

Wenlock Decommissioning Programmes

Final
January 2022

APR_WEN_PMGT_008 Rev C3



Document Control

Approvals

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Revision Control

Revision No	Reference	Changes/Comments	Issue Date
C1	Issued for Consultation	OPRED comments	04.03.2021
C2	Final	Consultee comments	08.06.2021
C3	Final	Addition of Partner Letters of Support	20.01.2022

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Terms and Abbreviations

Abbreviation	Explanation
APRL	Alpha Petroleum Resources Limited
BGT	Bacton Gas Terminal
CA	Comparative Assessment
SCAP	Supply Chain Action Plan
COP	Cessation of Production
CO2	Carbon dioxide
DCR	Design and Construction Regulations
DP	Decommissioning Programmes
EA	Environmental Appraisal
EIA	Environmental Impact Assessment
ESDV	Emergency Shut Down Valve
FBE	Fusion Bonded Epoxy
HSE	Health and Safety Executive
HVAC	Heating, ventilation, and air conditioning
Inde	Indefatigable
JNCC	Joint Nature Conservation Committee
JUWB	Jack-Up Work Barge
KM	Kilometre
LSA	Low Specific Activity
M	Metres
M ²	Meters Squared
M ³	Meters Cubed
MAT	Master Application Template
MCV	Monohull Crane Vessel
MEG	Monoethylene Glycol
N/A	Not Applicable
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers Organisation
NORM	Naturally Occurring Radioactive Material
NUI	Normally Unattended Installation
OGA	Oil & Gas Authority
OGUK	Oil & Gas United Kingdom

OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	Oslo and Paris Convention
P & A	Plug and Abandonment
PL	Pipeline
PON	Petroleum Operations Notice
PUK	Perenco (UK) Limited
PWA	Pipeline Works Authorisation
SAC	Special Area of Conservation
SAT	Subsidiary Application Template
SLV	Sheer Leg Vessels
SNS	Southern North Sea
SoW	Scope of Work
SSCV	Semi-Submersible Crane Vessel
Te	Tonne
UKCS	UK Continental Shelf
UTM	Universal Transverse Mercator
W1	Well 1 (49/12a-w1)
W2	Well 2 (49/12a-w2)
W3	Well 3 (49/12a-w3)
WGS84	World Geodetic System 1984
Legacy well	49/12a-8 Appraisal legacy well
23A	49/23A Installation
23AC	49/23A Compression Platform
"	Inch, 25.4millimetres

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1. EXECUTIVE SUMMARY

1.1 Combined Decommissioning Programmes

This document contains two decommissioning programmes for each set of associated notices served under section 29 of the Petroleum Act 1998.

The decommissioning programmes are for:

- Wenlock field installations
- Two Wenlock pipelines

1.2 Requirement for Decommissioning Programmes

Installation:

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Wenlock installations (*see Table 1.2*) are applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning the installations detailed in Section 2.1 and 2.2 of this programme. (See also Section 8 - Partners Letter of Support).

Following public, stakeholder and regulatory consultation, this decommissioning programme is submitted without derogation and in full compliance with OPRED guidelines.

Pipelines:

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Wenlock pipelines (*see Table 1.4*) are applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning the pipelines detailed in Section 2.3 of this programme. (See also Section 8 – Partner Letters of Support).

In accordance with Regulation 14 of the Pipeline Safety Regulations 1996, notification to the Health and Safety Executive (HSE) of the decommissioning of the pipelines and submission of the required variations to the Pipeline Works Authorisation to carry out the flushing and disconnection activities will be made.

1.3 Introduction

The Wenlock field is in the Southern Basin of the UKCS in licence P33 and P1062, block 49/12A and comprises one gas field which was first discovered in 1974. A three slot Normally Unmanned Installation (NUI) was installed on Wenlock in 2006 with a design life of 15 years and the first well (W1) was drilled and started production in 2007 and two subsequent wells were drilled and started production in 2008 (W2) and 2009 (W3). Production has since declined making the installation uneconomic and a Cessation of Production (CoP) application has been approved by OGA for CoP which is anticipated to be in March 2022.

The Wenlock platform has a topside weighing 435 tonnes and a jacket weighing 645 tonnes which is in 25m of water. There are two 37km pipelines connected to the Perenco (UK) Limited (PUK) operated Indefatigable (Inde) 49/23AC (23AC) platform, an 8" gas export and 3" chemical pipeline. PUK is the appointed Installation and Pipelines Operator, Alpha Petroleum Resources Limited (APRL) is the Wells Operator. APRL will transfer the Installation Operator and Pipeline Operator to another party for Late Life Operations and decommissioning.

The platform is located 98km offshore North East from the Bacton Gas Terminal (BGT), 45 km South West of the UK / Netherlands median line, 6.5kms North of Viking A and 36kms North West of the Inde field.

The platform and approximately 28.6 km of the route of the Wenlock pipelines, including the mid-line tee structure, is located within the boundary of the North Norfolk Sandbanks and Saturn Reef Special Area of Conservation (SAC), designated for the protection of Annex I sandbanks and biogenic reef. In addition, the Wenlock platform and approximately 16.5 km of the route of the Wenlock pipelines, excluding the mid-line tee structure, is located within the boundary of the Southern North Sea SAC, designated for the protection of harbour porpoises. See figure 1.5.

There is a legacy appraisal well 49/12a-8 subsea well within the Wenlock 500-meter safety zone. The well was first drilled in December 1988 and deemed non-viable and subsequently suspended with a single plug in February 1989.

Following public, stakeholder and regulatory consultation, the decommissioning programmes are submitted without derogation and in full compliance with OPRED guidelines. The decommissioning programmes explain the principles of the removal activities and is supported by an environmental appraisal (EA).

1.4 Overview of Installations and Pipelines Being Decommissioned

1.4.1 Installation

Table 1.1: Installation Being Decommissioned			
Field	Wenlock	Production Type (Oil/Gas/Condensate)	Gas
Water Depth (m)	25	UKCS block	49/12A
Distance to median (km)	45	Distance from nearest UK coastline (km)	98
Surface Installation(s)			
Number	Type	Topside Weight (Te)	Jacket Weight (Te)
1	Fixed steel jacket	435	645
Subsea Installation		Number of Wells	
Number	Type	Platform	Subsea
1	Mid-line tee	3	1 (legacy well)

Table 1.2: Installation Section 29 Notice Holders Details		
Section 29 Notice Holders	Registration Number	Equity Interest (%)
Alpha Petroleum Resources Limited	03949599	20%
Energiean UK Limited	06683599	80%
Alpha Petroleum (UK) Holdings Limited	08774092	0%
Energiean PLC	10758801	0%

1.4.2 Pipeline(s)

Table 1.3: Pipelines Being Decommissioned

Number of Pipelines (Details given in Table 2.3)	2
---------------------------------------------------------	---

Table 1.4: Pipelines Section 29 Notice Holders Details

Section 29 Notice Holders	Registration Number	Equity Interest (%)
Alpha Petroleum Resources Limited	03949599	20%
Energiean UK Limited	06683599	80%
Alpha Petroleum (UK) Holdings Limited	08774092	0%
Energiean PLC	10758801	0%

1.5 Summary of Proposed Decommissioning Programmes

Table 1.5: Summary of Decommissioning Programmes

Proposed Decommissioning Solution	Reason for Selection
1. Topside	
<p>Complete removal and re-use or recycle.</p> <p>The topside will be made hydrocarbon free, removed by a lift vessel and returned to shore.</p> <p>Re-use followed by recycle and then landfill will be the prioritised options for the topside.</p>	<p>Complies with OSPAR requirements and OPRED guidelines and maximises recycling of materials.</p>
2. Substructures – Jacket	
<p>Complete removal and re-use or recycle.</p> <p>Jacket will be removed and dismantled at an onshore location. Re-use followed by recycle will be the prioritised options.</p> <p>Jacket skirt piles will be severed at least 3.0m below the seabed. If any practical difficulties are encountered APRL will consult OPRED.</p>	<p>Leaves clear seabed, removes a potential obstruction to fishing operations and maximizes recycling of materials, to comply with OSPAR requirements and OPRED guidance.</p>
3. Subsea Installation –Mid-line tee	
<p>Complete removal and re-use or recycle.</p> <p>The complete protection structure will be removed and returned to shore for recycling. The piping manifold will be cut 600mm or greater below the natural seabed level and returned to shore for recycling. The remaining piping manifold attached to the pipeline will be left buried in situ.</p>	<p>To leave a clear seabed.</p> <p>Minimal seabed disturbance, lower energy usage, reduced risk to personnel</p>

4. Pipelines	
<p>Pipelines flushed and cleaned and left buried in situ. Cleaning methodology not yet defined but it is likely the 3" chemical pipeline will be flushed through with seawater into the 8" export pipeline. The 8" pipeline will then be flushed with seawater at velocity with two pipeline volumes and the contents disposed of down a Wenlock well.</p>	<p>Comparative Assessment concludes minimal seabed disturbance, lower energy usage and reduced risk to personnel is the practicable solution compared to complete removal.</p>
5. Pipeline spools and stabilisation features	
<p>Exposed tie-in spools and pipeline stabilisation features (mattresses and gravel bags) removed, returned to shore, and recycled. If any practical difficulties are encountered APRL will consult OPRED.</p> <p>Tie-in spools and pipeline stabilisation features (mattresses and gravel bags) under rock dump to remain in situ.</p>	<p>To leave, as far as reasonably practicable, a clear seabed to comply with OSPAR requirements and OPRED guidance</p>
6. Wells	
<p>Permanent well Plug and Abandonment (P&A) will be completed within 2 years of CoP.</p> <p>P&A in accordance with HSE 'Offshore Installations and Wells Design and Construction Regulations 1996', 'Oil & Gas UK Guidelines and licence conditions for the Suspension and Abandonment of wells Issue 6, June 2018', and compliant with the relevant WONS applications. Any problems encountered the relevant authority will be consulted.</p> <p>Conductors will be cut a minimum of 3m below the natural seabed level. If any practical difficulties are encountered APRL will consult OPRED.</p>	<p>Meets HSE regulatory requirements and is in accordance with OGUK and OGA guidelines and licence conditions.</p>
7. Legacy well	
<p>Permanent well P&A will be completed within 2 years of CoP.</p> <p>P&A in accordance with HSE 'Offshore Installations and Wells Design and Construction Regulations 1996', 'Oil & Gas UK Guidelines and licence conditions for the Suspension and Abandonment of wells Issue 6, June 2018', and compliant with the relevant WONS applications. Any problems encountered the relevant authority will be consulted.</p> <p>Conductor will be cut a minimum of 3m below the natural seabed level. If any practical difficulties are encountered APRL will consult OPRED.</p>	<p>Meets HSE regulatory requirements and is in accordance with OGUK and OGA guidelines and licence conditions.</p>

8. Interdependencies

The Wenlock pipelines will be decommissioned up to the first riser elbow flanges approximately 2m above seabed at the Inde 23AC platform. The risers are owned by PUK who will decommission the risers as part of the later PUK Inde 23AC decommissioning programme.

The remote abandoned appraisal well conductor will be identified to users of the sea in accordance with United Kingdom Hydrographic Office requirement and included on Admiralty charts if future planning dictates that the platform is removed before the conductor. The conductor is 30-inch diameter, remains 3.2m above the natural seabed level and is located within the Wenlock 500m safety zone, 239m South East of the Wenlock platform.

