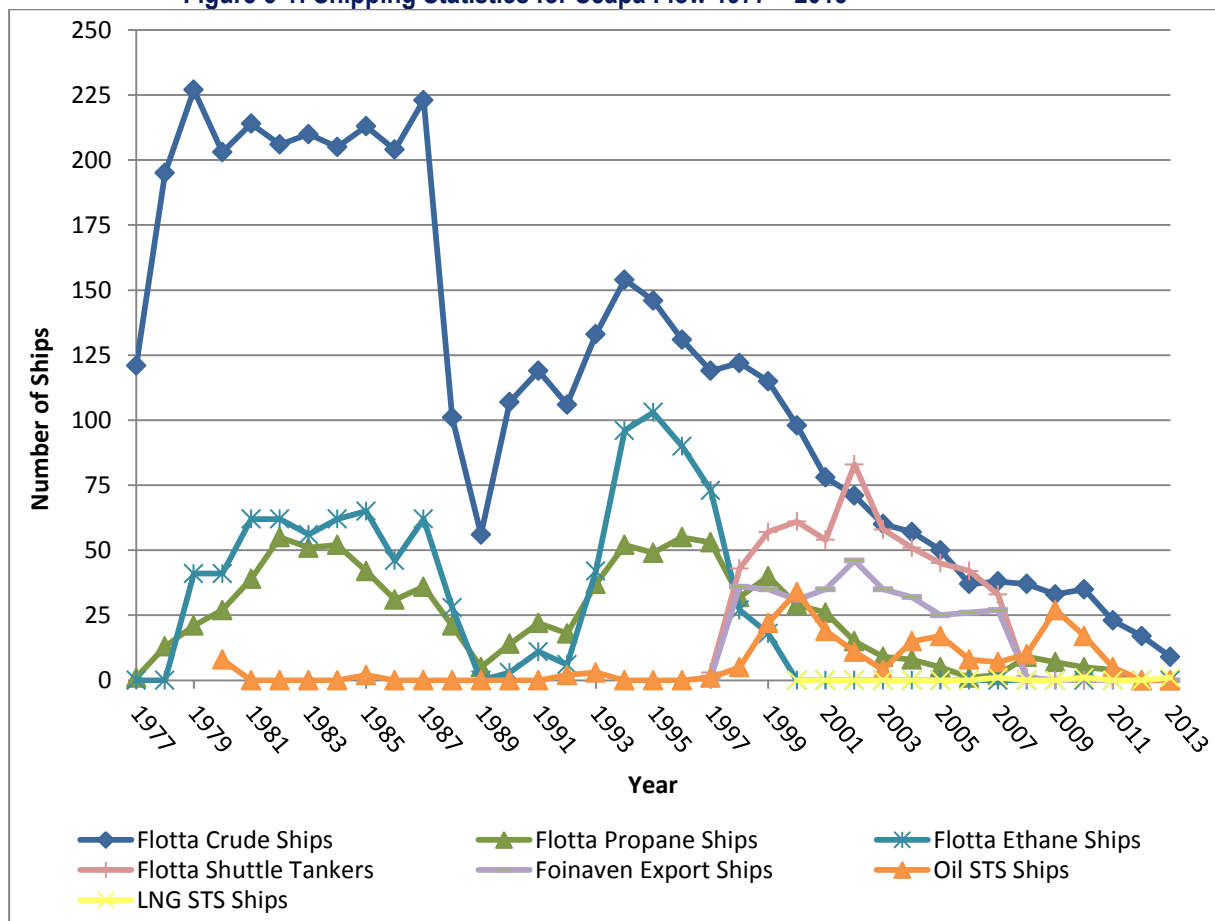
Flotta Oil Terminal has been operational since 1976. Flotta Oil terminal is currently operated by Talisman Sinopec Energy UK Limited and imports crude oil from several offshore installations through a subsea pipeline. The imported crude oil is processed and stored in segregated storage facilities at Flotta before being exported by tankers. Liquid petroleum gas (LPG) separated from

the oil is loaded onto gas tankers at Flotta's Jetty. Since 1977, there have been more than 4,200 crude oil tankers and more than 1,880 LPG tankers exporting oil and gas from Flotta (OIC Marine Services, 2014a).

The first STS transfer of oil took place in Scapa Flow in August 1980. Since then, over 200 STS transfers have been conducted in Scapa Flow involving more than 250 ships.

Figure 5-1 shows the number of oil and gas ships that have used Scapa Flow harbour since the opening of Flotta Oil Terminal. During this time period there have been no major environmental incidents. There has been a decrease in the number of ships over time due to a decrease in oil coming through the oil terminal. With new oil fields coming online in late 2014/early 2015, this is predicted to slowly increase. The proposed cargo transfers will involve minimal uplift from the recent numbers of ship movements.

Figure 5-1: Shipping Statistics for Scapa Flow 1977 – 2013



Environmental monitoring began in 1974 prior to the development of Flotta Oil Terminal with an aim to assess the impact of the Oil Terminal's operations on the Orkney Islands environment. In order to do this the Marine Environmental Unit was set up at OIC Marine Services (then OIC Harbour Department). OIC agreed that the monitoring programme should monitor the impact of the oil operations on the Orkney Islands marine environment and support the then Harbours Department in its obligations to both the Port users and to the OIC as Port Authority and Local Authority.

Environmental monitoring programmes for the Orkney Islands and Scapa Flow include the following:

- Rocky shore surveys.
- Sandy shore surveys.
- Orkney beached bird surveys.
- Seabed sediment surveys.
- Marine non-native species (NNS) monitoring.

Consideration of the above monitoring results will help to establish an environmental context in which the proposed cargo transfers can be assessed.

Rocky shore surveys record the abundance of fauna and flora throughout the Orkney Islands.

Annual sandy core samples are taken from sandy shores around Scapa Flow, from Orkney Mainland and Hoy. Marine benthic invertebrates in these samples are analysed. The data form a baseline from which environmental change can be studied. This monitoring began in 1974 and was led by OIC in conjunction with Dundee University until 1990, after which it was fully taken over by OIC. Monitoring re-started in 2002 on Orkney Mainland and in 2006 on Hoy.

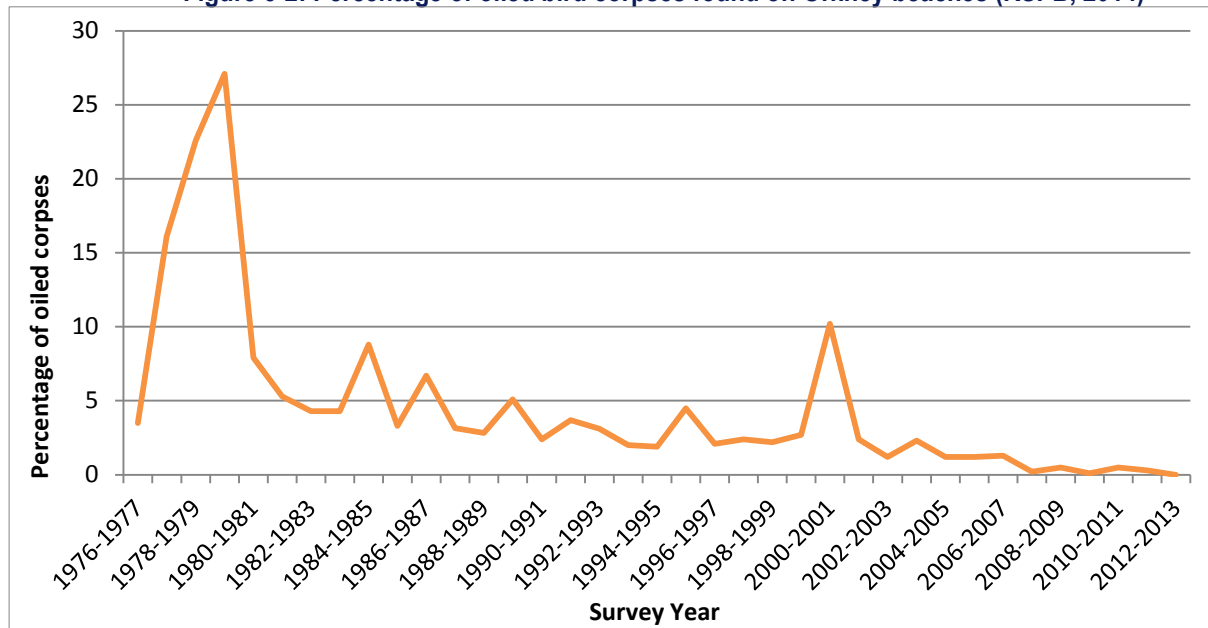
Analysis of the samples over a 14 year time period (1974 – 1988) showed that the operation of the oil terminal had caused negligible pollution during this period and consequently most changes observed across the sandy shore sampled have been either due to natural factors or caused by small-scale local anthropogenic factors (Atkins and Jones, 1989).

The Waulkmill Bay site was selected for further analysis. It was selected as no sewerage discharges or aquaculture located nearby and no other anthropogenic activities are known to have caused significant problems in the area. Analysis of the benthic macro invertebrate collected at the Bay shows that between 1974 and 2010 there were some changes in the diversity and structure of benthic communities. The increase in the level of disturbance appears to coincide with the construction of the Flotta Oil Terminal, which suggests that this may have had an impact even on sheltered sites like Waulkmill Bay (Mikkonen, 2011). It is concluded that a disturbance event most likely of anthropogenic origin occurred in the 1980's and has continued to impact the marine environment in the Waulkmill Bay since then. However, it is also important to note that the wreck of the Royal Oak has been known to leak several litres of oil a day from the weakening of its hull. Operations to remove this oil from the wreck began in 2003 and have been successful and the wreck is no longer thought to be leaking oil (Briggs Marine, 2010). However, it is possible that the years of oil leakage have had an impact on the surrounding marine ecosystems.

The Orkney beached bird surveys began in 1976 to monitor the effects that the North Sea oil industry might have on Orkney's breeding and wintering birds. The survey aims to monitor a sample of 30 beaches every lunar month and records all bird corpses and the degree to which they show signs of oil contamination. The percentage of oiled bird corpses has decreased dramatically since monitoring began (see Figure 5-2), peaking in 1979-1980 at 27.1 %. The survey for the year 2011-12 indicated that only 0.3 % of the bird corpses showed signs of oiling (663 bird corpses recorded). The most recent

survey (2012-13) saw another substantial drop in the number of corpses found, to 522 (Meek and Wilson, 2013). During this survey for the first time since monitoring began not a single oiled bird was found during the surveys. This continues the trend towards lower oiling rates (see Figure 5-2). The decline in bird corpses most likely is a result in the drop in seabird numbers nesting in Orkney. The decline in oiled bird corpses indicated that the oil terminal at Flotta is well managed and not damaging seabirds.

Figure 5-2: Percentage of oiled bird corpses found on Orkney beaches (RSPB, 2014)



The operators of Flotta Oil Terminal, Talisman Sinopec Energy UK Ltd, undertake an annual seabed survey off the coast of Flotta. Sediments are analysed for the presence of hydrocarbons and heavy metals. Results gathered since 1972 show only low-levels of contamination, with sources mainly being attributed to wartime activities, wrecks and land run-off (Aquaterra, 2007).

A baseline marine invasive NNS monitoring survey took place in 2013. Scapa Flow and Loch of Stenness will be surveyed annually in the summer months to record the presence of marine NNS. The monitoring programme has been introduced as part of the BWM Policy to detect NNS introductions and enable remedial actions to be undertaken. The results from the baseline survey found four NNS (OIC Marine Services, 2014c). Each of these species had been recorded in Orkney before and the baseline survey confirmed their presence and added knowledge on their distribution.

In summary, the environmental monitoring which has taken place to date indicates that the local environment of Orkney has not been significantly affected by the operations of Flotta Oil Terminal and STS transfers within Scapa Flow.

5.2 ASSESSMENT APPROACH

5.2.1 Introduction

The Regulations put in place a legislative regime for assessing and licensing harbour authorities which propose to allow STS transfer operations in their waters. The Regulations set out requirements to undertake environmental assessment (Schedule 2) and where appropriate an assessment of the impacts on European Sites (Schedule 1).

The purpose of the environmental assessment is to identify the potential significant effects that the proposed cargo transfers are likely to have on the environment.

The approach to the environmental assessment and determination of likely effects on European sites are discussed below.

5.2.2 Approach to the Environmental Assessment

The environmental assessment steps for the proposed cargo transfers are as follows:

- 1)** Prediction and assessment of potential environmental effects.
- 2)** Identification of mitigation measures.
- 3)** Assessment of residual environmental effects.

The sections below provide further details on the steps used in the assessment.

5.2.2.1 Prediction and assessment of Potential Environmental Effects

The potential unmitigated environmental effects that may arise from the proposed cargo transfers were predicted, including effects resulting from the following project aspects (listed in Schedule 2 (2 b) of The Regulations):

- The nature of the activities to be carried out and the manner in which they are carried out.
- The use of natural resources.
- The emissions of pollutants.
- The creation of nuisances.
- The elimination of waste.

The environmental effects considered covered direct and in-direct effects, secondary effects, cumulative effects, short-term, medium-term or long term effects, permanent and temporary effects and both positive and negative effects. In-combination effects were also assessed.

The potential environmental effects that may arise from the proposed cargo transfers were assessed against the environmental baseline to determine if they were likely to significantly affect the environment. The following were taken into account to assess this:

- The sensitivity or importance of the receiving environment or receptor.
- The likelihood of the effect occurring.
- The magnitude of the effect (incorporating scale, size and duration of the effect).

Numerical modelling was used to support the environmental assessment to help assess the impacts of accidental oil spill. Oil spills were modelled at the STS locations for light, medium and heavy oils; a variety of wind conditions derived from data collected at the Barrel of Butter, and for a full spring-neap tidal cycle. Details of the modelling approach are provided in Appendix B, along with the results of the modelling assessment. The modelling provided a quantitative assessment of potential impacts across the area and provided context for the magnitude of the potential impacts, likelihood of the impacts and overall significance.

5.2.2.2 Identification of Mitigation Measures

Schedule 2 paragraph 2(d) of The Regulations requires the Environmental Statement to include a description of *“the measures envisaged to prevent or reduce, and where possible offset, any significant effects of the proposed cargo transfers on the environment, including, if appropriate, any changes proposed to the harbour authority’s oil pollution emergency plan maintained in accordance with regulation 4 of the Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation) Regulations 1998(a)”*. These can be referred to as mitigation measures.

OIC already has a variety of mitigation measures in place. Implementation of these measures will ensure that the adverse environmental effects of the proposed cargo transfers are minimised wherever possible to as low as reasonably practicable (ALARP).

5.2.2.3 Prediction of Residual Environmental Effects

Following the application of mitigation measures any remaining residual effects were predicted.

5.2.3 Approach to Habitats Regulation Appraisal

The Regulations require the harbour authority to determine in accordance with the procedure in Schedule 1 of The Regulations, whether the cargo transfers to be authorised would be likely to have a significant effect on any European Sites. Schedule 1 of The Regulations refers to the Habitats Directive.

To determine whether the cargo transfers to be carried out are likely to have a significant effect on any European site, either individually or in-combination with other plans or projects, a screening assessment was carried out.

If it is determined that the proposed cargo transfers are likely to have a significant effect on any European site then the Secretary of State will make an AA of the implications of the proposed cargo transfers for the European site, in

view of the conservation objectives of the site, for the purposes of Article 5 of the Habitats Directive.

Environmental assessment of the release of ballast water into Scapa Flow has been assessed as part of the AA of BWM Policy (Intertek, 2013b), where relevant, results from this assessment were drawn upon.

5.2.3.1 Screening

The HRA screening process applied the following steps as set out in SNH's HRA guidance document (Tyldesley, 2012):

- 1) Screen the project for likely significant effects on a European Site.
- 1) Apply mitigation measures.
- 2) Re-screen the plan after mitigation measure have been applied.
- 3) Determine if impacts are likely to be significant.

The possible risks to designated sites posed by a STS transfer operation were identified. The designated sites were screened to determine whether a proposed cargo transfers either on its own or in-combination with other plans or projects is likely to cause any significant effects.

The Regulations require SACs, SPAs and Ramsar sites to be considered in the assessment. However, SSSI and proposed Marine Protected Areas (pMPAs) were also included in the screening. Reasons for the inclusion of SSSI and pMPA in the assessment are set out below.

The relevant designations are summarised below:

- **Special Areas of Conservation (SACs)** are designated sites under the Habitats Directive (Council Directive 92/43/EC). SACs are selected for particular habitats listed on Annex I and for species listed on Annex II of the Habitats Directive.
- **Special Protection Areas (SPAs)** are classified under the Birds Directive (Council Directive 2009/147/EC). SPAs are selected for a number of rare, threatened or vulnerable bird species listed in Article 4 of the Birds Directive, and also for regularly occurring migratory species.
- **Ramsar sites** are designated under the Convention on Wetlands (Ramsar, Iran, 1971), known as the "Ramsar Convention" to protect wetlands of international importance. In Scotland all Ramsar sites are also either SACs or SPAs. Although there is no specific legal framework that safeguards Scottish Ramsar sites, they are afforded the same protection as the Natura sites they overlap.
- **Sites of Special Scientific Interest (SSSI)** are nationally important areas of land and water (above mean low water) in Great Britain. In Scotland SSSIs are designated by SNH under the Nature Conservation (Scotland) Act 2004. SSSIs are protected by law and it is an offence for any person to intentionally or recklessly damage the protected natural features of a SSSI. SSSIs in Scotland are those areas that SNH considers to best represent Scottish natural heritage for its diversity of plants, animals, habitats, geology, landforms or a combination of these natural features. Most of the terrestrial Natura sites in Scotland are also SSSIs.

- **Proposed Marine Protected Areas (pMPA)** are designated by Scottish Ministers under the Marine (Scotland) Act 2010. These possible MPAs have been approved by Scottish Ministers for public consultation. As such, the locations are afforded policy protection as if they were designated. While these are not specifically referred to in The Regulations, we believe that the environmental assessment should also consider impacts on pMPA when these are designated.

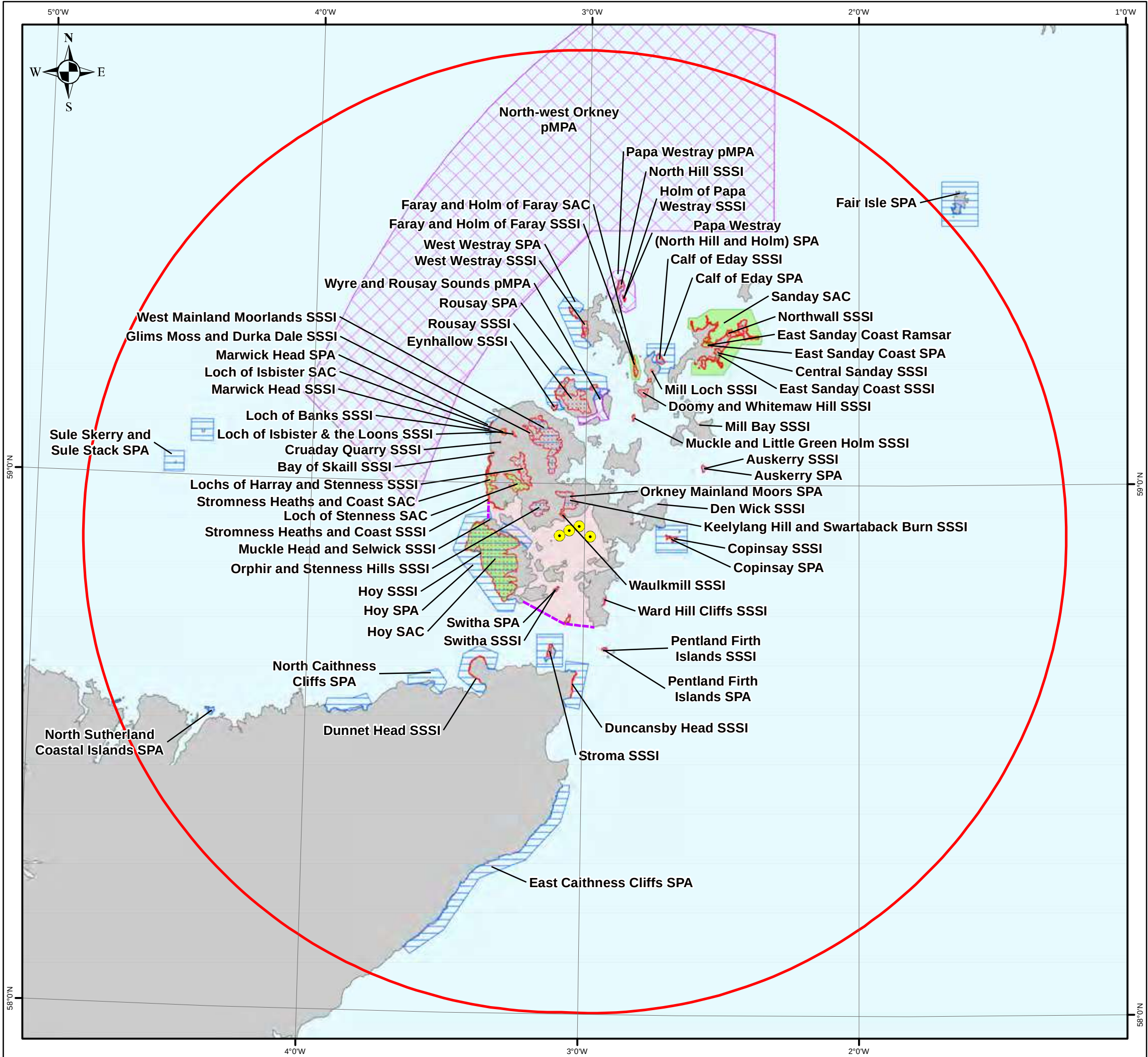
Numerical modelling was used to support the screening process to help assess the potential impacts on the designated sites. This provided a quantitative assessment of potential impacts and enabled the extent of an accidental oil spill and timescales to impacts at designated sites to be established.

5.2.4 Sites considered in the assessment

All designated sites within the Orkney Islands and Pentland Firth were considered in the assessment. In addition SPAs with seabirds within a distance of 100 kilometres (km) of the proposed cargo transfer locations were considered. These sites were considered because seabirds are known to forage outside of their SPAs and these seabirds may travel to the Scapa Flow and be impacted by an accidental oil spill.

Whilst it is acknowledged that seabirds may forage greater distances than 100 km, it is recognised that species from SPAs further away are less likely to travel to Scapa Flow in high enough numbers for the population of qualifying species to be significantly impacted. It is anticipated that SPAs within 100 km of the proposed cargo transfer locations are more likely to be adversely impacted than those further away.

The sites considered within the assessment are shown in Figure 5-3.



ORKNEY ISLANDS COUNCIL Oil Transfer Licence Application

Figure 5-3: Sites considered in the assessment

Legend

- Ship-to-Ship Transfer Location
- Scapa Flow Harbour Limits

100km Search Area

Designated Sites

SPA

SAC

Ramsar

SSSI

pMPA

Scapa Flow Harbour Area



NOTE: Not to be used for Navigation

Date	Thursday, June 26, 2014 12:21:05
Projection	British_National_Grid
Spheroid	Airy_1830
Datum	D_OSGB_1936
Data Source	GEBCO, JNCC, SNH, OIC, MS
File Reference	J:\P1861\Mxd\ES_Report\Protected_areas_All.mxd
Created By	Emma White
Reviewed By	Ian Charlton
Approved By	Fiona Bell



5.3 ASSESSMENT OF ENVIRONMENTAL EFFECTS

5.3.1 Potential Environmental Effects

This section addresses the requirements of The Regulations Schedule 2 – 2 (1) and (2).

The potential environmental effects that could arise during a proposed cargo transfer have been identified for the following environmental topic areas as required in Schedule 2 (2 a) of The Regulations:

- Human beings.
- Fauna and flora.
- Water.
- Air.
- Landscape.
- Material assets.
- Cultural heritage.

The topics of soil and climate have been screened out of the assessment for the following reasons:

- **Soil** - The proposed cargo transfers will take place afloat in Scapa Flow and therefore will not have any significant impact on soils.
- **Climate** - Emissions of greenhouse gases from the proposed cargo transfer will be insignificant.

The main environmental risks identified are likely to be from the following project activities:

- Movement and presence of ships.
- Accidental oil spill.
- Discharge of ballast water during transfer process.

The way in which these activities may impact the environment is discussed below.

5.3.1.1 Movement and presence of ships

Ships moving in and out of the area, and undertaking transfer operations, may lead to disturbance to birds and marine mammals in the area. Ships anchoring to undertake a cargo transfer may cause damage to the seabed.

It has been determined that there are, on average, 8,000 ships per annum within 25 miles of the Orkney coastline. Therefore, 36 STS cargo transfers per annum (average of three per calendar month and 2 ships per operation) amount to 0.9% of ship movements around Orkney.

5.3.1.2 Accidental oil spill

Accidental oil spill could arise during a proposed cargo transfer or due to accidental fire or explosion onboard.

During a cargo transfer an oil spill could occur during:

- the approach manoeuvre to the STS locations;
- berthing;
- mooring;
- hose connection;
- the transfer operation itself;
- hose disconnection;
- unmooring; and
- separation manoeuvre

Accidental fire or explosion onboard could cause a tank to be breached.

Hydrocarbons being released into the sea on a large scale would be likely to result in a significant negative effect on the environment.

The severity of environmental damage caused by a particular oil spill depends on many factors, including the amount of the oil spilled, the type of oil, the location of the spill, the species of wildlife in the area, the timing or breeding cycles and seasonal migrations, and the prevailing weather during and immediately after the oil spill.

5.3.1.3 Discharge of Ballast Water

During a cargo transfer operation the receiving ship (daughter vessel) will need to release ballast water in order to maintain ship stability. This will occur during cargo transfer and will be conducted in accordance with the OIC BWM Policy.

Ballast water is salt water that is held in, or discharged from, specially constructed and segregated tanks (i.e. meaning that ballast water cannot mix with other cargo, such as oil). Ballast water is used to provide stability and manoeuvrability during ship transit, especially when the ship is not carrying cargo. When ballast water is taken onboard it may contain organisms and chemicals from the source port. This water may contain NNS. Ballast water is discharged to compensate for the weight of cargo taken onboard.

OIC Harbour Authority has implemented a comprehensive BWM Policy which implements the requirements of the International Maritime Organisation (IMO) International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention). The BWM Convention was introduced to prevent and reduce the introduction of harmful or alien species to the marine environment from ballast water.

All ships undertaking a cargo transfer must carry out an IMO and OIC BWM Policy compliant ballast water exchange prior to entering Scapa Flow. If a ship has an onboard treatment system then this must be used in addition to undertaking ballast water exchange. The OIC policy of exchange and

treatment exceeds the IMO BWM Convention requirements, which requires exchange only initially and then treatment only in the longer term.

The amount of ballast water discharged is limited to the minimum essential quantity. Before a STS would be allowed to begin, details and records of ballast water exchange would be inspected by OIC Harbour Authority to ensure compliance with the BWM Policy. They may require a ship to submit a ballast water sample for testing and analysis prior to being given permission to discharge, and place limits on the total quantity to be discharged in Scapa Flow or require additional safe guards or restrictions. If ship operators cannot demonstrate compliance with the BWM Policy, discharge will not be permitted.

5.3.2 Impact Significance, Mitigation and Residual Effects

The significance of each potential environmental effect from the above activities was assessed in the context of the receiving environment. Numerical modelling was used for the assessment of accidental oil spill. The modelling results are presented in Appendix B and used here to provide context for the likelihood, magnitude and significance of the potential effects.

The effect was first assessed for the unmitigated situation and where potential effects were identified, appropriate mitigation measures were recommended. The impact significance was then re-assessed post mitigation, to determine residual effects.

Mitigation measures and residual effects are defined as follows:

Mitigation measures are as specified in The Regulations “*measures envisaged to prevent or reduce, and where possible offset, any significant effects of the proposed cargo transfers on the environment*”.

Residual effects are significant effects remaining after mitigation.

The assessment of potential environmental effects of the proposed cargo transfers from the three project activities likely to effect the environment is presented in Table 5-1.

Table 5-1: Assessment of potential significant effects of the proposed cargo transfers

Determination of Potential Effects		Pre-Mitigation Effects						Consideration of Mitigation Measures	
Project Activity	Potential Environmental Effect	Adverse/ Beneficial	Direct/Indirect	Permanent/Temporary	Duration	Significance	Mitigation Measures	Residual Environmental Effects	
Movement and presence of ships	Disturbance of marine mammals and seabirds	Adverse	Direct	Temporary	Short Term	Scapa Flow is an important area for marine mammals and seabirds. Disturbance could arise from propeller induced noise as well as noise propagating from the ship hull from onboard machinery e.g. pumps and generators. The likelihood of this effect causing significant disturbance is considered to be low, as the shipping industry has co-existed with wildlife for many years. The frequency of proposed cargo transfers (not exceeding an average of three per calendar month) will result in a minor increase in shipping activities. The magnitude of the effect will be small in scale, duration and size. Disturbance of marine mammals and seabirds is not considered to be significant.	Ships to be under pilotage as per Competent Harbour Authority (CHA) directions within Scapa Flow and travelling at slow speeds such that disturbance will be minimised.	No residual impacts predicted.	
	Seabed disturbance due to anchoring	Adverse	Direct	Temporary	Medium Term	Seabed disturbance could occur in the vicinity of the proposed cargo transfers from anchoring of ships. Anchors typically penetrate the seabed for a few meters in depth and may drag over some distance before holding. The seabed below the STS locations is mud with shell fragments and occasional unattached red algae with common large infaunal burrows and fairly benign in terms of benthic ecology. The extent of the effect is likely to be limited and the seabed will recover within one year. The frequency of operations (not exceeding an average of three per calendar month) is not expected to significantly impact the seabed. Therefore, seabed disturbance is not considered to be significant.	Transfer operations are restricted spatially to reduce the scale of seabed disturbance.	No residual impacts predicted.	
	Emissions from ships engines and pumps during a transfer operation carbon dioxide (CO ₂), nitrogen oxides (NO _x), sulphur oxides (SO _x) and Particulate Matter (PM))	Adverse	Indirect	Temporary	Short Term	During a transfer operation there will be emissions to the atmosphere of CO ₂ , SO _x , NO _x and PM from combustion productions from engines, pumps and generators. These releases will be no different to releases from past STS operations in the area. The frequency of proposed cargo transfers (not exceeding an average of three per calendar month) will result in a minor increase in emissions. However, the scale of the effect is small and will only occur during the transfer operation. Therefore, the effect is not considered to be significant.	Application of IMO guidelines for control of emissions will ensure that there will be no significant effects. Use of low sulphur fuels.	No residual impacts predicted.	

Determination of Potential Effects		Pre-Mitigation Effects				Consideration of Mitigation Measures		
Project Activity	Potential Environmental Effect	Adverse/ Beneficial	Direct/Indirect	Permanent/Temporary	Duration	Significance	Mitigation Measures	Residual Environmental Effects
	Venting of hydrocarbons during transfer operations	Adverse	Indirect	Temporary	Short Term	During a transfer operation there will be venting of hydrocarbons into the atmosphere. The process creates volatile organic compound (VOC) emissions from the oil tanks. The main compounds of interest with respect to air quality are benzene and toluene. Ships must comply with industry-standard control methods to reduce emissions of VOCs as far as practicable. The impact will be no different from that of previous STS transfer operations.	Operations should follow guidance from the IMO on minimisation of VOC emissions to the atmosphere. Including provision and maintenance of pressure control, relief systems and vapour recovery systems.	No residual impacts predicted.
	Impacts of coastal views and seascape	Adverse	Indirect	Temporary	Short Term	The presence of ships within Scapa Flow will be visible from the shore. The magnitude of the effect will be small in scale and duration. Ships have been anchored in Scapa Flow for over 100 years e.g. WWI and WWII fleets. As the proposed cargo transfers will be taking place within an existing operational port the impacts are considered to be insignificant.	N/A	No residual impacts predicted.
	Humans inhaling toxic fumes during a transfer operation	Adverse	Direct	Temporary	Short Term	The cargo transfer process can result in the release of VOCs associated with pungent odours. The designated transfer locations are located more than 2 km offshore. Emissions will be diluted and dispersed to insignificant levels over this distance and therefore will not cause a significant impact on human health.	Application of IMO guidelines for control of emissions will ensure that there will be no significant effects.	No residual impacts predicted.
	Impacts of odour	Adverse	Direct	Temporary	Short Term	The designated transfer locations are located more than 2 km offshore. The frequency of proposed cargo transfers (not exceeding an average of three per calendar month) may result in a minor increase in odour. Odour will be diluted and dispersed to insignificant levels over this distance and therefore will not be significant.	Application of IMO guidelines for control of emissions will ensure that there will be no significant effects.	No residual impacts predicted.

Determination of Potential Effects		Pre-Mitigation Effects						Consideration of Mitigation Measures	
Project Activity	Potential Environmental Effect	Adverse/ Beneficial	Direct/Indirect	Permanent/Temporary	Duration	Significance	Mitigation Measures	Residual Environmental Effects	
	Increased waste - bilge water, sludge, other waste	Adverse	Indirect	Temporary	Short Term	Waste levels may increase as a result of the proposed cargo transfers as a result in a minor increase in shipping levels (not exceeding an average of three per calendar month), however the increase in waste will be minimal and there are adequate facilities at Scapa Pier or Stromness Harbour for waste reception. This is then delivered to the Waste Disposal Authority for disposal. The magnitude of this effect is considered to be small and it is considered to be insignificant.	Port Waste Management Plan.	Application of the Port Waste Management Plan will ensure all waste material is correctly collected and disposed of. No residual impacts predicted.	
	Positive impacts on local economy due to proposed cargo transfers	Beneficial	Indirect	Temporary	Medium Term	An increase in shipping activities associated with the proposed cargo transfers will have an economic impact. It will ensure jobs for local tug boat workers and enable economic growth. This will have a positive impact on the local economy.	N/A	N/A	
Accidental oil spill	Negative impacts on income	Adverse	Indirect	Temporary	Short Term	In the unlikely event of a significant oil spill a negative impact on income across a variety of industries might be experienced. Incomes affected by an oil spill would include those employed in fishing, aquaculture, tourism and recreation industries. The magnitude of this effect will depend on the size of the spill and environmental influences at the time of the spill. The likelihood of such an oil spill occurring is considered to be very low. Therefore, the effect is not considered to be significant.	Application of best practice in proposed cargo transfer activities. Application of the Oil Spill Contingency Plan (OSCP).	No residual impacts predicted.	
	Consumption of contaminated seafood	Adverse	Indirect	Temporary	Short Term	Scapa Flow is an important area for aquaculture. Eating contaminated seafood following an oil spill can impact human health. Scapa Flow is dredged for scallops and also contains a number of fin fish farms. In the event of a significant oil spill these may become impacted by oil and become contaminated. The modelling results (Appendix B) indicate that oil has the potential to impact fin fish sites in Scapa Flow. However, the likelihood of an oil spill occurring is considered to be very low. Therefore, the effect is not considered to be significant.	Cultivation of seafood should be banned from human consumption.	No residual impacts predicted.	

Determination of Potential Effects		Pre-Mitigation Effects					Consideration of Mitigation Measures	
Project Activity	Potential Environmental Effect	Adverse/ Beneficial	Direct/Indirect	Permanent/Temporary	Duration	Significance	Mitigation Measures	Residual Environmental Effects
	Marine pollution	Adverse	Direct/Indirect	Temporary	Medium Term	Oil spill into the marine environment will have a direct impact on water quality. Oil spill reduces oxygen absorption of water due to the surface slick, causes chemical contamination and reduces light penetration into the water column, limiting photosynthesis of marine plants and phytoplankton. A large oil spill will have a significant impact on the environment and lead to direct and indirect effects on a wide range of marine life from plankton to marine mammals. The likelihood of an oil spill occurring is very low but the consequences of this would be significant.	Application of best practice in proposed cargo transfer activities. Application of the OSCP.	Adoption of best practice methods will reduce the risks of oil spill. If a small spill occurs the spill will be minimised in scale and effects managed.
	Negative impacts on birds	Adverse	Direct	Temporary	Medium Term	Scapa Flow is an important area for seabirds. Seabirds and shorebirds are highly sensitive to oiling. As the majority of the split oil will remain at the sea surface the most at risk are bird species which are found on the sea surface, this includes divers and waders. There is little evidence of long term impacts of oil spills on birds and local populations are likely to recover in the short to medium term (Moore, 2006). However, the magnitude of the impact is considered to be large. The modelling results (Appendix B) indicate that an oil spill event has the potential to impact anywhere in Scapa Flow and around the coastline. The likelihood of an oil spill occurring is very low but the consequences of this on birds would be significant.	Application of best practice in proposed cargo transfer activities. Application of the OSCP.	Adoption of best practice methods will reduce the risks of oil spill. If a small spill occurs the spill will be minimised in scale and effects managed.

Determination of Potential Effects		Pre-Mitigation Effects					Consideration of Mitigation Measures	
Project Activity	Potential Environmental Effect	Adverse/ Beneficial	Direct/Indirect	Permanent/Temporary	Duration	Significance	Mitigation Measures	Residual Environmental Effects
	Negative impacts on marine mammals	Adverse	Direct	Temporary	Medium Term	Scapa Flow is an important area for seals, cetaceans and otters. Marine mammals such as otters and seals can be impacted by oil spill as the oil coats their fur and poisons them (National Oceanic and Atmospheric Administration (NOAA), 2014a). High concentrations of oil can lead to marine mammals dying from poisoning. As most oil floats, mammals most affected by oil are those found on the sea surface or on shorelines (NOAA, 2014a). Cetaceans can be affected by oil clogging their blow holes; however the likelihood of this occurring is low. Marine mammals are not particularly sensitive to oiling due to their ability to move away from an oil spill and their body mass. In the long term there has been evidence of oil materials entering marine mammals through water and food and causing an adverse effect on reproduction, growth and behaviour. Although the likelihood of this is considered low. The magnitude of the effect to marine mammals is considered to be small to moderate. The likelihood of an oil spill occurring is very low, however if an oil spill occurred it could have a moderately significant impact on marine mammals.	Application of best practice in proposed cargo transfer activities. Application of the OSCP.	No residual impacts predicted.
	Negative impacts on fish	Adverse	Direct	Temporary	Short Term	Adult and juvenile populations are not usually significantly impacted by oil spill (NOAA, 2014b), with larval and spawning stages being most at risk. If an accidental oil spill occurs un-farmed fish are able to move away from impact, therefore the magnitude of the effect is considered to be small. Farmed fish will not be able to move away from the impact. The modelling results (Appendix B) indicate that oil has the potential to impact fin fish sites in Scapa Flow. The likelihood of an oil spill occurring is considered to be very low, however the effect is considered to be significant.	Application of best practice in proposed cargo transfer activities. Application of the OSCP.	No residual impacts predicted.

Determination of Potential Effects		Pre-Mitigation Effects					Consideration of Mitigation Measures	
Project Activity	Potential Environmental Effect	Adverse/ Beneficial	Direct/Indirect	Permanent/Temporary	Duration	Significance	Mitigation Measures	Residual Environmental Effects
	Shellfish contamination	Adverse	Indirect	Temporary	Medium Term	Oil spill can contaminate seafood stocks even when only exposed to pollutant for a very short time period. Shellfish are relatively immobile and therefore are not able to avoid exposure to oil (NOAA, 2014b). It is considered unlikely that an oil spill event would occur, therefore the likelihood of this impact is considered to be low. The significance of the effect is considered to be significant.	Application of best practice in proposed cargo transfer activities. Application of the OSCP. Cultivation of shellfish should be banned from human consumption.	No residual impacts predicted.
	Negative impacts on shorelines (rocky, sandy, muddy and saltmarsh)	Adverse	Direct	Temporary	Short to Medium Term	The shorelines around Scapa Flow consist of rocky shores, sandy shores, muddy shores and saltmarsh. The significance of effects depends on the type of shoreline. Coasts exposed to wave action generally recover quickly. Oil trapped in sheltered sediment habitats can cause more long-term impacts through chemical toxicity (Moore, 2006). The shorelines of Scapa Flow are low energy, therefore oil is likely to be more persistent. Rocky shores and sandy shores vary in their sensitivity to oiling (Dyrynda and Symberlist, 1998). However, oil can become incorporated in fine sands and persist for many years. Crevices in rocky shores can also trap oil. Muddy shorelines are sensitive to oiling and are often difficult to clean. Anaerobic conditions mean any oil in the mud takes a long time to breakdown. In sheltered locations mud can remain toxic for at least 20 years (Moore, 2006). Saltmarshes act as an oil trap and generally have slow rates of recovery (Teal <i>et al.</i> 1992). The modelling results (Appendix B) indicate that depending on the wind direction and spill location an oil spill could impact the shoreline between 6 and 18 hours after an incident. Therefore, the magnitude of the effect of an oil spill on the shorelines around Scapa Flow is considered to be moderate. Although the likelihood of an oil spill occurring is considered to be very low, the effect of oil spill on shorelines is considered to be significant.	Application of best practice in proposed cargo transfer activities. Application of the OSCP. Ensuring oil spill response equipment is mobilised to ensure spill does not reach the sensitive shorelines. Sheltered areas are vulnerable to oil spill, therefore preventing oil contamination of such area is the best way of minimising long-term environmental effects.	No residual impacts predicted.

Determination of Potential Effects		Pre-Mitigation Effects				Consideration of Mitigation Measures		
Project Activity	Potential Environmental Effect	Adverse/ Beneficial	Direct/Indirect	Permanent/Temporary	Duration	Significance	Mitigation Measures	Residual Environmental Effects
	Seabed contamination	Adverse	Direct	Temporary	Long Term	Spilt oil can become incorporated into seabed sediments. Suspended oil can gain weight by bonding with materials and settle on the seabed. This oil can persist for a long period of time and can go onto impact the benthic community of the area. The magnitude of the effect is considered to be moderate, however the likelihood of an oil spill occurring is considered to be very low. Therefore, oil spill causing seabed contamination is considered to be not significant.	Application of best practice in proposed cargo transfer activities. Application of the OSCP.	No residual impacts predicted.
	Negative impacts on aquaculture and fishing	Adverse	Indirect	Temporary	Short Term	As discussed above an oil spill may impact aquaculture and fishing in the area. Caged fish are unable to move away from an oil spill. The modelling results (Appendix B) indicate that oil has the potential to impact fin fish sites in Scapa Flow, therefore this could have an impact on the aquaculture and fishing industry. This industry is important to the Orkney Islands. If fish farms are affected by oil spill then cultivation should be banned from human consumption to ensure contamination does not spread up the food chain. Impacts will be temporary and short term. The likelihood of an oil spill occurring is considered to be very low, therefore no significant effects are predicted.	Caged fish should be moved if possible. Application of the OSCP to contain spill as much as possible. Ensuring oil spill response equipment is mobilised to ensure spill does not reach the shore or vulnerable aquaculture sites.	No residual impacts predicted.
	Negative impacts on recreation and tourism	Adverse	Indirect	Temporary	Short Term	Scapa Flow is an important area of recreation and tourism. The area of Scapa Flow is designated as a recreational water by SEPA. Following an accidental oil spill indirect impacts could occur on recreation in the area, as bathing, diving, angling and boating are likely to be restricted. Impacts will be temporary and short term. Indirect impacts may also occur on tourism of the area following an accidental oil spill. This will also be temporary and short term. Therefore, the magnitude of the effects is considered to be small. As the likelihood of an oil spill occurring is considered to be low then the effects are predicted to be not significant.	Application of the OSCP to contain spill as much as possible.	No residual impacts predicted.

Determination of Potential Effects		Pre-Mitigation Effects						Consideration of Mitigation Measures	
Project Activity	Potential Environmental Effect	Adverse/ Beneficial	Direct/Indirect	Permanent/Temporary	Duration	Significance	Mitigation Measures	Residual Environmental Effects	
	Access to cultural heritage wrecks reduced	Adverse	Indirect	Temporary	Medium Term	Oil spill may lead to reduced access to cultural heritage sites within the area. There are numerous wreck sites for divers across Scapa Flow. The majority of these are located in the western side of Scapa Flow, therefore away from the STS locations. Therefore, the magnitude of this effect is considered to be small. The likelihood on an oil spill occurring is considered to be very low, therefore no significant effects are predicted.	Application of best practice in proposed cargo transfer activities. Application of the OSCP.	No residual impacts predicted.	
Release of ballast water	Introduction of NNS from ballast water release causing biological disturbance	Adverse	Indirect	Permanent	Long Term	If established NNS may have the ability to potentially upset the balance of the existing ecosystem. Biological disturbance can occur due to displacement of native species, competition for food and space, smothering of species and fouling on structures. The likelihood of this occurring is considered to be low, however the magnitude is considered to be high, as any invasive NNS establishments would be difficult to eradicate. It is considered that the consequences of a NNS introduction would be significant.	Application of OIC BWM Policy.	No residual impacts predicted.	
	Introduction of NNS impacting local economy	Adverse	Indirect	Temporary/ Permanent	Long Term	Once established it can be extremely difficult to get rid of an invasive species in the marine environment. If NNS become established eradicating them is highly costly. Methods are often labour intensive. Therefore, the effect is considered to be significant.	Application of OIC BWM Policy.	No residual impacts predicted.	
	Introduction of NNS impacting water quality status under the Water Framework Directive (WFD)	Adverse	Indirect	Permanent	Long Term	Introduction of NNS may have impacts on the WFD status of the area. If one of the key species is found to be present and reproducing successfully then it could result in the water body failing to meet environmental objectives. Under the WFD the presence of any of the key NNS will mean that the highest classification of ecological status SEPA can assign can be “Good”. The likelihood of this occurring is considered to be low, but the magnitude is considered to be high. Therefore, the effect is considered to be significant.	Application of OIC BWM Policy.	No residual impacts predicted.	

5.3.3 Potential Effects Discussion

The table above (Table 5-1) assessed the significance of each potential environmental effect from the proposed cargo transfers. These section summaries' the effects for each environmental topic required for consideration in Schedule 2 of The Regulations.

5.3.3.1 Human Beings

The proposed cargo transfers will not have any adverse effects on human health. The transfer procedures may lead to odour and fumes in the atmosphere. However, the transfer locations are located more than 2 km offshore, over this distance the fumes emissions and odour will be diluted and dispersed to insignificant levels and therefore will not cause a significant impact on human health.

In the unlikely event on an oil spill, seafood may become contaminated with oil. Following this, cultivation will be banned from human consumption. An oil spill would have indirect effects on income. Procedures are in place to prevent the accidental discharge of oil.

An increase to former levels of shipping activities associated with the proposed cargo transfers would have a positive effect on the local economy.

5.3.3.2 Fauna and Flora

Effects of disturbance of marine mammals and seabirds due to the proposed cargo transfer are considered to be insignificant, as the shipping industry and wildlife have co-existed for many years in Scapa Flow. The low frequency of the proposed cargo transfers (not exceeding an average of three per calendar month) is not considered to have a significant impact on seabed disturbance. Emissions of noise from engines, generators and pumps causing disturbance to marine mammals and seabirds are not considered significant.

The release of ballast water associated with the proposed cargo transfers will not cause a significant impact on fauna and flora in the area, as procedures are in place (i.e. OIC BWM Policy) for the control of ballast water and to prevent the introduction of harmful or alien species to the marine environment from ballast water.

In the unlikely event of an oil spill, in the absence of any mitigation measures, significant impacts may occur on birds, marine mammals, fish and shellfish within the area. Due to the low energy environment within Scapa Flow it is considered that the shorelines may be adversely impacted by an accidental oil spill. Consequences of an oil spill on a number of receptors could be significant. However, procedures are in place to prevent the accidental discharge of oil and the risk of a significant impact is considered unlikely. Therefore, no residual effects are predicted. In the unlikely event of an oil spill, the OIC Oil Spill Contingency Plan (OSCP) will be enacted to contain and remove pollutant. A copy of this can be found in Appendix E.

The potential impacts on the designated sites within 100 km of the proposed cargo transfer have been assessed and the findings are presented in the Habitats Regulations Assessment provided in Section 6.3.

5.3.3.3 Water

There will be operational releases of ballast water during the proposed cargo transfers. Procedures are in place for the control of ballast water (i.e. OIC BWM Policy) to ensure there are no significant effects on water quality. Procedures are also in place to prevent the accidental discharge of oil. In the unlikely event of an oil spill, the OIC OSCP will be enacted to contain and remove the pollutant.

5.3.3.4 Air

The main releases to the air from the proposed cargo transfers will be combustion products from engines and generators, and gases/vapours arising from the stored products during transfer operations. The main emissions to the air will be of CO₂, SO_x, NO_x and PM. As of 2006, there was a requirement for all ships in a port area for more than 2 hours to transfer to using marine gas oil rather than heavy fuel oil, thereby reducing emissions. As of 2015, all ships entering the emissions control area are required to burn low sulphur marine gas oil, thereby reducing emissions even further.

The low frequency of proposed cargo transfers (maximum of 3 per month) will ensure the scale of the effect is small and will only occur during the proposed transfer operation. When planning a proposed cargo transfer, operators should include consideration of emissions of VOCs, should seek to mitigate against such emissions and should consider the use of VOC recovery systems where available. It is considered that, with the application of IMO guidelines for the control of VOC emissions during product transfer operations and other regulations in place to regulate air pollution, there will be no significant effects upon air quality.

5.3.3.5 Landscape

The proposed cargo transfers will take place afloat in Scapa Flow. The transfers will take place between ships operating within an existing operational port. The operations are no different from previous STS transfer operations, therefore landscape impacts are considered to be insignificant.

5.3.3.6 Material Assets

There are no significant changes required to onshore infrastructure to support the proposed cargo transfers. The proposed cargo transfers are no different from previous STS transfer operations. The proposed cargo transfers may lead to a small increase in the waste levels, however there are procedures in place to ensure all waste material is correctly collected and disposed of.

In the unlikely event of an oil spill there may be negative effects on a number of industries including: fishing, aquaculture, tourism and recreation. Procedures are in place to prevent the accidental discharge of oil. In the unlikely event of an oil spill the OIC OSCP will be enacted to contain and remove the pollutant. As a result effects on material assets are considered to be insignificant.

5.3.3.7 Cultural Heritage

The proposed cargo transfers will take place afloat in Scapa Flow. In the unlikely event of an oil spill, it may lead to reduced access to cultural heritage wrecks within the area. The cultural heritage sites themselves will not be directly impacted by the proposed cargo transfers. Therefore, impacts on cultural heritage are considered to be insignificant.

5.3.3.8 Use of Natural Resources

There will be no significant use of natural resources associated with the proposed cargo transfers. There is no requirement for construction to support the operations. Fresh water will be supplied from the shore in the usual way.

5.3.3.9 Emissions of Pollutants

The main emissions from the proposed cargo transfers will comprise of:

- Emissions to the air of combustion products from engines, pumps and generators (SO_x, NO_x and PM).
- Emissions to the air of greenhouse gasses (CO₂).
- Emissions of noise from engines, generators and pumps.
- Discharge of ballast water.

All emissions will be minimised and controlled in accordance with current best practice. None of the emissions to the air result in a significant change from previous shipping operations in Scapa Flow.

Discharge of ballast water will follow the Harbour Authorities BWM Policy and ensure that, as a minimum, ballast water is exchanged with at least 95 % volumetric efficiency. Further to this, ballast water treatment will be undertaken prior to discharge whenever it is available on the ship. This will ensure that concentrations of NNS and presence of chemicals and metals within the ballast water are reduced and removed.

In the unlikely event of an accidental oil spill, contingency plans will ensure the pollutant is controlled and that the spill is minimised in its scale to prevent widespread impacts.

5.3.3.10 Creation of Nuisances

The proposed cargo transfers will be similar to previous shipping operations within Scapa Flow. The proposed cargo transfers will not create significant impacts in terms of visual intrusion, noise, odour and other potential sources of nuisance.

5.3.3.11 Elimination of Waste

The proposed cargo transfers will not generate significant amounts of waste. Ships engaging in transfer operations will transfer their waste into skips and this waste will be delivered to Scapa Pier or Stromness Harbour for appropriate disposal. The application of the Port Waste Management Plan and best practice will ensure that the disposal of waste does not pose a significant impact.

In the event of an oil spill, waste oil which has been contained or recovered from the spill will be delivered in leak proof containers to the licensed disposal facility on Orkney Mainland (Bossack hazardous waste transfer station WML/N/50019) for temporary storage in a secure containment area. After which it will be sent to a suitable licensed disposal facility on mainland Scotland.

5.3.3.12 In-Combination and Cumulative Effects

Other projects in the area which could give rise to in-combination effects include:

- Flotta Oil Terminal.
- Flotta oil pipeline.
- Royal Oak wreck.
- Development projects within the area include:
 - Construction of new hospital on the south side of Kirkwall (outline planning permissions granted June 2014).
 - Development of housing on the east side of Kirkwall (permitted but not started).
 - Development of housing on the west side of Kirkwall (pre-application).
 - Development of an industrial unit at Hatston Pier (pending decision).
 - Development of an industrial unit at Lyness (pending decision).

All of the developments above are more than 6 km away from the designated STS locations. Mitigation measures are expected to be incorporated during construction of these new developments to avoid or reduce pollution events during their construction phase and no significant effects are predicted. In-combination effects on air quality may also arise from the emissions from Flotta Oil Terminal. However, the emissions from Flotta are strictly monitored and controlled by SEPA. Therefore, no significant effects on air quality are predicted.

In-combination effects may occur with a combined risk of oil spill during a proposed cargo transfer and an oil spill from Flotta Oil Terminal. There is also a potential for in-combination effects from an oil spill from the Royal Oak wreck and from Flotta Terminal's main oil pipeline, which crosses Hoxa Sound. However, the likelihood of an oil spill from one of these sources is considered to be very low. Combined with the very low likelihood of an oil spill during a cargo transfer it can be concluded that no in-combination effects from oil spill are predicted.

There is some risk of collision with other marine traffic and this would possibly result in a rupture of cargo and/or fuel tanks, resulting in a large spill. This risk, however, is controlled by Vessel Traffic Services (VTS) and procedures in place for the movement of ships within Harbour jurisdictions, restrictions on speed, the use of experienced ship Masters, OIC authorised Pilot onboard and

structural integrity of ships. Therefore, the risk of collision is not considered to cause a significant effect.

In summary, it is not considered that potential effects from the proposed cargo transfer are likely to combine with effects from other local projects, existing or planned, to cause a significant effect on the environment.

5.3.4 Mitigation

This section provides a description of the measures that will be implemented to prevent significant environmental effects from the proposed cargo transfers.

5.3.4.1 Operational Techniques

The application of best practice in STS transfer activities including STS operation manuals, MARPOL Annex I Chapter 8 (on the prevention of pollution during the transfer of oil cargo between oil tankers at sea) and OIC Standard Operation Procedures will ensure the risk of an oil spill is minimised.

STS transfers are to comply with the ICS/OCIMF STS Transfer Guide (Petroleum) Guidance (4th Edition) and the approved STS agent's check list and procedures. Only those STS agents approved by OIC Harbour Authority are permitted to supervise STS operations within Scapa Flow.

A STS Superintendent will be in overall control of the transfer operation. In addition the mother and daughter vessels will carry crew trained and certified in the transfer of oil cargos.

All ships transiting to and from STS locations will carry a certified and authorised OIC Pilot whose duty is to advise the ships' Master on navigational issues and provide expert local knowledge.

The fenders between mother and daughter vessels will be positioned in such a way that they form an effective barrier containing any oil that may be released in the event of a transfer hose failure. Hoses and fenders will be certified for use and inspected regularly.

Scapa Flow harbour is located within an Emission Control Area (ECA). From 2006, ships must use marine gas oil rather than heavy fuel oil when in port for more than two hours. As of 2015, to comply with new regulations, ship operators must use fuel in engines and boilers with a sulphur content that is within the limits set down by the regulators. These have been put into European law by the European directive 2012/32/EC.

Slowing down vessel steaming can also reduce emissions. Regulations in place to regulate air pollution in ports and harbours include the following:

- The European Directive 2012/33/EC as regards the sulphur content of marine fuels, limiting the sulphur content of marine fuels in ports to 0.1 % (when at berth for two or more hours).
- The European Ambient Air Quality Directive (2008/50/EC) defines limit values for pollutants that are valid from 2012 onward.
- The European NEC Directive (2001/81/EC), which defines National Emission Ceilings (NEC). Member states of the European Union have to adopt programs to comply with these ceilings.

Proposed cargo transfers will not occur outside of the operational constraints (e.g. adverse weather conditions). In accordance with the Standard Operating Procedures (SOPs), all hoses will be disconnected and consideration given to unmooring the ships to separate anchorages until there is a moderation in the weather and operations can safely resume. OIC SOPs can be found in Appendix D.

Implementation of the BWM Policy will reduce risks from NNS introductions (see Section 5.3.1.3).

5.3.4.2 Oil Spill Response

If an accidental oil spill was to take place then application of the OSCP would considerably reduce the environmental effects of a spill. It will minimise the scale and extent of an oil spill. Significant effects on the environment through marine pollution should be reduced to short-term manageable effects if the contingency plan can contain and minimise the scale of the spill and prevent any widespread impact.

Severe clean-up actions often provide removal or dispersal of oil. However, aggressive physical clean-up actions may cause more environmental damage than the oil itself (Moore, 2006). For example, heavy machinery on shores can damage the physical structure of fragile habitats e.g. saltmarshes. These actions will be controlled.

Oil spill response equipment available in the event of a spill includes the following (Briggs Environmental Services, 2014):

- Tier 1 response equipment at Scapa Flow piers, oil spill response kits with capability of dealing with up to 250 litres of oil containing:
 - 4 x M55 adsorbent booms.
 - 1 x M95 adsorbent roll sections.
 - 25 x M75 absorbent pads.
 - 2 x extra-large oily waste sacks with tie wraps.
 - 8 x plug rug (0.2m x 0.2m).
 - 1 x Polypropylene Rope.
 - 1 x Polypropylene Rope.
 - 1 x Protective Goggles.
 - 1 x Protective Gauntlets.
 - 1 x Instruction Leaflet.
- Tier 1 response equipment at Stromness Harbour, oil spill response kits with capability of dealing with up to 1,500 litres of oil containing:
 - 1 x M50 adsorbent booms.
 - 1 x M90 adsorbent roll.
 - 300 x M75 absorbent pads.

- 1 x oleophilic mop/wringer bucket.
- 10 x extra-large oily waste sacks with tie wraps.
- 2 x plug rug (0.4m x 0.4m).
- 4 x Purse weights.
- 1 x Plastic Shovel.
- 1 x Polypropylene Rope.
- 1 x Coverall Suit.
- 1 x Protective Goggles.
- 1 x Protective Gauntlets.
- 1 x Deployment Manual.
- Tier 2 response equipment at Scapa Pier
 - 1 x Hoyle ocean guardian boom (250 m).
 - 1 x Ro-disk 15 skimmer.
 - 1 x Ro-vac recovery system.
 - 1 x Lamor minimax 12 brush skimmer.
 - 1 x Lamor minimax 30 brush skimmer.
 - 4 x Fastank Rapide.
 - 9 x Fastank Firefighter.
 - 4 x Containment salvage drums.
 - 1 x fuelproof 2000 litre bunded road tanker.
 - 3 x Stihl BR 550/600 .
 - 7 x Hoyle senator tank .
 - 10 x IBC Hem.
 - 6 x Makita air blowers.
 - 1 x Suzuki VP20 pump.
 - 1 x Hatz E75 spillmaster pump.
 - 1 x Honda GX120 'S' pump.
 - 1 x Jabsco utility pump.
 - 1 x Hydrainer pump.
 - 1 x Honda WT20X Trash pump.
 - 1 x Peugeot boxer pick up.
 - 1 x Hyster 7.00 8 tonne fork lift.

- 1 x Open flat road trailer.
- 1 x Portable electric generator.
- 1 x Simpson rope winch.

In the event of a Tier 2 oil spill, Briggs Environmental Services Limited will mobilise within 1 hour of notification and arrive on site as soon as possible.

In the event of an oil spill, the location of the pollutant, type of oil, source, cause, extent and direction of movement will be reported to the Oil Pollution Officer. Depending on the tier of the spill, different response actions will be mobilised.

Implementing the above mitigation measures will reduce risk of proposed cargo transfers having a significant effect on the environment.

5.3.5 Residual Impacts

Following the application of a pre-STs meeting and the above mitigation measures, it is unlikely that the proposed cargo transfers will have any residual effects on the environment. This is due to the following reasons:

- The track record of the harbour and oil terminal and associated environmental monitoring evidence.
- The location of the proposed cargo transfers.
- The experience and application of best practice procedures during transfer operations.
- The existence of mitigation measures including the OSCP.

The likelihood of an accidental oil spill occurring is very low and in the unlikely event of it taking place, comprehensive OSCPs are in place to ensure a spill is contained and minimise the risk of significant impacts on the environment. The OSCP can be found in Appendix E.

6 SCREENING OF EUROPEAN SITES

This Section of the application addresses the requirements of The Regulations – Schedule 1.

6.1 INTRODUCTION

The assessment of environment effects in Section 5.3 above has determined that there may be risks to European designated sites by the proposed cargo transfers. Given the proximity between the proposed STS locations and designated sites and the receptors of designated sites, protected species and key habitats may be at risk of significant effects. This section focuses on establishing which of the sites in the vicinity of the project could be impacted by the proposed cargo transfers and whether the sites are likely to be significantly impacted. This is undertaken through a screening process.

The screening process aims to examine the likely effects of the proposed cargo transfers, alone and in-combination with other plans or projects upon designated sites and considers whether it can be objectively concluded that these effects will not be significant.

A likely effect is defined as one that cannot be ruled out on the basis of objective information. The test is a 'likelihood' of effects rather than a 'certainty' of effects. Where a project is likely to undermine the site's conservation objectives, it must be considered likely to have a significant effect on the site. The assessment of that risk must be made in the light, amongst other things, of the characteristics and specific environmental conditions of the site concerned.

Appendix A, Section A-2 presents an environmental baseline review of the designated sites and relevant EPS to be considered in the assessment.

6.2 POTENTIAL EFFECTS ON DESIGNATED SITES

The following potential significant effects on designated sites have been identified:

- Presence and movement of ships.
- Accidental oil spill.
- Discharge of ballast water during the transfer process.

The potential impacts on designated sites from the proposed cargo transfers are listed in Table 6-1.

Table 6-1: Potential impacts on designated sites

Project Activity	Potential Impact
Presence and movement of Ships	• Emissions to air from ships engines/hydrocarbon venting during transfer operations • Disturbance to marine species
Accidental oil spill	• Smothering of habitat or species causing damage or destruction • Fragmentation of habitat • Prevention of natural processes due to presence of oil • Chemical contamination of water
Discharge of ballast water	• Biological disturbance through introduction of NNS, heavy metals and discolouration of water.

Each of the potential sources of impacts is considered further below.

6.2.1 Presence and movement of ships

Presence and movement of ships undertaking transfer operations could lead to airborne pollution affecting qualifying species. Presence of ships could also lead to visual and noise disturbance of qualifying bird species in the area.

Airborne pollution - Within the assessment above on impacts on air quality it was established that the levels of proposed cargo transfers will not increase above past STS transfer operation levels. These releases will be no different to releases from past STS operations in the area. The low frequency of proposed cargo transfers will ensure the scale of the effect is small and will only occur during the transfer operation. Therefore, the levels of emissions are not likely to have a significant effect on qualifying species. With the application of IMO guidelines for control of emissions there will be no significant effects upon air quality. Therefore, the impact is not considered further.

Disturbance - It is recognised that some bird species can have large foraging distances (Thaxter *et al.*, 2012) and therefore some birds from SPAs within a considerably large radius of the project area could potentially be present during the proposed cargo transfers. However, the main impact to these individuals would be disturbance and potential displacement from the feeding ground. Marine mammals may be disturbed by the proposed cargo transfers, including cetaceans and seals. However, there are no sites within the immediate area designated for these species. The closest site is Muckle and Little Green Holm SSSI (24 km) designated for grey seals. The movements and mooring of ships are considered to be part of the normal port operations and there will be no significant increase above previous levels (not exceeding an average of three per calendar month) in port operations or shipping traffic as a result of the proposed cargo transfers. It is not considered that noise from engines, generators and pumps would disturb marine mammals and seabirds. The potential for the proposed cargo transfers to cause disturbance above what exists at present is considered negligible and a significant effect on designated sites is not likely. Therefore, this impact is not considered further.

6.2.1.1 Accidental Oil Spill

Water based pollution as a result of an accidental oil spill may affect qualifying species either directly or indirectly through damage to habitats and potential effects on prey species. An oil spill could directly impact qualifying bird species by birds ingesting oil or by their feathers becoming oiled. Many birds use the area of Scapa Flow to forage and feed, therefore an oil spill incident in the area could cause significant impacts on designated sites and birds using the area. The impact of accidental oil spill is considered further.

6.2.1.2 Discharge of Ballast Water

The discharge of exchanged ballast water within Scapa Flow during a proposed cargo transfer may have an impact on designated sites. The only site within the area which has the potential to be impacted from biological disturbance through introduction of NNS is the Loch of Stenness SAC. An AA was undertaken for this potential impact and it was ascertained beyond reasonable scientific doubt that with the mitigation measures enforced by OIC's BWM Policy the discharge of ballast water would have no adverse effect on the integrity of any European Sites. Therefore, this impact is not considered any further in this screening assessment.

6.2.1.3 Possible In-Combination Effects

The relevant projects considered for the potential of in-combination effects on designated sites are listed in Section 5.3.3.12 above. The identified projects within the area are not predicted to cause a significant impact. Therefore, it is not considered that potential impacts from the proposed cargo transfers are likely to combine with impacts from other local projects, existing or planned, to cause a significant effect on the designated sites.

6.3 SCREENING OF DESIGNATED SITES

The sites considered within the assessment are shown above in Figure 5-3. These sites were screened to determine whether they are likely to be effected by the proposed cargo transfers and an associated oil spill. Screening involved consideration of the qualifying interests of the designated sites to determine if they were likely to be significantly affected by an accidental oil spill.

Modelling of an oil spill from the various STS locations indicated that the likely zone of impact would be the area of Scapa Flow (see Appendix B). Mobile species outside of this area, such as seabirds from designated sites outside the likely zone of impact, may travel into Scapa Flow and therefore may be affected. For these sites foraging distances were assessed to determine if these species could forage within the zone of impact and potentially be impacted by an oil spill. Foraging ranges for seabirds during the breeding season were extracted from Thaxter *et al.* (2012) to establish which SPAs had the potential for connectivity to Scapa Flow. It is also recognised that during the non-breeding season species tend to range more widely and establishing connectivity with sites is more complex.

Screening was undertaken using the following two steps:

- 1) Determine the likelihood of an interaction between the oil spill and receptor.
- 2) Determine the potential for significant effects.

Appendix C contains the screening of designated sites. The qualifying interests were recorded for each site, as well as the minimum distance to the proposed cargo transfer locations. A qualifying interest of a site is the habitat or species which a site has been classified or designated for.

Likelihood of an interaction between the oil spill and receptor was determined using information of the qualifying interest features, such as foraging distances, and determining whether the interest features could be impacted by an oil spill.

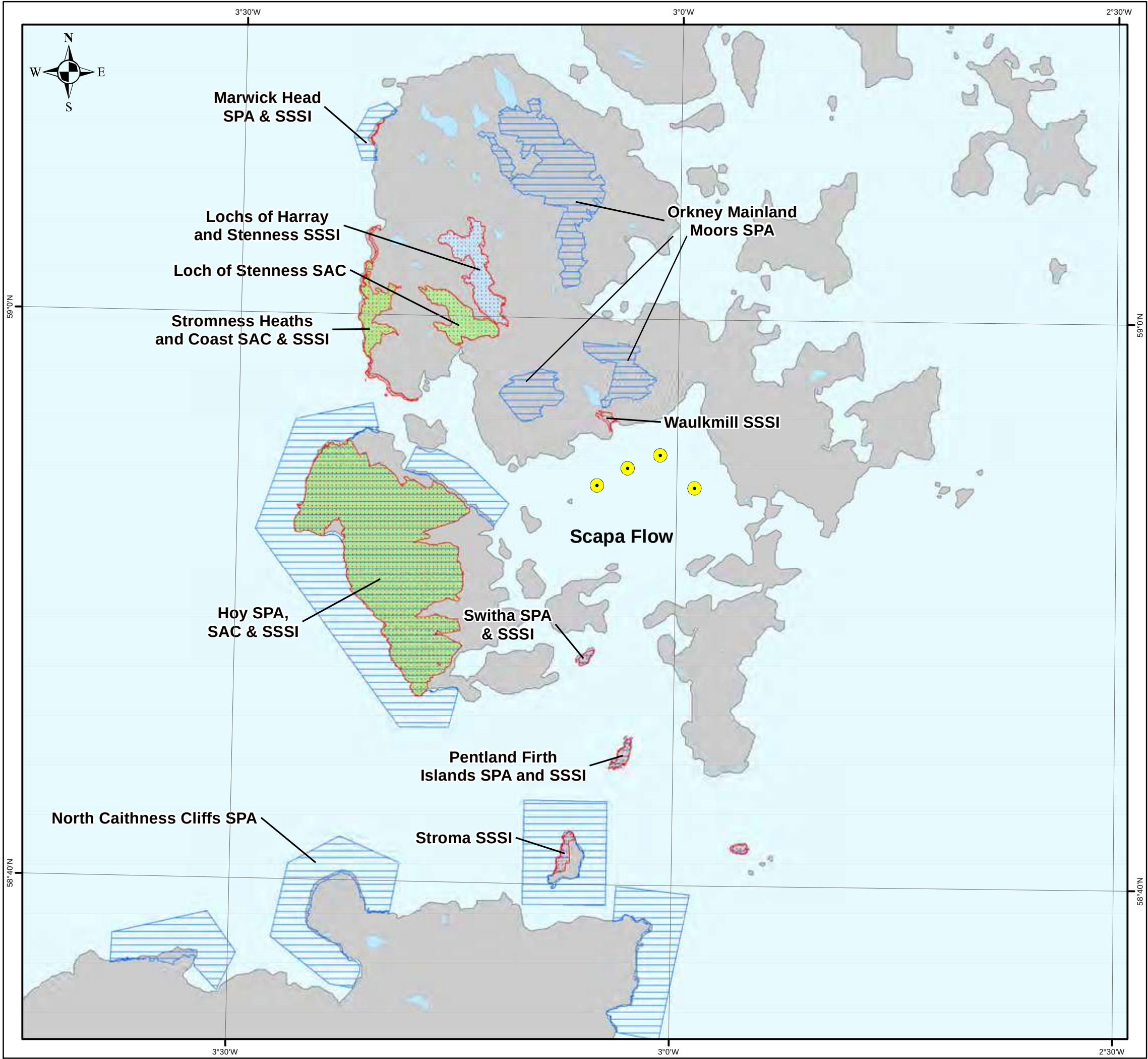
- Designated sites determined to have a **likely** interaction were concluded to have the potential for significant effects.
- Designated sites with a **possible** interaction were concluded to not have the potential for significant effects. While it is considered possible for an interaction between the receptor and the oil spill, it is considered unlikely for a significant impact to occur on the designated species. Therefore, it is concluded to be unlikely that a significant effect will occur on these designated sites.
- Designated sites determined to be **unlikely or not to** have an interaction were concluded to not have the potential for significant effects.

Table 6-2 shows the findings of the screening process. The list represents sites that could potentially be significantly affected by an oil spill from a proposed cargo transfer. The sites are also shown in Figure 6-1.

Table 6-2: Sites that could potentially be significantly affected by an accidental oil spill

Designation	Site Name	Designating features and comments
SAC	Hoy	Annex I Habitats that are a primary reason for designation • Vegetated sea cliffs of the Atlantic and Baltic Coasts • Natural dystrophic lakes and ponds • Northern Atlantic wet heaths with <i>Erica tetralix</i> • Alpine and Boreal heaths • Blanket bogs *Priority feature Annex I habitats present as qualifying feature but not primary feature • European dry heaths • Petrifying springs with tufa formation (<i>Cratoneurion</i>) * Priority feature • Alkaline fens • Calcareous rocky slopes with chasmophytic vegetation
SPA	Hoy	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season • Peregrine <i>Falco peregrinus</i>, 6 pairs representing at least 0.5% of the breeding population in Great Britain (Mid-1990s) • Red-throated Diver <i>Gavia stellata</i>, 56 pairs representing at least 6.0% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season • Great Skua <i>Catharacta skua</i>, 1,900 pairs representing at least 14.0% of the breeding World population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance • During the breeding season the area regularly supports 120,000 individual seabirds including: Puffin <i>Fratercula arctica</i>, Guillemot <i>Uria aalge</i>, Kittiwake <i>Rissa tridactyla</i>, Great Black-backed Gull <i>Larus marinus</i>, Arctic Skua <i>Stercorarius parasiticus</i>, Fulmar <i>Fulmarus glacialis</i>, Great Skua <i>Catharacta skua</i>.
SSSI	Hoy	Qualifying features: Breeding seabird colony; breeding Arctic skua, breeding fulmar, breeding great skua, breeding guillemot. Breeding bird assemblage; breeding peregrine, breeding red-throated diver, breeding great black-backed gull; blanket bog. Upland oak woodland, coastal geomorphology of Scotland, old red sandstone Igneous, upland assemblage, quaternary of Scotland, dystrophic loch. Non-marine Devonian.
SAC	Loch of Stenness	Annex I Habitats are the primary reason for designation • Coastal lagoons *Priority feature
SSSI	Lochs of Harray and Stenness	Qualifying features: Non-breeding goldeneye, non-breeding pochard, non-breeding scaup, non-breeding tufted duck; saline lagoon; freshwater nerite snail (<i>Theodoxus fluviatilis</i>); a caddis fly; eutrophic loch.
SPA	Marwick Head	Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season • Guillemot (<i>Uria aalge</i>), 24,388 pairs representing up to 1.1% of the breeding East Atlantic population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance The area regularly supports 75,000 individual seabirds including: Kittiwake (<i>Rissa tridactyla</i>), Guillemot (<i>Uria aalge</i>).

Designation	Site Name	Designating features and comments
SSSI	Marwick Head	Qualifying features: Breeding seabird colony; breeding guillemot; breeding kittiwake.
SPA	North Caithness Cliffs	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season - Peregrine Falco 45eregrines, 6 pairs representing at least 0.5% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season - Guillemot Uria aalge, 26,994 pairs representing at least 1.2% of the breeding East Atlantic population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance During the breeding season, the area regularly supports 110,000 individual seabirds including: Puffin Fratercula arctica, Razorbill Alca torda, Kittiwake Rissa tridactyla, Fulmar Fulmarus glacialis, Guillemot Uria aalge
SPA	Orkney Mainland Moors	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species During the breeding season - Hen Harrier Circus cyaneus, 30 pairs representing at least 6.0% of the breeding population in Great Britain - Red-throated Diver Gavia stellata, 15 pairs representing at least 1.6% of the breeding population in Great Britain - Short-eared Owl Asio flammeus, 20 pairs representing at least 2.0% of the breeding population in Great Britain Over winter - Hen Harrier Circus cyaneus, 13 individuals representing at least 1.7% of the wintering population in Great Britain
SPA	Pentland Firth Islands	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season Arctic Tern Sterna paradisaea, 1,200 pairs representing at least 2.7% of the breeding population in Great Britain
SSSI	Pentland Firth Islands	Qualifying features: Breeding Arctic tern; Vascular plant assemblage.
SSSI	Stroma	Qualifying features: Breeding Arctic tern; breeding seabird colony; breeding Guillemot; breeding sandwich tern; maritime cliff
SAC	Stromness Heaths and Coast	Annex I Habitats that are a primary reason for designation: - Vegetated sea cliffs of the Atlantic and Baltic Coasts - European dry heaths Annex I habitats present as qualifying feature but not primary feature - Alkaline fens
SSSI	Stromness Heaths and Coast	Qualifying features: Subalpine dry heath; coastal geomorphology; non-marine Devonian stratigraphy; maritime cliff.
SPA	Switha	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species over winter: Barnacle Goose Branta leucopsis, 1,000 individuals representing at least 3.7% of the wintering population in Great Britain
SSSI	Switha	Qualifying features: Non-breeding Greenland barnacle goose.
SSSI	Waulkmill	Qualifying features: Saltmarsh; golden-rod case-bearer moth; maritime cliff.



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ORKNEY ISLANDS COUNCIL

Oil Transfer Licence Application

Figure 6-1: Sites that could potentially be significantly affected by an accidental oil spill

Legend

● Ship-to-Ship Transfer Location

Designated Sites

SPA

SAC

SSSI

Inland water bodies

Date	Wednesday, June 25, 2014 14:08:37
Projection	British_National_Grid
Spheroid	Airy_1830
Datum	D_OSGB_1936
Data Source	GEBCO, JNCC, SNH, OIC,
File Reference	J:\P1861\Mxd\ES_Report\Protected_areas_assessment.mxd
Created By	Emma White
Reviewed By	Ian Charlton
Approved By	Fiona Bell



0 1.25 2.5 5 7.5 10 12.5 km

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6.4 MITIGATION MEASURES

As concluded in Section 6.2 the only aspect of the proposed cargo transfers considered likely to have the potential to cause a significant effect on a designated site is an accidental oil spill.

Mitigation measures have been identified for the remaining aspect of the plan, accidental oil spill, so that likelihood of the incident having a significant effect on a designated site can be minimised and ruled out.

The mitigation measures applied are listed in Table 6-3.

Table 6-3: Mitigation measures

Aspect of the plan which it was not possible to screen out as not being likely to have a significant effect on a European site, alone or in combination	Mitigation measure applied in order then to conclude that there would be no likely significant effect on a European site
Accidental oil spill	Application of best practice in proposed cargo transfer activities
	Application of the OSCP
	Application of robust control procedures in place to minimise the likelihood and potential of an oil spill
	Transfer between ships undertaken using industry standard certified hoses
	Ships having trained and experienced crew to undertake transfer operations
	Use of a qualified STS Superintendent to oversee transfer operation
	Application of onsite spill response procedures and equipment being mobilised to ensure spill doesn't reach European sites
	Positioning of fenders in a manner in which they create a barrier to contain any oil that may be spilt in the event of a hose failure
	Comprehensive stock of oil spill containment equipment held on site ready for deployment in case of an incident
	Availability of well trained staff to respond to oil spill

6.5 ASSESSMENT OF POTENTIAL IMPACT SIGNIFICANCE

Having taken into account all mitigation measures, the sites considered to have the potential for a significant effect from the proposed cargo transfers (listed in Table 6-2), were re-screened.

Modelling of an oil slick resulting from an accidental oil spill during a STS transfer is presented within Appendix B. The modelling results help to determine the magnitude and likelihood of a potential impact on designated sites and to determine if a significant effect is likely. Indicative travel times for the oil slick to the designated site are identified in the assessment below, where appropriate. It is important to note that these times are for indicative purposes only and are based on the results of the model runs which use certain assumptions (such as the assumption of constant mean wind from a set direction). The modelling did not set out to establish the absolute minimum time to impact and quicker times than those stated below are probably possible. The times do, however, provide a useful indication of the relative quickness with which designated sites could be impacted. This assessment is presented in Table 6-4.

Table 6-4: Assessment to determine if proposed cargo transfers are likely to have a significant effect on any European site

Site	Qualifying Interests	Possible impacts on site	Likely to have a significant effect?	Possible Cumulative Effects	Mitigation Measures	Residual Effects
Hoy SAC	Vegetated sea cliffs of the Atlantic and Baltic Coasts Natural dystrophic lakes and ponds Northern Atlantic wet heaths with <i>Erica tetralix</i> Alpine and Boreal heaths Blanket bogs *Priority feature European dry heaths Petrifying springs with tufa formation (<i>Cratoneurion</i>) * Priority feature Alkaline fens Calcareous rocky slopes with chasmophytic vegetation	Vegetated sea cliff habitat impacted by spray.	Yes, if significant oil spill occurred. Modelling results (Appendix B) show that an east wind and a north east wind could move the oil slick towards Hoy. This will impact the coastline of Hoy after approximately 17 hours.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.
Hoy SPA	Peregrine (<i>Falco peregrines</i>) Red-throated Diver (<i>Gavia stellata</i>) Great Skua (<i>Catharacta skua</i>) Puffin <i>Fratercula arctica</i> Guillemot <i>Uria aalge</i> Kittiwake <i>Rissa tridactyla</i> Great Black-backed Gull <i>Larus marinus</i> Arctic Skua <i>Stercorarius parasiticus</i> Fulmar <i>Fulmarus glacialis</i> Great Skua <i>Catharacta skua</i>.	- Red-throated diver, great skua, puffin, guillemot, kittiwake, great black-backed gull, arctic skua, fulmar and great skua directly impacted by oil spill. - Contamination and loss of coastal feeding sites, limiting foraging range. - Sea cliff habitat impacted by spray smothering seabird breeding sites.	Yes, if significant oil spill occurred. Modelling results (Appendix B) show that an east wind and a north east wind could move the oil slick towards Hoy. During a north east wind the SPA is impacted after approximately 16 hours. Birds feeding within the area are likely to be significantly impacted by the oil spill.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.

Site	Qualifying Interests	Possible impacts on site	Likely to have a significant effect?	Possible Cumulative Effects	Mitigation Measures	Residual Effects
Hoy SSSI	Breeding seabird colony Breeding Arctic skua Breeding fulmar Breeding great skua Breeding guillemot Breeding bird assemblage Breeding peregrine Breeding red-throated diver Breeding great black-backed gull Blanket bog Upland oak woodland Coastal geomorphology of Scotland Old red sandstone igneous Upland assemblages Quaternary of Scotland geology and geomorphology Dystrophic loch Non-marine Devonian	- Red-throated diver, great skua, puffin, guillemot, kittiwake, great black-backed gull, arctic skua, fulmar and great skua directly impacted by oil spill. - Contamination and loss of coastal feeding sites, limiting foraging range. - Sea cliff habitat impacted by spray smothering seabird breeding sites.	Yes, if significant oil spill occurred. As above.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.
Loch of Stenness SAC	Coastal lagoons *Priority feature	Lagoon contaminated with oil.	Yes, if significant oil spill occurred. Modelling results (Appendix B) indicate that during an east wind the oil slick could be carried towards Loch of Stenness SAC after around 1.5 days. An oil slick entering the Loch would have a significant impact on the lagoon.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.
Lochs of Harray and Stenness SSSI	Non-breeding goldeneye Non-breeding pochard Non-breeding scaup Non-breeding tufted duck Saline lagoon Freshwater nerite snail (<i>Theodoxus fluviatilis</i>) A caddis fly Eutrophic loch	- Lagoon contaminated with oil. - Contamination and loss of breeding and feeding sites.	Yes, if significant oil spill occurred. Modelling results (Appendix B) indicate that during an east wind the oil slick could be carried towards Loch of Stenness and could impact the lagoon habitat of the Lochs of Harray and Stenness.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.

Site	Qualifying Interests	Possible impacts on site	Likely to have a significant effect?	Possible Cumulative Effects	Mitigation Measures	Residual Effects
Marwick Head SPA	Guillemot (<i>Uria aalge</i>) Kittiwake (<i>Rissa tridactyla</i>)	Guillemot and kittiwake directly impacted by oil spill.	Yes, if significant oil spill occurred. Modelling results (Appendix B) indicate that during an east wind within 1.5 to 2 days the oil slick begins to exit Scapa Flow via Hoy Sound and is carried away from the Orkney Islands by the prevailing wind. In reality a change in wind direction could carry the slick north towards Marwick Head SPA. The designated seabirds are known to feed in areas off the coast of Marwick Head and may be directly impacted by the oil slick.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.
Marwick Head SSSI	Breeding seabird colony Breeding guillemot Breeding kittiwake	Guillemot and kittiwake directly impacted by oil spill.	Yes, if significant oil spill occurred. As above.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.
North Caithness Cliffs SPA	Peregrine Falco (<i>peregrines</i>) Guillemot (<i>Uria aalge</i>) Puffin <i>Fratercula arctica</i> Razorbill <i>Alca torda</i> Kittiwake <i>Rissa tridactyla</i> , Fulmar <i>Fulmarus glacialis</i>	Guillemot, puffin, razorbill, kittiwake and fulmar directly impacted by oil spill.	Yes, if significant oil spill occurred. Modelling results (Appendix B) indicate that during a north wind the oil slick could leave Scapa Flow and enter the Pentland Firth. Once in this area the slick would be rapidly advected by strong the tidal currents and could potentially directly impact the North Caithness Cliffs. Birds feeding within the Pentland Firth may be directly impacted by the oil slick.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.
Orkney Mainland Moors SPA	Hen Harrier (<i>Circus cyaneus</i>) Red-throated Diver (<i>Gavia stellata</i>) Short-eared Owl (<i>Asio flammeus</i>)	Red-throated diver directly impacted by oil spill.	Yes, if significant oil spill occurred. Modelling results (Appendix B) indicate that the coastline of Mainland will be impacted by an accidental oil spill. Red-throated divers feeding within this area could be directly impacted by the oil spill.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.

Site	Qualifying Interests	Possible impacts on site	Likely to have a significant effect?	Possible Cumulative Effects	Mitigation Measures	Residual Effects
Pentland Firth Islands SPA	Arctic Tern (<i>Sterna paradisaea</i>)	- Arctic tern directly impacted by oil spill. - Contamination and loss of coastal feeding sites, limiting foraging range.	Yes, if significant oil spill occurred. Modelling results (Appendix B) indicate that during a north wind the oil slick could leave Scapa Flow and enter the Pentland Firth. Once in this area the slick would be rapidly advected by strong the tidal currents and could potentially directly impact the Pentland Firth Islands. Arctic tern known to feed within the Pentland Firth could be impacted while feeding here.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.
Pentland Firth Islands SSSI	Breeding Arctic tern Vascular plant assemblage	- Arctic tern directly impacted by oil spill. - Contamination and loss of coastal feeding sites, limiting foraging range.	Yes, if significant oil spill occurred. As above.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring..
Stroma SSSI	Breeding Arctic tern Breeding seabird colony Breeding Guillemot Breeding sandwich tern Maritime cliff	- Arctic tern, guillemot and sandwich tern directly impacted by oil spill. - Sea cliff habitat impacted by spray smothering seabird breeding sites.	Yes, if significant oil spill occurred. Modelling results (Appendix B) indicate that during a north wind the oil slick could leave Scapa Flow and enter the Pentland Firth. Once in this area the slick would be rapidly advected by strong the tidal currents and could potentially impact Stroma SSSI. Modelling indicates that this occurs after approximately 2 days.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.
Stromness Heaths and Coast SAC	Vegetated sea cliffs of the Atlantic and Baltic Coasts European dry heaths Alkaline fens	Vegetated sea cliff habitat impacted by spray.	Yes, if significant oil spill occurred. Modelling results (Appendix B) indicate that during an east wind the oil slick could be carried towards Stromness Heaths and Coast. This would be approximately one day after the oil spill occurred.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.
Stromness Heaths and Coast SSSI	Subalpine dry heath Coastal geomorphology Non-marine Devonian stratigraphy Maritime cliff	Maritime cliff habitat impacted by spray.	Yes, if significant oil spill occurred. As above.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.

Site	Qualifying Interests	Possible impacts on site	Likely to have a significant effect?	Possible Cumulative Effects	Mitigation Measures	Residual Effects
Switha SPA	Barnacle Goose (<i>Branta leucopsis</i>)	- Barnacle goose directly impacted by oil spill. - Contamination and loss of coastal feeding sites, limiting foraging range.	Yes, if significant oil spill occurred. Modelling results (Appendix B) indicate that during a north wind an oil spill could potentially reach Switha and impact the coastline. This is predicted to happen approximately 1 day after release. This could have a significant effect on the population of barnacle geese.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.
Switha SSSI	Non-breeding Greenland barnacle goose	- Barnacle goose directly impacted by oil spill. - Contamination and loss of coastal feeding sites, limiting foraging range.	Yes, if significant oil spill occurred. As above.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.
Waulkmill SSSI	Saltmarsh Golden-rod case-bearer moth Maritime cliff	- Saltmarsh contaminated with oil. - Maritime cliff habitat impacted by spray.	Yes, if significant oil spill occurred. Modelling results (Appendix B) indicate that Waulkmill SSSI could be impacted by an oil spill within 7 hours of release. Saltmarshes are sensitive to oil spill and have slow rates of recovery, any contact will oil is likely to have a significant effect.	None.	Application of measure listed in Table 6-3.	None likely. Application of the mitigation measures will reduce the risk of an oil spill occurring.

6.6 SCREENING DETERMINATION

The proposed cargo transfers are not considered likely to have a significant effect on any European sites, either individually or in-combination with other plans or projects, as required under Schedule 1 (1) of The Regulations.

Potential effects resulting from the presence of ships (airborne pollution and disturbance) and the discharge of ballast water within Scapa Flow during a proposed cargo transfer were considered not likely to have a significant effect on the designated sites. Therefore, these effects were not considered any further in this screening assessment.

The potential effects from an unmitigated oil spill was determined to be likely to have a significant impact on a number of designated sites within the area. However, procedures are in place to significantly reduce the likelihood of the accidental discharge of oil. After applying these mitigation measures it can be concluded that the risk of a significant impact is considered unlikely. Therefore, no significant effects on designated sites are predicted.

7 CONCLUSIONS

7.1 INTRODUCTION

This section presents a summary of the key findings on the environmental assessment of the proposed cargo transfers. It identifies the significant effects that the proposed cargo transfers are likely to have on the environment and determines whether the cargo transfers to be authorised would be likely to have a significant effect on any European Sites.

Mitigation measures are then identified for the potential effects to prevent or reduce, and where possible offset, any significant effects of the proposed cargo transfers on the environment and residual effects identified.

7.2 KEY POTENTIAL ENVIRONMENTAL EFFECTS

The potential unmitigated environmental effects that may arise from the proposed cargo transfers were predicted to arise from the following activities:

- Movement and presence of ships.
- Accidental oil spill.
- Discharge of ballast water during transfer process.

Movement and presence of ships and discharge of ballast water were concluded to not have any significant effects on the environment.

In the unlikely event of an oil spill, in the absence of any mitigation measures, significant impacts may occur on birds, marine mammals, fish and shellfish within the area. Due to the low energy environment within Scapa Flow it is considered that the shorelines may be adversely impacted by an accidental oil spill. Consequences of an oil spill on a number of receptors could be significant. However, procedures are in place to prevent the accidental discharge of oil and the risk of a significant impact is considered unlikely.

7.3 EFFECTS ON DESIGNATED SITES

To determine whether the cargo transfers to be carried out are likely to have a significant effect on any European site, either individually or in-combination with other plans or projects, a screening assessment was carried out.

All designated sites within the Orkney Islands and Pentland Firth were considered in the assessment, as well as SPAs with seabirds within a distance of 100 km of the proposed cargo transfer locations. These sites were considered because seabirds are known to forage outside of their SPAs and these seabirds may travel to Scapa Flow and be impacted by an accidental oil spill.

Environmental assessment of the release of ballast water into Scapa Flow on designated sites has been assessed as part of the AA of BWM Policy (Intertek, 2013b). This AA concluded that the discharge of ballast water would have no adverse effect on the integrity of any designated sites.

Potential effects resulting from the presence of ships, airborne pollution and disturbance were considered not likely to have a significant effect on the designated sites. However, it was determined that water based pollution as a

result of an accidental oil spill may affect designated sites and qualifying species.

Designated sites within the area were assessed to determine if the proposed cargo transfers were likely to have a significant effect on them. It was concluded that if a significant oil spill occurred then it would be likely to have a significant effect on a number of designated sites. However, procedures are in place to prevent the accidental discharge of oil and the risk of a significant impact is considered unlikely. Therefore, no significant impacts on designated sites are predicted.

Screening determined that the proposed cargo transfers are not considered likely to have a significant effect on any European sites, either individually or in-combination with other plans or projects, as required under Schedule 1 (1) of The Regulations.

7.4 MITIGATION

Mitigation measures applied in order to determine that there is no significant effects on the environment include the following:

- Application of best practice in proposed cargo transfer activities.
- Application of the OSCP.
- Application of robust control procedures in place to minimise the likelihood and potential of an oil spill.
- Transfer between ships undertaken using industry standard certified hoses.
- Ships having trained and experienced crew to undertake transfer operations.
- Use of a qualified STS Superintendent to oversee transfer operation.
- Application of onsite spill response procedures and equipment being mobilised to ensure spill doesn't reach European sites.
- Positioning of fenders in a manner in which they create a barrier to contain any oil that may be spilt in the event of a hose failure.
- Comprehensive stock of oil spill containment equipment held on site ready for deployment in case of an incident.
- Back-up contractor for Tier 2 response.
- Availability of well trained staff to respond to oil spill.

Implementing the above mitigation measures will reduce the risk of proposed cargo transfers having a significant effect on the environment.

In the event of an oil spill the location of the pollutant, type of oil, source, cause, extent and direction of movement will be reported to the Oil Pollution Officer. Depending on the tier of the spill different response actions will be mobilised.

If an accidental oil spill was to take place then application of the OSCP would considerably reduce the environmental effects of a spill. It will minimise the scale and extent of an oil spill. Significant effects on the environment through marine pollution should be reduced to short-term manageable effects if the contingency plan can contain and minimise the scale of the spill and prevent any widespread impact.

7.5 RESIDUAL EFFECTS

Following the application of mitigation measures it is unlikely that the proposed cargo transfers will have any residual effects on the environment. This is due to the following reasons:

- Every proposed cargo transfer is well planned and a pre-STs meeting is undertaken prior to the operation.
- The track record of the harbour and oil terminal and associated environmental monitoring evidence.
- The location of the proposed cargo transfers.
- The experience and application of best practice procedures during transfer operations.
- The existence of mitigation measures including the OSCP.

The likelihood of an accidental oil spill occurring is very low and in the unlikely event of it taking place comprehensive OSCPs are in place to ensure a spill is contained and the risk of significant impacts on the environment is minimised.

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Appendix A Environmental Baseline

A.1 Introduction

This appendix describes aspects of the environment likely to be significantly affected by the proposed cargo transfers.

A.2 Fauna and Flora

A.2.1 European and Nationally Designated Sites

The Orkney Islands are valued for the abundance of birds and marine wildlife that inhabit the islands throughout the year. As such, the Orkney Islands includes a range of protected sites designated under European, International and national legislation. The study area includes the Orkney Islands and adjacent waters, the Pentland Firth, and the coastal regions of North Scotland. The following baseline description of designated sites (both existing and future designations) covers the main types of biodiversity designations found in this study area.

Existing Designations

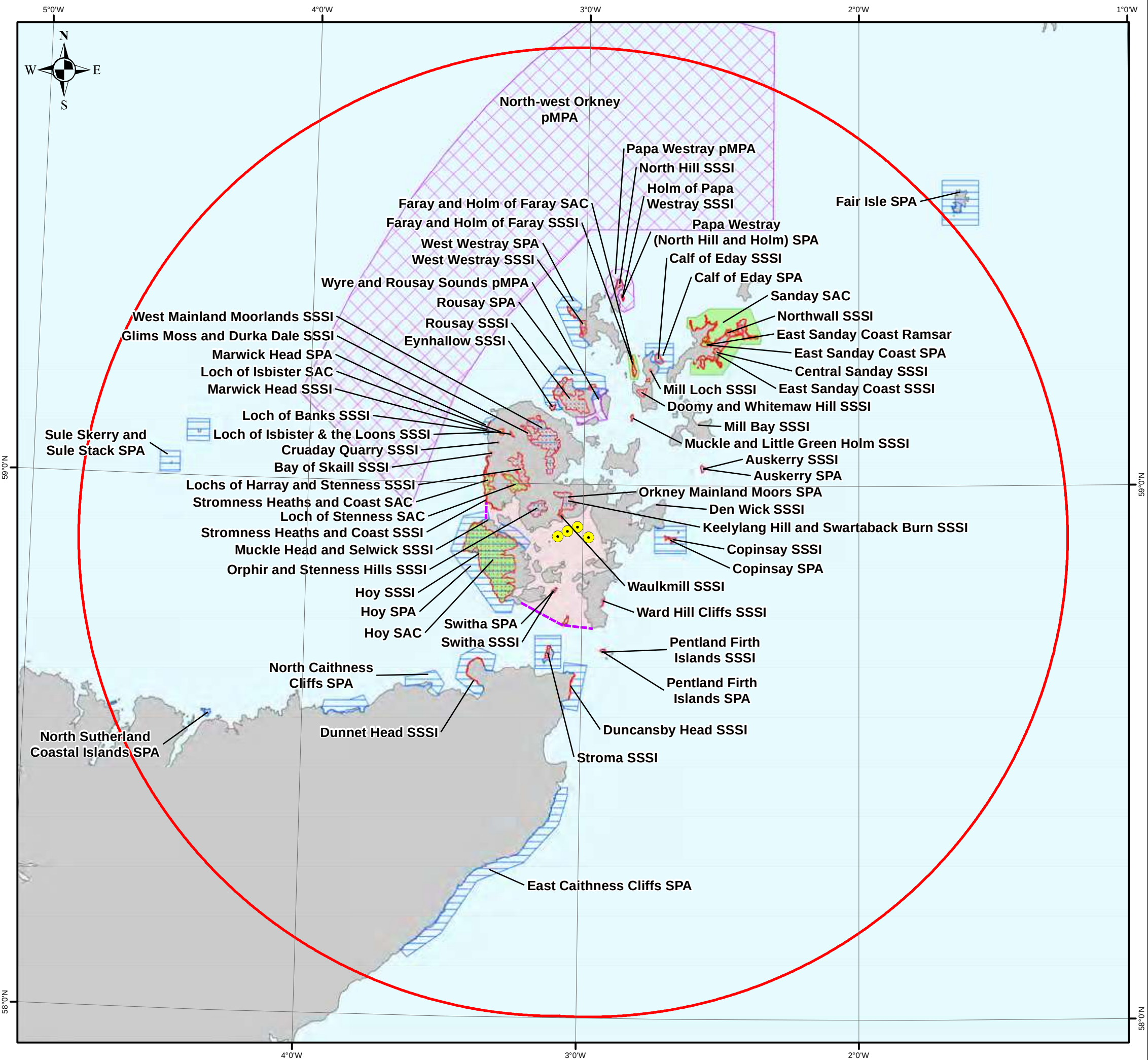
The main relevant protected site designations are as follows:

- Natura 2000 sites.
- Special Areas of Conservation (SACs).
- Special Protection Areas (SPAs).
- Sites of Special Scientific Interest (SSSI).
- Ramsar sites.

Of these designations, those in close proximity to Scapa Flow have been mapped in Figure A-1 and their designating features presented in Table A-1.

Natura 2000 Sites: Under the Habitats Directive (Council Directive 92/43/EC) and Birds Directive (Council Directive 2009/147/EC) Europe's most valuable habitats and species are protected through the designation of SACs and SPAs. Together these sites make up the Natura 2000 network. The aim of the Natura 2000 network is to ensure the long-term survival of European threatened species and habitats.

Orkney also contains a National Scenic Area, Hoy and West Mainland, and a Local Nature Reserve, Mull Head (SNH, 2014).



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Figure A-1: European, Nationally Designated Sites and Potential Designations

Legend

- Ship-to-Ship Transfer Location
- Scapa Flow Harbour Limits
- 100 km Search Area
- Designated Sites**
 - SPA
 - SAC
 - Ramsar
 - SSSI
 - pMPA
- Scapa Flow Harbour Area



NOTE: Not to be used for Navigation

Date	Thursday, June 26, 2014 12:24:20
Projection	British_National_Grid
Spheroid	Airy_1830
Datum	D_OSGB_1936
Data Source	GEBCO, JNCC, SNH, OIC, MS
File Reference	J:\P1861\Mxd\ES_Report\Appendix_A\Designated_and_Potentially_Designated_Protected_Sites.mxd
Created By	Emma White
Reviewed By	Ian Charlton
Approved By	Fiona Bell



Special Areas of Conservation (SACs)

SACs are designated sites under the Habitats Directive (Council Directive 92/43/EC). SACs are selected for particular habitats listed on Annex I and for species listed on Annex II of the Habitats Directive. All SACs within the study area have a marine component (designated for marine features), are designated for the presence of European Protected Species (EPS) (Annex IV species) or the presence of Annex II species. There are six SACs in the study area, see Figure A-1:

- Faray and Holm of Faray SAC.
- Hoy SAC.
- Loch of Isbister SAC.
- Loch of Stenness SAC.
- Sanday SAC.
- Stromness Heaths and Coast SAC.

Special Protection Areas (SPAs)

SPAs are classified under the Birds Directive (Council Directive 2009/147/EC). SPAs are selected for a number of rare, threatened or vulnerable bird species listed in Article 4 of the Birds Directive, and also for regularly occurring migratory species. There are 17 SPAs in the study area, Figure A-1:

- Aukerry SPA.
- Calf of Eday SPA.
- Copinsay SPA.
- East Caithness Cliffs SPA.
- East Sanday Coast SPA.
- Fair Isle SPA.
- Hoy SPA.
- Marwick Head SPA.
- North Caithness Cliffs SPA.
- North Sutherland Coastal Islands SPA.
- Orkney Mainland Moors SPA.
- Papa Westray (North Hill and Holm) SPA.
- Pentland Firth Islands SPA.
- Rousay SPA.
- Sule Skerry and Sule Stack SPA.
- Switha SPA.
- West Westray SPA.

Sites of Special Scientific Interest (SSSI)

SSSIs are nationally important areas of land and water (above mean low water) in Great Britain. In Scotland SSSIs are designated by SNH under the Nature Conservation (Scotland) Act 2004. SSSIs are protected by law and it is an offence for any person to intentionally or recklessly damage the protected natural features of a SSSI. SSSIs in Scotland are those areas that SNH considers to best represent Scottish natural heritage for its diversity of plants, animals, habitats, geology, landforms or a combination of these natural features. Most of the terrestrial Natura sites in Scotland are also SSSIs. There are 37 SSSIs in the study area, see Figure A-1:

- Auskerry SSSI.
- Bay of Skaill SSSI.
- Calf of Eday SSSI.
- Central Sanday SSSI.
- Copinsay SSSI.
- Cruaday Quarry SSSI.
- Den Wick SSSI.
- Doomy and Whitemaw Hill SSSI.
- Duncansby Head SSSI.
- Dunnet Head SSSI.
- East Sanday Coast SSSI.
- Eynhallow SSSI.
- Faray and Holm of Faray SSSI.
- Glims Moss and Durka Dale SSSI.
- Holm of Papa Westray SSSI.
- Hoy SSSI.
- Keelylang Hill and Swartaback Burn SSSI.
- Loch of Banks SSSI.
- Loch of Isbister and the Loons SSSI.
- Lochs of Harray and Stenness SSSI.
- Marwick Head SSSI.
- Mill Bay SSSI.
- Mill Loch SSSI.
- Muckle and Little Green Holm SSSI.
- Muckle Head and Selwick SSSI.
- North Hill SSSI.
- Northwall SSSI.
- Orphir and Stenness Hills SSSI.
- Pentland Firth Islands SSSI.

- Rousay SSSI.
- Stroma SSSI.
- Stromness Heaths and Coast SSSI.
- Switha SSSI.
- Ward Hill Cliffs SSSI.
- Waulkmill SSSI.
- West Mainland Moorlands SSSI.
- West Westray SSSI.

Ramsar

Ramsar sites are designated under the Convention on Wetlands (Ramsar, Iran, 1971), known as the "Ramsar Convention" to protect wetlands of international importance. In Scotland all Ramsar sites are also either SACs or SPAs. Although there is no specific legal framework that safeguards Scottish Ramsar sites, they are afforded the same protection as the Natura sites they overlap. There is one Ramsar site in the area. This is East Sanday Coast.

Potential Designations

Potential Nature Conservation Marine Protected Areas (MPAs)

The Marine (Scotland) Act 2010 and the UK Marine and Coastal Access Act 2009 include new powers and duties to designate new MPAs to protect features of importance to Scotland. MPAs for biodiversity and geodiversity (under both pieces of legislation) are collectively referred to as Nature Conservation MPAs (Marine Scotland, 2011).

Nature Conservation MPAs are being identified for features (habitats and species) that the Scottish Government believes require more protection than that offered by existing protected sites (Marine Scotland, 2013).

Sites designated in Scotland will contribute to Scottish, UK and international networks of MPAs. These networks will form a system of sites working together, within a range of protection levels, in order to meet their role more effectively than individual sites could alone. The sites which will make up the Scottish MPA network are:

- Nature Conservation MPAs, which protect nationally important biodiversity (species and habitats) and geodiversity (geology and undersea landforms) interests in Scotland's seas (SNH, 2012).
- European Marine Sites or Natura 2000 Sites: SACs and SPAs (Defra, 2012a).
- Marine components of SSSIs, which protect nationally important habitats, species and geological features and generally fall above the mean low water mark.
- Ramsar Sites which protect wetland habitats used by important migratory bird species (SNH, 2012).

To help target nature conservation action in Scotland, SNH and JNCC have generated a list of Priority Marine Features (PMFs) for the most important habitats and species in Scottish seas (SNH, 2013a).

MPAs can help conserve marine biodiversity and geodiversity where it is possible to spatially define where habitats and species are found. MPAs are not appropriate for all habitats and species (e.g. if a species is highly mobile and does not aggregate during specific life stages). The selection of MPAs will be based on a subset of the PMF list referred to as MPA search features which are features where spatial protection measures are thought to be appropriate (Marine Scotland, 2011, SNH, 2012). As yet, no MPAs have been designated in Orkney waters, but a number of PMFs are known to occur locally.

As such, the locations are afforded policy protection as if they were designated. While these are not specifically referred to in The Regulations, we believe that the environmental assessment should also consider impacts on pMPA when these are designated. The possible MPAs and MPA search location are shown in Figure A-1 and their biodiversity protected features presented in Table A-1. They are North-west Orkney pMPA, Papa Westray pMPA and Wyre and Rousay Sounds pMPA.

Table A-1: Sites to be considered in the environmental assessment (JNCC, 2014; SNH, 2014; OIC, 2012a, Marine Scotland, 2013)

Designation	Site Name	Site code	Designating features and comments
SPA	Auskerry	UK9002381	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season - Arctic Tern <i>Sterna paradisaea</i>, 780 pairs representing at least 1.8% of the breeding population in Great Britain - Storm Petrel <i>Hydrobates pelagicus</i>, 3,600 pairs representing at least 4.2% of the breeding population in Great Britain The site is important as a nesting area for a number of breeding seabirds. These birds feed outside the SPA in the waters surrounding the islands, as well as more distant waters.
SSSI	Auskerry	105	Qualifying features: Breeding storm petrel, breeding Arctic tern.
SSSI	Bay of Skail	156	Qualifying features: Palaeozoic Palaeobotany
SPA	Calf of Eday	UK9002431	Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance During the breeding season, the area regularly supports 30,000 individual seabirds including: Guillemot <i>Uria aalge</i>, Kittiwake <i>Rissa tridactyla</i>, Great Black-backed Gull <i>Larus marinus</i>, Cormorant <i>Phalacrocorax carbo</i>, Fulmar <i>Fulmarus glacialis</i>. The site is of importance as a nesting area for breeding seabirds, which feed in surrounding waters outside the SPA and use most of the island for loafing.
SSSI	Calf of Eday	295	Breeding cormorant.
SSSI	Central Sanday	354	Coastal geomorphology of Scotland (coastal sedimentary landforms); saltmarsh; machair; sand dunes.
SPA	Copinsay	UK9002151	Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance During the breeding season, the area regularly supports 70,000 individual seabirds including: Guillemot <i>Uria aalge</i>, Kittiwake <i>Rissa tridactyla</i>, Great Black-backed Gull <i>Larus marinus</i>, Fulmar <i>Fulmarus glacialis</i>.
SSSI	Copinsay	400	Qualifying features: Breeding seabird colony; breeding guillemot; breeding kittiwake.
SSSI	Cruaday Quarry	473	Qualifying features: Silurian – Devonian Chordata
SSSI	Den Wick	507	Qualifying features: Quaternary of Scotland geology and geomorphology.
SSSI	Doomy and Whitemaw Hill	524	Breeding Arctic skua; breeding whimbrel.
SSSI	Duncansby Head	564	Breeding fulmar; breeding seabird colony; breeding guillemot; breeding kittiwake; coastal geomorphology of Scotland; maritime cliff
SSSI	Dunnet Head	571	Breeding seabird colony; breeding guillemot; maritime cliff.

Designation	Site Name	Site code	Designating features and comments
SPA	East Caithness Cliffs	UK9001182	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season: - Peregrine <i>Falco peregrinus</i>, 6 pairs representing at least 0.5% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season - Guillemot <i>Uria aalge</i>, 71,509 pairs representing at least 3.2% of the breeding East Atlantic population - Herring Gull <i>Larus argentatus</i>, 9,370 pairs representing at least 1.0% of the breeding Northwestern Europe (breeding) and Iceland/Western Europe – breeding population - Kittiwake <i>Rissa tridactyla</i>, 31,930 pairs representing at least 1.0% of the breeding Eastern Atlantic – Breeding population - Razorbill <i>Alca torda</i>, 9,259 pairs representing at least 1.6% of the breeding population - Shag <i>Phalacrocorax aristotelis</i>, 2,345 pairs representing at least 1.9% of the breeding Northern Europe population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance: During the breeding season, the area regularly supports 300,000 individual seabirds including: Puffin <i>Fratercula arctica</i>, Great Black-backed Gull <i>Larus marinus</i>, Cormorant <i>Phalacrocorax carbo</i>, Fulmar <i>Fulmarus glacialis</i>, Razorbill <i>Alca torda</i>, Guillemot <i>Uria aalge</i>, Kittiwake <i>Rissa tridactyla</i>, Herring Gull <i>Larus argentatus</i>, Shag <i>Phalacrocorax aristotelis</i>.
SPA	East Sanday Coast	UK9002331	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species over winter - Bar-tailed Godwit <i>Limosa lapponica</i>, 600 individuals representing at least 1.1% of the wintering population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species over winter - Purple Sandpiper <i>Calidris maritima</i>, 840 individuals representing at least 1.7% of the wintering Eastern Atlantic – wintering population - Turnstone <i>Arenaria interpres</i>, 1,400 individuals representing at least 2.0% of the wintering Western Palearctic – wintering population
Ramsar	East Sanday Coast	UK13013	Ramsar criterion 6 – species/populations occurring at levels of international importance. Species with peak counts in winter: - Purple sandpiper, <i>Calidris maritima</i>, E Atlantic –wintering 840 individuals, representing an average of 1.1% of the population - Ruddy turnstone, <i>Arenaria interpres interpres</i>, NE Canada, Greenland/W Europe & NW Africa 1400 individuals, representing an average of 1.4% of the population
SSSI	East Sanday Coast	1678	Qualifying features: Non-breeding ringed plover, non-breeding bar-tailed godwit, non-breeding purple sandpiper, non-breeding sanderling, non-breeding turnstone; passage turnstone; rocky shore; sandflats; harbour seal; vascular plant assemblage.
SSSI	Eynhallow	618	Common (harbour) seal <i>Phoca vitulina</i>

Designation	Site Name	Site code	Designating features and comments
SPA	Fair Isle	UK9002091	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season: - Arctic Tern <i>Sterna paradisaea</i>, 1,120 pairs representing at least 2.5% of the breeding population in Great Britain - Fair Isle Wren <i>Troglodytes troglodytes fridariensis</i>, 37 individuals representing 100.0% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season - Guillemot <i>Uria aalge</i>, 25,165 pairs representing at least 1.1% of the breeding East Atlantic population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance: During the breeding season, the area regularly supports 180,000 individual seabirds including: Puffin <i>Fratercula arctica</i>, Razorbill <i>Alca torda</i>, Kittiwake <i>Rissa tridactyla</i>, Great Skua <i>Catharacta skua</i>, Arctic Skua <i>Stercorarius parasiticus</i>, Shag <i>Phalacrocorax aristotelis</i>, Gannet <i>Morus bassanus</i>, Fulmar <i>Fulmarus glacialis</i>, Guillemot <i>Uria aalge</i>, Arctic Tern <i>Sterna paradisaea</i>.
SAC	Faray and Holm of Faray	UK0017096	Annex II species that are a primary reason for designation Grey seal <i>Halichoerus grypus</i> These two uninhabited islands support the second largest breeding colony of grey seals in the UK, contributing to approximately 9% of the annual UK pup production.
SSSI	Faray and Holm of Faray	1683	Grey seal.
SSSI	Glims Moss and Durka Dale	739	Raised bog; Hydro morphological mire range; valley fen.
SSSI	Holm of Papa Westray	792	Breeding black guillemot.
SAC	Hoy	UK0012791	Annex I Habitats that are a primary reason for designation - Vegetated sea cliffs of the Atlantic and Baltic Coasts - Natural dystrophic lakes and ponds - Northern Atlantic wet heaths with <i>Erica tetralix</i> - Alpine and Boreal heaths - Blanket bogs *Priority feature Annex I habitats present as qualifying feature but not primary feature - European dry heaths - Petrifying springs with tufa formation (<i>Cratoneurion</i>) * Priority feature - Alkaline fens - Calcareous rocky slopes with chasmophytic vegetation

Designation	Site Name	Site code	Designating features and comments
SPA	Hoy	UK9002141	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season - Peregrine <i>Falco peregrinus</i>, 6 pairs representing at least 0.5% of the breeding population in Great Britain (Mid-1990s) - Red-throated Diver <i>Gavia stellata</i>, 56 pairs representing at least 6.0% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season - Great Skua <i>Catharacta skua</i>, 1,900 pairs representing at least 14.0% of the breeding World population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance - During the breeding season the area regularly supports 120,000 individual seabirds including :Puffin <i>Fratercula arctica</i>, Guillemot <i>Uria aalge</i>, Kittiwake <i>Rissa tridactyla</i>, Great Black-backed Gull <i>Larus marinus</i>, Arctic Skua <i>Stercorarius parasiticus</i>, Fulmar <i>Fulmarus glacialis</i>, Great Skua <i>Catharacta skua</i>.
SSSI	Hoy	798	Breeding seabird colony; breeding Arctic skua, breeding fulmar, breeding great skua, breeding guillemot. Breeding bird assemblage; breeding peregrine, breeding red-throated diver, breeding great black-backed gull; blanket bog. Upland oak woodland, coastal geomorphology of Scotland, old red sandstone Igneous, upland assemblage, quaternary of Scotland, dystrophic loch. Non-marine Devonian.
SSSI	Keelylang Hill and Swartaback Burn	826	Breeding hen harrier; breeding bird assemblage; upland assemblage (mosaic).
SSSI	Loch of Banks	1027	Non-breeding hen harrier; breeding bird assemblage; basin fen.
SAC	Loch of Isbister	UK0030193	Annex I Habitats that are a primary reason for designation - Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i>-type vegetation Annex I habitats present as qualifying feature but not primary feature - Transition mires and quaking bogs Annex II species that are a primary reason for designation - Otter <i>Lutra lutra</i>
SSSI	Loch of Isbister and the Loons	1031	Breeding pintail; breeding bird assemblage; basin fen.
SAC	Loch of Stenness	UK0014749	Annex I Habitats are the primary reason for designation Coastal lagoons *Priority feature
SSSI	Lochs of Harray and Stenness	1083	Qualifying features: Non-breeding goldeneye, non-breeding pochard, non-breeding scaup, non-breeding tufted duck; saline lagoon; freshwater nerite snail (<i>Theodoxus fluviatilis</i>); a caddis fly; eutrophic loch.

Designation	Site Name	Site code	Designating features and comments
SPA	Marwick Head	UK9002121	Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season: Guillemot (<i>Uria aalge</i>), 24,388 pairs representing up to 1.1% of the breeding East Atlantic population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance The area regularly supports 75,000 individual seabirds including: Kittiwake (<i>Rissa tridactyla</i>), Guillemot (<i>Uria aalge</i>).
SSSI	Marwick Head	1131	Breeding seabird colony; breeding guillemot; breeding kittiwake.
SSSI	Mill Bay	1152	Qualifying features: Quaternary of Scotland geology and geomorphology.
SSSI	Mill Loch	1155	Breeding red-throated diver (and loched designated for red throated divers).
SSSI	Muckle and Little Green Holm	1205	Quaternary of Scotland. Grey seal
SSSI	Muckle Head and Selwick	1207	Qualifying features: Quaternary of Scotland geology and geomorphology.
SPA	North Caithness Cliffs	UK9001181	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season - Peregrine Falco peregrinus, 6 pairs representing at least 0.5% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season - Guillemot <i>Uria aalge</i>, 26,994 pairs representing at least 1.2% of the breeding East Atlantic population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance - During the breeding season, the area regularly supports 110,000 individual seabirds including: Puffin <i>Fratercula arctica</i>, Razorbill <i>Alca torda</i>, Kittiwake <i>Rissa tridactyla</i>, Fulmar <i>Fulmarus glacialis</i>, Guillemot <i>Uria aalge</i>.
SSSI	North Hill	1237	Breeding Arctic skua; breeding Arctic tern; maritime cliff.
SPA	North Sutherland Coastal Islands	UK9001211	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species over winter: Barnacle Goose <i>Branta leucopsis</i>, 631 individuals representing at least 2.3% of the wintering population in Great Britain
SSSI	Northwall	1246	Machair loch; machair.
Possible MPA	North-west Orkney	-	The North-west Orkney possible MPA is recommended as an area of importance for sandeels, Sandeels are a key source of food for a range of marine wildlife, including many types of larger fish, and seabirds such as puffins. The area has been recommended for sandeels because of the important role the area plays in supporting wider populations of this fish in Scottish waters. Specifically, newly hatched sandeel larvae produced from this area are exported by currents to sandeel grounds around Shetland and south of the Moray Firth. The area also encompasses several unusual seabed forms of geological importance. Proposed protected features: - Newly emergent sandeel larvae - A range of geological features formed by the action of tides and currents, including sand banks, sand wave fields and sediment wave fields.

Designation	Site Name	Site code	Designating features and comments
SPA	Orkney Mainland Moors	UK9002311	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species During the breeding season - Hen Harrier <i>Circus cyaneus</i>, 30 pairs representing at least 6.0% of the breeding population in Great Britain - Red-throated Diver <i>Gavia stellata</i>, 15 pairs representing at least 1.6% of the breeding population in Great Britain - Short-eared Owl <i>Asio flammeus</i>, 20 pairs representing at least 2.0% of the breeding population in Great Britain Over winter - Hen Harrier <i>Circus cyaneus</i>, 13 individuals representing at least 1.7% of the wintering population in Great Britain
SSSI	Orphir and Stenness Hills	1259	Qualifying features: Breeding hen harrier; breeding bird assemblage; Upland assemblage (mosaic).
Possible MPA	Papa Westray	-	Papa Westray possible MPA supports over 400 breeding black guillemot every year. They raise their young in crevices and burrows along the shores of Papa Westray and the Holm of Papa Westray. They eat a variety of marine fish so breeding sites can only persist if there are healthy productive seas nearby. The possible MPA also lies within the Orkney carbonate production area. This is an internationally important example of a shelf carbonate system. The sand here consists primarily of calcium carbonate, formed by the erosion of the shells and skeletons of the animals that lived on or in the sea bed long ago. These sediments supply the sandy beaches of Orkney and underpin the development of small areas of coastal machair that supports diverse herb-rich grassland vegetation. Proposed protected features: - Black guillemot - Marine Geomorphology of the Scottish Shelf Seabed
SPA	Papa Westray (North Hill and Holm)	UK9002111	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season - Arctic Tern <i>Sterna paradisaea</i>, 1,950 pairs representing at least 4.4% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season - Arctic Skua <i>Stercorarius parasiticus</i>, 135 pairs representing at least 0.4% of the breeding North Atlantic population The terns feed outside the SPA in the waters surrounding the islands.
SPA	Pentland Firth Islands	UK9001131	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season Arctic Tern <i>Sterna paradisaea</i>, 1,200 pairs representing at least 2.7% of the breeding population in Great Britain
SSSI	Pentland Firth Islands	1677	Qualifying features: Breeding Arctic tern; Vascular plant assemblage.
SPA	Rousay	UK9002371	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season - Arctic Tern <i>Sterna paradisaea</i>, 1,000 pairs representing at least 2.3% of the breeding population in Great Britain (Seabird Census Register) Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance - During the breeding season, the area regularly supports 30,000 individual seabirds including: Guillemot <i>Uria aalge</i>, Kittiwake <i>Rissa tridactyla</i>, Arctic Skua <i>Stercorarius parasiticus</i>, Fulmar <i>Fulmarus glacialis</i>, Arctic Tern <i>Sterna paradisaea</i>.

Designation	Site Name	Site code	Designating features and comments
SSSI	Rousay	1386	Breeding Arctic tern; breeding guillemot; breeding kittiwake; breeding seabird colony; breeding Arctic skua; breeding bird assemblage; blanket bog; subalpine wet heath; mesotrophic loch; maritime cliff; Vascular plant assemblage.
SAC	Sanday	UK0030069	Annex I Habitats that are a primary reason for designation • Reefs Annex I habitats present as qualifying feature but not primary feature • Sandbanks which are slightly covered by sea water all the time • Mudflats and sandflats not covered by seawater at low tide Annex II species that are a primary reason for designation • Common seal <i>Phoca vitulina</i>
SSSI	Stroma	1498	Breeding Arctic tern; breeding seabird colony; breeding Guillemot; breeding sandwich tern; maritime cliff
SAC	Stromness Heaths and Coast	UK0013589	Annex I Habitats that are a primary reason for designation • Vegetated sea cliffs of the Atlantic and Baltic Coasts • European dry heaths Annex I habitats present as qualifying feature but not primary feature • Alkaline fens
SSSI	Stromness Heaths and Coast	1499	Subalpine dry heath; coastal geomorphology; non-marine Devonian stratigraphy; maritime cliff.
SPA	Sule Skerry and Sule Stack	UK9002181	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season • Leach's Storm-petrel <i>Oceanodroma leucorhoa</i>, 5 pairs representing at least 0.0% of the breeding population in Great Britain • Storm Petrel <i>Hydrobates pelagicus</i>, 1,000 pairs representing at least 1.2% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season • Gannet <i>Morus bassanus</i>, 4,890 pairs representing at least 1.9% of the breeding North Atlantic population • Puffin <i>Fratercula arctica</i>, 43,380 pairs representing at least 4.8% of the breeding population. The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds During the breeding season, the area regularly supports 100,000 individual seabirds including: Leach's Storm-petrel <i>Oceanodroma leucorhoa</i> , Guillemot <i>Uria aalge</i> , Shag <i>Phalacrocorax aristotelis</i> , Puffin <i>Fratercula arctica</i> , Gannet <i>Morus bassanus</i> , Storm Petrel <i>Hydrobates pelagicus</i> .
SPA	Switha	UK9002891	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species over winter • Barnacle Goose <i>Branta leucopsis</i>, 1,000 individuals representing at least 3.7% of the wintering population in Great Britain
SSSI	Switha	1702	Qualifying features: Non-breeding Greenland barnacle goose.
SSSI	Ward Hill Cliffs	1593	Maritime cliff.

Designation	Site Name	Site code	Designating features and comments
SSSI	Waulkmill	1598	Saltmarsh; golden-rod case-bearer moth; maritime cliff.
SSSI	West Mainland Moorlands	1610	Breeding hen harrier, breeding short-eared owl and breeding red-throated diver; breeding bird assemblage; upland assemblage (mosaic); blanket bog.
SPA	West Westray	UK9002101	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season - Arctic Tern <i>Sterna paradisaea</i>, 1,200 pairs representing at least 2.7% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season - Guillemot <i>Uria aalge</i>, 28,274 pairs representing at least 1.3% of the breeding East Atlantic population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance During the breeding season, the area regularly supports 120,000 individual seabirds including: Razorbill <i>Alca torda</i>, Kittiwake <i>Rissa tridactyla</i>, Arctic Skua <i>Stercorarius parasiticus</i>, Fulmar <i>Fulmarus glacialis</i>, Guillemot <i>Uria aalge</i>, Arctic Tern <i>Sterna paradisaea</i>.
SSSI	West Westray	1613	Breeding guillemot; breeding seabird colony; breeding Arctic skua; breeding Arctic tern; breeding kittiwake; breeding razorbill; maritime cliff.
Possible MPA	Wyre and Rousay Sounds	-	The Wyre and Rousay Sounds possible MPA comprises the sounds between the islands of Rousay, Wyre and Egilsay in Orkney. Tide-swept channels in this location support beds of maerl (a coralline seaweed) and kelp communities on sublittoral sediments. The maerl beds in this MPA proposal represent excellent examples of this habitat from amongst the largest known discontinuous area of maerl in UK waters. The beds have an exceptionally high proportion of live maerl and support diverse associated communities. Proposed protected features: - Kelp and seaweed communities on sublittoral sediment - Maerl beds - Marine Geomorphology of the Scottish Shelf Seabed

A.2.2 Protected Species

European Protected Species (EPS)

EPS are those species listed on Annex IV of the Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (Habitats Directive). They require “a system of strict protection”. In Scotland the Habitats Directive is transposed through a combination of the Conservation of Species and Habitats Regulations 2010 (in relation to reserved matters) and The Conservation (Natural Habitats, &c.) Regulations 1994. For UK offshore waters the Habitats Directive is transposed into UK law by the Offshore Marine Conservation (Natural Habitats & c.) Regulations 2007 (as amended).

The regulations make it an offence to deliberately capture, injure, kill or disturb any listed animal. Disturbance of animals includes activities that are likely to -

- a) Impair their ability –
 - (i) to survive, to breed or reproduce, or to rear or nurture their young; or
 - (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
- b) Affect significantly the local distribution or abundance of the species to which they belong.

Marine EPS include:

- All cetaceans (dolphins, porpoises and whales);
- Otters (*Lutra lutra*);
- Sturgeon fish (*Acipenser sturio*), and
- Marine turtles (*Caretta caretta*, *Chelonia mydas*, *Lepidochelys kempii*, *Eretmochelys imbricate*, *Dermochelys coriacea*).

Cetaceans and otters are found within the study area, further details of which are provided in individual sections below.

In addition to these EPSs, Annex II of the Habitats Directive, lists animal and plant species of community interest whose conservation requires the designation of SACs. Annex II species for which SACs have been designated in the study area include:

- Otter (*Lutra lutra*).
- Grey seal (*Halichoerus grypus*).
- Common seal (*Phoca vitulina*).

A summary of the SACs in the area which list an Annex IV (EPS) or Annex II species as an interest or qualifying feature are summarised in Table A-2.

Table A-2: SACs in the study area which list an Annex IV (EPS) or Annex II species as an interest or qualifying feature

Site Name	Annex IV species	Annex II species
Faray and Holm of Faray	-	Grey seal
Loch of Isbister	Otter	Otter
Sanday	-	Harbour seal

Cetaceans

All cetaceans occur on Annex IV of the Habitats Directive and therefore require strict protection. A SNH commissioned report (Evans *et al*, 2011) covering the abundance of cetaceans in the Pentland Firth and Orkney Waters indicates that:

- The Pentland Firth and Orkney Waters is one of the richest areas in the UK for cetaceans with 19 species recorded in the area since 1980, 17 of these as live sightings. The Draft Orkney Biodiversity Action Plan (BAP) lists 18 species of cetaceans (OIC, 2013a).
- Six cetacean species occur regularly: Harbour porpoise (*Phocoena phocoena*), minke whale (*Balaenoptera acutorostrata*), white-beaked dolphin (*Lagenorhynchus albirostris*), Risso's dolphin (*Grampus griseus*), killer whale (*Orcinus orca*) and bottlenose dolphin (*Tursiops truncatus*).
- Four species are casual visitors which normally inhabit offshore waters: short-beaked common dolphin (*Delphinus delphis*), Atlantic white-sided dolphin (*Lagenorhynchus acutus*), long finned pilot whale (*Globicephala melas*) and sperm whale (*Physeter macrorhynchus*).
- Harbour porpoise and long-finned whales are recorded year round, whilst observations of the other regular species are highest in the summer months.
- Although it is difficult to obtain clear distribution patterns from the uneven distribution of sightings, areas which are clearly important for cetaceans include: Scapa Flow and adjacent areas in South Orkney, Gills Bay, Dunnet Bay, and Strathy Bay on the Scottish mainland.

Two species of cetacean: the harbour porpoise and bottlenose dolphin are listed in Annex II of the Habitats Directive as species whose conservation required designation of SACs. There are no SACs in the study area designated for the harbour porpoise and bottlenose dolphin.

Cetacean sightings around the Orkney Islands between 2002 and 2013 are listed in Table A-3. During this time period the most commonly sighted cetaceans in Orkney were the harbour porpoise, followed by the killer whale Risso's dolphin and Minke whale. While these species may be present around the Orkney coastline, it is unlikely that the majority will be seen regularly within Scapa Flow, since the waters are shallower and the large shoals of fish upon which numerous cetaceans prey are likely to be typically absent in inshore waters (European Marine Energy Centre (EMEC), 2011).

Atlantic white-sided dolphin, bottlenose dolphin, fin whale, harbour porpoise, killer whale, long-finned pilot whale, Minke whale, Northern bottlenose whale, Risso's dolphin, short-beaked common dolphin, sperm whale and white-beaked dolphin are all listed on the recommended PMFs List and are known to be present in Orkney waters.

