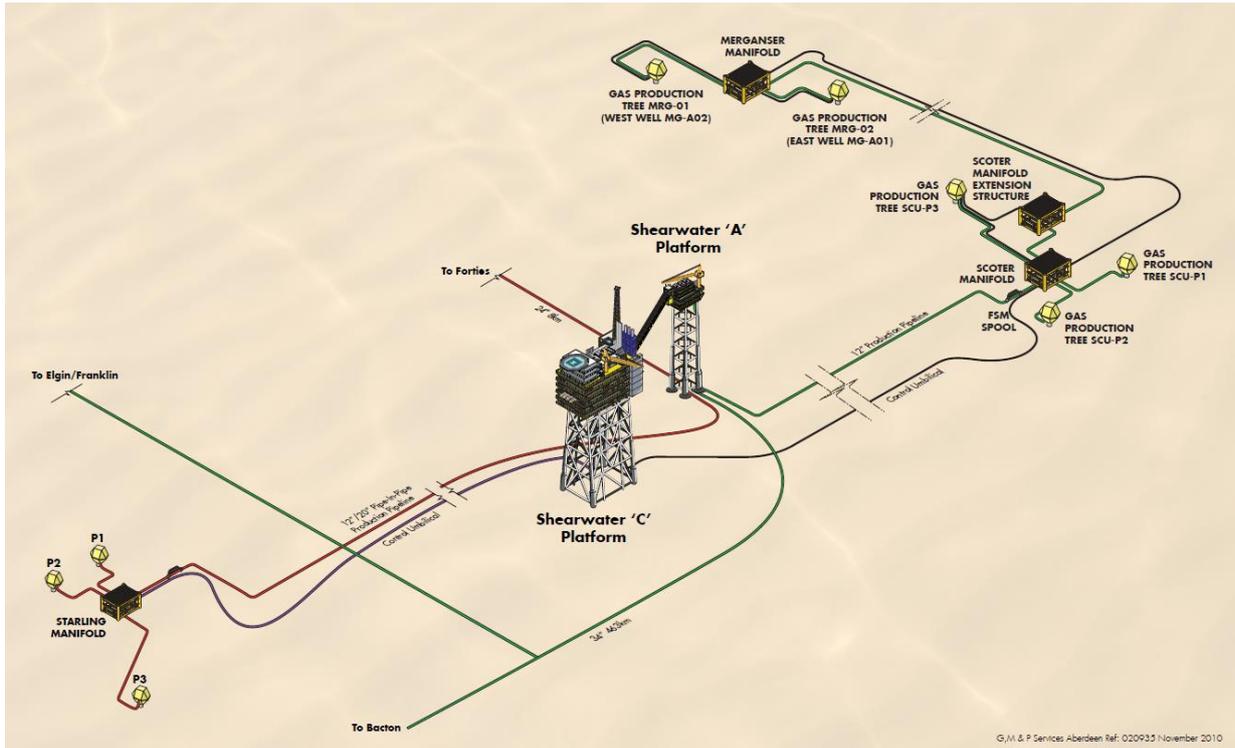


Scoter & Merganser Fields Decommissioning Programmes



Submitted to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED)

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Terms and Abbreviations

| Term | Explanation |
|-----------------|---|
| BEIS | Department for Business, Energy and Industrial Strategy (formerly DECC) |
| CA | Comparative Assessment |
| CMID | Common Marine Inspection Document |
| CoP | Cessation of Production |
| CO | Carbon Monoxide |
| CO ₂ | Carbon Dioxide |
| CPF | Central Processing Facility |
| DECC | Department of Energy and Climate Change (now BEIS) |
| DOB | Depth-of-Burial |
| DP | Decommissioning Programme(s) |
| E&A | Exploration and Appraisal (well) |
| EA | Environmental Appraisal |
| ENVID | Environmental Impact Identification |
| EUNIS | European Nature Information System |
| FSM | Field Signature Method |
| HazMat | Hazardous Material |
| HSE | Health and Safety Executive |
| HSSE&SP | Health, Safety, Security, Environment and Social Performance |
| JNCC | Joint Nature Conservation Committee |
| MARPOL | International Convention for the Prevention of Pollution from Ships |
| MCAA | Marine and Coastal Access Act |
| NORM | Naturally Occurring Radioactive Material |
| NOx | Nitrous Oxide |
| NSTA | North Sea Transition Authority |
| OBM | Oil Based Mud |
| ODU | Offshore Decommissioning Unit (OPRED) |
| OGA | Oil and Gas Authority |
| OGUK | Oil & Gas UK |
| OPRED | Offshore Petroleum Regulator for Environment and Decommissioning |
| OSPAR | Oslo and Paris Convention (for the Protection of the Marine Environment of the North-East Atlantic) |
| P&A | Plug and Abandonment (Wells) |



| Term | Explanation |
|-----------------|--------------------------------------|
| P&L | Plug and Lubricate (Wells) |
| PETS | Portal Environmental Tracking System |
| PLEM | PipeLine End Manifold |
| PON | Petroleum Operations Notice(s) |
| PPF | PolyPropylene Fibres |
| PWA | Pipeline Works Authorisation |
| PWR | Preparatory Works Request |
| SFF | Scottish Fishermen’s Federation |
| SMES | Scoter Manifold Extension Structure |
| SO ₂ | Sulphur Dioxide |
| SPU | Polyurea Elastic Waterproof Coating |
| Te | Metric Tonne |
| TUTU | Topsides Umbilical Termination Unit |
| UKCS | United Kingdom Continental Shelf |
| WBM | Water Based Mud |
| WBS | Work Breakdown Structure |
| WGS84 | World Geodetic System 1984 |
| WMP | Waste Management Plan |

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1 EXECUTIVE SUMMARY

1.1 Combined Decommissioning Programmes

This document contains five Decommissioning Programmes (DP) for the (1) Scoter installations, (2) the Merganser installations, (3 and 4) the Scoter pipelines / umbilicals, and (5) the Merganser pipelines / umbilicals.

The owners of the installations are Shell U.K. Limited (registered number 0140141 (Shell, the operator), NEO Energy Natural Resources Limited (registered number 13018823) (NEO), and Premier Oil UK Limited (registered number SC048705) (Premier). Shell has prepared these Programmes in accordance with Section 29 of the Petroleum Act 1998 [1], and both NEO and Premier confirms that it supports the proposals described in it. Letters of support from NEO and Premier, as well as Premier Oil E&P UK Limited (registered number 02761032) and Esso Exploration and Production UK Limited (registered number 00207426) as Exited Parties, are presented in Section 8.

Throughout this document the terms ‘owners’, ‘we’, and ‘our’ refer to all the co-venturers.

1.2 Requirement for Decommissioning Programmes

These DPs were submitted for statutory and public consultation in compliance with relevant legislation and guidelines [2] from the Offshore Petroleum Regulator for the Environment and Decommissioning (OPRED) part of the Department for Business, Energy and Industrial Strategy, (BEIS), formerly Department of Energy and Climate Change (DECC). It describes the principles of the decommissioning activities in compliance with national and international regulations, whilst also presenting an assessment of the environmental impacts of the proposed programme.

Scoter Installations:

In accordance with the Petroleum Act 1998 [1], the Section 29 notice holders of the Scoter installations / field (see Table 1.2) are applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning the installations detailed in Section 2.1.1 of these programmes. (See also Section 8 - Partner Letters of Support).

Scoter Pipelines:

In accordance with the Petroleum Act 1998 [1], the Section 29 notice holders of the eleven Scoter pipelines / umbilicals (see Tables 1.4 and 1.5) are applying to OPRED to obtain approval for decommissioning the pipelines / umbilicals detailed in Section 2.1.2 of these programmes. (See also Section 8 – Partner Letters of Support).

Merganser Installations:

In accordance with the Petroleum Act 1998 [1], the Section 29 notice holders of the Merganser installations / field (see Table 1.7) are applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning the installations detailed in Section 2.2.1 of these programmes. (See also Section 8 - Partner Letters of Support).



Merganser Pipelines:

In accordance with the Petroleum Act 1998 [1], the Section 29 notice holders of the seven Merganser pipelines / umbilicals (see Table 1.9) are applying to OPRED to obtain approval for decommissioning the pipelines / umbilicals detailed in Section 2.2.2 of these programmes. (See also Section 8 – Partner Letters of Support).

In conjunction with public, stakeholder and regulatory consultation, the decommissioning programmes are submitted in compliance with national and international regulations and OPRED guidelines. The schedule outlined in this document covers the majority of the infrastructure in a 5-year decommissioning project plan, due to begin in 2022. Decommissioning the sections of PL1945 and PLU1946 within the 500m safety zones at Shearwater and at the Marnock-Machar crossings will be aligned with the decommissioning of the host and crossed lines respectively, and timing is at this point uncertain.



1.3 Introduction

The Scoter and Merganser fields have been operational as gas-condensate producing fields since 2004 and 2006 respectively. Hydrocarbons from the three Scoter wells and two Merganser wells were produced via the Shell-operated Shearwater Cluster.

The Scoter and Merganser fields have exceeded their economic and technical limit. On 9 July 2020, the Oil and Gas Authority (OGA – now the North Sea Transition Authority) formally approved the Cessation of Production from both Scoter and Merganser fields “on or after 31 August 2020”. The fields formally ceased production on 17 December 2020.

An opportunity to re-use the Scoter Riser on the Shearwater A Platform has been identified. To support this re-use, flushing and disconnection of the Scoter and Merganser subsea infrastructure was executed in Q1 2021, whilst flushing of the Scoter and Merganser control umbilicals was executed in Q4 2021. As this scope was executed prior to the approval of these Decommissioning Programmes, the flush and disconnect campaign was approved under a separate Preparatory Works Request (PWR). The PWR is included in Appendix 1 of this document.

Following the flush and disconnect campaign, the Scoter Production Riser (part of PL1945) was transferred from the Scoter Pipeline Works Authorisation (PWA) 12/W/02 to the PWA for the new Arran development. Therefore, the Scoter Production Riser is not in scope of the Scoter pipelines Section 29 notice or the Scoter Pipeline Decommissioning Programme.

The Decommissioning Programmes contained in this document set out the decommissioning plans for the remaining infrastructure.

1.3.1 Asset Overview

Scoter and Merganser are two normal pressure and temperature gas-condensate subsea tie-backs to the Shearwater Cluster located in Block 22/30a of the Central North Sea

Scoter was discovered in 1989 and began production in March 2004, originally from two wells with a third added in August 2006. Merganser was discovered in 1995 and began production in December 2006 from two wells.

Production from the two Merganser wells was routed via 6” super duplex spools to the Merganser Manifold and from there, via an 8” carbon steel 3.8km-long trenched and buried pipeline, to the Scoter Manifold Extension Structure (SMES) adjacent to the Scoter well site. A 6” super duplex spool connects the SMES and the Scoter Manifold.

Production from the three Scoter wells was routed via 6” duplex spools to the Scoter Manifold and from there, to the Shearwater A Platform via a 12” carbon steel 11.7km-long trenched and buried pipeline. The 14” Scoter Production Riser brought the production to the platform process facilities. All surface-laid spools and pipelines transitions to and from trenches are protected by concrete mattresses.



Following the flush and disconnect campaign of Q1 2021, the 14” Scoter Production Riser was removed from the Scoter PWA (12/W/02) and the tie-in spools between the riser and the pipeline’s trench were removed. The removed spools from PL1945 are highlighted in Figure 1.1 below.

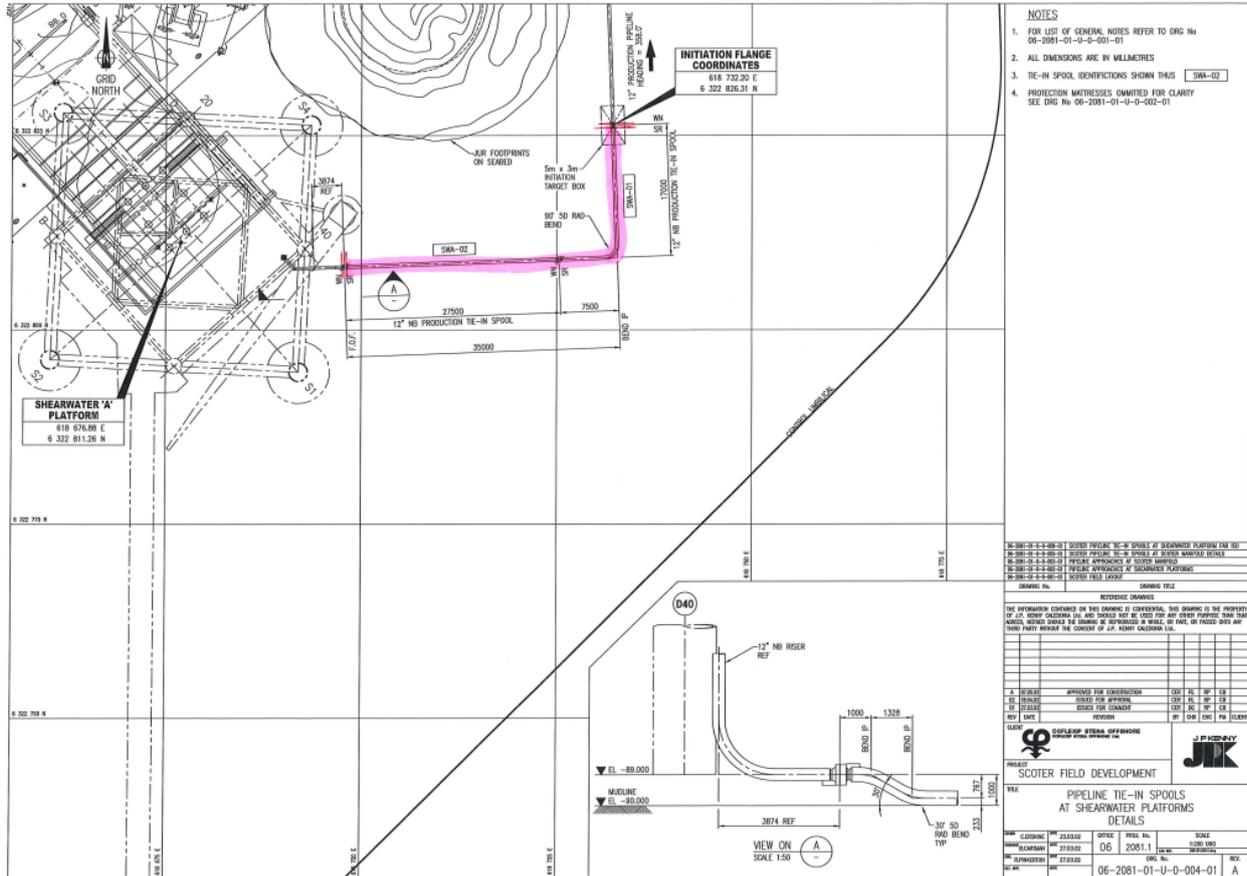


Figure 1.1: PL1945 spools removed during flush and disconnect campaign

Electro-hydraulic control and chemical supply was provided to the Scoter Manifold, Merganser Manifold, SMES and all wellheads from controls equipment located on the topsides of the Shearwater C Platform. Control and chemical supply was provided to the Scoter Manifold via a 12km-long trenched and buried umbilical from Shearwater C and from there via surface-laid umbilical jumpers to the Scoter wells. A separate umbilical jumper connected Wells AD at Scoter the SMES. Electro-hydraulic control and chemical supply was provided to the Merganser Manifold via a 4km-long trenched and buried umbilical from the Scoter Manifold, and from there to the two Merganser wells via surface-laid umbilical jumpers.

All surface-laid jumpers and umbilical transitions to and from trenches are protected by concrete mattresses.



1.4 Scoter – Decommissioning Overview

1.4.1 Installations

| Table 1.1: Scoter Installations Being Decommissioned | | | |
|--|-----------------------|--|--------------------|
| Field: | Scoter | Production Type: | Gas condensate |
| Water Depth (m) | 88m | UKCS Block: | 22/30; 23/26 |
| Distance to median line (km) | 21.2 | Distance from nearest UK coastline (km) | 230 |
| Surface Installations | | | |
| Number | Type | Topsides Weight (Te) | Jacket Weight (Te) |
| 0 | N/A | N/A | N/A |
| Subsea Installations | | Number of Wells | |
| Number | Type | Platform | Subsea |
| 1 | Manifolds (inc piles) | N/A | 3 |
| Drill Cuttings pile(s) | | | |
| Number of Piles | 0 | Total Estimated volume (m ³) | N/A |

| Table 1.2: Scoter Installations Section 29 Notice Holders Summary | | |
|---|---------------------|-----------------|
| S29 Notice Holder | Registration Number | Equity Interest |
| Shell U.K. Limited (Operator) | 00140141 | 44% |
| NEO Energy Natural Resources Limited | 13018823 | 44% |
| Premier Oil UK Limited | SC048705 | 12% |
| Premier Oil E&P UK Limited | 02761032 | Exited Party |
| Esso Exploration and Production UK Limited | 00207426 | Exited Party |

1.4.2 Pipelines

| Table 1.3: Scoter Pipelines being Decommissioned | |
|--|----|
| Number of Pipelines | 11 |
| Pipelines | 4 |
| Umbilicals | 7 |



| Table 1.4: Scoter Pipelines Section 29 Notice Holders Summary (exc PLU4924) | | |
|---|---------------------|-----------------|
| S29 Notice Holder | Registration Number | Equity Interest |
| Shell U.K. Limited (Operator) | 00140141 | 44% |
| NEO Energy Natural Resources Limited | 13018823 | 44% |
| Premier Oil UK Limited | SC048705 | 12% |
| Premier Oil E&P UK Limited | 02761032 | Exited Party |
| Esso Exploration and Production UK Limited | 00207426 | Exited Party |

| Table 1.5: PLU4924 (Scoter) Pipelines Section 29 Notice Holders Summary | | |
|---|---------------------|-----------------|
| S29 Notice Holder | Registration Number | Equity Interest |
| Shell U.K. Limited (Operator) | 00140141 | 44% |
| NEO Energy Natural Resources Limited | 13018823 | 44% |
| Premier Oil UK Limited | SC048705 | 12% |
| Esso Exploration and Production UK Limited | 00207426 | Exited Party |

1.5 Merganser – Decommissioning Overview

1.4.3 Installations

| Table 1.6: Merganser Installations Being Decommissioned | | | |
|---|----------------------|--|--------------------|
| Field: | Merganser | Production Type: | Gas condensate |
| Water Depth (m) | 88m | UKCS Block: | 22/30; 22/25 |
| Distance to median line (km) | 24.5 | Distance to nearest UK coastline (km) | 226 |
| Surface Installations | | | |
| Number | Type | Topsides Weight (Te) | Jacket Weight (Te) |
| 0 | N/A | N/A | N/A |
| Subsea Installations | | Number of Wells | |
| Number | Type | Platform | Subsea |
| 2 | Manifold (inc piles) | N/A | 2 |
| Drill Cuttings pile(s) | | | |
| Number of Piles | 0 | Total Estimated volume (m ³) | N/A |



| Table 1.7: Merganser Installations Section 29 Notice Holders Summary | | |
|--|---------------------|-----------------|
| S29 Notice Holder | Registration Number | Equity Interest |
| Shell U.K. Limited (Operator) | 00140141 | 48.0815% |
| NEO Energy Natural Resources Limited | 13018823 | 44% |
| Premier Oil UK Limited | SC048705 | 7.9185% |
| Premier Oil E&P UK Limited | 02761032 | Exited Party |
| Esso Exploration and Production UK Limited | 00207426 | Exited Party |

1.4.4 Pipelines

| Table 1.8: Merganser Pipelines being Decommissioned | |
|---|---|
| Number of Pipelines | |
| Pipelines | 3 |
| Umbilicals | 4 |

| Table 1.9: Merganser Pipelines Section 29 Notice Holders Summary | | |
|--|---------------------|-----------------|
| S29 Notice Holder | Registration Number | Equity Interest |
| Shell U.K. Limited (Operator) | 00140141 | 48.0815% |
| NEO Energy Natural Resources Limited | 13018823 | 44% |
| Premier Oil UK Limited | SC048705 | 7.9185% |
| Premier Oil E&P UK Limited | 02761032 | Exited Party |
| Esso Exploration and Production UK Limited | 00207426 | Exited Party |

