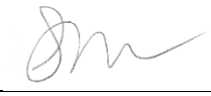
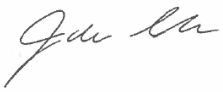
# PERENCO UK LIMITED
# Amethyst A1D, A2D, B1D & C1D Topsides Decommissioning Programme

Consultation Draft Version

**DOCUMENT CONTROL**

Approvals

| | Name | Signature | Date |
|---|---|---|---|
| Prepared by | Sophie Wood |  | 30/03/20 |
| Reviewed by | Julie Summerell |  | 30/03/20 |
| Approved by | Eric Baudon |  | 30/03/20 |

Revision Control

| Revision No | Reference | Changes / Comments | Issue Date |
|---|---|---|---|
| 1 | Draft V1 | First draft to OPRED | 17/12/19 |
| 2 | Draft V2 | Pre-consultation Draft | 17/02/20 |
| 3 | Draft V3 | Consultation Draft | 09/04/20 |
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|---|---|---|
| Offshore Decommissioning Unit | OPRED | 1 |

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## A. Table of Terms and Abbreviations

| Abbreviation | Explanation |
|---|---|
| Alpha Petroleum | Alpha Petroleum Resources Limited |
| AtoN | Aid to Navigation |
| B.O.S | Bottom of Steel |
| BP | Britoil Public Limited Company |
| CEFAS | Centre for Environment, Fisheries and Aquaculture Science |
| COP | Cessation of Production |
| CtL | Consent to Locate |
| DGT | Dimlington Gas Terminal |
| DP | Decommissioning Programme |
| E | East |
| EA | Environment Agency |
| EEGR | East of England Energy Group |
| EIA | Environmental Impact Assessment |
| EL | Elevation |
| EU | European Union |
| HAZMAT | Hazardous Materials |
| HCF | Hydrocarbon Free |
| HLV | Heavy Lift Vessel |
| HSE | Health and Safety Executive |
| JNCC | Joint Nature Conservation Committee |
| JUB | Jack-Up Barge |
| km | Kilometres |
| LAT | Lowest Astronomical Tide |
| LON | Longitude |
| LSA | Low Specific Activity |
| m | metre |
| $m^3$ | Cubic metre |
| MAT | Master Application Template |
| N | North |
| N/A | Not applicable |
| NFFO | National Federation of Fishermen's Organisations |

| Abbreviation | Explanation |
|---|---|
| NORM | Naturally Occurring Radioactive Material |
| NUI | Normally Unattended Installation |
| OD | Outer Diameter |
| OGA | Oil & Gas Authority |
| OGUK | Oil & Gas UK |
| OPRED | Offshore Petroleum Regulator for Environment & Decommissioning |
| OSPAR | Oslo and Paris Convention |
| P&A | Plug and Abandonment |
| PERENCO | Perenco (UK) Limited |
| PL | Pipeline |
| PLC | Public Limited Company |
| PDO | Potential Dropped Object |
| SAT | Subsidiary Application Template |
| SCAP | Supply Chain Action Plan |
| SLV | Sheer Leg Vessels |
| SNS | Southern North Sea |
| TBC | To be confirmed |
| Te | Tonne |
| TFSW | Transfrontier Shipment of Waste |
| UK | United Kingdom |
| UKCS | UK Continental Shelf |
| W2W | Walk to Work |

## B. List of Tables



## C. Table of Appendices

No appendices attached.

# 1.0 Executive Summary

## 1.1 Decommissioning Programme

This document is the Decommissioning Programme for the removal of the topsides of the Amethyst gas field installations A1D, A2D, B1D and C1D in the Southern North Sea (SNS).

In accordance with Regulation 14 of the Pipeline Safety Regulations 1996, Perenco UK Limited (Perenco) will notify the Health and Safety Executive (HSE) of the decommissioning of the pipelines and submit the required variations to the Pipeline Work Authorisations to carry out the flushing and disconnection activities.

Following public, stakeholder and regulatory consultation, this topsides removal decommissioning programme (Topsides DP) is submitted without derogation and in full compliance with OPRED guidelines. The Topsides DP explains the principles of the topsides removal activities.

## 1.2 Requirement for Decommissioning Programme

**Topsides:** In accordance with the Petroleum Act 1998, the section 29 notice holders of the Amethyst Installations (see Table 1.2) are applying to the Offshore Petroleum Regulator for Environment & Decommissioning (OPRED) to obtain approval for decommissioning the Amethyst platform topsides detailed in Section 2.1 of this programme.

In conjunction with public, stakeholder and regulatory consultation, this Topsides DP is submitted in compliance with national and international regulations and OPRED guidelines. The schedule outlined in this document is for the decommissioning of the Amethyst installations topsides, commencing in early 2020.

This Topsides DP will cover the decommissioning of the Amethyst platforms topsides, including HCF and pre-dismantlement works.

Subject to regulatory approval, a decommissioning jack-up barge (JUB) or a drilling rig jack-up will be used to plug and abandon (P&A) the platform wells, and make the platforms hydrocarbon free. The current plan is to use a decommissioning JUB to remove the topsides modules.

In this respect, disturbance of the seabed during removal of the topsides facilities will be limited to the deployment of the decommissioning JUB and / or drilling rig JUB on the seabed.

Perenco anticipates that the deposit of stabilisation material can be avoided with additional preloading of the JUB during the jacking down procedure.

The Amethyst platforms are not located within the boundary of any marine protected areas.

As the Topsides Decommissioning Programme will result in minimal environmental interactions (i.e. solely seabed disturbance and atmospheric emissions) from the JUB, Perenco plans to assess these impacts via an EIA Justification Document, which will be attached to the Consent to Locate (CTL) Supplementary Assessment Templates (SATs), under the existing Amethyst Production Master Application Templates (MATs).

Perenco will then undertake an EA to support the Decommissioning Programmes for the jacket removal and pipeline decommissioning activities.

**Jacket:** There will be a separate Decommissioning Programme for the decommissioning of the Amethyst installation jackets.

**Pipelines:** There will be a separate Decommissioning Programme for the decommissioning of pipelines (PL649, PL650, PL775, PL776, PL777, PL778 and PL3872) associated with Amethyst installations. The Helvellyn pipeline (PL1956) will be covered under a Decommissioning Programme to be submitted by Alpha Petroleum Resources Limited. The Rose pipeline (PL1987) has previously been decommissioned under the Rose field Decommissioning Programme.

The pipelines are flushed during the hydrocarbon free (HCF) campaign using seawater in accordance with industry good practice. Once flushed, they are isolated and physically air-gapped when they come onto the Amethyst platforms.

## 1.3 Introduction

The Amethyst gas field is located in the United Kingdom Continental Shelf (UKCS) centred on Block 47/14a, extending into Blocks 47/13a, 47/9a and 47/15a in the Southern North Sea, approximately 40km due east of the Humber Estuary and the Easington Terminal on the Yorkshire coast. The field consists of several separate gas accumulations; Amethyst East covers the 'A' / 'B' areas and Amethyst West covers the 'C' area. Discovered by the Britoil PLC in 1970 (West) and 1972 (East), Amethyst East and Amethyst West have been producing gas since 1990.

In 2012 the field operatorship was handed over from BP to Perenco. Perenco have explored all avenues for continuing production and have concluded that due to high operational costs and a reduction of gas production, continued operations are uneconomical.

The Cessation of Production (COP) documentation is in development and a draft document was submitted to the OGA in Feb 2020. Approval for COP will be gained prior to any commencement of the decommissioning programme.

The Amethyst field comprises of four normally unmanned installations (NUI):

- A1D (Latitude: 53° 36' 41" N, Longitude: 0° 43' 26" E)
- A2D (Latitude: 53° 37' 24" N, Longitude: 0° 47' 26" E)
- B1D (Latitude: 53° 33' 43" N, Longitude: 0° 52' 48" E)
- C1D (Latitude: 53° 38' 45" N, Longitude: 0° 36' 13" E)

As shown in Figure 1.1, C1D is connected to A1D via export gas pipeline PL776. PL777 then feeds into the main 30" export pipeline PL649, which exports gas to Dimlington Gas Terminal (DGT). A2D is directly connected to PL649 and receives exports from B1D via PL775 and from the Helvellyn subsea well and flowline PL 1956.

The Rose field (block 47/15) comprised of a single subsea well (47/15b-6W) which tied back to the Amethyst A2D platform via pipeline PL1987. The Rose subsea well, owned by Spirit Energy Resources Limited, ceased production and both the subsea structure and pipelines were subsequently decommissioned in 2015. PL1987 has been flushed, cut and the section of the umbilical within the J-tube at the Amethyst A2D platform has been fully removed. Therefore no considerations to the Rose subsea well will need to be made in this Topsides DP.

The Helvellyn development, owned by Alpha Petroleum Resources Limited (Alpha Petroleum) since 2001 is located in block 47/10a. The Helvellyn field consists of a single subsea well, tied back to the Amethyst A2D platform via pipeline PL1956, where it is co-mingled with Amethyst gas, and exported to DGT. The Helvellyn well is currently still producing, however a separate COP request will be made by Alpha Petroleum. Decommissioning of the Helvellyn development is the responsibility of Alpha Petroleum and will be covered under a separate DP.

