



# **Goldeneye DP Part 1 Decommissioning Close Out Report**

Close Out Report  
Shell Doc No: GDP-PT-E-AA-7878-00001



## Contents

|          |   |           |
|----------|---|-----------|
| <b>1</b> | <b>Summary</b>  | <b>5</b>  |
| 1.1      | Summary of Decommissioning Programmes                                   | 5         |
| 1.2      | Schematic of Installation(s)/Pipeline(s) Being Decommissioned           | 9         |
| 1.3      | Gantt chart/progress against approved schedule                          | 10        |
| 1.4      | Associated Decommissioning approvals                                    | 11        |
| <b>2</b> | <b>Decommissioning Activities</b>                                       | <b>14</b> |
| 2.1      | Contract Awards   | 14        |
| 2.2      | Platform Operations   | 14        |
| 2.3      | Well P&A  | 15        |
| 2.4      | Subsea Installations and Stabilisation Features                         | 15        |
| 2.5      | Pipelines/Umbilicals/Jumpers – Status, Survey History and Survey Regime | 16        |
| 2.6      | Pipelines, Umbilicals and Jumpers                                       | 17        |
| 2.7      | Key Milestones  | 18        |
| 2.8      | Stakeholder Engagement  | 19        |
| <b>3</b> | <b>Impact on environment</b>  | <b>20</b> |
| <b>4</b> | <b>Impact on HSE</b>  | <b>23</b> |
| 4.1      | HSE Performance   | 23        |
| 4.2      | Technical Safety  | 23        |
| 4.3      | Offshore Removals Scope   | 23        |
| 4.4      | Subsea Infrastructure Decommissioning                                   | 24        |
| 4.5      | Onshore Scope   | 24        |
| <b>5</b> | <b>Materials/Waste Inventory</b>  | <b>25</b> |
| <b>6</b> | <b>Lessons Learned</b>  | <b>29</b> |
| <b>7</b> | <b>Costs</b>  | <b>30</b> |
| <b>8</b> | <b>Photographs</b>  | <b>31</b> |
| <b>9</b> | <b>Appendices</b>   | <b>34</b> |



## Terms and Abbreviations

| Abbreviation | Explanation  |
|--------------|--|
| BAC          | Background Assessment Criteria   |
| BC           | Background Concentration   |
| BEIS         | Department for Business, Energy and Industrial Strategy (now DESNZ)                                      |
| CC(U)S       | Carbon Capture (Utilisation) and Storage   |
| CoP          | Cessation of Production  |
| DECC         | Department of Energy and Climate Change (now DESNZ)  |
| DESNZ        | Department for Energy Security and Net Zero  |
| DP           | Decommissioning Programmes   |
| DSA          | Norwegian Radiation and Nuclear Safety Authority ( <i>Direktoratet for strålevern og atomtryggleik</i> ) |
| EMT          | Environmental Management Team  |
| HAZID        | Hazard Identification  |
| HMC          | Heerema Marine Contractors   |
| HSE          | Health and Safety Executive  |
| IP           | Injured Party  |
| LAT          | Lowest Astronomical Tide   |
| LWIV         | Light Well intervention unit   |
| LOD          | Limit of Detection   |
| MAH          | Major Accident Hazard  |
| MEWP         | Mobile Elevated Work Platform  |
| NEA          | Norwegian Environment Agency ( <i>Miljødirektoratet</i> )  |
| NORM         | Naturally Occurring Radioactive Material   |
| NUI          | Normally Unattended Installation   |
| OBM          | Oil Based Mud  |
| ODU          | Offshore Decommissioning Unit  |
| OGA          | Oil and Gas Authority  |
| OPPC         | Oil Pollution Prevention and Control   |
| OPRED        | Offshore Petroleum Regulator for Environment and Decommissioning   |
| P&A          | Plug and Abandon (wells)   |
| PUI          | Permanently Unattended Installation  |
| PWA          | Pipeline Works Authorisation   |
| PWR          | Preparatory Works Request  |
| SEPA         | Scottish Environment Protection Agency   |
| SSCV         | Semi-Submersible Crane Vessel  |



---

| Abbreviation | Explanation                         |
|--------------|-------------------------------------|
| SSIV         | SubSea Isolation Valve              |
| THC          | Total HydroCarbon                   |
| TOC          | Total Organic Carbon                |
| TOM          | Total Organic Matter                |
| TUTU         | Topsides Umbilical Termination Unit |
| WBS          | Work Breakdown Structure            |



## 1 SUMMARY

This document presents the Close Out Report of decommissioning executed in accordance with the Goldeneye Decommissioning Programmes Part 1 (DP Part 1). There have been no revisions to the DP Part 1 as approved by OPRED 22 October 2019.

### 1.1 Summary of Decommissioning Programmes

The DP Part 1 for the Goldeneye installations and pipelines were approved by the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) 22 October 2019.

A combined programme was submitted to cover two notices served under Section 29 of the Petroleum Act 1998. The Section 29 notices are summarised below:

- Goldeneye – Offshore installations
  - Shell U.K. Limited, registered number 00140141
  - Esso Exploration and Production UK Limited, registered number 00207426
  - Waldorf Production UK PLC, registered number 05030838
  - Spirit Energy Resources Limited, registered number 02855151
- Goldeneye – Subsea Pipelines
  - Shell U.K. Limited, registered number 00140141
  - Esso Exploration and Production UK Limited, registered number 00207426
  - Waldorf Production UK PLC, registered number 05030838
  - Spirit Energy Resources Limited, registered number 02855151

Note that DP Part 1 for Goldeneye do not cover the full scope of the Section 29 notice for subsea pipelines. DP Part 1 included the topsides, jacket, wells and subsea infrastructure up to but excluding the main pipeline tie-in flanges only. Potential re-use opportunities are being investigated for the remaining pipelines between the tie-in flanges to landfall adjacent to the St Fergus Terminal. Therefore, the remaining pipeline sections are subject to a second document (DP Part 2) which will be submitted at a later date.

Goldeneye was operational as a gas producing field from 2004, the last well watering out on 8th December 2010. The field was finally shut-in on 16<sup>th</sup> February 2011 and formal Cessation of Production was approved by DECC in March 2011.

The non-producing Normally Unattended Installation (NUI) and associated infrastructure was preserved and maintained under a revised Safety Case, whilst the potential Peterhead Carbon Capture and Storage (CCS) Project, that is no longer progressing, was investigated. Following consultation with Carbon Capture Utilisation and Storage (CCUS) stakeholders, it was confirmed that future re-use opportunities for the wells and platform facilities were exhausted and so, in 2018, the NUI was converted to a Permanently Unattended Installation (PUI) in preparation for decommissioning.

The DP Part 1 for Goldeneye installation and subsea tie-in facilities were formally approved by OPRED 22 October 2019. No revisions have been required to any of the approved Programmes.

A summary of the infrastructure to be decommissioned and the approved decommissioning options is provided in the tables below.



| Table 1.1: Overview of Installation(s) to be decommissioned |                                  |                      |                    |
|---|----------------------------------|----------------------|--------------------|
| Surface Installation(s)                                     |                                  |                      |                    |
| Number  | Type                             | Topsides Weight (Te) | Jacket Weight (Te) |
| 1   | Wellhead structure type platform | 1245                 | 2779               |
| Number of Wells   |                                  |                      |                    |
| Platform  |                                  | Subsea               |                    |
| 5   |                                  | 0                    |                    |
| Drill Cuttings pile(s)                                      |                                  |                      |                    |
| Number of Piles   | 0                                |                      |                    |

| Table 1.2: Pipeline(s) Being Decommissioned  |                                      |
|--|--------------------------------------|
| Number of Pipeline(s) to be decommissioned   | 3 (2 partial pipelines, 1 umbilical) |
| Total KM of Pipeline(s) to be decommissioned | 0.9km                                |

| Table 1.3: Overview of the Stabilisation Features In The Approved DP |            |
|--|------------|
| Type   | Total      |
| Concrete Mattresses  | 53         |
| Grout Bags   | Approx 600 |

| Table 1.4: Summary of Decommissioning Programmes |  |  |
|--|--|--|
| Selected Option                                  | Reason for Selection   | Proposed Decommissioning Solution  |
| <b>1. Topsides</b>                               |  |  |
| Complete removal and re-use/recycling/disposal   | Allows jacket to be removed and will allow for re-use or maximise recycling of materials   | Topsides has been removed and recovered to shore. Topsides process equipment was drained, flushed, purged and vented offshore prior to preparation for removal; Where required, further cleaning was carried out at the dismantling/ disposal site to facilitate re-use or recycling, as appropriate.  |
| <b>2. Jacket/Floating Facility (FPSO etc.)</b>   |  |  |
| Complete removal and recycling/disposal          | To comply with OPSAR requirement to leave a clear seabed, removes a potential obstruction to fishing operations and maximises recycling of materials | Each leg pile was cut at a depth of 3.5m below mean seabed (11.5m from Top Of Pipe) and the jacket removed and recovered to shore; Cutting of the piles was executed using internal cutting equipment. Where required, cleaning was carried out at the dismantling/ disposal site for recycling, as appropriate.<br><br>Further, four docking piles used to support the initial installation of the jacket were cut at the following |