Table A-3: Cetaceans sighting around Orkney (2002-2013) (OBRC, 2014)

Species		Sightings around Orkney Islands
Common name	Latin name	
Minke Whale	Balaenoptera acutorostrata	255
Fin Whale	Balaenoptera physalus	3
Beluga whale	Delphinapterus leucas	1
Common Dolphin	Delphinus delphis	226
Long-finned Pilot Whale	Globicephala melas	74
Risso's dolphin	Grampus griseus	257
Atlantic White-sided Dolphin	Lagenorhynchus acutus	56
White-Beaked Dolphin	Lagenorhynchus albirostris	115
Humpback Whale	Megaptera novaeangliae	14
Killer Whale	Orcinus orca	1077
Harbour porpoise	Phocoena phocoena	1819
Sperm Whale	Physeter macrocephalus	20
Striped Dolphin	Stenella coeruleoalba	8
Bottlenose Dolphin	Tursiops truncatus	7
Cuvier's Beaked Whales	Ziphius cavirostris	2

Otters

The European otter (*Lutra lutra*) was once widespread in Europe, but numbers declined sharply in the 1960s and 70s due to pollution, exacerbated by habitat loss and hunting (JNCC, 2013b). In Great Britain, whilst numbers fell in England and Wales, they survived in Scotland's cleanest water bodies in the north and west, and Scotland has remained a European stronghold for otters. In 2003, the total Scottish population was estimated at around 8,000 (SNH, 2013c).

The European otter is an EPS, listed on Annex IV of the Habitats Directive. It is also listed on Annex II of the Habitats Directive requiring the designation of SACs for its conservation. Otters are semi-aquatic mammals that obtain most of their food from lochs, rivers or the sea. The Scottish population is unusual in that it comprises a particularly high proportion (50% or more) of coastal-dwelling otters which feed predominantly in the sea (SNH, 2013b, c). Whilst the most important coastal areas for otters in the British Isles are the west coast of Scotland and the Shetland Islands, one SAC in the study area lists otters as an interest or a qualifying feature. This is Loch of Isbister SAC.

Otters are also listed on the UK BAP List, Scottish Biodiversity List, Local Priority (Orkney) List and the recommended PMF List. In a national survey during 2003/04 otters were found in all the 10 km squares sampled in Orkney (SNH, 2007); therefore it should be assumed that otters occur throughout coastal areas in Orkney.

A.2.3 Other Protected Species

Seals

Two species of seals live and breed in UK waters: grey seals (*Halichoerus grypus*) and harbour (common) seals (*Phoca vitulina*). Both species are listed under Annex II of the EC Habitats Directive which lists animal and plant species of community interest whose conservation requires the designation of SACs. In Scotland the Marine (Scotland) Act 2010 provides for improved protection of seals by making it an offence to kill or take seals at any time. The Act allows exceptions only under specific licence or for animal welfare, and introduces a new offence of harassment of seals at listed haul-out sites. Both grey seals and harbour seals are listed on the recommended PMF List.

Harbour seal

Harbour seals are a UK BAP, Scottish Biodiversity List and Orkney BAP priority marine species and have been identified as threatened and requiring conservation action. The UK and Scotland support a large proportion of European harbour seal populations, with approximately 30% of European harbour seals found in the UK (a drop from 40% in 2002), and 79% of this population are in Scotland. Major declines have now been documented in harbour seal populations around Scotland with declines since 2000 of 66% in Orkney and 46% in the Moray Firth (SMRU, 2011b). Recent surveys of harbour seals in Orkney, during 2010, have concluded that numbers are continuing to decline. In 2010 this rate was appearing to slow (Duck and Morris, 2011). Between August 2008 and August 2010 a reduction of 6.2% was documented in Orkney, however this reduction is smaller than seen in previous surveys. A further survey undertaken in August 2012 concluded that the numbers of harbour seals has continued to decline. The rate of decline of harbour seals counted on the coastline surveyed in 2012 appears to be more or less constant since 2006 (Duck and Morris, 2013). The sheltered waters of Scapa Flow provide haul-out sites for harbour seals (EMEC, 2011).

There is one SAC designated for harbour seals in the study area:

- **Sanday SAC** is located in the north-east of Orkney and up until 2001, supported the largest group of harbour seals at any discrete site in Scotland. The breeding groups occur on intertidal haul out sites around the coast and represent over 4% of the UK population (SMRU, 2011a).

Grey seal

Grey seals are listed on the Orkney BAP. Approximately 38% of the world's population of grey seals breed in the UK and 88% of these breed at colonies in Scotland with the main concentrations in the Outer Hebrides and Orkney (SMRU, 2011b). As for harbour seals, the sheltered waters of Scapa Flow provide the ideal haul-out sites for grey seals (EMEC, 2011).

One of six SACs designated for grey seals in Scotland is located in Orkney:

- **Faray and Holm of Faray SAC** comprises two uninhabited islands in the northern part of Orkney. These islands support the third largest breeding colony in the UK (and fourth largest in the world) and, in 2008, contributed approximately 6% of annual UK pup production (Sea Mammal Research Unit (SMRU), 2011a).

Birds

Internationally important numbers of several species of seabird breed on the North Sea coastal margin, and depend on the offshore North Sea for their food supply and, for much of the year, their habitat. Orkney holds large numbers of breeding birds and the surrounding waters are very important for seabirds during the breeding season, especially for auks (*Alcidae*), skuas (*Stercorariidae*) and Arctic terns (*Sterna paradisaea*). The surrounding waters are important for some species throughout the year including, fulmars (*Fulmaris glacialis*), great black-backed gulls (*Larus marinus*), kittiwakes (*Rissa tridactyla*) and shags (*Phalacrocorax aristotelis*). Guillemots (*Uria aalge*) remain in the area throughout the winter months, although in lower numbers than during the breeding season (Stone et al., 1995).

Northern gannets (*Morus bassanus*) and Atlantic puffins (*Fratercula arctica*) are present in summer months, manx shearwaters (*Puffinus puffinus*) and European storm petrels (*Hydrobates pelagicus*) may be present between September and November, great skuas (*Stercorarius skua*), lesser black backed gulls (*Larus fuscus*) and little auks (*Alle alle*) may be present in low densities for the majority of the year, whilst herring gulls (*Larus argentatus*), glaucous gull (*Larus hyperboreus*) and great black-backed gulls (*Larus marinus*) are known to be present in the area in winter (Stone et al., 1995).

The highest densities of all these species listed above are found during the autumn and winter months (Stone et al., 1995). The offshore distribution of these seabirds varies across the year, being largely dependent on which stage of their lifecycle they are at. For example, offshore abundance will be lower during the breeding season but will be higher outside this time. The offshore distribution of seabirds outside of the breeding season is mostly driven by the availability of food. The distance to which birds will travel for food varies greatly between species and this influences offshore distribution. Non-breeding birds may be found foraging further offshore than breeding birds.

The Orkney Islands, including Scapa Flow and the surrounding area are important for a number of bird species. The Orkney BAP lists 114 individual species of birds (OIC, 2013a) and there are 13 RSPB nature reserves within Orkney (RSPB, 2012). Data was obtained from the Orkney Biological Records Centre in May 2014, comprising of waterbird sightings around the Orkney Islands from 2005 to 2013. Species numbers recorded over this period are supplied in Table A-4. The Black-throated diver (*Gavia arctica*), great northern diver (*Gavia immer*), red-throated diver (*Gavia stellate*) and Slavonian grebe (*Podiceps Auritus*) are all listed on Annex I of the Birds Directive. In recent years populations of seabirds around the Orkney Islands have been vastly reduced (RSPB, 2008).

A pollution incident anywhere in the Northern Isles would have serious implications for seabirds. Although species and numbers involved would depend on the time of year (Stone et al., 1995). The highest number of seabirds will occur between April and September when birds are breeding and fledging but species such as divers and grebes winter in the region and therefore sensitivity for these groups will be highest during this time.

Breeding and resident seabirds, ducks and divers around Scapa Flow will use the area around the STS locations for feeding. A number of important breeding seabird colonies are found around Scapa Flow, for example at designated SPAs, these birds will be found using Scapa Flow.

Table A-4: Bird sightings 2005-2013 (OBRC, 2014)

Species	Numbers recorded from 2005-2011
Black throated diver (<i>Gavia arctica</i>)	1,049
Common eider (<i>Somateria mollissima</i>)	40,650
Eurasian wigeon (<i>Anus Penelope</i>)	270,367
Great northern diver (<i>Gavia immer</i>)	12,325
Red-throated diver(<i>Gavia stellata</i>)	2,459
Slovenian grebe(<i>Podiceps auritus</i>)	5,763

A number of SPAs are designated within the area. Switha is an important island for barnacle geese (*Branta leucopsis*); the Pentland Firth Islands for Arctic terns (*Sterna paradisaea*), the mainland moors for red-throated divers (*Gavia stellata*), hen harrier (*Circus cyaneus*) and short-eared owl (*Asio flammeus*); Copinsay for its assemblage of seabirds including common guillemot (*Uria aalge*), black-legged kittiwake (*Rissa tridactyla*), great black-backed gull (*Larus marinus*) and northern fulmar (*Fulmarus glacialis*); and Hoy for peregrine (*Falco peregrines*), red-throated diver, great skua (*Catharacta skua*) and its assemblage of nesting birds including Atlantic puffin (*Fratercula arctica*), common guillemot, black-legged kittiwake, great black-backed gull, Arctic skua (*Stercorarius parasiticus*), northern fulmar and great skua (Dawson *et al.*, 2009).

The waters of Scapa Flow host large numbers of birds outwith the existing SPAs (Dean *et al.*, 2004) and particularly outside the breeding season. Scapa Flow has been an area of search for waterbirds because of the number of inshore waterbirds that use the area. In order to ascertain its suitability as an SPA an assessment was undertaken by JNCC. For the assessment aerial surveys and land/boat based surveys were conducted over a total of seven winter seasons to estimate the total number of inshore waterbirds. Species recorded during the aerial survey were: common eider (*Somateria mollissima*), longtailed duck (*Clangula hyemalis*), common scoter (*Melanitta nigra*), common goldeneye (*Bucephala clangula*), red-breasted merganser (*Mergus serrator*), red-throated diver (*Gavia stellate*), and great northern diver (*G. immer*). In addition land/boat-based counts documented velvet scoter (*M. fusca*), goosander (*M. merganser*), black-throated diver (*G. arctica*), little grebe (*Tachybaptus ruficollis*), rednecked grebe (*Podiceps grisena*) and Slavonian grebe (*P. Auritus*). The peak numbers of many of these species exceeded the criteria for SPA designation. During the winter season Scapa Flow meets UK SPA selection guidelines for consideration as a possible marine SPA for black-throated diver, great northern diver and slavonian grebe. In addition, winter populations of European shag also meet criteria for an SPA (Dawson *et al.*, 2009).

In a recent aerial bird survey for Orkney Waters and the Pentland Firth Fulmars were the most abundant species, with peak populations recorded in February and March (estimated at 49,672 birds). Auks were the next most abundant species group, with peak populations (estimated at 29,093 in July), followed by common guillemots / razorbills (estimated at 26,777 in July). The majority of birds were located close to the coast, with particularly large concentrations recorded around the north-west coast of Hoy, west coast of Westray, north coast of Rousay and north-east coast of mainland Scotland, reflecting the SPA sites in these areas (APEM, 2013).

A.2.4 Fish

The seas around Scotland support significant populations of commercially important species of fish and shellfish. Fishing targets both demersal and pelagic stocks (Scottish Government, 2011b). The distributions of these stocks and their species are mainly governed by two partially inter-related factors, depth and the physical nature of the seabed.

The Centre for Environment, Fisheries and Aquaculture Science (Cefas) provide information on spawning grounds (the location where eggs are laid) and nursery areas (the location where juveniles are common) for fish stocks in the region in the format of fisheries sensitivity maps. Scapa Flow is located within important areas for a number of commercially important fish species. Herring (*Clupea harengus*) spawn in the area in August and September, lemon sole (*Microstomus Kitt*) between April and September, sandeels (*Ammodytes marinus*) between November and February and sprat (*Sprattus sprattus*) between May and August, with peak in May and June. Saithe (*Pollachius virens*), lemon sole, Sandeel and sprat use the area as a nursery ground year round (Coull *et al.*, 1998).

Mackerel (*Scomber scombrus*) present during their migratory passage past Orkney, may also be found in the more energetic waters of Hoxa Sound in the south of Scapa Flow (EMEC, 2011). It is also possible that other migratory marine fish species, eels, salmon (*Salmo salar*) and trout (*Salmo trutta*) may move through the wider Orkney area. Numerous sea lochs, small burns and surrounding coastal seas of Orkney are reported to contain populations of sea trout (Robson, 1997), sea trout spawn in freshwater during the months of October to January and then migrate out to sea to mature.

A.2.5 Benthic Habitats

Benthic ecology describes the assemblages of organisms living in (infauna) or on, the seabed (epifauna), their diversity, abundance and function. Benthic communities include those found on the sea floor from the intertidal zone to the deepest parts of the marine environment. The major factor influencing the geographic distribution of benthic communities is the type of sediment in which they live, and the distribution of sediments is largely governed by hydrography (Eleftheriou *et al*, 2004).

In the Pentland Firth area strong tidal currents have resulted in heavily scoured and exposed bedrock and boulder outcrops. This lack of sediment has resulted in a community dominated by epifaunal biota. The fauna varies according to differences in current strength and scour but is predominately dominated by high numbers of the anenome (*Uticina feline*). Elevated upward facing rock located in areas of strong tidal currents is abundance and species-poor with barnacle crusts, scattered bryozoans and hydroid clumps, whereas in pockets of reduced current strength the abundance of these species increases to form localised tuffs (Moore, 2010).

The Orkney coast is predominantly rocky, supporting diverse intertidal communities. The intertidal habitats in Orkney and the surrounding area range from those characterised by extreme wave action on exposed coastlines and those characterised by calm condition on sheltered coastlines to extensive sandy beaches and lagoonal habitats (Bennett and Covey, 1998).

Intertidal benthic communities are largely defined by physical factors such as wave exposure, tidal stream length, temperature, salinity and climate (Moore, 2010).

Communities on exposed coastlines in the Orkney Islands and surrounding areas, exhibit those features associated with encrusting rocky shore communities dominated by the edible muscle (*Mytilus Edulis*), barnacles (*chthamalus* sp. and *Semibalanus balanoides*), the limpet (*Patella* sp.) and some lichens and brown algae such as *Fucus distichus*, *Fucus spiralis*, *Corallina officinalis*, *Fucus spiralis* and a few red seaweeds i.e. *Chondus crispis* and *Mastacarpus stellatus*. In sheltered areas of the rocky coast and on mixed sediments, communities are dominated by a dense covering fucoids such as *Pelvetia canaliculata*, *Fucus spiralis* and *Fucus vesiculosus* and barnacles, as well as the gastropods *Littorina neritoides* and *Gibbula umbicalis*.

Shallow rocky sublittoral and other exposed hard substrata are dominated by red and brown algal species and on the wave surged south coast sites, dense growths of encrusting sponges; ascidians, bryozoans and hydroids were present. The communities of the deeper and exposed sublittoral areas were dominated by bryozoans, mussel beds, brittle stars and faunal and algal encrusting species along with the presence of the sea urchin *Echinus esculentus*. In areas of shallow sublittoral mixed sediments communities are dominated by the kelp *Limnaria saccharina* and filamentous red seaweeds while bivalve species and muscle beds may be present. In the open coast and on the outer areas of the sounds, maerl beds, red seaweeds, hydroids, echinoderms and bivalves are dominant (Eleftheriou *et al*, 2004).

In Scapa Flow, on the more sheltered areas with variable sediments, species show an uneven distribution. Sedimentary beaches were dominated by the lugworm (*Arenicola marina*) and the spinoid polychaetes *Pygospio elegans* and *Spio Martinensis* and on the lower shore *Tellina tenuis* was present. Sublittoral fine sandy sediments in the central basin of the Flow supported communities dominated by bivalves such as *Thyasira flexuosa*, the polychaete *Prionospio fallax* as well as seapens, brittle stars and a number of bivalves (Murray *et al.*, 1999) along with the burrowing anemone *Cerianthus lloydii*. In coarse sediments the outer reaches of the Flow were dominated by the sea cucumber *Neopentadactyla mixta* and the polychaete *Lanice conchylega*. Diversity was greatest on coarse sediment shores while in the finer sediments of the northeastern part of the Flow diversity and abundance were low (Eleftheriou *et al*, 2004). To the north of Cava mixed sediment supports a population of the horse mussel (*Modiolus modiolus*), which supports a community associated with hard substrata including brittle stars. The extent of this mussel bed is uncertain (Moore, 2010).

A survey of the seabed below the four STS locations undertaken in 2013 indicated that the seabed consists of mud with shell fragments and occasional unattached red algae with common large infaunal burrows. Occasional starfish *Asterias rubens*, hermit crab *Pagurus bernhadus* and frequent swimming crab *Liocarcinus depurator*. Langoustine *Nephrops norvegicus* occasional at STS2 but absent on the other locations. The seabed at the four STS locations was very similar except at STS4 which had large scrape marks across the site most likely caused by mooring anchors.

Benthic species and habitats of conservation importance

- Horse Mussel (*modiolus modiolus*): widely distributed in the northern North Sea. Horse mussel beds are known to occur in Orkney. This species itself does not afford any protection, however horse mussel bed habitat are listed on OSPAR, UKBAP, recommended PMF list and could come under Annex I of the EC Habitat Directive for 'large shallow inlets and bays and reefs'.
- Annex I Habitat, Reefs: There is one SAC in the study area where the primary reason for the designation is the presence of reefs: Sandy Kelp and seaweed communities, Sanday SAC: Sanday is a large low lying island in the north east of the Orkney islands, notable for the extensive subtidal bedrock reefs that surround the island and provide a habitat for dense forests of kelp *Laminaria* spp. The kelp occurs to a depth of about 20 m and provides a habitat for species-rich, red algal turf communities. Sponges, such as *Clathrina coriacea*, and ascidians, such as *Aplidium punctum*, occur on the vertical rock faces. The north coast of Sanday is tide-swept and appears to support a richer fauna than the south coast, with a dense bryozoan/hydroid turf and dense brittlestar and horse mussel *Modiolus modiolus* beds in mixed sediment below the kelp zone. Crabs and brittlestars are common within crevices in the rock.
- Wyre and Rousay Sounds possible MPA: The islands are affected by the tides of the Atlantic and the North Sea with tide-swept channels supporting kelp communities on sublittoral sediments.
- Maerl beds: are known to occur in Orkney. Wyre and Rousay Sounds possible MPA supports beds of maerl (a coralline seaweed). The maerl beds within the possible MPA represent excellent examples of this habitat from amongst the largest known discontinuous area of maerl in UK waters. The beds have an exceptionally high proportion of live maerl and support diverse associated communities. Maerl beds are listed on the recommended PMF list and in the Orkney BAP.

A.2.6 Littoral Habitats

Shores of Orkney range from those exposed to extreme wave action on the west coast to very sheltered conditions between the islands. Table A-5 shows the different types of shores in the Orkney Islands. The majority of shores are Fucoid-dominated shores (Baxter, Jones and Simpson, 1985). Monitoring around Scapa Flow by the Orkney Marine Biology Unit has involved studying transects on both rocky and sedimentary shores to record the distribution and abundance of species.

Table A-5: The proportion of different shore types found in Orkney (Baxter, Jones and Simpson, 1985)

Shore type	Percentage
Fucoid-dominated shores	24%
<i>Ascophyllum</i> -dominated shores	21%
Barnacle-dominated shores	17%
Very exposed shores	14%
Sandy shores	12%
Barnacle/fucoid-dominated shores	8%
Shingle shores	4%

A number of UK BAP littoral habitats are known to occur in Orkney. These include:

- Intertidal Mudflats.
- Coastal Saltmarsh.
- Sandy shores.
- Seagrass beds.
- Intertidal underboulder communities.
- Blue mussel beds (*Mytilus edulis*) (OIC, 2013a).

Intertidal underboulder communities have been identified as a targeted habitat for action in the Orkney BAP 2013-16, along with coastal vegetated shingle. Both of which are considered to be at risk from human impacts from oil spills (OIC, 2013a).

There are three draft Local Nature Conservation Sites (LNCS) with special habitats of Intertidal mudflats within Orkney, Bay of Suckquoy, South Westray Coast and The Ouse, Aikerness (OIC, 2012b). LNCS are sites are designated by OIC and regarded as being worthy of protection for their ornithological, botanical or geological/geomorphological interest. Intertidal mudflats are also listed on the recommended PMF List.

Waulkmill SSSI contains the largest area of coastal saltmarsh in Orkney but there are other significant areas of the habitat on shorelines around Scapa Flow. Central Sanday SSSI also contains coastal saltmarsh. There are 14 draft LNCS with coastal saltmarsh as a special habitat within Orkney (OIC, 2012b).

There are a number of sandy shores located throughout the Orkney Islands, seven of which are in Scapa Flow (Atkins et al., 1985).

Eelgrass (*Zostera marina*) and slender eelgrass (*Z. Angustifolia*) occur in Orkney, with the former making up the majority of seagrass beds in Orkney. There are several significant sites of seagrass beds. These are typically in protected bays, estuaries and away from particularly strong winds (OIC, 2008a). Seagrass beds are also listed on the recommended PMF List.

A.3 Human Beings

A.3.1 Quality of Life

Orkney has amongst the highest life expectancy in Scotland. Life expectancy in Orkney for both males and females is higher than the Scottish average. In 2012, female life expectancy at birth (81.8 years) is greater than male life expectancy (79.7 years) (National Records of Scotland, 2014).

The estimated population of Orkney in 2012 was 21,530 (National Records of Scotland, 2014).

Population density across Orkney was 20 persons/km² in 2011 (National Records of Scotland, 2011). Since 1986, Orkney Islands' total population has risen overall. The most densely populated settlements are Kirkwall and Stromness with approximately 7,600 and 2,100 persons respectively. Between 1991 and 2001 Orkney's smaller islands experienced depopulation between 2% and 36% as people moved to the Orkney Mainland.

An oil spill has the potential to adversely impact quality of life through impacts on employment, recreation, water quality and the local economy.

A.3.2 Recreation

The Orkney Islands are valued for the abundance of birds and marine wildlife that inhabit the islands throughout the year. This makes them a popular tourist destination.

Scapa Flow is utilised for a number of different water sports and activities. Leisure activities practiced within Scapa Flow include diving on underwater wrecks, swimming, sailing, windsurfing and canoeing. There are a number of sailing clubs and marinas located within Scapa Flow.

A.3.3 Employment

Orkney's traditional industries are farming and fishing. However, tourism and food processing are increasingly becoming important employers. Over 8,000 people are employed in Orkney, with almost one third of these working for the Council, NHS and other public sector organisations (OIC, 2012c).

Employment in the fishing industry in Orkney has decreased between 2009 and 2012. The size of the fishing fleet in Orkney also decreased over this period (OIC, 2013b). Along with reduction in fleet size, the volume and value of landings of demersal and pelagic fish fell considerably in 2012.

Fish farming in the Orkney Islands increased by 51% between 2011 and 2012. Employment levels in fish farming fluctuate from year to year with no explanation (OIC, 2013b). An oil spill has the potential to adversely impact the fishing industry.

OIC Harbour Authority employs approximately 95 staff, many of which are directly involved in the management of the Harbour. Orkney Towage Company Limited (owned by OIC) employ around 20 staff, which primarily provide towage services for Flotta Oil Terminal, as well as assisting with the berthing and sailing of oil tankers involved in STS operations.

A.3.4 Health and Safety

Fatal and major injuries rates per 1,000 people in Orkney and Scotland are recorded in Table A-6. The results show that while the injury rate in Scotland has decreased over time, the injury rate for Orkney fluctuates.

Table A-6: Fatal and major injuries rates per 1,000 people (reported to enforcing authorities) (calculated from HSE and General Register Office for Scotland statistics)

	2007/08	2008/09	2009/10	2010/11	2011/12
Orkney	0.65	0.4	0.55	0.65	0.55
Scotland	0.55	0.54	0.52	0.52	0.43

Injuries within Orkney harbours recorded by OIC Marine Services and shown in Table A-7, indicate that injuries to staff and the public are minor, with no injuries occurring in some years.

Table A-7: Injuries recorded in OIC Harbours (OIC Marine Services, 2010, 2013b)

Injury Type	2008	2009	2010/11	2011/12	2012/13
Personnel Injury (Staff / Seaman)	2	0	4	0	0
Public Injury	2	0	0	0	2

The number of total accidents and incidents recorded in OIC Harbours, including near misses, incidents within marines and other accidents, has decreased overtime between 2008 and 2011/12. However, in the year 2012-2013 there was an increase in the number of accidents and incidents. This is being addressed through the OIC Harbour Authority's Safety Management System. Table A-8 shows the total number of accidents and incidents recorded over this time period.

Table A-8: Recorded accidents and Injuries in OIC Harbours (OIC Marine Services, 2010, 2013b)

Period	Total number of accidents and incidents
2008	17
2009	23
2010/11	11
2011/12	10
2012/13	23

A.4 Water

A.4.1 Water Quality

Water Framework Directive (WFD) Classification

The WFD aims to prevent deterioration and enhance the status of aquatic ecosystems (including coastal waters). In Scotland the WFD is implemented by SEPA. Results for the WFD coastal waters classification of Scapa Flow and Loch of Stenness are shown in Table A-9. The results show that while the WFD status of Scapa Flow has remained Good over time, the status of Loch of Stenness has fluctuated between Good and High. The fluctuation in the water quality status may be due to the pressures of the point source pollution of sewage, nutrient enrichment from diffuse source pollution and alterations in the beds and banks of burns entering the Loch of Stenness (SEPA, 2013).

Table A-9: Water Framework Directive Classification (SEPA, 2007-2012)

	2007	2008	2009	2010	2011	2012
Scapa Flow	Good	Good	Good	Good	Good	Good
Loch of Stenness	High	High	High	Good	Good	High

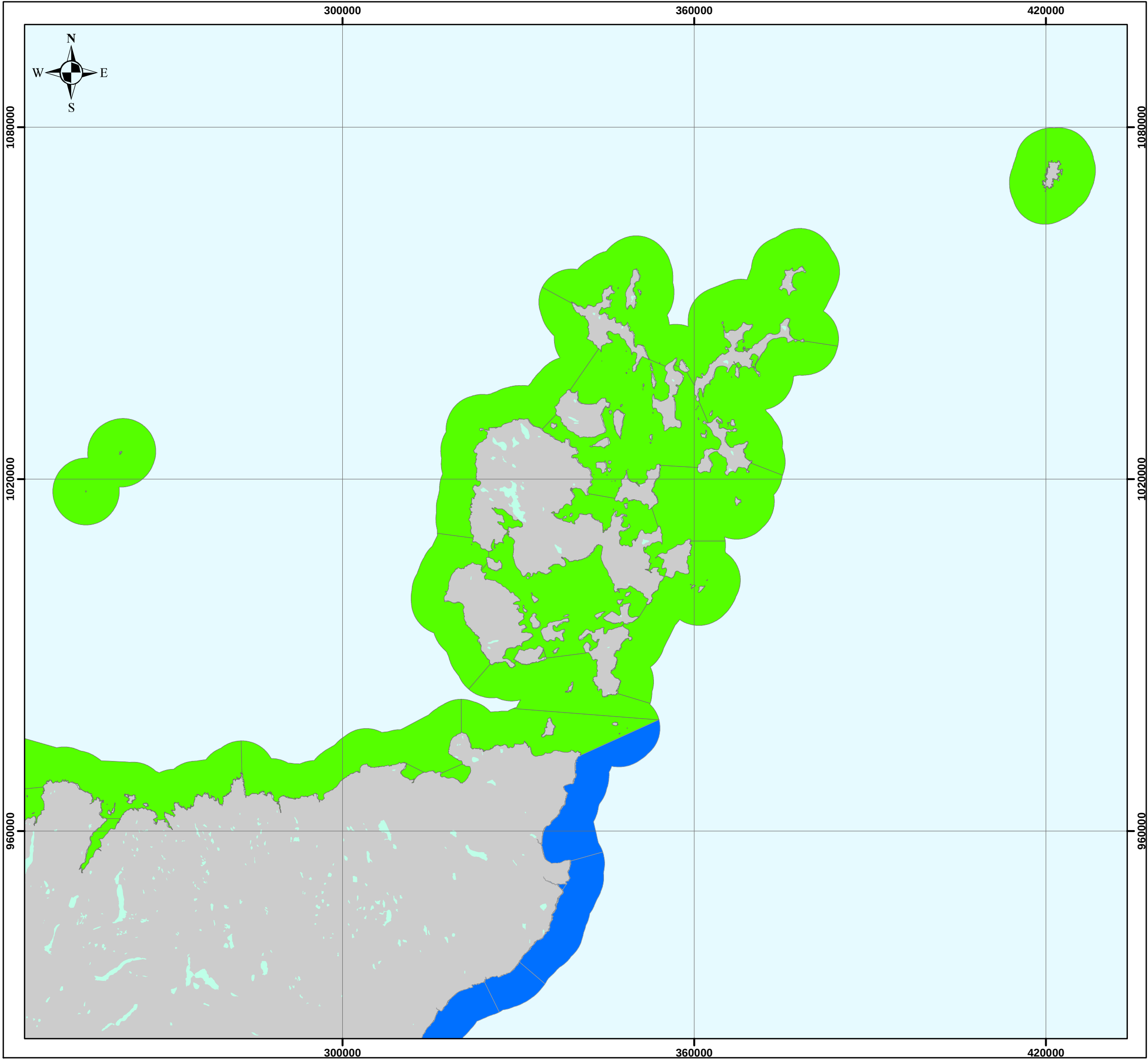
Figure A-2 shows the classification of coastal waters around Orkney in 2011. It shows that the majority of coastal water bodies are classified as Good, with the coastal waters from John o'Groats to Brora classified as High.

Bathing Water Quality

The Bathing Waters Directive requires bathing waters to meet water quality standards designed to protect the health of the people who bathe in these waters. Orkney does not contain any designated bathing waters.

Shellfish Water Quality

Orkney contains one designated shellfish growing area, the Bay of Firth. On 1st June 2012 the Bay of Ireland shellfish growing area (located at the entrance to Loch of Stenness) was de-designated based on there being no current cultivation of shellfish (The Scottish Government, 2012). Water quality monitoring at the Bay of Firth shellfish water shows that compliance with the guideline faecal coliforms has not failed between 2000 and 2010, however they were not monitored between 2002 and 2006 (SEPA, 2011a).



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Figure A-2: Classification of Coastal Waters 2011

Legend

Coastal Waters Classification 2011

- High
- Good
- Moderate



NOTE: Not to be used for Navigation

Date	Tuesday, June 10, 2014 15:26:55
Projection	British_National_Grid
Spheroid	Airy_1830
Datum	D_OSGB_1936
Data Source	SEPA, OSOD, ESRI
File Reference	J:\P1861\Mxd\ES_Report\Appendix_A\Classification_of_Coastal_Waters.mxd
Created By	Emma White
Reviewed By	Ian Charlton
Approved By	Fiona Bell



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A.4.2 Marine Pollution

Sources of marine pollution include:

- Industrial wastewater.
- Domestic sewage.
- Offshore oil.
- Farm runoff.
- Ballast water.
- Litter.

Diffuse source pollution (farm runoff) and sewerage treatment is listed as a pressure on the coastal waters around Scapa Flow by SEPA (2013).

There are existing ballast water discharges from Flotta Oil Terminal's discharge pipeline and from LPG ships. The Flotta pipeline discharge is governed by a SEPA licence (Permit number: PPC/A/1012610) and covers emissions to the water environment and requirements for sampling, testing and reporting. The permit includes limits for the discharge of oil, suspended sediments, sulphides, ammoniacal nitrogen and phenols. The permit does not include performance standards associated with the discharge of organisms. LPG ballast water discharge is controlled by the OIC BWM Policy.

Statistics for oil and chemical spills resulting from ships and offshore oil and gas installations are discussed in the section below.

A.4.3 Oil and Chemical Pollution

Only one major oil spill incident has occurred in or around northern Scotland since 1993, when the Braer tanker ran aground and spilt 85,000 tonnes of crude oil off the coast of the Shetland Islands. In August 2011, the flow line leading to the Gannet Alpha platform leaked >200 tonnes of oil into the North Sea, 180 km east of Aberdeen.

A number of small incidents, however, do occur each year from ships and offshore oil and gas installations. Figure A-3 shows the total number of incidents of oil and chemical spills between 2002 and 2012. The figures demonstrate that fewer oil and chemical spill incidents occur in the Orkney and Shetland area than in areas in Western and Eastern Scotland. This is most likely due to fewer oil and gas installations within the surrounding area of Orkney and Shetland. Oil spills occurring in coastal waters are usually due to accidents in the handling of oil or due to ships running aground, while most offshore spills occur at oil and gas installations.

Figure A-3: Number of incidents of oil and chemical spills from ships and installations (ACOPS, 2003-2012)

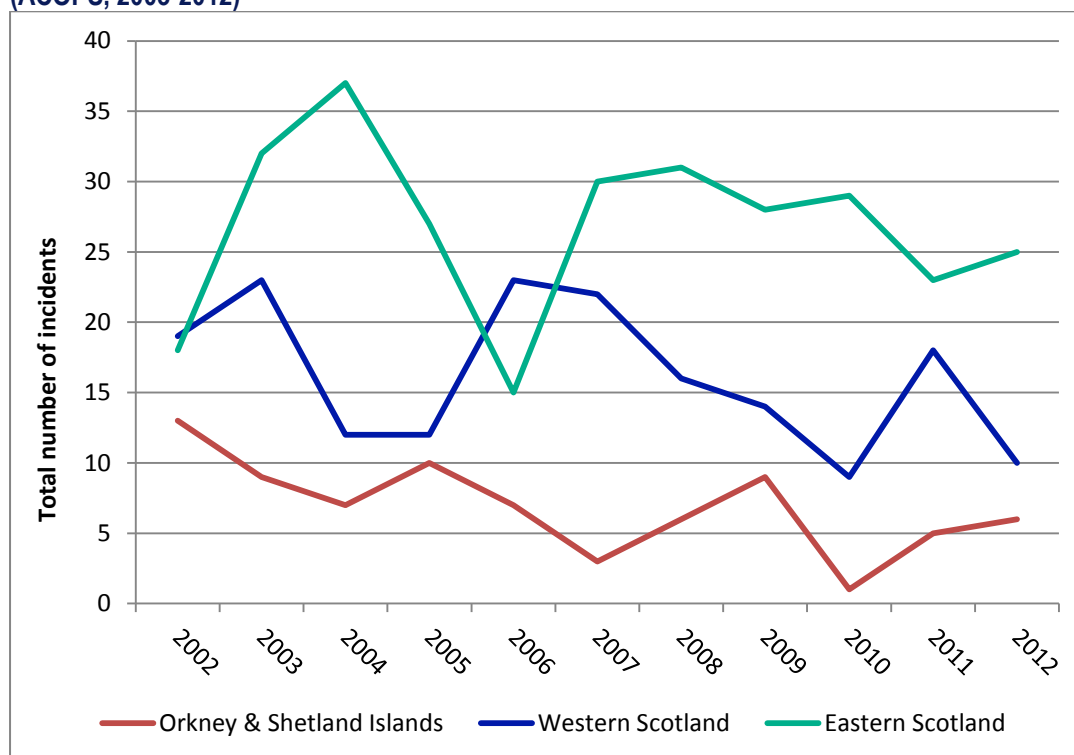


Table A-10 shows the estimated discharge volumes of oil and chemical spills recorded in the Orkney and Shetlands area between 2002 and 2012. The majority of spills are of relatively small volumes (between 1 and 455 litres).

Table A-10: Number of instances and estimated discharge volumes of oil and chemical spills in Orkney and Shetland (ACOPS, 2003-2012)

Estimated Volume	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1-455 litres	9	8	3	7	6	2	4	8	1	1	5
456-999 litres	-	-	-	-	-	-	-	-	-	-	-
1-50 tonnes	1	-	1	1	-	-	-	-	-	-	-
>50 tonnes	-	-	-	1	-	-	-	-	-	-	-
Not Known	3	1	3	1	1	1	2	1	-	4	1

A.5 Air

A.5.1 Air Quality

The main sources of air pollution include:

- Road engines (such as cars, trucks and buses).
- Non-road engines (aircraft, trains and boats).
- Industry and manufacturing.
- Household and commercial.

The Orkney Islands have minimal traffic congestion, with the highest levels of traffic found in Kirkwall and very light levels of traffic found across the mainland and Outer Islands (OIC, 2008b). The islands are overwhelmingly rural with very few industrial processes. The main industrial process comes from the Flotta Oil Terminal. Smaller industrial processes include fish processing and quarrying. There are no railways in Orkney. The main airport is located near Kirkwall on the mainland and there are a number of smaller airports across the Outer Islands linking to Orkney mainland. Ferry services link Orkney to the Scottish mainland and Shetland and there are a number of smaller inter-island links throughout Orkney. Shipping activities are concentrated around Scapa Flow and Kirkwall. These factors result in low levels of air pollution in Orkney.

Air quality monitoring in Orkney (OIC, 2008b) between 2007 and 2008 indicated that the Orkney Islands were well below air quality targets set out by National Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2000. As a result, it can be concluded that Orkney has very good air quality.

A.5.2 Pollutant Emissions

Emissions from shipping include sulphur oxides (SO_x), nitrogen oxides (NO_x) and particulate matter (PM). The main greenhouse gas from ships is carbon dioxide (CO₂). Ship generated emissions can be significant in areas subject to heavy marine traffic, as a result there have been numerous actions undertaken to significantly reduce emissions from ships. This includes initiatives to make ships more energy efficient, limits on air pollutants implemented through MARPOL Annex VI (*Regulations for the Prevention of Air Pollution from Ships*) and introduction of Emission control area (ECAs). ECAs are sea areas, where the amount of one or more kind of emissions is limited. Within ECAs emissions of SO_x, NO_x and PM must be further reduced to 1% for SO_x and PM, with a tiered approach to reductions in NO_x.

The North Sea is designated as an ECA for SO_x. The Orkney Islands are located within the ECA (see Figure A-4). The North Sea ECA was adopted in 2005, entered into force in 2006 and came into effect from 22 November 2007. To comply with the regulations ship operators must use fuel in engines and boilers with a sulphur content that is within the limits set down by the regulators. Alternatively the exhaust gas after combustion can be treated to remove the sulphur oxides or a combination of low sulphur fuel and after-treatment can be used on a ship. The ECA has a tiered reduction to limit SO_x to 1% m/m on and after 1st July 2010 and a further reduction to 0.1% m/m on and after 1st January 2015 (as stated in Regulation 14 in Annex VI of MARPOL). The sulphur

emission reductions are expected to deliver significant pollution emission reductions from the shipping sector.

Flotta Oil Terminal monitors their own emissions including NO_x and SO_x and is governed by a SEPA licence (Permit number: PPC/A/1012610).

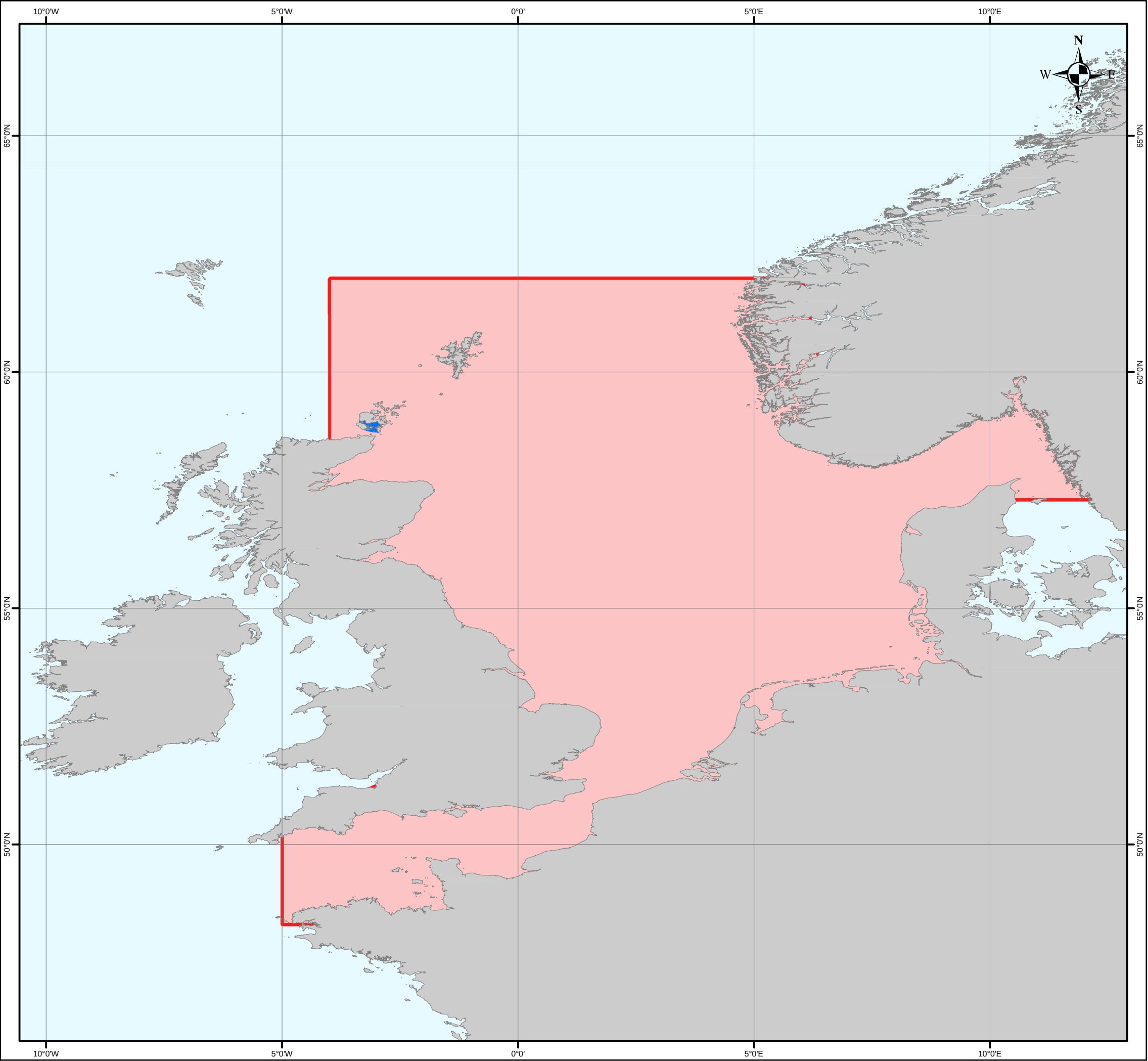
SO_x, NO_x and PM are by-products of combustion associated with engines used on ships and other engines. CO₂ is the primary greenhouse gas emitted through human activities.

The UK emissions maps produced by the National Atmospheric Emissions Inventory (NAEI) for 2011 show that total emissions including shipping from CO₂ are highest on Flotta and on the coast west of Stromness (> 1995 units t/1x1km), followed by the north east area of Scapa Flow and the area around Kirkwall (100 – 1995 units t/1x1km). The rest of Orkney shows levels of less than 100 CO₂ units t/1x1km.

Emissions data for SO₂ shows a similar pattern with the highest emissions (> 10 units t/1x1km) at Flotta and on the coast west of Stromness but also in Kirkwall (NAEI, 2011). The next highest emissions (0.8 – 10 units t/1x1km) are seen in the north east area of Scapa Flow, around Kirkwall and off the west coast of Hoy. The majority of the Orkney Islands show emissions of between <0.01 and 0.1 units t/1x1km, with small pockets of 0.1 to 0.8 units t/1x1km.

Data for NO₂ illustrates highest emissions (> 25 units t/1x1km) are concentrated on Flotta, off the west coast of Stromness and across the north east area of Scapa Flow (NAEI, 2011). Kirkwall and the area to the west of Hoy show emissions of between 1 and 25 units t/1x1km. The rest of mainland Orkney shows between 0.3 and 1 units t/1x1km, with areas of lower emissions in more rural areas.

Emissions data for PM follows a similar pattern.



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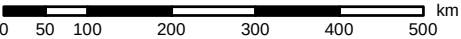
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Figure A-4: North Sea Emissions Control Area

Legend

- Scapa Flow Harbour Area
- North Sea Emissions Control Area

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Created By	Emma White
Reviewed By	Ian Charlton
Approved By	Fiona Bell



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A.5.3 Harbour Fleet Emissions

During the period of 2004-05 to 2011-12 there has been a decrease in carbon dioxide emissions produced via processes OIC are responsible for (Figure A-5). These processes include Council buildings heating and electricity, street lighting, business travel and waste. The CO₂ emissions have decreased from 26,290 tonnes in 2004-05 to 20,879 tonnes in 2011-12 (OIC, 2012d).

The Orkney Islands tugs and harbour craft account for a proportion of CO₂ emissions (Figure A-5). The percentage of the emissions has decreased during the time period assessed, from 14% of the total emissions in 2004-05 to 6% in 2011-12 (Table A-11). Increased STS operations may lead to increased levels of emissions from tugs and harbour craft.

Figure A-5: Orkney Islands Council Carbon Emissions

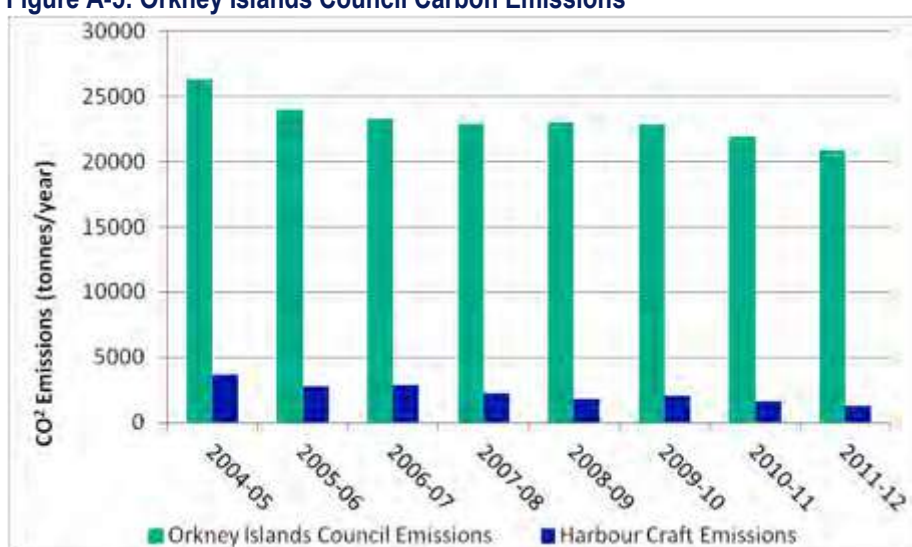


Table A-11: Percentage of Carbon Dioxide emissions from OIC Tugs and Harbour Craft

Period	Percentage of CO ₂ emissions from OIC Tugs and Harbour Craft
2004-05	14%
2005-06	11%
2006-07	12%
2007-08	10%
2008-09	8%
2009-10	9%
2010-11	7%
2011-12	6%

OIC Carbon Management Programme seeks to reduce the Councils Carbon Dioxide emissions by 11% by 2014 (OIC, 2007). In order to achieve this, OIC has set targets for Carbon Dioxide emissions. The target Carbon Dioxide emissions for 2012-13 and 2013-14 set by OIC are of 23,710 tonnes and 23,406 tonnes respectively (OIC, 2012d). The figures above show that they are

on their way to achieving this target. Reductions in emissions are dependent on the efficiency of individual craft and the size of the fleet.

A.6 Landscape

The Orkney Islands lie off the northern tip of Scotland and are made up of approximately 70 islands and skerries, of which only 16 are inhabited. The surrounding land is generally low lying and tree less, except for the island of Hoy which has several peaks higher than 300 m.

The scenery surrounding Scapa Flow is gently rolling landscape of green fields, heather moorland health and lochs. Much of the landscape is farmed, growing mainly grass for animal feed. Hoy is described as having dramatic hills and valleys.

The shoreline of Scapa Flow is diverse and includes sea cliffs, sandy beaches, boulder beaches and rugged rocky coasts. Small areas of saltmarsh are found in places. Habitats around Scapa Flow include:

- Heath and bogs.
- Lochs and pools.
- Streams and burns.
- Grassland.

Land Use Consultants (1998) report the sea as being very important to the physical and cultural landscapes of Orkney. Whilst the west coast of Scapa Flow is particularly renowned for cliffs, arches, stacks and geos, the lower lying coastal features likely to be found in the vicinity of the proposed cargo transfer locations (including tilted flags, sand dunes and sandy bays) are considered important for recreation and accessibility (Land Use Consultants, 1998).

A.7 Soil

Screened out of the assessment.

A.8 Climate

Screened out of the assessment.

A.9 Material Assets

A.9.1 Fishing and Aquaculture Industries

The diverse range of habitats in the Orkney Islands and surrounding areas support a wide range of commercially viable invertebrate resources, with most shellfish fisheries based in and around Orkney. These shellfish are listed in Table A-12. These species support a large proportion of the shellfish industry in Scotland.

Table A-12: Main commercial shellfish species in the Orkney Islands and surrounding area

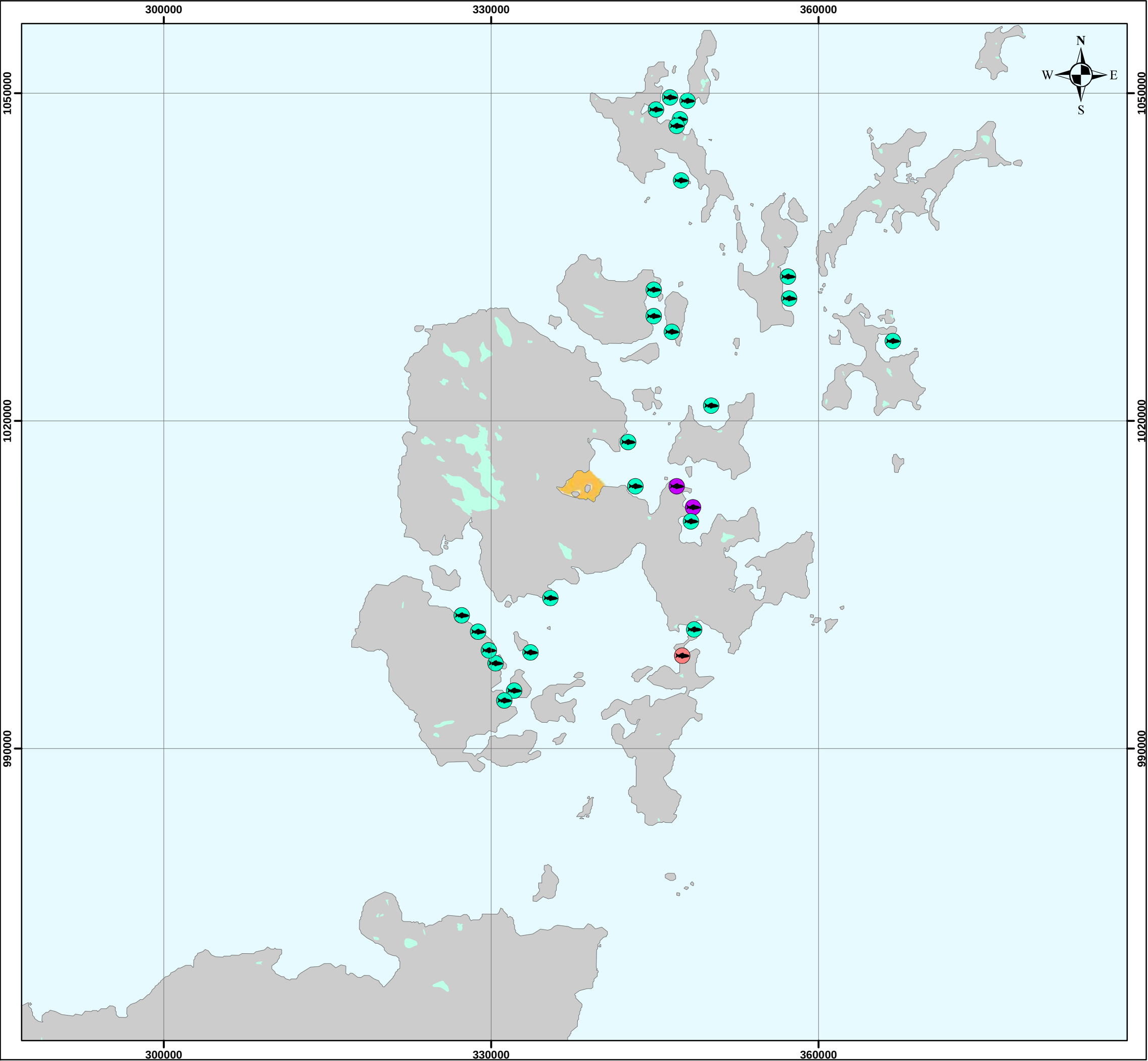
Crustacean species	Bivalve mollusc	Gastropod molluscs
Norway Lobster (<i>Nephrops norvegicus</i>)	King Scallop (<i>Pecten maximus</i>)	Whelk (<i>Buccinum undatum</i>)
European lobster (<i>Homarus gammarus</i>)	Queen scallop (<i>Aequipecten opercularis</i>)	Periwinkle (<i>Littorina littorea</i>)
Edible crab (<i>Cancer pagurus</i>)	Cockle (<i>Cerastoderma edule</i>)	
Velvet swimming crab (<i>Necora puber</i>)	Mussel (<i>Mytilus edulus</i>)	
Shore crab (<i>Carcinus maenus</i>)		
Pink shrimp (<i>Pandalus borealis</i>)		

Aquaculture is Scotland's most valuable food export. Scotland's aquaculture industry is dominated by Atlantic salmon, rainbow trout and mussel production. In Orkney between 2005 and 2009, aquaculture produced a live weight of 3,400 tonnes of shellfish, pelagic and white fish with a value of £6,268,000 GDP, over 90% of which was made up of shellfish products (Marine Scotland, 2009).

There is no commercial white fish industry in Scapa Flow, and fishing activity is based around the important shellfish stocks of the area. Scallops (king scallops and queen scallop) are collected either by divers or mechanical dredging. Dredging for scallops occurs mainly in the centre of Scapa Flow and through Hoxa Sound and diving for scallops occurs mainly around the north and west coasts of Scapa Flow (EMEC, 2011).

Within Orkney there are a total of 28 known marine fin fish farms, ten of which are located within Scapa Flow, most densely situated along the east coast of Hoy. Twenty five of these finfish farms are for salmon, two are for trout and salmon and one is for salmon, trout, halibut and cod (see Figure A-6).

The majority of the Orkney Islands shellfish production comes from the Bay of Firth shellfish growing area. Although scallops, mussels and oysters are found in the seas around Orkney, the natural spat fall is poor making it economically unviable. Instead, spat is collected from the waters and cultivated artificially in closely monitored conditions. A report commissioned by SNH (Horner and MacLennan, 2009) sets out the potential aquaculture capacity for Scapa Flow and the Wide Firth. The report highlights that these areas have the capacity to accommodate further small to medium scale aquaculture developments, taking the form of single medium scale farms within a specific location or a collection of well-sited smaller scale farms i.e. multi sites along with the possible extension of existing finfish farms (Dawson *et al*, 2009).



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Figure A-6: Orkney Island's Aquaculture

Legend

- Marine Fish Farms (Type)**
- Salmon Farm
 - Salmon and Trout Farm
 - Salmon, Trout, Halibut and Cod Farm
 - Bay of Firth Designated Shellfish Water



NOTE: Not to be used for Navigation

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Created By	Emma White
Reviewed By	Ian Charlton
Approved By	Fiona Bell



A.9.2 Waste

The Port Waste Management Plan (OIC, 2012e) contains details of the different types of port waste and how these are to be managed, locations of waste reception facilities and procedures for reporting and recording waste received.

Ships engaged in cargo transfers in Scapa Flow transfer their waste into skips and or International Catering Waste receptacles provided by the Harbour Authority. These are then landed at Scapa Pier or Stromness Harbour from where the waste is then delivered to OIC, Direct Services Division-Waste Disposal; the Waste Disposal Authority (OIC, 2012e).

In the event of an oil spill the disposal of waste oil, which has been contained or recovered following a spill or incident, is described in the OIC OSCP (Briggs Environmental Services, 2014) in Appendix E. Following a pollution incident it is the duty for the polluting party to ensure that oily waste material is contained, handled, transported and disposed of in an appropriate manner. The options for waste oil disposal or treatment of material (liquids and solids) listed with the OSCP are:

- a) Temporary store, clean, stabilise and then recover or re-use;
- b) Temporary store and then take to appropriate disposal site for burial;
- c) Take to a refinery / incinerator (mainly for oily liquids only);
- d) Take to appropriate disposal site

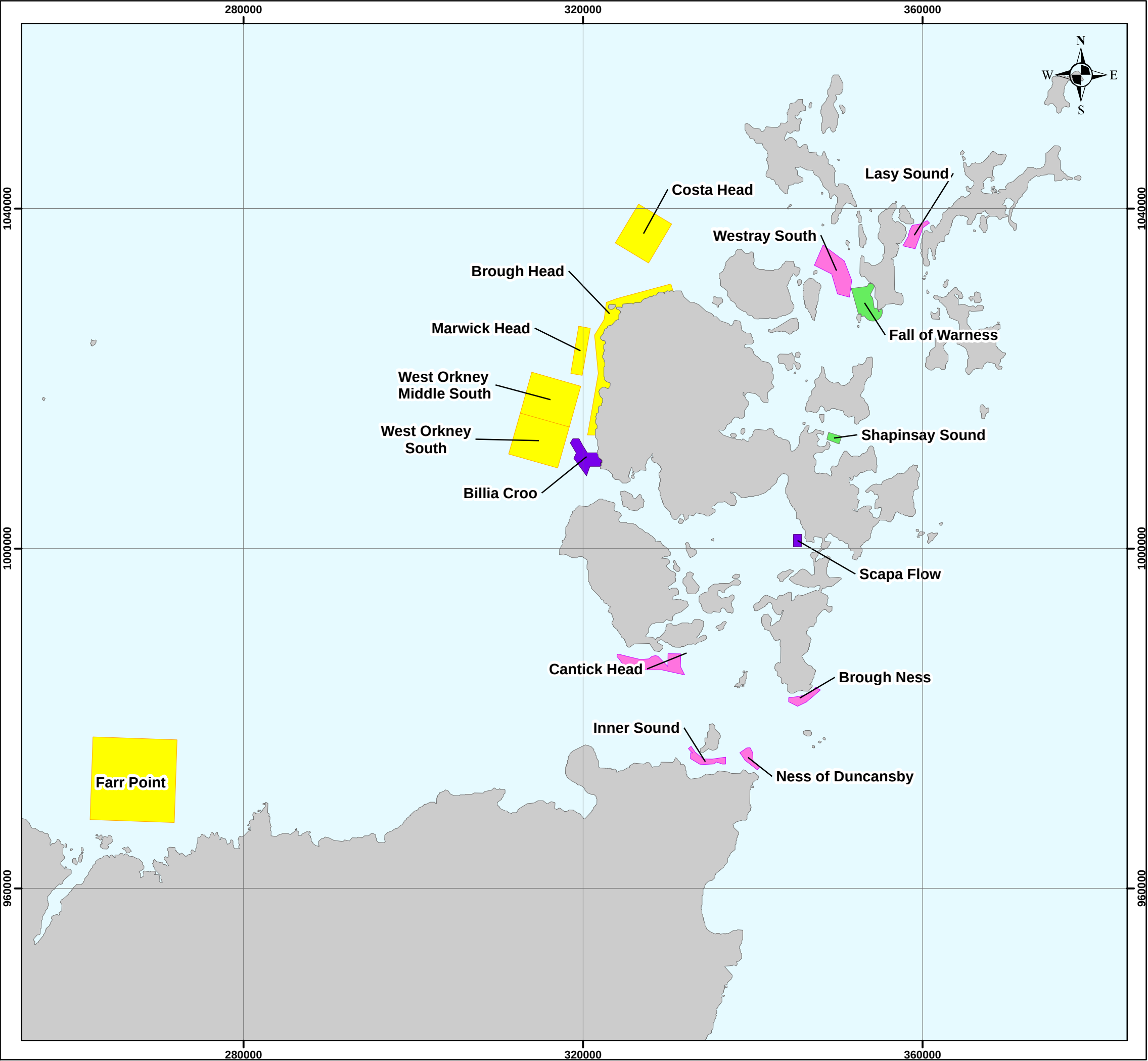
Waste disposal action checklists are available for each of the above.

A.9.3 Renewable Energy

Orkney is home to the EMEC, where developers are testing and monitoring the environmental and operational effects of new wave and tidal power generating systems in the sea (Orkney Renewables, 2013). EMEC has two test sites for both wave and tidal energy generation. One wave test site is situated outside the western entrance to Scapa Flow, while a nursery wave test site is located within Scapa Flow, near Churchill Barrier No 1. One tidal test site is situated south of Eday and a nursery tidal test site is within Shapinsay Sound. These developments are shown in Figure A-7.

The marine renewables industry will utilise the additional berthing and shore side development areas at Hatston Pier. Lyness Pier located on the island of Hoy has been refurbished as a centre for the assembly, storage and servicing of marine renewable energy devices (Orkney Renewables, 2013).

The Crown Estate has identified six wave energy development sites and five tidal energy development sites in Pentland Firth and Orkney waters for lease (see Figure A-7).



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Figure A-7: Pentland Firth and Orkney waters renewable energy lease sites

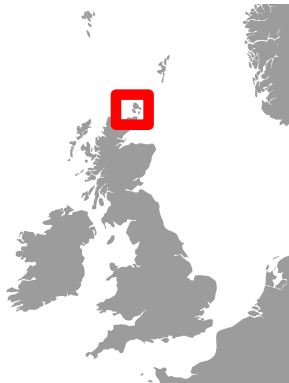
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Tidal Development Site

- Agreement for Lease
- Leased site (Operational)

Wave Development Site

- Agreement for Lease
- Leased site (Operational)



NOTE: Not to be used for Navigation

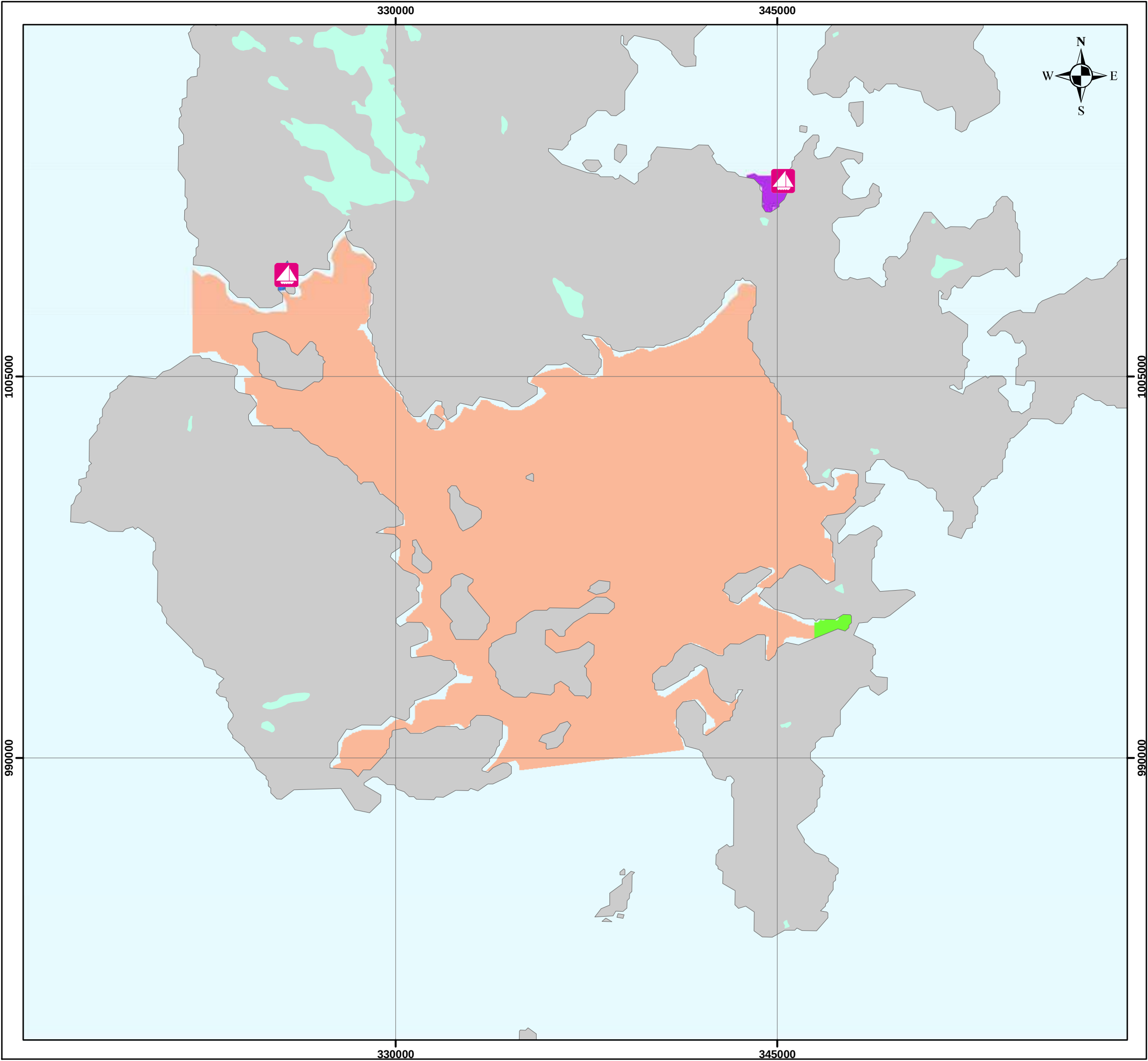
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Created By	Emma White
Reviewed By	Ian Charlton
Approved By	Fiona Bell



A.9.4 Tourism

Tourism is an important industry for the Orkney Islands. Visitors are attracted to the wild landscape and wildlife as well as, heritage and cultural sites. Orkney's renowned natural environment remains unspoilt and the pristine habitats provide a home to many plants and wildlife. Orkney is well known for its many species of seabirds, as well as otters, dolphins, porpoises and whales.

Scapa Flow is utilised for a number of different water sports and activities. Leisure activities practiced within Scapa Flow include diving on underwater wrecks, swimming, sailing, windsurfing and canoeing. Figure A-8 shows recreational activities undertaken in Scapa Flow. Scapa Flow is recognised as a recreational water, as it is an area commonly used for water contact sports or any activity with the risk of ingestion of water. SEPA requires recreational waters to achieve the mandatory microbiological bathing water standards. Further to the information provided in Figure A-8, we are aware of additional seasonal boating activities.



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Figure A-8: Scapa Flow's recreational waters

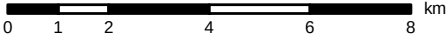
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-  Marina
- Scapa Flow's Recreational Waters**
-  Boating activity
-  Public access to harbour area and contact activity
-  Water contact activity
-  Water contact activity - boating



NOTE: Not to be used for Navigation

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Created By	Emma White
Reviewed By	Ian Charlton
Approved By	Fiona Bell



A.10 Cultural Heritage

A.10.1 World Heritage Sites

In 1999, part of Orkney was designated a UNESCO World Heritage Site for its unique group of Neolithic monuments. The Site is composed of the chambered tomb of Maeshowe, the Stones of Stenness, the Barnhouse Stone, the Watchstone, the Ring of Brodgar and associated funerary monuments and stone settings, and Skara Brae settlement (UNESCO, 2012). The site is cared for by Historic Scotland.

The Heart of Neolithic Orkney 2008 Management Plan Sensitive area covers the western side of Mainland Orkney incorporating Loch of Stenness and Loch of Harray, Graemsay and northern Hoy (see Figure A-9).

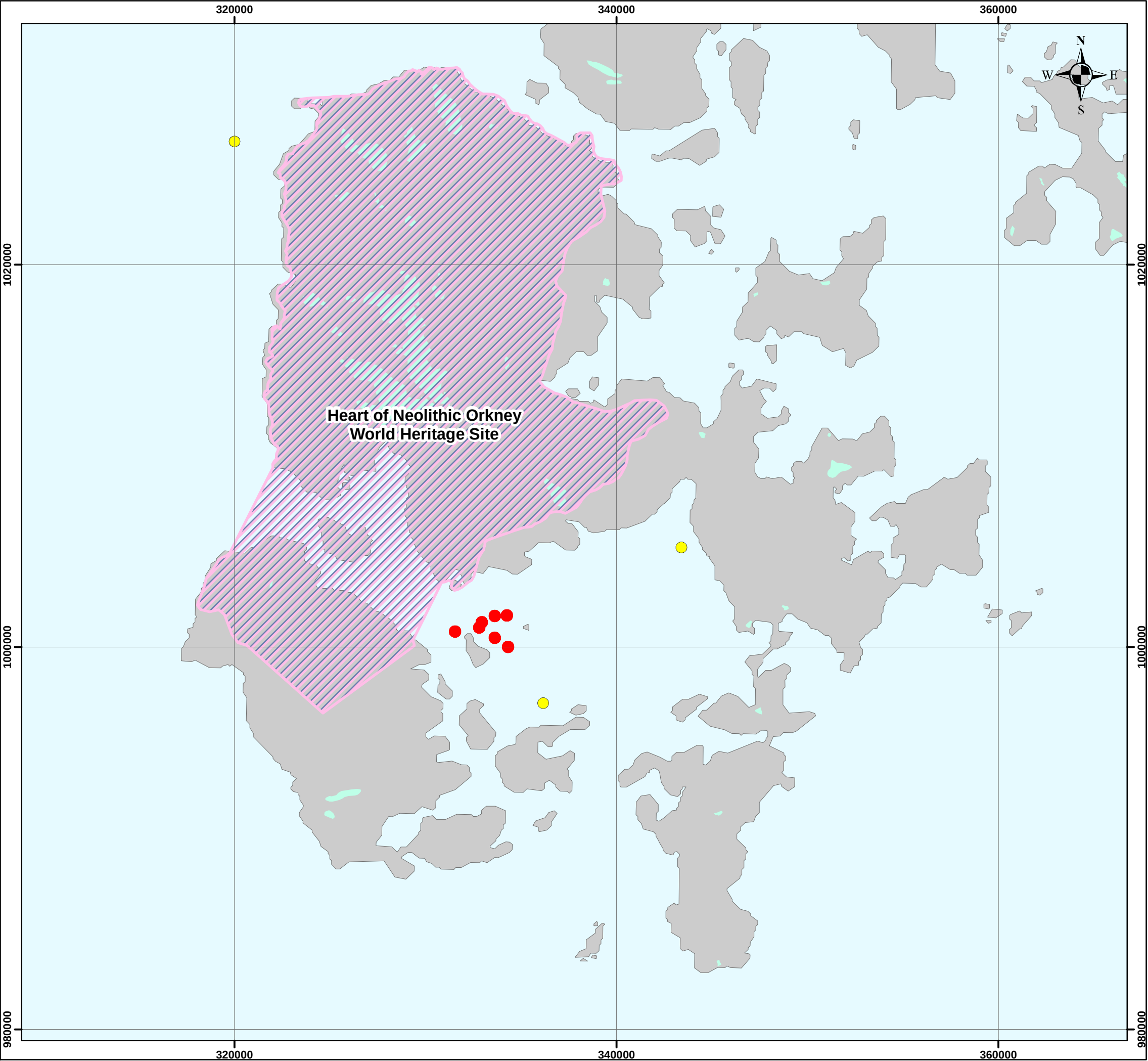
A.10.2 Wrecks

Scapa Flow contains a number of wrecks. Within Scapa Flow there are seven historic wrecks protected as Scheduled Monuments under the Ancient Monuments and Archaeological Areas Act 1979. These wrecks are shown in Figure A-9. These wrecks are the remains of the German High Seas Fleet scuttled in Scapa Flow in 1919 following World War I.

As part of Historic Scotland's marine strategy 2012-15, the Scapa Flow Scheduled wrecks will be considered for transition to Historic MPA status along with any other sites in Scapa Flow that might merit inclusion within a Historic MPA (Historic Scotland, 2012).

There are three wrecks in the vicinity of the Orkney Islands designated as Controlled Sites by the MOD under the Protection of Military Remains Act 1986 (see Figure A-9). Two of these wrecks; HMS Royal Oak and HMS Vanguard are located within Scapa Flow, while the wreck of HMS Hampshire lies off the North West coast of Orkney Mainland.

The wreck of HMS Royal Oak is known to leak oil, but oil is monitored and recovered (Baxter *et al.* 2011). However, no oil has been recovered in the last two years.



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Figure A-9: Orkney Islands Cultural Heritage

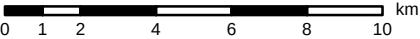
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- Controlled Sites under Protection of Military Remains Act 1986**
- Wreck
- Scheduled Monuments under Ancient Monuments and Archaeological Areas Act 1979**
- Wreck
- World Heritage Site
(2008 Management Plan Sensitive Area)



NOTE: Not to be used for Navigation

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Reviewed By	Ian Charlton
Approved By	Fiona Bell



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Appendix B Oil Spill Modelling

B.1 Purpose of Study

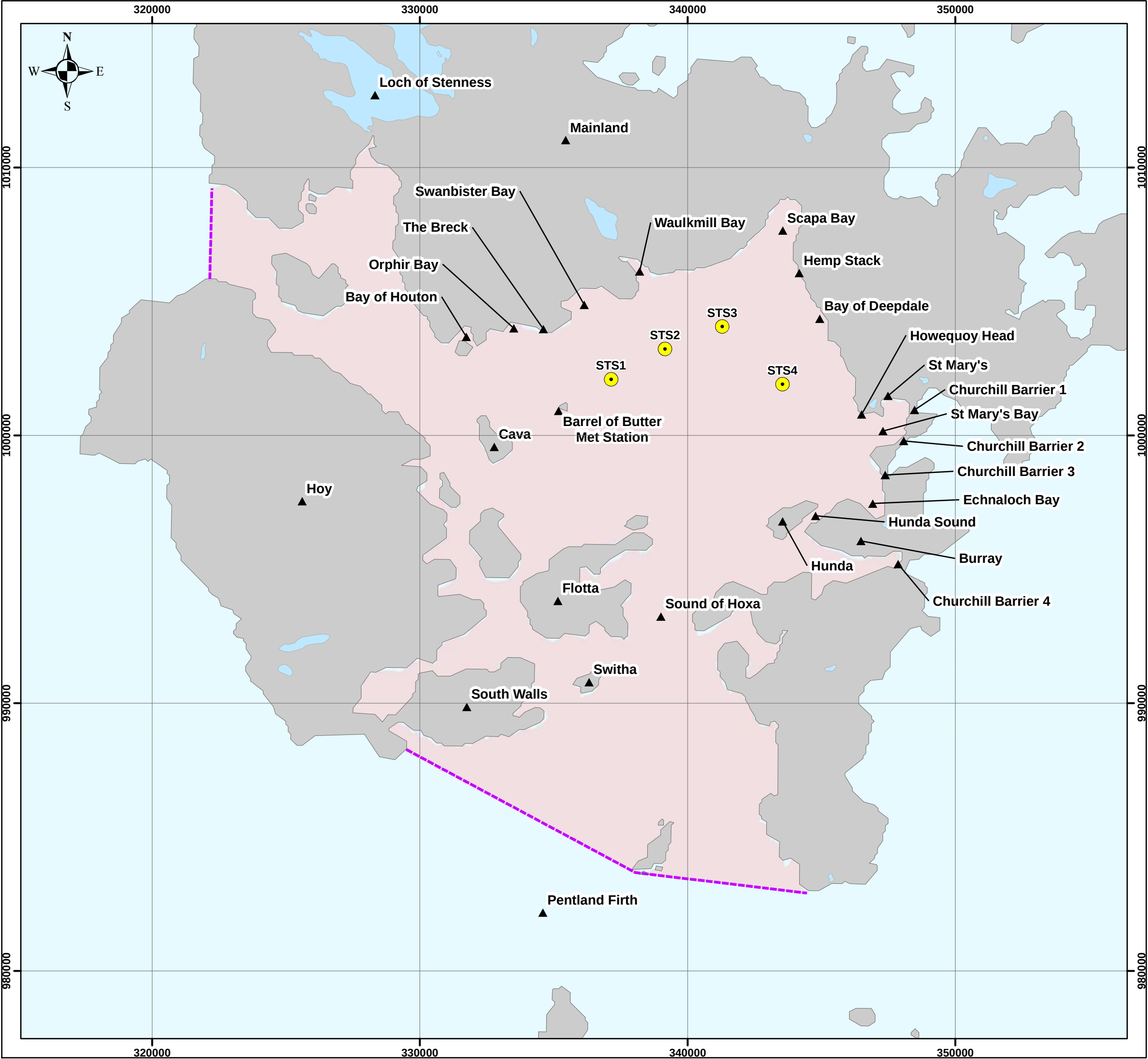
This Appendix presents a study of the potential impacts of oil spilt during a proposed cargo transfer within Scapa Flow. This Appendix forms part of the wider Environmental Assessment in support of OIC's OTL application. It also provides information suitable for input to the relevant OSCP for Scapa Flow.

Figure B-1 presents a geographical overview of the study area, indicating some of the locations that are referred to in this Appendix.

STS oil transfers will be undertaken at one of four locations (STS1 to STS4) in the north-eastern part of Scapa Flow. As part of the Environmental Assessment we considered the potential impact of accidental spillages from these locations on the surrounding seas and coastline. In particular, there are a number of designated sites in the area that could be significantly impacted by spilt oil, as shown in Figure B-2.

This Appendix describes the modelling assessment undertaken and the key potential impacts predicted by this assessment. These results are considered further within the main Environmental Assessment, where they are discussed in the context of:

- the magnitude of potential impacts;
- the likelihood of spills and the likelihood that any spill will impact a designated site;
- the sensitivity of the local designated sites;
- the overall significance of potential oil spills;
- the potential for cumulative or in-combination effects;
- any mitigation measures that may be deemed suitable (both preventative and responsive).



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Figure B-1: Geographical Overview

Legend

- ▲ Location Of Interest
- Ship-to-Ship Transfer Location
- Scapa Flow Harbour Limits

- Scapa Flow Harbour Area
- Inland water bodies



NOTE: Not to be used for Navigation

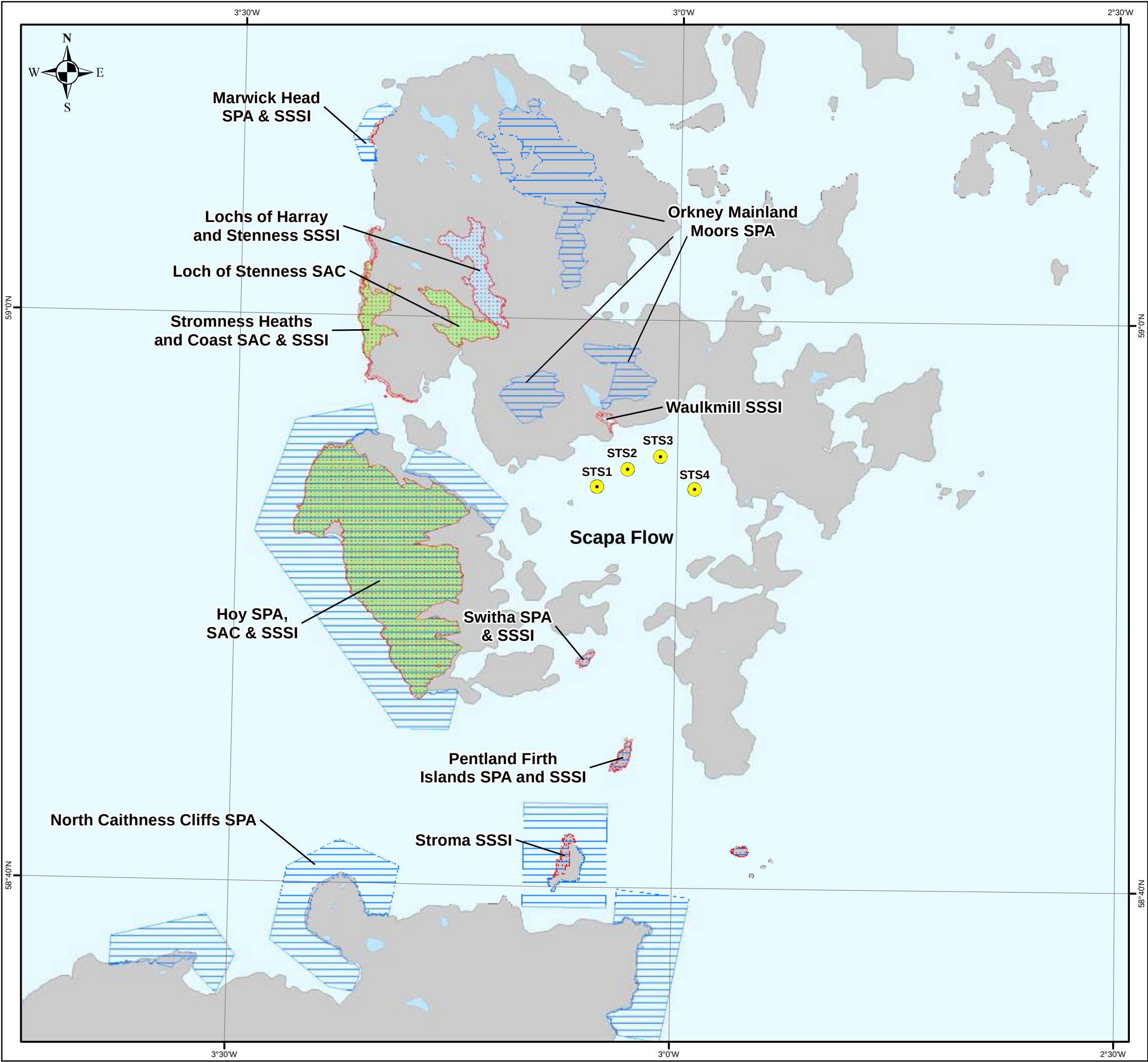
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Datum	D_OSGB_1936
Data Source	GEBCO, OSOD, OIC,
File Reference	J:\P1861\Mxd\ES_Report\Appendix_B\B-1_Geographical_Overview.mxd
Created By	Ian Charlton
Reviewed By	Emma White
Approved By	Fiona Bell



Valued Quality. Delivered.

0 0.5 1 2 3 4 5 km

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Oil Transfer Licence Application

Figure B-2: STS transfer locations and designated sites in and around Scapa Flow

Legend

● Ship-to-Ship Transfer Location

Designated Sites

SPA

SAC

SSSI

Inland water bodies



NOTE: Not to be used for Navigation

Date	Tuesday, June 10, 2014 13:01:32
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Data Source	GEBCO, JNCC, SNH, OIC,
File Reference	J:\P1861\Mxd\ES_Report\Appendix_B\B-2_Protected_Areas.mxd
Created By	Emma White
Reviewed By	Ian Charlton
Approved By	Fiona Bell



0 1.25 2.5 5 7.5 10 12.5 km

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B.2 Modelling Approach

B.2.1 Modelling System

The oil spill modelling assessment was undertaken using the Orkney Islands Modelling System (OIMS). This is a state of the art modelling system developed using the MIKE21 software package. The OIMS has previously been used by OIC in support of BWM studies. It has a spatial resolution of 200 m.

The OIMS includes a sophisticated oil spill module. This module is capable of representing a wide variety of oil weathering processes for a range of different oils and environmental conditions. The underlying model is the OIMS hydrodynamic model of current flows, which are driven by tidal and wind forcing. The processes incorporated in the oil spill module may be broadly summarised as:

- advection (due to tidal currents and wind drift);
- spreading;
- evaporation;
- dissolution;
- vertical dispersion;
- settling;
- biodegradation;
- dissolution;
- photo-oxidation.

B.2.2 Model Set-up

This Section describes the key model inputs and set-up parameters.

Oil Types

In discussion with OIC, three representative types of oil were modelled. These were selected from five templates that exist within the modelling software. The selected oils represented a range of different types (from fuel oil to crude). Each oil type was assigned a suitable composition in terms of the percentage of four different components:

- volatile oil fractions (weight below 160 g/mol, boiling point well below 300°C);
- heavy oil fractions (weight above 160 g/mol, boiling point above 300°C);
- wax;
- asphaltenes.

Table B-1 shows the total masses of these components that were modelled for each of the three selected oil types.

Table B-1: Oil types modelled as part of the Environmental Assessment

	Oil type 2	Oil type 4	Oil type 5
	Light oils or middle distillates – low aromatics (<30%)	Medium crude oil	Heavy fuel oil
Volatile oil fractions (kg)	300	80	75
Heavy oil fractions (kg)	689.9	783	775
Wax (kg)	10	22	70
Asphaltenes (kg)	0.1	115	80
Total (kg)	1000	1000	1000

In addition to the mass composition, each oil type was modelled with suitable weathering parameters (the physical constants that describe the rate and nature of such processes as evaporation, emulsification, dissolution etc.).

Oil Spill Mass

In the unlikely event of an oil spill, the volume, mass and type of oil cannot be predicted. For example, a spill from a fractured hose would be of small volume (i.e. 1,000 kilograms (kg)) whereas a spill from a ruptured cargo tank would probably be a much higher volume.

In discussion with OIC, and during pre-consultation meetings, it was agreed that any type of spill was unlikely, but a spill in excess of 1,000 kg was highly unlikely.

The purpose of the oil spill modelling is to predict where an oil spill may be advected to, rather than attempting to predict the concentration upon impact. This means that the actual mass released is not critical to the prediction.

Following consideration of the above, all oil spill modelling was undertaken using a mass of 1,000 kg.

Discharge Regime

In order to simulate a near-instantaneous release of oil resulting from a spill, the full mass of oil was released into the model over a period of ten minutes.

Each simulated release was made at one of the four STS transfer locations.

Model Run Period

Each oil discharge was modelled for a full spring-neap cycle of 15 days. This proved to be more than long enough to track the fate of each discharge and to assess its potential impact on the surrounding coastline and designated sites.

Tide Conditions

All releases were modelled as occurring at High Water on a mean spring tide. The rationale for this is as follows:

- A spring tide will produce greater advection of an oil slick than a neap tide, particularly once the slick has exited Scapa Flow.

- Tidal current speeds in Scapa Flow around the proposed cargo transfer locations are very low, so it was not felt necessary to model equivalent scenarios on neap tides.
- For the same reason, it was considered that there was no benefit to modelling releases under different states of the tide (e.g. Low Water).
- Sensitivity testing demonstrated that the above assumptions were justified.
- Limiting the number of tidal scenarios modelled kept the number of computational runs, and corresponding output presentations, within manageable limits.
- Initial transport of oil slicks from the proposed cargo transfer locations is dominated by surface wind drift currents.

Wind Conditions

Model wind conditions were derived from analysis of wind data collected at the Barrel of Butter meteorological station. This is the closest site to the proposed cargo transfer locations (see Figure B-1). It is also surrounded by water, which should produce more representative wind conditions than a land-based station that could be affected by local sheltering or turbulence.

Data from the five whole years December 2005 to November 2010 were analysed. This allowed wind statistics to be calculated for eight direction sectors centred on the cardinal compass points. For the model runs, it was decided to run the model using the average wind speed from each direction sector, which was applied for the full 15-day model run period. This was considered a reasonable compromise for modelling purposes; although stronger winds from each sector can and do occur, they are unlikely to be maintained constantly for a prolonged period of time.

It is also noted that if wind speeds above 27 knots (13.9 m/s), or sea/swell wave heights above 2 m, are forecast prior to a proposed cargo transfer, the operation will not go ahead. Similarly, if either of these thresholds is exceeded during transfer the operation will be suspended. As such, the very strongest wind speeds are unlikely to occur at the same time as a potential oil spill during proposed cargo transfers, although they could arise subsequently when the slick is already in the water.

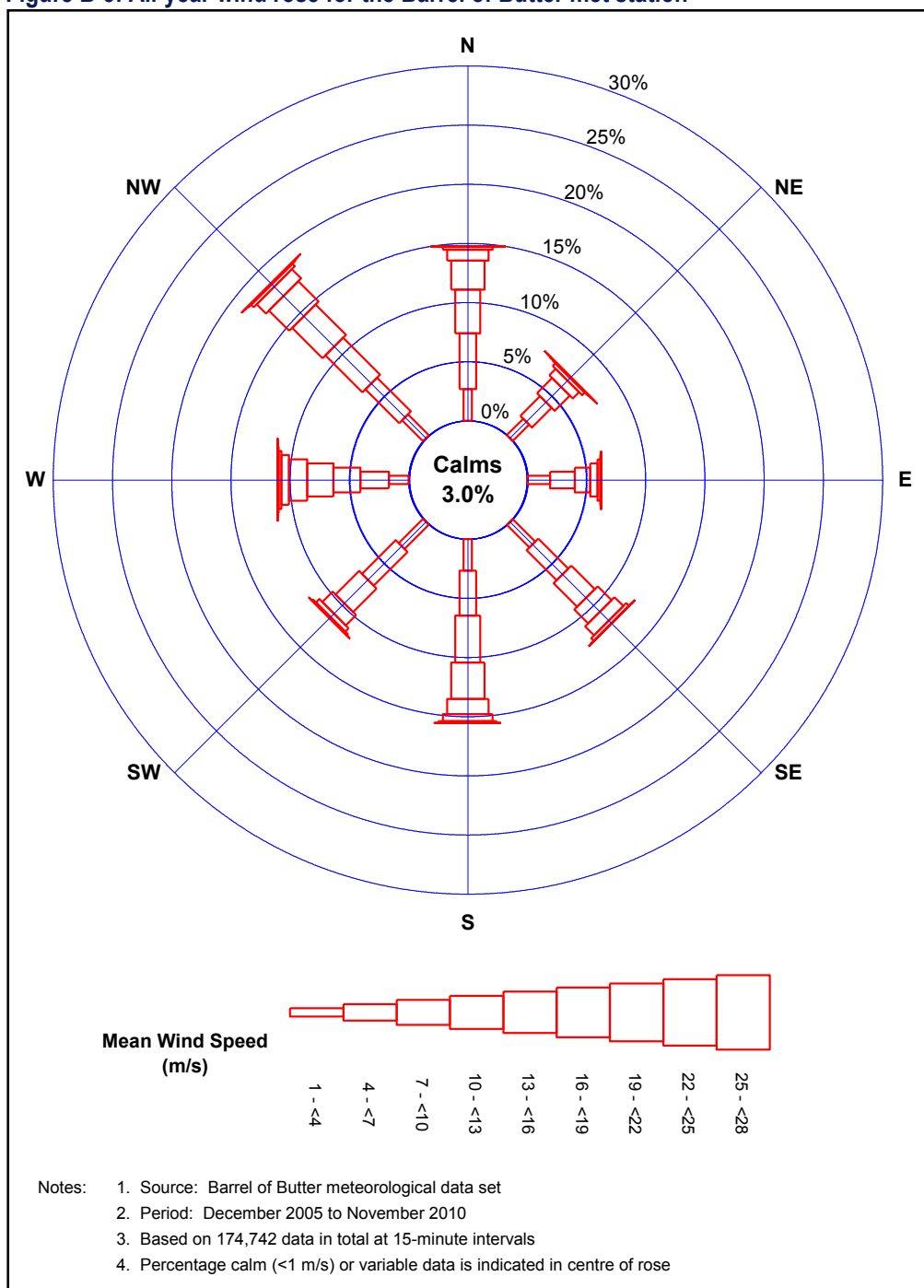
Table B-2 shows the eight wind scenarios that were applied during the oil spill modelling assessment.

Table B-2: Model wind scenarios derived from the Barrel of Butter meteorological station

Wind scenario no.	Speed (m/s)	Direction sector (from)	Direction (°N, from)
1	7.0	N	000
2	6.4	NE	045
3	6.0	E	090
4	7.3	SE	135
5	8.2	S	180
6	6.4	SW	225
7	9.1	W	270
8	9.0	NW	315

Figure B-3 presents the all-year wind rose for the Barrel of Butter met station, based on the same five years of data used in the oil spill assessment. Winds blow most frequently from the northwest, and are strongest from the west and northwest. They are lightest and least frequent from the east.

Figure B-3: All-year wind rose for the Barrel of Butter met station



Sea Temperature

A sea water temperature of 10°C was modelled. This is a realistic annual average for Scapa Flow, which sees an annual range of 5 to 15°C. Colder water will tend to reduce the rate of evaporation, particularly for the more volatile components, but this will be of less importance for the three selected oil types which are dominated by the heavy fraction (c.70% or more of the total).

B.2.3 Model Scenarios

Using the model set-up parameters, discharge characteristics and environmental conditions outlined in Section B.2.2, a number of oil spill model runs were undertaken. Rather than model every feasible combination of conditions, it was felt prudent to focus on those scenarios most likely to cause an impact on neighbouring coastlines and designated sites. To this end, each of the three selected oil types was modelled for the eight specified wind conditions, making a total of 24 model scenarios. However, instead of modelling all 24 scenarios for all four STS transfer locations, in each case only the “worst case” STS transfer location was modelled. “Worst case” in this context means the STS transfer location that was most likely to cause a rapid or significant impact on the nearby coastline, or to take oil towards a sensitive site, or to take oil away from Scapa Flow and into the surrounding waters.

Table B-3 shows the STS transfer location selected for each of the eight wind scenarios, and explains the rationale for this selection. Each of these eight scenarios was run for the three selected oil types (types 2, 4 and 5).

Table B-3: Model discharge scenarios and rationale

Wind scenario no.	Direction sector (from)	Associated STS transfer location	Rationale
1	N	STS2	Slick transport towards S out of Scapa Flow, and towards Pentland Firth Islands SPA/SSSI
2	NE	STS1	Shortest distance to coast; slick transport in general direction of Hoy SPA/SAC/SSSI and Switha SPA/SSSI
3	E	STS1	Short distance to coast; slick transport towards Hoy SPA/SAC/SSSI, and W out of Scapa Flow past Loch of Stenness and other designated sites
4	SE	STS1	Shortest distance to coast; possible slick transport W out of Scapa Flow past Loch of Stenness and other designated sites
5	S	STS2	Short distance to coast; slick transport towards Waulkmill SSSI
6	SW	STS3	Short distance to coast; slick transport into far NE of Scapa Flow (Scapa Bay)
7	W	STS4	Shortest distance to coast; slick transport into far E of Scapa Flow (St Mary's Bay, Churchill Barriers)
8	NW	STS4	Shortest distance to coast; slick transport into far E of Scapa Flow (St Mary's Bay, Churchill Barriers, Echnaloch Bay, Hunda Sound)

B.3 Oil Spill Modelling Predictions

B.3.1 Introduction

This Section presents results from the predictive oil spill modelling assessment. The model produces a potentially large number of outputs; even by limiting the analysis to 24 model runs, plots could be produced for different oil components, different points in time, and different metrics (mass, concentration, water content etc.), making hundreds or even thousands of presentations. Instead, a selected number of representative outputs is presented. These are intended to illustrate the key conclusions of the modelling assessment and allow informed discussion and analysis within the Environmental Assessment.

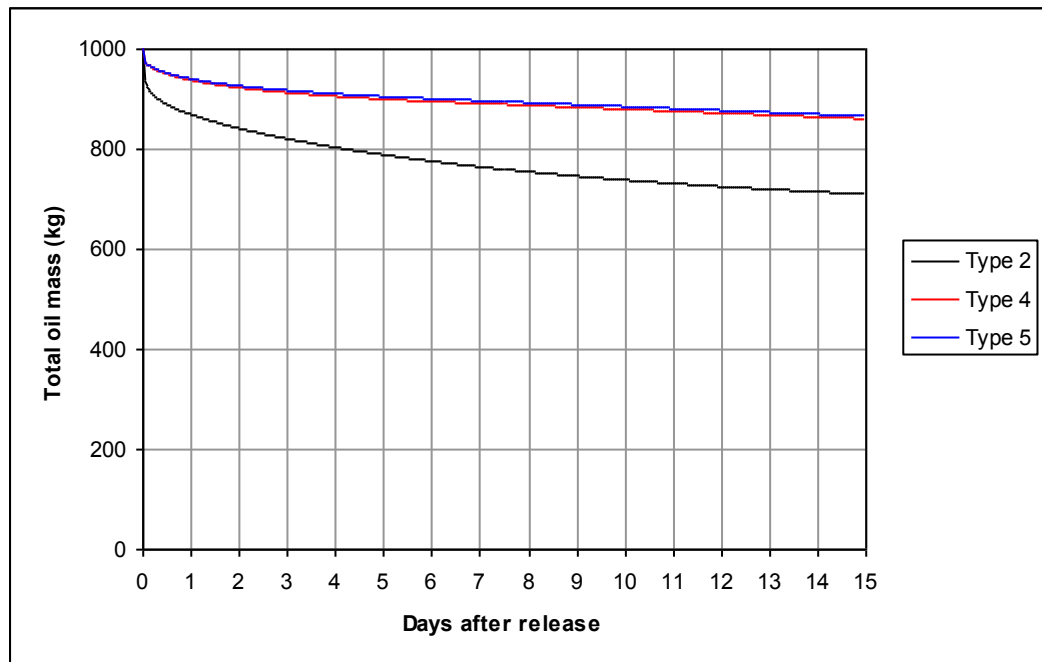
B.3.2 Weathering of Oil Components

Comparison of Different Oil Types

Figure B-4 plots the total mass of oil within the model domain for each of the three oil types. Wind scenario 5 (southerly wind) is shown, but all wind scenarios demonstrate a similar pattern. The plot illustrates that there is relatively little difference in the remaining mass between each of the three oil types. It also shows that the released oil is fairly persistent over the 15-day model run period, with a significant proportion of the released mass (1,000 kg) remaining at the end of this period. The explanation is as follows:

- The three selected oil types have a relatively low proportion of the volatile fraction (30% for type 2 and less than 10% for types 4 and 5). This is the fraction most likely to evaporate and cause a reduction in mass over time.
- The reduction in mass through the model run period is primarily a result of evaporation of the volatile component. However, this process slows over time as the evaporation causes the remaining volatile component to become more viscous, slowing further evaporation. This process is further hindered by emulsification of the oil and settling of some of the oil particles. Nevertheless, most of the volatile component has evaporated by the end of the model run.
- The heavy fraction comprises c.70% or more of all three oil types. This undergoes only slow evaporation under the environmental conditions experienced in Scapa Flow, and the majority of this component is left at the end of the model run period.
- The wax and asphaltene components are effectively conservative and experience no appreciable decay over the model run period.

**Figure B-4: Reduction in mass of the three oil types over the 15-day model run period
(wind scenario 5 – southerly)**



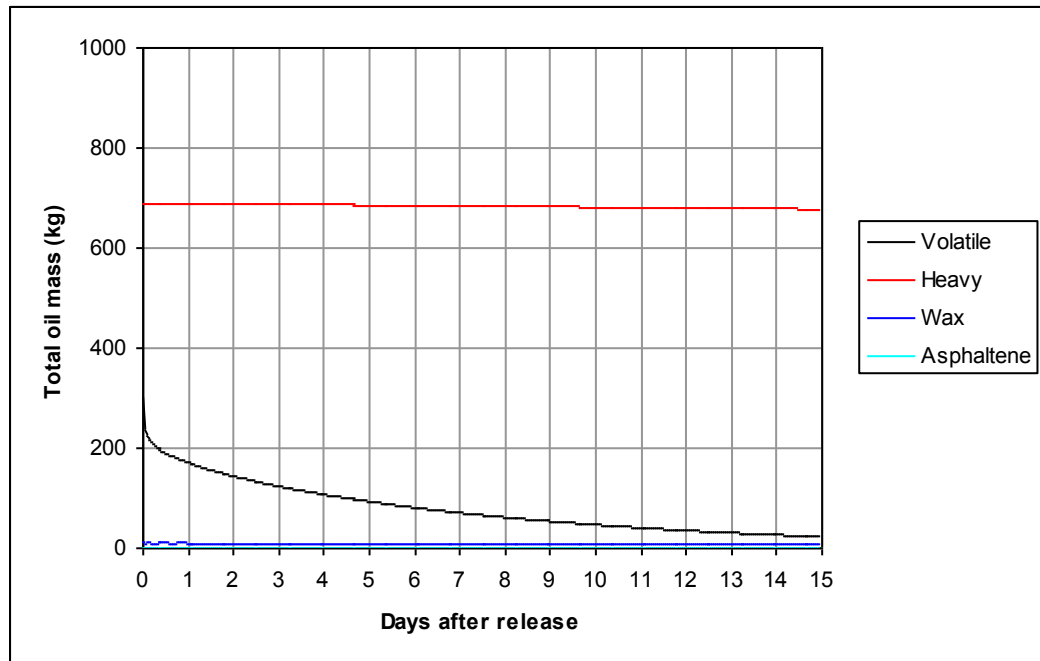
Comparison of Components for Oil Type 2

Figure B-5 plots the mass of the four components of oil type 2 (light oils or middle distillates with <30% aromatics) within the model domain. Wind scenario 5 (southerly wind) is used as an example; all wind scenarios show similar results. The plot shows:

- a significant reduction in the volatile component over the 15-day run period (over 90% has been evaporated);
- a small reduction in the heavy component over the run period (less than 2% has been evaporated);
- no reduction in the wax or asphaltene components (note that this oil type is only 1% wax and 0.01% asphaltene at release).

Overall, oil type 2 loses the greatest mass over the model run period because of its relatively higher concentration of volatiles compared to types 4 and 5.

Figure B-5: Reduction in mass of the four components of oil type 2 over the 15-day model run period (wind scenario 5 – southerly)

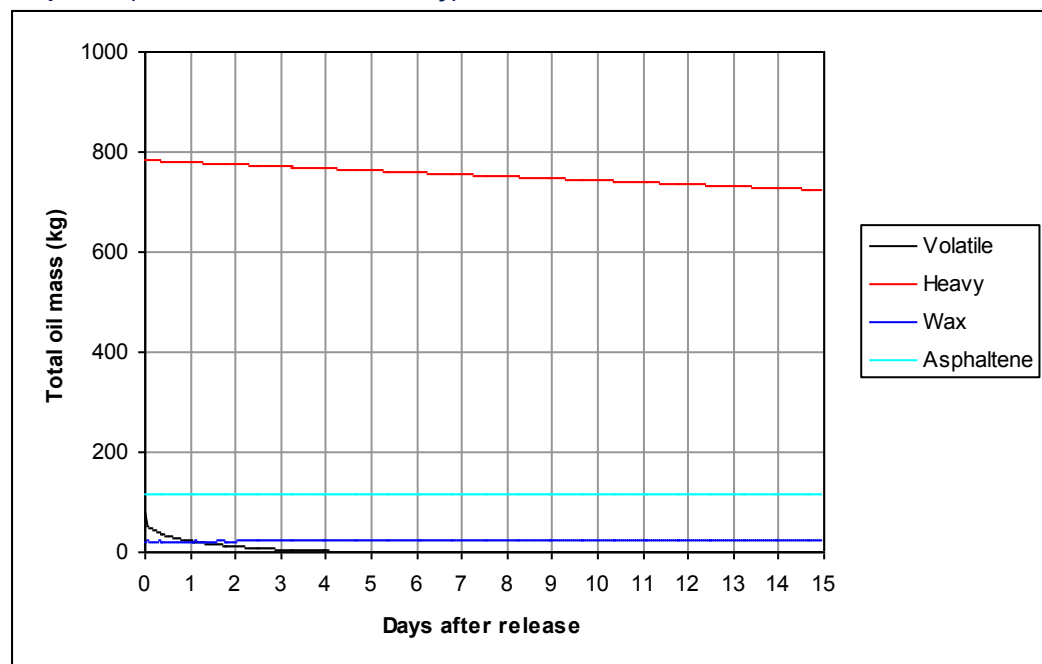


Comparison of Components for Oil Type 4

Figure B-6 plots the mass of the four components of oil type 4 (medium crude oil) within the model domain. Wind scenario 5 (southerly wind) is used as an example; all wind scenarios show similar results. The plot shows:

- the volatile component has almost entirely evaporated after 4-5 days, although this component only formed 8% of the total oil mass at release;
- the heavy component decreases steadily but slowly over the run period, with less than 10% lost after 15 days;
- no reduction in the wax or asphaltene components.

Figure B-6: Reduction in mass of the four components of oil type 4 over the 15-day model run period (wind scenario 5 – southerly)

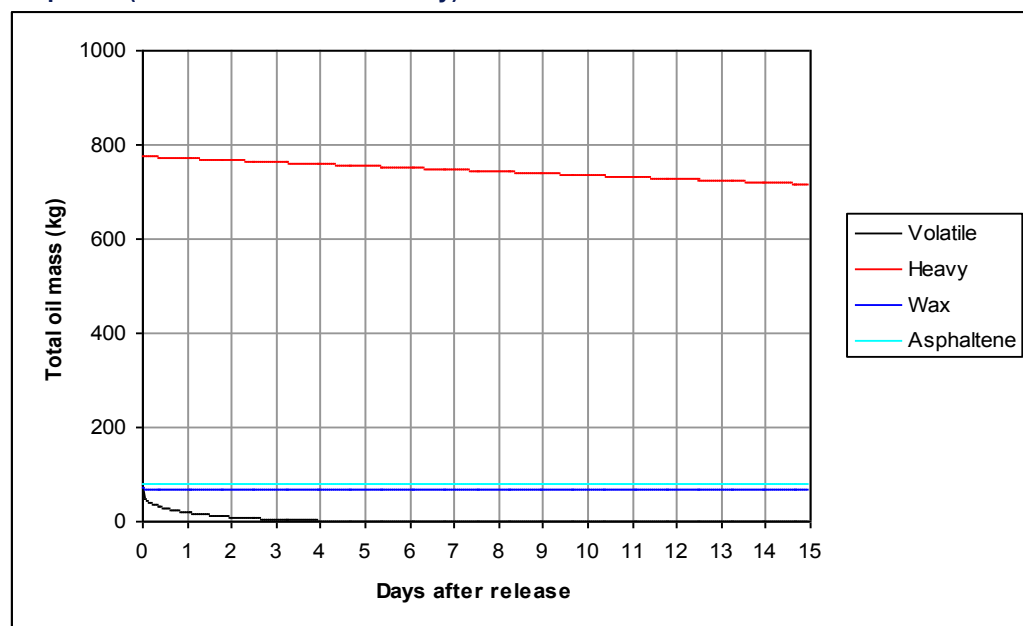


Comparison of Components for Oil Type 5

Figure B-7 plots the mass of the four components of oil type 5 (heavy fuel oil) within the model domain. Wind scenario 5 (southerly wind) is used as an example; all wind scenarios show similar results. The plot shows:

- the volatile component has almost entirely evaporated after 4-5 days, although this component only formed 7.5% of the total oil mass at release;
- the heavy component decreases steadily but slowly over the run period, with less than 10% lost after 15 days;
- no reduction in the wax or asphaltene components.

Figure B-7: Reduction in mass of the four components of oil type 5 over the 15-day model run period (wind scenario 5 – southerly)



B.3.3 Timing and Extent of Impact

Introduction

This Section presents selected key results for the modelling runs. Each of the eight selected wind scenarios is discussed. Because there are only small differences in the persistence of the three selected oil types, only one is described here. Oil type 5 has been selected since this behaves very similarly to oil type 4; both are slightly more conservative than oil type 2 which experiences greater mass reduction due to its higher volatile content. The spatial pattern of impact, and the time to impact at the nearby coast or designated sites, is very similar between all three oil types.

The plots all show the mass of the released oil on a roughly logarithmic scale. The mass (in kg) represents that within a 200 x 200 m model grid cell.

Discussion of Impacts – North Wind, STS2 Release

The first significant impact at the coast occurs approximately 18 hours after release. The slick initially impacts the north coast of Flotta. Figure B-8 shows the location of the slick after 20 hours when it is well spread along the coast of Flotta.

Over subsequent days, the slick gradually moves towards the south. A small amount passes to the east of Flotta to enter the Pentland Firth via the Sound of Hoxa. The majority passes west of Flotta to impact the coast of South Walls, before eventually making its way to the Pentland Firth between South Walls and Switha (potentially impacting the Switha SPA and SSSI).

Once in the Pentland Firth, the slick is rapidly advected by the strong tidal currents and, although much more disperse, may impact a potentially large area of coastline including the North Caithness Cliffs SPA and Stroma SSSI.

Discussion of Impacts – Northeast Wind, STS1 Release

The first significant impact at the coast occurs approximately 10 hours after release. The slick initially impacts the north coast of Cava. Figure B-9 shows the location of the slick after 12 hours when it is well spread along the coast of Cava.

Over the next few days, the slick hits the east coast of Hoy, causing some impact on the Hoy SPA, SAC and SSSI. Under the modelled wind conditions (constant from the northeast) the slick mostly persists in this area for the rest of the model run. In reality, a change in wind direction might carry the slick elsewhere in Scapa Flow or outside.

Discussion of Impacts – East Wind, STS1 Release

The first significant impact at the coast occurs approximately 8 hours after release. The slick initially impacts the coast of Mainland near The Breck (between Orphir Bay and Swanbister Bay). Figure B-10 shows the location of the slick after 10 hours when it is well spread along the coast.

Over the next day or so it is carried west towards Hoy Sound where it begins to experience the greater tidal currents here. The slick becomes more dispersed and begins to impact a number of designated sites including Hoy SPA, SAC and SSSI, Muckle Head and Selwick SSSI, and Stromness Heaths and Coasts SAC and SSSI. A portion of the slick is also carried towards Loch of Stenness SAC and Lochs of Harray and Stenness SSSI; Figure B-11 shows the slick's initial approach in the model simulation, occurring approximately 36 hours after release.

Between 1.5 and 2 days after release the slick begins to exit Scapa Flow via Hoy Sound. In the model simulation it is carried away from the Orkney Islands by the prevailing easterly wind, but in reality a change in wind direction could carry the slick further along the coast to north or south, potentially impacting other designated sites along the west coasts of Hoy or Mainland (such as the Marwick Head SPA and SSSI).



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Figure B-8: Oil type 5 spill from STS2, north wind, 20 hours after release

Legend

- Ship-to-Ship Transfer Location
- Scapa Flow Harbour Limits

Designated Sites

- SPA
- SAC
- SSSI
- Inland water bodies

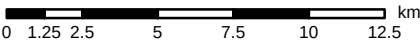
Oil mass (kg)

- Below 0.03
- 0.03 - 0.1
- 0.1 - 0.3
- 0.3 - 1
- 1 - 3
- 3 - 10
- 10 - 30
- 30 - 100
- 100 - 300
- Above 300



NOTE: Not to be used for Navigation

Date	Wednesday, June 11, 2014 14:26:29
Projection	British_National_Grid
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Datum	D_OSGB_1936
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File Reference	J:\P1861\Mxd\ES_Report\Appendix_B\B-8_Oil_T5Spill_STS2_N_20.mxd
Created By	Ian Charlton
Reviewed By	Emma White
Approved By	Fiona Bell



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Figure B-9: Oil type 5 spill from STS1, north-east wind, 12 hours after release

Legend

- Ship-to-Ship Transfer Location
- Scapa Flow Harbour Limits

Designated Sites

- SPA
- SAC
- SSSI

Inland water bodies

Oil mass (kg)

- Below 0.03
- 0.03 - 0.1
- 0.1 - 0.3
- 0.3 - 1
- 1 - 3
- 3 - 10
- 10 - 30
- 30 - 100
- 100 - 300
- Above 300



NOTE: Not to be used for Navigation

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File Reference	J:\P1861\Mxd\ES_Report\Appendix_B\B-9_Oil_T5Spill_STS1_NE_12.mxd
Created By	Ian Charlton
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0 1.25 2.5 5 7.5 10 12.5 km

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Figure B-10: Oil type 5 spill from STS1, east wind, 10 hours after release

Legend

- Ship-to-Ship Transfer Location
- Scapa Flow Harbour Limits

Designated Sites

- SPA
- SAC
- SSSI
- Inland water bodies

Oil mass (kg)

- Below 0.03
- 0.03 - 0.1
- 0.1 - 0.3
- 0.3 - 1
- 1 - 3
- 3 - 10
- 10 - 30
- 30 - 100
- 100 - 300
- Above 300

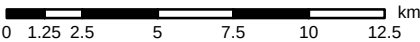


NOTE: Not to be used for Navigation

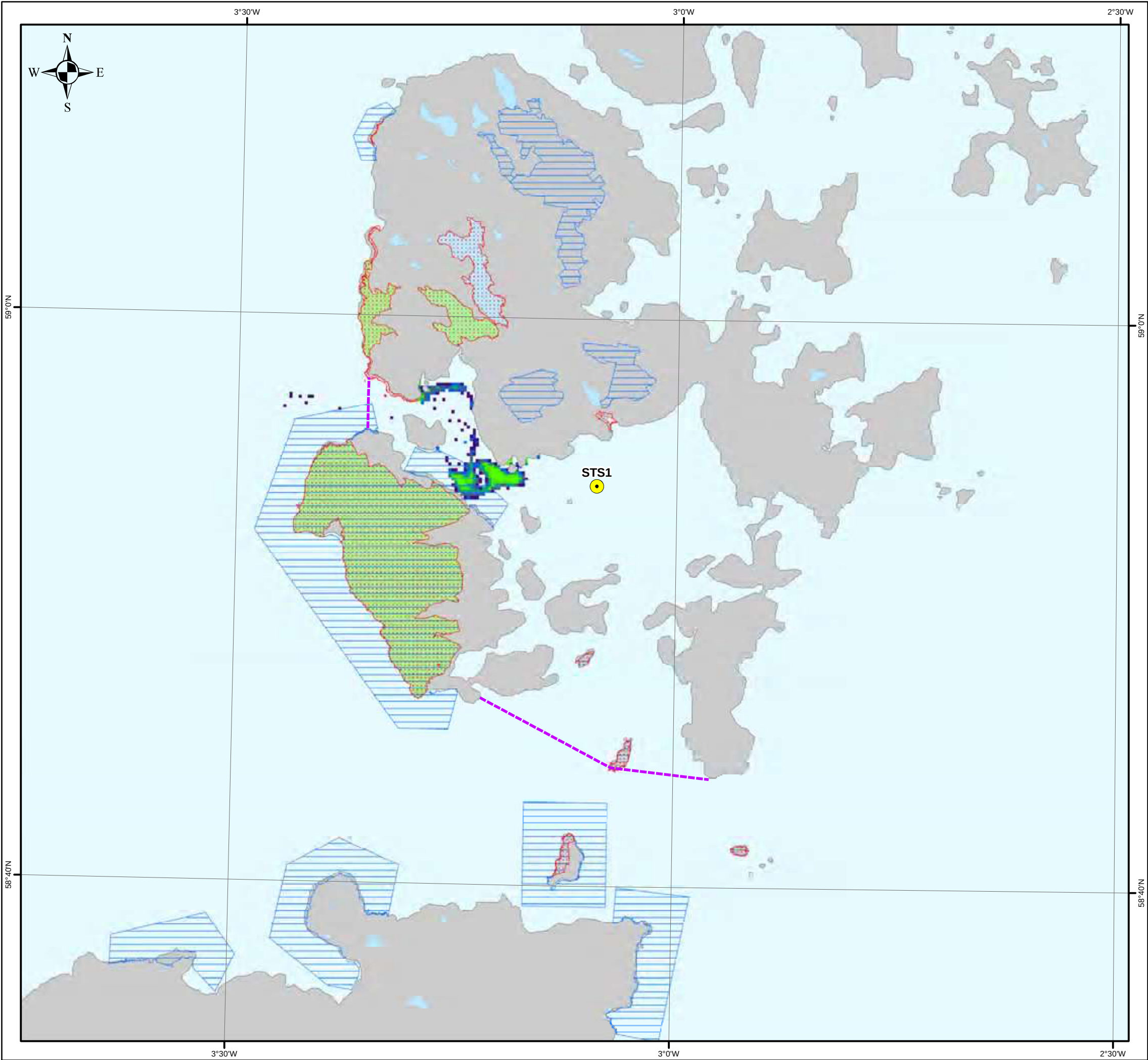
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Data Source	GEBCO, JNCC, SNH, OIC,
File Reference	J:\P1861\Mxd\ES_Report\Appendix_B\B-10_Oil_T5Spill_STS1_E_10.mxd
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Figure B-11: Oil type 5 spill from STS1, east wind, 36 hours after release

Legend

- Ship-to-Ship Transfer Location
- Scapa Flow Harbour Limits

Designated Sites

- SPA
- SAC
- SSSI

Inland water bodies

Oil mass (kg)

- Below 0.03
- 0.03 - 0.1
- 0.1 - 0.3
- 0.3 - 1
- 1 - 3
- 3 - 10
- 10 - 30
- 30 - 100
- 100 - 300
- Above 300



NOTE: Not to be used for Navigation

Date	Wednesday, June 11, 2014 14:38:01
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Spheroid	Airy_1830
Datum	D_OSGB_1936
Data Source	GEBCO, JNCC, SNH, OIC,
File Reference	J:\P1861\Mxd\ES_Report\Appendix_B\B-11_Oil_T5Spill_STS1_E_36.mxd
Created By	Ian Charlton
Reviewed By	Emma White
Approved By	Fiona Bell



Discussion of Impacts – Southeast Wind, STS1 Release

The first significant impact at the coast occurs approximately 6 hours after release. The slick initially impacts the coast of Mainland near The Breck (between Orphir Bay and Swanbister Bay). Figure B-12 shows the predicted position of the slick at this point in time.

Over the next few days, the slick spreads only slightly along this stretch of Mainland coast, between Bay of Houton and Swanbister Bay. Under the modelled wind conditions (constant from the southeast) the slick mostly persists in this area for the rest of the model run. In reality, a change in wind direction might carry the slick elsewhere in Scapa Flow or outside.

There are no designated sites along this stretch of coast that are impacted by the slick under the model simulation, although Waulkmill SSSI is not far to the east.

Discussion of Impacts – South Wind, STS2 Release

The first significant impact at the coast occurs approximately 6 hours after release. The slick initially impacts the coast of Mainland just east of Waulkmill Bay. Figure B-13 shows the location of the slick after 7 hours when it is well spread along the coast.

Over the next few days, the slick spreads along the Mainland coast east of Waulkmill Bay, eventually reaching Scapa Bay. Under the modelled wind conditions (constant from the south) the slick persists in this area for the rest of the model run. In reality, a change in wind direction might carry the slick elsewhere in Scapa Flow or outside.

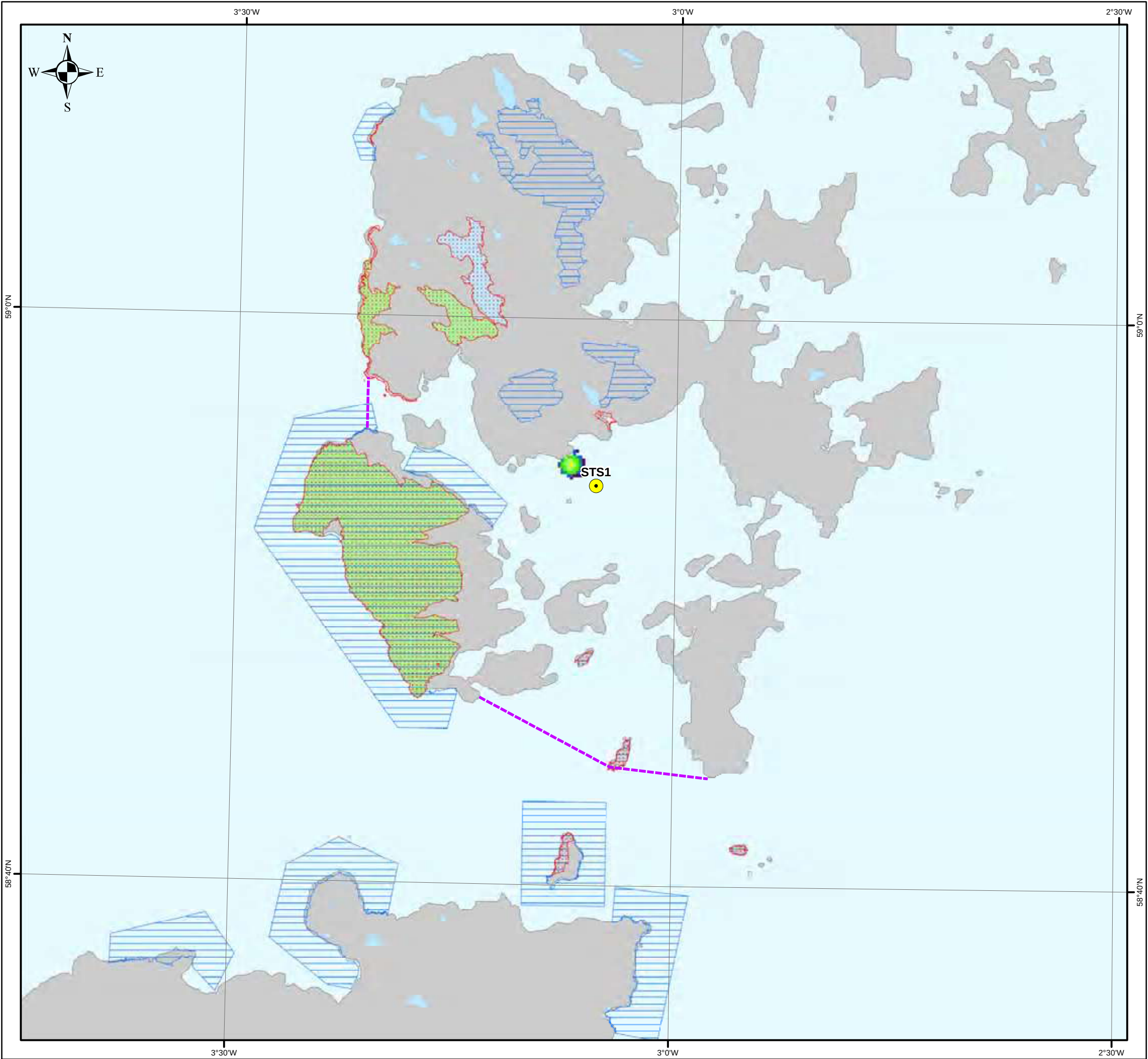
The Waulkmill SSSI is directly impacted by this modelled oil release within about 7 hours of the discharge.

Discussion of Impacts – Southwest Wind, STS3 Release

The first significant impact at the coast occurs approximately 9 hours after release. The slick initially impacts the coast of Mainland near Hemp Stack, about 1 km to the south of Scapa Bay. Figure B-14 shows the predicted position of the slick at this point in time.

Over the next few days, the slick spreads only slightly along this stretch of Mainland coast, between Scapa Bay and Bay of Deepdale. Under the modelled wind conditions (constant from the southwest) the slick persists in this area for the rest of the model run.

There are no designated sites along this stretch of coast that are impacted by the slick under the model simulation.



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Figure B-12: Oil type 5 spill from STS1, south-east wind, 6 hours after release

Legend

- Ship-to-Ship Transfer Location
- Scapa Flow Harbour Limits

Designated Sites

- SPA
- SAC
- SSSI

Inland water bodies

Oil mass (kg)

- Below 0.03
- 0.03 - 0.1
- 0.1 - 0.3
- 0.3 - 1
- 1 - 3
- 3 - 10
- 10 - 30
- 30 - 100
- 100 - 300
- Above 300



NOTE: Not to be used for Navigation

Date	Wednesday, June 11, 2014 14:38:01
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Datum	D_OSGB_1936
Data Source	GEBCO, JNCC, SNH, OIC,
File Reference	J:\P1861\Mxd\ES_Report\Appendix_B\B-11_Oil_T5Spill_STS1_E_36.mxd
Created By	Ian Charlton
Reviewed By	Emma White
Approved By	Fiona Bell





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Figure B-13: Oil type 5 spill from STS2, south wind, 7 hours after release

Legend

- Ship-to-Ship Transfer Location
- Scapa Flow Harbour Limits

Designated Sites

- SPA
- SAC
- SSSI

Inland water bodies

Oil mass (kg)

- Below 0.03
- 0.03 - 0.1
- 0.1 - 0.3
- 0.3 - 1
- 1 - 3
- 3 - 10
- 10 - 30
- 30 - 100
- 100 - 300
- Above 300



NOTE: Not to be used for Navigation

Date	Wednesday, June 11, 2014 14:42:45
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Spheroid	Airy_1830
Datum	D_OSGB_1936
Data Source	GEBCO, JNCC, SNH, OIC,
File Reference	J:\P1861\Mxd\ES_Report\Appendix_B\B-13_Oil_T5Spill_STS2_S_7.mxd
Created By	Ian Charlton
Reviewed By	Emma White
Approved By	Fiona Bell



0 1.25 2.5 5 7.5 10 12.5 km

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Figure B-14: Oil type 5 spill from STS3, south-west wind, 9 hours after release

Legend

- Ship-to-Ship Transfer Location
- Scapa Flow Harbour Limits

Designated Sites

- SPA
- SAC
- SSSI

Inland water bodies

Oil mass (kg)

- Below 0.03
- 0.03 - 0.1
- 0.1 - 0.3
- 0.3 - 1
- 1 - 3
- 3 - 10
- 10 - 30
- 30 - 100
- 100 - 300
- Above 300



NOTE: Not to be used for Navigation

Date	Wednesday, June 11, 2014 14:45:32
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Datum	D_OSGB_1936
Data Source	GEBCO, JNCC, SNH, OIC,
File Reference	J:\P1861\Mxd\ES_Report\Appendix_B\B-14_Oil_T5Spill_STS3_SW_9.mxd
Created By	Ian Charlton
Reviewed By	Emma White
Approved By	Fiona Bell



Discussion of Impacts – West Wind, STS4 Release

The first significant impact at the coast occurs approximately 6 hours after release. The slick initially impacts the coast of Mainland near Howequoy Head west of St Mary's. Figure B-15 shows the predicted position of the slick 9 hours after release, after it has impacted the coast and begun to move into St Mary's Bay.

Over the next few days, the slick moves predominantly into St Mary's Bay where it is captured by the Churchill Barriers. Under the modelled wind conditions (constant from the west) the slick persists in this area for the rest of the model run.

There are no designated sites along this stretch of coast that are impacted by the slick under the model simulation.

Discussion of Impacts – Northwest Wind, STS4 Release

The first significant impact at the coast occurs approximately 9 hours after release. The slick initially impacts the coast of Burray near the entrance to Echnaloch Bay. Figure B-16 shows the predicted position of the slick 10 hours after release as it first moves into Echnaloch Bay.

Over the next few days, the slick moves predominantly into the Echnaloch Bay area where it is captured by the Churchill Barriers and the causeway to Hunda. Under the modelled wind conditions (constant from the northwest) the slick persists in this area for the rest of the model run.

There are no designated sites along this stretch of coast that are impacted by the slick under the model simulation.



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Figure B-15: Oil type 5 spill from STS4, west wind, 9 hours after release

Legend

- Ship-to-Ship Transfer Location
- Scapa Flow Harbour Limits

Designated Sites

- SPA
- SAC
- SSSI

Inland water bodies

Oil mass (kg)

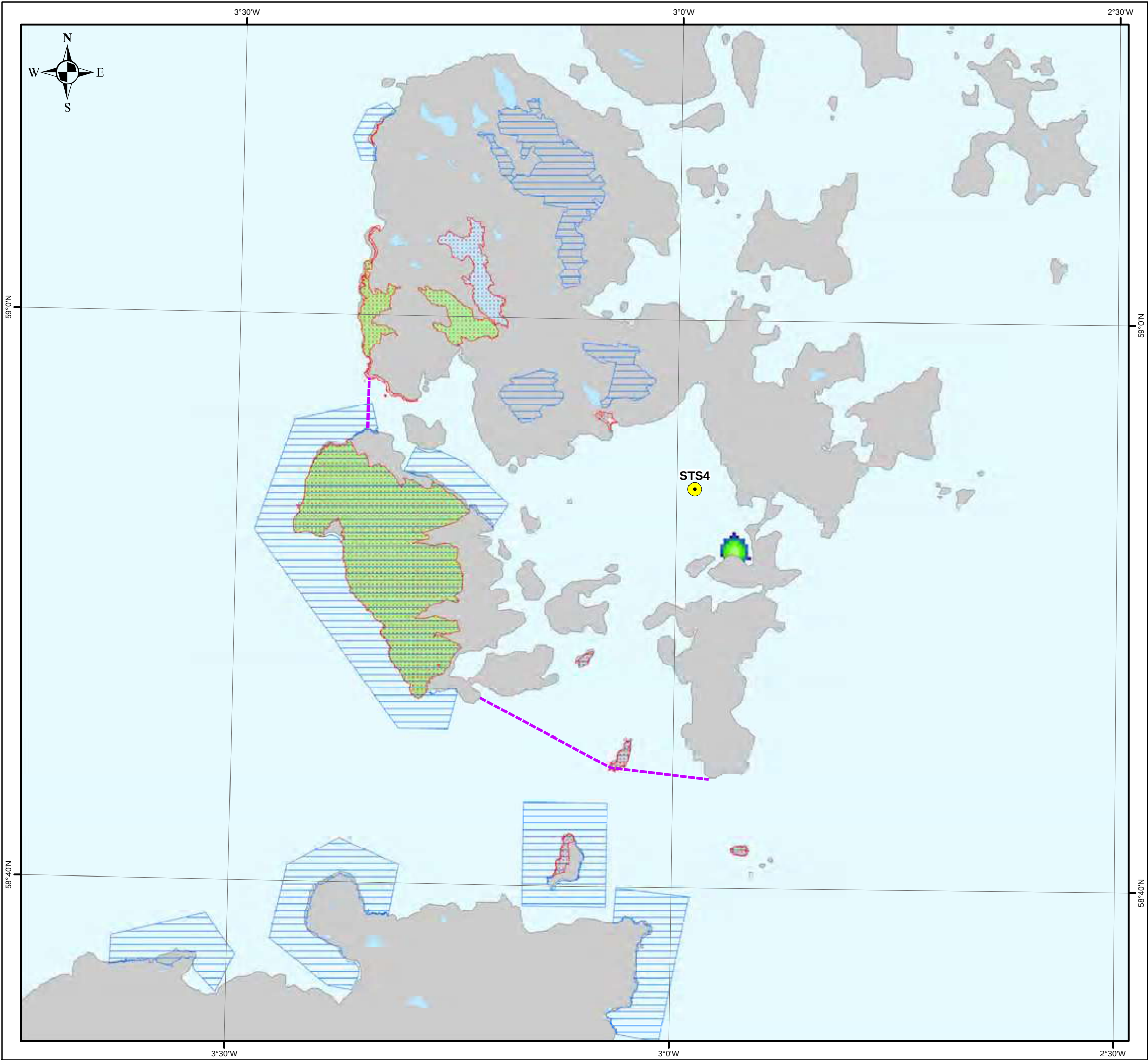
- Below 0.03
- 0.03 - 0.1
- 0.1 - 0.3
- 0.3 - 1
- 1 - 3
- 3 - 10
- 10 - 30
- 30 - 100
- 100 - 300
- Above 300



NOTE: Not to be used for Navigation

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Data Source	GEBCO, JNCC, SNH, OIC,
File Reference	J:\P1861\Mxd\ES_Report\Appendix_B\B-15_Oil_T5spill_STS4_W_9.mxd
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Figure B-16: Oil type 5 spill from STS4, north-west wind, 10 hours after release

Legend

- Ship-to-Ship Transfer Location
- Scapa Flow Harbour Limits

Designated Sites

- SPA
- SAC
- SSSI

Inland water bodies

Oil mass (kg)

- Below 0.03
- 0.03 - 0.1
- 0.1 - 0.3
- 0.3 - 1
- 1 - 3
- 3 - 10
- 10 - 30
- 30 - 100
- 100 - 300
- Above 300



NOTE: Not to be used for Navigation

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Spheroid	Airy_1830
Datum	D_OSGB_1936
Data Source	GEBCO, JNCC, SNH, OIC,
File Reference	J:\P1861\Mxd\ES_Report\Appendix_B\B-16_Oil_T5Spill_STS4_NW_10.mxd
Created By	Ian Charlton
Reviewed By	Emma White
Approved By	Fiona Bell



B.4 Conclusions

Oil spilt from any of the four STS transfer locations is likely to be affected initially by wind-driven currents, since there is only a weak tidal current regime in this area (northeast Scapa Flow). As the wind advects the slick further afield, particularly in the direction of the southern or western entrances to Scapa Flow, tidal currents become more important.