1.6 Summary of Proposed Decommissioning Programmes

| Table 1.10: Summary of Decommissioning Programmes | | |
|---|----------------------|-----------------------------------|
| Selected Option | Reason for Selection | Proposed Decommissioning Solution |
| 1. Topsides | | |
| N/A | N/A | N/A |
| 2. Jacket/Floating Facility (FPSO etc.) | | |
| N/A | N/A | N/A |



| Table 1.10: Summary of Decommissioning Programmes | | |
|---|--|---|
| Selected Option | Reason for Selection | Proposed Decommissioning Solution |
| 3. Subsea Installations | | |
| Manifolds <ul style="list-style-type: none"> • Scoter Manifold • Scoter Manifold Extension Structure • Merganser Manifold | To leave a clear seabed | Piles will be cut at a minimum of 3m below the seabed and the structure will be transported to a land-based facility for dismantlement and recycling, complete with any piping that they contain. |
| 4. Pipelines, Flowlines & Umbilicals | | |
| Surface-laid tie-in spools and jumpers <i>PL1945 JAB, PL1945 JAC, PL1945 JAD, PLU1946 JAB, PLU1946 JAC, PLU1946 JAD, PL2346 ident 7, PL2346 J1, PL2346 J2, PLU2347 J1, PLU2347 J2, PLU2386, PLU2386 J1, PLU2896, PLU4924</i> | To remove and leave a clear seabed | All surface-laid spools and jumpers, along with the associated stabilisation features, are to be recovered to shore for re-use / recycling / disposal |
| Trenched and buried pipelines <i>PL1945, PLU1946 excluding the Marnock-Machar crossing, PL2346 excluding ident 7, PLU2347</i> | The pipelines and umbilicals are sufficiently buried and stable for both the trenched sections and pipeline crossings; minimal seabed disturbance; reduced risk to personnel | The trenched and buried pipelines and umbilicals will be decommissioned <i>in situ</i> . The crossings associated with PL1945 will be decommissioned <i>in situ</i> (ref Table 1-11 for details). The ends of all pipelines and umbilicals listed will be remediated, such that all sections remaining <i>in situ</i> are buried to a minimum depth-of-cover of 0.6m. Stabilisation features associated with the ends will be recovered to shore for re-use / recycling / disposal. A confirmatory post-decommissioning depth-of-cover survey will be undertaken, with any areas of low cover being remediated with additional rock cover. |



| Table 1.10: Summary of Decommissioning Programmes | | |
|---|--|--|
| Selected Option | Reason for Selection | Proposed Decommissioning Solution |
| Scoter umbilical crossing of PL1575, PL1357 and PL1358 <i>PLU1946</i> | Minimise the number of cut ends left <i>in situ</i> minimise the number of transitions between rock berms; reduce the volume of material decommissioned <i>in situ</i> | <p>The Scoter umbilical (PLU1946) exits its trench for approximately 200m to cross PL1575, PL1357 and PL1358. This section is protected by either concrete mattresses, rock cover or a combination of both.</p> <p>The umbilical will be decommissioned <i>in situ</i>. Where the umbilical is surface-laid and protected only by mattresses, the exposed mattresses will be recovered to shore for re-use / recycling / disposal.</p> <p>Remedial rock-cover will be added to provide a continuous rock-berm across the 200m length of the crossing, to a target depth-of-cover for both the rock-covered and trenched sections on the umbilical of 0.6m.</p> <p>As the third-party pipelines being crossed are currently operational, the removal of the existing mattresses and remedial rock-cover will be executed only once the crossed lines have been removed from service and their decommissioning plans approved by OPRED.</p> <p>This removes the safety risk of lifting concrete mattresses over live pipelines and does not preclude any decommissioning option for the owners of the third-party crossed lines.</p> |
| 5. Wells | | |
| Well decommissioning in accordance with Oil & Gas UK Well Decommissioning Guidelines (issue 6, June 2018) | Meets HSE and NSTA regulatory requirements | <p>The reservoir will be fully and permanently isolated using a combination of semi-submersible drilling rig and Light Well Intervention vessel.</p> <p>Wellheads will be cut a minimum of 3m below seabed level and returned onshore for recycle or disposal.</p> |



| Table 1.10: Summary of Decommissioning Programmes | | |
|--|---|-----------------------------------|
| Selected Option | Reason for Selection | Proposed Decommissioning Solution |
| 6. Drill Cuttings | | |
| Decommissioning <i>in situ</i> | The Scoter and Merganser wells were drilled after the ban on discharge of Oil Based Mud (OBM). Water Based Mud (WBM) and cuttings were discharged at these locations, although there is little evidence from bathymetry data of any residual accumulations of water-based mud cuttings. Therefore, there is nothing present at the Scoter or Merganser wells which would constitute a drill cuttings pile within the definition in OSPAR Recommendation 2006/5. | N/A |
| 7. Interdependencies | | |
| <p>Please refer to the Preparatory Works Request in Appendix 1 of this document for details of the interface with the Scoter Production Riser (PL1945) and the Shearwater A Platform. The PWR covers the flushing and disconnection of the Scoter and Merganser production and controls systems. The production pipelines were flushed of bulk hydrocarbons in Q1 2021; whilst the chemical cores within the Scoter and Merganser control umbilicals were flushed in Q4 2021. The PWR also approved the removal of a short section of PL1945 on approach to Shearwater A.</p> <p>Trenched and buried sections of PL1945 and PLU1946 are located within the 500m safety zones of the Shearwater A and Shearwater C Platforms respectively. Decommissioning outcomes for both lines, including post-decommissioning surveys and seabed clearance verification, will be executed when the host platforms are removed and themselves decommissioned – with the exception of the spool removed in line with the Preparatory Works Request (Appendix 1).</p> | | |



1.7 Field Location Including Field Layout and Adjacent Facilities

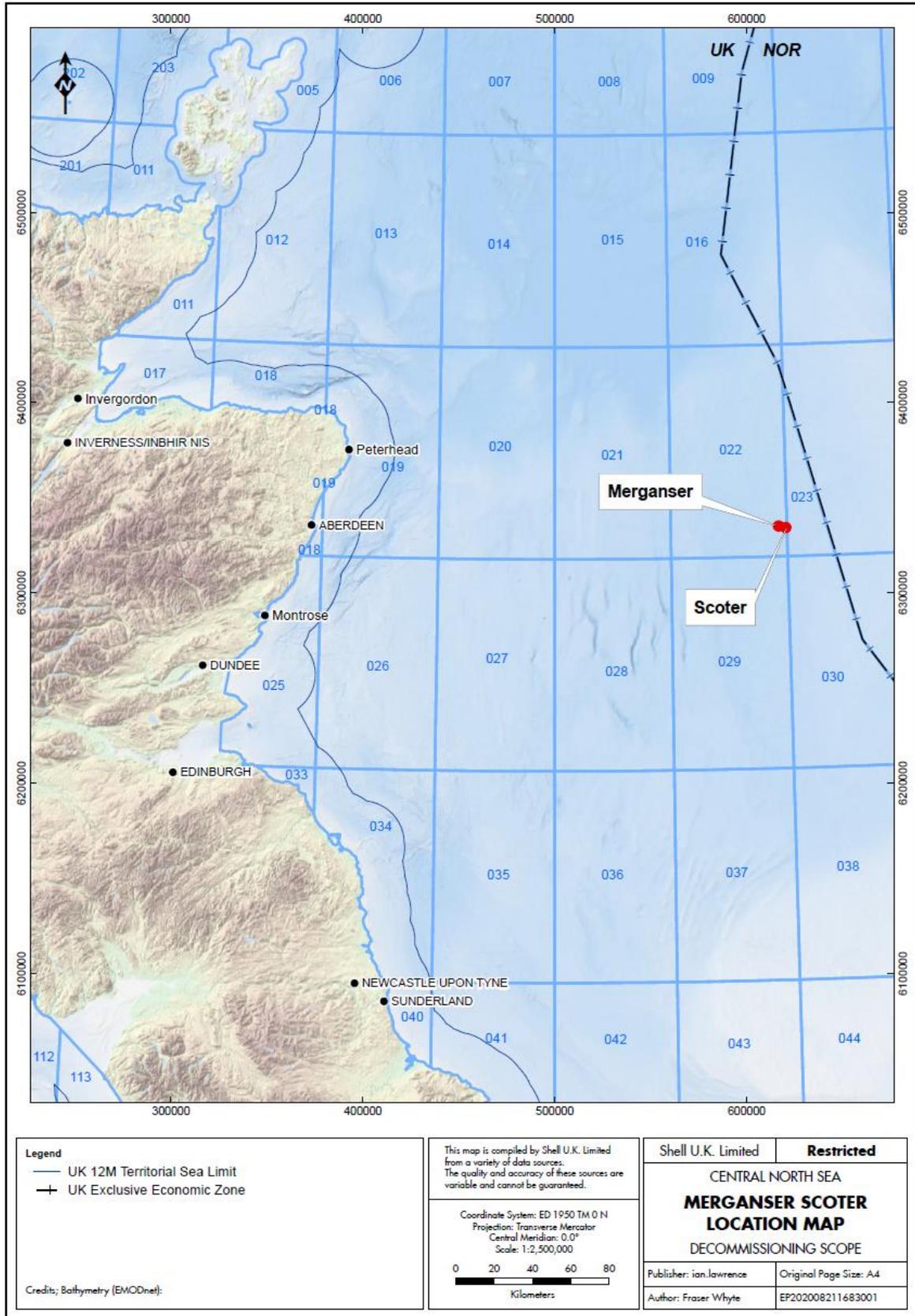


Figure 1.2: Field Location in UKCS

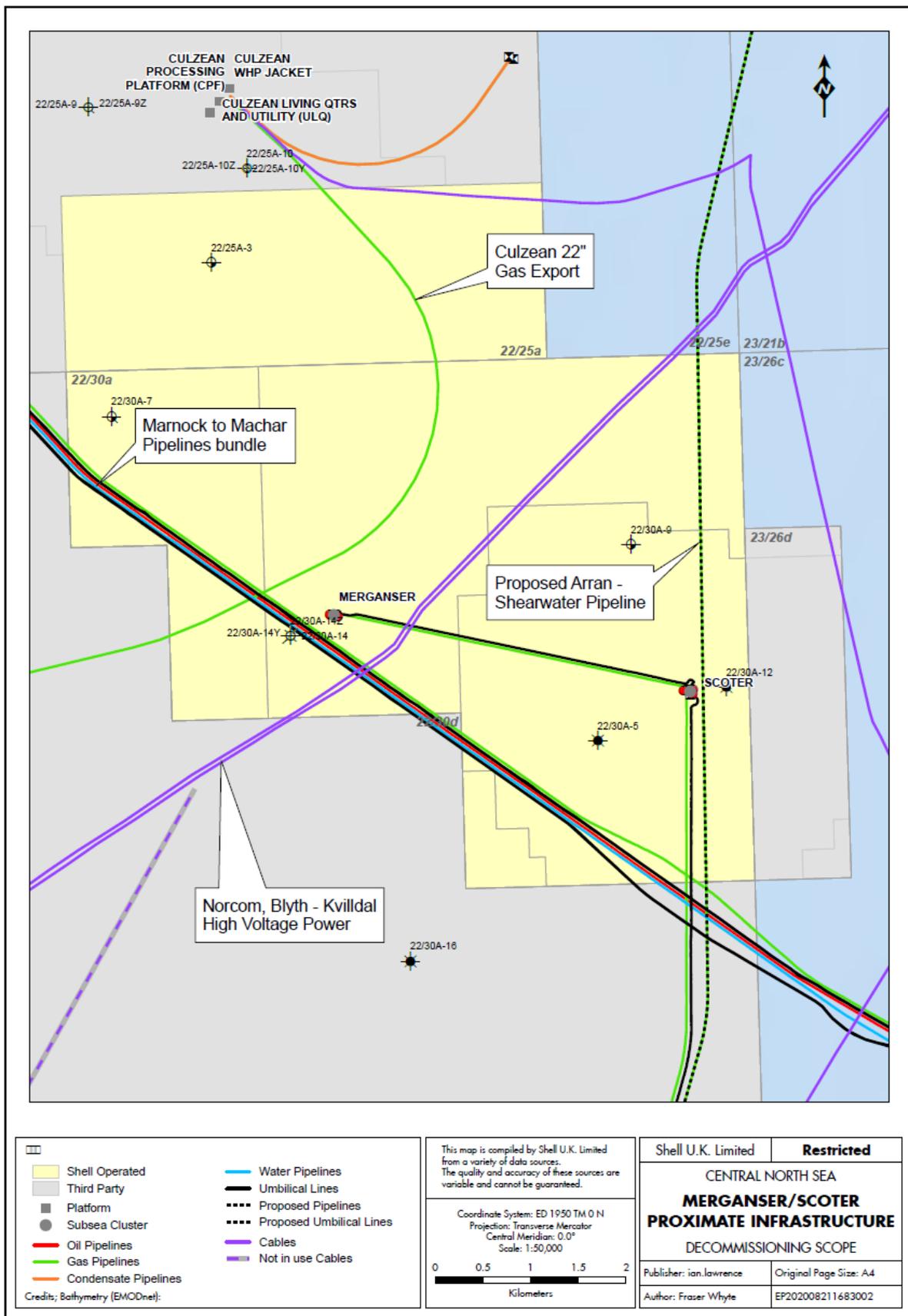


Figure 1.3: Field Layout



Table 1.11: Adjacent Facilities

| Owner | Name | Type | Distance/ Direction | Information | Status |
|--|-----------------------|--------------------------|--|--|--------|
| Total E&P North Sea UK Limited | Culzean (CPF) | Process Platform | 8.0km NW of Scoter Manifold, 5.7km N of Merganser Manifold | Production Platform | Active |
| Shell U.K. Limited | Shearwater | Platform | 11.6km S of Scoter Manifold, 12.5km S of Merganser Manifold | Host platform for Scoter and Merganser. Distances are provided to Shearwater A, the closest of the two Shearwater facilities | Active |
| National Grid Group Plc | Blyth-Kvilldal cables | Power cable (2-off) | 3.0 & 3.05km W of Scoter Manifold, 0.77 & 0.82km E of Merganser Manifold | Blyth to Kvilldal power cables (2-off), cross the Merganser Production Pipeline (PL2346) and Merganser Umbilical (PLU2347) | Active |
| BP Exploration Operating Company Limited | PL1357 | Oil Pipeline | 1.9km S of Scoter Manifold, 0.24km SW from Merganser | 16" Machar to Marnock Oil Pipeline, is crossed by Scoter Production Pipeline PL1945 and Scoter Umbilical PLU1946 The distances provided are from each manifold to the nearest point on the pipeline, not the crossing | Active |
| BP Exploration Operating Company Limited | PL1358 | Control umbilical | 1.9km S of Scoter Manifold, 0.24km SW from Merganser | Marnock to Machar Control Umbilical, crossed by Scoter Production Pipeline PL1945 and Scoter Umbilical PLU1946 The distances provided are from each manifold to the nearest point on the umbilical, not the crossing | Active |
| BP Exploration Operating | PL1575 | Water Injection Pipeline | 1.9km S of Scoter Manifold, 0.24km SW from Merganser | 12" Marnock to Machar Water Injection Pipeline, crossed by Scoter Production Pipeline PL1945 and Scoter Umbilical PLU1946 | Active |



| Table 1.11: Adjacent Facilities | | | | | |
|--|---------|-------------------|---|---|--------|
| Owner | Name | Type | Distance/ Direction | Information | Status |
| Company Limited | | | | The distances provided are from each manifold to the nearest point on the pipeline, not the crossing | |
| BP Exploration Operating Company Limited | PL1981 | Gas Lift Pipeline | 1.9km S of Scoter Manifold, 0.24km SW from Merganser Manifold | 6" Marnock to Machar Gas Lift Pipeline, crosses Scoter Production Pipeline PL1945 and Scoter Umbilical PLU1946 The distances provided are from each manifold to the nearest point on the pipeline, not the crossing | Active |
| BP Exploration Operating Company Limited | PLU3955 | Control Umbilical | 1.9km S of Scoter Manifold, 0.24km SW from Merganser Manifold | Marnock to Machar Electrical Upgrade Umbilical, crosses Scoter Production Pipeline PL1945 and Scoter Umbilical PLU1946 The distances provided are from each manifold to the nearest point on the umbilical, not the crossing | Active |
| Shell U.K. Limited | PL4645 | Gas Pipeline | 0.1km E from Scoter Manifold, 3.9km E from Merganser Manifold | 12" Shearwater to Columbus Tie-in Structure Pipeline (Arran) The distances provided are from each manifold to the nearest point on the pipeline The pipeline runs parallel to the Scoter Production Pipeline PL1945 and Scoter Umbilical PLU1946 from the Scoter Manifold to Shearwater A | Active |
| Shell U.K. Limited | PLU4650 | Control Umbilical | 0.1km E from Scoter Manifold, 3.9km E from Merganser Manifold | Control umbilical Shearwater to Columbus Tie-in Structure (Arran) | Active |



| Table 1.11: Adjacent Facilities | | | | | |
|--------------------------------------|--------|---------------------|---|--|--------|
| Owner | Name | Type | Distance/ Direction | Information | Status |
| | | | | <p>The distances provided are from each manifold to the nearest point on the umbilical</p> <p>The umbilical runs parallel to the Scoter Production Pipeline PL1945 and Scoter Umbilical PLU1946 from the Scoter Manifold to Shearwater C</p> | |
| Total E&P North Sea UK Limited | PL4106 | Gas Export Pipeline | 4km W from Scoter Manifold, 0.6km NW of Merganser Manifold | 22" Culzean to Stella PLEM Gas Export Flowline | Active |

Impacts of Decommissioning Proposals

The Scoter Production Pipeline PL1945 and Scoter Umbilical PLU1946 crosses over three BP-operated Marnock-Machar lines (PL1357, PL1358 and PL1575). The proposal within these Programmes to decommission the PL1945 crossing *in situ* does not change the current circumstances of the crossing and therefore has no impact on the decommissioning of the crossed lines. The proposal within these Programmes to remove the mattresses from the existing PLU1946 crossing and install remedial rock-cover will be executed only once the crossed lines have been removed from service and will not preclude any decommissioning options for the crossed lines.

In 2021, the Arran Development Project installed a production tie-in spool that crosses the Scoter Umbilical (PLU1946) within the Shearwater A 500m safety zone. This crossing consists of a series of concrete mattresses and grout bags. As it is assumed that the surface-laid approach of PLU1946 to Shearwater C will be removed only once the host platform has been taken out of service, this new crossing will not preclude the future removal of this section of PLU1946.

Execution of the scopes noted above will only be undertaken once a Pipeline Agreement has been agreed with the Owners of the third-party pipelines impacted by the decommissioning activity associated with these Programmes.

Pipelines that are within 100m of the Scoter and Merganser Pipelines and Umbilicals (PL1945, PLU1946, PL2346 and PLU2347) are included in Table 1.11 above. Other adjacent facilities and pipelines out with 100m can be seen in Figure 1.3.



1.8 Industrial Implications

We have looked to identify safe, efficient and cost-effective methods and procedures for various aspects of decommissioning the Scoter and Merganser Fields.

Contact was initiated on a portfolio basis, in late 2016, with the supply chain to explore decommissioning execution solutions, including:

- Inviting supply chain companies to present to the decommissioning team on their capabilities;
- Decommissioning & Remediation supply chain/market engagements including:
 - Portfolio presentation at introductory event held in March 2017;
 - Follow up engagement questionnaires and selective follow up “deep dives”;
- Participation in industry workgroups, events, seminars and conferences;
- Inclusion of trade organisations and enterprise bodies in supply chain consultations;
- Exploring multi-field and potentially multi-operator combined work scopes.

All procurement will be carried out in accordance with the company standards for contract and procurement. This includes the required utilisation of FPAL/Achilles for the identification of potential tenderers, where suitable.

In accordance with the Oil and Gas Authority’s (now NSTA) Supply Chain Action Plans Guidance (December 2017), Shell is developing a Supply Chain Action Plan to be submitted in support of these Decommissioning Programmes.



2 Description of Items to be decommissioned

2.1 Scoter Field

2.1.1 Scoter Field Installations: Subsea including Stabilisation Features

| Table 2.1: Scoter Subsea Installations and Stabilisation Features | | | | | |
|---|-----|--------------------------|-----------------------|--------------------------------|---|
| Subsea installations including Stabilisation Features | No. | Size / Weight (Te) | Location | | Comments / Status |
| Scoter Manifold | 1 | 9.3m x 7.3m x5.6m / 79Te | WGS84 Decimal Degrees | 57.134103° N 01.988228° E | Piled - 4 off 610mm dia, 25.4mm wall thickness x 17m. |
| | | | WGS84 Decimal Minute | 57° 08.046' N 01° 59.294' E | |
| Concrete mattresses | n/a | n/a | n/a | | n/a |
| Grout bags | n/a | n/a | n/a | | n/a |
| Formwork | n/a | n/a | n/a | | n/a |
| Froned Mats | n/a | n/a | n/a | | n/a |
| Rock Dump | n/a | n/a | n/a | | n/a |



2.1.2 Scoter Field: Pipelines Including Stabilisation Features

| Table 2.2: Scoter Pipeline/Flowline/Umbilical Information | | | | | | | | | |
|--|------------------------------|-------------------|---------------------|--|------------------|---|--|---|-----------------|
| Description | Pipeline Number (as per PWA) | Diameter (inches) | Approx. Length (km) | Description of Component Parts | Product Conveyed | From - To End Points | Burial Status | Pipeline Status | Current Content |
| Pipelines | | | | | | | | | |
| 6" Production Tie-in Spoolpiece | PL1945 J AB | 6 | 0.049 | Duplex pipe, PPF coating | Gas condensate | Well AB to Scoter Manifold | Surface-laid, protected by concrete mattresses | Non-operational | Seawater |
| 6" Production Tie-in Spoolpiece | PL1945 J AC | 6 | 0.046 | Duplex pipe, PPF coating | Gas condensate | Well AC to Scoter Manifold | Surface-laid, protected by concrete mattresses | Non-operational | Seawater |
| 6" Production Tie-in Spoolpiece | PL1945 J AD | 6 | 0.081 | Duplex pipe, PPF coating | Gas condensate | Well AD to Scoter Manifold | Surface-laid, protected by concrete mattresses | Non-operational | Seawater |
| Scoter Production Pipeline | PL1945 | 12 | 11.725 | Carbon steel pipeline, 4-layer PPF coating | Gas condensate | Scoter Manifold to end of trench adjacent to Shearwater A | Trenched and buried, transition to trench adjacent to Scoter Manifold is protected by mattresses | Non-operational Crossings listed in Table 1.11 | Seawater |
| Note that ~50m of surface-laid tie-in spool between the Scoter Production Riser and the Scoter Production Pipeline trench adjacent to Shearwater A has been removed during the flush and disconnect campaign. The length shown above for PL1945 does not include this section. | | | | | | | | | |



| Table 2.2: Scoter Pipeline/Flowline/Umbilical Information | | | | | | | | | |
|---|------------------------------|-------------------|---------------------|-------------------------------------|--------------------------------------|---|--|---|--------------------------------|
| Description | Pipeline Number (as per PWA) | Diameter (inches) | Approx. Length (km) | Description of Component Parts | Product Conveyed | From - To End Points | Burial Status | Pipeline Status | Current Content |
| Scoter Umbilical | PLU1946 | 117mm (Note 1) | 12 | Electro-hydraulic control umbilical | Methanol, hydraulic fluid, chemicals | TUTU on Shearwater C to Scoter Manifold | Trenched and buried, transitions to trench are protected by mattresses | Operational Crossings listed in Table 1.11 | Note 2 |
| Manifold Umbilical Jumper (Well AC) | PLU1946 J AC | 117mm (Note 1) | 0.070 | Electro-hydraulic control umbilical | Methanol, hydraulic fluid, chemicals | Scoter Manifold to Well AC | Surface-laid, protected by concrete mattresses | Operational | Hydraulic fluids and chemicals |
| Manifold Umbilical Jumper (Well AB) | PLU 1946 J AB | 117mm (Note 1) | 0.070 | Electro-hydraulic control umbilical | Methanol, hydraulic fluid, chemicals | Scoter Manifold to Well AB | Surface-laid, protected by concrete mattresses | Operational | Hydraulic fluids and chemicals |
| Manifold Umbilical Jumper (Well AD) | PLU 1946 J AD | 117mm (Note 1) | 0.097 | Electro-hydraulic control umbilical | Methanol, hydraulic fluid, chemicals | Scoter Manifold to Well AD | Surface-laid, protected by concrete mattresses | Operational | Hydraulic fluids and chemicals |
| Control Umbilical Jumper (Well AD) | PLU2386 | 25mm | 0.102 | Hydraulic control umbilical | Hydraulic fluids | Scoter Manifold to Well AD | Surface-laid, protected by concrete mattresses | Operational | Note 2 |



| Table 2.2: Scoter Pipeline/Flowline/Umbilical Information | | | | | | | | | |
|---|------------------------------|-------------------|---------------------|-------------------------------------|------------------|----------------------------------|---------------------------------------|-----------------|--------------------------------|
| Description | Pipeline Number (as per PWA) | Diameter (inches) | Approx. Length (km) | Description of Component Parts | Product Conveyed | From - To End Points | Burial Status | Pipeline Status | Current Content |
| Control Umbilical Jumper (SMES) | PLU2386 J1 | 25mm | 0.070 | Electro-hydraulic control umbilical | Hydraulic fluid | Well AD to SMES | Surface-laid, protected by grout bags | Operational | Hydraulic fluids and chemicals |
| Electrical Control Umbilical (FSM spool) | PLU4924 | 29mm | 0.094 | Electrical control umbilical | None | Well AC to Scoter FSM spoolpiece | Surface-laid, protected by grout bags | Operational | Electrical connection only |
| <p><i>Note 1</i> - the diameter shown for PLU1946, PLU1946 J AB, PLU 1946 J AC and PLU1946 J AD is the as-built external diameter for the full umbilical. Individual core diameters are as follows: 6 x 12.7mm diameter cores; 5 x 25.4mm diameter cores</p> <p><i>Note 2</i> – the umbilicals underwent a flushing campaign in Q4 2021, in which the chemical contents of each control umbilical were flushed and replaced with seawater. The electrical control cores remain connected to retain in-use monitoring of the Scoter wells until P&L in 2023.</p> | | | | | | | | | |



| Table 2.3: Scoter Subsea Pipeline Stabilisation Features | | | | |
|--|--------------|-------------------|---|---|
| Stabilisation Feature | Total Number | Weight (Te) | Location(s) | Exposed/Buried/Condition |
| Concrete mattresses | Approx. 255 | 5 Te each | PL1945 approach to Shearwater A – 44 PL1945 approach to Scoter Manifold - 68 PLU1946 approach to Shearwater C – 33 PLU1946 approach to Scoter Manifold - 44 PLU1946 crossings – 28 PL1945 J AC and PLU1946 J AC – 7 PL1945 J AB and PLU1946 J AB – 7 PL1945 J AD and PLU1946 J AD – 22 | Mainly exposed on seabed surface, some partially or fully buried. Generally good condition. 8 mattresses at the Machar crossings are rock-covered and will not be recovered Note that ~20 of the mattresses covering PL1945 on approach to Shearwater A have already been removed as part of the flush and disconnect campaign executed under the PWR contained in Appendix 1 |
| Concrete mattresses | 5 | 9 Te each | Below PL1945 and PLU1946 at the Machar crossings | Fully buried beneath rock cover at the crossings |
| Grout bags | Approx. 3000 | 0.025 Te each | Supporting PL1945 and PLU1946 transitions from their trenches Supporting PL1945 J AB, PL1945 J AC, PL1945 J AD, PLU1946 J AB, PLU1946 J AC and PLU1946 J AD connections to the Scoter Manifold and their respective wellheads | Mainly exposed on seabed surface, some partially or fully buried. Generally good condition. |
| Concrete plinths | 2 | 15.6 Te each | Supporting PL1945 and PLU1946 at the Machar crossings | Fully buried beneath rock cover at the crossings |
| Rock Cover | n/a | Approx. 10,900 Te | PL1945 and PLU1946 crossings as detailed in Table 1.11 | Rock cover to remain <i>in situ</i> |

A schematic providing indicative locations of these stabilisation features is provided in Figure 2.1.

