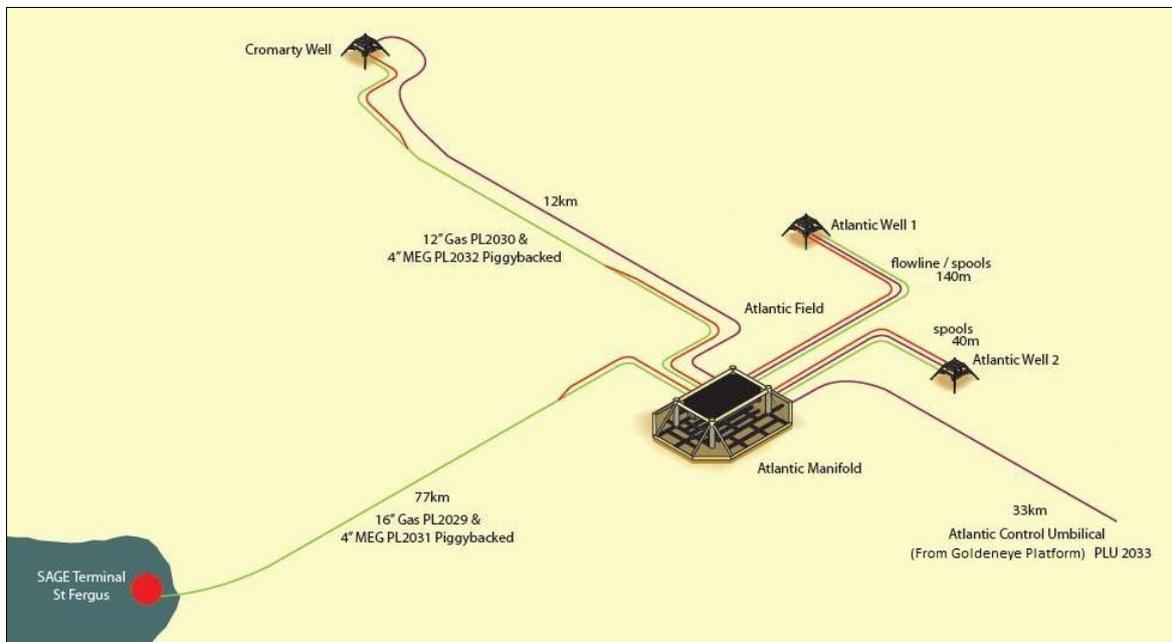




Atlantic & Cromarty Decommissioning Programmes Part 1



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Terms and Abbreviations

Term	Explanation
C&P	Contracts and Procurement
CA	Comparative Assessment
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
DESNZ	Department for Energy Security and Net Zero
DoC	Depth of Cover
DoL	Depth of Lowering
DP	Decommissioning Programme(s)
EA	Environmental Appraisal
ENVID	Environmental Impact Identification
EPS	European Protected Species
HazMat	Hazardous Material
HSE	Health and Safety Executive
ICES	International Council for the Exploration of the Sea
INTOG	Innovation and Targeted Oil and Gas
IPR	Interim Pipeline Regime
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
LTOBM	Low Toxicity Oil Based Mud
MEG	MonoEthylene Glycol
NCMPA	Nature Conservation Marine Protected Area
NFFO	National Federation of Fisheries Organisations
NMPi	National Marine Plan Interactive
NORM	Naturally Occurring Radioactive Material
NO _x	Nitrous Oxide
NSTA	North Sea Transition Authority
OD	Outside Diameter
ODU	Offshore Decommissioning Unit (OPRED)
OEUK	Offshore Energies UK (formerly OGUK – Oil and Gas UK)
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	Oslo and Paris Convention (for the Protection of the Marine Environment of the North-East Atlantic)



Term	Explanation
OVID	Offshore Vessel Inspection Database
plc	Public Limited Company
PMF	Priority Marine Feature
PWR	Preparatory Works Request
SAGE	Scottish Area Gas Evacuation
SCAP	Supply Chain Action Plan
SEAM	Safety Environmental Asset Management
SFF	Scottish Fishermen's Federation
SO ₂	Sulphur Dioxide
SOPEP	Shipboard Oil Pollution Emergency Plan
TUTU	Topsides Umbilical Termination Unit
UKCS	United Kingdom Continental Shelf
WBM	Water Based Mud
WHPS	Wellhead Protection Structure
WMP	Waste Management Plan
XT	Christmas Tree



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1 EXECUTIVE SUMMARY

1.1 Combined Decommissioning Programmes

This document contains four decommissioning programme(s) for (1) the Atlantic installations, (2) the Atlantic pipelines including umbilical, (3) the Cromarty installations and (4) the Cromarty pipelines including umbilical.

The pipelines and installations included in these Decommissioning Programmes (Atlantic & Cromarty Decommissioning Programmes Part 1) do not cover the full scope of the Atlantic Pipeline Section 29 Notice. To allow the re-purposing potential of the 16" export pipeline to St Fergus (PL2029) to be fully investigated, the main length of PL2029, along with the piggy-backed 4" MEG (MonoEthylene Glycol) pipeline PL2031, from the tie-in flanges adjacent to the Atlantic Manifold to Mean Low Water Springs on approach to the SAGE (Scottish Area Gas Evacuation) Terminal are excluded from these Programmes. The excluded sections of PL2029 and PL2031, along with the associated stabilisation features, will be the subject of a separate Programme to be submitted at a later date.