| Table 1.4: Summary of Decommissioning Programmes   |   |   |
|--|---|---|
| Selected Option  | Reason for Selection  | Proposed Decommissioning Solution   |
|  |   | depths below seabed: <ul style="list-style-type: none"> <li>• Pile A1 cut 3.2m below seabed</li> <li>• Pile A2 cut 3.25m below seabed</li> <li>• Pile B1 cut 4.44m below seabed</li> <li>• Pile B2 cut 3.85m below seabed</li> </ul>  |
| 3. Subsea Installations  |   |   |
| N/A  | N/A   | N/A   |
| 4. Pipelines, Flowlines & Umbilicals   |   |   |
| Gas Export SSIV complete removal and recycling/disposal  | To be aligned with OPSAR requirement to leave a clear seabed. | The piles were cut at the depths noted below and the structure recovered to shore, complete with the piping for dismantling and recycling onshore. Cutting of the piles was executed using internal cutting equipment. <ul style="list-style-type: none"> <li>• Pile A1 cut 3.4m below seabed</li> <li>• Pile A2 cut 3.35m below seabed</li> <li>• Pile B1 cut 3.4m below seabed</li> <li>• Pile B2 cut 3.4m below seabed</li> </ul>  |
| Full removal of spools (PL1978-7, PL1978-9, PL1979-2). Full removal of umbilical hoses (PLU4858)                                 | To remove and leave a clear seabed                            | Fully removed.  |
| 5. Wells   |   |   |
| Well decommissioning in accordance with Oil & Gas UK Guidelines for the Suspension and Abandonment of Wells (issue 5, July 2015) | Meets HSE and OGA regulatory requirements                     | The wells have been abandoned from the installation with support from a Jack Up Drilling Rig; PON5/PETS/Marine Licence applications under the relevant regulations were submitted in support of works carried out.<br><br>The conductors for the five Goldeneye wells were cut in 2018 to the following depths below seabed: <ul style="list-style-type: none"> <li>• GYA01 (14/29a-A3)                             <ul style="list-style-type: none"> <li>○ 20" casing cut at -3m; 30" at -1.5m</li> </ul> </li> <li>• GYA02 (14/29a-AGY4Z)                             <ul style="list-style-type: none"> <li>○ 20" casing cut at -3m; 30" at -1.5m</li> </ul> </li> <li>• GYA03 (14/29a-A5)                             <ul style="list-style-type: none"> <li>○ 20" casing cut at -3m; 30" at -3m</li> </ul> </li> <li>• GYA04 (14/29a-A1)                             <ul style="list-style-type: none"> <li>○ 20" casing cut at -3m; 30" at -1.5m</li> </ul> </li> <li>• GYA05 (14/29a-A2)                             <ul style="list-style-type: none"> <li>○ 20" casing cut at -3m; 30" at -1.5m</li> </ul> </li> </ul> All wells have been approved by the NSTA at AB3. |
| 6. Drill Cuttings  |   |   |
| N/A  | N/A   | N/A   |

**Table 1.4: Summary of Decommissioning Programmes**

| Selected Option   | Reason for Selection | Proposed Decommissioning Solution |
|---|----------------------|-----------------------------------|
| 7. Interdependencies  |                      |                                   |
| The jacket, topsides and subsea infrastructure above the seabed near to the platform base was available for disconnection and removal with no impacts/interdependencies. The Atlantic umbilical was non-operational and available to be decommissioned. |                      |                                   |





## 1.2 Schematic of Installation(s)/Pipeline(s) being decommissioned

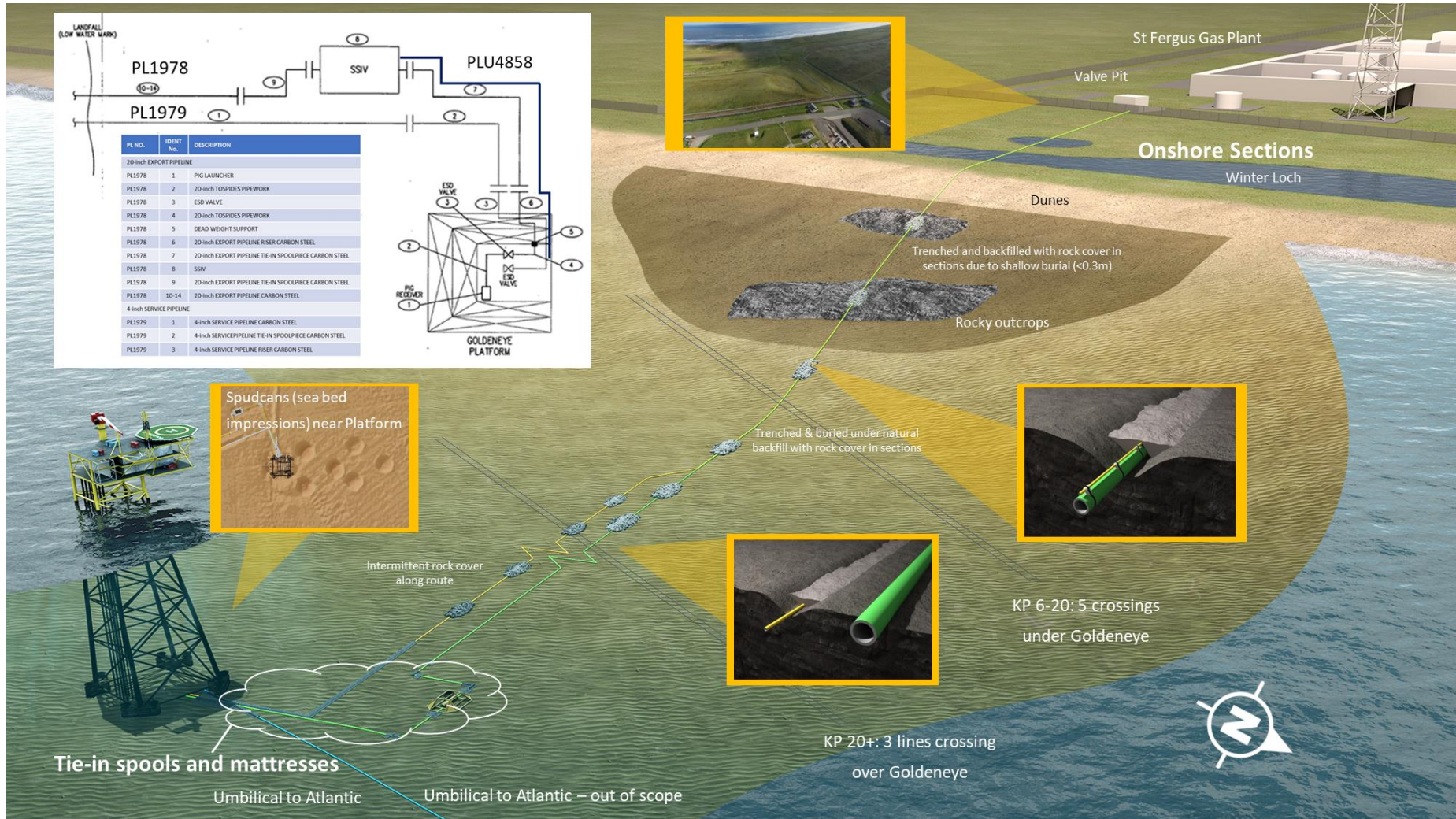


Figure 1.1: Schematic of Installation and Pipelines being decommissioned

**Note** – DP Part 1 and this Close Out Report cover the Goldeneye Topsides, Jacket and tie-in facilities (within the clouded area noted in Figure 1.1) only. The remaining pipeline sections will be subject to a later DP and are included above for information only.