The preferred plan is to commence decommissioning activities in the following order – C1D, B1D, A2D and A1D, starting with HCF operations, followed by removal of the platform topsides by use of a Jack-Up Barge (JUB); however, this sequence is subject to optimisation. Depending on the availability of jack-up barges, following completion of the HCF phase the platform will either remain in lighthouse mode or the topsides will immediately be removed and the jacket will remain in a 'dismantlement interval' phase.

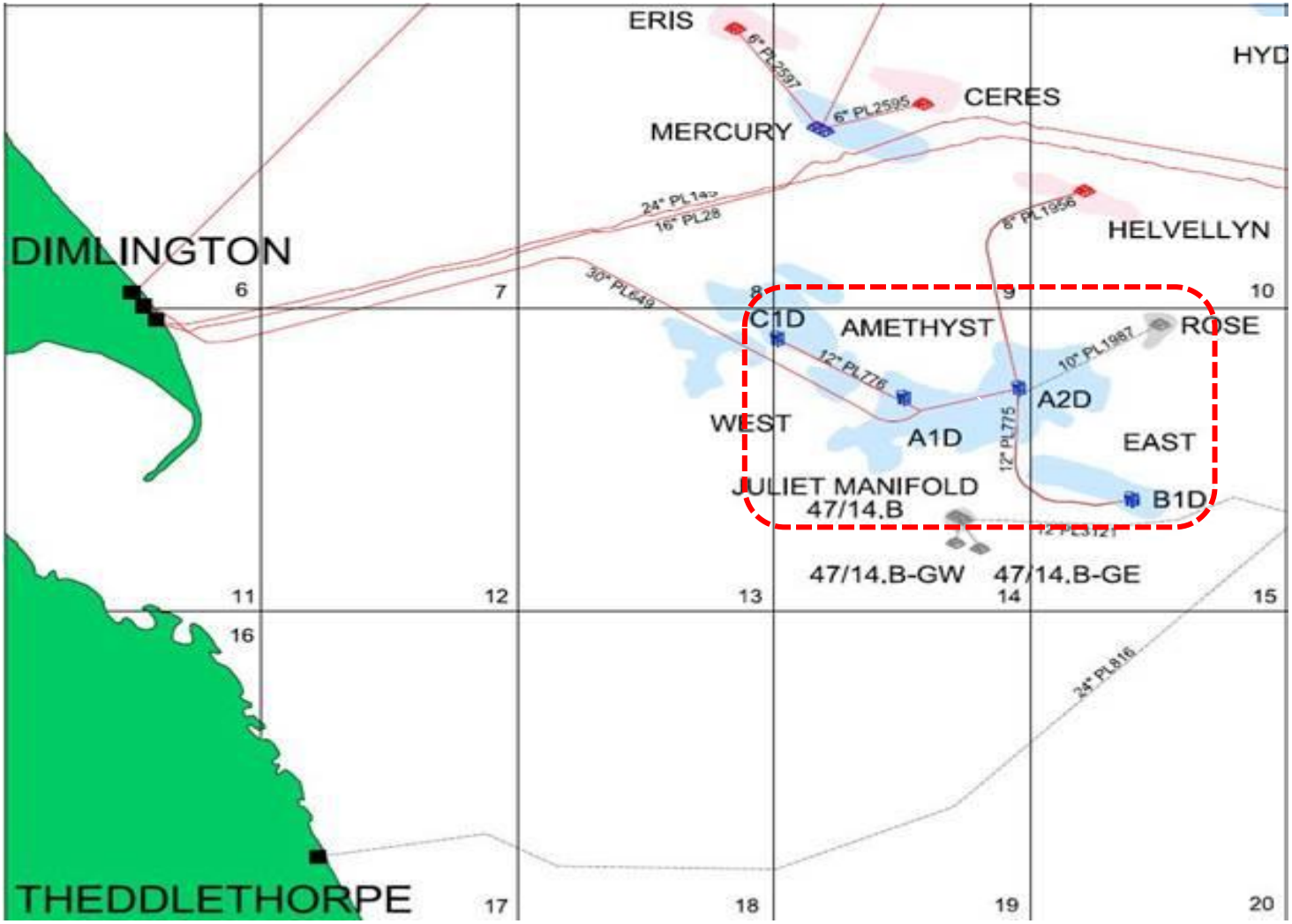


**Figure 1-1: Amethyst Field Layout**

**Platform descriptions:**

The four platforms of the Amethyst field were installed in 1989 (A1D and A2D) and 1991 (B1D and C1D) meaning the subsequent pairs are similar in configuration. They consist of conventional steel fixed jacket wellhead structures with helipads and cranes.

**Topsides**

Amethyst topsides are conventional truss structures comprising of a cellar deck, main deck and helidecks.

A1D and A2D topsides are the largest of the four platform topsides and consist of a cellar deck, mezzanine level, main deck and helideck, with a crane and vent boom.

B1D and C1D consist of a cellar deck, main deck, helideck and crane.

Further information on the Topsides sizes, weights and elevations are provided in section 3.1, table 3.1.

The Topsides Decommissioning Programme includes the following key activities:

- **Hydrocarbon Free Campaign** - The following activities are undertaken with the support of a JUB to render the installation hydrocarbon free:
  - Platform wells plugged and abandoned to Phase 2, as defined in the OGUK Well Decommissioning Guidelines.
  - Flushing and flooding of connecting pipelines, in accordance with Regulation 14 of the Pipeline Safety Regulations 1996.
  - Flushing and purging of topsides process equipment.
  - Structural survey to ensure that the structural integrity of the installation will be maintained throughout the decommissioning programme.

- **Preparation for Lighthouse Mode** - The following activities are undertaken with the support of a JUB once the platform is verified as hydrocarbon free to prepare the platform for lighthouse mode:
  - Disconnection of pipelines, j-tubes, and power cables from platforms.
  - Positive isolation of topsides and safety equipment to make equipment redundant; redundant equipment may be recovered for re-use on another installation.
  - Platform wells plugged and abandoned to 'Phase 3' as defined in the OGUK Well Decommissioning Guidelines Issue 6, June 2018.
  - Solar powered self-contained AtoNs (Aids to Navigation) commissioned and tested prior to the departure of the jack-up barge.
  - Removal of potential dropped objects (PDOs)
    - jacket spider deck (i.e. gratings and handrails)
    - corroded pipe and cable supports
    - platform signs, etc.

- **Dismantlement Preparation**: The following activities are undertaken with the support of a JUB once the platform is verified as hydrocarbon free to prepare the topsides for future removal:

  - Removal of jacket appurtenances (see note below) which may prevent the installation of skid support equipment, such as:
    - clamps and guides for risers, caissons and drain lines
    - escape to sea ladders
    - scaffold starter brackets, etc.
  - Removal of tertiary structures which may present an obstruction during the skidding operation; this may include:
    - vent boom
    - helideck (full or partial removal)
    - escape to sea ladder
    - supply hoses (i.e. fresh water and diesel)
  - Removal/partial removal of interface items between topsides and jackets which may obstruct separation of topsides and jacket, such as:
    - risers and j-tubes
    - caissons, i.e. seawater lift, seawater dump, black water dump (and associated tanks and lift pumps)
    - conductor centralisers, etc.
  - Removal of Potential Dropped Objects (PDOs), such as:
    - jacket spider deck (i.e. gratings and handrails)
    - corroded pipe and cable supports
    - platform signs, etc.
  - Removal/securing of process equipment unsecured for skidding, such as
    - pig receiver
    - ESDVs.
  - Preparation of structure for future removal of platform, including installation of skid support equipment.

- **Topsides Removal and Dismantlement Campaign** - The following activities are undertaken with a decommissioning JUB:
  - Removal of topsides and transport onshore to disposal yard.
  - Installation of solar powered AtoNs on a grillage on jacket leg. Commissioned/tested prior to the departure of the jack-up barge.
  - Onshore dismantlement of topsides at disposal yard, for reuse, recycling or disposal.

**Note:** Work platforms and/or scaffold starters (which enable the future installation of temporary scaffold structures) will be installed during the dismantlement preparation phase, and will remain in place on the jacket. The work platforms or future scaffold structures will enable the remediation/replacement of the AtoNS on the grillage and any required remediation work to the jacket structure once the topsides has been removed.

Any required remediation works to the jacket will be completed either by rope access, whilst the topsides are still in place, or by JUB and basket transfer / rope access once the topsides have been removed.

The Topsides Decommissioning Programme approach may vary between platforms and is dependent on vessel availability.

**Approach A – HCF followed by Lighthouse Mode:** currently it is anticipated that platforms C1D and A1D will go into Lighthouse Mode immediately after the completion of the HCF

campaign. Prior to the departure of the jack-up barge, self-contained solar powered AtoNs are installed on the topsides and are commissioned.