The Section 29 Notice Holders for these Programmes are Shell Global LNG Limited (registered number 01287989, Shell) and Hess Limited (registered number 00807346, Hess). Shell has prepared these Programmes in accordance with Section 29 of the Petroleum Act, and Hess confirms that it supports the proposals described in it. A letter of support from Hess will be provided in Section 8 of the final approval revision of this document.

Throughout this document the terms "owners", "we" and "our" refer to the Notice Holders as noted above.

1.2 Requirement for Decommissioning Programmes

These draft DPs are submitted for statutory and public consultation in compliance with relevant legislation and guidelines from the Offshore Petroleum Regulator for the Environment and Decommissioning (OPRED), part of the Department for Energy Security and Net Zero (DESNZ). They describe the principles of the decommissioning activities in compliance with national and international regulations, whilst also presenting an assessment of the environmental impacts of the proposed programmes.

Atlantic Installation(s):

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Atlantic installations (see **Table 1.2**) are applying to OPRED to obtain approval for decommissioning the installations detailed in Section 2.1.1 of these programmes. (See also Section 8 - Section 29 Notice Holder Letter(s) of Support).

Cromarty Installation(s):

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Cromarty installations (see **Table 1.4**) are applying to OPRED to obtain approval for decommissioning the installations detailed in Section 2.2.1 of these programmes. (See also Section 8 - Section 29 Notice Holder Letter(s) of Support).

Atlantic Pipeline(s):

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Atlantic pipelines (see **Table 1.6**) are applying to OPRED to obtain approval for decommissioning the pipelines detailed in Section 2.1.2 of these programmes. (See also Section 8 – Section 29 Notice Holder Letter(s) of Support).



Cromarty Pipeline(s):

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Cromarty pipelines (see **Table 1.8**) are applying to OPRED to obtain approval for decommissioning the pipelines detailed in Section 2.2.2 of these programmes. (See also Section 8 – Section 29 Notice Holder Letter(s) of Support).

In conjunction with public, stakeholder and regulatory consultation, the Decommissioning Programmes are submitted without derogation in compliance with national and international regulations and OPRED guidelines. The schedule outlined in this document is for a 5-year decommissioning project plan due to begin in 2025.



1.3 Introduction

The Atlantic and Cromarty Fields are located in the outer Moray Firth in UK Continental Shelf (UKCS) Blocks 14/26a, 20/1 (north) and 13/30a. The Atlantic and Cromarty Fields are both approximately 67km northeast of the St Fergus Gas Terminal in the north east Aberdeenshire coast and approximately 144km and 154km from the median line with Norway, respectively.

Shell Global LNG Limited (Shell) operates the Atlantic Field and Hess Limited (Hess) operates the Cromarty Field. Shell operates the joint facilities that serve both Fields. Shell is submitting the Cromarty Decommissioning Programmes within this document on behalf of Hess.

On 15 February 2016, the entire issued and to be issued share capital of BG Group plc was acquired by Royal Dutch Shell plc. Shell Global LNG Limited became the operator for the Atlantic and joint facilities.

The Fields were developed as gas and gas condensate fields by BG Global Energy Limited (now Shell Global LNG Limited) and Hess Limited. The installations and pipelines were installed in 2005, with production starting in 2006. Production from the Atlantic and Cromarty wells was routed to the Atlantic Manifold and then exported to the SAGE terminal at St Fergus via a 16" 77km export pipeline. Control of the wells was provided via an electro-hydraulic control umbilical from the Goldeneye Platform via the Atlantic Manifold. Hydrate control was provided via a MEG pipeline piggybacked to the export pipelines.

The development was designed for a field life of five years and it was anticipated that other opportunities could tie into the infrastructure. However, production stopped in 2009 and attempted restarts in 2010 were unsuccessful. The pipelines were therefore entered into the Interim Pipeline Regime (IPR) pending investigation of options to extend the useful life of the fields. Cessation of Production (CoP) for the Atlantic and Cromarty wells was agreed with the Department for Energy and Climate Change (DECC), now DESNZ, in 2011. The wells were suspended and initial plugs installed in 2014.

In 2016, Decommissioning Programmes for the Atlantic and Cromarty Fields were submitted for public consultation by BG Global Energy Limited (now Shell Global LNG Limited). During this consultation, the Carbon Capture Utilisation and Storage community requested that decommissioning proposals for the gas export pipeline PL2029 were put on hold to allow further investigation of the repurposing potential of the line to support CO₂ reinjection. The Decommissioning Programmes were therefore put on hold and the pipelines remained in IPR.