### 1.3 Gantt chart/progress against approved schedule

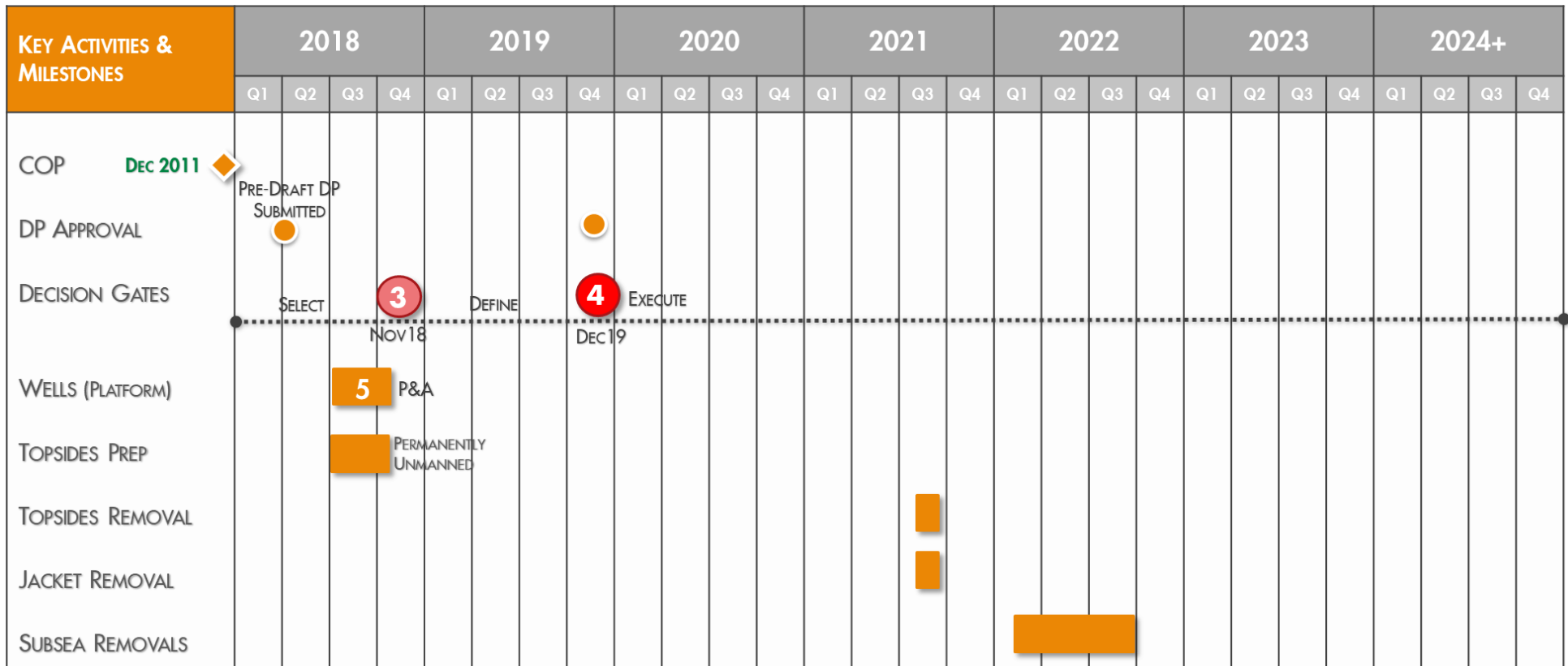


Figure 1.2: Revised schedule for Progress Report 1

There are no changes from the approved schedule in DP Part 1, however execution windows for the topsides, jacket and subsea removals have been replaced to show the actual execution dates. Further detail on key dates for the project is provided in Table 2.8.



### 1.4 Associated Decommissioning Approvals

| Table 1.7: Associated decommissioning Approvals |  |
|---|--|
| Platform well P&A                               | Not included here, as the wells were abandoned before the approval of DP Part 1. Well P&A was performed in accordance with the Offshore Energy UK Guidelines for Suspension and Abandonment of Wells.  |
| Pipeline Permits                                | <p>The following permits were approved to support the Intelligent Pigging of the main Goldeneye pipeline PL1978. This scope included disconnection of the main pipeline from the tie-in spools, which are in scope of DP Part 1.</p> <p>PLA/796:</p> <ul style="list-style-type: none"> <li>• CP/2460 Chemical Permit                             <ul style="list-style-type: none"> <li>○ Approved 17/12/20</li> <li>○ Amendment approved 02/07/21</li> </ul> </li> <li>• ML/640 Marine Licence                             <ul style="list-style-type: none"> <li>○ Approved 17/12/20</li> <li>○ Amendments approved 14/01/21, 02/07/21 and 09/02/22</li> </ul> </li> <li>• OTP/1048 Oil Discharge Permit                             <ul style="list-style-type: none"> <li>○ Approved 18/12/20</li> <li>○ Amendment approved 30/06/21</li> </ul> </li> </ul> <p>The following permits were approved to support the removal of the subsea infrastructure within the Goldeneye 500m zone.</p> <p>PLA/796:</p> <ul style="list-style-type: none"> <li>• ML/640 Marine Licence                             <ul style="list-style-type: none"> <li>○ Amendment approved 13/07/22</li> </ul> </li> <li>• CP/2790 Chemical Permit                             <ul style="list-style-type: none"> <li>○ Approved 15/06/22</li> </ul> </li> </ul> |
| Topside and jacket removal                      | <p>The following permits were approved to support the topside and jacket removal, including the disconnection from the pipeline and umbilical risers.</p> <p>PWA variations are listed separately below.</p> <p>Deposit Consent 3/D/21</p> <ul style="list-style-type: none"> <li>• Approved 14/01/21</li> </ul>   |



**Table 1.7: Associated decommissioning Approvals**

|   |  |
|---|--|
|   | <p>Pipeline Safety Regs, Reg 22 notification</p> <ul style="list-style-type: none"> <li>• Issued 01/09/21, acknowledged 06/09/21</li> </ul> <p>Marine Licence, Chemical Permit and OPPC were permitted under variations to the permits issued in support of the Intelligent Pig scope.</p> <p>PLA/796:</p> <ul style="list-style-type: none"> <li>• CP/2460 Chemical Permit                         <ul style="list-style-type: none"> <li>○ Approved 17/12/20</li> <li>○ Amendment approved 02/07/21</li> </ul> </li> <li>• ML/640 Marine Licence                         <ul style="list-style-type: none"> <li>○ Approved 17/12/20</li> <li>○ Amendments approved 14/01/21 and 02/07/21</li> </ul> </li> <li>• OTP/1048 Oil Discharge Permit                         <ul style="list-style-type: none"> <li>○ Approved 18/12/20</li> </ul> </li> </ul> <p>Amendment approved 30/06/21</p> |
| <p>Preparatory Works Request</p>          | <p>Note that a Preparatory Works Request was approved for the Atlantic Umbilical PLU2033, which ran from the Goldeneye topsides to the Atlantic Manifold. This PWR approved the removal of the umbilical section from the rock-berm adjacent to Goldeneye, through the riser and to the topsides including the TUTU and associated equipment.</p> <p>The PWR was accepted by OPRED ODU 30/04/21.</p>   |
| <p>Pipeline Works Authorisation (PWA)</p> | <p>The following PWA variations were approved to support the topside and jacket removal, including the disconnection from the pipeline and umbilical risers (PL1978, PL1979 and PLU4858).</p> <ul style="list-style-type: none"> <li>• Variation to the Goldeneye PWA (17/V/21) was approved 14/01/21</li> <li>• Variation to the Atlantic &amp; Cromarty PWA (201/V/21) was approved 03/08/21</li> </ul> <p>The following PWA variations were approved to support the subsea removals within the 500m exclusion zone at Goldeneye (PL1978, PL1979 and PLU4858)</p> <ul style="list-style-type: none"> <li>• Variation to the Goldeneye PWA (17/V/21) was approved 10/02/22</li> <li>• Variation to the Atlantic &amp; Cromarty PWA (201/V/21) was approved 28/02/22</li> </ul>  |



Table 1.7: Associated decommissioning Approvals

| Table 1.7: Associated decommissioning Approvals |   |                      |                            |                      |              |         |         |                |                           |         |          |        |                            |         |          |                |                            |
|---|---|----------------------|----------------------------|----------------------|--------------|---------|---------|----------------|---------------------------|---------|----------|--------|----------------------------|---------|----------|----------------|----------------------------|
|   | <p>Additional variations were raised to support Deposits Consents only, as follows:</p> <table border="1"> <thead> <tr> <th>Application Ref</th> <th>Consent Ref</th> <th>Pipelines Associated</th> <th>Consent Date</th> </tr> </thead> <tbody> <tr> <td>PA/3736</td> <td>25/V/22</td> <td>PL1978, PL1979</td> <td>10<sup>th</sup> Feb 2022</td> </tr> <tr> <td>PA/4198</td> <td>220/D/22</td> <td>PL1979</td> <td>15<sup>th</sup> June 2022</td> </tr> <tr> <td>PA/4032</td> <td>221/D/22</td> <td>PL1978, PL1979</td> <td>15<sup>th</sup> June 2022</td> </tr> </tbody> </table> | Application Ref      | Consent Ref                | Pipelines Associated | Consent Date | PA/3736 | 25/V/22 | PL1978, PL1979 | 10 <sup>th</sup> Feb 2022 | PA/4198 | 220/D/22 | PL1979 | 15 <sup>th</sup> June 2022 | PA/4032 | 221/D/22 | PL1978, PL1979 | 15 <sup>th</sup> June 2022 |
| Application Ref                                 | Consent Ref   | Pipelines Associated | Consent Date               |                      |              |         |         |                |                           |         |          |        |                            |         |          |                |                            |
| PA/3736   | 25/V/22   | PL1978, PL1979       | 10 <sup>th</sup> Feb 2022  |                      |              |         |         |                |                           |         |          |        |                            |         |          |                |                            |
| PA/4198   | 220/D/22  | PL1979               | 15 <sup>th</sup> June 2022 |                      |              |         |         |                |                           |         |          |        |                            |         |          |                |                            |
| PA/4032   | 221/D/22  | PL1978, PL1979       | 15 <sup>th</sup> June 2022 |                      |              |         |         |                |                           |         |          |        |                            |         |          |                |                            |
| Transfrontier Shipment of Waste                 | <p>The Goldeneye topsides and jacket was exported to the AF Offshore Decom dismantling yard in Vats, Norway. SEPA's consent to TFS GB0002 000707 was received 9<sup>th</sup> July 2021.</p> <p>31 ionising smoke detectors were recovered from the Goldeneye Topsides by AF Offshore Decom and repatriated to the UK for recycling / disposal. SEPA consented to the repatriation under the Transfrontier Shipment of Radioactive Waste and Spent Fuel Regulations 2019. Authorisation TFS/2023/001 was issued 06/07/2023</p>   |                      |                            |                      |              |         |         |                |                           |         |          |        |                            |         |          |                |                            |
| Consent to Locate                               | <p>On 15<sup>th</sup> November 2022, OPRED gave notice that Consent to Locate CL/164 and any previous variations had been surrendered.</p>  |                      |                            |                      |              |         |         |                |                           |         |          |        |                            |         |          |                |                            |





## 2 DECOMMISSIONING ACTIVITIES

### 2.1 Contract Awards

**Table 2.1: Contract Awards**

Following competitive tender, Heerema Marine Contractors (HMC) were awarded a contract to remove and dismantle the Goldeneye topsides and jacket. This contract includes the sub-contracted scope to safely dismantle, recycle and responsibly dispose of the Goldeneye topsides and jacket, awarded to AF Offshore Decom.