It can take between 6 and 18 hours for a released oil slick to impact the coast, depending on the wind direction and spill location. It is noted, however, that the modelling study has used average wind speeds. Over short periods, stronger winds can occur, and these would reduce the time to initial impact. However, the very strongest winds will not occur at the same time as cargo transfers since forecast or actual winds of 27 knots (13.9 m/s) or greater will lead to cancellation or suspension of operations. An equivalent wave height working limit of 2 m similarly places an upper limit on the severity of conditions that can occur during STS operations.

The three modelled oil types are all fairly persistent in the environment due to the dominance of heavy fractions plus wax and asphaltenes. A smaller proportion of each oil type comprises volatile fractions, and these generally evaporate within a period of 5-15 days after release, depending on the oil type.

Although only eight discrete wind conditions have been modelled, it is clear that a discharged oil slick has the capacity to impact anywhere around the coastline of Scapa Flow, and also to escape through its southern and western entrances in order to impact the coastline further afield (although this may take several days). It follows that any of the local protected sites can potentially be impacted by an oil spill from one of the STS transfer locations. There is predicted to be only a limited decrease in the spilt oil mass (through evaporation of the volatile fractions) prior to any impact at the protected sites.

Appendix C Screening of Designated Sites

Table C-1: Screening of designated sites (JNCC, 2014; SNH, 2014; Marine Scotland, 2013; Thaxter *et al.*, 2012)

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
SPA	Auskerry	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season. - Arctic Tern <i>Sterna paradisaea</i>, 780 pairs representing at least 1.8% of the breeding population in Great Britain - Storm Petrel <i>Hydrobates pelagicus</i>, 3,600 pairs representing at least 4.2% of the breeding population in Great Britain The site is important as a nesting area for a number of breeding seabirds.	27.2 km (from STS4)	Possible. Birds known to feed outside SPA in waters surrounding the island, and further afield. Foraging distances for breeding Arctic Tern maximum of 30 km and mean of 7 km. Foraging distances for breeding Storm Petrel more than 65 km.	No
SSSI	Auskerry	Qualifying features: Breeding storm petrel, breeding Arctic tern.	27.2 km (from STS4)	Possible. Foraging distances for breeding Arctic Tern maximum of 30 km and mean of 7 km. Foraging distances for breeding Storm Petrel more than 65 km.	No
SSSI	Bay of Skail	Qualifying features: Palaeozoic Palaeobotany	22.2 km (from STS1)	Unlikely. Qualifying features would not be impacted.	No
SPA	Calf of Eday	Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance During the breeding season, the area regularly supports 30,000 individual seabirds including: Guillemot <i>Uria aalge</i>, Kittiwake <i>Rissa tridactyla</i>, Great Black-backed Gull <i>Larus marinus</i>, Cormorant <i>Phalacrocorax carbo</i>, Fulmar <i>Fulmarus glacialis</i>. The site is of importance as a nesting area for breeding seabirds, which feed in surrounding waters outside the SPA and use most of the island for loafing.	36 km (from STS3)	Possible. Birds feed outside SPA in surrounding waters. Foraging distances for breeding Cormorant are maximum of 35 and mean of 5 km. Foraging distances for breeding Kittiwake are maximum of 120 km and mean of 25 km. Foraging distances for breeding Guillemot are maximum of 135 km and mean of 37 km. Foraging distances for breeding Fulmar are maximum of 580 km and mean of 47 km.	No
SSSI	Calf of Eday	Qualifying features: Breeding cormorant.	38.2 km (from STS3)	Unlikely. Foraging distances for breeding Cormorant are maximum of 35 and mean of 5 km.	No
SSSI	Central Sanday	Qualifying features: Coastal geomorphology of Scotland (coastal sedimentary landforms); saltmarsh; machair; sand dunes.	42.6 km (from STS3)	No. Qualifying features would not be impacted.	No

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
SPA	Copinsay	Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance: During the breeding season, the area regularly supports 70,000 individual seabirds including: Guillemot <i>Uria aalge</i>, Kittiwake <i>Rissa tridactyla</i>, Great Black-backed Gull <i>Larus marinus</i>, Fulmar <i>Fulmarus glacialis</i>.	13.7 km (from STS4)	Possible. Birds feed outside SPA. Foraging distances for breeding Kittiwake are maximum of 120 km and mean of 25 km. Foraging distances for breeding Guillemot are maximum of 135 km and mean of 37 km. Foraging distances for breeding Fulmar are maximum of 580 km and mean of 47 km.	No
SSSI	Copinsay	Qualifying features: Breeding seabird colony; breeding guillemot; breeding kittiwake.	17.7 km from STS4)	Possible. Foraging distances for breeding Kittiwake are maximum of 120 km and mean of 25 km. Foraging distances for breeding Guillemot are maximum of 135 km and mean of 37 km.	No
SSSI	Cruaday Quarry	Qualifying features: Silurian - Devonian Chordata	23 km (from STS1)	No. Habitats would not be impacted as all are terrestrial.	No
SSSI	Den Wick	Qualifying features: Quaternary of Scotland geology and geomorphology.	15.6 km (from STS4)	No. Qualifying features would not be impacted.	No
SSSI	Doomy and Whitemaw Hill	Qualifying features: Breeding Arctic skua; breeding whimbrel.	30.3 km (from STS3)	Possible. Foraging distances for breeding Arctic Skua are maximum of 75 km and mean of 6 km.	No
SSSI	Duncansby Head	Qualifying features: Breeding fulmar; breeding seabird colony; breeding guillemot; breeding kittiwake; coastal geomorphology of Scotland; maritime cliff.	28.5 km (from STS4)	Possible. Foraging distances for breeding Kittiwake are maximum of 120 km and mean of 25 km. Foraging distances for breeding Guillemot are maximum of 135 km and mean of 37 km. Foraging distances for breeding Fulmar are maximum of 580 km and mean of 47 km.	No
SSSI	Dunnet Head	Qualifying features: Breeding seabird colony; breeding guillemot; maritime cliff	30.1 km (from STS1)	Possible. Foraging distances for breeding Guillemot are maximum of 135 km and mean of 37 km.	No

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
SPA	East Caithness Cliffs	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season: - Peregrine <i>Falco peregrinus</i>, 6 pairs representing at least 0.5% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season - Guillemot <i>Uria aalge</i>, 71,509 pairs representing at least 3.2% of the breeding East Atlantic population - Herring Gull <i>Larus argentatus</i>, 9,370 pairs representing at least 1.0% of the breeding Northwestern Europe (breeding) and Iceland/Western Europe - breeding population - Kittiwake <i>Rissa tridactyla</i>, 31,930 pairs representing at least 1.0% of the breeding Eastern Atlantic - Breeding population - Razorbill <i>Alca torda</i>, 9,259 pairs representing at least 1.6% of the breeding population - Shag <i>Phalacrocorax aristotelis</i>, 2,345 pairs representing at least 1.9% of the breeding Northern Europe population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance: During the breeding season, the area regularly supports 300,000 individual seabirds including: Puffin <i>Fratercula arctica</i>, Great Black-backed Gull <i>Larus marinus</i>, Cormorant <i>Phalacrocorax carbo</i>, Fulmar <i>Fulmarus glacialis</i>, Razorbill <i>Alca torda</i>, Guillemot <i>Uria aalge</i>, Kittiwake <i>Rissa tridactyla</i>, Herring Gull <i>Larus argentatus</i>, Shag <i>Phalacrocorax aristotelis</i>.	52.4 km (from STS4)	Possible. Seabirds feed outside the SPA in inshore waters, as well as further away. Foraging distances for breeding Kittiwake are maximum of 120 km and mean of 25 km. Foraging distances for breeding Guillemot are maximum of 135 km and mean of 37 km. Foraging distances for breeding Razorbill are maximum of 95 km and mean of 23 km. Foraging distances for breeding Herring Gull are maximum of 92 km and mean of 10.5 km. Foraging distances for breeding Shag are maximum of 17 km and mean of 5.9 km. Foraging distances for breeding Puffin are maximum of 200 km and mean of 4 km. Foraging distances for breeding Fulmar are maximum of 580 km and mean of 47 km. Foraging distances for breeding cormorant are maximum of 35 km and mean of 5.2 km.	No
SPA	East Sanday Coast	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species over winter: - Bar-tailed Godwit <i>Limosa lapponica</i>, 600 individuals representing at least 1.1% of the wintering population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species over winter: - Purple Sandpiper <i>Calidris maritima</i>, 840 individuals representing at least 1.7% of the wintering Eastern Atlantic - wintering population - Tumstone <i>Arenaria interpres</i>, 1,400 individuals representing at least 2.0% of the wintering Western Palearctic - wintering population	41.5 km (from STS3)	Unlikely. Qualifying species are shorebirds. Due to the distances between the SPA and Scapa Flow it is considered unlikely that the shorebirds will travel to the area of oil spill and for the population of qualifying species to be significantly impacted.	No

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
Ramsar	East Sanday Coast	Ramsar criterion 6 – species/populations occurring at levels of international importance. Species with peak counts in winter: - Purple sandpiper, <i>Calidris maritima maritima</i>, E Atlantic –wintering 840 individuals, representing an average of 1.1% of the population - Ruddy turnstone, <i>Arenaria interpres interpres</i>, NE Canada, Greenland/W Europe & NW Africa 1400 individuals, representing an average of 1.4% of the population	41.5 km (from STS3)	Unlikely. Qualifying species are shorebirds. Due to the distances between the Ramsar site and Scapa Flow it is considered unlikely that the shorebirds will travel to the area of oil spill and for the population of qualifying species to be significantly impacted.	No
SSSI	East Sanday Coast	Qualifying features: Non-breeding ringed plover, non-breeding bar-tailed godwit, non-breeding purple sandpiper, non-breeding sanderling, non-breeding turnstone; passage turnstone; rocky shore; sandflats; common seal; vascular plant assemblage.	41.5 km (from STS3)	Unlikely. Qualifying species are shorebirds. Due to the distances between the SSSI and Scapa Flow it is considered unlikely that the shorebirds will travel to the area of oil spill and for the population of qualifying species to be significantly impacted.	No
SSSI	Eynhallow	Qualifying features: Common (harbour) seal <i>Phoca vitulina</i>	24.8 km (from STS3)	Unlikely. Qualifying interests would not be impacted. Seals are unlikely to travel to area of oil spill and population of qualifying species to be significantly impacted.	No

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
SPA	Fair Isle	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season: - Arctic Tern <i>Sterna paradisaea</i>, 1,120 pairs representing at least 2.5% of the breeding population in Great Britain - Fair Isle Wren <i>Troglodytes troglodytes fridariensis</i>, 37 individuals representing 100.0% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season - Guillemot <i>Uria aalge</i>, 25,165 pairs representing at least 1.1% of the breeding East Atlantic population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance: During the breeding season, the area regularly supports 180,000 individual seabirds including: Puffin <i>Fratercula arctica</i>, Razorbill <i>Alca torda</i>, Kittiwake <i>Rissa tridactyla</i>, Great Skua <i>Catharacta skua</i>, Arctic Skua <i>Stercorarius parasiticus</i>, Shag <i>Phalacrocorax aristotelis</i>, Gannet <i>Morus bassanus</i>, Fulmar <i>Fulmarus glacialis</i>, Guillemot <i>Uria aalge</i>, Arctic Tern <i>Sterna paradisaea</i>.	98.7 km (from STS3)	Possible. Birds feed in the waters around the island, outside the SPA. Foraging distances for breeding Arctic Tern are maximum of 30 km and mean of 7 km. Foraging distances for breeding Guillemot are maximum of 135 km and mean of 37 km. Foraging distances for breeding Shag are maximum of 17 km and mean of 5.9 km. Foraging distances for breeding Puffin are maximum of 200 km and mean of 4 km. Foraging distances for breeding Fulmar are maximum of 580 km and mean of 47 km. Foraging distances for breeding Kittiwake are maximum of 120 km and mean of 25 km. Foraging distances for breeding Arctic Skua are maximum of 75 km and mean of 6 km. Foraging distances for breeding Razorbill are maximum of 95 km and mean of 23 km. Foraging distances for breeding Great Skua are maximum of 219 km.	No
SAC	Faray and Holm of Faray	Annex II species that are a primary reason for designation Grey seal <i>Halichoerus grypus</i> These two uninhabited islands support the second largest breeding colony of grey seals in the UK, contributing to approximately 9% of the annual UK pup production.	32.7 km (from STS3)	Unlikely. Qualifying interests would not be impacted. Seals are unlikely to travel to area of oil spill and population of qualifying species to be significantly impacted.	No
SSSI	Faray and Holm of Faray	Qualifying features: Grey seal.	33.4 km (from STS3)	Unlikely. Qualifying interests would not be impacted. Seals are unlikely to travel to area of oil spill and population of qualifying species to be significantly impacted.	No
SSSI	Glims Moss and Durka Dale	Qualifying features: Raised bog; Hydro morphological mire range; valley fen.	20.3 km (from STS2)	No. Qualifying interests would not be impacted as all habitats terrestrial.	No

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
SSSI	Holm of Papa Westray	Qualifying features: Breeding black guillemot.	48.1 km (from STS3)	Unlikely. Black guillemot typically travel up to 2 km from their nest sites to forage during the breeding season (SNH, 2014). Therefore the qualifying species are unlikely to be impacted.	No
SAC	Hoy	Annex I Habitats that are a primary reason for designation • Vegetated sea cliffs of the Atlantic and Baltic Coasts • Natural dystrophic lakes and ponds • Northern Atlantic wet heaths with <i>Erica tetralix</i> • Alpine and Boreal heaths • Blanket bogs *Priority feature Annex I habitats present as qualifying feature but not primary feature • European dry heaths • Petrifying springs with tufa formation (<i>Cratoneurion</i>) * Priority feature • Alkaline fens • Calcareous rocky slopes with chasmophytic vegetation	8.5 km (from STS1)	Likely. Vegetated sea cliffs may be impacted by oil spill.	Yes
SPA	Hoy	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season • Peregrine <i>Falco peregrinus</i>, 6 pairs representing at least 0.5% of the breeding population in Great Britain (Mid-1990s) • Red-throated Diver <i>Gavia stellata</i>, 56 pairs representing at least 6.0% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season • Great Skua <i>Catharacta skua</i>, 1,900 pairs representing at least 14.0% of the breeding World population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance • During the breeding season the area regularly supports 120,000 individual seabirds including: Puffin <i>Fratercula arctica</i>, Guillemot <i>Uria aalge</i>, Kittiwake <i>Rissa tridactyla</i>, Great Black-backed Gull <i>Larus marinus</i>, Arctic Skua <i>Stercorarius parasiticus</i>, Fulmar <i>Fulmarus glacialis</i>, Great Skua <i>Catharacta skua</i>.	5.9 km (from STS1)	Likely. Mobile species could potentially be affected by an oil spill. The divers and seabirds are known to feed in the waters around Hoy, outside the SPA.	Yes

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
SSSI	Hoy	Qualifying features: Breeding seabird colony; breeding Arctic skua, breeding fulmar, breeding great skua, breeding guillemot. Breeding bird assemblage; breeding peregrine, breeding red-throated diver, breeding great black-backed gull; blanket bog. Upland oak woodland, coastal geomorphology of Scotland, old red sandstone Igneous, upland assemblage, quaternary of Scotland, dystrophic loch. Non-marine Devonian.	8.5 km (from STS1)	Likely. Mobile species could potentially be affected by an oil spill. The divers and seabirds are known to feed in the waters around Hoy in Scapa Flow.	Yes
SSSI	Keelylang Hill and Swartaback Burn	Qualifying features: Breeding hen harrier; breeding bird assemblage; upland assemblage (mosaic).	4.2 km (from STS2)	Unlikely. Qualifying interests would not be impacted.	No
SSSI	Loch of Banks	Qualifying features: Non-breeding hen harrier; breeding bird assemblage; basin fen.	22.5 km (from STS2)	Unlikely. Qualifying interests would not be impacted.	No
SAC	Loch of Isbister	Annex I Habitats that are a primary reason for designation - Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i>-type vegetation Annex I habitats present as qualifying feature but not primary feature - Transition mires and quaking bogs Annex II species that are a primary reason for designation - Otter <i>Lutra lutra</i>	24 km (from STS2)	Unlikely. Qualifying interests would not be impacted.	No
SSSI	Loch of Isbister and the Loons	Qualifying features: Breeding pintail; breeding bird assemblage; basin fen.	24 km (from STS2)	Unlikely. Qualifying interests would not be impacted.	No
SAC	Loch of Stenness	Annex I Habitats are the primary reason for designation Coastal lagoons *Priority feature	11.7 km (from STS1)	Likely. Lagoon could become contaminated with oil.	Yes
SSSI	Lochs of Harray and Stenness	Qualifying features: Non-breeding goldeneye, non-breeding pochard, non-breeding scaup, non-breeding tufted duck; saline lagoon; freshwater nerite snail (<i>Theodoxus fluviatilis</i>); a caddis fly; eutrophic loch.	11.7 km (from STS1)	Likely. Habitats may be impacted by oil spill.	Yes

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
SPA	Marwick Head	Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season Guillemot (<i>Uria aalge</i>), 24,388 pairs representing up to 1.1% of the breeding East Atlantic population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance The area regularly supports 75,000 individual seabirds including: Kittiwake (<i>Rissa tridactyla</i>), Guillemot (<i>Uria aalge</i>).	25.7 km (from STS1)	Likely. Mobile species could potentially be affected by an oil spill. Birds are known to feed in surrounding waters. Species may feed in Scapa Flow. Foraging distances for breeding Kittiwake are maximum of 120 km and mean of 25 km. Foraging distances for breeding Guillemot are maximum of 135 km and mean of 37 km.	Yes
SSSI	Marwick Head	Qualifying features: Breeding seabird colony; breeding guillemot; breeding kittiwake.	26.7 km (from STS1)	Likely. Mobile species could potentially be affected by an oil spill. Birds are known to feed in surrounding waters. Species may feed in Scapa Flow. Foraging distances for breeding Kittiwake are maximum of 120 km and mean of 25 km. Foraging distances for breeding Guillemot are maximum of 135 km and mean of 37 km.	Yes
SSSI	Mill Bay	Qualifying features: Quaternary of Scotland geology and geomorphology.	32.8 km (from STS3)	No. Qualifying interests would not be impacted.	No
SSSI	Mill Loch	Qualifying features: Breeding red-throated diver (and loched designated for red throated divers).	35.6 km (from STS 3)	Unlikely. Red-throated divers do not travel far enough. Foraging distances max 9 km, mean 4.5 km.	No
SSSI	Muckle and Little Green Holm	Qualifying features: Quaternary of Scotland. Grey seal	24.6 km (from STS3)	Unlikely. Qualifying interests would not be impacted. Seals are unlikely to travel to area of oil spill and population of qualifying species to be significantly impacted. Habitats will not be impacted.	No
SSSI	Muckle Head and Selwick	Qualifying features: Quaternary of Scotland geology and geomorphology.	14.8 km (from STS1)	No. While within the impacted area of oil spill qualifying interests would not be impacted.	No

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
SPA	North Caithness Cliffs	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season - Peregrine Falco C-10 peregrines, 6 pairs representing at least 0.5% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season - Guillemot Uria aalge, 26,994 pairs representing at least 1.2% of the breeding East Atlantic population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance During the breeding season, the area regularly supports 110,000 individual seabirds including: Puffin Fratercula arctica, Razorbill Alca torda, Kittiwake Rissa tridactyla, Fulmar Fulmarus glacialis, Guillemot Uria aalge.	20.7 km (from STS1)	Likely. Mobile species could potentially be affected by an oil spill. Bird species are known to feed in the Pentland Firth and surrounding waters. Species may feed in Scapa Flow.	Yes
SSSI	North Hill	Qualifying features: Breeding Arctic tern; breeding Arctic skua; maritime Cliff	50.3 km (from STS3)	Possible. Foraging distances for breeding Arctic Tern are maximum of 30 km and mean of 7 km. Foraging distances for breeding Arctic Skua are maximum of 75 km and mean of 6 km.	No
SPA	North Sutherland Coastal Islands	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species over winter: Barnacle Goose <i>Branta leucopsis</i>, 631 individuals representing at least 2.3% of the wintering population in Great Britain	80.9 km (from STS1)	Unlikely. Designated for Barnacle Goose, who feed on both islands, as well as other small islands outside the SPA. Qualifying features would not be impacted.	No
SSSI	Northwall	Qualifying features: Machair, Machair loch.	50.5 km (from STS3)	No. Habitats would not be impacted as all are terrestrial.	No

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
Possible MPA	North-west Orkney	The North-west Orkney possible MPA is recommended as an area of importance for sandeels, Sandeels are a key source of food for a range of marine wildlife, including many types of larger fish, and seabirds such as puffins. The area has been recommended for sandeels because of the important role the area plays in supporting wider populations of this fish in Scottish waters. Specifically, newly hatched sandeel larvae produced from this area are exported by currents to sandeel grounds around Shetland and south of the Moray Firth. The area also encompasses several unusual seabed forms of geological importance. Proposed protected features: - Newly emergent sandeel larvae - A range of geological features formed by the action of tides and currents, including sand banks, sand wave fields and sediment wave fields	31.3 km (from STS1)	Unlikely. Species and habitats would not be impacted.	No
SPA	Orkney Mainland Moors	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species. During the breeding season - Hen Harrier <i>Circus cyaneus</i>, 30 pairs representing at least 6.0% of the breeding population in Great Britain - Red-throated Diver <i>Gavia stellata</i>, 15 pairs representing at least 1.6% of the breeding population in Great Britain - Short-eared Owl <i>Asio flammeus</i>, 20 pairs representing at least 2.0% of the breeding population in Great Britain Over winter - Hen Harrier <i>Circus cyaneus</i>, 13 individuals representing at least 1.7% of the wintering population in Great Britain	3.9 km (from STS3)	Likely. Mobile species could potentially be affected by an oil spill. Red-throated diver may feed in Scapa Flow. Foraging ranges for breeding red-throated diver are 9 km maximum and 4.5 km mean.	Yes
SSSI	Orphir and Stenness Hills	Qualifying features: Breeding hen harrier; breeding bird assemblage; Upland assemblage (mosaic).	5.8 km (from STS2)	Unlikely. Qualifying features would not be impacted.	No

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
Possible MPA	Papa Westray	Papa Westray possible MPA supports over 400 breeding black guillemot every year. They raise their young in crevices and burrows along the shores of Papa Westray and the Holm of Papa Westray. They eat a variety of marine fish so breeding sites can only persist if there are healthy productive seas nearby. The possible MPA also lies within the Orkney carbonate production area. This is an internationally important example of a shelf carbonate system. The sand here consists primarily of calcium carbonate, formed by the erosion of the shells and skeletons of the animals that lived on or in the sea bed long ago. These sediments supply the sandy beaches of Orkney and underpin the development of small areas of coastal machair that supports diverse herb-rich grassland vegetation. Proposed protected features: - Black guillemot - Marine Geomorphology of the Scottish Shelf Seabed	46 km (from STS3)	Unlikely. Black guillemot typically travel up to 2 km from their nest sites to forage during the breeding season (SNH, 2014). Therefore the proposed protected species are unlikely to be impacted.	No
SPA	Papa Westray (North Hill and Holm)	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season - Arctic Tern <i>Sterna paradisaea</i>, 1,950 pairs representing at least 4.4% of the breeding population in Great Britain. Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season - Arctic Skua <i>Stercorarius parasiticus</i>, 135 pairs representing at least 0.5% of the breeding North Atlantic population.	48.1 km (from STS3)	Possible. Terns feed outside the SPA in the waters surrounding the islands. Foraging distances for breeding Arctic Tern are maximum of 30 km and mean of 7 km. Foraging distances for breeding Arctic Skua are maximum of 75 km and mean of 6 km.	No
SPA	Pentland Firth Islands	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season Arctic Tern <i>Sterna paradisaea</i>, 1,200 pairs representing at least 2.7% of the breeding population in Great Britain	16.8 km (from STS1)	Likely. Mobile species could potentially be affected by an oil spill. Bird species feed in surrounding Pentland Firth waters. Foraging distances for breeding arctic tern are 30 km maximum and 7 km mean.	Yes
SSSI	Pentland Firth Islands	Qualifying features: Breeding Arctic tern; Vascular plant assemblage.	16.8 km (from STS1)	Likely. Mobile species could potentially be affected by an oil spill. Bird species feed in surrounding Pentland Firth waters. Foraging distances for breeding arctic tern are 30 km maximum and 7 km mean.	Yes

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
SPA	Rousay	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season - Arctic Tern <i>Sterna paradisaea</i>, 1,000 pairs representing at least 2.3% of the breeding population in Great Britain (Seabird Census Register) Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance - During the breeding season, the area regularly supports 30,000 individual seabirds including: Guillemot <i>Uria aalge</i>, Kittiwake <i>Rissa tridactyla</i>, Arctic Skua <i>Stercorarius parasiticus</i>, Fulmar <i>Fulmarus glacialis</i>, Arctic Tern <i>Sterna paradisaea</i>.	24.7 km (from STS3)	Possible. Birds feed in waters around island outside the SPA, as well as further away. Foraging distances for breeding Arctic Tern are maximum of 30 km and mean of 7 km. Foraging distances for breeding Guillemot are maximum of 135 km and mean of 37 km. Foraging distances for breeding Fulmar are maximum of 580 km and mean of 47 km. Foraging distances for breeding Arctic Skua are maximum of 75 km and mean of 6 km. Foraging distances for breeding Kittiwake are maximum of 120 km and mean of 25 km.	No
SSSI	Rousay	Qualifying features: Breeding Arctic tern, breeding guillemot, breeding kittiwake; breeding seabird colony; breeding Arctic skua; breeding bird assemblage; blanket bog; subalpine wet heath; mesotrophic loch; maritime cliff; Vascular plant assemblage.	23.7 km (from STS3)	Possible. Foraging distances for breeding Arctic Tern are maximum of 30 km and mean of 7 km. Foraging distances for breeding Guillemot are maximum of 135 km and mean of 37 km. Foraging distances for breeding Fulmar are maximum of 580 km and mean of 47 km. Foraging distances for breeding Arctic Skua are maximum of 75 km and mean of 6 km. Foraging distances for breeding Kittiwake are maximum of 120 km and mean of 25 km.	No
SAC	Sanday	Annex I Habitats that are a primary reason for designation - Reefs Annex I habitats present as qualifying feature but not primary feature - Sandbanks which are slightly covered by sea water all the time - Mudflats and sandflats not covered by seawater at low tide Annex II species that are a primary reason for designation - Common seal <i>Phoca vitulina</i>	39.5 km (from STS3)	Unlikely. Qualifying interests would not be impacted. Seals are unlikely to travel to area of oil spill and population of qualifying species to be significantly impacted. Habitats will not be impacted.	No

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
SSSI	Stroma	Qualifying features: Breeding Arctic tern; breeding seabird colony; breeding Guillemot; breeding sandwich tern; maritime cliff.	22.8 km (from STS1)	Likely. Mobile species could potentially be affected by an oil spill. Species may feed in Scapa Flow. Foraging distances for breeding Arctic Tern are 30 km maximum and 7 km mean. Foraging distances for breeding Guillemot are 135 km maximum and 37 km mean. Foraging distances for breeding Sandwich tern are 54 km maximum and 11 km mean.	Yes
SAC	Stromness Heaths and Coast	Annex I Habitats that are a primary reason for designation: - Vegetated sea cliffs of the Atlantic and Baltic Coasts - European dry heaths Annex I habitats present as qualifying feature but not primary feature - Alkaline fens	17 km (from STS4)	Likely. Vegetated sea cliffs may be impacted by oil spill.	Yes
SSSI	Stromness Heaths and Coast	Qualifying features: Subalpine dry heath; coastal geomorphology; non-marine Devonian stratigraphy; maritime cliff.	13 km (from STS1)	Likely. Maritime cliff may be impacted by oil spill.	Yes
SPA	Sule Skerry and Sule Stack	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season - Leach's Storm-petrel <i>Oceanodroma leucorhoa</i>, 5 pairs representing at least 0.0% of the breeding population in Great Britain - Storm Petrel <i>Hydrobates pelagicus</i>, 1,000 pairs representing at least 1.2% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season - Gannet <i>Morus bassanus</i>, 4,890 pairs representing at least 1.9% of the breeding North Atlantic population - Puffin <i>Fratercula arctica</i>, 43,380 pairs representing at least 4.8% of the breeding population. The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 seabirds During the breeding season, the area regularly supports 100,000 individual seabirds including: Leach's Storm-petrel <i>Oceanodroma leucorhoa</i> , Guillemot <i>Uria aalge</i> , Shag <i>Phalacrocorax aristotelis</i> , Puffin <i>Fratercula arctica</i> , Gannet <i>Morus bassanus</i> , Storm Petrel <i>Hydrobates pelagicus</i> .	75.4 km (from STS1)	Possible. Seabirds feed in the waters off the north coast of Scotland outside the SPA. Foraging distances for breeding Puffin are maximum of 200 km and mean of 4 km. Foraging distances for breeding Guillemot are 135 km maximum and 37 km mean. Foraging distances for breeding Shag are maximum of 17 km and mean of 5.9 km. Foraging distances for breeding Leach's Petrel less than 120 km. Foraging distances for breeding Storm Petrel more than 65 km.	No

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
SPA	Switha	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species over winter: Barnacle Goose <i>Branta leucopsis</i>, 1,000 individuals representing at least 3.7% of the wintering population in Great Britain	10.8 km (from STS1)	Likely. Mobile species could potentially be affected by an oil spill. Barnacle geese rarely travel more than 5 km from their roost to feed. Therefore, roost on saltmarsh, intertidal sand banks and small islands offshore may be impacted.	Yes
SSSI	Switha	Qualifying features: Non-breeding Greenland barnacle goose.	10.8 km (from STS1)	Likely. Mobile species could potentially be affected by an oil spill. Barnacle geese rarely travel more than 5 km from their roost to feed. Therefore, roost on saltmarsh, intertidal sand banks and small islands offshore may be impacted.	Yes
SSSI	Ward Hill Cliffs	Qualifying features: Maritime cliff.	13.3 km (STS4)	No. Qualifying features would not be impacted.	No
SSSI	Waulkmill	Qualifying features: Saltmarsh; golden-rod case-bearer moth; maritime cliff.	2.6 km (from STS2)	Likely. Saltmarsh could be contaminated with oil.	Yes
SSSI	West Mainland Moorlands	Qualifying features: Breeding hen harrier, breeding short-eared owl and breeding red-throated diver; breeding bird assemblage; upland assemblage (mosaic); blanket bog.	12.4 km (from STS2)	Unlikely. Red-throated divers do not travel far enough. Foraging distances max 9 km, mean 4.5 km.	No
SPA	West Westray	Article 4.1 qualification of Directive (79/409/EEC) supporting populations of European importance Annex I species during the breeding season - Arctic Tern <i>Sterna paradisaea</i>, 1,200 pairs representing at least 2.7% of the breeding population in Great Britain Article 4.2 qualification of Directive (79/409/EEC) supporting populations of European importance migratory species during the breeding season - Guillemot <i>Uria aalge</i>, 28,274 pairs representing at least 1.3% of the breeding East Atlantic population Article 4.2 qualification of Directive (79/409/EEC) Assemblage qualification: A seabird assemblage of international importance During the breeding season, the area regularly supports 120,000 individual seabirds including: Razorbill <i>Alca torda</i> , Kittiwake <i>Rissa tridactyla</i> , Arctic Skua <i>Stercorarius parasiticus</i> , Fulmar <i>Fulmarus glacialis</i> , Guillemot <i>Uria aalge</i> , Arctic Tern <i>Sterna paradisaea</i> .	37.3 km (from STS3)	Possible. Seabirds feed on surrounding waters outside SPA. Foraging distances for breeding Arctic Tern are maximum of 30 km and mean of 7 km. Foraging distances for breeding Guillemot are maximum of 135 km and mean of 37 km. Foraging distances for breeding Fulmar are maximum of 580 km and mean of 47 km. Foraging distances for breeding Arctic Skua are maximum of 75 km and mean of 6 km. Foraging distances for breeding Kittiwake are maximum of 120 km and mean of 25 km. Foraging distances for breeding Razorbill are maximum of 95 km and mean of 23 km.	No

Designation	Site Name	Designating features and comments	Distance to STS transfer locations	Likelihood of interaction between oil spill and receptor	Potential for significant effects
SSSI	West Westray	Qualifying features: Breeding Arctic tern; breeding Kittiwake; breeding Razorbill; breeding seabird colony; breeding Guillemot; breeding Arctic skua; maritime cliff.	39.5 km (from STS3)	Possible. Foraging distances for breeding Arctic Tern are maximum of 30 km and mean of 7 km. Foraging distances for breeding Guillemot are maximum of 135 km and mean of 37 km. Foraging distances for breeding Arctic Skua are maximum of 75 km and mean of 6 km. Foraging distances for breeding Kittiwake are maximum of 120 km and mean of 25 km. Foraging distances for breeding Razorbill are maximum of 95 km and mean of 23 km.	No
Possible MPA	Wyre and Rousay Sounds	The Wyre and Rousay Sounds possible MPA comprises the sounds between the islands of Rousay, Wyre and Egilsay in Orkney. Tide-swept channels in this location support beds of maerl (a coralline seaweed) and kelp communities on sublittoral sediments. The maerl beds in this MPA proposal represent excellent examples of this habitat from amongst the largest known discontinuous area of maerl in UK waters. The beds have an exceptionally high proportion of live maerl and support diverse associated communities. Proposed protected features: • Kelp and seaweed communities on sublittoral sediment • Maerl beds • Marine Geomorphology of the Scottish Shelf Seabed	21.2 km (from STS3)	Unlikely. Protected features would not be impacted.	No

Appendix D OIC Standard Operating Procedures

The following Orkney Harbours Standard Operating Procedures are included on the pages overleaf:

- 1)** Emergency Plan
- 2)** Safety Management System Introduction
- 3)** STS Information Card
- 4)** Pre-STs Meeting Checklist
- 5)** Traffic Monitoring in Harbour Areas
- 6)** Recommended Navigation Channels for Larger Vessels Bound to or from Scapa Flow
- 7)** Procedure for Marine Operations Rooms
- 8)** Port Operations in Restricted Visibility
- 9)** Procedure for Pilot Operations
- 10)** Procedure for Suspending Pilotage
- 11)** Towage Guidelines
- 12)** Tug Escort Guidelines
- 13)** Tug Availability Guidelines
- 14)** STS and Bunkering Operations
- 15)** Tug Standby Duties
- 16)** Pilot Launch Operations
- 17)** Procedures in the Event of an Oil Spill

D.1 Emergency Plan

**ORKNEY ISLANDS COUNCIL
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Distribution List

Copy No.	Holder
01	OIC Harbours, Director of Marine Services
02	OIC Harbours, Head of Marine Services (Operations & Support)
03	OIC Harbours, VTS & Berthing Manager & PMSC/CP Manager
04	OIC Harbours, Marine Operations Room
05	OIC Safety Officer (School Place)
06	OIC Emergency Planning Manager
07	Kirkwall Harbour Piermaster
08	Stromness Harbour Piermaster
09	Burray & Holm Piermaster
10	Eday Piermaster
11	Egilsay Piermaster
12	Flotta Piermaster
13	Houton Piermaster
14	Longhope Piermaster
15	Lyness Piermaster
16	North Ronaldsay Piermaster
17	Papa Westray Piermaster
18	Rousay Pier Master
19	Sanday Piermaster
20	Shapinsay Piermaster
21	Stronsay Piermaster
22	Gill Piermaster Westray
23	Rapness Piermaster Westray
24	Burwick Piermaster
25	Marine Superintendents
26	Technical Superintendents
27	Northlink Ferries Ltd – Commercial Director
28	SMS, Designated Person
29	Highlands & Islands Fire & Rescue Service Group Manager
30	Northern Constabulary - Chief Inspector Orkney Area Command
31	Ambulance Service - Chief Paramedic
32	Shetland Coastguard
33	John Jolly
34	GAC/OBC Shipping Group Ltd
35	Graypen Shipping Ltd
36	Emergency Planning Officer Northern Constabulary Inverness
37	Talisman (UK) Flotta Terminal – Senior Health & Safety Advisor
38	Scottish Fuels Shore Street Kirkwall
39	Highland Fuels Depot Scapa
40	St Margaret's Hope Pier Trustees

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Appendix 7 – Role of Orkney Islands Council

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Appendix 11 - Casualty Information Report

Appendix 12 - Emergency Contact Numbers

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Preface

This contingency plan has been prepared by the Orkney Islands Council Marine Services.

Even in the best regulated organisations accidents can occur. At harbours, where there is a multiplicity of users, the possibility of an emergency arising is far greater than in many other locations. All persons working in a port environment must always be on their guard against complacency as this can be the very reason why an emergency situation develops.

A Port Emergency Plan is necessary so that employees involved in an incident know what has to be done and in what sequence.

The purpose of the this Emergency Plan is to consider the initial response by OIC Marine Services in the event of a incident within or affecting the port facilities operated by OIC Marine Services and to ensure that the correct action is taken in the most appropriate sequence and attempts to ensure that all eventualities are covered.

The role of response agencies is also briefly detailed in Appendix 3-7.

The plan contains information that is provided in confidence for official purposes. The contents are therefore only to be disclosed on a need to know basis to authorities concerned with implementing the plan in the event of an incident.

Recipients of the plan are asked to:

- (a) Read and check all information for accuracy.
- (b) Send any amendments immediately to the Port Safety/Counter Pollution Manager (PMSC/CP Manager), Orkney Islands Council Marine Services.
- (c) Insert amendments to the plan immediately upon receipt, ensure that the pages removed are destroyed and the accompanying transmittal note returned to the PMSC/CP Manager.
- (d) Ensure the plan is safely stored.

Definitions of terms used in the plan are included at Appendix 1.

Contact for amendments:

Port Safety/Counter Pollution Manager
Orkney Islands Council
Marine Services
Harbour Authority Building
Scapa
KW15 1SD

Tel	01856 873 636
Fax	01856 873 012
E-mail	harbours@orkney.gov.uk

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PART 1 - INTRODUCTION

1 Duty

- 1.1 The port authority, Orkney Islands Council Marine Services, is required to have in place an Emergency Plan that shall cover potential incidents within the port facilities and controlled buildings. This emergency plan must satisfy the requirements detailed in the: -
- Port Facility Security Instructions issued by Transport Security and Contingencies Directorate (TRANSEC) of the Department of Transport (DfT)
 - Dangerous Substances in Harbour Areas Regulation 1987, after consultation with all interested parties.
 - The Civil Contingencies Act 2004 (the Act) and the Civil Contingencies Act 2004 (Contingency Planning) Regulations 2005 (the Regulations) lays upon Scottish Category 1 responders (of which Orkney Islands Council is one) to "maintain plans which relate to more than one emergency or more than one kind of emergency".
- 1.2 The port authority is required to be in compliance with the Port Facility Security Instructions issued by TRANSEC.
- 1.3 Port Facility Security Instructions issued by TRANSEC are for the implementation of the following legislation: -
- Statutory Instrument 2004 No. 1495, The Ship and Port Facility (Security) Regulations 2004.
 - Statutory Instrument 2005 No. 1434, The Ship and Port Facility (Security) (Amended) Regulations 2005.
- 1.4 The port authority is required to be in compliance with The Merchant Shipping (Dangerous Goods and Marine Pollutant) Regulations 1990, which are enforced by the Department of Transport, and through The Dangerous Substances in Harbour Areas Regulations 1987, as enforced by HSE.
- 1.5 The port authority is in compliance with the Port Marine Safety Code (PMSC) and has in place Standard Operating Procedures (SOP's). The SOP's provide the port authority with the ability to address emergencies and refer to this Emergency Plan amongst other contingency plans in place.

2 Authority

- 2.1 This plan is issued under the authority of the Director of Marine Services, Orkney Islands Council, following consultation with the Emergency Services to meet the Orkney Islands Council Marine Services responsibility to prepare for potential incidents within the port facilities.
- 2.2 This contingency plan is supported by the: -
- Port Facility Security Plan (PFSP). The PFSP is a controlled document where only PFSP and deputy PFSP's have access to. The PFSP is approved by TRANSEC with review and audit procedures.
 - Oil Pollution Response and Contingency Plan (OPRC). The OPRC plan is a controlled plan and is approved by the Maritime and Coastguard Agency.



Signed

Director of Marine Services, Orkney Islands Council

ORKNEY ISLANDS COUNCIL MARINE SERVICES

3 Aim

- 3.1 The aim of this Plan is to identify the roles, responsibilities and procedures to be adopted to minimise the consequences of incidents within the port facilities and to ensure essential services are maintained where possible. All of the response organisations involved have their own emergency procedures and this Plan is not intended to replace or supersede these but to be used in a complimentary fashion.

4 Objectives

- 4.1 To comply with the regulations identified in section 1 of the above.
- 4.2 Minimise the effects of an incident;
- 4.3.1 Implement the measures necessary to protect persons, property and the environment from the effects of an incident.
- 4.4 Communicate the necessary information to the public, the emergency services and authorities concerned in the area.
- 4.5 To ensure when possible essential port services are maintained.

5 Security Incident Probability

- 5.1 The Joint Terrorism Analysis Centre (JTAC) collates and analyse intelligence data received. TRANSEC uses this information to determine threat levels. The OIC Marine Services rely on TRANSEC for notification of increases in security threats that would affect the port authority.
- 5.2 The OIC Marine Services personnel are responsible for the day to day security within the port facilities and report all security incidents to the Port Facility Security Officer (PFSO) or deputy PFSO.

6 Assessment

- 6.1 A port facility security assessment was completed as required by the International Ship & Port Facility Security Code (ISPS) prior to completing a Port Facility Security Plan (PFSP). From the assessment it was identified that the following facilities were required to be covered in the PFSP: -

- Kirkwall Harbour and Hatston Terminal (PAX, OBC and domestic passenger vessels).
- Stromness Harbour (PAX, OBC and domestic passenger vessels).
- Scapa Flow (Ship to Ship transfer operations for both oil and LNG cargos).

7 Associated Plans & Documents

- Orkney Islands Council – Major Emergencies Procedures.
- Orkney Islands Council, Marine Services - Oil Spill Preparedness and Response Contingency Plan.
- Orkney Islands Council COMA off-site emergency plan for Flotta Oil Terminal.
- Orkney Islands Council, Marine Services – Port Facility Security Plan.
- Orkney Islands Council, Marine Services – Pandemic Contingency Plan
- Northlink Ferries Ltd – Contingency plans for Stromness and Hatston passenger terminal operations.
- Orkney Ferries Ltd – Safety Management System
- Orkney Towage Ltd – Safety Management System

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PART 2 – SITES & POTENTIAL SCENARIOS

1 Location (see appendix 14 for site maps)

- 1.1 Kirkwall Harbour
- 1.2 Stromness Harbour
- 1.3 Scapa Flow Oil Port
- 1.4 Flotta oil terminal
- 1.5 North Isles Piers and terminals
- 1.6 South Isles Piers and terminals

2 Operations

- 2.1 Kirkwall Harbour provides facilities for OBC, PAX and domestic passenger ferry services. A number of vessels under the ISPS code visit Kirkwall Harbour either using Kirkwall Pier or Hatston Pier.

Kirkwall Pier serves cruise liners alongside, tenders from cruise liners at anchor in Kirkwall Bay and domestic class IIA ferry services to the outer north isles.

Hatston Pier serves cruise liners alongside, cargo vessels on international and UK voyages and domestic class A passenger vessels.

- 2.2 Stromness Harbour provides facilities for OBC, PAX and domestic passenger ferry services. Stromness North Pier serves visiting cruise liners and domestic class IIA ferry services to the Scottish mainland. Stromness South Pier serves cargo vessels on international and UK voyages.

- 2.3 Scapa Flow provides an anchorage location for the transfer of both oil and LNG cargos. Scapa Pier is used by vessels providing services to these operations along with the discharge point for hydrocarbons in shore under ground tanks in close proximity to Scapa Pier.

- 2.4 The Flotta oil terminal serves crude oil and gas tankers exporting oil and gas cargos. The terminal has two berths for these operations, LPG Jetty and a single point mooring.

- 2.5 North Isles piers and terminals are principally used by ro-ro/passenger ferries providing lifeline services to the port of Kirkwall. Local inshore vessels also use these facilities.

- 2.6 South Isles piers and terminals are principally used by ro-ro/passenger ferries providing lifeline services to the ports of Stromness and Houton. Local inshore vessels also use these facilities.

3 Potential incidents: -

- 1. Fire
- 2. Explosion
- 3. Pollution
- 4. Collision/Sinking
- 5. Escape of Toxic Gases, Liquids and Hazardous Chemicals
- 6. Radio Active Substances
- 7. Security Incident

See Appendix 2 for Incident Response Diagrams

It must be appreciated that a minor incident can, if appropriate action is not taken quickly, rapidly develop into a serious situation. Consequently it is essential that any incident under the above headings be dealt with as a matter of urgency no matter how trivial first indications of the incident may be.

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PART 3 – RESPONSE

1 Activation of Plan

- 1.1.1 It is important that any harbour employee coming upon anything covered by the above should immediately report the incident to the Marine Operations Room at the Harbour Authority Building, Scapa.

The Duty Marine Officer will be responsible for ensuring that the following services are summoned / provided to deal with, or are informed of, a particular emergency.

Refer to Port Security Contact List for notifications in the event of a security incident.

MARINE SERVICES – ORKNEY ISLANDS COUNCIL
POLICE
HIGHLAND & ISLANDS FIRE & RESCUE SERVICE
AMBULANCE SERVICE
ORKNEY ISLANDS COUNCIL
TALISMAN ENERGY (UK) LIMITED
SHIPS' AGENTS
HM COASTGUARD & RNLI (via Coastguard)
HEALTH & SAFETY EXECUTIVE
ORKNEY FERRIES LTD
ORKNEY TOWAGE LTD
NORTHLINK FERRIES LTD
STREAMLINE SHIPPING GROUP (Orkney)
HIGHLAND FUELS
SCOTTISH FUELS
SCOTTISH AND SOUTHERN (Electricity)
SCOTTISH NATURAL HERITAGE
SEPA
OIL POLLUTION TIER 2 RESPONDER

Have available list of all vessels within the port equipped for fire fighting duties.

The Duty Marine Officer will ensure that the Director of Marine Services (DoMS) and/or Head of Marine Services (Operations & Support) (HMS ops/sup) is informed of the situation as soon as possible.

- 1.2 For a security incident initial contact with the PFSO should be via the Marine Operations Room Scapa to the duty Marine Officer who will forward the information to the PFSO or their deputy. The Marine Operations room is manned continuously, telephone 01856 87 36 36.
- 1.3 The DoMS will initiate the Emergency Plan along with other relevant plans in place. In the event of DoMS being unavailable the HMS ops/sup will be contacted.
- 1.4 In the event of a security incident TRANSEC will contact the PFSO and deputy PFSO's via e-mail and fax of any increases in security levels affecting the port authority.

GENERAL INSTRUCTION

If, after reporting the incident, you feel it is within your capability to render "First Aid" you should only do so to the extent that you do not endanger your own well being – remember having reported the incident the appropriate emergency services will have been called for and will attend in a very short space of time – to foolhardily attempt something and then find yourself at risk presents the emergency services with another emergency.

IF YOU CANNOT SAFELY CONTAIN A HAZARD LEAVE IT ALONE!

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2 Control Responsibility

- 2.1 The responsibility for control and co-ordination of public safety measures will lie with the Police Incident Officer, acting on advice given to him by the Senior Fire Officer, the Director of Marine Services, the Senior Terminal Representative and other appropriate persons.
- 2.2 While each organisation involved will have its own tasks to perform and emergency procedures to follow, it is important that the overall response be based on an integrated approach, co-ordinated by the Police Incident Officer.

3 Control Locations

- 3.1 In the event of an incident, initial action will be taken in the Emergency Control Room Scapa. If the incident is of significant proportions, the Emergency Control Room will be mobilised and manned.

Within the Harbour Authority Building communications and support facilities are available. In the event of the Emergency Control Room being unavailable a secondary Emergency Control Room will be established in liaison with the Northern Constabulary.

Assembly Point locations are identified at all port locations. Kirkwall Pier, Hatston Terminal and Stromness Harbour have plans of buildings and piers are available for use by the emergency services. (Appendix 14)

4 Immediate Response

- 4.1 Some of these actions may already have been initiated as a result of the initial response to an incident by the Emergency Services. The primary responsibilities of emergency and support services are detailed in Appendices 3 to 7.

5 Northern Constabulary (Appendix 3)

- 5.1 The duty officer, Force Operations Centre, will notify services and personnel as appropriate in accordance with their Force Generic Major Incident Plan. This will include notifying the other emergency service controls; the Control Hospital (Balfour Hospital); the Emergency Planning Manager (OIC) and the Health and Safety Executive.
- 5.2 The Police will take immediate and appropriate action to protect any public in the area affected or likely to be affected such as: -
- Responsible for crowd control and evacuation and protection of property in areas outside of the port facility.
 - Co-ordination of Emergency Services for onshore emergencies.
- 5.3 Invite the Northern Constabulary to attend at the Emergency Control Room or location of the incident and to assume the role and responsibilities of Police Incident Officer.

6 Highlands and Islands Fire & Rescue Service (Appendix 4)

- 6.1 The Highlands and Islands Fire & Rescue Service Control Room will mobilise resources in accordance with their Standing Orders.
- 6.2 The incident commander at the incident will be responsible for: -
- Immediate mobilisation of the pre-determined attendance to a Rendezvous Point. See appendix 9 for details of rendezvous points for Kirkwall and Stromness Harbours.
 - Assuming overall command and control of fire fighting and rescue operations.

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- Control of fire fighting ashore and afloat alongside berths.
- Control of rescue operations.

In the case of a vessel on fire there will be consultation between Fire Officer, Director of Marine Services, Head of Marine Services and Ship's Master on action to be taken.

7 Scottish Ambulance Service (Appendix 5)

7.1 The Ambulance Control Centre will mobilise ambulance resources and alert the Receiving Hospital in accordance with their Standing Orders.

7.2 This would include:

- An initial attendance to the incident.
- Notification of the situation to the designated receiving Hospital.
- Responsible for the treatment and clearance of all casualties.

8 NHS Orkney - Control Hospital (Appendix 6)

8.1 The Control Hospital - (Balfour Hospital) will mobilise resources as required in order to give medical care to casualties and initiate their own NHS Orkney - Major Emergency Procedure.

9 Orkney Islands Council /NHS Orkney- Emergency Planning Manager (Appendix 7)

9.1 The Emergency Planning Manager or their representative will be contacted by the Duty Marine Officer, Marine Operations Room Scapa using the normal notified callout system. They will:

- Establish whether further OIC assistance/resources are required in backup/support
- Notify the Chief Executive, Orkney Islands Council, or in his absence the Deputy/Assistant Chief Executive
- Arrange for the OIC Emergency Centre to be established if necessary and instigate the cascade callout list.
- Make contact with the Chief Executive, NHS Orkney, or in their absence the Consultant in Public Health Medicine.
- Alert, if required, local authority departments/sections and inform them of the possible level of response required.

After discussion with the OIC Chief / deputy Chief Executive, will inform the emergency contact within Scottish Government, i.e. the duty officer of the Civil Contingency unit, Scottish Resilience.

10 Maritime and Coastguard Agency

State

"The Maritime and Coastguard Agency will respond within its overall remit to any reasonable request for assistance from any other authoritative agency."

Co-ordination of Emergency Services for all seaborne emergencies within and out with the port area.

In this connection the Fire Service may be involved with a vessel on fire in which event rescue would be a joint operation between the Maritime and Coastguard Agency and the Fire Service.

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PART 4 – IMPLEMENTATION

1 Identification of Key Personnel

1.1 To enable the rapid identification and movement of emergency services and key personnel the following arrangements apply:

- (a) **Emergency Services:** Harbour staff will direct and assist public emergency services on arrival at the facility entrance. The emergency services can be assumed to be adequately identified in the event of a security incident;
- (b) **OIC Marine Services staff:** Key call-in staff have authorised passes and names will be forwarded to the Northern Constabulary to confirm authority to enter an area in the event of road blocks being established;
- (c) **OIC Staff:** In the event that any OIC personnel require to approach or enter the port facility through Police road blocks and into the incident area identification must be produced by the individual;

The Police may in the event of an incident restrict and control access to the location.

2 Incident Development / Monitoring

2.1 As the emergency organisation is built up, response strategy may require to be adjusted in the light of incident development and continual monitoring, frequent briefings and liaison between all involved parties will be crucial.

3 Evacuation

3.1 Generic procedures for evacuation of people from the affected harbour facilities are detailed in appendix 10.

3.2 Any evacuation of persons within the off-site hazard area will be under the control of the Police, and evacuation procedures will be decided at the time, taking into account the type of incident, weather conditions and technical advice given by response agencies.

4 Casualties

4.1 Ambulance and medical services will deal with any casualties and arrange for their local medical treatment or removal to facilities elsewhere as appropriate.

4.2 Normal Police procedures will be followed if fatalities occur.

5 Press and Public Relations

5.1 The OIC will set up a Press Information Centre at an appropriate location - the telephone number will be issued at the time of the incident. All press statements regarding security matters should be agreed prior to issue by DOH, OIC Media, Police, and TRANSEC.

6 Other Interests and Resources

6.1 At the start of the incident preparation should be made for support and assistance of the incident to ensure continuity of services to the incident in case it proceeds over a lengthy period of time and or timely information to users on any alterations to standard services.

7 Meteorological Information

7.1 It will be important to establish wind and weather conditions at the location of any security incident and to arrange for continual forecast updates. OIC Marine Services receives forecasts

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for the Orkney Coastal Waters area twice daily with access to a duty forecaster available at anytime.

PART 5 – EVALUATION

1 Recording Events

- 1.1 All involved organisations will be responsible for maintenance of their own “Event Logs” under their own practices.

2 Financial Procedures for emergency response

- 2.1 In an emergency situation, additional expenditure is likely to be necessary and because of the urgency it may not be practicable to use normal approval procedures (e.g., hiring of plant and equipment and external services). In such circumstances the Chief Executive, Orkney Islands Council, through his Director of Finance or representative, may authorise immediate expenditure of funds in accordance with statutory provisions. It is important, therefore, that a record of expenditure is kept in order that apportionments and claims may be settled at a later date. (Orkney Islands Council Major Emergency Procedure, Part 5 refers.)
- 2.2 **General order books already held within departments must not be used for any "emergency" purchases.** The Finance Division will issue specific order books to be used, with details of the members of staff who will be authorised to sign the orders and the limit on the value of orders.
- 2.3 Staff should ensure that only essential items are ordered, that are necessary for dealing with the emergency. Following the emergency **every cost incurred by the Authority must be justifiable**, to enable all costs incurred to be reclaimed from insurance companies or other bodies.

Any queries regarding these arrangements should be made to the Director of Finance and Housing.

3.0 Insurance

- 3.1 The Finance Division's insurance administrator will contact the council's insurers with details of the emergency as soon as possible.
- 3.2 All incidents which may result in a claim should be notified without delay to the Insurance Administrator, and as soon as practicable, confirmed in writing. In cases of doubt the Insurance Administrator should always be contacted.
- 3.3 Any queries regarding the Council's insurance arrangements should be made to the Insurance Administrator, within the Finance Division.
- 3.4 Notification to the providers of the Port Operators Liability Insurance will be arranged by the Director of Marine Services or their deputy.

4 Stand Down

- 4.1 The responsibility for declaring any incident over and permitting 'stand down' in whole or in part will lie with the Police Incident Officer after consultation as appropriate.
- 4.2 If a recovery phase is entered into it is normally the responsibility of the local authority, Orkney Islands Council.

5 Review of Effectiveness

- 5.1 After the incident has passed and relative normality returned to the affected area, the Director of Marine Services under direction from the Chief / Deputy Chief Executive will arrange a review of the incident and procedures in place. (Orkney Islands Council Major Emergency Plan Part 2 page 2-7) The review will be reported to the OIC at an appropriate time via the standard committee process.

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6 Testing of this Emergency Plan

- 6.1 This elements of this plan are tested annually with a full review of the plan every two years.

D.2 Safety Management System Introduction

Certain job titles within this document have changed due to establishment changes within OIC Marine Services. However, the content of the SMS remains unchanged. The SMS is being adjusted accordingly at the time of OTL application production.

1 Introduction

1.1 Scope and Purpose of Plan

Orkney Islands Council (OIC) recognises it has a duty as Harbour Authority to take reasonable care, so long as the harbour is open for public use, that all who choose to navigate within its harbour limits may do so without danger to their lives or property. This includes an obligation to conserve and facilitate the safe use of the harbour and a duty of care against loss caused by the authority's negligence.

OIC recognises its duties to serve this public interest through the powers conferred on it as a Harbour Authority. OIC recognises the need for it to ensure that it has the systems and procedures in place to ensure the safe and efficient use of the harbour, by those who have a right to use its facilities. In line with this responsibility, OIC Marine Services has in place a Safety Management System, which gives guidance to its personnel and enables a transparent and auditable system of safe operations.

This document lays out OIC Marine Services' Safety Management System, which is in line with the principles of the Port Marine Safety Code. The document lays out the general philosophy and approach to managing marine operations in all of the OIC Marine Services' areas in a safe manner.

This document is supported by a number of other documents and records, which make up the safety management system, in particular: -

- Policy Documents;
- Standard Operating Procedures and associated Standard Forms;
- Job Descriptions and Training Records;
- Documented Targets and Objectives;
- Safety Records and Incident Reports; and
- Risk Assessment Records.

1.2 Designation of Harbour Authority

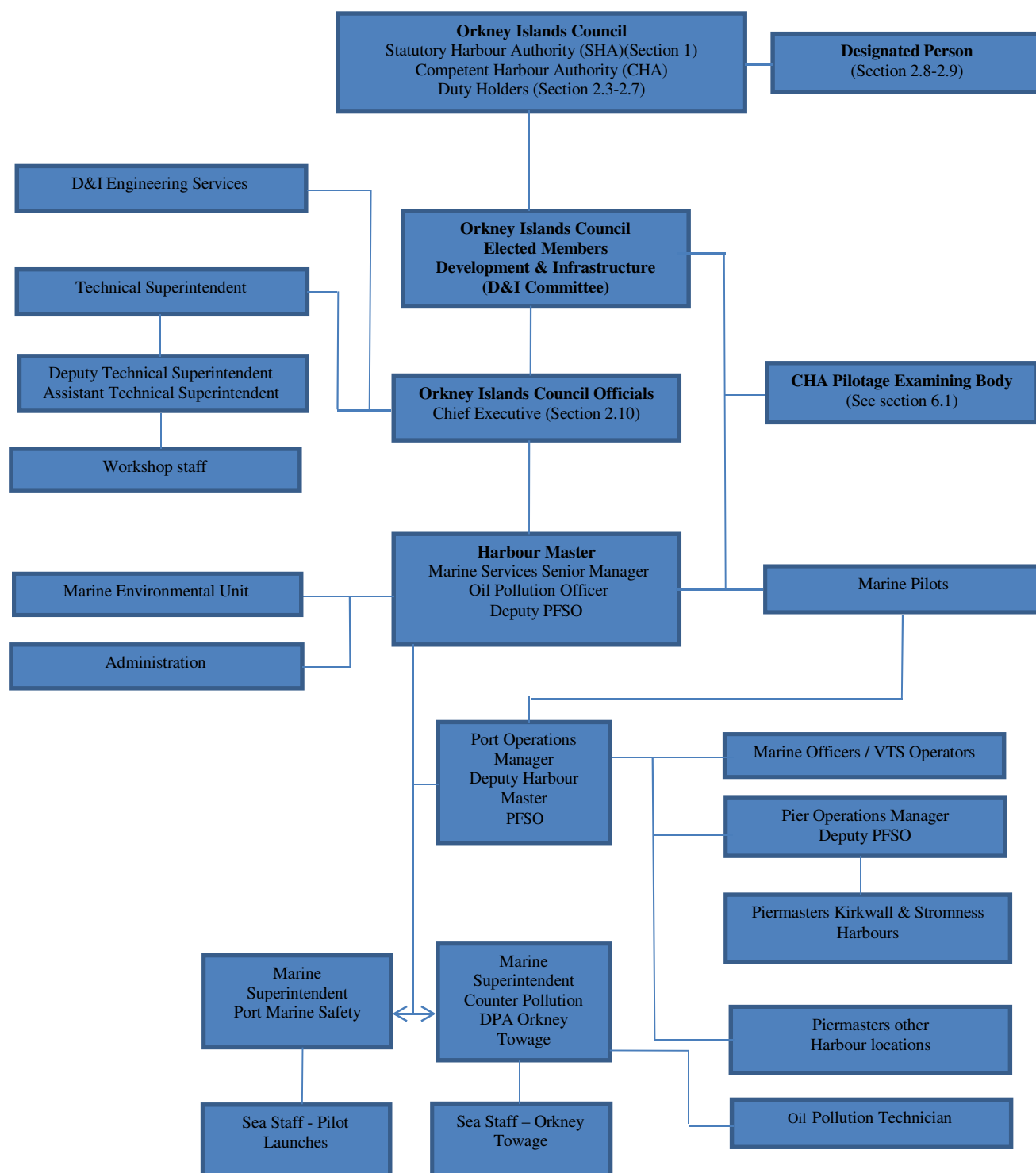
OIC is authorised under the Orkney County Council Act 1974 as amended, to exercise harbour jurisdiction and powers in relation to the harbour areas defined under Schedule 1 of the Orkney County Council Act 1974 as amended and extended. These areas are summarised in Section 1.3 below.

1.3 Duties and Responsibilities

The duties and responsibilities as they relate to the management of port marine safety and the Port Marine Safety Code are described below and shown in an organogram.

Figure 1.1 Organogram for Port Marine Safety Responsibilities

Section references to Port Marine Safety Code (December 2012)



1.3.1 Orkney Islands Council

OIC as designated Harbour Authority (see Section 1.2) is assigned the Duty Holder as defined by the Port Marine Safety Code.

OIC recognises that under the requirements of the Port Marine Safety Code, it is accountable for the discharge of its duties and powers as the designated Harbour Authority. Full Council has the responsibility for ensuring that OIC's duties and powers as Harbour Authority are met. Full Council members are collectively and individually responsible for the proper exercise of its legal duties as a Harbour Authority and as the Duty Holder, and as such will have an appropriate understanding of OIC's marine safety responsibilities.

OIC as Harbour Authority has powers to appoint personnel, including the Marine Services Senior Manager / Harbour Master, to manage the operation of its harbour areas. OIC also exercises a number of its functions as Harbour Authority through the Development and Infrastructure Committee (see Section 1.3.2). However, OIC and Full Council Members retain ultimate accountability as Harbour Authority and Duty Holder.

OIC as Harbour Authority and Duty Holder has a number of powers, duties and responsibilities: -

- Duty to ensure an effective Safety Management System is in place as defined by the Port Marine Safety Code. This duty embraces: -
 - ⇒ Development and maintenance of its harbour areas to meet the requirements of port users and safe operation of its harbour areas;
 - ⇒ Development and implementation of appropriate policies, plans and procedures;
 - ⇒ Ensuring that risk assessments and reviews of the Safety Management System are undertaken as required;
- Duty to adopt appropriate powers as required for effective enforcement of its statutory duties (Harbour Byelaws & directions);
- Responsibility for setting harbour dues at a level, which adequately funds the discharge of their duties;
- Powers to appoint a Harbour Master (Marine Services Senior Manager) (see Section 1.3.4);
- Duty to provide marine services and facilities to meet their obligations as Harbour Authority.

OIC is also designated as Competent Harbour Authority under the Pilotage Act 1987 (see Section 6). As such, OIC has a number of duties and responsibilities pertaining to the provision of a pilotage service: -

- Provision of pilotage services to meet their obligations under the Pilotage Act 1987.
- Authorisation and discipline of pilots and issue of pilotage exemption certificates. This function is discharged through the Examining Body (see Section 6.1).

1.3.2 Development and Infrastructure Committee

OIC exercises a number of its functions as a Harbour Authority through the Development and Infrastructure Committee.

Functions assigned to the Development and Infrastructure Committee includes: -

- The maintenance and improvement of harbour areas, piers, slips and jetties;
- The arrangements for the management and regulation of harbour areas; and
- The provision of berthing facilities and all arrangements to ensure and promote the safety of navigation within harbour areas.

1.3.3 Orkney Islands Council Chief Executive

The function of Chief Executive for OIC Marine Services as defined by the Port Marine Safety Code is held by the Chief Executive of Orkney Islands Council.

1.3.4 Marine Services Senior Manager

The Marine Services Senior Manager is the appointed Harbour Master as defined by the Orkney County Council Act 1974.

The Marine Services Senior Manager has a number of functions and responsibilities and these include: -

- Principal operational responsibility for the safety of navigation in OIC Marine Services' areas as the designated Harbour Master;
- Responsibility for the financial control and efficient operation of OIC Marine Services;
- Overall responsibility for conducting OIC Marine Services' business with an awareness of the environmental sensitivities of the harbour areas and meeting its statutory environmental responsibilities;
- Advising OIC on all matters relating to its duties and powers as Harbour Authority and Competent Harbour Authority, including contributing to the strategic management of the OIC Marine Services' areas.
- Overseeing the implementation of OIC policies and decisions;
- Responsibility for the safety, training and recruitment of OIC Marine Services' personnel;
- Responsible for development and implementation of emergency plans and procedures for the OIC Marine Services harbour areas, including regulation of dangerous goods in transit on ships;
- Management of the pilotage service on behalf of OIC and accountable for discharging OIC's function as Competent Harbour Authority under the Pilotage Act 1987.
- Management of the pilotage service for the Competent Harbour Authority areas (see Section 6.1).

The Marine Services Senior Manager is also the designated Oil Pollution Officer and as such is responsible, on behalf of OIC, for the control of oil pollution with OIC Marine Services' areas. Responsibilities of OIC and the Oil Pollution Officer are detailed in the OIC Marine Services' Oil Spill Contingency Plan and include ensuring adequate contingency plans and resources are in place for dealing with an oil spill.

1.3.5 Designated Person

The Port Marine Safety Code requires that each Harbour Authority appoint a Designated Person to oversee the Harbour Authority's obligations in respect of the provision of an effective Safety Management System. The function of the designated person is to provide independent assurance directly to the duty holder that the Safety Management System is working effectively.

The person or persons to whom this function is entrusted must have direct access to the highest level of the Authority.

Designated Person or Organisation may also act as external auditor (see Section 3.2).

The contact details of the present appointed 'Designated Person' are issued in the preamble of this document on page vii.

1.3.6 Port Operations Manager

The Port Operations Manager is responsible to the Harbour Master for the effective management and safe operation of all ports and harbours under the jurisdiction of OIC.

The Port Operations Manager can deputise for the Harbour Master and act on their behalf in all matters pertaining to OIC's function as Harbour Authority. The Port Operations Manager also acts as Deputy Oil Pollution Officer.

The Port Operations Manager is responsible for the line management of Pilots, VTS Officers and Piermasters on a daily basis to ensure suitable resources are available to enable VTS Operations, Pilotage Operations, harbour towage, un-berthing and berthing and other operations within the Harbour Authority area take place efficiently and safely in accordance with Orkney Harbours Standard Operating Procedures.

The Port Operations Manager is the designated Port Facilities Security Officer and is responsible to the Harbour Master for carrying out all security duties and associated matters with this position.

1.3.7 Marine Superintendent – Port Marine Safety

The Marine Superintendent – Port Marine Safety is responsible to the Port Operations Manager for the development and maintenance of QA/Safety Management Systems. This duty encompasses the responsibility for ensuring document control, risk assessments, internal and external reviews of the Safety Management System are undertaken.

The Marine Superintendent –Port Marine Safety is also responsible to the Marine Services Senior Manager and the Port Operations Manager in acting as the designated Safety Officer for Marine Services, carrying out investigations into breaches of Health and Safety including accidents and dangerous occurrences, and risk assessments.

1.3.8 Marine Superintendent – Counter Pollution

The Marine Superintendent – Counter Pollution acts as Assistant Pollution Officer and in this role has the responsibility for the review and update of the OPRC plan, general management of the counter-pollution equipment and contingencies, including the planning of emergency exercises and personnel training in oil spill and emergency responses amongst others

1.3.9 Environmental Officer - Marine Biologist

The Marine Biologist advises the Harbour Master on all environmental issues relevant to OIC Marine Services' operations

1.4 Overview of Harbour Areas

OIC Marine Services has jurisdiction over the harbour areas of Scapa Flow to the south and Wide Firth and Shapinsay Sound to the north of Orkney Mainland (see Figure 1.2) as defined in the Orkney County Council Act 1974. This jurisdiction extends to those piers and minor harbours falling within these areas (see Sections 1.4.1 and 1.4.2). In addition, OIC Marine Services exercises jurisdiction over a number of small piers and harbours in the North Isles as defined by the Orkney Islands Council Order Confirmation Act 1978 and the Orkney Islands Council Harbour Revision Order 1989 (see Section 1.4.3) (see Figure 1.2).

Figure 1.2 OIC Marine Services Harbour Areas



Port marine operations within the OIC Marine Services' harbour limits are diverse ranging from oil tankers involved in cargo import/export or ship-to-ship transfer operations within Scapa Flow, to local passenger ferry traffic and cargo vessels throughout its area with significant passenger cruise liners visiting during spring/summer months, oil support and supply vessels; as well as small-scale fishing and pleasure craft activities at the smaller piers. Port marine operations within these areas, to which this Safety Management System applies, are summarised below.

1.4.1 Scapa Flow Harbour Area

The Scapa Flow Harbour Area is defined in the Orkney County Council Act 1974 as the area bounded in the west by a line from Out Taings, Hoy to Breckness, Mainland and in the south by a line from Brough Ness, South Ronaldsay to the southern most tip of Swona and thence to Brims Ness, Hoy (see Figure 1.2).

This area also encompasses the following piers and harbours: -

- Stromness Harbour;
- Scapa Pier;
- Houton Ro-Ro Terminal;
- Graemsay Pier;
- Hoy, Lyness Piers and Terminal;
- Burray Pier;
- Hoy Moaness Pier;
- Flotta Sutherland Pier;
- Flotta Gibraltar Pier and Ro-Ro Terminal;
- St Marys, Holm Pier;
- Longhope Pier;
- South Ronaldsay, Burwick Pier.

Shipping activities in the Scapa Flow Harbour Area include oil tanker traffic to and from the Flotta Oil Terminal, or Ship-to-Ship transfer and bunkering operations at anchor. Other traffic includes regular ferry services inter island and to the Scottish mainland, coastal fuel tankers, cruise liners and marine support vessels for marine renewables activities.

There is also small commercial craft, including salmon farm workboats, dive charter vessels and fishing vessels, with recreational vessels also making use of the area.

1.4.2 Wide Firth and Shapinsay Sound

The Wide Firth and Shapinsay Sound Harbour Area is defined in the Orkney County Council Act 1974 as the area bounded to the south by a straight line between Harpy Taing on Mainland and Strombery on Shapinsay and to the east by a straight line between Hackness on Shapinsay to Rerwick Head on Mainland (see Figure 1.2).

This area also encompasses the following harbours and piers: -

- Kirkwall Harbour;
- Kirkwall Hatston Pier and Terminal;
- Shapinsay Balfour Pier and Terminal;
- Kirkwall Hatston Slip.

The shipping activities in the Wide Firth and Shapinsay Sound harbour area include passenger cruise liners during spring/summer months, coastal fuel tankers, cargo vessels, container freight services, regular ferry services both to the North Isles and Scottish mainland, platform supply vessels and specialist support vessels. Small commercial craft, including fish farm workboats, fishing vessels, recreational and marine support vessels for marine renewables activities also make use of the area.

1.4.3 Minor Harbours in the North and South Isles

In addition to the two major harbour areas under the jurisdiction of OIC Marine Services, there are also a number of smaller piers and harbours. These are listed below (see Figure 1.2). Harbour areas for these piers extend to 1 km from the end of the pier, with the exceptions of Westray Rapness Terminal and Sanday Loth Terminal, where the harbour limit is 500m from the end of the pier.

- Rousay Trumland Pier and Terminal;
- Westray Pierowall Harbour;
- Westray Rapness Terminal (500m);
- Egilsay Pier and Terminal;
- Evie Tingwall Terminal;
- Wyre Pier and Terminal;
- Sanday Blackrock Pier;
- Stronsay Whitehall Pier and Terminal;
- Stronsay West Pier;
- North Ronaldsay Nouster Pier;
- Eday Backaland Pier and Terminal;
- Sanday Loth Terminal (500m);
- Papa Westray Moclett Pier;
- Sanday Kettletoft Pier.

Activities at these smaller piers are largely associated with regular inter-island ferry traffic and small commercial vessels, including salmon farm workboats and fishing vessels. Small coastal cargo vessels may occasionally visit the larger piers.

1.4.4 St Margaret's Hope Pier

A small privately owned Trust Port also exists at St Margaret's Hope (see Figure 1.2).

The St Margaret's Hope Pier Trustees have authority of the marine area lying within nine hundred yards of any part of the pier. As such, the Trustees have responsibility for any required dredging works and the installation and maintenance of Aids to Navigation to ensure safe local navigation in the approaches to the St Margaret's Hope pier. The requirements for Aids to Navigation are as directed by the Northern Lighthouse Board (see Section 4.3). Consent for marine works is however required from OIC as the Harbour Authority prior to any undertaking.

1.5 Safety Policy

1.5.1 OIC Health and Safety Policy

OIC has a Health and Safety Policy under the Health and Safety at Work Act 1974. This policy is supported by Service health and safety policies, which detail the organisation and arrangements in force within each Service to ensure that the aims of the OIC policy are met.

The OIC Health and Safety Policy details the responsibilities and organisation of health and safety management within the Chief Executives division. It also sets out the responsibilities of the Heads of Service (including the Marine Services Senior Manager / Harbour Master). These responsibilities include: -

- Preparation and revision of a Service's Health and Safety Policy;
- Setting out of the organisation within their Service through which the policy will be implemented;
- Setting out the arrangements to meet the aims listed in their Service's Health and Safety Policy;
- Ensuring that adequate resources are made available to enable implementation of the Service's Health and Safety Policy;

- Visible demonstration of commitment to achieving a high standard of health and safety performance and development of a positive attitude to health and safety among employees;
- Implementation of health and safety management systems within their Service, which will ensure the assessment of risk and the effective planning, organisation, control, monitoring and review of the preventative and protective measures necessary to eliminate or control the risks;
- Assisting the OIC's Safety Officer to prepare an annual report evaluating the health and safety of each Service.

The OIC Health and Safety Policy also sets out responsibilities for employees. All employees are expected to co-operate in the implementation of the OIC's Health and Safety Policy by: -

- Acting in the course of their employment with due care for their own safety and that of others who may be affected by their acts or omissions at work;
- Co-operating as far as is necessary, to enable the Council to perform any duty or to comply with any requirements, as a results of any health and safety legislation which may be in force; and
- Using correctly all work items provided by the Council in accordance with the training and the instructions they receive to enable them to use the items safely.

1.5.2 OIC Marine Services Health and Safety Policy

OIC Marine Services as a Service within OIC has in place a number of policies relating to health and safety management (see Appendix 3), in line with the requirements of the OIC Health and Safety Policy. These are: -

- Health and Safety Policy;
- Alcohol and Drug Abuse Policy;
- Environmental Policy.

OIC Marine Services policy is to provide and maintain safe and healthy working conditions, equipment and systems of work for all our employees, and to provide such information, training and supervision as they need for this purpose.

OIC Marine Services recognises that accident prevention is the responsibility of every employee with high standards of behaviour being set and maintained.

OIC Marine Services also accepts its responsibility for the health and safety of others that may be affected by its activities.

The allocation of duties for safety matters and the particular arrangements made to implement the policy are set out within the OIC Marine Services Health and Safety Policy. The policy is kept up to date as changes in working practices evolve and is reviewed on an annual basis.

1.6 Legal Background

1.6.1 National and international legislation

There is a wide body of legislation applicable to the safe management of the OIC Marine Services' operations. It is the responsibility of OIC Marine Services to ensure that it keeps up to date with both international and national legal requirements as appropriate. Appendix 2 lists the current legislation applicable to safety and environmental management for all harbour operations. The Marine Superintendent – Port Marine Safety updates this list periodically as new or amended legislation is introduced in line with other document control procedures described in [SOP 01-001](#).

1.6.2 Byelaws and Directions

OIC has powers under the Local Government (Scotland) Act 1973 and Section 46 of the Orkney County Council Act 1974 to make Byelaws empowering them to regulate activities within the OIC Marine Services harbour area. Powers conferred may include enforcement and penalties. Byelaws are OIC Marine Services principle statutory tool for the management of their harbour areas and the regulation of vessels operating within these areas. Byelaws fall between the basic powers given to the Harbour Authority by general harbour legislation and the executive powers of the Marine Services Senior Manager / Harbour Master and their deputies to give Directions (see below).

In addition to powers to make general byelaws, OIC also has powers under the Dangerous Substances in Harbour Areas Regulations 1987, to make byelaws with respect to the control of dangerous substances.

In addition to the power to make Byelaws, OIC has powers under Section 40 of the Orkney County Council Act 1974 to make General and Special Directions.

Byelaws and Directions are kept under regular review to ensure they remain fit for purpose in changing circumstances. Additional powers that may be required will be achieved through amendment of existing instruments or issue of new instruments as appropriate. By the same token redundant or obsolete legal powers may be removed. A process of consultation is required for amendment and issue of new Byelaws and General Directions. Special Directions may be made at any time.

Requirements of these statutory instruments are defined by on going risk assessments undertaken as part of the Safety Management System (see Section 2).

Byelaws and Directions currently in force include: -

- OIC General Byelaws 1977;
- The Orkney Harbours (Liquefied Gases) Byelaws 1978;
- The Orkney Harbours (Petroleum) Byelaws 1980;
- OIC Harbour Areas (Vehicles) Byelaws 1984;
- Orkney Pilotage Directions 1988 (as amended 2007 & 2010)

1.6.3 Enforcement

The Orkney County Council Act 1974 and the OIC Marine Services harbour Areas General Byelaws 1977 provides OIC with a number of enforcement powers.

Failure to comply with any General Direction or Special Direction is an offence under the Orkney County Council Act 1974 and may be liable to a fine. Contravention of the OIC Marine Services harbour Areas General Byelaws 1977 is also an offence and liable to a fine on summary conviction. Where a vessel fails to comply with a General Direction or Special Direction, Section 44 of the Orkney County Act 1974 gives OIC Marine Services powers to put persons aboard the vessel to carry out the Direction or to cause the vessel to be handled in accordance with the Direction.

OIC Marine Services undertakes regular harbour patrols in order to maintain a presence within the harbour areas and to undertake pollution and shipping surveys (see Section 5.9). A presence is also maintained in the Stromness and Kirkwall Harbour areas by shore staff.

Compliance monitoring is included in performance monitoring, objectives and targets (see Section 3.1).

1.7 Consultation Process

The OIC Marine Services safety management system has been developed through a process of risk assessment and consultation. Consultation is an ongoing process and the following groups and organisations were involved in the development of the Safety Management System: -

- OIC Marine Services personnel;
- Flotta Oil Terminal;
- Shipping companies (including tankers);
- Cruise liners;
- Shipping agents;
- Stevedoring services;
- Other commercial workboats and service providers;
- Ferry operators;
- Towage companies;
- STS operators;
- Fishing industry;
- Salmon farm industry;
- Dive charter vessels;
- Recreational users.

In order to facilitate ongoing consultation, a number of user groups have been established; these groups meet on a six or four monthly basis, and include: -

- Harbour Operations Committee
- Health and Safety Committee;
- Orkney Marine & Environmental Protection Committee;
- Port Security Committee;
- Kirkwall and Stromness Harbour Working Groups

A list of all harbour users for consultation purposes is provided in Appendix 1, and this is periodically up dated by the Marine Superintendent – Port Marine Safety.

1.8 Interface with other Documents

The OIC Marine Services Safety Management System interfaces with a number of other documents, in particular with safety management systems operated by contractors (e.g. Orkney Towage Ltd) and commercial marine operations within the OIC Marine Services' areas (e.g. Flotta Oil Terminal). These plans will dovetail to the OIC Marine Services Safety Management System where their

operations overlap with port marine operations, in which OIC as duty holder has overall responsibility.

OIC Marine Services' Safety Management System also interfaces with a number of Emergency Plans (see Section 10.2), in particular: -

- OIC Marine Services Oil Spill Contingency Plan;
- OIC Marine Services Emergency Plans;
- OIC Marine Services requirements under the ISPS Code.
- Vessel Safety Management Systems produced under the ISM Code.
- OIC Emergency plans

1.9 Document review and Control Procedures

This Safety Management System, the associated Standard Operating Procedures (SOPs) and Standard Forms (SF) are controlled documents ensuring that the contents are accurate, current and valid and that the most recent information is available to the relevant personnel.

The Safety Management System and its supporting policies and documentation will be reviewed every 5 years or when there is a major change in operations, whichever is the soonest.

The document control procedure is described in [SOP-01-001](#).

2 Risk Management

2.1 Definitions

This section provides definitions for some commonly used terms in safety management.

Hazard	Something that has the potential to cause harm including: • Ill health and injury; • Damage to property, plant, products or the environment; • Interruption to operations or increased liabilities.
Risk	Is a combination of frequency of occurrence of a hazard and its consequences. For example, an occurrence could have little consequence but occur frequently. This therefore has high a risk. Likewise another type of incident could occur infrequently, but as the consequence is major, the risk is also high.
Risk Assessment	Assessing the risks, which may arise from hazards?
Risk Control	Deciding on suitable measures to eliminate or control risks.
ALARP	As Low as Reasonably Practical. A risk that has been reduced to ALARP corresponds to the concept of tolerable risk.

2.2 Risk Assessment Process

OIC Marine Services has in place a formal system of risk assessment that enables the safe management of all its operations through identification of potential risks and implementation of appropriate risk control measures. The risk assessment, their logging, and monitoring procedures are described in Standard Operating Procedure [SOP-02-001](#).

The process of risk assessment involves consultation with appropriate harbour personnel, marine services and port users as described in the risk assessment procedure.

A list of operations and locations for which risk assessments have been undertaken is provided in the SMS Monitor register.

2.3 Risk Control and Reduction Measures

Risk control measures identified by the risk assessment process are logged and prioritised for action as described [SOP-02-001](#) and [SOP 02-003](#). Priority levels given to an item reflect the urgency of action required. Progress on implementing identified risk control measures will be kept under review by the Marine Superintendent – Port Marine Safety through the SMS Monitor Register.

2.4 Accident, Incident and Defect reporting

OIC Marine Services has in place an Accident and Incident reporting system. All accidents, incidents, hazardous occurrences, ship defects or notable events must be reported as described in [SOP-02-004](#), and [SOP 02-006](#).

These reports are logged and thereafter investigated in conjunction with appropriate personnel as described in [SOP-02-004](#), [SOP 02-006](#). Following an investigation, all remedial actions identified or recommended, including any requirements for additional training or amendments of the Safety Management System's policy or procedures, will be kept under review and monitored as described in [SOP-02-004](#) by the Marine Superintendent – Port Marine Safety. Once all corrective actions are achieved the incident report may be closed out.

Reporting of incidents is actively encouraged in order to meet OIC Marine Services' objective of continuous safety improvement.

Any incident involving a pilot or person holding a pilotage exemption certificate will have a specific investigation undertaken by the Examining Body (Section 6.9) as described in [SOP 06-006](#).

'Safety Circular Memo' will be produced and circulated to appropriate personnel as described in [SOP-02-004](#) following any significant incident where the follow up investigation recommends specific new safety recommendations, or advise.

Accident analysis and effectiveness of any control measures will form part of the performance monitoring of the SMS as described in [SOP 03-001](#).

Some accidents due to the nature or circumstances will require further statutory reporting to external bodies or Government agencies as described in [SOP 02-005](#).

2.5 Informal / Formal Briefings

In order to encourage a culture of individual participation in safety issues, the custom of undertaking informal briefings (Tool box talks) before engaging in any operation is promoted. Depending on the frequency of operations, these talks may be daily, weekly or ad-hoc.

Formal discussions on the Safety Management System and safety issues are maintained in the agenda of the 'Harbours Operation Committee Meetings' and 'Health & Safety Committee Meetings' as described in section 1.7.

Formal tool box talks take place prior to commencement of Ship to Ship operations as per [SOP 07-005](#).

3 Performance Monitoring

3.1 Objectives and Targets

In order to measure its performance in safe management for all its harbour operations, OIC Marine Services sets itself objectives and performance targets as described in [SOP-03-001](#). These objectives and targets are published along with the achievements as part of the 'Marine Services – Annual Performance Report'.

Specific safety issues arising from the reporting system, reviews or other monitoring can be circulated to all or relevant personnel through the Safety Circular Memo system as described in [SOP 03-001](#), and discussed at 'Harbour Operations Committee Meetings' and 'Health & Safety Committee Meetings'.

3.2 Reviews and Audits

A Safety Management System depends upon systematic review of performance using information from self-monitoring and from independent audits of the whole system. OIC Marine Services has a commitment to continuous improvement and as part of this; regular reviews and audits are undertaken of the Safety Management System.

3.2.1 Reviews and Reporting

Review of the performance of the Safety Management System against set standards and targets is made on an annual basis.

3.2.2 Audits

Internal audits are undertaken annually as detailed in [SOP-03-002](#). Any non-conformances are reported and acted upon as detailed in [SOP-03-003](#).

External audits are undertaken every 2-3 years as detailed in [SOP-03-002](#) External audits may be undertaken by the Designated Person (see Section 1.3.4) or another external contractor as required.

4 Conservancy

4.1 Introduction

OIC Marine Services has a duty under the Port Marine Safety Code to: -

- Conserve the harbour so that it is fit to use as a port and a duty of reasonable care to see that the harbour is in a fit condition for a vessel to use it; and to
- Provide users with adequate information about conditions in the harbour.

In order to meet these duties and responsibilities, OIC Marine Services has the following in place: -

- Survey and maintenance dredging programme;
- Inspection and maintenance programme for Aids to Navigation;
- Programme of review for navigational aid requirements;
- Maintenance of proper hydrographic and hydrological records;
- Publication of information through Admiralty Charts and Notices to Mariners;
- Pilotage service for vessels requiring compulsory pilotage (see Section 6.4).

4.2 Hydrographic Surveys and Dredging

4.2.1 Survey and maintenance dredging programme

OIC Marine Services has in place a survey and maintenance dredging programme, the frequency of which is based on risk assessment and on-going consultation. This programme is reviewed on a 5-yearly basis.

4.2.2 Controls on dredging

OIC Marine Services has a statutory power under the Orkney County Council Act 1974 to undertake maintenance and capital dredging within the OIC Marine Services harbour area. A number of other statutory controls are also in place, which OIC Marine Services complies with through OIC planning and legal departments. Consent requirements are described in [SOP-04-002](#).

4.3 Aids to Navigation

4.3.1 Northern Lighthouse Board

As a General Lighthouse Authority under the Merchant Shipping Act 1995, the Northern Lighthouse Board has the responsibility for general superintendence and management of all lighthouses, buoys or beacons within Scottish waters. They have a duty to inspect all lighthouses, buoys, beacons and other Aids to Navigation belonging to or under the management of a Local Lighthouse Authority (LLA) and may give directions to a LLA.

Maintenance of a number of navigational marks and lights within OIC Marine Services waters remain the responsibility of the Northern Lighthouse Board and these are listed in the Navigation Lights and Buoys Failures folder held in the Marine Operations Room.

4.3.2 Local Lighthouse Authority

Under the Merchant Shipping Act 1995, OIC Marine Services is the Local Lighthouse Authority (LLA) for the OIC Marine Services harbour areas. OIC Marine Services has the power and responsibility to install and maintain navigational marks and lights within its Harbour Authority area or on harbour land.

OIC Marine Services as the LLA may not erect, remove or change any navigational mark or light without the consent of the Northern Lighthouse Board. All approved installations or changes are notified to users and the UK Hydrographic Office through issue of a Notice to Mariners prior to any installation or change being made.

Navigational marks and lights used for general navigation remain the responsibility of the Northern Lighthouse Board (see Section 4.6.2).

4.3.3 Inspection and maintenance

All navigational marks and lights owned and maintained by OIC Marine Services are listed in the Navigation Lights and Buoys Failures folder. These Aids to Navigation are established and maintained in accordance with the availability criteria laid down by the Northern Lighthouse Board. In order to meet these criteria, a rolling-programme of inspection and maintenance is undertaken as described in [SOP-04-003](#).

Procedures are also in place for emergency repair ([SOP-04-003](#)) and reporting of navigational aid malfunction and appropriate issue of a navigational warning ([SOP-04-004](#)).

4.3.4 Review of Aids to Navigation

Risk assessment and ongoing consultation have determined the requirement for Aids to Navigation in OIC Marine Services areas. The effectiveness and need for new or amended Aids to Navigation is reviewed on a 5-yearly basis and sooner if required.

4.4 Wrecks and Salvage

OIC Marine Services has powers under Section 252 of the Merchant Shipping Act 1995 to mark or remove wreck or abandoned vessels, which in their opinion is, or is likely to become, an obstruction or danger to navigation. This power is exercised by use of the established risk assessment procedure ([SOP-02-001](#)) with the aim of reducing the risk to ALARP.

Procedures for marking or removal of wreck or abandoned vessels are described in [SOP-04-005](#). Information on new wrecks is passed to the UK Hydrographic Office for marking on navigational charts for the area.

A number of known and charted wrecks exist in OIC Marine Services harbour waters and some of these are of historic importance: -

- The remains of the German WW I High Seas Fleet lies to the north and east of Cava in Scapa Flow. These wrecks are protected under the Ancient Monuments and Archaeological Areas Act 1979. Damage to these wrecks (including anchoring) is a criminal offence.
- HMS Royal Oak and HMS Vanguard, which lie in Scapa Flow, are both recognised war graves. These wrecks are protected under the Protection of Military Remains

Act 1986. The OIC Marine Services harbour Byelaws 1977 also prohibits diving on these wrecks.

The wreck of the oil tanker 'Prudentia' lies to the north of Flotta. Diving is forbidden on this wreck under the OIC Marine Services harbour Byelaws 1977 due to dangers these activities may impose on navigation at the Flotta Oil Terminal.

4.5 Regulation of Harbour Works

Orkney Islands Council under the Orkney County Council Act 1974, OIC has powers to license works or dredging undertaken within OIC Marine Services' areas. This power is exercised through the Development & Infrastructure Committee (see Section 1.3.2). Under the Coastal Protection Act 1949, OIC Marine Services is also a statutory consultee for any harbour works and foreshore planning applications. These considerations will not only include tidal works, but also extend to the impact of shore development height and lighting and any potential interference with navigational lights or marks.

As part of this process full consultation will take place with Marine Scotland, directorate for the Scottish Government for marine and fisheries issues in Scotland.

The Port Marine Safety Code requires that in the exercising of these responsibilities, OIC Marine Services should give full consideration to the safety of navigation.

Conditions may be placed on tidal works licences issued including the requirement to place navigational marks as required by the Northern Lighthouse Board. Planning consents for onshore developments may also include conditions to safeguard navigational safety.

4.6 Promulgation of Information

4.6.1 Publication of navigational information

Navigational information including (but not limited to) water depth, navigational hazards, harbour works (including marine fish farming developments), navigational lights and marks are published in a range of publications including Admiralty charts, relevant sailing and in Notices to Mariners.

The UK Hydrographic Office is notified of any permanent or temporary change in navigational marks and hazards for appropriate publication.

4.6.2 Navigational warnings

If OIC Marine Services becomes aware of any navigational hazard that is not presented on marine charts or other published navigational information, it will, having verified any reports received, publish a suitable warning through issue of a Notice to Mariners ([SOP-04-006](#)) and during Traffic Information Broadcasts. (see Section 5.5). The Notice to Mariners is distributed as per [SOP 04-006](#) and [SOP 04-007](#). Such navigational warnings may include (but not be limited to): -

- Adverse weather conditions;
- Shipping movements including STS Operations;
- Changes in charted water depths;
- Damaged or malfunctioning Aids to Navigation;

- New or amended Aids to Navigation;
- Wrecks or abandoned vessels;
- New or temporary exclusion areas;
- Works in harbour areas; and
- Miscellaneous safety warnings.

If the navigational hazard is not of a temporary nature, changes to nautical charts and published information will be made if considered necessary by the UK Hydrographic Office

5 Management of Navigation

5.1 Introduction

The requirement for regulation of navigation has been identified through a process of ongoing risk assessment ([SOP-02-001](#)) and consultation. Navigational control measures identified are implemented through a variety of mechanisms including byelaws, directions and Admiralty publications. Specific navigational management measures in place include: -

- Published navigation lights and marks (see Section 4);
- General directions and byelaws;
- Recommended navigation channels;
- Port control and Vessel Tracking System (VTS);
- Traffic warnings;
- Pre-arrival notices of vessels that trade to sea;
- Special directions;
- Port Passage Planning;
- Requirement for compulsory pilotage of certain vessels.
- Tug Escort and Towage.

These are described in more detail in the following sections.

5.2 General Directions and Byelaws

5.2.1 General directions

General directions, following appropriate consultation (see Section 1.7) may be issued to give general instructions to vessels navigating in OIC Marine Services' areas, in particular for the following purposes: -

- For designating areas, routes or channels within the harbour area which vessels are to use or refrain from using;
- For designating certain times or certain periods within which movement is permitted or restricted;
- For requiring Ship masters to provide reasonable information concerning their vessels to OIC Marine Services.
- For requiring vessels to maintain minimum equipment onboard.

General recommendations on navigation for vessels requiring pilotage when entering Scapa Flow are issued with the OIC Marine Services Tide Tables. These are published annually. Details on vessels subject to compulsory pilotage are described in the Orkney Pilotage Directions 1988 (as amended 2007 & 2010) (see Section 6).

5.2.2 Byelaws

A number of byelaws are in place (see Section 1.6.2), which provide instructions to vessels arriving/departing and navigating through OIC Marine Services' waters.

OIC Marine Services regularly reviews the byelaws in order to ensure they meet the requirements for current commercial and recreational activities. Action will be undertaken to amend them to

include current operating practices and to extend them to incorporate control measures identified during risk assessments and the development of this Safety Management System.

5.3 Recommended Navigation Channels

Recommended navigation channels are identified for entry and departure of Scapa Flow for deep-draught vessels including tankers under pilotage and are detailed in [SOP-05-002](#). These are published on Admiralty Charts 35 and 2581.

Recommendations for navigation channels are also published in the OIC Marine Services Tide Tables, which are published annually (see Section 5.2.1).

5.4 Port Control and VTS

OIC Marine Services has a duty to regulate navigation within its harbour areas using available powers and means. This function depends on communication with port marine traffic and is known as “port control” primarily due to its typical location in a port control room or communication centre. There are a number of levels of port control operated within the OIC Marine Services harbour areas and these are described below.

Procedures for general Marine Officer duties and recording of information are given in [SOP-05-003](#).

5.4.1 VTS information service (Orkney VTS)

The Vessel Traffic System (VTS) is installed at the Harbour Authority Building and managed from the Marine Operations Room. This enables efficient two-way communication and monitoring of traffic within the Scapa Flow and approaches, Kirkwall Bay, Wide Firth and Shapinsay Sound areas. The VTS system in use incorporates automatic vessel detection and tracking as well as the use of electronic navigation charts in addition to radar coverage. This service is manned 24 hours a day by Marine Officers qualified to V103/1 standard.

Procedures for VTS monitoring of traffic are provided in [SOP-05-001](#).

5.4.2 Secondary Harbours including Kirkwall and Stromness

The respective Pier Masters manage port control of secondary harbours within the OIC Marine Services area (including Stromness and Kirkwall). Pier Masters issue directions for approach and mooring/unmooring within their harbour areas. Procedures for port control in these secondary harbours are described in the following procedures: -

- Kirkwall Harbour ([SOP-05-004](#));
- Stromness Harbour ([SOP-05-005](#)).

5.5 Traffic Information Broadcasts

Traffic information broadcasts are made by OIC Marine Services Orkney VTS on the pending arrival, departure or special operations or circumstances applicable to any vessel as described in [SOP-05-006](#).

Navigational information in the form of Notices to Mariners in force are included with the local weather forecast at each routine broadcast as described in [SOP 05-003](#) or at other times if circumstances require. (See Section 4.6.2)

5.6 Special Directions

When communicating with vessels, OIC Marine Services' Orkney VTS will in general issue navigational information to vessels within OIC Marine Services' waters. However the Marine Services Senior Manager / Harbour Master (and their authorised deputies, which include Pier Masters and Marine Officers) has powers to issue Special Directions under the Orkney County Council Act 1974 if required.

Special directions may be given in any manner considered appropriate by the Marine Services Senior Manager / Harbour Master and their authorised deputies.

5.7 Pre-arrival Notices

Pre-arrival notifications are required to be submitted by vessels that trade to sea prior to arriving in any OIC Marine Services harbour area: -

Pre- arrival security declaration and arrival info.....[SOP 11-001](#).... [SF 11-001](#)
Prior notification arrival info.....[SOP 05-011](#) ... [SF 05-001](#)
Pre - arrival waste declaration.[SOP 07-010](#) ... [SF 07-007](#)

These notices should be issued by the ship's master or the appropriate shipping agent; and should include as a minimum the information prescribed in the relevant SOP's and SF's.

5.8 Port Passage Planning and Guidance

The Port Marine Safety Code requires that harbour authority's powers of direction should be used to require the use of port passage plans in appropriate cases, whether vessels are piloted or not. The procedure for port passage planning is described in [SOP-05-007](#).

The object of port passage planning and guidance is to ensure that: -

- All parties know relevant details of any particular port passage in advance;
- There is a clear, shared understanding of potential hazards, margins of safety and the ship's characteristics;
- Intention and required actions are agreed for the conduct of the port passage, including use of tugs and their availability, and any significant deviation should it become necessary.

The requirements for port passage plans has been identified by a process of risk assessment and consultation, and the following vessel types are considered to require port passage plans: -

- Vessels over 50 mtrs loa;
- All ferry traffic and cruise liners;
- All bunker and coastal tankers carrying oil/gas.

5.9 Harbour Patrols

OIC Marine Services pilot launches undertake periodic patrols of the Scapa Flow or Wide Firth areas for the purpose of pollution and shipping surveys. These patrols may occasionally include other remote harbour areas in the outer isles; the procedure is described in [SOP-05-008](#).

The patrol serves to ensure a visible presence of OIC Marine Services in the Scapa Flow / Kirkwall port areas. A harbour presence is also implemented by the respective Pier Masters in Kirkwall and Stromness Harbours during shipping hours.

5.10 Recreational Users

5.10.1 General navigation

Navigation by recreational users is largely governed by the General Byelaws 1977.

OIC Marine Services is also committed to ongoing consultation with recreational users through the establishment of a Port Users Group (see Section 1.7).

OIC Marine Services is also committed to a general programme of education in terms of recreational navigation.

5.10.2 Event planning

Requirements for marine event planning including regattas are detailed under the General Byelaws 1977.

5.10.3 Facilities for recreational users

There are specific marina facilities for recreational boat users in OIC Marine Services harbour areas at the following locations: -

- Kirkwall Harbour
- Stromness Harbours,
- Pierowall Harbour (Westray).

A number of all-season yacht mooring buoys are also available in both North and South Isle locations as documented in the Ports Handbook.

5.10.4 Shore side lifesaving equipment

OIC Marine Services owns and maintains shore side lifesaving equipment at all its piers. Shore side lifesaving equipment owned and maintained by OIC Marine Services.

A procedure is in place for the inspection, maintenance and replacement of shore side lifesaving equipment and this is detailed in [SOP-05-009](#).

5.10.5 Recreational diving.

A high level of recreational diving is undertaken in Scapa Flow as well as other OIC Marine Services harbour areas including Wide Firth/Shapinsay Sound. The majority of recreational

diving is undertaken through commercial dive charter vessels operating within OIC Marine Services harbour waters. OIC Marine Services is a member of the Diving Liaison Committee, which meets to discuss aspects of diving operations and diving safety in Orkney waters, including OIC Marine Services' areas (in particular Scapa Flow).

OIC Marine Services harbour Areas byelaws requires all diving operations in the harbour areas to have the written permission from the Harbour Master in the form of a Dive Permit which is used for a maximum period of one calendar month.

Diving on wrecks is likely to be subject to other regulations that prohibit disturbance or the removal of artefacts, some guidance is provided in [SOP 07-009](#).

The 'Diving at Work' Regulations 1997 applies to any diving operation, diver instruction or training, when a financial arrangement exists, even if some of the service is provided by volunteering individuals. (See Section 7.6 and [SOP 07-009](#))

6 Pilotage

6.1 OIC Harbour Responsibilities

OIC is designated as a Competent Harbour Authority under the Pilotage Act 1987. This function is discharged through the Development and Infrastructure Committee (see Section 1.3.2).

OIC has also appointed an Examining Body (see section 6.5.1) as described in the Orkney Pilotage Directions 1988 (as amended 2007 & 2010). The Examining Body reports to OIC as the Competent Harbour Authority. This group has the responsibility for: -

- Authorisation of pilots and pilotage exemption certificates;
- Consideration of all matters relating to pilotage within the OIC Marine Services areas and advise on their views;
- Conduct of preliminary investigations into any accidents or incidents involving vessels that at the time of the incident had an authorised pilot or a person holding a pilotage exemption certificate.

Pilotage requirements for OIC Marine Services harbour areas have been based on operating experience and by formal risk assessment. Pilotage requirements are reviewed by risk assessment on a 5-yearly basis or sooner if there is a major operational change in vessel traffic entering and leaving the OIC Marine Services harbour area as described in Section 2.2 or as a result of an incident involving pilotage service. Particular attention is given to any hazardous cargoes that may be carried.

6.2 Pilotage Services

Pilots are available on a 24-hour basis for all vessels entering or leaving OIC Marine Services Areas if requested and subject to payment of the published fees. Some vessel movements have compulsory requirements for pilotage (see Section 6.4).

OIC Marine Services publish a generic port passage plan for both Scapa Flow and Wide Firth/Shapinsay Sound. This includes information on pilotage requirements and the pilotage services available within OIC Marine Services' areas.

General procedures on pilotage are provided in [SOP-06-001](#), and port pilotage planning in [SOP - 06-004](#).

In periods of adverse weather conditions, pilotage may be suspended. The procedures undertaken in this event are described in [SOP-06-002](#).

6.3 Pilotage Directions and Regulations

Pilotage is a form of risk control. OIC Marine Services through a process of risk assessment and consultation has considered requirements for compulsory pilotage. Compulsory pilotage areas, pilot stations and requirements for compulsory pilotage are described in the Orkney Pilotage Directions 1988 (as amended 2007 & 2010). Pilotage Directions cannot be waived.

OIC Marine Services regularly reviews the Pilotage Directions, in a similar way to the Byelaws in order to ensure they meet the current requirements. Action will be undertaken to amend them to include changes in operating practices or to extend them to incorporate control measures

identified during risk assessments and the continued development of this Safety Management System.

6.4 Compulsory Pilotage

Requirements for compulsory pilotage are described in the Orkney Pilotage Directions 1988 (as amended 2007 & 2010). These requirements have been based on operating experience and reviewed by risk assessment as part of the development of the Safety Management System.

6.5 Pilot Training, Assessment and Authorisation

6.5.1 Examining Body

OIC Marine Services has in place an Examining Body as described in the Orkney Pilotage Directions 1988 (as amended 2007 & 2010). This body has the responsibility for: -

- Setting qualifications required for pilots;
- Conducting the examination of applicants for pilot authorisations or pilotage exemption certificates under the Pilotage Act 1987.

The Pilotage Directions 1988 (as amended 2007 & 2010) set out a number of minimum requirements for pilots including qualifications and medical examinations. Two classes of pilot are recognised: -

- Class 1 Pilot – Unrestricted, may pilot vessels of any tonnage or size:-
- Class 2 Pilot – Limited to piloting vessels with a draught not exceeding 6.5 metres or maximum LOA 125 metres.

Pilot authorisations may also be suspended or revoked as described in the Pilotage Directions 1988 (as amended 2007 & 2010).

6.5.2 Maintenance of pilot knowledge

OIC Marine Services pilots are required to maintain a level of knowledge on all marine operations and harbour areas, which they may be required to apply while undertaking of pilot services on behalf of OIC Marine Services. Knowledge in these areas is maintained in a number of ways: -

- In-house training;
- Bespoke Simulator training undertaken at the South Tyneside College, South Shields.

6.6 Pilotage Exemption Certificates

The OIC Pilotage Directions 1988 (as amended 2007 & 2010) set out requirements for issue of Pilotage Exemption Certificates (PECs).

As per the requirements of the Pilotage Act 1987, only the Bona fida Master or First Mate of a ship may hold and use a PEC.

Pilotage Exemption Certificates are issued following successful examination by an individual to demonstrate competency and sufficient local knowledge, the certificate is non transferable, valid

only for a maximum one year and to specific stated vessels. Annual renewal is by confirmation that the holder has achieved the necessary predetermined minimum number of trips during the past year, in the last five years has completed at least one assessment trip with an authorised harbour pilot and continues to hold both a valid certificate of competency and Seafarers medical certificate.

All Certificates must be renewed on the 1st September each year. If there has been a lapse in the predetermined number and frequency of trips, the Examining Board may require a PEC holder to be re-examined before a certificate is re-issued.

The Examining Body if dissatisfied with the conduct of a PEC holder may revoke his certificate at any time or ask him to attend further examination. These procedures are outlined in [SOP-06-005](#) and [SF-06-005](#).

6.7 Pilot Boarding

All vessels requiring use of a pilot must comply with the Merchant Shipping (Pilot Transfer Arrangements) Regulations 1999; this gives the requirements for pilot boarding ladders

All pilot boarding operations should be carried out in accordance with procedures adopted in the latest MCA Code of Practice for the Safety of Small Work Boats & Pilot Boats, and the UKMPA Code of Safety Practices.

6.8 Pilot-Master Communications

Pilot-master exchange is an important aspect of pilotage services provided by OIC Marine Services and the Pilotage Act 1987 requires a certain minimum exchange of information between the master of a ship and the pilot.

The OIC Pilotage Directions 1988 (as amended 2007 & 2010) set out requirements for pilot behaviour and communication with the master of the vessel. These should be based around establishing agreement on the port pilotage plan ([SOP 06-004](#)) and ensuring a clear understanding with the bridge team on its execution, any difficulties should be reported as described [SOP 06-001](#). The pilot should conduct the navigation of the vessel in a safe and professional manner.

General requirements of pilots are described in [SOP-06-001](#).

OIC Marine Services ensures allocation of pilots in adequate time to enable production of Port Pilotage Plans and other documentation as required.

The procedures for reporting vessel deficiencies noted by the pilot are contained in [SOP 02-006](#).

6.9 Incidents involving pilots / PEC Holders

Any incident involving pilots or PEC Holders should immediately be reported by the pilot/PEC holder involved, to the Pilotage Superintendent as per [SOP-02-004](#).

OIC Marine Services has in place a formal incident and disciplinary procedure in the event of a marine incident involving a pilot or person holding a pilotage exemption certificate. This procedure is detailed in [SOP-06-006](#).

The Examining Body undertakes preliminary investigations of an incident involving a pilot or person holding a pilotage exemption certificate.

As recommended by the Port Marine Safety Code, masters of ships using pilot services are able to make reports of unsatisfactory performance by an authorised pilot, whether or not there has been an incident. These incidents will be investigated and the outcome reported back to the report originator or their representative as per [SOP-06-006](#).

7 Marine Services

7.1 Orkney Towage

OIC Marine Services provides towage services through Orkney Towage Ltd. Orkney Towage Ltd is an independent company, although OIC is the sole owner. Towage services available in OIC Marine Services areas are described in [SOP-07-001](#).

OIC Marine Services towage policies have been based on risk assessments and consultation undertaken. The following towage guidance is in place: -

- General Towage Guidance ([SOP-07-001](#));
- Tug Escort Guidelines ([SOP-07-002](#));
- Tug Availability Guidelines ([SOP-07-003](#)).

These guidelines are generally advisory; however minimum levels of tug escort as set are mandatory.

Orkney Towage Ltd operates its own Safety Management System under the ISM Code which came into force in September 2002: this dovetails with the OIC Marine Services Safety Management System, and ensures that the industry's minimum standards and crew competency are maintained as per STCW 95 requirements.

7.2 Mooring at Flotta Terminal

Flotta Terminal is owned and operated by Talisman Sinopec Energy UK Limited who is responsible for all operations within the Terminal area, including its piers and jetties and at the SPMs. Flotta Terminal is responsible for providing personnel for safe mooring and unmooring at the Flotta Terminal jetty and SPM. OIC Marine Services retains responsibility for overseeing the safety of all port marine operations within the OIC Marine Services area.

[SOP-07-004](#) provides berthing procedures for mooring and unmooring vessels at the Flotta Terminal jetty or SPM.

7.3 Ship to Ship Transfers and Bunkering

The appropriate STS Service provider undertaking the ship-to-ship transfer or bunkering operation is responsible for the supervision of the ship-to-ship transfer or bunkering operation.

Procedures for ship to ship transfer (STS) and bunkering operations should follow those set out in the ICS/OCIMF Ship to Ship Transfer (Petroleum) Guide 4th Edition 2005, or ICS/OCIMF Ship to Ship Transfer (Liquefied gases) Guide 2nd Edition 1995. Any STS Service Provider supervising ship-to-ship transfer or bunkering operations must have in place appropriate procedures and checklists approved for use by OIC Marine Services. OIC Marine Services will review procedures and checklists on a 2-yearly basis. The Port Operations Manager keeps a record of reviews undertaken and subsequent review dates.

Prior to any STS Operation a meeting is held to discuss and clarify operational matters.

OIC Marine Services operational procedures for STS operations are detailed in [SOP-07-005](#).

7.4 Mooring and Berthing Services at OIC Harbour Piers

OIC Marine Services do not provide mooring services other than for vessels operated by or on behalf of the Orkney Islands Council. It is the responsibility of the ship owners to provide linesmen and mooring crews as necessary for the safe berthing and mooring/unmooring of their vessels. OIC Marine Services personnel will oversee the safety of the operation and provide advice on berths available where mooring is taking place at an OIC Marine Services' owned pier.

Additional procedures are in place for mooring and unloading of import fuel tankers at Scapa and Kirkwall Piers. These are described in [SOP-07-006](#) (Scapa) and [SOP-07-007](#) (Kirkwall).

7.5 Harbour Craft and Workboats

The Port Marine Safety Code requires that authorities should ensure all harbour craft, workboats and pilot launches used in their harbours and proceed to sea of harbour limits comply with the Merchant Shipping (Small Work Boats) Regulations 2004 and the associated Marine Guidance Notices.

All workboats and pilot launch activities are considered through a process of risk assessment and consultation as per [SOP-02-001](#).

All pilot launches and workboats owned and operated by OIC Marine Services meet the requirements of the above Regulations. An inspection and maintenance log is kept for each vessel along with all appropriate certificates,

Contractor vessels are required to provide evidence of meeting the requirements of the 2004 Regulations prior to contract award or on an annual basis if a long-term contract is in place.

All other harbour craft and small workboats that do not comply with the Merchant Shipping (Small Workboats and Pilot Boats) Regulations 2004 and that are operating within OIC Marine Services' waters should be "fit for purpose".

Under the OIC Harbour Byelaws, the master of a vessel underway must ensure at all times that a responsible officer is on watch and a crew on board which is adequate to comply effectively with any Byelaws or Directions given and to deal with an emergency. The master of a vessel must also hold a suitable minimum qualification appropriate for the vessel operating area, type and size of vessel.

7.6 Commercial Diving Operations

The Diving at Work Regulations 1997 and the appropriate approved Codes of Practice regulates all commercial diving operations within OIC Marine Services waters.

Diving at Work Regulations will apply where there is some form of remuneration involved even if some individuals within the operation maybe volunteers. Recreational diving activities are covered under Section 5.10.5.

OIC Marine Services Byelaws 1977 states that no diving is permitted in an OIC Marine Services area "except with the written permission of the Harbour Master". This is implemented through the services of the Port Operations Manager as described in [SOP-07-009](#).

Where OIC Marine Services hires in the services of a commercial diving contractor it is responsible for: -

- Ensuring that they appoint a diving contractor who is competent to undertake the duties.
- Ensuring that the site is safe to use;
- Identifying known hazards to the diving contractor, such as tides, currents, location of underwater hazards and contaminated waters;
- Supporting the diving supervisor and diving contractor in the event of an emergency.

OIC has in place an approved dive contractor list for diving work undertaken by diving contractors on behalf of OIC and OIC Marine Services. Diving contractors wishing to be placed on this list must submit full evidence of their compliance with the Health and Safety regulations and diver qualification.

OIC Marine Services does not directly employ any divers and is therefore not a diving contractor under the terms of the Diving at Work Regulations 1997.

Diving on wrecks is likely to be subject to other regulations that prohibit disturbance or the removal of artefacts, some guidance is provided in [SOP 07-009](#).

7.7 Port Waste Management

The Merchant Shipping and Fishing vessel (Port Waste Reception Facilities) Regs 2003 requires harbour authorities and port terminal operators to ensure there is provision for adequate reception facilities for ships generated waste to meet the needs of those vessels normally using the harbour or terminal.

OIC Marine Services is committed to protecting the marine environment and in addition to the requirements under the above regulations further arrangements have been put in place to accept waste from all other vessels such as Recreational and Fishing vessels that are outside the scope of the regulation.

OIC Marine Services has in place as part of its statutory obligations a 'Port Waste Management Plan' this details all the port waste facilities, together with reception and data recording procedures.

Some vessels are required to submit a declaration indicating types and quantities of garbage to the Harbour Authority prior to their arrival in port. Procedures for dealing with this requirement are provided in [SOP 07-010](#).

Where appropriate OIC Marine Services will support or participate in new developments or initiatives to minimise maritime pollution arising from waste disposal issues affecting its port users.

7.8 Ballast Water Management (Scapa Flow)

Since the creation of the Scapa Flow Oil Port, the OIC has recognised the special circumstances relating to the marine environment of Scapa Flow; and has endeavoured to ensure developments that could give rise to the potential for marine pollution, have been considered in a process of risk assessment and consultation, and from that have ensured proper safe guards are established to minimise such risks to an accepted and tolerable level.

Ballast water management has been one such aspect. The OIC Marine Services in association with the operators of the Flotta Oil terminal have maintained a policy prohibiting the discharge of ships ballast water within Scapa Flow; unless such vessels can either access the specially provided facilities at the Flotta terminal, or can conform to specific restrictive conditions, present details of which are provided in [SOP 07-012](#).

Those vessels which cannot comply with these conditions are required to proceed out of Scapa Flow as defined by the Harbour limits, in order to undertake any de-ballast operation they may require.

This policy may need to be reviewed periodically to remain flexible and ensure that it can evolve and react to the latest aspects of environmental awareness, be consistent with any new legislation requirements and allow the best practices in marine environmental protection to be exercised.

8 Personnel

8.1 Introduction

OIC Marine Services employs a range of personnel including: -

- Management positions (Marine Services Senior Manager / Harbour Master, Port Operations Manager, Marine Superintendents, Pier Operations Manager);
- Safety/Environmental Officers;
- Marine Officers;
- Pilots;
- Launch crews and coxswains;
- Maintenance engineers and supervisors;
- Administration support.

The Marine Services Senior Manager / Harbour Master is responsible for ensuring that personnel employed by OIC Marine Services are competent and adequately trained in order to undertake all operations on its behalf safely. This responsibility also extends to ensuring adequate personnel numbers.

8.2 Training Policy

OIC Marine Services maintains training records for all its personnel. Training is generally in line with the National Vocational Standards for Port Personnel being developed by the Port Skills & Safety group. A review of each individuals training requirements is carried out annual at the Staff Review and Development Scheme appraisal, or at other times if new training requirements or opportunities are identified.

8.3 Qualifications and Recruitment

Each post has minimum entry qualifications/experience and qualifications/experience required for progression and these are set out in the respective job descriptions. Marine crew positions are maintained to the competency requirements issue by the Maritime and Coastguard Agency applicable for the marine craft and areas of operations.

Specific qualification and training requirements for licensed Pilots are further detailed in the Pilotage Directions 1988 (as amended 2007 & 2010).

OIC Marine Services personnel are encouraged in career progression.

8.4 Appraisals

OIC has in place a staff review and development scheme for appraising its entire staff, this includes OIC Marine Services staff. The scheme procedures are detailed in [SOP-08-001](#) and should enable staff achievements to be reviewed along with any additional training requirements. Job descriptions for each post holder, including duties and responsibilities, are also reviewed and updated as necessary.

9 Health and Safety at Work

9.1 Introduction

OIC has overall responsibility for the health, safety and welfare of its personnel, including OIC Marine Services personnel, within the terms of the Health and Safety at Work Act 1974. Responsibilities include, inter-alia, the provision of a safe system of work, appropriate supervision, training and protective equipment.

OIC Marine Services maintains regular Operations Meetings and Health & Safety Meetings. This ensures a formal outlet exists for matters of Health and Safety to be discussed in addition to tool box talks amongst all harbour staff representatives.

9.2 Fire Regulations

A fire risk assessment has been undertaken in line with the requirements of the Fire Precautions (Workplace) Regulations 1997 as amended and the Health and Safety at Work etc Act 1974. In addition, as required by the legislation, there is a written record of the implementation of the assessments findings as well as: -

- Provision and maintenance of fire precautions necessary to safeguard users of the workplace;
- Information, instruction and training for employees about fire precautions in the workplace;
- Nominated personnel have specific roles as identified under the provisions of the fire risk assessment and employees have been consulted regarding these roles;
- A reliable and tested means to contact the emergency services; and
- The workforce is aware of its legal responsibility to co-operate with the OIC Marine Services to ensure the premises are safe from fire and its effects and to do nothing to place them or other people at risk.

Contractors and new personnel are required to undergo a safety induction including fire precautions in place.

OIC Marine Services' Health and Safety Policy is an appendix to this document under 'Policy Statement No 1'

10 Emergency Preparedness and Response

10.1 Emergency Response Contingency Plans

OIC Marine Services recognises that accidents may occur within its harbour area. To this end a number of emergency and contingency plans are in place that detail the actions required. This pre-planning ensures an effective and co-ordinated response in the event of an emergency.

OIC Marine Services has a number of emergency plans in place and these meet their statutory responsibilities as a Harbour Authority.

10.1.1 Dangerous Substances in Harbour Areas Regulations 1987

OIC Marine Services has in place a Port Emergency Plan to meet its obligations under the 1987 Regulations. This plan has been prepared after consultation with all interested parties. Emergencies covered include: -

- Fire;
- Explosion;
- Pollution incidents;
- Collision, sinking and grounding;
- Escape of toxic gases, liquids and hazardous chemicals;
- Radioactive material;
- Harbour Authority Building emergencies; and
- Bomb threats.
- Security incidents.
- Pandemic Contingency.

This plan is reviewed on a 2-yearly basis

10.1.2 Merchant Shipping (Oil Pollution Preparedness Response and Co-operation Convention) Regulations 1998

OIC Marine Services has in place an oil spill contingency plan for oil handling facility offering berths alongside, on buoys or at anchor, to ships of over 400 gross tonnes (GT) or oil tankers of over 150 GT. The Oil Spill Contingency Plan covers all the major and minor harbours and piers under OIC Marine Services control.

The OIC Marine Services Oil Spill Contingency Plan requires government approval to ensure it conforms to the three tier response strategy National Counter Pollution Contingency Plan. The plan is therefore reviewed on a 5-yearly basis by the MCA or sooner if required following any major modification to harbour operations or circumstances

OIC Marine Services holds and maintains counter pollution equipment as per its OPRC regulation requirements at various harbour properties to respond to Oil pollution incidents in line with the National Contingency plan.

The overall responsibility for responding to oil pollution incidents within the OIC Marine Services' area rests with Orkney Islands Council. The authority to act on OIC's behalf has been given to the Marine Services Senior Manager / Harbour Master in their capacity as Oil Pollution Officer.

Training has been identified and put into place to ensure staff familiarisation in equipment and response procedures. Exercises are also undertaken on a regular basis.

10.2 Interface with other Emergency Plans

Section 84 of the Local Government (Scotland) Act 1973 gives Orkney Islands Council power to take immediate action where an emergency either threatens or has occurred. To this end, Orkney Islands Council complies with the civil Contingencies Act 2004 and the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005, and has in place Major Emergency Procedures, which describes the roles, responsibilities and resources available to deal with a major emergency, which the OIC Marine Services emergency plans should be consistent with.

10.3 Training and Exercises

OIC Marine Services training and exercise strategy has been designed to ensure effective implementation of its emergency plans as described above. Training has been identified and implemented as required for each post holder to ensure staff familiarisation with equipment and procedures in the event of an emergency.

Exercises are also undertaken on a regular basis. These are either paper exercises to verify communication procedures or operational exercises involving deployment of personnel equipment and materials. On completion of each exercise, an evaluation is conducted to examine any deficiencies that may have been identified in the emergency plans. This allows revisions and amendments to be made to improve the effectiveness of these plans.

[SOP-10-001](#) details the procedures for responding to emergencies together with training and exercise programmes.

11 Port Security

11.1 Introduction

International Ship and Port Facility Security Code.

Following increased international terrorism in recent times where transportation and their facilities have been favoured targets. The ISPS code was developed through International co-operation to enhance maritime security, based on a three tier level of security treat and corresponding counter measures. This code came into force on the 1st July 2004, and was incorporated in the Ship and Port Facility (Security) Regulations 2004 as amended.

These regulations apply to the following types of ships engaged on international voyages, and to ports and terminals that handle such vessels: -

- Passenger ships, including high-speed passenger craft.
- Cargo ships, including high-speed craft of 500 gross tonnage and upwards
- Mobile off shore drilling units
- Port facilities serving such ships engaged on international voyages.

The following Orkney port facilities are presently covered by the regulations: -

Kirkwall Harbour,
Hatston Pier,
Stromness Harbour,
Scapa Flow (including Scapa Pier and Lyness Pier)

OIC Marine Services has in place a Port Facility Security Plan (PFSP) covering these ports, and associated security measures. This plan was developed based upon the Port facility Security instructions and guidance as issued by Department of Transport Maritime Security (Formally TRANSEC).

The PFSP receives government approval by Department of Transport Maritime Security prior to implementation they also carry out inspections and intermediate verification during the plans five year rotation.

Flotta Oil Terminal within Scapa Flow is not covered by the OIC Marine Services Security Plan. Whilst the terminal still falls within the scope of the security regulations these apply to the terminal operators, and therefore in this case is the duty of operators (Talisman Sinopec Energy UK Limited)

Further enhancement of these maritime security regulations through EU directive 725/2004 requires further specific security measure to be in place for the following.

- Class A passenger ships on domestic shipping routes / 1st July 2005.
(Applicable to the Ferry Route.....Lerwick/Hatston/Aberdeen)
- Class B, C, D passenger ships on domestic shipping routes / 1st July 2007.
(Applicable to the Pentland Firth Ferry Routes.)

The relevant security requirements for this are covered within the ports security plan.

11.2 Pre-arrival Security Notification

Vessels arriving from international destinations and to which these regulations apply are required to provide the Harbour Authority with a pre-arrival notification giving specific information on security and its recent trading movements, this allows the Harbour Authority to assess the security risk and requirements of each vessel including, port access denial. This procedure is described in [SOP 11-001](#).

11.3 Operational Security

The regulations require the appointment of a 'Port Facility Security Officer' this position is assigned to the Port Operations Manager or their deputy PFSO's who have responsibility to maintain the 'Port facility Security Plan'; and to liaise with Ship Security Officers on board vessels and other harbour staff to establish clear understanding on security measures as necessary during a vessel's port visit.

Specific security measures and procedure applicable to the varying operational needs and requirements are described within the plan.

Security awareness is now part of daily routines of all OIC Marine Services employees, reporting suspicion on any security matter is covered by [SOP 11-002](#).

Where the control of individuals or vehicles within designated restricted areas is deemed necessary, OIC Marine Services has procedures for the use of a pass system; this procedure is covered by [SOP 11-003](#).

11.4 Training and Exercises

Security Exercises will be carried out at regular intervals to test procedures and responses. Training of personnel with security duties will be carried out as necessary in accordance with the regulations.

Internal reviews of the PFSP will take place every six months or sooner if changes are necessary following exercises. The plan will also be audited annually.

Appendix 1 List of Port Users

SPT Marine
Fendercare Marine Ltd
Safe STS ltd
John Jolly Shipping Agents
GAC
Global Energy
Graypen Ltd
Northern Lighthouse Board
Talisman Sinopec Energy UK Limited
Orkney Ferries Ltd
Orkney Towage Ltd
Streamline Shipping Group Ltd
Pentland Ferries Ltd
Serco NorthLink Ferries Ltd
RNLI Kirkwall, Longhope, Stromness
Orkney Fisheries Association
Orkney Fishermen's Society
Orkney Marina Group
Orkney Sailing Club
Stromness Sailing Club
Orkney Sea Anglers Association
Individual dive charter vessel operators
Leask Marine Ltd
Scotmarine Ltd
Orkney College Department of Maritime Studies
Orkney Tourist Board
Community Council Liaison Officer

Appendix 2 Register of Legislation

1. Section 1 of the Pilotage Act 1987 defines a competent harbour authority
2. Marine Guidance Note MGN 458 [M+F] "Accident Reporting and Investigation" is addressed to Harbour Authorities, amongst others and explains the reporting requirements of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012
3. Section 26 of the Harbours Act 1964
4. Section 33 of the Harbours, Docks and Piers Clauses Act 1847
5. Section 198 to the Merchant Shipping Act 1995
6. Section 48A of the Harbours Act 1964
7. Regulation 3(4) of the Conservation (Natural Habitats &c) Regulations 1994 (SI 1994 No 2716)
8. Section 262 of the Town and Country Planning Act 1990
9. Section 40 of the Natural Environment and Rural Communities Act 2006.
10. Civil Contingency Act 2004 (Contingency Planning) Regulations 2005 (SI 2005/2042) and the guidance document *Emergency Preparedness*
11. Section 40 of the Harbours Act 1964
12. Schedule 2 of the Harbours Act 1964
13. Section 7(5) of the Pilotage Act 1987
14. Section 83 of the Harbours, Docks and Piers Clauses Act 1847
15. Section 236 of the Local Government Act 1972
16. Sections 30 & 42 of the Harbours Act 1964 and Sections 10(5) & 14 of the Pilotage Act 1987
17. Section 10(3) of the Pilotage Act 1987
18. Section 10(6) of the Pilotage Act 1987
19. Section 31 of the Harbours Act 1964.
20. Section 51 of the Harbours, Docks and Piers Clauses Act 1847
21. Section 83 of the Harbours, Docks and Piers Clauses Act 1847
22. Section 52 of the Harbours, Docks and Piers Clauses Act 1847
23. Section 53 of the Harbours, Docks and Piers Clauses Act 1847
24. Guidelines for voyage planning IMO Resolution A.893(21) adopted on 25 November 1999
25. Schedule 3A of the Merchant Shipping Act 1995 as inserted by the Marine Safety Act 2003
26. Paragraph 8 of Schedule 3A to the Merchant Shipping Act 1995
27. Section 1 of the Dangerous Vessels Act 1985
28. Section 3 of the Dangerous Vessels Act 1985
29. The Dangerous Substances in Harbour Areas Regulations 1987 (SI 1987 No 37)
30. Section 144 of the Merchant Shipping Act 1995
31. Section 135 of the Merchant Shipping Act 1995
32. Section 136 of the Merchant Shipping Act 1995
33. Section 259(6) of the Merchant Shipping Act 1995
34. The Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations (SI 1998/1056)
35. The Merchant Shipping (Vessel Traffic Monitoring and Reporting Requirements) Regulations 2004 (SI 2004 No 2110)
36. Section 84 of the Railways and Transport Safety Act 2003
37. Regulation 6 of the Merchant Shipping (Vessel Traffic Monitoring and Reporting Requirements) Regulations 2004 (SI 2004 No. 2110)
38. Sections 2(1) & (2) of the Pilotage Act 1987
39. Section 2(3) of the Pilotage Act 1987
40. Section 7 of the Pilotage Act 1987
41. PEC requirements are outlined in Sections 8 and 15 of the Pilotage Act 1987
42. Section 3 of the Pilotage Act 1987
43. Section 195 of the Merchant Shipping Act 1995
44. Section 193 of the Merchant Shipping Act 1995
45. Section 201 of the Merchant Shipping Act 1995
46. Sections 198 and 199 of the Merchant Shipping Act 1995
47. Section 198 of the Merchant Shipping Act 1995
48. Section 252 of the Merchant Shipping Act 1995

Appendix 3 OIC Marine Services Policy Statement List

- 1 Health and Safety Policy**
- 2 Drug and Alcohol Abuse Policy**
- 3 Environmental Policy**



Policy Statement No. 1

HEALTH AND SAFETY POLICY

Contact:	Marine Services Senior Manager / Harbour Master	Tel:	01856 87 3636
	Harbour Authority Building	Fax:	01856 87 3012
	Scapa		
	Orkney KW15 1SD		

SECTION A

GENERAL STATEMENT OF POLICY

HEALTH AND SAFETY AT WORK etc. ACT 1974

Accidents at work can cause suffering to families and pain to individuals. They also reduce efficiency and are costly. They can happen anywhere if precautions are not taken.