The AtoNs provide marine coverage for the duration of the lighthouse mode and are monitored remotely from a Perenco Gas Terminal by Perenco Operators to ensure the AtoNs remain functional. In the event of failure of the AtoNs, a contingency plan will be put in place; this includes the use of a stand-by vessel until the AtoNs can either be repaired or replaced using either a W2W vessel or a jack-up barge.

At the end of the Lighthouse Phase, the topsides will be removed and it is anticipated that the installation will then go into a 'dismantlement interval' phase prior to the jacket being finally removed.

**Approach B – HCF followed by Topsides Removal**: currently it is anticipated that the topsides for B1D and A2D will be removed immediately after the completion of the HCF campaign. The installation will then go into a 'dismantlement interval' phase prior to the jacket being finally removed. Prior to the departure of the jack-up barge, self-contained solar powered AtoNs are installed on a grillage on one of the jacket legs and are commissioned.

**Note:** The implementation of approaches A and B are subject to change. The order and approach for decommissioning of each platform is dependent on vessel availability.

**Dismantlement Interval Phase**

During the dismantlement interval phase, AtoNs will be placed on the grillage at approximately the current cellar deck B.O.S. (EL+22.5m) to ensure that they are at an acceptable elevation. This strategy is being adopted for the Pickerill A & B Installations Decommissioning Programme, (where the AtoNs will be located at an elevation of approx. EL +22m), and has been agreed in principle by Trinity House subject to approval of the Consent to Locate (CtL).

The AtoNs provide marine coverage for the duration of the dismantlement interval phase and will be monitored remotely from a Perenco Gas Terminal by Perenco Operators to ensure the AtoNs remain functional.

Perenco has developed a contingency plan, which will be used in the event of failure of the AtoNs. This contingency plan includes the use of a stand-by vessel until the AtoNs can either be repaired or replaced using a jack-up barge. Work platforms and/or scaffold starter installed during the dismantlement preparation will remain in place to support rope access work.

The grillage, on which the AtoNs will be situated, is designed to be lifted into position from a JUB. In the event that the removal of the AtoNs is required for repair or replacement, the grillage can be lifted using a JUB with the assistance of a work basket.

The following phases are excluded from the Topsides Decommissioning Programme and will be part of the Jacket Decommissioning Programme and Pipeline Decommissioning Programme:

1. Jacket Dismantlement Phase: Successful tenderer(s) remove the jacket and transport the module to an onshore dismantlement yard, for reuse, recycling or disposal.
2. Seabed clearance and verification: Post-decommissioning environmental surveys undertaken following platform removal.

**Jacket**

The Amethyst Jackets are of conventional fabricated tubular design with four legs set on a rectangular configuration giving a 12m by 15m top plan dimension immediately under the cellar deck level. The size of each jacket varies and is site specific to accommodate the water level at each individual installation.

The legs have a 'batter' of 1:10 on both the lateral and longitudinal directions with three levels of bracing at the +11.5m, -8.0m and -18.0m positions. Piles vary with each platform, with penetrations varying from 23m to 81m:

A1D, A2D and C1D – Four piles (fitted through legs), diameter 1372mm OD, thickness 63.5mm, Length 92m (A1D&A2D), 66m (C1D).

B1D - Eight piles (2 piles per leg, fitted through skirt pile sleeves), diameter 1372mm OD, thickness 35mm, length 39m.

This decommissioning programme only covers the decommissioning/removal of the Amethyst platform topsides. Further details of the jacket will be provided in the subsequent Jacket Decommissioning Programme.

**Pipelines:**

Decommissioning of the pipelines will be dealt with in a separate DP, however jacket risers (including the Helvellyn riser), j-tubes, and caissons will be partially removed prior to the topsides removal. Pipelines will be air gapped and flushed during the HCF campaign, prior to the removal of the risers.

## 1.4 Overview of Topsides Being Decommissioned

| Table 1.1a: Decommissioning Programme Amethyst A1D | | | |
|---|---|---|---|
| **Field:** | Amethyst West | **Production Type (Oil/Gas/Condensate)** | Gas |
| **Water Depth (m)** | 29.2 | **UKCS block** | 47/14a |
| **Surface Installation** | | | |
| **Number** | **Type** | **Topsides Weight (Te)** | |
| 1 | Fixed leg small steel NUI platform | 1004 | |
| **Subsea Installation** | | **Number of Wells** | |
| **Number** | **Type** | **Platform** | **Subsea** |
| 0 | N/A | 5 | 0 |
| **Drill Cuttings pile** | | **Distance to median** | **Distance from nearest UK coastline** |
| **Number of Piles** | **Total Estimated volume ($m^3$)** | **km** | **km** |
| N/A | N/A | 150 | 37 |

| Table 1.1b: Decommissioning Programme Amethyst A2D | | | |
|---|---|---|---|
| **Field:** | Amethyst East | **Production Type (Oil/Gas/Condensate)** | Gas |
| **Water Depth (m)** | 23.9 | **UKCS block** | 47/14a |
| **Surface Installation** | | | |
| **Number** | **Type** | **Topsides Weight (Te)** | |
| 1 | Fixed leg small steel NUI platform | 1165 | |
| **Subsea Installation** | | **Number of Wells** | |
| **Number** | **Type** | **Platform** | **Subsea** |
| 0 | N/A | 6 | 0 |
| **Drill Cuttings pile** | | **Distance to median** | **Distance from nearest UK coastline** |
| **Number of Piles** | **Total Estimated volume ($m^3$)** | **km** | **km** |
| N/A | N/A | 143 | 42 |

| Table 1.1c: Decommissioning Programme Amethyst B1D | | | |
|---|---|---|---|
| **Field:** | Amethyst East | **Production Type (Oil/Gas/Condensate)** | Gas |
| **Water Depth (m)** | 19.9 | **UKCS block** | 47/15a |
| **Surface Installation** | | | |
| **Number** | **Type** | **Topsides Weight (Te)** | |
| 1 | Fixed leg small steel NUI platform | 911 | |
| **Subsea Installation** | | **Number of Wells** | |
| **Number** | **Type** | **Platform** | **Subsea** |
| 0 | N/A | 6 | 0 |
| **Drill Cuttings pile** | | **Distance to median** | **Distance from nearest UK coastline** |
| **Number of Piles** | **Total Estimated volume ($m^3$)** | **km** | **km** |
| N/A | N/A | 140 | 48 |

| Table 1.1d: Decommissioning Programme Amethyst C1D | | | |
|---|---|---|---|
| **Field:** | Amethyst West | **Production Type (Oil/Gas/Condensate)** | Gas |
| **Water Depth (m)** | 20.0 | **UKCS block** | 47/14a |
| **Surface Installation** | | | |
| **Number** | **Type** | **Topsides Weight (Te)** | |
| 1 | Fixed leg small steel NUI platform | 830 | |
| **Subsea Installation** | | **Number of Wells** | |
| **Number** | **Type** | **Platform** | **Subsea** |
| 0 | N/A | 7 | 0 |
| **Drill Cuttings pile** | | **Distance to median** | **Distance from nearest UK coastline** |
| **Number of Piles** | **Total Estimated volume ($m^3$)** | **km** | **km** |
| N/A | N/A | 155 | 31 |

### 1.5 Section 29 Notice Holders

| Table 1.2: Installation Section 29 Notice Holders Details | | |
|---|---|---|
| **Section 29 Notice Holder(s)** | **Registration Number** | **Equity Interest (%)** |
| Perenco UK Limited | 04653066 | 100 |
| Arco British Limited, LLC | BR001713 | 0 |
| BP Exploration Operating Company Limited | 00305943 | 0 |
| Britoil Limited | SC077750 | 0 |
| Murphy Petroleum Limited | 00811102 | 0 |
| Spirit Energy Resources Limited | 02855151 | 0 |

## 1.6 Summary of Proposed Decommissioning Programme

| Table 1.3: Summary of Decommissioning Programme | | |
|---|---|---|
| Selected Option | Reason for Selection | Proposed Decommissioning Solution |
| **1. Topsides** | | |
| Complete removal, re-use or disposal | Complies with OSPAR requirements and OPRED guidelines and maximises recycling of materials. | Topsides rendered HCF and removed either by (1) HLV, (2) skidding, (3) through a combination of crane vessel lift and piece small dismantling.<br><br>Re-use followed by recycle and other recovery routes before disposal as a final option is considered. |
| **2. Jacket** | | |
| Not covered in this Decommissioning Programme | | |
| **3. Subsea Installations** | | |
| None | | |
| **4. Pipelines, Flowlines & Umbilical** | | |
| Not covered in this Decommissioning Programme | | |
| **5. Wells** | | |
| Permanent well Plug and Abandonment (P&A). | Meets HSE regulatory requirements and is in accordance with OGUK and OGA guidelines. | Plug and abandoned to comply with the HSE regulation, i.e. “The Offshore Installations and Wells (design and construction etc.) Regulations 1996" , and in accordance with OGUK Well Decommissioning Guidelines, Issue 6, June 2018 |
| **6. Drill Cuttings** | | |
| No evidence of significant drilling cuttings in place.<br><br>Leave in place to degrade naturally. | Cuttings pile is widely dispersed and fall below OSPAR 2006/5 thresholds. | Any drill cuttings will remain in situ and may be disturbed during the decommissioning programme; however, will result in no significant environmental impact. |
| **7. Interdependences** | | |
| C1D feeds into A1D and B1D and Helvellyn feed into A2D. Decommissioning is planned in the following order to address these interdependencies: C1D, B1D, A1D and A2D. Helvellyn is also due to be decommissioned, but is the responsibility of Alpha Petroleum. | | |