The subsea removals associated with Goldeneye were part of a competitive tender in which Shell awarded a contract to DeepOcean to decommission subsea infrastructure across its portfolio of North and Central North Sea assets. This contract includes the sub-contracted scope to dismantle, recycle and responsibly dispose of the recovered subsea infrastructure, awarded to NorSea Decom.

Following competitive tender, Gardline were awarded a contract to execute the post-decommissioning environmental survey scope.

### 2.2 Platform Operations

**Table 2.2: Platform Decommissioning**

The Goldeneye facilities had been in Permanently Unattended Installation mode since 2018.

In September 2021, the Goldeneye topsides and jacket were removed by Heerema Marine Contractors’ Thialf Semi-Submersible Crane Vessel (SSCV). Key milestones for this operation are listed in Section 2.8 of this document.

Following lessons learned from a separate Shell decommissioning project, the NORM potential assessment for Goldeneye was revisited. In conjunction with Shell’s Radioactive Waste Advisor, it was confirmed that there had been no history of NORM on the Goldeneye facilities and that the residual risk of NORM contamination was low. Nevertheless, additional checks were completed during the offshore campaign and prior to the transboundary shipment. During this additional testing, no NORM was found.

The jacket and topsides were then transported to and loaded-in at the AF Offshore Decom’s Environmental Base in Vats, Norway. The topsides and jacket were dismantled at the yard, with the resulting waste being re-used, recycled and disposed of as detailed in Section 5 of this report.



### 2.3 Well P&A

| Table 2.3: Well Decommissioning |                             |   |                  |
|---------------------------------|-----------------------------|---|------------------|
| Well                            | Designation                 | Status (& Date of Abandonment)                          | Category of Well |
| GYA01 (14/29a-A3)               | Gas / condensate production | Permanently plugged and made safe (AB3 status), Q4 2018 | PL 4-3-3         |
| GYA02 (14/29a-AGY4Z)            | Gas / condensate production | Permanently plugged and made safe (AB3 status), Q4 2018 | PL 4-3-3         |
| GYA03 (14/29a-A5)               | Gas / condensate production | Permanently plugged and made safe (AB3 status), Q4 2018 | PL 4-3-3         |
| GYA04 (14/29a-A1)               | Gas / condensate production | Permanently plugged and made safe (AB3 status), Q4 2018 | PL 4-3-3         |
| GYA05 (14/29a-A2)               | Gas / condensate production | Permanently plugged and made safe (AB3 status), Q4 2018 | PL 4-3-3         |

### 2.4 Subsea Installations and Stabilisation Features

| Table 2.4: Subsea Installations and Stabilisation Features   |                           |                      |  |
|--|---------------------------|----------------------|--|
| Description  | Planned Status (Quantity) | Removals This Period | Total Removal To Date (Actual) + Date of Removal |
| N/A. The pipeline structure and associated stabilisation features are recorded in the pipeline sections. |                           |                      |  |



## 2.5 Pipelines/Umbilicals/Jumpers – Status, Survey History and Survey Regime

| Table 2.5: Pipelines, Umbilicals, Jumpers – Status, Survey History and Survey Regime |                       |                       |  |                              |   |
|--|-----------------------|-----------------------|--|------------------------------|---|
| PL/PLU Number  | Currently Operational | Date taken out of use | Outcome  | Proposed date of next survey | Survey period justification   |
| PL1978<br>(idents 1 to 9)  | No                    | 29/05/2013            | All sections of PL1978 associated with DP Part 1 have been recovered to shore for recycling / disposal | None                         | All sections of PL1978, PL1979 and PLU4858 associated with DP Part 1 have been fully removed and seabed clearance verified through overtrawl. No infrastructure associated with DP Part 1 has been decommissioned in situ and therefore no future survey is required.<br><br>Please note that the to-shore sections of PL1978 and PL1979 remain in place and are subject to DP Part 2, which will be submitted at a later date. These remaining sections of PL1978 and PL1979 will be surveyed in accordance with the Interim Pipeline Regime agreement with OPRED. |
| PL1979<br>(idents 2 and 3)   | No                    | 29/05/2013            | All sections of PL1979 associated with DP Part 1 have been recovered to shore for recycling / disposal | None                         |   |
| PLU4858  | No                    | 05/11/2018            | All sections of PLU4858 have been recovered to shore for recycling / disposal                          | None                         |   |





## 2.6 Pipelines, Umbilicals and Jumpers

| Table 2.6: Pipelines, Umbilicals, Jumpers and Stabilisation Features |                               |                       |   |  |
|--|-------------------------------|-----------------------|---|--|
| PL Number  | Description                   | Agreed Decom Solution | Removals this Period  | Current Status   |
| PL1978<br>(idents 1 to 6)  | 20" gas export pipeline riser | Full removal          | Riser section removed to shore with jacket<br>Removed Sept 2021   | Removed  |
| PL1978<br>(idents 7 to 9)  | 20" gas export pipeline       | Full removal          | Fully removed in June 2022  | Removed  |
| PL1979<br>(ident 2)  | 4" MEG pipeline               | Full removal          | Fully removed in June 2022  | Removed  |
| PL1979<br>(ident 3)  | 4" MEG pipeline risers        | Full removal          | Riser section removed to shore with jacket<br>Removed Sept 2021   | Removed  |
| PLU4858  | SSIV umbilical hoses          | Full removal          | Riser sections removed to shore with jacket in Sept 2021<br>Fully removed in June 2022  | Removed  |
|  | Concrete mattresses           | Full removal          | Fully removed in May 2022<br>A total of 58 mattresses were recovered, including 8 which supported the crossing of PLU2033 – the Atlantic Umbilical that is outwith the scope of the Goldeneye DPs | Removed  |
|  | Grout bags                    | Full removal          | Fully removed in May 2022   | Removed<br>(2253)  |
|  | Gas Export SSIV Manifold      | Full removal          | Fully removed in March 2022   | Removed<br>Piles were cut at 3.35m (Pile A2) and 3.40m (Piles A1, B1 and B2) below mean seabed and removed |



## 2.7 Key Milestones

Table 2.7: Key Milestones

### Goldeneye Pipeline Intelligent Pig campaign

- 20<sup>th</sup> May 2021 to 5<sup>th</sup> June 2021
- Including disconnection of PL1978 tie-in spools

### Goldeneye Topsides and Jacket removal campaign

- 7<sup>th</sup> September 2021 – mobilisation to Thialf SSCV and arrival at Goldeneye Field; jacket lift preparatory scopes commenced
- 8<sup>th</sup> September 2021 – topsides lift preparatory scopes commenced
- 9<sup>th</sup> September 2021 – topsides lift executed
- 16<sup>th</sup> September 2021 – jacket lift executed and transit to Norway commenced
- 18<sup>th</sup> September 2021 – arrival at AF Offshore Decom yard, Vats, Norway; title transfer to dismantling yard executed
- 21<sup>st</sup> September 2021 – dismantling commenced at AF Offshore Decom yard, Vats, Norway.
- 31<sup>st</sup> March 2022 – completion of dismantling at AF Offshore Decom yard, Vats, Norway.
- July 2023 - Repatriation of ionising smoke detectors, being the final waste fraction to be dispatched from AFOD's facility.
  - The disposal of the ionising smoke detectors removed from the Goldeneye facility was delayed, due to uncertainty in the regulatory approval process for repatriation. Per Table 1.7, the smoke detectors were repatriated under the Transfrontier Shipment of Radioactive Waste and Spent Fuel Regulations 2019.
  - Note that repatriation has been completed from AFOD to ASCO, where the smoke detectors were held and combined with stock from other facilities until sufficient numbers had been received to justify the final combined shipment to the recycling / disposal facility at ACB. The shipment to ACB took place 11<sup>th</sup> October 2023.