OIC Marine Services' policy is to provide and maintain safe and healthy working conditions, equipment and systems of work for all our employees, and to provide such information, training and supervision as they need for this purpose.

Accident prevention is the responsibility of every employee with high standards of behaviour being set and maintained.

We also accept our responsibility for the health and safety of others that may be affected by our activities.

The allocation of duties for safety matters and the particular arrangements, which we will make to implement the policy, are set out within this statement.

The policy will be kept up to date as changes in working practices evolve and will be reviewed annually by the Safety Committee.

Signed David Sawkins

Marine Services Senior Manager / Harbour Master

Date: 02 August 2013

Responsibilities

1. Overall and final responsibility for health and safety in Marine Services (Harbour Authority) is that of the Marine Services Senior Manager and the Port Operations Manager

2. The following staff are responsible for safety in particular areas:

Position	Area
Port Operations Manager	OIC Harbour Offices and Pilotage.
Assistant Technical Superintendent	Workshops, stores and OIC Harbour pilot vessels.
Biologist	Environmental Unit.
Marine Superintendents	Oil Pollution and Incidents.
Piermasters	Harbour facilities at their location.

3. All employees have the responsibility to co-operate with supervisors and management to achieve a healthy and safe workplace and to take reasonable care of themselves and others.
4. Whenever an employee, supervisor or manager notices a health or safety problem, which they are not able to put right, they must inform the appropriate person named above. Consultation between management and employee is through their line manager or the Marine Superintendent - Port Marine Safety.
5. Personnel responsible for: -
 - Safety training, safety inspection and accident investigation is the Marine Superintendent – Port Marine Safety
 - Monitoring maintenance of workshop plant, pilot launches and equipment is the Assistant Technical Superintendent.
 - Monitoring maintenance of oil pollution equipment is the Marine Superintendent – Counter Pollution.
 - Monitoring maintenance of administration equipment is the Office Manager.
 - Marine Services fire equipment is checked and maintained by an approved service engineer every 12 months.

SECTION B

GENERAL ARRANGEMENT

1 Accidents, Incidents and Dangerous Occurrences

All accidents, incidents and dangerous occurrences, regardless of seriousness must be reported immediately to the line manager and the Marine Superintendent – Port Marine Safety.

Accident/Incident Report books are located at: -

- a) Reception, Harbour Authority Building, Scapa
- b) Marine Operations Room, Harbour Authority Building, Scapa
- c) Piermasters' Office, Stromness
- d) Piermasters' Office, Kirkwall

The completed white top copy of this report form must be forwarded to the OIC Safety Officer. The completed pink copy of this report must be forwarded to the Office Manager who is responsible for the filing of all completed reports.

A record of all accident, incidents and dangerous occurrences to employees and members of the public reported within OIC Marine Services harbour areas will be maintained. These records will be used to review occurrence statistics as part of the Marine Services – Annual Performance Report.

The person responsible for reporting incidents via form F2508 or F2508A (RIDDOR) to the Health and Safety Executive is the OIC Safety Officer

First Aid boxes are located at: -

- a) Main Office, workshops and environmental unit Harbour Authority Building, Scapa.
- b) Piermasters' Office, Kirkwall.
- c) Piermasters' Office, Stromness.
- d) Onboard each pilot launch and small craft.
- e) In all vehicles owned by Marine Services.

Trained/qualified first aiders are: -

- a) Office Manager, Harbour Authority Building, Scapa.
- b) Piermaster, Kirkwall.
- c) Piermaster, Stromness.
- d) Pilot Launch Crew Members.

Line managers under the Marine Services Senior Manager are responsible for the maintenance of all first aid equipment in their areas of responsibility.

2 Emergency Procedures

Every employee should familiarise themselves with the OIC Marine Services Emergency Plan. The plan covers the seven major situations that could possibly occur, namely: -

1. Fire
2. Explosion
3. Pollution
4. Collision/Sinking
5. Escape of Toxic Gases, Liquids and Hazardous Chemicals
6. Radio Active Substances.
7. Security Incident

It must be appreciated that a minor incident can, if appropriate action is not taken quickly, rapidly develop into a serious situation; consequently it is essential that any incident be dealt with as a matter of urgency.

3 Advice and Consultancy

Advice on all aspects of health and safety can be obtained from the: -

Health and Safety Executive
Longman House
28 Longman Drive
Longman Industrial Estate
Inverness
IV1 1SF

Fax number 01463 713 459

OIC Safety Officer
Council Building
School Place
Kirkwall

Telephone number 01856 873535 ext 2255

Marine Superintendent – Port Marine Safety
Harbour Authority Building
Scapa

Telephone 01856 873636

4 Training

OIC Marine Services will ensure all employees are given training on health and safety to equip them to undertake their work tasks safely and efficiently, external courses on specific aspects of safety will be utilised as and when appropriate under the guidance of the Marine Superintendent – Port Marine Safety. Internal training will always take due cognisance of safety elements in job performance and management control.

5 Transport

Employees using private motor vehicles on official business must ensure that: -

- a) Any such vehicle is owned and insured by the employee.
- b) The vehicle in use is maintained in a roadworthy condition and will at all times when in official use comply with legal requirements and conditions set out in the insurance policy. Employees must not carry goods in their vehicles unless their insurance policy covers such liability.
- c) Employee's insurance cover must be Business use.

Official vehicles and plant owned by the OIC Marine Services must be used in accordance with the safety code drawn up for that particular vehicle or plant.

6 Disciplinary Rules

Disciplinary action will be taken against any employee who shows wilful disregard for safe working practices. Where total disregard for safe working practices seriously affects the health and safety of themselves or that of other employees or the public, the employee may be instantly dismissed.

It shall be a condition of employment that where safety equipment is issued for a specific purpose, it shall be used at all times for that purpose.

7 Contractors and Visitors

All other persons on port premises, although not being employed shall: -

- a) Observe the Marine Services safety rules and the instructions given by persons enforcing the Marine Services safety policy.
- b) Not work on the premises until the relevant safety rules are read, understood and formally accepted.
- c) Not work on the premises until covered by insurance against risk.

SECTION C

HAZARDS

1 General Responsibilities

It is the employer's responsibility to ensure that relevant hazard information identified through risk assessments and manufactures instructions is brought to the attention of the workforce through the relevant line manager/superintendent.

Generic risk assessments are in place to cover most routine operations within the department. When it is identified that a work task is non routine and there is no risk assessment previously completed, the line manager should be advised and a risk assessment carried out. All identified control measures must be in place prior to commencing the work task. "Tool box talks" can be used to discuss the results of a risk assessment prior to commencing a task and ensure all staff involved are aware of the identified hazards and the control measures to be in place.

Every employee shall use any machinery, equipment or safety device provided for him by his employer in accordance with both training and instruction in respect to their use.

All personal protective equipment (PPE) provided or identified in a risk assessment for the work task to be completed will comply with the Personal Protective Equipment Regulations 2002 (as amended) and must be worn/used appropriately as per the manufacturers instructions.

All PPE issued to staff should be maintained according to the manufactures instructions. When there is concern an item of PPE is no longer fit for its designed purpose, employees should contact their line manager who will arrange for replacement as necessary.

When an item of PPE requires specialist servicing the Marine Superintendent – Port Marine Safety or Assistant Technical Superintendent will arrange for servicing and replacement of such items.

2 Fire

All staff must comply fully with the "Fire Safety Plan" for all Marine Services buildings. All new staff will be issued with a copy of the relevant procedures for the location of their work which is part of the induction procedure for all new staff.

The responsibility for testing of fire alarms on a weekly basis and fire drills every six months lies with: -

- a) Marine Superintendent – Port Marine Safety, Harbour Authority Building, Scapa
- b) Piermaster Kirkwall, Kirkwall and Hatston terminal buildings
- c) Piermaster Stromness, Stromness terminal buildings

An identified trained member of staff at each location will be responsible for testing of fire alarms in the absence of the assigned responsible person.

3 Housekeeping

Cleanliness – The workforce and line managers are responsible for ensuring staircases, floors, entrances, exits and washrooms are kept clean, tidy and maintained.

Waste Disposal - waste and rubbish must be cleared away regularly either by the weekly O.I.C. collection system or direct to the Chinglebrae's Waste Disposal site via Marine Services transport. Adequate containers are provided throughout all premises for the safe collection of waste materials. It is important that in the interest of health and safety that retained waste and rubbish are distanced from possible sources of ignition and other combustible materials.

Waste material designated as special wastes must be disposed of in the appropriate manner. Employees should contact their line manager if there are any concerns over the correct method of disposal.

All OIC Marine Services staff must follow "The Management of Orkney Islands Council Produced Wastes: Policy Statement".

Safe Stacking and Storage - all material and equipment must be safely stored and stacked in such a way as to prevent accidents. Flammable liquids are to be stored in the specific containers for this purpose and away from any source of ignition.

Marking and Keeping Clear Gangways, Exits etc. - every obstacle or hazard in the Harbours premises which is likely to be dangerous when vehicles, lifting appliances or people move shall be made conspicuous by means of colouring, marking, lighting or any combination thereof. There shall be provided and properly maintained safe means of access to every part of the Marine Services premises which any person has to visit for the purpose of dock operations.

All ladders and step ladders - whether portable or not shall be of good construction, sound material, of adequate strength for the purpose for which they are used, free from defect and properly maintained. A ladder shall not be used unless it extends at least 1 meter above the place of landing to which it provides access or there is adequate handhold and effective measures are taken to prevent it slipping or falling.

4 Electrical Equipment

Annual inspection and testing of electrical equipment is carried out by an authorised electrical contractor assigned the task by the OIC. No electrical equipment should be used which is damaged or defective. All such equipment must be withdrawn from use and reported to your line manager.

IT equipment is inspected and tested prior to installation by OIC Information Services.

Faults with electrical equipment must only be repaired by the department's Electrician or by an authorised Electrical Contractor. At all times the Electricity at Work Regulations 1989 must be adhered to. All employees using electrical equipment must observe the manufacturer's instructions for use.

5 Machinery

All machinery must be used as per the manufacturer's operating instructions with safety guards being in place at all times when machinery is in use. Personal injury may be caused as a result of: -

- a) Contact or entanglement of hair, clothing or jewellery between the machine and any other material or fixed structures.
- b) Contact or entanglement with any of the material in motion.
- c) Being struck by ejected parts of machinery and being struck by materials from the machinery.

6 Cranes and Other Lifting Machines

All lifting machinery must have a test and thorough examination by a competent person before being taken into use.

All lifting machinery must have a thorough examination at least once every 12 months. Records of all thorough inspection reports are held by the Technical Superintendent or their deputy. Lifting appliances shall be securely anchored or adequately ballasted or counter balanced or supported by outriggers.

No employee shall be permitted to operate a lifting appliance until suitably trained and tested. No employee shall attempt to lift a weight in excess of the safe working load (SWL) of the appliance they are operating.

7 Cutting and Welding

In all case of electric arc welding and oxy-gas welding and cutting, the eyes must be protected from molten metal, sparks and intense light. Exposed skin must also be protected from slashes, sparks and contact with hot metal.

In gas welding, proper storage, handling and maintenance of cylinders and their fittings with particular care taken of the regulator must be maintained. Regulators, hoses and connections should be checked for leaks using a soap solution each time bottles are changed. To prevent flashbacks the torch is to be properly cleaned and equipment purged before use.

Electrical and welding sets require to be properly used and maintained. It is important to ensure a proper earth return from the work place to the set.

No plant, tank or vessel, which contains or has contained any explosives or flammable substance, shall be subject unless it has been made safe to any welding, brazing, soldering or cutting involving the application of heat.

8 Grinding

Grinding wheels must always be handled carefully. Wheels are fragile to a degree, which varies according to the specification, and great care should be exercised in handling and storage to prevent damage. Normal work pressure applied as intended in an approved grinding set up does not produce serious mechanical stress in a wheel, but excessive work pressure could prove dangerous, and work should not be forced against a “cold” wheel.

Every abrasive wheel must be properly mounted. No one may mount an abrasive wheel unless he is trained, competent and specifically appointed to do so. A guard must be provided and kept in position at every abrasive wheel in motion and the

Provision and Use of Work Equipment Regulations 1998 (PUWER 98) and Supply of Machinery (Safety) Regulations 1992 (as amended) observed.

9 Eye Protection

Eye protection will be supplied to employees involved in work, which is hazardous to their eyes on an individual basis. Such eye protection must be suitable for use by the person to whom they are issued. Every employee who is provided with eye protection, a shield or a fixed shield, when engaged in work (or, in appropriate cases, alongside) a specified process, must wear or make use of such equipment. The loss, damage or destruction of this equipment must be reported immediately, when a replacement will be issued.

10 Ear Protection

All possible measures will be taken to ensure noise control at the source, in accordance with the control measures identified from a risk assessment. However, should it prove impossible or impracticable to reduce noise levels to within safe limits as defined in “The Control of Noise at Work Regulations 2005”, then employees exposed will be issued with suitable hearing protection for the working environment. Where a working area is identified as requiring the use of hearing protectors by persons in the area, such equipment must be worn at all times when the source of noise is in use.

11 Skin Protection

Skin infection, including eczema and dermatitis can arise when employees are exposed to substance, which may damage their skin.

Employees must read the labels on all substances they handle and line managers will make available hazard data sheets for each substance used.

Good personal hygiene and self inspection is extremely important with the department supplying adequate washing facilities, suitable barrier cream and skin cleanser. Suitable protective clothing, primarily gloves, to prevent direct contact will be supplied as required.

Medical advice must be obtained at the first sign of skin related problems.

12 Head Protection

Employees are required to wear a safety helmet if they enter an area designated a “hard hat” area or there is risk of falling objects. Such safety helmets will be supplied and issued by OIC Marine Services.

13 Footwear

Protective footwear provided by Marine Services must be worn at all times. The duty to wear and look after footwear rests with the employee, who must report the loss of, damage to, or destruction of foot wear immediately to their line manager.

14 Safety Afloat

Lifejackets or other suitably approved buoyancy aids must be worn by personnel working on the deck of a craft or in an open boat owned and operated by the department. Every small boat shall carry an appropriate safety kit containing: -

- a) VHF set;
- b) Distress flares and First Aid Kit;
- c) Air pump (for inflatable type craft);
- d) Bailer and spare set of bungs.

15 Manual handling

Employees should not attempt to lift or carry any load which could result in a risk of personal injury. An assessment of any such lifts should be carried out and the advice of line management taken if required. Generally safe lifting methods must be used when lifting or carrying. There is no maximum recommended weight above which an employee may not lift. Each case is dependent on various factors including the ability of the individual, whatever the case an employee will not be expected to lift or carry a weight which could result in personal injury.

16 Working at Height

The Work at Height Regulations 2005 (as amended) applies to all work at height where there is a risk of a fall liable to cause personal injury. Employees must report any hazards and use the equipment supplied (including safety devices) properly.

The regulations set out the following hierarchy for managing and selecting equipment for working at height: -

- a) Avoid work at height where you can.
- b) Use work equipment or other measures to prevent falls where they cannot avoid working at height.
- c) Where they cannot eliminate the risk of a fall, use work equipment or other measures to minimise the distance and consequences of a fall should one occur.

All work at height must be properly planned and organised. Equipment must be properly inspected prior to completing the work task and consideration given to the environment at the location.

Any member of staff who requires further information should contact their line manager or the Marine Superintendent – Port Marine Safety.

17 Display Screen Equipment

Staff who use display screen equipment habitually as part of their normal working day will be given a copy of the HSE “Working with VDUs leaflet” as part of the induction procedure for all new staff.

The Orkney Islands Council Health and Safety Policy should be referred to for further information and guidance. This policy is issued as part of the induction procedure for all new staff.

Any member of staff who requires further information should contact their line manager or the Marine Superintendent – Port Marine Safety.

18 Control of Substance Hazardous to Health (COSHH)

Within the service there are a number of areas of operations where the use of products is covered by the Control of Substances Hazardous to Health Regulations 2002 (COSHH).

Substances or mixtures of substances classified as dangerous to health under the Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP) can be identified by their warning label and the supplier must provide a safety data sheet for such products.

The Storeman holds safety data sheets for all products identified under the CHIP regulations that are held in the main stores.

The Biologist holds safety data sheets for all products identified under the CHIP regulations that are held in the Environmental Unit.

Employees should refer to the product safety data sheet and the risk assessment for information on safe working practices when intending to work with any product that is identified under the CHIP regulations.

The Marine Superintendent - Port Marine Safety should be contacted for additional information on COSHH if required.

19 Smoking

The Orkney Islands Council (OIC) has in place a smoking policy that applies to all OIC owned and managed premises. Employees are not permitted to smoke in enclosed public spaces including all enclosed workspaces; this includes vehicles and craft owned or controlled by the OIC. A copy of this policy can be obtained from the Marine Services Safety Officer or Personnel Services.

The law in Scotland now makes it an offence to smoke in a public place. If any employee wishes to report any person for a breach of this law you should contact their line manager or the Marine

Services Senior Manager to report the incident.

20 Stress

The Orkney Islands Council recognises that the well being of employees at work is important and is committed therefore to develop procedures and to provide training and support to help managers and employees understand and recognise the nature and causes of stress and to take positive measures to manage stress effectively. A copy of the Stress Management Policy is available from the Marine Superintendent – Port Marine Safety or Personnel Services.

21 Personal Safety

All incidents of threatening or violent behaviour encountered by staff members at work should be reported to their line manager. The incident will be recorded and brought to the attention of all relevant personnel.

When there is a high risk of violence occurring, the Police should be requested to provide assistance. If refused, the matter should be referred to your line manager.

22 Diving

All commercial diving operations undertaken with OIC Marine Services harbour waters will be undertaken within the requirements of the Health and Safety at work Act 1984, Diving at work Regulations 1997 (SI 1997 No. 2776) and the Orkney Harbour Byelaws 1977 and Diving Safely Regulations 2002.

All commercial diving contractors who carry out diving operations within a harbour area must be on the OIC list of approved diving contractors.

OIC HARBOURS SAFETY COMMITTEE

TERMS OF REFERENCE

The OIC Marine Services Safety Committee's objective is to promote co-operation between the employer and the employees in instigating, developing and carrying out measures to ensure employees' health and safety at work. The Safety Committee will: -

- a) Have a scheduled Health & Safety Meeting ever 4 months
- b) Study accident/reportable disease statistics and trends, so that reports can be made to management on unsafe or unhealthy conditions and practices, along with recommendations for remedial action.
- c) Examine safety audit reports on a similar basis
- d) Analyse information and reports provided by enforcing authority inspectors
- e) Consider reports from appointed safety representatives
- f) Develop, introduce and monitor works safety rules and safe systems of work
- g) Constantly appraise the effectiveness of safety training
- h) Be watchful on the adequacy of health and safety communication and publicity in the workplace
- i) Provide a link with the appropriate inspectors appointed by the enforcing authority.

GENERAL STATEMENT OF POLICY

It is the policy of OIC Marine Services to provide and maintain safe and healthy working conditions, equipment and systems of work for all its employees, and to provide such information, training and supervision, as they need for this purpose. OIC Marine Services also accepts its responsibility for the health and safety of other people who may be affected by its activities.

The Health and Safety at Work Act 1974, places duties on both employers and employees. Under s.2 employers are required to ensure as far as is reasonably practicable, the health, safety and welfare at work of all employees. Section 7 of the Act requires employees to take reasonable care of the health and safety of themselves and others who may be affected by their acts and omissions at work.

The Merchant Shipping Regulations place general duties on employers, employees and others in respect of health and safety on board UK ships. The main duties are as follows:

- a) On employers - to ensure, so far as is reasonably practicable, the health and safety of their employees and other persons aboard ship;
- b) On employees - to take reasonable care for their own health and safety and for others aboard ship and to co-operate with their employers with regard to the statutory health and safety duties.

These regulations also make it an offence for any person to intentionally or recklessly interfere with or misuse anything provided in the interests of health and safety aboard a UK ship in pursuance of Merchant Shipping legislation.

There are clearly serious implications for an employer or employee with regards to alcohol and drug related accidents at work.

It is the responsibility of every employer to make clear to its employees exactly what constitutes a drinking and or drug offence within their organisation and as such this policy addresses those responsibilities.

Signed David Sawkins Marine Services Senior Manager / Harbour Master

Date: 02 August 2013

1 Alcohol and the Workplace

Alcohol is not a stimulant. It is a depressant - it increases certain brain functions, which means it affects judgement, self-control and co-ordination. Hence people often feel uninhibited after a drink. The concentration of alcohol in the body depends upon how much is drunk, whether the stomach is empty or not, height, weight, age and sex.

Alcohol tends to make water move out of the body cells, which leads to dehydration and other factors producing a “hangover”. It is not possible to “sober up” by drinking black coffee or taking a cold shower.

As the level of alcohol consumption goes up, both co-ordination and judgement becomes impaired and reaction times slow down. Consequently, drinkers are a hazard not only to themselves, but also to others.

Facts:

- * There is one unit of alcohol in a half-pint of beer; therefore there are 4 units of alcohol in 2 pints of beer.
- * A single whisky contains 1 unit of alcohol.
- * Seven pints, in the evening, could mean that a person is still over the legal driving limit the next morning.

2 Drugs and the Workplace

Drug misuse is defined as the non-medical use of drugs that are only intended for use in medical purpose.

The main drugs used are:

- * Opiates such as heroin;
- * Stimulants such as cocaine, amphetamines and ecstasy;
- * Tranquillisers;
- * Hallucinogens such as LSD; and
- * Cannabinoids such as cannabis.

Non-prescribed drugs can affect the nervous system of the user in a similar way to alcohol. In circumstances where employees are exposed to substances (e.g. Solvents) as part of their job if alcohol has been previously consumed, this could have a cumulative effect and make their occupations and their performance even more hazardous. An understanding of the effects of drugs is an important element in the process of accepting that so called “social” drug users pose a health and safety risk.

3 Potential Risks

All employees must be aware of the risks posed by alcohol and drugs in the workplace. These risks include:

- * Impaired judgement;
- * Loss of confidence;
- * Slow decision making;
- * Poor co-ordination;
- * Low quality decision making;
- * Accidents;
- * Poor advice given;
- * Failure to prioritise work;
- * Missed deadlines; and
- * Relationship problems with colleagues.

4 Pro-Active Risk Reduction

It is OIC Marine Services' policy to raise awareness of the need to take action regarding inappropriate drinking and drug use and to secure everyone's co-operation in this regard.

Within OIC Marine Services, the ability to marshal resources effectively, to set and meet standards of quality appropriate to the purpose and resources available is paramount. In particular the quality of work produced by its employees is a clear indication of the high standards to which OIC Marine Services wishes to emulate.

This pursuit of excellence can be undermined across OIC Marine Services as a whole by factors such as inappropriate drinking and drug use. On an individual level, personal performance at work is also affected by inappropriate drinking and drug misuse. This has a knock on effect since the performance by one team member can disrupt the activities of the group as a whole. Under these circumstances, attempts to manage performance effectively and safely may suffer.

Poor performance and a poor safety record may in turn affect OIC Marine Services' ability to achieve excellence as well as undermining customer/client confidence.

5 Help for the Individual

OIC Marine Services believes in its employees and recognises the need to encourage anyone who may have an alcohol/drug problem to seek help and treatment.

Should any employee feel he may experience difficulty in adhering to the policy or have similar concerns about a colleague they can discuss this privately and in confidence with the Marine Services Senior Manager or their deputy.

It is OIC Marine Services' policy therefore to:

- * Encourage employees to seek help voluntarily.
- * Provide advice and any other type of help needed.
- * Offer an opportunity for help where work has deteriorated.

Nevertheless it must be clearly understood that this policy and the help and support which OIC Marine Services is willing to give is only available to employees who come forward voluntarily and independently of any breach of discipline involving drink or drugs. A claim to be alcoholic or drug dependent is not an acceptable excuse for a breach of the rules on alcohol and drugs (see Section 7 below).

6 The taking of Prescribed Drugs

Notwithstanding the aforementioned it is a prerequisite that all employees advise their employer of drugs any member of the medical profession has prescribed them, which may affect their performance.

7 Drink, Drugs and Work

No employee of OIC Marine Services shall drink or take non-medical drugs prior to work or during work.

OIC Marine Services reserves the right to test any employee for alcohol or drugs. Such tests may take place at any time while the employee is at work and/or during medical examination.

Employees of OIC Marine Services must not be involved with drugs or engage in drug abuse (including possession) or in trafficking or dealing in drugs, when onboard or ashore and whether or not at work.

Employees of OIC Marine Services must not:

- * Be at work whilst under the influence of alcohol (an individual with less than 40 mg of alcohol per 100 ml of blood will not be considered to be under the influence of alcohol);
- * Consume alcohol whilst on duty, whether aboard or ashore;
- * Have any alcohol in their possession whilst on duty whether aboard or ashore;
- * Whether or not on duty, be in licensed premises wearing identifiable OIC Marine Services uniform issue or insignia.

An employee is "on duty" throughout any period when rostered for duty and whether or not working.

A breathalyser will be available:

- * Where an individual is considered to be under the influence of alcohol in breach of the above policy, he will be so advised and given the opportunity to take an immediate breathalyser test;
- * In the event that a breathalyser is not available immediately or if the individual refuses to take a breathalyser test then it will remain a matter of judgement as to whether or not the individual is under the influence of alcohol;
- * Refusal to take or co-operate in a breathalyser test may be taken into account when forming a judgement as to whether or not the individual is under the influence of alcohol.

Any employee found contravening these directives would be deemed as having committed an act of gross misconduct, which may lead to summary suspension or dismissal.



Policy Statement No. 3

ENVIRONMENTAL POLICY

Contact:	Marine Services Senior Manager / Harbour Master	Tel:	01856 87 3636
	Harbour Authority Building	Fax:	01856 87 3012
	Scapa		
	Orkney KW15 1SD		

GENERAL STATEMENT OF POLICY

Declaration of commitment

OIC Marine Services under its responsibility as a harbour authority endeavours to minimise environmental pollution in all of its own activities, and through its influence over others. OIC Marine Services will review all of its policies, programmes and services and undertakes to act wherever necessary to meet the highest environmental standards.

Policy Development

OIC Marine Services will develop policies to support this commitment, such policies to include but not limited to:

- a) Energy Policy - based on energy conservation and clean technology, and establishes a cross-department energy management.
- b) A strategy for monitoring and minimise pollution - within the OIC Marine Services harbour areas, including pollution caused by OIC Marine Services' own activities.
- c) A health strategy - which recognised the links between the environment and public health to include the implementation of an amended Health and Safety Policy which has full regard to environmental hazards.

Implementation

OIC Marine Services uses numerous mechanisms to implement its policies effectively namely:

- a) The establishment of an Environmental Protection and Monitoring Group to develop and monitor environmental strategies and policies.
- b) To commission regular environmental audits covering the state of the marine environment, and the impact of existing policies and practices.
- c) Encourage and enable public participation in OIC Marine Services activities through freedom of information, consultation and publicity.
- d) Provide environmental information and education services for the public and businesses.
- e) Make environmental requirements part of its purchasing and procurement policy.
- f) Implement its policies in OIC Marine Services Contract Tender Specifications.
- g) Development and implementation of a Waste Management System.

Signed David Sawkins

Marine Services Senior Manager / Harbour

Master Date: 02 August 2013

Document: Environmental Policy

Date of Issue: 02 August 2013 Revision: 5.0

D.3 STS Information Card

OIC Marine Services STS Information Card

VHF Channels

- Orkney VTS: VHF Channel 11
- Berthing Operations: VHF Channel 09
- Preferred STS Working: VHF Channel 06 (Unless otherwise agreed at the Pre-STs Meeting)

Weather Forecast

The weather forecast is received by Orkney VTS twice daily and is broadcast on VHF Channel 20 at 0915 and 1715 including a summary of local notices to mariners. Verbal update can be obtained out with these times by contacting VTS on Channel 16/11 or by telephone 01856 87 3636

Adverse Weather

All cargo operations are to cease in the event of either of the following weather conditions:

- Mean wind speed exceeds 35 knots
- Electrical storm

Close communications should be kept with Orkney VTS in the event that either of these conditions is expected.

Reported Times

The following times should be reported to the duty VTS Operator:

- All fast
- Hoses connected
- Commence cargo
- Complete cargo
- Hoses disconnected
- Let go
- Any other significant events such as hose failure, suspension of cargo ops.

Trim requirements

All vessels must arrive in Scapa Flow with their propeller submerged and trimmed no greater than 4 metres by the stern. A trim must be maintained which allows the vessels to be manoeuvred without difficulty throughout their stay.

Counter Pollution

Orkney Marine Services will provide a manifold spill kit to be kept on one of the vessels throughout the operation as detailed in the letter provided for the ship's Master. Any and all instances of loss of containment must be reported to Orkney VTS immediately.

Other Requirements

All navigation equipment to be tested prior to arrival or subsequent movements with Orkney VTS informed of any defects.
During personnel transfers on pilot launch, all persons to wear appropriate PPE including lifejackets and safety footwear.

D.4 Pre-STs Meeting Checklist

OIC Marine Services Pre STS Meeting Checklist

Names of Vessels:

Mother Vessel Length:

Drafts:

Date:

Propulsion:

Daughter Vessel Length:

Drafts:

Propulsion:

Item	Notes	Yes/No
Anchoring position agreed?		
Confirmed anchored vessel and berthing side?		
Number of Pilots Required for Operation?		
Mooring plan for each vessel drawn/received and agreed?		
Informed of pollution response gear? (NOFI booms on Scapa Pier and at Harbour Building. Hoyle Booms at Scapa and Flotta. Ship provided with manifold spill kit.)		
Passed oil pollution information? (Any and all loss of primary containment on board either vessel during operation to be reported to Orkney VTS regardless if contained on vessel)		
Passed VHF radio channel information? (Orkney VTS Ch 11, Berthing Ops Ch 09, Preferred STS Working Ch 06)		
Deballasting plan agreed?		
Pilot remaining on board for deballasting?		
Latest weather forecast available? (Informed that forecast will be broadcast on VHF Ch 20 at 0915 and 1715 daily)		
Informed criteria for ceasing operations? (Operation must be ceased if mean wind speed reaches 35 knots or in the event of an electrical storm)		
Suitability of weather to commence operations?		
Deployment of tugs?		
Deployment of fenders – time/name of tug?		
Reporting of times required by SOP? (SOP requires times for All Fast, Hoses Connected, Commence Cargo, Complete Cargo, Hoses Disconnected, Let Go, other relevant events)		
Informed of Maximum Trim Requirements? (Maximum allowable arrival/departure trim is 4 metres by the stern)		

D.5 Traffic Monitoring in Harbour Areas

Orkney Islands Council

Marine Services

Standard Operating Procedure for Traffic Monitoring in Harbour Areas

Controlled Document

(Uncontrolled when printed)

Document Number: SOP-05-001	Issue/Revision: 5.0
Number of Pages: 3	Date of Issue: 02 August 2013
Author: OICMS	Authorisation for Issue: D Sawkins

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Procedure for Traffic Monitoring in Harbour Areas

1 Purpose

The purpose of this procedure is to ensure that all vessel traffic entering, leaving, transiting or carrying out special operations in the competent harbour authority areas for Scapa Flow, Wide Firth/Shapinsay Sound are tracked or monitored. OIC Marine Services is therefore able to co-ordinate all port movements within these areas and provide advice accordingly.

This procedure ensures that Section 2.4.9 of the Port Marine Safety Code is complied with.

2 Scope

This procedure covers all vessel movements within the Scapa Flow, Wide firth, Kirkwall and Shapinsay harbour areas (Section 3.1) and vessels transiting the Pentland Firth (Section 3.2).

3 Procedure

3.1 Traffic monitoring and VTS system

General

The Duty Marine Officer is expected to maintain an alert watch by all means available, with all relevant watch equipment kept switched on and operational. The volume of the radios should be set so that they can be easily and readily heard at all times. A continuous listening watch will be maintained on VHF channels 16 and 11; together with the tug or Pilot launch private channels.

Traffic must be monitored on the VTS system when approaching, transiting or leaving harbour areas. There may also be requirements at other times to monitor closely specific locations such as, but not limited to, vessels at anchor, STS transfer or diving operations; particularly when special circumstances prevail, or an exclusion zone has been established for operational safety or port security purposes.

When vessel names are not automatically assigned to targets through the Automatic Identification system (AIS) transmissions, these should be assigned manually by the duty Marine Officer to all radar targets when identification is established.

Any vessel, which appears to be standing into danger, must be contacted and advised accordingly. Similarly any vessel in contravention of the OIC Marine Services Byelaws must be contacted and advised of this fact. It should be noted that any contravention of Marine Services byelaws may result in a prosecution and any evidence should be correctly handled.

In addition the duty Marine Officers should ensure that due to the strong tidal influences existing in and around the area, that traffic arriving or departing pilot stations are acquired and tracked on the VTS system. It is essential that the duty Marine Officer monitors these vessels inward bound and outward bound in accordance with SOP 05-002 and acts accordingly to ensure vessels maintain any recommended approach channels or intended passage plan. Particular attention should be given prior to the pilot boarding the vessel and once the pilot has disembarked until a vessel is well clear.

Information originating from the VTS system can be passed to vessels on request as advice, but cannot be used for remote Pilotage purposes.

Marine Officers should bear in mind when relaying such information or advice, those areas which are supported by both Radar and AIS, and those which are at present only supported by AIS.

Records and promulgation of information

The Duty Marine Officer will ensure that Pilots, Pilot launches and tugs are kept informed of shipping movements.

Daily shipping movement records are forwarded to HM Customs and Excise

4 Responsibility

The Duty Marine Officer is responsible for the monitoring of vessel traffic.

D.6 Recommended Navigation Channels for Larger Vessels Bound to or from Scapa Flow

Orkney Islands Council

Marine Services

Recommended Navigation Channels for Larger Vessels Bound to or from Scapa Flow

Controlled Document

(Uncontrolled when printed)

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Recommended Navigation Channels for larger vessels Bound to or from Scapa Flow

1 Purpose

These procedures ensures that all larger vessels bound to or from Scapa Flow or the Flotta Oil Terminal follow the recommended navigation channels, which are shown on Admiralty Charts and therefore ensures they are navigated in the safest waters within the approaches to Scapa Flow.

This procedure meets requirements made under Section 2.4.9 of the Port Marine Safety Code.

2 Scope

This procedure applies to all vessels subject to compulsory pilotage, as defined by the pilotage directions, bound to or from Scapa Flow and using the southern pilot stations.

3 Procedure

3.1 General

Larger vessels bound to or from Scapa Flow are to prepare a passage plan in accordance with SOP 05-007 in considering tidal information under Section 3 (g) of the procedure the tidal flow in the Pentland Firth is such that Masters should pay particular attention to the information and details contained in the following publications, prior to their arrival or departure from Scapa Flow, ensuring that suitable allowances are made within their passage plan.

- Admiralty Tidal Stream Atlas Orkney and Shetland Islands NP209;
- Admiralty Sailing Directions NP52; and
- The recommendations on Admiralty chart number 2162.

Failure to do so could result in a vessel experiencing navigational difficulties arising from the effects that these strong tidal currents can cause.

3.2 Recommended routes

See note on Admiralty Charts 2162, 2581 and 35 for deep drafted vessels as defined in the harbour byelaws 1977, approaching recommended channels and tracks.

The duty Marine Officer shall monitor the passage of vessels to ensure they keep to the recommended channel, advising any vessel that navigates out with the channel(s) of the situation; unless advised by the pilot or Master onboard that a deviation is anticipated in accordance with their agreed passage plan. The duty Marine Officer will monitor the vessels passage by use of the harbour VTS System as per SOP 05-001.

3.3 Recommended routes for arriving at the Pilot station for the first time

Approaching from southeast bound for westerly Pilot boarding area

- Vessels should pass 1.5 miles East of Duncansby Head then steer a course to pass midway between Swona and Stroma Islands;
- When approaching with the flood tide (Easterly flow) vessels should maintain a Westerly course until at least 1.5 miles west of Swona Island before proceeding to the Pilot boarding area;

- With the ebb tide (westerly flow) vessels can steer towards the Pilot boarding area once they are clear of the south end of Swona Island.

Approaching from west to westerly Pilot boarding area

Vessels should pass at least 2.5 miles south of Torness on the island of Hoy before setting course to the Pilot boarding area Easterly Pilot boarding area - north of Swona Island

- It is **not** recommended that Masters without local knowledge proceed between the islands of Swona and South Ronaldsay unless advised to do so by the Pilot who should be on station at the boarding area prior to the vessel entering the OIC Marine Services harbour area. Masters who are familiar with the area may proceed between Swona and South Ronaldsay but must ensure that when proceeding with the flood tide they do not set on to the Lother Rock and with ebb tide do not set on to Swona Island.

Passage between South Ronaldsay and Muckle Skerry

- It is not recommended that vessels use this channel.

3.4 Departing Scapa Flow

West bound vessels

- The Master should proceed into the Pentland Firth passing one mile east of Switha Island and set a course to pass at least 1.5 miles southeast of South Walls.

South east bound vessels

- The Master should proceed into the Pentland Firth passing one mile east of Switha Island and then proceed on a south-westerly course keeping at least 1.5 miles west of Swona Island. A course can then be set to pass midway between Swona and Stroma Islands;
- The vessel should then make a course to pass 1.5 miles northeast of Duncansby Head;
- The Master must keep a careful watch on the effect that the tides have on his vessel whilst turning to port;
- With the ebb tide, the vessel may be slow to respond due to the vessels bow encountering the ebb tide while the stern is still in the eddy west of Swona.

Passage east of Swona

- It is not recommended that Masters without local knowledge use this channel. Providing Masters who are fully aware of the tidal currents which will affect the vessel when passing between Swona Island and Lother Rock, they may use this channel;
- It cannot be emphasised strongly enough that vessels will experience strong tidal set both eastwards with flood tide and westwards with the ebb tide as they proceed down this channel and once clear of the south end of Swona Island;
- Masters should make a course to pass midway between Swona and South Ronaldsay when Stanger Head is 0.5 miles abeam;
- When abeam of the north end of Swona Island, the Master should steer a course keeping to the middle of the channel. A careful watch must be maintained on the vessels course and speed as the very strong tides can quickly set the vessel towards the Lother Rock with flood tide and towards Swona Island with the ebb tide;
- Once clear of the Lother Rock a course can be set to pass 1.5 miles east of Duncansby Head.

Passage between South Ronaldsay and Muckle Skerry

- It is not recommended that vessels use this channel.

3.5 Manoeuvring for boarding and landing Pilots

- Masters should, where possible, when approaching the Pilot boarding area, maintain full sea speed until advised to reduce by the Pilot. Once the Pilot has disembarked on departure, the Master should increase to full sea speed as soon as possible;
- The normal speed for boarding and landing Pilots is to the Launch Coxswain's requirements and Pilot's advice ;
- The Master should ensure that his vessel remains in hand steering when navigating the Pentland Firth and its approaches and not engage automatic steering, until well clear of the area.

Pilots are expected to advise Ships Masters on these matters through usual Pilot/Master exchanges of information either when onboard or through radio communications from Pilot launches.

3.6 Suspension of boarding and landing Pilots

- In severe weather conditions, boarding and landing of Pilots may be suspended. Orkney VTS will advise Masters as soon as possible when these restrictions are in operation. Reference should be made to SOP-06-002.

3.7 Orkney VTS

- Orkney VTS maintains a continuous watch on VHF channel 16 & 11 and can advise vessels on the latest tidal, shipping or pilotage matters.

4 Responsibility

The Responsibility for ensuring that a vessel follows, as closely as practicable, the recommended navigation channel lies with the ship's Master, assisted by the Pilot if one is aboard.

The responsibility for establishing and promulgating information indicating Safe Navigation Channels lies with the Harbour Authority.

It is the Duty Marine Officer's responsibility to monitor traffic using the recommended channels and to advise vessels if their progress becomes non-compliant.

D.7 Procedure for Marine Operations Rooms

Orkney Islands Council

Marine Services

Standard Operating Procedure for Marine Operations Room

Controlled Document

(Uncontrolled when printed)

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Marine Operations Room

1 Purpose

This procedure ensures that all information logs are completed correctly and kept up to date. The procedure also ensures consistency between watch shifts and ensures a smooth hand-over of each watch.

2 Scope

This procedure covers administrative duties and operational requirements in the Marine Operations Room, Harbour Authority Building, Scapa. Reference should also be made to other relevant SOPs detailing other Marine Operation room duties.

3 Procedure

3.1 General

The Duty Marine Officer will frequently ascertain that all equipment is in good working order and any faults, deficiencies etc are recorded and notified to the relevant person for remedial action as appropriate.

Computer database and movements book must be updated as soon as practical as the database is accessible over the network. Every vessel should have a next movement pending giving the time the Pilot is required and the estimated box ticked if necessary. Such updating should be completed prior to handing over the watch.

The Duty Marine Officer shall maintain a continuous listening watch on Channels 11 and 16. A listening watch may also be required on any other prearranged working channel, including (but not limited to):

- Channel 9 – tug operations channel;
- Pre-programmed private channels for tug and pilot launches.
- Channel 14 – Operations at Kirkwall and Stromness

The duty marine officer should monitor weather conditions at Scapa Pier with reference to the safety of tugs and pilot launches. If at all concerned contact: -

- Pilot launch – duty crew or 2nd duty crew after considering hours worked previously
- Tugs – Marine Superintendent – Counter Pollution

Prior to the end of each shift the marine operations room watch hand over records must be completed. All parts of the check list must be completed and signed off. The Marine Officer commencing the shift must also sign the page to acknowledge they are aware of any items defective or outstanding.

3.2 Operators log

The operator's log (SF 05-002) is a primary source of information in the event of an enquiry and should contain a detailed record of events that are clear and understandable. All operational or safety incoming and outgoing communications via radio or telephone must be logged showing times, source and means of communications used. In the case of radio, the channel used should be logged. Fax or e-mail messages should be filed appropriately.

The weather conditions should be entered in the log at midnight, noon and at the end of each watch. This should include wind speed and direction, barometric pressure, visibility and general weather. In exceptional poor weather conditions, severe winds or if there is a dramatic change in the weather conditions then a weather report should be entered more frequently, hourly if it is thought appropriate.

If any errors are made these should not be erased. A line should be drawn through the error and a correction written beside or above it. Any such corrections should be initialled by the person making them.

The Duty Marine Officer should sign his name at the bottom of each page on which he has made entries and sign the log at the end of each watch with the time he completes his watch. The on-coming Officers should sign on for the start of his watch.

If, at any time during a watch, the duty Marine Officer is relieved for a short period, then he should sign off in the log and the person covering for him should sign on. On his return to duty, the Marine Officer should sign on again after the covering man has signed off.

3.3 Non AIS vessel reporting log sheet

Vessels reporting to Orkney VTS not fitted with AIS equipment must be recorded in the non AIS vessel movement log sheet (SF 05-003), all relevant details must be recorded. Completed log sheets must be filed in the appropriate folder.

3.4 PEC record sheet

A compulsory pilotage vessel reporting to Orkney VTS on departure from a berth and inwards to the Competent Harbour Authority Area with a PEC holder on board must be recorded in the PEC record sheet (SF 05-005). At the end of each day the number of entries must be totalled for each vessel. The sheet will be forwarded to the main reception office at the end of each calendar month.

3.5 Tidal information and weather forecasts

The Duty Marine Officer on night shift is responsible for updating the tidal information.

Local weather forecasts are to be broadcast at 0915 and 1715 daily. Updates to the local weather forecast are to be broadcast as soon after receipt as possible at times of adverse weather. The times when the local forecast is transmitted should be recorded in the operator's log.

Local weather forecasts are also to be recorded onto the telephone voicemail and Harbour's web site as soon as they are received. The receptionist during office hours will divert telephone weather forecast enquiries to voicemail, at other times this will be the duty of the Marine Officer.

Weather observations should be entered in to the spreadsheet and e-mailed to forecast provider at 0000, 0600, 1200, and 1800.

Care should be taken that all transmitted documents are properly typed and formatted.

3.6 Daily routine duties

Duty Marine Officers should complete the following during a 24 hours shift period:

- 0005 Update Pilot board
- 0600 Update duty Pier Master and pilot launch crew board
 - E-mail shipping movements to HM Customs – Mondays only with updates if required.
 - Weather forecast - When received from the forecasting provider these to be:-
 - Faxed and/or e-mailed, to the appropriate weather group and other approved recipients
 - Marine Services website and the voicemail telephone message system updated.
 - Fax shipping movements to the Orcadian (Mondays only) and to APP on Fridays prior to 0700hrs shift change.
 - Fax shipping movements to Marintel Monday – Wednesday – Friday and to HM Customs daily.
 - Change barograph sheet (Mondays only)
- 0730 Check shipping movements database updated for office staff arriving
- 0915 Broadcast weather forecast and any navigation warnings
- 1530 Weather forecast... When received from the forecast provider these to be:-
 - Faxed and/or e-mailed, to the appropriate weather group and other approved recipients
 - Marine Services website and the voicemail telephone message system updated.
- 1715 Broadcast weather forecast and any navigation warnings

Update shipping movements on the database and the Marine Services website as required.

3.7 Pilot movements and downtime

All movements of pilot boats and crews are to be logged.

Prior to a Pilots departure, the required forms should be prepared along with a Personal Locator Beacon and Radio handset tested and ready for use. You should also ensure that any other requested preparation for the anticipated shipping movement is in hand. On completion of the pilotage act, the record of the act should be recorded without delay. Duty Marine Officers should liaise with Ship Agents to ensure no relevant information field is left empty.

When a Pilot leaves a pier for the purpose of ship handling, a continuous listening watch will be maintained on agreed working channels, which may be in addition to those channels listed in Section 3.1. Such additional listening watch will be maintained until the Pilot returns to the pier.

Any down time when boarding or landing of Pilots is suspended must be recorded in the ops room downtime records in the computer network. A more frequent log of the weather conditions during such times must be kept in the operator's log. The Duty Marine officer should relay all information from duty pilots and/or duty Coxswains to the Marine Services Senior Manager and or the Port Operations Manager when formal requests for the suspension of the pilotage service are being requested.

3.8 Pilot launch crew

When a pilot launch is required in Kirkwall and Scapa Flow simultaneously, arrangements should be made for the second duty crew to muster to enable the manning of both launches. Such appropriate arrangements should be made in a timely manner with the designated second duty crew whenever possible. When calling for a pilot launch, the Duty Marine Officer should phone the coxswain who shall then call the remaining crew members.

3.9 Flotta Terminal

Close contact must be maintained with the Flotta Oil Terminal and the information on the berthing of vessels, expected completion and times a pilot is required to be recorded. The Duty Marine Officer is also expected to check periodically with the Flotta Oil Terminal on the progress of operations.

When vessels are loading on the SPM and mean wind speeds of over 30 knots are experienced, loading operations will cease, the hoses will be disconnected, blanked off and hung off ready for instant slipping. In extreme weather conditions, it may be necessary to unberth the vessel from the SPM. It is therefore imperative that the situation be closely monitored with the Flotta Oil Terminal.

The operating wind parameter for loading at the LPG jetty is set at a mean speed of 43 knots. In both scenarios the Duty Marine Officer should consult with the Flotta Oil Terminal if in fact operations have been suspended and note the times in the operators log and ops room downtime records.

Prior to a pilot arriving at the Flotta Oil Terminal the duty Marine Officer must contact the security office to arrange for transport to the LPG Jetty for the pilot.

3.10 Flotta Terminal VHF

Oil Movements Control Room at Flotta terminal has a radio set permanently tuned to marine VHF channel 69. When it is necessary to contact the Terminal and all other methods of communication have failed, this channel can be used. The call sign for Oil Movements Control Room is "FLOTTA BASE".

The purpose of this channel is to serve as a back-up communication method to terminal VHF radio sets placed on all vessels loading and/or discharging at the jetty or SPM. All communications will be answered at any time as the Oil Movements Control Room is manned on a 24-hour basis. The duty operator will pass on all messages immediately

3.11 Ship to ship transfers

The operating wind parameter for ship-to-ship transfers (STS) is set at a mean wind speed of 35 knots. If the wind speed reaches this level then STS vessels must be instructed to cease pumping cargo and disconnect cargo hoses; the Port Operations Manager should be informed of this action. If the vessels are moving in a manner such that they may damage each other then they should be separated and anchored at a safe location within Scapa Flow.

If during a ship to ship transfer, weather conditions are forecast to deteriorate to mean wind speeds of 35 knots or greater, the following should be informed to enable early communication between STS Superintendent, STS Vessel Masters and Pilots. This will enable timely mobilization of pilots if separation is likely to be needed: -

- STS superintendent for onward notification of Vessel Masters and ship agents;
- Duty Pilot;
- Port Operations Manager

3.12 Tug Manning –vessels at anchor in Scapa Flow

When any vessel, laden or in ballast, is at anchor in Scapa Flow the duty marine officer must monitor the current and forecasted weather conditions affecting the Scapa Flow area.

When a forecast is received indicating a mean wind speed of 35 knots or more, all tugs are to be informed of the same. This will set in motion the need for the tug to have a night watchman on board.

Once the actual mean speed reaches 35 knots (60 minute average) at 2 of the 4 (Barrel of Butter, Scapa, Sandy Hill or Stromness) weather stations situated around Scapa Flow the tugs must be advised of the same.

Two of the three tugs then will be fully manned. The tug crews will be called in by the night watchman.

If the mean wind speed is forecast to be in excess of 50 knots then call either the Marine Services Senior Manager or the Port Operations Manager for further advice on the manning of tugs.

The above should be treated as the norm but is subject to change depending on the number of vessels at anchor and whether in ballast or laden condition.

In addition to the above, it is a requirement for vessels anchored within Scapa Flow to have their main engines ready for manoeuvring on a maximum notice period of 30 minutes when the mean wind speed has reached 35 knots at two of the four weather stations situated around Scapa Flow. The duty marine officer shall inform vessels when this wind speed criteria has been reached.

3.13 Berth availability and usage at smaller harbours

For vessels bound for Kirkwall, Stromness or other small piers information on berth availability and usage can be obtained on through contact with their respective offices or pier master during working hours. When non scheduled vessels are expected for the relevant Harbour or Pier, staff should be contacted and advised of the situation and updated as required; the vessel should be advised to contact the local harbour or pier on the working channel or given relayed information as appropriate. The Duty Marine Officer should also satisfy himself that all necessary arrangements are in hand for the safe arrival or departure of such a vessel.

Recreational vessels wishing to use marina facilities at OIC harbours and who fail to make radio contact with local harbours should be advised of the location of visitor berths and appropriate procedures to ensure their arrival is suitably recorded.

3.14 Miscellaneous

The number of passengers on board liners must be recorded in the Shipping Records book and also on the list of liners calling into Orkney for quick reference.

Keep the Office Administrator informed of the following:-

- Tankers arriving at Scapa Flow, then departing without uplifting cargo (due to change of orders);
- STS receiving or importing vessels;

- Pilot boat use – e.g. overcarried pilots, ferry trips for teachers to North Isles, etc., where there is not a pilot on board – a chit must still be completed and charter recorded on the reporting forms;
- Bunker vessels and tankers using Scapa Pier;
- Any other vessels which do not follow normal operating procedures e.g. Royal Naval vessels, Fishery Protection vessels, NLB V/Ls, CG ETV, etc.
- Any compulsory pilotage vessel that arrives or departs without a Pilot onboard due to pilotage being suspended.

3.15 Power Cuts

In the event of a power cut, a diesel generator located at the rear of the main building should automatically start and provide power to the Marine Operations Room. Should the engine start the light above the radar transceiver room door will illuminate. If the engine fails to start automatically then the engine will have to be started manually from the generator room. Self-contained emergency lighting will provide illumination for exit from the building.

To start the generator:

- Take the key (hanging in key box in Marine Operations Room) and enter the generator room via louvered double doors at rear of building;
- Locate 'reset' button on control panel and press it. Engine should start;
- If the engine fails to start, turn 'plant control' switch to RUN position;
- If malfunction persists, call the Electrician.

When mains power has been restored, press 'Mains Return' button.

Whenever the emergency generator plant has been used, inform the Electrician at earliest opportunity.

3.16 Harbour Patrols

The Duty Marine Officer should liaise with the duty Coxswain to ensure periodic patrols of OIC Harbour Authority's waters are undertaken by the pilot launches or similar craft as described in SOP-05-008. These are to be recorded with any salient observations in the operation room's log.

3.17 Emergency Response.

OIC Marine Services maintains a series of contingency plans to deal with possible port emergencies and covers such events as, but not restricted to:-

- i) Fire
- ii) Explosion
- iii) Pollution
- iv) Collision/sinking
- v) Escape of toxic gases, liquid and hazardous chemicals
- vi) Radio active substances.
- vii) Security Incident.

The duty Marine Officer should on receiving any notification that such an incident has occurred follow the procedures as described in SOP 10-001 and the relevant Emergency Contingency Plan.

3.18 Minor Incidents and Non-Conformity reports.

Accidents, Incidents occurring should be reported to the Marine Services Senior Manager and or the Port Operations manager and further reported to the Marine Superintendents within an appropriate timing for additional investigation or action as required.

Recording of all Accidents, Incidents and Non-Conformities are described in SOP 02-004 and SOP 03-003 respectively. The duty Marine Officer should initiate the required recording as per the stated procedures, if not already being undertaken by others.

3.19 Pre-arrival Notification

Certain vessels required to provide Harbour Authorities with specific information prior to their arrival in port, as detailed in:-

- SOP 05-011 (Vessel Prior Notification Reports)
- SOP 07-010 (Port Waste Management)
- SOP 07-012 (Ballast Water Management in Scapa Flow)
- SOP 11-001 (Pre-arrival security information)

Duty Marine Officers should ensure that these are received at the operations room and processed in accordance with the relevant SOP.

3.20 Mobilisation of tugs - Outside of normal Harbour Operations

All requests or inquiries regarding towage services for Orkney Towage tugs outside normal Harbour Operations should be immediately directed to Orkney Towage management in the following order of availability:

- Marine Superintendent – Counter Pollution
- Marine Services Senior Manager

In the initial enquiry, tug availability should not be discussed as this may compromise subsequent contractual negotiations.

3.21 Lone working alarm system

The marine operations room is fitted with a lone worker alarm system. The equipment must remain active at all times. The room sensor will monitor the marine operations room at all times. When it is necessary to leave the marine operations room/top floor area the radio alarm transmitter must be taken by the marine officer. This will disable the motion sensor and activate the radio alarm transmitter.

The radio alarm transmitter must be tested daily by using the alert function. The receiver unit should be cancelled prior to the lone worker alarm system dialing to the Central Station monitoring. A test must be completed with the central station monitoring on the first Monday evening of each month.

Procedure: -

- 1 Contact Central Station monitoring on telephone 01279 635 464.
- 2 Request to test lone worker alarm system and quote password – 161426 and agree test.

- 3 Activate the lone worker alarm on the radio alarm transmitter for a period of at least 1-2 minutes.
- 4 Cancel alarm.
- 5 Contact Central Station monitoring on telephone 01279 635 464 and confirm test was received.

Marine Officers must be familiar with the operation of the equipment at all times.

4 Responsibility

It is the responsibility of the Duty Marine Officer to ensure that all aspects of this procedure are carried out in a timely fashion and logged accordingly.

It is the responsibility of the Port Operations Manager to oversee all operations carried out in the Marine Operations Room and to ensure compliance with relevant regulations and guidelines.

D.8 Port Operations in Restricted Visibility

Orkney Islands Council

Marine Services

Port Operations in Restricted Visibility

Controlled Document

(Uncontrolled when printed)

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Restricted Visibility

1 Purpose

This procedure is to provide clear guidelines for Masters, Pilots, PEC holders, Launch Crews and Marine Officers regarding the movement of vessels during periods of restricted visibility.

2 Scope

The procedure is applicable to all vessels underway within the limits of the harbour authority areas during periods of restricted visibility.

3 Procedure

3.1 General

All vessels, while navigating in harbour authority areas, are required to comply with the International Regulations for Preventing Collisions at Sea (except as provided in parts III and IV of the Orkney Harbour Areas General Bye-Laws). In restricted visibility, mariners are required to pay particular attention to rules 19 and 35 of the collision regulations and adopt good seamanship practice with regard to proceeding at an appropriate speed and keeping a proper lookout.

Any vessel encountering restricted visibility within the harbour authority areas should report details to Orkney VTS as soon as possible.

3.2 Suspension of Pilotage due to Reduced Visibility

In the event that visibility is reduced within the port, an assessment should be made by the pilot, PEC holder, and/or launch coxswain as to the extent of the area of restricted visibility. The pilot, PEC holder, and/or launch coxswain should then liaise with Orkney VTS and explain exactly which pilotage area(s) is/are affected. They should discuss the conditions of visibility they would consider necessary for the resumption of Pilotage, this must be relayed by the duty marine officer to the Marine Services Senior Manager or the Port Operations Manager to request formal suspension of the Pilotage service.

All affected vessels are to be advised of the suspension, the reason for the suspension and the time of the next review. All details pertaining to the suspension of pilotage must be noted in the marine officer's log and the period of suspension recorded on the Ops Room Downtime Records spreadsheet.

The Marine Services Senior Manager should be notified immediately should a compulsory pilotage vessel proceed within the compulsory pilotage area without a pilot. Should this vessel be a tanker leaving its anchorage or mooring, the Marine Services Senior Manager permission **must** be sought.

In the event that the visibility reduces to an unsafe level during an act of pilotage, the master of the vessel with the pilot's advice should make a decision as to whether it would be safer to continue the operation to its conclusion or to abort the operation.

3.3 Towage Operations

Vessel movements, incorporating the use of tugs during periods of restricted visibility, shall not be undertaken where: -

- (a) During anchoring, escorting or navigating operations visibility is deemed by the master, pilot or tug master to be less than 250 metres or where;
- (b) During berthing or unberthing operations at the LPG Jetty visibility is deemed by the master, pilot or tug master to be less than 300 metres or where;
- (c) During berthing or unberthing operations at the SPM or a Ship to Ship visibility is deemed by the master, pilot, or tug master to be less than 500 metres or where;
- (d) The ship/barge end of a towline cannot be clearly seen from the towing vessel's bridge.

When berthing a barge or un-powered vessel (dead ship) in restricted visibility, a full risk assessment (which will include the involvement of the pilot, if carried), should be undertaken. The results should be reflected in the passage plan before commencing the operation.

3.4 Gas Tankers

As outlined in the Orkney Harbours (Liquefied Gases) Bye-laws, the movement of LGV vessels in restricted visibility is prohibited unless otherwise directed by the Harbour Master.

4 Responsibility

- Responsibility for formally suspending Pilotage during periods of restricted visibility and for notifying the duty Marine Officer of its resumption lies with the Marine Services Senior Manager based on the advice of the duty pilot and/or duty launch coxswain.
- It is the responsibility of Masters, and Pilots including PEC holders to report restricted visibility to Orkney VTS should they encounter it while proceeding in the harbour authority areas.
- It is the responsibility of the harbour authority to advise all affected vessels that Pilotage has been suspended. This will be undertaken by the duty Marine Officer.
- It is the responsibility of the duty Marine Officer to inform the Marine Services Senior Manager of any compulsory Pilotage vessel which wishes to proceed within the compulsory Pilotage area without a Pilot.
- It is the responsibility of the duty Marine Officer to inform vessels when reporting to Orkney VTS that areas of restricted visibility are likely to be encountered within the VTS area.
- It is the responsibility of the duty Marine Officer to inform the pilot if periods of restricted visibility have been forecast for the VTS area so as to allow an assessment to be carried out.

D.9 Procedure for Pilot Operations

Orkney Islands Council

Marine Services

Standard Operating Procedure for Pilot Operations

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Pilot Operations

1 Purpose

The purpose of this procedure is to ensure that all acts of Pilotage are undertaken to standards set by OIC Marine Services and within statutory requirements. This procedure is supported by a number of other procedures including passage planning and ship defect/incident reporting.

This procedure meets requirements as described in Section 2.5 of the Port Marine Safety Code.

Reference should be made to the following procedures regarding specific operations undertaken within Scapa Flow and/or Kirkwall Harbour: -

- SOP-05-001 Traffic Monitoring in Harbour Areas
- SOP-05-002 Recommended Channels to/from Scapa Flow
- SOP-05-004 Kirkwall port control
- SOP-05-005 Stromness port control
- SOP-05-006 Traffic Information Broadcasts
- SOP-05-011 Prior Notification Report
- SOP-06-002 Suspending Pilotage
- SOP-06-004 Port Pilotage Planning
- SOP-06-006 Pilotage Incident Investigation
- SOP 07-001 Towage Guidelines
- SOP-07-002 Tug Escort Guidelines
- SOP-07-003 Tug Availability Guidelines
- SOP-07-004 Mooring/Unmooring at Flotta Oil Terminal
- SOP-07-005 Ship to Ship Transfers
- SOP-07-006 Tanker Operations at Scapa Pier
- SOP-07-007 Tanker Operations at Kirkwall Pier
- SOP-10-002 Access to/from Flotta

2 Scope

This procedure covers all acts of pilotage undertaken by OIC Marine Services Pilots.

3 Procedure

3.1 General

Pilots are expected to keep themselves familiar with the latest information on the vessel and conditions, which may affect the planning and performance of an act of Pilotage. All relevant information is to be available in the Marine Operations Room and Pilots should check for any alterations to this information prior to conducting a vessel.

When on call, Pilots are expected to make periodic checks on their next anticipated act of pilotage and ensure that the Duty Marine Officer is aware of any requirements they may have relating to the act, this should include being acquainted with relevant details forwarded to the Marine Operations room in the ships Master's Prior Notification report (SF 05-001) and Pre-arrival security information (SF 11-001). Such requirements should be made known in ample time for them to be put in hand.

With regard to navigation, the VTS Radar Equipment is to be used for monitoring vessels and as a tool in helping give result orientated advice. It is not to be used for remote Pilotage.

If a Pilot is ever in any doubt with regard to any aspect of his duties, he should, without hesitation, contact the Marine Services Senior Manager for further advice.

3.2 Preparation for Pilotage Act

The Pilot should allow sufficient time before undertaking an act of Pilotage to prepare a Pilotage passage plan as per SOP-06-004.

3.3 Pilot-Master communications

Pilots should make their first contact with inbound vessels by VHF from the Marine Operations Room prior to departing or from the pilot boat whilst on route to the Pilot station to confirm the rendezvous time, position and any other relevant information.

On boarding a vessel the Pilot must establish a clear understanding with the Master and the Bridge team members of the vessel and to confirm the vessels present position, course and speed.

The Master of the vessel must supply the Pilot with the Pilot Card; which should provide all relevant information and details regarding the vessels' maneuverability, its equipment and also to inform the Pilot of the vessels state of readiness to proceed on pilotage passage.

The Pilot should present the Master with his prepared Pilotage passage plan from embarkation to the berth or from the berth to disembarkation discussing and formally agreeing the plan to each others satisfaction as per SOP-06-004.

If a Pilot has concerns with a Master or a bridge team member's ability to comply with this instructions or requirement, then the vessel must not attempt to berth/un-berth until the situation can be clarified. The Marine Operations Room should be notified accordingly.

Prior to any final berthing approach the Pilot will check with the Ship's Master for confirmation that all the necessary preparatory work has been carried out by the ships crew and that adequate crew are at stations under the supervision of a responsible officer.

The Pilot should conduct the navigation of the vessel in a safe and professional manner to and from any point within the OIC Marine Services' area of responsibility, including having due attention to avoiding any damage to other vessels or property.

3.4 Boarding and Landing

Pilots should only use a certified pilot launch for boarding and landing to vessels requiring Pilotage services, unless agreed with by the Marine Services Senior Manager.

Before using a Pilot ladder the Pilot should satisfy himself that the ladder is fit for purpose and complies with nationally agreed standards of construction, condition and rigging (MS (Pilot Transfer Arrangements) Regulations 1999, and any advisory 'M' Notices.) Pilots will also make themselves familiar with: "The Embarkation and Disembarkation of Pilots – Code of Safe Practice (Revised March 2007)"

3.5 Pilot-Marine Officer Communications

When conducting a vessel, Pilots will keep the Marine Operations Room advised by radio on the progress of the act as necessary. The Pilot should specifically report the following: -

- Vessels draughts.
- Cargo details including any Dangerous cargoes.
- Times of boarding and landing
- Times of mooring/anchoring/underway
- Passing Nevi Skerry or Hellier Holm.

3.6 Record keeping

All Radios, together with fully completed and signed Pilot chits, Tug chits, and Port Pilotage plan briefing (SF 06-001) documentation as appropriate, are to be returned to the Marine Operations Room as soon as possible after the act of Pilotage has been completed.

3.7 Ship defects

If a vessel is encountered having a defect(s), then the reporting procedures described in SOP 02-006 should be followed.

3.8 Adverse weather conditions

Where reference is made to operating wind parameters, these relate to loading/discharging limits only. Pilotage of vessels to or from the LPG jetty, SPM, Anchorages, STS Operations or other piers and harbours within the OIC Marine Service harbour areas in strong winds and reduced visibility will be carried out at the discretion of the Pilot and in consultation with the Master of the vessel to be piloted taking into account the situation appertaining at the time.

Where adverse weather causes conditions at a Pilot station to be unsafe, and therefore a need to suspend Pilotage the procedures in SOP 06-002 should be followed.

4 Responsibilities

It is the responsibility of the Marine Services Senior Manager to ensure that Pilotage Operations are carried out to the correct standards.

It is the responsibility of the Pilots to undertake their duties as described and in accordance with the OIC Marine Services relevant Byelaws and Pilotage Directions.

D.10 Procedure for Suspending Pilotage

Orkney Islands Council

Marine Services

Standard Operating Procedure for Suspending Pilotage

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Suspended Pilotage

1 Purpose

This procedure is to provide a clear guideline for Pilots and Marine Officers with regard to situations where Pilotage is suspended and in particular, where compulsory Pilotage vessels wish to enter or proceed within the compulsory Pilotage area during such periods of suspension.

2 Scope

The procedure is applicable to all vessels required to have a Pilot on board while entering or proceeding within the harbour authority areas as defined in the Orkney Pilotage Directions 1988 (as amended 2007 & 2010).

3 Procedure

It is important that Pilots and Marine Officers be aware of and notes the following.

Where through mechanical failure, crewing difficulties or during periods of bad weather the duty Pilot and/or duty Pilot launch coxswain declare that it is not possible to either board or land a Pilot:-

- The Pilot and/or Coxswain should liaise with the duty Marine Officer and explain exactly which Pilotage area(s) is affected. They should also discuss the likely conditions they would consider necessary for the resumption of Pilotage, this should be relayed by the duty Marine Officer to the Marine Services Senior Manager to request formal suspension of the Pilotage service.
- All affected vessels are to be advised of the suspension, the reason for the suspension and when it is likely to be lifted (if this is known).
- All details pertaining to the suspension of Pilotage must be noted in the marine officer's log and the period of suspension recorded in the appropriate record sheet.
- During the period of suspended Pilotage, a vessel subject to compulsory Pilotage may wish to enter or proceed within the compulsory Pilotage area without a Pilot. The duty Pilot or Marine Officer should be careful not to advise or recommend this as a course of action.
- Should the Master of such a vessel ask if he may enter or proceed within the area, he should be advised that this is not recommended by the port but that the ultimate decision on whether to proceed rests with him, if the Master continues to proceed then the vessel will be monitored in accordance with SOP 05-001.
- The Marine Services Senior Manager should be notified immediately should a compulsory Pilotage vessel wish to enter or proceed within the compulsory Pilotage area without a Pilot. Should this vessel be a tanker leaving its anchorage or mooring, the Marine Services Senior Manager permission must also be sought.

- Any compulsory Pilotage vessel which chooses to proceed into or within the compulsory Pilotage area without a Pilot should be offered towage services where appropriate and available. The duty marine officer, where possible, shall track the vessel on the harbour VTS system, informing the vessel if, during its passage, it is standing into danger. Any advice given to the vessel should be result orientated only, leaving the details of execution on matters such as course to be steered and engine manoeuvres to the master.
- When Pilotage is suspended, any vessel movements should be limited to those which move a vessel from a hazardous situation to one which is less hazardous.

4 Responsibility

- Responsibility for formally suspending Pilotage (for whatever reason) and for notifying the duty Marine Officer of its resumption, lies with the Marine Services Senior Manager based on the duty Pilot and/or duty launch Coxswain advice.
- It is the responsibility of the harbour authority to advise all affected vessels that Pilotage has been suspended. This will be undertaken by the duty marine officer.
- It is the responsibility of the duty Marine Officer to inform the Marine Services Senior Manager of any compulsory Pilotage vessel which chooses to proceed into or within the compulsory Pilotage area without a Pilot
- It is the responsibility of the duty Marine Officer to advise tankers, where appropriate, that they require the Marine Services Senior Manager permission should they wish to leave their anchorage, mooring or berth.

D.11 Towage Guidelines

Orkney Islands Council

Marine Services

Towage Guidelines

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Towage Guidelines

1 Introduction

This document outlines the OIC Marine Services policy on the use of tugs with relation to movements carried out on vessels in the approaches to, and within Scapa Flow.

This procedure meets the requirements of Sections 2.7.2-2.7.6 of the Port Marine Safety Code.

2 Scope

This procedure applies to all shipping operations that involve the use of tugs in OIC Marine Services harbour areas.

3 Procedure

3.1 Utilisation of Tugs

Masters and Pilots are expected to. Any deviation is to be reported to the Marine Services Senior Manager or his deputy at follow these guidelines, in conjunction with the port's general directions, and deviate from them only on grounds of safety the earliest opportunity. OIC Marine Services policies on tug availability and tug escort are outlined in SOP-07-002 and SOP-07-003 respectively.

In situations where the Master does not wish to follow the professional judgement of the Pilot, the Marine Services Senior Manager or his deputy should be referred to for special directions.

3.2 Tugs used by OIC Marine Services Harbour Authority

The tugs normally used for operations in Scapa Flow are the "Einar", "Erlend" and "Harald". All three tugs are modern, powerful and highly manoeuvrable. However, Masters and Pilots should always be aware of the limitations of tugs and their equipment and the circumstances under which these limitations are prevalent. Technical details of the above tugs along with information on their crew competence and training can be found in Annex 1.

From time to time alternative tugs are used (e.g. when the regular tugs are away for refit or extra tugs are required for operational purposes). Information on these can be obtained from Orkney Towage as required.

3.3 Tow Lines

The tug lines supplied to the Orkney Towage tugs are designed to withstand all reasonable forces they are likely be subjected to during towage operations. They are to be used wherever possible. In the event of this being impractical (e.g. where the ship leads are too small to accept the tug lines), a good ship's line should be used. The Pilot, Ships Master and Tug should agree on this procedural deviation.

The Pilot, Shipmaster and Tug Masters should confer with regard to the maximum strain the rope is likely to withstand.

3.4 Berthing/Unberthing

OIC Marine Services requires the use of tugs for the operation of berthing and unberthing certain vessels at piers and moorings in Scapa Flow. The use of tugs with large ships will improve the

efficiency of the operation but their requirement is primarily one of safety. Details on the tugs to be made available for specific operations are outlined in SOP-07-003.

It is important that the Pilot's intentions for the use of tugs for berthing and unberthing are included in his Port Pilotage Plan (as per SOP-06-004) The Pilot and Master should reach agreement in the initial Pilot/Master exchange of information.

The variation on matters such as ship sizes, ship characteristics and the prevailing weather conditions make it impractical to issue detailed guidelines for the use of tugs for each conceivable act of Pilotage to or from a specific mooring. It is therefore left to the Pilot, in conjunction with the Master's support and guidance, to use the tugs to best effect. It is incumbent upon the Pilot to base his decisions on an objective assessment of safety and not on economic considerations. His decisions should take into consideration the physical aspects of the harbour area in which the ship is operating, the present weather and tidal situation and on the characteristics of the vessel being piloted.

During the manoeuvre the Pilot should ensure that: -

- (1) Any concerns a Tug Master may have concerning the safety of his tug and its crew are addressed as quickly as possible;
- (2) The Tug Masters are kept informed of the ship's main engine movements, significant alterations in course, thruster movements or anything else which may affect their tug or their understanding of the manoeuvre;

3.5 Pilot/Tug Communications

As soon as practical after boarding a ship requiring towage services, the Pilot should establish communication with all the operational tugs and satisfy himself that reception is satisfactory on the preferred working radio channel. If he changes from one radio to another, he should ask each tug for another radio check.

Other than for initial contact, Pilots should not communicate with tugs on the Orkney VTS working frequency (channel 11). The working channels for communication with tugs are channels 9, 10 and 13.

Instruction given to tugs should be clear, concise and unambiguous. For manoeuvring orders, only the accepted port vocabulary should be used. The working terminology in ascendancy of power required is:

"Stretch your line"	(pulling only)
"Minimum pull"	(or push)
"Easy pull"	(or push)
"Slow pull"	(or push)
"Half pull"	(or push)
"Three-quarter pull"	(or push)
"Full pull"	(or push)

The name of the tug to which the order applies should be called first followed by the command.

For directional "pulls", compass points relative to the ship should be used, for example "Einar – slow pull 2 points abaft the beam".

Vague and informal terminology (e.g. “a wee bit more” or “down a touch”) should be avoided.

Tug Masters will repeat all orders to ensure that they have been understood.

In the event of radio failure the manoeuvre will be aborted.

3.6 Distress Calls

From time to time ships get into difficulties around the coasts of Orkney and on such occasions they may urgently require the assistance of a tug or tugs. Pilots, in the course of their duties, would normally hear of such a situation from the Duty Marine Officer who would have received the request for assistance from the coastguard. The request for tug assistance may have originated from a “Mayday” call.

The Marine Services Senior Manager or their deputy will normally deal with this situation and pilots will be contacted to discuss tug availability.

If the Marine Services Senior Manager or their deputy is not available, the ship’s Master and Pilot should agree on the best course of action. They should feel free to abandon the present operation and may relax the requirements of these guidelines where they consider it safe to do so. If the tug requirement originated from a “Mayday” call, tugs should be released at the earliest opportunity wherever the safety of the port and ships within permits. The Duty Marine Officer is to advise the Marine Services Senior Manager or their deputy of any such developments as soon as practically possible.

Pilots, Marine Officers and Tug Masters should always feel free to approach the Marine Services Senior Manager or their deputy with any queries or comments they may have regarding this policy.

4 Reference

Information in the field of ship handling and escorting with tugs can be found in the following documents available for view in the harbour office: -

- Tug Use In Port – A Practical Guide, by Capt. H. Hensen;
- The Royal Institution of Naval Architects & Nautical Institute report on their 1993 conference on Escort Tugs, Design, Construction and Handling;
- Escort Service with a High Risk Factor (Lloyds List article), by Mike Corkhill;
- The Utilisation of Escort Tugs in Restricted Waters (Port Technology International – Issue 9).

5 Responsibility

It is the responsibility of the Marine Services Senior Manager to ensure that Towage Guidelines are adhered to.

ANNEX 1

Tug Crew Competence and Training

All crew employed by Orkney Towage Ltd are certificated to STCW95 standards.

Any new crew member is given Familiarisation Training. This will include a tour of the vessel and a Familiarisation Checklist which details the minimum training that is required before a crew member can begin his duties aboard any company vessel.

Section 6.4 of the Orkney Towage Company Safety Management System (ISM Code) refers to this and is shown below.

6.4 FAMILIARISATION TRAINING

This procedure applies to all personnel joining the vessel.

The Master is responsible for ensuring that this procedure is complied with.

To ensure full continuity of operations on-board the vessel and to ensure that the safety of all personnel, the vessel and the environment is protected, all personnel joining the vessel must familiarise themselves with all aspects of their responsibilities and the vessel's emergency procedures.

The 'Damage and Defect List' shall be used as the basis for the passing of responsibilities. All relevant details of the position, the operation of machinery/equipment, safety and pollution prevention requirements, including any Company documentation shall be handed on. The Company's Damage and Defect List must be read by the incoming Master and Chief Engineer as soon as practical on taking over on board.

The Master shall issue any new entrant to the Company with a 'Familiarisation Checklist'. The Master must ascertain from the individual his relevant experience in his position.

The 'Familiarisation Checklist' details the minimum training that is required prior to the vessel sailing for a fully experienced individual. He shall be given a tour of the vessel.

Change of Command

When the Master is relieved he shall ensure that the tug is in all respects fit for sea.

M. T. 'EINAR' and 'ERLEND'

LENGTH O.A.	31.5 m	FUEL CAPACITY	91.0 tonnes
BREADTH MLD	10.0 m	F.W. CAPACITY	50.0 tonnes
SUMMER DRAUGHT	4.78 m	DISPERSANT CAPACITY	11.7 tonnes
TRIAL SPEED	12.8 knots	FOAM CAPACITY	11.1 tonnes
B.P. AHEAD	53 tonnes	B.P. ASTERN	50 tonnes

MAIN ENGINES - 2 off RUSTON 6RK 270M developing 1492Kw each, at 900rpm.

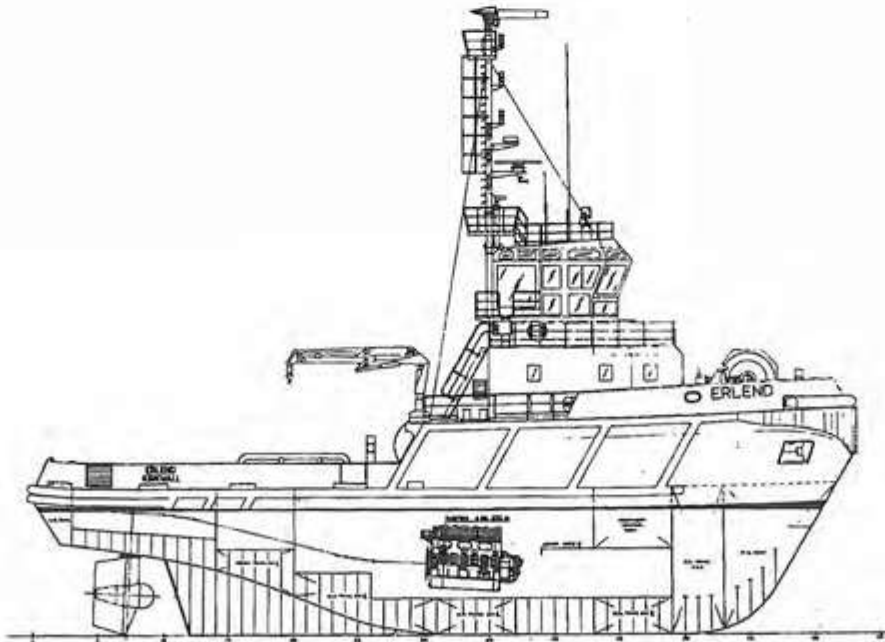
PROPULSION - 2 off AQUAMASTER US2001
driven through twin disc MCD units

GENERATORS - 2 off 150Kw Alternator driven by VOLVO TMD 122A
1 off 48Kw Alternator driven by LISTER C36M

DECK MACHINERY - Hydraulic NORWINCH anchor/windlass/tow winch
30tonnes at 12.5m/mins.
Hydraulic NORWINCH tow winch 30tonnes at 12.5m/mins
EFFER knuckle boom hydraulic crane 12tonnes/metre

FIRE PUMPS - 2 off 360 m3/hour at 135m head driven by VOLVO 122A
Supplying 1 remote and 2 hand operated monitors.

LLOYDS CLASS - 100A1TUG +LMC UMS; D.O.T. CLASS IX



M.T. "HARALD"

LENGTH O.A.	32.0 m	FUEL CAPACITY	91.0 tonnes
BREADTH MLD	10.0 m	F.W. CAPACITY	40.0 tonnes
SUMMER DRAUGHT	4.78 m	DISPERSANT CAPACITY	12.0 tonnes
TRIAL SPEED	12.8 knots	FOAM CAPACITY	12.0 tonnes
B.P. AHEAD	55 tonnes	B.P. ASTERN	50 tonnes

MAIN ENGINES – 2 off RUSTON 6RK270M developing 1492 KW each at 900 rpm

PROPULSION – 2 off AQUAMASTER US2001/UNIT driven through twin disc M.C.D. units

GENERATORS – 2 off 110 KW Alternator driven by Volvo TMD 122A
1 off 220 KW Alternator driven by Volvo TAMD 122A

DECK MACHINERY – Norwinch Hydraulic anchor windlass/tow winch (FWD)
tow winch (AFT)

Details: 10 m/min at 30 ton pull (40 ton stall)

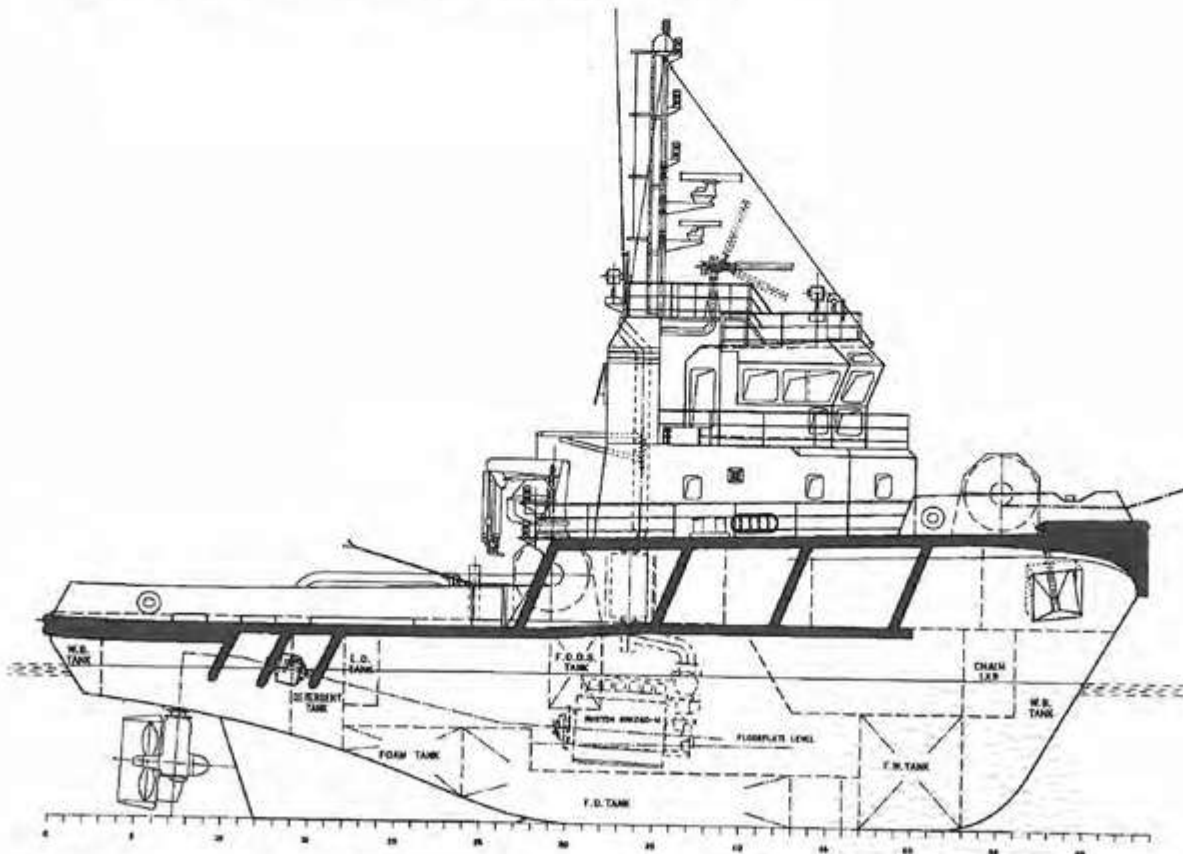
Brake capacities 160 ton

Auto tension controls with indicators

Effer knuckle boom hydraulic crane 44 tonnes metre

FIRE PUMPS – 2 off 360 m³/hour at 135m head each driven by Volvo TMD 122A
supplying 2 remote operated monitors

LLOYDS CLASS – 100 A1 TUG LMC UMS; D.O.T. CLASS IX



D.12 Tug Escort Guidelines

Orkney Islands Council

Marine Services

Tug Escort Guidelines

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Tug Escort Guidelines

1 Purpose

OIC Marine Services requires a tug escort for certain vessels navigating within Scapa Flow and its approaches. The escort is there to offer assistance should the vessel find itself in difficulty (e.g. through a main engine or steering gear failure). This procedure is to ensure that Section 2.7.2 of the Port Marine Safety Code is complied with.

2 Scope

This policy bases the requirement for tug escort on the quantity of pollutants carried by individual ships and other safety aspects. Details of the quantities of pollutants and areas of escort are detailed in Section 3.2 below.

For the purposes of this Procedure Pollutants are defined as Crude Oil and Heavy Fuel Oil.

Tug escort is only provided for ships that require a Pilot.

3 Procedure

3.1 General

The tugs employed in Scapa Flow are essentially harbour tugs and are not designed to work effectively at anything other than harbour speeds. Masters and Pilots should bear this in mind while under tug escort. It is appreciated that there may be occasions when tides, weather and a ship's steering characteristics may dictate the safe speed of a vessel in confined waters; but whenever practicable the ship's speed should be kept under 6 knots (this requirement is not applicable with respect to Area A (see below)).

The number of tugs to be used for escorting is detailed on the table in Section 3.2 below. This gives the number of tugs that are recommended to be used in each of the three areas, however, these figures are only applicable when there is a Pilot on board the ship being escorted. When a Pilot deems it safe to terminate the act of Pilotage and disembark the ship, then the requirement for active tug escort in that area is dispensed with prior to him leaving the bridge.

The decision on whether to use escort tugs actively or passively should be agreed between the Master and Pilot after having discussed the environmental conditions and the ship's manoeuvring characteristics. The final decision on how to use the tugs rests with the Pilot.

It is important that the Pilot's intentions for the use of tugs for escorting, whether passive or active, are included in his Port Pilotage Plan (as per SOP-06-004) and therefore part of the initial Pilot/Master exchange. It is also important that the Pilot gives tug masters a broad outline of the plan at an early stage and keep them informed of his intentions with regard to course and/or speed as the vessel movement progresses.

3.2 Level of Tug Escort Required

For the purpose of outlining the requirements for tug escort, Scapa Flow and approaches have been divided into areas A, B and C (see map). Each area poses its own particular hazards: -

- A: exposure to weather and exceptional tide flows;
- B: proximity to land; and
- C: proximity to anchored ships.

Area*	Quantity of pollutants	No. of Tugs	Mode
A	>5,000 tonnes	1	Stand By
B	>5,000 tonnes	1	Passive
B	>15,000 tonnes	2	Minimum 1 active
B	>170,000 tonnes	3	Minimum 1 active
C	>15,000 tonnes	2	Passive
C	>170,000 tonnes	2	Minimum 1 active

* See Map

In addition to the above table, it is recommended that any crude oil tanker in ballast should be escorted in Area A by one tug in stand by mode and in Area B by one active tug escort and in area C by one tug in passive mode.

Having taken into consideration the weather conditions and the manoeuvring characteristics of the vessel being Piloted the Pilot has discretion to dispense with any escort tug in Area C. If the Pilot wishes to reduce the number of tugs from that stated in the guidelines, then he must notify the duty Marine Officer. The duty Marine Officer will record any reduction in the number of tugs used in the operations room log.

Note: Tugs escorting vessels transiting Area A should stand by close south of the line dividing Areas A and B.

3.3 Active Escorting

Active escorting is generally accepted as being the more effective method of providing a tug escort, particularly with larger vessels. In some areas three escort tugs are required for vessels carrying more than 170,000 tonnes of pollutants and Pilots should consider securing all three for escort. Active tug escorting is only permitted where there is an OIC Marine Services Pilot on board.

In considering the use of an active escort using more than one tug, the Pilot must first discuss his plan with the tug masters to ascertain the placement of the tugs with due regard to the proximity of the other tugs and the deck layout of the ship for the tug line leads.

There are impracticalities with the use of active escorts on smaller vessels where the disadvantages can often outweigh the advantages. Pilots may wish to confer specifically with the Master on this matter.

Sufficient crew should always be stationed ready to tend the tug's line; the Pilot should have this confirmed by the escorted vessel.

3.4 Passive Escorting

Wherever possible, passive escorting should be conducted with the tug less than 1 cable from the vessel being escorted. Sufficient crew should always be stationed ready to secure the tug at short notice.

3.5 Priorities and Convoys

Occasionally the situation arises where two or more vessels require a tug escort simultaneously. This may occur where: -

- (a) One vessel is sailing while another is arriving; or
- (b) Where the vessels are arriving or sailing together.

In the case of (a), vessels arriving are to be given priority.

In the case of (b), two vessels may proceed a safe distance apart in convoy providing the guidelines on the required number of tugs and their deployment are followed as closely as circumstances permit. This will necessitate the use of an extra tug or tugs where available. The Marine Services Senior Manager or Port Operations Manager should be advised prior to any such movement and no such movement may occur without his prior approval.

In situations where more than two ships are due to arrive or sail simultaneously, then only two may be escorted at any one time.

4 Responsibility

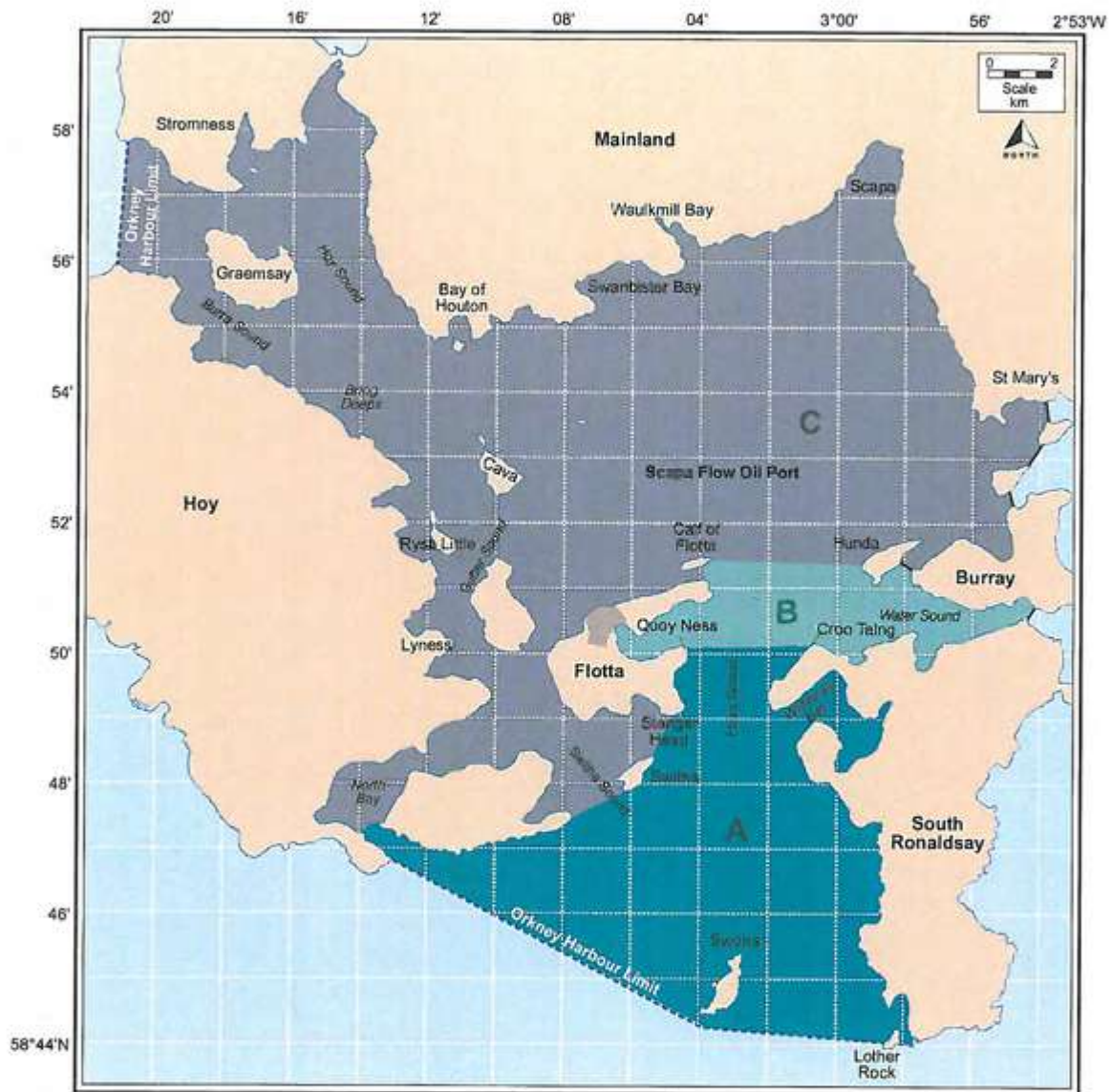
It is the responsibility of the Pilots to be familiar with and comply with the Tug Escort Guidelines.

It is the responsibility of the Marine Services Senior Manager to review the Tug Escort Guidelines in the event of a significant change in operations.

It is the Tug Master's responsibility to ensure that his tug and crew are ready and on station for escort duty at the specified time.

It is the Duty Marine Officer's responsibility to advise Tug Masters of forthcoming movements and the number of tugs required.

Figure 1. Tug escort areas for Scapa Flow and approaches



D.13 Tug Availability Guidelines

Orkney Islands Council

Marine Services

Tug Availability Guidelines

Controlled Document

(Uncontrolled when printed)

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Tug Availability Guidelines

1 Purpose

This procedure ensures that there are a sufficient number of tugs available to masters/pilots for safely manoeuvring vessels within the harbour authority areas.

This procedure meets the requirements of Section 2.7.3 of the Port Marine Safety Code.

2 Scope

This procedure applies to all tug usage undertaken within OIC Marine Services harbour waters. Reference should also be made to requirements under the Towage Guideline (SOP-07-001) and Tug Escort Guidelines (SOP-07-002).

3 Procedure

3.1 General

The number of tugs to be available for duty for specific ship movements is outlined in the table below. It is the tug Master's duty to ensure that his tug and crew are ready and on station for towage duty at the specified time.

It is the Marine Officer's duty to advise tug Masters of forthcoming movements and the number of tugs required. Tug Masters should be given as much advance notice as practicably possible.

Table 1

Movement	Ship Group	No. of Tugs
Berthing/Unberthing at LPG Jetty	< 5,000 tonnes DWT	1
Berthing at LPG Jetty	> 5,000 tonnes DWT	3
Berthing at LPG Jetty	> 5,000 tonnes DWT (capability class 2 DP vessels or higher)	2
Unberthing LPG Jetty	> 5,000 tonnes DWT	2
Berthing/Unberthing at SPMs	All ships	2
Berthing/Unberthing STS Operations	All ships (in the event of 2 VLCCs)	3 4

Note

- (1) The above table indicates the maximum number of tugs available to a Master/Pilot for a specific manoeuvre carried out under normal circumstances.
- (2) The actual number of tugs used (up to the maximum number indicated in table 1) and their utilisation remains a decision for the Master/Pilot.
- (3) In exceptional circumstances (e.g. severe weather or where ships reliability may be in question) the master/pilot should feel free to request a further tug or tugs for assistance.
- (4) The Pilot is to inform the duty Marine Officer of any situation where the number of tugs used, deviates from the number of tugs indicated in the table as available. This is to be recorded by the marine officer in the operations room log.
- (5) Tugs engaged in holding tankers on station at an SPM should be considered "available". However, where such a tug is required for other duties, the duty Marine Officer should give the terminal operators maximum notice.

- (6) In the event that there are vessels anchored in Scapa Flow the following measures shall apply: -
- i. When a forecast is received indicating a mean wind speed of 35 knots or more, all tugs are to be informed of the same. This will set in motion the need for the tug to have a night watchman on board.
 - ii. Once the actual mean wind speed reaches 35 knots (60 min average) at 2 of the 4 weather stations situated around Scapa Flow, the tugs must be advised of the same.
 - iii. Two of the three tugs will then be fully manned. The tug crews will be called in by the night watchman.
 - iv. If the mean wind speed is forecast to be in excess of 50 knots, call either the Marine Services Senior Manager or the Port Operations Manager for further advice on the manning of tugs.
 - v. The above should be treated as the norm but is subject to change depending on the number of vessels at anchor and whether in ballast or loaded condition.
- (7) Where it is not possible to meet the above availability requirements (e.g. mechanical failure, tugs on refit or other duties), the Marine Services Senior Manager or the Port Operations Manager is to be contacted for special directions. This should be carried out on a case by case basis.

3.2 Tug at SPM

Operational parameters that would necessitate the release of a tug from SPM duties (thus putting the onus on the terminal to supply an appropriate workboat), are the following: -

- a) If a vessel is berthing or unberthing at the terminal jetty, i.e. a three tug operation;
- b) If an STS berthing or unberthing operation is to take place;
- c) If, due to increased shipping movements, the efficiency of the harbour operations would be compromised without a third tug being available; and
- d) Where for any reason, pertaining to safety, the allocation of a tug is appropriate.

The terminal will be advised at the earliest opportunity that a tug is either unavailable or will be redeployed from or to SPM duties.

3.3 Emergency tug deployment

In emergency situations and exceptional circumstances, all tugs are to make themselves available at Master/Pilot's request as soon as possible while within the harbour area.

In the event of any emergency* situation within the approaches to Scapa Flow and the Pentland Firth the Marine Officer will request a tug/s to muster in readiness to attend the casualty. The Marine Services Senior Manager or the Port Operations Manager must be advised immediately following such action being taken and fully briefed on the incident. Deployment of tugs must be sanctioned by either the Marine Services Senior Manager or the Port Operations Manager, unless the tug is responding to a MayDay.

The Marine Officer will liaise with the Pilot/Master of any vessel berthing/unberthing, arriving/sailing to arrange for tug/s release from existing duties where necessary.

3.4 The Use of Tugs by PEC Holders

Tugs are not available to PEC holders without a pilot on board.

4 Responsibility

It is the responsibility of Pilots to be familiar with and comply with the Tug Availability Guidelines.

It is the responsibility of the Marine Services Senior Manager to review the Tug Availability Guidelines in the event of a significant change in operations.

It is the tug Master's responsibility to ensure that his tug and crew are ready and on station for towage duty at the specified time.

It is the duty Marine Officer's responsibility to advise tug Masters of forthcoming movements and the number of tugs required.

* Vessel in danger of grounding with threat of pollution and or loss of life.

D.14 STS and Bunkering Operations

Orkney Islands Council

Marine Services

Standard Operating Procedure for Ship to Ship Transfer and Bunkering Operations

Controlled Document

(Uncontrolled when printed)

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Ship to Ship Transfer and Bunkering Operations

1 Purpose

This procedure is to give guidance on the mooring/unmooring and to ensure that all the necessary precautions are undertaken to achieve a safe Ship to Ship Transfer (STS) Operation.

2 Scope

This procedure covers all Ship to Ship transfers including bunkering operations undertaken within OIC Marine Services waters.

3 Procedure

3.1 General

Ship to Ship transfers can only proceed with the authorisation of the Harbour Authority.

All vessels must arrive in Scapa Flow with their propeller submerged and trimmed no greater than 4 metres by the stern. A trim must be maintained which allows the vessels to be manoeuvred without difficulty throughout their stay.

No ballast water is to be discharged at any time within Scapa Flow except in accordance with SOP 07-012 (Ballast water management in Scapa Flow.). Vessels that will require to undertake a deballast operation outside the harbour limits should make suitable allowances within their cargo loading or discharge sequence plans.

VHF channel 06 is the preferred channel to be used for inter-ship communications, although the actual channel to be used for each STS operation will be agreed at the pre-operation meeting described in 3.2.

3.2 Ship to ship transfer (STS)

Transfer operations are to comply with the ICS/OCIMF STS Transfer Guide (Petroleum) Guidance (4th Edition) and the approved STS Service Provider's check lists and procedures. Only those 'Service Providers' approved by OIC Marine Services are permitted to supervise the STS operations within Scapa Flow.

STS Services Providers must submit their STS procedures for approval by OIC Marine Services; these are reviewed on a 2-yearly basis. A record of reviews, any points raised and next review date is kept by the Port Operations Manager.

Prior to any STS Operation (excluding 'Bunkering Ops') getting under way, a pre-operation meeting is held at the Harbour Office attended where possible by: -

Port Operations Manager
Pilot Representative(s)
Marine Superintendent – Counter Pollution
STS Superintendent
Ship's Agents Representative
STS Service Provider's Representative

The Pre-STS Meeting Form (SF 07-005) should be completed during the meeting. The meeting ensures all are fully briefed on the following information, and agreement finalised on any outstanding matters.

- Procedures relating to the operation;
- Intended sequence of events;
- Designated anchor position for the operation;
- Mooring configuration;
- Tug deployment;
- Oil spill response;
- Liaison requirements with Fender Care superintendent and statutory bodies.
- Communication issues
- List of visitors or crew transfers

There are four preferred designated anchor positions for STS Transfers. These are:-

STS 1 -	58° 54.098'N	003° 05.559'W
STS 2 -	58° 54.727'N	003° 03.484'W
STS 3 -	58° 55.194'N	003° 01.271'W
STS 4 -	58° 54.054'N	002° 58.889'W

However further alternative positions maybe assigned with the authority of the Port Operations Manager.

In the event of a vessel arriving several days earlier than required for a transfer operation the vessel may be anchored one of the other designated anchorages decided by the Pilot based on the expected weather conditions. However vessels must then be re-anchored within the designated STS anchorage as appropriate, prior to the rigging of hoses and fenders and in good time for the arrival alongside of transferring vessel(s).

This should be borne in mind when anchoring other tankers for bunkering or awaiting berths.

The exact sequence and order of operations, particularly during multiple ship operations will be by specific agreement between the Port Operations Manager and the STS Service Provider with full regard to the safety, and commercial interests resulting in a successful and efficient operation.

The duty Marine Officer to log times of: -

- All fast;
- Hoses connected;
- Commence cargo;
- Complete cargo;
- Hoses disconnected; and
- Let go.
- Other relevant events such as high wind warnings, suspension of cargo operations (for whatever reason)

The above information is contained in the STS Information Card (SF 07-004) which should be distributed to the STS Superintendent at the Pre-STS Meeting.

HM Coastguard (Shetland) to be informed of the commencement and completion of cargo transfer operations with this action logged.

3.3 Bunkering

Bunkering operations are to comply with appropriate sections of the ICS/OCIMF STS Transfer Guide (Petroleum) Guide, (4th Edition).

The duty Marine Officer to log times of: -

- All fast;
- Commence bunker transfer;
- Complete bunker transfer; and
- Let go.
- Other relevant events such as high wind warnings, suspension of cargo operations (for whatever reason)

HM Coastguard to be advised of commencement and completion times with this action logged.

3.4 Mooring/Unmooring

Pilots in preparing their Port Pilotage plans should include a mooring plan as per SOP 06-004. This should incorporate along with their own wealth of experience in such operations, the guidance and best practices as per the latest ICS/OCIMF STS Transfer Guide (Petroleum) Guide (4th Edition), and the STS Service Provider's procedures. The intended mooring/unmooring operation is to be fully discussed to the satisfaction of the Ship's master and STS Superintendent. Wherever possible a pre defined mooring plan provided by the STS Superintendent should be used as discussed at the pre STS meeting.

If the duty Pilot feels it is necessary, the second duty Pilot may be requested to stand by on the bridge of the anchored ship to report headings and rates of swing.

3.5 Adverse Weather

During periods of adverse weather the safety of the STS operations could be jeopardised by allowing its continuation in very high winds. Therefore, when the mean wind strength exceeds 35 knots, cargo transfer operations shall cease. All cargo hoses shall be disconnected, and consideration given to unmooring the import and export vessels to separate anchorages until there is a moderation in the weather, when cargo operations can safely resume.

In addition to the above, cargo transfer operations shall cease in the event of an electrical storm.

To prevent the possibility that deteriorating weather could reach a point where the Pilotage services and the effective use of Tugs are no longer available, the following procedure should be followed: -

- a) When the weather forecast indicates the approach of adverse weather likely to take effect prior to or during an STS operation, the Marine Officer should, in a timely manner with due regard to the expected conditions advise the following people: -
 - i) Port Operations Manager,
 - ii) the duty Pilot(s),
 - iii) the STS Superintendent,
 - iv) the Masters of the STS transfer vessels engaged in the transfer or likely to be engaged during the period of adverse weather.

- b) Port Operations Manager will take advice from the duty Pilots and the STS Superintendent. After taking all factors in to consideration, will take action as necessary.
- c) The Marine Officer shall implement agreed action in accordance with appropriate timing.

3.6 LNG Vessel Operations

- a) Pilot to confirm anchorage position prior to attending the vessel. Two Pilots are to attend the loaded LNG vessel while underway within the harbour area.
- b) An exclusion zone of 500m is to be established around both the loaded and ballasted vessels and should be monitored for unauthorised vessels entering throughout the operation. Any entry in to the exclusion zone will only be at the prior approval of Orkney VTS.
- c) In the event of an unauthorised vessel entering the exclusion zone the duty Marine Officer should establish contact with the vessel if possible and advise it to remain outside the 500m exclusion zone. If it is not possible to establish contact, a Pilot launch should be dispatched to escort the vessel clear of the zone.
- d) The Pilot vessel is to provide an escort to both the loaded and ballasted vessels when entering Scapa Flow. The escort should remain approximately 500m clear ahead of the transiting vessel and advise the duty Marine Officer of any vessels liable to be within the exclusion zone.
- e) Prior to an LNG vessel crossing harbour limits, a navigation warning containing the vessel's name, route, proposed anchoring position and establishment of the 500m exclusion zone is to be broadcast on VHF Ch 16 and 11.
- f) If mean wind speeds are in excess of 27 knots and/or are imminent or forecast to increase then consideration should be given to aborting berthing.
- g) During the operation, a navigation warning should be broadcast twice daily on VHF Channel 20 at 09:15hrs and 17:15hrs local time containing the vessel's name, position and a reminder for vessels not to enter the 500m exclusion zone.
- h) De-Ballasting operations are only to be carried out in accordance with procedures as outlined in SOP-07-12.

4 Responsibility

The responsibility for ensuring Ship to Ship Transfer and Bunkering Operations procedures are adhered to lies with the Port Operations Manager, the STS Superintendent and Ships Master.

The Marine Officer is responsible for notifying the necessary people in the event adverse weather is expected.

D.15 Tug Standby Duties

Orkney Islands Council

Marine Services

Standard Operating Procedure for Tug Standby Duties

Controlled Document

(Uncontrolled when printed)

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Tug Standby Duties

1 Purpose

This procedure is to ensure that there are a sufficient number of tugs available to provide standby duties for shipping operations within Scapa Flow.

Standby duty is when a tug is fully manned and ready for duty at all times.

2 Scope

This procedure applies to all shipping loading or discharging at any of the Flotta Oil Terminal facilities, all Ship-to-Ship Transfers within Scapa Flow and during discharge operations of coastal tankers at Scapa Pier.

The transfer of bunkers is not to be included in Ship-to-Ship transfers for the purpose of this procedure.

The Marine Services Senior Manager or the Port Operations Manager can request additional standby duties as deemed appropriate for the safe operation of the port (Other shipping activities or weather conditions).

3 Procedure

When tugs are not required for berthing or unberthing duties they will provide standby cover for operations within Scapa Flow as follows: -

• Vessels at the LPG Jetty < 5000 DWT	1 tug
• Vessels at the LPG Jetty > 5000 DWT	2 tugs
• Vessels on the SPM	1 tug
• Ship-to-ship transfer operations	2 tugs

Tugs on standby duties at the LPG Jetty can be used for escort duties, berthing or unberthing ship-to-ship transfer operations as per SOP-07-002 (Tug Escort Guidelines).

A tug on standby duties at the SPM can also be used to provide standby duties for the LPG Jetty. The tug providing standby duty and towing at the SPM will be the last to be assigned other duties and must be returned to SPM standby duty as soon as possible.

Tugs on standby duty for the LPG Jetty will berth in the vicinity of the LPG Jetty, either Sutherland Pier or a Tug mooring buoy.

When there is no shipping berthed at any of the Flotta Oil Terminal facilities but there are Ship-to-Ship transfers operations taking place, standby duties can be covered from the Scapa Pier.

Whilst a coastal tanker is discharging cargo alongside the Scapa Pier, all tugs berthed at the Scapa Pier will be on standby duty.

When a tug on standby duties is to deviate from this requirement in order to undertake other operational duties as stated in this SOP, the Tug Master will inform the duty Marine Officer of their intention to do so.

4 Responsibility

It is the responsibility of the duty Marine Officer to advise Tug Masters of vessels that are < 5000 DWT intending to berth at the LPG Jetty.

The Duty Marine Officer will liaise closely with the Mooring Masters at the Flotta Oil Terminal regarding the need for a tug to be released from SPM standby duty and towing to assist in other berthing and unberthing operations within Scapa Flow.

See SOP-07-003, (Tug Availability Guidelines)

It is the Tug Masters responsibility to ensure that their tug is available for standby duties as dictated by the shipping operations taking place within Scapa Flow.

If a tug has to leave a berth in the vicinity of the LPG Jetty due to weather conditions, the Tug Master should inform the duty Marine Officer of their intentions to do so.

The duty Marine Officer will advise the Mooring Masters at the Flotta Oil Terminal of the Tug Masters intentions.

D.16 Pilot Launch Operations

Orkney Islands Council

Marine Services

Standard Operating Procedure for Pilot Launch Operations

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Pilot Launch Operations

1 Purpose

The purpose of this procedure is to ensure that OIC Marine Services Pilot launches are operated and maintained in a consistent and safe manner.

2 Scope

The Pilot Launches are maintained and operated in accordance with the guidance as stipulated in MGN 280.

The procedure extends to all OIC Marine Services Pilot vessels, their Coxswains and Crew Members.

3 Procedure

The Coxswains and crews are responsible while on duty for the carrying out of the requirements of the pilotage service, and ensuring compliance with appropriate instructions given on behalf of OIC Marine Services by the Marine Services Senior Manager or the Port Operations Manager

The Coxswains and crews are responsible through the Marine Superintendent - Port Marine Safety for the safe, efficient and economical operation of the launch fleet and for ensuring proper procedures are followed for the efficient use, care and maintenance of each launch, its machinery and associated equipment.

Coxswains in association with the Marine Superintendent – Port Marine Safety are expected to ensure that the launches are kept ready for immediate use. Properly fuelled and stored in accordance with standing instructions.

Coxswains are charged with maintaining appropriate discipline of their crews with respect to operational procedures and time keeping, as well as also ensuring the OIC Marine Services Health and Safety, Drug and Alcohol, and Environmental policies as well as others are adhered to in accordance with standing instructions.

All damages and defects either to the launch and or its equipment or damage caused to other vessels or property occurring during a watch, however caused should be reported immediately to the Marine Operations Room.

Log books are to be accurately completed, and copies forwarded to the Harbour Authority Building Scapa on a weekly basis.

The additional duties for Pilot launches will include non-Pilotage use such as, but not limited to, Harbour Patrols (SOP 05-008), Aids to Navigation and Pier Inspections, Counter Pollution, Security and Private Hire requirements, as well as other occasional sundry voyages to fulfill OIC Marine Services operational needs.

Accidents and incidents should be reported in accordance with SOP 02-004.

4 Responsibility

While on duty, the Coxswains have responsibility for ensuring the safety of the crew and integrity of the vessel.

The Marine Superintendent – Port Marine Safety has responsibility for ensuring launch maintenance, repairs and appropriate certification.

D.17 Procedures in the Event of an Oil Spill

Orkney Islands Council

Marine Services

Marine Officer Procedures In The Event Of An Oil Spill

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CHECK LISTS

PROCEDURES

Procedure No.

1. DUTY MARINE OFFICER

START UP

On notification of incident - Decide start up

If report NOT initiated by Terminal 1

If report initiated by Terminal 2

On instruction of Oil Pollution Officer or his deputy
execute call out of selected members of OSR Team 3

Action incident log 4

On instruction of Oil Pollution Officer or his deputy
advise outside organisations 5

Co-ordinate communications 6

Duty pilot or first manager on scene to set up
Emergency Control Room 7

Duty pilot - co-ordinate display of management
data on walls of ECR 8

Assist Pollution Officer or his deputy as required

PROCEDURES

- (1) Advise Terminal Liaison Officer**
- (2) Call Oil Pollution Officer or deputy**
- (3) Executing call out**
- (4) Action incident log**
- (5) Advise outside organisations**
- (6) Co-ordinate communications**
- (7) Establish emergency control room (ECR)**
- (8) ECR information displays**

PROCEDURES

Procedure No. 1

ADVISE TERMINAL LIAISON OFFICER (Flotta Ships Only)

EXECUTOR: DUTY MARINE OFFICER

In the event that an oil pollution report has **NOT** been initiated by the Terminal the Duty Marine Officer will advise the Terminal Liaison Officer (Duty Shipping Supervisor) accordingly providing him if possible with the following details: -

- Location of pollution
- Type of oil
- Source
- Cause
- Extent
- Direction of movement
- Name of informant

Request terminal launch be directed to location of pollution to investigate.

Inform Oil Pollution Officer or his deputy of incident.

Action procedures as directed by the Oil Pollution Officer or his deputy.

PROCEDURES

Procedure No. 2

CALL OIL POLLUTION OFFICER OR HIS DEPUTY

EXECUTOR: **DUTY MARINE OFFICER**

The Duty Marine Officer on receiving advice of pollution will immediately inform the Oil Pollution Officer: -

Title and Name:	OIL POLLUTION OFFICER – DAVID SAWKINS				
Contact Numbers:	Home: _____		Mobile: _____		Office Ext: 3600
Time Called, Response and ETA	1 st	Hrs.	Positive ☐	Negative ☐	Hrs.
	2 nd	Hrs.	Positive ☐	Negative ☐	Hrs.
	3 rd	Hrs.	Positive ☐	Negative ☐	Hrs.

OR

DEPUTY OIL POLLUTION OFFICER

Provide the following details to the OIL POLLUTION OFFICER: -

- Location of pollution
- Type of oil
- Source
- Cause
- Extent
- Direction of movement
- Name of informant
- Action taken

Request what further action to be taken.

Call in Duty Pilot to act as Historian / logger in the ECR, and action Incident Log.

PROCEDURES

Procedure No. 3

EXECUTING CALL OUT

EXECUTOR: DUTY MARINE OFFICER

On instructions of the Oil Pollution Officer or his deputy contact specified team members and record callout responses: tick as required.

Contact message to read:

THERE HAS BEEN AN OIL SPILL, PLEASE REPORT TO THE EMERGENCY RESPONSE CENTRE, SCAPA. WHAT WILL BE YOUR E.T.A.?

Title and Name:	PORT OPERATIONS MANAGER - ABUL ALAM				
Contact Numbers:	Home:	Mobile:		Office Ext: 3620	
Time Called, Response and ETA	1 st	Hrs.	Positive ☐	Negative ☐	Hrs.
	2 nd	Hrs.	Positive ☐	Negative ☐	Hrs.
	3 rd	Hrs.	Positive ☐	Negative ☐	Hrs.

Title and Name:	COUNTER POLLUTION OFFICER – EOIN MILLAR				
Contact Numbers:	Home:	Mobile:		Office Ext: 3645	
Time Called, Response and ETA	1 st	Hrs.	Positive ☐	Negative ☐	Hrs.
	2 nd	Hrs.	Positive ☐	Negative ☐	Hrs.
	3 rd	Hrs.	Positive ☐	Negative ☐	Hrs.

Title and Name:	MARINE SUPERINTENDENT – DAVID HIBBERT				
Contact Numbers:	Home:	Mobile:		Office Ext: 3623	
Time Called, Response and ETA	1 st	Hrs.	Positive ☐	Negative ☐	Hrs.
	2 nd	Hrs.	Positive ☐	Negative ☐	Hrs.
	3 rd	Hrs.	Positive ☐	Negative ☐	Hrs.

Title and Name:	BIOLOGIST – JENNI KAKKONEN				
Contact Numbers:	Home:	Mobile:		Office Ext: 3652	
Time Called, Response and ETA	1 st	Hrs.	Positive ☐	Negative ☐	Hrs.
	2 nd	Hrs.	Positive ☐	Negative ☐	Hrs.
	3 rd	Hrs.	Positive ☐	Negative ☐	Hrs.

Title and Name:	EMERGENCY PLANNING MANAGER – MARGARET WALTERS				
Contact Numbers:	Home:		Mobile:		Office Ext: 2119
Time Called, Response and ETA	1st	Hrs.	Positive ☐	Negative ☐	Hrs.
	2nd	Hrs.	Positive ☐	Negative ☐	Hrs.
	3rd	Hrs.	Positive ☐	Negative ☐	Hrs.

Title and Name:	COMMUNICATIONS CONSULTANT – DAVID HARTLEY				
Contact Numbers:	Home:		Mobile:		Office Ext: 2245
Time Called, Response and ETA	1st	Hrs.	Positive ☐	Negative ☐	Hrs.
	2nd	Hrs.	Positive ☐	Negative ☐	Hrs.
	3rd	Hrs.	Positive ☐	Negative ☐	Hrs.

Title and Name:	BRIGGS ENVIRONMENTAL SERVICES EMERGENCY NUMBER				
Contact Numbers:	24 Hr Contact:		Membership Number: CM113		
Time Called, Response and ETA	1st	Hrs.	Positive ☐	Negative ☐	Hrs.
	2nd	Hrs.	Positive ☐	Negative ☐	Hrs.
	3rd	Hrs.	Positive ☐	Negative ☐	Hrs.

PROCEDURES

Procedure No. 4

INCIDENT LOG

EXECUTOR: ANY

From start up to stand down, record all:

- Key events and times**
- Key decisions and why**
- Start and finish of key tasks**
- External contacts and times**

Use pre-printed log books provided by Historian or notebook ruled and annotated in the matters shown below

At end of shift hand over to relief

At stand down, hand log book to Historian

OIL SPILL RESPONSE

SHEET NO

DATE _____

[illegible]

PROCEDURES

Procedure No. 5

ADVISE OUTSIDE ORGANISATIONS

EXECUTOR: DUTY MARINE OFFICER

TIER 1 - A spill requiring localised deployment of resources but not all available resources

NOTIFICATION -

- Terminal (if not reported by Terminal)**
- Scottish Natural Heritage (SNH)**
- RSPB Orkney**
- Executive Director of Development & Infrastructure**
- Head of Transport & Amenities**
- Environmental Health Manager**
- H M Coastguard - Shetland**
- Marine Lab - Aberdeen**
24 Hr No
- ERT Orkney**
- SEPA (Orkney)**
- Police**

PROCEDURES

Procedure No. 5

ADVISE OUTSIDE ORGANISATIONS

EXECUTOR: DUTY MARINE OFFICER

TIER 2 - A spill requiring the mobilisation of the majority of local resources plus Briggs Environmental Services.

NOTIFICATION - As TIER 1 plus

**Secretary Orkney
Fisherman's Society**

SSPCA Orkney

**Emergency Planning
Manager**

**Scottish Office
Environmental Dept,
Edinburgh**

**Chief Inspector Kirkwall
Police**

**Briggs Environmental
Services Emergency
24hr Number**

PROCEDURES

Procedure No. 5

ADVISE OUTSIDE ORGANISATIONS

EXECUTOR: DUTY MARINE OFFICER

TIER 3 - A spill requiring resources in excess of these available in Orkney.

NOTIFICATION - MAJOR SPILL

**As TIER 2 plus
Highland Region Council
Oil Pollution Officer**

**Division Officer HIFB
Kirkwall**

**Maritime and Coastguard
Agency, Aberdeen**

**Principal Officer of the
East of Scotland Marine
Survey District:
MCA Aberdeen**

PROCEDURES

Procedure No. 6

CO-ORDINATE COMMUNICATIONS

EXECUTOR: DUTY MARINE OFFICER

Establish VHF 10 as the assigned channel for communications by all vessels involved in the clean up operations.

Monitor issue of radio equipment and record.

In event of an excess of radio traffic on channel 10 authorise the use of an alternative frequency subject to approval by the Harbour Master.

PROCEDURES

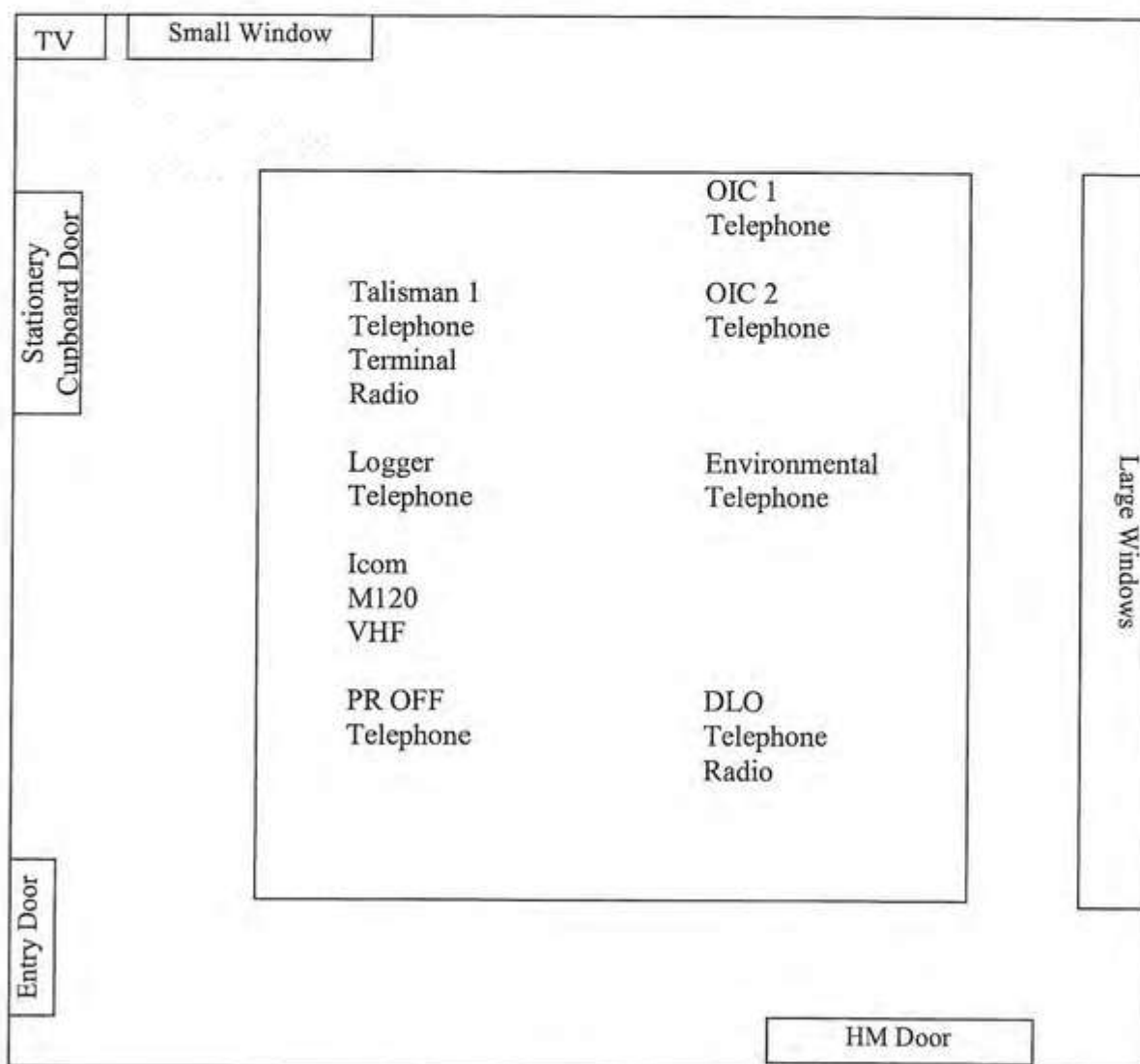
Procedure No. 7

ESTABLISH EMERGENCY CONTROL ROOM

EXECUTOR: First Manager on scene or Duty Pilot

Following the arrival of the first manager on scene or the duty Pilot instruct to proceed to ECR and set up systems as per layout drawing below. Once the ECR is set up the duty Marine Officer should be informed and the duty Pilot will assume the role of logger in the ECR

NB. Communication equipment stored in wall unit,



PROCEDURES

Procedure No. 8

EMERGENCY CONTROL ROOM INFORMATION DISPLAYS

EXECUTOR: LOGGER

CHARTS TO BE ACTIONED ON WALLS OF ECR

HEADING	*	INFORMATION CONTAINED ON CHART
RESOURCES	A	VESSEL - CURRENT TASK - LOCATION
INCIDENT LOG	B	TIME - EVENT
WEATHER/TIDES	C	LATEST WEATHER FORECASTS
	D	MAP SHOWING LOCATION OF SLICK (S) AND POSITIONS OF OIL ON BEACHES
	E	MAP SHOWING DETAILS OF LAND MASS, FOR LOCATION OF FACILITIES AND ACCESS ROADS

Appendix E OIC Marine Services Oil Spill Contingency Plan



ORKNEY ISLANDS COUNCIL MARINE SERVICES OIL SPILL CONTINGENCY PLAN

CONTROLLED COPY 1

Orkney Islands Council Marine Services

Tel: 01856 873636

Prepared By:
Briggs Environmental Services Ltd.

Tel: +44 (0)1592 872939
consultancy@briggsevenvironmental.com
www.briggsmarine.com

BESL REF: P0006

REVISION: 3.1

JANUARY 2014

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DOCUMENT CONTROL AND PLAN REVISION

The Orkney Islands Council's Oil Spill Contingency Plan is a controlled document. All document holders, detailed in the distribution list, are assigned a specific copy number. It is the responsibility of Orkney Islands Council's head of Marine Services, Engineering and Transportation for the maintenance of the document.

Any changes to the situation at the piers and harbours, changes to be made to the plan or any other updates will be issued as amendments to all holders of the plan within 3 months of such change. Irrespective, the plan will be revised on an annual basis so as to incorporate changes occurring during the year plus lessons learned from the annual exercise.

This document has an approved life span of 5 years from the date of approval by MCA and it shall be submitted in its entirety for re-approval 3 months prior to its expiry date.

REVISION PAGE

Revision	Date	Document Changes
1.0	Aug 1999	Inclusion of SNH, RSPB, SEPA and OIC Emergency Planning comments.
1.1	Oct 1999	Incorporation of SEERAD and MCA comments
1.2	Nov 1999	Change in distribution list and inclusion of MCA approval letter
1.3	July 2000	Addition to distribution list.
1.4	Mar 2001	Update to contact database, change in ownership of Flotta Terminal and update to maps.
1.5	May 2002	Update to contact database and changes to Emergency Control Room plan. Addition of the Northern Constabulary to call out (Section 6.2). Minor amendments including change of SEERAD name.
1.6	Dec 2002	Addition of Briggs Environmental Services to distribution list
2.0	Jan 2006	
2.1	May 2006	Incorporation of MCA comments
3.0	Aug 2012	Alter layout to better reflect recommendations. Removal of unnecessary content
3.1	Dec 2013	Update of document format by BESL.

STATEMENTS FROM CONSULTEES

Statement for MCA

I can confirm that the Orkney Islands Councils' Oil Spill Contingency Plan gives a realistic assessment of the perceived risk of Oil Pollution, and the response strategy required, for the area covered by this plan.