1.6 Field Location Including Field Layout and Adjacent Facilities

Figure 1.1 Field Location in UKCS

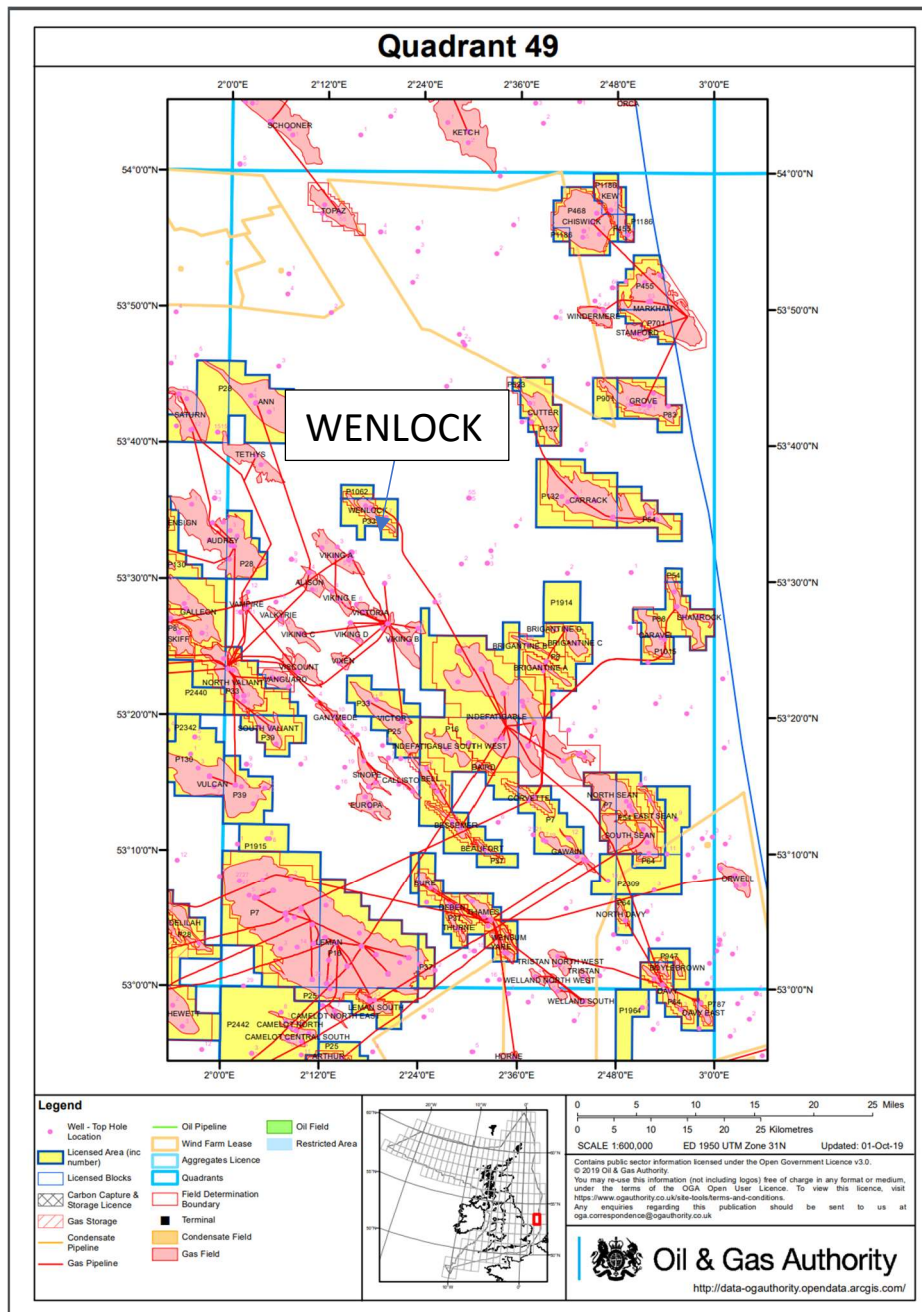


Figure 1.2 Map showing Wenlock Field Location in relation the host platform Indefatigable 23A & other adjacent facilities & wells

The numbered dots are existing wells and abandoned wells. Within the Wenlock licence blocks P33 and P1062 are the Wenlock platform wells and legacy well. All other wells are not owned by APRL. Number 5 located close to the Wenlock export line is the Exploration and Appraisal suspended well 49/18 5Z which is not currently licenced or viewed as a current economic prospect by APRL. This well is 171m from the Wenlock export pipeline mid-line tee which was originally installed as a tie-in point for this reservoir.