Since the initial public consultation in 2016, all credible opportunities for the wells and installations have been exhausted. However, repurposing options for the export pipeline were the subject of further repurposing assessments. To progress decommissioning of the offshore infrastructure excluding the export pipeline in a timely manner, per regulatory requirements, Shell has agreed with OPRED to split the Decommissioning Programmes for the Atlantic & Cromarty Fields. This document outlines the decommissioning proposals for the Atlantic and Cromarty installations and pipelines up to but excluding the tie-in flanges for the gas export pipeline PL2029 and piggybacked MEG import pipeline PL2031. The remaining sections of these pipelines, along with the associated stabilisation features, will be the subject of a separate Programme to be submitted at a later date.

The Atlantic and Cromarty wells were plugged and made safe in 2017, including recovery of the associated wellheads. In 2021, OPRED approved a Preparatory Works Request (PWR) for the removal of a section of



the Atlantic Umbilical PLU2033 associated with the Goldeneye Platform. In accordance with this PWR, the riser section of PLU2033 and the Topsides Umbilical Termination Unit (TUTU) were removed with the Goldeneye topsides and jacket in 2021. A further short section of PLU2033 was cut and recovered to shore in 2022, in order to leave the seabed safe for other users of the sea. The PWR is included as Appendix 3 of this document.

The remaining Atlantic and Cromarty infrastructure has been flushed of hydrocarbons and remains *in situ* pending final decommissioning. Subsea safety zones are in place at the Atlantic and Cromarty drill sites to protect the surface-laid infrastructure.



1.4 Overview of Installations and Pipelines Being Decommissioned

1.4.1 Atlantic Installation

Table 1.1: Atlantic Installation Being Decommissioned			
Field(s)	Atlantic	Production Type	Gas and Gas Condensate
Water Depth (m)	115	UKCS block	14/26a, 20/1 (north)
Distance to median (km)	147	Distance from nearest UK coastline (km)	72
Subsea Installation(s)		Number of Wells	
Number	Type	Platform	Subsea
1	Atlantic Manifold	-	2
2*	Atlantic Wellhead Protection Structures		
Drill Cuttings pile(s)			
Number of Piles	0	Total Estimated volume (m ³)	N/A
* The Atlantic wellhead structures have previously been recovered (under permit applications ML/246/1 and WIA/549. Therefore the recovery of these two structures is not captured in the EA.)			

Table 1.2: Atlantic Installation Section 29 Notice Holders Summary		
S29 Notice Holder	Registration Number	Equity Interest
Shell Global LNG Limited	01287989	75%
Hess Limited	00807346	25%



1.4.2 Cromarty Installation

Table 1.3: Cromarty Installation Being Decommissioned			
Field(s)	Cromarty	Production Type	Gas and Gas Condensate
Water Depth (m)	115	UKCS block	13/30a
Distance to median (km)	156	Distance from nearest UK coastline (km)	65
Subsea Installation(s)		Number of Wells	
Number	Type	Platform	Subsea
1	Cromarty Wellhead Protection Structure (1-off)*	0	1
1	Cromarty Piping Assembly		
Drill Cuttings pile(s)			
Number of Piles	0	Total Estimated volume (m ³)	N/A
* The Cromarty wellhead structure has previously been recovered (under permit applications ML/258/1 and WIA/559. Therefore the recovery of this structure is not captured in the EA.'			

Table 1.4: Cromarty Installation Section 29 Notice Holders Summary		
S29 Notice Holder	Registration Number	Equity Interest
Shell Global LNG Limited	01287989	10%
Hess Limited	00807346	90%



1.4.3 Atlantic Pipelines

Table 1.5: Atlantic Pipelines Being Decommissioned	
Number and total length (km) of Pipeline(s) Full details given in Table 2.2	9 32.0km Note: only short sections of PL2029 and PL2031 are included in these Programmes, ref Sect 1.3

Table 1.6: Atlantic Pipelines Section 29 Notice Holders Summary		
S29 Notice Holder	Registration Number	Equity Interest
Shell Global LNG Limited	01287989	42.5%
Hess Limited	00807346	57.5%

1.4.1 Cromarty Pipelines

Table 1.7: Cromarty Pipelines Being Decommissioned	
Number and total length (km) of Pipeline(s) Full details given in Table 2.7	3 35.7km

Table 1.8: Cromarty Pipelines Section 29 Notice Holders Summary		
S29 Notice Holder	Registration Number	Equity Interest
Shell Global LNG Limited	01287989	42.5%
Hess Limited	00807346	57.5%