### Goldeneye subsea infrastructure

- 15<sup>th</sup> and 16<sup>th</sup> February 2022 – Completion of as-found survey
- 15<sup>th</sup> – 19<sup>th</sup> and 24<sup>th</sup> – 27<sup>th</sup> March 2022 – Goldeneye SSIV Manifold Structure Recovery
- 8<sup>th</sup> May and 14<sup>th</sup> – 15<sup>th</sup> May 2022 – Recovery of mattresses associated with Goldeneye Pipelines PL1978 and PL1978, Goldeneye Umbilical PLU4858 and the Atlantic Umbilical PLU2033 adjacent to Goldeneye
- 17<sup>th</sup> – 25<sup>th</sup> May and 4<sup>th</sup> – 6<sup>th</sup> June 2022 – Cutting and recovery of surface-laid sections of PL1978, PL1979 and PLU4858, including installation of blind flange and protection frame to sections of PL1978 and PL1979 that will remain in situ pending DP Part 2.
- 1<sup>st</sup> – 2<sup>nd</sup> July 2022 and 18<sup>th</sup> – 19<sup>th</sup> August 2022, Debris recovery
- 29<sup>th</sup> June 2022 and 3<sup>rd</sup> July 2022 – Rock installation
- 11<sup>th</sup> – 31<sup>st</sup> August 2022 – Post-decommissioning environmental survey (Gardline). Reference Section 3
- 6<sup>th</sup> – 11<sup>th</sup> September 2022 – Overtrawl survey of Goldeneye 500m exclusion zone
- Onshore recycling and disposal of the Goldeneye subsea infrastructure took place throughout 2022, with the final consignment of steel debris received 12<sup>th</sup> September 2022



## 2.8 Stakeholder Engagement

**Table 2.8: Stakeholder Engagement**

Stakeholder engagement was conducted with statutory consultees during the approval process for the Decommissioning Programmes. Ongoing stakeholder engagement is performed through Shell UK's regular engagements with relevant stakeholders such as the NSTA, the HSE and the Scottish Fishermen's Federation.



### 3 IMPACT ON ENVIRONMENT

All discharges during offshore operations were covered by environmental permits with no unplanned discharges (see Section 1.4).

During dismantlement of the Goldeneye topsides and jacket at AF Decommissioning Yard, the following discharge exceeded the limits of the yard's permits:

- Suspended solids (SS) – Failing turbidity meter
  - Suspended solids were above permitted concentration limits during 3 weeks in Sept / Oct 2021, due to a failing turbidity meter which was replaced with a new metering solution. The metering failure may have been caused by water from the buffer tank that had been subject to insufficient treatment prior to discharge when not being returned for the required additional purification.

Between 11<sup>th</sup> and 31<sup>st</sup> August 2022, Gardline Limited conducted a post-decommissioning survey on behalf of Shell UK Limited at the removed Goldeneye Platform location. The survey included a habitat assessment and an environmental baseline survey. A total of nineteen co-located camera and sediment sample stations were investigated across the survey area – all stations were co-located with the previous baseline sampling locations. A summary of the survey is provided below. Report reference GDP-SHELL-E-HE-0702-00001, Rev1.

The stations were successfully investigated using a digital shallow water camera system and sediment sampling was undertaken using a 0.1m<sup>2</sup> Day grab. Water depths ranged from 115m lowest astronomical tide (LAT) to 125m LAT. The seabed at the removed Goldeneye platform had an average gradient of less than 0.5° which deepened towards the north to northeast, with an elevation change of 4.4m.

Seabed imagery revealed that visible fauna was typically sparse across the survey area and characterised by burrows, Actinopterygii and Animalia tubes. Three species of sea pens (*Pennatula phosphorea*, *Funicilina quadrangularis* and *Virgularia*) were identified at sixteen stations, whilst burrows were observed at all stations. Burrow densities were classified within a range that encompassed 'frequent' on the SACFOR classification scale; therefore, the survey area showed some similarity to the 'sea pen and burrowing megafauna communities' habitat as defined by OSPAR (2008) and the Scottish priority marine features 'burrowed mud' habitat. Nineteen individuals of whiting (*Merlangius merlangus*) were recorded in the imagery across four stations. This species is listed on the Scottish Biodiversity List and as a mobile species PMF in Scottish offshore waters. However, it is listed as least concern on the IUCN Red List.

The particle size analysis results classified all stations as poorly sorted very fine sand under Wentworth and presented a relatively homogenous muddy sand sediment. Two stations presented a sandy mud sediment according to the modified Folk classification. Across the survey area the mean particle diameter varied between 35µm and 62µm. The sediment composition was consistent with the previous survey, which was classified as poorly sorted silty sand. Sand (≥63µm and <2mm) was the dominant fraction across all stations. Concentrations of total organic matter (TOM) varied between 4.3% and 6.8%, and were higher than the previous comparison survey. Concentrations of total organic carbon (TOC) varied from 0.43% and 0.77%, and were slightly lower than recorded in the comparison survey.

Total hydrocarbon (THC) concentrations ranged from 7.08µg g<sup>-1</sup> to 11.92µg g<sup>-1</sup>. Concentrations of THC were above those ranges recorded in the previous survey and ten stations recorded concentrations higher than the UKOOA mean. However, all THC concentrations were below the UKOOA Central North Sea 95<sup>th</sup> percentile value at all stations and could be considered consistent with background concentrations for the wider area. Whilst concentrations of THC at some stations may impact on populations of some specific sensitive species, concentrations were generally below thresholds expected to impact on fauna communities. Gas chromatography traces and the prevalence of higher molecular



weight (HMW) odd-numbered n-alkanes indicated terrestrial plant sources and the residue of highly weathered and biodegraded petrogenic material including natural seeps, shipping discharge and oil and gas exploration and extraction.

The polycyclic aromatic hydrocarbons (PAH) concentrations ranged between  $0.147\mu\text{g g}^{-1}$  and  $0.723\mu\text{g g}^{-1}$ . Calculated NPD/4-6 ring PAH ratios were  $<1$  at all stations, suggesting predominantly pyrogenic PAHs, which is further evidenced by the dominance of parent PAH alkyl homologues. Once normalised to 2.5% TOC, several US EPA 16 PAHs were recorded above background concentration (BC) values at all stations. When comparing average concentrations for the entire survey area against the background assessment criteria (BAC) values, all PAH concentrations were below their respective BAC value. Total, low molecular weight and HMW PAH concentrations were well below their respective effects range low values and apparent effects threshold indicating that toxic effects to fauna by PAHs would be extremely unlikely.

Barium (Ba) concentrations by nitric acid digest ranged between  $34\mu\text{g g}^{-1}$  to  $340\mu\text{g g}^{-1}$ , with a mean of  $83\mu\text{g g}^{-1}$  ( $\pm 77$  SD). Concentrations of Ba were notably higher at four stations than those recorded at the remaining stations; however, all stations were below the UKOOA (2001) mean ( $348.48\mu\text{g g}^{-1}$ ) for the CNS. All stations had Ba concentrations significantly lower than  $2000\mu\text{g g}^{-1}$ , suggesting they are unlikely to be contaminated by drill cuttings. Overall, Ba concentrations can be considered typical of the background for sediments in close proximity to historic oil and gas exploration in the wider area. Of the remaining metals, lithium was below limit of detection (LOD) at the majority of stations whilst mercury (Hg) was below LOD at seven stations. Concentrations of arsenic, cadmium, copper, nickel, lead and zinc exceeded the OSPAR (2005) BC levels at all stations. Furthermore, Hg had concentrations above its respective BC value at all stations where concentrations were above LOD. Concentrations of vanadium were above OSPAR (2005) BRC values at all stations. In contrast, all metal concentrations were below their respective ERL and AET values, where data were available. This revealed that toxicological impacts to biota associated with metal concentrations were therefore unlikely to occur.

The macrofaunal community was characterised by a dominance of polychaete species accounting for 61% of sampled individuals and 42% of sampled taxa. There were two juvenile taxa (Echinoidea and Spatangoida) amongst the most dominant taxa in the survey. Large juvenile populations are often ephemeral; therefore, analysis was conducted on both with and without the inclusion of juveniles. A total of 394 juvenile individuals of *Arctica islandica* were identified across the survey area. The ocean quahog, *A. islandica*, is a species of conservation importance on the OSPAR (2008) list of threatened and/or declining species and is listed as a PMF in Scottish offshore waters due to its low or limited mobility. Despite being listed as a species on conservation importance, *A. islandica* is a common species found within this area of the North Sea. The dominance of polychaetes was consistent with the previous survey. Multivariate analysis of the adult only and the full data set both revealed that overall, the macrofaunal community across the survey area was more similar than dissimilar and the variations observed between stations were most likely due to the natural fluctuations in the physical sediment characteristics and the physico-chemical factors related to the historic use for oil and gas exploration.

With the consideration of the PSA, imagery and macrofaunal results, classification of EUNIS level 5 biotopes was attempted for all stations using a bottom-up approach based on the characterising infaunal community identified at each station, however due to an imperfect fit of macrofauna data with available information at all stations, a level 5 EUNIS classification was not established. A top-down approach was therefore used and subsequently led to a level 4 EUNIS classification MD521 (Faunal communities in Atlantic offshore Circalittoral Sand) at two stations, and a level 4 EUNIS classification MD621 (Faunal communities in Atlantic Offshore Circalittoral Mud) for one station.