## 1.7 Field Location Including Field Layout and Adjacent Facilities

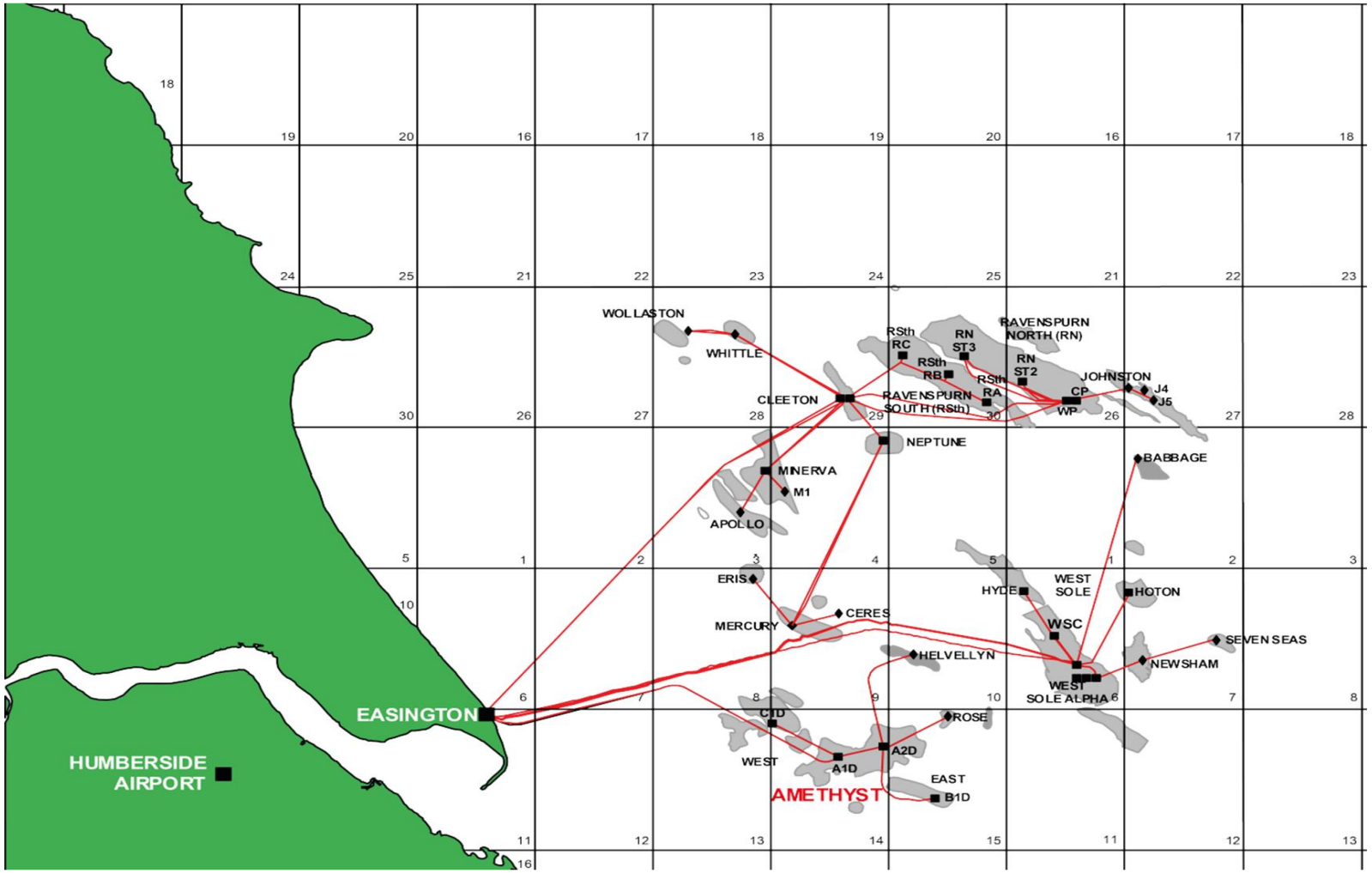


**Figure 1.2: Amethyst field location within the Southern North Sea**

| Table 1.4: List of Adjacent Facilities | | | | | |
|---|---|---|---|---|---|
| **Owner** | **Name** | **Type** | **Distance/Direction** | **Information** | **Status** |
| Perenco UK Limited | Mercury | Subsea Development | From Amethyst A1D to Mercury is 17.8km<br>From Amethyst A2D to Mercury is 19.1km<br>From Amethyst B1D to Mercury is 28km<br>From Amethyst C1D to Mercury is 13.2km | Two well subsea completion tied back to Neptune. | Operational |
| Spirit Energy North Sea Limited | Eris | Subsea Development | From Amethyst A1D to Eris is 25.5km<br>From Amethyst A2D to Eris is 26.4km<br>From Amethyst B1D to Eris is 35.3km<br>From Amethyst C1D to Eris is 19.7km | Single well subsea completion tied back to Mercury | Operational |
| Spirit Energy North Sea Limited | Ceres | Subsea Development | From Amethyst A1D to Ceres is 19.2km<br>From Amethyst A2D to Ceres is 18.3km<br>From Amethyst B1D to Ceres is 26.7km<br>From Amethyst C1D to Ceres is 17km | Single well subsea completion tied back to Mercury | Operational |
| Perenco UK Limited | West Sole Alpha | Platform | From Amethyst A1D to West Sole Alpha is 29.8km<br>From Amethyst A2D to West Sole Alpha is 25.3km<br>From Amethyst B1D to West Sole Alpha is 23.9km<br>From Amethyst C1D to West Sole Alpha is 36.7km | Adjacent platform | Operational |
| Perenco UK Limited | West Sole Bravo | Platform | From Amethyst A1D to West Sole Bravo is 28.6km<br>From Amethyst A2D to West Sole Bravo is 24.1km<br>From Amethyst B1D to West Sole Bravo is 23.6km<br>From Amethyst C1D to West Sole Bravo is 35km | Adjacent Platform | Operational |

| Table 1.4: List of Adjacent Facilities | | | | | |
|---|---|---|---|---|---|
| **Owner** | **Name** | **Type** | **Distance/Direction** | **Information** | **Status** |
| Perenco UK Limited | West Sole Charlie | Platform | From Amethyst A1D to West Sole Charlie is 28.6km<br>From Amethyst A2D to West Sole Charlie is 24.1km<br>From Amethyst B1D to West Sole Charlie is 25.4km<br>From Amethyst C1D to West Sole Charlie is 33.7km | Adjacent Platform | Operational |
| Perenco UK Limited | Hyde | Platform | From Amethyst A1D to Hyde is 29.4km<br>From Amethyst A2D to Hyde is 25.5km<br>From Amethyst B1D to Hyde is 29km<br>From Amethyst C1D to Hyde is 33.3km | Adjacent Platform | Operational |
| Perenco Gas (UK) Limited | Pickerill A | Platform | From Amethyst A1D to Pickerill A is 24.3km<br>From Amethyst A2D to Pickerill A is 20.7km<br>From Amethyst B1D to Pickerill A is 13.1km<br>From Amethyst C1D to Pickerill A is 33.1km | Adjacent Platform | Non producing (in Lighthouse Mode) |
| Perenco Gas (UK) Limited | Pickerill B | Platform | From Amethyst A1D to Pickerill B is 30.6km<br>From Amethyst A2D to Pickerill B is 26.9km<br>From Amethyst B1D to Pickerill B is 19.2km<br>From Amethyst C1D to Pickerill B is 39.3km | Adjacent Platform | Non producing (in Lighthouse mode) |
| Neptune E&P UKCS Limited | Juliet Field | Subsea Development | From Amethyst A1D to Juliet Field is 6.93km<br>From Amethyst A2D to Juliet Field is 8.1km<br>From Amethyst B1D to Juliet Field is 8.15km<br>From Amethyst C1D to Juliet Field is 14.4km | Two well subsea completion tied back to Pickerill A | Non producing (in Cold Phase) |

| Table 1.4: List of Adjacent Facilities | | | | | |
|---|---|---|---|---|---|
| **Owner** | **Name** | **Type** | **Distance/Direction** | **Information** | **Status** |
| Alpha Petroleum Resources Limited | Helvellyn | Subsea Development | From Amethyst A1D to Helvellyn is 15.7km<br>From Amethyst A2D to Helvellyn is 12.6km<br>From Amethyst B1D to Helvellyn is 19.2km<br>From Amethyst C1D to Helvellyn is 18.4km | Single well subsea completion tied back to Amethyst B1D | Operational |
| **Impacts of Decommissioning Proposals** | | | | | |
| Decommissioning of the Amethyst Platforms will have no impact on the adjacent facilities Mercury, Eris, Ceres, West Sole (Alpha, Bravo and Charlie), Hyde, Pickerill A, Pickerill B and Juliet.<br><br>The Helvellyn subsea well development (owned by Alpha Petroleum) is tied back to Amethyst A2D. The subsea pipeline will be flushed and air-gapped on the platform in conjunction with the A2D HCF operations. The Helvellyn well is still available for production; submission of COP and subsequent decommissioning of the subsea well, pipeline and umbilical, and subsea structure is the responsibility of Alpha Petroleum. | | | | | |