1.5 Summary of Proposed Decommissioning Programmes

Table 1.9: Summary of Decommissioning Programmes		
Selected Option	Reason for Selection	Proposed Decommissioning Solution
1. Subsea Installation(s)		
Full removal of: <ul style="list-style-type: none"> - Atlantic Manifold - 2-off Atlantic WHPS - 1-off Cromarty WHPS including piping assembly 	To remove all seabed structures and leave a clear seabed	Disconnect from all pipelines, umbilicals, spools and jumpers. The Atlantic Manifold piles will be cut to a target depth of 3m below mean seabed (no other piled structures). Structures will be recovered to surface for recycling / disposal. Sections of piles below the cut to be decommissioned <i>in situ</i> . All 3 WHPS were removed with the wellheads in 2017.
2. Pipelines, Flowlines & Umbilicals		
Full removal of surface-laid tie-in spools and umbilical jumpers PL2029 Ident 1 and a 5m section of Ident 2 (~45m section from tie-in flange to Atlantic Manifold) PL2029JAW1 PL2029JAW2 PL2031 Ident 4 and a 5m section of Ident 3 (~45m section from tie-in flange to Atlantic Manifold) PL2031JAW1 PL2031JAW2 PLU2033JAW1 PLU2033JAW2	To leave a clear seabed	Disconnect from structures and recover to surface for recycling / disposal.
CA Group A Rigid Pipelines, Piggybacked fully trenched and buried PL2030, PL2032	Based on the evaluation results, the three remediate in situ options (Exposed Sections Rock Covered, Exposed Sections Trenched and Buried, and Exposed Sections Cut and Removed) were not significantly different. However, it is recommended that Option 2a (Exposed Sections Rock Covered) is the Most Preferred Option. This recommendation reflects: <ul style="list-style-type: none"> • The uncertainty of trenching / technical success for Option 2b (Exposed Sections Trenched and Buried) for sections that 	



Table 1.9: Summary of Decommissioning Programmes		
Selected Option	Reason for Selection	Proposed Decommissioning Solution
	<p>could not previously be adequately trenched – with failure to meet target DoC a risk to other users of the sea. Should trenching not be successful, Option 2a would be the remediation option anyway.</p> <ul style="list-style-type: none"> That Option 2c (Exposed Sections Cut and Removed) would require rock coverage to protect the cut ends. The quantity of rock would be similar to Option 2a but with additional operations / activities to first remove the exposed sections. <p>Recognising the lack of significant difference, all three options (2c, 2a and 2b) are acceptable for use and could be carried forward to C&P (Contracts and Procurement) tendering, with Shell free to select any of the three options based on feedback from the market and potential synergies with other scopes. DESNZ will be informed by Shell on the overall strategy.</p> <p>It is recommended that Option 1c (Total Removal by Cut and Lift) be discounted:</p> <ul style="list-style-type: none"> Option 1c was ranked 4th. This was driven by a Higher Impact (Red) ranking related to Cost and Moderate Impact (Amber) ratings for Risk during Project Execution (onshore/offshore and to other users), Seabed Disturbance (short term) and Risk of Major Project Failure and Technical Complexity when compared to Options 2a, 2b and 2c. 	
<p>CA Group B Umbilicals, trenched and self-burying / partially rock-covered PLU2034 (whole line) and sections of PLU2033 with >0.6m DoC (KP0 to KP 4.5 and KP 17.5 to KP 31.247)</p>	<p>Based on the evaluation results, Option 2c (Exposed Sections Cut and Removed) was ranked 1st.</p> <p>Ratings across 6 of the 13 sub-criteria across all options evaluated were considered Not Significantly Different (all being individually rated Lower Impact (Green)). No Higher Impact (Red) ratings were assigned for any of the options.</p> <p>Reflecting the lack of significant difference between the three remediate options (Rock Cover, Trench and Bury, or Cut and Remove) it is suggested they could all be carried forward to Execution phase C&P tendering, with Shell free to select any of the three options based on feedback from the market and potential synergies with other scopes.</p> <p>It is recommended that Option 1a (Total Removal by Reverse Reeling), which was ranked 4th, be discounted due to the most Moderate Impacts (amber) for Risk During Project Execution (Onshore and Offshore), Seabed Disturbance and additional Cost.</p>	
<p>CA Group C Umbilical, trenched and DoC <0.6m</p>	<p>All other options were screened out during the Comparative Assessment screening and, to leave a clear seabed, this section of PLU2033 will be fully removed to shore for recycling / disposal.</p>	



Table 1.9: Summary of Decommissioning Programmes		
Selected Option	Reason for Selection	Proposed Decommissioning Solution
PLU2033 (KP4.5 – KP 17.5)		
3. Wells		
The three wells (2-off Atlantic and 1-off Cromarty) were plugged and made safe to AB3 in 2017.	Meets NSTA and HSE regulatory requirements	Plugged and made safe to AB3 Wellhead were severed 4.24m (14/26A-A1Y), 4.24m (14/26A-A2Z) and 4.54m (13-30A-6Z) below mean seabed respectively and recovered to shore for recycling / disposal.
4. Stabilisation Features		
Full removal of all surface-laid, accessible concrete tunnels, concrete deflector block, concrete mattresses and grout bags Existing rock cover to be decommissioned in situ	To leave a clear seabed	Recover accessible concrete tunnels, concrete deflector blocks, concrete mattresses and grout bags to shore for re-use, recycling and disposal In the event of practical difficulties in removing these items, OPRED will be consulted
5. Interdependencies		
Crossings associated with third-party pipelines, umbilicals or cables are listed in Section 1.6. The remaining sections of PL2029 and PL2031 will remain <i>in situ</i> to allow for repurposing options to be fully assessed. In the event that repurposing options are exhausted, the remaining sections of these lines will be subject to a separate Decommissioning Programme issued at a later date.		