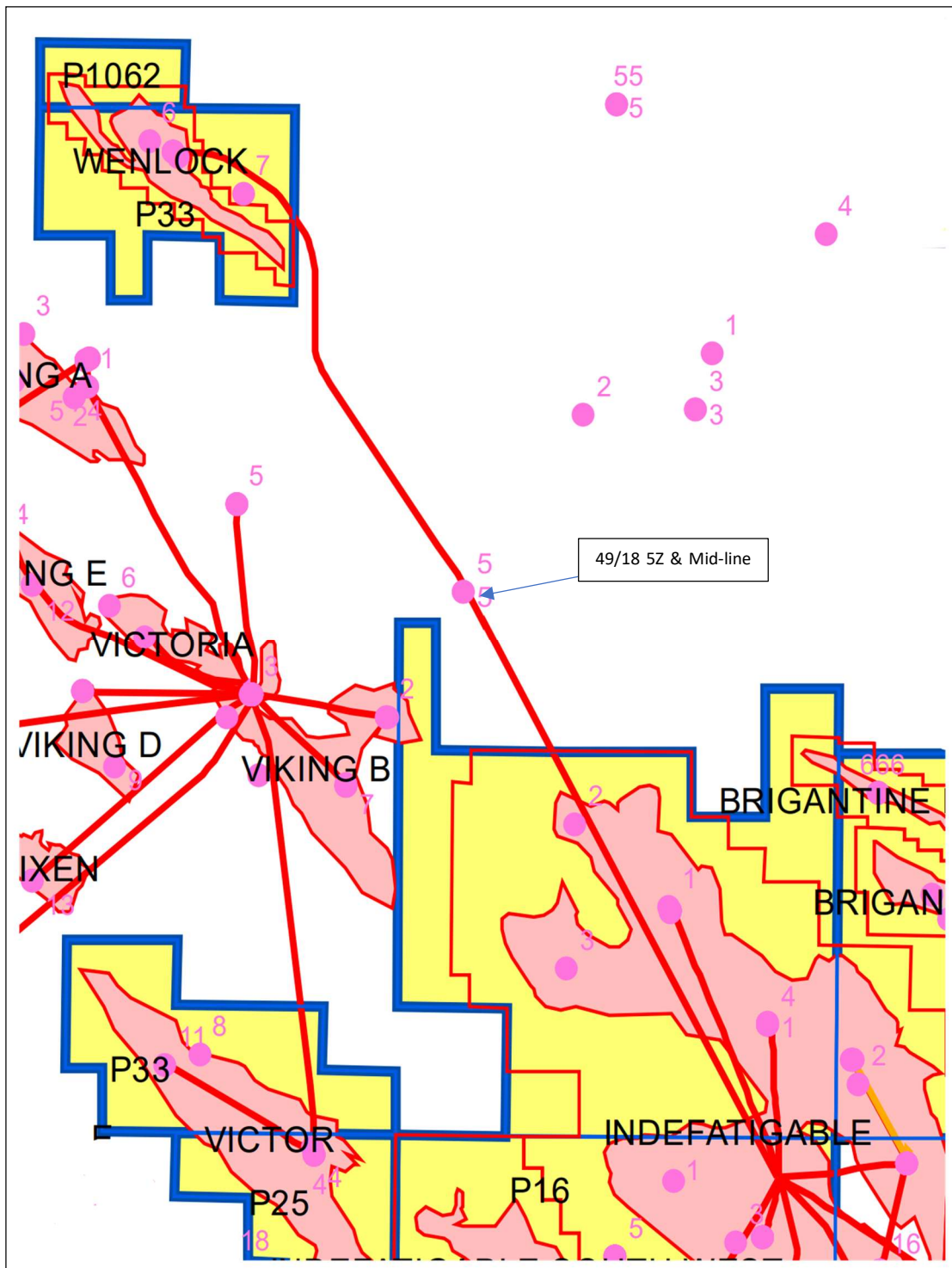


Figure 1.3 Field Layout

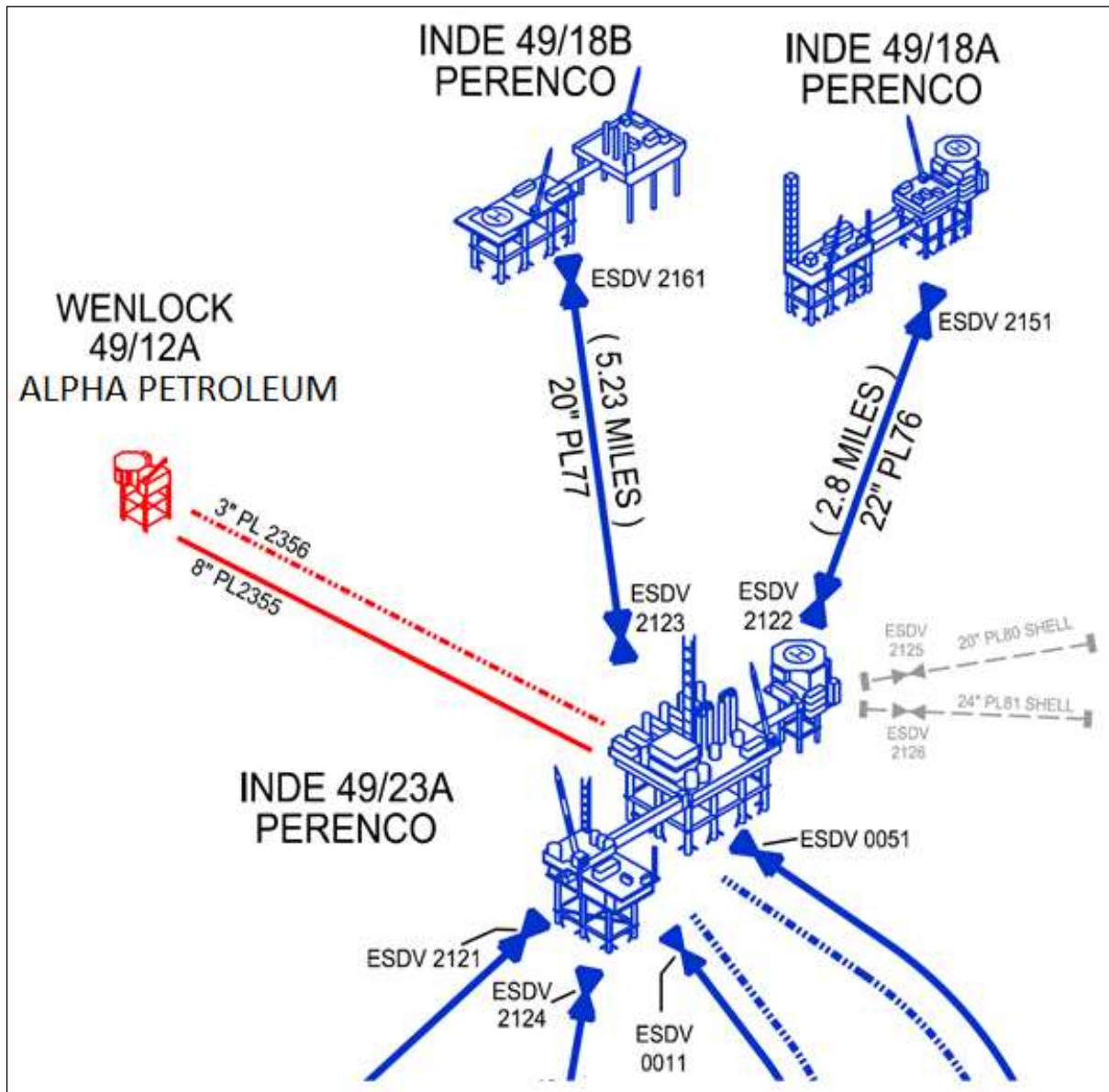


Figure 1.4 Legacy Well location

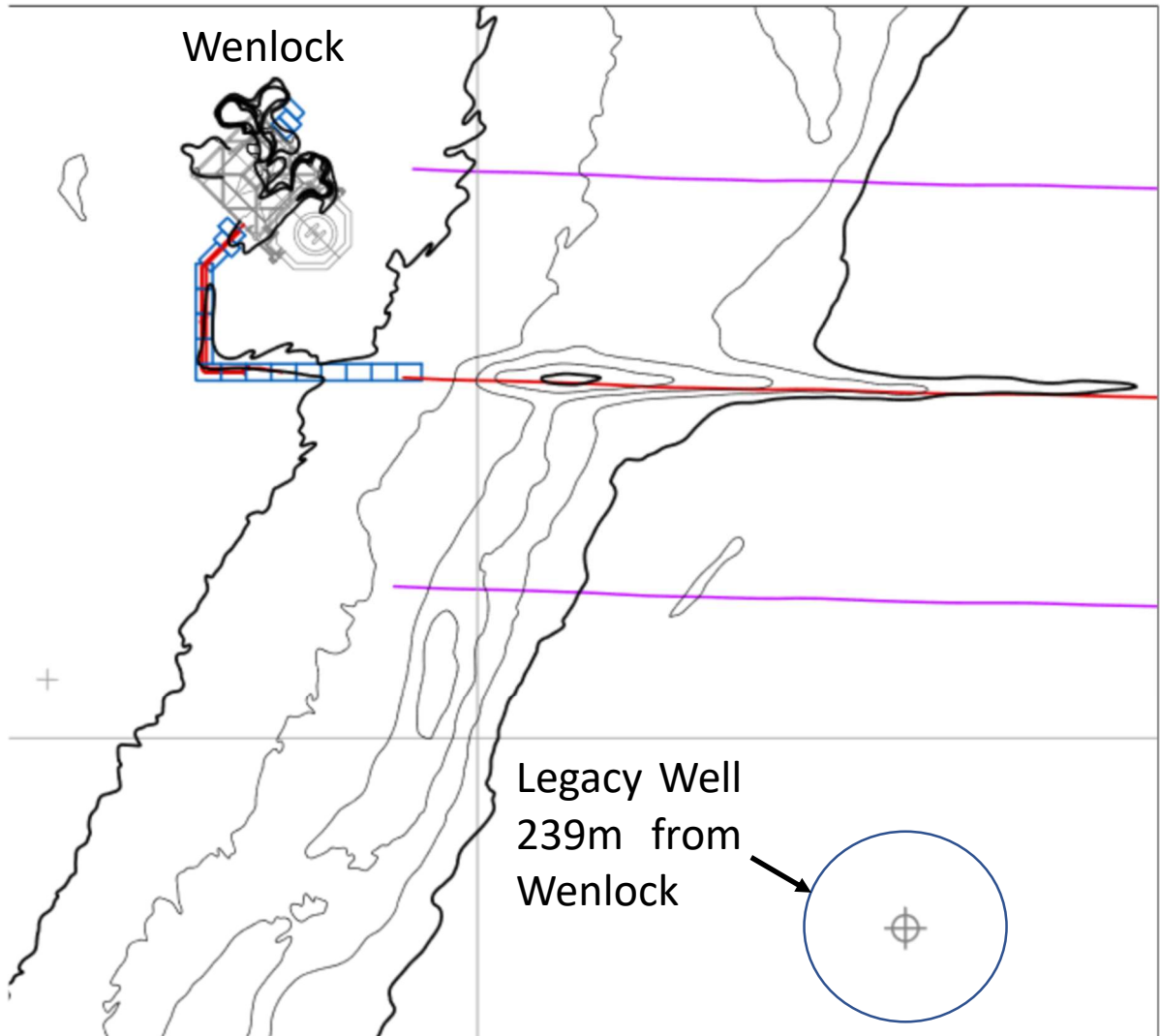


Figure 1.5 Marine Protected Areas surrounding Wenlock

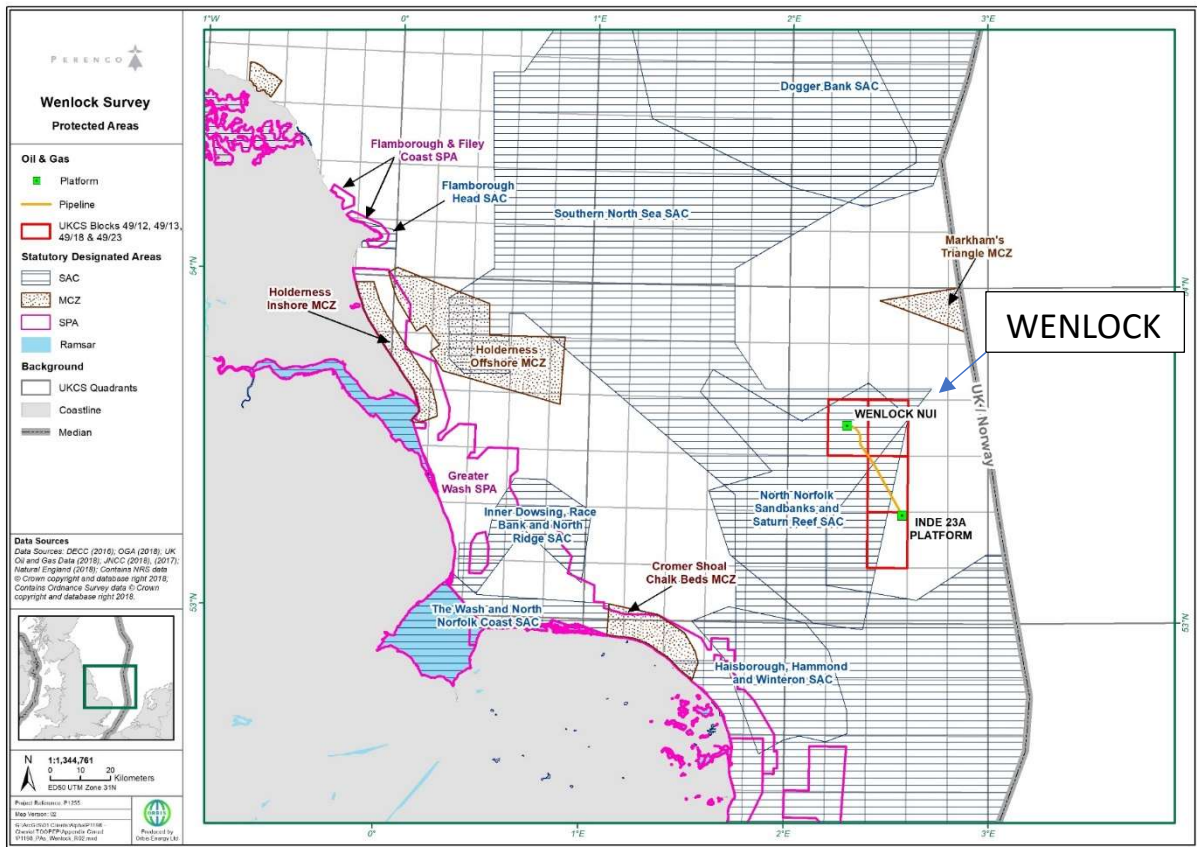


Figure 1.6 Field Location and Adjacent Facilities

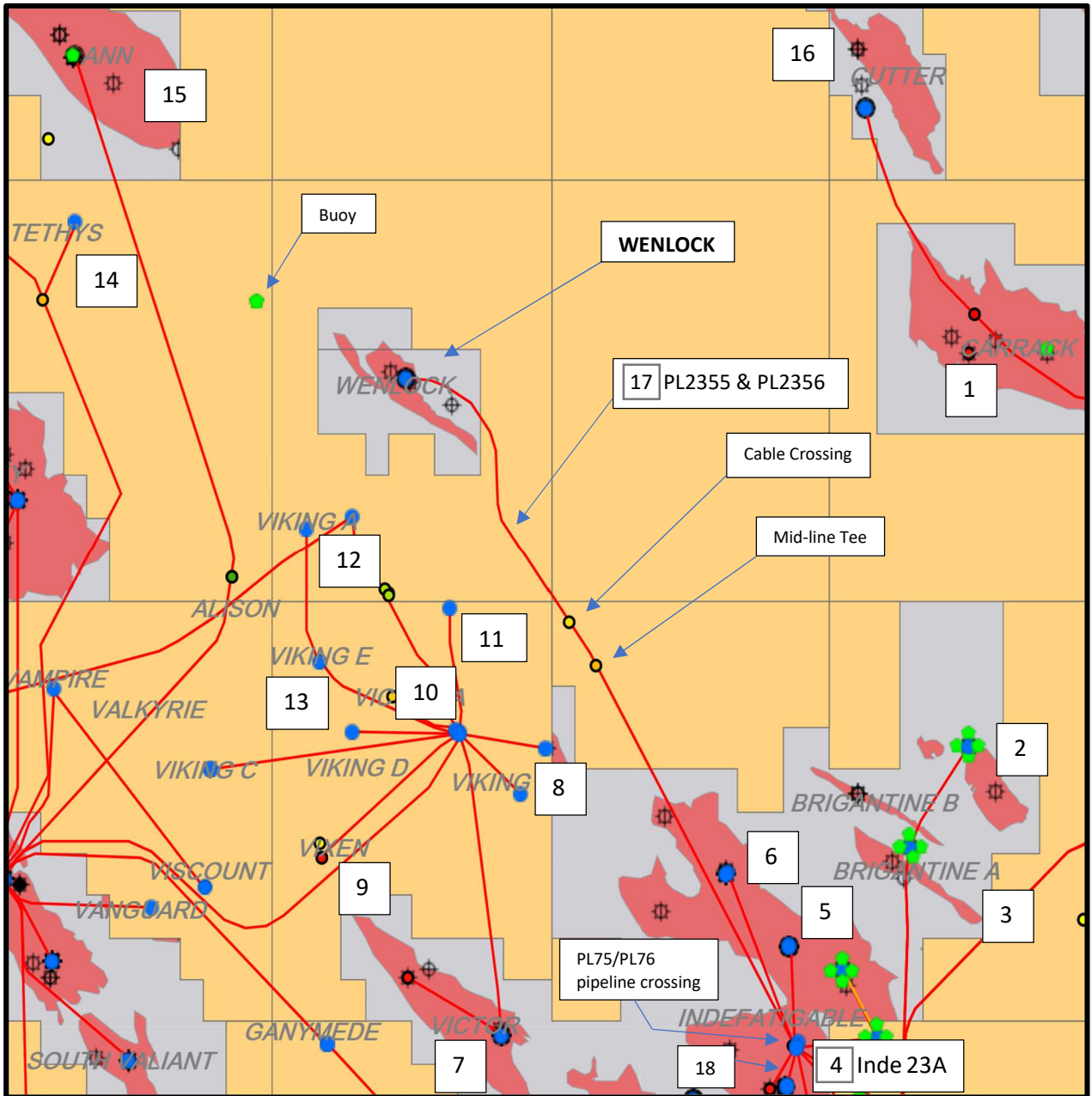


Table 1.6: Adjacent Facilities

Ref	Operator	Name	Type	Distance/ Direction	Information	Status
1	Shell U.K. Limited	Carrack QA	Platforms	32km East, 90°	Third party installation	Operational
2	Shell U.K. Limited	Brigantine BR	Platforms	31km South South-East 120°	Third party installation	Operational
3	Shell U.K. Limited	Brigantine BG	Platforms	30km South South-East, 130°	Third party installation	Operational
4	Perenco (UK) Limited	Inde 23A 3 platforms: 23AC 23AT 23AQ	Platforms	35km South South-East 147°	Third party installation. Wenlock Gas/liquids exported 36km to 23AC for onward export approx. 36km to Leman 27B. MEG injection from 23AC 36km to Wenlock.	Operational
5	Perenco (UK) Limited	Inde 18B	Platform	35km South South-East 144°	Third party installation. Pipeline to 23A approx. 4.5km	Operational
6	Perenco (UK) Limited	Inde 18A	Platform	35km South South-East 157°	Third party installation. Pipeline to 23A approx. 8.5km	Operational
7	Chrysaor Production (U.K.) Limited	Victor JD	Platform	30km South 171°	Third party installation.	Decommissioned
8	Chrysaor Production (U.K.) Limited	Viking Delta	Platform	17.5km South South-East, 159°	Third party installation	Decommissioned
9	Chrysaor Production (U.K.) Limited	Vixen VM	Subsea well	22km South South-West, 190°	Third party installation	Decommissioning underway
10	Chrysaor Production (U.K.) Limited	Viking Bravo	Platform	16km South, 170°	Third party installation	Decommissioning underway
11	Chrysaor Production (U.K.) Limited	Viking Hotel	Platform	10.5km South, 169°	Third party installation	Decommissioned

12	Chrysaor Production (U.K.) Limited	Viking Alpha	Platform	7km South South-West, 203°	Third party installation	Decommissioning underway
13	Chrysaor Production (U.K.) Limited	Viking Echo	Platform	13km South South-West, 198°	Third party installation	Decommissioned
14	Chrysaor Production (U.K.) Limited	Tethys	Platform	17km North-West, 294°	Third party installation	Operational
15	Spirit Energy North Sea Limited	Ann	Subsea well	22km North North-West, 312°	Third party installation	Decommissioning underway
16	Shell U.K. Limited	Cutter	Platform	25km North North-East, 60°	Third party installation	Operational
17	Alpha Petroleum Resources Limited	Wenlock Pipelines, PL2355 / PL2356	Pipelines	Between Wenlock and 23AC	PL2355: 36km 8" Gas export pipeline PL2356: 36km 3" Methanol pipeline	Operational
18	Perenco (UK) Limited	23A Export, PL22	Pipeline	Between 23AT and 27BT	PL22: 36km 30" export pipeline for Inde and Wenlock	Operational

Impacts of Decommissioning Proposals

The Inde 23A installation is the only installation affected by Wenlock decommissioning. The Wenlock gas reception facilities owned by PUK and located on the Inde 23AC platform, will be decommissioned by PUK as part of their future Inde 23AC platform decommissioning in accordance with their section 29 notification. PUK agree to this proposal.

The Wenlock pipelines PL2355 and PL2356 cross over the Inde pipelines PL76 & PL77 inside the Inde 23A 500m zone. Where the pipeline spools cross over the Indefatigable pipelines PL76 and PL77, concrete mat supports were built below the Wenlock spools to ensure the pipelines had separation between them. These sections of spool pipeline were then rock dumped to provide protection of the whole area. These pipeline crossings are proposed to be left in-situ; should the approach be approved by OPRED, the PL crossing, on-going monitoring, and any remediation of the PL crossing will remain the responsibility of Alpha Petroleum and its partner Edison. PUK agree to this proposal.

The Wenlock pipelines cross over the Norsesea communications cable operated by Tampnet AS and will be left in-situ at the crossing. Tampnet AS agree to this proposal.

1.7 Industrial Implications

It is the intention to develop a contract and procurement strategy that will result in a safe, efficient, and cost-effective execution of the decommissioning works that is scheduled in order to provide flexibility. Where appropriate, existing framework agreements may be used for decommissioning scope. APRL will aim to reduce costs by combining scope with other Operators should the opportunity arise.

APRL has submitted the Supply Chain Action Plan (SCAP) to OGA which outlines the Wenlock decommissioning project activities in relation to its supply chain. This is to derive maximum value, reduce expenditure and demonstrate APRL and its partner Energean are well positioned to deliver their Decommissioning Programme commitments. The SCAP outlines how APRL intends to contribute towards Total Value Added through fair and open engagement with its chosen supply chains, through a robust 'Invitation To Tender' (ITT), assessment process and evaluation process.

APRL have identified the intention to complete the work using vessel(s) within the Decommissioning Programmes. The vessel(s) will be identified at a later date.

2. DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Installation: Surface Facilities

Table 2.1: Surface Facilities Information									
Name	Facility Type	Location		Topside		Jacket			
				Weight (Te)	No of modules	Weight (Te)	Number of legs	Number of piles	Weight of piles (Te)
Wenlock Installation	Fixed platform (NUI)	WGS84 Decimal Minute	53°35.1983' N 2° 34.2976' E	435	1	645	4	4	351

2.2 Installation: Subsea Installation only

Table 2.2: Subsea Installations					
Subsea installations	Number	Size/Weight (Te)	Location		Comments/Status
Remote abandoned appraisal well 49/12a-8	1	2.2Te above seabed	Geographical coordinates	53°35'18.12" N 2° 17' 51.11" E	The remote abandoned appraisal well is located within the Wenlock 500m safety zone, 239m South East of the Wenlock platform. The well has been abandoned with a single plug February 1989 and two further plugs are required to fully abandon in line with regulations. The 30-inch diameter conductor was originally cut and remains 3.2m above the natural seabed level and will be removed -3m below the natural seabed level.
Mid-line tee structure	1	4.5m x 2.8m x 2.2m/5.4Te	Geographical coordinates	53°28'29.23" N 2° 25' 49.65" E	On the export pipeline is a protection structure, not piled to the seabed, which is located within a dredged area of the seabed and is partially buried with the structure lid visible above the natural seabed. Gravel bags and 4 off 6m x 3m x 0.3m concrete mats are placed around the edge of the structure within the dredged area.

2.3 Pipelines Including Stabilisation Features

Table 2.3: Pipeline Information									
Description	Pipeline Number (as per PWA)	Diameter (inches)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
Gas Export Pipeline	PL2355	8"	36.316 (PWA consented length)	API 5L X65 steel pipe with FBE coating	Gas	Wenlock Platform – 23AC Platform ESDV's	Fully trenched and buried up to tie-in spools	Operational	Unprocessed Natural Gas
Chemical Injection Pipeline	PL2356	3"	36.316 (PWA consented length)	API 5L X65 steel pipe with FBE coating	Chemicals	Wenlock Platform – 23AC Platform ESDV's	Fully trenched and buried up to tie-in spools	Operational	MEG and Corrosion Inhibitor
PL2355 / PL2356 crossing over the Norsea communications cable	N/A	N/A	N/A	Concrete mattresses are over the cable crossing covered with rock dump	N/A	Geographical coordinates 53°29'29.81" N 2° 24' 41.71" E	Buried and covered with rock dump	N/A	N/A
PL2355 / PL2356 crossing over PL 76 / PL77 within the Inde 23A 500m zone	N/A	N/A	N/A	Concrete mattresses and gravel bags are underneath the Wenlock pipelines to provide separation. The full area of both crossings has been subsequently rock dumped over both Indefatigable and Wenlock pipelines	N/A	Geographical coordinates 53°19'24.4" N 2° 34' 26.5" E And 53°19'24.6" N 2° 34' 27.7" E	Buried and covered with rock dump	N/A	N/A

Table 2.4: Pipeline Stabilisation Features				
Stabilisation Feature	Total Number	Weight (Te)	Location(s)	Exposed/Buried/Condition
Concrete mattresses	61	Various: ≈6.12 Te – 9.2 Te	Along PL2355 and PL2356. 18 within the Wenlock 500m safety zone. 35 within the Indefatigable 500m safety zone. 4 at the mid-line tee structure. 4 at the Norsesea communications cable crossing	Exposed and buried
Gravel bags	≈100	25kg each	Various around the concrete mattresses	Buried and exposed around the concrete mattresses
Rock Dump (Wenlock and pipeline)	23 locations	5,240 Te	23 locations	Exposed and buried
Rock Dump (23A)	1 location	1200 Te	1 location	Exposed and buried
Rock Dump (Norsea communications cable crossing)	1 location	956 Te	1 location	Exposed and buried

2.4 Wells

Table 2.5: Well Information			
Platform Wells	Designation	Status	Category of Well
49/12a-W1 49/12a-W1z (side-track)	Gas Production	Producing	PL 3-3-3
49/12a-W2 49/12a-W2z (side-track)	Gas Production	Producing	PL 3-3-3
49/12a-W3 49/12a-W3z (side-track)	Gas Production	Producing	PL 3-3-3
Subsea Wells			
49/12a-8	Appraisal gas well (legacy well)	The reservoir has been permanently isolated (AB1). Possible intermediate zones with flow potential have been permanently isolated. Isolation needs confirmation. (AB2)	SS 0-2-1 or SS 0-4-1

2.5 Drill Cuttings

There is no evidence of drill cuttings associated with the Wenlock installation or appraisal well 49/12a-8. Drill cuttings that were generated during the prior drilling activity would have been distributed widely during drilling due to the local currents. APRL has carried out seabed sampling to verify the absence of any cutting debris.

2.6 Inventory Estimates

Figure 2.1: Pie Chart of Estimated Inventories (Installation)

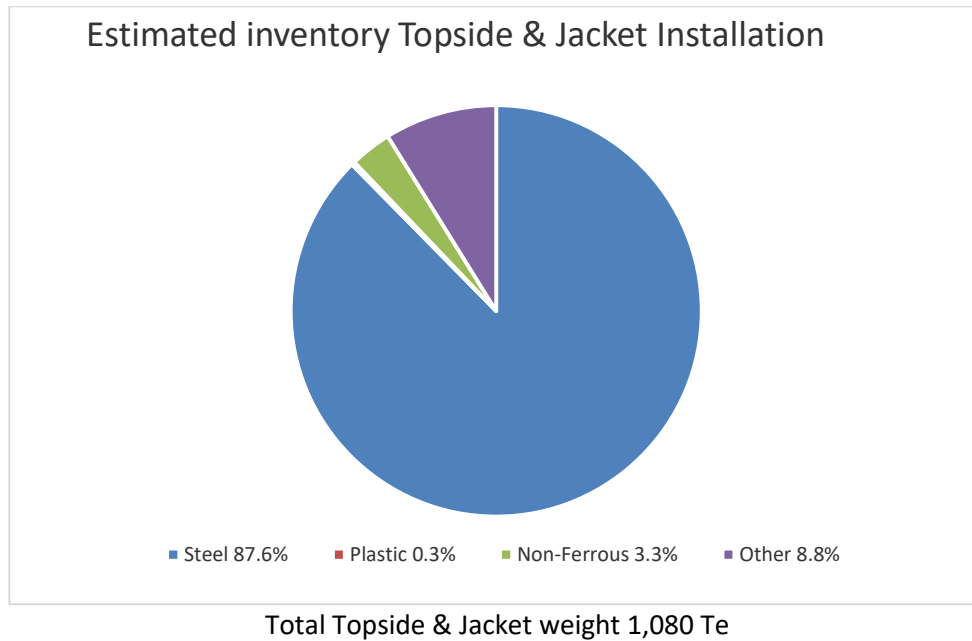
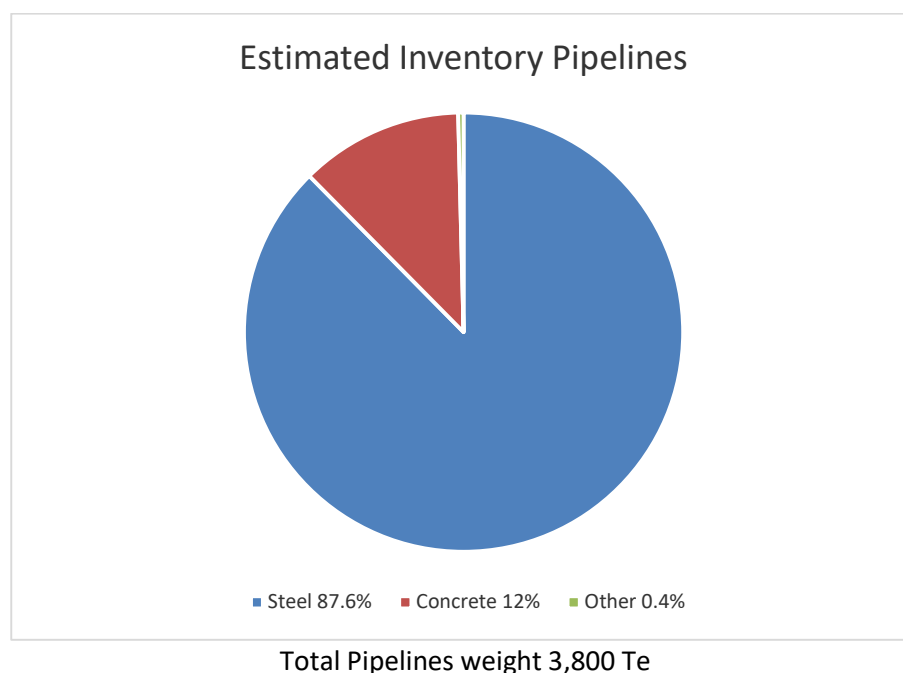


Figure 2.2: Pie Chart of Estimated Inventory (Pipelines)

Reference to the EA for further information on inventories remaining and their environmental impact.



3. REMOVAL AND DISPOSAL METHODS

Waste will be dealt with in accordance with the Waste Framework Directive 2008/98/EC. The reuse of an installation or pipelines (*or parts thereof*) is first in the order of preferred decommissioning options, followed by recycling, recover other value and landfill if no alternative is available. Waste generated during decommissioning will be segregated by type and transported to shore in an auditable manner to a disposal yard/dismantling site and recycled through licensed waste contractors in accordance with regulations. Waste disposed of outside of the United Kingdom will be in accordance with the Transfrontier Shipment of Waste Regulations 2007. Steel and other recyclable metal are estimated to account for the greatest proportion of the materials inventory. Reference EA, section 3.5, for further information on waste.

Alternative uses for the Wenlock facilities have been investigated and considered within the CoP document submitted to OGA and none were found viable. These were;

- Platform Electrification,
- Gas-to-Wire (GTW),
- Carbon Capture and Storage (CCS),
- Hydrogen (H₂) – both ‘Blue’ (methane reforming, with capture and storage of resulting CO₂) and ‘Green’ (water electrolysis, using power from renewable sources)
- Energy Hubs.

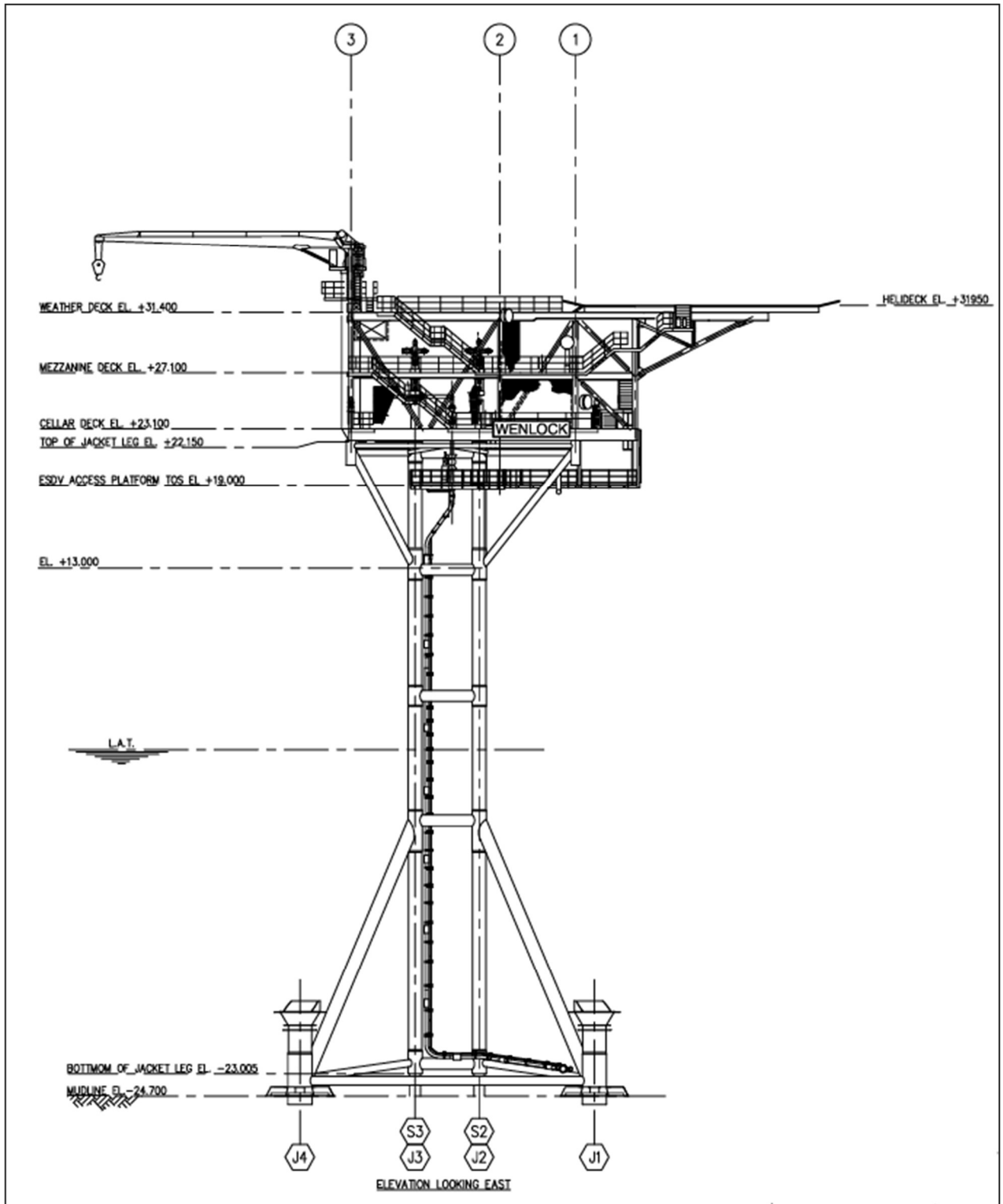
The platform equipment inventory will be assessed for use as spares for APRL asset portfolio.