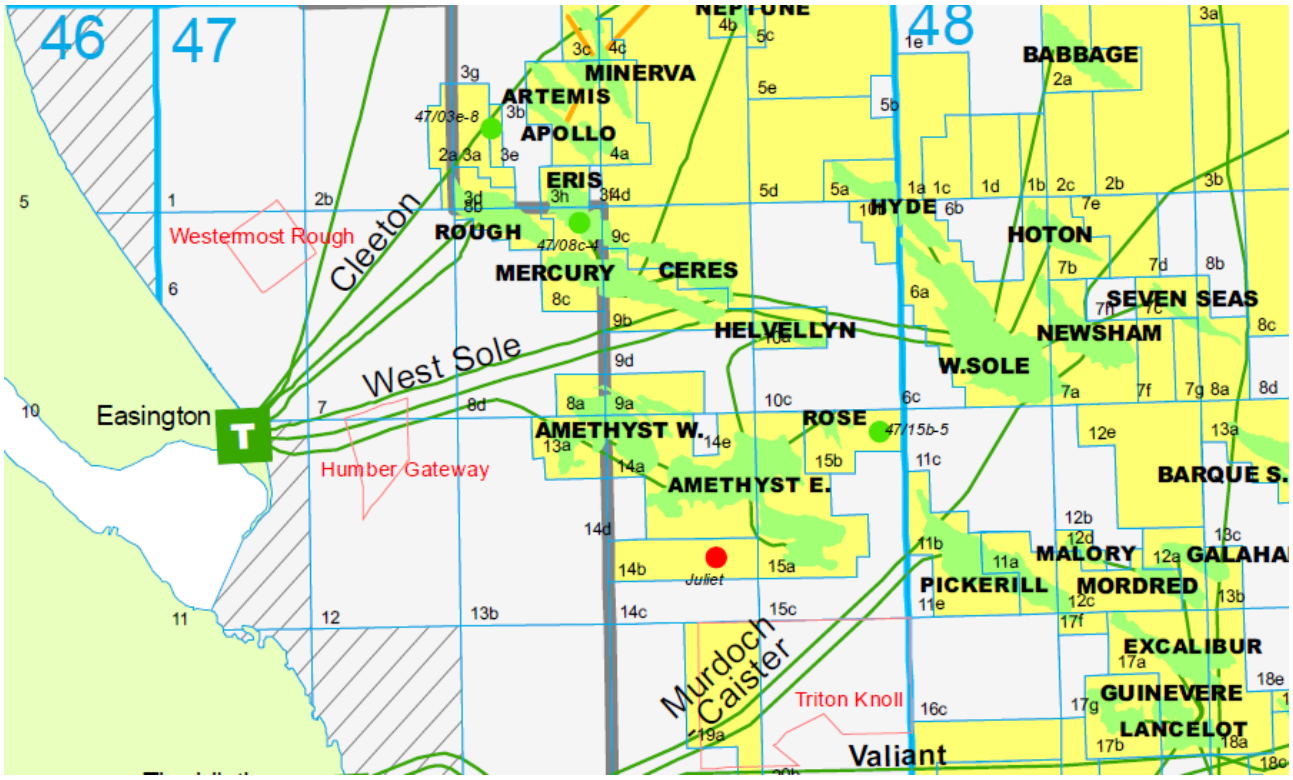


**Figure 1.3: Adjacent facilities to the Amethyst field**

## 1.8 Industrial Implications

As detailed in section 1.3 above, the Topsides Decommissioning Programme includes the following key activities:

- **Pre-decommissioning surveys** - debris and environmental surveys undertaken prior to the HCF campaign.
- **Hydrocarbon Free Campaign** – activities undertaken during the HCF campaign to render the installation hydrocarbon free.
- **Preparation for Lighthouse Mode** - activities undertaken at the end of the HCF campaign, once the platform is verified as hydrocarbon free, to prepare the platform for lighthouse mode; this includes the installation of the solar powered AtoNs.
- **Dismantlement Preparation** - activities undertaken to prepare for removal of the platform; this includes the removal of potential obstructions and installation of removal equipment.
- **Topsides Removal and Dismantlement Campaign** - removal of topsides and transport onshore to disposal yard, and onshore dismantlement of topsides at disposal yard, for reuse, recycling or disposal.

The above activities are planned carefully to recognise synergies and efficiencies. Engineering and planning takes into account potential integration of various activities, therefore the above activities above may be completed in an alternate order to above.

All contracts will be tendered according to Perenco procedures. Suppliers' offers will be assessed along many criterions, including: their technical ability and capacity to execute the work in a safe and efficient manner that minimises the impact on the environment; the commercial offer; and the experience of carrying out this type of operation in the UKCS.

Perenco have engaged with the OGA Supply Chain team, and it has been agreed that a Supply Chain Action Plan (SCAP) is required for the Amethyst Topsides DP. The draft SCAP is currently in production, and will be submitted to OGA for review once complete.

Perenco are active participants in various industry initiatives including:

a. OGUK Supply Chain Forum
b. OGUK Decommissioning Forum
c. OGUK Wells Forum
d. East of England Energy Group (EEGR)

Current operational contracts for items such as environmental permitting, potential vessel sharing and logistical support will be implemented to support decommissioning activities and wider business optimisation.

## 2.0 Description of items to be decommissioned

### 2.1 Installations: Topsides

| Table 2.1: Surface Facilities Information | | | | |
|---|---|---|---|---|
| Name | Facility Type | Location WGS84 Format | Topsides/Facilities | |
| | | | Weight (Te) | No of modules |
| A1D | NUI | LAT 53° 36' 38.4406"N LON 00° 43' 21.3858"E | 1004 | 1 |
| A2D | NUI | LAT 53° 37' 21.0228"N LON 00° 47' 20.6881"E | 1165 | 1 |
| B1D | NUI | LAT 53° 33' 39.6424"N LON 00° 52' 38.1894"E | 911 | 1 |
| C1D | NUI | LAT 53° 38' 41.7738"N LON 00° 36' 08.2471"E | 830 | 1 |

### 2.2 Installations: Subsea including Stabilisation Features

Decommissioning of the platform jackets and pipelines will be dealt with in a separate DP.

### 2.3 Wells

| Table 2.2a: A1D Well Information | | | |
|---|---|---|---|
| Platform Wells – A1D | Designation | Status | Category of Well * |
| 47/14a-J1 | Gas Production | Current status is completed shut-in. To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-J2 | Gas Production | Current status is completed shut-in. To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-J3 | Gas Production | Current status is completed shut-in. To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-J4 | Gas Production | Current status is completed shut-in. To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-J5 | Suspended (side-tracked to J05z) | Current status is abandoned to Phase 1. To be Abandoned to Well Decommissioning Phase 3 | PL-0-1-1 |
| 47/14a-J5z | Gas Production | Current status is completed shut-in. To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| Subsea Wells – A1D | | | |
| None | N/A | N/A | N/A |

| Table 2.2b: A2D Well Information | | | |
|---|---|---|---|
| Platform Wells – A2D | Designation | Status | Category of Well * |
| 47/14a-K1 | Gas Production | Current status is completed shut-in.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-K2 | Gas Production | Current status is completed shut-in.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-K3 | Gas Production | Current status is completed shut-in.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-K4 | Gas Production | Current status is completed shut-in.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-K5 | Gas Production | Current status is completed shut-in.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-3-1-1 |
| 47/14a-K6 | Gas Production | Current status is completed shut-in.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| Subsea Wells – A2D | | | |
| None | N/A | N/A | N/A |

| Table 2.2c: B1D Well Information | | | |
|---|---|---|---|
| Platform Wells – B1D | Designation | Status | Category of Well * |
| 47/15a-L1 | Gas Production | Current status is completed shut-in.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/15a-L2 | Gas Production | Current status is completed shut-in.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/15a-L3 | Gas Production | Current status is completed shut-in.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/15a-L4 | Gas Production | Current status is completed shut-in.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/15a-L5 | Suspended<br>(side-tracked to L05z) | Current status is abandoned to Phase 1.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-0-1-1 |
| 47/15a-L5z | Suspended<br>(side-tracked to L05y) | Current status is abandoned to Phase 1.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-0-1-1 |
| 47/15a-L5y | Gas Production | Current status is completed shut-in.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/15a-L6 | Gas Production | Current status is completed shut-in.<br>To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| Subsea Wells – B1D | | | |
| None | N/A | N/A | N/A |