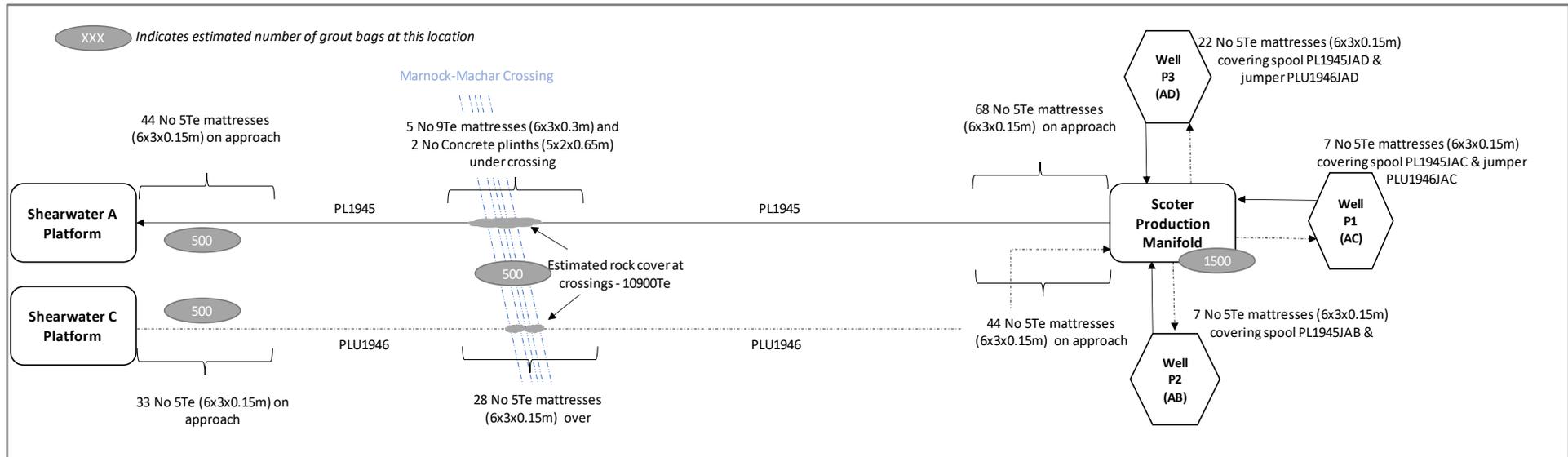


Figure 2.1: Schematic indicating location of Scoter stabilisation features



2.1.3 *Scoter Field Wells*

| Table 2.4: Scoter Well Information | | | |
|------------------------------------|-------------------------|---------|------------------|
| Subsea Wells | Designation | Status | Category of Well |
| 22/30a-s1 | Gas condensate producer | Shut-in | SS-3-0-1 |
| 22/30a-s2 | Gas condensate producer | Shut-in | SS-3-0-1 |
| 22/30a-s3 | Gas condensate producer | Shut-in | SS-3-0-1 |

For details of well categorisation, see OGUK Guidelines for the Suspension or Abandonment of Wells, Issue 6 June 2018.

2.1.4 *Scoter Field Drill Cuttings*

The Scoter wells were drilled after the ban on discharge of Oil Based Mud (OBM). Water Based Mud (WBM) and cuttings were discharged at these locations, although there is little evidence from bathymetry data of any residual accumulations of water-based mud cuttings. Therefore, there is nothing present at the Scoter wells which would constitute a drill cuttings pile within the definition in OSPAR Recommendation 2006/5.

Refer to Section 2.2.6 of the Environmental Appraisal [3] for further details.



2.1.5 Scoter Field Inventory Estimates

The total inventory of pipeline and installations materials at the Scoter field is 4048 tonnes; 232 tonnes of this total relates to installations, with the remaining 3816 tonnes relating to pipelines, umbilicals, spool pieces and pipeline support structures.

The tables and pie charts which follow present estimates for the Scoter inventory. Refer to Section 8 of the Environmental Appraisal [3] for further details of the waste inventory.

| Table 2.5: Scoter Material Inventory | | |
|--------------------------------------|-------------|-------------|
| Material | Weight (Te) | % of total |
| Installations | | |
| Carbon Steel | 79 | 34.1% |
| Stainless Steel | 119 | 51.3% |
| Non-Ferrous Metal | 1 | 0.5% |
| Concrete | 14 | 6.0% |
| Plastics | 19 | 8.0% |
| Haz Mat/NORM | 0 | - |
| Other Non-Hazardous | 0 | - |
| Installations Total | 232 | 100% |
| Pipelines | | |
| Carbon Steel | 2103 | 55.1% |
| Stainless Steel | 73 | 1.9% |
| Non-Ferrous Metal | 28 | 0.7% |
| Concrete | 1385 | 36.3% |
| Plastics | 227 | 5.9% |
| Haz Mat/NORM | 0 | - |
| Other Non-Hazardous | 0 | - |
| Pipelines Total | 3816 | 100% |

Note that figures are rounded and may not sum to exactly 100%.

Material inventory excludes rock cover.

Details of wastes are given in Section 3.8 of this Decommissioning Programme.

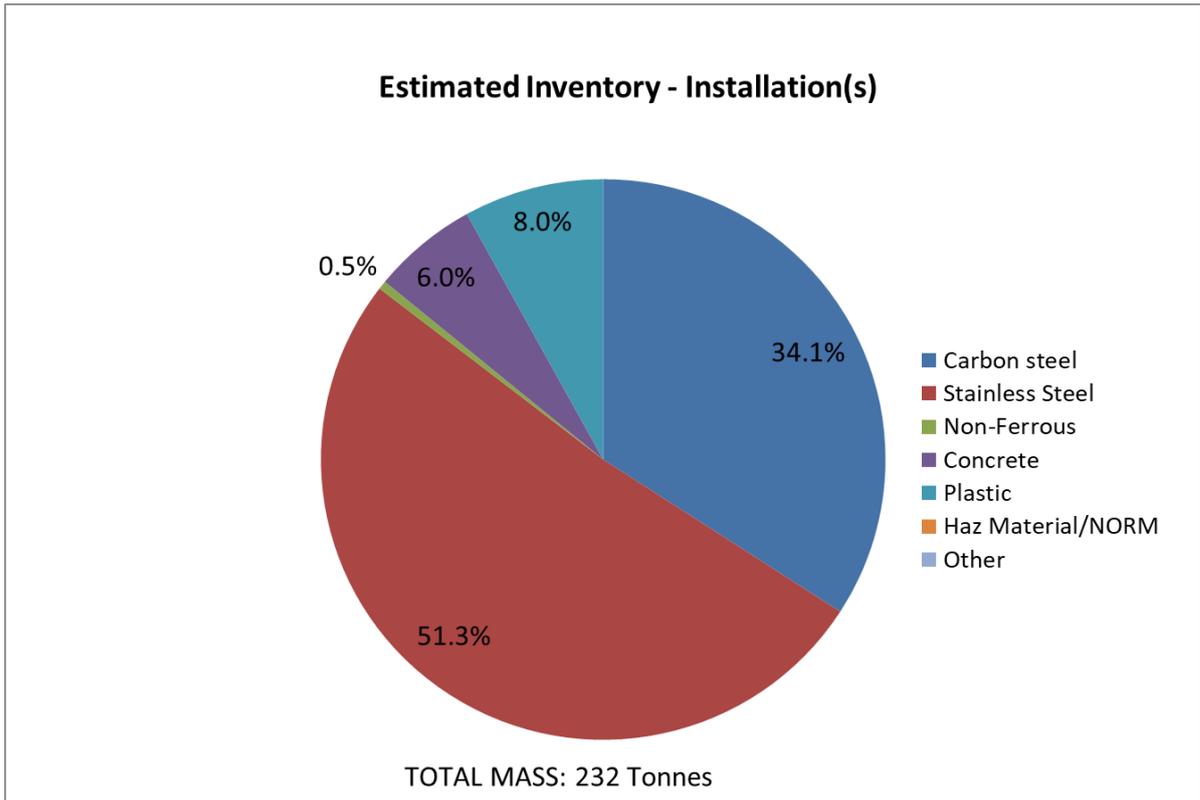


Figure 2.2: Estimated Inventories (Scoter Installations)

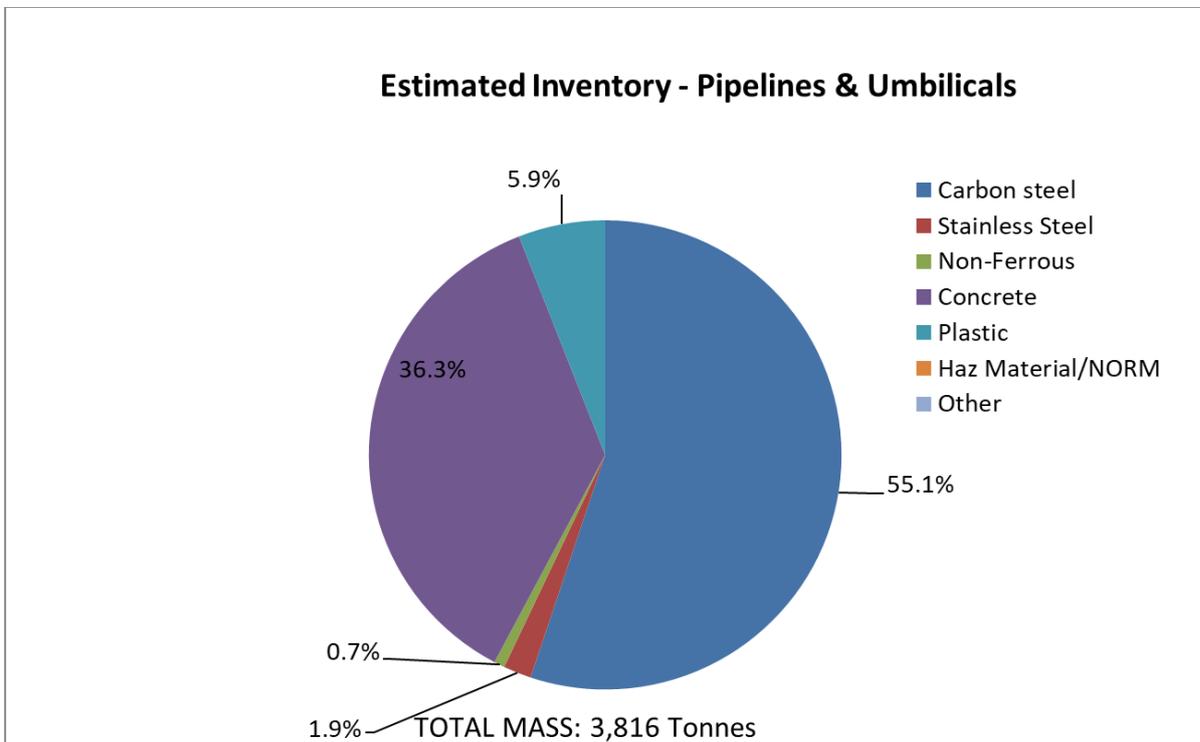


Figure 2.3: Estimated Inventories (Scoter Pipelines) (excluding rock cover)



2.2 Merganser Field

2.2.1 Merganser Field Installations: Subsea including Stabilisation Features

| Table 2.6: Merganser Subsea Installations and Stabilisation Features | | | | | |
|--|-----|-----------------------------|-----------------------|--------------------------------|---|
| Subsea installations including Stabilisation Features | No. | Size / Weight (Te) | Location | | Comments / Status |
| Scoter Manifold Extension Structure (SMES) | 1 | 6.8m x 5.3m x 4.3m / 34.5Te | WGS84 Decimal Degrees | 57.134303° N 01.987973° E | Piled - 4 off 610mm dia, 25.4mm wall thickness x 17m. |
| | | | WGS84 Decimal Minute | 57° 08.058' N 01° 59.278' E | |
| Merganser Manifold | 1 | 9.3m x 7.3m x 5.5m / 76.6Te | WGS84 Decimal Degrees | 57.142365° N 01.927038° E | Piled - 4 off 610mm dia, 25.4mm wall thickness x 17m. |
| | | | WGS84 Decimal Minute | 57° 08.542' N 01° 55.622' E | |
| Concrete mattresses | n/a | n/a | n/a | | n/a |
| Grout bags | n/a | n/a | n/a | | n/a |
| Formwork | n/a | n/a | n/a | | n/a |
| Froned Mats | n/a | n/a | n/a | | n/a |
| Rock Dump | n/a | n/a | n/a | | n/a |



2.2.2 Merganser Field: Pipelines including Stabilisation Features

| Table 2.7: Merganser Pipeline/Flowline/Umbilical Information | | | | | | | | | |
|--|------------------------------|-------------------|---------------------|--|------------------|---|---|-----------------|-----------------|
| Description | Pipeline Number (as per PWA) | Diameter (inches) | Approx. Length (km) | Description of Component Parts | Product Conveyed | From - To End Points | Burial Status | Pipeline Status | Current Content |
| Pipelines | | | | | | | | | |
| Merganser Production Pipeline | PL2346 | 8 | 3.847 | Carbon steel pipeline, 4-layer PPF coating | Gas condensate | Merganser Manifold to SMES | Trenched and buried, transitions to trench adjacent to Merganser Manifold and from trench adjacent to SMES are protected by rock Surface-laid tie-in sections between rock cover and each manifold are protected by mattresses | Non-operational | Seawater |
| SMES to Scoter Manifold tie-in spool | PL2346 ident 7 | 6 | 0.026 | Super duplex spool, SPU coating | Gas condensate | SMES to Scoter Manifold | Surface-laid, protected by concrete mattresses | Non-operational | Seawater |
| 6" Production tie-in spool | PL2346 J1 | 6 | 0.058 | Super duplex spool, SPU coating | Gas condensate | Merganser East Well to Merganser Manifold | Surface-laid, protected by concrete mattresses | Non-operational | Seawater |



| Table 2.7: Merganser Pipeline/Flowline/Umbilical Information | | | | | | | | | |
|--|------------------------------|-------------------|---------------------|-------------------------------------|---------------------------------------|---|---|-----------------|--------------------------------|
| Description | Pipeline Number (as per PWA) | Diameter (inches) | Approx. Length (km) | Description of Component Parts | Product Conveyed | From - To End Points | Burial Status | Pipeline Status | Current Content |
| 6" Production tie-in spool | PL2346 J2 | 6 | 0.089 | Super duplex spool, SPU coating | Gas condensate | Merganser West Well to Merganser Manifold | Surface-laid, protected by concrete mattresses | Non-operational | Seawater |
| Merganser umbilical | PLU2347 | 105mm (Note 1) | 4.006 | Electro-hydraulic control umbilical | Methanol, hydraulic fluids, chemicals | Scoter Manifold to Merganser Manifold | Trenched and buried, transitions to trench adjacent to Merganser Manifold and from trench adjacent to Scoter Manifold are protected by rock Surface-laid sections between rock cover and each manifold are protected by mattresses | Operational | Note 2 |
| Manifold Umbilical Jumper (East Well) | PLU2347 J1 | 105mm (Note 1) | 0.060 | Electro-hydraulic control umbilical | Methanol, hydraulic fluid, chemicals | Merganser Manifold to Merganser East Well | Surface-laid, protected by concrete mattresses | Operational | Hydraulic fluids and chemicals |



| Table 2.7: Merganser Pipeline/Flowline/Umbilical Information | | | | | | | | | |
|--|------------------------------|--------------------------|---------------------|-------------------------------------|--------------------------------------|---|--|-----------------|--------------------------------|
| Description | Pipeline Number (as per PWA) | Diameter (inches) | Approx. Length (km) | Description of Component Parts | Product Conveyed | From - To End Points | Burial Status | Pipeline Status | Current Content |
| Manifold Umbilical Jumper (West Well) | PLU2347 J2 | 105mm <i>(Note 1)</i> | 0.086 | Electro-hydraulic control umbilical | Methanol, hydraulic fluid, chemicals | Merganser Manifold to Merganser West Well | Surface-laid, protected by concrete mattresses | Operational | Hydraulic fluids and chemicals |
| Retrofit Cable | PLU2896 | N/A | 0.060 | Electrical jumper | Power / signal cables | Merganser Manifold to East Well | Surface-laid, protected by concrete mattresses | Operational | Electrical connection only |

Note 1 - Note the diameter shown for PLU2347, PLU2347 J1 and PLU 2347 J2 is the as-built external diameter for the full umbilical. Individual core diameters are as follows: 2 x 25.4mm cores, 2 x 15.9mm cores, 5 x 12.7mm cores and power / signal cables.

Note 2 – the umbilicals underwent a flushing campaign in Q4 2021, in which the chemical contents of each control umbilical was flushed and replaced with seawater. The electrical control cores remain connected to retain in-use monitoring of the Merganser wells until P&L, in 2023.



| Table 2.8: Merganser Subsea Pipeline Stabilisation Features | | | | |
|---|--------------|------------------|---|---|
| Stabilisation Feature | Total Number | Weight (Te) | Location(s) | Exposed/Buried/Condition |
| Concrete mattresses | Approx. 75 | 5 Te each | SMES to Scoter Manifold tie-in spool – 5 PL2346 approach to SMES – 12 PLU2347 approach to Scoter Manifold – 7 PL2346 approach to Merganser Manifold – 21 PLU2347 approach to Merganser Manifold – 5 East Well spools / jumpers – 10 West Well spools / jumpers – 15 | Mainly exposed on seabed surface, some partially or fully buried. Generally good condition. |
| Grout bags | Approx. 3000 | 0.025 Te each | Supporting PL2346 and PLU2347 transitions from their trenches Supporting PL2346 J1, PL2346 J2, PLU2347 J1 and PLU2347 J2 connections to the Merganser Manifold, SMES and their respective wellheads | Mainly exposed on seabed surface, some partially or fully buried. Generally good condition. |
| Formwork | n/a | n/a | n/a | n/a |
| Froned Mats | n/a | n/a | n/a | n/a |
| Rock Cover | n/a | Approx. 3,560 Te | PL2346 and PLU2347 transitions from trenches; and spot rock used to mitigate areas of low cover on installation | Rock cover to remain <i>in situ</i> |

A schematic providing indicative locations of these stabilisation features is provided in Figure 2.4.