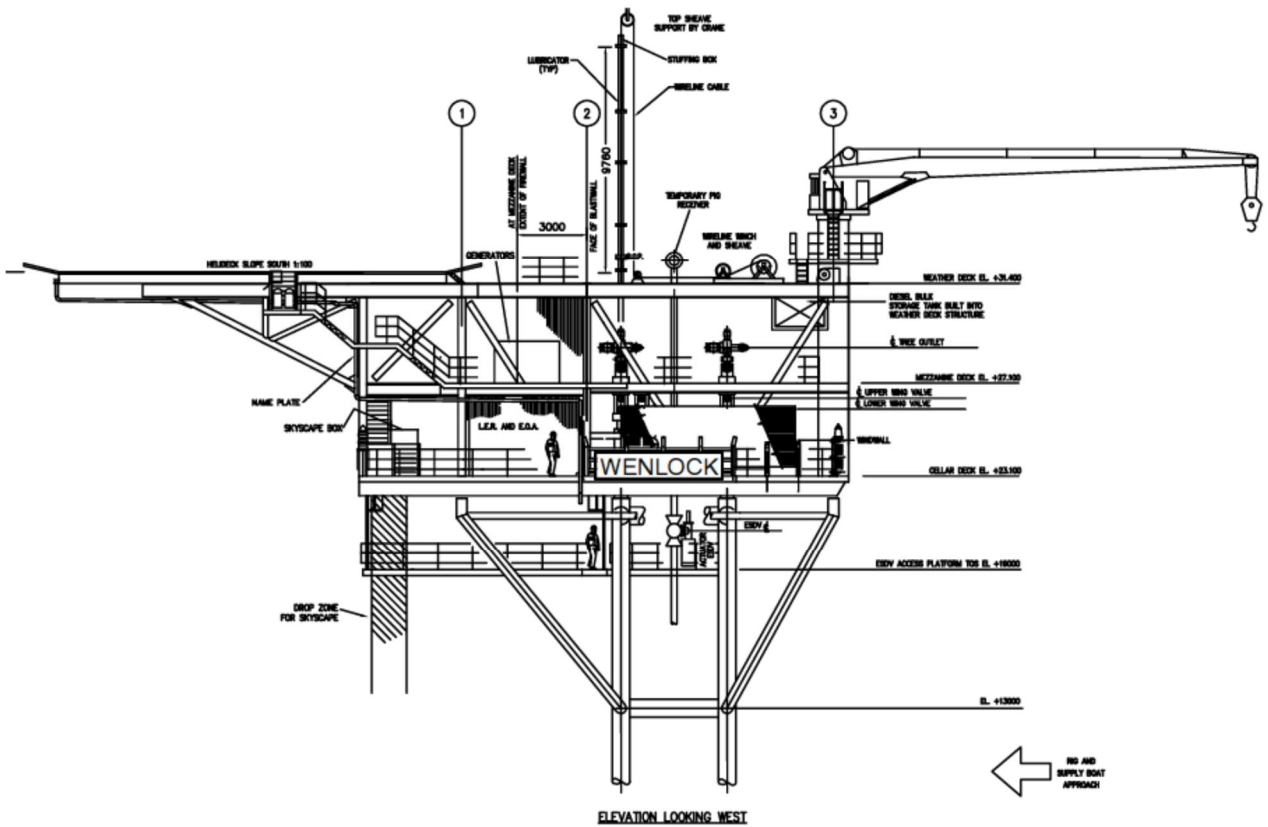
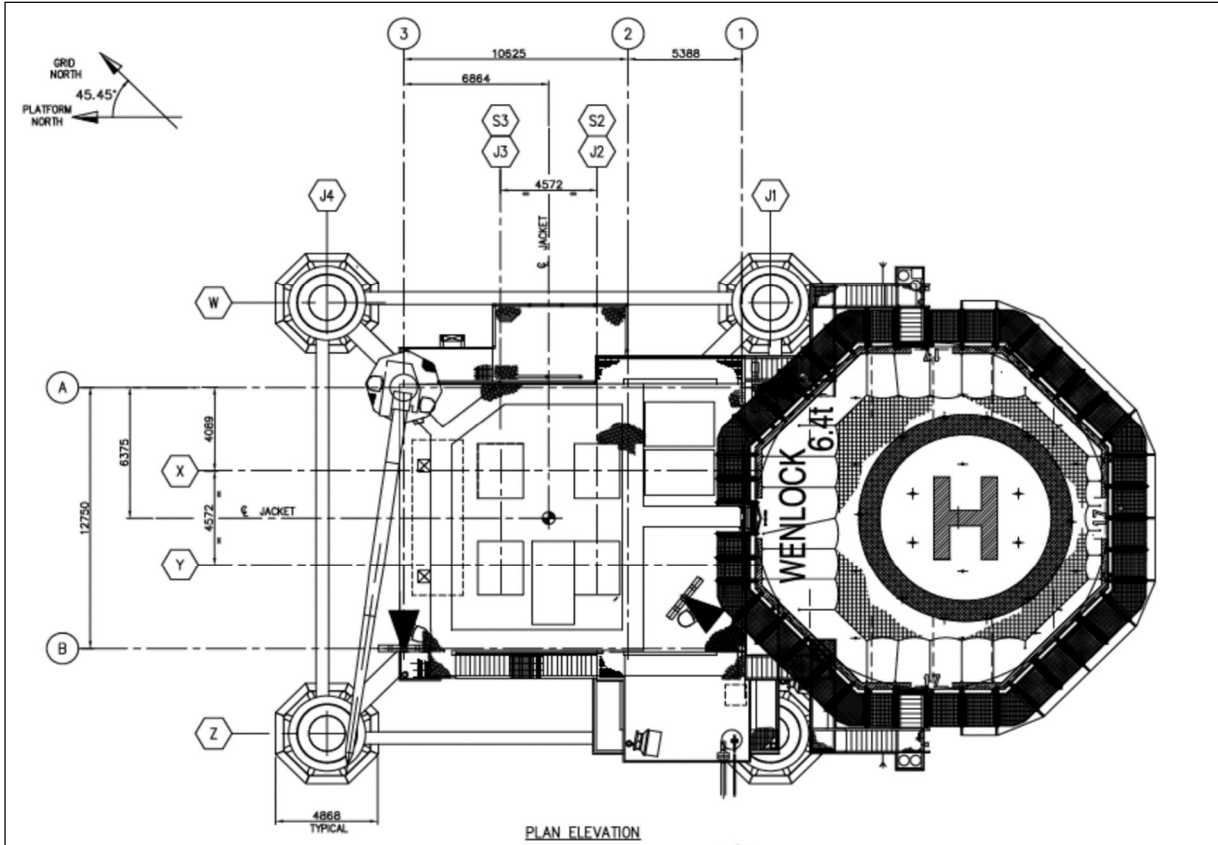
3.1 Topside

3.1.1 Topside Decommissioning Overview

Topside Description: The Wenlock topside structure comprises three levels with an ESDV deck underneath, weighs 435 Te and the primary structure measures 12.75m x 16m x 9.25m high. The lower level is the Cellar Deck and has the three wellheads, wellhead control panel, Local Equipment Room, Temporary Refuge and from which gas is exported via an 8” riser and MEG imported via a 3” riser. The Mezzanine Deck has the Christmas trees, generators, freshwater tank, and HVAC system. The Main Deck has the diesel tank integrated within the steel framework, crane, and cantilevered helideck.

Figures 3.1: Drawings of the Topside





3.1.2 Preparation/Cleaning:

Table 3.1: Cleaning of the Topside for Removal		
Waste Type	Composition of Waste	Disposal Route
Onboard hydrocarbons	Process fluids, fuels, and lubricants	Flushed clean and either injected into platform wells or drained to tote tanks for transport and appropriate disposal onshore
Other hazardous materials	NORM, LSA Scale, any radioactive material, instruments containing heavy metals, batteries	Some of these materials may be present and if identified will be transported onshore for re-use/disposal by appropriate methods. NORM will be disposed of in accordance with the appropriate permits. In the event that a Transfrontier Shipment of Waste (TFSW) permit is required, APRL will liaise with the relevant Waste Authority and ensure all relevant permits/consents are in place
Original paint coating		Wenlock has no lead-based paint. Appropriate safety measures will be taken dealing with all coatings
Asbestos and Ceramic Fibre		Wenlock has no asbestos or ceramic fibre. Appropriate safety measures will be taken dealing with all material removals

3.1.3 Removal Methods:

Table 3.2: Topside Removal Methods	
1) Semi-Submersible Crane Vessel <input checked="" type="checkbox"/> 2) Monohull Crane Vessel <input checked="" type="checkbox"/> 3) Shear Leg Vessel <input checked="" type="checkbox"/> 4) Jack up Work barge <input checked="" type="checkbox"/> 5) Piece small or large <input checked="" type="checkbox"/> 6) Complete with jacket <input checked="" type="checkbox"/>	
Method	Description
Single lift removal along with jacket using SSCV/MCV/SLV	Removal of topside and jacket as a complete unit followed by recovery to shore for re-use, recycling, and disposal as appropriate.
Single lift removal using SSCV/MCV/SLV	Removal of topside as a single unit followed by recovery to shore for re-use, recycling, disposal as appropriate.

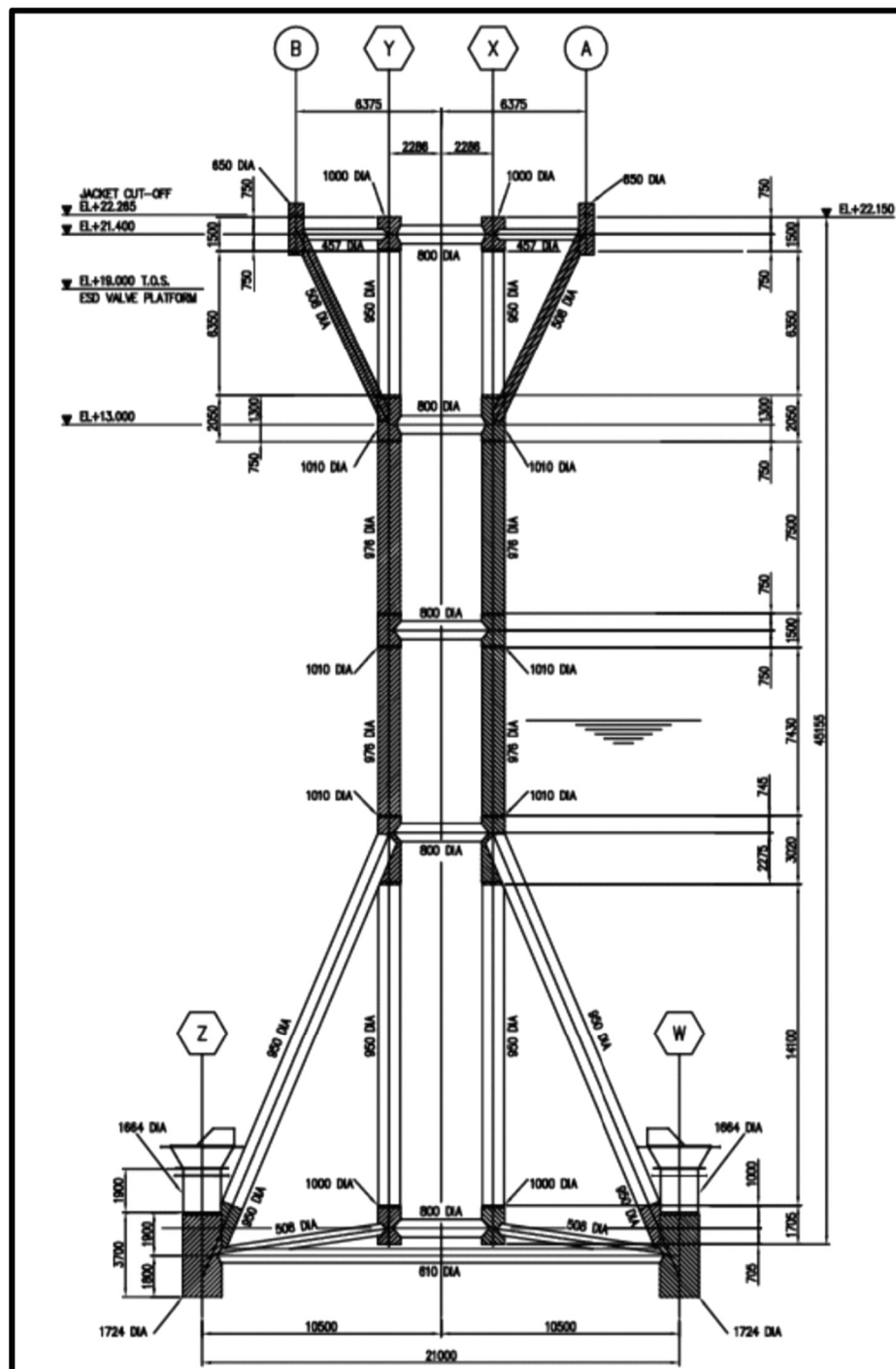
<p>Piece-small or piece large removal using JUWB</p>	<p>Removal of topside in a series of smaller sub-units making use of the JUWB used for the well decommissioning activities, followed by recovery to shore for a programme of re-use, recycling or disposal as appropriate.</p>
<p>Proposed removal method and disposal route</p>	<p>Removal of topside followed by recovery to shore for re-use, recycling, and final disposal to landfill as appropriate. A final decision on the decommissioning method will be made following a commercial tendering process and OPRED notified. It is likely the platform removal will be a reverse of the installation, with a single lift of the topside followed by a single lift of the jacket.</p> <p>The preferred options will be to prepare Wenlock topside for lift, then a) collaborate with other decommissioning or installation projects to share costs, and /or b) to engage in dialogue with lift vessel owners and closely monitor for opportunities where a lift vessel has unplanned availability in the vicinity and can at short notice remove the Wenlock topside. These solutions could involve any of the lift vessel types.</p>

3.2 Jacket

3.2.1 Jacket Decommissioning Overview

The jacket weighs approximately 645Te which includes the weight the piles sections removed, and an estimate of marine growth and lifting appurtenances. It is likely the jacket removal will be a reverse of its installation, a single lift. With the topside removed the piles will be internally cut 3.0m or greater below the seabed, slings attached, the jacket lifted and returned to shore for recycling. If any practical difficulties are encountered APRL will consult OPRED.