| Table 2.2d: C1D Well Information | | | |
|---|---|---|---|
| Platform Wells – C1D | Designation | Status | Category of Well * |
| 47/14a-M1 | Suspended (side-tracked to M01z) | Current status is abandoned to Phase 1. To be Abandoned to Well Decommissioning Phase 3 | PL-0-1-1 |
| 47/14a-M1z | Gas Production | Current status is completed shut-in. To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-M2 | Gas Production | Current status is completed shut-in. To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-M3 | Gas Production | Current status is completed shut-in. To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-M4 | Gas Production | Current status is completed shut-in. To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-M5 | Suspended (side-tracked to M05z) | Current status is abandoned to Phase 1. To be Abandoned to Well Decommissioning Phase 3 | PL-0-1-1 |
| 47/14a-M5z | Gas Production | Current status is completed shut-in. To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-M6 | Gas Production | Current status is completed shut-in. To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| 47/14a-M7 | Suspended (side-tracked to M07z) | Current status is abandoned to Phase 1. To be Abandoned to Well Decommissioning Phase 3 | PL-0-1-1 |
| 47/14a-M7z | Suspended (side-tracked M07y) | Current status is abandoned to Phase 1. To be Abandoned to Well Decommissioning Phase 3 | PL-0-1-1 |
| 47/14a-M7y | Gas Production | Current status is completed shut-in. To be Abandoned to Well Decommissioning Phase 3 | PL-1-1-1 |
| Subsea Wells – C1D | | | |
| None | N/A | N/A | N/A |

## 2.4 Drill Cuttings

As this DP only covers Amethyst Topsides. The presence and potential impact of drill cuttings will be assessed in the Jacket DP.

## 2.5 Inventory Estimates

Tables 2.3a, 2.3b, 2.3c and 2.3d show the estimated topsides inventory to be decommissioned for Amethyst A1D, A2D, B1D and C1D respectively. The inventories exclude the jacket and piles, which will be dealt with in a later DP.

The removed equipment, appurtenances and steelwork will be transported onshore to a dismantlement yard for reuse, recycling or disposal.

| Table 2.3a: Inventory Estimate for Amethyst A1D | | |
|---|---|---|
| **Material** | **Weight (Te)** | **Estimated volume ($m^3$)** |
| Steel | 964 | 122 |
| Concrete | 5 | 0.5 |
| Plastic | 5 | 0.5 |
| Non Ferrous | 5 | 0.5 |
| Hazardous | 5 | 0.5 |
| Radioactive waste (NORM etc.) | 5 | 0.5 |
| Other | 15 | 2 |

| Table 2.3b: Inventory Estimate for Amethyst A2D | | |
|---|---|---|
| **Material** | **Weight (Te)** | **Estimated volume ($m^3$)** |
| Steel | 1117 | 143 |
| Concrete | 6 | 0.5 |
| Plastic | 6 | 0.5 |
| Non Ferrous | 6 | 0.5 |
| Hazardous | 6 | 0.5 |
| Radioactive waste (NORM etc.) | 6 | 0.5 |
| Other | 18 | 3 |

| Table 2.3c: Inventory Estimate for Amethyst B1D | | |
|---|---|---|
| **Material** | **Weight (Te)** | **Estimated volume ($m^3$)** |
| Steel | 875 | 112 |
| Concrete | 4.5 | 0.5 |
| Plastic | 4.5 | 0.5 |
| Non Ferrous | 4.5 | 0.5 |
| Hazardous | 4.5 | 0.5 |
| Radioactive waste (NORM etc.) | 4.5 | 0.5 |
| Other | 13.5 | 2 |

| Table 2.3d: Inventory Estimate for Amethyst C1D | | |
|---|---|---|
| **Material** | **Weight (Te)** | **Estimated volume ($m^3$)** |
| Steel | 798 | 102 |
| Concrete | 4 | 0.5 |
| Plastic | 4 | 0.5 |
| Non Ferrous | 4 | 0.5 |
| Hazardous | 4 | 0.5 |
| Radioactive waste (NORM etc.) | 4 | 0.5 |
| Other | 12 | 2 |

# 3.0 Removal and Disposal Methods

In line with the waste hierarchy, in which the prevention of waste is preferred, Perenco has assessed the options for extending the producing life of the platforms, but this was not commercially viable.

The re-use and relocation of the platform topsides has also been considered. Re-use may be a viable option for at least one of the platforms; however, this is not the case for all, due to the ageing technology and high maintenance costs of the fabric and structural integrity, technically viable reuse options are limited.

Perenco will continue to review the platforms equipment inventories to assess the potential for adding to their existing asset portfolio spares inventory or for resale to the open market.

Recovered material will be landed ashore for disposal by a contractor. It is not possible to forecast the wider reuse market with any accuracy or confidence this far forward. Perenco will continue to track reuse market trends in order to seize reuse opportunities at the appropriate time.

In the event that a Transfrontier Shipment of Waste (TFSW) permit is required, Perenco will liaise with the relevant Waste Authority and ensure that all relevant permits and consents are in place in accordance with the Transfrontier Shipment of Waste Regulation 2007 (as amended) or The International Waste Shipments (Amendment ) (EU Exit) Regulation 2018, approved by UK parliament on 27 February 2019 and which would come into force the day the UK leave the EU in the event the UK leave without a deal.

## 3.1 Topsides

### 3.1.1 Topsides Decommissioning Overview

The four Amethyst topsides are similar in configuration, the exact specifications are given in the below table. The topsides are conventional truss steel structures combining of: a cellar deck, mezzanine level (A1D and A2D only), main deck and helideck, located above the main deck.

The deck elevations and estimated topsides sizes and weight to be removed and transported onshore for each platform is detailed below. This includes the weights of equipment due to be removed in preparation for the topsides removal.

| Table 3.1: Topside Configurations | | | | |
|---|---|---|---|---|
| | A1D | A2D | B1D | C1D |
| Helideck (EL) | 40.500 | 40.500 | 39.300 | 39.300 |
| Main Deck (EL) | 33.200 | 33.200 | 32.000 | 32.000 |
| Mezzanine Level (EL) | 27.700 | 27.700 | N/A | N/A |
| Cellar Deck (EL) | 22.700 | 22.700 | 23.500 | 23.500 |
| Vent Boom (EL) | 46.900 | 46.900 | N/A | N/A |
| Topsides Weight (Te) | 1004 | 1165 | 911 | 830 |
| Size (m) | 28.9 x 19.0 x 7.3 | 28.9 x 19.0 x 7.3 | 28.4 x 20.0 x 7.3 | 28.4 x 20.0 x 7.3 |