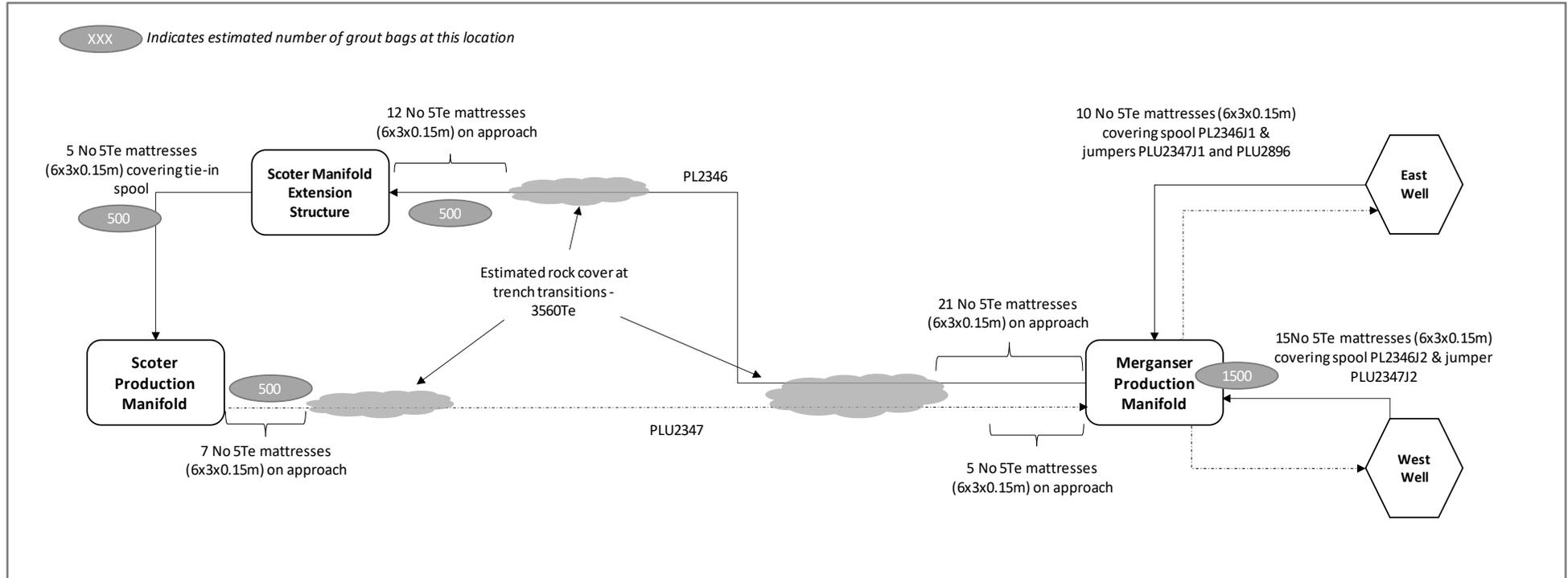


Figure 2.4: Schematic indicating location of Merganser stabilisation features



2.2.3 Merganser Field Wells

| Table 2.9: Merganser Well Information | | | |
|---------------------------------------|-------------------------|---------|------------------|
| Subsea Wells | Designation | Status | Category of Well |
| 22/30a-M1Y | Gas condensate producer | Shut-in | SS-3-0-1 |
| 22/30a-M2Y | Gas condensate producer | Shut-in | SS-4-0-1 |

For details of well categorisation, see OGUK Guidelines for the Suspension or Abandonment of Wells, Issue 6 June 2018.

2.2.4 Merganser Field Drill Cuttings

The Merganser wells were drilled after the ban on discharge of OBM. WBM and cuttings were discharged at these locations, although there is little evidence from bathymetry data of any residual accumulations of water-based mud cuttings. Therefore, there is nothing present at the Merganser wells which would constitute a drill cuttings pile within the definition of OSPAR Recommendation 2006/5.

Refer to Section 2.2.6 of the Environmental Appraisal [3] for further details.



2.2.5 Merganser Field Inventory Estimates

The total inventory of pipeline and installations materials at the Merganser field is 1196 tonnes; 294 tonnes of this total relates to installations with the remaining 902 tonnes relating to pipelines, umbilicals, spool pieces and pipeline support structures.

The tables and pie charts which follow present estimates for the Merganser inventory. Refer to Section 8 of the Environmental Appraisal [3] for further details of the waste inventory.

| Table 2.10: Merganser Material Inventory | | |
|--|-------------|-------------|
| Material | Weight (Te) | % of total |
| Installations | | |
| Carbon Steel | 145 | 49.5% |
| Stainless Steel | 107 | 36.3% |
| Non-Ferrous Metal | 2 | 0.5% |
| Concrete | 28 | 9.5% |
| Plastics | 12 | 4.2% |
| Haz Mat/NORM | 0 | - |
| Other Non-Hazardous | 0 | - |
| Installations Total | 294 | 100% |
| Pipelines | | |
| Carbon Steel | 373 | 41.4% |
| Stainless Steel | 32 | 3.6% |
| Non-Ferrous Metal | 4 | 0.5% |
| Concrete | 428 | 47.4% |
| Plastics | 65 | 7.2% |
| Haz Mat/NORM | 0 | - |
| Other Non-Hazardous | 0 | - |
| Pipelines Total | 902 | 100% |

Note that figures are rounded and may not sum to exactly 100%.

Material inventory excludes rock cover.

Details of wastes are given in Section 3.8 of this Decommissioning Programme.

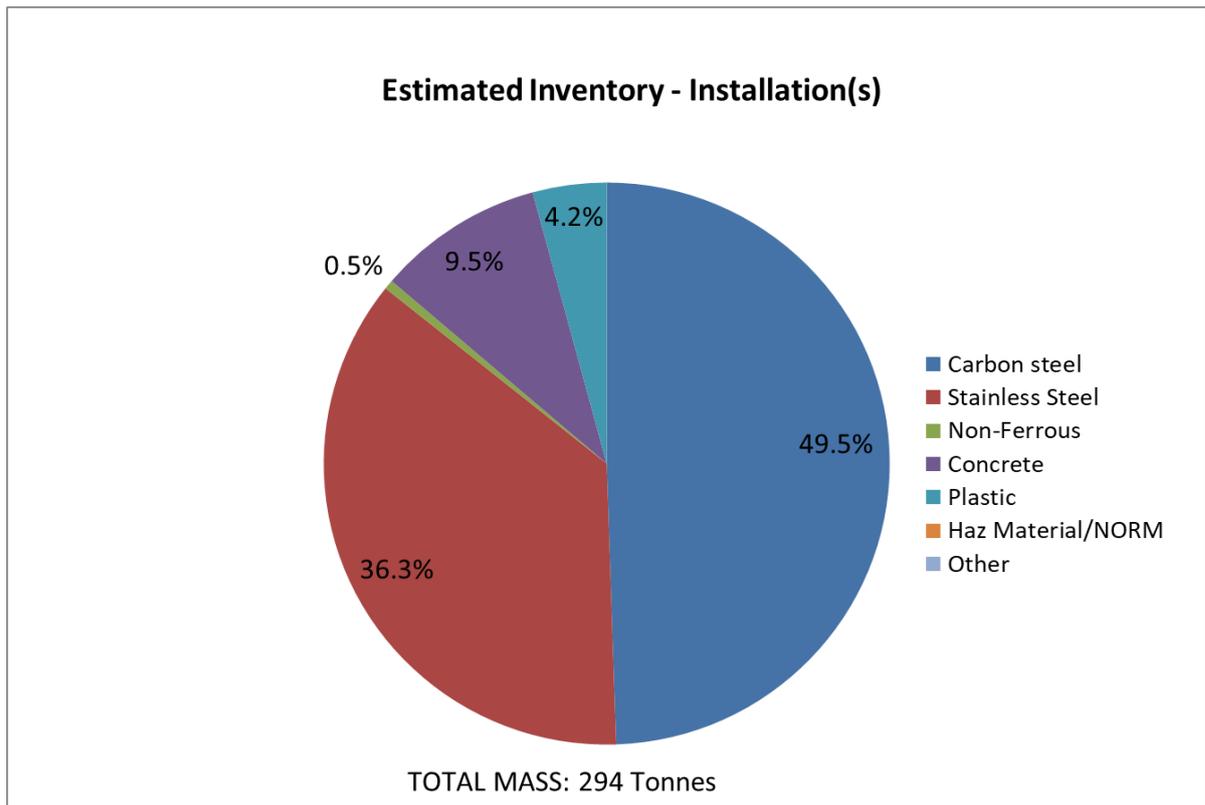


Figure 2.5: Estimated Inventories (Merganser Installations)

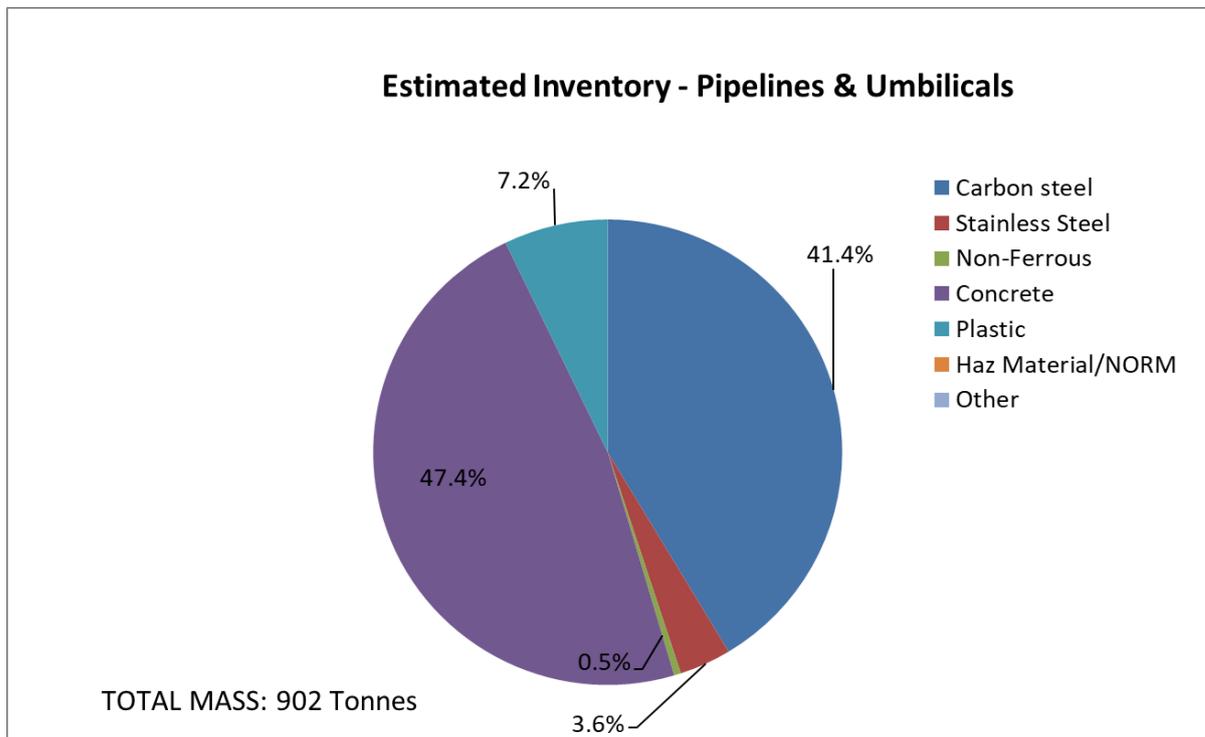


Figure 2.6: Estimated Inventories (Merganser Pipelines) (excluding rock cover)



3 REMOVAL AND DISPOSAL METHODS

The Scoter and Merganser decommissioning project will implement Shell’s HSE & SP Control Framework, supporting a waste management hierarchy that optimises the re-use and recycling of waste and aims to minimise waste disposal in accordance with the EU Waste Framework Directive. The risks associated with waste will be assessed before removal to shore and opportunities to re-use the waste for the same or other purposes or, failing that, to recycle or recover materials will be identified. Waste will be characterised, classified, segregated, stored and transported according to appropriate regulatory requirements.

When removed from the seabed, the equipment will be transported to a decommissioning contractor’s onshore yard, where different types of material will be segregated with a view to optimising re-use and recycling. The onshore yard(s) has (have) not yet been selected. Should the yard(s) be located outside the UK, permits to satisfy the Basel Convention and transboundary shipment of waste regulations will be sought.

The decommissioning contractor for the subsea installations and pipelines may look for opportunities to re-use equipment or component parts, either as spares or for them to be refurbished through their normal channels. It is anticipated there may be limited commercial interest given the age of the asset.

The decommissioning contractor’s established arrangements with recycling companies will facilitate optimisation of the quantity of materials that can be sent for recycling. A project Waste Management Plan (WMP) will be implemented that tracks waste materials through to the recycling endpoint. Shell will provide a summary of each waste stream and the proportions of re-use, recycling and landfill within the Close Out Report following completion of final decommissioning, see Section 6.5.

Materials for which no re-use or recycling options are available will be tracked through to disposal in landfill.

3.1 Topsides

There are no topsides associated with the Scoter and Merganser Decommissioning Programmes.

| Table 3.1: Topsides Removal Methods | |
|--|-------------|
| 1) HLV (semi-submersible crane vessel) <input type="checkbox"/> 2) Monohull crane vessel <input type="checkbox"/> 3) SLV <input type="checkbox"/> 4) Piece small <input type="checkbox"/> 5) Other <input type="checkbox"/> | |
| Method | Description |
| N/A | N/A |



3.2 Jacket

There are no jackets associated with the Scoter and Merganser Decommissioning Programmes.

| Table 3.2: Jacket Decommissioning Methods | |
|---|---|
| 1) HLV (semi-submersible crane vessel) <input type="checkbox"/> | 2) Monohull crane vessel <input type="checkbox"/> |
| 3) SLV <input type="checkbox"/> | 4) Piece small <input type="checkbox"/> |
| | 5) Other – <input type="checkbox"/> |
| Method | Description |
| N/A | N/A |

3.3 Subsea Installations and Stabilisation Features

| Table 3.3: Subsea Installations and Stabilisation Features | | | |
|--|--------|---------------|--------------------------------|
| Subsea installations and stabilisation features | Number | Option | Disposal Route (if applicable) |
| Production Manifold | 3 | Full recovery | Return to shore for recycling |
| Concrete mattresses | n/a | | |
| Grout bags | n/a | | |
| Formwork | n/a | | |
| Froned Mats | n/a | | |
| Rock Dump | n/a | | |

Note – stabilisation features supporting the tie-in spools and jumpers between manifolds and wellheads are included within the Pipeline Stabilisation Features, Section 3.5.



3.4 Pipelines

A comparative assessment review of the pipeline decommissioning options was performed in accordance with the OPRED Guidance Notes [2], OGUK Guidelines on Comparative Assessment [4] and Shell U.K. Guidance [5]. At this review, the following options for decommissioning were considered (see also Table 2.2 for more information on current status):

***Key to Options:**

- | | | |
|-----------------------|-----------------------|-------------------------|
| 1) Total Removal | 2) Partial Removal | 3) Trench and bury |
| 4) Blanket Rock Cover | 5) Partial Rock Cover | 6) Decommission in situ |

Table 3.4: Pipeline or Pipeline Groups Decommissioning Options

| Pipeline / group (as per PWA) | Condition of line/group | Whole or part of pipeline/group | Decommissioning options considered |
|--|--|------------------------------------|---------------------------------------|
| Surface-laid tie-in spools and jumpers <i>PL1945 JAB, PL1945 JAC, PL1945 JAD, PLU1946 JAB, PLU1946 JAC, PLU1946 JAD, PL2346 ident 7, PL2346 J1, PL2346 J2, PLU2347 J1, PLU2347 J2</i> | Surface-laid, protected by concrete mattresses | Whole | 1, 4, 6 |
| Trenched and buried pipelines <i>PL1945, PLU1946 excluding the Marnock-Machar crossing, PL2346 excluding ident 7, PLU2347</i> | Trenched and buried, transition sections and surface-laid approaches to manifolds and tie-ins are protected by rock, concrete mats or a combination of the two | Part | 1, 2, 6 |
| Scoter umbilical crossing of PL1575, PL1357 and PL1358 <i>PLU1946</i> | Surface-laid, protected by a combination of concrete mattresses and rock cover | Part | 1, 2, 4, 6 |

Comparative Assessment Method:

Decommissioning options were assessed in line with the requirements of the OPRED Guidance Notes [2] and largely adopted the guidance provided in Appendix A of the Oil & Gas UK Guidelines for Comparative Assessment in Decommissioning Programmes, Issue 1, as required. Application of the OPRED and OGUK Guidelines for Shell decommissioning projects, including adaptations of the assessment criteria, is detailed in the Shell CA Procedure [5].



Screening workshops were held to ensure the required information was available for the CA and that relevant studies were available. A CA workshop was held with relevant external stakeholders and consultants to ensure a robust assessment was completed.

The assessments were arranged by unique geographical and technical conditions. Options were scored according to pre-agreed qualitative and quantitative scales provided in the CA Procedure [5].

Outcome of Comparative Assessment:

The results of the CA workshop have been issued to stakeholders, with feedback sought prior to the final recommendations being issued as the Comparative Assessment Report [6] in support of this document.

| Table 3.5: Outcomes of Comparative Assessment | | |
|---|--|--|
| Pipeline or Group | Recommended Option | Justification |
| Surface-laid tie-in spools and jumpers | Total removal | Leaves a clear seabed for other users of the sea, providing the lowest legacy safety risk and lowest environmental legacy risk |
| Trenched and buried pipelines | Decommission <i>in situ</i> with end remediation | Leaves a clear seabed, minimising risk to other users of the sea, whilst achieving the lowest safety risk to project personnel and reducing the short-term environmental impact |
| Scoter umbilical crossing | Remove mattresses and rock cover | Minimises the number of cut ends and transitions between rock berms to reduce the legacy risk to other users of the sea, whilst reducing the legacy environmental impact by removing the matts and reducing the material decommissioned <i>in situ</i> |



3.5 Pipeline Stabilisation Feature(s)

| Table 3.6: Pipeline Stabilisation Features | | | |
|--|------------------------------------|---------------|---------------------------------------|
| Stabilisation feature(s) | Number | Option | Disposal Route (if applicable) |
| Exposed concrete mattresses | Approx. 320 | Full recovery | To shore for recycling ^[1] |
| Buried concrete mattresses | Approx. 19 ^[4] | Leave in situ | n/a |
| Concrete plinths | 2 | Leave in situ | n/a |
| Exposed grout bags | Approx. 6000 ^[2] | Full recovery | To shore for recycling |
| Rock cover (Te) | Approx. 14400 Te ^[3] | Leave in situ | n/a |

Notes

1. In the event of practical difficulties (e.g. poor integrity or fully covered with rock), OPRED will be consulted.
2. The number of grout bags is estimated.
3. This is the existing rock that is estimated as being present at time of CoP.
4. Mattresses and grout bags used at pipeline crossings for PL1945 (e.g. for protection of other pipelines, support or stability purposes). Installed under pipelines and/or covered under rock.

3.6 Wells

| Table 3.7: Well Plug and Abandonment |
|--|
| <p>The wells, as listed in Section 2.1.3 (Table 2.4) and Section 2.2.3 (Table 2.9), will be decommissioned in accordance with Oil and Gas UK (OGUK) Guidelines for the suspension and abandonment of wells.</p> <p>A PON5/PETS/MCAA Application will be submitted in support of any such work to be carried out.</p> |



3.7 Drill Cuttings

The Scoter and Merganser wells were drilled after the ban on discharge of OBM. WBM and cuttings were discharged at these locations, although there is little evidence from bathymetry data of any residual accumulations of water-based mud cuttings. Therefore, there is nothing present at the Scoter and Merganser wells which would constitute a drill cuttings pile within the definition of OSPAR Recommendation 2006/5.

Refer to Section 2.2.6 of the Environmental Appraisal [3] for further details.

| Table 3.8: Drill Cuttings Decommissioning Options | |
|--|---|
| How many drill cuttings piles are present? | 0 |
| Tick options examined: <input type="checkbox"/> Remove and re-inject <input type="checkbox"/> Leave in place <input type="checkbox"/> Cover <input type="checkbox"/> Relocate on seabed <input type="checkbox"/> Remove and treat onshore <input type="checkbox"/> Remove and treat offshore <input type="checkbox"/> Other | |
| Review of Pile characteristics | |
| How has the cuttings pile been screened? Actual samples taken? | |
| Dates of sampling | |
| Sampling included in pre-decommissioning survey? | |
| Does it fall below both OSPAR thresholds? | |
| Will the drill cuttings pile have to be displaced in order to remove the jacket? | |
| What quantity (m ³) would have to be displaced/removed? | |
| Will the drill cuttings pile have to be displaced in order to remove any pipelines? | |
| What quantity (m ³) would have to be displaced/removed? | |
| Have you carried out a Comparative Assessment of options for the Cuttings Pile? | |



3.8 Waste Streams

| Table 3.9: Waste Stream Management Methods | |
|--|--|
| Waste Stream | Removal and Disposal Method |
| Bulk Liquids | As part of the flush and disconnect campaign detailed within the Preparatory Works Request (see Appendix 1), the Scoter and Merganser subsea systems have been flushed with seawater. The production pipelines were flushed back to the reservoir via the Merganser West Well |
| Marine growth | Marine growth that remains attached to the subsea equipment after load-in to the onshore dismantling site will be removed. It will be disposed of in accordance with the regulations in force at the site following the site operator's licences and procedures (e.g. decommissioning yards Waste Management Plan) |
| NORM/LSA Scale | There is no historical evidence of NORM at the Scoter and Merganser fields. However, tests for NORM will be carried out in full compliance with Shell's standard procedures, relevant regulations and permit conditions. If NORM is found to be present, it will be cleaned from the recovered infrastructure and disposed of according to relevant regulations and permit conditions. |
| Asbestos | There is no asbestos within the Scoter and Merganser subsea infrastructure or pipelines. Should asbestos be identified during the execution phase, it shall be identified, labelled, segregated, treated and disposed in full compliance with relevant regulations and permit conditions. |
| Other hazardous wastes | No other hazardous wastes were identified within the Scoter and Merganser Inventory of Materials. Should additional hazardous waste(s) be identified during the execution phase, the waste shall be identified, labelled, segregated, treated and disposed in full compliance with relevant regulations and permit conditions. |
| Onshore Dismantling sites | Selection of an onshore dismantling site will be made on the basis of a commercial process, taking account of HSSE&SP criteria. Screening, followed by site audits, will be performed and Shell U.K. will only consider sites that are licenced to receive the types and quantities of materials identified in the Materials Inventory. Candidate sites must demonstrate the capability to manage waste streams and disposal throughout the deconstruction process. The dismantling site operator will have established arrangements with facilities that recycle steel, copper, aluminium and other materials. |

The Waste Management Strategy for the Scoter and Merganser decommissioning project is based on the waste hierarchy (avoid, re-use, recycle, recover energy, dispose) underpinned by the commitment to comply with legal requirements.

The material to be removed during decommissioning activities is shown in Table 3.10.



| Table 3.10: Inventory Disposition | | | |
|--|--------------------------------|---------------------------------|------------------------------------|
| | Total Inventory Tonnage | Planned tonnage to shore | Planned left <i>in situ</i> |
| Installations | | | |
| Carbon Steel | 224 | 191 | 34 |
| Stainless Steel | 226 | 226 | 0 |
| Non-Ferrous Metal | 3 | 3 | 0 |
| Concrete | 42 | 0 | 42 |
| Plastics | 31 | 31 | 0 |
| Haz Mat/NORM | 0 | 0 | 0 |
| Other Non-Hazardous | 0 | 0 | 0 |
| Installations Total | 526 | 449 | 76 |
| Pipelines | | | |
| Carbon Steel | 2476 | 63 | 2413 |
| Stainless Steel | 105 | 26 | 79 |
| Non-Ferrous Metal | 32 | 1 | 31 |
| Concrete | 1813 | 1651 | 161 |
| Plastics | 292 | 22 | 270 |
| Haz Mat/NORM | 0 | 0 | 0 |
| Other Non-Hazardous | 0 | 0 | 0 |
| Pipelines Total | 4718 | 1764 | 2955 |

Note that numbers are rounded to the nearest whole and therefore the totals do not always align

Inventory tonnes excludes rock cover.

Of the total of materials in this Scoter and Merganser Decommissioning Programme workscope, it can be seen that approximately 42% of the inventory tonnage is planned to be recovered. The remaining 58% of the inventory tonnage is proposed to be decommissioned in situ.