Overall, this survey concluded that hydrocarbon concentrations were considered background, consistent with conclusions from the previous report. Hydrocarbon concentrations recorded within this survey were generally below thresholds expected to impact faunal communities. Metal concentrations recorded within this survey were above OSPAR (2005) concentrations, but lower than within the previous survey,



consistent with the wider region and below thresholds for toxicological impact to biota. There was no evidence within this survey to indicate point-source contamination of hydrocarbons or metals. Macrofaunal analyses conducted indicates a community which is more diverse and less dominated than the community recorded in the previous survey. This could be interpreted as a macrofaunal community that is in the process of recovery.

**Table 3.1: Future Surveys and Monitoring Proposals**

| Table 3.1: Future Surveys and Monitoring Proposals   |
|--|
| <b>1. Substructures (Jackets)</b>  |
| The Goldeneye jacket has been removed in its entirety, therefore no future surveys or monitoring are required  |
| <b>2. Pipelines, Flowlines &amp; Umbilicals</b>  |
| The pipelines and umbilicals associated with Goldeneye DP Part 1 have been removed in their entirety, therefore no future surveys or monitoring are required   |
| Note: the remaining sections of PL1978 and PL1979 are subject to DP Part 2 which will be submitted at a future date. The to-shore sections of both pipelines remain in situ and are subject to ongoing surveys in line with the Interim Pipeline Regime  |
| <b>3. Pipeline Stabilisation Features</b>  |
| The pipelines stabilisation features associated with Goldeneye DP Part 1 have been removed in their entirety, therefore no future surveys or monitoring are required   |
| Note: the remaining sections of PL1978 and PL1979, including the associated stabilisation features, are subject to DP Part 2 which will be submitted at a future date. The to-shore sections of both pipelines, including associated stabilisation features, remain in situ and are subject to ongoing surveys in line with the Interim Pipeline Regime  |
| <b>4. Drill Cuttings</b>   |
| Any oil-based muds (OBM) associated with Goldeneye used in drilling the wells were contained and shipped back to shore at the time. Hence nothing is present that would constitute an oil-based mud cuttings piles within the definition in OSPAR Recommendation 2006/5. No future surveys are required.   |
| <b>5. Environmental Surveys</b>  |
| The post-decommissioning environmental survey provided results for hydrocarbons and metal concentrations that were considered background and consistent with conclusions from the previous report and wider area. Macrofaunal analyses conducted indicates a community which is more diverse and less dominated than the community recorded in the previous survey. This could be interpreted as a macrofaunal community that is in the process of recovery. |
| Nothing within the post-decommissioning survey indicates contamination levels or ecological effects that would justify any further monitoring surveys.   |
| Therefore, it is Shell's proposal that no further environmental surveys are required to support Goldeneye DP Part 1. Note that DP Part 2 will identify any survey requirements associated with the remaining pipeline sections.  |



## 4 IMPACT ON HSE

### 4.1 HSE Performance

Working in close collaboration with Heerema Marine Contractor (HMC) and DeepOcean independently, Shell's ambition of Goal Zero: No Harm, No Leaks, was realised for the offshore scopes. Both the subsea infrastructure decommissioning (DeepOcean) and offshore removals scopes (HMC) were executed with zero incidents.

During onshore dismantling there were two minor incidents at AF Offshore Decom's Environmental Base. One incident where minor damage was caused to a company vehicle by a mobile elevated work platform (MEWP) whilst manoeuvring and the other, a swollen ankle resulting from a piece of pipe impacting an individual's foot. The injured party (IP) was cutting up pieces of steel within the scrap area when a wheel loader entered the area to collect steel pipes. The wheel loader operator had not seen a smaller pipe which was underneath the pile and the IP had not heard the wheel loader approaching. As the wheel loader picked up the load, the smaller pipe underneath was pressed against the IP's left ankle and the piece of steel the IP was cutting.

### 4.2 Technical Safety

In terms of major accident hazards (MAHs), associated safety critical elements (SCEs), and performance standards (PSs), the transition from an offshore installation in production mode through CoP, dismantlement and eventually post-dismantlement required revisions of the platform Safety Case to ensure that the document reflected changing installation status. With the exception of the main transition from an Operational Safety Case to the Dismantlement Safety Case, most of the revisions did not require submission to the UK HSE because they did not constitute a 'Material Change', as defined in the Offshore Safety Case Regulations. In terms of MAHs, the significant change during the transition from production to dismantlement was the elimination of the gross hydrocarbon inventory, which represents about 50% of the MAH profile on a production installation.

### 4.3 Offshore Removals Scope

Shell, HMC and AFOD came together in November 2020 to develop a joint Safety Charter. This charter featured heavily in the HSSE induction process for the heavy lift vessel and the disposal yard. The HSSE induction process covered Behavioural Safety, Shell and HMC/AFOD standards, legislation and safety case requirements, details of the scope and associated hazards and control measures.

Emergency Bridging and Information Manuals were developed and in place for the execution of the work offshore. A desktop training exercise was facilitated by a member of Shell's Crisis Management Team prior to mobilisation to test the effectiveness of the emergency response arrangements. The scenario considered was a COVID outbreak onboard the heavy lift vessel.

A series of HAZID workshops were held between Shell, HMC and AFOD for the offshore removals scope, load-in at the disposal yard and onshore dismantling. Closeout of HAZID actions formed part of the overall Statement of Fitness and execution readiness processes for the project.

Although Shell had previous experience from removing the Brent structures, removing a topsides and jacket structure, particularly during a pandemic, was a novel operation. In line with Shell procedure, an 'Activity HSE Review Panel' or 'ASRP' was held with members of Senior Management to test that the project had undertaken sufficient assurance and that appropriate controls and mitigations were in place.

In preparation for execution, Shell also led what was called an 'Exceptional Circumstances Hazard Identification Risk Assessment (HIRA)', presenting 'what if' challenges in the event of serious incidents or



identified projects risks being realised. Examples that were considered included positive COVID case during initial mandatory quarantine period, COVID outbreak onboard the vessel, a significant Environmental incident, flooded structural members in the jacket structure or other structural defects and extreme weather resulting in an extended campaign.

Once offshore, Shell and HMC visited the worksites together performing regular HSSE assurance at the worksite utilising HMC's safety management system.

#### **4.4 Subsea Infrastructure Decommissioning**

The subsea removals contractor developed Task Plans for all removals scopes – each of which were reviewed and approved by Shell. These Task Plans were further subjected to HIRAs where all stakeholders had the opportunity to consider the hazards and risk mitigation measures associated with the workscope. Any gaps identified were closed prior to the work being undertaken and confirmed by pre-mobilisation Readiness Reviews.

Emergency Response Bridging Documents and Emergency Response Notification Charts were developed for each workscope.

Throughout execution, Shell attended Morning Calls and reviewed daily reports from the vessel, to ensure that correct standards were being maintained throughout the execution of the scope. Shell deployed Offshore Representatives onboard each execution vessel to ensure that operations were performed to the correct standard. Any material changes to scope were reviewed and assured through the approved Management of Change Process.

#### **4.5 Onshore Scope**

Prior to delivery of the topsides and jacket to AFOD's Environmental Base at Vats in Norway, a HAZID identification workshop was held between Shell UK, HMC and AFOD for the load-in and dismantling scopes.

On delivery of the structures to the yard, representatives onboard the Thialf from both Shell UK and HMC participated in a Start Strong presentation hosted by AFOD.

Due to COVID related quarantine requirements in Norway it was difficult for the UK based Shell team to visit the site once dismantling had commenced. During this time, Shell UK utilised an in-country HSSE Consultancy, NorthQ, as well as colleagues from A/S NORSKE Shell to conduct regular HSSE assurance on site. Once in-country travel restrictions relaxed, Shell UK and HMC also started to visit the site regularly. Due to the size of Asset nearly all the dismantling was carried out by an excavator with a large shear, which removes personnel from harm.





## 5 MATERIALS/WASTE RETURNED TO SHORE

All material returned to shore was consigned to permitted waste facilities that had been subjected to Duty of Care audits in accordance with Shell's Waste Control Framework. Waste Management Plans were maintained and all waste tracked to its final recycling / disposal destination.

For installations, 5128 tonnes of waste was returned to shore, with 94.9% of this waste being re-used, recycled or used for energy recovery. The remaining 5.1% was hazardous waste and consigned to landfill. Cross-checking the waste records against the as-weighed-in values from the heavy lift vessel, the totals are within 0.16% of the delivered manifest – confirming that all waste has been accounted for.

For pipelines, 653.3 tonnes of waste was returned to shore, with 99.47% of this waste being recycled and the remaining 0.53% being consigned to landfill.

A summary of the waste types and volumes, and their respective end states, is provided in Table 5.1. It should be noted that the masses provided in the approved DPs were estimates, whereas the volumes returned to shore are as-weighed. Per Table 2.8, seabed clearance verification has been completed to confirm that no material remains in situ on the seabed. Shell's estimating methodology will be updated for future decommissioning scopes to reflect the discrepancy between estimated and actual weights recovered.