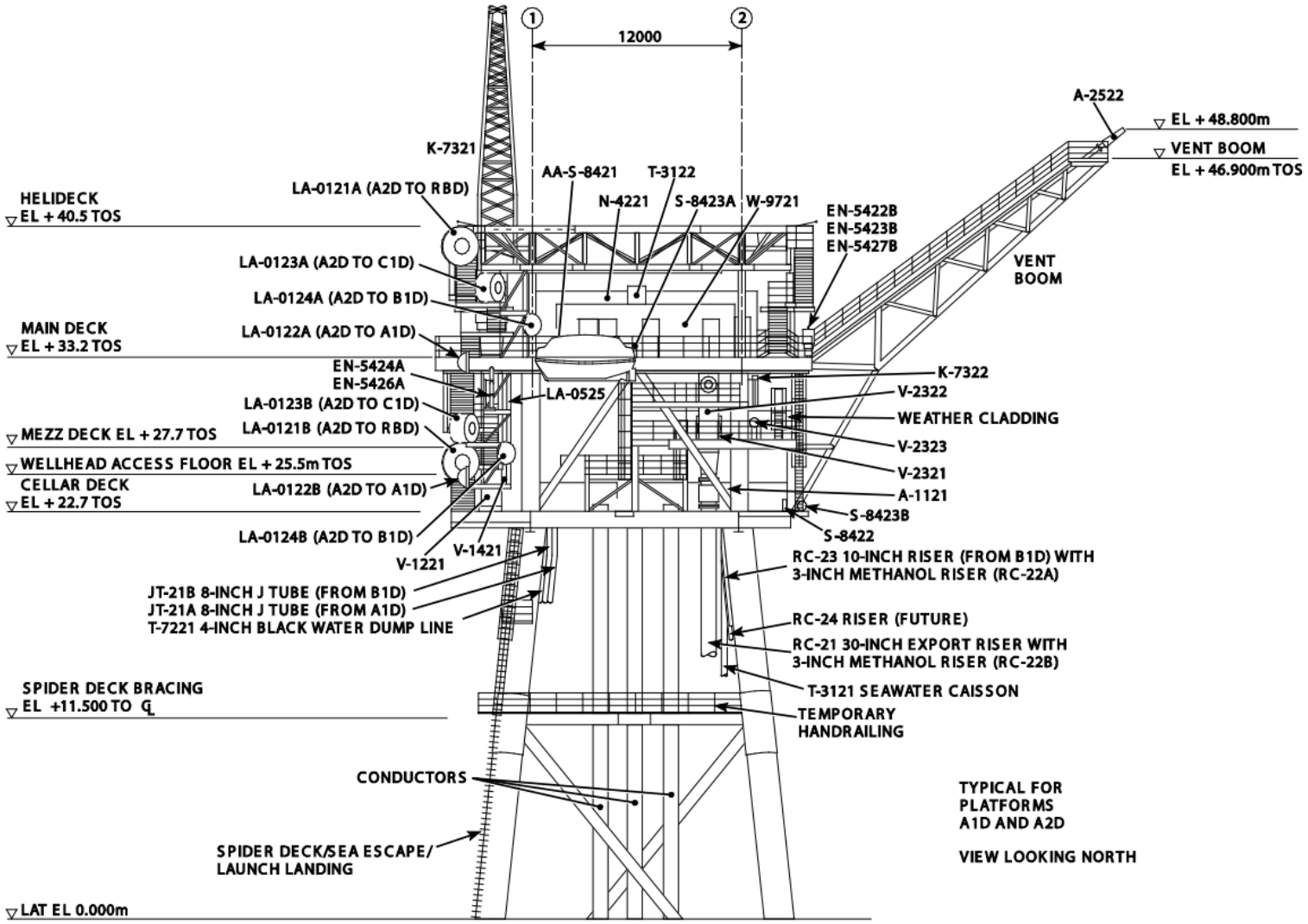


**Figure 3.1a: Diagram of A1D and A2D Topsides**

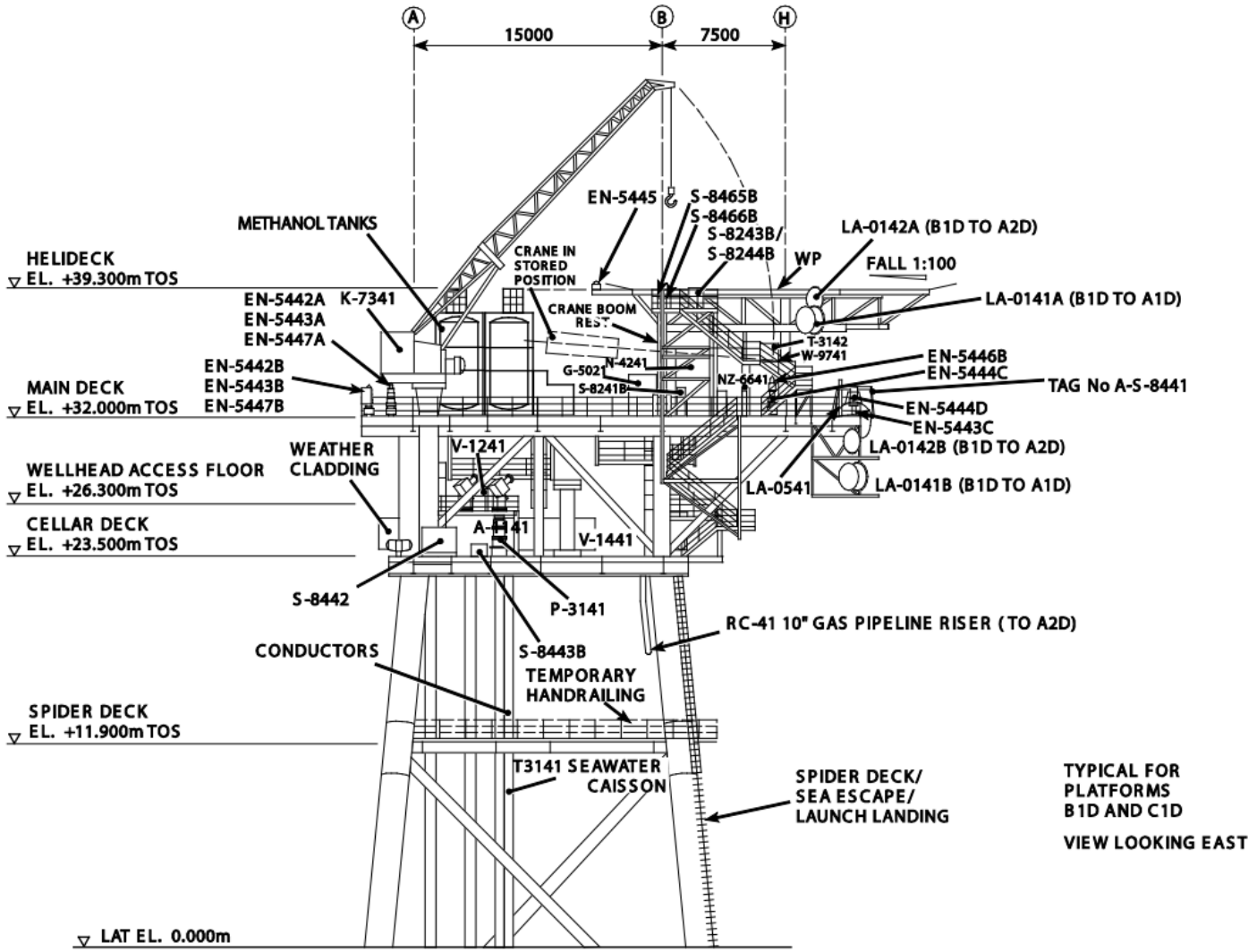


**Figure 3.1b: Diagram of B1D and C1D Topsides**

**Preparation/Cleaning:**

| Table 3.2: Cleaning of Topsides for Removal | | |
|---|---|---|
| **Waste Type** | **Composition of Waste** | **Disposal Route** |
| On-board hydrocarbons | Process fluids, fuels and lubricants | Flushed and either injected into platform wells or drained to tote tanks for transport and appropriate disposal onshore. |
| Other hazardous materials | NORM and radioactive material, instruments containing heavy metals, batteries | Transported ashore for re-use, recycling or disposal by appropriate methods.<br>In the event that a Transfrontier Shipment of Waste (TFSW) permit is required, Perenco will liaise with the relevant Waste Authority and ensure all relevant permits/consents are in place. |
| Original paint coating | Lead-based paints | May give off toxic fumes/dust if flame-cutting or grinding/blasting is used so appropriate health safety measures will be taken. |
| Asbestos and ceramic fibre | Minor quantities | Appropriate control and management will be enforced. Transported ashore for disposal by appropriate methods. |

**Removal Methods:**

| Table 3.3: Topsides Removal Methods | |
|---|---|
| 1) HLV (semi-submersible crane vessel) ☑<br>2) Mono-hull crane vessel ☐<br>3) SLV ☑<br>4) Piece small ☑<br>5) Other ☑ | |
| Method | Description |
| Single lift removal by SLV/HLV | Removal of topsides as complete unit and transportation to shore for re-use of selected equipment, recycling, break up and/or disposal. Single lift dependant on vessel availability. |
| Modular removal and re-use/recycle by HLV | Removal of parts/modules of topsides for transportation and reuse in alternate location(s) and/or recycling/disposal. |
| Other - skidding | Removal of topsides as complete unit using alternative methodologies currently being developed by industry. Transportation to shore for re-use of selected equipment, recycling, break up and/or disposal. |
| Offshore removal 'piece small' for onshore reuse/disposal | Removal of topsides by breaking up offshore and transporting to shore using work barge. Items will then be sorted for re-use, recycling or disposal. |
| Proposed removal method and disposal route | Topsides will be removed to shore and disposed of at a selected disposal yard to comply with relevant legislation and company policy. The current plan is to remove the Topsides using a JUB and with the use of hydraulic jacks the skidding of the topsides module onto the JUB deck.<br>However, we are assessing other removal options to establish the most efficient and cost effective method to remove the topsides module. A final decision on the removal method will be made following detailed engineering studies and OPRED will be informed of any change to the current plan. |

## 3.2 Wells

The wells which remain to be abandoned, as listed in section 2.2 (tables 2.2), will be plugged and abandoned in accordance with Oil and Gas UK Guidelines for the suspension and abandonment of wells.

A Master Application Template (MAT) and the supporting Subsidiary Application Template (SAT) application will be submitted in support of any such work that is to be carried out.