Signed

Name and Position Professor John M Baxter Principal Adviser – Marine

Representing Scottish Natural Heritage

Date 03/06/14

Statement for MCA

I can confirm that the Orkney Islands Councils' Oil Spill Contingency Plan gives a realistic assessment of the perceived risk of Oil Pollution, and the response strategy required, for the area covered by this plan.

Signed

Name and Position

Representing

Date

SEPA

The statutory consultee from Marine Scotland was contacted on 25/03/2014 and again on 26/05/2014. No comments were received regarding this plan and as such it has been assumed that the statutory consultee is content with the plan in its current form.

CERTIFICATE OF APPROVAL FROM THE MCA

ORKNEY ISLANDS COUNCIL ENVIRONMENTAL POLICY

This policy applies to all ports and harbours operated by Orkney Islands Council.

1. Protect the environment and ensure the health and safety of employees and others by considering safety, health and environmental management in all business decisions.
2. Provide necessary training and resources to implement this policy.
3. Demonstrate commitment at all levels and actively encourage consultation and participation with all employees. Have a safety conscious culture where personnel can take pride in protecting the environment.
4. Ensure all legal requirements are fulfilled using industry best practices.
5. Ensure all safety and environmental risks are assessed and manage hazards to ensure risks are as low as reasonably practical.
6. Maintain contingency plans to minimise consequences of reasonably foreseeable incidents and ensure a fast and effective response.
7. Audit compliance with this policy. Monitor its effectiveness and take appropriate action.

GLOSSARY

Abbreviation	Definition
ALARP	As Low As Reasonably Practicable
BESL	Briggs Environmental Services Ltd
BPEO	Best Practical Environmental Option
BPO	Baltic Ports Organisation
CPSO	Counter Pollution and Salvage Officer
DfT	Department for Transport
HFO	Heavy Fuel Oil
HMRC	Her Majesty's Revenue and Customs
HSG	Health and Safety Guidance
IBA	Important Bird Area
IFO	Intermediate Fuel Oil
IMO	International Maritime Organisation
ISGOTT	International Safety Guide for Oil Tankers and Terminals
ITOPF	International Tanker Owners Pollution Federation
JNCC	Joint Nature Conservation Committee
LA	Local Authority
LAN	Local Area Network
LFO	Light Fuel Oil
LOA	Length Overall
MCA	Maritime and Coastguard Agency
MFO	Marine Fuel Oil
MGO	Marine Gas Oil
MMD	Marine Management Division
MoD	Ministry of Defence
MRC	Marine Response Centre
MRCC	Marine Response Co-ordination Centre
MS	Marine Scotland
NCP	National Contingency Plan
OPRC	Oil Pollution Preparedness, Response and Co-operation Convention
OSCP	Oil Spill Contingency Plan
POB	Persons On Board
POLREP	Pollution Report
PPE	Personal Protective Equipment
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SCU	Salvage Control Unit
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SOSREP	Secretary of State's Representative
SPA	Special Protection Area
SRC	Shoreline Response Centre
SSSI	Site of Special Scientific Interest
STS	Ship-to-Ship
UK	United Kingdom
UKBAP	United Kingdom Biodiversity Action Plan
UKPIA	United Kingdom Petroleum Industry Association

FAST FACTS

KIRKWALL



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 59.18' N 02° 57.42' W	
Admiralty chart numbers	1553-0	
Water Depth (Below Chart Datum)	1-5.5m	
Maximum available length*	119m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Available	
Pilotage	Kirkwall Harbour Radio VHF channel 14 or contact Orkney VTS on VHF Ch11/16.	
Berths	Available	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	n/a	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	Yes	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

HATSTON PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	59° 00.18'N 02° 58.12'W	
Admiralty chart numbers	1553-0	
Water Depth (Below Chart Datum)	5-11m	
Maximum available length*	385m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	May be available from Scapa Flow	
Pilotage	For berth availability contact Orkney VTS on VHF Ch11/16	
Berths	1A=225m, 1B=160m, 2A=103m, 2b=124m, 3=115m, Ro Ro=157m	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	n/a	
Local authority	Orkney Island Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	Yes	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

KIRWALL – HATSTON SLIPWAY



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone Email Website	01856 873636 harbours@orkney.gov.uk www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 59.40'N 02° 58.00'W	
Admiralty chart numbers	1553-0	
Water Depth (Below Chart Datum)	0.74m at toe.	
Maximum available length*	n/a	
Maximum beam*	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	n/a	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	n/a	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

STROMNESS



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 57.4' N 03° 17.5' W	
Admiralty chart numbers	2568-1	
Water Depth (Below Chart Datum)	3-6m	
Maximum available length*	135m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SSSI – Stromness Heaths and Coast National Scenic Area – Hoy and West Mainland For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	May be available from Scapa Flow	
Pilotage	Contact Orkney VTS on VHF Ch11/16	
Berths	Available	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	n/a	
Local authority	Orkney Island Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	Yes	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

STROMNESS – POLE STAR PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 57.51'N 03° 17.90'W	
Admiralty chart numbers	2568-1	
Water Depth (Below Chart Datum)	3-6m	
Maximum available length*	50m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SSSI – Stromness Heaths and Coast National Scenic Area – Hoy and West Mainland For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Available	
Pilotage	Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	n/a	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

COPLANDS DOCK



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	58 57.70'N 03 17.60'W	
Admiralty chart numbers	1553-0	
Water Depth (Below Chart Datum)	3.5 – 6m	
Maximum available length*	100m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SSSI – Stromness Heaths and Coast National Scenic Area – Hoy and West Mainland For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>		
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	Yes	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

BURRAY PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone Email Website	01856 873636 harbours@orkney.gov.uk www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 50.60'N 02° 54.93'W	
Admiralty chart numbers	2581-0	
Water Depth (Below Chart Datum)	1-4m	
Maximum available length*	14m	
Maximum beam*	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	n/a	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

BURWICK TERMINAL



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone Email Website	01856 873636 harbours@orkney.gov.uk www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 44.40'N 02° 57.90'W	
Admiralty chart numbers	2581-0	
Water Depth (Below Chart Datum)	3-4m	
Maximum available length*	n/a	
Maximum beam*	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SSSI/SPA – Pentland Firth Islands. For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	n/a	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

EDAY – BACKALAND PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	59°09.40' N 02°44.70' W	
Admiralty chart numbers	2562-2	
Water Depth (Below Chart Datum)	5-7m	
Maximum available length*	50m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SPA – Calf of Eday. For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Contact VTS.	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Ro-Ro and conventional	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

EGILSAY PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	59°09.30'N 02°56.60'W	
Admiralty chart numbers	2249/2250	
Water Depth (Below Chart Datum)	1-2m	
Maximum available length*	28m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – i.e. leading lights, buoyage	See Section 19.4	
Environmental sensitivities	SPA – Rousay. Wyre & Rousay Sounds MPA For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – i.e. dry docks and slipways	n/a	
Cargo handling facilities – i.e. bulk, fuel, containers	Hard Ramp	
Local authority	Orkney Islands Council	
Hazards – pipelines, overhead cables		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

FLOTTA – GIBRALTAR PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 50.30' N 03° 07.80' W	
Admiralty chart numbers	2568-2	
Water Depth (Below Chart Datum)	2-3m	
Maximum available length*	53m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – i.e. leading lights, buoyage	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – i.e. dry docks and slipways	n/a	
Cargo handling facilities – i.e. bulk, fuel, containers	Conventional/ Ro-Ro	
Local authority	Orkney Islands Council	
Hazards – pipelines, overhead cables		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

FLOTTA - SUTHERLAND PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone Email Website	01856 873636 harbours@orkney.gov.uk www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 50.20' N 03° 07.90' W	
Admiralty chart numbers	2562-2	
Water Depth (Below Chart Datum)	3-5m	
Maximum available length*	100m	
Maximum beam*	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Conventional	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

GRAMESAY PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone Email Website	01856 873636 harbours@orkney.gov.uk www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 55.90' N 03° 15.90' W	
Admiralty chart numbers	2568-1	
Water Depth (Below Chart Datum)	2-5m	
Maximum available length*	20m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SPA – Hoy Natural Scenic Area – Hoy and West Mainland For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Conventional	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

HOLM PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 53.80' N 02° 54.50' W	
Admiralty chart numbers	2250-0	
Water Depth (Below Chart Datum)	1-3m	
Maximum available length*	30m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Conventional	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

HOUTON TERMINAL



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 811397
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 55.10'N 03° 11.00'W	
Admiralty chart numbers	2568-3	
Water Depth (Below Chart Datum)	1-3m	
Maximum available length*	53m	
Maximum beam*	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SPA – Hoy Natural Scenic Areas – Hoy and West Mainland For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Contact Orkney VTS on VHS channel 11/16	
Berths	This is the ferry terminal that serves Lyness and Flotta.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Ro - Ro	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

HOY – LONGHOPE PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone Email Website	01856 873636 harbours@orkney.gov.uk www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 48.10' N 03° 12.25' W	
Admiralty chart numbers	2162-0	
Water Depth (Below Chart Datum)	2-5m	
Maximum available length*	53m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Conventional	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

HOY – LYNESS PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 50.15'N 03° 11.45'W	
Admiralty chart numbers	2568-2	
Water Depth (Below Chart Datum)	4-8m	
Maximum available length*	170m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	For Tug availability contact Orkney VTS on VHF Ch11/16.	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Conventional/ Ro-Ro	
Local authority	Orkney islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

HOY – MOANESS PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone Email Website	01856 873636 harbours@orkney.gov.uk www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 55.00' N 03° 18.70' W	
Admiralty chart numbers	2568-1	
Water Depth (Below Chart Datum)	1-2m	
Maximum available length*	20m	
Maximum beam*	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SPA – Hoy National Scenic Area – Hoy and West Mainland For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Conventional	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

NORTH RONALDSAY – NOUSTER PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	59° 21.24'N 02° 26.18'W	
Admiralty chart numbers	2250-0	
Water Depth (Below Chart Datum)	1-3m	
Maximum available length*	50m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SPC – Sanday. For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Conventional	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

PAPA WESTRAY – MOCLETT PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	59° 19.60'N 02° 53.40'W	
Admiralty chart numbers	2249/2250	
Water Depth (Below Chart Datum)	1-3m	
Maximum available length*	50m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SSSI – Holm of Papa Westray SPA – Papa Westray (North Hill and Holm) For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Conventional	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

ROUSAY – TRUMLAND PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	59° 07.80'N 02° 59.10'W	
Admiralty chart numbers	2249/2250	
Water Depth (Below Chart Datum)	1-4m	
Maximum available length*	28m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SPA/SSSI – Rousay SSSI – Eynhallow Wyre & Rousay Sounds MPA For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Hard Ramp and Conventional	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

SANDAY – KETTLETOFT PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	59° 13.90'N 02° 35.80'W	
Admiralty chart numbers	2562-2	
Water Depth (Below Chart Datum)	1-2m	
Maximum available length*	50m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SAC – Sanday SSSI/SPA/Ramsar – East Sanday Coast. For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Conventional	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

SANDAY – LOTH PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone Email Website	01856 873636 harbours@orkney.gov.uk www.orkneyharbours.com
Latitude and longitude of harbour entrance	59° 11.50'N 02° 41.80'W	
Admiralty chart numbers	2562-2	
Water Depth (Below Chart Datum)	3-7m	
Maximum available length*	50m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SPA – Calf of Eday. For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Ro-Ro and Conventional	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

SCAPA PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	58° 57.40'N 02° 58.40'W	
Admiralty chart numbers	35-0	
Water Depth (Below Chart Datum)	3-6m	
Maximum available length*	80m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Available	
Pilotage	Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Conventional and Oil Pipeline	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

SHAPINSAY – BALFOUR PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	59° 01.90'N 02° 54.40'W	
Admiralty chart numbers	2584-0	
Water Depth (Below Chart Datum)	2-4m	
Maximum available length*	33m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Hard Ramp and Conventional	
Local authority	Orkney Islands Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

STRONSAY - WEST PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone Email Website	01856 873636 harbours@orkney.gov.uk www.orkneyharbours.com
Latitude and longitude of harbour entrance	59° 08.60'N 02° 36.10'W	
Admiralty chart numbers	2562-2	
Water Depth (Below Chart Datum)	1-2m	
Maximum available length*	n/a	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Conventional	
Local authority	Orkney Island Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

STRONSAY WHITEHALL



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	59°08.60'N 02°36.00'W	
Admiralty chart numbers	2562-2	
Water Depth (Below Chart Datum)	1-4m	
Maximum available length*	50m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Ro-Ro and Conventional	
Local authority	Orkney Island Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

TINGWALL PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	59° 05.40'N 03° 02.50'W	
Admiralty chart numbers	2249-0	
Water Depth (Below Chart Datum)	1.5-3.5m	
Maximum available length*	28m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Hard Ramp	
Local authority	Orkney Island Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

WESTRAY – PIEROWALL HARBOUR



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone:	01856 871313
	Mobile:	07515 397 561
	e-mail:	harbours@orkney.gov.uk
	web site:	www.orkneyharbours.com
Latitude and longitude of harbour entrance	59° 19.32'N 02° 58.60'W	
Admiralty chart numbers	2249/2250	
Water Depth (Below Chart Datum)	2-5m	
Maximum available length*	50m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Conventional	
Local authority	Orkney Island Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

WESTRAY – RAPNESS PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	59° 14.90'N 02° 51.40'W	
Admiralty chart numbers	2562-2	
Water Depth (Below Chart Datum)	2-5m	
Maximum available length*	50m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	SAC/SSSI – Faray and Holm of Faray. For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Ro-Ro and Conventional.	
Local authority	Orkney Island Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

WYRE PIER



Harbour Office contact details	Orkney Islands Council Marine Services Harbour Authority Building Scapa Orkney KW15 1SD	
	Telephone	01856 873636
	Email	harbours@orkney.gov.uk
	Website	www.orkneyharbours.com
Latitude and longitude of harbour entrance	59° 07.50'N 02° 58.40'W	
Admiralty chart numbers	2249/2250	
Water Depth (Below Chart Datum)	1-3m	
Maximum available length*	28m	
Maximum beam*	n/a	
Lock dimensions	n/a	
Navigational access – <i>i.e. leading lights, buoyage</i>	See Section 19.4	
Environmental sensitivities	Wyre & Rousay Sounds MPA For full designations see: http://gateway.snh.gov.uk/sitelink/searchmap.jsp	
Tugs	Not Available	
Pilotage	Not Available	
Berths	For berth availability contact Orkney VTS on VHF Ch11/16.	
Repair facilities – <i>i.e. dry docks and slipways</i>	n/a	
Cargo handling facilities – <i>i.e. bulk, fuel, containers</i>	Ro-Ro	
Local authority	Orkney Island Council	
Hazards – <i>pipelines, overhead cables</i>		
Tidal range	4m	
ISPS compliant	No	

*Larger vessels may be accepted on a case by case basis at the sole discretion of the harbour master

HARBOURS PROXIMITY TO ENVIRONMENTAL SENSITIVITIES

See SNH for more detail regarding environmental sensitivities in the Orkney area.

<http://gateway.snh.gov.uk/sitelink/searchmap.jsp>

ID	Name	Latitude Decimal Degree	Longitude Decimal Degree	Protected Site	Distance (km)	Direction
1	Kirkwall	58.9863	-2.9570	Orkney Mainland Moors SPA Keelylang Hill and Swartaback Burn SSSI	4.7 km	South West
				West Mainland Moors SSSI	9.9 km	North West
				Waulkmill SSSI	8.3 km	South West
2	Hatston Pier	59.0030	-2.9687	Orkney Mainland Moors SPA Keelylang Hill and Swartaback Burn SSSI	5 km	South West
				West Mainland Moors SSSI	8.7 km	North West
				Waulkmill SSSI	9 km	South West
3	Kirkwall - Hatston Slipway	58.9877	-2.9595	Orkney Mainland Moors SPA Keelylang Hill and Swartaback Burn SSSI	4.7 km	South West
				West Mainland Moors SSSI	9.7 km	North West
				Waulkmill SSSI	8.3 km	South West
4	Stromness	58.9567	-3.2917	National Scenic Area	0 km	Within
				Stromness Heaths and Coast SSSI	0.7 km	South West
				Hoy SPA	3.5 km	West
				Orkney Mainland Moors SPA Orphir and Stenness Hills SSSI	4.9 km	East
				Lochs of Harray and Stenness SSSI	3.5 km	North East
				Loch of Stenness SAC		
				Stromness Heaths and Coast SAC	4.1 km	North West
				Muckle Head and Selwick SSSI	4.3 km	South West
				Hoy SAC Hoy SSSI	5.6 km	South

ID	Name	Latitude Decimal Degree	Longitude Decimal Degree	Protected Site	Distance (km)	Direction
5	Stromness - Pole Star Pier	58.9585	-3.2983	National Scenic Area	0 km	Within
				Hoy SPA	3.2 km	South West
				Stromness Heaths and Coast SSSI	0.8 km	South
				Lochs of Harray and Stenness SSSI Loch of Stenness SAC	3.6 km	North East
				Stromness Heaths and Coast SAC	3.6 km	North West
				Muckle Head and Selwick SSSI	4.2 km	South West
				Hoy SAC Hoy SSSI	5.6 km	South
				Orkney Mainland Moors SPA Orphir and Stenness Hills SSSI	5.3 km	East
6	Copland Dock	58.9618	-3.2930	National Scenic Area	0 km	Within
				Hoy SPA	3.6 km	South West
				Lochs of Harray and Stenness SSSI Loch of Stenness SAC	3.1 km	North East
				Stromness Heaths and Coast SSSI	1.2 km	South West
				Stromness Heaths and Coast SAC	3.4 km	North West
				Muckle Head and Selwick SSSI	4.7 km	South West
				Hoy SAC Hoy SSSI	6 km	South West
				Orkney Mainland Moors SPA Orphir and Stenness Hills SSSI	5 km	East
7	Burray Pier	58.8425	-2.9180	Ward Hill Cliffs SSSI	6.5 km	South
8	Burwick Terminal	58.7375	-2.9590	Ward Hill Cliffs SSSI	4 km	North
				North Caithness Cliffs SPA	7.1 km	South West
				Pentland Firth Islands SPA Pentland Firth Islands SSSI	5.3 km	West
				Stroma SSSI	10 km	South West

ID	Name	Latitude Decimal Degree	Longitude Decimal Degree	Protected Site	Distance (km)	Direction
9	Eday - Backland Pier	59.1540	-2.7403	Doomy and Whitemaw Hill SSSI	2.9 km	North West
				Faray and Holm of Faray SAC	6.3 km	North West
				Sanday SAC	9.2 km	North East
				Calf of Eday SPA	6.3 km	North
				Mill Loch SSSI	6.6 km	North
				Calf of Eday SSSI	8.3 km	North
				Muckle and Little Green Holm SSSI	5.4 km	South West
				Faray and Holm of Faray SSSI	7 km	North West
				Mill Bay SSSI	9.5 km	South East
10	Egilsay Pier	59.1533	-2.9393	Wyre and Rousay Sounds pMPA	0 km	Within
				Rousay SPA	1.5 km	North West
				Rousay SSSI	3.2 km	West
				Fara and Holm of Faray SAC	7.7 km	North East
				Eynhallow SSSI	9.7 km	West
				Fara and Holm of Faray SSSI	8.5 km	North East
				Muckle and Little Green Holm SSSI	6.5 km	South East
				Doomy and Whitemaw Hill SSSI	7.7 km	East
11	Flotta - Gibraltar Pier	58.8363	-3.1247	Switha SSSI Switha SPA	3.9 km	South
				Hoy SSSI Hoy SAC	6.9 km	West
				Hoy SPA	6.7 km	North West
				National Scenic Area	8.5 km	North West
12	Flotta - Sutherland Pier	58.8353	-3.1257	Switha SSSI Switha SPA	3.8 km	South
				Hoy SSSI Hoy SAC	6.8 km	West
				Hoy SPA	6.7 km	North West
				National Scenic Area	8.5 km	North West

ID	Name	Latitude Decimal Degree	Longitude Decimal Degree	Protected Site	Distance (km)	Distance
13	Gramesay Pier	58.9258	-3.2590	National Scenic Area	0 km	Within
				Hoy SSSI Hoy SAC	2.8 km	South
				Orkney Mainland Moors SPA Orphir and Stenness Hills SSSI	4.4 km	North East
				Lochs of Harray and Stenness SSSI Loch of Stenness SAC	6.3 km	North
				Stromness Heaths and Coast SAC	7.8 km	North West
				Hoy SPA	0.8 km	South
				Stromness Heaths and Coast SSSI	3.5 km	North West
				Muckle Head and Selwick SSSI	5 km	West
				Waulkmill SSSI	9.6 km	East
14	Holm Pier	58.8913	-2.9050	Copinsay SPA	9.4 km	East
15	Houton Terminal	58.9177	-3.1833	Hoy SPA	2.6 km	South West
				Hoy SAC Hoy SSSI	4.5 km	South West
				Lochs of Harray and Stenness SSSI Loch of Stenness SAC	8.2 km	North West
				National Scenic Area	0.7 km	West
				Keelylang Hill and Swartaback Burn SSSI	6.4 km	North East
				Muckle Head and Selwick SSSI	9.4 km	West
				Stromness Heaths and Coast SSSI	7.5 km	North West
				Waulkmill SSSI	5.8 km	North East
				Orkney Mainland Moors SPA Orphir and Stenness Hills SSSI	2.3 km	North
16	Hoy - Longhope Pier	58.8007	-3.2025	Hoy SAC Hoy SSSI Hoy SPA	2.4 km	West
				North Caithness Cliffs SPA	9.7 km	South
				Switha SSSI Switha SPA	5.1 km	East
				National Scenic Area	9.2 km	North West
				Pentland Firth Islands SPA	10 km	South East
17	Hoy - Lyness Pier	58.8353	-3.1873	Hoy SAC Hoy SSSI Hoy SPA	3.3 km	West
				Switha SSSI Switha SPA	5.9 km	South East
				National Scenic Area	6.1 km	North West

ID	Name	Latitude Decimal Degree	Longitude Decimal Degree	Protected Site	Distance (km)	Direction
18	Hoy - Moaness Pier	58.9168	-3.3063	National Scenic Area	0 km	Within
				Hoy SPA	0.9 km	East
				Hoy SSSI Hoy SAC	1.4 km	South
				Lochs of Harray and Stenness SSSI Loch of Stenness SAC	7.9 km	North East
				Stromness Heaths and Coast SSSI	3.7 km	North
				Orkney Mainland Moors SPA Orphir and Stenness Hills SSSI	7.1 km	North East
				Muckle Head and Selwick SSSI	2.7 km	North West
				Stromness Heaths and Coast SAC	7.2 km	North
19	North Ronaldsay - Nouster Pier	59.3540	-2.4363	Sanday SAC	2.3 km	South
				East Sanday Coast SPA East Sanday Coast Ramsar East Sanday Coast SSSI	4.5 km	South
				Northwall SSSI	5.8 km	South
20	Papa Westray - Moclett Pier	59.3227	-2.8873	Papa Westray pMPA	0.8 km	North
				Faray and Holm of Faray SAC	9 km	South
				Faray and Holm of Faray SSSI	9.5 km	South
				Holm of Papa Westray SSSI Papa Westray (North Hill and Holm) SPA	2.8 km	North
				West Westray SSSI West Westray SPA	6.9 km	West
				North Hill SSSI	4.9 km	North
				Calf of Eday SPA	8.6 km	South East

ID	Name	Latitude Decimal Degree	Longitude Decimal Degree	Protected Site	Distance (km)	Direction
21	Rousay - Trumland Pier	59.1292	-2.9885	Wyre and Rousay Sounds pMPA	0 km	Within
				Rousay SPA	3.3 km	North
				Rousay SSSI	0.5 km	North
				Orkney Mainland Moors SPA West Mainland Moors SSSI	7.5 km	South West
				Muckle and Little Green Holm SSSI	8.8 km	East
				Eynhallow SSSI	7.4 km	West
22	Sanday - Kettleoft Pier	59.2257	-2.5913	Sanday SAC	0 km	Within
				East Sanday Coast SPA East Sanday Coast Ramsar East Sanday Coast SSSI	0.2 km	East
				Calf of Eday SPA	5.1 km	West
				Calf of Eday SSSI	7.2 km	West
				Central Sanday SSSI	1 km	North
				Mill Loch SSSI	9.7 km	West
				Northwall SSSI	8.5 km	North East
23	Sanday - Loth Pier	59.1883	-2.6913	Calf of Eday SPA	2.5 km	North
				Calf of Eday SSSI	4.9 km	North
				Muckle and Little Green Holm SSSI	9.9 km	South West
				Doomy and Whitemaw Hill SSSI	4.3 km	West
				Sanday SAC	4.8 km	North East
				Faray and Holm of Faray SAC	6.9 km	West
				Mill Loch SSSI	4.9 km	West
				Mill Bay SSSI	10 km	South East
				Central Sanday SSSI	7.5 km	North East
				Faray and Holm of Faray SSSI	7.5 km	West
				East Sanday Coast SPA East Sanday Coast Ramsar East Sanday Coast SSSI	6.7 km	North East
24	Scapa Pier	58.9550	-2.9683	Waulkmill SSSI	6.2 km	West
				Orkney Mainland Moors SPA Keelylang Hill and Swartaback Burn SSSI	3.8 km	West
				Orphir and Stenness Hills SSSI	9.4 km	West

ID	Name	Latitude Decimal Degree	Longitude Decimal Degree	Protected Site	Distance (km)	Direction
25	Shapinsay - Balfour Pier	59.0315	-2.9058	Orkney Mainland Moors SPA Keelylang Hill and Swartaback Burn SSSI	9.7 km	South West
				Wyre and Rousay Sounds pMPA	10 km	North
26	Stronsay - West Pier	59.1390	-2.5932	Sanday SAC	7.7 km	North
				East Sanday Coast SPA East Sanday Coast Ramsar East Sanday Coast SSSI	8.9 km	North
				Mill Bay SSSI	2.7 km	South
27	Stronsay - Whitehall	59.1457	-2.5952	Sanday SAC	6.9 km	North
				Mill Bay SSSI	3.5 km	South
				East Sanday Coast SPA East Sanday Coast Ramsar East Sanday Coast SSSI	8.2 km	North
				Central Sanday SSSI	9.8 km	North
28	Tingwall Pier	59.0872	-3.0375	Rousay SPA	6.6 km	North West
				Orkney Mainland Moors SPA West Mainland Moors SSSI	3.1 km	West
				Wyre and Rousay Sounds pMPA	2.6 km	North
				Rousay SSSI	5.3 km	North
				Glims Moss and Durka Dale SSSI	8.9 km	West
				Eynhallow SSSI	7.2 km	North West
29	Westray - Pierowall Harbour	59.3220	-2.9767	Papa Westray pMPA	4.8 km	North East
				West Westray SSSI West Westray SPA	2.3 km	South West
				Papa Westray (North Hill and Holm) SPA Holm of Papa Westray SSSI	6.7 km	North East
				North Hill SSSI	6.8 km	North East

ID	Name	Latitude Decimal Degree	Longitude Decimal Degree	Protected Site	Distance (km)	Direction
30	Westray - Rapness Pier	59.2423	-2.8550	Mill Loch SSSI	5.7 km	South East
				Doomy and Whitemaw Hill SSSI	6.6 km	South East
				Calf of Eday SSSI	6.1 km	East
				West Westray SSSI	9.4 km	North West
				Faray and Holm of Faray SAC	0.4 km	East
				Calf of Eday SPA	4 km	East
				Papa Westray pMPA	9.3 km	North
				Wyre and Rousay Sounds pMPA	8 km	South West
				Rousay SPA	6.2 km	South West
				West Westray SPA	8 km	West
				Rousay SSSI	8.8 km	South West
				Faray and Holm of Faray SSSI	1.1 km	East
31	Wyre Pier	59.1217	-2.9708	Wyre and Rousay Sounds pMPA	0.3 km	North
				Rousay SPA	4.1 km	North
				Rousay SSSI	1.7 km	North West
				Orkney Mainland Moors SPA West Mainland Moors SSSI	8.1 km	South West
				Muckle and Little Green Holm SSSI	7.9 km	East
				Eynhallow SSSI	8.6 km	North West

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PART 1: ACTIONS & OPERATIONS

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SECTION 1: INTRODUCTION

1.1 PURPOSE OF THE PLAN

The requirement to have an Oil Spill Contingency Plan for Ports, Harbour and Oil Handling Terminals around UK waters has been formalised by the Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations 1998, which implements the International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC 1990). The convention, adopted by the International Maritime Organisation (IMO) is aimed to “mitigate the consequences of major oil pollution incidents involving, in particular, ships, offshore units, sea ports and oil handling facilities”.

This plan has been prepared in accordance with the “Oil Spill Contingency Plan Guidelines for Ports, Harbours and Oil Handling Facilities” issued by the Maritime Coastguard Agency who are responsible for applying the regulations to all Ports, Harbours and Oil Handling Facilities in the UK.

This Plan has been compiled to cover the response to any spillage caused by or during operations within the jurisdiction of Orkney Island’s Council Ports and Harbour. The plan details a tiered response strategy that is in accordance with UK legislative requirements and takes into account the spill risk associated with operations; the nature of the hydrocarbons/ substances that could be spilt; the prevailing meteorological and hydrographical conditions and the environmental sensitivity of the surrounding areas.

The plan is designed to guide Orkney Island’s Council’s response personnel through the processes required to manage an oil spill originating from operations within or approaching the Ports and Harbours. The plan will be activated to deal with up to a Tier 2 hydrocarbon spill.

1.2 LEAD AGENCY

The lead agency is Orkney Island’s Council Harbour Authority with Headquarters at Scapa. The plan preparation, updating and implementation will be the Council’s Head of Marine Services Engineering & Transportation. The Deputy Harbour Master: Strategic & Support is responsible for the implementation of these plans in defined areas, are based as follows:-

Area 1: Scapa Flow Oil Port

Area 2: South Isles Harbours

Area 3: Kirkwall Harbour Area (Wide Firth/Shapinsay Sound)

Area 4: Harbours in the North Isles

Area 5: Coastline areas around Orkney outside the Harbour Area

1.3 LEVELS OF CALL OUT

Orkney Island’s Council has in place a tiered incident response system for oil spillage. The responsibility of escalating an incident from Tier 1 to Tier 2 lies with the Harbour Master or Deputy.

Tier 1 spills

For minor spills, where the response is addressed within the slipway or pier, the Orkney Islands Harbour Master will take the appropriate action and arrange for safe storage and legal disposal of waste. Tier 1 spills will be monitored and dealt with by the Orkney Island’s Council and in the event that the situation escalated into Tier 2 an external oil pollution contractor (Briggs Environmental Services Ltd) will be brought in. Since all oil spills, regardless of size, have to be reported to the appropriate Authorities, the Harbour Master will always alert the MCA.

Tier 2 and Tier 3 spills

For all spills of a higher level or those which escape the confines of the harbour, the Harbour Master will alert the Incident Response Organisation according to this Plan.

The plan indicates the Tier 1 response available at the slipways and piers. Relevant to the perceived risk through normal operations and the mechanisms for calling upon Tier 2 or 3 responses in the event of an abnormal incident or major accident. A definition of tiered levels used in this harbour are shown in Table 1.

Table 1: Tiered Response Definitions

Response Tier	Definition
Contained Operational Spills	These are spills which are contained on the vessel or dockside and do not enter the water.
Tier 1	Small operational spills that may occur within a location as a result of daily activities. The level at which events can be controlled using on site resources. A Tier 1 spill is not likely to require recourse to intervention by resources out with the port, an external incident response organisation or external authorities, except for purposes of notification.
Tier 2	Medium sized spills within the Port, that will be handled by Port Personnel and a nominated contractor or other external assistance as nominated within this plan. A Tier 2 incident may involve Local Government.
Tier 3	In the event of a much larger spill or a loss of containment incident the MCA and other authorities will mobilise along with relevant Tier 3 and national stockpiles. A Tier 3 incident is beyond the capabilities of both local and regional resources.

Source: Contingency Planning for Marine Pollution Preparedness and Response: Guidelines for Ports (2012)

1.4 CONSULTATION

This document has been compiled in consultation with the following statutory bodies and Authorities:

- Scottish Environment Protection Agency (SEPA);
- Scottish Natural Heritage (SNH);
- Marine Scotland (MS);
- The Maritime and Coastguard Agency (MCA);
- Orkney Island's Council; and
- Talisman Sinopec Energy UK Ltd.

Port Of Refuge

A Place of Refuge is defined as a place where a ship in need of assistance can take action to enable it to stabilise its condition, reduce hazards to navigations and to protect the environment and human life. A ship in need of assistance is defined as a ship in a situation that could give rise to the loss of the vessel or an environmental or navigational hazard. This does not include situations which require rescue of those on-board the vessel.

Orkney Islands Council's Ports and Harbours might be chosen by the SOSREP as a Place of Refuge for vessels. Details of each of the Ports, Harbours and Slipways are detailed in the Fast Facts within the Index of this plan.

Conditions for Vessels Entering Orkney Island Councils Ports, Harbours and Slipways

Sea temperature data show an annual variation from 5 °C in February to 13 °C in July. However in very hot summers areas of Scapa Flow have been known to reach sea temperatures of 14-16 °C.

Due to the moderating influence of the sea, Orkney has a relatively small daily range of air temperature. Annual average daily minimum temperature is 5.3 °C and annual average daily maximum is 10.3 °C. Coldest months tend to be between December and March (low of 1.4 °C) and the warmest between June and September (high of 15.0 °C).

Winds can occur from any direction, with predominant winds being from the west through to the south and south south east. Light winds (<18 knots) occur for 63% of the time and direction is evenly spread. This pattern does not however hold for stronger winds (>18 knots), which occur for 31.5% of the time with greatest frequency from the west through to south south east. Winds of gale force (>34 knots) occur for 1% of the time and periods of calm for 0.06% of the time. Strong winds are more frequent October to March, but can occur at any time of the year.

Visibility conditions are generally extremely good, excepting the occurrence of sea fog. Sea fogs can occur at any time of the year and are most common with winds from the south-east, although they will usually clear quickly if the wind changes direction to the south-west. Heavy rain or snow showers can also rapidly reduce visibility to less than one mile. Orkney experiences extended periods of daylight during the summer months, when the sun is above the horizon for over 18 hours. In contrast, during midwinter there is very little daylight with the sun above the horizon for 6 hours per day.

Assessment of weather and sea state

The weather and sea state conditions are crucial in deciding on a practical response strategy for an incident because:

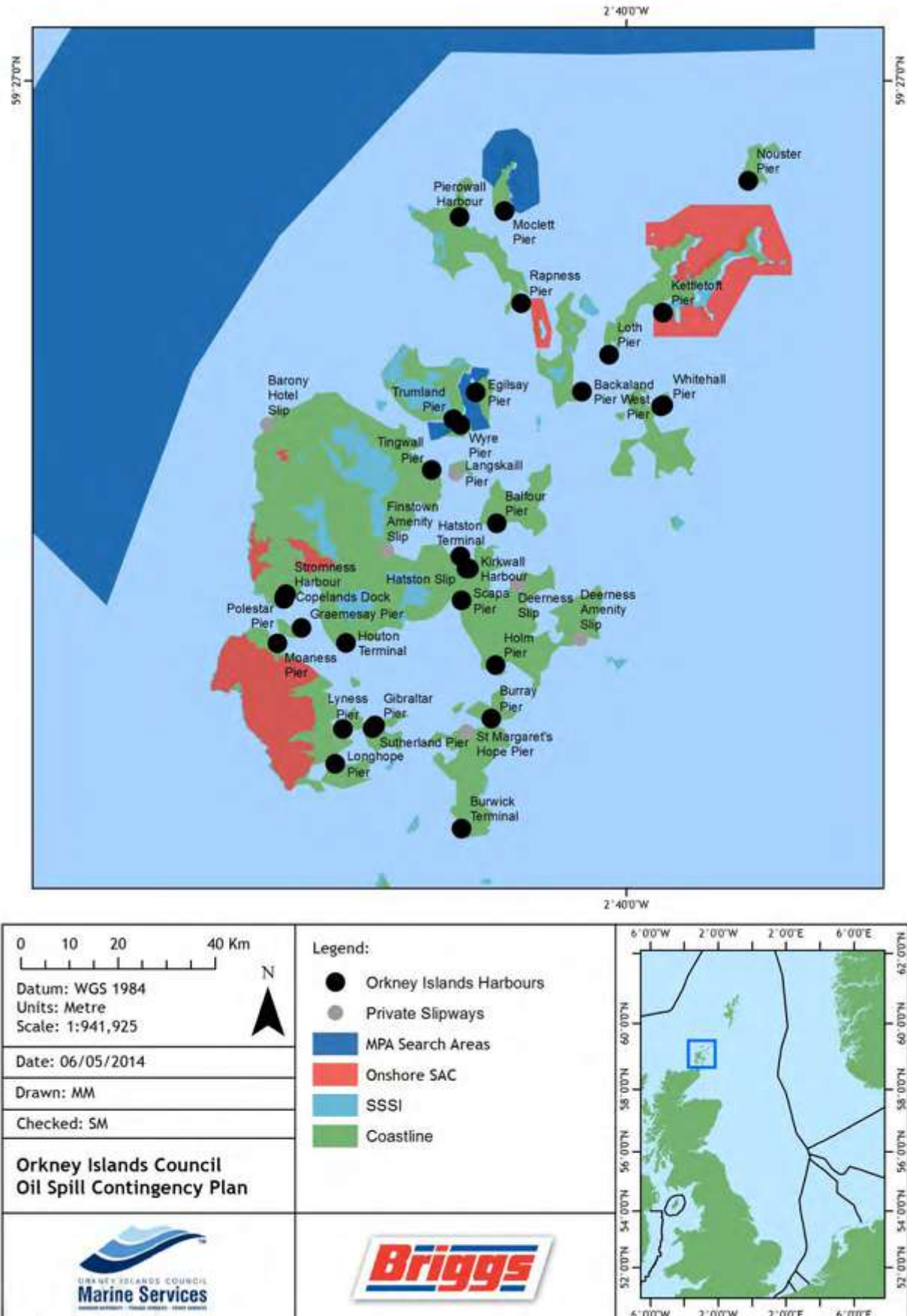
- In conjunction with the properties of the oil spilled, weather conditions will determine rate of natural dispersion and break-up of the spill.
- They will determine the feasibility of response for containment and clean-up operations and for vessel mounted and aerial spraying of dispersants.
- They will determine direction of movement of the slick.

Where possible the following parameters should be determined and reported:

- Wind speed and direction;
- Wave height/period;
- Air temperature;
- Sea surface temperature.

SECTION 2: AREA OF OPERATION

2.1 ORKNEY ISLANDS AREA



SECTION 3: ROLES AND RESPONSIBILITIES

3.1 ROLES AND RESPONSIBILITIES OF PARTIES ASSOCIATED WITH THIS PLAN

3.1.1 Orkney Islands Council

The responsibility for control of oil pollution within the statutory harbour areas and the coastline surrounding the Orkney Islands rests with Orkney Islands Council, as the statutory Harbour Authority and Shoreline Responder for areas out-with the harbour. The authority to act on their behalf has been given to the Deputy Harbour Master: Strategy & Support in his capacity as Oil Pollution Officer. The Deputy Harbour Master: Strategy & Support's roles and responsibilities include:

- Having in place appropriate contingency planning procedures.
- Ensuring adequate resources and trained personnel available to respond to any oil spill in harbour waters.
- Implementing and co-ordinating all measures outlined in the Oil Spill Contingency Plan.
- Employing outside contractors, equipment or vessels as necessary.
- Liaison with HM Coastguard, MCA Pollution Control, Scottish Natural Heritage, Scottish Environment Protection Agency (SEPA) and other external agencies as required.
- Shoreline clean-up (as Harbour Authority and Local Authority).
- Co-ordinate release of information to the media.
- Establishing a Shoreline Response Centre (SRC) in conjunction with MCA Counter Pollution Branch.
- Co-ordinate with MCA concerning establishment of Marine Response Centre (MRC)

3.1.2 Tanker or Vessel Owners

- Responsible for having in place adequate Shipboard Oil Pollution Emergency Plan (SOPEP).
- Responsible for having third party liability, including pollution liability, insurance.

3.1.3 Maritime and Coastguard Agency (MCA)

- Responsible for ensuring that port and harbour authorities have adequate contingency plans and resources for dealing with a spill in harbour waters.
- Co-ordinate government response to pollution at sea.
- Acts in accordance with National Contingency Plan.
- Mobilise government equipment resources as required.
- Assists in co-ordinating clean-up of the shoreline (in conjunction with local authorities).
- Responsible for establishment of SRC on request from OIC and following mutual agreement between both parties that such an action is necessary.
- Provide advice and technical/scientific expertise.
- Establish a Marine Response Centre (MRC)

3.1.4 HM Coastguard

- Co-ordinate maritime search and rescue.
- Provide early warning system for oil pollution and reports all spills to the Maritime & Coastguard Agency.
- Provide facilities for MCA pollution response operations if required.

3.1.5 Secretary of State's Representative (SOSREP)

The role of the SOSREP is to represent the Secretaries of State for the Department for Transport (in relation to ships) and for the Department of Energy and Climate Change (in relation to offshore installations) by removing or reducing the risk to safety, property and the UK environment arising from accidents involving ships, fixed or floating platforms or sub-sea infrastructure. SOSREP's powers extend to UK territorial waters (12 nautical miles from the coast/baseline) for safety issues and to the UK Pollution Control Zone (200 miles or the median line with neighbouring states) for pollution. SOSREP is empowered to make crucial and often time-critical decisions, without delay and without recourse to higher authority, where such decisions are in the overriding UK public interest.

Working closely with the MCA, its parent organisation the Department for Transport (DfT) and the Department of Energy and Climate Change (DECC), SOSREP's key responsibilities include:

- acting at the earliest point during a shipping or offshore incident to assess the risk to safety, to prompt the end of any such incident and to ensure that increasing risk is evaluated and appropriate measures taken to prevent or respond to escalation;
- monitoring all response measures to significant incidents involving shipping and the offshore industry;
- if necessary, exercising ultimate control by implementing the powers of intervention, acting in the overriding interests of the UK and its environment;
- participating in major national and international exercises;
- reviewing all activities after significant incidents and exercises.

3.1.6 Scottish Natural Heritage (SNH)

- Lead conservation body with respect to oil pollution incidents within the 12-mile territorial limit.
- Provide advice on conservation issues to SRC.
- Will participate in the advisory Environment Group should one be established.
- Carry out surveys of any affected coastline in the event of an oil spill.
- Responsibility to safeguard and enhance Scotland's natural heritage, particularly its natural, genetic and scenic diversity.

3.1.7 Scottish Environment Protection Agency (SEPA)

- SEPA is a non-departmental public body responsible for the protection of the environment in Scotland and is accountable to the Secretary of State for Scotland.
- Responsible for water quality issues from land-based sources, including monitoring discharges, taking enforcement action where illegal pollution occurs and overseeing remedial work.
- Provides advice on the impact of spills and at-sea operations as far as these affect licensed sites such as marine fish farms.
- Regulatory authority on the disposal and management of waste.
- Provide advice on waste minimisation.
- Provide advice on the location and form of temporary waste storage and treatment.
- Provide advice on the disposal options for waste.

3.1.8 Royal Society for the Protection of Birds (RSPB)

- A voluntary organisation concerned with the conservation of birds and their habitats
- Provides up to date information on the numbers and whereabouts of birds at risk.
- Can mobilise staff and volunteers to establish numbers of oiled birds on beaches.

3.1.9 Ministry of Defence (MoD)

- Responsible for dealing with pollution caused by naval or other MoD vessels.

3.1.10 International Oil Pollution Compensation Fund (IOPC)

- Provides compensation for oil pollution damage from laden tankers over and above the liability of the vessel owner.

3.1.11 International Tanker Owners Pollution Federation (ITOPF)

- Provide technical advice on oil spill response.
- Advises IOPC fund on technical aspects of the response option and reasonableness of claims for compensation.
- Advises vessel owners and P&I club insurers on technical aspects of oil spill response.
- Provides advice to central and local government on clean-up measures with particular relevance to compensation schemes.

3.1.12 St. Margaret's Hope Pier Trustees

- Operate a small harbour which abuts the harbour area of the Orkney Harbour Authority
- The harbour is a terminus and home port for Pentland Ferries' vessels
- The harbour is also used by a number of creel boats and some dive charter vessels
- It operates its own Tier 1 response within the terms of OPRC
- It has an agreement with the Orkney Harbour Authority for assistance in pollution response. This agreement extends to the involvement of the Orkney Harbour Authority's Tier 2 responders – Briggs Marine Environmental Services.

3.1.13 UK Petroleum Industry Association (UKPIA)

- Consultation service
- Technical and information services

3.1.14 HM Revenue and Customs (HMRC)

- Responsible for claiming Petroleum Revenue Tax from landed recovered oil.

3.1.15 Scottish Society for Prevention of Cruelty to Animals (SSPCA)

- A voluntary organisation concerned with the prevention of cruelty to animals.
- Can mobilise staff and volunteers to help in the event of an incident.

3.1.16 Orkney Wildlife Emergency Response Group (OWERG)

- A voluntary organisation concerned with the protection of wildlife in Orkney.
- Can mobilise volunteers to help in the event of an incident.

3.2 INTERFACES WITH OTHER PLANS

The divisions of responsibility, which are adhered to by the MCA Counter Pollution Branch (as the national competent authority), and which determine which contingency plans will be activated to respond to a pollution incident, are defined in the National Contingency Plan. These divisions of responsibility are dependent on the source of pollution and the likelihood of oil beaching.

Under the National Contingency Plan, ports and harbours are responsible for responding to incidents of marine pollution within their areas of jurisdiction. St. Margaret's Hope Pier has their own OSCP in place for tier 1 response. They have an agreement with the Orkney Harbour Authority for assistance in pollution response.

In addition, the National Contingency Plan states that in the early stages of an incident, the local authority or EHS establishes a Tier 1 or Tier 2 response. As a municipal harbour authority, Orkney Islands Council Marine Services shall act on behalf of the local authority in this instance.

OIC Harbours has developed a detailed coastal sensitivity and clean-up strategy computerised database (OIC Harbours Oil Spill Contingency Plan Database) based on one-kilometre squares covering the full extent of Orkney's coastline.

The interfaces between OIC Harbours Oil Spill Contingency Plan and other local, national and international guidance are shown in **Figure 1** below.



Figure 1: OSCP interfaces

3.3 INCIDENT RESPONSE ORGANISATION

In response to an oil spill, OIC Marine Services personnel will be mobilised. The level of response is determined by the size of oil spill incident. OIC Marine Services Oil Pollution Officer will be responsible for co-ordinating response to oil spill incidents in Orkney harbour waters. The Head of Marine Services, Engineering & Transportation is responsible to the Oil Pollution Officer for all onshore clean-up activities.

In the event of an oil spill an Emergency Response Team (ERT) will be established by the Oil Pollution Officer. The ERT will be comprised of all technical, operational and administrative support elements required as determined by the size and nature of the oil spill incident. **Figure 2** below shows the oil spill response organisation.

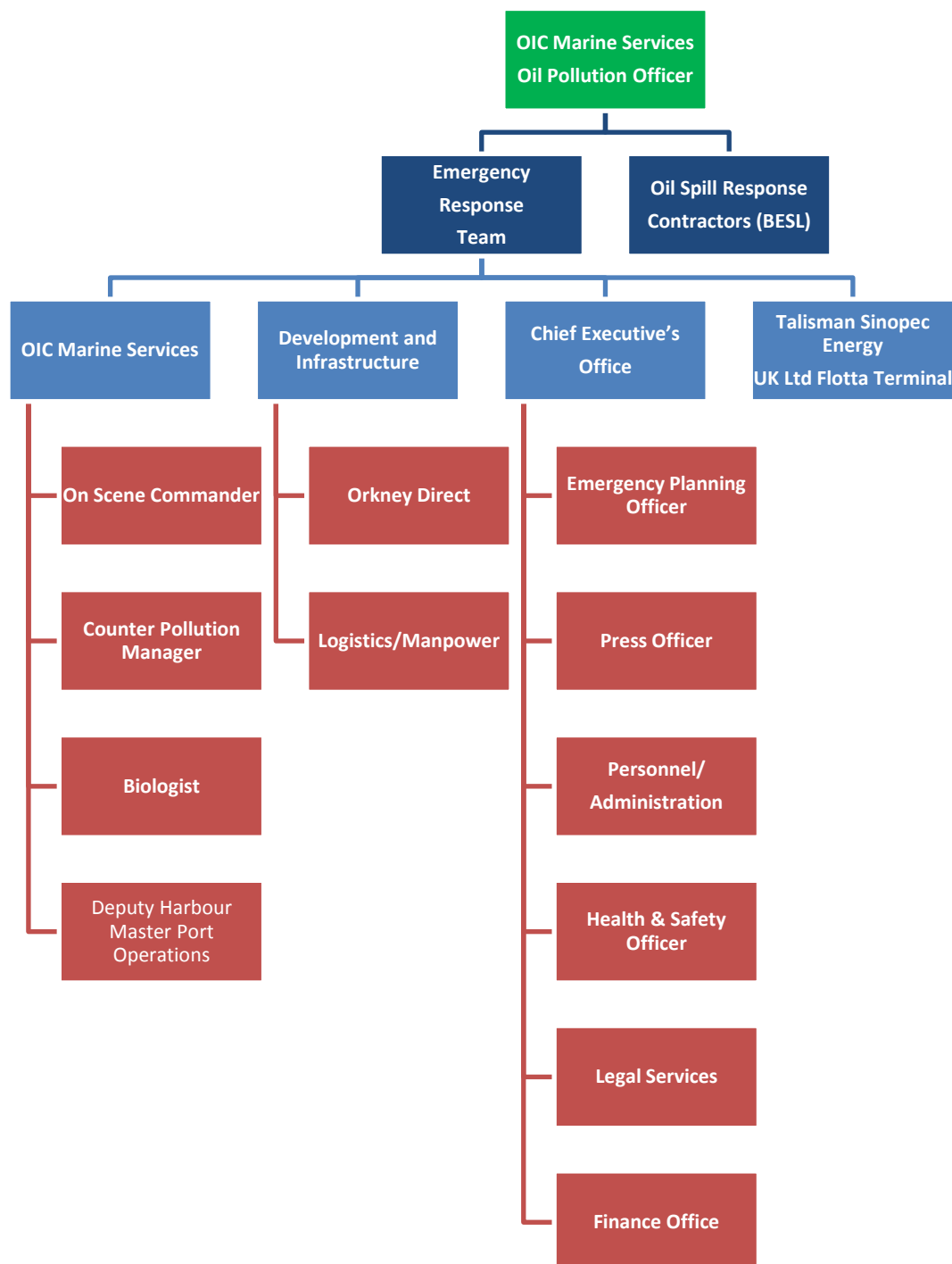


Figure 2: Concerned parties in the event of a spill

As an incident response progresses it is imperative to have feedback from sites in the field, assessment of the situation and forward planning, all on a regular basis.

Table 2: The responsibility for clean-up operations.

Location of pollution	Responsibility for clean-up lies with:
On the water	Harbour authority
Jetties/wharves/structures owned by Harbour Authorities	Harbour authority
Beach/shoreline owned by the harbour authority	Harbour authority
Foreshore owned by a private individual or group	Foreshore owner(s)
Shoreline (including land exposed by falling tide) and other structures	Local authority

Definitions of tiered levels used in this harbour are shown in *Section 1.3*

3.4 RESPONSIBILITIES AND INCIDENT CONTROL ARRANGEMENTS

In the event of an oil spill, the Emergency Control Room (ECR) will be established for the use of the ERT at the Harbour Authority Building, Scapa. For small Tier 1 spills it may not be necessary to establish the ECR where the Duty Marine Officer or Flotta Terminal personnel can manage the situation. The decision not to establish the ECR will be made by the Oil Pollution Officer or his delegate.

In a major spill situation (Tier 3) where OIC resources are not sufficient to deal with the spill a Shoreline Response Centre (SRC) may be established. An SRC will only be established at the request of OIC Marine Services to the Maritime & Coastguard Agency (MCA) and with the mutual agreement of both parties. An MCA counter pollution officer will be deployed to act as land co-ordinator and other central government scientific, technical and administrative staff will be brought in as necessary. OIC Marine Services will retain control of determining strategy and priorities for action and the MCA will assist in achieving these objectives.

In the event that an incident escalates such that the National Contingency Plan is activated, primacy of control will be with SOSREP. In this case the Harbour Authority will render advice and every assistance to SOSREP in achieving his objectives whilst ensuring that ultimate responsibility for the response remains, and is seen to remain, with SOSREP. SOSREP will control salvage, pollution prevention and control in relation to incident response. SOSREP has no responsibility for pollution clean up or shoreline response. The ECR will remain an operational centre though SOSREP and his team will be housed elsewhere. Various sites have been identified for this including the Coastguard building in Kirkwall, various hotels, or the Pickaquoy Centre. As the scale of an incident becomes apparent various aspects of Orkney Islands Council Emergency Plan will be invoked to accommodate an influx of responders, press, volunteers, etc, as well as dealing with external media enquiries.

SECTION 4: ACTION SHEETS

This section contains an overview of incident control arrangements held by personnel within OIC Marine Services in the event of an oil spill. Personnel call-out will be determined by the specific oil spill situation and it is the responsibility of the Oil Pollution Officer to determine personnel call-out requirements.

All spills	
Team Member	Key responsibility
Duty Marine Officer	Call-out of Emergency Response Team personnel.
Oil Pollution Officer	Overall responsibility for all pollution control activities. In the event of a major spill he will coordinate all onshore and offshore responses.
Counter Pollution Manager	Act on behalf of the Oil Pollution Officer where required. Offer operational advice and act as on-scene commander. Assist with the set-up of the Emergency Control Room on arrival at Harbour Authority Building Designated Safety Officer for OIC Marine Services
Terminal Shipping Superintendent* (Flotta Terminal spills only)	Responsible for immediate response to any Terminal oil spill and activation of Flotta Terminal Oil Spill Contingency Plan. Liaison between OIC Harbours and Talisman.
Deputy Harbour Master Port Operations	Deputise for Counter Pollution Manager in the event of absence. Assist with the set-up of the Emergency Control Room on arrival at Harbour Authority Building.
Pier Operations Manager/Pier Master	Ensure prompt reporting to Duty Marine Officer. Initiate initial response using oil pollution kit on site.
Major spills (>1 tonne)	
Team Member	Key responsibility
On-scene Commander	Overall on-scene control of the incident.
Counter Pollution Manager	Offers operational advice and liaison. Act as On Scene Commander if required by Oil Pollution Officer. Designated Safety Officer for OIC Marine Services
Deputy Harbour Master Port Operations	Deputise for Counter Pollution Manager in the event of absence. Assist with the set up of the Emergency Control Room on arrival at Harbour Authority Building.
Duty Pilot	Assist with the set up of the Emergency Control Room on arrival at Harbour Authority Building. Key responsibility is communications logging following handover from Duty Marine Officer.
Head of Marine Services Engineering & Transportation	Responsible through the On-scene Commander for all onshore clean-up activity.
OIC Press Officer	Responsible for all the media liaison and dissemination of information and advice to the public.
OIC Emergency Planning Officer	Call-out of council officers as required. Co-ordination and logistics for large-scale emergency.
Chief Executive's Office	Provision of administration, legal and financial support.
Beach Master	Responsible for local organisation of clean-up and response on a site-by-site basis.

Duty Marine Officer (All Spills)	
Call-out Reporting	
• Contact Oil Pollution Officer (or Deputy) providing following details: ○ Location and extent of pollution ○ Type of oil ○ Source and cause of spill ○ Direction of movement ○ Name of informant ○ Any action taken? • Request what further action be taken • Inform Talisman is spill from Flotta Terminal operations and if the report was not received from terminal staff • Carry out statutory notification to HM Coastguard, SNH, SEPA and notifications to other agencies as required • On instruction from Oil Pollution Officer call out specified emergency team members as instructed • Call duty pilot • Instruct first responder to initiate Emergency Control Room	
Establish Incident Log	
• Establish incident log using form provided (Section 5.2) • Complete initial media report and ensure all switchboard staff are briefed • Establish VHF Channel 10 as the assigned channel for communications by all vessels involved in clean-up operations • Monitor issue of radio equipment and record issue (communication equipment allocation register) • In the event of an excess of radio traffic on Channel 10 authorise the use of an alternative frequency subject to approval by the Oil Pollution Officer	
Ongoing Activities	
• Handover ECR logging function to Duty Pilot following briefing • Return to manning Operations Room VTS desk	
Final Actions	
• Stand down VHF Channel 10 and ensure all communications equipment returned.	

Oil Pollution Officer (minor spills <1 tonne)	
Assess Situation	
- On contact from Duty Marine Officer determine present situation and full extent of incident; ensure that spill has been correctly classified. - Request any additional information from Marine Services personnel/Terminal Shipping Superintendent (as appropriate) on scene.	
Call-out and Notification	
- Request Duty Marine Officer to call-out Emergency Response Team members as required by situation. Ensure all ERT functions are covered. - Ensure insurance brokers or P & I club are advised. - Ensure statutory notification is undertaken - Ensure all other notification is carried out - Ensure approval is sought from appropriate authority and all dispersant use reported	
Initiate Response	
- Ensure slick surveillance and tracking is undertaken. If necessary call-out aerial surveillance - Mobilise OIC/Flotta Terminal equipment and personnel resources as appropriate to situation. - Identify appropriate response and direct Terminal Shipping Superintendent or On-scene Commander as appropriate. - Ensure oil sample taken.	
Monitor and Investigate	
- Monitor situation. Ensure that Harbour personnel/Terminal Shipping Superintendent (as appropriate) keeps you informed of progress. - If necessary, reclassify spill and request call-out of additional Emergency Response Team members and external contractors as appropriate. Request Terminal Shipping Superintendent to relocate to ECR. Nominate On-scene Commander.	
Close Out	
- When on-scene reports confirm that oil has been satisfactorily dispersed and/or cleaned up, action may be stood down. - Notify parties involved of stand down. - Ensure normal operations are resumed. - Prepare final report for OIC officials and convene contingency planning meeting to review reports and assess response.	

Oil Pollution Officer (major spills >1 tonne)	
Assess Situation	
- On contact from Duty Marine Officer determine present situation and full extent of incident; ensure that spill has been correctly classified. - Request any additional information from Terminal Shipping Superintendent or Harbour personnel on-scene as appropriate. - Identify immediate problems.	
Call-out and Notification	
- Request Duty Marine Officer to call-out Emergency Response Team members as required by situation. Ensure all ERT functions are covered. Request Terminal Shipping Superintendent to relocate to ECR (if appropriate). Nominate On-scene Commander. - Ensure statutory notification is undertaken. - Ensure ECR is established by first responding officer. - Ensure insurance brokers or P & I club are advised. - Ensure all response team functions are covered. - Request assistance from other OIC services and mobilise external contractors (BESL) as required.	
Initiate Response	
- Mobilise appropriate resources to undertake detailed assessment of spill (vessel/aerial/beach assessment) in conjunction with ERT. - Develop situation map and resource board or delegate to Logger. Request briefing on priority areas for protection from Biologist. - Approve outline response strategy. Options include: - Natural dispersion and monitoring. - Containment and recovery. - Chemical dispersion. - Coastal protection/clean-up. - Determine immediate and future equipment requirements. Authorise mobilisation of specialist equipment necessary for response. If necessary, activate onshore response via Executive Director of Development & Infrastructure. Request additional administration support if needed.	
Monitor and Re-assess	
- Monitor effectiveness of response strategy and levels of equipment/manpower. Reassess and stand down, place on standby or mobilise as necessary. - If necessary initiate establishment of Shoreline Response Centre (SRC) in agreement with MCA. Delegate team members to attend.	
Communication and Administration	
- Convene regular planning meetings and brief response teams and external contractors as necessary. - Maintain liaison with authorities and monitor all operations to ensure compliance with government agency regulations. - Ensure logs are maintained and response discussed with insurance/legal advisors (e.g. ITOPF and/or Chief Executive Office). - Ensure information is supplied to Press Officer for preparation of regular, updated media release. Consult with Chief Executive and OIC on press release. - Ensure all staff are briefed on media response.	
Waste Disposal	
- Ensure all oily waste from at sea response is disposed of through appropriate channels. - In the event of onshore clean-up and oily beach waste, offer assistance to Executive Director of Development & Infrastructure for liaison with SEPA regarding selection and licensing of temporary storage sites and onward disposal.	
Close Out	
- When on-scene reports confirm that oil has been satisfactorily dispersed and/or cleaned up, action may be stood down. - Notify parties involved of stand down. - Ensure normal operations are resumed. - Prepare final report for OIC officials and convene Contingency Planning Meeting to review reports and assess response. - Collate compensation and damages claims. Initiate legal proceedings if required through Procurator Fiscal. - Investigate source and cause of spill. Implement remedial or preventative actions.	

Biologist (all spills)	
Call-out	- On notification of spill, make note of all relevant details. If classified as major spill proceed to ECR. - Obtain copy of oil pollution report form.
Priority Areas for Protection	- Assist in estimation and extent of pollution and assessment of risk in conjunction with On-scene Commander. - Access OIC Marine Services Oil Spill Contingency Database and identify priority areas for protection and preferred response strategy. - Advise On-scene Commander and brief Oil Pollution Officer.
Survey	- Undertake aerial and onshore surveillance and prepare briefing. Continue surveillance at regular intervals until stand-down. - Organise collection, recording and storage of oil samples. Arrange for analysis. - Ensure oil spill tracking is ongoing. Review information concerning incident status, predicted behaviour of slick, changes in weather, etc, that could affect response objectives.
Communication and Reporting	- Assist in liaison with environmental bodies. Instruct Logger of your intentions for ongoing liaison. - Attend planning meetings and report to ERT on environmental issues. - Maintain incident log.
Close Out	- Close out incident log and make report to Oil Pollution Officer. - If necessary, arrange and undertake ongoing monitoring of any impacted sites. Make regular reports to Oil Pollution Officer. - Ensure all dispersant use has been logged and report submitted to the appropriate authority.

Deputy Harbour Master Port Operations / Pier Masters (All Spills)	
Call-out	- If primary observer of spill, report details immediately to OIC Marine Services Duty Marine Officer. - If notified of spill, make notes of all relevant details. - Proceed to scene of oil spill. Assume on-scene control until relieved by On-scene Commander.
Safety	Ensure precautions have been taken to ensure safety of all personnel and public.
Source and Size of Spill	- Ascertain source and cause of spill. Take all measures available to stop spill if ongoing. - If spill size unknown, attempt to estimate size of spill. - If possible, take sample of oil for record. - Make report to Counter Pollution Officer.
Incident Log	Commence log of events.
Undertake Response	- As directed by On-scene Commander deploy oil spill response equipment. - Monitor situation. If incident escalating report immediately to On-scene Commander. - Continue response until clean up complete or hand over/stand down instructed by On-scene Commander.
Close Out	- Ensure all waste material, including oily waste, is correctly collected for disposal. - Closeout incident log and copy to Counter Pollution Manager.

On-scene Commander (major spills >1 tonne)		
Call-out		
- On nomination, make notes of all relevant details. - Collect 'grab bag' (see contents below). - Proceed as directed to scene		
	Grab Bag Contents:	
	Handheld marine VHF with fully charged battery Mobile phone Contacts card Camera (preferably digital) Notebook and pen/pencil	Incident Log Sheets Witness statement sheets Risk Assessment sheets Map and/or chart of the area Lifejacket Waterproofs Wellingtons Sampling kit Torch Harbours tabard Hard hat
Spill Assessment		
- On arrival assume overall on-scene control of the incident. - Determine what actions taken to date. Undertake following steps if not already completed. - Ascertain source and cause of spill. Take all measures available to stop spill if ongoing. - If spill size unknown, attempt to estimate size of spill. - Initiate spill tracking. Continue tracking until handover delegated as directed by Oil Pollution Officer. - If possible, take sample of oil for record. - Make report to Oil Pollution Officer and advise of any additional resources required.		
Incident Log		
Commence log of events. Use Incident Log Sheets.		
Incident Investigation		
Commence incident investigation as directed by Oil Pollution Officer.		
Undertake Response		
- Determine priority areas for protection in conjunction with Biologist. - As directed by Oil Pollution Officer deploy oil spill response equipment. - Monitor situation. If incident escalating report immediately to Oil Pollution Officer. - Continue response until clean up complete or handover/stand down instructed by Oil Pollution Officer.		
Close Out		
- Ensure all waste material, including oily waste, is correctly collected for disposal. - Close out incident log and copy to Counter Pollution Officer. - Make report to Oil Pollution Officer.		

Counter Pollution Manager	
Call-out	
- On notification of spill, make note of all relevant details. Proceed to ECR unless directed by OPO. - Obtain copy of oil pollution report form. If assuming role of On-Scene-Commander, see OSC Action Sheet	
Initial Phase	
- Commence log of events. Use Incident Log Sheets. - If ECR to be activated, establish ECR. - Maintain ECR communications role until Duty Pilot can assume role of logger. - Ensure non-Marine Services personnel attending ECR are familiar with arrangements and, if not, arrange safety and security induction. - With assistance from administration staff ensure adequate supplies of food and drink are available. - Assist in estimation and extent of pollution. - In conjunction with OPO and On Scene Commander identify equipment needs and deployment	
Equipment Deployment	
- Manage despatch and return of response equipment. - Ensure field maintenance, refuelling, etc, of deployed equipment. - Ensure OPO aware of staffing issues – working hours, shift patterns, training levels, etc. - Liaise with response contractors and equipment manufacturers for additional equipment as necessary. - If incident is ongoing, ensure replacement consumables are ordered.	
Close Out	
- Complete own log. - Ensure all other logs are completed. Collect and collate. - Liaise with OPO to ensure full cost recovery where appropriate.	
Post Incident	
- Arrange restocking of consumables used in incident. - In conjunction with Pollution Maintenance, arrange cleaning of all equipment used in response. Assess condition and arrange repair/disposal/replacement as appropriate. - Re-stow all equipment and ensure OPO aware of any shortfalls, equipment out of commission, or out of position.	

Press Officer (major spills >1 tonne)	
Call-out	
- On call-out proceed immediately to Emergency Control Room. - Obtain briefing from Oil Pollution Officer on status and extent of oil spill.	
Initial Actions	
- Ascertain what information released to media/public already. - Determine likely media reaction: local/national/international. - Take control of information releases. - Prepare initial press release and obtain approval from Oil Pollution Officer and Terminal Manager as appropriate. Ensure staff are aware of “media management” issues.	
Ongoing Actions	
- Arrange news conferences and/or interviews. - Prepare ongoing press releases. - Brief Oil Pollution Officer and Emergency Response Team members prior to press conferences. Monitor news/press coverage. In particular look for gross inaccuracies, which should be corrected.	
Close Out	
- Provide final press release and organise final press conference. - Provide Counter Pollution Officer with incident log including copies of all press releases, etc. Consider follow-up PR once situation returned to normal.	

Deputy Harbour Master Port Operations	
Call-out	
- On call-out proceed immediately to Emergency Control Room. - Determine details of situation and response ongoing.	
Safety	
- Act as designated Safety Officer. - Undertake Health and Safety risk assessments of response operations, and advise the Oil Pollution Officer. - Advise the Oil Pollution Officer of health and safety issues that could arise associated with the incident. - Ensure safe operating practices are implemented at the incident site and halt any activities that could potentially cause a health and safety problem. - Establish contact with local emergency/medical services. Determine requirement for first aid posts. - Liaise with HSE/local authority safety inspectors on site. - Establish safety and security induction facilities for contract labour. - Maintain Health and Safety log. Investigate any safety problems (e.g. accidents) and if required prepare safety report.	
VTs/IT	
- Discuss with Oil Pollution Officer / Counter Pollution Manager IT requirements for ECR – printers/faxes/email. - Notify OIC IT support of ECR activation and likely requirements. - Discuss with Oil Pollution Officer activation of incident web-site. - Notify website providers to initiate web-site. - Advise Counter Pollution Manager and Press Officer on mechanisms to load information onto web-site. - Agree with Oil Pollution Officer / Counter Pollution Manager / Press Officer a 'Regulator' for web-site content and maintenance.	
Close Out	
- Close out Health and Safety log and make report to Oil Pollution Officer. - If required ensure that HSE report has been prepared and sent to HSE.	

Emergency Planning Manager (major spills >1 tonne)	
Call-out	
- On notification of spill, make note of spill details. - Proceed to Emergency Control Room.	
Emergency Planning	
- Obtain briefing from Oil Pollution Officer. - Contact and brief Chief Executive and other council officers as required. - Ascertain requirements and establish availability in conjunction with Oil Pollution Officer and Executive Director of Development & Infrastructure with regards to: - Catering/accommodation; - Communications; - Office space/admin support; - Emergency equipment/protective clothing. - Liaise with finance unit re purchase order and application for expenditure system to run during emergency.	
Communication	
- Attend regular planning meetings. Ascertain any future requirements. - Liaise with Chief Executive's Office regarding finance, legal and personnel issues. - Keep and maintain incident log.	
Close Out	
Provide Counter Pollution Officer with incident log.	

Duty Pilot	
Call-out	
• On notification of spill advise on time of arrival and proceed to ECR	
Initial Actions	
• Receive briefing from Duty Marine Officer and/or Counter Pollution Manager.	
Maintain Incident Log	
- Maintain incident log. Record all: - key events and times; - key decisions and why; - start and finish of key tasks; - external contacts and times. - Obtain regular weather reports. - Maintain wallboards showing:- - Key events - Contact confirmations - Resource deployments - Weather details	
Co-ordinate Communications	
- Complete media report and ensure all switchboard and radio staff are briefed. - Maintain VHF Channel 10 as the assigned channel for communications by all vessels involved in clean-up operations. - Monitor and record issue of radio equipment (communication equipment allocation register). In the event of an excess of radio traffic on Channel 10 authorise the use of an alternative frequency subject to approval by the Oil Pollution Officer.	
Ongoing Activities	
- Continue with incident log. At end of shift hand over to relief. - Monitor VHF communications and report any difficulties to Oil Pollution Officer. - Call-out additional team members as requested by Oil Pollution Officer. Attend planning/review meetings. Undertake additional activities as directed by Oil Pollution Officer.	
Final Actions	
- Hand over incident log to Counter Pollution Manager. - With Duty Marine Officer, stand down VHF Channel 10 and ensure all communications equipment returned. - Assist with demobilisation of the Emergency Control Room.	

Beach Master (major spills >1 tonne)	
Call-out	
• On notification proceed to site and request briefing on situation.	
Ongoing Actions	
- Initiate daily incident log. - Carry out initial risk assessment. - Reassess site on daily basis and present operational plan for day (use Beach Master checklists.) - Submit completed daily forms to On-scene Commander. - Attend regular planning meeting and debrief on-site operations.	
Close Out	
- Ensure all equipment and operational debris removed from site and disposed of appropriately. - Submit incident log to Counter Pollution Officer.	

Head of Marine Services Engineering & Transportation	
Call-out	
- On notification of spill, determine status. - Determine from Oil Pollution Officer requirements for additional manpower, transport and level of onshore clean-up. If requested, proceed to Emergency Control Room.(ECR)	
Onshore Clean-up	
- Assume responsibility for onshore clean-up through On-scene Commander to Oil Pollution Officer. - Agree clean-up strategy with Oil Pollution Officer and implement operation. - Determine likely size of equipment and manpower requirements. Source requirements through OIC and external contractors as appropriate. - Liaise with Emergency Planning Manager over catering/accommodation requirements. - Organise transport to site of manpower and resources. Ensure Beach Masters are allocated for each site. - Designate preferred access routes in liaison with police. - Ensure health and safety procedures are in place (in conjunction with Marine Services Safety Officer).	
Waste Disposal	
- Mobilise local authority equipment available for transportation of oiled wastes. Ensure all vehicles (including contractors) are carrying valid Registered Carrier documents. - Determine likely waste storage requirements and disposal routes. Ensure frequency of removal of waste from temporary storage sites is sufficient. - Initiate appropriate Duty of Care and Special Waste documentation. Liaise with SEPA regarding consents for temporary emergency waste storage sites at clean-up sites. Liaise with ITOPF/legal advisors and SEPA on preferred disposal route.	
Communications	
- Attend regular planning meetings with Oil Pollution Officer and ERT. - Obtain daily briefings from Beach Master on clean-up status and report to Oil Pollution Officer.	
Close Out	
- Organise return of equipment to appropriate location. Make report on any lost or damaged equipment. - Arrange closedown of temporary waste storage areas and ensure all documentation completed. - Ensure all recoverable costs have been identified. Provide Counter Pollution Officer with incident log.	

STS Superintendent (STS Transfer Spills Only)	
Call-out	
- On call-out proceed to scene of oil spill. Assume on-scene control until relieved by OIC Marine Services On-scene Commander. Start and maintain Incident Log. - Identify source and cause of spill. Take all measures available to stop spill if ongoing in conjunction with vessel Master.	
Response	
- If spill size unknown, attempt to estimate size of spill. If not already undertaken, report spill. - Request on scene vessel to initiate tracking and continue tracking until relieved or delegated. If possible take sample of oil for record. Report ongoing situation to OIC Marine Services Oil Pollution Officer or On-scene Commander. - Undertake initial response using shipboard oil spill response kit. Continue response until clean-up complete or hand-over/stand down instructed by OIC Marine Services Oil Pollution Officer. - If incident escalates report immediately to Oil Pollution Officer. - Follow any further instructions as given by Oil Pollution Officer or On-scene Commander.	
Close Out	
- Make report to Oil Pollution Officer. - Close out incident log and copy to Counter Pollution Officer.	

Chief Executive's Office (major spills >1 tonne)	
Call-out	
- On notification of spill obtain briefing from Oil Pollution Officer of spill status and planned response strategy. - Determine extent of equipment and manpower requirements from Oil Pollution Officer and Executive Director of Development & Infrastructure.	
Administration	
- Establish appropriate filing systems in order to ensure accurate records are maintained for future support of financial claims. - Provide secretarial/admin support as needed. - Ensure telephone switchboards are adequately manned. Request operators to maintain a call log. - Ensure switchboards are aware to direct all press enquiries, etc, to the Press Officer. - Obtain and file all site and personnel reports.	
Finance Support	
- Determine extent of financial support required. Establish bank/cash arrangements. - Set-up dedicated financial system: - Incident specific codes; - Incident order books; - Promulgate advice to ensure all costs associated with the incident are readily identifiable as such. - Provide regular reports to Oil Pollution Officer on estimated costs to date. Provide forecast costs.	
Legal	
- In conjunction with the OPO determine responsibility and liability for incident and resulting clean-up. - Advise Oil Pollution Officer on all steps necessary to minimise any liabilities arising from law. - Monitor ongoing situation and proposed strategy and advise on possible changes in legal issues.	
Communications	
Attend daily planning meetings and brief OPO on admin/financial status. Advise team on any documentation requirements.	
Close Out	
- Prepare incident report. - Assist Oil Pollution Officer in preparation of financial claim documentation and following procedures.	

Terminal Shipping Superintendent (Flotta Spills Only)	
Call-out	
• If primary observer of spill, report details immediately to OIC Marine Services. • If notified of spill, make notes of all relevant details. If Tier 3 situation immediately inform Terminal Manager.	
Immediate Response	
• Activate the Terminal Oil Spill Contingency Plan. • Ensure source and cause of spill ascertained. Take all measures available to stop spill if ongoing. • Initiate visual surveillance of slick by workboat. • Assess safety and fire risk. Ensure all precautions have been taken to ensure safety of personnel and public.	
Spill Classification and Reporting	
• Confirm spill size and classification to OIC Marine Services Duty Marine Officer. • Ensure personnel notified as per Terminal Oil Spill Contingency Plan. Ensure Terminal Manager kept aware of situation.	
Response	
• In conjunction with Oil Pollution Officer decide appropriate response strategy. • Mobilise Flotta Terminal containment and recovery equipment as appropriate to size of spill; ensure pollution teams are called out to deploy equipment. • Ensure surveillance and tracking of oil spill continues. Ensure sample of oil taken and retained. • If situation ongoing or classification elevated to Tier 2/3 response, response co-ordination will pass to Oil Pollution Officer at OIC Marine Services and On-scene Commander will be allocated. Shipping Superintendent to relocate to ECR and continue with support provision and liaison function. • Log all communications, actions and resources utilised.	
Close Out	
• Ensure any oily waste collected by Flotta Terminal resources disposed of through correct channels. • Close incident log and copy to OPO and Talisman Archivist. • Make report to Terminal Manager of events. • Review incident management with Oil Pollution Officer.	
*Note: Terminal Shipping Superintendent action list given here, as he is point of liaison between OIC Harbours and Talisman. Action lists for other Talisman personnel are provided in the Flotta Terminal oil spill contingency plan. Some tasks may be delegated to other Terminal personnel.	

For specific telephone numbers see Section 6.1

SECTION 5: INCIDENT SHEETS

5.1 INFORMATION TO BE OBTAINED AS INITIAL SPILL REPORT (CG 77 POLREP)

To MCA – MRCC Shetland

Copy to Agencies as required

From

Fax to 01595694810

INCIDENT:	
Classification	i) Doubtful
	ii) Probable
	iii) Confirmed
Date	
Time	
Name of person reporting incident	
Job title	
Details of company / organisation or address	
Call back number	
Location of the incident	
Extent of spill (m² / km²)	
Estimated quantity of spill (litres / tonnes)	
Type of oil / substance spilled	
If bulk chemicals, UN Number (if known)	
Source of spill (if known)	
Reason for spill	
Action taken to prevent further spillage	
Is the spill continuous (Y/N)	
Has the MCA / MRCC been informed?	
Other relevant information	

All incidents and actions taken need to be detailed in this form or a form which contains similar information. This is for internal use and for use in the event of an audit of an incident.

[illegible]

SECTION 6: NOTIFICATIONS

6.1 NOTIFICATION MATRIX

Organisation	Oil Spill Tier			Contact Details	Remarks
	1	2	3		
Orkney Islands Council Marine Services Head Office	✓	☎	☎	Tel: 01856 873636 Fax: 01856 873012	Orkney Islands Council Marine Services should be notified of all spills by telephone immediately.
MCA MRCC Shetland	☎	☎	☎	015 9569 2976	Coastguard will require information on the Oil Spill Report Form (Section 5.3). Confirm details with fax. Coastguard will inform the Pollution Response Unit.
MCA MRCC Aberdeen	☎	☎	☎	01224 597 900	
SNH Edinburgh	✓	☎	☎	07774161273	Fax all spills immediately. Contact immediately by telephone or fax if spill exceeds one tonne.
	✓	☎	☎	0131 316 2610	
	☎	☎	☎	0131 316 2690	
SEPA	☎	☎	☎	01546 602876 0800 807 060	Call routed to a 24 hour call centre and cascaded to appropriate persons
Marine Scotland	✓	☎	☎	07770 733 423	The Marine Laboratory should be contacted. Marine Scotland will notify fish farm operators and shellfish farm operators
Police Scotland Orkney Police HQ, Police Station, Burgh Road, Kirkwall, Orkney, KW15 1AH	☎	☎	☎	Tel:101 Tel:01856 872241 Fax: 01856 873055	Notify as soon as possible all spills that are associated with a dangerous occurrence and are likely to attract media attention.
Briggs Environmental Services Ltd. Oil Spill Contractor		☎	☎	01224 898666 0800 374 348	Contact 24 hour contact number and ask for the Duty Manager.

✓ Notify during normal hours

☎ Notify immediately by phone

☎ Notify immediately by fax

For additional contact details and telephone and fax numbers see Section 6.3.

6.2 COMMUNICATIONS AND REPORTING

Reporting of oil pollution

It is essential that all spills are reported by whatever means as quickly as possible.

- A. Responsibility for reporting of oil pollution rests with the Master in all cases involving a vessel and with the berth Operator in the case of a berth or quayside incident. In cases involving a vessel alongside both parties are equally responsible.
- B. Any person either ashore or afloat, seeing oil pollution on the water within the Harbour Authority's jurisdiction or liable to pose a threat to it, should report it whether or not the source is known. (*Section 5.1*)
- C. The Harbour Master is responsible for ensuring mandatory notifications are made.

Communications

Initially reports will be passed by both landline and mobile telephone (when using mobile consideration should be given to security implications). The Harbour Authority maintains VHF sets, which would be issued to On-scene Commanders once a clean-up strategy had been established. VHF Channel 10 is the channel designated for use by all concerned with an oil spill.

In the event of a clean-up operation, a shift system will be instituted to ensure the main switchboard is manned on a 24 hour basis.

Records

It is essential that all events occurring during an incident are logged and recorded (sheet shown in *Section 5.2*). This will provide assistance if liability, compensation or reimbursement issues arise as a result of the incident. To achieve this, logs should be kept by all key personnel namely Incident Controller and On-scene Commander, Clean-Up Supervisor and Communication Controller.

Entries in the log should detail as a minimum of events, actions taken, communications with outside Agencies, decisions made and points relevant to the operation.

These logs should be forwarded to the Harbour Master once the incident has ended to form part of the final incident report and provide the basis for a "wash-up" meeting.

6.3 CONTACTS DIRECTORY

It is important to note that all contact details within this section are placed in alphabetical order according to company/body name.

COMPANY / BODY NAME	CONTACT	OFFICE HOURS	OUT OF HOURS	FAX
Briggs Environmental Services Ltd	24 hour Duty Manager	0800 374 348	0800 374 348	01224 213 162
Talisman Sinopec Energy UK Ltd, Flotta Terminal	Shipping Superintendent	01856 884000	01856 884000	01856 884015
OIC Harbours	Oil Pollution Officer	01856 873636 Ext 3600	Contact VTS on VHF Ch14/16.	
	Deputy Harbour Master Port Operations	01856 873636 Ext 3620	Contact VTS on VHF Ch14/16.	
	Counter Pollution Officer	01856 873636 Ext 3645	Contact VTS on VHF Ch14/16.	
	Senior Biologist	01856 873636 Ext 3652	07545 436369	
	Technical Superintendent	01856 873636 Ext 3623	01856 851028 07841 452430	
Orkney Towage	Marine Superintendent	01856 873636 Ext 3603		
OIC Development and Infrastructure	Director (G Barr)	01856 873535 Ext 2301	01856 721273 07703751691	
	Head of Marine Services Engineering and Transportation	01856 873535 Ext 2703 Ext 3637	01856781483 07891 247605	
	OIC DIS Duty Officer	01856 872311	Pager: 07693 363 007 (24 hours) (leave name and contact number)	01856 874311
	If no response contact: Duty Supervisor	Pager 07626 478 319 (24 hours) (leave name and contact number)		
	Road Operations Manager (B Johnston)	01856 872311 Ext224	01856 874124	
	Road Services Manager (S Butcher)	01856 873535 Ext2725	01856 831 550	
Chief Executives Office	Emergency Planning Officer	01856 873535 Ext 2119	01856 875310 07801 793233	
	If the above contacts fail contact 24 hour duty foreman –	01856 872241		
	Press Officer	01856 873535 Ext 2228	01856741323 07713913992	
	Environmental Health Manager	01856 873535 Ext 2817	07850 285230	01856 886450

6.4 STATUTORY NOTIFICATION

Organisation to be contacted	When and how to report	Contact person	Contact details (24 hours unless stated)
HM Coastguard Shetland Marine Rescue Sub-Centre, The Knab, Knab Road, Lerwick, ZE1 0AX	Report immediately by telephone and confirm by fax any discharge or escape of hydrocarbon entering the sea. Use Oil Spill Report Proforma. HM Coastguard will notify MCA	Duty Officer	Tel: 01595 692976 Fax: 01595 694810
Scottish Environment Protection Agency (SEPA) North Region, Orkney Area Office, Norlantic House, Hatston Industrial Estate, Kirkwall, Orkney, KW15 1RE	Report all spills immediately by telephone and confirm by fax. Report using Oil spill Report Proforma.	Switchboard	Tel: 01856 871080 (call divert system in operation out of hours) Fax: 01856 871090
Scottish Natural Heritage (SNH), 54-56 Junction Road, Kirkwall, Orkney, KW15 1AW	Report all spills immediately by telephone and confirm by fax. Report using Oil Spill Report Proforma In the event that there is no reply at the Orkney Office, contact Dr John Baxter at Head Office.	Switchboard Gail Churchill (Operation Manager) John Baxter (Advisory Services)	Tel: 01856 875302 (office hours) Fax: 01856 876372 Tel: 01856 741 314 (out of hours) Tel: 0131 316 2410 (office hours) Fax: 0131 316 2690 Tel: 01620 895 669 (out of hours) Mobile: 07774161273 Pager: 07699761509
Marine Scotland	The Marine Laboratory should be contacted. Marine Scotland will notify fish farm operators and shellfish farm operators	Duty Officer	07770 733 423
Maritime and Coastguard Agency's Counter Pollution Branch	The coastguard will automatically alert the MCA. Therefore there are no statutory reporting requirements. Operational and scientific advice can be requested as required throughout the incident.	Marine Emergency Operations Room (MEOR) Operational Advice & Scientific Advice Lead Environmental Scientist Kevin Collcomb Environmental Scientist Advisor	Tel: 02380 329 600 (office hours) Fax: 02380 329 414 Tel: 02380 329 411 (office hours) Tel: 02380 329228 (office hours)
HM Custom & Excise	Notify of any oil that is recovered. Provide details of approximate amount of oil recovered location of spill and affected vessel.		Tel: 01224 844 844
Briggs Marine Environmental Services (BESL)	Call-out by Oil Pollution Officer (or Terminal Shipping Superintendent)	BMES Duty Manager or Duty Officer	Tel: 01224 898666 Fax: 01224 896950 24hr National Emergency Response 0800 374 348
Oil Spill Response Ltd (OSRL)	Tier 3 only. Call-out by Oil Pollution Officer/Flotta Terminal	OSRL Duty Manager	Tel 02380 331551 (24 hours) Fax: 02380 331972 Pager: 08700 555500 & 07623 523523 (ask for OIL39)

6.5 CONTACT DETAILS FOR OTHER ORGANISATIONS

Organisations to be contacted	When and how to report	Contact person	Contact details (24 hours unless stated)
Royal Society for the Protection of Birds (RSPB). Orkney Office, North End Road, Stromness, Orkney, KW16 3AG	Notify all spills. Mainly for consultation purposes regarding seabirds at sea and preferred action to minimise pollution damage.	Orkney Manager (Sarah Sanky)	Tel:01856 850176 (office hours) Fax:01856 851311 Mobile: 07718696101
		Alan Leitch (Sites Manager)	Mobile: 07887626327
Scottish Society for the Prevention of Cruelty to Animals (SSPCA), SSPCA House, Heddle Road, Finstown, Orkney, KW17 2EG	Notify all spills by fax. Notify immediately by telephone if spill >1 tonne.	Mike Lynch	Tel:01856 761267 Mobile:07775695450 Fax: 07834800753
Health and Safety Executive	Notify as soon as possible by telephone any "dangerous occurrence" involving the release of hydrocarbon.	Incident number	Tel: 01224 621717 (office hours) Fax: 01224 252555
		Duty Officer	Tel: 0151 922 0609 (out of hours) Tel: 0151 922 0137 (out of hours)
International Tanker Owners Pollution Federation (ITOPF)	Inform ITOPF of major incidents involving tankers. Give brief description of incident and vessel from which it occurred. Report using Oil Spill Proforma.	Switchboard	Tel: 02075 666999 (office hours) Tel:07623984606 (out of hours) Fax:02075 666950
OPOL	Regarding incidents associated with pipelines and offshore installations		Tel: 02087 863640 Fax: 02087 863641
NorthLink Ferries		Kirkwall Office	Tel: 01856 885500 Fax:01856 879688 Duty Mobile:07901 553218
		Hatston Office	Tel: 01856 879672 Fax:1856 879673 Duty Mobile:07990 978624
		Stromness Office	Tel: 01856 850143 Fax: 01856 851984 Duty Mobile:07990 978626
		Scrabster Office	Tel:01847 891904 Fax: 01847 895362 Duty Mobile: 07990 978627
		Aberdeen Office	Tel: 01224 564880 Fax:01224 560320 Duty Mobile: 07799 760496
		Hjaltland	GSM Mobile: 07900 216361
		Hrossey	GSM Mobile: 07900 216448
		Hamnavoe	GSM Mobile: 07900 216431
		Heliar	GSM Mobile: 07919033820
		Hildasay	GSM Mobile: 07920487117
Pentland Ferries		St Margaret's Hope Office Gills Bay Office	Tel: 01856 831226 Tel: 01955 611773
John O' Groats Ferry		John O' Groats	Tel: 01955 611353 Tel: 01955 611342 Fax: 01955 611301
Orkney Fisheries Association	Notify of any major oil spills	Fiona Matheson	Office hours: Tel: 01856 871818 Fax: 01856 871919 Mobile: 07725039183

Organisations to be contacted	When and how to report	Contact person	Contact details (24 hours unless stated)
Orkney Fisherman's Society	Notify of any major oil spills	Stewart Crichton	Tel: 01856 850375 (office hours) Tel: 01856 851001 (out of hours)
Meridian Salmon, Orkney	Notify of any major oil spills in the vicinity of cages		Tel: 01856 876101 (office hours) Tel: 01856 879344 (Home)
Scottish Seafarms	Notify of any major oil spills in the vicinity of cages	Richard Darbshire	Tel: 01856 870569
Highland Council	Authority will be notified of spills likely to approach coastline by coastguard of MCA. Should OIC be required to liaise with the authorities this should take place through MCA.	Brian Downie	Tel: 01463 713479
Highland and Islands Brigade	Notify as soon as possible all spills that have a fire or explosion risk. Contact Inverness for mobilisation of Orkney services.	Inverness Control	Tel: 01463 240999

SECTION 7: RESOURCES DIRECTORY

7.1 TIER 1

Tier 1 resources are held on site and can be mobilised by the Harbour Master or Deputy.

South Isles Resources Tier 1 Resources	
Stromness Harbour Oil spill response kits with capability of dealing with up to 1,500 litres of oil containing: 1 x M50 adsorbent booms; 1 x M90 adsorbent roll; 300 x M75 absorbent pads; 1 x oleophilic mop/wringer bucket; 10 x extra-large oily waste sacks with tie wraps 2 x plug rug (0.4m x 0.4m). 4 x Purse weights 1 x Plastic Shovel 1 x Polypropylene Rope (mm) 1 x Coverall Suit 1 x Protective Goggles 1 x Protective Gauntlets 1 x Deployment Manual	All other Scapa Flow and South Isle Piers Oil spill response kit with capability of dealing with up to 250 litres of oil containing: 4 x M55 adsorbent booms; 1 x M95 adsorbent roll sections; 25 x M75 absorbent pads; 2 x extra-large oily waste sacks with tie wraps; 8 x plug rug (0.2m x 0.2m). 1 x Polypropylene Rope (mm) 1 x Coverall Suit 1 x Protective Goggles 1 x Protective Gauntlets 1 x Instruction Leaflet
Note: Scapa Pier also has on-site access to the OIC Harbours Oil Pollution Response Equipment Stores, which are located at Scapa and Kirkwall.	

Kirkwall Bay and Balfour Area Tier 1 Resources	
Kirkwall Pier Oil spill response kits with capability of dealing with up to 1,500 litres of oil containing: 1 x M50 adsorbent booms; 1 x M90 adsorbent roll; 300 x M75 absorbent pads; 1 x oleophilic mop/wringer bucket; 10 x extra-large oily waste sacks with ties 2 x plug rug (0.4m x 0.4m). 4 x Purse weights 1 x Plastic Shovel 1 x Polypropylene Rope (mm) 1 x Coverall Suit 1 x Protective Goggles 1 x Protective Gauntlets 1 x Deployment Manual	Balfour Pier and Terminal Oil spill response kit with capability of dealing with up to 250 litres of oil containing: 4 x M55 adsorbent booms; 1 x M95 adsorbent roll sections; 25 x M75 absorbent pads; 2 x extra-large oily waste sacks with ties 1 x plug rug (0.2m x 0.2m). 1 x Polypropylene Rope (mm) 1 x Coverall Suit 1 x Protective Goggles 1 x Protective Gauntlets 1 x Instruction Leaflet
Note: Kirkwall Pier/Hatston Terminal and Balfour Pier have ready access to the OIC Harbours Oil Pollution Response Equipment Stores, which are located at Scapa and Kirkwall.	

North Isles Resources Tier 1 Resources	
North Isles Piers and Harbours Oil spill response kit with capability of dealing with up to 250 litres of oil containing: 4 x M55 adsorbent booms; 1 x M95 adsorbent roll sections; 25 x M75 absorbent pads; 2 x extra-large oily waste sacks with tie wraps 1 x plug rug (0.2m x 0.2m).	

Permanent Personnel Location	Number
Kirkwall	3
Stromness	1

7.2 TIER 2

Provision of Tier 2 resources will be from Briggs Environmental Services Limited. BESL will mobilize within 1 hour of notification and arrival on site will be achieved as soon as possible. Availability of ferries and weather conditions will dictate final arrival time. From time of mobilization call, Briggs would hope to arrive on site within 4-8 hours depending on traffic and ferries etc.

SPILL RESPONSE CONTRACTOR				
Company Name	Contact	Office Hours	Out of Hours	Fax
Briggs Environmental Services Ltd	24 hour Emergency Response	0800 374 348	0800 374 348	
	Duty Manager	01224 898 666	01224 898 666	01224 213 162
	Burntisland	01592 872 939		01592 873 779

7.3 TIER 3

Tier 3 Response resources may be available from the MCA UK stockpiles. The response will be in accordance with the National Contingency Plan. Talisman has a contract with OSRL to provide oil spill response equipment and expertise. This may be mobilised in a Tier 3 incident and will be undertaken by Talisman.

Company Name	Contact	Office Hours	Fax
Oil Spill Response Ltd (OSRL)	Duty Manager	02380 331551	02380 331972

7.4 ADDITIONAL RESOURCES

FLOTTA

The Flotta Terminal possesses an individual oil spill contingency plan and comprehensive oil spill response equipment. This equipment may be used in case of an emergency in the area.

SCAPA

Item	Remarks	Number
HOYLE OCEAN GUARDIAN BOOM .. 250 mtrs (Reeled in container with power pack) Freeboard 0.44 mtr / Skirt 0.455 mtr	Towing bridle with hawse rope attached	1
RO-DISC 15 SKIMMER with (3) Float legs Recovery rate 15 tph / unit wt	(1) Hydraulic Power pack (Diesel) (1) Remote control Unit (1) Spare Hydrainer Pump	1
RO-VAC RECOVERY SYSTEM (Non - Trailerised Unit) Rated Air flow 480 cu mtr / hr	No Hopper unit or Water jet system	1
LAMOR MINIMAX 12 BRUSH SKIMMER Recovery rate.12 tph / wt 28 kg	Hydraulic Power pack (Diesel)	1
LAMOR MINIMAX 30 BRUSH SKIMMER Recovery rate 30 tph / wt 180 kg	Hydraulic Power pack (Diesel) Power Pack Weight 630kg Power pack Weight 630 kg	1
FASTANK (Rapide) 1,500 ltr wt 15 kg		4
FASTANK (Firefighter) 10,000 ltr wt 67 kg		9
CONTAINMENT SALVAGE DRUMS	UN Overpak salvage drums 360 ltr	2
	UN Approved Poly drums 200 ltr	2
FUELPROOF 2000Litre Bunded Road Tanker		1
STIHL BR 550/600 (Petrol) Maximum Volumetic pumping capacity = 900m³/hr	Main intended use Inflation of Hoyle Sea Sentinal & Ocean Guardian Booms 2" cam/groove coupling	3
HOYLE SANATOR TANK (2,000 ltrs)	Self supporting type	7
IBC HEM (1,000 ltr) Dimensions 1200 x 120 x 140mm		10
Makita Air Blowers	Main intended use Inflation of Hoyle Sea Sentinal & Ocean Guardian Booms 2" cam/groove couplin	6
SUZUKI VP20 PUMP (Petrol)	Main intended use Ballasting Shore Guardian booms 2" cam/groove coupling	1
HATZ E75..SPILLMASTER PUMP (Diesel) (Peristaltic pump ..max 20m³/hour)	Main intended use Oil/Water Transfers 2" cam/groove coupling	1
HONDA GX120 'S' PUMP (Petrol) (pump .. max 30m³/hour)	Main intended use General Water Pump 2" cam/groove coupling // wt .. 31 kg	1
JABSCO UTILITY PUMP (Electric 230 volt) (pump .. max 25m³/hour)	Main intended use Water / Light Oil Transfer (Not Petrol) 25mm rib pipe coupling // wt .. 11 kg	1
HYDRAINER PUMP (Hydraulic Ops) (Submersible pump ..max 50m³/hour)	Main intended use Spare pump to Ro-disc Skimmer 2" cam/groove coupling // wt .. 31 kg	1
HONDA WT20X Trash Pump (Petrol) (trash pump max 30m³ / hour)	Main Intended use Oil/Water Transfers 2" cam/groove coupling	1
PEUGEOT BOXER PICK UP Reg No SY10 BDV	Fitted Towing bracket	1
HYSTER 7.00 8 TONNE FORK LIFT Reg No H 466 WBS	Normally in use at Scapa	1
OPEN FLAT ROAD TRAILER Maximum wt .. 2,600 kg	FOR GENERAL USE Dimensions 1.6 mtr x 3.0 mtr	1
PORTABLE ELECTRIC GENERATOR EB450 X with Honda GX 390 (Petrol)		1
SIMPSON ROPE WINCH with Tecumseh TC300 - Motor. (Petrol)		1

Item	Remarks	Number
KEW POWER WASHER 450 3KB with Honda GX 340 Engine (Petrol)	Portable wheeled Unit	1
4.5 mtr OPEN ALUMINIUM BOAT with own road trailer Fitted with Yamaha 15HP Outboard		1
SPILFYTER 'M50'	Absorbent Boom 203mm x 3.0mtr .. (8" x 10')	
SPILFYTER 'M90'	Absorbent Matting (Double weight) 813mm x 45.7mtr .. (32" x 150')	
SPILFYTER 'M-75'	Absorbent Pads 406mm x 457mm .. (18" x 18")	
SPILFYTER 'M-55'	Absorbent Boom 127mm x 3.0mtr .. (5" x 10')	
SPILFYTER 'M-70'	Absorbent Pads (Single weight) 406mm x 457mm .. (16" x 18")	
SPILFYTER 'M-80'	Absorbent Sweep 406mm x 3.0 mtr .. (16" x 100')	
SPILFYTER S2-30	Absorbent Sock 75mm x 1.2mtr .. (3" x 4')	
SPILFYTER S2-75	Absorbent Pads (Double weight) 406mm x 457mm .. (16" x 18")	
STS MANFOLD RESPONSE KIT 4 x M50 Absorbent Boom (203mm x 3mtr) EFFECTIVE LENGTH..10 mtr	295 ltr Plastic container/screw lid All 4 Booms connected up, with abt 25 mtr 10mm polypropylene rope tails attached each end	2
STS MANFOLD RESPONSE KIT 12 x M55 Absorbent Boom (127mm x 3mtr) EFFECTIVE LENGTH..30 mtr	Old Liferaft fibreglass casing. All 12 Booms connected up, with abt 25 mtr 10mm polypropylene rope tails attached each end	2

KIRKWALL PIER

Item	Remarks	Number
HOYLE SEA SENTINAL BOOM (Trailerised reel ..150 mtr) consists :- 1 x 25 mtr + 2 x 50 mtr + 1 x 25 mtr (shore guardian) Freeboard / Skirt	Sections connected and reeled as a single length with a towing bridle attached (Shore Guardian inner end) Trailer wt.....820 kg	4
HOYLE SEA SENTINAL BOOM (25 mtr section) Freeboard 0.375 mtr / 0.715 mtr Skirt weight 2.8 kg/m	Each in individual canvas valises	12
NOFI BOOM EP350 / .. 150 mtr (palletised) Freeboard 0.35 mtr / Skirt 0.50 mtr ...weight 17.5 kg/m	1 Transportation Road Trailer (OP-KP-013) (Complete pallet wt = 1,100 kg)	2
NOFI BOOM EP350 / .. 50 mtr (palletised) Freeboard 0.35 mtr / Skirt 0.50 mtr ...weight 17.5 kg/m		1
RO-VAC RECOVERY SYSTEM (Trailerised Unit) Rated Air flow 480 cu mtr / hr	Full unit with Ro-weir attachment Complete trailer wt ..1,140 kg	1
DESMI RO-MOP OM140 Recovery rate ...5 tph		1
RUBBER PILLOW TANK (2,270 ltr) (500 gallons)	Fitted with lifting straps 2 " Treaded connection	8
STIHL BLOWER (Petrol) Maximum Volumetic pumping capacity = 480m³/hr	Main intended use Inflation of Hoyle Sea Sentinal & Ocean Guardian Booms 2" cam/groove coupling	3
SELWOOD SPATE 75C PUMP (Diesel) (pump .. max 30m³/hour)	Main intended use Oil/Water Transfers 3½" bauer coupling	2
CREST FLOWLINE ..MASTER PUMP (Diesel) (Peristaltic pump ..max 20m³/hour)	Main intended use Flowline Oily water Separator	1
HYSTER 4 TONNE FORK LIFT Reg No R 949 KSS	Normally in use at Kirkwall	1
OPEN FLAT ROAD TRAILER Maximum wt .. 2,700 kg	FOR NOFI BOOM TRANSPORT Dimensions 2.2 mtr x 4.2 mtr	1
CREST FLOWLINE OIL/WATER SEPARATOR (Trailerised unit with diesel..20m³/hr peristaltic pump). Trailer wt (Unladen) = 1,400 kg	Potential processing capacities Lube Oil.....12 m³/hr Crude Oil/Diesel ...8 m³/hr	1
HYLITE MOBILE FLOODLIGHT UNIT (Trailerised) Complete Trailer wt ...840 kg	4 x 1000 watt Halogen Diesel Generator.	1
KEW STEAM/HOT WATER POWER WASHER with Ruggieri MD 151 Engine (Diesel)	Traileriser Unit	1
ORKNEY DAY ANGLER 21 ("Scapa Protector") with own road trailer		1

SECTION 8: PRESS AND PUBLIC INFORMATION

8.1 PRESS STATEMENT

In the event of a pollution incident, it will be necessary for an efficient and comprehensive information service to be brought into action so as to:

- Deal professionally with the representatives of the media.
- Co-ordinate and release information to the general public regarding the pollution incident and Orkney Islands Council's response to it.
- Keep Orkney Islands Staff and Board members informed of developments regarding the progress of the incident; in so far as it affects their responsibilities.
- Minimise the pressures on those directly concerned with combating the spill.
- Responsibility for media relations needs to be clearly understood and who will be required to respond.

Please note that unless you are designated as your organisation's spokesperson you are NOT authorised to offer comment on behalf of the organisation therefore please decline media requests.

In the event of a major oil pollution incident, after agreement between the Orkney Islands Council Chief Executive, Oil Pollution Officer, Press Officer and the Emergency Planning Manager the OIC Emergency Plan will be activated.

The media support team will be headed by the OIC's Press Officer as per the Council's Emergency Plan with support from Marine Services. The Flotta Terminal representation will be as agreed between Marine Services and the Terminal Manager.

Press conferences, venues for same, press releases, press passes and other similar administrative services, including arrangements for VIP visits, will be organised by the Press Officer.

8.2 INITIAL PRESS STATEMENT

'Orkney Islands Council confirms that an incident has occurred (*state where and give brief description*) at approximately (*give time*) hours today.

Emergency response procedures have been initiated and relevant authorities (*have been/ are being*) advised. All support services are being co-ordinated through the Authority's incident response team and every possible effort is being made both to minimise risk to personnel at the scene and to contain and mitigate any effects to the environment and property.

Further information will be released, (as it becomes available) at a press conference scheduled for time today."

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PART 2: STRATEGY

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SECTION 9: RISK ASSESSMENT

9.1 RISK ASSESSMENT

A risk assessment to meet with OPRC Contingency planning requirements for Ports and Terminals has been completed by Briggs Environmental Services Ltd. (BESL) on the basis of format previously agreed with the Maritime Coastguard Agency (MCA).

9.2 ASSESSMENT SCOPE

This assessment covers both quayside operations and marine operations carried out within Orkney Island's Council's jurisdiction of the ports / piers and slipways of the following:

- Area 1: Scapa Flow Oil Port
- Area 2: South Isles Harbours
- Area 3: Kirkwall Harbour Area (Wide Firth/Shapinsay Sound)
- Area 4: Harbours in the North Isles
- Area 5: Coastline areas around Orkney outside the Harbour Area

Each area of jurisdiction is as shown.

9.3 METHODOLOGY

This risk assessment is designed to identify potential oil sources, the size of potential spills, the probability of potential spills and to estimate the environmental impacts of an oil spill into the marine environment. The result will be a targeted, specific investigation which will identify areas of unacceptable risk and potential mitigation methods.

In order to assess the consequence, and subsequent overall risk acceptance criteria of a spill, it is important to identify those systems that contain oil and are associated with the harbour's operations. Operations that could initiate events resulting in an accidental spillage are examined and the potential maximum volume that could be released is identified. Probability and consequence are then combines in a risk matrix model to ascertain overall risk acceptance criteria.

The frequency of a specific type of incident can be expressed as probability. When classified against criteria this should provide an indication as to the most commonly occurring events. Control measures can reduce the probability of an event occurring. The full range of control measures implemented by Orkney Island's Council to minimise the risk of an oil spill event have therefore been considered before applying specific probability criteria

Table 1 shows the risk ratings used in this risk assessment.

Table 1: Probability of Scenario Occurrence

Risk Rating	Description
Low	Minimal or no impacts detectable; No detectable aroma of oil or silvery sheen. A small operational type spill confined to harbour limits.
Moderate	Minor to Moderate damage to immediate environment; Definite aroma of oil in the air; Oil visible as metallic sheen on water surface; Moderate bunkering spill or small hydraulic spill.
High	Extensive damage to immediate environment; Extensive contamination of nearby shorelines; Oil visible as metallic sheen on water surface; Large diesel spill or heavy oil spill.

Probability and consequences can be multiplied to produce an overall risk rating. This can then be applied to specific scenarios in order to prioritise potential control measures and risk minimisation procedures. Table 3 determines the overall level of risk. In principle, all risks should be within the insignificant to minor categories. Moderate risk and above will require attention and improvement plans to reduce the risk.

When potential hazards and the probability of their occurrence have been established the oil type and fate of the oil must be considered to evaluate consequence. It should be remembered that although the level of risk of an incident occurring may be low, the level of impact on the environment can potentially be high (high volume or increased toxicity for example). The consequence for each identified hazard is evaluated using the level of risk and the impact. Should the biological impact be rated high, the risk overall will have a higher rating.

Hydrocarbons are broadly grouped into four categories: group I oils such as diesels are non-persistent and will tend to dissipate completely within a few days. Group II and III oils are more persistent and have a tendency to form emulsions. Group IV oils are very persistent due to the lack of volatile constituents and will remain in the environment indefinitely (ITOPF, 2006/2007). The volume and type of hydrocarbons released will determine the consequences for low to high probabilities. The consequences for all low to high probabilities will be mild to severe unless proven otherwise.

Each pier or harbour risk assessment contains a table which identifies the initiating events and corresponding control measures that were considered in relation to the oil containing systems in order to identify the potential size and frequency of spills associated with operations at the pier or harbour. The risks encountered at each harbour area have been assessed using the criteria in Table 2 to assess whether the existing control measures are sufficient, or whether further procedures need to be implemented.

Table 2: Overall Level of Risk

Risk	Description
Low	Risks are broadly acceptable. Need to maintain assurance that risks remain at this level.
Moderate	Tolerable risks – action may be required to reduce risks in this region. Risks are tolerable provided they can be demonstrated to be ALARP (As Low As Reasonably Practicable), i.e. if risk reduction is impracticable or its cost is disproportionate to the improvement gained.
High	Unacceptable risks – action generally required to reduce risks in this region.

9.4 HISTORICAL DATA

There have been no significant or reportable spills within the last 5 years.

9.5 FACTORS OF ASSESSMENT

The ports and slipways covered by this plan are controlled by the Orkney Islands Council's Harbour Masters and are mainly used by small fishing vessels. Sailing boats and leisure craft occasionally use the facilities but this is mainly during the summer months.

Vessels in Transit

The statutory duty for reporting and dealing with pollution from any vessel en route to Orkney Islands Harbours prior to entering the port or harbour area, lies with the Master and vessel owners. After commencing pilotage to Orkney Islands Harbours through the designated area of jurisdiction covered by the plan, reporting and response to an oil pollution incident will be co-ordinated through the Orkney Islands Council's Oil Spill Contingency Plan. Orkney is made up of a number of islands, meaning that all imports and exports take place via the water. The following numbers are from the UK Maritime Accident Summary form from 2012. The numerous harbours/ports and piers are used by a variety of different industries and pursuits. Table 3 below shows the vessel movement that took place during 2012.

Table 3: Vessel Movement in 2012

Type of Vessel	Number of Movements
Commercial Vessels	380
Fishing Vessels	57600
Passenger Vessels	40231
Workboat/Port Craft Movements	64560
Pleasure Craft Movements	224952

Pre-Arrival Checks

Pre-arrival form must be completed.

Availability Pilot Vessels

Pilotage shall be compulsory within the Competent Harbour Authority areas for the following ships:

- All passenger vessels over 65 metres overall length.
- All other vessels over 80 metres overall length.
- All vessels under tow where the combined overall length of the towing vessel and the vessel being towed is over 65 metres.
- All vessels over 300 GT carrying persistent oils in bulk.
- A pilot will be used to enter and leave Wide Firth/Shapinsay Sound.
- A small tug/pilot boat is available by request from Kirkwall as the normal pilot launch cannot function as a harbour tug.

Embarkation

The designated Pilotage embarkation positions are:

Kirkwall - 59° 00.42'N 02° 48.83'W

Scapa Flow West - 58° 45.7'N 03° 07.83'W

Scapa Flow East - 58° 45.82'N 03° 01.73'W

Stromness and Hoy Mouth - 58° 56.6'N 03° 21.8'W

Disembarkation

The designated Pilotage disembarkation positions are:

Kirkwall - 59° 00.42'N 02° 48.83'W or 59° 00.8'N 02° 53.15'W

Scapa Flow West - 58° 45.7'N 03° 07.83'W or 58° 50.0'N 03° 03.3'W

Scapa Flow East - 58° 45.82'N 03° 01.73'W or 58° 50.0'N 03° 03.3'W

Stromness and Hoy Mouth - 58° 56.6'N 03° 21.8'W

Vessels requiring or requesting a pilot must provide a minimum of 2 hours' notice to Orkney VTS.

Further information can be found in Orkney Islands Council, The Orkney Pilotage Direction 1988 (As Amended 2007 & 2010).

9.6 AVAILABILITY OF TUGS

Orkney Towage Co. Ltd operates a 24 hour towage service in Scapa Flow with 3, 55 tonne bollard pull, azimuth stern drive tugs; Einar, Erlend and Harald.

Each tug is also equipped with firefighting monitors and can also be used for counter pollution duties. On occasion, the tugs assist with general port services such as supplying fresh water or gas oil.

The following table outlines the number of tugs available for specific ship movements in Scapa Flow.

During emergency situations and in exceptional circumstances, additional tugs may be called on for assistance.

Harbour tugs are available for assisting vessels manoeuvring in other areas around Orkney and for salvage work.

Table 4: Tug Availability

Movement	Ship Group	No. of Tugs
Berthing/Unberthing at LPG Jetty	<5,000 tonnes DWT	1
Berthing at LPG Jetty	>5,000 tonnes DWT	3
Berthing at LPG Jetty	>5,000 tonnes DWT (capability class 2 DP vessels or higher)	2
Unberthing LPG Jetty	> 5,000 tonnes DWT	2
Berthing/Unberthing at SPMs	All ships	2
Berthing/Unberthing STS Operations	All ships (in the event of 2 VLCCs)	3 4

Orkney Harbour Authority requires that certain vessels (primarily loaded tankers) navigating in the Hoxa Sound / Scapa Flow areas are escorted by tugs. The requirements are based on the quantity of pollutants carried and are outlined in the table below.

Table 5: Tug Operations

Area*	Quantity of Pollutants	Number of tugs	Mode
A	>5000	1	Standby
B	>5000	1	Passive
B	>15000	2	Minimum 1 Active
B	>170000	3	Minimum 1 Active
C	>15000	2	Passive
C	>170000	2	Minimum 1 Active

*see Figure 1 overleaf. (The above table also applies to LNG vessels)

The Master and Pilot have the authority to dispense with a tug escort in area "C" should they consider it appropriate.

It is also recommended that ballasted tankers are accompanied by a tug escort as follows:

Table 6: Tug Modes

Area	Mode
Area A	1 tug standby
Area B	1 tug on active mode
Area C	1 tug on passive mode

Figure 1: Area of Tug Operation



9.7 PLACES OF REFUGE IN THE ORKNEY ISLANDS

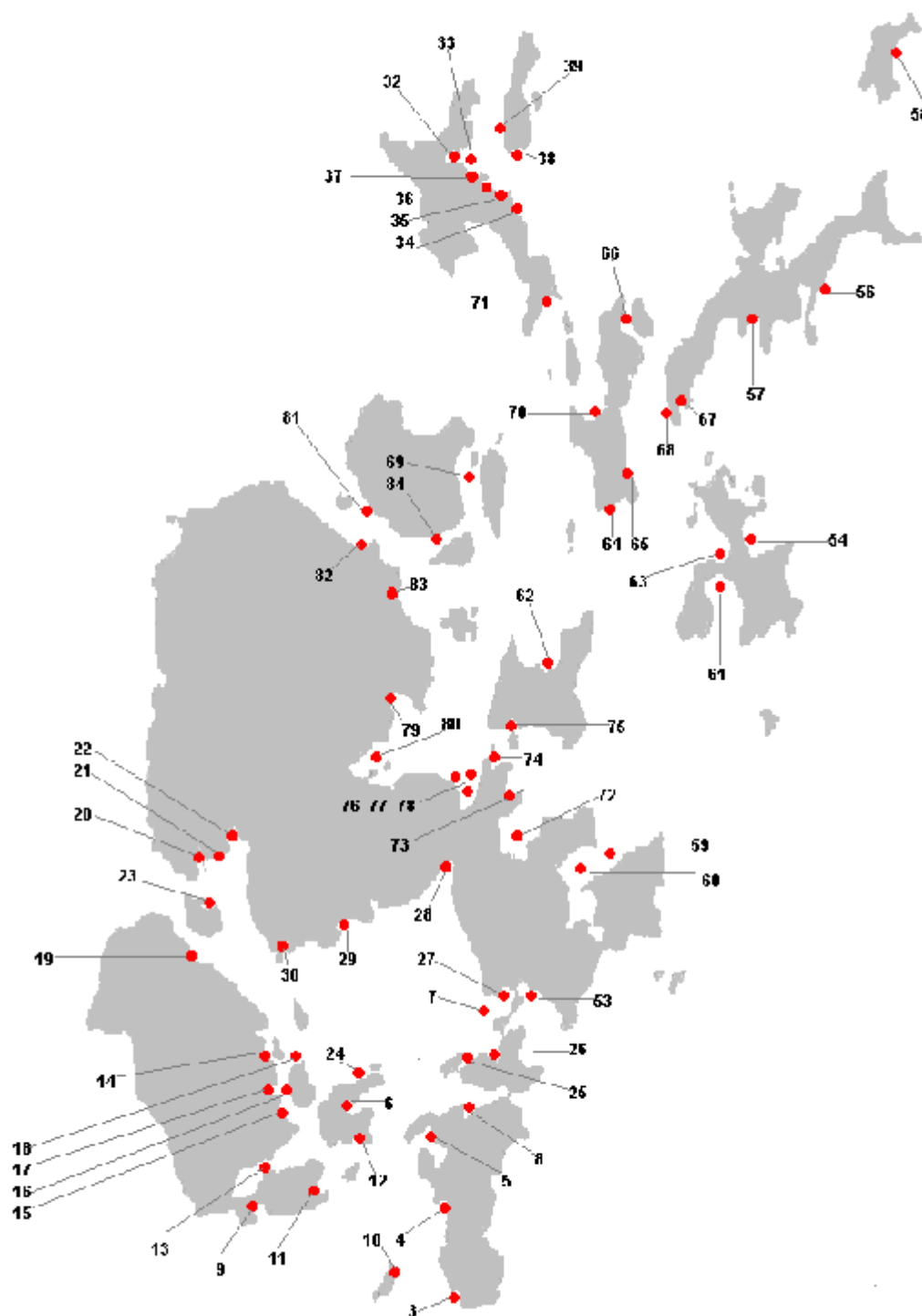


Figure 2: Places of refuge in the Orkney Islands

Table 7: Places of Refuge in the Orkney Islands

Places of Refuge			
3	Burwick, S. Ronaldsay	38	Bay of Moclett, Papa Westray
4	Sand Wick, S. Ronaldsay	39	Backiskail, Papa Westray
5	Widewall Bay, S. Ronaldsay	52	Wind-Wick, Copinsay Pass
6	Pan Hope, Flotta	53	Holm Sound
7	Water Sound: western part	54	Mill Bay, Sanday Sound
8	St Margaret's Hope, S. Ronaldsay	55	Jack's Hole (4 cables W of Point of Graand)
9	Aith Hope, Longhope	56*	Bay of Newark, Sanday
10*	Swona	57*	Kettletoft Bay, Sanday
11	Kirk Hope, Cantick Sound	58	Linklet Bay, North Ronaldsay
12	Kirk Bay, Switha Sound	59	Deer Sound, Deerness
13	Longhope	60	Deer Sound approaches
14	Rysa Sound, Hoy	61	Bay of Holland, Stronsay
15	Ore Bay, Hoy	62	Veantrow Bay, Shapinsay
16	Lyness, Hoy	63	St Catherine's Bay, Stronsay
17	Mill Bay, Hoy	64	Eday
18	Fara	65	Bay of Backaland, Eday
19	Bay of Quoys, Burra Sound	66	Bay of Carrick, Calf Sound, Eday
20*	Stromness Harbour	67	Bay of Stove, Sanday
21*	Cairston Road, Hoy Sound	68	Loth, Sanday
22*	Bay of Ireland, Hoy Sound	69	Rousay Sound
23	Graemsay	70	Fers Ness Bay, Eday
24	Flotta Marine Oil Terminal	71	Rapness Sound
25	Hunda Sound, Burray	72	Inganess Bay, Mainland
26	Echnaloch Bay, Burray	73	Bay of Meil, Mainland
27	Saint Mary's Bay, Holm	74	Bay of Carness, Mainland
28	Scapa Bay	75	Elwick, Shapinsay
29	Swanbister Bay	76	Bay of Kirkwall
30	Bay of Houton	77	Kirkwall Pier
31	Brough Head to North-west of Rousay	78	Hatston Ferry Terminal
32	Pierowall Road, Westray	79	Bay of Isbister, Mainland
33	Pierowall Harbour, Westray	80	Bay of Firth, Mainland
34*	Skel Wick, Westray	81	Bay of Westness, Rousay
35*	Bay of Swartmill, Westray	82	Off Sands of Evie, Mainland
36*	Bay of Cleat, Westray	83	Wood Wick, Mainland
37*	Bay of Brough, Westray	84	Wyre Sound

*** These sites are within the boundary of one or more environmental sensitive sites (see section 19). Consideration should be given to the sensitive nature of these locations and whether a more suitable location could be selected for a vessel in difficulty.**

The places of refuge outlined in figure 2 and table 7 are for your information and their use is not a forgone conclusion. In the event of a spill the SOSREP will consult with SNH on the best course of action regarding refuge.

Existing Control Measures

There are control measures in place to ensure the safety at all times. All bunkering operations are supervised at all times and are carried out by experienced and qualified operators. The port is notified of the arrival of the road tanker by the road tanker operator in advance of arriving at the port.

The tankers have emergency shut-off valves and all hoses used are armoured and certified for oil transfer.

On-board the commercial vessels there are automated tank alarms, which sound at the designated high level point and overflow alarms which sound if fuel pours out of the tank into the overflow tank. In the event of overfilling the fuel will run into the double bottomed hull where it will be contained until it is pumped back into the fuel tanks and filtered prior to use. The fishing vessels are controlled visually by port personnel.

SECTION 10: HARBOUR CHARACTERISTICS

10.1 SCAPA FLOW HARBOUR AREA

Scapa Flow Harbour Area is defined in the Orkney County Council Act 1974 as the area bounded in the west by a line from Out Taings, Hoy to Breckness, Mainland and in the south by a line from Brough Ness, South Ronaldsay to the southernmost tip of Swona and thence to Brims Ness, Hoy

Many harbour operations carry with them a risk of hydrocarbon spillage to the sea. A risk assessment has therefore been carried out to:

- Identify as far as possible likely oil spill scenarios from harbour operations;
- Quantify the possible frequency and size of spills;
- Identify the likely consequences of a hydrocarbon spill.

The risk assessment undertaken considered the risk of oil pollution in the areas covered by this section, Scapa Flow Oil Port. Based on the risk assessment, a response strategy for each area has been devised.

IDENTIFIED RISKS TO THE NORTH

Principal marine operations are of vessels travelling to/from Flotta Terminal, Houton and Scapa Pier. Fifty square miles of sheltered, deep water designated anchorage areas used for STS operations and bunkering are present within the area. Main risk from small operational spills of diesel or oily bilge, or associated with oil cargo or bunker transfer operations. Some risk of collision, e.g. with other marine traffic, exists with possibility of associated larger spill.

There is also a potential risk of oil spill from the Royal Oak and from Flotta Terminal's main oil line.

IDENTIFIED RISKS CENTRAL

This is an area of increased marine traffic and with tanker operations at SPM and Flotta Terminal jetties. Main risk is from loss of tanker on inventory. Spills likely to be ~ 300,000 tonnes of oil. Risk of diesel and lube/hydraulic oil spills also exists. Some risk of collision, e.g. with other marine traffic, exists with possibility of associated larger spill

IDENTIFIED RISKS TO THE WEST

The main risk in this area, as an entrance to Scapa Flow and Stromness harbour, including the Polestar pier and the new Coplands dock, is one of vessel grounding or collision. This could lead to a spill of >10 tonnes of marine diesel or intermediate fuel oil from rupture of single or multiple fuel tanks.

Oil tankers do not use the western entrance.

IDENTIFIED RISKS TO THE SOUTH

Hoxa Sound is used by tankers entering and leaving Scapa Flow. The greatest risk of oil spill is from tanker grounding or collision leading to single or multiple ruptures of cargo and/or fuel tanks. Spill likely to be >500 tonnes.

COASTAL RISKS

Apart from those stretches of coastline with harbours or piers, which will be covered in other sections, the coastal zone is unlikely to be the source of a significant oil release, rather it is likely to be in the path of oil released farther offshore. There does however remain the possibility of a land-based release (e.g. domestic or commercial heating oil which may enter the sea via a watercourse). Equally a vessel grounded on the shore either accidentally or deliberately may be the source of pollution.

OPERATIONAL HAZARDS

RISK: BUNKERING VIA ROAD TANKER AND STS TRANSFER

Vessels use Scapa Pier for bunkering from Highland Fuels road tankers carrying up to 26,000 tonnes. Vessels, which use Scapa Pier for bunkering, include the OIC Harbour vessels and miscellaneous fishing and dive charter boats. Fuel taken on board is principally marine gas oil. Road tankers maximum capacity is 26,000 litres. There is also a bunded tank of marine diesel at the Scapa Pier that is used by smaller vessels. The storage capacity of this is 200 gallons.

Ship to ship transfers take place in sheltered deep water designated for anchorage. The likelihood of a spill is moderate to low as they have had an impeccable record for over 30 years.

ACCIDENTAL HAZARDS

RISK: BERTHING FAILURE OR COLLISION

The Pier is used by OIC Harbour vessels and miscellaneous fishing and dive charter boats. Whilst berthing and disembarking there is a risk of a collision with the pier or other vessels in the vicinity. Berthing failure is considered to be a low-level risk at this harbour due to lack of physical restrictions on vessel's movement, the harbour is well sheltered and all berths being well found and in good condition. Collision risk is small and the only scenario envisaged was between a ferry and a visiting fishing vessel, coaster or yacht.

Existing Control Measures

Any berthing operations would be suspended in very high wind speeds. The Harbour Master has overall control of any operations in port and can suspend any operations deemed to be unsafe due to weather conditions or health and safety. There are experienced and qualified ferry masters which are on hand for berthing operations.

The Harbour Master is responsible for the co-ordination and control of all waterborne traffic within the Port. He will inform vessels when they may enter or leave the port. All vessels are subject to a speed restriction within the port. The port operates a Traffic Light Control System with VHF and Visuals on approaches.

Volume Liable to be lost

In the event of a catastrophic collision where the vessel is holed at the base of the fuel tanks the entire bunker contents of the vessel could be lost. The largest vessel to enter the jurisdiction of Scapa Flow would spill **no more than 50 tonnes** of fuel oil as a result of collision damage. The risk of an oil spill is low due to the control measures currently in place.

SUMMARY OF POTENTIAL SPILLAGE

Scapa Pier is used by Highland Fuels for import of kerosene, petrol and diesel to the Scapa Depot. Twelve tankers came into Scapa Pier during 2013 to offload to the Highland Fuels Scapa Depot with the largest vessel to visit being 5,400 dwt and carrying 3,200 tonnes of fuel products. Product data sheets of oil products held at Scapa Depot are held in the Harbours Department Operations Room.

Vessels use Scapa Pier for bunkering from Highland Fuel road tankers. Vessels, which use Scapa Pier for bunkering, include the OIC Harbour vessels and miscellaneous fishing and dive charter boats. Fuel taken onboard is principally marine gas oil. Road tankers maximum capacity is 26,000 litres. There is also a bunded tank of marine diesel at the Scapa Pier that is used by smaller vessels. The storage capacity of this is 200 gallons.

Risks associated with harbour activities within Scapa Flow are shown to be as low as reasonably practicable (ALARP) however in the event that an unacceptable risk is identified when assigning a risk criteria, Orkney Islands Council will introduce additional control measures.

At Scapa Flow there is a very low risk of collisions or grounding, however 10.1.1 on the next page is a worst case scenario of what would be lost.

Environmental Sensitivities

Hoy SSSI, SAC, SPA, NSA
Waulkmill SSSI
Pentland Firth Islands SSSI, SPA, IBA
Otters, Seals and Harbour Porpoise

10.1.1 Risk of an Oil Spill in Scapa Flow region.

HAZARD	SPILL VOLUME	RISK PRIOR TO CONTROL	EXISTING CONTROL MEASURES	RISK FOLLOWING CONTROL
OPERATIONAL				
Bunkering STS Incident	<26,000 litres ~300,000 tonnes	Moderate	- Carried out by trained and competent individuals - Always personnel on duty during fuel transfer - Follow set procedures	Low
ACCIDENTAL				
Tanker Berthing Failure / Collision	~ 300,000 tonnes	Moderate – High	- Procedures in place for the movement of vessels within the area of jurisdiction - All vessel movements cease if certain vessels are moving - Clear system of lights and marker buoys - Restricted speed - Experiences Masters - Structural integrity of the vessels	Low - Moderate
Risk	Description			
Low	Risks are broadly acceptable. Need to maintain assurance that risks remain at this level.			
Moderate	Tolerable risks – action may be required to reduce risks in this region. Risks are tolerable provided they can be demonstrated to be ALARP (As Low As Reasonably Practicable), i.e. if risk reduction is impracticable or its cost is disproportionate to the improvement gained.			
High	Unacceptable risks – action generally required to reduce risks in this region.			

10.2 SOUTHERN ISLES HARBOURS

This Section covers oil spill contingency for harbours around the South Isles. Statutory harbours are defined as 1km radius from the seaward end of each pier, which is defined as the area to the east of a line between the Outer Holms and Ness Point.

Risk Assessment

Introduction

Many harbour operations carry with them a risk of hydrocarbon spillage to the sea. A risk assessment has therefore been carried out to:

- Identify as far as possible likely oil spill scenarios from harbour operations;
- Quantify the possible frequency and size of spills;
- Identify the likely consequences of a hydrocarbon spill;

The risk assessment undertaken here considers the risk of oil pollution in the areas covered by this section, namely Stromness Harbour, Scapa Pier, Burray Pier, Lyness Pier and Ro-Ro Terminal, Flotta Gibraltar Pier and Ro-Ro Terminal and Flotta Sutherland Pier. A summary of the risk assessment is provided here.

The risk assessment looks in turn at environmental sensitivities, marine operations in each area before a qualitative risk analysis is undertaken. Based on these risk assessments, a response strategy for each area has been devised.

OPERATIONAL HAZARDS

RISK: BUNKERING

Vessel traffic in the South Isles small harbours is dominated by ferries, dive boat operations (Northlink, Pentland Ferries and inter-island) and fishing traffic. There is also traffic to and from the Flotta Oil Terminal (have their own independent response plan); this increased traffic may result in potential spills. There is some cruise liner traffic. In summary, the most frequent spill events in harbours in the Scapa Flow and South Isles harbours are likely to be from tankers resulting in large oil loss, ~ 300,000 tonnes.