Figure 3.2: Diagram of the Jacket



3.2.2 Jacket Removal Methods

Table 3.3: Jacket Removal Methods	
1) Semi-Submersible Crane Vessel <input checked="" type="checkbox"/> 2) Monohull Crane Vessel <input checked="" type="checkbox"/> 3) Shear Leg Vessel <input checked="" type="checkbox"/> 4) Jack up Work barge <input checked="" type="checkbox"/> 5) Piece small or large <input checked="" type="checkbox"/> 6) Complete with topside <input checked="" type="checkbox"/>	
Method	Description
Single lift removal along with topside using SSCV/MCV/SLV	Removal of topside and jacket as a complete unit followed by recovery to shore for re-use, recycling, and disposal as appropriate.
Single lift removal using SSCV/MCV/SLV	Removal of jacket as a single unit followed by recovery to shore for re-use, recycling, disposal as appropriate.
Piece-small or piece large removal using JUWB	Removal of jacket in a series of smaller sub-units, followed by recovery to shore for re-use, recycling or disposal as appropriate.
Proposed removal method and disposal route	<p>Removal of the jacket, piles cut 3m below the natural seabed level, followed by recovery to shore for re-use, recycling, and final disposal to landfill as appropriate.</p> <p>A final decision on the decommissioning method will be made following a commercial tendering process and OPRED notified. It is likely the jacket removal will be a reverse of the installation, a single lift of the jacket.</p> <p>The preferred options will be to prepare Wenlock jacket for lift, then a) collaborate with other decommissioning or installation projects to share costs, and /or b) to engage in dialogue with lift vessel owners and closely monitor for opportunities where a lift vessel has unplanned availability in the vicinity and can at short notice remove the Wenlock jacket. These solutions could involve any of the lift vessel types.</p>

3.3 Subsea Installations Decommissioning Options

Table 3.4: Subsea Installations Decommissioning Options			
Subsea installations	Number	Option	Disposal Route (if applicable)
Mid-line tee Protection Structure.	1	Complete removal.	Return to shore for reuse/recycling/disposal
Remote abandoned appraisal well conductor	1	<p>Conductor will be cut internally >3.0m below the natural seabed level and removed. The vessel utilised to fully plug and abandon the well will execute the cut.</p> <p>If any practical difficulties are encountered APRL will consult OPRED.</p>	Return to shore for reuse or recycling

3.4 Pipelines

Decommissioning Options:

*Key to Options:

- | | | |
|-----------------------------|---------------------------|-----------------------------|
| 1) Remove - reverse reeling | 2) Remove - Reverse S lay | 3) Trench and bury |
| 4) Remedial removal | 5) Remedial trenching | 6) Partial Removal |
| 7) Leave in place | 8) Cut and lift | 9) Removal of tie-in spools |

Table 3.5: Pipelines Decommissioning Options			
Pipeline	Condition of line/group (Surface laid/trenched/buried/spanning)	Whole or part of pipeline/group	Decommissioning options considered
PL2355, PL2356	Trenched, buried	Whole of pipelines	1, 6, 7, 9

Comparative Assessment Method:

The options were assessed using the OPRED Decommissioning Guidance Notes and project specific guidelines developed for a detailed assessment workshop.

A two-stage process with an early option screening assessment to narrow options to a manageable number followed by a detailed comparative assessment of selected options was adopted.

Stage 1: Option screening

A list of potential decommissioning options was developed for each pipeline which included an option for full recovery of all infrastructure, a leave all infrastructure in situ option and several partial removal options of specific elements. In a desktop exercise each of these options were then evaluated against safety, environmental, technical, societal, and economic categories, and considerations. They were then identified within each category as either an acceptable solution, a solution that may be acceptable with appropriate actions or control measures or an unacceptable option. Each option was then reviewed across all categories to establish whether the option should be selected for a more detailed comparative assessment. The outcome of this desktop exercise was then peer reviewed by Alpha Petroleum Limited staff not directly involved with Wenlock decommissioning planning and was shared with OPRED to ensure agreement that all potentially viable options were considered as part of the stage 2 detailed assessment.

Stage 2: Detailed assessment

Following development and approval of a Terms of Reference document a virtual workshop with available stakeholders and Alpha decommissioning project team members was held. The workshop was conducted via MS Teams as a result of the COVID-19 pandemic. This, along with pre workshop reading material and post workshop sharing of the output result worksheets ensured all relevant parties input to the assessment was captured.

In order to rate the impact of the selected options a further review against safety, environmental, technical, societal, and economic categories was carried out. Subcategories were reviewed and allocated a red, green, or amber rating code for each option in line with a pre-prepared guide table. Once the impacts for all subcategories were allocated the workshop attendees assigned an overall rating for each Category. A high, mid, or low certainty was also allocated to the degree of definition of the methods to be used, status of the infrastructure, equipment required, public opinion perception and any hazards.

A final colour rating to each option/sub option in line with the below table was then allocated.

Final rating options

Preferred solution	
Broadly acceptable	
Tolerable not preferred	
In tolerable, not acceptable	

Outcome of Comparative Assessment:

As a result of the assessment, it is recommended that for both the PL2355 pipeline and the PL2356 pipeline that a partial removal option is adopted where the majority of the pipelines are left in situ. At the platform ends the sections of mattress covered pipelines shall be removed up until the point where the pipelines are either rock dumped or buried to greater than 0.6m. The protection mattresses shall also be recovered. At the mid-line tee location, the recommendation was to remove the protection structure cover and leave the remaining infrastructure in situ flush with the natural seabed level. As part of the consultation process with OPRED they have confirmed that the mid-line tee protection structure is classed as an installation and is subject to international obligations for decommissioning under the terms of OSPAR Decision 98/3. Given these OSPAR requirements and the fact that full removal of the mid-line tee structure was also found to be an acceptable option within the Comparative Assessment, full removal of the mid-line tee protection structure will be undertaken.

Table 3.6: Outcome of Comparative Assessment		
Pipeline or Group (as per PWA)	Recommended Option	Justification
PL2355, PL2356	Option 9. Removal of tie-in spoils.	Already trenched and buried to >0.6m, stable seabed, no snagging hazards

3.5 Pipeline Stabilisation Features

Table 3.7: Pipeline Stabilisation Features			
Stabilisation feature(s)	Number	Option	Disposal Route (if applicable)
Concrete mattresses (Wenlock)	18	<p>Full recovery of all exposed and not buried to 0.6m below the seabed.</p> <p>It is intended that 17 exposed or partially exposed mattresses will be recovered to shore. It is also intended to remove the pipelines underneath each recovered mattress.</p> <p>A single mattress may be used to cover the remaining pipeline end if exposed. The mattress will be moved, the pipelines cut, and then the mattress placed over the cut ends.</p>	Return to shore for reuse/recycling/disposal

		In the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment.	
Concrete mattresses (Inde)	35	<p>Full recovery of all exposed and not buried to 0.6m below the seabed. Those covered with rock dump are to be left in situ.</p> <p>It is intended that 17 exposed or partially exposed mattresses will be recovered to shore, 16 mattresses covered by rock dump will be left in situ. It is also intended to remove the pipelines underneath each recovered mattress.</p> <p>A single mattress may be used to cover each remaining pipeline end if exposed. The mattress will be moved, the pipelines cut, and then the mattress placed over the cut ends.</p> <p>In the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment.</p>	Return to shore for reuse/recycling/disposal
Concrete mattresses (Mid-line tee)	4	<p>Leave in situ if >50% of the surface area is buried to 0.6m below the seabed.</p> <p>Full recovery of mattresses if not buried, however, in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment.</p>	Return to shore for reuse/recycling/disposal
Concrete mattresses (Norsea communications cable crossing)	4	Leave in situ	N/A

Gravel bags	Approx. 100 around the concrete mattresses	Leave in situ if buried 0.6m below the seabed. Full recovery if not buried and if the associated mattresses in the vicinity are to be recovered.	Return to shore for reuse/recycling/disposal
Rock Dump (Wenlock and pipeline)	24 locations, 6,196 tonnes	Leave in situ. Mattresses beneath rock dump will be left in situ.	N/A
Rock Dump (Inde)	1 location, 1200 tonnes	Leave in situ. Mattresses beneath rock dump will be left in situ.	N/A

3.6 Wells

Table 3.8: Well Plug and Abandonment

The wells which remain to be abandoned, as listed in Section 2.4 (Table 2.5) will be plugged and abandoned in accordance with:

- OGUK Well Decommissioning Guidelines – Issue 6 – July 2018
- OGUK Guidelines on Qualification of Materials for the Abandonment of Wells – Issue 2 - 2015
- Design and Construction Regulations (DCR) 2015

A Well Intervention Master Application Template (WIA MAT) and supporting Subsidiary Application Template (SATs) will be submitted via the OPRED UK Energy Portal to gain consent to carry out the works.

A PON 5 will also be submitted to OGA for application to decommission the wells.

The platform wells are planned to be abandoned in 2021. The legacy well is planned to be abandoned by Q2 2024.

3.7 Waste Streams

Table 3.9: Waste Stream Management Methods

Waste Stream	Removal and Disposal method
Bulk liquids	<p>Hydrocarbons will be removed from the topside and shipped to shore in accordance with maritime transportation guidelines. Further cleaning will take place onshore prior to re-use or recycling.</p> <p>Contaminated seawater will be disposed of down a Wenlock well or cleaned offshore and discharged to sea. If disposal is not practicable offshore, then contaminated seawater will be removed from the topside and shipped to shore in accordance with maritime transportation guidelines. Further cleaning will take place onshore prior to re-use or recycling.</p>
Marine growth	<p>Marine growth will be removed offshore where necessary and practicable. Remaining marine growth will be disposed of onshore in accordance with guidance and company policies.</p> <p>It is estimated there will be 100 Te of marine growth.</p>

NORM/LSA Scale	Tests for NORM/LSA scale will be undertaken offshore by the Radiation Protection Supervisor and any encountered will be dealt with and disposed of in accordance with guidelines and under appropriate permit.
Asbestos	No asbestos is expected, but if small quantities are found they will be dealt with and disposed of onshore in accordance with guidelines.
Other hazardous wastes	Will be recovered to shore and disposed of in accordance with guidelines and under appropriate permit.
Onshore Dismantling sites	Appropriate licenced sites will be selected. Facility chosen by removal contractor must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver re-use and recycling options.

Table 3.10: Inventory Disposition			
	Total Inventory Tonnage	Planned tonnage to shore	Planned tonnage left <i>in situ</i> *2
Installations			
Topside	435	435	0
Jacket	645	645	0
Piles	351	100	251 (72%). Piles >3m below the mudline will remain.
Mid-line tee Protection Structure (including anodes)	5.4	5.4	0
Pipelines including stabilisation features			
Pipelines*	3,298	0	3,297 (100%)
Tie-in spools Wenlock (includes anodes)	17.06	17.06	0
Tie-in spools Inde (includes anodes)	20.55	11.71	8.84 (43%). Tie-in spools covered by rock dump.
Mattresses Wenlock	117.6	111.4	6.2 (5%). 1 mattress to cover the exposed pipeline end following severance.
Mattresses Inde	265	159.6	105.4 (40%). Mattresses covered by rock dump and 2 mattresses used to cover exposed pipeline ends following severance.
Mattresses Norsesea cable crossing / Tie-in tee	49.6	0	49.6 (100%)
Gravel bags	2.5	1.5	1 (40%). Gravel bags covered with rock dump will be left.
Mid-line tee piping manifold	0.5	0.25	0.25 (50%)

All recovered material will be transported onshore for re-use, recycling, or disposal.

- * Pipelines weight differs from the pipeline pie chart weight (3,800 Te) as it excludes tie-in spools, anodes, mattresses, gravel bags, mid-line tee protection frame and manifold.
- * Approximately 110m of pipeline and spool lengths will be removed at both Inde AC and Wenlock approach ends. Approximately 35,926m will remain in situ.

4. ENVIRONMENTAL APPRAISAL OVERVIEW

4.1 Environmental Sensitivities (Summary)

The environmental sensitivities in the area in which the decommissioning activities will take place are summarised in Table 4.1. Further details are available in the Environmental Appraisal report.