The largest discrepancies between the estimate contained in the approved DPs and the actual recovered weights are:

- The approved DPs contained as estimate of 4742 tonnes of carbon steel to be recovered from the topsides, jacket and conductors. 3980 tonnes were actually recovered. Approximately 250 tonnes of this difference is attributed to steel which was contaminated with heavy metals (paint etc) and could not be recycled – therefore it has been consigned as Hazardous Waste. This, in turn, has caused the increase of “Haz Mat / NORM” from the 2 tonne estimate within the approved DPs.
- The approved DPs also contained an estimate of 608 tonnes of “other non-hazardous” associated with the installations, including an estimate of 528 tonnes of marine growth adhered to the Goldeneye jacket. On return to shore, only 98.8 tonnes of marine growth were found on the jacket – resulting in the discrepancy indicated in Table 5.1.



| Table 5.1: Materials/Waste Returned to Shore |                           |                            |                               |                                  |   |
|--|---------------------------|----------------------------|-------------------------------|----------------------------------|---|
| Material/Waste                               | Original DP Estimate (Te) | As-Built Total Weight (Te) | Tonnage In situ Estimate (Te) | Tonnage to shore As-weighed (Te) | Disposal Method   |
| <b>Installations</b>                         |                           |                            |                               |                                  |   |
| Carbon Steel                                 | 8745                      | 7983                       | 4003<br>See note 1            | 3980                             | <b>269Te re-used at AF</b><br><b>3304Te recycled</b><br>Norscrap Karmøy<br>Stena Recycling<br>Celsa Armeringsstål<br><b>407Te recycled following PUI campaign</b><br>John Lawrie Metals Ltd |
| Stainless Steel                              | 141                       | 120                        | -                             | 120                              | <b>Recycled</b><br>Stena Recycling<br>Norscrap Karmøy   |
| Non-ferrous metals                           | 113                       | 64                         | -                             | 64                               | <b>Recycled</b><br>Stena Recycling<br>Norscrap Karmøy   |
| Concrete                                     | 123                       | 134                        | -                             | 134                              | <b>Re-use</b><br>HIM IKS  |
| Plastics                                     | 30                        | 0                          | -                             | 0                                | The plastics were included within the non-hazardous material for energy recovery  |



| Table 5.1: Materials/Waste Returned to Shore |                           |                            |                               |                                  |  |
|--|---------------------------|----------------------------|-------------------------------|----------------------------------|--|
| Material/Waste                               | Original DP Estimate (Te) | As-Built Total Weight (Te) | Tonnage In situ Estimate (Te) | Tonnage to shore As-weighed (Te) | Disposal Method  |
| Haz Mat / NORM                               | 2                         | 267                        | -                             | 267                              | <p><b>3.3Te recycled</b><br/>Norsk Spesialolje<br/>Stena Recycling<br/>Batteriretur</p> <p><b>1.6Te Energy recovery</b><br/>HIM IKS<br/>Ragn-Sells<br/>Tankrenovasjon</p> <p><b>262Te landfill</b><br/>SIM Næring<br/>HIM IKS<br/>Norscrap Narmøy<br/>Celsa Armeringsstål<br/>Ionising smoke detectors consigned to ACB via ASCO Ltd</p> |
| Other Non-Hazardous                          | 608                       | 148                        | -                             | 148                              | <p><b>5.4Te Re-use</b><br/><b>133.6Te Recycling</b><br/><b>9.1Te Energy Recovery</b><br/>All options at:<br/>Nippon Gases<br/>Lifeboat Import<br/>Amsterdam<br/>Stena Recycling<br/>Norscrap Karmøy<br/>Reve Kompost<br/>Norsk Spesialolje<br/>HIM IKS<br/>Ølen Apotek</p>   |
| <b>Pipelines</b>                             |                           |                            |                               |                                  |  |
| Carbon Steel                                 | 160                       | 221.5                      | 0                             | 221.5                            | <b>Recycled</b><br>John Lawrie Metals  |
| Stainless Steel                              | 0                         |                            | -                             | -                                |  |
| Non-ferrous metals                           | 1                         | 1                          | 0                             | 1                                | <b>Recycled</b><br>John Lawrie Metals  |



| Table 5.1: Materials/Waste Returned to Shore |                           |                            |                               |                                  |   |
|--|---------------------------|----------------------------|-------------------------------|----------------------------------|---|
| Material/Waste                               | Original DP Estimate (Te) | As-Built Total Weight (Te) | Tonnage In situ Estimate (Te) | Tonnage to shore As-weighed (Te) | Disposal Method   |
| Concrete                                     | 368                       | 427.8                      | 0                             | 427.8                            | <b>Recycled</b><br>Concrete – Nicol Of Skene<br>Grout – A&M Smith                             |
| Plastics                                     | 5                         | 3.4                        | 0                             | 3.4                              | <b>Landfill</b><br>Cables and General Waste - Taylors Industrial Services<br>Rope – A&M Smith |
| Haz mat / NORM                               | 0                         |                            | -                             | -                                |   |
| Other Non-Hazardous                          | 7                         | 0.5                        | 0                             | 0.5                              | <b>Recycling</b><br>(Concrete separated from pipe spools at John Lawrie)                      |
| <b>Total</b>                                 | <b>10303</b>              | <b>9370.2</b>              | <b>4003</b>                   | <b>5367.2</b>                    |   |

**Note 1** – the tonnage *in situ* for Installations refers to the conductor and pile sections below the cut lines that have been decommissioned *in situ*.



## 6 LESSONS LEARNED

Following the completion of the heavy lift campaign to remove the Goldeneye topsides and jacket, Shell completed two Lessons Learned sessions – aimed at capturing lessons from the onshore preparation scope and offshore execution phase.

Some of the key learnings identified in these sessions are summarised below.

### Learnings to be replicated

- The tooling used during cutting of the platform jacket piles utilised pressure monitoring to positively verify the completion of the cuts from topsides.
- The project conducted a Permits and Consents Familiarisation session with both the Contractor and major Subcontractor. The session outlined Company's permit obligations, including the transfrontier shipment of waste, and identified where support / interface was required with other parties. This was hugely beneficial in obtaining timely information and ensuring all parties were aware of the project's regulatory commitments.
- The project carried out an Exceptional Circumstances Hazard Identification Risk Assessment (HIRA), presenting 'what if' challenges in the event of serious incidents or identified projects risks being realised. This was considered to be a success and very valuable exercise to repeat.

### Areas for improvement

- Hazard Identification sessions (HAZIDs) should explicitly include arrangements for mobilisation and demobilisation – particularly regarding the potential use of vessel-to-vessel transfers or utilisation of man-riding baskets.
- Timing of the requirement for the Norwegian radiation regulator, DSA, to endorse the transfrontier shipment of waste application in addition to the Norwegian Competent Authority for Basel Convention applications, the NEA.
- Timing of identification of ceramic fibres (fire protection) – increased awareness of the risk of ceramic fibres is required, particularly for any waste shipments to Norway. Preparation of hazardous waste inventories should explicitly investigate the potential for ceramic fibres (passive fire protection, insulation, etc) onboard.
- Building on the success of the Permits and Consents Familiarisation session, it would be beneficial to hold similar sessions with Contractors and key Subcontractors to share awareness of the roles and responsibilities of the Duty Holder during dismantlement scopes.

Following final completion of the onshore dismantling scope, a further Lessons Learned session was held in September 2023 with Shell, Heerema Marine Contractors and AF Decommissioning in attendance. The primary area for improvement, in addition to those identified above, concerned the repatriation of ionising smoke detectors.

Ionising smoke detectors contain a very small radioactive source and were required to be repatriated to the UK for disposal as UK-origin radioactive waste. 31 Am-121 ionising smoke detectors were removed from the Goldeneye Platform and, as of 31<sup>st</sup> August 2022, were left as the only remaining waste from the dismantlement of the topsides and jacket (net weight 4kg). The regulations to repatriate this waste were unclear, with at-times contradictory advice received from the Norwegian and Scottish authorities.

Consent for repatriation was eventually received on 6<sup>th</sup> July 2023, under the Transfrontier Shipment of Radioactive Waste and Spent Fuel (EU Exit) Regulations 2019. The delay in repatriating this small waste fraction postponed the close out of the Goldeneye topsides and jacket dismantlement contract by almost a year.



---

## 7 COST

Provided to OPRED separately.