ACCIDENTAL HAZARDS

RISK: BERTHING FAILURE OR COLLISION

Larger spills will be less frequent events and may occur due to a grounding or collision. Such an event could lead to a worst case scenario of total loss of capacity of a tanker. The size of spill may vary from 1 tonne (small fishing vessel) upwards to 460 tonnes (large fishing vessel) of marine diesel to ~300,000 tonnes. Some of the Northlink ferries and cruise liners also carry on board intermediate or heavy fuel oil. The risk of grounding or collision is greatest at entrances to the harbours and in areas of strong tidal currents. Likely oil: marine diesel or intermediate fuel oil. There also exists a risk of spill of cargo fuels during offloading at the Scapa Pier. Hydrocarbons likely to be spilled include gasoline (petrol), kerosene, marine diesel and DERV. Procedures are in place to minimise the risk of spillage during offloading operations. These operations are always manned allowing rapid shut down in the event of any hose or valve failure. The largest volume of cargo carried is 3,200 tonnes. The worst case scenario would be a collision or grounding leading to a total loss of containment.

SUMMARY OF POTENTIAL SPILLAGE

Potential sources of Oil Pollution:

Grounding or collision.

Risks associated with harbour activities within the Southern Islands are shown to be as low as reasonably practicable (ALARP) however in the event that an unacceptable risk is identified when assigning a risk criteria, Orkney Islands Council will introduce additional control measures.

The risk of collisions or grounding in the Southern Isles is low, however 10.2.1 on the next page is a worst case scenario of what could be lost.

Environmental Sensitivities

Waulkmill SSSI
Pentland Firth Islands SSSI, SPA, IBA
Otters, Seals and Harbour Porpoise

10.2.1 RISK OF AN OIL SPILL IN THE SOUTHERN ISLANDS

HAZARD	SPILL VOLUME	RISK PRIOR TO CONTROL	EXISTING CONTROL MEASURES	RISK FOLLOWING CONTROL
OPERATIONAL				
Bunkering	~300,000 tonnes	Low - Moderate	- Carried out by trained and competent individuals - Always personnel on duty during fuel transfer - Follow set procedures	Low - Moderate
ACCIDENTAL				
Berthing Failure / Collision	Small fishing vessel < 1 tonnes	Moderate – High	- Procedures in place for the movement of vessels within the area of jurisdiction - All vessel movements cease if certain vessels are moving - Clear system of lights and marker buoys - Restricted speed - Experiences Masters - Structural integrity of the vessels	Low - Moderate
	Large fishing vessel <460 tonnes			
	Northlink Ferries <3,200			
	Tanker ~300,000			
Risk		Description		
Low		Risks are broadly acceptable. Need to maintain assurance that risks remain at this level.		
Moderate		Tolerable risks – action may be required to reduce risks in this region. Risks are tolerable provided they can be demonstrated to be ALARP (As Low As Reasonably Practicable), i.e. if risk reduction is impracticable or its cost is disproportionate to the improvement gained.		
High		Unacceptable risks – action generally required to reduce risks in this region.		

10.3 KIRKWALL HARBOUR AREA

This section covers oil spill contingency for the Wide Firth and Shapinsay Sound Harbour Area, which is defined in the Orkney County Council Act 1974 as the area bounded to the south by a straight line between Harpy Taing on Mainland and Strombery on Shapinsay, and to the east by a straight line between Hackness on Shapinsay to Rerwick Head on Mainland. This section also contains response procedures for Shapinsay, Balfour Pier, Ro-Ro Terminal, Hatston Terminal and Kirkwall Harbour.

Risk Assessment

Introduction

Many harbour operations carry with them a risk of hydrocarbon spillage to the sea. A risk assessment has therefore been carried out to:

- Identify as far as possible likely oil spill scenarios from harbour operations;
- Quantify the possible frequency and size of spills;
- Identify the likely consequences of a hydrocarbon spill.

The risk assessment undertaken considered the risk of oil pollution in the areas covered by this section, namely Wide Firth/Shapinsay Sound, Kirkwall Pier, Hatston Terminal and Balfour Pier and Ro-Ro Terminal in Shapinsay.

A summary of the risk assessment is provided here.

The risk assessment looked in turn at environmental sensitivities, marine operations in each area and then a qualitative risk analysis is undertaken. Based on the risk assessment, a response strategy for each area has been devised.

OPERATIONAL HAZARDS

RISK : BUNKERING

The most frequent spill events in the Kirkwall Harbour, Pier and Wide Firth/Shapinsay Sound area are likely to be small operational spills of marine diesel, with likely spill volumes of <0.5 tonnes. Such spills are likely to result from illegal bilge discharges and small spills during bunkering. Bunkering is mainly limited to the Kirkwall Pier.

Bunkering or cargo discharge operation e.g. through hose failure. Spill volume likely to be between 1-50 tonnes depending on time taken to shut off.

Bunkering and cargo discharge (e.g. Scottish Fuels) operations are mainly limited to the Kirkwall Pier. Likely oil: marine diesel or kerosene.

ACCIDENTAL HAZARDS

RISK : BERTHING FAILURE OR COLLISION

Grounding or collision could lead to a worst case scenario of total loss of capacity of fuel tank and/or cargo. Size of spill may vary from 1 tonne (small fishing vessel) upwards to 4,000 tonne (cruise liner/Northlink Ferry). Some of the largest cruise liners in the world come alongside at Hatston Pier, the risk of a spill from this source is considered low due to mitigation measures in place; however a worst case spill scenario from this source would be a complete loss of fuel inventory (~7500 tonnes). Dive Support Vessels, Heavy Lift Vessels and Offshore Supply Vessels come alongside the Hatston Pier, meaning there is an increased risk in this area. The Standby/Supply Vessels will be loading and carrying various types of fuels and products including ATK, drilling mud, diesel fuel, lube oil etc. Small spills of these products are most likely to occur during loading operations.

The risk of grounding or collision is greatest at entrances to the harbours and in areas of strong tidal currents e.g. The String. Risk of collision with quayside and other vessels is greatest at Hatston Pier. Likely oil: marine diesel or intermediate fuel oil.

SUMMARY OF POTENTIAL SPILLAGE

Grounding/Collision, potential up to 4000 tonnes.

Risks associated with harbour activities within the Southern Islands are shown to be as low as reasonably practicable (ALARP) however in the event that an unacceptable risk is identified when assigning a risk criteria, Orkney Islands Council will introduce additional control measures.

The risk of collisions or grounding in the Kirkwall area are low, however 10.3.1 below is a worst case scenario of what could be lost.

Environmental Sensitivities

No major designations but the surrounding area is known to support populations of Otters, Seals and Harbour Porpoise. Kirkwall is regionally important for fishing effort and for recreational value.

10.3.1 RISK OF AN OIL SPILL IN KIRKWALL

HAZARD	SPILL VOLUME	RISK PRIOR TO CONTROL	RISK FOLLOWING CONTROL
OPERATIONAL			
Bunkering	<50 tonnes	Moderate	Low
ACCIDENTAL			
Berthing Failure / Collision	Tug/Small Fishing Vessel >1 tonne	Moderate	Low - Moderate
	Standby Supply Vessel >425 tonnes	Moderate	Low - Moderate
	Ferry Collision <4000 tonnes	Moderate	Low – Moderate
	Cruise Liner ~7500 tonnes	Major	Low - Moderate
Risk	Description		
Low	Risks are broadly acceptable. Need to maintain assurance that risks remain at this level.		
Moderate	Tolerable risks – action may be required to reduce risks in this region. Risks are tolerable provided they can be demonstrated to be ALARP (As Low As Reasonably Practicable), i.e. if risk reduction is impracticable or its cost is disproportionate to the improvement gained.		
High	Unacceptable risks – action generally required to reduce risks in this region.		

10.4 HARBOURS IN THE NORTH ISLANDS

This section covers oil spill contingency for harbours in the North Isles. Statutory harbours are defined as 1km radius from the seaward end of each pier with the exception of Westray Rapness Ro-Ro Terminal and Sanday Loth where harbour responsibility extends for 500m from the seaward end of the pier.

Risk Assessment

Introduction

Many harbour operations carry with them a risk of hydrocarbon spillage to the sea. A risk assessment has therefore been carried out to:

- Identify as far as possible likely oil spill scenarios from harbour operations;
- Quantify the possible frequency and size of spills;
- Identify the likely consequences of a hydrocarbon spill.

The risk assessment undertaken here considers the risk of oil pollution in the areas covered by this section, namely Westray Pierowall Harbour; Westray Rapness Ro-Ro Terminal; Stronsay Whitehall Pier & Ro-Ro Terminal; Stronsay West Pier; North Ronaldsay Nouster Pier; Eday Backaland Pier & Ro-Ro Terminal; Papa Westray Moclett Pier and Sanday Loth Pier.

The risk assessment looks in turn at environmental sensitivities, marine operations in each area and then a qualitative risk analysis is undertaken. Based on these risk assessments, a response strategy for each area has been devised

OPERATIONAL HAZARDS
RISK : BUNKERING Vessel traffic in the Orkney North Isles small harbours is dominated by ferry and fishing traffic. In summary, the most frequent spill events in harbours in the North Isles are likely to be small operational spills of marine diesel, with likely spill volumes of <0.5 tonnes. Such spills are likely to result from illegal bilge discharges and small spills during bunkering.
ACCIDENTAL HAZARDS
RISK : BERTHING FAILURE/GROUNDING/COLLISION Larger spills will be less frequent events and may occur due to a grounding or collision. Such an event could lead to a worst case scenario of total loss of capacity of a vessel fuel tank. The size of spill may vary from 1 tonne (small fishing vessel) upwards to 35 tonnes (Orkney Ferries Ltd vessel). The risk of grounding or collision is greatest at entrances to the harbours and in areas of strong tidal currents. Likely oil: marine diesel.
SUMMARY OF POTENTIAL SPILLAGE
Grounding or collision, potential oil spill up to 35 tonnes. Risks associated with harbour activities within the Northern Islands are shown to be as low as reasonably practicable (ALARP) however in the event that an unacceptable risk is identified when assigning a risk criteria, Orkney Islands Council will introduce additional control measures. The risk of collisions or grounding around the Northern Islands is low, however 10.4.1 below is a worst case scenario of what could be lost.

Environmental Sensitivities

West Westray SSSI, SPA
North Hill SSSI
Papa Westray SPA
Calf of Eday SSSI, SPA
Faray SSSI, SAC
Central Sanday SSSI
East Sanday SSSI, SPA, RAMSAR
Otters, Seals and Harbour Porpoise

10.4.1 RISK OF AN OIL SPILL IN THE NORTHERN ISLANDS

HAZARD	SPILL VOLUME	RISK PRIOR TO CONTROL	RISK FOLLOWING CONTROL
OPERATIONAL			
Bunkering	<0.5 tonnes	Moderate	Low - Moderate
ACCIDENTAL			
Grounding/Collision	Small Fishing Vessel >1 tonne	Moderate	Low - Moderate
	Orkney Ferries <35 tonnes		
Risk	Description		
Low	Risks are broadly acceptable. Need to maintain assurance that risks remain at this level.		
Moderate	Tolerable risks – action may be required to reduce risks in this region. Risks are tolerable provided they can be demonstrated to be ALARP (As Low As Reasonably Practicable), i.e. if risk reduction is impracticable or its cost is disproportionate to the improvement gained.		
High	Unacceptable risks – action generally required to reduce risks in this region.		

10.5 COASTLINE AREAS AROUND ORKNEY OUTSIDE THE HARBOUR AREA

This section covers oil spill contingency for all coastal areas within Orkney out-with harbour areas which fall under the remit of the local authority for initial oil spill response. As Orkney Islands Council Marine Services is a municipal harbour authority, the roles of harbour authority and local authority are one and the same

Risk Assessment

Introduction

The risk assessment undertaken here considers the risk of passing traffic potentially causing a hydrocarbon spillage in the coastal areas around the Orkney Isles which do not fall within the harbour areas.

The risk assessment looks in turn at environmental sensitivities, marine operations in each area and then a qualitative risk analysis is undertaken. Based on these risk assessments, a response strategy for each area has been devised.

OPERATIONAL HAZARDS
RISK : OPERATIONAL SPILLS/ BILGE DISCHARGES The waters surrounding the Orkney Isles play host to a large number of commercial vessels, varying greatly in size and amount of hydrocarbons contained therein. In summary, the most frequent spill events in this area are likely to be small operational spills of marine diesel, with likely spill volumes of <0.5 tonnes. Such spills are likely to result from illegal bilge discharges and may go largely unreported due to their geographic location.
ACCIDENTAL HAZARDS
RISK : BERTHING/MECHANICAL FAILURE/COLLISION/GROUNDING Larger spills will be less frequent events and may occur due to a grounding or collision. Such an event could lead to a worst case scenario of total loss of cargo containment, full capacity of a vessel fuel tank or the loss of heavy fuel oil from the bunker. The size of spill may vary from 1 tonne (small fishing vessel) upwards to 300,000 tonnes (large VLCC's transiting the area). Although very unlikely, the largest of these spills would automatically call for a National Response.
SUMMARY OF POTENTIAL SPILLAGE
Grounding or Collision, potential oil spill of 300, 000 tonnes. Risks associated with harbour activities within the Coastal areas are shown to be as low as reasonably practicable (ALARP) however in the event that an unacceptable risk is identified when assigning a risk criteria, Orkney Islands Council will introduce additional control measures. The risk of collisions or grounding around the Coastal area of the Orkneys is low; however table 10.5.1 below shows worst case scenario of what could be lost.

Environmental Sensitivities

Otters, Seals and Harbour Porpoise
See section 19 for full designations.

10.5.1 RISK OF A SPILL IN THE COASTAL AREA

HAZARD	SPILL VOLUME	RISK PRIOR TO CONTROL	RISK FOLLOWING CONTROL
OPERATIONAL			
Operational Spills/Bilge Discharges	<0.5 tonnes	Moderate	Moderate - Low
ACCIDENTAL			
Berthing/Mechanical Failure / Collision	Small fishing vessel collision < 1 tonne	Moderate	Low - Moderate
	Ferry Collision <300,000 tonnes MGO		
	Mechanical Failure >300,000 tonnes HFO		
Risk	Description		
Low	Risks are broadly acceptable. Need to maintain assurance that risks remain at this level.		
Moderate	Tolerable risks – action may be required to reduce risks in this region. Risks are tolerable provided they can be demonstrated to be ALARP (As Low As Reasonably Practicable), i.e. if risk reduction is impracticable or its cost is disproportionate to the improvement gained.		
High	Unacceptable risks – action generally required to reduce risks in this region.		

SECTION 11: RESPONSE STRATEGY

11.1 HEALTH AND SAFETY

Statutory Duties

Table 8 provides a synopsis of applicable statutory law and its implications for the work place.

Table 8: Applicable Statutory Law

LAW	IMPLICATIONS
The Health and Safety at Work Act 1974	Places duty on all employers and persons responsible for premises to ensure the workplace is safe and in the case of the employer, to have a safe system of work. This duty is placed regardless of whether the workers are employees, sub-contract workers, temporary workers or self employed persons.
Implementation of the Health and Safety at Work Regulations 1999	All employers carry out suitable and sufficient Risk Assessments of all tasks to be undertaken in the workplace. Where five or more employees are employed then the Assessment is to be recorded and those at particular risk must be informed accordingly. The employer is required to execute a Safety Management System and that measurement of performance against standards is made. All employees must receive adequate training, information and supervision. Additionally, there is a requirement for all employees to receive suitable and sufficient health surveillance to ensure that they are fit to carry out the work and that the work and conditions do not cause them adverse effect.
The Provision and Use of Work Equipment Regulations 1998	All equipment provided for use at work is safe and fit for purpose. The persons using the equipment must be adequately trained in its use and use must be properly supervised.
The Personal Protective Equipment Regulations 1992	All equipment provided is fit for purpose and does not cause adverse effect. That all personnel are trained in its use and that all associated risks are recorded controlled and pointed out to those affected.
The Manual Handling Regulations 1992	All work where lifting, pulling and pushing is involved, is assessed and all risks to the health and safety of those involved are reduced to a level as low as reasonably practicable.
The Control of Substances Hazardous to Health Regulations 2002	All substances to which a worker may be exposed, including dusts and gasses are properly assessed and the risks to health reduced to a safe and acceptable level.

Site Safety Plan

To achieve a safe operation, those in charge of the response must follow those generalised parts of the Contingency Plan, which apply in all circumstances. Additionally they must have available the means to prepare those elements of the Plan which are site and response specific.

The Site Safety Plan is intended to prevent uncontrolled incidents occurring which may cause further damage to the environment or loss due to damage, injury or illness. The Site Safety Plan should comprise the sections shown in Table 8. Each section should be addressed jointly and separately before work commences and the appropriate steps taken to ensure that requirements are adequately met.

Table 9: Site Safety Plan Sections

SECTION	CONTENTS
Site survey	A site survey form should be available, which when followed correctly will add all of those site unique details which assist in the decision making process and remind staff of essentials which might otherwise be omitted. The site survey should address the safety of those personnel taking part in the cleanup as well as those members of the public who may also be involved. The following indicates a few of those subjects which, should be addressed, assessed and reported in the survey. The list is by no means exhaustive. • Communications requirements; • Exposure to temperature; • Feasibility of handrails or ropes; • Hazards to the eyes; • Lack of or shelter from weather; • Lighting conditions; • Machinery usage; • Manoeuvrability; • Manual handling; • Pedestrian traffic; • Requirement to access confined spaces; • Sample collection; • Terrain surface and incline; • Vehicle traffic; • Visibility; and • Water hazards.
Operations analysis	Having surveyed the site and assessed the aspects which are influenced by the terrain, water conditions, and other pertinent factors. The On-Scene Commander will assess the way in which the operation is to be conducted. The intention to use the following facilities can be stated and the reasons for and priorities of each facility established. • Cranes; • Boats; • Breathing apparatus; • Detergents; • Forklifts; • Hoses and pumps; • Low loaders; • Motor vehicles; • Raking and sweeping gear; and • Winches

SECTION	CONTENTS
Site Control	It is essential that those in charge of the spill cleanup have control of the site as soon as possible and before any significant part of the cleanup operation begins. Access to the site must be restricted to those personnel who are essential to the cleanup operation. Arrangements must be made for the area to be barriered, closed and policed such that no one can enter the work area without reporting to the site supervisor. No workers should be allowed on site until they have received the full vetting and briefing with respect to the safety plan.
Logistics and supplies	Specifically with respect to safety, it should be ensured that the appropriate equipment, materials and substances are available at the required times. Particular attention should be paid to the availability of the various sizes of protective clothing required. This sometimes cannot be established until the members of the workforce have been detailed and their individual roles and tasks decided. Consideration must be given for a prolonged clean-up operation possibly stretching to 24 hours operations. In which case shelter, accommodation, feeding, refreshment, rest areas, sanitation and first aid must be available. Where training has to be delivered, the necessary instructors and equipment must be available before work commences. It is an error to allow experienced workers to commence work whilst others are waiting for training. Personal Protective Equipment (PPE). If the weather is at all inclement, the protective clothing issued to workers must be warm, water and chemical-proof. It should include coveralls, gloves, boots, eye protection and headgear. If the weather is warm, the use of the same protective clothing may be necessary, but the requirements for ventilation and cooling will be greater. PPE includes: • Breathing apparatus including respirators; • Flotation suits and vests; • Gloves / gauntlets; • Protective clothing; • Goggles, visors and safety glasses; • Hard hats; • Insulated clothing; and • Reinforced boots, shoes and gloves. First Aid. The Health and Safety (First Aid) Regulations 1981, together with the New Code of Practice on First Aid, lay down the requirements for trained first aiders and the equipment that must be provided. A foreshore clean up is considered as a special circumstance and the appropriate extra provisions should be taken into account.
Personnel	Selection of Personnel to carry out the cleanup must be dominated by safety considerations.

Safety on the Dockside

During the execution of a foreshore Site Survey, access to the area to be cleaned must be carefully assessed. Account needs to be taken of low and high tides and the need for workers to access difficult to navigate inlets, cliffs and terrain. Tide tables should be consulted as well as the taking of advice from those with local knowledge.

Where necessary and appropriate, the use of equipment such as handrails, ropes and ladders should be considered. Where workers are, by necessity, required to work out of sight of one another, communication between them and the supervisor is essential. The provision and use of Personal Emergency Beacons and Distress Flares by appropriate personnel should be considered.

Safety on the Water for HSE Purposes

The Harbour Office should be informed of vessels involved in operations together with all the necessary details of vessel capability and POB.

Workers operating from sea-going vessels should be equipped with harnesses built to BS 1397. They should, at all times, wear an approved self or automatic inflating lifejacket and should be protected by a survival suit.

Safe Operations

Risk Assessment

The identification of all hazards at a worksite or spill location is a singular task that should be done by involvement of the people who are expected to carry out the work. The supervisor responsible for co-ordinating the risk assessment should ensure that all hazards are identified before the next step in the process is attempted. A hazard is an object, place, process or circumstance with the potential to do harm in the form of injury, damage, delay or pollution.

Decontamination

Conditions requiring decontamination

Clothing contaminated by crude oil or chemicals, which might have been used during the cleanup operation, needs to be cleaned to prevent further contamination. Facilities for such cleansing should be made available either near to Rest or Feeding areas or close by, but clear of the work site.

Personal hygiene practices on the job

Workers should be instructed on the dangers of ingesting hydrocarbons and chemicals through contact of contaminated equipment or clothing. Facilities for removing protective clothing and washing before consuming food or smoking should be made available.

Decontamination area drainage

Cleansing water and contaminants washed from clothing and personal equipment should be drained into tanks. Care should be taken to ensure contaminated waste does not drain into either the normal drainage system or into soil under the decontamination area.

Disposal of contaminated clothing

Clothing, which is not fully washable or capable of having all traces of contaminant removed, may need to be disposed of safely. Such clothing may comprise Special or Hazardous Waste. If incineration facilities do not exist at the site, the clothing may need to be delivered to the Local Authority or to a Special Waste Contractor.

11.2 OIL SPILLS

Introduction

An oil spill can occur almost anywhere - a leakage or accident during transportation or during use, which can affect many areas including sea, coastlines, harbours and land.

Oil contains a variety of different types of hydrocarbons. The exact composition is dependent upon its origin. Oil may also contain a variety of impurities such as sulphur and nitrogen products. Generally oil is of relatively low toxicity; however this is dependent upon the properties of the source oil. The route of human exposure is via inhalation and skin absorption.

Oil when released in a spill will be subjected to various actions:

- spreading;
- evaporation;
- oxidation;
- dissolution;
- emulsification; and
- microbial degradation.

The effect of all these actions is to reduce the original oil volume by evaporation but increase it by emulsification, also reduce its flammability and its toxicity. The rate of these actions is dependent upon the physical composition of the oil and environmental conditions prevailing at the time. Therefore to be able to effectively combat a spill these factors must be known.

Oil Spill Sampling

Samples of the spilt oil should be taken as soon as possible before the oil has weathered. These samples may be required as evidence in legal proceedings. Guidance in the matter of collection samples is given in MCA STOp Notice 4/2001. Oil samples can be arranged by the Harbour Master.

It should be noted that MCA STOp Notice 4/2001 does not refer to the requirements in Scotland, to have every step of the sampling and analytical process witnessed if the results of the analysis are to be used in the report to the Procurator Fiscal. A sample label format has been developed to prompt the sampler to obtain a witness and deal correctly with the sample.

SECTION 12: TRAINING AND EXERCISE POLICY

12.1 TRAINING POLICY

The Contingency Planning for Marine Pollution Preparedness and response Guidelines for Ports state all personnel likely to be involved in a Marine Pollution Incident have to meet certain requirements and standards. Training should be conducted by a Nautical Institute accredited training provider.

In order to familiarise personnel in the use of this Oil Spill Contingency Plan and comply with MCA guidelines, Oil Spill Response training courses will be held for all employees of Orkney Islands Council's Marine Services, their contractors and port operators with an identified role within the plan. In addition, there will also be awareness briefings with other harbour users and the Agencies involved in the consultation process.

After initial training, instruction will be specific with the use of the Tier 1 oil spill response equipment. This will be tested and deployed using those personnel who will be responsible for operating this equipment in the event of a spill. In the event of a Tier 1 spill, OIC have 20 operatives trained to respond with a further 9 to be trained by the end of 2014. An incident would be reported through VTS and a response team dispatched. Harbour/pier location would not be an issue in response to a tier 1 spill as OIC can use their own tugs and vessels.

In order to meet the minimum levels as recommended in the MCA guidelines, the training and exercising of key personnel is detailed below.

Table 10: Training in the use of this Plan

Position	Timing	Type of Training
Depute Harbour Master	Three Year Refresher	MCA Level 4p (IMO2)
OIC Marine Services	Three Year Refresher	MCA Level 1 MCA Level 2
Beachmasters	At plan approval	Contingency Plan Familiarisation briefing

Orkney Islands Council Marine Services have seven personnel trained to MCA level 4 standard and two trained to MCA level 5 that could assume the role of OSC in an emergency. In addition, OIC has 10 members trained to MCA level 2 and 2 more trained to level 3.

12.2 EXERCISE PROGRAMME

The Contingency Planning for Marine Pollution Preparedness and Response Guidelines for Ports state:

"Each Port / harbour / oil handling facility must participate in exercises in accordance with the provisions within their OPRC Compliant Oil Spill Contingency plan"

To ensure that the Oil Spill Contingency Plan is "user friendly" and understood by all those involved in its use, communications and practical exercises will be undertaken on an annual basis.

A record of Personnel Training and Contingency Plan Exercises will be held by the Orkney Islands Council Marine Services and available for inspection by MCA.

The provisions specific to Orkney Islands Council Marine Services are detailed in table 10 on the next page.

Table 11: Exercises in the use of this Plan

Exercise Type	Frequency
Notification Exercises	Twice per year
Mobilisation Exercises	Twice per year
Table-top Exercise (may incorporate mobilisation and deployment of local response equipment)	Once per year
Incident Management Exercise (will incorporate mobilization and deployment of resources up to Tier 2 level)	Once every 3 years*
*In an instance where a port, harbour or oil handling facility considers this requirement to be unduly onerous on the basis of the risk assessment, they may submit an alternative exercise programme to the Regional CPSO for consideration and approval, on an individual basis. In some circumstances it may be permissible to undertake an Incident Management Exercise in the fourth year of the plan's five-year life-cycle providing for the 'lessons-learned' to be captured within the final plan review/update year.	

Sharing of Exercises

In a situation where a group of ports and harbours are within a distinct geographic region and sharing the same Tier 2 contractor, there may be scope to undertake a joint exercise at one of the ports. Key individuals from nearby ports could be invited to observe or participate, thus gaining from the experience of the hosting port. In any case, each plan holder must host their own exercise involving mobilisation and deployment of their Tier 2 response, at least every three years.

A post exercise/incident form should be completed and forwarded to the Regional CPSO, and all relevant plan holders, each time an exercise is carried out.

Further guidance can be found in Section 17.

12.3 FORMS TO BE COMPLETED – POST EXERCISE

Below is a post exercise / incident report form which should be completed and forwarded to the regional CPSO and all relevant plan holders, each time an exercise is carried out. Similarly if a real incident were to occur details should be logged and copied to the MCA.

Proforma on following page.

Post Exercise / Incident* Report



Name of Port/Harbour/Oil Handling Facility:			
Tier Level (T1,2 or 3)		Name exercise / incident	
Names of any other participating ports, harbours or oil handling facilities if joint equipment deployment exercise/incident			
Date of exercise / incident		Time of exercise / incident	
Location of exercise/incident:			
Name of exercise / incident co-ordinator:			
Name of personnel participating in exercise/incident and role played:		List of equipment deployed:	
Name of any other organisations or authorities participating in exercise / incident:			
Details of amendments to be made to the Contingency Plan resulting from this exercise / incident:			
(in addition to this form the revision list is to be updated & the appropriate pages within the plan amended & issued to all plan holders)			
I can confirm that the details on this form provide a realistic summary of the exercise/incident. Any action points resulting from this exercise/incident have been dealt with accordingly, the relevant documents updated and copies provided to the appropriate bodies for their attention.			
Authorised by (name in block capitals):		Position / Job Title:	
Signature:		Date:	

12.4 FORMS TO BE COMPLETED ON AN ANNUAL BASIS

To ensure that the MCA's records remain up-to-date, Port / Harbour authorities should complete an annual return of changes made (e.g. exercises conducted, new personnel trained, etc.). 'Nil' returns should also be submitted.

Electronic copies of the following form can be obtained from the MCA.



OPRC Annual Return

Name of Port, Harbour or Oil Handling Facility:			
Annual Return Period:		to	
Plan Approval date:			(5 year life span of plans)
Summary of Incidents: (include date, source, type and quantity of pollution)			
Summary of Exercises: (include date and type of exercise conducted)			
Pollution Training Undertaken (include date, MCA Level, Name & certificate No.)			
Summary of Amendments: (include date, amendment No., & item(s) changed)			
Signed:		Print:	
Position:		Date:	

This form must be completed by Ports, Harbours and Oil Handling facilities at the end of each calendar year by the 31st January and returned to the Regional Counter Pollution & Salvage Officer. Continue on separate sheet if necessary. Nil returns are required.

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PART 3: DATA DIRECTORY

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SECTION 13: MCA STOp NOTICE 4/2001



SCIENTIFIC, TECHNICAL AND OPERATIONAL ADVICE NOTE

- STOp 4/2001

IMPORTANT

This STOp notice replaces STOp 2/98; please destroy your copy of STOp 2/98

ADVICE TO LOCAL AUTHORITIES ON THE COLLECTION AND HANDLING OF OIL SAMPLES

1. Background
2. Sampling from the sea and shoreline
3. Size of samples
4. Methods of collecting samples
5. Bottling, sealing, packaging and boxing of samples
6. Labelling and addressing of samples
7. Transportation of samples
8. Handling of samples for Bonn agreement states

Appendices

Appendix A: Oil Pollution Sample – Standard Label

Appendix B: Collection of Sample – Standard Form

Note: This document should be read in conjunction with:

- STOp 1/2001 - The Environment Group and Maritime pollution response in the UK.
- STOp 2/2001 - The Establishment, Management Structure, Roles and Responsibilities of a Shoreline Response Centre during a Maritime Pollution Incident in the United Kingdom.
- The National Contingency Plan for Marine Pollution from Shipping and Offshore Installations (NCP).

All extant MCA STOp notices may be found on the MCA web site: www.mcga.gov.uk and all enquiries regarding this and other MCA STOp notices should be directed to meor@mcga.gov.uk

1. BACKGROUND

Where an oil pollution incident is thought to have arisen from an illegal operational discharge an effort should be made to collect a sample of the pollutant and, if possible, matching samples from the suspect ship or other source for analysis, comparison, and possible subsequent use in legal proceedings. Samples of the pollutant may need to be taken from the sea or coastline. When beach pollution has occurred, local authorities or HM Coastguard would usually take the necessary samples. For advice on sampling at sea, contact the Counter Pollution Branch of the Maritime and Coastguard Agency (MCA) on 02380 329483. This notice sets out the procedures to be followed when collecting and handling oil samples.

The MCA's Enforcement Unit will collect evidence concerning pollution incidents from shipping at sea, upon which a decision will be made as to prosecute or not. In England, Wales and Northern

Ireland the MCA will conduct prosecutions. In Scotland the case will be presented to the Procurator Fiscal for action.

If samples are likely to be used in connection with legal proceedings then the following procedures should be implemented:

In England and Wales

Although a single sealed sample of each type of pollutant is required by law, MCA would prefer three samples to be collected.

In Scotland

There is no longer a legal requirement for three sealed samples of each type of pollutant in Scotland but as in England MCA recommend three samples: one for analysis, a second to be handed to the owner or master of the suspect vessel for retention and any appropriate action, and the third for production in court, where the prosecution will be handled by the local Procurator Fiscal.

In Northern Ireland

Although the law in Northern Ireland concerning this matter is the same as that in England and Wales, the Director of Public Prosecutions, who is responsible for handling prosecutions in Northern Ireland, has asked that for the sake of safety, three sealed samples of each type of pollutant should be provided on the same basis as in Scotland.

Responsibility for the collection of oil samples in Northern Ireland rests with Environment and Heritage Service, Department of the Environment (Northern Ireland).

Samples will usually be requested by a scientist/mariner in the MCA's Counter Pollution Branch or one of the Principal Counter Pollution and Salvage Officers as part of the response to a reported incident. Once a sample has been taken, agreement must be obtained from the Counter Pollution Branch before it is analysed.

Please remember that analysis of sample will only be carried out and paid for by the MCA if authorised by the Counter Pollution Branch.

Please note that organisations such as Ports and Harbours or the Environmental Regulator may be taking independent samples as part of their own individual responsibilities for oil spill response and pollution regulation. The analysis of the samples and the cost of analysis of such samples will be the responsibility of the organisation taking the sample and not the MCA.

2. SAMPLING FROM THE SEA & SHORELINE

When a large oil slick exists at sea or on a coastline, the number of samples that MCA may require is:

offshore spill - minimum of 1 sample / slick / day where possible,

onshore spill - representative samples from the shoreline, following discussion with Counter Pollution Branch .

Following an incident, attempts may be made to infer that not all the oil pollution came from one vessel, and that some of it may have come from other sources. Where therefore an oiled beach is being sampled, a careful and detailed examination of the beach should be made to determine the uniformity of the oil deposit and the extent to which it is polluted by more than one type of oil. In particular, if there are any tarry, semi-solid lumps or wet tarry patches, their presence should be recorded and some idea of their quantity and extent obtained. In addition, samples of such pollution should be retained and an attempt should be made to estimate costs expended on the cleanup of different oils.

In cases where samples have been taken at intervals along the beach, these should be clearly identified (see section 6 on labelling). It is desirable that samples of oil are taken in the area where the oil is first washed ashore. This is helpful since the fresher the oil the easier it is to identify by laboratory techniques.

3. SIZE OF SAMPLES

Modern analytical methods mean that very little original pollutant is required to carry out most analyses. However, a larger sample is likely to be more representative. Detailed analyses are often hampered by either contamination or the loss of the oil's lighter fractions. A larger undisturbed sample may consist of a weathered oil crust covering a less weathered (holding a greater percentage of lighter fractions) and therefore more valuable sample. The recommended minimum quantities required for a detailed programme of analyses are:

Type	Quantity
Unweathered oils that are liquid and substantially free of water	10ml
Oil exposed to seas surface and forming water-in-oil emulsion "chocolate mousse"	10ml
Overside water discharge where contravention of 100ppm or 15ppm is suspected	1 litre of the discharge
Tarry lumps as found on beaches	10 grammes

A sample should not be withheld because the recommended quantity cannot be obtained, since much smaller samples can give useful results. In cases of pollution within UK territorial waters, when it is only necessary to prove that some oil has been discharged, a relatively small sample may be acceptable. Larger samples may be useful to carry out a range of tests to determine the most appropriate response/clean-up strategy. MCA can advise when and why such an approach is desirable.

4. METHODS OF COLLECTING SAMPLES

When liquid samples are skimmed off the surface of the sea, care should be taken to ensure that the sample contains sufficient oil. Various techniques may be adopted to skim thin layers of oil from the waters' surface and consolidate 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. The sample container should be sealed as soon as possible to minimise evaporation of the higher fractions.

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.

5. BOTTLING, SEALING, PACKAGING AND BOXING OF SAMPLES

All samples should be securely packed and sealed, using screw topped containers and UN approved fibreboard boxes to ensure safe carriage of the sample. These have been supplied to HM Coastguard Stations and MCA Marine Offices for use by MCA Staff. In consultation with CPB, MCA sampling bottles can be made available to local authorities.

As proof against unauthorised opening, the sample container should be sealed with wire and a lead or sealing wax seal. Alternatively, adhesive labels with a signature stuck on the bottle top in such a way that they have to be broken to open the bottle are acceptable.

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 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 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, the Peters and May (Dangerous Goods) Ltd, packing instructions should be followed, to ensure the integrity of the package for transport under Dangerous Goods regulations. Vermiculite 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 degrees C in the dark. These precautions are particularly important for samples containing water or sediment, but less so for bulk oil samples.

When ordering sample bottles it is important to consider the following:

- Wide necked bottles make sampling easier.
- Sample security can be achieved with locking cap seal.
- Ensure that no components of the bottle can interfere with analysis, e.g. waxed cap inserts.

6. 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 MCA for analysis. 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 proforma. The form accompanying each container should therefore provide the following details: -

a.	An identifying number:	year	2 digits
		month	2 digits
		day	2 digits

and the initials of the official in charge of taking the samples.

For example 02/04/17/JS = Sample taken on 17th April 2002 by John Smith

b.	Description of samples.
c.	Position from which sample was taken, grid reference if possible.
d.	Date and time of sampling.
e.	Purpose for which sample was taken.
f.	If known, suspected source, e.g. name of tanker or ship.
g.	Whether or not dispersants have been used and, if known, their type and make.
h.	Method of sampling (description of sampling device and any possible contamination).
i.	Name, address and contact details of person taking the samples and of anyone witnessing the taking of it.

If possible the following information would also be helpful:

j.	Wind direction and velocity.
k.	Air and water temperature.
l.	Sample descriptions, i.e. viscosity, colour and contaminants.
m.	Description of the oil spill, i.e. distribution and consistency.

An example of the recommended oil pollution sample standard label can be found in Appendix A. The recommended sample form is at Appendix B.

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 details as to m, where available.

7. TRANSPORTATION OF SAMPLES

If a sample needs to be analysed the Counter Pollution Branch will contact their contractor to arrange for the sample to be collected by courier and analysed.

Please ensure that samples are labelled correctly and securely packed in UN approved boxes to avoid breakage. It is important that the standard proforma described in section 6 should also be included with the sample along with all carriage documentation. To facilitate sample transportation, clear information on the number of samples to be collected, the location they need to be collected from and a contact name and phone number must be given to Counter Pollution Branch.

8. HANDLING OF SAMPLES FOR BONN AGREEMENT STATES

In cases where samples are taken at the request of a contracting member of the Agreement for Co-operation in Dealing with Pollution of the North Sea by Oil, the Bonn Agreement, the 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 contracting party involved was informed.

SECTION 14: SPILL SAMPLING

14.1 OIL POLLUTION SAMPLE – STANDARD LABEL

OIL POLLUTION SAMPLE – STANDARD LABEL				OIL POLLUTION SAMPLE – STANDARD LABEL			
ID No.	Date/Time	Location) (Grid Ref)	Name and Address of person taking sample	ID No.	Date/Time	Location) (Grid Ref)	Name and Address of person taking sample
..... For continuity of evidence: Please complete clearly Sample passed to:				 For continuity of evidence: Please complete clearly Sample passed to:			
Date	Name	Address	Signature	Date	Name	Address	Signature
.....							
.....							
.....							
OIL POLLUTION SAMPLE – STANDARD LABEL				OIL POLLUTION SAMPLE – STANDARD LABEL			
ID No.	Date/Time	Location) (Grid Ref)	Name and Address of person taking sample	ID No.	Date/Time	Location) (Grid Ref)	Name and Address of person taking sample
..... For continuity of evidence: Please complete clearly Sample passed to:				 For continuity of evidence: Please complete clearly Sample passed to:			
Date	Name	Address	Signature	Date	Name	Address	Signature
.....							
.....							
.....							

14.2: OIL POLLUTION SAMPLE: STANDARD FORM

Collection of oil samples - This form to be completed by person taking sample If in doubt please refer to MCA STOp Notice on sampling. Remember to complete sample jar label and sign		
A	ID Number - YY/MM/DD - with initials of person taking sample	
B	Sample description	
C	Location of sample – OS Grid Ref or Lat/Long if possible	
D	Date and time of sample collection	
E	Purpose for which sample was taken	
F	If known, suspected source	
G	Were dispersants used?	
H	Method of sampling (device?)	
I	Name, address, e-mail address & Tel No of person taking sample and any witnesses	
If possible the following information would also be helpful		
J	Wind speed and direction	
K	Air and Sea Temperature	
L	Sample description, viscosity, colour, any contaminants?	
M	Description of the oil spill, distribution and consistency	
Original form to be kept with sample - please send copy of the form to the Counter Pollution Branch of the MCA - Bay 1/11, Spring Place, 105 Commercial Road, Southampton, SO15 1EG Tel:023 8032 9485		

14.3: SAMPLE LABEL FORMAT FOR PROCURATOR FISCAL

<u>DATE:</u>	
<u>TIME:</u>	
<u>NATURE OF SAMPLE:</u>	
(description)	
	
<u>SAMPLED AT:</u>	
(Site / positions)	
	
<u>SAMPLED BY:</u>	
	Print name
	SIGNATURE
<u>WITNESSED BY:</u>	
	Print name
	SIGNATURE
<u>REFERENCE NUMBER OF TAMPER PROOF PLASTIC TAG</u>	

SECTION 15: BONN AGREEMENT COLOUR CODES

Code 1 – Sheen (< 0.3 µm)

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)

Rainbow oil appearance represents a range of colours, yellow, pink, purple, green, blue, and red, copper, orange; this is caused by an optical effect and 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, 400nm or 0.4 µm, through to red, 700nm 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)

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 greenish 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 either 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.

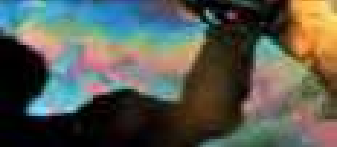
Code 5 – True Colours (>200 µm)

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.

Table 1: Oil Characteristics

Code	Oil Appearance / Colour	Pictorial	Quantity (Tonnes / km ²)	Litres per km ²
1	Sheen (Silvery / Grey)		0.04 to 0.30	40 – 300
2	Rainbow		0.30 to 5.0	300 – 5000
3	Metallic		5.0 to 50	5000 – 50,000
4	Discontinuous true oil colour		50 to 200	50,000 – 200,000
5	Continuous true oil colour		More than 200	More than 200,000

15.1: ESTIMATING THE SIZE OF A SPILL

It is important to determine the size of the spill and to classify it. **Where possible, calculate the volume of oil spilled from methods other than the evaluation of a spill on the sea for example from:**

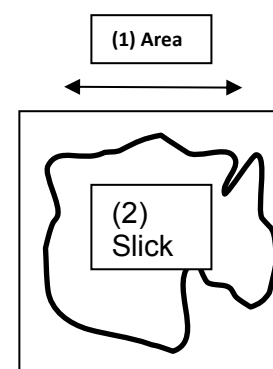
- volume of diesel in hose;
- lost or unaccounted volume of diesel or oil.

If an estimate of the spill size cannot be determined from operational information, a visual inspection may be made by observing the slick on the sea surface. Although this can be performed from a pier or vessel, best estimates are made during aerial surveillance flights. When using this technique, bear in mind that the entire area of the slick may not be visible and that this can only provide an order of magnitude estimate of the amount of oil spilled. The following tables and graphs should be used to assist you to make a best estimate of spill size.

Calculation of the volume of oil spilled from the appearance of oil film on water

Estimate total size of the area as a square or rectangle (in km) ie maximum extremities of the slick.

- 1 Assess the area affected by the slick in km² calculated as a % of the total area in (1).
- 2 Estimate the area covered by each colour of oil, calculated as a % of the total area affected.
- 3 Multiply the area covered by each colour by the appropriate figure in the oil quantity table below.
- 4 Adding all of the colour figures will give the total quantity of oil in m³ within the slick.



Example: if the total area of a rectangle is 30km² and the area within that covered by oil is estimated to be about 75% then total area affected is 22.5km². If the area covered by "blue" oil is 40% then that will equal 9m³, area covered by "rainbow" oil is 60% then that will be 4m³; total amount of oil spilled will then be about 13m³.

Table 2: Oil Quantity estimation by colour

Code	Appearance/colour	Quantity (m ³ /km ²)
1	Silvery	0.02
2	Grey	0.1
3	Rainbow	0.3
4	Blue	1
5	Blue/brown	5
6	Brown/black	15-25
7	Dark brown/black	>100

Mass Balance Calculations

With the variable compositions of oils the initial volume spilt can often be significantly different to the amount which remains on the water over time or is stranded on the shoreline. This is because of the processes of evaporation, dissolution and emulsification. Whilst some idea of the magnitude of these processes can be ascertained from an examination of the physical properties of the fresh oil this can be only a guide.

On the NOAA website: <http://response.restoration.noaa.gov> there are a number of tools available to oil spill responders, one of these is a software package called ADIOS 2 which is available for free download. This application has a database of oil characteristics and by entering a number of simple parameters (volume spilt, wind speed, time since spill) it will calculate and graph changes in the mass balance ie: amount evaporated, amount emulsified, etc. This gives a much better overview of the changes through time of the amounts of material likely to be encountered.

ADIOS 2 is installed on a number of PCs within the OIC Harbours Department

15.2: SLICK TRACKING AND SURVEILLANCE

After the initial spill assessment has been completed, the slick should be tracked and monitored throughout the incident to evaluate the extent of the slick, monitor the movement of the slick and decide on the appropriate action. This will occur as follows:

- 1 In the early stages of the incident, the slick may be monitored from the pier side or harbour vessel. Figure 1, which predicts the movement of oil on water as a function of wind and current, should be used to assist this.
- 2 For large spills, the Oil Pollution Officer should mobilise aircraft to undertake aerial surveillance. Surveillance should be undertaken at least twice per day until such time as no oil is visible on the sea surface. OIC Harbours will notify the HM Coastguard of its intentions to use aerial surveillance. Aerial surveillance will be undertaken as soon as possible after an incident has occurred.

Table 3: Slick surveillance/tracking checklist

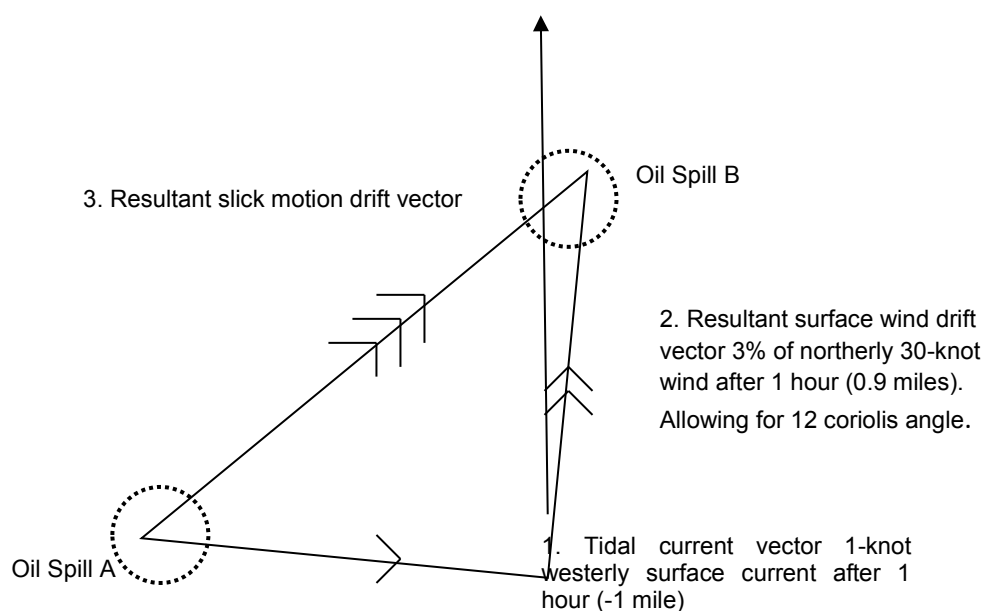
Checklist	Notes
Determine extent and co-ordinates of slick	
Chart slick size, growth patterns and affected area(s); estimate quantities if possible.	Estimate by direct observation and use Annex 34.
Carry out slick trajectory predictions	Use vectors ($\Rightarrow$ Figure 1 over page)
Follow direction of movement of slick	
Identify heaviest concentrations of oil	Likely to be at downwind leading edge of spill
Identify onset and progress of water in oil emulsion formation	Heavy oil (eg intermediate fuel oil) will change in appearance soon after spill; in initial stages, the thicker parts will appear as dense, black areas, but as emulsification takes place, the colour will change to brown, orange or yellow.
Watch for any flocks of birds	Refer to Environmental Maps
Watch for any oil floating subsurface	
Watch for break up of slick and determine direction of movement of any oil patches	
Report on progress of natural dispersion	This is likely to be good for diesel or base oil hydrocarbon spills
Report on effectiveness of response	If dispersants are employed watch particularly for signs of dispersant not working.

In addition to gravity spreading which will cause the oil to cover a progressively larger area, the oil moves on water as a function of wind and current – the current has a 100% influence and the wind a 3% influence. A slick will continue to spread until a thickness of about 1-mm is reached. Once this stage is reached, the slick may break up into windrows, which will further increase the spread of the slick. To plot the movement of a slick, the following steps should be taken in association with Figure 1:

- 1 Plot 100% of the current speed on an appropriate chart in the direction that it flows (ie if the current is 1 knot, then plot 1 nautical miles on an appropriate chart).
- 2 From this end point then plot the wind direction as 3% of its value in the direction it is blowing (ie if the wind is 30 knots, then plot 0.9 nautical miles in the direction it is blowing).
- 3 Point B will be the centroid of the oil spill 1 hour later and vector AB its predicted trajectory.

For best results, the plot should be updated hourly and verified with overflights.

Figure 1: Manual prediction of oil slick trajectory prediction



Computerised Slick Tracking

There are a number of software applications used to predict the movement of oil spills. Over the years these have become increasingly sophisticated with a library of oil types and aspects of the 3-Dimensionality being incorporated. However they remain fundamentally limited to the quality of the environmental data ie: wind speeds, current speeds, fed into them. Thus they are useful tools to forecast slick movement when visual observation is impossible but visual observation should always be used to calibrate and correct the forecasts. Within confined waters, as would be found around Orkney, the timescale to beaching is often so short to highlight further limitations in the modelling packages.

SECTION 16: POLREP (POLLUTION REPORT) FORM

To MCA – MRCC - Shetland
Copy to Agencies as required
From

Part 1 – Information which should be provided in an initial pollution report	
A.	Classification of Report: (i) doubtful (ii) probable (iii) confirmed (Delete as necessary)
B.	Date: _____ Time: _____ pollution observed Identity of Observer/Reporter: _____
C.	Position of Pollution _____ (by latitude and longitude if possible, state range and bearing from some prominent landmark) Extent of Pollution _____ litres/barrels/tonnes Size of polluted area _____ from _____ (from where sighted) (estimated amount of pollution, e.g. size of polluted area, number of tonnes of oil spilled; or number of containers, drums, etc. lost. When appropriate give position of observer relative to pollution)
D.	Wind Speed: _____ knots; Direction from: _____ Tidal status at time pollution observed: _____ after/before HW/LW
E.	Weather Conditions and sea state: _____ sea state/ wave height _____ metres
F.	Characteristics of Pollution: Type: _____ (e.g. oil, crude, diesel: packaged or bulk chemicals UN Number if known, garbage) Appearance: _____ (e.g.: liquids, floating solid, liquid oil, semi-liquid sludge: tarry lumps; weathered oil, discoloration of sea; visible vapour; etc.)
G.	Source of Pollution: _____ (from vessel or other undertaking)

	Cause of Pollution: _____

	(apparent deliberate discharge or casualty. If the latter give a brief description. Where possible name, type, size, nationality and Port of Registry of polluting vessel. If vessel underway give course speed and destination if known)
H.	Details of other vessels in the area: _____

	(to be given if the polluter cannot be identified and the spill is considered to be of recent origin)
J.	Photographs taken Yes / No
	Sample taken for analysis Yes / No
K.	Remedial action taken, or intended, to deal with spillage: _____

L.	Forecast of likely effect of pollution: _____

	(e.g. arrival on coastline, with estimated timing)
M.	Names of those informed other than addressees:

N.	Any Other relevant information: _____

	(e.g. names of other witnesses, references to other instances of pollution pointing to source)

Part 2 – Supplementary information to be provided later	
(this part may be disregarded when POLREPS are for UK internal distribution only)	
O.	Results of sample analysis _____

P.	Results of photographic analysis

Q.	Results of supplementary Inquiries: _____

	(e.g. inspection by Surveyors, statements from ship's personnel, etc. if applicable)
R.	Results of mathematical models _____

SECTION 17: MCA OPRC EXERCISE GUIDELINES

OPRC Plans – Exercises – MCA Guidance

The following provides guidance on planning and conducting exercises which have been designed to evaluate the contingency plan and include a degree of training for any personnel likely to be involved in an oil spill incident.

Each port / harbour / oil handling facility must participate in exercises in accordance with the provisions within their OPRC Compliant Oil Spill Contingency Plan.

The objectives of any exercise need to be pre-agreed, enabling the exercise planners to tailor the exercise to the needs of the players. For example, it may be desirable for different aspects of the plan to be exercised separately such as notifications or equipment mobilisation / deployment. A larger exercise, encompassing all aspects of the response, may not explore the detail of each of these individual themes but will help promote a wider understanding of the purpose and scope of the whole plan. Whatever the scale or type of exercise, the invited participation by the appropriate environmental and regulatory authorities, and others, will aid the collective understanding of the plan, to the benefit of all involved.

The following list gives examples of exercise types that can be undertaken.

Notification Exercise - announced or unannounced

Used to test alert and call-out procedures for response teams, test communication systems, availability of personnel, evaluate travel options and arrangements and test the transmission of information. Such an exercise can be used to check the validity of contact information within the plan and should be carried out at least twice per year.

Mobilisation Exercise

May be used to test the actual mobilisation times of individuals and contracted resources. Ideally mobilisation should be tested without prior warning, although the requirement for an unannounced callout will need to be balanced against the practical difficulties and financial penalties of doing so. Whilst this important aspect of the response may be exercised in isolation, it may be seen as beneficial to incorporate this as a specific objective within the scope of another of the framework exercises.

Desk-Top Exercise

Whilst the degree of complexity can be decided upon by the exercise coordinator, a table-top exercise can be used to test the emergency management knowledge and capability. It provides individual and also team training, enabling personnel to be familiarised with the various roles and responsibilities and identification of resources. A table-top exercise can also explore the interaction between the different parties involved, particularly by testing the principles of the response strategies. These exercises can be used to test coordination with local authorities and the emergency services. Some organisations, which have peripheral responsibilities, may be role-played. During this exercise the capability to respond to a Tier 2 type spill and initiate the primary actions in the event of a Tier 3 response can be put to the test. As discussed above, it can be effective to combine this exercise with an equipment mobilisation / deployment exercise, but in any case a table-top exercise of the incident management structure should be incorporated within the exercise programme at least annually.

Incident Management Exercise - requires significant planning

These exercises can test the capability of local teams to respond to Tier 1, Tier 2 and Tier 3 type incidents, providing experience of local conditions and spill scenarios, enhancing individual skills and teamwork, integrating the roles of external bodies and organisations. MCA considers that each port, harbour and oil handling facility *must* hold an Incident Management Exercise, incorporating equipment deployment to a Tier 2 level at least every three years, following initial plan approval. This is likely to incorporate, or be combined with a Tier 1 equipment deployment. Such exercises need, so far as possible, to involve actual involved organisations to represent a real emergency. However, if this cannot be achieved, role-playing personnel can be used to simulate roles and responsibilities.

A Balanced Programme of Exercises

Different types of exercises will test different facets of the plan whilst even the most ambitious Incident Management Exercise cannot be expected to test every aspect of the plan. Notification exercises, which are useful to update contact details within a plan, should be undertaken with greater frequency than equipment mobilisation exercises, for example. Before an exercise takes place, the appropriate authorities should be notified. This notification procedure should be formally documented and a copy of this documentation held and logged within the port / harbour / oil handling facility.

A typical programme of exercise frequency is as follows:

EXERCISE TYPE	FREQUENCY
Notification & Mobilisation Exercises	Twice per year
Table-top Exercise (may incorporate mobilisation and deployment of local response equipment)	Once per year
Incident Management Exercise (IME) (will incorporate mobilisation and deployment of resources up to Tier 2 Level)	Once every 3 years*
*In an instance where a port, harbour or oil handling facility considers this requirement to be unduly onerous on the basis of the risk assessment, they may submit an alternative exercise programme to the Regional CPSO for consideration and approval, on an individual basis. In some circumstances it may be permissible to undertake an Incident Management Exercise in the fourth year of the plan's five-year life-cycle providing for the 'lessons-learned' to be captured within the final plan review/update year.	

Sharing of exercises

In a situation where a group of ports and harbours within a distinct geographic region and sharing the same Tier 2 contractor, there may be scope to undertake a joint exercise at one of the ports. Key individuals from nearby ports could be invited to observe or participate, thus gaining from the experience of the hosting port. In any case, each plan holder must host their own exercise involving mobilisation and deployment of their Tier 2 response, at least every three years.

A post exercise/incident form should be completed and forwarded to the Regional CPSO, and all relevant plan holders, each time an exercise is carried out.

SECTION 18: THE ROLE OF THE SOSREP

18.1 ENVIRONMENT GROUP

An Environment Group (EG) will not normally be formed for a local spill, although there are circumstances when an EG could be formed, depending on the locale of the spill relative to sensitive resources and type of oil spilt. With a local spill {Tier 1} individual organisations will normally deal with the incident as defined by the NCP and local authority plans. In Scotland there is a standing EG which is chaired by Marine Scotland.

An EG will be formed for regional and national (i.e. Tier 2 and Tier 3) spills at the discretion of the MCA. The response to any maritime incident in the UK requiring a national {Tier 3} or regional {Tier 2} response, of whatever scale, involves the establishment of an Environment Group. However, the MCA under all situations will guide the activation of the EG for the scenario.

Key Roles in the EG will be filled by individuals most suited to the job and purpose (STOp 2/2009). The scope of the Environment Group 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 EG will need to be graduated to meet changing requirements, escalating or diminishing in the input to each phase over time.

As stated in the STOp Notice 2/2009 the Harbour Authority should consult with the EG. This will be at the discretion of all parties.

The EG will have an Environment Liaison Officer (ELO) in each response unit established to deal with the incident. The chair of Environment Group will nominate the ELO for each response unit, taking into account the location, nature and scale of the incident, and the sort of expertise that each unit is most likely to require.

Core members of EG will comprise as a minimum representatives from:

- Scottish Natural Heritage
- Marine Scotland
- Scottish Environment Protection Agency

The location of the EG will depend on the nature and location of the incident and will be agreed with MCA.

18.2 SOSREP

The Secretary of State's Representatives (SOSREP) role has been created as part of the Government's response to Lord Donaldson's Review of Salvage and Intervention and their command and control.

The report identified that during salvage activities, ultimate control over all operation should become the responsibility of a single designated Secretary of State's Representative (SOSREP) for the purpose of maritime salvage and intervention and that the SOSREP could not abdicate his responsibility. Whether or not he exercised any intervention powers at all the SOSREP would be in no doubt what so ever that he was in charge and would be held responsible for the outcome of all plans and decisions. Put simply – to ignore a situation is not an option.

The powers of intervention with which the SOSREP is vested could indeed not be more far reaching. They are however, presently wider for response to pollution than for safety. They provide that the SOSREP can direct a person to take, or refrain from taking "any action of any kind whatsoever". Indeed, if the 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.

In the event of an incident requiring salvage operations the SOSREP will decide whether it is necessary to set up a Salvage Control Unit (SCU). If the size of the incident merits the establishment of a SCU, the SOSREP will travel to the scene at the appropriate time. Upon establishment of a SCU, the Harbour Master/ Port Manager will become an active member of the SCU team liaising with the SOSREP throughout the course of the incident. The members of the SCU are:

- SOSREP
- The Salvage Manager from the salvage company appointed by the ship owner
- The Harbour Master / Port Manager, if the incident involves the Harbour of its services
- A single representative nominated by agreement between the ship owner and the insurers (for both the physical property and their liabilities)
- A counter pollution and salvage officer
- An Environmental Liaison Officer, nominated by the Chair of the Environment Group
- Coastguard liaison office; and
- If SOSREP decides to appoint on, SOSREP's personal salvage advisor.

The SCU will be located at the nearest Orkney Island Council's Port / Slipway Office. Facilities available at the office include adequate space for at least 11 personnel, mobile phone coverage, Local Area Network (LAN) connectivity, Wi-Fi connectivity, and full VHF radio coverage of the area.

SECTION 19: ENVIRONMENTAL SENSITIVITIES AND PRIORITIES FOR PROTECTION

19.1 GENERAL STRATEGY

If anything other than small operational spills occur, SEPA and SNH should be contacted.

Where possible, considering safety and local conditions, any floating oil on the water surface should either be allowed to degrade naturally or be removed physically – no chemical dispersants are to be used. Removal should particularly be attempted where this may significantly reduce the possibility of quantities of oil coming ashore on areas of recreational and environmental importance. Floating absorbent should be used when necessary to prevent oil coming ashore and to reduce the amount of oil on the water.

Where access to shoreline is possible, considering safety and local conditions, mechanical methods to clean up oil may be used – no chemical dispersants are to be used – otherwise oil should be left to degrade naturally.

Where oil comes ashore, it should generally be left to degrade naturally although some manual removal (but not mechanically) may be possible. No chemical dispersants are to be used during this treatment. In some instances the use of protective or deflective booms to reduce oil on the shore may be possible.

Land within the Sites of Special Scientific Interest (SSSI) should not be used for wider oil spill control/ co-ordination works unless consulted upon by SNH.

19.2 ENVIRONMENTALLY SENSITIVE AREAS

Table 4: Protected Areas in the Orkney Islands

Location	Area Description
Auskerry	SPA/IBA/SSSI
Bay of Skail	SSSI
Calf of Eday	SPA/SSSI
Copinsay	SPA/IBA/SSSI
East Sanday Coast	SPA/SSSI/Ramsar/IBA
Eday	IBA
Eynhallow	SSSI
Faray & Holm of Faray	SAC/SSSI
Hoy	SPA/IBA/SSSI
Loch of Banks	SSSI
Loch of Isbister and Loons	SAC/SSSI
Loch of Stenness	SAC
Marwick Head	SPA/IBA/SSSI
Mill Bay	SSSI
Muckle and Little Green Holm	SSSI
Mucklehead and Selwick	SSSI
Papa Westray (North Hill and Holm)	SPA/IBA/SSSI/MPA
Pentland Firth Islands	SPA/IBA/SSSI
Rousay	SPA/IBA/SSSI
Sanday	SAC/SSSI
South Westray Coast	IBA
Stromness Heaths and Coasts	SAC/SSSI
Switha	SSSI
Switha (South Walls and Switha)	SPA/IBA/SSSI
Ward Hill Cliffs	SSSI
Waulkimill	SSSI
West Mainland Moorland	SPA/SSSI
West Westray	SPA/IBA/SSSI
Wyre and Rousay Sounds	MPA

Figure 2: Environmental Sensitivities in the Northern Islands

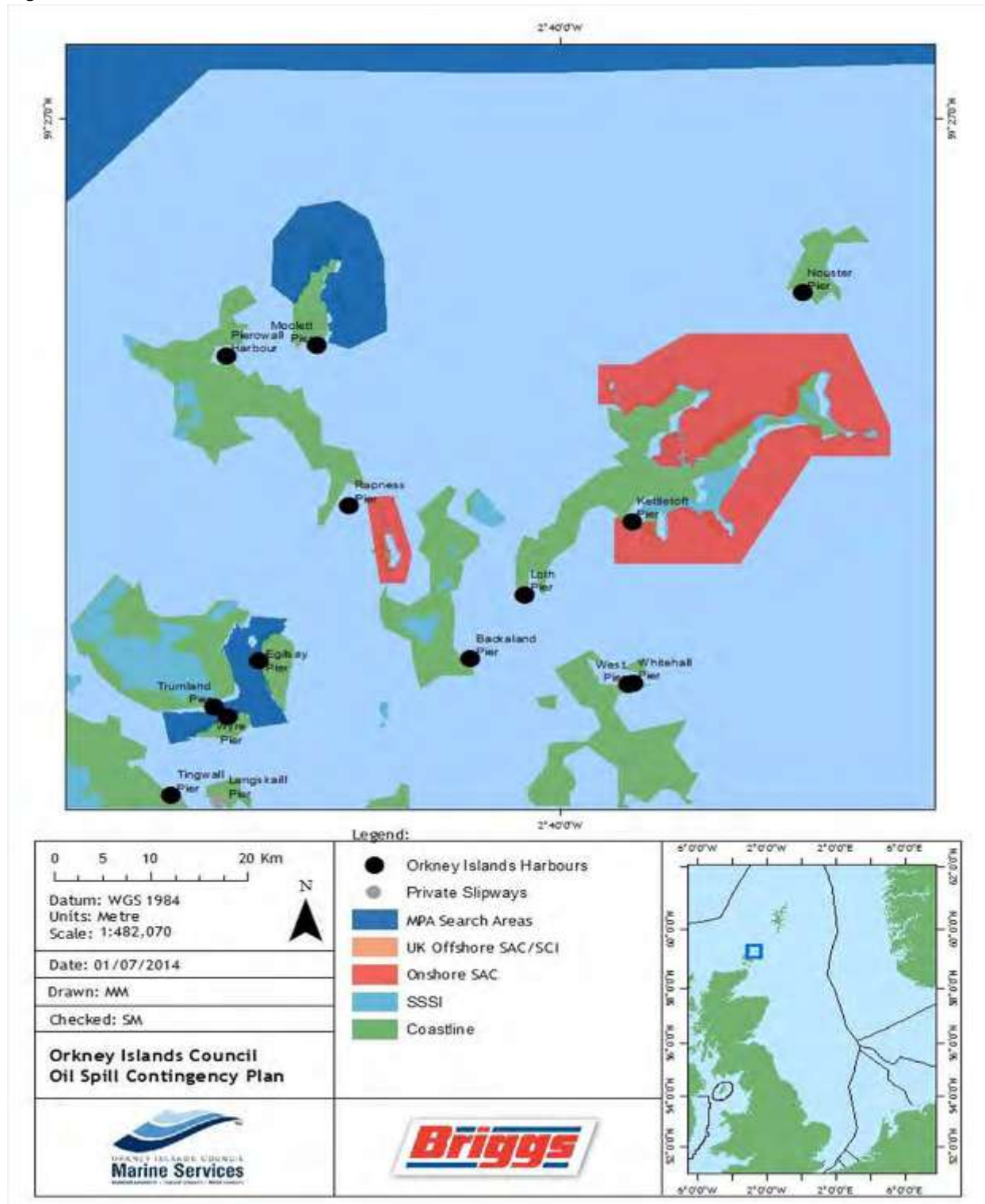


Figure 3: Environmental Sensitivities in the Central Islands

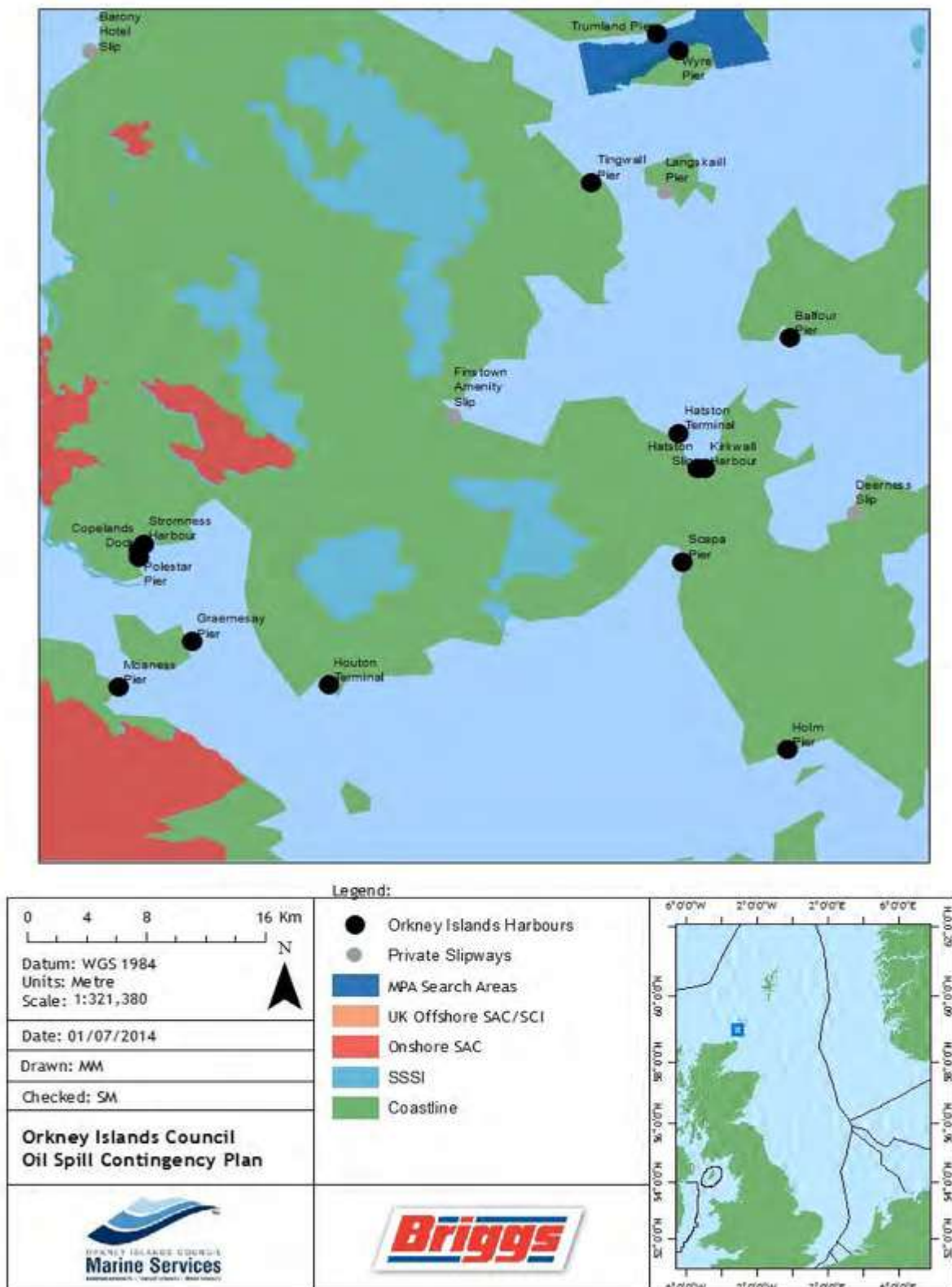


Figure 4: Environmental Sensitivities in the Southern Islands

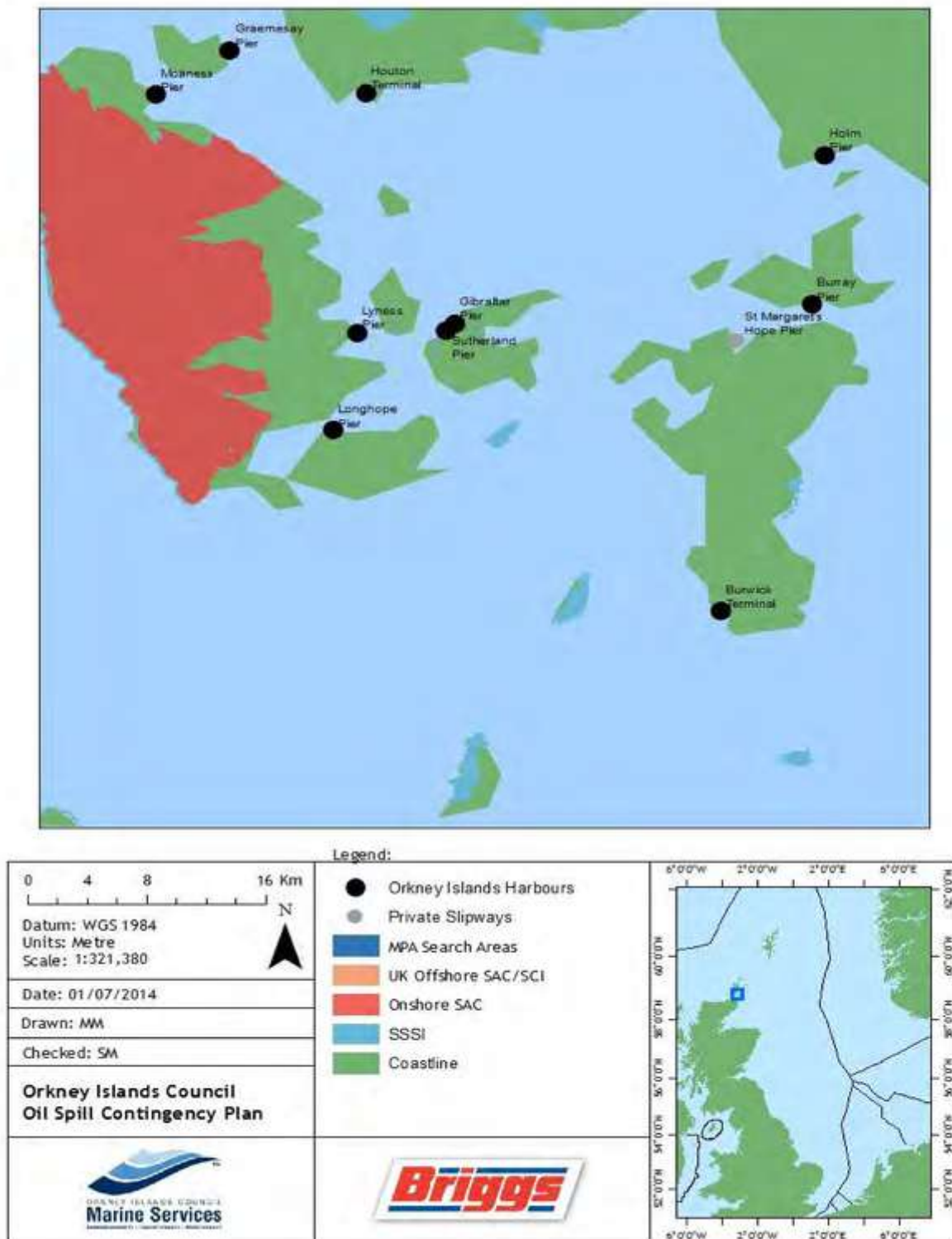


Table 5: Protected areas in the Orkney Islands Continued

Name of Site	Description
Auskerry	<u>SSSI</u> Small island to the south of Stronsay. Supports large numbers of breeding seabirds and water bird and is an internationally important breeding ground for Storm petrel and Arctic tern. Storm petrels nest mainly in old rabbit burrows and Arctic terns nest in groups, tending to use different areas of the island from year to year. The rare Iceland yellowcress (<i>Rorippa palustris</i>) grows here, along with the nationally scarce fern, small adderstongue (<i>Ophioglossum azoricum</i>) (BSBI, 1998). <u>SPA</u> Annex I Species: Arctic Tern (<i>Sterna paradisaea</i>), 780 pairs representing at least 1.8% of the breeding population in Great Britain (4 year mean, 1992-1995). Storm Petrel (<i>Hydrobates pelagicus</i>), 3,600 pairs representing at least 4.2% of the breeding population in Great Britain (Count, as at 1995). <u>IBA</u> Populations of IBA Trigger Species: European Storm-petrel (<i>Hydrobates pelagicus</i>) 994 Breeding pairs in 2001.
Bay of Skail	<u>SSSI</u> Encompasses the intertidal rock platform at Hangabacks and associated coastal cliffs on the north side of the Bay of Skail. It is a site of international importance for its fossil plants (Protopteridium thomsonii and Barnandina, a fossil genus).
Calf of Eday	<u>SSSI</u> The dominant vegetation on the island is dry dwarf-shrub heath dominated by Heather (<i>Calluna vulgaris</i>), with smaller areas of wet heath, semi-improved grassland and coastal grassland. The site is of importance as a nesting area for breeding seabirds, which feed in surrounding waters outside the SPA and use most of the island for loafing. <u>SPA</u> Gulls and cormorant (<i>Phalacrocorax carbo</i>) nest in the dry heath and grassland areas, whilst fulmar (<i>Fulmarus glacialis</i>), kittiwake (<i>Rissa tridactyla</i>) and auks nest on the cliffs. <u>IBA</u> Populations of IBA Trigger Species: Great Black-backed Gull (<i>Larus marinus</i>), 940 breeding pairs in 1996.
Copinsay	<u>SSSI</u> Copinsay is backed by approximately 1.5km of steep cliffs, which rise to more than 60 metres in height. These support a large colony of breeding seabirds including Guillemot (<i>Uria aalge</i>), Kittiwake (<i>Rissa tridactyla</i>), Great Black-backed Gull (<i>Larus marinus</i>), fulmar (<i>Fulmarus glacialis</i>), shag (<i>Phalacrocorax aristotelis</i>), lesser black-backed gull (<i>Larus fuscus</i>), herring gull (<i>Larus argentatus</i>), common gull (<i>Larus canus</i>), razorbill (<i>Alca torda</i>), black guillemot (<i>Cepphus grille</i>) and puffin (<i>Fratercula arctica</i>). <u>SPA</u> Article 4.2 species: Guillemot (<i>Uria aalge</i>), Kittiwake (<i>Rissa tridactyla</i>), Great Black-backed Gull (<i>Larus marinus</i>), Fulmar (<i>Fulmarus glacialis</i>). <u>IBA</u> Populations of IBA Trigger Species: Great Black-backed Gull (<i>Larus marinus</i>), 1,127 breeding pairs in 1999.
Eynhallow	<u>SSSI</u> It is notified for common seals (<i>Phoca vitulina</i>) and supports on average more than 10% of Orkney's total Common Seal population. The island also supports a locally important seabird assemblage and moorland assemblage, although these are not notified natural features of the SSSI. Species include fulmar (<i>Fulmarus glacialis</i>), Arctic skua (<i>Stercorarius parasiticus</i>), Great Skua (<i>Catharacta skua</i>), puffin (<i>Fratercula arctica</i>), black guillemot (<i>Cepphus grille</i>). And Arctic Tern (<i>Sterna paradisaea</i>).
Faray	<u>SSSI</u> The islands are internationally important for their colony of grey seals. The seals use the islands from the beginning of September to the end of November for pupping and breeding. At other times the islands are used as a haul-out site. <u>SAC</u> Annex II Species: Grey seal (<i>Halichoerus grypus</i>), second largest breeding colony in the UK. They tend to be found in locations with easy access to shore and would be particularly vulnerable to oil pollution.

Name of Site	Description
Hoy	<u>SSSI</u> The features for which it is notified are: its geology and geomorphology; its breeding populations of great skuas (<i>Catharacta skua</i>), red-throated divers (<i>Gavia stellate</i>), moorland birds and seabirds; and its diverse habitats which include wet and Montane heath, petrifying tufa springs, woodland and upland heaths. <u>SPA</u> Article 4.1 species: Peregrine Falco (<i>Peregrinus</i>), 6 pairs in the mid-1990s. Red-throated diver (<i>Gavia stellate</i>), 56 breeding pairs, 1994. Article 4.2 Species Great Skua (<i>Catharacta skua</i>) 1900 breeding pairs. <u>IBA</u> Populations of IBA Trigger Species: Red-throated Loon (<i>Gavia stellate</i>) 58 breeding pairs in 1994. Great Black-backed Gull (<i>Larus marinus</i>) 469 breeding pairs in 2000. Great Skua (<i>Catharacta skua</i>) 1973 breeding pairs. A4iii Species group – seabirds 69,066 breeding pairs
Loch of Banks	<u>SSSI</u> A large reed bed at Loch of Banks is a favourite roost for around eight hen harriers (<i>Circus cyaneus</i>). Across Britain only 30 to 40 pairs of pintail (<i>Anas acuta</i>) nest each year, with one pair regularly found on this site. It also supports a large community of breeding wildfowl and waders. These include wigeon (<i>Anas penelope</i>), teal (<i>Anas crecca</i>), shoveler (<i>Anas clypeata</i>), mallard (<i>Anas platyrhynchos</i>), tufted duck (<i>Aythya fuligula</i>), red-breasted merganser (<i>Mergus serrator</i>), shelduck (<i>Tadorna tadorna</i>), mute swan (<i>Cygnus olor</i>), oystercatcher (<i>Haematopus ostralegus</i>), ringed plover (<i>Charadrius hiaticula</i>), dunlin (<i>Calidris alpina</i>), snipe (<i>Gallinago gallinago</i>), curlew (<i>Numenius arquata</i>), lapwing (<i>Vanellus vanellus</i>) and redshank (<i>Tringa totanus</i>). The site contains a mix of reed-bed, open water and wetland. The area is rich in nutrients and supports a wide variety of wetland plants, including the large stand of reeds, willow scrub, creeping willow, sedges, bog-rush, yellow flag iris (<i>Iris pseudacorus</i>), branched bur-reed (<i>Sparganium</i>) and meadow sweet (<i>Filipendula ulmaria</i>).
Lochs of Harray and Stenness	<u>SSSI</u> Loch of Harray is naturally nutrient rich (eutrophic) and supports a diverse range of flora and fauna. However, nutrient levels in the loch vary both with location and between seasons and years; this is reflected in an unusual mix of plant species. These include nine species of pondweed, two of which, Slender-leaved Pondweed (<i>Potamogeton filiformis</i>), and Flat-stalked pondweed (<i>Potamogeton friesii</i>) are nationally scarce. Other nationally scarce species present include lesser bearded stonewort (<i>Chara curta</i>) and tassel stonewort (<i>Tolypella glomerata</i>). Both lochs provide habitat for a diverse range of wintering wildfowl, including populations which contribute significantly to the British totals as follows; pochard (<i>Aythya ferina</i>) 2.8%, tufted duck (<i>Aythya fuligula</i>) 1.2%, scaup (<i>Aythya marila</i>) 48.4% and goldeneye (<i>Bucephala clangula</i>) 5.4%. The site is also notified for its nationally important invertebrates, namely the caddis fly (<i>Ylodes reuteri</i>) and the freshwater nerite snail (<i>Theodoxus fluviatilis</i>). The caddis fly is very rare in the UK and has only previously been recorded in a few coastal marsh sites in England. <u>SAC</u> Annex I Habitats: Coastal Lagoons. It is the largest brackish lagoon in the UK and is of particular importance on account of its large size, stability, reduced salinity regime and northern location. There is a salinity gradient in the lagoon, and communities representing sheltered marine, brackish and freshwater conditions are found
Loch of Isbister and the Loons	<u>SSSI</u> The variety of bog habitats support a very rich assemblage of wetland plants including autumnal water-starwort, slender-leaved pondweed and the regionally scarce fragrant orchid. The rich habitat provides a nationally important breeding ground for a range of birds including: wigeon (<i>Anas Penelope</i>), mallard (<i>Anas platyrhynchos</i>), teal (<i>Anas crecca</i>), tufted duck (<i>Aythya fuligula</i>), red breasted merganser (<i>Mergus serrator</i>), shoveler (<i>Anas clypeata</i>) and shelduck (<i>Tadorna tadorna</i>). The site is also notified for its nationally important breeding population of pintail, supporting on average 6% of the British population. <u>SAC</u> Annex I Habitats: Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation. High-quality basin-mire complex, with excellent examples of open-water transition plant communities. The loch supports a rich plant flora typical of the Magnopotamion type, with plants able to grow in the centre of the loch due to its shallow nature, including abundant stoneworts (<i>Characeae</i>), and pondweeds (<i>Potamogeton</i>). The loch is rich in northern species and is the most northerly site for natural eutrophic lakes in the UK. Annex II species present as a qualifying feature, but not a primary reason for site selection: Otter (<i>Lutra lutra</i>)

Name of Site	Description
Marwick Head	<u>SSSI</u> Marwick Head is one of the three biggest seabird colonies in Orkney. The headland is made up of 2km of Old Red Sandstone cliffs, which provide ideal nesting ledges. Birds nesting here include guillemot, kittiwake, puffin, razorbill, fulmar, shag, jackdaw and herring gull. The maritime grassland on the cliff tops is studded with flowers such as thrift, spring squill and kidney vetch. The cliff face by comparison has very little vegetation, with only a few clumps of scurvy grass. <u>SPA</u> Article 4.2 Species: Guillemot (<i>Uria aalge</i>), 24,388 pairs in 1991 Seabirds, Kittiwake (<i>Rissa tridactyla</i>), Guillemot (<i>Uria aalge</i>) 75,000 during breeding season. <u>IBA</u> Populations of IBA Trigger Species: Common Guillemot (<i>Uria aalge</i>), 10,476 in 2004.
Mill Bay	<u>SSSI</u> The Mill Bay SSSI is a nationally important site for its Quaternary earth science interest. Mill Bay provides the finest exposure of the 'shelly till' which characterises the glacial deposits of Orkney. The Bay site is important because the shell material has the potential, via geochemical dating methods, to aid in determining the timing of the last glaciation of the islands. The erratics (pebbles and boulders derived from far away) and underlying bedrock striations (or scratches) may indicate the general direction of the ice movement. The presence of shells indicates that the ice flowed over the sea bed.
Muckle and Little Green Holm	<u>SSSI</u> Muckle and Little Green Holms lie 4 km north of Shapinsay and 2 km south of Eday. The site is of outstanding nature conservation interest within the UK for its nationally important breeding colony of breeding grey seals. The vegetation of Muckle Green Holm consists almost entirely of rough pasture with coarse tussocks of tufted hair grass. In addition, a small area of marsh around the valley drains into a lagoon behind the shingle beach at the north-west of the island. Little Green Holm supports rank grassland with high cover of the grass, Yorkshire fog.
Mucklehead and Selwick	<u>SSSI</u> The Muckle Head and Selwick SSSI is located on the north coast of the island of Hoy and is nationally important for its Quaternary earth science interest. Both Muckle Head and Selwick represent excellent examples of 'raised beach' deposits. These deposits are 6 to 12 metres above present-day sea-level and were formed at a time when the ice caps had melted, and consequently the sea-level was higher. The raised beach deposits underlie a 'glacial till' which was deposited during a subsequent glaciation period.
Papa Westray (North Hill and Holm)	<u>SSSI</u> The northern tip of Papa Westray is famous as the place where one of the last great auks was killed in 1813. Today it supports an internationally important Arctic tern colony. There is also a nationally important colony of Arctic skua. The cliffs are home to guillemot, razorbill and kittiwake. Eider duck, oystercatcher, ringed plover and redshank also nest on the site. Narrow strips of clifftop coastal grassland featuring thrift, sea plantain and spring squill give way inland to extensive areas of botanically rich maritime heath. Plants here include <i>Primula scotica</i>, crowberry, ling heather, glaucous sedge and creeping willow. Other notable species include limestone bedstraw, slender-leaved pondweed, Iceland yellow-cress, heath pearlwort, bristle club rush, field gentian, frog orchid, alpine bistort, shoreweed and adder's tongue. <u>SPA</u> Article 4.1 Species: Arctic Tern <i>Sterna paradisaea</i>, 1,950 pairs in 1997. Article 4.2 Species: Arctic Skua <i>Stercorarius parasiticus</i>, 135 pairs. <u>IBA</u> Populations of IBA Trigger Species: Arctic Tern (<i>Sterna paradisaea</i>) 800 breeding pairs in 2007. Black Guillemot (<i>Cepphus grylle</i>) 294 individuals in 2007. <u>MPA</u> Biodiversity: Black guillemot Geodiversity: Marine Geomorphology of the Scottish Shelf Seabed

Name of Site	Description
Pentland Firth Islands	<u>SSSI</u> Swona and Muckle Skerry are home to internationally important breeding colonies of Arctic tern. Swona is surrounded by low cliffs, with some caves and offshore stacks. Lush semi-improved grassland is found around the empty houses, while half the island is covered by a grassy maritime heath. A nationally rare eyebright grows on the island, along with oysterplant and two nationally scarce pondweeds. Swona is famous for its herd of wild cattle. Since 1974 they have evolved through natural selection and are now classed as a new and distinct breed – Swona cattle – in the World Dictionary of Livestock Breeds. Low cliffs with numerous geos and small caves also surround Muckle Skerry. The cliffs are topped with maritime grassland. Inland the plant life is dominated by tormentil, common cotton-grass and tufted hair-grass. <u>SPA</u> Article 4.1 Species: Arctic Tern (<i>Sterna paradisaea</i>), 1,200 pairs 1992-1995. <u>IBA</u> Populations of IBA Trigger Species: European Storm-petrel (<i>Hydrobates pelagicus</i>) 232 breeding pairs in 2000 Seabirds 13,035 breeding pairs 2000-2002
Rousay	<u>SSSI</u> This site is made up of two distinct areas, both important for the bird and plant life they sustain. The area around Quendal-Brings and Faraclett forms the second largest coastal heath classed as a SSSI in Orkney. The rest of the site is the third largest area of moorland in the county. The coastal heath supports a colony of Arctic tern and the cliffs are home to guillemot, kittiwake, fulmar, razorbill, puffin, black guillemot and shag. Further inland can be found five species of gull. The heathland supports a nationally important colony of Arctic skua. Arctic skua also nest on the moorland along with red-throated diver, hen harrier, merlin, red grouse, golden plover, dunlin, snipe, curlew, great skua, short-eared owl, stonechat, wheatear and twite. The coastal area of the site forms a rich mosaic of plant life and several colonies of the rare <i>Primula scotica</i> can be found. This area is of national importance for its wide range of plants associated with clifftop maritime grassland, maritime heath and inland heath. The moorland rises to 250 metres and plants on its exposed hilltops are normally found at much higher altitudes elsewhere in Scotland. These include alpine bearberry, alpine saw-wort and dwarf willow. Much of the moorland is covered by blanket bog and wet heath. There are also stands of tall herbs, ferns and rushes called 'dales' vegetation. Five nationally scarce plants are found on the moorland. In Orkney three of those – serrated wintergreen, shady horsetail and a hybrid pondweed – can only be found here. The pondweed is found in Muckle Water. Because of its unique nutrient levels this loch is rich in plant life, including some scarce species. It is the only loch of its kind in Orkney. <u>SPA</u> Article 4.1 Species: Arctic Tern (<i>Sterna paradisaea</i>), 1,000 pairs (Seabird census register). Article 4.2 Species: During the breeding season, the area regularly supports 30,000 individual seabirds (Three year mean, 1986-1988) including: Guillemot (<i>Uria aalge</i>), Kittiwake (<i>Rissa tridactyla</i>), Arctic Skua (<i>Stercorarius parasiticus</i>), Fulmar (<i>Fulmarus glacialis</i>), Arctic Tern (<i>Sterna paradisaea</i>). <u>IBA</u> Populations of IBA Trigger Species: Arctic Tern (<i>Sterna Paradisaea</i>), 24 nests in 2007.

Name of Site	Description
Sanday	<u>SSSI (Central Sanday).</u> It is notable for the presence of sand dune and machair habitats, rare outside the Hebrides, as well as extensive intertidal flats and saltmarsh. The site is further characterised by a series of tombolos, bars, spits and shingle ridges. Flowers to be found include lesser meadow rue (<i>Thalictrum</i>), thyme (<i>Thymus vulgaris</i>), limestone bedstraw (<i>Galium sternerii</i>), fairy flax (<i>Linum catharticum</i>) and felwort (<i>Swertia perennis</i>). Growing on wetter areas are jointed rush (<i>Juncus articulatus</i>), grass of Parnassus (<i>Parnassia</i>) and lesser clubmoss (<i>Selaginella selaginoides</i>). The coastline supports internationally important populations of wintering waders.
	<u>SSSI (East Sanday Coast)</u> The site is internationally and nationally important for its winter assemblage of wading birds, including turnstone (<i>Arenaria interpres</i>), purple sandpiper (<i>Calidris maritime</i>), ringed plover (<i>Charadrius hiaticula</i>), sanderling (<i>Calidris alba</i>) and bar-tailed godwit (<i>Limosa lapponica</i>). The SSSI has a superb range of habitats for waders. In winter, huge piles of rotting kelp harbour large numbers of sand hoppers and other invertebrates, providing a plentiful food supply. The area is also of international importance as the home of Orkney's largest common seal colony. Iceland yellowcress (<i>Rorippa islandica</i>), oysterplant (<i>Tragopogon porrifolius</i>) and curved sedge (<i>Carex maritima</i>) are amongst the plants which grow along this coast.
	<u>SSSI (Northwall)</u> This site contains the largest area of machair outside the Western isles. Machair is one of the rarest habitats in Europe. Yellow rattle (<i>Rhinanthus minor</i>), grass of Parnassus (<i>Parnassia</i>) and ragged robin (<i>Lychnis flos-cuculi</i>) can be found in profusion on this site. Mosses proliferate in wet dune areas and it is the only place in Orkney to find a liverwort called <i>Moerckia hibernica</i>.
	<u>SPA</u> Article 4.1 species: Bar-tailed Godwit (<i>Limosa lapponica</i>), 600 individuals Article 4.2 Species Purple Sandpiper (<i>Calidris maritime</i>), 840 individuals Turnstone (<i>Arenaria interpres</i>), 1,400 individuals 1991-1994
	<u>IBA</u> Populations of IBA Trigger Species: Ruddy Turnstone (<i>Arenaria interpres</i>), 238 individuals in 2007. Sandwich Tern (<i>Sterna sandvicensis</i>), 135 breeding pairs in 1994. <u>RAMSAR</u> East Sanday Coast SPA is located on the island of Sanday in the Orkney Islands of northern Scotland. The site comprises a 55km stretch of coast, and consists of both rocky and sandy sections. It is notable for the presence of sand dune and machair habitats, rare outside the Hebrides, as well as extensive intertidal flats and saltmarsh. The site is further characterised by a series of tombolos, bars, spits and shingle ridges. The coastline supports internationally important populations of wintering waders.
South Westray Coast	<u>IBA</u> Populations of IBA Trigger Species: Sanderling (<i>Calidris alba</i>), 47 individuals in 2007 Purple Sandpiper (<i>Calidris maritime</i>), 280 individuals in 2007
Stromness Heaths and Coasts	<u>SAC</u> Annex I habitats Vegetated sea cliffs of the Atlantic and Baltic coasts. European Dry Heaths.
Switha (South Walls and Switha)	<u>SSSI</u> Switha is a small, uninhabited, low-lying island which lies 2km east of South Walls and 2km south of Flotta. It has a rocky coastline and is almost totally covered by maritime grassland, with smaller areas of heath and bog. Switha is of outstanding scientific and nature conservation interest within the UK and the EC for its internationally important wintering population of Greenland barnacle geese. This is the third largest wintering population of Greenland barnacle goose in the UK (after Islay and North Uist), and is the most northern nationally important wintering station. The coastline also supports an assemblage of breeding seabirds which include great black-backed gull, cormorant, guillemot, black guillemot, Arctic skua, great skua, fulmar, Arctic tern, shag, herring gull, kittiwake and razorbill. The site is also frequented by otters and grey seals. <u>IBA</u> Populations of IBA Trigger Species: Barnacle Goose (<i>Branta leucopsis</i>), 2,073 individuals between 2004 and 2006. <u>SPA</u> Article 4.1 species: Barnacle Goose (<i>Branta leucopsis</i>), 1000 individuals .

Name of Site	Description
Ward Hill Cliffs	<u>SSSI</u> Ward Hill Cliffs in South Ronaldsay is a nationally important site for its species-rich lichen heath. It also supports a rich diversity of cliff-top flowering plants in a mosaic of other habitats that include thickly vegetated high cliff slopes, coastal heath, coastal grassland and marshy grassland. The variety of plant life further increases where springs create more calcium-rich conditions. Vegetation on this site grows more luxuriantly than on the more highly exposed cliffs on the western coast of Orkney. The northern part of the site contains the lichen-heath which is made up of a rich mix of heather, bell heather, cross-leaved heath, crowberry, numerous herbs, mosses, liverworts and several species of lichens. Ward Hill Cliffs is also the only known site in Orkney where hemp agrimony can be found, growing amongst tall herbs on sheltered areas of the cliff top. Crowberry and a variety of grasses dominate the coastal heath and the coastal grassland of the southern part of the site. Seabirds, including kittiwake, nest on the cliffs. The base of the cliffs is one of the few breeding sites used by grey seals away from Orkney's more outlying islands.
Waulkimill	<u>SSSI</u> Waulkimill is regarded as one of Orkney's most beautiful beaches. This sheltered sandy bay contains a wide variety of wildlife habitats. The largest saltmarsh in Orkney is found behind a shingle spit at the head of the bay. Covered by the sea at high tide, it has a distinctive flora of plants that tolerate salt, such as sea milk-wort, sea arrow-grass, saltmarsh flat sedge and one-glumed spike-rush. The cliffs that surround the bay support a rich variety of herbs, ferns and shrubs. The only colony of native aspen on the Orkney mainland is found on cliffs on the eastern side of the bay and has a different genetic make-up to aspen found elsewhere in the islands. The cliffs are also one of the best habitats for butterflies and moths in the county. One species of moth, <i>Coloephora vigaureae</i>, has only been seen here. Surrounding the cliffs and saltmarsh are areas of heather moorland and patches of well-developed willow scrub. Wildfowl and waders feed where the burn flows into the bay, while the moorland and scrub provide good habitat for a variety of birds including stonechat.
West Mainland Moorland	<u>SSSI</u> These moorlands are outstanding for their assemblage of upland breeding birds, in particular red-throated diver which are attracted to the hill lochans, hen harrier and short-eared owl. Other moorland birds which nest on this site include merlin, golden plover, whimbrel, wigeon, lapwing, dunlin, snipe, curlew, Arctic skua, great skua, stonechat, wheatear and ravens. The moorlands are mainly acidic in nature and are made up of wet and dry heaths with large areas of blanket bog. The plant life increases in variety where springs create more alkaline conditions. In these areas, species such as alpine meadow rue and bog rush can be found, along with carpets of brown moss. Abundant communities of tall-herb plants such as wild angelica, valerian, water avens, rose bay willow herb, male fern and buckler fern are found in the sheltered dales. The only trees – mainly eared willow and grey willow – also form patchy scrub in the dales. Other plants include moonwort, frog orchid, twayblade, chickweed wintergreen and hybrid horsetail. <u>SPA</u> Article 4.1 Species: Hen Harrier (<i>Circus cyaneus</i>), 30 pairs 1998. Red-throated Diver (<i>Gavia stellate</i>), 15 pairs 1994-1996. Short-eared Owl (<i>Asio flammeus</i>), 20 pairs mid 1990s.
West Westray	<u>SSSI</u> This site follows an 8km stretch of coastline and includes adjacent areas of grassland and heath. The high sea cliffs support populations of breeding kittiwake, guillemot, razorbill, Arctic skua, fulmar, shag, great skua, common gull, herring gull, black guillemot and puffin. A colony of Arctic tern breeds on the coastal heathland behind. There are particularly good examples of species-rich maritime grassland and maritime sedge-heath at the site. These support cliff-top plants such as sea plantain, spring squill and Scottish primrose (<i>Primula scotica</i>). Some of the rocky outcrops support well developed fern communities which include sea spleenwort, brittle bladder fern and male fern. <u>SPA</u> Article 4.1 species: Arctic Tern (<i>Sterna paradisaea</i>) 1200 pairs. Article 4.2 species: Guillemot (<i>Uria aalge</i>) 28,274 pairs. During the breeding season, the area regularly supports 120,000 individual seabirds including: Razorbill (<i>Alca torda</i>), Kittiwake (<i>Rissa tridactyla</i>), Arctic Skua (<i>Stercorarius parasiticus</i>), Fulmar (<i>Fulmarus glacialis</i>), Guillemot (<i>Uria aalge</i>), Arctic Tern (<i>Sterna paradisaea</i>). <u>IBA</u> Populations of IBA Trigger Species: Arctic Tern (<i>Sterna paradisaea</i>), 2,166 breeding pairs in 2000 Common Guillemot (<i>Uria aalge</i>), 50,613 individuals in 2007 Seabirds, 43,019 breeding pairs between 1999 and 2002 Water birds, 37,500 breeding pairs between 1999 and 2002
Wyre and Rousay Sounds	<u>MPA</u> Biodiversity - Kelp and seaweed communities on sublittoral sediment; maerl beds. Geodiversity - Marine Geomorphology of the Scottish Shelf Seabed.

MARINE PROTECTED AREAS (MPA'S)

At this present time there have been two areas outlined as potential MPA's, they are Papa Westray and Wyre and Rousay Sounds. More may be introduced in the near future, for more information please see: <http://www.snh.gov.uk/>

NATIONAL NATURE RESERVE'S (NNR'S)

There are no National Nature Reserves in the Orkney.

GEOLOGICAL CONSERVATION REVIEW SITES (GCR's)

These sites have been nominated of their geological and/or geomorphological importance and are listed below.

Table 6: GCR sites in Orkney

GCR sites in Orkney		
South Fersness Bay	Greenan Nev Coast	Central Sanday
Mill Bay	Denwick	Tarracliff Bay to Newark Bay
South Stromness Coast	Yesnaby & Gaulton Coast	Point of Ayre
West Coast of Orkney	Bay of Skail	Too of the Head
Old Man of the Hoy Coast	North Hoy	

RSPB RESERVES

Table 7: RSPB Reserves in Orkney

RSPB Reserves
Hoy
Birsay Moors & Cottascarth Mainland
Marwick Head
Noup Cliffs, Westray
North Hill, Papa Westray
Mill Dam
Copinsay
Hobbister

NATIONAL TRUST FOR SCOTLAND SITES

There are no National Trust sites in the Orkneys.

SCOTTISH WILDLIFE TRUST RESERVES

Table 8: Scottish Wildlife Trust Reserves

SCOTTISH WILDLIFE TRUST RESERVES	
Hill of White Hammers	This reserve lies on the South coast of South Walls Island in Orkney off the minor road between The Ayre and Cantick Head. A healthy population of Scottish primrose and a wide variety of herbs flourish on the grazed cliff ledges. The many narrow inlets provide good opportunities for short range viewing of the cliff nesting sea birds.
Holm of Burghlee	This reserve is on the East coast of Shapinsay. Lying on coastal hill ground, the reserve is an area of ungrazed maritime heathland much of which has been lost from Shapinsay due to agricultural improvement. It supports an interesting bird community with breeding gulls, terns, skuas and waders.
Cruaday Quarry	Cruaday Quarry in Sandwick is noted for its abundance and quality of fossil specimens exposed in the natural geology of the Sandwick Fish Bed revealed through previous quarrying activity. The geology of Cruaday is from the Eifelian Epoch (middle Devonian period) and is of importance because of the fossils embedded in the rock. These fossils contain evidence of some of the earliest known species of fish as well as being very well preserved specimens. The concentration and abundance of species is also of great importance.

INSHORE FISHERIES AND AQUACULTURE

One of the main industries in the Orkneys is fishing, both deep water and near shore, for crab, lobster and diving for scallops. Table 9 below shows the active fish farms and aquaculture in the Orkney area.

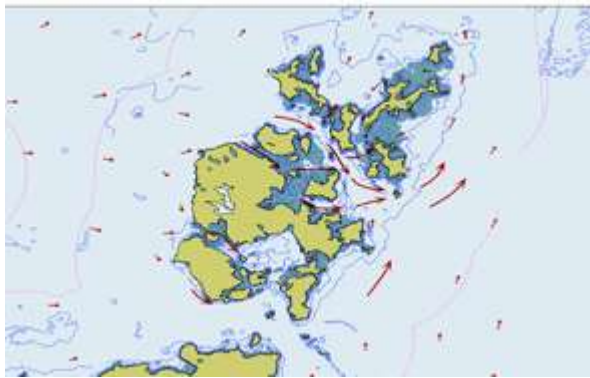
Table 9: Orkney Aquaculture

Name of Site	Location	Contact number	Aquaculture	Water Type	Operator	Species
Bay of Cleat (North)	Pierowall Westray	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Bay of Cleat (South)	Pierowall	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Bay of Ham	Orkney	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Bay of Vady	Rousay	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Bring Head	Old Kirkwall Pier	01856 870569	Fish	Seawater	Scottish Sea Farms Ltd	Atlantic Salmon
Carness Bay	Hatston, Kirkwall	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Chalmers Hope	Hoy	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Clestrain Skerry	Stromness	01856 851116	Shellfish	Seawater	Orkney Mussels Ltd	Common mussel
Fara West	Hoy	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Head of Banks, Orphir	Netherton Road Stromness	01856 850046	Shellfish	Seawater	Sinclair Mussels	Common mussel
Inganess Bay	Orkney	01856 741267	Shellfish	Seawater	Benesther Shellfish	Common mussel
Kirk Noust	Orkney	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Lamb Holm Quarry	Lamb Holm	01856 781424	Shellfish	Seawater	O-Fish-Shell Ltd	European lobster
Lyrawa Bay	Lyness, Hoy	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon

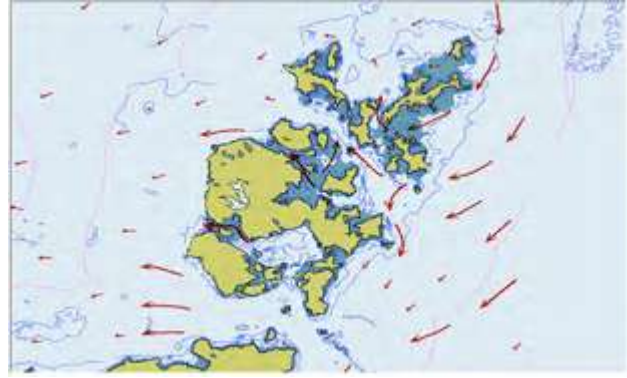
Name of Site	Location	Contact Details	Aquaculture	Water Type	Operator	Species
Meil Bay	Hatston, Kirkwall	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Mill Bay	Stromness	01856 851116	Shellfish	Seawater	Orkney Mussels Ltd	Common mussel
Millburn	Lyness	01856 791271	Fish	Freshwater	Millburn Salmon Hatchery	Atlantic Salmon
Mirkady Beach	Deerness	01856 741267	Shellfish	Seawater	Benesther Shellfish	Pacific Oyster, Flat or native oyster
Old Pumping Station	Kirbister Loch	01856 875159	Fish	Freshwater	Orkney Trout Fishing Association	Brown Trout and sea trout
Orkney Lobster Hatchery	Lamb Holm	01856 781424	Shellfish	Seawater	Orkney Sustainable Fisheries Ltd	European lobster
Ouseness	Pierowall Westray	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Pegal Bay	Lyness Hoy	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Puldrite	Old Kirkwall Pier	01856 870569	Fish	Seawater	Scottish Sea Farms Ltd	Atlantic Salmon
Quanterness	Hatston	01856 876 101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Scarfall Point	Pierowall Westray	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Shapinsay	Old Kirkwall Pier	01856 870569	Fish	Seawater	Scottish Sea Farms Ltd	Atlantic Salmon
South Cava	Lyness Hoy	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon
Toyness	Old Kirkwall Pier	01856 870569	Fish	Seawater	Scottish Sea Farms Ltd	Atlantic Salmon
Vestness	Pierowall Westray	01856 876101	Fish	Seawater	Meridian Salmon Farms Ltd	Atlantic Salmon

19.3 TIDAL INFORMATION

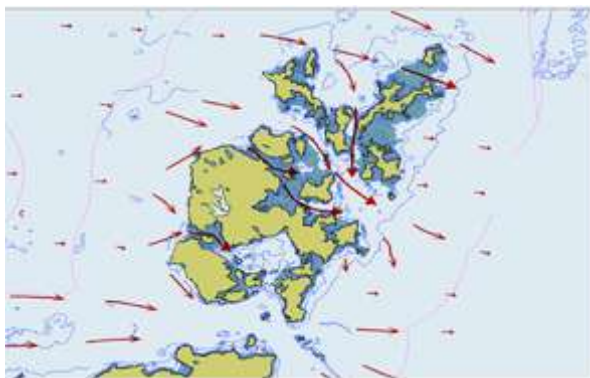
Figure 5: Indication of the tidal variants and maximum strengths



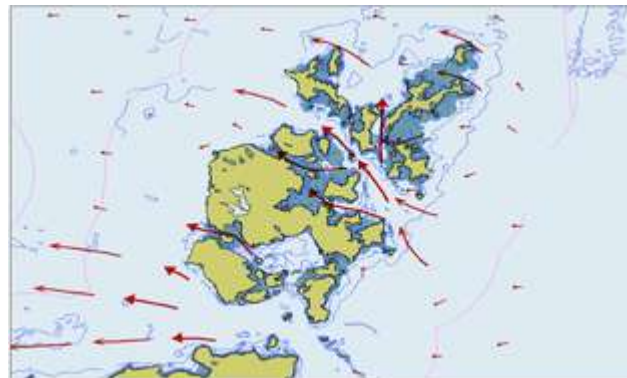
HW -5



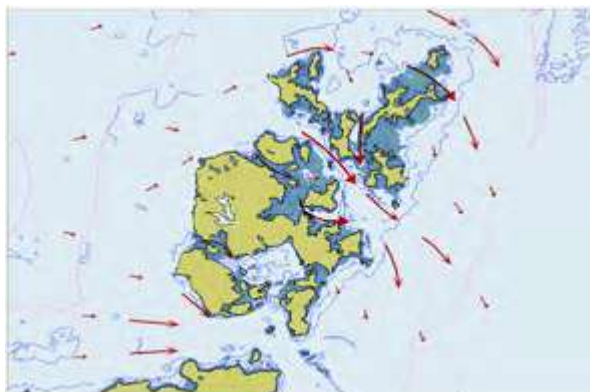
HW +1



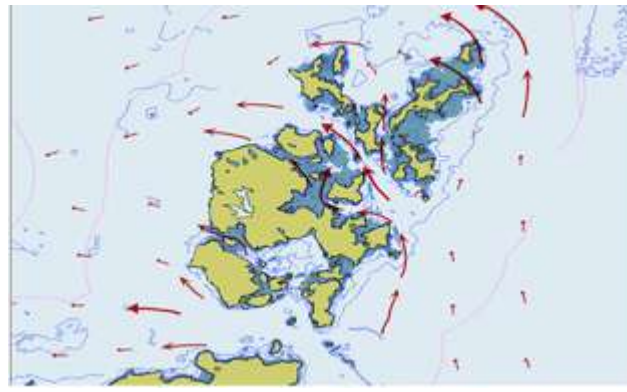
HW -3



HW +3



HW -1



HW +5

19.4 ORKNEY ISLANDS COUNCIL NAVIGATIONAL MARKERS

Table 10: Navigational Markers in the Orkneys

Location/name	Latitude N	Longitude W
Scargun Shoal	59 00.70	002 58.50
Linga Skerry	59 02.40	002 57.56
Boray Skerry	59 03.66	002 57.65
Skertours	59 04.15	002 56.60
Graand	59 06.90	002 54.40
Galt Skerry	59 05.30	002 54.30
Eday Gruna	59 08.50	002 43.80
Rusk Holm	59 12.70	002 50.60
Rapness Sound	59 14.05	002 50.58
Wyre Skerry	59 07.00	003 02.00
Stronsay Harbour		
Quiabow	59 09.82	002 36.30
No 1 buoy	59 09.171	002 36.50
No 2 buoy	59 08.90	002 36.614
No 4 buoy	59 08.78	002 36.476
No 3 buoy	59 08.679	002 36.123
Scapa Flow		
Grinds	58 50.90	003 08.00
Vanguard Wreck	58 51.44	003 06.14
PrudentiaWreck	58 50.80	003 07.80
Royal Oak Wreck	58 00.70	002 59.30`
Scapa Skerry	58 56.80	002 59.30
Crockness	58 49.25	003 09.80
Gutter Sound Wreck	58 50.73	003 11.40
Bay of Houton	58 54.81	003 11.15
Peter Skerry	58 58.28	003 13.50
Riddock Shoal	58 55.89	003 15.00
Sand Eel	58 56.42	003 15.35
Barr Rock	58 56.65	003 16.90
Stromness Harbour		
Outer Buoy	58 57.25	003 17.60
Inner Buoy	58 57.40	003 17.65
Coplands Dock	58 57.75	003 17.63
European Marine Energy Test Site		
North buoy	58 59.50	003 23.80
East buoy	58 58.84	003 22.50
South buoy	58 57.45	003 23.10
West buoy	58 58.50	003 24.70
West buoy (2)	58 59.50	003 25.33

19.5 DISPERSANT USE

It is not the Orkney Islands Council's policy to use dispersants unless a 'force majeure' situation exists.

Under the provisions of Part 4 of the Marine (Scotland) Act 2011, as read with regulation 15 of The Marine Licensing (Exempted Activities)(Scottish Inshore Region) Order 2011 (SSI 2011 No 204), and regulation 13 of The Marine Licensing (Exempted Activities)(Scottish Offshore Region) Order 2011 (SSI 2011 No. 57), no deposit may be made in the sea of any (a) marine chemical treatment substance, (b) marine oil treatment substance, or (c) marine surface fouling cleaner in an area of the sea where the depth of water is less than 20 metres or within one nautical mile of any such area except with the prior approval of the Scottish Ministers. This includes any area submerged at mean high water springs (eg beaches and other inter-tidal zones). Scottish Ministers are the marine licensing authority for internal waters, UK territorial waters, and UK controlled waters adjacent to Scotland, while designated staff at the Marine Scotland Marine Laboratory, Aberdeen act as the first point of contact within the Scottish Government in the event of an oil or chemical spill in these specified sea areas.

For Scottish sea areas outwith shallow waters (the 20 metres plus one nautical mile rule) there is no such statutory obligation. Those responsible for responding to oil and chemical spills are however advised that it is UK Government/Scottish Government policy that the appropriate licensing authority should be consulted in advance of all proposals to use treatment substances except under "force majeure" conditions, eg where people's health is at risk, or the safety of a vessel or offshore installation is threatened. It is therefore essential to consult Marine Scotland for advice in advance of treatment operations commencing about the implications for fisheries and the marine environment of using treatment substances except where other arrangements have been approved in advance eg where a standing approval to spray dispersants has been applied for and agreed.

To request approval for dispersant spraying, please contact the Marine Scotland Duty Officer as detailed below:

Duty Officer

Mobile 07770 733 423

Fax 01224 295 524

E-mail spillresponse@marlab.ac.uk

(should normally only be used once initial contact has been established by phone.)

In the event that a call to the mobile phone fails to connect with the duty officer then a call should be made to the Marine Scotland Marine Laboratory switchboard: (01224) 876 544.

All enquiries about this information should be addressed directly to either:-

MARINE SCOTLAND

Marine Laboratory
PO Box 101
375 Victoria Road
ABERDEEN
AB11 9DB

Tel: 01224 295 579

Fax: 01224 295 524

SECTION 20: BOOMING AND WASTE DISPOSAL

20.1 BOOMING

In general, spills should be contained in the smallest area possible. This can be achieved by drawing booms across corners of docks or around vessels to capture the oil.

N.B: No recovery or containment of any oils or spilt fluids should be attempted without donning the appropriate Personal Protective Equipment (PPE).

20.2 WASTE DISPOSAL OPERATION

NB: Within this Plan waste oil refers to oil which has been contained and recovered as the result of a spill or a pollution incident.

The waste department within Orkney Islands Council has been identified to deal with the waste disposal. Any oily waste can be temporarily stored in Tankerness at the Bossack landfill area.

The safe handling and disposal of recovered oil is governed by relevant sections in the following legislation:

- a) The Environmental Protection Act 1990;
- b) The Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991;
- c) Control of Pollution (Amendment) Act 1989;
- d) The Waste Management Licensing Regulations 2011;
- e) Special Waste Regulations 1996 (as amended);
- f) The Water Environment (Controlled Activities) (Scotland) Regulations 2011
- g) Landfill (Scotland) Regulations 2003
- h) Water Environment (Oil Storage) Regulations 2006

If oily waste material is produced as a result of a pollution incident then the polluting party (operator) has a duty of care to ensure that the waste is contained, handled, transported and ultimately disposed of in an appropriate manner. If the material is to be handled by contractors then the operator (to reduce liabilities to a minimum) has to ensure that each contractor has the relevant transportation registration and waste management licences, where applicable.

SNH and SEPA (as the Waste Regulatory Authority) should be consulted on any proposal to dispose or store waste material to ensure that sensitive wildlife areas such as designated sites are not affected. SEPA should also be consulted to ensure compliance with the relevant legislation relating to controlled waste and the protection of controlled waters. In addition HM Revenue and Customs must be notified if recovered oil is brought ashore by dedicated oil recovery vessels. Landing should not be hindered by the absence of an official from HM Revenue and Customs; however, the Operator should maintain a careful log on the quantity and nature of the recovered oil.

The options for waste disposal or treatment of material, be it oily liquids or oiled solids are:

- a) Temporary store, clean, stabilise and then recover or re-use;
- b) Temporary store and then take to appropriate disposal site for burial;
- c) Take to a refinery / incinerator (mainly for oily liquids only);
- d) Take to appropriate disposal site.

Each disposal option is examined below with various points for consideration highlighted.

a) Temporary storage / clean, treat, stabilise, recover, reuse

This option aims to store the material temporarily and then, slowly over the ensuing period, to clean or stabilise it and then to recover or reuse it. In most cases this is the best practicable environmental option (BPEO), avoiding the risk of changing what was a marine oil pollution problem into an inland surface pollution problem or groundwater pollution problem.

From temporary storage the contaminated material can be stabilised with cement, lime, clay, organic binders and asphalt. The characteristic of each product needs to be considered when determining the ultimate disposal route or any perceived end use. It is important to note that the treatment of wastes also comes under the waste management licensing system. Therefore, any strategy to deal with the waste in this manner can only be developed through close liaison with the Local Authority concerned and SEPA.

SEPA should be consulted on any intention to temporarily store oil collected on shores and beaches under paragraph 41 Exemption under Schedule 3 of the Waste Management Licensing Regulations 1994. Furthermore, waste oil is likely to be classified as Special Waste and should be treated as such until otherwise determined. It would therefore be subject to the Special Waste Regulations (as amended) 1996. Mixes of crude oil / sand and oil / seawater etc would be considered as Special Waste if the percentage of carcinogenic compounds is above 0.1% or where the waste would be considered as an absolute entry in the European Waste Catalogue (EWC 1994). It is therefore likely that oily beach materials and oil / water liquids would have to be handled as Special Waste.

b) Temporary storage and take to an appropriate disposal site for burial

The reasons for constructing a temporary storage site are as follows:

1. There is no immediate disposal outlet for large quantities of oil / sand mixture or for oil / water mixtures and clean-up cannot be slowed or stopped.
2. The equipment used to clean beaches is usually labour intensive and therefore requires an immediate transfer area adjacent to the site to be provided.
3. The nature of the roads precludes high traffic densities.
4. The in situ treatment of contaminated material is often preferable to removing large quantities of material from the shoreline.

In addition, under the above legislation, the temporary storage site itself may require a Registered Exemption from Waste Management Licensing. Each site will have to be constructed in a specific manner. It is essential that the construction of temporary storage sites be done through close liaison with the Local Authority concerned and SEPA.

SEPA should be consulted on any intention to temporarily store oil collected on shores and beaches under paragraph 41 Exemption under Schedule 3 of the Waste Management Licensing Regulations 1994. Furthermore, waste oil is likely to be classified as Special Waste and should be treated as such until otherwise determined. It would therefore be subject to the Special Waste Regulations (as amended) 1996. Mixes of crude oil / sand and oil / seawater etc would be considered as Special Waste if the percentage of carcinogenic compounds is above 0.1% or where the waste would be considered as an absolute entry in the European Waste Catalogue (EWC 1994). It is therefore likely that oily beach materials and oil / water liquids would have to be handled as Special Waste.

c) Take to a refinery / incinerator (mainly for oily liquids only)

This material should be removed from site by a licensed waste handling company who will then arrange for its disposal in an appropriate manner. If there is suitable access, oily liquids produced from a shoreline clean-up operation can be removed from site by road tanker.

If the oily liquids are onboard a dedicated recovery vessel following an at sea containment and recovery operation then it can be transferred across the quay, at a suitable berth, to a road tanker or other suitable waste reception facility. Alternatively this waste can be fed directly into the reception facility at a marine terminal of an oil refinery. It is the responsibility of the Ships Master to ensure that

this waste is disposed of appropriately. However, the Harbour Authority must confirm that any contractors have the necessary licenses to handle and dispose of the waste. The disposal route should also be agreed with SEPA to ensure it meets with their satisfaction.

Waste oil is likely to be classified as Special Waste and should be treated as such until otherwise determined. It would therefore be subject to the Special Waste Regulations (as amended) 1996. Mixes of crude oil / sand and oil / seawater etc would be considered as Special Waste if the percentage of carcinogenic compounds is above 0.1%. It is therefore likely that oily beach materials and oil / water liquids would have to be handled as Special Waste.

d) Direct to appropriate disposal site

All disposal sites require a Waste Management Licence. The licence is specific to the type of material that can be disposed of at the site. There are only a few sites that are licensed to receive organic or chemically polluting materials (includes oily waste). The Landfill (Scotland) Regulations 2003 ban the landfill of liquid wastes including oily waste. There will be a charge levied by the site operator for depositing material at the site. In addition there is landfill tax / levy applied to all waste deposited in a landfill.

Furthermore, waste oil is likely to be classified as Special Waste and should be treated as such until otherwise determined. It would therefore be subject to the Special Waste Regulations (as amended) 1996. Mixes of crude oil / sand and oil / seawater etc would probably be considered as Special Waste if the percentage of carcinogenic compounds is above 0.1%. It is therefore likely that oily beach materials and oil / water liquids would have to be handled as Special Waste.

The transportation of Special Wastes generally requires that the Scottish Environment Protection Agency (SEPA) be informed before the waste is removed. This is done by filling in parts A, B and D of a Special Waste Consignment Note, available from the SEPA, which is sent to SEPA responsible for the receiving facility. This should be done at least three clear working days before the waste is to be moved.

However, in the event of an 'emergency' SEPA may waive the requirement for pre-notification. The licensed waste carrier completes part C of the Consignment Note and takes it with the load to the receiving facility. The licensed operator of the receiving facility then signs the consignment note to say that they have accepted the load and that they are authorised to manage it properly.

The requirement for pre-notification generally does not apply to special waste from ships. Therefore oil recovered at sea by a dedicated Oil Recovery Vessel could be discharged within a Harbour to an appropriate waste reception facility without having to pre-notify SEPA. However a consignment note will have to be supplied with each load sent for disposal.

To ensure that oily waste material is transported and disposed of in an appropriate manner, a licensed waste carrier and disposal company should be contracted. The Operator and Waste Disposal Company should then liaise with SEPA to confirm that the disposal route identified meets with their satisfaction.

20.3 WASTE DISPOSAL ACTION CHECKLIST

Oily Waste Generated from a Shoreline Clean-up Operation Temporary storage / clean, treat, stabilise, recover, reuse

1. Discuss requirement to establish temporary storage sites along the shoreline with SEPA and the Local Authority.
2. If agreed, identify temporary storage sites in close liaison with SEPA and Local Authority.
3. Instruct Oil Spill Response Contractors to construct temporary storage sites.
4. Confirm treatment methods and ultimate disposal with SEPA and Local Authority.
5. In close liaison with the Oil Spill Response Contractors agree course of action and assist with the necessary arrangements where necessary.
6. Ensure all associated paperwork, i.e. consignment notes, is retained and catalogued.

Temporary storage and appropriate disposal site for burial

1. Discuss requirement to establish temporary storage sites along the shoreline with SEPA and the Local Authority.
2. If agreed, identify temporary storage sites in close liaison with SEPA and Local Authority.
3. Instruct Oil Spill Response Contractors to construct temporary storage sites.
4. Identify suitably licensed waste carrier to remove material from site.
5. Confirm with waste carrier the disposal route and ultimate disposal site. Liaise with SEPA to ensure that the disposal strategy is acceptable.
6. Ensure all associated paperwork, i.e. consignment notes, are retained and catalogued.

Take to a refinery / incinerator (mainly for oily liquids only)

1. Identify suitably licensed waste carrier to remove material from site.
2. Identify suitable facility to receive the waste.
3. Confirm with waste carrier the disposal route and ultimate disposal site.
4. Liaise with SEPA to ensure that the disposal strategy is acceptable.
5. Ensure all associated paperwork, i.e. consignment notes, are retained and catalogued.

Direct transportation to appropriate disposal site for burial

1. Identify suitably licensed waste carrier to remove material from site.
2. Confirm with waste carrier the disposal route and ultimate disposal site.
3. Liaise with SEPA to ensure that the disposal strategy is acceptable.
4. Ensure all associated paperwork, i.e. consignment notes, are retained and catalogued.

Oily Liquids Recovered at Sea and Held on a Dedicated Recovery Vessel

1. Notify HM Revenue and Customs that you intend to land recovered oil.
2. Identify suitable oil handling plant (refinery) to receive the waste.
3. If 2 is not available identify a harbour with a suitable berth for handling oils.
4. Identify a suitably licensed waste carrier to take the oily liquids off the vessel.
5. Confirm the disposal route with the waste carrier.
6. Notify Regulator and confirm that the identified disposal route meets with their satisfaction. Ensure all associated paperwork, i.e. consignment notes, are retained and catalogued.
7. The removal of landed ships waste that is special waste to:
 - a. conveyance for transport outside the harbour area
 - b. reception facilities within the harbour area
 - c. by pipeline to reception facilities outside the harbourAll require to be consigned. However, there is no requirement to pre-notify these movements and consignment notes can be SC coded.
 - d. All oil wastes including fuels, mixtures, emulsification and spills are classed as Absolute Entries in terms of the regulations therefore there is no longer any percentage threshold of carcinogenic compounds; they are now special waste regardless. All waste oils with the exception of edible oils are considered special waste irrespective of their composition, biodegradability, synthetic nature or otherwise. There is no longer any threshold applicable to consider whether they are special waste or not.

Notify Regulator and confirm that the identified disposal route meets with their satisfaction. Ensure all associated paperwork, i.e. consignment notes, are retained and catalogued

SECTION 21: MATERIAL DATA SAFETY SHEETS

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Safety Data Sheet
according to 1907/2006/EC, Article 31

Printing date 24.01.2010

Revision: 24.01.2010

1 Identification of the substance/preparation and of the company/undertaking

- Product details

- Trade name: **Kerosine (petroleum), hydrosulfurized**
ATK désulfuré
aviation turbo kerosine

- Application of the substance / the preparation hydrocarbon

- Manufacturer/Supplier:

Ineos Europe LTD
Hawkslease Chapel Lane
Lyndhurst
Hampshire
SO43 7FG
UK

G LAV USERS FDS ADMIN@ineos.com

- Further information obtainable from: Laboratory

- Information in case of emergency:

+44 (0) 208-762-8322 (CARECHEM24)

+33 (0) 1-45-42-59-59 (ORFILA)

+ 33 (0) 4-42-42-70-91 (Lavéra France)

In case of marine incident :

+44 (0) 13- 24- 476- 575 (Grangemouth, Scotland)

In case of barge incident :

+49 (0)-21-33-553-222 (Cologne, Germany)

2 Hazards identification

- Hazard description:



Xn Harmful

- Information concerning particular hazards for human and environment:

R 65 Harmful: may cause lung damage if swallowed.

3 Composition/information on ingredients

- Chemical characterization:

- CAS No. Description

64742-81-0 Kerosine (petroleum), hydrosulfurized

- Identification number(s)

- EINECS Number: 265-184-9

- Index number: 649-423-00-8

4 First aid measures

- After excessive inhalation: Supply fresh air; consult a doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- After eye contact: Rinse opened eye for several minutes under running water.

(Contd. on page 2)

GE

Safety Data Sheet according to 1907/2006/EC, Article 31

Printing date 24.01.2010

Revision: 24.01.2010

Trade name: **Kerosine (petroleum), hydrodesulfurized
ATK désulfuré
aviation turbo kerosine**

- **After swallowing:** If symptoms persist consult a doctor.

(Contd. of page 1)

5 Fire-fighting measures

- **Suitable extinguishing agents:**
CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Protective equipment:** No special measures required.

6 Accidental release measures

- **Person-related safety precautions:** Not required.
- **Measures for environmental protection:** Do not allow to enter sewers/ surface or ground water.
- **Measures for cleaning/collecting:**
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.

7 Handling and storage

- **Handling:**
- **Information for safe handling:** Ensure good ventilation/exhaustion at the workplace.
- **Information about fire - and explosion protection:** No special measures required.
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.

8 Exposure control/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **Ingredients with limit values that require monitoring at the workplace:** Not required.
- **Additional information:**
As a basis for the production of this document, the most current valid lists were used.
- **Personal protective equipment:**
- **General protective and hygienic measures:**
Keep away from food, beverages and petfood.
Wash hands before breaks and at the end of work.
- **Respiratory protection:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.

(Contd. on page 3)

CB

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date 24.01.2010

Revision: 24.01.2010

Trade name: **Kerosine (petroleum), hydrodesulfurized
ATK désulfuré
aviation turbo kerosine**

(Contd. of page 2)

Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Gloves material:

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Eye protection: Not required.

9 Physical and chemical properties

General Information

Form:	Liquid
Colour:	Light brown
Odour:	Characteristic

Change in condition

Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	Undetermined.

Flash point:	Not applicable.

Ignition temperature:	Not applicable.

Danger of explosion:	Product does not present an explosion hazard.

Density:	Not determined.

Solubility in / Miscibility with water:	Insoluble.

10 Stability and reactivity

Thermal decomposition / conditions to be avoided:

No decomposition if used according to specifications.

Dangerous reactions

No dangerous reactions known.

Dangerous decomposition products:

No dangerous decomposition products known.

11 Toxicological information

Acute toxicity:

Primary irritant effect:

On the skin: No irritant effect.

On the eye: No irritating effect.

(Contd. on page 4)

Safety Data Sheet according to 1907/2006/EC, Article 31

Printing date 24.01.2010

Revision: 24.01.2010

Trade name: **Kerosine (petroleum), hydrodesulfurized
ATK désulfuré
aviation turbo kerosine**

· **Sensitization:** No sensitizing effects known.

(Contd. of page 3)

12 Ecological information

· **General notes:**
Water hazard class 1 (German Regulation) (Assessment by list): slightly hazardous for water.
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

13 Disposal considerations

· **Product:**
· **Recommendation**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
· **Uncleaned packaging:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **Land transport ADR/RID (cross-border) :**
· **ADR/RID class:** -
· **Maritime transport IMDG:**
· **IMDG Class:** -
· **Air transport ICAO-TI and IATA-DGR:**
· **ICAO/IATA Class:** -

15 Regulatory information

· **Labelling according to EU guidelines:**
The product has been marked in accordance with EU Directives / respective national laws.
2008/58/CE (30eme ATP) ; 2006/8/CE
· **Code letter and hazard designation of product:**
 Xn Harmful
· **Risk phrases:**
65 Harmful; may cause lung damage if swallowed.
· **Safety phrases:**
2 Keep out of the reach of children.