Table 4.1: Environmental Sensitivities	
Environmental Receptor	Main Features
Conservation interests	<p>The Wenlock platform and approximately 28.6 km of the route of the Wenlock pipelines, including the mid-line tee structure, is located within the boundary of the North Norfolk Sandbanks and Saturn Reef Special Area of Conservation (SAC), designated for the protection of Annex I habitats, namely sandbanks which are slightly covered by sea water all the time and biogenic reef.</p> <p>The SAC contains the most extensive example of offshore linear ridge-type sandbanks in UK waters and encloses a series of ten main sand banks and associated smaller banks. The Wenlock pipelines cross one of the Indefatigable sandbanks between KP 4.4 to KP 13.6.</p> <p>Areas of <i>Sabellaria spinulosa</i> biogenic reef are present within the SAC, consisting of thousands of fragile sand-tubes made by ross worms (polychaetes) which have consolidated together to create solid structures rising above the seabed. During the 2020 pre-decommissioning survey, the presence of <i>S. spinulosa</i> was observed on the camera transects taken to the North West of the Wenlock platform. An assessment of 'reefiness' was subsequently performed which identified one main reef area consisting of approximately 55% 'Low Reef' structures, 34% 'Medium Reef' structures, and 11% 'Not a Reef' structures. The patches within this area were very variable and as such could not be broken down further; however, as the area totalled approximately 7,000m², it is considered to be an area of 'Low Reef'. Further areas of disturbed sediment with the potential to contain <i>S. spinulosa</i> reef were also delineated from the geophysical data within the vicinity of the Wenlock platform. These areas were assigned a 'worst case' level of potential reefiness, resulting in a total of six areas of potential 'Low Reef' and one area to the south East of the Wenlock platform that has delineated as 'Potential Low-Medium Reef'. <i>S. spinulosa</i> was not observed along the route of the pipelines.</p> <p>The Wenlock platform and approximately 16.5 km of the route of the Wenlock pipelines, excluding the mid-line tee structure, is also located within the boundary of the Southern North Sea SAC, designated for the protection of Annex II species, namely the harbour porpoises.</p>
Seabed	Seabed sediments in the vicinity of the Wenlock platform are comprised of sandy gravel. Along the pipelines, the start of the route is composed

	<p>of sandy gravel and gravelly sand. The section crossing the sandbank (KP 4.4 to 13.6) is mostly composed of sand at the exception of the summit where coarser material (gravelly sand to gravel) was reported. The section between KP 13.6 to 27.6 comprises sandy gravel/gravelly sand, while the last section of the route, towards the Inde 23A platform, was interpreted as a sandy seabed.</p> <p>Physio-chemical analysis of seabed sediment samples collected during the 2020 pre-decommissioning survey found that all stations sampled had low Total Organic Carbon (TOC) levels representative of an organically deprived environment, which is typical for the Southern North Sea region due to the dominance of the sand/gravel fractions. No stations showed Total hydrocarbon content (THC) levels in excess of the OSPAR (2006) 50mg.kg-1 threshold for THC, used to delineate the chemical boundaries of cuttings piles and above which impacts on the biota may occur. Polycyclic aromatic hydrocarbons (PAH) concentrations at all stations within 500m of the Wenlock platform exceeded the UKOOA 50th percentile for the Southern North Sea of 0.07 mg.kg-1, although the results were attributed to diffuse impact from riverine plumes and shipping traffic rather than drilling related. Metal concentrations were elevated above background levels for all metals at almost every station. However, correlations between metals and sand and gravel, suggested variability in metals concentrations was natural and influenced by sediment characteristics across the survey area.</p> <p>Based on the ground-truthing data obtained during 2020 pre-decommissioning survey, two European Nature Information System (EUNIS) habitat classifications were assigned for the survey area, 'Circalittoral Coarse Sediment' (SS.SCS.CCS/A5.14) within the Wenlock 500 m zone and 'Circalittoral Fine Sand' (SS.SCS.CFiSa/A5.25) along the route of the pipelines. Observed fauna within the areas identified as Circalittoral Coarse Sediment included Annelida (Serpulidae, Lanice conchilega, Sabellaria spinulosa), Cnidaria (Alcyonium digitatum, Hydrallmania falcata), Arthropoda (Pagurus bernhardus, Cancer pagurus, Carcinus maenas, Cirripedia), Echinodermata (Asterias rubens, Ophiuroidea sp.), Mollusca (observed as siphons protruding from the seabed) and Bryozoa (Flustra foliacea, Bryozoa turf). Observed fauna within the areas identified as Circalittoral Fine Sand included Echinodermata (Asterias rubens, Ophiuroidea sp., Spatangoidea sp.) Cnidaria (possible Cerianthus lloydii), Arthropoda (Pagurus bernhardus, Corystes cassivelaunus), and Mollusca (observed as siphons protruding from the seabed).</p> <p>Macrofaunal analysis of seabed sediment samples collected during the 2020 pre-decommissioning survey found that species richness and faunal abundance varied within the survey area, reflecting the change in sediment type between the Wenlock platform and along the route of the pipelines. A total of 764 individuals (infauna and solitary epifauna) were identified from the 18 samples analysed. Of the 110 taxa recorded, five were solitary epifauna, and 96 were infaunal.</p>
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Fish	<p>Comparison with the Wenlock 2005 pre-drill survey revealed a similar trend to that seen with the 2020 pre decommissioning survey, indicating that there has been little impact to the benthic communities at the comparable stations as a result of the construction and operation of the Wenlock field.</p> <p>The area supports spawning and/or nursery habitats for a number of species including cod, herring, lemon sole, mackerel, <i>Nephrops</i>, plaice (at high intensity), sandeel, sole, anglerfish, spiny dogfish, tope shark and whiting (at high intensity). Additionally, age 0 group fish are defined as fish in the first year of their lives and can also be classified as juvenile. The Wenlock infrastructure is located in an area of moderate probability of 0 group fish for herring, horse mackerel, mackerel and whiting, and low probability for anglerfish, blue whiting (<i>Micromesistius poutassou</i>), cod, haddock (<i>Melanogrammus aeglefinus</i>), hake (<i>Merluccius merluccius</i>), Norway pout (<i>Trisopterus esmarkii</i>), plaice, sole and sprat.</p>
Fisheries	<p>The Wenlock infrastructure is located within ICES Statistical Rectangles 35F2 and 36F2. Fishing effort is relatively low in ICES Rectangle 36F2, with the mean annual fishing effort between 2011 and 2018 at only 114 days. Fishing effort is highest in May, August, and September. The majority of fishing effort is from trawlers followed by traps. Landings data (by weight) indicates that catches are largely composed of demersal species (76%) followed by pelagic species (24%). The most commonly caught species are plaice, <i>Nephrops</i> and sole. In-depth fisheries statistics for ICES Rectangle 35F2 are only available for the years 2011 to 2013 for effort and 2011 to 2012 for landings. This suggests that fishing effort within ICES Rectangle 35F2 is very low, with an average of 46 days fished per year. Landings data demonstrate that catches (by weight) are largely composed of demersal species (57%), followed by pelagic species (40%) and shellfish (3%). The most commonly caught species are sprats, plaice and sole.</p>
Marine Mammals	<p>Annex II species harbour porpoise and white-beaked dolphin are considered to be regularly occurring in the Southern North Sea and both species have been observed in the vicinity of the Wenlock area. Minke whale is also a frequent seasonal visitor. The Wenlock platform is located within the northern two thirds of the Southern North Sea SAC which is recognised as important for harbour porpoises during the summer season (April to September). The distribution of grey seals and harbour seals in the vicinity of the Wenlock infrastructure is very low (< 1 individual per 25 km²).</p>
Birds	<p>The offshore waters of the Southern North Sea are visited by seabirds, mainly for feeding purposes in and around the shallow sandbanks. The most abundant species present in the vicinity of the Wenlock area are guillemot in the breeding season, guillemot and razorbill over winter,</p>

	<p>and guillemot during the post breeding dispersal period. Peak numbers of seabirds tend to be found offshore following the breeding season and throughout winter, between July and March. Seabird sensitivity to oiling in the area is generally low between August and October and May and June, then varies from high to low between November and April, and extremely high to low in June.</p> <p>Of note, during the summer of 2020, APRL recorded kittiwake nesting on the steel work below the helideck on the Wenlock platform. Approximately 45 to 50 nests were counted in July, with adults observed rearing their chicks. It is therefore acknowledged that nesting kittiwake could be present on the Wenlock topside in future years, potentially between the months of April and September. The Wenlock infrastructure also falls within the breeding season foraging ranges of several seabird species including, European storm petrel (<i>Hydrobates pelagicus</i>), Northern fulmar (<i>Fulmarus glacialis</i>), Manx shearwater (<i>Puffinus puffinus</i>), Northern gannet (<i>Morus bassanus</i>), black-legged kittiwake (<i>Rissa tridactyla</i>), lesser black-backed gull (<i>Larus fuscus</i>), great skua (<i>Stercorarius skua</i>) and Atlantic puffin (<i>Fratercula arctica</i>).</p> <p>An assessment of the medium seabird sensitivity to oil pollution scores for the blocks of interest within which the Wenlock infrastructure is located, indicates that sensitivity is generally low between August and October, and May and June, high to low between November and April, and extremely high to low in July.</p>
Onshore Communities	<p>Decommissioning will provide short-term employment for project teams, both on and offshore contractors. There may be an increase in traffic associated with movement of waste from the receiving port, however this will be temporary and unlikely to be significant in relation to existing traffic movements. APRL will ensure that the licensed waste contractor and chosen onshore dismantling site has a proven track record with regards to the waste stream management and can demonstrate compliance with the waste hierarchy and all applicable waste regulations thereby minimising the impact on the environment.</p>
Other Users of the Sea	<p>Wenlock is located within a mature gas province with a comprehensive network of typically unmanned installations, larger processing hubs and associated interfield and export pipelines. The active 'Norsea communications' telecom cable (Operator: Tampnet AS) crosses the Wenlock pipelines at KP14.45.</p> <p>The Hornsea Project Three (Status: In-planning) and Hornsea Project One (Status: Operational) wind farm turbine areas (Operator: Ørsted) are located ca. 25 km North East and 27 km North West respectively of the Wenlock platform. The planned Hornsea Project Three export cable corridor is located 9 km North West of the Wenlock infrastructure and the active Hornsea Project One export cables are located 25 km North West. In addition, the Norfolk Boreas (Status: In-planning) and the Norfolk Vanguard West (Status: Consent Granted) wind farm areas are being developed by Vattenfall Wind Power Ltd and are located ca. 26 km South East and 31 km South respectively of the Inde 23A platform.</p>

	<p>There are aggregate areas located approximately 4 km North East, 18 km North West and 21 km South West at nearest point respectively from the Wenlock infrastructure.</p> <p>The area overlaps with a Ministry of Defence Royal Airforce Practice and Exercise Area (PEXA).</p> <p>Shipping activity is high in the vicinity of the Wenlock platform, predominantly comprised of cargo ships and offshore support vessels.</p>
Atmosphere	<p>Emissions will be generated from fuel combustion on the various vessels involved in the decommissioning activities and will primarily comprise of carbon dioxide (CO₂), carbon monoxide (CO), oxides of nitrogen (NO_x), sulphur dioxide (SO₂), methane (CH₄) and volatile organic compounds (VOCs). Although minor, emissions will contribute both to localised and short term increases in atmospheric pollutants, and to global atmospheric GHG concentrations. In the context of wider UK emissions these effects are considered to be negligible, and there will be a minor positive benefit from the return of recyclable materials to shore which will have a future use and offset the extraction and transport of primary raw materials.</p>

4.2 Potential Environmental Impacts and their Management

Environmental Impact Assessment Summary:

Table 4.2: Environmental Impact Management		
Activity	Main Impacts	Management
Topside Removal	<p>Removal of the topside will cause some localised environmental impact due to the lifting and support vessels, leading to increased vessel traffic, seabed disturbance, atmospheric emissions and noise.</p> <p>The removal of the Wenlock topside could impact seabirds nesting on the platform through disturbance by operational movement and noise.</p> <p>There will also be an impact the availability of nesting sites for seabirds once the topside is removed. Approximately 50 kittiwake nests were identified on the Wenlock platform in 2020.</p>	<p>Consent to Locate permits will be in place, existing collision risk management plans will be reviewed and notifications of the proposed decommissioning activities will be made.</p> <p>An anchor management plan will be developed for the moored HLV and jack-up vessel, to ensure anchors and anchor chains/wires deployed avoid the identified potential <i>S. spinulosa</i> reef aggregations, where possible.</p> <p>Operations will be planned to reduce vessel movements and minimise the overall duration of the project. Where vessels are required to hold position for extended durations, jack-up or moored vessel will be used in favour of DP vessels.</p> <p>Installation of nesting bird deterrents will be considered when the preparatory work is being undertaken to discourage birds from nesting on the platform once it enters the Lighthouse Mode phase.</p> <p>Planning of operations to programme topside removal activities outside of the breeding bird season, if possible.</p>
Jacket	<p>Removal of the jacket will cause some localised environmental impact due to the lifting and support vessels, leading to increased vessel traffic, atmospheric emissions, seabed disturbance and noise.</p>	<p>Consent to Locate permits will be in place, existing collision risk management plans will be reviewed, and notifications of the proposed decommissioning activities will be made.</p> <p>An anchor management plan will be developed for the moored HLV and jack-up vessel, to ensure anchors and anchor chains/wires deployed avoid the identified potential <i>S. spinulosa</i> reef aggregations, where possible.</p>