1.6 Field Location Including Field Layout and Adjacent Facilities

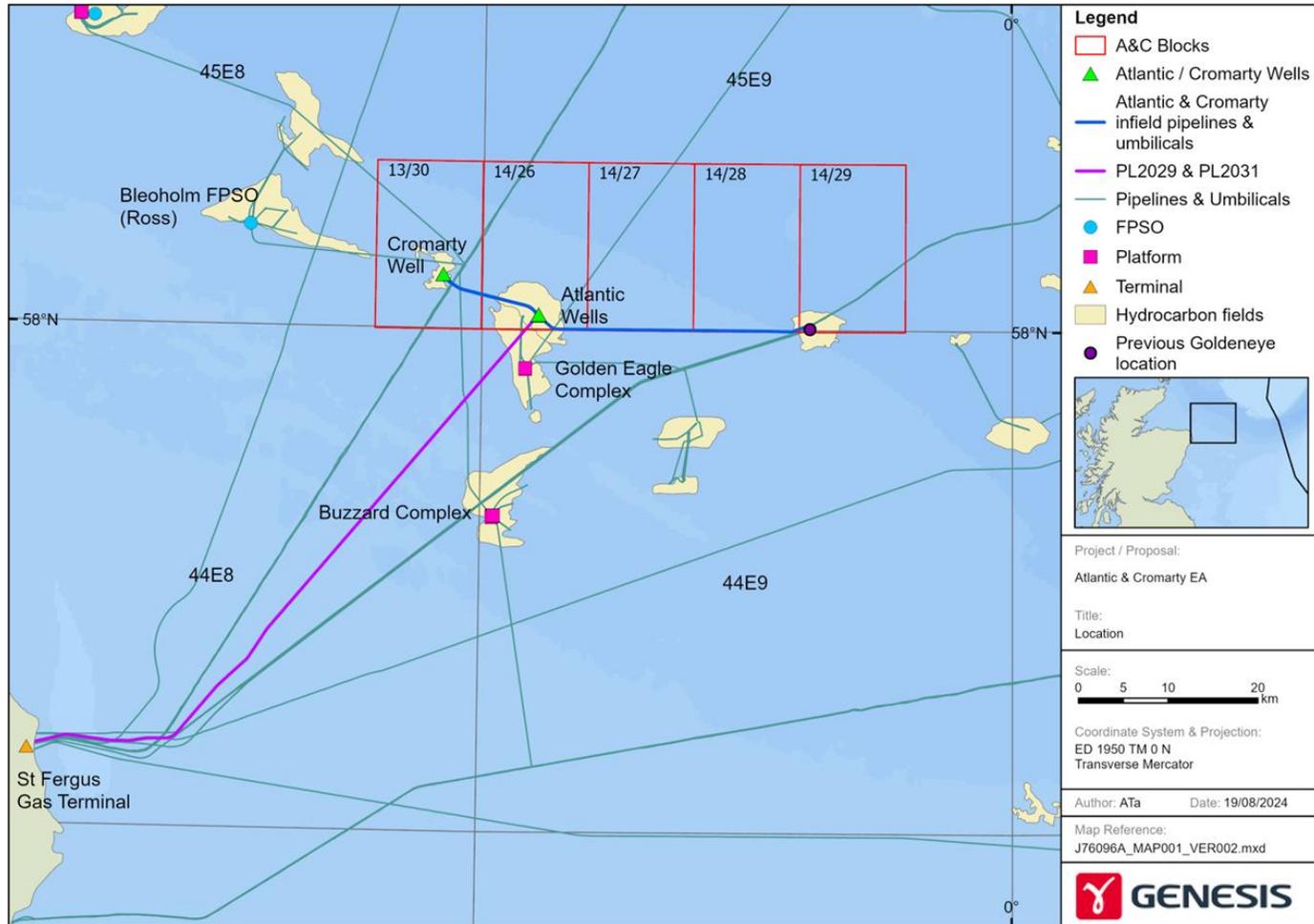


Figure 1.1: Field Location in UKCS



Table 1.10: Adjacent Facilities					
Owner	Name	Type	Distance/Direction	Information	Status
Cromarty to Atlantic Pipelines PL2030 c/w piggybacked PL2032					
North Sea Midstream Partners Operations Limited	PL2049 Formerly PL7S, Frigg to St Fergus 2 South	32" pipeline, trenched with natural backfill	Crossing	PL2030/2032 cross over PL20149 at KP1.38. The crossing is rock-covered	Active
CNOOC International Limited	PL2072, Buzzard to Captain Tee Pipeline	10" pipeline, trenched and buried	Crossing	PL2030/2032 cross over PL2072 at KP2.52. The crossing is rock covered	Active
Gassco	PL6, Frigg to St Fergus 1 South ("Vesterled" pipeline)	32" pipeline, trenched with natural backfill	Crossing	PL2030/2032 cross over PL6S at KP1.47. The crossing is rock-covered	Active
Cromarty to Atlantic Umbilical PLU2034					
CNOOC International Limited	PL2072, Buzzard to Captain Tee Pipeline	10" pipeline, trenched and buried	Crossing	PLU2034 crosses over PL2072 at KP9.39. The crossing is rock covered	Active
North Sea Midstream Partners Operations Limited	PL2049 Formerly PL7S, Frigg to St Fergus 2 South	32" pipeline, trenched with natural backfill	Crossing	PLU2034 crosses over PL20149 at KP10.37. The crossing is rock-covered	Active
Gassco	PL6, Frigg to St Fergus 1 South ("Vesterled" pipeline)	32" pipeline, trenched with natural backfill	Crossing	PLU2034 crosses over PL6S at KP10.46. The crossing is rock-covered	Active
Goldeneye to Atlantic Umbilical PLU2033					
Shell U.K. Limited	PL1978 Goldeneye to St Fergus gas export pipeline	20" pipeline, surface-laid	0.1km west of PLU2033 end at former Goldeneye platform location	Hydrocarbon free pipeline filled with inhibited water	Out of use