In addition to the above, approximately 20Te (wet) of marine growth is expected to be recovered. Most of this weight represents water. Some marine growth will dry out in transit and onshore, so a much smaller dry weight of biological waste will require disposal. It is likely that the marine growth will be disposed of landfill.

The Scoter and Merganser Decommissioning Project will target the maximum possible re-use or recycle of materials arising from the decommissioning works and recovered to shore.



4 ENVIRONMENTAL APPRAISAL OVERVIEW

4.1 Environmental Sensitivities (Summary)

| Table 4.1: Environmental Sensitivities | |
|--|--|
| Environmental Receptor | Main Features |
| Conservation interests | <p>The closest designated area of conservation interest to the Scoter and Merganser fields is the East of Gannet and Montrose Fields Nature Conservation Marine Protected Area, approximately 18 km west of the Merganser manifold. This area is designated for offshore deep sea muds and ocean quahog (<i>Arctica islandica</i>) aggregations. The Fulmar Marine Conservation Zone is approximately 58 km south of the Scoter and Merganser manifolds and is designated for subtidal sand, subtidal mud, subtidal mixed sediments and <i>A. islandica</i>.</p> <p>There is a Norwegian Particularly Valuable Area for mackerel spawning approximately 25 km east of the Scoter manifold.</p> <p>A well-defined area of Methane-Derived Authigenic Carbonate is located over a subsurface salt diapir c. 2 km to the north of Merganser well heads.</p> |
| Seabed | <p>The seabed sediment in the area around the Scoter and Merganser fields comprise mainly fine muddy sand to sandy mud with intermittent areas additionally containing small quantities (<4%) of gravels. The sediment habitats are mainly assigned to the EUNIS biotope 'Deep circalittoral sand' and 'Circalittoral muddy sand' which, while common throughout the central North Sea, are listed as 'Endangered' on the European Red List of Habitats. Sea pens and faunal burrows, associated with these biotopes and observed in the vicinity of the Scoter and Merganser fields, are not considered to occur at high enough densities to constitute the Priority Marine Feature habitat 'Sea pens and burrowing megafauna' or the Oslo/Paris Convention threatened and/or declining habitat 'Sea pens and burrowing megafauna communities'.</p> <p>Hydrocarbon concentrations in sediments were generally low across survey areas within at least 10 km of Scoter and Merganser except where OBM-contaminated cuttings had been discharged during drilling of wells associated with other fields. As no OBM was discharged during the drilling of the five production wells, hydrocarbon concentrations in sediments at Scoter and Merganser are anticipated to be at background levels.</p> |
| Fish | <p>The Scoter and Merganser fields lie within spawning grounds for a number of fish species of commercial and/or conservation importance. None of these spawn at the seabed and their populations are consequently less vulnerable to seabed disturbance.</p> |
| Fisheries | <p>Fishing effort is low to moderate compared with the wider central North Sea although, the statistics on fishing effort and weight and</p> |



| Table 4.1: Environmental Sensitivities | |
|--|---|
| Environmental Receptor | Main Features |
| | value of the catch from this area may in part be suppressed by the presence of safety zones around oil and gas infrastructure such as Scoter and Merganser. |
| Marine Mammals | Atlantic white-sided dolphin (<i>Lagenorhynchus acutus</i>), harbour porpoise (<i>Phocoena phocoena</i>), minke whale (<i>Balaenoptera acutorostrata</i>) and white beaked dolphin (<i>Lagenorhynchus albirostris</i>) are likely to occur in the area, with high densities of white-beaked dolphin noted. Low densities of grey seal (<i>Halichoerus grypus</i>) are also expected. |
| Birds | Various seabird species are found in low numbers in the area of the decommissioning activities at different seasons throughout the year, with medium densities of combined species in the summer and breeding season. Vulnerability of seabirds to oil spills is predominantly low across the area and during most of the year, but reach a level of High sensitivity in September and October. |
| Onshore Communities | The oil and gas supply chain is well established in the North Sea, including for the processing of recovered materials from executing the DP. |
| Other Users of the Sea | The area is well developed for oil and gas exploration and production, with the closest facility being the Culzean Platform c. 4 km from Merganser. Shipping in the area is low density. The TAMPNET cable passes approximately 2 km to the east of Scoter and the Blyth – Kvilldal North Sea Link Interconnector high voltage power cable passes within approximately 600 m of the Merganser manifold. |
| Atmosphere | Scoter and Merganser are c. 240 km from the nearest shore. Air quality is anticipated to be good with minimal impact from emissions from oil and gas facilities in the area. |

4.2 Potential Environmental Impacts and their Management

Environmental Impact Assessment Summary

An ENVironmental impact IDentification (ENVID) has been undertaken for the project with the anticipated impacts highlighted in Table 4.2 below. The Environmental Appraisal (EA) [3] covers these potential impacts where appropriate. Decommissioning of Scoter and Merganser is not anticipated to give rise to any major or moderately significant environmental impacts.



| Table 4.2: Environmental Impact Management | | |
|---|--|--|
| Activity | Main Impacts | Management of the Impacts |
| Subsea Installation Removal and Decommissioning of Drill Cuttings | Atmospheric Emissions: emissions of CO ₂ , NO _x , CO and SO ₂ associated with vessel operations will contribute to reduction in air quality. | Vessel requirements and operations will be coordinated and optimised. All vessels will comply with MARPOL 73/78 Annex VI on air pollution. |
| | Discharges to Sea: Disconnection and recovery of manifolds, Christmas trees, production jumpers and tie-in spools will result in the release of small volumes of substances which pose little or no impact to the environment and of seawater with low levels of oil in water. Discharges of grey and black water from vessels undertaking decommissioning activities will result in some organic enrichment and chemical contamination of the water column. | Flushing of the pipelines and subsea installations will be undertaken prior to disconnection, with flushing water being injected into the Merganser reservoir. Vessel use will be minimised through efficient journey and activity planning. All vessels will be MARPOL compliant. Shell will review vessel CMID as part of assurance. |
| | Waste Generation: The subsea installations will be taken to a cleaning and/or dismantling yard, where they will be cleaned and recycled resulting in non-hazardous and hazardous waste streams being generated. | A waste inventory has been compiled and will form the basis of the decommissioning Waste Management Plan. Shell will carry out an assessment of potential dismantling yards; Only licensed yards capable of handling expected waste streams, with appropriate permits in place will be selected. |
| | Seabed Disturbance: removal of subsea installations, grout bags and mattresses, and the burial of pipeline ends will disturb small areas of sediment, resulting in resuspension of sediment in the water column, which may affect certain species. Rock placement may be applied to make safe pipeline ends, and to replace concrete mattresses in places along the pipelines. | The activity will be limited in extent and in time; sediment is expected to resettle relatively quickly after disturbance. Little if any natural habitat will be affected. Non-intrusive methods for demonstrating a safe seabed will be adopted, with overtrawl trials only considered if agreed with OPRED. The majority of area to be covered with rock is currently covered with concrete mattresses. Little natural habitat will be lost. |
| | Underwater Noise: cutting and disconnection of the subsea infrastructure will result in elevated underwater noise arising from use of cutting tool and additional vessels operating in the | Activities will be of short-term and will not involve use of explosives. |



| Table 4.2: Environmental Impact Management | | |
|--|--|---|
| Activity | Main Impacts | Management of the Impacts |
| | <p>field simultaneously (some with DP system). This will add to baseline noise levels with potential disturbance to marine mammals.</p> <p>Post-decommissioning surveys will include use of low intensity seismic equipment such as sub-bottom profiler pingers with the potential to effect the hearing sensitivity and behaviour of marine fauna over short distances and over a short surveying period.</p> | <p>Post decommissioning surveys will adopt mitigation measures established by JNCC guidance as appropriate.</p> |
| | <p>There are no drill cuttings from use of oil based muds to be decommissioned.</p> | |
| Decommissioning of Pipelines | <p>Impacts associated with the use and presence of vessels are as above for the recovery of subsea installations.</p> | |
| | <p>Discharges to sea: Over time the contents of the pipelines and umbilicals will passively diffuse into the water column, releasing seawater left in the lines after flushing. This will contain low levels of residual hydrocarbons.</p> | <p>The flushing procedures have been developed to reduce the residual oil in water concentration to as low as is reasonably practical.</p> |
| | <p>Seabed Disturbance: Sediment will be disturbed during the removal of stabilisation features to access the pipelines and recover the surface laid sections of pipelines and umbilicals.</p> <p>Rock placement may be applied to make safe pipeline ends, and to replace concrete mattresses in places along the pipelines.</p> | <p>The activity will be limited in extent and in time; sediment is expected to resettle relatively quickly after disturbance. Little if any natural habitat will be affected.</p> <p>The majority of area to be covered with rock is currently covered with concrete mattresses. Little natural habitat will be lost.</p> |
| Decommissioning Stabilisation Features | <p>Waste Generation: Recovered material will be classed as waste.</p> | <p>An inventory of materials has been compiled and the fate of all materials will be tracked through an active waste management plan using waste consignment notes, up to the point of materials re-entering the supply system following recycling or, where necessary, to the point of disposal.</p> |



5 INTERESTED PARTY CONSULTATIONS

Pre-Engagement Summary

Pre-engagement with stakeholders commenced in 2018 with discussions held with statutory advisor and regulatory bodies. These covered the emerging decommissioning plans and the scope of the pre-decommissioning environmental baseline surveys. Ongoing introductory engagements and meetings with statutory consultees were progressed. Other meetings have taken place, as required, with regulatory authorities and others (e.g. NSTA, JNCC, Marine Scotland, OPRED Environmental Management Team, SFF).

A Comparative Assessment workshop was held in October 2019 to consult and engage key stakeholders through the decisions to be made. From the workshop, the emerging recommendations report was updated and the notes of minutes detailing the outcomes was circulated to all stakeholders in attendance and comments, where received, were taken account of.

| Table 5.1: Summary of Stakeholder Comments | | |
|---|--|--|
| Points raised during statutory and public consultations | | |
| Stakeholder | Comment | Response |
| National Federation of Fishermen's Organisations | None received | |
| Scottish Fishermen's Federation (SFF) | See SFF's letter in Appendix 4 | See Shell's letter in Appendix 4 |
| Northern Ireland Fish Producers Organisation (NIFPO) | None received | |
| Global Marine Systems Limited (GMS) | <p>Email from Global Marine Group Permitting Manager Alex Riddell, 05/04/22</p> <p>Many thanks for providing the Scoter and Merganser Field decommissioning program for review.</p> <p>I note that your program has mentioned that the TAMPNET cable passes approximately 2 km to the east of Scoter and the Blyth – Kvilldal North Sea Link Interconnector high voltage power cable passes within approximately 600 m of the Merganser manifold. If you</p> | <p>Shell thanks Global Marine Systems Limited for the guidance provided and confirms that notifications will be issued to the owners of the noted cables ahead of any execution work related to the Scoter and Merganser Decommissioning Programmes.</p> |



| Table 5.1: Summary of Stakeholder Comments | | |
|--|--|-----------------|
| Points raised during statutory and public consultations | | |
| Stakeholder | Comment | Response |
| | have not done so already, it will be important to notify any nearby cable owners of any upcoming operations. Contact details of the cable owners can be sourced from https://kis-orca.org/map/ | |
| Public | None received | |



6 PROGRAMME MANAGEMENT

6.1 Project Management and Verification

Members of the Project Management team have been appointed to manage suitable sub-contractors for the disconnection and removal activities. Standard company procedures for operational control and hazard identification and management will be used. Where possible the work will be coordinated with other decommissioning operations in the Central North Sea to secure schedule and cost efficiencies. This may lead to Scoter and Merganser decommissioning being executed in several phases over an extended time. There may be significant periods of inactivity following a phase of work. Regular Progress Reports, and a final Close Out Report, will be submitted to ODU.

Note that, in line with the Preparatory Works Request (PWR) in Appendix 1, the Scoter and Merganser Decommissioning Project has undertaken a campaign to flush and disconnect the Scoter and Merganser subsea infrastructure in 2021. Progress Reports have been provided against this execution and will continue until the pre-works covered by the PWR have been completed.

The process of consents and the engagements required to execute the decommissioning project have commenced and will be fully managed and monitored. In the event of any changes in the detail of the offshore removal programme being required, these would be discussed and agreed with OPRED in advance.

If it is determined by ODU that pipeline monitoring is required during a prolonged decommissioning execution period, the results of any such surveys will be submitted to ODU.

6.2 Post-Decommissioning Debris Clearance and Verification

A post decommissioning debris survey will be carried out within the 500m safety zones centred on the Scoter Manifold and Merganser Manifold, as well as a 100m corridor along each existing pipeline and umbilical route (50m either side).

Any significant oil and gas related seabed debris will be recovered for onshore disposal or recycling in line with existing disposal methods. Any unsafe seabed depressions, for example spud can depressions and anchor scars from well activities, will be remediated with rock cover if required.

Verification of seabed clearance will be obtained and submitted to OPRED. Confirmation of seabed clearance will also be submitted to the Seabed Data Centre (Offshore Installations) at the United Kingdom Hydrographic Office. The means by which seabed clearance is verified will be discussed and agreed with OPRED. Whilst it is assumed that non-intrusive methods will be used, the Environmental Appraisal for Scoter and Merganser [3] has assumed the use of over-trawling in order to reflect the maximum potential impact to the seabed.

6.3 Schedule

An indicative schedule for the scope of these programmes is provided in Figure 6.1.

Please note that the decommissioning of PLU1946 at the Marnock-Machar crossing and the decommissioning of PL1945 and PLU1946 within the 500m safety zones at Shearwater are not included within this schedule. These scopes cannot be scheduled until the cessation of production from fields outwith the scope of these programmes.

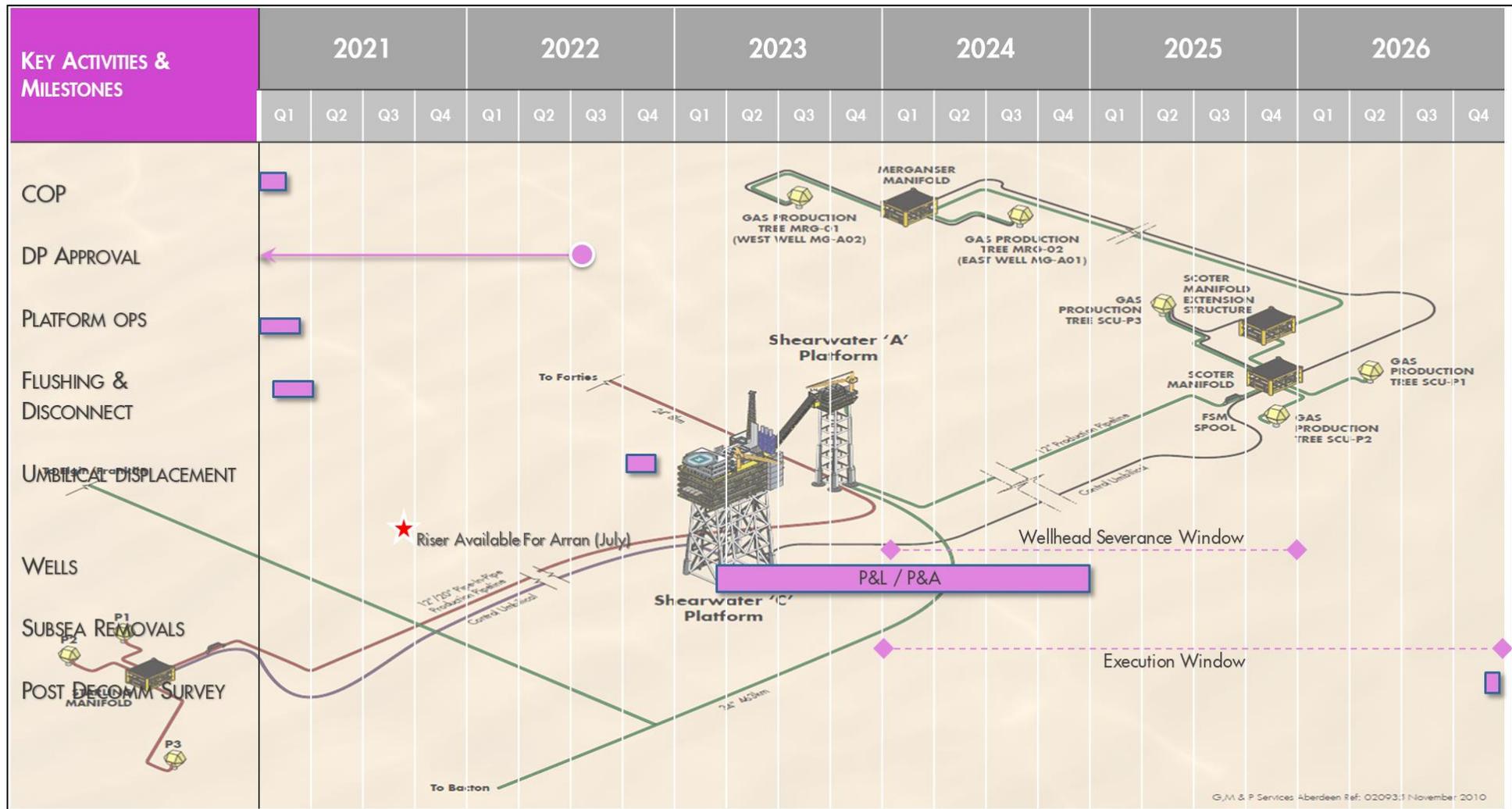


Figure 6.1: Project Plan

Note – Well decommissioning scheduling is subject to partner alignment



6.4 Costs

A separate costed revision of these Programmes was provided to OPRED ‘commercial – in confidence’ at public consultation submission. A second, costed revision of these Programmes will be provided to OPRED ‘commercial – in confidence’ following approval.

An overall cost estimate is being provided to OPRED in confidence, following U.K. Oil and Gas Guidelines on Decommissioning Cost Estimation in-line with OGUK Work Breakdown Structure (WBS) Guidelines.

| Table 6.1: Provisional Decommissioning Programmes - Costs | | |
|---|---|---------------------------------|
| OGUK WBS | Item | Estimated Cost (£m) |
| 1.0 | Operator PM | Provided to OPRED in confidence |
| 2.0 | Facility running/owner costs | |
| 3.0 | Wells abandonment | |
| 4.0 | Facilities/pipelines making safe | |
| 5.0 | Topsides preparation – Not Relevant for Scoter and Merganser | |
| 6.0 | Topsides removal – Not Relevant for Scoter and Merganser | |
| 7.0 | Substructure removal- – Not Relevant for Scoter and Merganser | |
| 8.0 | Topsides and substructure onshore recycling – Not Relevant for Scoter and Merganser | |
| 9.0 | Subsea Infrastructure | |
| 10.0 | Site Remediation | |
| 11.0 | Monitoring | |

6.5 Close Out

In accordance with OPRED guidelines, a close out report will be submitted to OPRED within 12 months of completion of the offshore decommissioning scope including debris removal, verification of seabed clearance and the first post-decommissioning environmental and pipeline surveys. The report will detail the outcomes of surveys as well as explain any major variances from these programmes.

6.6 Post-Decommissioning Monitoring and Evaluation

A post-decommissioning environmental seabed survey centred on the sites of subsea installations and pipeline/umbilical corridors will be carried out. The survey will focus on any chemical and physical disturbances of the decommissioning activities compared with the pre-decommissioning data.



Results of this survey will be available once the work is complete, with a copy forwarded to OPRED. All pipeline routes and structure sites will be the subject of geo-physical surveys when decommissioning activity has concluded. After the summary of the surveys has been sent to OPRED and reviewed, a post-monitoring survey regime will be agreed.

The parties to the approved Decommissioning Programmes will be the contact points for any third-party claims arising from damage caused by any remaining infrastructure under the approved Scoter and Merganser Decommissioning Programmes. All the pipelines which are proposed to be left in place remain the property and responsibility of the owners, even if they were to exit the UKCS.



7 SUPPORTING DOCUMENTS

| Table 7.1: Supporting Documents | | |
|---------------------------------|-------------------------|--|
| Ref | Document Number | Title |
| [1] | Chapter 17 | The Petroleum Act 1998 |
| [2] | N/A | OPRED GUIDANCE NOTES - Decommissioning of Offshore Oil and Gas Installations and Pipelines November 2018 |
| [3] | SMDP-PT-S-HE-0702-00001 | Scoter and Merganser Environmental Appraisal |
| [4] | N/A | Oil and Gas UK Guidelines for Comparative Assessment in Decommissioning Programmes, Issue 1 October 2015 |
| [5] | EOFL-PT-S-QA-6050-00001 | Comparative Assessment Methodology |
| [6] | SMDP-PT-S-AA-7180-00005 | Scoter and Merganser Comparative Assessment Report |

These documents are available as follows:

1. At the Shell website at <https://www.shell.co.uk/sustainability/decommissioning.html>
2. By email from: SUKEP-Shell-Decommissioning-Correspondence@shell.com
3. Due to the COVID-19 pandemic, Shell UK will not provide hard copies for review at its offices in Aberdeen. Instead, electronic copies may be requested by emailing SUKEP-Shell-Decommissioning-Correspondence@shell.com or writing to James Blackburn, Decommissioning Business Opportunity Manager, Decommissioning Strategy, Shell U.K. Limited, 1 Altens Farm Road, Nigg, Aberdeen, AB12 3FY.



8 PARTNER LETTERS OF SUPPORT

Letters from field partners NEO Energy Natural Resources Limited and Premier Oil UK Limited, and Premier Oil E&P UK Limited and Esso Exploration and Production UK Limited as Exited Parties, provided below.



**Offshore Petroleum Regulator for Environment and Decommissioning
Department for Business, Energy & Industrial Strategy**

3rd Floor, Wing C
AB1 Building
Crimson Place
Aberdeen
AB10 1BJ
United Kingdom

30 August 2022

Dear Sir or Madam,

Scoter and Merganser Decommissioning Programmes, Petroleum Act 1998

We, NEO Energy Natural Resources Limited (Registered Number, 13018823), confirm that we authorise Shell U.K. Limited (Registered Number 00140141) to submit abandonment programmes on our behalf relating to the Scoter and Merganser installations and pipelines as directed by the Secretary of State on 28 July 2022.

We confirm that we support the proposals detailed in the Shell U.K. Limited Decommissioning Programmes dated 1 August 2022, which are to be submitted by Shell U.K. Limited in so far as they relate to those facilities in respect of which we are required to submit an abandonment programme under Section 29 of the Petroleum Act 1998.