	<p>Potential for <i>S. spinulosa</i> biogenic reef and sited within the NNS&SR SAC.</p> <p>If the jacket is left after the topside is removed, that could pose an additional navigational impact.</p>	<p>Operations will be planned to reduce vessel movements and minimise the overall duration of the project. Where vessels are required to hold position for extended durations, jack-up or moored vessel will be used in favour of DP vessels.</p> <p>If the jacket is removed in a separate campaign to the topside, a solar navaid / foghorn will be installed to warn other sea users of its presence.</p>
Subsea Installations Removal	<p>Removal of legacy appraisal well conductor and mid-line tee protection structure will cause some localised environmental impact due to the lifting and support vessels, leading to increased vessel traffic, atmospheric emissions, seabed disturbance and noise.</p>	<p>If the legacy appraisal well conductor has not yet been removed after the 500 m safety exclusion zone surrounding the Wenlock platform is withdrawn, APRL will advise the UK Hydrographic Office (UKHO) at least 6 weeks in advance so the conductor can be marked on navigation charts.</p> <p>Internal cutting techniques will be utilised where possible, which do not produce any significant noise emissions. Where internal cuts are not possible, external cuts will be via mechanical methods as they produce significantly less noise than of abrasive methods.</p>
Decommissioning Pipelines	<p>Cutting of pipeline ends, removal of exposed pipeline sections / tie-in spools will cause some localised environmental impact due to the lifting and support vessels, leading to increased vessel traffic, atmospheric emissions, seabed disturbance and noise.</p>	<p>Operations will be planned to reduce vessel movements and minimise the overall duration of the project. Where vessels are required to hold position for extended durations, moored vessel will be used in favour of DP vessels.</p> <p>No additional mattresses on the cut ends, instead the redeployment of mattresses and/or gravel bags to protect the cut ends of the pipelines, if exposed at the seabed.</p>
Decommissioning Stabilisation Features	<p>Removing and redeployment of mattresses and gravel bags will cause some localised environmental impact due to the lifting and support vessels, leading to increased vessel traffic, atmospheric emissions, seabed disturbance and noise.</p>	<p>No new mattresses, gravel bags or rock dump will be placed on the seabed.</p>

5. INTERESTED PARTY CONSULTATIONS

Consultations Summary:

Table 5.1: Summary of Stakeholder Comments		
Who	Comment	Response
Statutory Consultations		
National Federation of Fishermen's Organisations	Early contact made with NFFO. Face to Face meeting held.	No concerns with pre-decommissioning plans. Regular communication and updates requested.
Scottish Fishermen's Federation	Early contact made with Scottish Fishermen's Federation.	Liaise with NFFO for decommissioning. No further contact required.
Northern Irish Fish Producer's Organisation Limited	Early contact made with Northern Irish Fish Producer's Organisation Limited.	Liaise with NFFO for decommissioning. No further contact required.
Global Marine Group	<p>Early contact made with Global Marine Group.</p> <p>Early contact made with the Operators of the Norseia communication cable; Tampnet AS. Proposed to leave the pipeline in situ at the cable crossing.</p>	<p>Global Marine Group response summary: No other nearby cable assets are influenced by the decommissioning program other than Tampnet AS operational fibre optic cable nearby.</p> <p>Tampnet AS response; 'We have no questions or concerns regarding this and agree with the recommendation that existing crossing infrastructure and pipeline is left in place. Please keep us posted on OPRED's conclusion'.</p>
Informal Stakeholder Consultations		
Joint Nature Conservation Committee	Early contact made with JNCC. Face to Face meeting held.	No initial concerns with pre-decommissioning plans. Regular communication and updates requested. Attended the detailed Comparative Assessment workshop.
Public	Public notice issued in the press and on APRL website.	No Public comments received.

6. PROGRAMME MANAGEMENT

6.1 Project Management and Verification

An APRL Project Management team will manage suitable Contractors for decommissioning activities and the removal of the installation. The team will ensure the decommissioning is executed safely, in accordance with legislation and APRL Health and Safety principles. Where possible the work will be coordinated with other decommissioning operations in the SNS. The team will monitor and track the process of consents and the consultations required as part of this process. Any changes in detail to the offshore removal programme will be discussed and agreed with OPRED.

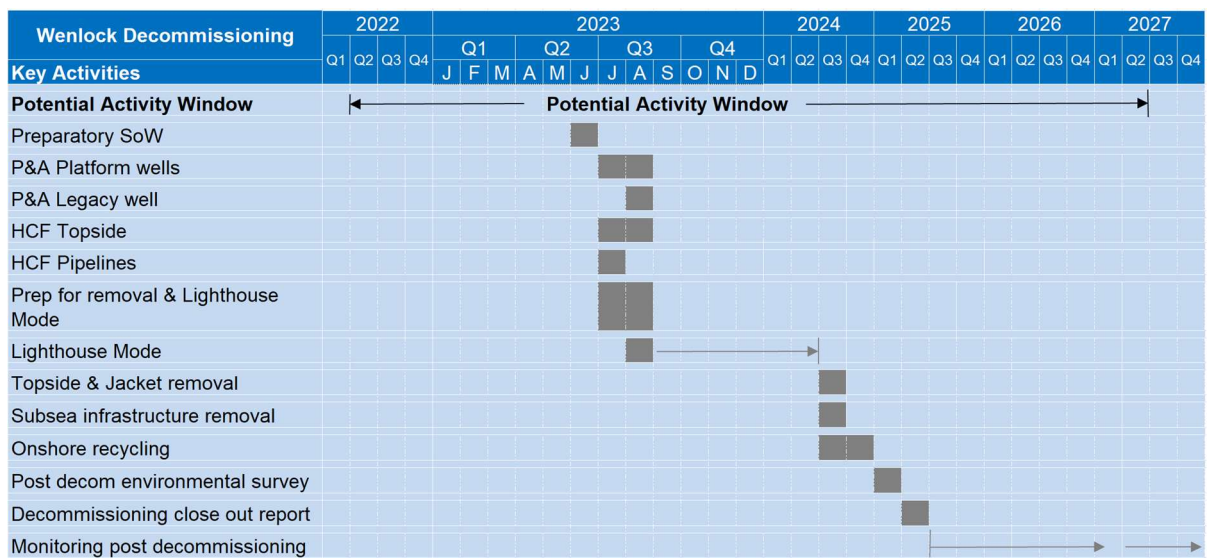
6.2 Post-Decommissioning Debris Clearance and Verification

A post decommissioning site survey will be carried out around the Wenlock platform 500m radius and a (*minimum*) 100m corridor (*50m either side*) along each existing pipeline route where decommissioning activities have taken place to identify any oil and gas debris. Any seabed debris related to offshore oil and gas activities will be recovered for onshore disposal or recycling in line with existing disposal methods. Verification of seabed clearance will be provided to OPRED following decommissioning activities. This will be included in the Close Out Report and sent to the Seabed Data Centre (Offshore Installations) at the Hydrographic Office.

6.3 Schedule

The Project Plan is subject to approval of the decommissioning programmes, unavoidable constraints such as Contractor availability (vessel availability) and changes in economics such as gas price which could extend the platform life. OPRED will be informed of dates of activity in advance, when known.

Figure 6.1: Project Plan



Note: Indicative plan, the activity window is subject to tender award and synergies with other operations for cost savings.

6.4 Costs

Decommissioning costs are provided separately to OPRED and OGA.

Table 6.1: Provisional Decommissioning Programmes costs	
Item	Estimated Cost (£m)
Project Management	Provided to OPRED & OGA
Facility Running/Owner	Provided to OPRED & OGA
Well Abandonment (<i>platform</i>)	Provided to OPRED & OGA
Well Abandonment (<i>subsea</i>)	Provided to OPRED & OGA
Making Safe	Provided to OPRED & OGA
Topside Preparation	Provided to OPRED & OGA
Topside Removal	Provided to OPRED & OGA
Substructure Removal	Provided to OPRED & OGA
Subsea Infrastructure	Provided to OPRED & OGA
Onshore Recycling and Disposal	Provided to OPRED & OGA
Site Remediation	Provided to OPRED & OGA
Monitoring	Provided to OPRED & OGA
TOTAL	Provided to OPRED & OGA

6.5 Close Out

In accordance with the OPRED guidelines, a close out report will be submitted to OPRED within 1 year of the completion of the offshore decommissioning scope including debris clearance, verification of seabed clearance and the results of the post-decommissioning environmental survey. The report will detail the outcomes of surveys as well as explain any major variances from the programme.

6.6 Post-Decommissioning Monitoring and Evaluation

A post-decommissioning environmental seabed survey will be carried out around the platform and pipeline route by APRL where decommissioning activities have taken place. The survey report will be reviewed, compared with the pre-decommissioning survey, and a risk-based post monitoring survey regime will be proposed by APRL which will be agreed with OPRED. Liability will remain with the Section 29 holders identified in Table 1.4.2. unless agreed otherwise with OPRED.

7. SUPPORTING DOCUMENTS

Table 7.1: Supporting Documents	
Document Number	Title
APR_WEN_PMGT_010	Wenlock Pipelines Decommissioning Options Comparative Assessment
APR_WEN_PMGT_011	Wenlock Environmental Appraisal Report

8. PARTNER LETTERS OF SUPPORT



Energiean UK Limited
Accurist House
44 Baker Street
London W1U 7AL

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

15 February 2022

Dear Sir or Madam

WENLOCK DECOMMISSIONING PROGRAMMES PETROLEUM ACT 1998

We acknowledge receipt of your letter dated 19 January 2022.

We, Energiean UK Limited, confirm that we authorise Alpha Petroleum Resources Limited to submit on our behalf an abandonment programme relating to the abandonment of the Wenlock field facilities as directed by the Secretary of State on 19 January 2022.

We confirm that we support the proposals detailed in the Wenlock Decommissioning Programme dated January 2022, which is to be submitted by Alpha Petroleum Resources Limited in so far as they relate to those facilities in respect of which we are required to submit an abandonment programme under section 29 of the Petroleum Act 1998.

Yours faithfully



Fiona Goodfellow
UK Country Manager
For and on behalf of **Energiean UK Limited**

Alpha Petroleum (UK) Holdings Limited
3rd Floor
11-12 St James's Square
London
SW1Y 4LB

Offshore Petroleum Regulator for Environment and Decommissioning

Department for Business, Energy & Industrial Strategy
3rd Floor, Wing C
AB1 Building
Crimon Place
Aberdeen
AB10 1BJ

16 February 2022

Dear Sir or Madam

WENLOCK DECOMMISSIONING PROGRAMMES PETROLEUM ACT 1998

We acknowledge receipt of your letter dated 19 January 2022.

We, Alpha Petroleum (UK) Holdings Limited, confirm that we authorise Alpha Petroleum Resources Limited to submit on our behalf an abandonment programme relating to the abandonment of the Wenlock field facilities as directed by the Secretary of State on 19 January 2022.

We confirm that we support the proposals detailed in the Wenlock Decommissioning Programme dated January 2022, which is to be submitted by Alpha Petroleum Resources Limited in so far as they relate to those facilities in respect of which we are required to submit an abandonment programme under section 29 of the Petroleum Act 1998.

Yours faithfully



Arun Subbiah
Director
For and on behalf of Alpha Petroleum (UK) Holdings Limited



Energiean PLC
Accurist House
44 Baker Street
London W1U 7AL

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

18 February 2022

Dear Sir or Madam

WENLOCK DECOMMISSIONING PROGRAMMES PETROLEUM ACT 1998

We acknowledge receipt of your letter dated 19 January 2022.

We, Energiean PLC, confirm that we authorise Alpha Petroleum Resources Limited to submit on our behalf an abandonment programme relating to the abandonment of the Wenlock field facilities as directed by the Secretary of State on 19 January 2022.

We confirm that we support the proposals detailed in the Wenlock Decommissioning Programme dated January 2022, which is to be submitted by Alpha Petroleum Resources Limited in so far as they relate to those facilities in respect of which we are required to submit an abandonment programme under section 29 of the Petroleum Act 1998.

Yours faithfully



Panos Benos

Chief Financial Officer & Director – Energiean PLC

Energiean plc
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Registered Office: 3rd Floor Accurist House, 44 Baker Street, London, W1U 7AL
www.energean.com

APPENDIX – COPY OF PUBLIC NOTICE

PUBLIC NOTICE

PETROLEUM ACT 1998

Removal of the WENLOCK FACILITY

Alpha Petroleum Resources Limited has submitted, for the consideration of the Secretary of State for Business, Energy and Industrial Strategy, draft combined Decommissioning Programmes for the removal of the Wenlock platform and pipelines in accordance with the provisions of the Petroleum Act 1998. It is a requirement of the Act that interested parties be consulted on such decommissioning proposals.

The Wenlock facility covered by the combined Decommissioning Programmes is in block 49/12a, which is 98km offshore North East from the Bacton Gas Terminal in Norfolk, 45 km South West of the UK / Netherlands median line. It comprises of a minimal facilities topside, single jacket and two pipelines that run parallel 37km to a host platform.

Alpha Petroleum Resources Limited hereby gives notice that a summary of the Wenlock combined Decommissioning Programmes can be viewed at: <https://www.alphapetroleum.com/assets/wenlock/decommissioning>

Should you require a copy of the decommissioning programme for review, please contact:

Alpha Petroleum Resources Limited

No.1 London Square
Cross Lanes
Guildford
Surrey GU1 1UN

Email: decom@alphapetroleum.com

Representations regarding the Wenlock combined Decommissioning Programmes should be submitted in writing using the contact details above (preferably by email) where they must be received by 30th April 2021 and should state the grounds upon which any representations are being made.