Table 1.10: Adjacent Facilities					
Owner	Name	Type	Distance/Direction	Information	Status
Shell U.K. Limited	PL1979 St Fergus to Goldeneye MEG import pipeline	4" pipeline, trenched and buried with rock-dumped end	0.03km west of PLU2033 end at former Goldeneye platform location	Flushed pipeline with inhibited water	Out of use
BP Exploration Ltd	PL720 Miller to St Fergus Gas Export Pipeline	30" pipeline, surface-laid	Crossing	PLU2033 crosses over PL720 at KP0.376. The crossing is rock-covered	Out of use
Ancala Midstream Acquisitions Ltd	PL762 SAGE Beryl A Pipeline to St Fergus	30" pipeline, surface-laid	Crossing	PLU2033 crosses over PL762 at KP0.456. The crossing is rock-covered	Active
CNOOC International Limited	PL3036 Golden Eagle Oil Export Pipeline to Claymore	14" pipeline, trenched	Crossing	PL3036 crosses over PLU2033 at KP29.01. The crossing is rock-covered	Active
CNOOC International Limited	Golden Eagle	Platform	Approx 6km south of Atlantic Manifold	Block 20/1N	Active
CNOOC International Limited	Golden Eagle North Drill Centre	Subsea tieback	Approx 1.6km west of the Atlantic Manifold, with a 500m subsea safety zone in place	Subsea development wells tied back to the Golden Eagle Platform	Active
Impacts of Decommissioning Proposals					
Decommissioning of the Goldeneye Platform has already been completed by Shell U.K. Limited. The removal of the PLU2033 riser and remediation of the subsea end was completed in 2022 by Shell U.K. Limited.					

1.7 Industrial Implications

The Atlantic and Cromarty Decommissioning Project is aiming to identify safe, efficient and cost-effective methods and procedures for various aspects of decommissioning the Atlantic and Cromarty Fields.

Initiatives for a portfolio-based approach are part of the contracting strategy development to explore decommissioning execution solutions, including:



-
- Market Engagements with supply chain companies to identify market capabilities and get market input on the best possible Contracting and Execution Strategies.
 - Participation in industry workgroups, events, seminars and conferences.
 - Utilisation of enterprise bodies in supply chain consultations such as NSTA pathfinder.
 - Exploring multi-field and potentially multi-operator combined work scopes.

All procurement will be carried out in accordance with the company standards for contract and procurement, and in accordance with the supply chain code of conduct. Furthermore, in accordance with the North Sea Transition Authority's Supply Chain Action Plans Guidance, Shell is developing a Supply Chain Action Plan (SCAP) to be submitted in support of these Decommissioning Programmes. The first draft of the SCAP will be issued to the NSTA in support of the public consultation revision of these programmes. The final approval revision of the SCAP will be issued to the NSTA in support of the final approval revision of these programmes.



2 Description of Items to be decommissioned

2.1 Atlantic

2.1.1 Atlantic Installation: Subsea Facilities

Table 2.1: Subsea Installation and Stabilisation Features				
Subsea installations including Stabilisation Features	Number	Size/Weight (Te)	Location	Comments/Status
Atlantic Manifold	1	17.8m x 13.7m x 5.46m 203.6Te	58° 00.85080' N 00° 53.61427' W	The total weight includes the manifold protection structure, the roof panels, the internal piping and valve skid, and the securing piles. The manifold is secured by 4-off piles, 27.1m long x 0.61m OD, 10Te each



2.1.2 Atlantic: Pipelines Including Stabilisation Features

Table 2.2: Atlantic Pipeline and Umbilical 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
Atlantic Production Pipeline	PL2029	PL2029 Ident 1 and 5m section of Ident 2 only subject to these Programmes The full length of PL2029 is 77.6km. The remaining pipeline will be subject to a later Programme.							
		16	0.045	X65 steel with 3LPP, FBE, CTE and CWC	Gas / gas condensate	Atlantic Manifold to pipeline tie-in flange	Surface-laid, protected by mattresses and concrete tunnels	Out of use	Inhibited river water
Atlantic MEG Pipeline (Piggybacked to PL2029)	PL2031	PL2031 Ident 4 and 5m section of Ident 3 only subject to these Programmes The full length of PL2031 is 77.6km. The remaining pipeline will be subject to a later Programme.							
		4	0.045	X65 Steel with 3LPP, FBE and CTE	MEG	Pipeline tie-in flange to the Atlantic Manifold	Surface-laid, protected by mattresses and concrete tunnels	Out of use	Inhibited river water
Atlantic well 1 production spool	PL2029JAW1	8	0.138	X65 steel with 3LPP	Gas / gas condensate	Atlantic well 1 to Atlantic Manifold	Surface-laid, protected by mattresses	Out of use	Inhibited sea water / inhibited fresh water