Yours faithfully,

Andrew Barker

Development and Technical Services Manager

For and on behalf of NEO Energy Natural Resources Limited (Registered Number, 13018823)

Level 32, The Gherkin
30 St Mary Axe
London EC3A 8BF

9th Floor, The Silver Fin Building
455 Union Street
Aberdeen AB11 6DB

+44 (0)203 357 9700
info@neweuropeanoffshore.com
www.neweuropeanoffshore.com



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Premier Oil UK Limited
Rubislaw House
Anderson Drive
Aberdeen
AB15 6FZ
harbourenergy.com



FAO Fiona Livingston
Department for Business, Energy and Industrial Strategy
Offshore Decommissioning Unit
AB1 Building, 3rd Floor
Crimon Place, Aberdeen, AB10 1BJ

5 August 2022

Dear Ms Livingston,
Scoter and Merganser Decommissioning Programmes, Petroleum Act 1998

We, Premier Oil UK Limited (Registered Number SC048705), refer to your letters of 29th July 2022 in respect of:

- Decommissioning of the Merganser Field Installations
- Decommissioning of the Merganser Field Pipelines
- Decommissioning of the Scoter Field Installation
- Decommissioning of the Scoter Field Pipelines
- Decommissioning of the Scoter Field Pipeline PLU4924

We confirm that we authorise Shell U.K. Limited (Registered Number 00140141) to submit, on our behalf, abandonment programmes relating to the Scoter and Merganser installations and pipelines.

We confirm that we support the proposals detailed in the Shell U.K. Limited Decommissioning Programmes dated 1 August 2022, which are to be submitted by Shell U.K. Limited in so far as they relate to those facilities in respect of which we are required to submit an abandonment programme under Section 29 of the Petroleum Act 1998.

Yours faithfully,

DocuSigned by:

ADF896E32ED0446A...

Richard Tocher
SVP Decommissioning and Major Projects
For and on behalf of Premier Oil UK Limited



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Premier Oil E&P UK Limited
Rubislaw House
Anderson Drive
Aberdeen
AB15 6FZ
harbourenergy.com



FAO Fiona Livingston
Department for Business, Energy and Industrial Strategy
Offshore Decommissioning Unit
AB1 Building, 3rd Floor
Crimon Place, Aberdeen, AB10 1BJ

5 August 2022

Dear Ms Livingston,
Scoter and Merganser Decommissioning Programmes, Petroleum Act 1998

We, Premier Oil E&P UK Limited (Registered Number 02761032), refer to your letters of 29th July 2022 in respect of:

- Decommissioning of the Merganser Field Installations
- Decommissioning of the Merganser Field Pipelines
- Decommissioning of the Scoter Field Installation
- Decommissioning of the Scoter Field Pipelines

We have no current ownership or equity interest in Scoter or Merganser but acknowledge that we remain in receipt of notices under Section 29 of the Petroleum Act 1998 which are relevant to facilities located at Scoter and Merganser.

In such capacity, and in so far as relevant to such facilities, we confirm that we have no objection to Shell U.K. Limited submitting abandonment programmes relating to Scoter and Merganser.

Yours faithfully

DocuSigned by:

ADF69E32E0846A...

Richard Tocher
SVP Decommissioning and Major Projects
For and on behalf of Premier Oil E&P UK Limited



Esso Exploration and Production UK Limited
Emyn House
Emyn Way
Leatherhead
Surrey KT22 8UX

ExxonMobil

3rd August 2022

FAO: Offshore Petroleum Regulator for Environment & Decommissioning
Department for Business, Energy & Industrial Strategy
3rd Floor, Wing C, AB1 Building, Crimon Place,
Aberdeen AB10 1BJ

Dear Sir or Madam,

Scoter and Merganser Decommissioning Programmes, Petroleum Act 1998

We, Esso Exploration and Production UK Limited (Registered Number 00207426), acknowledge receipt of your letters dated 29 July 2022 relating to the decommissioning of the following facilities: Merganser Field Installations, Merganser Field Pipelines, Scoter Field Installation, Scoter Field Pipelines and Scoter Field Pipeline-PLU4624.

In our capacity as a recipient of notices under section 29(1) of the Petroleum Act 1998 in respect of the above-referenced facilities, we hereby confirm that Shell U.K. Limited, as operator of the Merganser and Scoter Fields, will be submitting the relevant decommissioning programmes dated 1st August 2022, relating to the above-referenced facilities on our behalf as a s.29 notice holder and take no exception thereto.

Yours faithfully,

DocuSigned by:
Gregor Nicol
FCAE889F910C4BE

Gregor Nicol
Business Unit Coordinator
For and on behalf of Esso Exploration and Production UK Limited
(Registered Number, 00207426)

Registered in England
Number 00207426
Registered Office:
Emyn House, Emyn Way
Leatherhead, Surrey
KT22 8UX

An ExxonMobil Subsidiary



APPENDIX 1 – PREPARATORY WORKS REQUEST

Note that OPRED agreed to Shell’s Preparatory Works Request on 19 December 2019.



Unrestricted
Jennie Smith
Decommissioning Manager
Offshore Decommissioning Unit
Offshore Petroleum Regulator for Environment &
Decommissioning
Department for Business, Energy and Industrial Strategy
3rd Floor, AB1 Building (Wing C), Crimon Place
Aberdeen
AB10 1BJ

Shell U.K. Limited
1 Altens Farm Road
Nigg
Aberdeen
AB12 3FY
United Kingdom
Tel +44 122488 2000
Internet <http://www.shell.co.uk>

4th October 2019

Scoter & Merganser Decommissioning – Preparatory Works Request

Dear Jennie,

This Preparatory Works Request is submitted by the Scoter and Merganser co-venturers, as set out in Table 1 below: Shell U.K. Limited, registered company number 00140141 (Shell, operator); Esso Exploration and Production U.K. Limited, registered company number 00207426 (Esso); and Premier Oil E&P U.K. Limited register company number 02761032 and Premier Oil U.K. Limited registered company number SC048705 (Premier), being the recipients of the Section 29 Notices. Throughout this document the terms ‘owners’, ‘we’ and ‘our’ refer to all the co-venturers.

| Section 29 Notice | Notice Holder | Equity Share |
|---|--------------------------|----------------------------|
| Scoter Installations Your Ref: 12.04.06.06/277C | Shell Esso Premier | 44% 44% 12% |
| Scoter Pipelines Your Ref: 12.04.06.05/381C | Shell Esso Premier | 44% 44% 12% |
| Merganser Installations Your Ref: 12.04.06.06/221C | Shell Esso Premier | 48.0185% 44% 7.9815% |
| Merganser Pipelines Your Ref: 12.04.06.05/365C | Shell Esso Premier | 48.0185% 44% 7.9815% |

Table 1 – Scoter & Merganser Co-Venturers

Shell U.K. Limited,
Registered in England number 140141,
Registered office Shell Centre London SE1 7NA,
VAT reg number GB 235 7632 55

Scoter & Merganser Decommissioning – Preparatory Works Request



Scoter and Merganser are two normal pressure and temperature gas-condensate subsea tie-backs to the Shearwater Cluster located in Block 22/30a of the Central North Sea (see Figure 1).

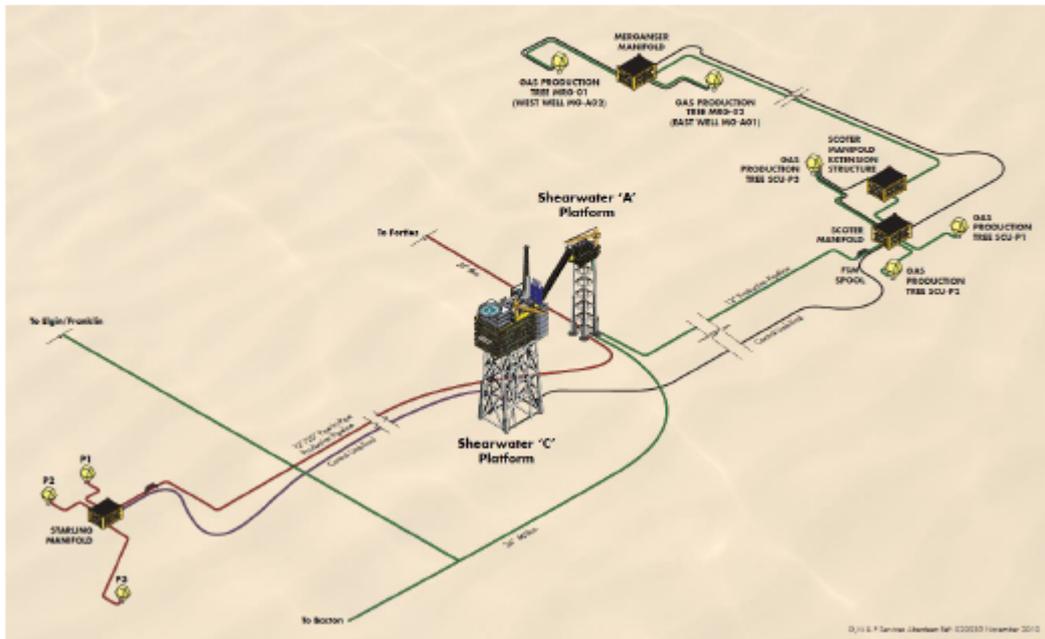


Figure 1 – Scoter & Merganser Field Schematic

Scoter was discovered in 1989 and began production in March 2004, originally from two wells with a third added in August 2006. Merganser was discovered in 1995 and began production in December 2006 from two wells.

Production from the two Merganser wells is routed via 6" super duplex spools to the Merganser Manifold and from there, via an 8" carbon steel 4km-long trenched-and-buried pipeline, to the Scoter Manifold Extension Structure (SMES) adjacent to the Scoter well site. A 6" super duplex spool connects the SMES and the Scoter Manifold.

Production from the three Scoter wells is routed via 6" duplex spools to the Scoter Manifold and delivered, together with the production from Merganser, to the Shearwater A platform via a 12" carbon steel 11.6km-long trenched-and-buried pipeline. The 14" Scoter Production Riser brings the production to the platform process facilities. All surface-laid spools and pipeline transitions to and from trenches are protected by concrete mattresses.

Electro-hydraulic control and chemical supply is provided to the Scoter Manifold, Merganser Manifold, SMES and all wellheads from controls equipment located on the topsides of the Shearwater C platform. Control and chemical supply is provided to the Scoter Manifold via a 12km-long trenched-and-buried umbilical from Shearwater C and from there via surface-laid umbilical jumpers to the Scoter wells. A further umbilical jumper connects Well AD at Scoter to the SMES. Electro-hydraulic control and chemical supply is provided to the Merganser Manifold via a 4km-long trenched-and-buried umbilical from the Scoter Manifold, and from there to the two Merganser wells via surface-laid umbilical jumpers.



All surface-laid jumpers and umbilical transitions to and from trenches are protected by concrete mattresses.

Production will cease from both Scoter and Merganser in June 2020, in accordance with the Cessation of Production document submitted to the Oil and Gas Authority (OGA) in May 2019.

Shell are also developing the Arran field as a subsea tie-back to Shearwater, which will re-use the current Scoter production riser for Arran production. It has been agreed with OPRED that the Scoter riser will transfer from the Scoter PWA and s29 Notice to those for Arran.

To enable the Arran Development Project to re-use the Scoter riser, Shell are required to flush and disconnect the Scoter and Merganser infrastructure per the Scope of Work detailed below. This work must be completed by 15 November 2020. To mitigate the risk that the Scoter and Merganser Decommissioning Programmes are not approved in time, we are submitting this Preparatory Works Request to seek OPRED's approval to commence flush and disconnect activities.

Scope of Work

This scope of work will detail the base case methodology for removing the Scoter and Merganser pipelines and umbilicals from service, allowing disconnection of the Scoter riser from the Scoter Pipeline and subsequent removal of the Scoter Riser Tie-in Spool.

The Shearwater Cluster will enter a ~60-day planned shutdown (TurnAround – TAR) for maintenance when Scoter & Merganser cease production in June 2020. The activities detailed below will take place following the end of the Shearwater TAR and no later than 15 November 2020.

Prior to any subsea intervention, the following activities will be performed from the Shearwater A Platform topsides:

- Scoter and Merganser production well tie-in spools will be methanol flushed to remove bulk hydrocarbons;
- The corrosion inhibitor and manifold chemical cores of each umbilical will be displaced by seawater into the Merganser Manifold;
- The methanol cores of each umbilical will be displaced by seawater into one of the Merganser wells.
- NOTE: The umbilical chemical cores may alternatively be displaced by ethylene glycol mono-butyl ether (EGMBE) to assist with later backflushing of the hydraulic cores.

Utilising a Dive Support Vessel (DSV), the production tie-in spools between the Merganser Manifold and Merganser wells, and between the Scoter Manifold and Scoter wells will be flushed to seawater and then disconnected at both ends. Pressure retaining blind flanges will be installed on both the well flowbases and manifold branches. The disconnection points are shown in Figures 2 and 3 below, indicated by the red lines.

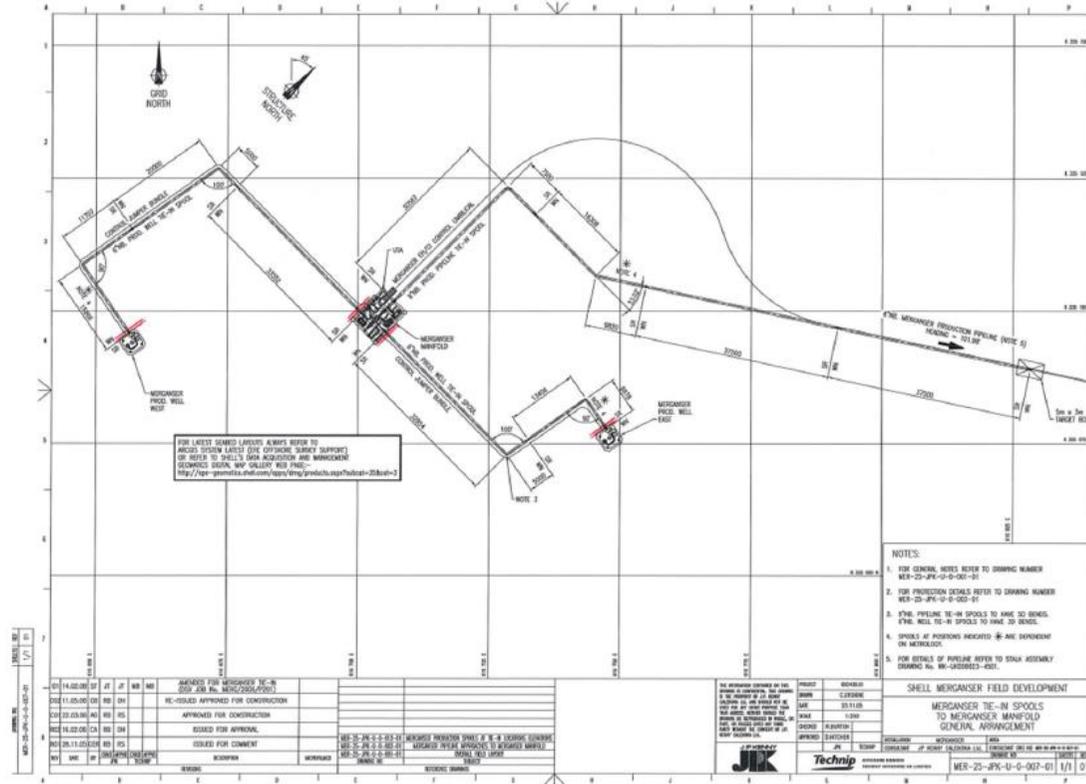


Figure 2 – Disconnection Points at the Merganser Manifold / Trees

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 Registered in England number 140141,
 Registered office Shell Centre London SE1 7NA,
 VAT reg number GB 235 7632 55

Scoter & Merganser Decommissioning – Preparatory Works Request

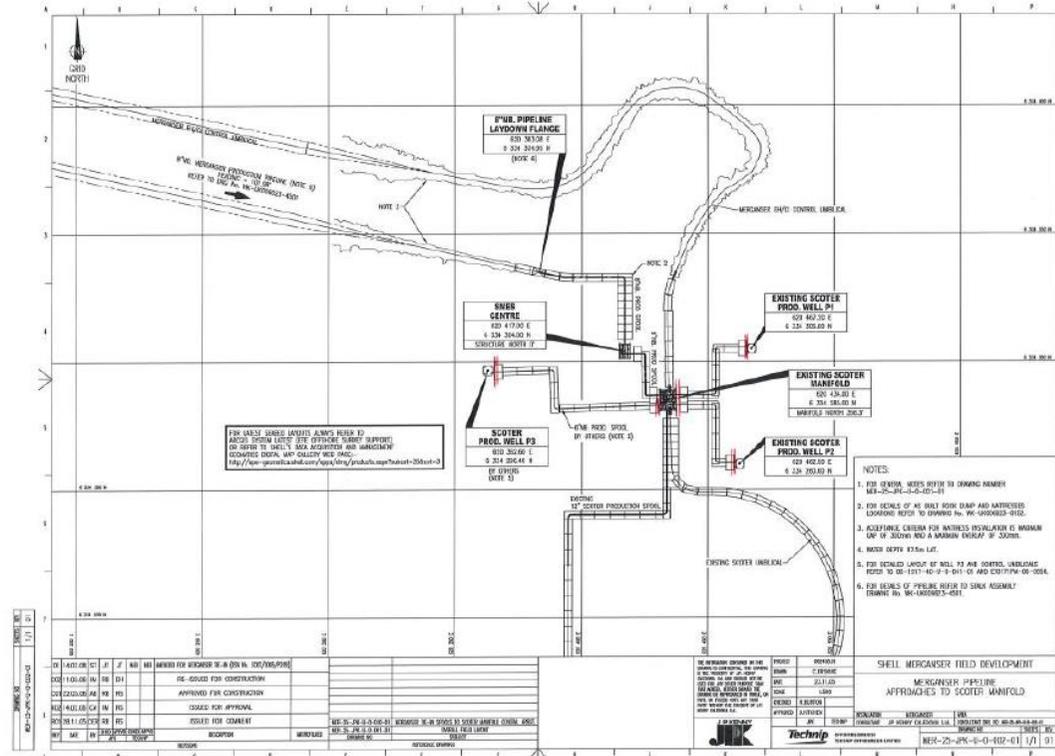


Figure 3 – Disconnection Points at the Scoter Manifold / Trees



The disconnected spools and well umbilical jumpers will remain in situ protected by their existing concrete mattresses and grout bags pending the submission of the Decommissioning Programmes.

The Scoter & Merganser Pipelines (PL1945 and PL2345) will then be flushed to seawater in a 2-stage operation. Each pipeline will initially be bulk de-oiled using MEG and gel pigs propelled by seawater from a DSV based pumping spread connected initially at Merganser and then Scoter. The displaced pipeline hydrocarbon contents will be routed through the Shearwater platform process facilities. Each pipeline will then be flushed with seawater from Merganser and then Scoter to the Shearwater A Platform topsides. Displaced fluids will be routed through a temporary water clean-up skid installed at Shearwater. Water will be cleaned to an acceptable standard prior to discharge to sea.

The Scoter & Merganser Pipelines (PL1945 and PL2345) will be left in situ filled with uninhibited seawater pending the submission of the Decommissioning Programmes. The pipelines will be left connected to the Merganser Manifold, Scoter Manifold Extension Structure (SMES) and the Scoter Manifold. All existing subsea pipeline protection features such as concrete mattresses, grout bags and the existing 500m subsea safety zones will remain in situ pending the submission of the Decommissioning Programmes.

A DSV will then disconnect and recover the two tie-in spools of pipeline PL1945 at their connection to the Scoter production riser at Shearwater A. The spools to be removed are shown in Figure 4 below, highlighted in pink. The section to be removed is listed as ident 1.09 in PWA 12/W/02 for PL1945. The DSV will also recover the ~20 concrete mattresses associated with the removed spools.

Either a blind flange or a temporary pig receiver will be installed on the disconnected Scoter riser, depending on the requirements of the Arran Project to which the riser will be transferred. The disconnected end of PL1945 will be left open and the existing mattresses used to protect the end. The end will remain in situ, within the Shearwater 500m safety zone, pending the submission of the Decommissioning Programmes.

Flushing loops will be fitted to the BUTA at the Merganser Manifold, allowing round-trip flushing of the remaining chemical and hydraulic umbilical cores in both umbilicals using a temporary flushing spread on the Shearwater Platform. The controls equipment located on Shearwater C will then be disconnected and mothballed for later decommissioning.

The Scoter and Merganser wells will be plugged and lubricated following the completion of pipeline flush and disconnect activities.

Shell U.K. Limited,
Registered in England number 140141,
Registered office Shell Centre London SE1 7NA,
VAT reg number GB 235 7632 55

Scoter & Merganser Decommissioning – Preparatory Works Request

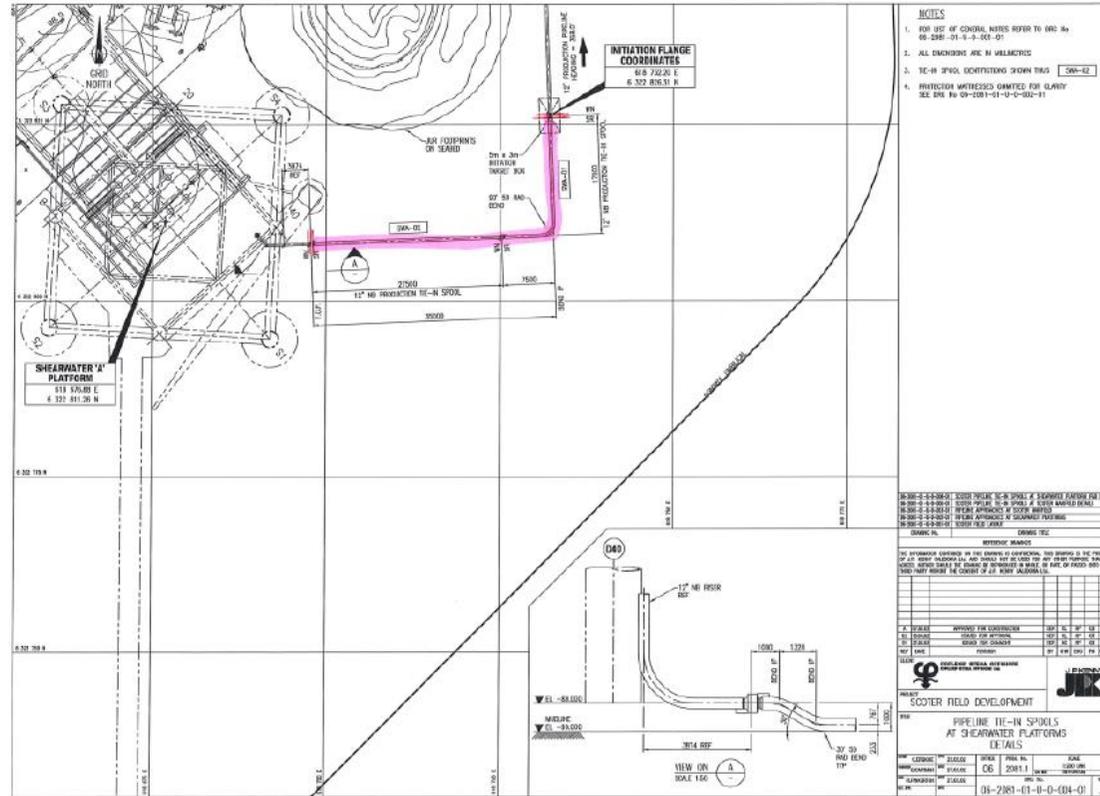


Figure 4 – Spools to be removed at Shearwater A

Shell U.K. Limited,
 Registered in England number 140141,
 Registered office Shell Centre London SE1 7NA,
 VAT reg number GB 235 7632 55

Scoter & Merganser Decommissioning – Preparatory Works Request



Infrastructure

The pipelines and umbilicals to be flushed are listed in Table 2 below. The pipelines and umbilicals are listed with the current contents within the “product conveyed” column. Note that the Scoter Riser and associated equipment, marked with a *, is included in Table 2 but will be transferred to the Arran Section 29 Notice and PWA at a later date. Ident 1.09 of PL1945 will be removed as part of the flush and disconnect scope detailed above.