(Contd. on page 5)

Safety Data Sheet
according to 1907/2006/EC, Article 31

Printing date 24.01.2010

Revision: 24.01.2010

Trade name: **Kerosine (petroleum), hydrodesulfurized**
ATK désulfuré
aviation turbo kerosine

23 Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer). (Contd. of page 4)

24 Avoid contact with skin.

62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name: Gas Oil Class A2, Class D

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified use(s): Fuel.

Uses advised against: Follow supplier's recommendations on correct use of the product. Uses other than those covered by the exposure scenarios included in this safety data sheet are not supported.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier: Certas Energy UK Limited
302 Bridgewater Place
Birchwood Park
Warrington
Cheshire
WA3 6XG

Telephone: 0800 685 685

E-mail: hse.admin@certasenergy.co.uk

1.4 Emergency telephone number

In case of emergency, call: 01642 679 461 (24 hours, 7 days)

SECTION 2: Hazard Identification

2.1 Classification of the substance or mixture

2.1.1. Classification according to Regulation (EC) No. 1272/2008 (CLP)

Flam. Liq. 3; H226
Asp Tox 1; H304
Skin Irrit. 2; H315
Acute Tox. 4; H332
Carc. 1B; H350
STOT RE 2; H373 (Thymus, liver, bone marrow)
Aquatic Chronic 2; H411

2.1.2. Classification according to Directive Directive 1999/45/EC (CHIP)

R10
Harmful; Xn; R20
Irritant; Xi; R38
Carc. Cat. 2; R45
Harmful; Xn; R48
Harmful; Xn; R65
Dangerous for the environment; N; R51/53

2.2 Label elements

2.2.1. Label according to Regulation (EC) No. 1272/2008 (CLP)

Hazard pictogram(s):



Signal Word:

Danger.

Hazard Statement(s):

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H332: Harmful if inhaled.
H350: May cause cancer.
H373: May cause damage to organs (Thymus, liver, bone marrow) through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

P102: Keep out of reach of children.
P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331: Do NOT induce vomiting.
P405: Store locked up.
P501: Dispose of contents/container to approved disposal facility.

Supplemental Hazard information (EU):

None.

2.2.2. Label according to Directive 1999/45/EEC (CHIP)

Hazard pictogram(s):



Indications of danger:

Harmful, Dangerous for the environment

Hazard Statement(s):

R10: Flammable.
R20: Harmful by inhalation.
R38: Irritating to skin.
R45: May cause cancer.
R48: Danger of serious damage to health by prolonged exposure.
R65: Harmful: may cause lung damage if swallowed.
R51/53: Toxic to aquatic organisms, may cause long-term

adverse effects in the aquatic environment.

Precautionary Statement(s):

S2: Keep out of the reach of children.
S29: Do not empty into drains.
S36/37: Wear suitable protective clothing and gloves.
S61: Avoid release to the environment. Refer to special instructions / safety data sheets.
S62: If swallowed, do not induce vomiting: seek medical advice immediately and show this label or container.

2.3 Other hazards

The product does not meet the criteria for PBT or vPvB substances.

SECTION 3: Composition/Information on Ingredients

3.2 Mixtures

Chemical name	% w/w	CAS No.	EC No.	Index No.	Classification (Regulation (EC) No. 1272/2008 (CLP))	Classification (Directive 67/548/EEC)
Fuels, diesel <i>REACH: 01-2119484664-27-XXXX</i>	90-100	68334-30-5	269-822-7	649-224-00-6	Flam. Liq. 3; H226 Asp Tox 1; H304 Skin Irrit. 2; H315 Acute Tox. 4 H332 Carc. 2 H351 STOT RE 2; H373 (Thymus, liver, bone marrow) Aquatic Chronic 2; H411	R10 Xn; R20 Xi; R38 Carc. Cat. 3; R40 Xn; R48 Xn; R65 N; R51/53
Fatty acids, vegetable-oil, Me esters	0-10	68990-52-3	273-606-8	-	-	-
Fatty acids, tallow, Me esters	0-10	61788-61-2	262-989-7	-	-	-
Naphthalene	< 1	91-20-3	202-049-5	601-052-00-2	Acute Tox. 4; H322 Carc. 1B; H350 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	Xn; R22 Carc. Cat. 2; R45 N; R50/53

See Section 16 for full description of R phrases and H statements.

Total sulphur: < 0.1%

SECTION 4: First Aid Measures

4.1 Description of first aid measures

INHALATION:

Remove person to fresh air and keep comfortable for breathing. Keep warm and at rest. If symptoms persist, obtain medical attention.

SKIN CONTACT:

Remove contaminated clothing immediately. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.

EYE CONTACT:

Remove contact lenses if present and easy to do. Wash eyes immediately with plenty of water, making sure to rinse under

eyelids. If symptoms persist, obtain medical attention.

INGESTION:

Obtain medical attention immediately. Do not induce vomiting. Do not give anything by mouth because of risk of material entering the lungs and causing lung damage. If person is drowsy or unconscious and vomiting, place on left side with head down. If possible, do not leave unattended and observe closely for adequacy of breathing.

4.2 Most important symptoms and effects, both acute and delayed:

Skin contact causes irritation, redness and pain. Repeated exposure may cause skin dryness or cracking. Eye contact may cause slight irritation, watering, redness and pain. Inhalation of high concentrations of vapours may cause drowsiness or dizziness. Ingestion may cause irritation of the mouth and digestive tract. If swallowed, aspiration into lungs may result in chemical pneumonia.

May cause cancer. May cause damage to organs (Thymus, liver, bone marrow) through prolonged or repeated exposure.

4.3 Indication of any immediate medical attention and special treatments needed:

In case of accident or if you feel unwell, seek medical advice immediately. If swallowed, patient should be monitored for signs of breathing difficulty as effects of aspiration may be delayed for up to 48 hours. If breathing is laboured, oxygen should be administered by qualified personnel.

SECTION 5: Fire-fighting Measures

5.1 Extinguishing Media

Suitable extinguishing media: Foam, CO2 or dry powder.

Unsuitable extinguishing media: Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Flammable liquid and vapour: Vapour may form explosive mixture with air. Vapour is heavier than air and may accumulate in confined spaces. Vapours may travel considerable distances to ignition sources where they can ignite, flash back or explode. The product will float on surface water and can reignite. Containers exposed to heat may burst due to increase in pressure.

Combustion may liberate toxic fumes: Carbon monoxide, carbon dioxide, various hydrocarbons, nitrogen oxides, sulphur oxides.

5.3 Advice for fire-fighters

A self-contained breathing apparatus and suitable protective clothing should be worn in fire conditions. Move undamaged containers from fire area if this can be done safely. Keep fire exposed containers cool by spraying with water. Do not allow product or run-off to enter drains, sewers or watercourses.

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Use only non-sparking tools. Use explosion-proof electrical, ventilating and lighting equipment. Caution – spillage area may be slippery.

Keep upwind. Ensure adequate ventilation. Avoid inhalation of vapours. Avoid contact with skin and eyes. Wear suitable personal protective equipment. Wear appropriate respirator when ventilation is inadequate. (See Section 8).

6.1.2 For emergency responders

Keep unnecessary personnel away. Wear suitable protective clothing (See Section 8). Contaminated clothing should be thoroughly cleaned.

6.2 Environmental precautions

Collect spillage. Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body. If spill occurs on water notify the appropriate authorities and advise shipping of any hazard.

6.3 Methods and materials for containment and clearing up

6.3.1 For containment

Stop the leak if it is safe to do so. Contain the spillage with sand, earth or any suitable adsorbent material.

6.3.2 For cleaning up

Use sand, earth or any suitable non-combustible adsorbent material to adsorb spillages. Using non-sparking tools transfer the contaminated absorbent material into a container for disposal. For spillages on water, remove use appropriate methods such as skimming, booms or adsorbents. For spillages onto soil, remove contaminated soil for remediation or disposal in accordance with local regulations.

Waste containers used should be plastic-lined sealable drums. Containers should be sealed before being disposed of via an authorised waste disposal contractor.

6.3.3 Other advice

None.

6.4 Reference to other sections

See Section 8 for personal protective equipment. See Section 13 for waste disposal.

SECTION 7: Handling and Storage

7.1 Precautions for safe handling

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Take precautionary measures against static discharge. Use only non-sparking tools. Use explosion-proof electrical, ventilating and lighting equipment.

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. Provide adequate ventilation, including local extraction, to ensure occupational exposure limits are not exceeded. Avoid breathing vapours/spray. Avoid contact with skin and eyes. Wear suitable personal protective equipment (See Section 8).

Do not eat, drink or smoke in the vicinity of the product. Wash thoroughly after handling. Take off contaminated clothing and wash it before reuse. Contaminated clothing should be thoroughly cleaned or disposed of as hazardous waste.

Product transfer

Electrostatic charges may be generated during pumping. Ensure electrical continuity by bonding all equipment. Avoid splash filling. Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. Contamination resulting from product transfer may give rise to light hydrocarbon vapour in the headspace of tanks that have previously contained gasoline. This vapour may explode if there is a source of ignition. Partly filled containers present a greater hazard than those that are full, therefore handling, transfer and sampling activities need special care.

Tank cleaning

Cleaning, inspection and maintenance of storage tanks is a specialist operation that requires the implementation of strict procedures and precautions. These include issue of work permits, gas-freeing of tanks, using a manned safety harness, lifelines and wearing air-supplied breathing apparatus. Prior to entry and while cleaning is underway, the atmosphere within the tank must be monitored using an oxygen meter and explosimeter. Additional precautions are required where the tank may have previously contained leaded gasoline.

7.2 Conditions for safe storage, including any incompatibilities

Keep away from heat and sources of ignition. Keep away from direct sunlight. Store locked up. Store in a well-ventilated place. Keep container tightly closed. Keep cool. Empty containers retain product residue and can be hazardous.

Keep away from oxidising agents, reducing agents.

This product must never be stored in buildings occupied by people. Drums and small containers should be stored in well-ventilated areas, flameproof cabinets or stores. Keep in a bunded area with a sealed floor to provide containment against spillage. Stack drums to a height not exceeding three metres without the use of racking. Seek specialist advice for the design, construction and operation of bulk storage facilities.

Recommended Storage Container materials

For containers or container linings use mild steel or stainless steel, aluminium may also be used for applications where it does not present an unnecessary fire hazard. Examples of suitable materials are: high density polyethylene (HDPE), polypropylene (PP), and Viton (FKM) which have specifically tested for compatibility with the product. For container linings, use amine-adduct cured epoxy paint. For seals and gaskets use: graphite, PTFE, Viton A, Viton B.

Unsuitable Storage Container materials

Synthetic materials such as plastics and fiberglass may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), nitrile rubber (NBR), ethylene propylene rubber (EPDM), polymethyl methacrylate (PMMA), polystyrene, polyvinyl chloride (PVC), polyisobutylene. However some may be suitable for glove materials.

7.3 Specific end uses(s)

Refer to supplemental exposure scenarios attached or 'fuel for oil-fired heating systems'.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control parameters

Workplace exposure limits

Source: EH40/2005, 2nd Ed., 2011.

None assigned.

Community exposure limits

Sources: ILV: 91/322/EEC; IOELV: 2000/39/EC, 2006/15/EC, 2009/161/EU

Substance	Exposure Limit Type	CAS No.	LTEL (8 hr TWA)		STEL (15 min)		Comments
			ppm	mg/m ³	ppm	mg/m ³	
Naphthalene	ILV	91-20-3	10	30	-	-	-

IOELV: Indicative Occupational Exposure Limit Value

ILV: Indicative Limit Value

Skin: Can be absorbed through the skin.

Other exposure limits

Source: American Conference of Governmental Industrial Hygienists (ACGIH)

Substance	CAS No.	LTEL (8 hr TWA)		STEL (15 min)		Comments
		ppm	mg/m ³	ppm	mg/m ³	
Fuels, diesel	68334-30-5	-	100	-	-	Skin
Naphthalene	91-20-3	10	-	15	-	Skin, A3

Skin: Can be absorbed through the skin.

A3: Confirmed animal carcinogen with unknown relevance to humans.

Source: Phillips 66 Guidelines

Substance	CAS No.	LTEL (8 hr TWA)		STEL (15 min)		Comments
		ppm	mg/m ³	ppm	mg/m ³	
Naphthalene	91-20-3	-	0.2	-	-	As total of 17 PNAs measured by NIOSH method 5506

DNELs (Workers)

Inhalation: 68.3 mg/m³/day

Dermal: 2.9 mg/kg bw/day

DNELs (Consumers)

Inhalation: 61.2 mg/m³/day

Dermal: 1.3 mg/kg bw/day

PNECs

None assigned.

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Provide adequate ventilation to ensure that occupational exposure limits are not exceeded. Local extraction may be required. Eye wash and quick-drench shower facilities should be available in the work area. Contaminated clothing and shoes should be thoroughly washed before reuse.

8.2.2 Personal protection

Eye protection:

Goggles or safety glasses with side shields giving complete protection to eyes. (EN 166). Depending on conditions of use, close-fitting eye protection and a face shield may be necessary.

Skin protection:

Hand protection:

Chemical-resistant gloves. (EN 374). Suitable glove material: nitrile, neoprene or PVC (breakthrough time > 240 minutes). Contact glove supplier to confirm suitable glove material, thickness and breakthrough times.

Other:

Long sleeve protective clothing. Plastic apron. Rubber boots.

Respiratory protection:

Where airborne levels below the exposure limits cannot be maintained, wear an air-purifying respirator (EN 140) with a Type A/P2 filter or better suitable for organic gases and

vapours with a boiling point above 65°C. (EN 14387).

Thermal hazards:

Wear suitable temperature resistant gloves and protective clothing if the product is heated.

8.2.3 Environmental exposure controls

Inform environmental manager of all incidents involving this product.

SECTION 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Data given below are typical values

Appearance:	Clear, straw-coloured liquid.
Odour:	Diesel.
Odour threshold:	Not available.
pH:	Not applicable.
Melting/freezing point:	Not available.
Initial boiling point and boiling range:	165 – 375°C
Flash point:	> 55°C (closed cup)
Evaporation rate:	Not available.
Flammability (solid; gas):	Not applicable.
Upper/lower flammability or explosive limits:	0.5% – 6.0% (v/v in air)
Vapour pressure:	< 0.3 kPa (20°C)
Vapour density:	> 1 (Air = 1)
Relative density:	0.82 – 0.85 (15°C) (Water = 1)
Solubility(ies):	Negligible in water (20°C) Miscible in aromatic solvents.
Partition coefficient: n-octanol/water:	Log Kow: 3.9-6 (approximate)
Auto-ignition temperature:	250-270°C
Decomposition temperature:	Not available.
Viscosity:	4.8 mm ² /s (20°C) 2-4.5 mm ² /s (40°C)
Explosive properties:	Not explosive. Vapour may form explosive mixture in air.
Oxidising properties:	Not oxidising.
9.2 Other information	
Pour point:	-24°C

SECTION 10: Stability and Reactivity

10.1 Reactivity	Reacts with oxidising agents.
10.2 Chemical stability	Stable under normal conditions.
10.3 Possibility of hazardous reactions	No hazardous reactions expected during normal use.
10.4 Conditions to avoid	Keep away from sources of ignition, hot surfaces, direct sunlight. Prevent accumulation of vapours. Contact with incompatible materials.
10.5 Incompatible materials	Oxidising agents e.g. chlorates and ammonium nitrate which

may be used in agriculture. Reducing agents. Reducing agents.

10.6 Hazardous decomposition products

Combustion may liberate toxic fumes: Carbon monoxide, carbon dioxide, various hydrocarbons, nitrogen oxides, sulphur oxides.

SECTION 11: Toxicological Information

11.1 Information on toxicological effects

Acute toxicity

No data available on the mixture. The following data are for the product components:

Fuels, diesel:

LD₅₀ (oral/rat): > 5,000 mg/kg

LD₅₀ (dermal/rabbit): > 4,300 mg/kg

LC₅₀ (inhalation/rat (male and female/mist): > 4.1 mg/L air (analytical), 4 h

LC₅₀ (inhalation/rat (male/mist): > 5.4 mg/L air (analytical), 4 h

LC₅₀ (inhalation/rat (female/mist): > 3.6 mg/L air (analytical), 4 h

Naphthalene:

LD₅₀ (oral/rat): > 2,000 mg/kg

LD₅₀ (dermal/rat): > 2,500 mg/kg

LC₅₀ (inhalation/rat (male and female/vapour): > 0.4 mg/L air (analytical), 4 h

Skin corrosion/irritation

Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious eye damage/irritation

May cause slight eye irritation.

Skin sensitisation

Not expected to be a skin sensitiser.

Respiratory sensitisation

Not expected to be a respiratory sensitiser.

Germ cell mutagenicity

The product does not contain substances classified as mutagenic above the classification thresholds.

Carcinogenicity

May cause cancer. Petroleum middle distillates have been shown to cause skin tumours in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumours are produced through a non-genotoxic mechanism associated with frequent cell damage and repair and that they are not likely to cause tumours in the absence of prolonged skin irritation.

Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The US National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

Reproductive toxicity

The product does not contain substances classified for reproductive toxicity above the classification thresholds.

Specific Target Organ Toxicity – single exposure

Based on the available data, the classification criteria are not met.

Specific Target Organ Toxicity – repeated exposure

May cause damage to organs (Thymus, liver, bone marrow) through prolonged or repeated exposure.

Aspiration hazard

May be fatal if swallowed and enters airways. Risk of aspiration into lungs resulting in chemical pneumonia.

Information on likely routes of exposure

Inhalation

Inhalation of high concentrations of vapours may cause drowsiness or dizziness.

Skin contact

Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Eye contact

May cause slight eye irritation.

Ingestion

May be fatal if swallowed and enters airways. Risk of aspiration into lungs resulting in chemical pneumonia. Ingestion may cause irritation of the mouth and digestive tract.

Symptoms related to the physical, chemical and toxicological characteristics

Skin contact causes irritation, redness and pain. Repeated exposure may cause skin dryness or cracking. Eye contact may cause slight irritation, watering, redness and pain. Inhalation of high concentrations of vapours may cause drowsiness or dizziness. Ingestion may cause irritation of the mouth and digestive tract. If swallowed, aspiration into lungs may result in chemical pneumonia.

Mixture versus substance information

No data available.

Other information

None.

SECTION 12: Ecological Information

12.1 Toxicity

Toxic to aquatic life with long lasting effects.

Experimental studies on samples of gas oils show acute aquatic toxicity values typically in the range 2-20 mg/L. These values are consistent with the predicted aquatic toxicity based on their hydrocarbon compositions.

No data available on the mixture. The following data are for the product components:

Fuels, diesel:

LL₅₀ (*Oncorhynchus mykiss*): 21 mg/L, 96 h (WAF)

NOEL (*Oncorhynchus mykiss*): 10 mg/L, 96 h (WAF)

NOEL (*Oncorhynchus mykiss*): 0.083 mg/L, 14 days (WAF) (estimated using PETROTOX computer model)

EL₅₀ (*Daphnia magna*): 210 mg/L, 48 h (WAF)

NOEL (*Daphnia magna*): 46 mg/L, 48 h (WAF)

NOEL (*Daphnia magna*): 0.2 mg/L, 21 days (WAF) (estimated using PETROTOX computer model)

EL₅₀ (*Pseudokirchnerella subcapitata*): 10 mg/L, 72 h (biomass)

NOEL (*Pseudokirchnerella subcapitata*): 1 mg/L, 72 h (biomass)

EL₅₀ (*Pseudokirchnerella subcapitata*): 22 mg/L, 72 h (growth)

rate)
NOEL (*Pseudokirchnerella subcapitata*): 1 mg/L, 72 h (growth rate)
EL₅₀ (*Tetrahymena pyriformis*): > 1,000 mg/L, 40 h (estimated using PETROTOX computer model)
NOEL (*Tetrahymena pyriformis*): 3.217 mg/L, 40 h (estimated using PETROTOX computer model)

Naphthalene:
LC₅₀ (*Pimephales promelas*): 6.08 mg/L, 96 h
LC₅₀ (*Oncorhynchus mykiss*): 1.6 mg/L, 96 h
LC₅₀ (*Oncorhynchus kisutch*): 2.1 mg/L, 96 h
EC₅₀ (*Daphnia magna*): 2.16 mg/L, 48 h
NOEC (*Oncorhynchus kisutch*): 0.37 mg/L, 40 days
NOEC (*Daphnia pulex*): 0.59 mg/L, 125 days

12.2 Persistence and degradability

Based on the known or expected properties of individual components, the product is not expected to be readily biodegradable. Some components are expected to be persistent however other components will be easily degraded by microorganisms under aerobic conditions.

12.3 Bioaccumulative potential

The product components have measured or predicted Log Kow values in the range 3.9 – 6 or above and therefore have a high potential to bioaccumulate. In practice, lower molecular weight compounds will be readily metabolised and the actual bioaccumulation potential of higher molecular weight compounds is limited by the low water solubility and large molecular size.

12.4 Mobility in soil

The product components are immiscible in water and will float on the surface of water. Lower molecular weight components will evaporate from the surface, reducing the risk to aquatic organisms. In air the hydrocarbon components undergo photodegradation by hydroxyl radicals with half lives in the range of less than one day.
The majority of components will be adsorbed onto sediment. Adsorption is the predominant process on release to soil. Adsorbed components will slowly degrade in both water and soil.

12.5 Results of PBT and vPvB assessment

The product does not contain substances assessed to be PBT or vPvB.

12.6 Other adverse effects

None known.

SECTION 13: Disposal Considerations

13.1 Waste treatment methods

To be disposed of as hazardous waste. Disposal should be in accordance with local, state or national legislation.

Contaminated adsorbent must be removed in sealed, plastic lined drums and disposed of via an authorised waste disposal contractor. Empty containers retain product residue and can be hazardous. Do not empty into drains; dispose of this material and its container in a safe way.

Suggested EU Waste Code: 13 07 01* (fuel oil and diesel)). Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport Information

ADR

14.1	UN Number	1202
14.2	UN Proper shipping name	GAS OIL
14.3	Transport hazard class(es)	3
14.4	Packing group	III
14.5	Environmental hazards	Yes
14.6	Special precautions for the user	Read SDS and supplier instructions on correct use of the product.

ADN

14.1	UN Number	1202
14.2	UN Proper shipping name	GAS OIL
14.3	Transport hazard class(es)	3
14.4	Packing group	III
14.5	Environmental hazards	Yes
14.6	Special precautions for the user	Read SDS and supplier instructions on correct use of the product.

RID

14.1	UN Number	1202
14.2	UN Proper shipping name	GAS OIL
14.3	Transport hazard class(es)	3
14.4	Packing group	III
14.5	Environmental hazards	Yes
14.6	Special precautions for the user	Read SDS and supplier instructions on correct use of the product.

IATA/ICAO

14.1	UN Number	1202
14.2	UN Proper shipping name	GAS OIL
14.3	Transport hazard class(es)	3
14.4	Packing group	III
14.5	Environmental hazards	Yes
14.6	Special precautions for the user	Read SDS and supplier instructions on correct use of the product.

IMDG

14.1	UN Number	1202
14.2	UN Proper shipping name	GAS OIL
14.3	Transport hazard class(es)	3
14.4	Packing group	III
14.5	Environmental hazards	Marine pollutant.
14.6	Special precautions for the user	Read SDS and supplier instructions on correct use of the product.
14.7	Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code	The product is not intended to be transported in bulk.

SECTION 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

This Safety Data Sheet was prepared in accordance with EC Regulation (EC) No. 1907/2006 as amended. The product has been classified in accordance with Regulation (EC) No. 1272/2008 (CLP), Directive 67/548/EEC & Directive 1999/45/EC.

15.2 Chemical Safety Assessment

A chemical safety assessment has been carried out.

SECTION 16: Other Information

Full text of relevant R-phrases and/or H-statements:

Hazard Statement(s):

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H332: Harmful if inhaled.
H350: May cause cancer.
H351: Suspected of causing cancer.
H373: May cause damage to organs through prolonged or repeated exposure.
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.
H411: Toxic to aquatic life with long lasting effects.

Supplemental Hazard information (EU):

Not applicable.

Risk phrase(s):

R10: Flammable.
R20: Harmful by inhalation.
R22: Harmful if swallowed.
R38: Irritating to skin.
R40: Limited evidence of a carcinogenic effect.
R45: May cause cancer.
R48: Danger of serious damage to health by prolonged exposure.
R65: Harmful: may cause lung damage if swallowed.
R67: Vapours may cause drowsiness and dizziness.
R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Abbreviations:

CAS:	Chemical Abstracts Service;
EINECS:	European Inventory of Existing Commercial Chemical Substances
EC ₅₀ :	Effective Concentration 50%
EL ₅₀ :	Effective Loading rate 50%
LC ₅₀ :	Lethal Concentration 50%
LD ₅₀ :	Lethal Dose 50%
LL ₅₀ :	Lethal Loading rate 50%
LOEL:	Lowest Observed Effect Level
NOEL:	No Observed Effect Level
PBT:	Persistent, Bioaccumulative and Toxic.
RMM:	Risk Management Measures
UVCB:	Substance of Unknown or Variable composition, Complex reaction products or Biological materials

vPvB: Very Persistent and Very Bioaccumulative
WAF: Water Accommodated Fraction

References:

Supplier's Safety Data Sheets
ECHA disseminated REACH dossiers
ECHA Classification and Labelling Inventory
Approved Classification and Labelling Guide (Sixth edition)
The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009
Regulation (EC) No. 1272/2008 of the European Parliament and of the council.

Disclaimer:

This safety data sheet contains important information to ensure the safe storage, handling and use of this product, it does not however constitute an assessment of workplace risks.

Users are advised to refer to relevant legislation, approved codes of practice and guidance available from the Health & Safety Executive (website: <http://www.hse.gov.uk>) and to the IP Codes of Practice available from the Energy Institute (website: <http://www.energyinst.org.uk>)

Further information:

The above information is based on our current knowledge of the product. The purpose of this data sheet is to describe the product in terms of its safety and environmental requirements. It is the user's responsibility to satisfy themselves as to the application of this information and/or recommendations for their own use.

Version history:

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Sections changed from previous version:	1-16

Annex to extended Safety Data Sheet (eSDS)

1. Manufacture of substance – Industrial

Section 1: Exposure scenario	
Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Manufacture of substance	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites. SU 8: Manufacture of bulk, large scale chemicals (including petroleum products). SU 9: Manufacture of fine chemicals.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 15: Use as laboratory reagent.
Environmental Release Category(ies):	ERC 1: Manufacture of substances. ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles.
Specific Environmental Release Category:	ESVOC SpERC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills

	immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
General exposures (closed systems):	Handle within a closed system.
General exposures (open systems):	Wear suitable gloves tested to EN 374.
Process sampling:	No other specific measures identified.
Bulk closed loading and unloading:	Handle within a closed system. Wear suitable gloves tested to EN 374.
Bulk open loading and unloading:	Wear suitable gloves tested to EN 374.
Laboratory activities:	No other specific measures identified.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear suitable gloves tested to EN 374 in combination with basic employee training.
Bulk product storage:	Store substance within a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	28,000,000
Fraction of regional tonnage used locally:	0.021
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.01
Release fraction to wastewater from process (initial release prior to RMM)	0.00003
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	90

Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 90.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	97.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	3,300,000
Assumed domestic sewage treatment plant flow (m ³ /d):	10,000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf). Scaled local assessments for EU refineries have been performed using site-specific data and are attached in the PETRORISK file 'Site Specific Production' Worksheet.	

2. Use of substance as an intermediate – Industrial

Section 1: Exposure scenario	
Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as an intermediate	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites. SU 8: Manufacture of bulk, large scale chemicals (including petroleum products). SU 9: Manufacture of fine chemicals.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to

	vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 15: Use as laboratory reagent.	
Environmental Release Category(ies):	ERC 6a: Industrial use resulting in manufacture of another substance (use of intermediates)	
Specific Environmental Release Category:	ESVOC SpERC 6.1a.v1	
Processes, tasks, activities covered		
Use of the substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.		
Section 2: Operation conditions and risk management measures		
2.1 Control of worker exposure		
Product Characteristics		
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.	
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).	
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).	
Other operational conditions affecting exposure:	Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.	
Contributing Scenarios		
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions	
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.	
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.	
General exposures (closed systems):	Handle within a closed system.	
General exposures (open systems):	Wear suitable gloves tested to EN 374.	
Process sampling:	No other specific measures identified.	
Bulk closed loading and unloading:	Handle within a closed system. Wear suitable gloves tested to EN 374.	
Bulk closed loading and unloading:	Wear suitable gloves tested to EN 374.	
Laboratory activities:	No other specific measures identified.	
Equipment cleaning and maintenance:	No other specific measures identified.	
Bulk product storage:	Store substance within a closed system.	
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.		
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating		

to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

2.2 Control of Environmental Exposure

Product Characteristics

Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	350,000
Fraction of regional tonnage used locally:	0.043

Frequency and duration of use

Continuous release.

Emission days (days/year):	300

Environmental factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.001
Release fraction to wastewater from process (initial release prior to RMM)	0.00003
Release fraction to soil from process (initial release prior to RMM)	0.001

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites, thus conservative process release estimated used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.

Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 51.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0

Organisation measures to prevent/limit release from site

Prevent discharge of undissolved substance to or recover from onsite wastewater.

Do not apply industrial sludge to natural soils.

Sludge should be incinerated, contained or reclaimed.

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	410,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000

Conditions and measures related to external treatment of waste for disposal

This substance is consumed during use and no waste of the substance is generated.

Conditions and measures related to external recovery of waste

This substance is consumed during use and no waste of the substance is generated.

Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

3. Distribution of substance – Industrial

Section 1: Exposure scenario	
Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Distribution of the substance	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC 15: Use as laboratory reagent.
Environmental Release Category(ies):	ERC 1: Manufacture of substances. ERC 2: Formulation of preparations. ERC 3: Formulation in materials. ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles. ERC 5: Industrial use resulting in inclusion into or onto a matrix. ERC 6a: Industrial use resulting in manufacture of another substance (use of intermediates). ERC 6b: Industrial use of reactive processing aids. ERC 6c: Industrial use of monomers for manufacture of thermoplastics. ERC 6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers. ERC 7: Industrial use of substances in closed systems.
Specific Environmental Release Category:	ESVOC SpERC 1.1b.v1
Processes, tasks, activities covered	
Loading (including marine vessel/barge, road/rail car and IBC loading), and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.	

Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
General exposures (closed systems):	Handle substance within a closed system.
General exposures (open systems):	Wear suitable gloves tested to EN 374.
Process sampling:	No other specific measures identified.
Laboratory activities:	No other specific measures identified.
Bulk closed loading and unloading:	Handle substance within a closed system. Wear suitable gloves tested to EN 374.
Bulk open loading and unloading:	Wear suitable gloves tested to EN 374.
Drum and small package filling:	Wear suitable gloves tested to EN 374.
Equipment cleaning and maintenance:	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance within a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause	

cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

2.2 Control of Environmental Exposure

Product Characteristics

Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	28,000,000
Fraction of regional tonnage used locally:	0.002

Frequency and duration of use

Continuous release.

Emission days (days/year):	300

Environmental factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.001
Release fraction to wastewater from process (initial release prior to RMM)	0.000001
Release fraction to soil from process (initial release prior to RMM)	0.00001

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites, thus conservative process release estimated used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.

Treat air emission to provide a typical removal efficiency of (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 9.6
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0

Organisation measures to prevent/limit release from site

Prevent discharge of undissolved substance to or recover from onsite wastewater.
Do not apply industrial sludge to natural soils.
Sludge should be incinerated, contained or reclaimed.

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	410,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000

Conditions and measures related to external treatment of waste for disposal

The substance is consumed during use and no waste of the substance is generated.

Conditions and measures related to external recovery of waste

The substance is consumed during use and no waste of the substance is generated.

Section 3: Exposure Estimation

3.1 Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.

3.2 Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.

Section 4: Guidance to check the compliance with the exposure scenario

4.1 Health

Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not

support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.

4.2 Environment

Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf>).

4. Formulation and (Re)packing of substance – Industrial

Section 1: Exposure scenario

Vacuum of Hydrocracked Gas Oils and Distillate Fuels

Title

Formulation and (Re)packing of substances and mixtures

Use Descriptor

Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites. SU 10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys).
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation. PROC 15: Use as laboratory reagent.
Environmental Release Category(ies):	ERC 2: Formulation of preparations.
Specific Environmental Release Category:	ESVOC SpERC 2.2.v1

Processes, tasks, activities covered

Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, material transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

Section 2: Operation conditions and risk management measures

2.1 Control of worker exposure

Product Characteristics

Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
General exposures (closed systems):	Handle substance within a closed system.
General exposures (open systems):	Wear suitable gloves tested to EN 374.
Process sampling:	No other specific measures identified.
Drum/batch transfers:	Use drum pumps or carefully pour from container. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Bulk transfers:	Handle substance within a closed system. Wear suitable gloves tested to EN 374.
Mixing operations (open systems):	Provide extract ventilation to points where emissions occur. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Production or preparation of articles by tableting, compression, extrusion or pelletisation:	Wear suitable gloves tested to EN 374.
Laboratory activities:	No other specific measures identified.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear suitable gloves tested to EN 374.
Storage:	Store substance within a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	

2.2 Control of Environmental Exposure	
Product Characteristics Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	28,000,000
Fraction of regional tonnage used locally:	0.0011
Frequency and duration of use Continuous release.	
Emission days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.01
Release fraction to wastewater from process (initial release prior to RMM)	0.00002
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 60.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	91.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	91.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	680,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	

4.2 Environment

Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf>).

5. Use of substance in metal working fluids/rolling oils – Industrial

Section 1: Exposure scenario

Vacuum of Hydrocracked Gas Oils and Distillate Fuels

Title

Use in metal working fluids/rolling oils

Use Descriptor

Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC 7: Industrial spraying. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC 10: Roller application or brushing. PROC 13: Treatment of articles by dipping and pouring. PROC 17: Lubrication at high energy conditions and in partly open process.
Environmental Release Category(ies):	ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles.
Specific Environmental Release Category:	ESVOC SpERC 4.7a.v1

Processes, tasks, activities covered

Covers the use in formulated metal working fluids (MWFs)/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils.

Section 2: Operation conditions and risk management measures

2.1 Control of worker exposure

Product Characteristics

Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios

Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush

	equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
General exposures (closed systems):	Handle substance within a closed system.
General exposures (open systems):	Provide extract ventilation to points where emissions occur.
Bulk transfers:	Handle substance within a closed system. Wear suitable gloves tested to EN 374.
Filling/preparation of equipment from drums or containers:	Wear suitable gloves tested to EN 374.
Process sampling:	No other specific measures identified.
Metal machining operations:	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear suitable gloves (tested to EN 374), coveralls and eye protection.
Treatment by dipping and pouring:	Wear suitable gloves tested to EN 374.
Spraying:	Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Manual roller, spreader, flow application:	Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Automated metal rolling/forming:	Handle substance within a predominantly closed system provided with extract ventilation.
Semi-automated metal rolling/forming:	Provide extract ventilation to points where emissions occur.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance in a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	

Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	10,000
Fraction of regional tonnage used locally:	0.01
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.02
Release fraction to wastewater from process (initial release prior to RMM)	0.000003
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater. Prevent discharge of undissolved substance to or recover from onsite wastewater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	70
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (Kg/d):	78,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal	

efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf>).

6. Use of substance as release agents or binders – Industrial

Section 1: Exposure scenario	
Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as release agents or binders	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 6: Calendering operations. PROC 7: Industrial spraying. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 10: Roller application or brushing. PROC 13: Treatment of articles by dipping and pouring. PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation.
Environmental Release Category(ies):	ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles.
Specific Environmental Release Category:	ESVOC SpERC 4.10a.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting and handling of waste.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for

	indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Bulk transfers:	Handle substance within a closed system.
Drum/batch transfers:	Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Mixing operations (closed systems):	No other specific measures identified.
Mixing operations (open systems):	Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Mould forming:	Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Casting operations (open systems):	Minimise exposure by partial enclosure for the operation or equipment and provide extract ventilation at openings. Wear suitable gloves tested to EN 374.
Machine spraying:	Minimise exposure by extracted full enclosure for the operation or equipment. Wear suitable gloves tested to EN 374.
Manual spraying:	Wear a full face respirator conforming to EN 140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN 374), coveralls and eye protection. Ensure operatives are trained to minimise exposures.
Manual roller, spreader, flow application:	Wear chemical-resistant gloves (tested to EN 374) in combination with specific activity training.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance within a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	14,000
Fraction of regional tonnage used locally:	0.18
Frequency and duration of use	
Continuous release.	

Emission days (days/year):	100
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0
Release fraction to wastewater from process (initial release prior to RMM)	0.0000003
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 59.2
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	170,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

7. Use of substance as release agents or binders – Professional

Section 1: Exposure scenario	
Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as release agents or binders	
Use Descriptor	
Sector(s) of use:	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen).
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 6: Calendering operations. PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC 10: Roller application or brushing. PROC 11: Non-industrial spraying. PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation.
Environmental Release Category(ies):	ERC 8a: Wide dispersive indoor use of processing aids in open systems. ERC 8d: Wide dispersive outdoor use of processing aids in open systems.
Specific Environmental Release Category:	ESVOC SpERC 8.10b.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application by spraying and brushing and handling of waste.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide

	basic employee training to prevent/minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Material transfers (closed systems):	No other specific measures identified.
Drum/batch transfers:	Wear suitable gloves tested to EN 374.
Mixing operations (closed systems):	No other specific measures identified.
Mixing operations (open systems):	Wear suitable gloves tested to EN 374.
Mould forming:	Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN 374.
Casting operations with local exhaust ventilation:	Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN 374.
Casting operations without local exhaust ventilation:	Wear a respirator conforming to EN 140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN 374), coveralls and eye protection.
Manual spraying with local exhaust ventilation:	Carry out in a vented booth or extracted enclosure. Wear suitable gloves (tested to EN 374), coveralls and eye protection. Ensure operatives are trained to minimise exposures.
Manual spraying without local exhaust ventilation:	Wear a respirator conforming to EN 140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN 374), coveralls and eye protection. Ensure operatives are trained to minimise exposures.
Manual roller, spreader, flow application:	Wear chemical-resistant gloves (tested to EN 374) in combination with specific activity employee training.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance in a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	2,900
Fraction of regional tonnage used locally:	0.0005
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	365

Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.95
Release fraction to wastewater from process (initial release prior to RMM)	0.025
Release fraction to soil from process (initial release prior to RMM)	0.025
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	Not applicable.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (Kg/d):	62
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

8. Use of substance as a fuel – Industrial

Section 1: Exposure scenario	
Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC 16: Using material as fuel sources, limited exposure to unburned product to be expected.
Environmental Release Category(ies):	ERC 7: Industrial use of substances in closed systems.
Specific Environmental Release Category:	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
Bulk transfers:	Wear suitable gloves tested to EN 374.
Drum/batch transfers:	Wear suitable gloves tested to EN 374.
Use as a fuel (closed systems):	No other specific measures identified.

Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance within a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	4,500,000
Fraction of regional tonnage used locally:	0.34
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.005
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 97.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 60.4
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1

Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	5,500,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

9. Use of substance as a fuel – Professional

Section 1: Exposure scenario	
Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of use:	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen).
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC 16: Using material as fuel sources, limited exposure to unburned product to be expected.
Environmental Release Category(ies):	ERC 9a: Wide dispersive indoor use of substances in closed systems. ERC 9b: Wide dispersive outdoor use of substances in closed systems.
Specific Environmental Release Category:	ESVOC SpERC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	

Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
Bulk transfers:	Wear suitable gloves tested to EN 374.
Drum/batch transfers:	Use drum pumps or carefully pour from container. Wear suitable gloves tested to EN 374.
Refuelling:	Wear suitable gloves tested to EN 374.
Use as a fuel (closed systems):	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) or ensure operation is undertaken outdoors.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance within a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2	

of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	6,700,000
Fraction of regional tonnage used locally:	0.0005
Frequency and duration of use Continuous release.	
Emission days (days/year):	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.0001
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	Not applicable.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (Kg/d):	140,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support	

the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.

4.2 Environment

Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf>).

10. Use of substance as a fuel – Consumer

Section 1: Exposure scenario

Vacuum of Hydrocracked Gas Oils and Distillate Fuels

Title

Use as a fuel

Use Descriptor

Sector(s) of use: SU 21: Consumer uses: Private households (= general public = consumers).

Product Category(ies): PC 13: Fuels.

Environmental Release Category(ies): ERC 9a: Wide dispersive indoor use of substances in closed systems.
ERC 9b: Wide dispersive outdoor use of substances in closed systems.

Specific Environmental Release Category: ESVOC SpERC 9.12c.v1

Processes, tasks, activities covered

Covers consumer uses of liquid fuels.

Section 2: Operation conditions and risk management measures

2.1 Control of worker exposure

Product Characteristics

Physical form of product: Liquid. Vapour pressure: > 10 Pa at standard temperature and pressure.

Concentration of substance in product: Covers percentages of substance in product up to 100% (unless stated otherwise).

Amounts used: For each use event, covers use amounts of up to 37,500 g. Covers skin contact area of up to 420 cm².

Frequency and duration of use: Covers use up to 0.143 times per day (i.e. one use every 7 days).
Covers exposure of up to 2 hours per use event.

Contributing Scenarios

Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions

Liquid: Automotive refuelling	Covers concentrations of up to 100%. Covers use up to 52 days/year. Covers use up to 1 time per day. Covers skin contact area up to 210 cm ² . For each use event, covers use amounts up to 37,500 g. Covers outdoor use. Covers use in room size of 100 m ³ . Covers exposure of up to 0.05 hours (3 min) per use event. No specific risk management measures identified beyond those operational conditions stated.

Liquid: Garden equipment - Use	Covers concentrations of up to 100%. Covers use up to 26 days/year. Covers use up to 1 time a day. For each use event, covers use amounts up to 750 g. Covers outdoor use. Covers use in room size of 100 m ³ . Covers exposure of up to 2 hours per use event. No specific risk management measures identified beyond those operational conditions stated.

Liquid: Garden equipment - refuelling	Covers concentrations of up to 100%.

Covers use up to 26 days/year. Covers use up to 1 time a day. Covers skin contact area up to 420 cm². For each use event, covers use amounts up to 750 g. Covers use in a one car garage (34 m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure of up to 0.03 hours (1.8 min). No specific risk management measures identified beyond those operational conditions stated.	
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	16,000,000
Fraction of regional tonnage used locally:	0.0005
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (Kg/d):	350,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate consumer exposures consistent with the content of ECETOC report #107 and Chapter R15 of the IR & CSA TGD. Where exposure determinants differ to these sources they are indicated.	

3.2 Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.

Section 4: Guidance to check the compliance with the exposure scenario

4.1 Health

Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values.

Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels.

4.2 Environment

Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf>).

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name: Diesel Fuel

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified use(s): Fuel.

Uses advised against: Follow supplier's recommendations on correct use of the product. Uses other than those covered by the exposure scenarios included in this safety data sheet are not supported.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier: Certas Energy UK Limited
302 Bridgewater Place
Birchwood Park
Warrington
Cheshire
WA3 6XG

Telephone: 0800 685 685

E-mail: hse.admin@certasenergy.co.uk

1.4 Emergency telephone number

In case of emergency, call: 01642 679 461 (24 hours, 7 days)

SECTION 2: Hazard Identification

2.1 Classification of the substance or mixture

2.1.1. Classification according to Regulation (EC) No. 1272/2008 (CLP)

Flam. Liq. 3; H226
Asp Tox 1; H304
Skin Irrit. 2; H315
Acute Tox. 4; H332
Carc. 1B; H350
STOT RE 2; H373 (Thymus, liver, bone marrow)
Aquatic Chronic 2; H411

2.1.2. Classification according to Directive 67/548/EEC & Directive 1999/45/EC (CHIP)

R10
Harmful; Xn; R20
Irritant; Xi; R38
Carc. Cat. 2; R45
Harmful; Xn; R48
Harmful; Xn; R65
Dangerous for the environment; N; R51/53

2.2 Label elements

2.2.1. Label according to Regulation (EC) No. 1272/2008 (CLP)

Hazard pictogram(s):



Signal Word:

Danger.

Hazard Statement(s):

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H332: Harmful if inhaled.
H350: May cause cancer.
H373: May cause damage to organs (Thymus, liver, bone marrow) through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

P102: Keep out of reach of children.
P201: Obtain special instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331: Do NOT induce vomiting.
P405: Store locked up.
P501: Dispose of contents/container to approved disposal facility.

Supplemental Hazard information (EU):

None.

2.3 Other hazards

The product does not meet the criteria for PBT or vPvB substances.

SECTION 3: Composition/Information on Ingredients

3.2 Mixtures

Chemical name	% w/w	CAS No.	EC No.	Index No.	Classification (Regulation (EC) No. 1272/2008 (CLP))	Classification (Directive 67/548/EEC)
Fuels, diesel <i>REACH: 01-2119484664-27-XXXX</i>	90-100	68334-30-5	269-822-7	649-224-00-6	Flam. Liq. 3; H226 Asp Tox 1; H304 Skin Irrit. 2; H315 Acute Tox. 4 H332 Carc. 2 H351 STOT RE 2; H373 (Thymus, liver, bone marrow) Aquatic Chronic 2; H411	R10 Xn; R20 Xi; R38 Carc. Cat. 3; R40 Xn; R48 Xn; R65 N; R51/53

Chemical name	% w/w	CAS No.	EC No.	Index No.	Classification (Regulation (EC) No. 1272/2008 (CLP))	Classification (Directive 67/548/EEC)
Fatty acids, vegetable-oil, Me esters	0-10	68990-52-3	273-606-8	-	-	-
Fatty acids, tallow, Me esters	0-10	61788-61-2	262-989-7	-	-	-
Naphthalene	< 1	91-20-3	202-049-5	601-052-00-2	Acute Tox. 4; H322 Carc. 1B; H350 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	Xn; R22 Carc. Cat. 2; R45 N; R50/53

See Section 16 for full description of R phrases and H statements.

Total sulphur: < 0.1%

SECTION 4: First Aid Measures

4.1 Description of first aid measures

INHALATION:

Remove person to fresh air and keep comfortable for breathing. Keep warm and at rest. If symptoms persist, obtain medical attention.

SKIN CONTACT:

Remove contaminated clothing immediately. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.

EYE CONTACT:

Remove contact lenses if present and easy to do. Wash eyes immediately with plenty of water, making sure to rinse under eyelids. If symptoms persist, obtain medical attention.

INGESTION:

Obtain medical attention immediately. Do not induce vomiting. Do not give anything by mouth because of risk of material entering the lungs and causing lung damage. If person is drowsy or unconscious and vomiting, place on left side with head down. If possible, do not leave unattended and observe closely for adequacy of breathing.

4.2 Most important symptoms and effects, both acute and delayed:

Skin contact causes irritation, redness and pain. Repeated exposure may cause skin dryness or cracking. Eye contact may cause slight irritation, watering, redness and pain. Inhalation of high concentrations of vapours may cause drowsiness or dizziness. Ingestion may cause irritation of the mouth and digestive tract. If swallowed, aspiration into lungs may result in chemical pneumonia.

May cause cancer. May cause damage to organs (Thymus, liver, bone marrow) through prolonged or repeated exposure.

4.3 Indication of any immediate medical attention and special treatments needed:

In case of accident or if you feel unwell, seek medical advice immediately. If swallowed, patient should be monitored for signs of breathing difficulty as effects of aspiration may be delayed for up to 48 hours. If breathing is laboured, oxygen should be administered by qualified personnel.

SECTION 5: Fire-fighting Measures

5.1 Extinguishing Media

Suitable extinguishing media: Foam, CO2 or dry powder.

Unsuitable extinguishing media: Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Flammable liquid and vapour: Vapour may form explosive mixture with air. Vapour is heavier than air and may accumulate in confined spaces. Vapours may travel considerable distances to ignition sources where they can ignite, flash back or explode. The product will float on surface water and can reignite. Containers exposed to heat may burst due to increase in pressure.

Combustion may liberate toxic fumes: Carbon monoxide, carbon dioxide, various hydrocarbons, nitrogen oxides, sulphur oxides.

5.3 Advice for fire-fighters

A self-contained breathing apparatus and suitable protective clothing should be worn in fire conditions. Move undamaged containers from fire area if this can be done safely. Keep fire exposed containers cool by spraying with water. Do not allow product or run-off to enter drains, sewers or watercourses.

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Use only non-sparking tools. Use explosion-proof electrical, ventilating and lighting equipment. Caution – spillage area may be slippery.

Keep upwind. Ensure adequate ventilation. Avoid inhalation of vapours. Avoid contact with skin and eyes. Wear suitable personal protective equipment. Wear appropriate respirator when ventilation is inadequate. (See Section 8).

6.1.2 For emergency responders

Keep unnecessary personnel away. Wear suitable protective clothing (See Section 8). Contaminated clothing should be thoroughly cleaned.

6.2 Environmental precautions

Collect spillage. Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body. If spill occurs on water notify the appropriate authorities and advise shipping of any hazard.

6.3 Methods and materials for containment and cleaning up

6.3.1 For containment

Stop the leak if it is safe to do so. Contain the spillage with sand, earth or any suitable adsorbent material.

6.3.2 For cleaning up

Use sand, earth or any suitable non-combustible adsorbent material to adsorb spillages. Using non-sparking tools transfer the contaminated absorbent material into a container for disposal. For spillages on water, remove use appropriate methods such as skimming, booms or adsorbents. For spillages onto soil, remove contaminated soil for remediation or disposal in accordance with local regulations.

Waste containers used should be plastic-lined sealable drums. Containers should be sealed before being disposed of via an authorised waste disposal contractor.

6.3.3 Other advice

None.

6.4 Reference to other sections

See Section 8 for personal protective equipment. See Section 13 for waste disposal.

SECTION 7: Handling and Storage**7.1 Precautions for safe handling**

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Take precautionary measures against static discharge. Use only non-sparking tools. Use explosion-proof electrical, ventilating and lighting equipment.

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. Provide adequate ventilation, including local extraction, to ensure occupational exposure limits are not exceeded. Avoid breathing vapours/spray. Avoid contact with skin and eyes. Wear suitable personal protective equipment (See Section 8).

Do not eat, drink or smoke in the vicinity of the product. Wash thoroughly after handling. Take off contaminated clothing and wash it before reuse. Contaminated clothing should be thoroughly cleaned or disposed of as hazardous waste.

Product transfer

Electrostatic charges may be generated during pumping. Ensure electrical continuity by bonding all equipment. Avoid splash filling. Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. Contamination resulting from product transfer may give rise to light hydrocarbon vapour in the headspace of tanks that have previously contained gasoline. This vapour may explode if there is a source of ignition. Partly filled containers present a greater hazard than those that are full, therefore handling, transfer and sampling activities need special care.

Tank cleaning

Cleaning, inspection and maintenance of storage tanks is a specialist operation that requires the implementation of strict procedures and precautions. These include issue of work permits, gas-freeing of tanks, using a manned safety harness, lifelines and wearing air-supplied breathing apparatus. Prior to entry and while cleaning is underway, the atmosphere within the tank must be monitored using an oxygen meter and explosimeter. Additional precautions are required where the tank may have previously contained leaded gasoline.

7.2 Conditions for safe storage, including any incompatibilities

Keep away from heat and sources of ignition. Keep away from direct sunlight. Store locked up. Store in a well-ventilated place. Keep container tightly closed. Keep cool. Empty containers retain product residue and can be hazardous.

Keep away from oxidising agents, reducing agents.

This product must never be stored in buildings occupied by people. Drums and small containers should be stored in well-ventilated areas, flameproof cabinets or stores. Keep in a bunded area with a sealed floor to provide containment against spillage. Stack drums to a height not exceeding three metres without the use of racking. Seek specialist advice for the design, construction and operation of bulk storage facilities.

Recommended Storage Container materials

For containers or container linings use mild steel or stainless steel, aluminium may also be used for applications where it does not present an unnecessary fire hazard. Examples of suitable materials are: high density polyethylene (HDPE), polypropylene (PP), and Viton (FKM) which have specifically tested for

compatibility with the product. For container linings, use amine-adduct cured epoxy paint. For seals and gaskets use: graphite, PTFE, Viton A, Viton B.

Unsuitable Storage Container materials

Synthetic materials such as plastics and fiberglass may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), nitrile rubber (NBR), ethylene propylene rubber (EPDM), polymethyl methacrylate (PMMA), polystyrene, polyvinyl chloride (PVC), polyisobutylene. However some may be suitable for glove materials.

7.3 Specific end uses(s)

Refer to supplemental exposure scenarios attached or 'fuel for oil-fired heating systems'.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control parameters

Workplace exposure limits

Source: EH40/2005, 2nd Ed., 2011.

None assigned.

Community exposure limits

Sources: ILV: 91/322/EEC; IOELV: 2000/39/EC, 2006/15/EC, 2009/161/EU

Substance	Exposure Limit Type	CAS No.	LTEL (8 hr TWA)		STEL (15 min)		Comments
			ppm	mg/m ³	ppm	mg/m ³	
Naphthalene	ILV	91-20-3	10	30	-	-	-

IOELV: Indicative Occupational Exposure Limit Value

ILV: Indicative Limit Value

Skin: Can be absorbed through the skin.

Other exposure limits

Source: American Conference of Governmental Industrial Hygienists (ACGIH)

Substance	CAS No.	LTEL (8 hr TWA)		STEL (15 min)		Comments
		ppm	mg/m ³	ppm	mg/m ³	
Fuels, diesel	68334-30-5	-	100	-	-	Skin
Naphthalene	91-20-3	10	-	15	-	Skin, A3

Skin: Can be absorbed through the skin.

A3: Confirmed animal carcinogen with unknown relevance to humans.

Source: Phillips 66 Guidelines

Substance	CAS No.	LTEL (8 hr TWA)		STEL (15 min)		Comments
		ppm	mg/m ³	ppm	mg/m ³	
Naphthalene	91-20-3	-	0.2	-	-	As total of 17 PNAs measured by NIOSH method 5506

DNELs (Workers)

Inhalation: 68.3 mg/m³/day

Dermal: 2.9 mg/kg bw/day

DNELs (Consumers)

Inhalation: 61.2 mg/m³/day
Dermal: 1.3 mg/kg bw/day

PNECs

None assigned.

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Provide adequate ventilation to ensure that occupational exposure limits are not exceeded. Local extraction may be required. Eye wash and quick-drench shower facilities should be available in the work area. Contaminated clothing and shoes should be thoroughly washed before reuse.

8.2.2 Personal protection

Eye protection:

Goggles or safety glasses with side shields giving complete protection to eyes. (EN 166). Depending on conditions of use, close-fitting eye protection and a face shield may be necessary.

Skin protection:

Hand protection:

Chemical-resistant gloves. (EN 374). Suitable glove material: nitrile, neoprene or PVC (breakthrough time > 240 minutes). Contact glove supplier to confirm suitable glove material, thickness and breakthrough times

Other:

Long sleeve protective clothing. Plastic apron. Rubber boots.

Respiratory protection:

Where airborne levels below the exposure limits cannot be maintained, wear an air-purifying respirator (EN 140) with a Type A/P2 filter or better suitable for organic gases and vapours with a boiling point above 65°C. (EN 14387).

Thermal hazards:

Wear suitable temperature resistant gloves and protective clothing if the product is heated.

8.2.3 Environmental exposure controls

Inform environmental manager of all incidents involving this product.

SECTION 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Data given below are typical values

Appearance:	Clear, straw-coloured liquid.
Odour:	Diesel.
Odour threshold:	Not available.
pH:	Not applicable.
Melting/freezing point:	Not available.
Initial boiling point and boiling range:	165 – 375°C
Flash point:	> 55°C (closed cup)
Evaporation rate:	Not available.
Flammability (solid; gas):	Not applicable.
Upper/lower flammability or explosive limits:	0.5% – 6.0% (v/v in air)

Diesel Fuel

Vapour pressure:	< 0.3 kPa (20°C)
Vapour density:	> 1 (Air = 1)
Relative density:	0.82 – 0.85 (15°C) (Water = 1)
Solubility(ies):	Negligible in water (20°C). Miscible in organic solvents.
Partition coefficient: n-octanol/water:	Log Kow: 3.9-6 (approximate)
Auto-ignition temperature:	250-270°C
Decomposition temperature:	Not available.
Viscosity:	4.8 mm ² /s (20°C) 2-4.5 mm ² /s (40°C)
Explosive properties:	Not explosive. Vapour may form explosive mixture in air.
Oxidising properties:	Not oxidising.
9.2 Other information	
Pour point:	-24°C

SECTION 10: Stability and Reactivity

10.1 Reactivity	Reacts with oxidising agents.
10.2 Chemical stability	Stable under normal conditions.
10.3 Possibility of hazardous reactions	No hazardous reactions expected during normal use.
10.4 Conditions to avoid	Keep away from sources of ignition, hot surfaces, direct sunlight. Prevent accumulation of vapours. Contact with incompatible materials.
10.5 Incompatible materials	Oxidising agents e.g. chlorates and ammonium nitrate which may be used in agriculture. Reducing agents. Reducing agents.
10.6 Hazardous decomposition products	Combustion may liberate toxic fumes: Carbon monoxide, carbon dioxide, various hydrocarbons, nitrogen oxides, sulphur oxides.

SECTION 11: Toxicological Information

11.1 Information on toxicological effects	
Acute toxicity	No data available on the mixture. The following data are for the product components:
	Fuels, diesel:
	LD ₅₀ (oral/rat): > 5,000 mg/kg
	LD ₅₀ (dermal/rabbit): > 4,300 mg/kg
	LC ₅₀ (inhalation/rat (male and female/mist): > 4.1 mg/L air (analytical), 4 h
	LC ₅₀ (inhalation/rat (male/mist): > 5.4 mg/L air (analytical), 4 h
	LC ₅₀ (inhalation/rat (female/mist): > 3.6 mg/L air (analytical), 4 h
	Naphthalene:
	LD ₅₀ (oral/rat): > 2,000 mg/kg
	LD ₅₀ (dermal/rat): > 2,500 mg/kg
	LC ₅₀ (inhalation/rat (male and female/vapour): > 0.4 mg/L air (analytical), 4 h

Diesel Fuel

Skin corrosion/irritation	Causes skin irritation. Repeated exposure may cause skin dryness or cracking.
Serious eye damage/irritation	May cause slight eye irritation.
Skin sensitisation	Not expected to be a skin sensitiser.
Respiratory sensitisation	Not expected to be a respiratory sensitiser.
Germ cell mutagenicity	The product does not contain substances classified as mutagenic above the classification thresholds.
Carcinogenicity	May cause cancer. Petroleum middle distillates have been shown to cause skin tumours in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumours are produced through a non-genotoxic mechanism associated with frequent cell damage and repair and that they are not likely to cause tumours in the absence of prolonged skin irritation. Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The US National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.
Reproductive toxicity	The product does not contain substances classified for reproductive toxicity above the classification thresholds.
Specific Target Organ Toxicity – single exposure	Based on the available data, the classification criteria are not met.
Specific Target Organ Toxicity – repeated exposure	May cause damage to organs (Thymus, liver, bone marrow) through prolonged or repeated exposure.
Aspiration hazard	May be fatal if swallowed and enters airways. Risk of aspiration into lungs resulting in chemical pneumonia.

Information on likely routes of exposure

Inhalation	Inhalation of high concentrations of vapours may cause drowsiness or dizziness.
Skin contact	Causes skin irritation. Repeated exposure may cause skin dryness or cracking.
Eye contact	May cause slight eye irritation.
Ingestion	May be fatal if swallowed and enters airways. Risk of aspiration into lungs resulting in chemical pneumonia. Ingestion may cause irritation of the mouth and digestive tract.

Symptoms related to the physical, chemical and toxicological characteristics

Skin contact causes irritation, redness and pain. Repeated exposure may cause skin dryness or cracking. Eye contact may cause slight irritation, watering, redness and pain. Inhalation of high concentrations of vapours may cause drowsiness or dizziness. Ingestion may cause irritation of the mouth and digestive tract. If swallowed, aspiration into lungs may result in chemical pneumonia.

Mixture versus substance information

No data available.

Other information

None.

SECTION 12: Ecological Information

12.1 Toxicity

Toxic to aquatic life with long lasting effects.

Experimental studies on samples of gas oils show acute aquatic toxicity values typically in the range 2-20 mg/L. These values are consistent with the predicted aquatic toxicity based on their hydrocarbon compositions.

No data available on the mixture. The following data are for the product components:

Fuels, diesel:

LL₅₀ (*Oncorhynchus mykiss*): 21 mg/L, 96 h (WAF)
 NOEL (*Oncorhynchus mykiss*): 10 mg/L, 96 h (WAF)
 NOEL (*Oncorhynchus mykiss*): 0.083 mg/L, 14 days (WAF) (estimated using PETROTOX computer model)
 EL₅₀ (*Daphnia magna*): 210 mg/L, 48 h (WAF)
 NOEL (*Daphnia magna*): 46 mg/L, 48 h (WAF)
 NOEL (*Daphnia magna*): 0.2 mg/L, 21 days (WAF) (estimated using PETROTOX computer model)
 EL₅₀ (*Pseudokirchnerella subcapitata*): 10 mg/L, 72 h (biomass)
 NOEL (*Pseudokirchnerella subcapitata*): 1 mg/L, 72 h (biomass)
 EL₅₀ (*Pseudokirchnerella subcapitata*): 22 mg/L, 72 h (growth rate)
 NOEL (*Pseudokirchnerella subcapitata*): 1 mg/L, 72 h (growth rate)
 EL₅₀ (*Tetrahymena pyriformis*): > 1,000 mg/L, 40 h (estimated using PETROTOX computer model)
 NOEL (*Tetrahymena pyriformis*): 3.217 mg/L, 40 h (estimated using PETROTOX computer model)

Naphthalene:

LC₅₀ (*Pimephales promelas*): 6.08 mg/L, 96 h
 LC₅₀ (*Oncorhynchus mykiss*): 1.6 mg/L, 96 h
 LC₅₀ (*Oncorhynchus kisutch*): 2.1 mg/L, 96 h
 EC₅₀ (*Daphnia magna*): 2.16 mg/L, 48 h
 NOEC (*Oncorhynchus kisutch*): 0.37 mg/L, 40 days
 NOEC (*Daphnia pulex*): 0.59 mg/L, 125 days

12.2 Persistence and degradability

Based on the known or expected properties of individual components, the product is not expected to be readily biodegradable. Some components are expected to be persistent however other components will be easily degraded by microorganisms under aerobic conditions.

12.3 Bioaccumulative potential

The product components have measured or predicted Log Kow values in the range 3.9 – 6 or above and therefore have a high potential to bioaccumulate. In practice, lower molecular weight compounds will be readily metabolised and the actual bioaccumulation potential of higher molecular weight compounds is limited by the low water solubility and large

molecular size.

12.4 Mobility in soil

The product components are immiscible in water and will float on the surface of water. Lower molecular weight components will evaporate from the surface, reducing the risk to aquatic organisms. In air the hydrocarbon components undergo photodegradation by hydroxyl radicals with half lives in the range of less than one day.

The majority of components will be adsorbed onto sediment. Adsorption is the predominant process on release to soil. Adsorbed components will slowly degrade in both water and soil.

12.5 Results of PBT and vPvB assessment

The product does not contain substances assessed to be PBT or vPvB.

12.6 Other adverse effects

None known.

SECTION 13: Disposal Considerations

13.1 Waste treatment methods

To be disposed of as hazardous waste. Disposal should be in accordance with local, state or national legislation.

Contaminated adsorbent must be removed in sealed, plastic lined drums and disposed of via an authorised waste disposal contractor. Empty containers retain product residue and can be hazardous. Do not empty into drains; dispose of this material and its container in a safe way.

Suggested EU Waste Code: 13 07 01* (fuel oil and diesel). Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport Information

ADR

14.1	UN Number	1202
14.2	UN Proper shipping name	DIESEL FUEL
14.3	Transport hazard class(es)	3
14.4	Packing group	III
14.5	Environmental hazards	Yes
14.6	Special precautions for the user	Read SDS and supplier instructions on correct use of the product.

ADN

14.1	UN Number	1202
14.2	UN Proper shipping name	DIESEL FUEL
14.3	Transport hazard class(es)	3
14.4	Packing group	III
14.5	Environmental hazards	Yes
14.6	Special precautions for the user	Read SDS and supplier instructions on correct use of the product.

RID

14.1	UN Number	1202
14.2	UN Proper shipping name	DIESEL FUEL
14.3	Transport hazard class(es)	3
14.4	Packing group	III
14.5	Environmental hazards	Yes

14.6 Special precautions for the user

Read SDS and supplier instructions on correct use of the product.

IATA/ICAO

14.1 UN Number

1202

14.2 UN Proper shipping name

DIESEL FUEL

14.3 Transport hazard class(es)

3

14.4 Packing group

III

14.5 Environmental hazards

Yes

14.6 Special precautions for the user

Read SDS and supplier instructions on correct use of the product.

IMDG

14.1 UN Number

1202

14.2 UN Proper shipping name

DIESEL FUEL

14.3 Transport hazard class(es)

3

14.4 Packing group

III

14.5 Environmental hazards

Marine pollutant.

14.6 Special precautions for the user

Read SDS and supplier instructions on correct use of the product.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code

The product is not intended to be transported in bulk.

SECTION 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

This Safety Data Sheet was prepared in accordance with EC Regulation (EC) No. 1907/2006 as amended. The product has been classified in accordance with Regulation (EC) No. 1272/2008 (CLP), Directive 67/548/EEC & Directive 1999/45/EC.

15.2 Chemical Safety Assessment

A chemical safety assessment has been carried out.

SECTION 16: Other Information

Full text of relevant R-phrases and/or H-statements:

Hazard Statement(s):

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H332: Harmful if inhaled.
H350: May cause cancer.
H351: Suspected of causing cancer.
H373: May cause damage to organs through prolonged or repeated exposure.
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.
H411: Toxic to aquatic life with long lasting effects.

Supplemental Hazard information (EU):

Not applicable.

Risk phrase(s):

R10: Flammable.
R20: Harmful by inhalation.
R22: Harmful if swallowed.

R38: Irritating to skin.
R40: Limited evidence of a carcinogenic effect.
R45: May cause cancer.
R48: Danger of serious damage to health by prolonged exposure.
R65: Harmful: may cause lung damage if swallowed.
R67: Vapours may cause drowsiness and dizziness.
R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Abbreviations:

CAS: Chemical Abstracts Service;
EINECS: European Inventory of Existing Commercial Chemical Substances
EC₅₀: Effective Concentration 50%
EL₅₀: Effective Loading rate 50%
LC₅₀: Lethal Concentration 50%
LD₅₀: Lethal Dose 50%
LL₅₀: Lethal Loading rate 50%
LOEL: Lowest Observed Effect Level
NOEL: No Observed Effect Level
PBT: Persistent, Bioaccumulative and Toxic.
RMM: Risk Management Measures
UVCB: Substance of Unknown or Variable composition, Complex reaction products or Biological materials
vPvB: Very Persistent and Very Bioaccumulative
WAF: Water Accommodated Fraction

References:

Supplier's Safety Data Sheets
ECHA disseminated REACH dossiers
ECHA Classification and Labelling Inventory
Approved Classification and Labelling Guide (Sixth edition)
The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009
Regulation (EC) No. 1272/2008 of the European Parliament and of the council.

Disclaimer:

This safety data sheet contains important information to ensure the safe storage, handling and use of this product, it does not however constitute an assessment of workplace risks.

Users are advised to refer to relevant legislation, approved codes of practice and guidance available from the Health & Safety Executive (website: <http://www.hse.gov.uk>) and to the IP Codes of Practice available from the Energy Institute (website: <http://www.energyinst.org.uk>)

Further information:

The above information is based on our current knowledge of the product. The purpose of this data sheet is to describe the product in terms of its safety and environmental requirements. It is the user's responsibility to satisfy themselves as to the application of this information and/or recommendations for their own use.

Version history:

Version:	7.0
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Sections changed from previous version:	1-16

Annex to extended Safety Data Sheet (eSDS)

1. Manufacture of substance – Industrial

Section 1: Exposure scenario	
Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Manufacture of substance	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites. SU 8: Manufacture of bulk, large scale chemicals (including petroleum products). SU 9: Manufacture of fine chemicals.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 15: Use as laboratory reagent.
Environmental Release Category(ies):	ERC 1: Manufacture of substances. ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles.
Specific Environmental Release Category:	ESVOC SpERC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills

	immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
General exposures (closed systems):	Handle within a closed system.
General exposures (open systems):	Wear suitable gloves tested to EN 374.
Process sampling:	No other specific measures identified.
Bulk closed loading and unloading:	Handle within a closed system. Wear suitable gloves tested to EN 374.
Bulk open loading and unloading:	Wear suitable gloves tested to EN 374.
Laboratory activities:	No other specific measures identified.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear suitable gloves tested to EN 374 in combination with basic employee training.
Bulk product storage:	Store substance within a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	28,000,000
Fraction of regional tonnage used locally:	0.021
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.01
Release fraction to wastewater from process (initial release prior to RMM)	0.00003
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	90

Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 90.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	97.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	3,300,000
Assumed domestic sewage treatment plant flow (m ³ /d):	10,000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf). Scaled local assessments for EU refineries have been performed using site-specific data and are attached in the PETRORISK file 'Site Specific Production' Worksheet.	

2. Use of substance as an intermediate – Industrial

Section 1: Exposure scenario Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as an intermediate	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites. SU 8: Manufacture of bulk, large scale chemicals (including petroleum products). SU 9: Manufacture of fine chemicals.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to

	vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 15: Use as laboratory reagent.	
Environmental Release Category(ies):	ERC 6a: Industrial use resulting in manufacture of another substance (use of intermediates)	
Specific Environmental Release Category:	ESVOC SpERC 6.1a.v1	
Processes, tasks, activities covered		
Use of the substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.		
Section 2: Operation conditions and risk management measures		
2.1 Control of worker exposure		
Product Characteristics		
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.	
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).	
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).	
Other operational conditions affecting exposure:	Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.	
Contributing Scenarios		
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions	
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.	
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.	
General exposures (closed systems):	Handle within a closed system.	
General exposures (open systems):	Wear suitable gloves tested to EN 374.	
Process sampling:	No other specific measures identified.	
Bulk closed loading and unloading:	Handle within a closed system. Wear suitable gloves tested to EN 374.	
Bulk closed loading and unloading:	Wear suitable gloves tested to EN 374.	
Laboratory activities:	No other specific measures identified.	
Equipment cleaning and maintenance:	No other specific measures identified.	
Bulk product storage:	Store substance within a closed system.	
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.		
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating		

to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

2.2 Control of Environmental Exposure

Product Characteristics

Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	350,000
Fraction of regional tonnage used locally:	0.043

Frequency and duration of use

Continuous release.

Emission days (days/year):	300

Environmental factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.001
Release fraction to wastewater from process (initial release prior to RMM)	0.00003
Release fraction to soil from process (initial release prior to RMM)	0.001

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites, thus conservative process release estimated used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.

Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 51.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0

Organisation measures to prevent/limit release from site

Prevent discharge of undissolved substance to or recover from onsite wastewater.
Do not apply industrial sludge to natural soils.
Sludge should be incinerated, contained or reclaimed.

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	410,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000

Conditions and measures related to external treatment of waste for disposal

This substance is consumed during use and no waste of the substance is generated.

Conditions and measures related to external recovery of waste

This substance is consumed during use and no waste of the substance is generated.

Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

3. Distribution of substance – Industrial

Section 1: Exposure scenario	
Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Distribution of the substance	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC 15: Use as laboratory reagent.
Environmental Release Category(ies):	ERC 1: Manufacture of substances. ERC 2: Formulation of preparations. ERC 3: Formulation in materials. ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles. ERC 5: Industrial use resulting in inclusion into or onto a matrix. ERC 6a: Industrial use resulting in manufacture of another substance (use of intermediates). ERC 6b: Industrial use of reactive processing aids. ERC 6c: Industrial use of monomers for manufacture of thermoplastics. ERC 6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers. ERC 7: Industrial use of substances in closed systems.
Specific Environmental Release Category:	ESVOC SpERC 1.1b.v1
Processes, tasks, activities covered	
Loading (including marine vessel/barge, road/rail car and IBC loading), and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.	

Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
General exposures (closed systems):	Handle substance within a closed system.
General exposures (open systems):	Wear suitable gloves tested to EN 374.
Process sampling:	No other specific measures identified.
Laboratory activities:	No other specific measures identified.
Bulk closed loading and unloading:	Handle substance within a closed system. Wear suitable gloves tested to EN 374.
Bulk open loading and unloading:	Wear suitable gloves tested to EN 374.
Drum and small package filling:	Wear suitable gloves tested to EN 374.
Equipment cleaning and maintenance:	Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance within a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause	

cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.

2.2 Control of Environmental Exposure

Product Characteristics

Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	28,000,000
Fraction of regional tonnage used locally:	0.002

Frequency and duration of use

Continuous release.

Emission days (days/year):	300

Environmental factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.001
Release fraction to wastewater from process (initial release prior to RMM)	0.000001
Release fraction to soil from process (initial release prior to RMM)	0.00001

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites, thus conservative process release estimated used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.

Treat air emission to provide a typical removal efficiency of (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 9.6
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0

Organisation measures to prevent/limit release from site

Prevent discharge of undissolved substance to or recover from onsite wastewater.
Do not apply industrial sludge to natural soils.
Sludge should be incinerated, contained or reclaimed.

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	410,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000

Conditions and measures related to external treatment of waste for disposal

The substance is consumed during use and no waste of the substance is generated.

Conditions and measures related to external recovery of waste

The substance is consumed during use and no waste of the substance is generated.

Section 3: Exposure Estimation

3.1 Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.

3.2 Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.

Section 4: Guidance to check the compliance with the exposure scenario

4.1 Health

Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not

support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.

4.2 Environment

Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf>).

4. Formulation and (Re)packing of substance – Industrial

Section 1: Exposure scenario

Vacuum of Hydrocracked Gas Oils and Distillate Fuels

Title

Formulation and (Re)packing of substances and mixtures

Use Descriptor

Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites. SU 10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys).
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation. PROC 15: Use as laboratory reagent.
Environmental Release Category(ies):	ERC 2: Formulation of preparations.
Specific Environmental Release Category:	ESVOC SpERC 2.2.v1

Processes, tasks, activities covered

Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, material transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

Section 2: Operation conditions and risk management measures

2.1 Control of worker exposure

Product Characteristics

Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
General exposures (closed systems):	Handle substance within a closed system.
General exposures (open systems):	Wear suitable gloves tested to EN 374.
Process sampling:	No other specific measures identified.
Drum/batch transfers:	Use drum pumps or carefully pour from container. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Bulk transfers:	Handle substance within a closed system. Wear suitable gloves tested to EN 374.
Mixing operations (open systems):	Provide extract ventilation to points where emissions occur. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Production or preparation of articles by tableting, compression, extrusion or pelletisation:	Wear suitable gloves tested to EN 374.
Laboratory activities:	No other specific measures identified.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear suitable gloves tested to EN 374.
Storage:	Store substance within a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect.	

2.2 Control of Environmental Exposure	
Product Characteristics Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	28,000,000
Fraction of regional tonnage used locally:	0.0011
Frequency and duration of use Continuous release.	
Emission days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.01
Release fraction to wastewater from process (initial release prior to RMM)	0.00002
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 60.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	91.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	91.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	680,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	

4.2 Environment

Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf>).

5. Use of substance in metal working fluids/rolling oils – Industrial

Section 1: Exposure scenario

Vacuum of Hydrocracked Gas Oils and Distillate Fuels

Title

Use in metal working fluids/rolling oils

Use Descriptor

Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC 7: Industrial spraying. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC 10: Roller application or brushing. PROC 13: Treatment of articles by dipping and pouring. PROC 17: Lubrication at high energy conditions and in partly open process.
Environmental Release Category(ies):	ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles.
Specific Environmental Release Category:	ESVOC SpERC 4.7a.v1

Processes, tasks, activities covered

Covers the use in formulated metal working fluids (MWFs)/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils.

Section 2: Operation conditions and risk management measures

2.1 Control of worker exposure

Product Characteristics

Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios

Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is

	potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
General exposures (closed systems):	Handle substance within a closed system.
General exposures (open systems):	Provide extract ventilation to points where emissions occur.
Bulk transfers:	Handle substance within a closed system. Wear suitable gloves tested to EN 374.
Filling/preparation of equipment from drums or containers:	Wear suitable gloves tested to EN 374.
Process sampling:	No other specific measures identified.
Metal machining operations:	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear suitable gloves (tested to EN 374), coveralls and eye protection.
Treatment by dipping and pouring:	Wear suitable gloves tested to EN 374.
Spraying:	Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Manual roller, spreader, flow application:	Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Automated metal rolling/forming:	Handle substance within a predominantly closed system provided with extract ventilation.
Semi-automated metal rolling/forming:	Provide extract ventilation to points where emissions occur.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance in a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	

Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	10,000
Fraction of regional tonnage used locally:	0.01
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.02
Release fraction to wastewater from process (initial release prior to RMM)	0.000003
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater. Prevent discharge of undissolved substance to or recover from onsite wastewater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	70
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (Kg/d):	78,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal	

efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf>).

6. Use of substance as release agents or binders – Industrial

Section 1: Exposure scenario	
Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as release agents or binders	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 6: Calendering operations. PROC 7: Industrial spraying. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 10: Roller application or brushing. PROC 13: Treatment of articles by dipping and pouring. PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation.
Environmental Release Category(ies):	ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles.
Specific Environmental Release Category:	ESVOC SpERC 4.10a.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting and handling of waste.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact

	with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Bulk transfers:	Handle substance within a closed system.
Drum/batch transfers:	Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Mixing operations (closed systems):	No other specific measures identified.
Mixing operations (open systems):	Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Mould forming:	Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Casting operations (open systems):	Minimise exposure by partial enclosure for the operation or equipment and provide extract ventilation at openings. Wear suitable gloves tested to EN 374.
Machine spraying:	Minimise exposure by extracted full enclosure for the operation or equipment. Wear suitable gloves tested to EN 374.
Manual spraying:	Wear a full face respirator conforming to EN 140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN 374), coveralls and eye protection. Ensure operatives are trained to minimise exposures.
Manual roller, spreader, flow application:	Wear chemical-resistant gloves (tested to EN 374) in combination with specific activity training.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance within a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	14,000
Fraction of regional tonnage used locally:	0.18
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	100

Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0
Release fraction to wastewater from process (initial release prior to RMM)	0.0000003
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 59.2
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	170,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

7. Use of substance as release agents or binders – Professional

Section 1: Exposure scenario	
Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as release agents or binders	
Use Descriptor	
Sector(s) of use:	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen).
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 6: Calendering operations. PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC 10: Roller application or brushing. PROC 11: Non-industrial spraying. PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation.
Environmental Release Category(ies):	ERC 8a: Wide dispersive indoor use of processing aids in open systems. ERC 8d: Wide dispersive outdoor use of processing aids in open systems.
Specific Environmental Release Category:	ESVOC SpERC 8.10b.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application by spraying and brushing and handling of waste.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide

	basic employee training to prevent/minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Material transfers (closed systems):	No other specific measures identified.
Drum/batch transfers:	Wear suitable gloves tested to EN 374.
Mixing operations (closed systems):	No other specific measures identified.
Mixing operations (open systems):	Wear suitable gloves tested to EN 374.
Mould forming:	Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN 374.
Casting operations with local exhaust ventilation:	Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN 374.
Casting operations without local exhaust ventilation:	Wear a respirator conforming to EN 140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN 374), coveralls and eye protection.
Manual spraying with local exhaust ventilation:	Carry out in a vented booth or extracted enclosure. Wear suitable gloves (tested to EN 374), coveralls and eye protection. Ensure operatives are trained to minimise exposures.
Manual spraying without local exhaust ventilation:	Wear a respirator conforming to EN 140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN 374), coveralls and eye protection. Ensure operatives are trained to minimise exposures.
Manual roller, spreader, flow application:	Wear chemical-resistant gloves (tested to EN 374) in combination with specific activity employee training.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance in a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	2,900
Fraction of regional tonnage used locally:	0.0005
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	365

Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.95
Release fraction to wastewater from process (initial release prior to RMM)	0.025
Release fraction to soil from process (initial release prior to RMM)	0.025
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	Not applicable.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	62
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

8. Use of substance as a fuel – Industrial

Section 1: Exposure scenario	
Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC 16: Using material as fuel sources, limited exposure to unburned product to be expected.
Environmental Release Category(ies):	ERC 7: Industrial use of substances in closed systems.
Specific Environmental Release Category:	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
Bulk transfers:	Wear suitable gloves tested to EN 374.
Drum/batch transfers:	Wear suitable gloves tested to EN 374.
Use as a fuel (closed systems):	No other specific measures identified.

Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance within a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	4,500,000
Fraction of regional tonnage used locally:	0.34
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.005
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 97.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 60.4
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMS (%):	94.1

Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	5,500,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

9. Use of substance as a fuel – Professional

Section 1: Exposure scenario	
Vacuum of Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of use:	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen).
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC 16: Using material as fuel sources, limited exposure to unburned product to be expected.
Environmental Release Category(ies):	ERC 9a: Wide dispersive indoor use of substances in closed systems. ERC 9b: Wide dispersive outdoor use of substances in closed systems.
Specific Environmental Release Category:	ESVOC SpERC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	

Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: < 0.5 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities:	Control of any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of the exposure and are aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clean up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
Bulk transfers:	Wear suitable gloves tested to EN 374.
Drum/batch transfers:	Use drum pumps or carefully pour from container. Wear suitable gloves tested to EN 374.
Refuelling:	Wear suitable gloves tested to EN 374.
Use as a fuel (closed systems):	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) or ensure operation is undertaken outdoors.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance. Wear chemical-resistant gloves (tested to EN 374) in combination with 'basic' employee training.
Storage:	Store substance within a closed system.
Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs. Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect. Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in Section 2	

of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.	
2.2 Control of Environmental Exposure	
Product Characteristics Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	6,700,000
Fraction of regional tonnage used locally:	0.0005
Frequency and duration of use Continuous release.	
Emission days (days/year):	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.0001
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	Not applicable.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (Kg/d):	140,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for dermal irritant health effects. Available hazard data do not support	

the need for a DNEL to be established for other irritant health effects. Risk Management Measures are based on qualitative risk characterisation.

4.2 Environment

Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf>).

10. Use of substance as a fuel – Consumer

Section 1: Exposure scenario

Vacuum of Hydrocracked Gas Oils and Distillate Fuels

Title

Use as a fuel

Use Descriptor

Sector(s) of use: SU 21: Consumer uses: Private households (= general public = consumers).

Product Category(ies): PC 13: Fuels.

Environmental Release Category(ies):
ERC 9a: Wide dispersive indoor use of substances in closed systems.
ERC 9b: Wide dispersive outdoor use of substances in closed systems.

Specific Environmental Release Category: ESVOG SpERC 9.12c.v1

Processes, tasks, activities covered

Covers consumer uses of liquid fuels.

Section 2: Operation conditions and risk management measures

2.1 Control of worker exposure

Product Characteristics

Physical form of product:	Liquid. Vapour pressure: > 10 Pa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Amounts used:	For each use event, covers use amounts of up to 37,500 g. Covers skin contact area of up to 420 cm ² .
Frequency and duration of use:	Covers use up to 0.143 times per day (i.e. one use every 7 days). Covers exposure of up to 2 hours per use event.

Contributing Scenarios

Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions

Liquid: Automotive refuelling	Covers concentrations of up to 100%. Covers use up to 52 days/year. Covers use up to 1 time per day. Covers skin contact area up to 210 cm ² . For each use event, covers use amounts up to 37,500 g. Covers outdoor use. Covers use in room size of 100 m ³ . Covers exposure of up to 0.05 hours (3 min) per use event. No specific risk management measures identified beyond those operational conditions stated.
Liquid: Garden equipment - Use	Covers concentrations of up to 100%. Covers use up to 26 days/year. Covers use up to 1 time a day. For each use event, covers use amounts up to 750 g. Covers outdoor use. Covers use in room size of 100 m ³ . Covers exposure of up to 2 hours per use event. No specific risk management measures identified beyond those operational conditions stated.

Liquid: Garden equipment - refuelling	Covers concentrations of up to 100%. Covers use up to 26 days/year. Covers use up to 1 time a day. Covers skin contact area up to 420 cm². For each use event, covers use amounts up to 750 g. Covers use in a one car garage (34 m³) under typical ventilation. Covers use in room size of 34 m³. Covers exposure of up to 0.03 hours (1.8 min). No specific risk management measures identified beyond those operational conditions stated.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit acute inhalation toxicity and are classified as R20 (Harmful by inhalation) / H332 (Harmful if inhaled) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS.

Vacuum or hydrocracked Gas Oils and Distillate Fuels exhibit irritation to the skin and are classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R65 (Harmful: May cause lung damage if swallowed) / H304 (May be fatal if swallowed and enters airways). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.

Vacuum or hydrocracked Gas Oils and Distillate Fuels are classified as R45 (May cause cancer) / H350 (May cause cancer). The available data for this adverse effect do not provide quantitative dose-response information for a DNEL or DMEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMS in Section 2 of the SDS aim to define the appropriate RMMS necessary to protect from this adverse effect.

2.2 Control of Environmental Exposure

Product Characteristics

Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	16,000,000
Fraction of regional tonnage used locally:	0.0005

Frequency and duration of use

Continuous release.

Emission days (days/year):	365

Environmental factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (Kg/d):	350,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000

Conditions and measures related to external treatment of waste for disposal

Combustion emissions limited by required exhaust emission controls.

Combustion emissions considered in regional exposure assessment.

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations.

Section 3: Exposure Estimation

3.1 Health

The ECETOC TRA tool has been used to estimate consumer exposures consistent with the content of ECETOC report #107 and Chapter R15 of the IR & CSA TGD. Where exposure determinants differ to these sources they are

indicated.

3.2 Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.

Section 4: Guidance to check the compliance with the exposure scenario

4.1 Health

Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values.

Predicted exposures are not expected to exceed the DNEL or DMEL when Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels.

4.2 Environment

Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (<http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf>).

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name: Kerosine (petroleum)
Synonyms: Kerosene
CAS No.: 8008-20-6
EC No.: 232-366-4
Index No.: 649-404-00-4
REACH Registration No.: 01-2119485517-27-XXXX

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified use(s): Fuel.
Uses advised against: Follow supplier's recommendations on correct use of the product.
Uses other than those covered by the exposure scenarios included in this safety data sheet are not supported.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier: Certas Energy UK Limited
302 Bridgewater Place
Birchwood Park
Warrington
Cheshire
WA3 6XG
Telephone: 0800 685 685
E-mail: hse.admin@certasenergy.co.uk

1.4 Emergency telephone number

In case of emergency, call: 01642 679 461 (24 hours, 7 days)

SECTION 2: Hazard Identification

2.1 Classification of the substance or mixture

2.1.1. Classification according to Regulation (EC) No. 1272/2008 (CLP)

Flam. Liq. 3; H226
Asp. Tox. 1; H304
Skin Irrit. 2; H315
STOT SE 3; H336
Aquatic Chronic 2; H411

2.1.2. Classification according to Directive 67/548/EEC (CHIP)

R10
Irritant; Xi; R38
Harmful; Xn; R65
R67
Dangerous for the environment; N; R51/53

2.2 Label elements

2.2.1. Label according to Regulation (EC) No. 1272/2008 (CLP)

Hazard pictogram(s):



Signal Word:

Danger.

Hazard Statement(s):

H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

P102: Keep out of reach of children.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331: Do NOT induce vomiting.
P405: Store locked up.
P501: Dispose of contents/container to approved disposal facility.

Supplemental Hazard information (EU):

None.

2.2.2. Label according to Directive 67/548/EEC (CHIP)

Hazard pictogram(s):



Indications of danger:

Harmful, Dangerous for the environment

Hazard Statement(s):

R10: Flammable.
R38: Irritating to skin.
R65: Harmful: may cause lung damage if swallowed.
R67: Vapours may cause drowsiness or dizziness.
R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Precautionary Statement(s):

S2: Keep out of the reach of children.
S3: Do not breathe vapour.
S24: Avoid contact with skin.
S29: Do not empty into drains.
S36/37: Wear suitable protective clothing and gloves.

S43: In case of fire use foam/dry powder/AFFF/carbon dioxide – NEVER USE WATER.

S61: Avoid release to the environment. Refer to special instructions / safety data sheets.

S62: If swallowed, do not induce vomiting: seek medical advice immediately and show this label or container.

2.3 Other hazards

The product does not meet the criteria for PBT or vPvB substances.

SECTION 3: Composition/Information on Ingredients

3.1 Substances

Chemical name	% w/w	CAS No.	EC No.	Index No.	Classification (Regulation (EC) No. 1272/2008 (CLP))	Classification (Directive 67/548/EEC)
Kerosine (petroleum) <i>REACH: 01- 2119485517-27-XXXX</i>	100	8008-20-6	232-366-4	649-404-00-4	Flam. Liq. 3; H226 Asp. Tox. 1; H304 Skin Irrit. 2; H315 STOT SE 3; H336 Aquatic Chronic 2; H411	R10 Xi; R38 Xn; R65 R67 N; R51/53

See Section 16 for full description of R phrases and H statements.

Total sulphur: < 0.1%

SECTION 4: First Aid Measures

4.1 Description of first aid measures

INHALATION:

Remove person to fresh air and keep comfortable for breathing. Keep warm and at rest. If symptoms persist, obtain medical attention.

SKIN CONTACT:

Remove contaminated clothing immediately. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.

EYE CONTACT:

Remove contact lenses if present and easy to do. Wash eyes immediately with plenty of water, making sure to rinse under eyelids. If symptoms persist, obtain medical attention.

INGESTION:

Obtain medical attention immediately. Do not induce vomiting. Do not give anything by mouth because of risk of material entering the lungs and causing lung damage. If person is drowsy or unconscious and vomiting, place on left side with head down. If possible, do not leave unattended and observe closely for adequacy of breathing.

4.2 Most important symptoms and effects, both acute and delayed:

Skin contact causes irritation, redness and pain. Repeated exposure may cause skin dryness or cracking. Eye contact may cause slight irritation, watering, redness and pain. Inhalation of vapours may cause drowsiness or dizziness. Ingestion may cause irritation of the mouth and digestive tract. If swallowed, aspiration into lungs may result in chemical pneumonia.

4.3 Indication of any immediate medical attention and special treatments needed:

In case of accident or if you feel unwell, seek medical advice immediately. If swallowed, patient should be monitored for signs of breathing difficulty as effects of aspiration may be delayed for up to 48 hours. If breathing is laboured, oxygen should be administered by qualified personnel.

SECTION 5: Fire-fighting Measures

5.1 Extinguishing Media

Suitable extinguishing media: Foam, CO2 or dry powder.

Unsuitable extinguishing media: Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Flammable liquid and vapour: Vapour may form explosive mixture with air. Vapour is heavier than air and may accumulate in confined spaces. Vapours may travel considerable distances to ignition sources where they can ignite, flash back or explode. The product will float on surface water and can reignite. Containers exposed to heat may burst due to increase in pressure.

Combustion may liberate toxic fumes: Carbon monoxide, carbon dioxide, various hydrocarbons, nitrogen oxides, sulphur oxides.

5.3 Advice for fire-fighters

A self-contained breathing apparatus and suitable protective clothing should be worn in fire conditions. Move undamaged containers from fire area if this can be done safely. Keep fire exposed containers cool by spraying with water. Do not allow to enter drains, sewers or watercourses.

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Use only non-sparking tools. Use explosion-proof electrical, ventilating and lighting equipment. Caution – spillage area may be slippery.

Keep upwind. Ensure adequate ventilation. Avoid inhalation of vapours. Avoid contact with skin and eyes. Wear suitable personal protective equipment. Wear appropriate respirator when ventilation is inadequate. (See Section 8).

6.1.2 For emergency responders

Keep unnecessary personnel away. Wear suitable protective clothing (See Section 8). Contaminated clothing should be thoroughly cleaned.

6.2 Environmental precautions

Collect spillage. Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body. If spill occurs on water notify the appropriate authorities and advise shipping of any hazard.

6.3 Methods and materials for containment and clearing up

6.3.1 For containment

Stop the leak if it is safe to do so. Contain the spillage with sand, earth or any suitable adsorbent material.

6.3.2 For cleaning up

Use sand, earth or any suitable non-combustible adsorbent material to adsorb spillages. Using non-sparking tools transfer the contaminated absorbent material into a container for disposal.

For spillages on water, remove use appropriate methods such as skimming, booms or adsorbents. For spillages onto soil, remove contaminated soil for remediation or disposal in accordance with local regulations.

Waste containers used should be plastic-lined sealable drums. Containers should be sealed before being disposed of via an authorised waste disposal contractor.

6.3.3 Other advice

None.

6.4 Reference to other sections

See Section 8 for personal protective equipment. See Section 13 for waste disposal.

SECTION 7: Handling and Storage

7.1 Precautions for safe handling

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical, ventilating and lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge.

Use only outdoors or in a well-ventilated area. Provide adequate ventilation, including local extraction, to ensure occupational exposure limits are not exceeded. Avoid breathing vapours/spray. Avoid contact with skin and eyes. Wear suitable personal protective equipment (See Section 8).

Do not eat, drink or smoke in the vicinity of the product. Wash thoroughly after handling. Take off contaminated clothing and wash it before reuse. Contaminated clothing should be thoroughly cleaned or disposed of as hazardous waste.

Product transfer

Electrostatic charges may be generated during pumping. Ensure electrical continuity by bonding all equipment. Avoid splash filling. Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. Contamination resulting from product transfer may give rise to light hydrocarbon vapour in the headspace of tanks that have previously contained gasoline. This vapour may explode if there is a source of ignition. Partly filled containers present a greater hazard than those that are full, therefore handling, transfer and sampling activities need special care.

Tank cleaning

Cleaning, inspection and maintenance of storage tanks is a specialist operation that requires the implementation of strict procedures and precautions. These include issue of work permits, gas-freeing of tanks, using a manned safety harness, lifelines and wearing air-supplied breathing apparatus. Prior to entry and while cleaning is underway, the atmosphere within the tank must be monitored using an oxygen meter and explosimeter. Additional precautions are required where the tank may have previously contained leaded gasoline.

7.2 Conditions for safe storage, including any incompatibilities

Keep away from heat and sources of ignition. Keep away from direct sunlight. Store locked up. Store in a well-ventilated place. Keep container tightly closed. Keep cool. Empty containers retain product residue and can be hazardous.

Keep away from oxidising agents, reducing agents.

This product must never be stored in buildings occupied by people. Drums and small containers should be stored in well-ventilated areas, flameproof cabinets or stores. Keep in a bunded area with a sealed floor to

provide containment against spillage. Stack drums to a height not exceeding three metres without the use of racking. Seek specialist advice for the design, construction and operation of bulk storage facilities.

Recommended Storage Container materials

For containers or container linings use mild steel or stainless steel, aluminium may also be used for applications where it does not present an unnecessary fire hazard. Examples of suitable materials are: high density polyethylene (HDPE), polypropylene (PP), and Viton (FKM) which have specifically tested for compatibility with the product. For container linings, use amine-adduct cured epoxy paint. For seals and gaskets use: graphite, PTFE, Viton A, Viton B.

Unsuitable Storage Container materials

Synthetic materials such as plastics and fiberglass may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), nitrile rubber (NBR), ethylene propylene rubber (EPDM), polymethyl methacrylate (PMMA), polystyrene, polyvinyl chloride (PVC), polyisobutylene. However some may be suitable for glove materials.

7.3 Specific end uses(s)

Refer to supplemental exposure scenarios attached or 'fuel for oil-fired heating systems'.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control parameters

Workplace exposure limits

Source: EH40/2005, 2nd Ed., 2011.

None assigned.

Other exposure limits

Source: American Conference of Governmental Industrial Hygienists (ACGIH)

Substance	CAS No.	LTEL (8 hr TWA)		STEL (15 min)		Comments
		ppm	mg/m ³	ppm	mg/m ³	
Kerosine (petroleum)	8008-20-6	-	200	-	-	Skin

Skin: Can be absorbed through the skin.

DNELs (Workers)

None assigned.

DNELs (Consumers)

Ingestion: 18.8 mg/kg bw/day.

PNECs

None assigned.

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Provide adequate ventilation to ensure that occupational exposure limits are not exceeded. Local extraction may be required. Eye wash and quick-drench shower facilities should be available in the work area. Contaminated clothing and shoes should be thoroughly washed before reuse.

8.2.2 Personal protection

Eye protection:

Goggles or safety glasses with side shields giving complete

protection to eyes. (EN 166). Depending on conditions of use, close-fitting eye protection and a face shield may be necessary.

Skin protection:

Hand protection: Chemical-resistant gloves. (EN 374). Suitable glove material: nitrile, neoprene or PVC (breakthrough time > 240 minutes). Contact glove supplier to confirm suitable glove material, thickness and breakthrough times.

Other: Long sleeve protective clothing. Nitrile, neoprene or PVC apron. Rubber boots.

Respiratory protection: Where airborne levels below the exposure limits cannot be maintained, wear an air-purifying respirator (EN 140) with a Type A/P2 filter or better suitable for organic gases and vapours with a boiling point above 65°C. (EN 14387).

Thermal hazards: Wear suitable temperature resistant gloves and protective clothing if the product is heated.

8.2.3 Environmental exposure controls

Inform environmental manager of all incidents involving this product.

SECTION 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Data given below are typical values

Appearance:	Colourless liquid.
Odour:	Kerosene.
Odour threshold:	Not available.
pH:	Not applicable.
Melting/freezing point:	< -47°C
Initial boiling point and boiling range:	140 – 300°C
Flash point:	> 38°C
Evaporation rate:	Not available.
Flammability (solid; gas):	Not applicable.
Upper/lower flammability or explosive limits:	0.5% – 6.0% (v/v in air)
Vapour pressure:	3 kPa (20°C)
Vapour density:	> 1 (Air = 1)
Relative density:	0.77 – 0.82 (15°C) (Water = 1)
Solubility(ies):	Immiscible in water. Miscible in aromatic solvents.
Partition coefficient: n-octanol/water:	Log Kow: 3-6 (approximate)
Auto-ignition temperature:	250°C
Decomposition temperature:	Not available.
Viscosity:	1.3 – 2.9 cSt (20°C)
Explosive properties:	Not explosive. Vapour may form explosive mixture in air.
Oxidising properties:	Not oxidising.

9.2 Other information

Pour point: < -47°C

SECTION 10: Stability and Reactivity

10.1	Reactivity	Reacts with oxidising agents.
10.2	Chemical stability	Stable under normal conditions.
10.3	Possibility of hazardous reactions	No hazardous reactions expected during normal use.
10.4	Conditions to avoid	Keep away from sources of ignition, hot surfaces, direct sunlight. Prevent accumulation of vapours. Contact with incompatible materials.
10.5	Incompatible materials	Oxidising agents e.g. chlorates and ammonium nitrate which may be used in agriculture. Reducing agents.
10.6	Hazardous decomposition products	Combustion may liberate toxic fumes: Carbon monoxide, carbon dioxide, various hydrocarbons, nitrogen oxides, sulphur oxides.

SECTION 11: Toxicological Information

11.1 Information on toxicological effects

Acute toxicity	LD ₅₀ (oral/rat): > 5,000 mg/kg LD ₅₀ (dermal/rabbit): > 2,000 mg/kg LC ₅₀ (inhalation/rat/vapour): > 5.28 mg/L air (analytical), 4 h
Skin corrosion/irritation	Causes skin irritation. Repeated exposure may cause skin dryness or cracking.
Serious eye damage/irritation	May cause slight eye irritation.
Skin sensitisation	Not expected to be a skin sensitiser.
Respiratory sensitisation	Not expected to be a respiratory sensitiser.
Germ cell mutagenicity	The product does not contain substances classified as mutagenic above the classification thresholds.
Carcinogenicity	The product does not contain substances classified as carcinogenic above the classification thresholds.
Reproductive toxicity	The product does not contain substances classified for reproductive toxicity above the classification thresholds.
Specific Target Organ Toxicity – single exposure	May cause drowsiness or dizziness.
Specific Target Organ Toxicity – repeated exposure	Based on the available data, the classification criteria are not met. Excessive and prolonged inhalation of mists may cause a chronic inflammatory reaction of the lungs and a form of pulmonary fibrosis.
Aspiration hazard	May be fatal if swallowed and enters airways. Risk of aspiration into lungs resulting in chemical pneumonia.

Information on likely routes of exposure

Inhalation	May cause drowsiness or dizziness.
Skin contact	Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Kerosene

Eye contact

May cause slight eye irritation.

Ingestion

May be fatal if swallowed and enters airways. Risk of aspiration into lungs resulting in chemical pneumonia. Ingestion may cause irritation of the mouth and digestive tract.

Symptoms related to the physical, chemical and toxicological characteristics

Skin contact causes irritation, redness and pain. Repeated exposure may cause skin dryness or cracking. Eye contact may cause slight irritation, watering, redness and pain. Inhalation of vapours may cause drowsiness or dizziness. Ingestion may cause irritation of the mouth and digestive tract. If swallowed, aspiration into lungs may result in chemical pneumonia.

Mixture versus substance information

No data available.

Other information

None.

SECTION 12: Ecological Information

12.1 Toxicity

Toxic to aquatic life with long lasting effects.

Acute toxicity studies on samples of jet fuel and kerosene streams show acute toxicity values greater than 1 mg/L, typically in the range 1-10 mg/L. Tests were carried out on water accommodated fractions (WAF) in closed systems to prevent evaporative loss.

Kerosine (petroleum), hydrodesulfurised:

EL₅₀ (*Daphnia magna*): 1.4 mg/L, 48 h (WAF)

NOEL (*Daphnia magna*): 0.3 mg/L, 48 h (WAF)

NOEL (*Daphnia magna*): 0.48 mg/L, 21 days (WAF)

LOEL (*Daphnia magna*): 1.2 mg/L, 21 days (WAF)

EL₅₀ (*Daphnia magna*): 0.89 mg/L, 21 days (reproduction)(WAF)

EL₅₀ (*Raphidocelis subcapitata*): 1-3 mg/L, 72 h (growth rate) (WAF)

NOEL (*Raphidocelis subcapitata*): 1.0 mg/L, 72 h (growth rate) (WAF)

Kerosines:

NOEL (*Oncorhynchus mykiss*): 0.098 mg/L, 28 day (estimated using PETROTOX computer model)

NOEL (*Tetrahymena pyriformis*): 677.9 mg/L, 72 h (estimated using PETROTOX computer model)

Solvent naphtha (petroleum), heavy arom.:

LL₅₀ (*Oncorhynchus mykiss*): 2-5 mg/L, 96h (WAF)

NOEL (*Oncorhynchus mykiss*): 2.0 mg/L, 96 h (WAF)

12.2 Persistence and degradability

The product components are not readily biodegradable but are considered inherently biodegradable due to degradation by microorganisms.

If released to water, the majority of kerosene will evaporate at a moderate rate but a small proportion will dissolve. Dissolved components will be either absorbed in sediments or evaporate to air. In aerobic water and sediments they will biodegrade, but in anaerobic conditions they will persist.

In air the hydrocarbon components undergo photodegradation by hydroxyl radicals with half lives in the range of 0.1 – 0.7 days.

Kerosene

12.3	Bioaccumulative potential	The product components have measured or predicted Log Kow values in the range 3 – 6 or above and therefore have potential to bioaccumulate. In practice, metabolic processes may reduce bioconcentration.
12.4	Mobility in soil	The product components are immiscible in water and will float on the surface of water. Higher molecular weight components may be adsorbed onto sediment. Biodegradation is expected to be negligible in water. Small volumes released on land will evaporate at a moderate rate, with a proportion of the product being absorbed in the upper soil layers and being subject to biodegradation. Larger volumes may penetrate into anaerobic layers in which the product will persist. The product may reach the water table on which it will form a floating layer and move along with the groundwater flow. In this case the more soluble components, such as aromatics, will cause groundwater contamination.
12.5	Results of PBT and vPvB assessment	The product does not contain substances assessed to be PBT or vPvB.
12.6	Other adverse effects	None known.

SECTION 13: Disposal Considerations

13.1 Waste treatment methods

To be disposed of as hazardous waste. Disposal should be in accordance with local, state or national legislation.

Contaminated adsorbent must be removed in sealed, plastic lined drums and disposed of via an authorised waste disposal contractor. Empty containers retain product residue and can be hazardous. Do not empty into drains; dispose of this material and its container in a safe way.

Suggested EU Waste Code: 13 07 03* (other fuels (including mixtures)). Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14: Transport Information

ADR

14.1	UN Number	1223
14.2	UN Proper shipping name	KEROSENE
14.3	Transport hazard class(es)	3
14.4	Packing group	III
14.5	Environmental hazards	Yes
14.6	Special precautions for the user	Read SDS and supplier instructions on correct use of the product.

ADN

14.1	UN Number	1223
14.2	UN Proper shipping name	KEROSENE
14.3	Transport hazard class(es)	3
14.4	Packing group	III
14.5	Environmental hazards	Yes
14.6	Special precautions for the user	Read SDS and supplier instructions on correct use of the product.

RID

14.1	UN Number	1223

Kerosene

14.2	UN Proper shipping name	KEROSENE
14.3	Transport hazard class(es)	3
14.4	Packing group	III
14.5	Environmental hazards	Yes
14.6	Special precautions for the user	Read SDS and supplier instructions on correct use of the product.

IATA/ICAO

14.1	UN Number	1223
14.2	UN Proper shipping name	KEROSENE
14.3	Transport hazard class(es)	3
14.4	Packing group	III
14.5	Environmental hazards	Yes
14.6	Special precautions for the user	Read SDS and supplier instructions on correct use of the product.

IMDG

14.1	UN Number	1223
14.2	UN Proper shipping name	KEROSENE
14.3	Transport hazard class(es)	3
14.4	Packing group	III
14.5	Environmental hazards	Marine pollutant.
14.6	Special precautions for the user	Read SDS and supplier instructions on correct use of the product.
14.7	Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code	The product is not intended to be transported in bulk.

SECTION 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

This Safety Data Sheet was prepared in accordance with EC Regulation (EC) No. 1907/2006 as amended. The product has been classified in accordance with Regulation (EC) No. 1272/2008 (CLP), Directive 67/548/EEC & Directive 1999/45/EC.

15.2 Chemical Safety Assessment

A chemical safety assessment has been carried out.

SECTION 16: Other Information

Full text of relevant R-phrases and/or H-statements:

Hazard Statement(s):	H226: Flammable liquid and vapour. H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H336: May cause drowsiness or dizziness. H411: Toxic to aquatic life with long lasting effects.

Supplemental Hazard information (EU): Not applicable.

Risk phrase(s):	R10: Flammable. R38: Irritating to skin. R65: Harmful: may cause lung damage if swallowed. R67: Vapours may cause drowsiness and dizziness. R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Abbreviations:

CAS:	Chemical Abstracts Service;
EINECS:	European Inventory of Existing Commercial Chemical Substances
EC ₅₀ :	Effective Concentration 50%
EL ₅₀ :	Effective Loading rate 50%
LC ₅₀ :	Lethal Concentration 50%
LD ₅₀ :	Lethal Dose 50%
LL ₅₀ :	Lethal Loading rate 50%
LOEL:	Lowest Observed Effect Level
NOEL:	No Observed Effect Level
PBT:	Persistent, Bioaccumulative and Toxic.
RMM:	Risk Management Measures
UVCB:	Substance of Unknown or Variable composition, Complex reaction products or Biological materials
vPvB:	Very Persistent and Very Bioaccumulative
WAF:	Water Accommodated Fraction

References:

Supplier's Safety Data Sheets
ECHA disseminated REACH dossiers
ECHA Classification and Labelling Inventory
Approved Classification and Labelling Guide (Sixth edition)
The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009
Regulation (EC) No. 1272/2008 of the European Parliament and of the council.

Disclaimer:

This safety data sheet contains important information to ensure the safe storage, handling and use of this product, it does not however constitute an assessment of workplace risks.

Users are advised to refer to relevant legislation, approved codes of practice and guidance available from the Health & Safety Executive (website: <http://www.hse.gov.uk>) and to the IP Codes of Practice available from the Energy Institute (website: <http://www.energyinst.org.uk>)

Further information:

The above information is based on our current knowledge of the product. The purpose of this data sheet is to describe the product in terms of its safety and environmental requirements. It is the user's responsibility to satisfy themselves as to the application of this information and/or recommendations for their own use.

Version history:

Version:	7.0
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Previous Version:	6.0
Issue date of previous version:	24/11/2011
Sections changed from previous version:	1-16

Annex to extended Safety Data Sheet (eSDS)

1. Manufacture of substance – Industrial

Section 1: Exposure scenario	
Kerosenes	
Title	
Manufacture of substance	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites. SU 8: Manufacture of bulk, large scale chemicals (including petroleum products). SU 9: Manufacture of fine chemicals.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 15: Use as laboratory reagent.
Environmental Release Category(ies):	ERC 1: Manufacture of substances. ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles.
Specific Environmental Release Category:	ESVOC SpERC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: 0.5 – 10 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
General exposures (closed systems):	No other specific measures identified.
General exposures (open systems):	No other specific measures identified.
Bulk transfers:	No other specific measures identified.
Process sampling:	No other specific measures identified.
Laboratory activities:	No other specific measures identified.
Equipment cleaning and maintenance:	No other specific measures identified.
Bulk product storage:	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified as R38 (Irritating to skin) / H315 (Causes skin irritation)	

accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

2.2 Control of Environmental Exposure

Product Characteristics

Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	5,400,000
Fraction of regional tonnage used locally:	0.11

Frequency and duration of use

Continuous release.

Emission days (days/year):	300

Environmental factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.01
Release fraction to wastewater from process (initial release prior to RMM)	0.0003
Release fraction to soil from process (initial release prior to RMM)	0.0001

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites, thus conservative process release estimated used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. Onsite wastewater treatment required.

Treat air emission to provide a typical removal efficiency of (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 97.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 56.1

Organisation measures to prevent/limit release from site

Do not apply industrial sludge to natural soils.

Sludge should be incinerated, contained or reclaimed.

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	97.7
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (Kg/d):	2,000,000
Assumed domestic sewage treatment plant flow (m ³ /d):	10,000

Conditions and measures related to external treatment of waste for disposal

During manufacturing no waste of the substance is generated.

Conditions and measures related to external recovery of waste

During manufacturing no waste of the substance is generated.

Section 3: Exposure Estimation

3.1 Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.

3.2 Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.

Section 4: Guidance to check the compliance with the exposure scenario

4.1 Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, users should

ensure that risks are managed to at least equivalent levels.

4.2 Environment

Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf>). Scaled local assessments for EU refineries have been performed using site-specific data and are attached in the PETRORISK file 'Site Specific Production' Worksheet.

2. Use of substance as an intermediate – Industrial

Section 1: Exposure scenario Kerosenes

Title

Use as an intermediate

Use Descriptor

Sector(s) of use: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
SU 8: Manufacture of bulk, large scale chemicals (including petroleum products).
SU 9: Manufacture of fine chemicals.

Process Category(ies): PROC 1: Use in closed process, no likelihood of exposure.
PROC 2: Use in closed, continuous process with occasional controlled exposure.
PROC 3: Use in closed batch process (synthesis or formulation).
PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises.
PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities.
PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities.
PROC 15: Use as laboratory reagent.

Environmental Release Category(ies): ERC 6a: Industrial use resulting in manufacture of another substance (use of intermediates)

Specific Environmental Release Category: ESVOC SpERC 6.1a.v1

Processes, tasks, activities covered

Use of the substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.

Section 2: Operation conditions and risk management measures

2.1 Control of worker exposure

Product Characteristics

Physical form of product:	Liquid. Vapour pressure: 0.5 – 10 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios

Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.

General exposures (closed systems):	No other specific measures identified.
General exposures (open systems):	No other specific measures identified.
Bulk transfers:	No other specific measures identified.
Process sampling:	No other specific measures identified.
Laboratory activities:	No other specific measures identified.
Equipment cleaning and maintenance:	No other specific measures identified.
Bulk product storage:	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	180,000
Fraction of regional tonnage used locally:	0.083
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.01
Release fraction to wastewater from process (initial release prior to RMM)	0.0003
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 81.4
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	180,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
This substance is consumed during use and no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	

Section 3: Exposure Estimation

3.1 Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.

3.2 Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.

Section 4: Guidance to check the compliance with the exposure scenario

4.1 Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels.

4.2 Environment

Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf>).

3. Distribution of substance – Industrial

Section 1: Exposure scenario

Kerosenes

Title

Distribution of the substance

Use Descriptor

Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC 15: Use as laboratory reagent.
Environmental Release Category(ies):	ERC 1: Manufacture of substances. ERC 2: Formulation of preparations. ERC 3: Formulation in materials. ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles. ERC 5: Industrial use resulting in inclusion into or onto a matrix. ERC 6a: Industrial use resulting in manufacture of another substance (use of intermediates). ERC 6b: Industrial use of reactive processing aids. ERC 6c: Industrial use of monomers for manufacture of thermoplastics. ERC 6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers. ERC 7: Industrial use of substances in closed systems.
Specific Environmental Release Category:	ESVOC SpERC 1.1b.v1

Processes, tasks, activities covered

Loading (including marine vessel/barge, road/rail car and IBC loading), and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.

Section 2: Operation conditions and risk management measures

2.1 Control of worker exposure

Product Characteristics

Physical form of product:	Liquid. Vapour pressure: 0.5 – 10 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios

Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
General exposures (closed systems):	No other specific measures identified.
General exposures (open systems):	No other specific measures identified.
Bulk transfers:	No other specific measures identified.
Process sampling:	No other specific measures identified.
Laboratory activities:	No other specific measures identified.
Drum and small package filling:	No other specific measures identified.
Equipment cleaning and maintenance:	No other specific measures identified.
Bulk product storage:	No other specific measures identified.

Kerosene exhibits irritation to the skin and is classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.

2.2 Control of Environmental Exposure

Product Characteristics

Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	5,400,000
Fraction of regional tonnage used locally:	0.002

Frequency and duration of use

Continuous release.

Emission days (days/year):	300

Environmental factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.01
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0.00001

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites, thus conservative process release estimated used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk from environmental exposure is driven by freshwater. No wastewater treatment required.

Treat air emission to provide a typical removal efficiency of (%):	90

Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	2,600,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

4. Formulation and (Re)packing of substance – Industrial

Section 1: Exposure scenario Kerosenes	
Title	
Formulation and (Re)packing of substances and mixtures	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites. SU 10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys).
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities.

	PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC 14: Production of preparations or articles by tableting, compression, extrusion, palletisation. PROC 15: Use as laboratory reagent.	
Environmental Release Category(ies):	ERC 2: Formulation of preparations.	
Specific Environmental Release Category:	ESVOC SpERC 2.2.v1	
Processes, tasks, activities covered		
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, material transfers, mixing, tableting, compression, palletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.		
Section 2: Operation conditions and risk management measures		
2.1 Control of worker exposure		
Product Characteristics		
Physical form of product:	Liquid. Vapour pressure: 0.5 – 10 kPa at standard temperature and pressure.	
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).	
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).	
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.	
Contributing Scenarios		
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions	
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.	
General exposures (closed systems):	No other specific measures identified.	
General exposures (open systems):	No other specific measures identified.	
Bulk transfers:	No other specific measures identified.	
Process sampling:	No other specific measures identified.	
Laboratory activities:	No other specific measures identified.	
Mixing operations (open systems):	No other specific measures identified.	
Manual transfer/pouring from containers:	No other specific measures identified.	
Drum/batch transfers:	No other specific measures identified.	
Production or preparation or articles by tableting, compression, extrusion or palletisation.	No other specific measures identified.	
Drum and small package filling:	No other specific measures identified.	
Equipment cleaning and maintenance:	No other specific measures identified.	
Bulk product storage:	No other specific measures identified.	
Kerosene exhibits irritation to the skin and is classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.		
2.2 Control of Environmental Exposure		
Product Characteristics		
Substance is a complex UVCB. Predominantly hydrophobic.		
Amounts Used		
Fraction of EU tonnage used in region:	0.1	
Regional use tonnage (tonnes/year):	5,200,000	

Fraction of regional tonnage used locally:	0.0058
Frequency and duration of use Continuous release.	
Emission days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.01
Release fraction to wastewater from process (initial release prior to RMM)	0.0002
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 86.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	260,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

5. Use of substance in metal working fluids/rolling oils – Industrial

Section 1: Exposure scenario	
Kerosenes	
Title	
Use in metal working fluids/rolling oils	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC 7: Industrial spraying. PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC 10: Roller application or brushing. PROC 13: Treatment of articles by dipping and pouring. PROC 17: Lubrication at high energy conditions and in partly open process.
Environmental Release Category(ies):	ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles.
Specific Environmental Release Category:	ESVOC SpERC 4.7a.v1
Processes, tasks, activities covered	
Covers the use in formulated metal working fluids (MWFs)/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: 0.5 – 10 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
General exposures (closed systems):	No other specific measures identified.
General exposures (open systems):	No other specific measures identified.
Bulk transfers:	No other specific measures identified.

Filling/preparation of equipment from drums or containers:	No other specific measures identified.
Process sampling:	No other specific measures identified.
Metal machining operations:	No other specific measures identified.
Treatment by dipping and pouring:	No other specific measures identified.
Spraying:	No other specific measures identified.
Manual roller, spreader, flow application:	No other specific measures identified.
Automated metal rolling/forming:	No other specific measures identified.
Semi-automated metal rolling/forming:	No other specific measures identified.
Equipment cleaning and maintenance – dedicated facility:	No other specific measures identified.
Equipment cleaning and maintenance – non-dedicated facility:	No other specific measures identified.
Storage:	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	550
Fraction of regional tonnage used locally:	0.18
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.02
Release fraction to wastewater from process (initial release prior to RMM)	0.00003
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater. Prevent discharge of undissolved substance to or recover from onsite wastewater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	70
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMS (%):	94.7
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (Kg/d):	490,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000

Conditions and measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste
External recovery and recycling of waste should comply with applicable local and/or national regulations.
Section 3: Exposure Estimation
3.1 Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.
3.2 Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.
Section 4: Guidance to check the compliance with the exposure scenario
4.1 Health
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels.
4.2 Environment
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).

6. Use of substance in metal working fluids/rolling oils – Professional

Section 1: Exposure scenario	
Kerosenes	
Title	
Use in metal working fluids/rolling oils	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC 8a: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC 10: Roller application or brushing. PROC 11: Non-industrial spraying. PROC 13: Treatment of articles by dipping and pouring. PROC 17: Lubrication at high energy conditions and in partly open process.
Environmental Release Category(ies):	ERC 8a: Wide dispersive indoor use of processing aids in open systems. ERC 8b: Wide dispersive indoor use of reactive substances in open systems
Specific Environmental Release Category:	ESVOC SpERC 8.7c.v1
Processes, tasks, activities covered	
Covers the use in formulated metal working fluids (MWFs) including transfer operations, open and contained cutting/machining activities, automated and manual application of corrosion protections, draining and working on contaminated/reject articles and disposal of waste oils.	

Section 2: Operation conditions and risk management measures

2.1 Control of worker exposure

Product Characteristics

Physical form of product:	Liquid. Vapour pressure: 0.5 – 10 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios

Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
General exposures (closed systems):	No other specific measures identified.
Bulk transfers:	No other specific measures identified.
Filling/preparation of equipment from drums or containers – dedicated facility:	No other specific measures identified.
Filling/preparation of equipment from drums or containers – non-dedicated facility:	No other specific measures identified.
Process sampling:	No other specific measures identified.
Metal machining operations:	No other specific measures identified.
Manual roller, spreader, flow application:	No other specific measures identified.
Spraying:	No other specific measures identified.
Equipment cleaning and maintenance – dedicated facility:	No other specific measures identified.
Equipment cleaning and maintenance – non-dedicated facility:	No other specific measures identified.
Treatment by dipping and pouring:	No other specific measures identified.
Storage:	No other specific measures identified.

Kerosene exhibits irritation to the skin and is classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS.

2.2 Control of Environmental Exposure

Product Characteristics

Substance is a complex UVCB. Predominantly hydrophobic.

Amounts Used

Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	550
Fraction of regional tonnage used locally:	0.0005

Frequency and duration of use

Continuous release.

Emission days (days/year):	365

Environmental factors not influenced by risk management

Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.15
Release fraction to wastewater from process (initial release prior to RMM)	0.05
Release fraction to soil from process (initial release prior to RMM)	0.05
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	Not applicable.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	90
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

7. Use of substance as release agents or binders – Industrial

Section 1: Exposure scenario	
Kerosenes	
Title	
Use as release agents or binders	
Use Descriptor	
Sector(s) of use:	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure.

	PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 6: Calendering operations. PROC 7: Industrial spraying. PROC 8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities. PROC 10: Roller application or brushing. PROC 13: Treatment of articles by dipping and pouring. PROC 14: Production of preparations or articles by tableting, compression, extrusion, palletisation.	
Environmental Release Category(ies):	ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles.	
Specific Environmental Release Category:	ESVOC SpERC 4.10a.v1	
Processes, tasks, activities covered		
Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting and handling of waste.		
Section 2: Operation conditions and risk management measures		
2.1 Control of worker exposure		
Product Characteristics		
Physical form of product:	Liquid. Vapour pressure: 0.5 – 10 kPa at standard temperature and pressure.	
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).	
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).	
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.	
Contributing Scenarios		
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions	
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.	
Bulk transfers:	No other specific measures identified.	
Drum/batch transfers:	No other specific measures identified.	
Mixing operations (closed systems):	No other specific measures identified.	
Mixing operations (open systems):	No other specific measures identified.	
Mould forming:	No other specific measures identified.	
Casting operations:	No other specific measures identified.	
Machine spraying:	No other specific measures identified.	
Manual spraying:	No other specific measures identified.	
Manual rolling, brushing:	No other specific measures identified.	
Dipping, immersion and pouring:	No other specific measures identified.	
Bulk product storage:	No other specific measures identified.	
Kerosene exhibits irritation to the skin and is classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.		

2.2 Control of Environmental Exposure	
Product Characteristics Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	800
Fraction of regional tonnage used locally:	1
Frequency and duration of use Continuous release.	
Emission days (days/year):	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0
Release fraction to wastewater from process (initial release prior to RMM)	0.000003
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater. Prevent discharge of undissolved substance to or recover from onsite wastewater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	4,100,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels.	

4.2 Environment
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).

8. Use of substance as release agents or binders – Professional

Section 1: Exposure scenario Kerosenes	
Title	
Use as release agents or binders	
Use Descriptor	
Sector(s) of use:	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen).
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises. PROC 6: Calendering operations. PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC 10: Roller application or brushing. PROC 11: Non-industrial spraying. PROC 14: Production of preparations or articles by tableting, compression, extrusion, palletisation.
Environmental Release Category(ies):	ERC 8a: Wide dispersive indoor use of processing aids in open systems. ERC 8d: Wide dispersive outdoor use of processing aids in open systems.
Specific Environmental Release Category:	ESVOC SpERC 8.10b.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application by spraying and brushing and handling of waste.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: 0.5 – 10 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol

	release, e.g. spraying.
Bulk transfers:	No other specific measures identified.
Drum/batch transfers:	No other specific measures identified.
Mixing operations (closed systems):	No other specific measures identified.
Mixing operations (open systems):	No other specific measures identified.
Mould forming:	No other specific measures identified.
Casting operations:	No other specific measures identified.
Machine spraying:	No other specific measures identified.
Manual spraying:	No other specific measures identified.
Rolling, brushing:	No other specific measures identified.
Dipping, immersion and pouring:	No other specific measures identified.
Bulk product storage:	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	800
Fraction of regional tonnage used locally:	0.0005
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.95
Release fraction to wastewater from process (initial release prior to RMM)	0.025
Release fraction to soil from process (initial release prior to RMM)	0.025
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	Not applicable.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMS (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	130
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations.

Section 3: Exposure Estimation

3.1 Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.

3.2 Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.

Section 4: Guidance to check the compliance with the exposure scenario

4.1 Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels.

4.2 Environment

Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf>).

9. Use of substance as a fuel – Industrial

Section 1: Exposure scenario Kerosenes

Title

Use as a fuel

Use Descriptor

Sector(s) of use: SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites.

Process Category(ies): PROC 1: Use in closed process, no likelihood of exposure.
PROC 2: Use in closed, continuous process with occasional controlled exposure.
PROC 3: Use in closed batch process (synthesis or formulation).
PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
PROC 16: Using material as fuel sources, limited exposure to unburned product to be expected.

Environmental Release Category(ies): ERC 7: Industrial use of substances in closed systems.

Specific Environmental Release Category: ESVOC SpERC 7.12a.v1

Processes, tasks, activities covered

Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

Section 2: Operation conditions and risk management measures

2.1 Control of worker exposure

Product Characteristics

Physical form of product: Liquid. Vapour pressure: 0.5 – 10 kPa at standard temperature and pressure.

Concentration of substance in product: Covers percentages of substance in product up to 100% (unless stated otherwise).

Frequency and duration of use: Covers daily exposures of up to 8 hours (unless stated otherwise).

Other operational conditions affecting exposure: Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
General exposures (closed systems):	No other specific measures identified.
Use as a fuel (closed systems):	No other specific measures identified.
Bulk transfers:	No other specific measures identified.
Drum/batch transfers:	No other specific measures identified.
Equipment cleaning and maintenance:	No other specific measures identified.
Bulk product storage:	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.	
2.2 Control of Environmental Exposure	
Product Characteristics Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	550,000
Fraction of regional tonnage used locally:	1
Frequency and duration of use Continuous release.	
Emission days (days/year):	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.005
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 84.6
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	5,300,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000

Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

10. Use of substance as a fuel – Professional

Section 1: Exposure scenario	
Kerosenes	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of use:	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen).
Process Category(ies):	PROC 1: Use in closed process, no likelihood of exposure. PROC 2: Use in closed, continuous process with occasional controlled exposure. PROC 3: Use in closed batch process (synthesis or formulation). PROC 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities. PROC 16: Using material as fuel sources, limited exposure to unburned product to be expected.
Environmental Release Category(ies):	ERC 9a: Wide dispersive indoor use of substances in closed systems. ERC 9b: Wide dispersive outdoor use of substances in closed systems.
Specific Environmental Release Category:	ESVOC SpERC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: 0.5 – 10 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).

Frequency and duration of use:	Covers daily exposures of up to 8 hours (unless stated otherwise).
Other operational conditions affecting exposure:	Assumes use at not more than 20°C above ambient temperature (unless stated otherwise). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants):	Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with the substance is likely. Clean up contamination/spills immediately. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
General exposures (closed systems):	No other specific measures identified.
Use as a fuel (closed systems):	No other specific measures identified.
Bulk transfers:	No other specific measures identified.
Transfer/pouring from containers:	No other specific measures identified.
Equipment cleaning and maintenance:	No other specific measures identified.
Bulk product storage:	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMs.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	4,400,000
Fraction of regional tonnage used locally:	0.0005
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.001
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites, thus conservative process release estimated used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	Not applicable.
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency (%):	≥ 0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥ 0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7

Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	690,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise stated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

11. Use of substance as a fuel – Consumer

Section 1: Exposure scenario	
Kerosenes	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of use:	SU 21: Consumer uses: Private households (= general public = consumers).
Product Category(ies):	PC 13: Fuels.
Environmental Release Category(ies):	ERC 9a: Wide dispersive indoor use of substances in closed systems. ERC 9b: Wide dispersive outdoor use of substances in closed systems.
Specific Environmental Release Category:	ESVOC SpERC 9.12c.v1
Processes, tasks, activities covered	
Covers consumer uses of liquid fuels.	
Section 2: Operation conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product:	Liquid. Vapour pressure: 0.5 – 10 kPa at standard temperature and pressure.
Concentration of substance in product:	Covers percentages of substance in product up to 100% (unless stated otherwise).
Amounts used:	For each use event, covers use amounts of up to 50,000 g. Covers skin contact area of up to 420 cm ² .
Frequency and duration of use:	Covers use up to 0.143 times per day (i.e. one use every 7 days). Covers exposure of up to 2 hours per use event.