Table 2.2: Atlantic Pipeline and Umbilical 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
Atlantic well 2 production spool	PL2029JAW2	8	0.036	X65 steel with 3LPP	Gas / gas condensate	Atlantic well 2 to Atlantic Manifold	Surface-laid, protected by mattresses	Out of use	Inhibited seawater / inhibited freshwater
Atlantic well 1 MEG spool	PL2031JAW1	4	0.137	X65 steel with 3LPP	MEG	Atlantic Manifold to Atlantic well 1	Surface-laid, protected by mattresses	Out of use	Inhibited seawater / inhibited freshwater
Atlantic well 2 MEG spool	PL2031JAW2	4	0.038	X65 steel with 3LPP	MEG	Atlantic Manifold to Atlantic well 2	Surface-laid, protected by mattresses	Out of use	Inhibited seawater / inhibited freshwater
Atlantic Control Umbilical	PLU2033	3.55	31.357	Steel armoured electrohydraulic and chemical injection umbilical	Power / signal / hydraulics	Cut end adjacent to former location of Goldeneye Platform to the Atlantic Manifold	Trenched and buried. Rock- covered at Goldeneye end. Surface- laid transition to Atlantic Manifold is protected by mattresses	Out of use	Seawater



Table 2.2: Atlantic Pipeline and Umbilical 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
Atlantic Well 1 control jumper	PLU2033JAW1	4.59	0.145	Electrohydraulic and chemical injection jumper	Power / signal / hydraulics	Atlantic Manifold to Atlantic Well 1	Surface-laid, protected by mattresses	Out of use	Hydraulic fluids, chemical injection hoses and 50/50 MEG water mix – out of use
Atlantic Well 2 control jumper	PLU2033JAW2	4.59	0.042	Electrohydraulic and chemical injection jumper	Power / signal / hydraulics	Atlantic Manifold to Atlantic Well 2	Surface-laid, protected by mattresses	Out of use	Hydraulic fluids, chemical injection hoses and 50/50 MEG water mix – out of use



Table 2.3: Atlantic Subsea Pipeline Stabilisation Features

Stabilisation Feature	Total Number	Weight (Te)	Location(s)	Exposed/Buried/Condition
Concrete mattresses 6m x 3m x 0.3m	118	9Te each	27 protecting spools / jumpers at Atlantic Well 1 6 protecting spools / jumpers at Atlantic Well 2 8 protecting PLU2033 at the former location of the Goldeneye Platform 77 protecting the pipeline and umbilical approaches to the Atlantic Manifold	All mattresses are surface-laid and presumed to be in good condition
Concrete tunnel segments 9 sections, each 3m x 6.31m x 1.9m 4 sections, each 4.3m x 6.31m x 1.9m	13	Mid sections 9Te each End sections 12Te each	Protecting the tie-in flanges of PL2029 and PL2031 before the trench transition	All tunnel segments are surface-laid and presumed to be in good condition
Concrete deflector block 2.4m x 2.1m x 2m	1	12.5Te	Atlantic Manifold	Surface-laid and presumed to be in good condition
Grout bags	640	25kg each	Used to support spool and jumper connections to manifold and wells	All grout bags at the Atlantic well site (600 of) are presumed to be surface-laid and in reasonable condition. 40 grout bags at approach to Goldeneye are rock covered and will be decommissioned <i>in situ</i> .
Rock cover	-	~6600Te	Crossings and additional depth of cover protection for PLU2033	Stable rock cover



2.1.3 Atlantic Field Wells

Table 2.4: Atlantic Well Information				
Shell No	DTI No	Designation	Status	Category of Well
Atlantic 1	14/26a-A2Z	Production	AB3	SS 2-3-1
Atlantic 2	14/26a-A1Y	Production	AB3	SS 2-3-1

2.1.4 Atlantic Drill Cuttings

Only limited quantities of water based mud (WBM) cuttings were discharged when the Atlantic wells were drilled. These deposits were well-scattered and do not constitute drill cuttings within the definition in OSPAR Recommendation 2006/5.



2.1.5 Atlantic Inventory Estimates

The total inventory of installation and pipeline materials at the Atlantic Field is 1907 tonnes. 204 tonnes of this total relates to installations, with the remaining 1703 tonnes relating to pipelines, umbilicals, mattresses and grout bags. In addition, ~6600 tonnes of rock cover is *in situ* protecting PLU2033.

The following charts indicate the estimated inventory of material for the Atlantic installations and pipelines. Rock cover has been excluded from the tables and charts below. The previously recovered wellheads and section of PLU2033 already removed at the Goldeneye Platform are not included in the waste inventory provided below.