Approximately 20 concrete mattresses associated with these spools will also be removed. Shell will investigate the opportunity to re-use the mattresses protecting the Scoter Riser Tie-in Spool as protection for the Arran Riser Tie-in Spool.

There are three subsea structures associated with the Scoter & Merganser fields:

- Scoter Manifold:
 - 9.3 x 7.3 x 5.6 metres
 - 79 Tonnes dry weight in air
- Merganser Manifold:
 - 9.3 x 7.3 x 5.5 metres
 - 76.6 Tonnes dry weight in air
- Scoter Manifold Extension Structure (SMES)
 - 6.8 x 5.3 x 4.3 metres
 - 34.5 Tonnes dry weight in air

All three structures are of carbon steel tubular construction, piled and will remain in situ following the flush and disconnect works. The piles are all carbon steel tubulars of 610mm diameter, 25.4mm wall thickness.

Decommissioning of the structures will be covered by the Decommissioning Programmes to be issued at a later date. Locations of the structures are indicated in Figures 2 and 3 in the Scope of Work section above.

Shell U.K. Limited,
Registered in England number 140141,
Registered office Shell Centre London SE1 7NA,
VAT reg number GB 235 7632 55

Scoter & Merganser Decommissioning – Preparatory Works Request



| Pipeline Number | Ident Number | From | To | Description of Main Components of Pipeline | Length (m) | External Diameter (mm) | Internal Diameter (mm) | Wall Thickness (mm) | Type of Insulation Thickness (mm) | Maximum Allowable Operating Pressure (barg) | Product to be Conveyed |
|--|--------------|---------|-----------------|--|------------|------------------------|------------------------|---------------------|-----------------------------------|---|------------------------|
| PL1945 – Scoter Production Pipeline | | | | | | | | | | | |
| | 1.00 | | | Well AB | | | | | | | |
| PL1945 J AB | 1.01 | Well AB | Scoter Manifold | 6" Production Tie-in Spoolpiece (duplex) | 48.7 | 168.3 | 142.9 | 12.7 | PPF 31.5 | 345 | Produced Fluids |
| | 1.02 | | | Well AC | | | | | | | |
| PL1945 J AC | 1.03 | Well AC | Scoter Manifold | 6" Production Tie-in Spoolpiece (duplex) | 46.2 | 168.3 | 142.9 | 12.7 | PPF 31.5 | 345 | Produced Fluids |
| | | Well AD | | | | | | | | | |
| PL1945 J AD | | Well AD | Scoter Manifold | 6" Production Tie-in Spoolpiece (duplex) | 64 | 168.3 | 124.5 | 21.9 | PPF 31.5 | 345 | Produced Fluids |
| | 1.04 | | | Scoter Manifold | | | | | | | |

Shell U.K. Limited,
 Registered in England number 140141,
 Registered office Shell Centre London SE1 7NA,
 VAT reg number GB 235 7632 55

Scoter & Merganser Decommissioning – Preparatory Works Request



| Pipeline Number | Ident Number | From | To | Description of Main Components of Pipeline | Length (m) | External Diameter (mm) | Internal Diameter (mm) | Wall Thickness (mm) | Type of Insulation Thickness (mm) | Maximum Allowable Operating Pressure (barg) | Product to be Conveyed |
|-----------------|--------------|---|---|---|------------|------------------------|------------------------|---------------------|-----------------------------------|---|------------------------|
| PL1945 | 1.05 | Scoter Manifold | FSM | 12" Production Tie-in Spoolpiece (duplex) | 30 | 323.9 | 288.9 | 17.48 | PPF 31.5 | 258 | Produced Fluids |
| | 1.06 | 12" production Tie-in Spoolpiece (duplex) | 12" Production Tie-in Spoolpiece (carbon steel) | FSM Corrosion Monitoring Spool (carbon steel) | 6 | 323.9 | 288.9 | 17.48 | PPF 31.5 | 258 | Produced Fluids |
| | 1.07 | FSM Corrosion Monitoring Spool (carbon steel) | 12" Production Flowline (carbon steel) | 12" Production Tie-in Spoolpiece (carbon steel) | 65 | 323.9 | 276.3 | 23.8 | PPF 31.5 | 258 | Produced Fluids |
| | 1.08 | 12" Production Tie-in Spoolpiece (carbon steel) | 12" Production Tie-in Spoolpiece (carbon steel) | 12" Production Flowline | 11624.4 | 323.9 | 276.3 | 23.8 | PPF 31.5 | 258 | Produced Fluids |



| Pipeline Number | Ident Number | From | To | Description of Main Components of Pipeline | Length (m) | External Diameter (mm) | Internal Diameter (mm) | Wall Thickness (mm) | Type of Insulation Thickness (mm) | Maximum Allowable Operating Pressure (barg) | Product to be Conveyed |
|-----------------|--------------|---|---|---|------------|------------------------|------------------------|---------------------|-----------------------------------|---|------------------------|
| | 1.09 | 12" Production Flowline (carbon steel) | 14" Production Riser (carbon steel) | 12" Production Tie-in Spoolpiece (carbon steel) | 52 | 323.9 | 276.3 | 23.8 | PPF 31.5 | 258 | Produced Fluids |
| | 1.10* | 12" Production Tie-in Spoolpiece (carbon steel) | 12" Production Topsides Spoolpiece (carbon steel) | 14" Production Riser (carbon steel) | 108.2 | 355.6 | 284.2 | 35.7 | N/A | 258 | Produced Fluids |
| | 1.11* | 14" Production Riser (carbon steel) | 12" ESDV Shearwater A Wellhead Platform | 12" Production Topsides Spoolpiece (carbon steel) | 50 | 323.9 | 288.9 | 17.48 | N/A | 258 | Produced Fluids |
| | 1.12* | 12" ESDV Shearwater A Wellhead Platform | Pig Trap Shearwater A Wellhead Platform | 12" ESDV Shearwater A Wellhead Platform | N/A | N/A | N/A | N/A | N/A | 258 | Produced Fluids |

* will be transferred to the Arran Section 29 Notice and PWA at a later date



| Pipeline Number | Ident Number | From | To | Description of Main Components of Pipeline | Length (m) | External Diameter (mm) | Internal Diameter (mm) | Wall Thickness (mm) | Type of Insulation Thickness (mm) | Maximum Allowable Operating Pressure (barg) | Product to be Conveyed |
|--|--------------|--------------------|---------|--|------------|------------------------|------------------------|---------------------|-----------------------------------|---|------------------------|
| | 1.13* | | | Pig Trap Shearwater A Wellhead Platform | | | | | | | |
| * will be transferred to the Arran Section 29 Notice and PWA at a later date | | | | | | | | | | | |
| PLU1946 – Scoter Control Umbilical | | | | | | | | | | | |
| | 1.04 | | | Scoter Manifold | | | | | | | |
| PLU1946 J AC | 1.05 | Scoter Manifold | Well AC | Manifold Umbilical Jumper | 50 | 117 | N/A | N/A | N/A | 517 | See Table 3 |
| | 1.06 | | | Well AC | | | | | | | |
| PLU1946 J AB | 1.07 | Scoter Manifold | Well AB | Manifold Umbilical Jumper | 50 | 117 | N/A | N/A | N/A | 517 | See Table 3 |
| | 1.08 | | | Well AB | | | | | | | |
| PLU1946 J AD | | Scoter Manifold | Well AD | Manifold Umbilical Jumper | 70 | 117 | N/A | N/A | N/A | 517 | See Table 3 |
| | | | | Well AD | | | | | | | |



| Pipeline Number | Ident Number | From | To | Description of Main Components of Pipeline | Length (m) | External Diameter (mm) | Internal Diameter (mm) | Wall Thickness (mm) | Type of Insulation Thickness (mm) | Maximum Allowable Operating Pressure (barg) | Product to be Conveyed |
|---|--------------|----------------------|------------------------|--|------------|------------------------|------------------------|---------------------|-----------------------------------|---|------------------------|
| PLU1946 | 1.01 | | | Topsides Umbilical Termination Unit (TUTU) Shearwater C PUC Platform | | | | | | | |
| | 1.02 | TUTU | Scoter Manifold BUTA | Chemical Pipeline | 12000 | 117 | N/A | N/A | N/A | 517 | See Table 3 |
| | 1.03 | Chemical Pipeline | Scoter Manifold | Bull-nose Umbilical Termination Assembly (BUTA) | N/A | 117 | N/A | N/A | N/A | 517 | See Table 3 |
| | 1.04 | | | Scoter Manifold | | | | | | | |
| PL2346 – Merganser Production Pipeline | | | | | | | | | | | |
| | 3.01 | | | Merganser Manifold | | | | | | | |
| PL2346 | 3.02 | Merganser Manifold | 8" Tie-in Spoolpiece | 8" Tie-in Spool | 26 | 168.3 | 139.7 | 14.3 | SPU 115 | 345 | Produced Fluids |
| | 3.03 | 8" Tie-in Spoolpiece | 8" Production Pipeline | 8" Tie-in Spool | 38 | 168.3 | 139.7 | 14.3 | SPU 115 | 345 | Produced Fluids |



| Pipeline Number | Ident Number | From | To | Description of Main Components of Pipeline | Length (m) | External Diameter (mm) | Internal Diameter (mm) | Wall Thickness (mm) | Type of Insulation Thickness (mm) | Maximum Allowable Operating Pressure (barg) | Product to be Conveyed |
|--|--------------|------------------------|--|--|------------|------------------------|------------------------|---------------------|-----------------------------------|---|------------------------|
| | 3.04 | 8" Tie-in Spoolpiece | 8" Scoter Extension Structure Tie-in Spool | 8" Production Pipeline | 3726 | 168.3 | 139.7 | 14.3 | SPU 115 | 345 | Produced Fluids |
| | 3.05 | 8" Production Pipeline | Scoter Manifold Extension Structure | 8" Scoter Extension Structure Tie-in Spool | 56.5 | 219.1 | 139.7 | 19.1 | SPU 105 | 258 | Produced Fluids |
| | 3.06 | | | Scoter Manifold Extension Structure (SMES) | | | | | | | |
| PL2346J1 | 1.01 | Merganser East Well | Merganser Manifold | 6" Well Tie-in Spoolpiece | 59.5 | 168.3 | 139.7 | 14.3 | SPU 115 | 345 | Produced Fluids |
| PL2346J2 | 2.01 | Merganser West Well | Merganser Manifold | 6" well Tie-in Spoolpiece | 86 | 168.3 | 139.7 | 14.3 | SPU 115 | 345 | Produced Fluids |
| PLU2347 – Merganser Control Umbilical | | | | | | | | | | | |
| PLU2347 | 1.01 | Scoter Manifold | Merganser Manifold | Electro-hydraulic Chemical Injection Umbilical | 4100 | 105 | N/A | N/A | N/A | Various | See Table 4 |



| Pipeline Number | Ident Number | From | To | Description of Main Components of Pipeline | Length (m) | External Diameter (mm) | Internal Diameter (mm) | Wall Thickness (mm) | Type of Insulation Thickness (mm) | Maximum Allowable Operating Pressure (barg) | Product to be Conveyed |
|--|--------------|--------------------|---------------------|---|------------|------------------------|------------------------|---------------------|-----------------------------------|---|------------------------|
| PLU2347J1 | 3.01 | Merganser Manifold | Merganser East Well | Electro-hydraulic Chemical Injection Jumper | 59.5 | N/A | N/A | N/A | N/A | N/A | See Table 4 |
| PLU2347J2 | 2.01 | Merganser Manifold | Merganser West Well | Electro-hydraulic Chemical Injection Jumper | 86 | N/A | N/A | N/A | N/A | N/A | See Table 4 |
| PLU2896 – Merganser Power & Signal Jumper | | | | | | | | | | | |
| PLU2896 | 1 | Merganser Manifold | Merganser West Well | Power / Signal Jumper | 86 | N/A | N/A | N/A | N/A | N/A | N/A |
| PLU2897 – Merganser Power & Signal Jumper | | | | | | | | | | | |
| PLU2897 | 1 | Merganser Manifold | Merganser West Well | Power / Signal Jumper | 86 | N/A | N/A | N/A | N/A | N/A | N/A |

* will be transferred to the Arran Section 29 Notice and PWA at a later date

Table 2 – Scoter & Merganser Pipelines and Umbilicals, data from PWA Table A



The contents of the Scoter and Merganser umbilicals and associated jumpers are detailed in Table 3 and 4 below.

| Ident | Description | Size | Contents | DWP (barg) |
|-------|---------------------|---------------------------|----------------------|------------|
| 1 | LP1 Hydraulics | ½" (12.7mm ID, 1.01mm WT) | SV3 | 517 |
| 2 | LP2 Hydraulics | ½" (12.7mm ID, 1.01mm WT) | SV3 | 517 |
| 3 | HP1 Hydraulics | ½" (12.7mm ID, 1.01mm WT) | SV3 | 517 |
| 4 | HP2 Hydraulics | ½" (12.7mm ID, 1.01mm WT) | SV3 | 517 |
| 5 | Return Hydraulics | 1" (25.4mm ID, 1.5mm WT) | SV3 | 345 |
| 6 | XT Chemical | ½" (12.7mm ID, 1.01mm WT) | MEG / water 80:20 | 517 |
| 7 | Manifold Chemical | ½" (12.7mm ID, 1.01mm WT) | MEG / water 80:20 | 517 |
| 8 | Methanol | 1" (25.4mm ID, 1.5mm WT) | Methanol | 345 |
| 9 | Corrosion Inhibitor | 1" (25.4mm ID, 1.5mm WT) | CRW85440 | 345 |

Table 3 – Scoter Umbilical (PLU1946) contents

| Ident | Description | Size | Contents | DWP (barg) |
|-------|---------------------|---------------------------|----------------------|------------|
| 1 | LP1 Hydraulics | ⅝" (15.87 ID, 1.1 WT) | SV200 | 345 |
| 2 | LP2 Hydraulics | ⅝" (15.87 ID, 1.1 WT) | SV3 | 345 |
| 3 | HP1 Hydraulics | ½" (12.7mm ID, 1.01mm WT) | SV200 | 517 |
| 4 | HP2 Hydraulics | ½" (12.7mm ID, 1.01mm WT) | SV3 | 517 |
| 5 | Return Hydraulics | 1" (25.4mm ID, 1.5mm WT) | SV3 | 345 |
| 6 | XT Chemical | ½" (12.7mm ID, 1.01mm WT) | MEG / water 80:20 | 517 |
| 7 | Manifold Chemical | ½" (12.7mm ID, 1.01mm WT) | MEG / water 80:20 | 517 |
| 8 | Methanol | 1" (25.4mm ID, 1.5mm WT) | Methanol | 345 |
| 9 | Corrosion Inhibitor | ½" (12.7mm ID, 1.01mm WT) | CRW85440 | 517 |

Table 4 – Merganser Umbilical (PLU2347) contents

Permits and Consents

Shell will issue PWA variations for PWAs 12/W/02 and 16/W/06 to the OGA for approval. Further, the Scoter and Merganser Decommissioning Project maintains a Permits and Consents Register which has identified the following permits to be submitted for this scope:

- Deposit Consents, per Petroleum Act 1998
- Pipeline Safety Regulation 22 notification, per SI 1996/825
- Marine Licence, per Marine and Coastal Act 2009
- Notifications to the Hydrographics Office
- Pipeline Operation Permit (POP), per Environmental Impact Assessment Regulations 1999 and Offshore Chemical Regulations 2002

Shell U.K. Limited,
Registered in England number 140141,
Registered office Shell Centre London SE1 7NA,
VAT reg number GB 235 7632 55

Scoter & Merganser Decommissioning – Preparatory Works Request



- Chemical Permits, per Environmental Impact Assessment Regulations 1999 and Offshore Chemical Regulations 2002
- EEMS Reporting, per Environmental Impact Assessment Regulations 1999 and Offshore Chemical Regulations 2002
- Oil Discharge Permit (OPPC), per Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005

Shell will continue to engage regularly with the HSE, Scottish Fishermen’s Federation and BEIS OPRED to inform ongoing permit and consents requirements for the project.

Decommissioning Programme

Shell are developing Decommissioning Programmes for the four s29 Notices listed in Table 1. Shell expect to submit these for public consultation in June 2020 and to seek regulatory approval by December 2020.

A copy of this Preparatory Works Request will be an appendix to the Decommissioning Programmes and reference made to the work executed.

Impact on Future Decommissioning

Shell confirms that the scope to be executed under this Preparatory Works Request will not compromise or prejudice feasible decommissioning options for the remaining infrastructure.

Yours sincerely,
Shell U.K. Limited

Rob Jansen
Head of Decommissioning Projects, UK and India
Shell U.K. Limited



APPENDIX 2 – BURIAL DEPTH DATA

The charts below were presented to attendees at the Scoter and Merganser Comparative Assessment Workshop and summarise the data that Shell has available regarding the burial status of each line.

Generally, there are two definitions for burial depth; depth of lowering and depth of cover, which are both illustrated in the figure below. The depth of cover is the conventional definition of burial depth, which is the depth of backfill or rock on top of the pipeline or umbilical. The depth of lowering is the depth of the top of the pipeline or umbilical below the natural mean seabed level. The natural mean seabed level is ignoring any berms to the sides of the trench.

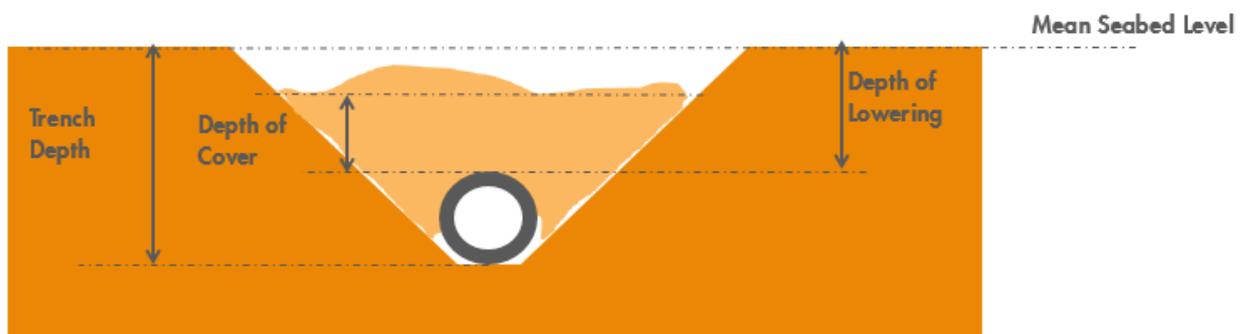


Figure APP2-1 – Burial depth definition

The graphics below, Figures APP2-2 to APP2-5, show the depth-of-cover data from as-trenched surveys of the Scoter and Merganser pipelines and umbilicals following their installation in 2002 and 2006 respectively. This survey data was supplemented in the Comparative Assessment Workshop with sonar and ROV survey data from 2004 to 2017 and 2008 to 2017 for Scoter and Merganser respectively.

A brief explanatory note is provided for each line.

On the completion of decommissioning activities, Shell will perform a depth-of-cover survey for the full length of each line being decommissioned *in situ*. The results of these surveys will be presented to OPRED in a similar linear graph format as part of the Close Out Report.

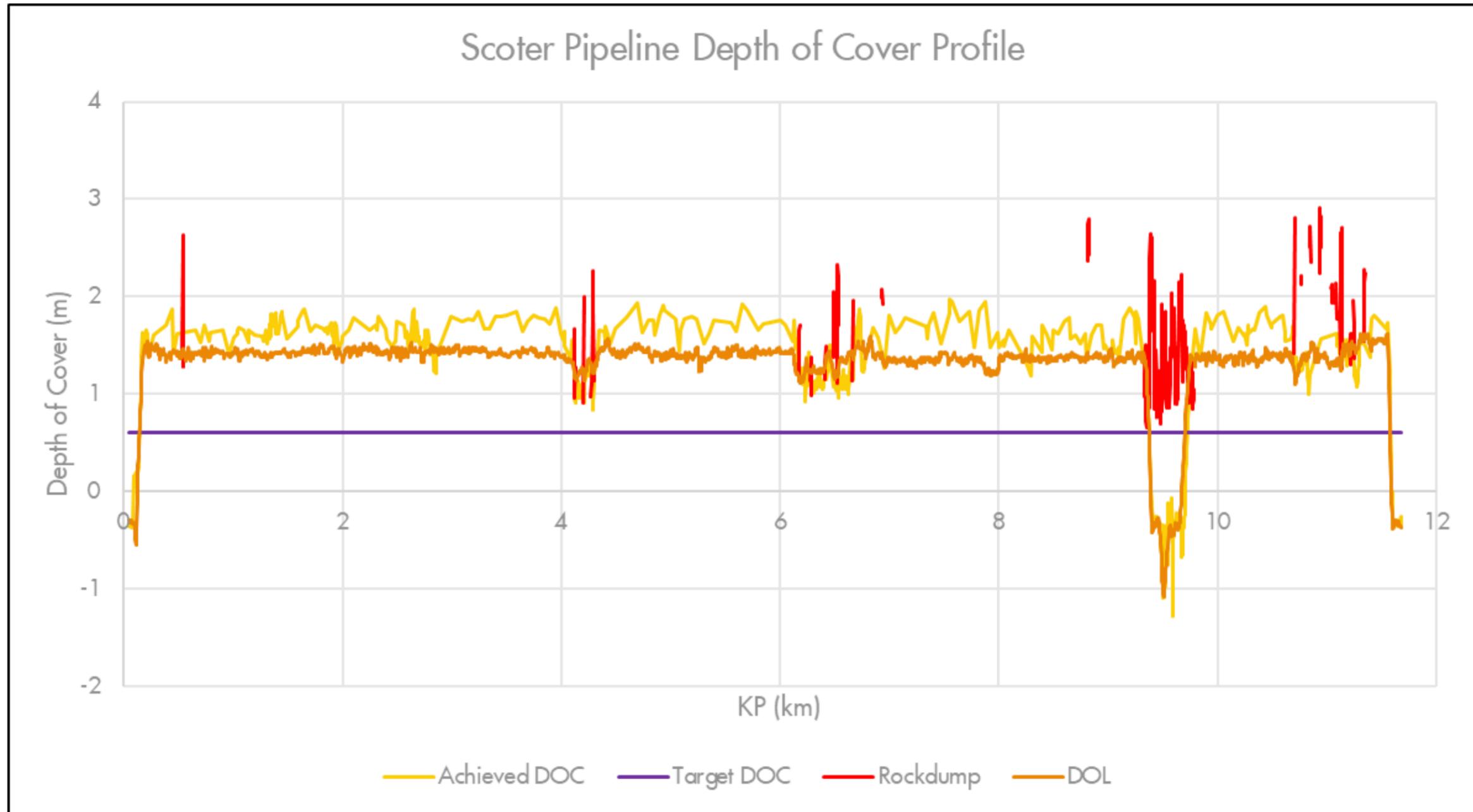


Figure APP2-2 – Scoter Production Pipeline Survey Results Summary (N0795 / PL1945)

Figure APP2-2 shows the survey results from the 2002 as-installed depth-of-cover survey. The horizontal purple line indicates the minimum target depth-of-cover (0.6m) in line with the OPRED Guidance Notes [2]. The red lines indicate areas of rock cover. At ~KP4.2, ~KP6.4 and ~KP11-11.5, the rock was installed to prevent upheaval buckling of the pipeline. At ~KP9.2-9.6, the rock was installed to protect the crossing detailed in Table 1.11.