## 8 PHOTOGRAPHS

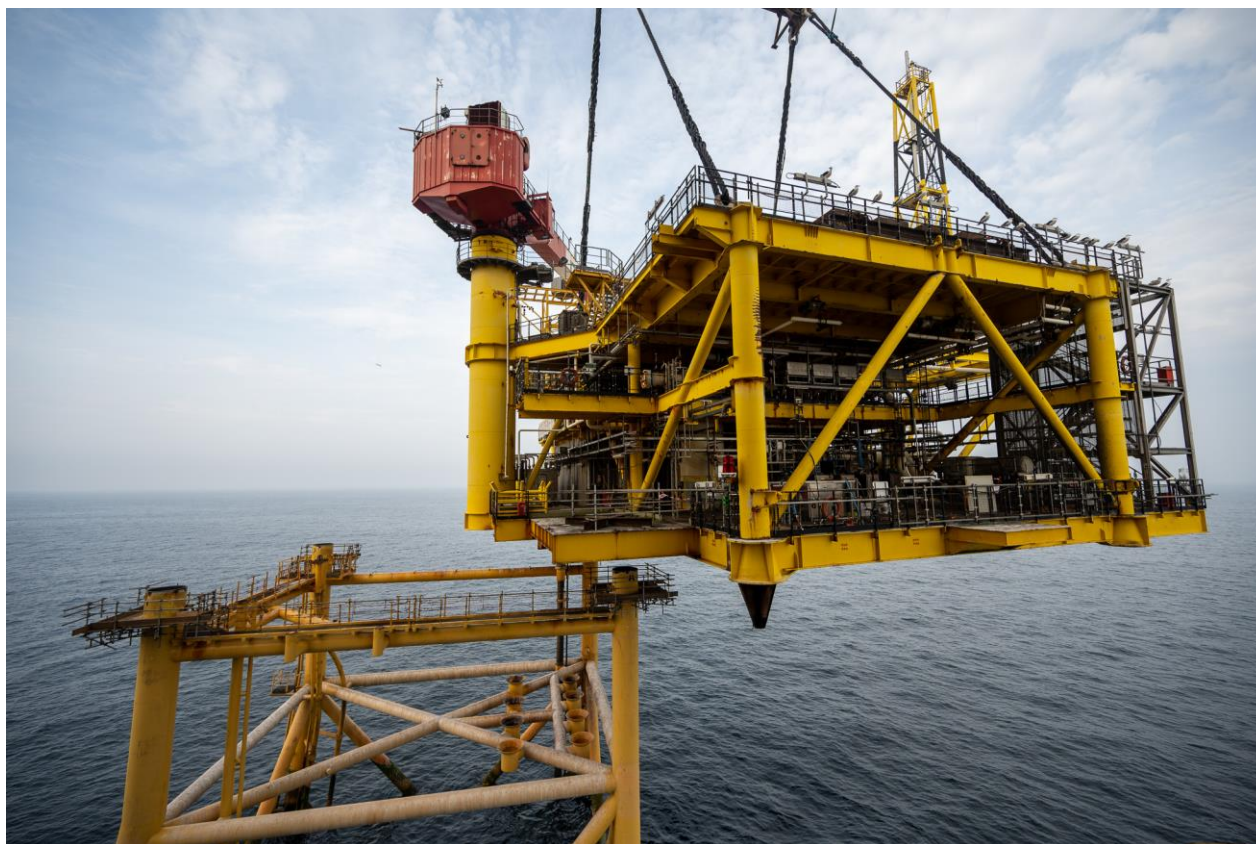


Figure 8.1: Goldeneye Facility





**Figure 8.2: Thialf SSCV preparing to lift Goldeneye topsides**



**Figure 8.3: Goldeneye topsides lifted clear of jacket**



**Figure 8.4: Removing continuity bolt during SSIV recovery**





Figure 8.5: Goldeneye SSIV offload at quay



Figure 8.6: Ionising smoke detectors awaiting repatriation



## 9 APPENDIX 1 – SEABED CLEARANCE CERTIFICATE



SFF Services Limited  
24 Rubislaw Terrace  
Aberdeen, AB10 1XE  
Scotland UK

T: +44 (0) 1224 646966  
F: +44 (0) 1224 647078  
E: [sff.services@sff.co.uk](mailto:sff.services@sff.co.uk)

[www.sffservices.co.uk](http://www.sffservices.co.uk)

Date: 12/09/2022

### DEEPOCEAN/SHELL: GOLDENEYE POST DECOMMISSIONING CLEARANCE / VERIFICATION TRAWL SWEEPS

This is to certify that the MV “Leanne” PD345 has carried out a post decommissioning seabed / trawl verification sweep of the Goldeneye 500 metre safety zone, not including the section marked on the attached schematic drawing (Appendix 1). The Beryl Alpha to St Fergus pipeline crossing the northern section of the 500m safety zone was not over-trawled during these operations. A 200 metre buffer zone was put in place to ensure the trawl gear did not approach this pipeline or the nearby Miller pipeline.

Using best endeavours and practice available, no oilfield related obstructions were encountered that will affect current and future fishing activity in the defined area. To the best of our knowledge the swept areas have been successfully cleared of all equipment / infrastructure are considered safe to allow normal fishing operations to proceed.

Signed for on behalf of the Owners of MV “Leanne” PD345

Robert Wilson, Skipper

Signed for on behalf of SFF Services Limited

Andrew Third, Industry Advisor

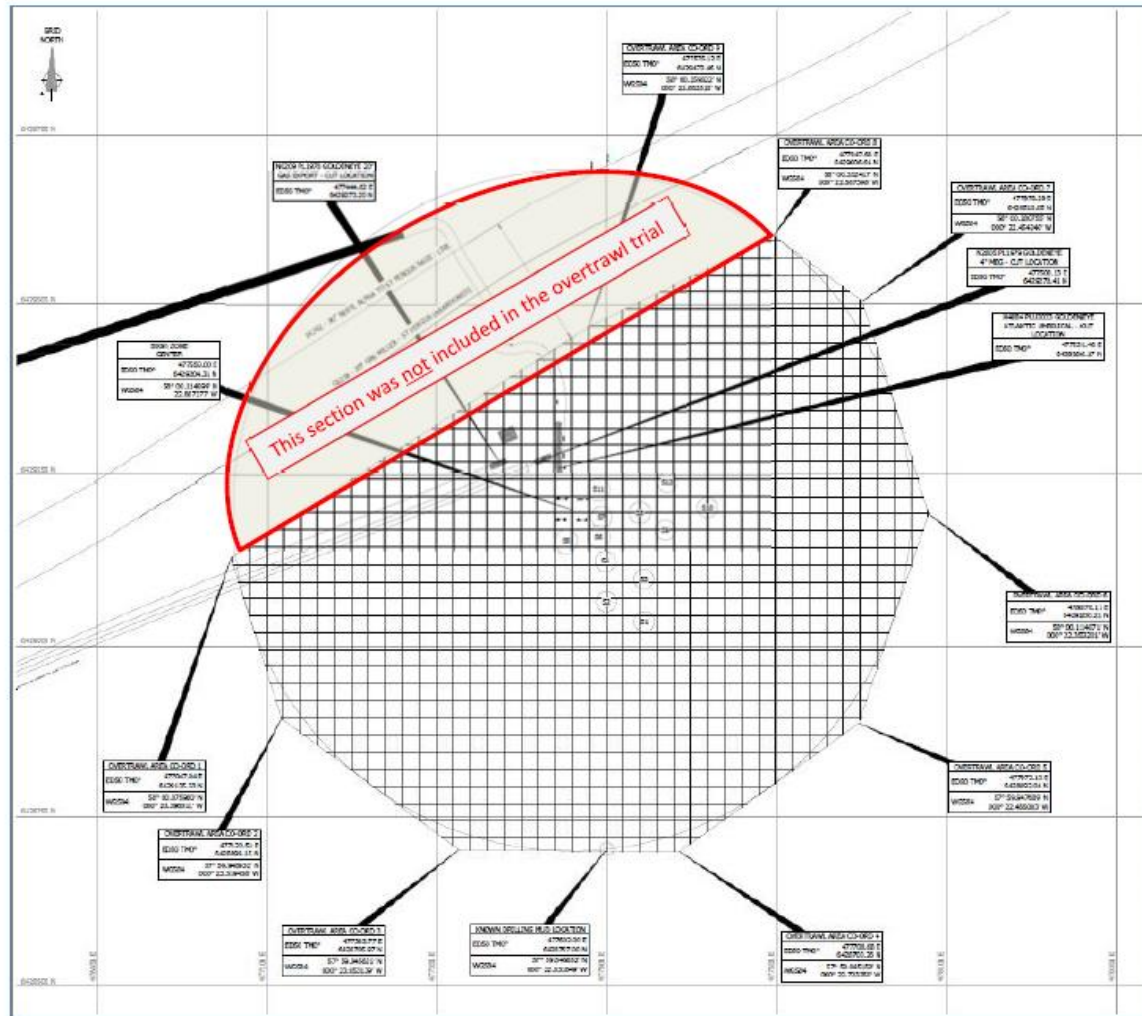
SFFSL-QU-T-5 Rev 9, Sep-21

A company wholly owned by the Scottish Fishermen’s Federation  
VAT Reg. No: 498 420 807  
Registered in Scotland Company No: SC 098563  
Registered Office: 24 Rubislaw Terrace Aberdeen, UK, AB10 1XE





APPENDIX 1



SFFSL-QU-T-5 Rev 9, Sep-21

A company wholly owned by the Scottish Fishermen's Federation  
 VAT Reg. No: 498 420 807  
 Registered in Scotland Company No: SC 098563  
 Registered Office: 24 Rubislaw Terrace Aberdeen, UK, AB10 1XE