## 3.3 Waste Streams

| Table 3.4: Waste Stream Management Methods | |
|---|---|
| **Waste Stream** | **Removal and Disposal method** |
| **Bulk liquids** | Removed from vessels and pipework, and either injected into platform wells for disposal or discharged into tote tanks for transport and appropriate disposal onshore.<br>Vessels, pipework and sumps will be drained prior to removal to shore and shipped in accordance with maritime transportation guidelines. Package filtration equipment for disposal of liquids to sea may be utilised and relevant permits will be sought for such operations. |
| **Marine growth** | Removed offshore / onshore. Disposed of according to guidelines. |
| **NORM/LSA Scale** | Tests for NORM/LSA will be undertaken offshore by the Radiation Protection Supervisor and any NORM encountered will be dealt with and disposed of in accordance with guidelines and company policies and under appropriate permit. |
| **Asbestos** | Tests for asbestos will take place offshore and will be dealt with / disposed of according to guidelines and company policies. |
| **Other hazardous wastes** | Detailed survey for other hazardous wastes will be undertaken offshore and will be dealt with / disposed of according to guidelines and company policies. |
| **Onshore Dismantling sites** | Appropriate licensed sites will be selected. The chosen facility must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver recycling options. |

## 3.4 Inventory Disposition

| Table 3.5: Inventory Disposition | | | |
|---|---|---|---|
| | **Total Inventory Tonnage Te** | **Planned tonnage to shore Te** | ***Planned tonnage left in situ Te** |
| **A1D** | 2104 | 1004 | 1100 |
| **A2D** | 2145 | 1165 | 980 |
| **B1D** | 1911 | 911 | 1000 |
| **C1D** | 1830 | 830 | 1000 |

* Planned tonnage left in situ includes jackets and piles.

| Table 3.6: Proposed Fate of Amethyst Infrastructure Materials | | |
|---|---|---|
| **Infrastructure** | **Recommended decommissioning option** | **Destination** |
| **Jacket** | To be confirmed in Jacket DP | To be confirmed in Jacket DP |
| **Topside** | Complete removal | Re-use, recycling and disposal |

## 4.0 Environmental Appraisal Overview

A gap analysis was carried which reviewed the existing environmental survey data in the vicinity of the Amethyst platforms to support the proposed scope of works. The results of the gap analysis were shared with the OPRED Environmental Management Team.

In summary, the review found that the seabed communities surrounding the Amethyst platforms were typical of the Southern North Sea. There was no presence of mussel beds or reef structures within the vicinity of the installations. The Amethyst field is part of a wider herring spawning ground around the North Sea and North East Atlantic, however the majority had little or no potential for use and is not considered a critical habitat.

Subject to regulatory approval, a decommissioning jack-up barge (JUB) or a drilling rig JUB will be used to plug and abandon (P&A) the platform wells, make the platforms hydrocarbon free. A decommissioning JUB will be used to remove the topsides facilities.

Perenco anticipates that the deposit of stabilisation material can be avoided with additional preloading of the JUB during the jacking down procedure. This approach has been used successfully during the recent Pickerill decommissioning campaign.

As the installations are not located within any marine protected areas, and disturbance to the sea bed will be limited to the deployment and jacking down of the JUB onto the seabed a full Environmental Appraisal for this Topsides DP is not required.

Perenco plans to carry out a geophysical site survey in Q1/Q2 2020 to support the environmental baseline survey and gather further data. Data collected in these surveys will be assessed and presented in the environmental and navigational applications made to OPRED.

Perenco will undertake a full EA to support the Decommissioning Programmes for the jacket removal and pipeline decommissioning activities.

## 5.0 Interested Party Consultations

Consultations Summary:

| Table 5.1: Summary of Consultee Comments | | |
|---|---|---|
| Who | Comment | Response |
| **INFORMAL CONSULTATIONS** | | |
| OGA | OGA were provided an outline of the decommissioning programme as part of the COP notification. In addition, they are provided regular updates on the decommissioning programme. | COP currently being reviewed by OGA. |
| JNCC | To be completed post the consultation period | |

| Table 5.1: Summary of Consultee Comments | | |
|---|---|---|
| Who | Comment | Response |
| **INFORMAL CONSULTATIONS** | | |
| OPRED EMT | To be completed post the consultation period | |
| HSE | HSE to review and accept: Combined Operation Notifications (COMOPS), Dismantlement Safety Case, and Schedule 9 notifications. | |
| Environment Agency | To be completed post the consultation period | |
| MOD | To be completed post the consultation period | |
| CEFAS | To be completed post the consultation period | |
| NFFO | To be completed post the consultation period | |

| Table 5.1 Summary of Consultee Comments | | |
|---|---|---|
| Who | Comment | Response |
| **STATUTORY CONSULTATIONS** | | |
| NFFO | To be completed post the consultation period | |
| SFF | To be completed post the consultation period | |
| NIFPO | To be completed post the consultation period | |
| Global Marine Systems | To be completed post the consultation period | |
| Public | To be completed post the consultation period | |

### 5.1 Project Management and Verification

A Perenco Project Management team will be appointed to manage suitable sub-contractors for the removal of the Amethyst installations. Perenco standard procedures for operational control and hazard identification and management will be used. Where possible the work will be coordinated with other operations in the SNS. Perenco will monitor and track the progress of consents and the consultations required as part of this process. Any major changes to the decommissioning programme will be discussed and agreed with OPRED.

### 5.2 Post-Decommissioning Debris Clearance and Verification

This DP only covers Topsides removal. Post-decommissioning surveys will be dealt with in the subsequent Jacket Decommissioning programme.

### 5.3 Schedule

The Topsides Decommissioning Programme approach may vary between platforms and is dependent on vessel availability.

**Approach A – HCF followed by Lighthouse Mode:** currently it is anticipated that platforms C1D and A1D will go into Lighthouse Mode immediately after the completion of the HCF campaign. At the end of the Lighthouse Phase, the topsides will be removed and it is anticipated that the installation will then go into a ‘dismantlement interval’ phase prior to the jacket being finally removed.

**Approach B – HCF followed by Topsides Removal**: currently it is anticipated the topsides for B1D and A2D will be removed immediately after the completion of the HCF campaign. The installation will then go into a ‘dismantlement interval’ phase prior to the jacket being finally removed.

The work carried out during the various phases of the Topsides Decommissioning Programme is described below:

1. **Hydrocarbon Free (HCF) Campaign**: Debris surveys will be completed prior to commencement of the campaign. A jack-up vessel interfaces with the platform and carries out well plugging and abandonment, removing all hydrocarbons from topside pipework / vessels, flushing pipelines and pipeline severance, and possible removal of obstructions in preparation for the platform dismantlement.

2. **Lighthouse Mode**: Prior to the departure of the jack-up barge, self-contained solar powered AtoNs are installed on the topsides and are commissioned. The AtoNs provide marine coverage for the duration of the lighthouse mode and are monitored remotely from a Perenco Gas Terminal by Perenco Operators to ensure the AtoNs remain functional.

3. **Topsides Removal Campaign**: Successful tenderer(s) remove the topsides and transport the module to an onshore dismantlement yard, for reuse, recycling or disposal.

4. **Dismantlement Interval Phase**: Prior to the departure of the decommissioning JUB, self-contained solar powered AtoNs are installed on a grillage on one of the jacket legs and are commissioned. The AtoNs provide marine coverage for the duration of the dismantlement interval phase and will be monitored remotely from a Perenco Gas Terminal by Perenco Operators to ensure the AtoNs remain functional.

   During the Dismantlement Interval Phase the 500m Safety Zones will remain in place. The following phases are excluded from the Topsides Decommissioning Programme and will be part of the Jacket Decommissioning Programme and Pipeline Decommissioning Programme:

5. **Jacket Removal Campaign**: Successful tenderer(s) remove the jacket and transport the module to an onshore dismantlement yard, for reuse, recycling or disposal.

6. **Seabed clearance and verification**: Post-decommissioning environmental surveys undertaken following platform removal.

The schedule presented below in Figure 6.1 indicates the earliest dates the dismantlement of the topsides is estimated to take place. The completion dates for the decommissioning programme are driven by the availability of vessels, favourable weather windows, and market opportunities

**Figure 5.1: High-level Schedule**

| | 2020 | | | | 2021 | | | | 2022 | | | | 2023 | | | | 2024 | | | | 2025 | | | | 2026 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| **Pre-decommissioning surveys** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **C1D Installation** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HCF Campaign | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lighthouse Mode | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Topside Removal | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dismantlement Interval Phase | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **B1D Installation** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HCF Campaign | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Topside Removal | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dismantlement Interval Phase | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **A1D Installation** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HCF Campaign | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lighthouse Mode | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Topside Removal | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dismantlement Interval Phase | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **A2D Installation** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HCF Campaign | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Topside Removal | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dismantlement Interval Phase | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Jacket Removal** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Remediation** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Post-decommissioning surveys** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Close out report** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Earliest Start  Latest Finish

## 5.4 Costs

A cost estimate for the preparation, removal and disposal of the platform and jacket will be provided to OPRED with the full Amethyst Installations Decommissioning Programme.

The decommissioning costs detailed within this DP have been provided to OPRED. The costs provided covered the scope of work associated with the HCF campaigns, dismantlement preparation, and removal of the topsides.

**Table 5.2: Provisional Topsides Decommissioning Programme costs**

| Activity | A1D £m | A2D £m | B1D £m | C1D £m | Total Estimated Cost (£m) |
|---|---|---|---|---|---|
| Project Management | | | | | |
| Facility Running Costs | | | | | |
| Platform Well P&A | | | | | |
| Conductor Removal | | | | | |
| Making Safe Topsides | | | | | |
| Making Safe Pipeline (HCF) | | | | | |
| Topsides Preparation | | | | | |
| Topsides Removal | | | | | |
| Onshore disposal & recycling | | | | | |
| **TOTAL** | | | | | |