The depth-of-cover achieved across the pipeline is well in excess of the target 0.6m.

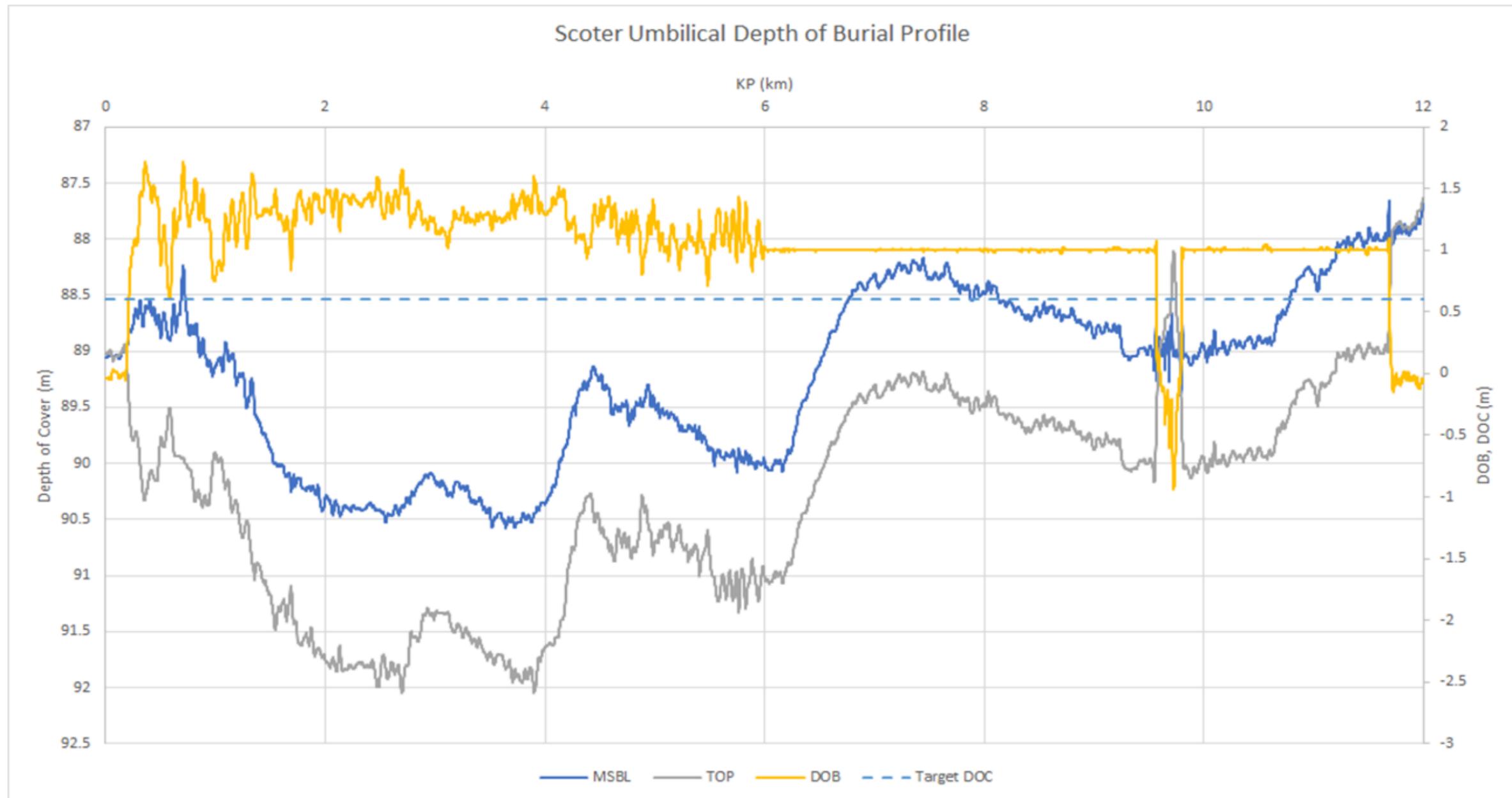


Figure APP2-3 – Scoter Umbilical Survey Results Summary (N1841 / PLU1946)

Figure APP2-3 shows the survey results from the 2002 as-installed depth-of-cover survey. The horizontal dashed blue line indicates the minimum target depth-of-cover (0.6m) in line with the OPRED Guidance Notes [2]. The Scoter umbilical was laid in a pre-cut trench and allowed to naturally backfill. The blue line indicates the Mean Seabed Level (MSBL) and the grey line indicates the Top of the Pipe (TOP) as tracked during the as-installed survey. This provides the Depth of Burial (DOB) shown in the yellow line. Subsequent sonar surveys indicate that the pre-cut trench has backfilled completely, therefore the Depth of Burial indicated is assumed to be the current Depth of Cover.

The depth-of-cover achieved across the trenched and buried sections of the umbilical is well in excess of the target 0.6m. The lower depth-of-cover shown at ~KP9.4-9.7 indicates the crossings detailed in Table 1.11.

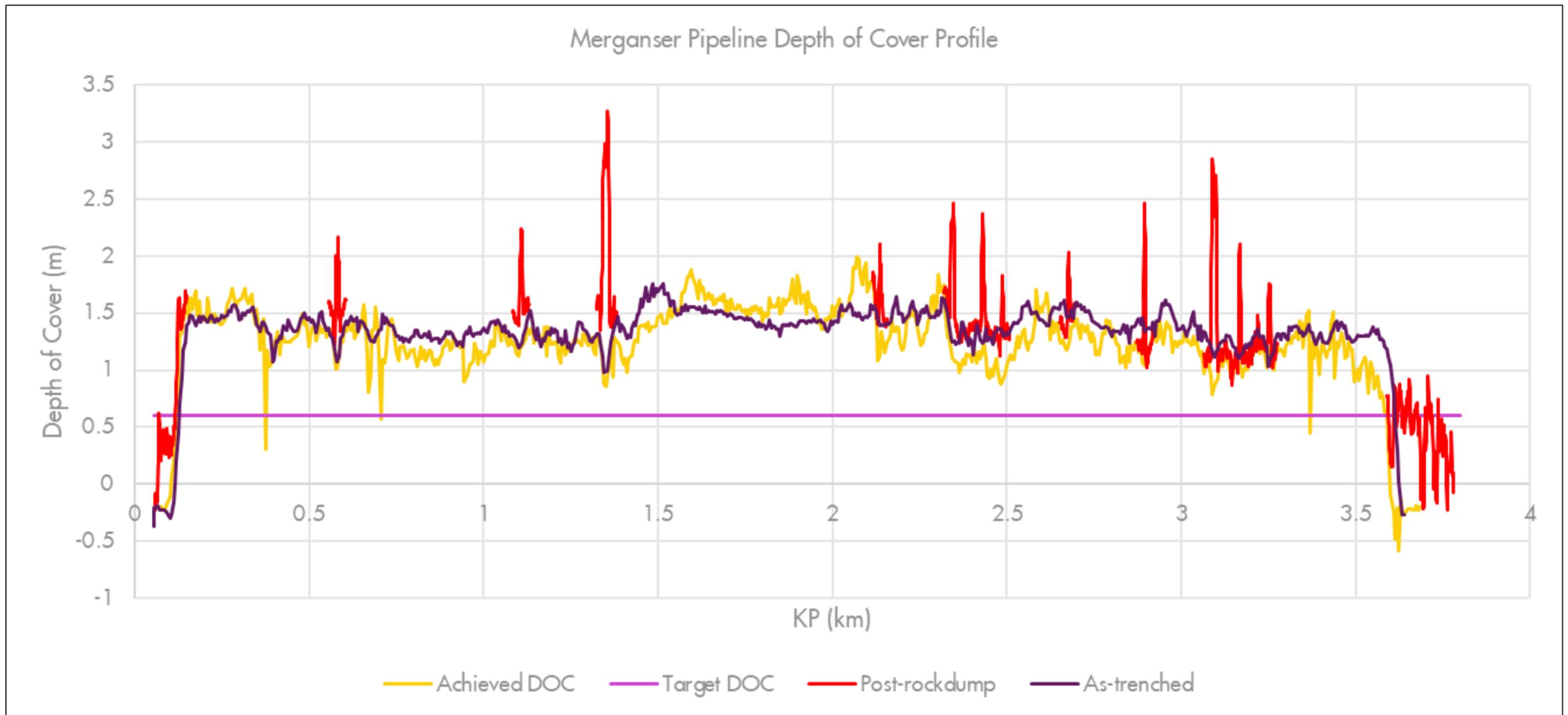


Figure APP2-4 – Merganser Production Pipeline Survey Results Summary (N1759 / PL2346)

Figure APP2-4 shows the survey results from the 2006 as-installed depth-of-cover survey. The horizontal purple line indicates the minimum target depth-of-cover (0.6m) in line with the OPRED Guidance Notes [2]. The red lines indicate areas of rock cover, installed either to mitigate areas of low cover following pipelay or to prevent upheaval buckling. The extended rock-cover at ~KP3.6 onwards indicates the rock covering the transition from the pipeline's trench on approach to the Merganser Manifold. The three 'spikes' in the yellow line (~KP0.4, ~KP0.75, ~KP3.4), indicating the achieved Depth-of-Cover, were assessed by the survey team to be 'noise' during the survey which distorted the results and are not representative of seabed conditions. These areas were presented during the Comparative Assessment for discussion with the stakeholders present.

The depth-of-cover achieved across the trenched and buried pipeline is well in excess of the target 0.6m.

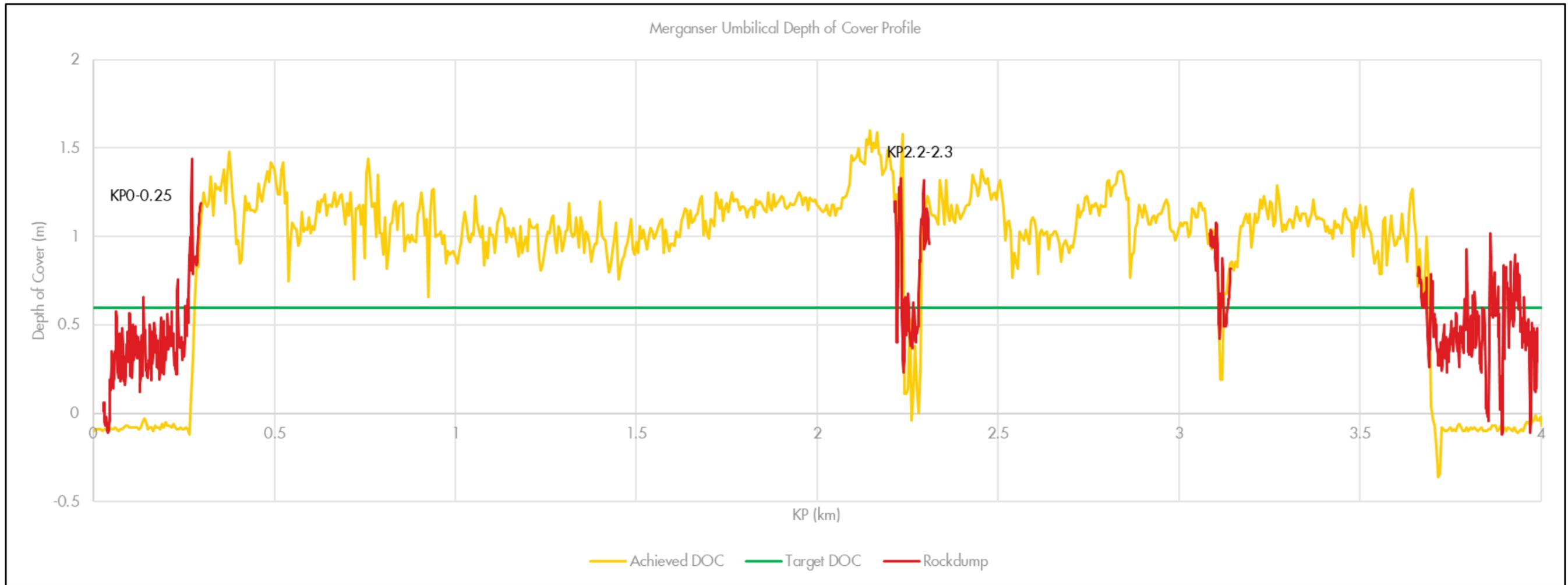


Figure APP2-5 – Merganser Umbilical Survey Results Summary (N2842 / PLU2347)

Figure APP2-5 shows the survey results from the 2006 as-installed depth-of-cover survey. The horizontal green line indicates the minimum target depth-of-cover (0.6m) in line with the OPRED Guidance Notes [2]. The red lines indicate areas of rock cover, installed to mitigate areas of low cover following the as-laid survey of the umbilical. The extended red lines at the start and end of the umbilical indicate the rock-cover protecting the transitions from the umbilical’s trench on approach to the SMES and Merganser Manifold respectively.

The depth-of-cover achieved across the trenched and buried umbilical is well in excess of the target 0.6m.



APPENDIX 3 – PUBLIC NOTICE

The Petroleum Act 1998

Scoter and Merganser Decommissioning Programmes

On 4 April 2022, Shell U.K. Limited submitted, for the consideration of the Secretary of State for Business, Energy and Industrial Strategy, the draft Decommissioning Programmes for the Scoter and Merganser Fields in accordance with the provisions of the Petroleum Act 1998. It is a requirement of the Act that interested parties be consulted on such decommissioning proposals.

Scoter and Merganser are two normal pressure and temperature gas-condensate subsea tie-backs to the Shearwater Cluster, located in Block 22/30a of the Central North Sea. The Fields are 230km and 226km from the nearest UK shoreline respectively. The items / facilities covered by the Decommissioning Programmes are:

- Installations and subsea infrastructure associated with the Scoter Field, comprising of the Scoter Manifold, Scoter Production Pipeline, Scoter Umbilical and associated tie-in spools, jumpers and stabilisation features.
- Installations and subsea infrastructure associated with the Merganser Field, comprising of the Merganser Manifold, Scoter Manifold Extension Structure, Merganser Production Pipeline, Merganser Umbilical and associated tie-in spools, jumpers and stabilisation features.

Shell U.K. Limited hereby gives notice that the Scoter and Merganser Decommissioning Programmes can be viewed online at <https://www.shell.co.uk/sustainability/decommissioning.html>.

Alternatively, a digital copy of the Programmes can be requested:

Contact: James Blackburn, Business Opportunity Manager, Decommissioning, Shell U.K.

Email: SUKEP-Shell-Decommissioning-Correspondence@shell.com

Representations regarding the Scoter and Merganser Decommissioning Programmes should be submitted in writing to Shell U.K. Limited marked for the attention of James Blackburn at the above email address, where they should be received no later than the consultation closing date (6 May 2022) and should state the grounds upon which any representations are being made.

4 April 2022

James Blackburn

Business Opportunity Manager, Decommissioning

Shell U.K. Limited

1 Altens Farm Road, Nigg

Aberdeen, AB12 3FY



APPENDIX 4 – CORRESPONDENCE WITH STATUTORY CONSULTEES

Letter received from the Scottish Fishermen’s Federation, 27 April 2022, per public consultation:



Our Ref: SA/04/05

Your Ref:

27 April 2022

Scottish Fishermen's Federation
24 Rubislaw Terrace
Aberdeen, AB10 1XE
Scotland UK

T: +44 (0) 1224 646944
F: +44 (0) 1224 647078
E: sff@sff.co.uk

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FAO James Blackburn
Decommissioning Business Opportunity Manager
c/o SUKEP-Shell-Decommissioning-Correspondence@shell.com

Dear James,

Scoter and Merganser Decommissioning Programmes - Public Consultation

I refer to the Consultation on Decommissioning Programmes and key supporting documentation provided by email on 4 April 2022.

The Scottish Fishermen’s Federation (SFF) appreciates the clearly laid out and detailed explanation of the proposals submitted by Shell U.K. Limited for the decommissioning of the Scoter and Merganser Fields’ installations and pipelines and place on record our appreciation of the information provided.

For your information, I can advise that the SFF’s Oil and Gas Decommissioning Policy and accompanying Key Principles document can be viewed via the SFF’s website using the following link: <https://www.sff.co.uk/sff-offshore-oil-gas-decommissioning-policy/>.

As highlighted in these documents, the concerns of fishermen are primarily that of safety and the physical impact on the fishing grounds of the long-term presence of oil industry infrastructure on the seabed. I can confirm that the SFF’s preferred position regarding the decommissioning of oil and gas infrastructure is one of total removal.

We are therefore pleased to note that under the two Installation Decommissioning Programmes, it is Shell’s intention to fully remove the single Scoter and the two Merganser production manifold installations and to undertake the decommissioning of the five associated wellhead structures in accordance with Oil & Gas UK Well Decommissioning Guidelines (issue 6, June 2018).

Regarding the proposals for decommissioning pipelines (seven) and umbilicals (eleven), it is noted that these have been prepared in line with OPRED Guidance Notes and following comparative assessment of credible options. We are pleased to find that all surface-laid tie-in spools and jumpers are to be removed.

Members:

Anglo Scottish Fishermen’s Association · Fife Fishermen’s Association · Fishing Vessel Agents & Owners Association (Scotland) Ltd · Mallaig & North-West Fishermen’s Association Ltd · Orkney Fisheries Association · Scottish Pelagic Fishermen’s Association Ltd · The Scottish White Fish Producers’ Association Ltd · Shetland Fishermen’s Association

VAT Reg No: 605 096 748



In relation to the trenched and buried pipelines and umbilicals that are proposed to be decommissioned in situ, we accept the reasoning behind the recommendation (based on the outcome of the comparative assessment of feasible options) of leaving these in situ with minimum intervention so as to minimise seabed disturbance. As you will be aware, any pipelines/umbilicals left on the seabed represent a legacy issue and will require on going monitoring. Where rock cover is deployed, we would look for the size and profile of the rock to follow normal industry standards and would recommend that such rock dump berms are incorporated into the post decommissioning debris clearance trawl sweeps to verify that, at the time of deposit, they did not pose a risk to fishing.

In relation to drill cuttings, it is noted that these are to be decommissioned in situ since 'the Scoter and Merganser wells were drilled after the ban on discharge of Oil Based Mud (OBM). It is further noted that Water Based Mud (WBM) and cuttings were discharged at these locations, although there is little evidence from bathymetry data of any residual accumulations of water-based mud cuttings. Therefore, there is nothing present at the Scoter or Merganser wells which would constitute a drill cuttings pile within the definition in OSPAR Recommendation 2006/5' – from this information, can Shell provide confirmation that should a fishing vessel inadvertently trawl over the Scoter/Merganser sites (once the 500 metre Safety Zones have been relinquished), that there would be no threat of catch contamination from coming into contact with these drill cuttings?

We would take this opportunity to highlight that the SFF has serious reservations and is yet to be convinced regarding the use of alternative methods of verifying to fishermen that it is safe for fishing to resume in an area following the removal of oil and gas related infrastructure. It is our view that the undertaking of trawl verification sweeps under controlled conditions, which replicate the fishing operations that will be permitted in the area following the decommissioning work, is the best method of establishing that it is safe for fishing to resume in said area. This viewpoint has been shared with OPRED on multiple occasions.

The Federation having stated the above position, would reaffirm its appreciation of the decommissioning plans provided and its wish to work closely and positively with the Scoter and Merganser Fields Decommissioning Team, as you work through the challenges before you.

Yours sincerely,

Steven Alexander
Offshore Liaison



Shell UK's response to the Scottish Fishermen's Federation letter of 27 April 2022:



Steven Alexander
Scottish Fishermen's Federation (SFF)
24 Rubislaw Terrace
Aberdeen, AB10 1XE
Scotland, UK

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AB12 3FY
United Kingdom
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Internet <http://www.shell.co.uk>

15 June 2022

Scoter and Merganser Decommissioning Programmes – Response to Public Consultation
Your Ref: SA/04/05

Dear Steven,

We thank you for your letter of 27 April 2022 and note the guidance provided therein.

In response to the two specific queries raised in your letter, Shell U.K. Limited (Shell) can advise the following.

Regarding the presence of residual Water Based Mud (WBM), as stated within Section 2.2.6 of the Environmental Appraisal, only cuttings drilled with WBM were discharged during the drilling of the Scoter and Merganser wells. Shell can therefore confirm that any residual cuttings material present from drilling the wells will not present a risk of contamination to fish.

Regarding the SFF's reservation on the use of methods of seabed clearance verification other than trawl sweeps, Shell understands that OPRED's default policy is that clear seabed verification is to be undertaken using non-intrusive means and that overtrawl is likely to be approved only in cases where it is deemed necessary. Shell will engage with OPRED and the SFF during the execution phase of the project on the appropriate means of survey to be undertaken.

Your contribution to the public consultation, and throughout the development, of the Scoter and Merganser Decommissioning Programmes is appreciated and we will continue to work with the SFF throughout the planned execution of the works contained therein.

Yours sincerely,
Shell U.K. Limited

Steve Jordan
Decommissioning Project Director, Shell U.K. Limited

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