Other operational conditions affecting exposure:	Covers use at ambient temperature. Covers use in room size of 20 m ³ . Covers use under typical household ventilation.
Contributing Scenarios	
Contributing Scenarios/Product Category	Specific Risk Management Measures & Operating Conditions
Liquid: Automotive refuelling	Covers concentrations of up to 100%. Covers use up to 52 days/year. Covers use up to 1 time a day. Covers skin contact area up to 210 cm ² . For each use event, covers use amounts up to 50,000 g. Covers outdoor use. Covers use in room size of 100 m ³ . Covers exposure of up to 0.05 hours (3 min). No specific risk management measures identified beyond those operational conditions stated.
Liquid: Home space heater fuel	Covers concentrations of up to 100%. Covers use up to 365 days/year. Covers use up to 1 time a day. Covers skin contact area up to 210 cm ² . For each use event, covers use amounts up to 1,500 g. Covers use under typical household ventilation. Covers use in room size of 20 m ³ . Covers exposure of up to 0.03 hours (1.8 min). No specific risk management measures identified beyond those operational conditions stated.
Liquid: Garden equipment - Use	Covers concentrations of up to 100%. Covers use up to 26 days/year. Covers use up to 1 time a day. For each use event, covers use amounts up to 1,000 g. Covers outdoor use. Covers use in room size of 100 m ³ . Covers exposure of up to 2 hours. No specific risk management measures identified beyond those operational conditions stated.
Liquid: Garden equipment - refuelling	Covers concentrations of up to 100%. Covers use up to 26 days/year. Covers use up to 1 time a day. Covers skin contact area up to 420 cm ² . For each use event, covers use amounts up to 1,000 g. Covers use in a one car garage (34 m ³) under typical ventilation. Covers use in room size of 34 m ³ . Covers exposure of up to 0.03 hours (1.8 min). No specific risk management measures identified beyond those operational conditions stated.
Kerosene exhibits irritation to the skin and is classified as R38 (Irritating to skin) / H315 (Causes skin irritation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but appropriate toxicity data exists to allow a qualitative characterisation. Please see Section 2 of the SDS for the necessary RMMS.	
2.2 Control of Environmental Exposure	
Product Characteristics	
Substance is a complex UVCB. Predominantly hydrophobic.	
Amounts Used	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage (tonnes/year):	180,000
Fraction of regional tonnage used locally:	0.0005
Frequency and duration of use	
Continuous release.	
Emission days (days/year):	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor:	10

Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.001
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0.00001
Conditions and measures related to municipal sewage treatment plant	
Risk from environmental exposure is driven by freshwater.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (Kg/d):	31,000
Assumed domestic sewage treatment plant flow (m ³ /d):	2,000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3: Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate consumer exposures consistent with the contact of ECETOC report #107 and Chapter R15 of the IR & CSA TGD. Where exposure determinants differ to these sources they are indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk Model.	
Section 4: Guidance to check the compliance with the exposure scenario	
4.1 Health	
Users are advised to consider national Occupational Exposure Limits (OELs) or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may or may not be applicable to all sites; thus scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://www.cefic.org/Documents/IndustrySupport/REACH-Implementation/Guidance-and-Tools/SPERCs-Specific-Environmental-Release-Classes.pdf).	

Safety Data Sheet

According to EC 1907/2006



Section 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Name: Unleaded Gasoline
Safety Data Sheet Number: 814647
MARPOL Annex I Category: Gasoline and Spirits
REACH Registration Number: 01-2119471335-39-0012

1.2 Relevant identified uses of the substance or mixture and uses advised against

Intended Use: Fuel for spark ignition piston engines - **NOT** recommended for aviation piston engines

Uses Advised Against: Uses other than those covered by the exposure scenarios appended to this Safety Data Sheet are not supported.

1.3 Details of the supplier of the substance or mixture

Manufacturer: Phillips 66 Ltd, Humber Refinery
South Killingholme, North Lincolnshire DN40 3DW
+44 (0)1469 571571
Customer Service: URL: www.Phillips66.com
SDS Information: Email: ESDS@P66.com

1.4 Emergency telephone number +44 (0)1469 555348 (24 Hours)

Section 2: Hazards Identification

2.1 Classification of the substance or mixture

CLP Classification (EC No 1272/2008)

H224 -- Flammable liquids -- Category 1
H304 -- Aspiration Hazard -- Category 1
H315 -- Skin corrosion/irritation -- Category 2
H336 -- Specific target organ toxicity (single exposure) -- Category 3
H340 -- Germ cell mutagenicity -- Category 1B
H350 -- Carcinogenicity -- Category 1B
H361F -- Reproductive toxicity -- Category 2
H361D -- Reproductive toxicity -- Category 2
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2

Superseded DSD Classification (67/548/EEC and 1999/45/EC):

F+;R12, Xi;R38, Carc. Cat. 2;R45, Muta. Cat.2;R46, Repr. Cat. 3;R62, Repr. Cat. 3;R63, Xn;R65, R67, N;R51/53

2.2 Label Elements



DANGER

H224: Extremely flammable liquid and vapor.

H315: Causes skin irritation

H304: May be fatal if swallowed and enters airways

H336: May cause drowsiness or dizziness

H350: May cause cancer

H340: May cause genetic defects

H361: Suspected of damaging fertility or the unborn child.

H411: Toxic to aquatic life with long lasting effects.

P201: Obtain special instructions before use

P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking

P280: Wear protective gloves / protective clothing / eye protection / face protection

P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician

P403+P233: Store in a well-ventilated place. Keep container tightly closed

P501: Dispose of contents/container to approved disposal facility.

2.3 Other hazards

Does not meet the criteria for persistent, bioaccumulative and toxic (PBT) or very persistent, very bioaccumulative (vPvB) substances.

Section 3: Composition / Information on Ingredients

3.1 Substance

Component	CASRN	EINECS	REACH Registration No.	Concentration ¹	CLP Classification ²	DSD Classification ³
Gasoline	86290-81-5	289-220-8	01-2119471335-39	100	H350,H340,H304 4	Carc.Cat.2; R45 Muta.Cat.2; R46 Xn; R65
Toluene	108-88-3	203-625-9	Not applicable	4-23	H225,H361d,H304,H373,H315, H336	F; R11 Xi; R38 Xn; R48/20-65 Repr.Cat.3; R63 R67
n-Hexane	110-54-3	203-777-6	Not applicable	<2	H225,H361f,H304,H373,H315, H336,H411	F; R11 Xi; R38 N; R51-53 Repr.Cat.3; R62 Xn; R65-48/20 R67
Benzene	71-43-2	200-753-7	Not applicable	<1	H225,H350,H340,H372,H304,H319,H315	F; R11 Xi; R36/38 Carc.Cat.1; R45 Muta.Cat.2; R46 T; R48/23/24/25 Xn; R65

¹ All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

² Regulation EC 1272/2008.

³ Superseded Directives 67/548/EEC and 1999/45/EC.

Total Sulfur: < 0.1

Section 4: First Aid Measures

4.1 Description of first aid measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician. (see Note to Physician)

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If breathing is difficult, oxygen or artificial respiration should be administered by qualified personnel. If symptoms persist, seek medical attention.

Ingestion (Swallowing): Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

4.2 Most important symptoms and effects

Acute: Headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue

Delayed: Dry skin and possible irritation with repeated or prolonged exposure.

4.3 Indication of immediate medical attention and special treatment needed

Notes to Physician: When using high-pressure equipment, injection of product under the skin can occur. In this case, the casualty should be sent immediately to hospital. Do not wait for symptoms to develop. High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. These injuries often require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury. Early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias.

Section 5: Fire-Fighting Measures

5.1 Extinguishing media

Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

5.2 Special hazards arising from the substance or mixture

Unusual Fire & Explosion Hazards: Extremely flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of nitrogen and sulfur may also be formed.

5.3 Special protective actions for firefighters

For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Avoid spreading burning liquid with water used for cooling purposes. Cool equipment exposed to fire with water, if it can be done safely.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Extremely flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

6.2 Environmental precautions

Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard.

6.3 Methods and material for containment and cleaning up

Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

Section 7: Handling and Storage

7.1 Precautions for safe handling

Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Nonsparking tools should be used. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

Extremely Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Open container slowly to relieve any pressure. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes for specific bonding/grounding requirements). Do not enter confined spaces such as tanks or pits without following proper entry procedures. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus or from pinhole leaks in tubing of high pressure hydraulic oil equipment.

For use as a motor fuel only. Do not use as a solvent due to its flammable and potentially toxic properties. Siphoning by mouth can result in lung aspiration which can be harmful or fatal.

The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of incomplete combustion products (e.g. carbon monoxide, oxides of sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels.

Gasoline engine exhaust contains hazardous combustion products and has been identified as a possible cancer hazard. Exposure should be minimized to reduce potential risk.

7.2 Conditions for safe storage, including any incompatibilities

Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

Portable Containers: Static electricity may ignite gasoline vapors when filling portable containers. To avoid static buildup do not use a nozzle lock open device. Use only approved containers for the storage of gasoline. Place the container on the ground before filling. Keep the nozzle in contact with the container during filling. Do not fill any portable container in or on a vehicle or marine craft.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to appropriate guidance pertaining to cleaning, repairing, welding, or other contemplated operations. Outdoor or detached storage is preferred. Indoor storage should meet Country or Committee standards and appropriate fire codes.

7.3 Specific end use(s)

Refer to supplemental exposure scenarios if attached.

Section 8: Exposure Controls / Personal Protection

8.1 Control parameters

Occupational Exposure Limits			
Component	ACGIH	UK-EH40	Other
Gasoline	STEL: 500 ppm TWA: 300 ppm	---	0.5 ppm TWA8hr (as benzene) 0.25 ppm TWA12hr (as benzene) 2.5 ppm STEL (as benzene) (Phillips 66 Guidelines)
Toluene	TWA: 20 ppm	STEL: 100 ppm STEL: 384 mg/m ³ TWA: 50 ppm TWA: 191 mg/m ³ Skin	---
n-Hexane	TWA: 50 ppm Skin	STEL: 60 ppm STEL: 216 mg/m ³ TWA: 20 ppm TWA: 72 mg/m ³	---
Benzene	STEL: 2.5 ppm TWA: 0.5 ppm Skin	STEL: 3 ppm STEL: 9.75 mg/m ³ TWA: 1 ppm TWA: 3.25 mg/m ³ Skin	---

STEL = Short Term Exposure Limit (15 minutes); TWA = Time Weighted Average (8 hours); --- = No Occupational Exposure Limit

Biological Limit Values			
Component	ACGIH	EU 98/24/EC	UK-EH40
Gasoline	---	---	---

Toluene	Toluene in blood: 0.02 mg/L, prior to last shift of workweek () Toluene in urine: 0.03 mg/L, end of shift () o-Cresol with hydrolysis in urine: 0.3 mg/g creatinine, end of shift (background)	---	---
n-Hexane	2,5-Hexanedione without hydrolysis in urine: 0.4 mg/L, end of shift at end of workweek ()	---	---
Benzene	S-Phenylmercapturic acid in urine: 25 µg/g creatinine, end of shift (background) t,t-Muconic acid in urine: 500 µg/g creatinine, end of shift (background)	---	---

--- = No Biological Limit Value

Relevant DNEL and PNEC:

Worker Derived No-Effect Level (DNEL)

Inhalation: 3.2 mg/m³/day (DMEL, as benzene)

Dermal: 0.234 mg/kgbw/day (DMEL, as benzene)

Consumer Derived No-Effect Level (DNEL)

Inhalation: Not applicable

Dermal: Not applicable

Ingestion: Not applicable

Environmental Predicted No-Effect Concentration (PNEC): Not applicable

8.2 Exposure controls

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds EN 166 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, close fitting eye protection and a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled that comply with EN 374 is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit an approved air purifying respirator equipped with Type A, organic gases and vapour filters (as specified by the manufacturer) may be used.

A respiratory protection program that follows recommendations for the selection, use, care and maintenance of respiratory protective devices in EN 529:2005 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health.

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Environmental Exposure Controls: Refer to Sections 6, 7, 12 and 13.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Data represent typical values and are not intended to be specifications. N/A = Not Applicable; N/D = Not Determined

Appearance:	Clear, pale yellow (may be dyed various colors)
Physical Form:	Liquid
Odor:	Gasoline
Odour Threshold:	N/D
pH:	N/A
Melting/Freezing Point:	N/D
Initial Boiling Point/Range:	22 - 210 °C
Flash Point:	-40 °C; (ASTM D56)
Evaporation Rate (nBuAc=1):	10-11
Flammability (solid, gas):	Extremely Flammable
Upper Explosive Limits (vol % in air):	7.6
Lower Explosive Limits (vol % in air):	1.3
Vapour Pressure:	60 kPa @20°C
Relative Vapour Density (air=1):	>1
Relative Density (water=1):	0.75 @ 15°C
Solubility (ies):	Solubility in water: 0.01g/L
Partition Coefficient (n-octanol/water) (Kow):	N/D
Auto-ignition Temperature:	450 °C
Decomposition Temperature:	N/D
Viscosity:	0.5-1.5 mm ² /s @ 20°C
Explosive Properties:	N/A
Oxidising Properties:	N/A

9.2 Other Information

Pour Point:	N/D

Section 10: Stability and Reactivity

10.1 Reactivity	Not chemically reactive.
10.2 Chemical stability	Stable under normal ambient and anticipated conditions of use.
10.3 Possibility of hazardous reactions	Hazardous reactions not anticipated.
10.4 Conditions to avoid	Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.
10.5 Incompatible materials	Avoid contact with strong oxidizing agents and strong reducing agents.
10.6 Hazardous decomposition products	Not anticipated under normal conditions of use.

Section 11: Toxicological Information

11.1 Information on Toxicological Effects of Substance/Mixture

Substance / Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Expected to have a low degree of toxicity by inhalation		>5.2 mg/L (vapor)
Skin Absorption	Unlikely to be harmful		3.75 g/kg

Ingestion (Swallowing)	Unlikely to be harmful	14 g/kg

Aspiration Hazard: May be fatal if swallowed and enters airways.

Skin Corrosion/Irritation: Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Signs and Symptoms: Effects of overexposure can include slight irritation of the respiratory tract, nausea, vomiting, and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue). Continued exposure to high concentrations can result in vomiting, cardiac irregularities and sudden loss of consciousness.

Skin Sensitization: Not expected to be a skin sensitizer.

Respiratory Sensitization: Not expected to be a respiratory sensitizer.

Specific Target Organ Toxicity (Single Exposure): May cause drowsiness and dizziness.

Specific Target Organ Toxicity (Repeated Exposure): Not expected to cause organ effects from repeated exposure. Two year inhalation studies of wholly vaporized unleaded gasoline, and 90 days studies of various petroleum naphthas, did not produce significant target organ toxicity in laboratory animals. Nephropathy in male rats, characterized by the accumulation of alpha-2-u- globulin in epithelial cells of the proximal tubules was observed, however follow-up studies suggest that these changes are unique to the male rat.

Carcinogenicity: May cause cancer. Based on component information. Two year inhalation studies of vaporized unleaded gasoline produced an increased incidence of kidney tumors in male rats and liver tumors in female mice. Repeated skin application of various petroleum naphthas in mice for two years resulted in an increased incidence of skin tumors but only in the presence of severe skin irritation. Follow-up mechanistic studies suggest that the occurrence of these tumors may be the consequence of promotional processes and not relevant to human risk assessment. Epidemiology data collected from a study of more than 18,000 petroleum marketing and distribution workers showed no increased risk of leukemia, multiple myeloma, or kidney cancer from gasoline exposure. Unleaded gasoline has been identified as a possible carcinogen by the International Agency for Research on Cancer.

Germ Cell Mutagenicity: May cause genetic defects. Based on component information. Gasoline was negative in microbial mutagenicity and unscheduled DNA tests in rat hepatocytes. Gasoline did not induce chromosome aberrations in vivo in rat bone marrow cells and was negative in a mouse dominant lethal assay.

Reproductive Toxicity: Suspected of damaging the unborn child. Suspected of damaging fertility. Based on component information. No evidence of developmental toxicity was found in pregnant laboratory animals (rats and mice) exposed to high vapor concentrations of unleaded gasoline and petroleum naphthas via inhalation. A two-generation reproductive toxicity study of vapor recovery gasoline did not adversely affect reproductive function or offspring survival and development.

Other Comments: Gasoline engine exhaust has been classified by the International Agency for Research on Cancer (IARC) as possibly carcinogenic to human.

11.2 Information on Hazardous Components Toluene

Carcinogenicity: Exposure of rats and mice to toluene at concentrations ranging from 120-1200 ppm for two years did not demonstrate evidence of carcinogenicity. Toluene has not been listed as a carcinogen by IARC.

Target Organs: Epidemiology studies suggest that chronic occupational overexposure to toluene may damage color vision. Subchronic and chronic inhalation studies with toluene produced kidney and liver damage, hearing loss and central nervous system (brain) damage in laboratory animals. Intentional misuse by deliberate inhalation of high concentrations of toluene has been shown to cause liver, kidney, and central nervous system damage, including hearing loss and visual disturbances.

Reproductive Toxicity: Exposure to toluene during pregnancy has demonstrated limited evidence of developmental toxicity in laboratory animals. Decreased fetal body weight and increased skeletal variations in both inhalation and oral studies, but only at doses that were maternally toxic. No fetal toxicity was seen at doses that were not maternally toxic. Decreased sperm counts have been observed in male rats in the absence of a reduction in fertility. Toluene has been reported to cause mental or growth retardation in the children of solvent abusers who directly inhale toluene during pregnancy.

n-Hexane

Target Organs: Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone.

Reproductive Toxicity: Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Benzene

Carcinogenicity: Benzene is an animal carcinogen and is known to produce acute myelogenous leukemia (a form of cancer) in humans. Benzene has been identified as a human carcinogen by IARC, the US National Toxicology Program and the US-Occupational Safety and Health Administration.

Target Organs: Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

Reproductive Toxicity: Some studies in occupationally exposed women have suggested benzene exposure increased risk of miscarriage and stillbirth and decreased birth weight and gestational age. The size of the effects detected in these studies was small, and ascertainment of exposure and outcome in some cases relied on self-reports, which may limit the reliability of these results.

Germ Cell Mutagenicity: Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells. Exposure has also been associated with chromosomal aberrations in sperm cells in human and animal studies.

Section 12: Ecological Information

12.1 Toxicity

Acute aquatic toxicity studies on samples of gasoline and naphtha streams show acute toxicity values greater than 1 mg/L and mostly in the range 1-100 mg/L. These tests were carried out on water accommodated fractions, in closed systems to prevent evaporative loss. Results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon composition. These substances should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment. Classification: H411; Chronic Cat 2.

12.2 Persistence and degradability

The hydrocarbons in this material are not readily biodegradable but are regarded as inherently biodegradable since their hydrocarbon components can be degraded by microorganisms.

Persistence per IOPC Fund definition: Non-Persistent

12.3 Bioaccumulative potential

Log Kow values measured for the hydrocarbon components of this material range from 3 to greater than 6 and therefore are regarded as having the potential to bioaccumulate. In practice, metabolic processes or physical properties may prevent this effect or limit bioavailability.

12.4 Mobility in soil and environmental fate

On release to water, hydrocarbons will float on the surface and since they are sparingly soluble, the only significant loss is volatilization to air. In air, these hydrocarbons are photodegraded by reaction with hydroxyl radicals with half lives varying from 6.5 days for benzene to 0.5 days for n-dodecane.

12.5 Results of PBT and vPvB Assessment

Not a PBT or vPvB substance.

12.6 Other Adverse Effects

None anticipated.

Section 13: Disposal Considerations

13.1 Waste treatment methods

European Waste Code: 13 07 02* petrol

This material, if discarded as produced, would be considered as hazardous waste pursuant to Directive 91/689/EEC on hazardous waste, and subject to the provisions of that Directive unless Article 1(5) of that Directive applies.

This code has been assigned based upon the most common uses for this material and may not reflect contaminants resulting from actual use. Waste generators/producers are responsible for assessing the actual process used when generating the waste and its contaminants in order to assign the proper waste disposal code.

Disposal must be in accordance with Directive 2006/12/EC and other applicable national or regional provisions, and based upon material characteristics at time of disposal. For incineration of waste, follow Directive 2000/76/EC. For landfill of waste, follow Directive 1999/31/EC. Product is suitable for burning in an enclosed controlled burner for fuel value if >5000 BTU, or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Follow Directive 2000/76/EC.

Empty Containers: Container contents should be completely used and containers emptied prior to discard. Empty drums should be properly sealed and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with applicable regulations.

Section 14: Transport Information

14.1 UN number	UN1203
14.2 UN proper shipping name	GASOLINE or MOTOR SPIRIT or PETROL
14.3 Transport hazard class(es)	3
14.4 Packing group	II
14.5 Environmental hazards	Marine pollutant - Environmentally Hazardous
14.6 Special precautions for user	<i>If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.</i>
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable

Section 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EC 1272/2008 - Classification, labelling and packaging of substances and mixtures
EN166:2002 Eye Protection
EN 529:2005 Respiratory Protective devices
BS EN 374-1:2003 Protective gloves against chemicals and micro-organisms
Workplace Exposure Limits, EH40/2005, Control of Substances Hazardous to Health
Directive 91/689/EEC on hazardous waste (European Waste Codes)
Directive 2000/76/EC on incineration of waste
Directive 1999/31/EC on landfill of waste

Export Rating: NLR (No License Required)

15.2 Chemical Safety Assessment

A chemical safety assessment has been carried out for the substance/mixture.

Section 16: Other Information

Date of Issue:	08/23/2012
Status:	FINAL
Previous Issue Date:	06/13/2012
Revised Sections or Basis for Revision:	Composition (Section 3) Handling and Storage information (Section 7) Toxicological (Section 11)
Safety Data Sheet Number:	814647
Language:	English
List of Relevant Hazard Statements:	

H224: Extremely flammable liquid and vapour
H225: Highly flammable liquid and vapour
H304: May be fatal if swallowed and enters airways
H315: Causes skin irritation
H319: Causes serious eye irritation
H336: May cause drowsiness or dizziness
H340: May cause genetic defects
H350: May cause cancer
H361: Suspected of damaging fertility or the unborn child
H372: Causes damage to organs through prolonged or repeated exposure
H373: May cause damage to organs through prolonged or repeated exposure
H411: Toxic to aquatic life with long lasting effects

R11: Highly flammable
R12: Extremely flammable
R20: Harmful by inhalation
R23: Toxic by inhalation
R24: Toxic in contact with skin
R25: Toxic if swallowed
R36: Irritating to eyes
R38: Irritating to skin
R45: May cause cancer
R46: May cause heritable genetic damage
R48: Danger of serious damage to health by prolonged exposure
R62: Possible risk of impaired fertility
R63: Possible risk of harm to the unborn child
R65: Harmful: may cause lung damage if swallowed
R67: Vapors may cause drowsiness and dizziness
R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; ADR = Agreement on Dangerous Goods by Road; BMGV = Biological Monitoring Guidance Value; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit; EINECS = European Inventory of Existing Commercial Chemical Substances; EPA = [US] Environmental Protection Agency; Germany-TRGS = Technical Rules for Dangerous Substances; IARC = International Agency for Research on Cancer; ICAO/IATA = International Civil Aviation Organization / International Air Transport Association; INSHT = National Institute for Health and Safety at Work; IMDG = International Maritime Dangerous Goods; Ireland-HSA = Ireland's National Health and Safety Authority; LEL = Lower Explosive Limit; MARPOL = Marine Pollution; N/A = Not Applicable; N/D = Not Determined; NTP = [US] National Toxicology Program; PBT = Persistent, Bioaccumulative and Toxic; RID = Regulations Concerning the International Transport of Dangerous Goods by Rail; STEL = Short Term Exposure Limit; TLV = Threshold Limit Value; TRGS 903 = Technical rules for hazardous substances; TWA = Time Weighted Average; UEL = Upper Explosive Limit; UK-EH40 = United Kingdom EH40/2005 OEL; vPvB = very Persistent, very Bioaccumulative

Disclaimer of Expressed and implied Warranties:

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Exposure Scenario Annex

Unleaded Gasoline

1. Manufacture of substance - Industrial

Section 1 Exposure Scenario	
Low Boiling Point Naphthas Gasoline	
Title	
Manufacture of substance	
Use Descriptor	
Sector(s) of Use	3, 8, 9
Process Category(ies)	1, 2, 3, 8a, 8b, 15
Environmental Release Category(ies)	1, 4
Specific Environmental Release Category	ESVOC SpERC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance or use as a process chemical or extraction agent within closed or contained systems. Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Operation is carried out at elevated temperature (>20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.

General exposures (closed systems) With sample collection	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Wear suitable gloves tested to EN374.
General exposures (closed systems)	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Wear suitable gloves tested to EN374.
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.
Bulk transfers	Ensure material transfers are under containment or extract ventilation. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clear spills immediately. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Avoid carrying out activities involving exposure for more than 1 hour. Ensure operation is undertaken outdoors.
Storage	Wear suitable gloves tested to EN374. Store substance within a closed system.
Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified R45 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.87e7
Fraction of regional tonnage used locally	0.03
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.05
Release fraction to wastewater from process (initial release prior to RMM)	0.003
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Prevent discharge of undissolved substance to or recover from onsite wastewater. Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation). Onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	99.0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	95.2
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	80.4

Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	95.5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	99.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (kg/d):	2.0e6
Assumed domestic sewage treatment plant flow (m ³ /d):	10000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file – “Site-Specific Production” worksheet. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required.	

2. Use of substance as an intermediate - Industrial

Section 1 Exposure Scenario	
Low Boiling Point Naphthas Gasoline	
Title	
Use as an intermediate	
Use Descriptor	
Sector(s) of Use	3, 8, 9
Process Category(ies)	1, 2, 3, 8a, 8b, 15
Environmental Release Category(ies)	6a
Specific Environmental Release Category	ESVOC SpERC 6.1a.v1
Processes, tasks, activities covered	
Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting exposure	Operation is carried out at elevated temperature (>20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
Remanufacture of reject articles	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
General exposures (closed systems) With sample collection	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Wear suitable gloves tested to EN374.
General exposures (closed systems)	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Wear suitable gloves tested to EN374.
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.
Bulk transfers	Ensure material transfers are under containment or extract ventilation. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clear spills immediately. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Avoid carrying out activities involving exposure for more than 1 hour. Ensure operation is undertaken outdoors.
Storage	Wear suitable gloves tested to EN374. Store substance within a closed system.

Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified R45 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect.

2.2 Control of environmental exposure

Product Characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.21e6
Fraction of regional tonnage used locally	0.0068

Frequency and duration of use

Continuous release.

Emission days (days/year)	300

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.025
Release fraction to wastewater from process (initial release prior to RMM)	0.003
Release fraction to soil from process (initial release prior to RMM)	0.001

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Prevent discharge of undissolved substance to or recover from onsite wastewater. Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	92.9
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0

Organisation measures to prevent/limit release from site

Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment (%):	95.5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95.5
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	7.8e4
Assumed domestic sewage treatment plant flow (m³/d):	2000

Conditions and measures related to external treatment of waste for disposal

This substance is consumed during use and no waste of the substance is generated.

Conditions and measures related to external recovery of waste

This substance is consumed during use and no waste of the substance is generated.

Section 3 Exposure Estimation

3.1 Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

3.2 Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Section 4 Guidance to check compliance with the Exposure Scenario

4.1 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.
4.2 Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

3. Distribution of substance - Industrial

Section 1 Exposure Scenario	
Low Boiling Point Naphthas Gasoline	
Title	
Distribution of substance	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 8a, 8b, 15
Environmental Release Category(ies)	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	ESVOC SpERC 1.1b.v1
Processes, tasks, activities covered	
Bulk loading (including marine vessel/barge, rail/road car and IBC loading) of substance within closed or contained systems, including incidental exposures during its sampling, storage, unloading, maintenance and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
General exposures (closed systems) With sample collection	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Wear suitable gloves tested to EN374.
General exposures (closed systems)	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Wear suitable gloves tested to EN374.
Process sampling	Sample via a closed loop or other system to avoid exposure. Wear suitable gloves tested to EN374.
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.
Bulk closed loading	Ensure material transfers are under containment or extract ventilation. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Bulk closed loading and unloading	Ensure material transfers are under containment or extract ventilation. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clear spills immediately. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Avoid carrying out activities involving exposure for more than 1 hour. Ensure operation is undertaken outdoors.
Storage	Wear suitable gloves tested to EN374. Store substance within a closed system.

Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified R45 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect.

2.2 Control of environmental exposure

Product Characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.87e7
Fraction of regional tonnage used locally	0.002

Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.001
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation). If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	12
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils	
Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	95.5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95.5
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	1.1e6
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

4. Formulation & (Re)packing of substance - Industrial

Section 1 Exposure Scenario

Low Boiling Point Naphthas Gasoline

Title	
Formulation & (re)packing of substances and mixtures	
Use Descriptor	
Sector(s) of Use	3, 10
Process Category(ies)	1, 2, 3, 8a, 8b, 15
Environmental Release Category(ies)	2
Specific Environmental Release Category	ESVOC SpERC 2.2.v1
Processes, tasks, activities covered	
Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
General exposures (closed systems) With sample collection	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Wear suitable gloves tested to EN374.
General exposures (closed systems)	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Wear suitable gloves tested to EN374.
Storage	Wear suitable gloves tested to EN374. Store substance within a closed system.
Process sampling	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Wear suitable gloves tested to EN374.
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.

Bulk transfers	Ensure material transfers are under containment or extract ventilation. Wear suitable gloves tested to EN374.
Drum/batch transfers	Ensure material transfers are under containment or extract ventilation. Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clear spills immediately. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Avoid carrying out activities involving exposure for more than 1 hour. Ensure operation is undertaken outdoors.
Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified R45 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.65e7
Fraction of regional tonnage used locally	0.0018
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.025
Release fraction to wastewater from process (initial release prior to RMM)	0.002
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Prevent discharge of undissolved substance to or recover from onsite wastewater. Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation). If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	56.5
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	94.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	95.5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95.5

Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	1.0e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

5. Use of substance as a Fuel - Industrial

Section 1 Exposure Scenario	
Low Boiling Point Naphthas Gasoline	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 8a, 8b, 16
Environmental Release Category(ies)	7
Specific Environmental Release Category	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
Bulk closed unloading	Ensure material transfers are under containment or extract ventilation.
Drum/batch transfers	Ensure material transfers are under containment or extract ventilation.
Refuelling	Ensure material transfers are under containment or extract ventilation.
Refuelling aircraft	Ensure material transfers are under containment or extract ventilation.
General exposures (closed systems)	Handle substance within a closed system. Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.
Use as a fuel (closed systems)	Handle substance within a closed system.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clear spills immediately. Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system. Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.
Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified R45 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect.	
2.2 Control of environmental exposure	

Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.4e6
Fraction of regional tonnage used locally	1
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.0025
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation). If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	99.4
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	76.9
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	95.5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95.5
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	4.6e6
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

6. Use of substance as a Fuel - Professional

Section 1 Exposure Scenario	
Low Boiling Point Naphthas Gasoline	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of Use	22
Process Category(ies)	1, 2, 3, 8a, 8b, 16
Environmental Release Category(ies)	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
General exposures (closed systems) Outdoor	Handle substance within a closed system.
Bulk closed unloading	Ensure material transfers are under containment or extract ventilation.

Drum/batch transfers	Ensure material transfers are under containment or extract ventilation.
Refuelling	Ensure material transfers are under containment or extract ventilation.
Use as a fuel (closed systems)	Handle substance within a closed system.
Equipment maintenance	Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clear spills immediately. Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan. Ensure operatives are trained to minimise exposures.
Storage	Store substance within a closed system. Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.

Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified R45 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect.

2.2 Control of environmental exposure

Product Characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.19e6
Fraction of regional tonnage used locally	0.0005

Frequency and duration of use

Continuous release.

Emission days (days/year)	365

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.01
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0.00001

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation). If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Treat air emission to provide a typical removal efficiency of (%):	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	3.4
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0

Organisation measures to prevent/limit release from site

Do not apply industrial sludge to natural soils
Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	95.5
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95.5
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	1.5e4
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls	
Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

7. Use of substance as a Fuel - Consumer

Section 1 Exposure Scenario	
Low Boiling Point Naphthas Gasoline	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of Use	21
Product Category(ies)	13
Environmental Release Category(ies)	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12c.v1
Processes, tasks, activities covered	
Covers consumer uses of automotive fuels only.	
Section 2 Operational conditions and risk management measures	
2.1 Control of consumer exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	For each use event, covers use amounts up to (g): 37500. Covers skin contact area up to (cm²): 420.
Frequency and duration of use	Covers use up to (times/day of use): 0.143 Covers exposure up to (hours/event): 2
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

Liquid: Automotive Refuelling	Covers concentrations up to (%): 1%. Covers use up to (days/year): 52. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm ²): 210. For each use event, covers use amounts up to (g): 37500. Covers outdoor use. Covers use in room size of (m ³): 100. Covers exposure up to (hours/event): 0.05. No specific risk management measure identified beyond those operational conditions stated.
Liquid Scooter Refuelling	Covers concentrations up to (%): 1%. Covers use up to (days/year): 52. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm ²): 210.00. For each use event, covers use amounts up to (g): 37500. Covers outdoor use. Covers use in room size of (m ³): 100. Covers exposure up to (hours/event): 0.03. No specific risk management measure identified beyond those operational conditions stated.
Liquid Garden Equipment - Use	Covers concentrations up to (%): 1%. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. For each use event, covers use amounts up to (g): 750. Covers outdoor use. Covers use in room size of (m ³): 100. Covers exposure up to (hours/event): 2. No specific risk management measure identified beyond those operational conditions stated.
Liquid: Garden Equipment - Refueling	Covers concentrations up to (%): 1%. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm ²): 420. For each use event, covers use amounts up to (g): 750. Covers use in a one car garage (34 m ³) under typical ventilation. Covers use in room size of (m ³): 34. Covers exposure up to (hours/event): 0.03. No specific risk management measure identified beyond those operational conditions stated.

Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified R45 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect.

2.2 Control of environmental exposure

Product Characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.39e7
Fraction of regional tonnage used locally	0.0005

Frequency and duration of use

Continuous release.

Emission days (days/year)	365

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.01
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0.00001

Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	95.5
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	1.8e5
Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of ECETOC report #107 and the Chapter R15 of the IR&CSA TGD. Where exposure determinants differ to these sources, then they are indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

Safety Data Sheet

According to EC 1907/2006



Section 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Name: Auto Diesel / DERV
Safety Data Sheet Number: 814648
MARPOL Annex I Category: Gas Oils, Including Ship's Bunkers
REACH Registration Number: 01-2119484664-27-0004

1.2 Relevant identified uses of the substance or mixture and uses advised against

Intended Use: Fuel
Uses Advised Against: Uses other than those covered by the exposure scenarios appended to this Safety Data Sheet are not supported.

1.3 Details of the supplier of the substance or mixture

Manufacturer: Phillips 66 Ltd, Humber Refinery
South Killingholme, North Lincolnshire DN40 3DW
Customer Service: +44 (0)1469 571571
SDS Information: URL: www.Phillips66.com
Email: ESDS@P66.com

1.4 Emergency telephone number

+44 (0)1469 555348 (24 Hours)

Section 2: Hazards Identification

2.1 Classification of the substance or mixture

CLP Classification (EC No 1272/2008)

H226 -- Flammable liquids -- Category 3
H304 -- Aspiration Hazard -- Category 1
H315 -- Skin corrosion/irritation -- Category 2
H332 -- Acute toxicity, Inhalation -- Category 4
H350 -- Carcinogenicity -- Category 1B
H373 -- Specific target organ toxicity (repeated exposure) -- Category 2
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2

Superseded DSD Classification (67/548/EEC and 1999/45/EC):

R10, Xn;R20, Xi;R38, Carc. Cat. 2;R45, Xn;R48/21, Xn;R65, N;R51/53

2.2 Label Elements



DANGER

H226: Flammable liquid and vapor.

H351: Suspected of causing cancer
H332: Harmful if inhaled
H304: May be fatal if swallowed and enters airways
H315: Causes skin irritation
H373: May cause damage to organs through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

P201: Obtain special instructions before use
P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P260: Do not breathe dust/fume/gas/mist/vapours/spray
P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P331: Do NOT induce vomiting
P501: Dispose of contents/container to approved disposal facility.

2.3 Other hazards

Does not meet the criteria for persistent, bioaccumulative and toxic (PBT) or very persistent, very bioaccumulative (vPvB) substances.

Section 3: Composition / Information on Ingredients

3.2 Mixture

Component	CASRN	EINECS	REACH Registration No.	Concentration ¹	CLP Classification ²	DSD Classification ³
Fuels, diesel	68334-30-5	269-822-7	Not applicable	90-100	H351	Carc.Cat.3; R40
Fatty acids, vegetable-oil, Me esters	68990-52-3	273-606-8	Not applicable	0-10	-	-
Fatty acids, tallow, Me esters	61788-61-2	262-989-7	Not applicable	0-10	-	-
Naphthalene	91-20-3	202-049-5	Not applicable	<1	H351, H302, H410	Xn; R22 Carc.Cat.3; R40 N; R50-53

¹ All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

² Regulation EC 1272/2008.

³ Superseded Directives 67/548/EEC and 1999/45/EC.

Total Sulfur: < 0.1

Section 4: First Aid Measures

4.1 Description of first aid measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician. (see Note to Physician)

Inhalation (Breathing): If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

4.2 Most important symptoms and effects

Acute: Minor respiratory irritation at high vapor concentrations.

Delayed: Dry skin and possible irritation with repeated or prolonged exposure.

4.3 Indication of immediate medical attention and special treatment needed

Notes to Physician: When using high-pressure equipment, injection of product under the skin can occur. In this case, the casualty should be sent immediately to hospital. Do not wait for symptoms to develop. High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. These injuries often require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury. Early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Section 5: Fire-Fighting Measures

5.1 Extinguishing media

Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

5.2 Special hazards arising from the substance or mixture

Unusual Fire & Explosion Hazards: Flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of nitrogen and sulfur may also be formed.

5.3 Special protective actions for firefighters

For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Avoid spreading burning liquid with water used for cooling purposes. Cool equipment exposed to fire with water, if it can be done safely.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

6.2 Environmental precautions

Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard.

6.3 Methods and material for containment and cleaning up

Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

Section 7: Handling and Storage

7.1 Precautions for safe handling

Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Nonsparking tools should be used. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/clothing and eye/face protection. Do not breathe vapors or mists. Use only outdoors or in well-ventilated area. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Open container slowly to relieve any pressure. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes for specific bonding/grounding requirements). Do not enter confined spaces such as tanks or pits without following proper entry procedures. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

For use as a motor fuel only. Do not use as a solvent due to its flammable and potentially toxic properties. Siphoning by mouth can result in lung aspiration which can be harmful or fatal.

The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of incomplete combustion products (e.g. carbon monoxide, oxides of sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels.

Diesel engine exhaust contains hazardous combustion products and has been classified as a probable cancer hazard in humans.

High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus or from pinhole leaks in tubing of high pressure hydraulic oil equipment.

7.2 Conditions for safe storage, including any incompatibilities

Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to appropriate guidance pertaining to cleaning, repairing, welding, or other contemplated operations. Outdoor or detached storage is preferred. Indoor storage should meet Country or Committee standards and appropriate fire codes.

7.3 Specific end use(s)

Refer to supplemental exposure scenarios if attached.

Section 8: Exposure Controls / Personal Protection

8.1 Control parameters

Occupational Exposure Limits			
Component	ACGIH	UK-EH40	Other
Fuels, diesel	TWA: 100 mg/m ³ Skin	---	---
Fatty acids, vegetable-oil, Me esters	---	---	---
Fatty acids, tallow, Me esters	---	---	---
Naphthalene	STEL: 15 ppm TWA: 10 ppm 2 ppm TWA; skin; A3 - confirmed animal carcinogen with unknown relevance to humans; TLV basis: upper respiratory tract irritation Skin	---	TWA: 0.2 mg/m ³ (as total of 17 PNAs measured by NIOSH Method 5506) (Phillips 66 Guidelines)

STEL = Short Term Exposure Limit (15 minutes); TWA = Time Weighted Average (8 hours); --- = No Occupational Exposure Limit

Biological Limit Values			
Component	ACGIH	EU 98/24/EC	UK-EH40
Fuels, diesel	---	---	---
Fatty acids, vegetable-oil, Me esters	---	---	---
Fatty acids, tallow, Me esters	---	---	---
Naphthalene	---	---	---

--- = No Biological Limit Value

Relevant DNEL and PNEC:

Worker Derived No-Effect Level (DNEL)

Inhalation: 68.3 mg/m³/day

Dermal: 2.9 mg/kgbw/day

Consumer Derived No-Effect Level (DNEL)

Inhalation: 61.2 mg/m³/day

Dermal: 1.3 mg/kgbw/day

Ingestion: Not applicable

Environmental Predicted No-Effect Concentration (PNEC): Not applicable

8.2 Exposure controls

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds EN 166 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, close fitting eye protection and a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled that comply with EN 374 is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit an approved air purifying respirator equipped with Type A, organic gases and vapour filters (as specified by the manufacturer) may be used.

A respiratory protection program that follows recommendations for the selection, use, care and maintenance of respiratory protective devices in EN 529:2005 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health.

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Environmental Exposure Controls: Refer to Sections 6, 7, 12 and 13.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Data represent typical values and are not intended to be specifications. N/A = Not Applicable; N/D = Not Determined

Appearance:	Clear straw colored
Physical Form:	Liquid
Odor:	Diesel fuel
Odour Threshold:	N/D
pH:	N/A
Melting/Freezing Point:	N/D
Initial Boiling Point/Range:	165 - 375 °C
Flash Point:	> 55 °C; (Closed Cup)
Evaporation Rate (nBuAc=1):	N/D
Flammability (solid, gas):	Flammable
Upper Explosive Limits (vol % in air):	6.0
Lower Explosive Limits (vol % in air):	0.5
Vapour Pressure:	<0.3 kPa @20°C
Relative Vapour Density (air=1):	>1
Relative Density (water=1):	0.82-0.845 @ 15°C
Solubility (ies):	Solubility in water: Negligible @20°C
Partition Coefficient (n-octanol/water) (Kow):	N/D
Auto-ignition Temperature:	250-270 °C
Decomposition Temperature:	N/D
Viscosity:	4.8 mm ² /s @ 20°C; 2-4.5 mm ² /s @ 40°C
Explosive Properties:	N/A
Oxidising Properties:	N/A

9.2 Other Information

Pour Point:	-24 °C

Section 10: Stability and Reactivity

10.1 Reactivity	Not chemically reactive.
10.2 Chemical stability	Stable under normal ambient and anticipated conditions of use.
10.3 Possibility of hazardous reactions	Hazardous reactions not anticipated.
10.4 Conditions to avoid	Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

10.5 Incompatible materials

Avoid contact with strong oxidizing agents and strong reducing agents.

10.6 Hazardous decomposition products

Not anticipated under normal conditions of use.

Section 11: Toxicological Information

11.1 Information on Toxicological Effects of Substance/Mixture

Substance / Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Harmful if inhaled		4.65 mg/L (mist)
Skin Absorption	Unlikely to be harmful		>4.1 g/kg
Ingestion (Swallowing)	Unlikely to be harmful		> 5 g/kg

Aspiration Hazard: May be fatal if swallowed and enters airways.

Skin Corrosion/Irritation: Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Signs and Symptoms: While significant vapor concentrations are not likely, high concentrations can cause minor respiratory irritation, headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Ingestion can cause irritation of the digestive tract, nausea, diarrhea, and vomiting.

Skin Sensitization: No information available. Not expected to be a skin sensitizer.

Respiratory Sensitization: No information available.

Specific Target Organ Toxicity (Single Exposure): Not expected to cause organ effects from single exposure.

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or repeated exposure. Repeated dermal application of petroleum gas oils for 90 days resulted in decreased liver, thymus, and spleen weights, and altered bone marrow function. Microscopic alterations included liver hypertrophy and necrosis, decreased hematopoiesis and lymphocyte depletion.

Carcinogenicity: May cause cancer. Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation.

Germ Cell Mutagenicity: Not expected to cause heritable genetic effects.

Reproductive Toxicity: Not expected to cause reproductive toxicity.

11.2 Information on Hazardous Components

Naphthalene

Carcinogenicity: Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The US National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

Section 12: Ecological Information

12.1 Toxicity

Experimental studies of gas oils show that acute aquatic toxicity values are typically in the range 2-20 mg/L. These values are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions. They should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment. Classification: H411; Chronic Cat 2.

12.2 Persistence and degradability

Gas oils are complex combinations of individual hydrocarbon species. Based on the known or expected properties of individual constituents, category members are not predicted to be readily biodegradable. Some hydrocarbon constituents of gas oils are predicted to meet the criteria for persistence; on the other hand, some components can be easily degraded by microorganisms under aerobic conditions.

Persistence per IOPC Fund definition: Non-Persistent

12.3 Bioaccumulative potential

Gas oil components have measured or calculated Log Kow values in the range of 3.9 to 6 which indicates a high potential to bioaccumulate. Lower molecular weight compounds are readily metabolized and the actual bioaccumulation potential of higher molecular weight compounds is limited by the low water solubility and large molecular size.

12.4 Mobility in soil and environmental fate

Releases to water will result in a hydrocarbon film floating and spreading on the surface. For the lighter components, volatilization is an important loss process and reduces the hazard to aquatic organisms. In air, the hydrocarbon vapors react readily with hydroxyl radicals with half-lives of less than one day. Photooxidation on the water surface is also a significant loss process particularly for polycyclic aromatic compounds. In water, the majority of components will be adsorbed on sediment. Adsorption is the most predominant physical process on release to soil. Adsorbed hydrocarbons will slowly degrade in both water and soil.

12.5 Results of PBT and vPvB Assessment

Not a PBT or vPvB substance.

12.6 Other Adverse Effects

None anticipated.

Section 13: Disposal Considerations

13.1 Waste treatment methods

European Waste Code: 13 07 01* fuel oil and diesel

This material, if discarded as produced, would be considered as hazardous waste pursuant to Directive 91/689/EEC on hazardous waste, and subject to the provisions of that Directive unless Article 1(5) of that Directive applies. This code has been assigned based upon the most common uses for this material and may not reflect contaminants resulting from actual use. Waste generators/producers are responsible for assessing the actual process used when generating the waste and its contaminants in order to assign the proper waste disposal code.

Disposal must be in accordance with Directive 2006/12/EC and other applicable national or regional provisions, and based upon material characteristics at time of disposal. For incineration of waste, follow Directive 2000/76/EC. For landfill of waste, follow Directive 1999/31/EC. Product is suitable for burning in an enclosed controlled burner for fuel value if >5000 BTU, or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Follow Directive 2000/76/EC.

Empty Containers: Container contents should be completely used and containers emptied prior to discard. Empty drums should be properly sealed and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with applicable regulations.

Section 14: Transport Information

14.1 UN number	UN1202
14.2 UN proper shipping name	DIESEL FUEL <i>or</i> GASOIL <i>or</i> HEATING OIL, LIGHT
14.3 Transport hazard class(es)	3
14.4 Packing group	III

14.5 Environmental hazards	Marine pollutant - Environmentally Hazardous
14.6 Special precautions for user	<i>If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.</i>
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable

Section 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EC 1272/2008 - Classification, labelling and packaging of substances and mixtures
EN166:2002 Eye Protection
EN 529:2005 Respiratory Protective devices
BS EN 374-1:2003 Protective gloves against chemicals and micro-organisms
Workplace Exposure Limits, EH40/2005, Control of Substances Hazardous to Health
Directive 91/689/EEC on hazardous waste (European Waste Codes)
Directive 2000/76/EC on incineration of waste
Directive 1999/31/EC on landfill of waste

Export Rating: NLR (No License Required)

15.2 Chemical Safety Assessment

A chemical safety assessment has been carried out for the substance/mixture.

Section 16: Other Information

Date of Issue:	09/22/2011
Status:	FINAL
Previous Issue Date:	05/23/2011
Revised Sections or Basis for Revision:	Manufacturer (Section 1)
Safety Data Sheet Number:	814648
Language:	English

List of Relevant Hazard Statements:

H226: Flammable liquid and vapour
H302: Harmful if swallowed
H304: May be fatal if swallowed and enters airways
H315: Causes skin irritation
H332: Harmful if inhaled
H351: Suspected of causing cancer
H373: May cause damage to organs through prolonged or repeated exposure
H410: Very toxic to aquatic life with long lasting effects
H411: Toxic to aquatic life with long lasting effects

R10: Flammable
R20: Harmful by inhalation
R22: Harmful if swallowed
R38: Irritating to skin
R40: Limited evidence of a carcinogenic effect
R48/21: Harmful: danger of serious damage to health by prolonged exposure in contact with skin
R65: Harmful: may cause lung damage if swallowed
R66: Repeated exposure may cause skin dryness or cracking
R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; ADR = Agreement on Dangerous Goods by Road; BMGV = Biological Monitoring Guidance Value; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit; EINECS = European Inventory of Existing Commercial Chemical Substances; EPA = [US] Environmental Protection Agency; Germany-TRGS = Technical Rules for Dangerous Substances; IARC = International Agency for Research on Cancer; ICAO/IATA = International Civil Aviation Organization / International Air Transport Association; INSHT = National Institute for Health and Safety at Work; IMDG = International Maritime Dangerous Goods; Ireland-HSA = Ireland's National Health and Safety Authority; LEL = Lower Explosive Limit; MARPOL = Marine Pollution; N/A = Not Applicable; N/D = Not Determined; NTP = [US] National Toxicology Program; PBT = Persistent, Bioaccumulative and Toxic; RID = Regulations Concerning the International Transport of Dangerous Goods by Rail; STEL = Short Term Exposure Limit; TLV = Threshold Limit Value; TRGS 903 = Technical rules for hazardous substances; TWA = Time Weighted Average; UEL = Upper Explosive Limit; UK-EH40 = United Kingdom EH40/2005 OEL; vPvB = very Persistent, very Bioaccumulative

Disclaimer of Expressed and implied Warranties:

The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.



Exposure Scenario Annex

Auto Diesel / DERV

1. Manufacture of substance - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Manufacture of substance	
Use Descriptor	
Sector(s) of Use	3, 8, 9
Process Category(ies)	1, 2, 3, 4, 8a, 8b, 15
Environmental Release Category(ies)	1, 4
Specific Environmental Release Category	ESVOC SpERC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Operation is carried out at elevated temperature (>20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Bulk closed loading and unloading	Handle substance within a closed system. Wear suitable gloves tested to EN374.

Bulk open loading and unloading	Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Laboratory activities	No other specific measures identified.
Bulk product storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.8e7
Fraction of regional tonnage used locally	0.021
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-5
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	90.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	3.3e6
Assumed domestic sewage treatment plant flow (m³/d):	10000
Conditions and measures related to external treatment of waste for disposal	

During manufacturing no waste of the substance is generated.
Conditions and measures related to external recovery of waste
During manufacturing no waste of the substance is generated.
Section 3 Exposure Estimation
3.1 Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
3.2 Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.
Section 4 Guidance to check compliance with the Exposure Scenario
4.1 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.
4.2 Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file – “Site-Specific Production” worksheet.

2. Use of substance as an intermediate - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as an intermediate	
Use Descriptor	
Sector(s) of Use	3, 8, 9
Process Category(ies)	1, 2, 3, 4, 8a, 8b, 15
Environmental Release Category(ies)	6a
Specific Environmental Release Category	ESVOC SpERC 6.1a.v1
Processes, tasks, activities covered	
Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Operation is carried out at elevated temperature (>20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Bulk closed loading and unloading	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Bulk open loading and unloading	Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance	No other specific measures identified.
Laboratory activities	No other specific measures identified.
Bulk product storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	3.5e5
Fraction of regional tonnage used locally	0.043
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-5
Release fraction to soil from process (initial release prior to RMM)	0.001

Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	51.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater	
Do not apply industrial sludge to natural soils	
Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	4.1e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
This substance is consumed during use and no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

3. Distribution of substance - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Distribution of substance	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 4, 8a, 8b, 9, 15
Environmental Release Category(ies)	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	ESVOC SpERC 1.1b.v1
Processes, tasks, activities covered	
Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.	

Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Laboratory activities	No other specific measures identified.
Bulk closed loading and unloading	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Bulk open loading and unloading	Wear suitable gloves tested to EN374.
Drum and small package filling	Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	

Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.8e7
Fraction of regional tonnage used locally	0.002
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	1.0e-6
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	9.6
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (kg/d):	4.1e5
Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	
This substance is consumed during use and no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

4. Formulation & (Re)packing of substance - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Formulation & (re)packing of substances and mixtures	
Use Descriptor	
Sector(s) of Use	3, 10
Process Category(ies)	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15
Environmental Release Category(ies)	2
Specific Environmental Release Category	ESVOC SpERC 2.2.v1
Processes, tasks, activities covered	
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Drum/batch transfers	Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Bulk transfers	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Mixing operations (open systems)	Provide extract ventilation to points where emissions occur. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Production or preparation or articles by tableting, compression, extrusion or pelletisation	Wear suitable gloves tested to EN374.
Drum/batch transfers	Wear suitable gloves tested to EN374.
Laboratory activities	No other specific measures identified.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear suitable gloves tested to EN374.
Storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.8e7
Fraction of regional tonnage used locally	0.0011
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	2.0e-5
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	60.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	91.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	6.8e5
Assumed domestic sewage treatment plant flow (m³/d):	2000

Conditions and measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste
External recovery and recycling of waste should comply with applicable local and/or national regulations.
Section 3 Exposure Estimation
3.1 Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
3.2 Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.
Section 4 Guidance to check compliance with the Exposure Scenario
4.1 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.
4.2 Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

5. Use of substance in Metal working fluids / rolling oils - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Metal working fluids / rolling oils	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 17
Environmental Release Category(ies)	4
Specific Environmental Release Category	ESVOC SpERC 4.7a.v1
Processes, tasks, activities covered	
Covers the use in formulated MWFs/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	Handle substance within a closed system.
General exposures (open systems)	Provide extract ventilation to points where emissions occur.
Bulk transfers	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Filling / preparation of equipment from drums or containers	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Metal machining operations	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.
Treatment by dipping and pouring	Wear suitable gloves tested to EN374.
Spraying	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear suitable gloves (tested to EN374), coverall and eye protection.
Manual Roller, spreader, flow application	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Automated metal rolling/forming	Handle substance within a predominantly closed system provided with extract ventilation.
Semi-automated metal rolling/forming	Provide extract ventilation to points where emissions occur.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	

Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.0e4
Fraction of regional tonnage used locally	0.01
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.02
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-6
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	70
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency $\geq$ (%):	8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq$ (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater	
Do not apply industrial sludge to natural soils	
Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	7.8e4
Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

6. Use of substance as Release agents or binders - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as binders and release agents	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 4, 6, 7, 8b, 10, 13, 14
Environmental Release Category(ies)	4
Specific Environmental Release Category	ESVOC SpERC 4.10a.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting, and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Bulk transfers	Handle substance within a closed system.
Drum/batch transfers	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Mixing operations (closed systems)	No other specific measures identified.

Mixing operations (open systems)	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Mold forming	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Casting operations (open systems)	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Wear suitable gloves tested to EN374.
Machine Spraying	Minimise exposure by extracted full enclosure for the operation or equipment. Wear suitable gloves tested to EN374.
Manual Spraying	Wear a full face respirator conforming to EN140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN374), coverall and eye protection. Ensure operatives are trained to minimise exposures.
Manual Roller, spreader, flow application	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.4e4
Fraction of regional tonnage used locally	0.18
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	100
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-7
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	59.2
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0

Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater	
Do not apply industrial sludge to natural soils	
Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	1.7e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

7. Use of substance as Release agents or binders - Professional

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as binders and release agents	
Use Descriptor	
Sector(s) of Use	22
Process Category(ies)	1, 2, 3, 4, 6, 8a, 8b, 10, 11, 14
Environmental Release Category(ies)	8a, 8d
Specific Environmental Release Category	ESVOC SpERC 8.10b.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Material transfers (closed systems)	No other specific measures identified.
Drum/batch transfers	Wear suitable gloves tested to EN374.
Mixing operations (closed systems)	No other specific measures identified.
Mixing operations (open systems)	Wear suitable gloves tested to EN374.
Mold forming	Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN374.
Casting operations With local exhaust ventilation	Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN374.
Casting operations Without local exhaust ventilation	Wear a respirator conforming to EN140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN374), coverall and eye protection.
Spraying Manual Without local exhaust ventilation	Carry out in a vented booth or extracted enclosure. Wear suitable gloves (tested to EN374), coverall and eye protection. Ensure operatives are trained to minimise exposures.
Spraying Manual Without local exhaust ventilation	Wear a full face respirator conforming to EN140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN374), coverall and eye protection. Ensure operatives are trained to minimise exposures.
Manual Roller, spreader, flow application	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.

Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.

2.2 Control of environmental exposure

Product Characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.9e3
Fraction of regional tonnage used locally	0.0005

Frequency and duration of use

Continuous release.

Emission days (days/year)	365

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.95
Release fraction to wastewater from process (initial release prior to RMM)	0.025
Release fraction to soil from process (initial release prior to RMM)	0.025

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Treat air emission to provide a typical removal efficiency of (%):	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0

Organisation measures to prevent/limit release from site

Do not apply industrial sludge to natural soils
Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	6.2e1
Assumed domestic sewage treatment plant flow (m³/d):	2000

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations.

Section 3 Exposure Estimation

3.1 Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

3.2 Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

8. Use of substance as a Fuel - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 8a, 8b, 16
Environmental Release Category(ies)	7
Specific Environmental Release Category	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Bulk transfers	Wear suitable gloves tested to EN374.
Drum/batch transfers	Wear suitable gloves tested to EN374.
Use as a fuel (closed systems)	No other specific measures identified.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	4.5e6
Fraction of regional tonnage used locally	0.34
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	5.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	97.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	60.4
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater	
Do not apply industrial sludge to natural soils	
Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	97.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	5.5e6
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

9. Use of substance as a Fuel - Professional

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of Use	22
Process Category(ies)	1, 2, 3, 8a, 8b, 16
Environmental Release Category(ies)	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Bulk transfers	Wear suitable gloves tested to EN374.
Drum/batch transfers	Use drum pumps or carefully pour from container. Wear suitable gloves tested to EN374.
Refuelling	Wear suitable gloves tested to EN374.
Use as a fuel (closed systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	6.7e6
Fraction of regional tonnage used locally	0.0005
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-4
Release fraction to wastewater from process (initial release prior to RMM)	0.00001

Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater	
Do not apply industrial sludge to natural soils	
Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	1.4e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls	
Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

10. Use of substance as a Fuel - Consumer

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of Use	21
Product Category(ies)	13
Environmental Release Category(ies)	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12c.v1
Processes, tasks, activities covered	
Covers consumer uses in liquid fuels.	

Section 2 Operational conditions and risk management measures	
2.1 Control of consumer exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 Pa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	For each use event, covers use amounts up to (g): 37500 Covers skin contact area up to (cm ²): 420
Other operational conditions affecting exposure	Covers use up to (times/day of use): 0.143 Covers exposure up to (hours/event): 2 hours per event
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
Liquid: Automotive Refuelling	Covers concentrations up to (%): 100%. Covers use up to (days/year): 52. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm ²): 210.00. For each use event, covers use amounts up to (g): 37500. Covers use in room size of (m ³): 100. Covers exposure up to (hours/event): 0.05. Covers outdoor use. No specific risk management measure identified beyond those operational conditions stated.
Liquid Garden Equipment - Use	Covers concentrations up to (%): 100%. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. For each use event, covers use amounts up to (g): 750. Covers outdoor use. Covers use in room size of (m ³): 100. Covers exposure up to (hours/event): 2.00. No specific risk management measure identified beyond those operational conditions stated.
Liquid: Garden Equipment - Refueling	Covers concentrations up to (%): 100%. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm ²): 420.00. For each use event, covers use amounts up to (g): 750. Covers use in a one car garage (34 m ³) under typical ventilation. Covers use in room size of (m ³): 34. Covers exposure up to (hours/event): 0.03. No specific risk management measure identified beyond those operational conditions stated.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.6e7
Fraction of regional tonnage used locally	0.0005
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	365
Environmental factors not influenced by risk management	

Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	3.5e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of ECETOC report #107 and the Chapter R15 of the IR&CSA TGD. Where exposure determinants differ to these sources, then they are indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

Safety Data Sheet

According to EC 1907/2006



Section 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Name: **Kerosene**
Safety Data Sheet Number: **815841**
MARPOL Annex I Category: Kerosenes
REACH Registration Number: 01-2119485517-27-0005

1.2 Relevant identified uses of the substance or mixture and uses advised against

Intended Use: Fuel
Uses Advised Against: Uses other than those covered by the exposure scenarios appended to this Safety Data Sheet are not supported.

1.3 Details of the supplier of the substance or mixture

Manufacturer: Phillips 66 Ltd, Humber Refinery
South Killingholme, North Lincolnshire DN40 3DW
Customer Service: +44 (0)1469 571571
SDS Information: URL: www.Phillips66.com
Email: ESDS@P66.com

1.4 Emergency telephone number

+44 (0)1469 555348 (24 Hours)

Section 2: Hazards Identification

2.1 Classification of the substance or mixture

CLP Classification (EC No 1272/2008)

H226 -- Flammable liquids -- Category 3
H315 -- Skin corrosion/irritation -- Category 2
H304 -- Aspiration Hazard -- Category 1
H336 -- Specific target organ toxicity (single exposure) -- Category 3
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2

Superseded DSD Classification (67/548/EEC and 1999/45/EC):

R10, Xi;R38, Xn;R65, R67, N;R51/53

2.2 Label Elements



DANGER

H226: Flammable liquid and vapor.

H304: May be fatal if swallowed and enters airways

H315: Causes skin irritation

H336: May cause drowsiness or dizziness.

H411: Toxic to aquatic life with long lasting effects.

P102: Keep out of reach of children

P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking

P280: Wear protective gloves / protective clothing / eye protection / face protection

P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician

P331: Do NOT induce vomiting

P501: Dispose of contents/container to approved disposal facility.

2.3 Other hazards

Does not meet the criteria for persistent, bioaccumulative and toxic (PBT) or very persistent, very bioaccumulative (vPvB) substances.

Section 3: Composition / Information on Ingredients

3.1 Substance

Component	CASRN	EINECS	REACH Registration No.	Concentration ¹	CLP Classification ²	DSD Classification ³
Kerosine (petroleum)	8008-20-6	232-366-4	01-2119485517-27	100	H304	Xn; R65

¹ All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

² Regulation EC 1272/2008.

³ Superseded Directives 67/548/EEC and 1999/45/EC.

Total Sulfur: < 0.1

Section 4: First Aid Measures

4.1 Description of first aid measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse.

Inhalation (Breathing): If respiratory symptoms develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If breathing is difficult, oxygen or artificial respiration should be administered by qualified personnel. If symptoms persist, seek medical attention.

Ingestion (Swallowing): Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention. First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

4.2 Most important symptoms and effects

Acute: Minor respiratory irritation at high vapor concentrations.

Delayed: Dry skin and possible irritation with repeated or prolonged exposure.

4.3 Indication of immediate medical attention and special treatment needed

Other Comments: None

Section 5: Fire-Fighting Measures

5.1 Extinguishing media

Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

5.2 Special hazards arising from the substance or mixture

Unusual Fire & Explosion Hazards: Flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of nitrogen and sulfur may also be formed.

5.3 Special protective actions for firefighters

For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Avoid spreading burning liquid with water used for cooling purposes. Cool equipment exposed to fire with water, if it can be done safely.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

6.2 Environmental precautions

Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard.

6.3 Methods and material for containment and cleaning up

Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

Section 7: Handling and Storage

7.1 Precautions for safe handling

Take precautionary measures against static discharge. Nonsparking tools should be used. Keep away from ignition sources such as heat/sparks/open flame – No smoking. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8). Wear protective gloves.

Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Open container slowly to relieve any pressure. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes for specific bonding/grounding requirements). Do not enter confined spaces such as tanks or pits without following proper entry procedures. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of incomplete combustion products (e.g. carbon monoxide, oxides of sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels.

7.2 Conditions for safe storage, including any incompatibilities

Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to appropriate guidance pertaining to cleaning, repairing, welding, or other contemplated operations. Outdoor or detached storage is preferred. Indoor storage should meet Country or Committee standards and appropriate fire codes.

7.3 Specific end use(s)

Refer to supplemental exposure scenarios if attached.

Section 8: Exposure Controls / Personal Protection

8.1 Control parameters

Occupational Exposure Limits			
Component	ACGIH	UK-EH40	Other
Kerosine (petroleum)	TWA: 200 mg/m ³ Skin based on Kerosene 8008-20-6	---	---

STEL = Short Term Exposure Limit (15 minutes); TWA = Time Weighted Average (8 hours); --- = No Occupational Exposure Limit

Biological Limit Values			
Component	ACGIH	EU 98/24/EC	UK-EH40
Kerosine (petroleum)	---	---	---

--- = No Biological Limit Value

Relevant DNEL and PNEC:

Worker Derived No-Effect Level (DNEL)

Inhalation: Not applicable

Dermal: Not applicable

Consumer Derived No-Effect Level (DNEL)

Inhalation: Not applicable

Dermal: Not applicable

Ingestion: 18.8 mg/kgbw/day

Environmental Predicted No-Effect Concentration (PNEC): Not applicable

8.2 Exposure controls

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled that comply with EN 374 is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Suggested protective materials:

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit an approved air purifying respirator equipped with Type A, organic gases and vapour filters (as specified by the manufacturer) may be used.

A respiratory protection program that follows recommendations for the selection, use, care and maintenance of respiratory protective devices in EN 529:2005 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health.

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Environmental Exposure Controls: Refer to Sections 6, 7, 12 and 13.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Data represent typical values and are not intended to be specifications. N/A = Not Applicable; N/D = Not Determined

Appearance:	Colorless
Physical Form:	Liquid
Odor:	Kerosene
Odour Threshold:	N/D
pH:	N/A
Melting/Freezing Point:	< -47 °C
Initial Boiling Point/Range:	140 - 300 °C
Flash Point:	> 38 °C
Evaporation Rate (nBuAc=1):	N/D
Flammability (solid, gas):	Flammable
Upper Explosive Limits (vol % in air):	6.0
Lower Explosive Limits (vol % in air):	0.5
Vapour Pressure:	3 kPa @20°C
Relative Vapour Density (air=1):	>1
Relative Density (water=1):	0.77-0.82 @ 15°C
Solubility (ies):	Insoluble in water.
Partition Coefficient (n-octanol/water) (Kow):	N/D
Auto-ignition Temperature:	250 °C
Decomposition Temperature:	N/D
Viscosity:	1.3-2.9 mm ² /s @ 20°C
Explosive Properties:	N/A
Oxidising Properties:	N/A

9.2 Other Information

Pour Point: < -47 °C

Section 10: Stability and Reactivity

10.1 Reactivity	Not chemically reactive.
10.2 Chemical stability	Stable under normal ambient and anticipated conditions of use.
10.3 Possibility of hazardous reactions	Hazardous reactions not anticipated.
10.4 Conditions to avoid	Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.
10.5 Incompatible materials	Avoid contact with strong oxidizing agents and strong reducing agents.
10.6 Hazardous decomposition products	Not anticipated under normal conditions of use.

Section 11: Toxicological Information

11.1 Information on Toxicological Effects of Substance/Mixture

Substance / Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Expected to have a low degree of toxicity by inhalation		>5.2 mg/L (mist)
Skin Absorption	Unlikely to be harmful		> 2 g/kg
Ingestion (Swallowing)	Unlikely to be harmful		> 5 g/kg

Aspiration Hazard: May be fatal if swallowed and enters airways.

Skin Corrosion/Irritation: Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Signs and Symptoms: While significant vapor concentrations are not likely, high concentrations can cause minor respiratory irritation, headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Ingestion can cause irritation of the digestive tract, nausea, diarrhea, and vomiting.

Skin Sensitization: Not expected to be a skin sensitizer.

Respiratory Sensitization: No information available.

Specific Target Organ Toxicity (Single Exposure): May cause drowsiness and dizziness.

Specific Target Organ Toxicity (Repeated Exposure): Not expected to cause organ effects from repeated exposure.

Carcinogenicity: Not expected to cause cancer. Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation.

Germ Cell Mutagenicity: Not expected to cause heritable genetic effects.

Reproductive Toxicity: Not expected to cause reproductive toxicity.

Section 12: Ecological Information

12.1 Toxicity

Acute aquatic toxicity studies on samples of jet fuel and kerosine streams show acute toxicity values greater than 1 mg/L and mostly in the range 1-100 mg/L. These tests were carried out on water accommodated fractions, in closed systems to prevent evaporative loss. Results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon composition. Kerosines should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment. Classification: H411; Chronic Cat 2.

12.2 Persistence and degradability

The hydrocarbons in this material are not readily biodegradable but are regarded as inherently biodegradable since their hydrocarbon components can be degraded by microorganisms.

Persistence per IOPC Fund definition: Non-Persistent

12.3 Bioaccumulative potential

Hydrocarbon constituents of kerosine show measured or predicted Log Kow values ranging from 3 to 6 and above and therefore would be regarded as having the potential to bioaccumulate. In practice, metabolic processes may reduce bioconcentration.

12.4 Mobility in soil and environmental fate

On release to water, hydrocarbons will float on the surface and since they are sparingly soluble, the only significant loss is volatilization to air. It is possible that some of the higher molecular weight hydrocarbons will be adsorbed on sediment. Biodegradation in water is a minor loss process. In air, these hydrocarbons are photodegraded by reaction with hydroxyl radicals with half lives varying from 0.1 to 0.7 days.

12.5 Results of PBT and vPvB Assessment

Not a PBT or vPvB substance.

12.6 Other Adverse Effects

None anticipated.

Section 13: Disposal Considerations

13.1 Waste treatment methods

European Waste Code: 13 07 03* other fuels (including mixtures)

This material, if discarded as produced, would be considered as hazardous waste pursuant to Directive 91/689/EEC on hazardous waste, and subject to the provisions of that Directive unless Article 1(5) of that Directive applies. This code has been assigned based upon the most common uses for this material and may not reflect contaminants resulting from actual use. Waste generators/producers are responsible for assessing the actual process used when generating the waste and its contaminants in order to assign the proper waste disposal code.

Disposal must be in accordance with Directive 2006/12/EC and other applicable national or regional provisions, and based upon material characteristics at time of disposal. For incineration of waste, follow Directive 2000/76/EC. For landfill of waste, follow Directive 1999/31/EC.

Empty Containers: Container contents should be completely used and containers emptied prior to discard. Empty drums should be properly sealed and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with applicable regulations.

Section 14: Transport Information

14.1 UN number	UN1223
14.2 UN proper shipping name	KEROSENE
14.3 Transport hazard class(es)	3
14.4 Packing group	III

14.5 Environmental hazards	Marine pollutant - Environmentally Hazardous
14.6 Special precautions for user	<i>If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.</i>
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable

Section 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EC 1272/2008 - Classification, labelling and packaging of substances and mixtures
EN166:2002 Eye Protection
EN 529:2005 Respiratory Protective devices
BS EN 374-1:2003 Protective gloves against chemicals and micro-organisms
Workplace Exposure Limits, EH40/2005, Control of Substances Hazardous to Health
Directive 91/689/EEC on hazardous waste (European Waste Codes)
Directive 2000/76/EC on incineration of waste
Directive 1999/31/EC on landfill of waste

Export Rating: NLR (No License Required)

15.2 Chemical Safety Assessment

A chemical safety assessment has been carried out for the substance/mixture.

Section 16: Other Information

Date of Issue:	09/22/2011
Status:	FINAL
Previous Issue Date:	05/23/2011
Revised Sections or Basis for Revision:	Manufacturer (Section 1)
Safety Data Sheet Number:	815841
Language:	English

List of Relevant Hazard Statements:

H226: Flammable liquid and vapour
H304: May be fatal if swallowed and enters airways
H315: Causes skin irritation
H336: May cause drowsiness or dizziness
H411: Toxic to aquatic life with long lasting effects

R10: Flammable
R38: Irritating to skin
R65: Harmful: may cause lung damage if swallowed
R67: Vapors may cause drowsiness and dizziness
R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; ADR = Agreement on Dangerous Goods by Road; BMGV = Biological Monitoring Guidance Value; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit; EINECS = European Inventory of Existing Commercial Chemical Substances; EPA = [US] Environmental Protection Agency; Germany-TRGS = Technical Rules for Dangerous Substances; IARC = International Agency for Research on Cancer; ICAO/IATA = International Civil Aviation Organization / International Air Transport Association; INSHT = National Institute for Health and Safety at Work; IMDG = International Maritime Dangerous Goods; Ireland-HSA = Ireland's National Health and Safety Authority; LEL = Lower Explosive Limit; MARPOL = Marine Pollution; N/A = Not Applicable; N/D = Not Determined; NTP = [US] National Toxicology Program; PBT = Persistent, Bioaccumulative and Toxic; RID = Regulations Concerning the International Transport of Dangerous Goods by Rail; STEL = Short Term Exposure Limit; TLV = Threshold Limit Value; TRGS 903 = Technical rules for hazardous substances; TWA = Time Weighted Average; UEL = Upper Explosive Limit; UK-EH40 = United Kingdom EH40/2005 OEL; vPvB = very Persistent, very Bioaccumulative

Disclaimer of Expressed and implied Warranties:

The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.



Exposure Scenario Annex

Kerosene

1. Manufacture of substance - Industrial

Section 1 Exposure Scenario	
Kerosenes	
Title	
Manufacture of substance	
Use Descriptor	
Sector(s) of Use	3, 8, 9
Process Category(ies)	1, 2, 3, 4, 8a, 8b, 15
Environmental Release Category(ies)	1, 4
Specific Environmental Release Category	ESVOC SpERC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Operation is carried out at elevated temperature (>20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	No other specific measures identified.
General exposures (open systems)	No other specific measures identified.
Bulk transfers	No other specific measures identified.
Process sampling	No other specific measures identified.
Laboratory activities	No other specific measures identified.
Equipment cleaning and maintenance	No other specific measures identified.
Bulk product storage	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	5.4e6
Fraction of regional tonnage used locally	0.11

Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-4
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. Onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	97.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	56.1
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils	
Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	97.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	2.0e6
Assumed domestic sewage treatment plant flow (m³/d):	10000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file – “Site-Specific Production” worksheet.	

2. Use of substance as an intermediate - Industrial

Section 1 Exposure Scenario
Kerosenes
Title
Use as an intermediate

Use Descriptor	
Sector(s) of Use	3, 8, 9
Process Category(ies)	1, 2, 3, 4, 8a, 8b, 15
Environmental Release Category(ies)	6a
Specific Environmental Release Category	ESVOC SpERC 6.1a.v1
Processes, tasks, activities covered	
Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Operation is carried out at elevated temperature (>20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	No other specific measures identified.
General exposures (open systems)	No other specific measures identified.
Bulk transfers	No other specific measures identified.
Process sampling	No other specific measures identified.
Laboratory activities	No other specific measures identified.
Equipment cleaning and maintenance	No other specific measures identified.
Bulk product storage	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.8e5
Fraction of regional tonnage used locally	8.3e-2
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-4
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	81.4
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	1.8e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
This substance is consumed during use and no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

3. Distribution of substance - Industrial

Section 1 Exposure Scenario	
Kerosenes	
Title	
Distribution of substance	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 4, 8a, 8b, 9, 15
Environmental Release Category(ies)	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	ESVOC SpERC 1.1b.v1
Processes, tasks, activities covered	
Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP

Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	No other specific measures identified.
General exposures (open systems)	No other specific measures identified.
Process sampling	No other specific measures identified.
Laboratory activities	No other specific measures identified.
Bulk transfers	No other specific measures identified.
Drum and small package filling	No other specific measures identified.
Equipment cleaning and maintenance	No other specific measures identified.
Bulk product storage	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	5.4e6
Fraction of regional tonnage used locally	2.0e-3
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	1.0e-5
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7

Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	2.6e6
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

4. Formulation & (Re)packing of substance - Industrial

Section 1 Exposure Scenario	
Kerosenes	
Title	
Formulation & (re)packing of substances and mixtures	
Use Descriptor	
Sector(s) of Use	3, 10
Process Category(ies)	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15
Environmental Release Category(ies)	2
Specific Environmental Release Category	ESVOC SpERC 2.2.v1
Processes, tasks, activities covered	
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	No other specific measures identified.
General exposures (open systems)	No other specific measures identified.
Process sampling	No other specific measures identified.
Laboratory activities	No other specific measures identified.
Bulk transfers	No other specific measures identified.
Mixing operations (open systems)	No other specific measures identified.
Manual Transfer from/pouring from containers	No other specific measures identified.
Drum/batch transfers	No other specific measures identified.
Production or preparation of articles by tableting, compression, extrusion or pelletisation	No other specific measures identified.
Drum and small package filling	No other specific measures identified.
Equipment cleaning and maintenance	No other specific measures identified.
Bulk product storage	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	5.2e6
Fraction of regional tonnage used locally	5.8e-3
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	2.0e-4
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	86.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	2.6e5
Assumed domestic sewage treatment plant flow (m³/d):	2000

Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

5. Use of substance in Metal working fluids / rolling oils - Industrial

Section 1 Exposure Scenario	
Kerosenes	
Title	
Metal working fluids / rolling oils	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 17
Environmental Release Category(ies)	4
Specific Environmental Release Category	ESVOC SpERC 4.7a.v1
Processes, tasks, activities covered	
Covers the use in formulated MWFs/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
General exposures (closed systems)	No other specific measures identified.
General exposures (open systems)	No other specific measures identified.
Bulk transfers	No other specific measures identified.
Filling / preparation of equipment from drums or containers	No other specific measures identified.
Process sampling	No other specific measures identified.
Metal machining operations	No other specific measures identified.
Treatment by dipping and pouring	No other specific measures identified.
Spraying	No other specific measures identified.
Manual Roller, spreader, flow application	No other specific measures identified.
Automated metal rolling/forming	No other specific measures identified.
Semi-automated metal rolling/forming	No other specific measures identified.
Equipment cleaning and maintenance Dedicated facility	No other specific measures identified.
Equipment cleaning and maintenance Non-dedicated facility	No other specific measures identified.
Storage	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	5.5e2
Fraction of regional tonnage used locally	0.18
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.02
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-5
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater. Prevent discharge of undissolved substance to or recover from onsite wastewater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	70
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7

Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	4.9e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

6. Use of substance in Metal working fluids / rolling oils - Professional

Section 1 Exposure Scenario	
Kerosenes	
Title	
Metal working fluids / rolling oils	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 5, 8a, 8b, 9, 10, 11, 13, 17
Environmental Release Category(ies)	8a, 8d
Specific Environmental Release Category	ESVOC SpERC 8.7c.v1
Processes, tasks, activities covered	
Covers the use in formulated MWFs including transfer operations, open and contained cutting/machining activities, automated and manual application of corrosion protections, draining and working on contaminated/ reject articles, and disposal of waste oils.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
General exposures (closed systems)	No other specific measures identified.
Bulk transfers	No other specific measures identified.
Filling / preparation of equipment from drums or containers Dedicated facility	No other specific measures identified.
Filling / preparation of equipment from drums or containers Non-dedicated facility	No other specific measures identified.
Process sampling	No other specific measures identified.
Metal machining operations	No other specific measures identified.
Manual Roller, spreader, flow application	No other specific measures identified.
Spraying	No other specific measures identified.
Equipment cleaning and maintenance Dedicated facility	No other specific measures identified.
Equipment cleaning and maintenance Non-dedicated facility	No other specific measures identified.
Treatment by dipping and pouring	No other specific measures identified.
Storage	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	5.5e2
Fraction of regional tonnage used locally	5.0e-4
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.15
Release fraction to wastewater from process (initial release prior to RMM)	0.05
Release fraction to soil from process (initial release prior to RMM)	0.05
Technical conditions and measures at process level (source) to prevent release	
Technical conditions and measures at process level (source) to prevent release Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7

Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	90
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

7. Use of substance as Release agents or binders - Industrial

Section 1 Exposure Scenario	
Kerosenes	
Title	
Use as binders and release agents	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 4, 6, 7, 8b, 10, 13, 14
Environmental Release Category(ies)	4
Specific Environmental Release Category	ESVOC SpERC 4.10a.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting, and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Bulk transfers	No other specific measures identified.
Drum/batch transfers	No other specific measures identified.
Mixing operations (closed systems)	No other specific measures identified.
Mixing operations (open systems)	No other specific measures identified.
Mold forming	No other specific measures identified.
Casting operations	No other specific measures identified.
Machine Spraying	No other specific measures identified.
Manual Spraying	No other specific measures identified.
Manual Rolling, Brushing	No other specific measures identified.
Dipping, immersion and pouring	No other specific measures identified.
Bulk product storage	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMS.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	8.0e2
Fraction of regional tonnage used locally	1
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-6
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater. Prevent discharge of undissolved substance to or recover from onsite wastewater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMS (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	4.1e6

Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

8. Use of substance as Release agents or binders - Professional

Section 1 Exposure Scenario	
Kerosenes	
Title	
Use as binders and release agents	
Use Descriptor	
Sector(s) of Use	22
Process Category(ies)	1, 2, 3, 4, 6, 8a, 8b, 10, 11, 14
Environmental Release Category(ies)	8a, 8d
Specific Environmental Release Category	ESVOC SpERC 8.10b.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Bulk transfers	No other specific measures identified.
Drum/batch transfers	No other specific measures identified.
Mixing operations (closed systems)	No other specific measures identified.
Mixing operations (open systems)	No other specific measures identified.
Mold forming	No other specific measures identified.
Casting operations	No other specific measures identified.
Machine Spraying	No other specific measures identified.
Manual Spraying	No other specific measures identified.
Rolling, Brushing	No other specific measures identified.
Dipping, immersion and pouring	No other specific measures identified.
Bulk product storage	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	8.0e2
Fraction of regional tonnage used locally	5e-4
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.95
Release fraction to wastewater from process (initial release prior to RMM)	0.025
Release fraction to soil from process (initial release prior to RMM)	0.025
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	130
Assumed domestic sewage treatment plant flow (m³/d):	2000

Conditions and measures related to external treatment of waste for disposal
External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste
External recovery and recycling of waste should comply with applicable local and/or national regulations.
Section 3 Exposure Estimation
3.1 Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
3.2 Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.
Section 4 Guidance to check compliance with the Exposure Scenario
4.1 Health
Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
4.2 Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

9. Use of substance as a Fuel - Industrial

Section 1 Exposure Scenario	
Kerosenes	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 8a, 8b, 16
Environmental Release Category(ies)	7
Specific Environmental Release Category	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	No other specific measures identified.
Use as a fuel (closed systems)	No other specific measures identified.

Bulk transfers	No other specific measures identified.
Drum/batch transfers	No other specific measures identified.
Equipment cleaning and maintenance	No other specific measures identified.
Bulk product storage	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	5.5e5
Fraction of regional tonnage used locally	1
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	5.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	84.6
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	5.3e6
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	

Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2 Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

10. Use of substance as a Fuel - Professional

Section 1 Exposure Scenario	
Kerosenes	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of Use	22
Process Category(ies)	1, 2, 3, 8a, 8b, 16
Environmental Release Category(ies)	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	No other specific measures identified.
Use as a fuel (closed systems)	No other specific measures identified.
Bulk transfers	No other specific measures identified.
Transfer from/pouring from containers	No other specific measures identified.
Equipment cleaning and maintenance	No other specific measures identified.
Bulk product storage	No other specific measures identified.
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	

Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	4.4e6
Fraction of regional tonnage used locally	5.0e-4
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater. No wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	6.9e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

11. Use of substance as a Fuel - Consumer

Section 1 Exposure Scenario Kerosenes

Title	
Use as a fuel	
Use Descriptor	
Sector(s) of Use	21
Product Category(ies)	13
Environmental Release Category(ies)	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12c.v1
Processes, tasks, activities covered	
Covers consumer uses in liquid fuels.	
Section 2 Operational conditions and risk management measures	
2.1 Control of consumer exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	For each use event, covers use amounts up to (g): 50000 . Covers skin contact area up to (cm2): 420.
Frequency and duration of use	Covers use up to (times/day of use): 0.143 Covers exposure up to (hours/event): 2
Other operational conditions affecting exposure	Covers use at ambient temperatures. Covers use in room size of (m3): 20. Covers use under typical household ventilation.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
Liquid: Automotive Refuelling	Covers concentrations up to (%): 100%. Covers use up to (days/year): 52. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm2): 210.00. For each use event, covers use amounts up to (g): 50000. Covers outdoor use. Covers use in room size of (m³): 100. Covers exposure up to (hours/event): 0.05. No specific risk management measure identified beyond those operational conditions stated.
Liquid: Home space heater fuel	Covers concentrations up to (%): 100%. Covers use up to (days/year): 365. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm2): 210.00. For each use event, covers use amounts up to (g): 1500. Covers use under typical household ventilation. Covers use in room size of (m³): 20. Covers exposure up to (hours/event): 0.03. No specific risk management measure identified beyond those operational conditions stated.
Liquid Garden Equipment - Use	Covers concentrations up to (%): 100%. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. For each use event, covers use amounts up to (g): 1000. Covers outdoor use. Covers use in room size of (m³): 100. Covers exposure up to (hours/event): 2.00. No specific risk management measure identified beyond those operational conditions stated.
Liquid: Garden Equipment - Refueling	Covers concentrations up to (%): 100%. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm2): 420.00. For each use event, covers use amounts up to (g): 1000. Covers use in a one car garage (34 m³) under typical ventilation. Covers use in room size of (m³): 34. Covers exposure up to (hours/event): 0.03. No specific risk management measure identified beyond those operational conditions stated.
Kerosene exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs.	
2.2 Control of environmental exposure	

Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.8e5
Fraction of regional tonnage used locally	0.0005
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0.00001
Conditions and measures related to municipal sewage treatment plant	
Risk from environmental exposure is driven by freshwater.	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.7
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (kg/d):	3.1e4
Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls	
Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of ECETOC report #107 and the Chapter R15 of the IR&CSA TGD. Where exposure determinants differ to these sources, then they are indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

Safety Data Sheet

According to EC 1907/2006



Section 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Name: Gas Oil
Safety Data Sheet Number: 814649
MARPOL Annex I Category: Gas Oils, Including Ship's Bunkers
REACH Registration Number: 01-2119484664-27-0004

1.2 Relevant identified uses of the substance or mixture and uses advised against

Intended Use: Heating and fuel oil for industrial applications
Uses Advised Against: Uses other than those covered by the exposure scenarios appended to this Safety Data Sheet are not supported.

1.3 Details of the supplier of the substance or mixture

Manufacturer: Phillips 66 Ltd, Humber Refinery
South Killingholme, North Lincolnshire DN40 3DW
Customer Service: +44 (0)1469 571571
SDS Information: Email: SDS@P66.com
Email: ESDS@P66.com

1.4 Emergency telephone number

+44 (0)1469 555348 (24 Hours)

Section 2: Hazards Identification

2.1 Classification of the substance or mixture

CLP Classification (EC No 1272/2008)

H226 -- Flammable liquids -- Category 3
H304 -- Aspiration Hazard -- Category 1
H315 -- Skin corrosion/irritation -- Category 2
H332 -- Acute toxicity, Inhalation -- Category 4
H350 -- Carcinogenicity -- Category 1B
H373 -- Specific target organ toxicity (repeated exposure) -- Category 2
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2

Superseded DSD Classification (67/548/EEC and 1999/45/EC):

R10, Xn;R20, Xi;R38, Carc. Cat. 2;R45, Xn;R48/21, Xn;R65, N;R51/53

2.2 Label Elements



DANGER

H226: Flammable liquid and vapor.

H304: May be fatal if swallowed and enters airways
H315: Causes skin irritation
H332: Harmful if inhaled
H350: May cause cancer
H373: May cause damage to organs through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

P201: Obtain special instructions before use
P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P260: Do not breathe dust/fume/gas/mist/vapours/spray
P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P331: Do NOT induce vomiting
P501: Dispose of contents/container to approved disposal facility.

2.3 Other hazards

Does not meet the criteria for persistent, bioaccumulative and toxic (PBT) or very persistent, very bioaccumulative (vPvB) substances.

Section 3: Composition / Information on Ingredients

3.2 Mixture

Component	CASRN	EINECS	REACH Registration No.	Concentration ¹	CLP Classification ²	DSD Classification ³
Fuels, diesel	68334-30-5	269-822-7	Not applicable	90-100	H351	Carc.Cat.3; R40
Fatty acids, vegetable-oil, Me esters	68990-52-3	273-606-8	Not applicable	0-10	-	-
Fatty acids, tallow, Me esters	61788-61-2	262-989-7	Not applicable	0-10	-	-
Naphthalene	91-20-3	202-049-5	Not applicable	<1	H351,H302,H410	Xn; R22 Carc.Cat.3; R40 N; R50-53

¹ All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

² Regulation EC 1272/2008.

³ Superseded Directives 67/548/EEC and 1999/45/EC.

Total Sulfur: < 0.1

Gas oil for marine use contains <0.1% fatty acids, ME (FAME).

Section 4: First Aid Measures

4.1 Description of first aid measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse.

Inhalation (Breathing): If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

4.2 Most important symptoms and effects

Acute: Minor respiratory irritation at high vapor concentrations.

Delayed: Dry skin and possible irritation with repeated or prolonged exposure.

4.3 Indication of immediate medical attention and special treatment needed

Other Comments: None

Section 5: Fire-Fighting Measures

5.1 Extinguishing media

Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

5.2 Special hazards arising from the substance or mixture

Unusual Fire & Explosion Hazards: Flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of nitrogen and sulfur may also be formed.

5.3 Special protective actions for firefighters

For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Avoid spreading burning liquid with water used for cooling purposes. Cool equipment exposed to fire with water, if it can be done safely.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

6.2 Environmental precautions

Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard.

6.3 Methods and material for containment and cleaning up

Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

Section 7: Handling and Storage

7.1 Precautions for safe handling

Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Nonsparking tools should be used. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe vapors or mists. Use only outdoors or in well-ventilated area. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

Open container slowly to relieve any pressure. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes for specific bonding/grounding requirements). Do not enter confined spaces such as tanks or pits without following proper entry procedures. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames. Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas.

The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of incomplete combustion products (e.g. carbon monoxide, oxides of sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels.

7.2 Conditions for safe storage, including any incompatibilities

Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to appropriate guidance pertaining to cleaning, repairing, welding, or other contemplated operations. Outdoor or detached storage is preferred. Indoor storage should meet Country or Committee standards and appropriate fire codes.

7.3 Specific end use(s)

Refer to supplemental exposure scenarios if attached.

Section 8: Exposure Controls / Personal Protection

8.1 Control parameters

Occupational Exposure Limits			
Component	ACGIH	UK-EH40	Other
Fuels, diesel	TWA: 100 mg/m ³ Skin	---	---
Fatty acids, vegetable-oil, Me esters	---	---	---
Fatty acids, tallow, Me esters	---	---	---

Naphthalene	STEL: 15 ppm TWA: 10 ppm 2 ppm TWA; skin; A3 - confirmed animal carcinogen with unknown relevance to humans; TLV basis: upper respiratory tract irritation Skin	---	TWA: 0.2 mg/m ³ (as total of 17 PNAs measured by NIOSH Method 5506) (Phillips 66 Guidelines)

STEL = Short Term Exposure Limit (15 minutes); TWA = Time Weighted Average (8 hours); --- = No Occupational Exposure Limit

Biological Limit Values			
Component	ACGIH	EU 98/24/EC	UK-EH40
Fuels, diesel	---	---	---
Fatty acids, vegetable-oil, Me esters	---	---	---
Fatty acids, tallow, Me esters	---	---	---
Naphthalene	---	---	---

--- = No Biological Limit Value

Relevant DNEL and PNEC:

Worker Derived No-Effect Level (DNEL)

Inhalation: 68.3 mg/m³/day

Dermal: 2.9 mg/kgbw/day

Consumer Derived No-Effect Level (DNEL)

Inhalation: 61.2 mg/m³/day

Dermal: 1.3 mg/kgbw/day

Ingestion: Not applicable

Environmental Predicted No-Effect Concentration (PNEC): Not applicable

8.2 Exposure controls

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds EN 166 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, close fitting eye protection and a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled that comply with EN 374 is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit an approved air purifying respirator equipped with Type A, organic gases and vapour filters (as specified by the manufacturer) may be used.

A respiratory protection program that follows recommendations for the selection, use, care and maintenance of respiratory protective devices in EN 529:2005 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health.

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Environmental Exposure Controls: Refer to Sections 6, 7, 12 and 13.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Data represent typical values and are not intended to be specifications. N/A = Not Applicable; N/D = Not Determined

Appearance:	Clear red
Physical Form:	Liquid
Odor:	Diesel fuel
Odour Threshold:	N/D
pH:	N/A
Melting/Freezing Point:	N/D
Initial Boiling Point/Range:	180 - 390 °C
Flash Point:	> 55 °C; (Closed Cup); (Marine Gas Oil >60°C)
Evaporation Rate (nBuAc=1):	N/D
Flammability (solid, gas):	Flammable
Upper Explosive Limits (vol % in air):	5.0
Lower Explosive Limits (vol % in air):	0.5
Vapour Pressure:	<0.3 kPa @20°C
Relative Vapour Density (air=1):	>1
Relative Density (water=1):	0.82-0.875 @ 15°C
Solubility (ies):	Solubility in water: Negligible @20°C
Partition Coefficient (n-octanol/water) (Kow):	N/D
Auto-ignition Temperature:	250 °C
Decomposition Temperature:	N/D
Viscosity:	4.8 mm ² /s @ 20°C; 1.5-5.5 mm ² /s @ 40°C
Explosive Properties:	N/A
Oxidising Properties:	N/A

9.2 Other Information

Pour Point:	-24 °C

Section 10: Stability and Reactivity

10.1 Reactivity	Not chemically reactive.
10.2 Chemical stability	Stable under normal ambient and anticipated conditions of use.
10.3 Possibility of hazardous reactions	Hazardous reactions not anticipated.
10.4 Conditions to avoid	Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.
10.6 Hazardous decomposition products	Not anticipated under normal conditions of use.

Section 11: Toxicological Information

11.1 Information on Toxicological Effects of Substance/Mixture

Substance / Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Harmful if inhaled		4.65 mg/L (mist)
Skin Absorption	Unlikely to be harmful		>4.1 g/kg
Ingestion (Swallowing)	Unlikely to be harmful		> 5 g/kg

Aspiration Hazard: May be fatal if swallowed and enters airways.

Skin Corrosion/Irritation: Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Signs and Symptoms: While significant vapor concentrations are not likely, high concentrations can cause minor respiratory irritation, headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Ingestion can cause irritation of the digestive tract, nausea, diarrhea, and vomiting.

Skin Sensitization: Not expected to be a skin sensitizer.

Respiratory Sensitization: No information available.

Specific Target Organ Toxicity (Single Exposure): Not expected to cause organ effects from single exposure.

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or repeated exposure. Repeated dermal application of petroleum gas oils for 90 days resulted in decreased liver, thymus, and spleen weights, and altered bone marrow function. Microscopic alterations included liver hypertrophy and necrosis, decreased hematopoiesis and lymphocyte depletion.

Carcinogenicity: May cause cancer. Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation.

Germ Cell Mutagenicity: Not expected to cause heritable genetic effects.

Reproductive Toxicity: Not expected to cause reproductive toxicity.

11.2 Information on Hazardous Components

Naphthalene

Carcinogenicity: Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The US National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

Section 12: Ecological Information

12.1 Toxicity

Experimental studies of gas oils show that acute aquatic toxicity values are typically in the range 2-20 mg/L. These values are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions. They should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment. Classification: H411; Chronic Cat 2.

12.2 Persistence and degradability

Gas oils are complex combinations of individual hydrocarbon species. Based on the known or expected properties of individual constituents, category members are not predicted to be readily biodegradable. Some hydrocarbon constituents of gas oils are predicted to meet the criteria for persistence; on the other hand, some components can be easily degraded by microorganisms under aerobic conditions.

Persistence per IOPC Fund definition: Non-Persistent

12.3 Bioaccumulative potential

Gas oil components have measured or calculated Log Kow values in the range of 3.9 to 6 which indicates a high potential to bioaccumulate. Lower molecular weight compounds are readily metabolized and the actual bioaccumulation potential of higher molecular weight compounds is limited by the low water solubility and large molecular size.

12.4 Mobility in soil and environmental fate

Releases to water will result in a hydrocarbon film floating and spreading on the surface. For the lighter components, volatilization is an important loss process and reduces the hazard to aquatic organisms. In air, the hydrocarbon vapors react readily with hydroxyl radicals with half-lives of less than one day. Photooxidation on the water surface is also a significant loss process particularly for polycyclic aromatic compounds. In water, the majority of components will be adsorbed on sediment. Adsorption is the most predominant physical process on release to soil. Adsorbed hydrocarbons will slowly degrade in both water and soil.

12.5 Results of PBT and vPvB Assessment

Not a PBT or vPvB substance.

12.6 Other Adverse Effects

None anticipated.

Section 13: Disposal Considerations

13.1 Waste treatment methods

European Waste Code: 13 07 01* fuel oil and diesel

This material, if discarded as produced, would be considered as hazardous waste pursuant to Directive 91/689/EEC on hazardous waste, and subject to the provisions of that Directive unless Article 1(5) of that Directive applies. This code has been assigned based upon the most common uses for this material and may not reflect contaminants resulting from actual use. Waste generators/producers are responsible for assessing the actual process used when generating the waste and its contaminants in order to assign the proper waste disposal code.

Disposal must be in accordance with Directive 2006/12/EC and other applicable national or regional provisions, and based upon material characteristics at time of disposal. For incineration of waste, follow Directive 2000/76/EC. For landfill of waste, follow Directive 1999/31/EC. Product is suitable for burning in an enclosed controlled burner for fuel value if >5000 BTU, or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Follow Directive 2000/76/EC.

Empty Containers: Container contents should be completely used and containers emptied prior to discard. Empty drums should be properly sealed and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with applicable regulations.

Section 14: Transport Information

14.1 UN number	UN1202
14.2 UN proper shipping name	GAS OIL <i>or</i> DIESEL FUEL <i>or</i> HEATING OIL, LIGHT
14.3 Transport hazard class(es)	3
14.4 Packing group	III
14.5 Environmental hazards	Marine pollutant - Environmentally Hazardous
14.6 Special precautions for user	<i>If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.</i>
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable

Section 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EC 1272/2008 - Classification, labelling and packaging of substances and mixtures
EN166:2002 Eye Protection
EN 529:2005 Respiratory Protective devices
BS EN 374-1:2003 Protective gloves against chemicals and micro-organisms
Workplace Exposure Limits, EH40/2005, Control of Substances Hazardous to Health
Directive 91/689/EEC on hazardous waste (European Waste Codes)
Directive 2000/76/EC on incineration of waste
Directive 1999/31/EC on landfill of waste

Export Rating: NLR (No License Required)

15.2 Chemical Safety Assessment

A chemical safety assessment has been carried out for the substance/mixture.

Section 16: Other Information

Date of Issue:	09/22/2011
Status:	FINAL
Previous Issue Date:	05/23/2011
Revised Sections or Basis for Revision:	Manufacturer (Section 1)
Safety Data Sheet Number:	814649
Language:	English

List of Relevant Hazard Statements:

H226: Flammable liquid and vapour
H302: Harmful if swallowed
H304: May be fatal if swallowed and enters airways
H315: Causes skin irritation
H332: Harmful if inhaled
H350: May cause cancer
H351: Suspected of causing cancer
H373: May cause damage to organs through prolonged or repeated exposure
H411: Toxic to aquatic life with long lasting effects

R10: Flammable
R20: Harmful by inhalation
R22: Harmful if swallowed
R38: Irritating to skin
R40: Limited evidence of a carcinogenic effect
R45: May cause cancer
R48/21: Harmful: danger of serious damage to health by prolonged exposure in contact with skin
R65: Harmful: may cause lung damage if swallowed
R66: Repeated exposure may cause skin dryness or cracking
R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; ADR = Agreement on Dangerous Goods by Road; BMGV = Biological Monitoring Guidance Value; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit; EINECS = European Inventory of Existing Commercial Chemical Substances; EPA = [US] Environmental Protection Agency; Germany-TRGS = Technical Rules for Dangerous Substances; IARC = International Agency for Research on Cancer; ICAO/IATA = International Civil Aviation Organization / International Air Transport Association; INSHT = National Institute for Health and Safety at Work; IMDG = International Maritime Dangerous Goods; Ireland-HSA = Ireland's National Health and Safety Authority; LEL = Lower Explosive Limit; MARPOL = Marine Pollution; N/A = Not Applicable; N/D = Not Determined; NTP = [US] National Toxicology Program; PBT = Persistent, Bioaccumulative and Toxic; RID = Regulations Concerning the International Transport of Dangerous Goods by Rail; STEL = Short Term Exposure Limit; TLV = Threshold Limit Value; TRGS 903 = Technical rules for hazardous substances; TWA = Time Weighted Average; UEL = Upper Explosive Limit; UK-EH40 = United Kingdom EH40/2005 OEL; vPvB = very Persistent, very Bioaccumulative

Disclaimer of Expressed and implied Warranties:

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Exposure Scenario Annex

Gas Oil

1. Manufacture of substance - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Manufacture of substance	
Use Descriptor	
Sector(s) of Use	3, 8, 9
Process Category(ies)	1, 2, 3, 4, 8a, 8b, 15
Environmental Release Category(ies)	1, 4
Specific Environmental Release Category	ESVOC SpERC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Operation is carried out at elevated temperature (>20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Bulk closed loading and unloading	Handle substance within a closed system. Wear suitable gloves tested to EN374.

Bulk open loading and unloading	Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Laboratory activities	No other specific measures identified.
Bulk product storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.8e7
Fraction of regional tonnage used locally	0.021
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-5
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	90.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	3.3e6
Assumed domestic sewage treatment plant flow (m³/d):	10000
Conditions and measures related to external treatment of waste for disposal	

During manufacturing no waste of the substance is generated.
Conditions and measures related to external recovery of waste
During manufacturing no waste of the substance is generated.
Section 3 Exposure Estimation
3.1 Health
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
3.2 Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.
Section 4 Guidance to check compliance with the Exposure Scenario
4.1 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.
4.2 Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html). Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file – “Site-Specific Production” worksheet.

2. Use of substance as an intermediate - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as an intermediate	
Use Descriptor	
Sector(s) of Use	3, 8, 9
Process Category(ies)	1, 2, 3, 4, 8a, 8b, 15
Environmental Release Category(ies)	6a
Specific Environmental Release Category	ESVOC SpERC 6.1a.v1
Processes, tasks, activities covered	
Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Operation is carried out at elevated temperature (>20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Bulk closed loading and unloading	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Bulk open loading and unloading	Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance	No other specific measures identified.
Laboratory activities	No other specific measures identified.
Bulk product storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	3.5e5
Fraction of regional tonnage used locally	0.043
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-5
Release fraction to soil from process (initial release prior to RMM)	0.001

Technical conditions and measures at process level (source) to prevent release Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	51.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	4.1e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal This substance is consumed during use and no waste of the substance is generated.	
Conditions and measures related to external recovery of waste This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

3. Distribution of substance - Industrial

Section 1 Exposure Scenario Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title Distribution of substance	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 4, 8a, 8b, 9, 15
Environmental Release Category(ies)	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	ESVOC SpERC 1.1b.v1
Processes, tasks, activities covered Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.	

Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Laboratory activities	No other specific measures identified.
Bulk closed loading and unloading	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Bulk open loading and unloading	Wear suitable gloves tested to EN374.
Drum and small package filling	Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	

Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.8e7
Fraction of regional tonnage used locally	0.002
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	1.0e-6
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	9.6
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater	
Do not apply industrial sludge to natural soils	
Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	4.1e5
Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	
This substance is consumed during use and no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

4. Formulation & (Re)packing of substance - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Formulation & (re)packing of substances and mixtures	
Use Descriptor	
Sector(s) of Use	3, 10
Process Category(ies)	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15
Environmental Release Category(ies)	2
Specific Environmental Release Category	ESVOC SpERC 2.2.v1
Processes, tasks, activities covered	
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Drum/batch transfers	Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Bulk transfers	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Mixing operations (open systems)	Provide extract ventilation to points where emissions occur. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Production or preparation or articles by tableting, compression, extrusion or pelletisation	Wear suitable gloves tested to EN374.
Drum/batch transfers	Wear suitable gloves tested to EN374.
Laboratory activities	No other specific measures identified.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear suitable gloves tested to EN374.
Storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.8e7
Fraction of regional tonnage used locally	0.0011
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	2.0e-5
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater.	
Treat air emission to provide a typical removal efficiency of (%):	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	60.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	91.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	6.8e5
Assumed domestic sewage treatment plant flow (m³/d):	2000

Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

5. Use of substance in Metal working fluids / rolling oils - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Metal working fluids / rolling oils	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 17
Environmental Release Category(ies)	4
Specific Environmental Release Category	ESVOC SpERC 4.7a.v1
Processes, tasks, activities covered	
Covers the use in formulated MWFs/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and disposal of waste oils.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	Handle substance within a closed system.
General exposures (open systems)	Provide extract ventilation to points where emissions occur.
Bulk transfers	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Filling / preparation of equipment from drums or containers	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Metal machining operations	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.
Treatment by dipping and pouring	Wear suitable gloves tested to EN374.
Spraying	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear suitable gloves (tested to EN374), coverall and eye protection.
Manual Roller, spreader, flow application	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Automated metal rolling/forming	Handle substance within a predominantly closed system provided with extract ventilation.
Semi-automated metal rolling/forming	Provide extract ventilation to points where emissions occur.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	

Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.0e4
Fraction of regional tonnage used locally	0.01
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	20
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	0.02
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-6
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	70
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater	
Do not apply industrial sludge to natural soils	
Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	7.8e4
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

6. Use of substance as Release agents or binders - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as binders and release agents	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 4, 6, 7, 8b, 10, 13, 14
Environmental Release Category(ies)	4
Specific Environmental Release Category	ESVOC SpERC 4.10a.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting, and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Bulk transfers	Handle substance within a closed system.
Drum/batch transfers	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Mixing operations (closed systems)	No other specific measures identified.

Mixing operations (open systems)	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Mold forming	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Casting operations (open systems)	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Wear suitable gloves tested to EN374.
Machine Spraying	Minimise exposure by extracted full enclosure for the operation or equipment. Wear suitable gloves tested to EN374.
Manual Spraying	Wear a full face respirator conforming to EN140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN374), coverall and eye protection. Ensure operatives are trained to minimise exposures.
Manual Roller, spreader, flow application	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.4e4
Fraction of regional tonnage used locally	0.18
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	100
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-7
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	59.2
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0

Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater	
Do not apply industrial sludge to natural soils	
Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	1.7e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

7. Use of substance as Release agents or binders - Professional

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as binders and release agents	
Use Descriptor	
Sector(s) of Use	22
Process Category(ies)	1, 2, 3, 4, 6, 8a, 8b, 10, 11, 14
Environmental Release Category(ies)	8a, 8d
Specific Environmental Release Category	ESVOC SpERC 8.10b.v1
Processes, tasks, activities covered	
Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
Material transfers (closed systems)	No other specific measures identified.
Drum/batch transfers	Wear suitable gloves tested to EN374.
Mixing operations (closed systems)	No other specific measures identified.
Mixing operations (open systems)	Wear suitable gloves tested to EN374.
Mold forming	Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN374.
Casting operations With local exhaust ventilation	Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN374.
Casting operations Without local exhaust ventilation	Wear a respirator conforming to EN140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN374), coverall and eye protection.
Spraying Manual Without local exhaust ventilation	Carry out in a vented booth or extracted enclosure. Wear suitable gloves (tested to EN374), coverall and eye protection. Ensure operatives are trained to minimise exposures.
Spraying Manual Without local exhaust ventilation	Wear a full face respirator conforming to EN140 with Type A/P2 filter or better. Wear suitable gloves (tested to EN374), coverall and eye protection. Ensure operatives are trained to minimise exposures.
Manual Roller, spreader, flow application	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.

Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.

2.2 Control of environmental exposure

Product Characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.9e3
Fraction of regional tonnage used locally	0.0005

Frequency and duration of use

Continuous release.

Emission days (days/year)	365

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	0.95
Release fraction to wastewater from process (initial release prior to RMM)	0.025
Release fraction to soil from process (initial release prior to RMM)	0.025

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites thus conservative process release estimates used.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Treat air emission to provide a typical removal efficiency of (%):	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0

Organisation measures to prevent/limit release from site

Do not apply industrial sludge to natural soils
Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (kg/d):	6.2e1
Assumed domestic sewage treatment plant flow (m ³ /d):	2000

Conditions and measures related to external treatment of waste for disposal

External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

External recovery and recycling of waste should comply with applicable local and/or national regulations.

Section 3 Exposure Estimation

3.1 Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

3.2 Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.
Section 4 Guidance to check compliance with the Exposure Scenario
4.1 Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.
4.2 Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

8. Use of substance as a Fuel - Industrial

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of Use	3
Process Category(ies)	1, 2, 3, 8a, 8b, 16
Environmental Release Category(ies)	7
Specific Environmental Release Category	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Bulk transfers	Wear suitable gloves tested to EN374.
Drum/batch transfers	Wear suitable gloves tested to EN374.
Use as a fuel (closed systems)	No other specific measures identified.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	4.5e6
Fraction of regional tonnage used locally	0.34
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	5.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	97.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	60.4
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater	
Do not apply industrial sludge to natural soils	
Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	

Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	97.7
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	5.5e6
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

9. Use of substance as a Fuel - Professional

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of Use	22
Process Category(ies)	1, 2, 3, 8a, 8b, 16
Environmental Release Category(ies)	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Section 2 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions

General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Bulk transfers	Wear suitable gloves tested to EN374.
Drum/batch transfers	Use drum pumps or carefully pour from container. Wear suitable gloves tested to EN374.
Refuelling	Wear suitable gloves tested to EN374.
Use as a fuel (closed systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	6.7e6
Fraction of regional tonnage used locally	0.0005
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-4
Release fraction to wastewater from process (initial release prior to RMM)	0.00001

Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat air emission to provide a typical removal efficiency of (%):	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%):	8.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from onsite wastewater	
Do not apply industrial sludge to natural soils	
Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	1.4e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls	
Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.	
4.2 Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

10. Use of substance as a Fuel - Consumer

Section 1 Exposure Scenario	
Vacuum or Hydrocracked Gas Oils and Distillate Fuels	
Title	
Use as a fuel	
Use Descriptor	
Sector(s) of Use	21
Product Category(ies)	13
Environmental Release Category(ies)	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12c.v1
Processes, tasks, activities covered	
Covers consumer uses in liquid fuels.	

Section 2 Operational conditions and risk management measures	
2.1 Control of consumer exposure	
Product Characteristics	
Physical form of product	Liquid, vapour pressure > 10 Pa at STP
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use	For each use event, covers use amounts up to (g): 37500 Covers skin contact area up to (cm ²): 420
Other operational conditions affecting exposure	Covers use up to (times/day of use): 0.143 Covers exposure up to (hours/event): 2 hours per event
Contributing Scenarios	
Contributing Scenarios / Product Category	Specific Risk Management Measures & Operating Conditions
Liquid: Automotive Refuelling	Covers concentrations up to (%): 100%. Covers use up to (days/year): 52. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm ²): 210.00. For each use event, covers use amounts up to (g): 37500. Covers use in room size of (m ³): 100. Covers exposure up to (hours/event): 0.05. Covers outdoor use. No specific risk management measure identified beyond those operational conditions stated.
Liquid Garden Equipment - Use	Covers concentrations up to (%): 100%. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. For each use event, covers use amounts up to (g): 750. Covers outdoor use. Covers use in room size of (m ³): 100. Covers exposure up to (hours/event): 2.00. No specific risk management measure identified beyond those operational conditions stated.
Liquid: Garden Equipment - Refueling	Covers concentrations up to (%): 100%. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm ²): 420.00. For each use event, covers use amounts up to (g): 750. Covers use in a one car garage (34 m ³) under typical ventilation. Covers use in room size of (m ³): 34. Covers exposure up to (hours/event): 0.03. No specific risk management measure identified beyond those operational conditions stated.
Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits acute inhalation toxicity and is classified R20 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels exhibits irritation to the skin and is classified R38 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Vacuum or Hydrocracked Gas Oils and Distillate Fuels is classified R65 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect. There is limited evidence of carcinogenic effects in Vacuum or Hydrocracked Gas Oils and Distillate Fuels and it is classified R40 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aim to define the appropriate RMMs necessary to protect from these adverse effects.	
2.2 Control of environmental exposure	
Product Characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.6e7
Fraction of regional tonnage used locally	0.0005
Frequency and duration of use	
Continuous release.	
Emission days (days/year)	365
Environmental factors not influenced by risk management	

Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%):	94.1
Maximum allowable site tonnage (Msafe) based on release following total wastewater treatment removal (kg/d):	3.5e5
Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls Combustion emissions considered in regional exposure assessment.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1 Health	
The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of ECETOC report #107 and the Chapter R15 of the IR&CSA TGD. Where exposure determinants differ to these sources, then they are indicated.	
3.2 Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1 Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.	
4.2 Environment	
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	

Appendix F Business Case for STS Transfers in Scapa Flow

F.1 Introduction

Scapa Flow has, traditionally, been the location for safe Ship to Ship (STS) operations due to the swell free, sheltered, deep water anchorage and the presence of a full range of oil related services including towage, pollution response and Vessel Traffic Services (VTS). In recent years the number of STS operations has dwindled due in part to an operationally restrictive Ballast Water Management (BWM) Policy but as this has now been updated to an IMO Ballast Water Convention compliant solution, Scapa Flow is once again ready to capture a proportion of the UK, European and Worldwide STS business. The new BWM Policy was approved in December 2013 which means that progress can be made towards acquiring an Oil Transfer Licence (OTL) and the purpose of this Business Case is to underpin the OTL application and to justify the anticipated volume of STS activity.

F.2 Abstract of Findings

Activity levels of STS transfer operations is cyclical and is related to many factors including oil prices and vessel charter rates. However, what is clear is that some 100 STS operations took place in and around the UK in 2012 and, in the past, Scapa Flow has been the location for up to 34 STS operations in one year. Therefore, it is reasonable to assume the Scapa Flow should be able to capture at least one third of the current UK business (plus a small percentage increase); such a level is entirely achievable and is consistent with previous peaks of STS activity.

The overall conclusion, therefore, is that Scapa Flow can cope with and should plan for up to 36 STS operations per annum. With a typical vessel size of 62,395 gross tonnage (gt) (or 115,605 deadweight tonnage (dwt)) and consolidated harbour dues of £0.42 per tonne transferred, this could generate £1.7m (revenue income) per annum in harbour dues plus consequential business for local agents, fender supply companies, logistics support and travel/accommodation expenditure.

F.3 Background

Ship to Ship (STS) transfers of oil take place in five main locations in the UK and Europe, namely underway off Southwold on the east coast of England, Rotterdam in the Hague, the Skaw on the Jutland Peninsula in Denmark, Cromarty Firth (Nigg) on the Scottish east coast and Sullom Voe in Shetland. Scapa Flow in Orkney has a long history of safe and successful STS transfers but activity has been low in recent years due to an operationally and commercially restrictive BWM arrangement. A new BWM Policy has now been in place since December 2013 and it is envisaged that this will re-invigorate STS activity in the sheltered waters of the Scapa Flow.

F.4 STS Location Choices

STS operations (around the UK, Europe and the World) are conducted and charged differently depending on the port regulation and the Maritime and Coastguard Agency regulations and / or other national authority requirements. Operations at Sullom Voe, Cromarty Firth (Nigg) and Rotterdam are conducted primarily alongside, with occasional exceptions via a Single Point Mooring

(SPM); operations at the Skaw and Southwold are conducted under way in open seas. Scapa Flow STS operations are all conducted at anchor within the sheltered waters of the Scapa Flow harbour limits.

The overall (i.e.: on a UK, Europe and Worldwide basis) choice of STS location depends on many influences including:

- Source of cargo – including source locations which restrict vessel size or construction vis ice affected areas.
- Routes of cargo – vis choke points for STS operations.
- The Safety Case.
- Placement/location of vessels.
- Port dues/costs.
- Time critical transfers/laycan dates.
- Availability of berth – not an issue for STS at anchor.
- Charter rates.
- Cargo type.
- Vessel classification.
- Weather – vis the need for shelter and ease of arrival/departure in all conditions.
- Safety case considerations.
- Ballast regulations.
- Environmental factors.
- Market forces/conditions.

F.5 Scapa Flow

STS operations are attracted to Scapa Flow for the following primary reasons:

- An approved BWM Policy which is IMO compliant and incorporates treatment as and when ships are fitted and/or this becomes an IMO requirement.
- Location of the port for that particular operation
 - Proximity to oil fields.
 - Proximity to areas of restricted tanker size / type – North northern Europe; ice regions.
 - Shipping choke point (Pentland Firth).
 - Boundary of the Emission Control Area.
- Anchorage dues are levied – which are cheaper than alongside dues.
- Operations conducted at anchor so minimising risk
 - Relatively straightforward pilotage approach without river or estuary risk.
 - STS are at anchor and not underway/drifted.

- No berthing alongside hence avoiding berthing risk.
- Sea room hence time to react in the event of an incident without having to consider land impacts in the immediate time frame.
- Sheltered harbour hence removing risk of damage whilst alongside
- Sheltered harbour with deep water anchorage so minimising delay in poor weather
- Port services available 24/7
 - VTS.
 - Towage & fire/pollution response tugs.
 - Pilotage.
- Exceptional historical safety record and strong local skills/knowledge

F.6 The Competition

A strengths and weaknesses analysis of the competition has been undertaken but is not included in this documentation as it contains sensitive information which is not appropriate for external publication.

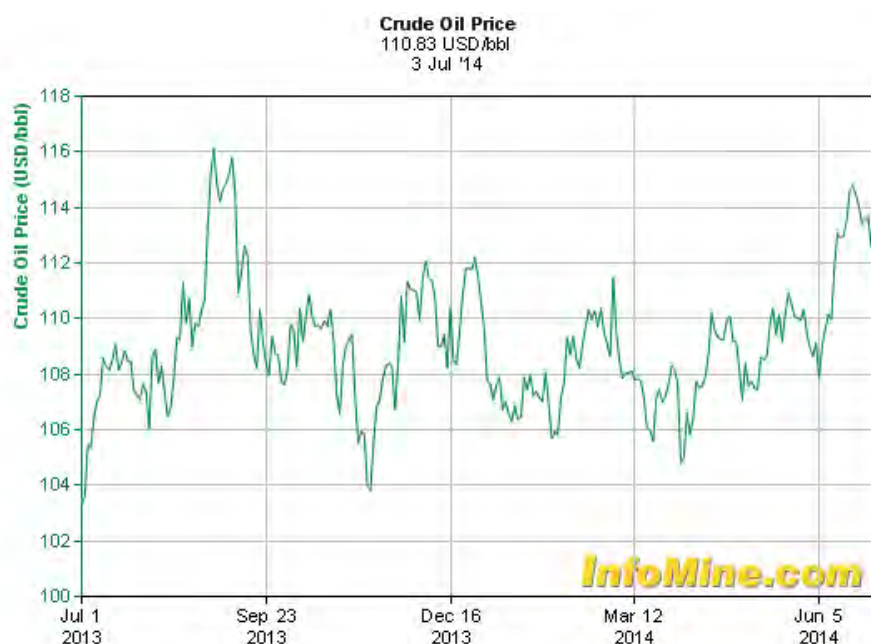
F.7 STS Business Overview – Past Performance

Whilst past performance is no guarantee of future business, it is a good benchmark for establishing opportunity levels.

The business of STS has been, and is, lucrative, but totally driven by the supply and demand for oil on a global scale. Due to dramatic fluctuations in oil prices and regional demand, the industry can be categorised as commercially 'fickle' and unpredictable, so therefore it is a market that is difficult to predict and strategize with any commercial certainty.

Figure F-1 overleaf shows the fluctuation in oil price over the last year.

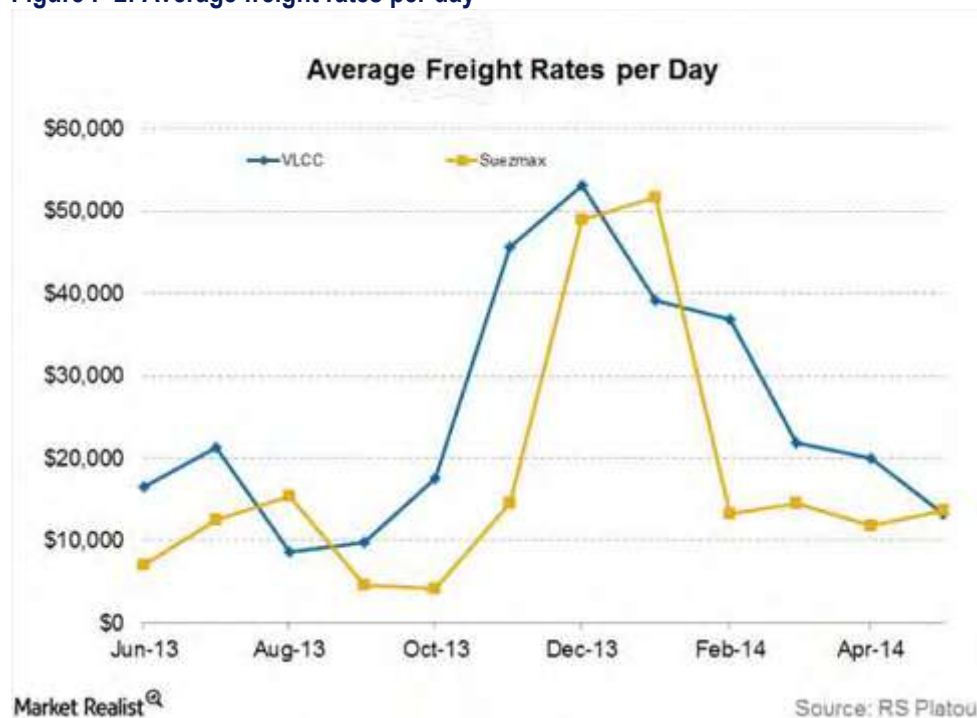
Figure F-1: Fluctuation in oil price over the last year



Prices can be seen to be relatively stable over the last year, but fluctuate for general Crude from US \$70 (in 2010 not shown on this graph) to US \$128 (in 2011 not shown on this graph) back to US \$ 111 today. This demonstrates an overall differential of almost 90% which can have and has had a large global impact over such a short period of time. This, in turn, has an effect on the movement and storage of oil and hence, the level of STS operations.

Equally volatile is the daily tanker charter rates as in Figure F-2 below.

Figure F-2: Average freight rates per day



It can be seen that as charter rates plunge, with lower demand and costs increase (fuel in particular), this leads to a surplus of both Aframax and Suezmax tankers (maximum 700,000 barrels) to Very Large Crude Carriers (VLCC) (maximum 2 million barrels). From previous information obtained by the Harbour Authority In 2009, the daily charter rate for a VLCC was US \$80,000. This diagram shows a present daily rate of US \$15, 000 and these rates dipped as low as US \$10,000 in Europe last year.

The extent to which these factors have affected the Scapa Flow STS business is not entirely certain but what is important is that the Scapa Flow share of business has reduced.

That said, any port area which wishes to have STS transfers as a revenue stream will not only be competing with market forces, but competing with other port and harbour areas who wish to attract this business model and trade.

To demonstrate that Scapa Flow has been part of that business opportunity in the past, Table F-1 sets out the cargo volumes, number of operations and revenues generated from STS operations in Scapa Flow in the last 14 years.

The notable decline in operations, particularly in the last three years, is due in part to the previous BWM Policy in force for Scapa Flow. As can be seen, the number of STS operations is partly cyclical in nature. Although the general trend for Scapa Flow has been downward, it is considered that this is (in the most) attributable to the previous BWM Policy, in addition to tightening margins - against a relatively - high cost/time consuming process. Globally, there appears to be a declining trend on STS, the whole reason for the apparent global decline in STS business cannot be attributed to one point as in many instances the STS enquiry will not be referred to the Harbour Authority. However, there can be no doubt that the new BWM Policy for Scapa Flow is a significant improvement and, for those companies with an eye to environmental issues, the Orkney BWM Policy has been the subject of, probably, the most comprehensive analysis and modelling of any of the STS sites in Europe, if not worldwide.

Table F-1: Ship-to-Ship transfers 2000-2013

STS OPERATIONS - SCAPA FLOW					
YEAR	STS OPS (Oil)	OIL TONNAGE	STS OPS (LNG)	LNG TONNAGE	GROSS REVENUES (GBP)
2000	34	3,681,885	0	0	1,472,754
2001	19	1,812,085	0		724,834
2002	11	926,399	0		370,559
2003	4	575,184	0		232,814
2004	15	2,660,841	0		1,090,944
2005	17	1,746,715	0		716,153
2006	8	993,759	0		407,441
2007	7	930,136	1	56,827	381,355
2008	10	582,097	0		247,541
2009	27	2,599,461	0		1,068,073
2010	17	941,629	1	8,128	390,828
2011	5	282,708	0	0	128,483
2012	0	0	0	0	0
2013	0	0	1	32,583	27,563
TOTAL	174	17,772,899	2	97,538	7,259,342

In 2012, 100 STS operations were conducted in / around the United Kingdom. This volume is an approximate reduction of 50% compared to the previous two years, due to the economic downturn. STS operations in Europe and the Far East are, however, buoyant and continue to hold up well in the current climate. The question remains as to how attractive Scapa Flow will be to the industry now that the new Scapa Flow BWM Policy has been approved.

The Harbour Authority has recorded that revenues in the region of £800,000 were lost to competitors in relation to gas condensate transfers in the winters of 2011 and 2012. If a revised BWM Policy had been in place, that business would without question have come to Scapa Flow. There is certainty in this statement as both the agents and the facilitators for these operations stated this unequivocally.

F.8 STS Business Overview – Future Opportunity

Oil traders, STS facilitators and shipping agents have been kept up to date with the process and approval of the Scapa Flow BWM Policy and anticipate a positive outcome. The industry consensus is that Scapa Flow will become an STS destination in its own right, rather than a default winter location when inclement weather in international and coastal STS locations redirects shipping to Orkney.

For Scapa Flow to hold its competitive advantage as a sheltered location for such operations, and bearing in mind that operations at sea do not incur port dues (only towage and facilitator dues) the Harbour Authority has ensured that pricing structures are both competitive and profitable for the revised market.

Economies of scale will come into play; the Harbour Authority hopes to find itself being able to attract future volume business and having the flexibility to structure our charges to encourage single agent/operator volume long term consolidated business. The current charging method is to utilise a consolidated charge for all services. This makes it difficult to benchmark against competitors hence a shadow charging rate which itemises the charges for each element of towage services, pilotage, boarding and landing and harbour dues, will allow the Harbour Authority to conduct more realistic benchmarking.

In considering the future opportunity, the following can therefore be taken into account in establishing potential activity levels.

Table F-2: Potential activity levels

Factor	Evidence	Realistic annual activity levels for Scapa Flow
Previous Business	Maximum 34	34 max plus 10% growth = 36
	Average since 2000 12	16 min
	Average (excluding fallow years) 16	
PORT CAPACITY	1 STS per week realistic max	50 max
	Plus assume 1 Flotta tanker per week	50 max
UK STS Business	2012 100	33 max
	Assume Scapa Flow can capture 33% of market share.	
	Or Assume Scapa Flow can capture 16% of market share	16 min

On the basis of Table F-2, it can be seen that the maximum capacity of 50 exceeds the likely maximum business opportunity of 34 (historic and without 10% growth factor) or 33 (assumed one third of market share). It is therefore assessed that the maximum realistic level would be 34 STS plus 10% growth giving 36 per annum and this figure should be used for the OTL application. Given the historic maximum and growth figure there is no evidence to suggest that this would be exceeded and that the maximum capacity limit of 50 would then be reached. The new Scapa Flow BWM Policy enables the Harbour Authority to once again be viable for STS and to increase from minimal STS activity for the past two years towards a realistic market share.

For the purpose of business prudence, a lower figure of 16 per annum should be assumed as this is based on the historic average. This may appear pessimistic given the new Scapa Flow BWM Policy but a span of likely activity between 36 as a maximum and 16 minimum would be prudent.

F.9 Market Capture

In order to capitalise on the new Scapa Flow BWM Policy, the Scapa Flow facility must be marketed. Several things need to be considered to achieve this:

- Immediate strong marketing campaign to the industry to create awareness of Scapa Flow's new and approved BWM Policy, why this policy and the designated exchange areas have been selected and the competitive advantage of Scapa Flow.
- Litmus test of traders, facilitators and agents to assess the revised demand for Scapa Flow in conjunction with the marketing campaign.
- Further market research for the long term oil storage market for Scapa Flow.
- Harbour vessel fleet review to ensure a continuing capability to deliver vessel support on time and on schedule with an anticipated upturn in Flotta traffic.
- Site visit by agents and facilitators to observe towage, counter pollution equipment and response, VTS and pilotage.
- Itemisation of STS charging structures should be considered so that the port remains competitive and that such charges complement Scapa Flow's revised competitive advantage.

F.10 Return on Investment

On the basis of the case presented above, the net financial benefits to Orkney are set out below. Other than the costs associated with the development of the new Scapa Flow BWM Policy and the subsequent Oil Transfer Licence, there are no immediate investment costs associated with re-establishing Scapa Flow as an STS location of choice. The infrastructure, vessels and expertise is already in place for oil and general port business and each STS will offset costs already committed.

Therefore, in terms of income, the Scapa Flow Oil Port Account could expect to receive in the region of £1.7m per annum for 36 STS operations based upon 62,395gt (115,605dwt) vessel previously mentioned at current harbour dues. Additional income could accrue from other elements such as additional launch

activity and towage duties which are over and above those directly associated with the main STS effort.

Beyond the harbour account, other benefits will accrue from:

- Ships Agents activity.
- Storage and deployment of fenders.
- STS management company fees.
- Water supplies and garbage removal.
- Crew change and associated accommodation and transport expenditure.
- Logistics and victualing.

F.11 Risk

The business risk in marketing and undertaking STS activity is low as the costs are largely committed and the business activity is not new. Operational risks are not the subject of this report and are covered elsewhere in the OTL application, in establishing a maximum likely level of activity of 36 STS operations per annum does set the level of exposure to operational risk.

F.12 Conclusion

In conclusion, it is assessed that the likely level of STS business is in the range of 16 – 36 operations per annum with 36 being a realistic maximum given the historic maximum, a 10% growth allowance and the fact that the new BWM Policy frees up a previous business constraint. At this level, the potential income, to offset fixed operational costs already committed to other oil port business, would be of the order of up to £1.7m per annum, not including wider benefits to Orkney.