Table 2.5: Atlantic Material Inventory		
Material	Weight (Te)	% of total
Installations		
Steel	200	98
Copper	0	0
Zinc Alloy	4	2
Concrete	0	0
Plastics	0	0
Haz Mat/NORM	0	0
Other Non-Hazardous	0	0
Installations Total	204	100
Pipelines		
Steel	321	19
Copper	25	1
Zinc Alloy	0.2	<1
Concrete	1256	74
Plastics	101	6
Haz Mat/NORM	0	0
Other Non-Hazardous	0	0
Pipelines Total	1703	100

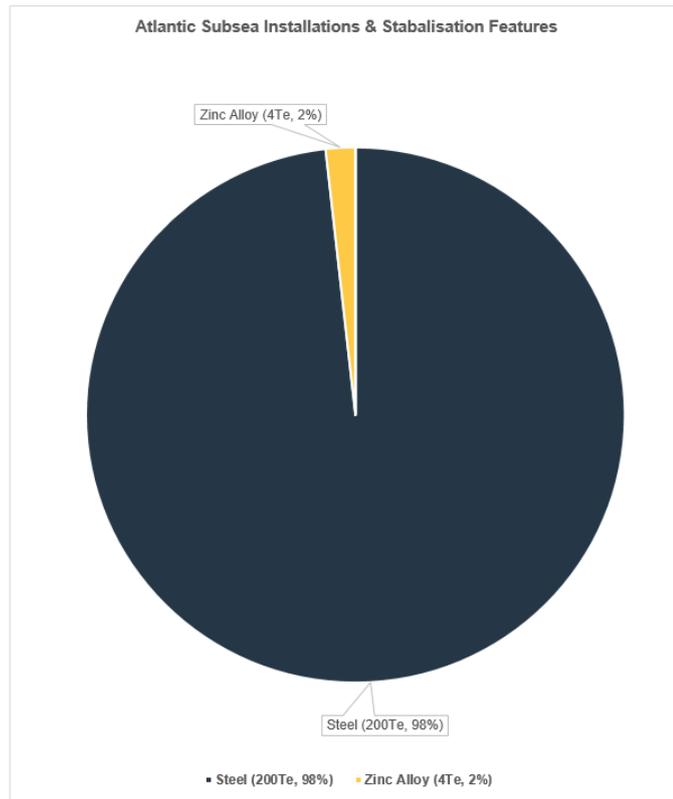


Figure 2.1: Estimated Inventories (Atlantic Installations)

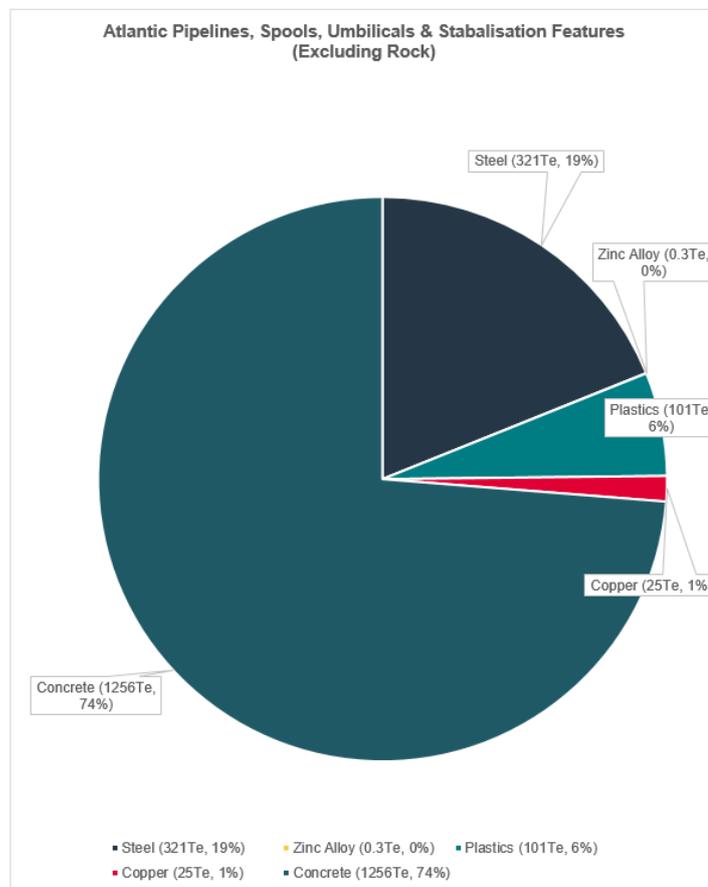


Figure 2.2: Estimated Inventories (Atlantic Pipelines) (excluding rock cover)



2.2 Cromarty

2.2.1 Cromarty Installations: Subsea including Stabilisation Features

Table 2.6: Subsea Installation and Stabilisation Features				
Subsea installations including Stabilisation Features	Number	Size/Weight (Te)	Location	Comments/Status
Cromarty Piping Assembly	1	Piping Assembly: 7.7m x 1.5m x 1.5m 8Te	58° 03.24495' N 01° 04.37275' W	The Cromarty Piping Assembly was separated from the previously removed Wellhead Protection Structure and remains <i>in situ</i> .



2.2.2 Cromarty: Pipelines including Stabilisation Features

Table 2.7: Cromarty Pipeline and Umbilical 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
Cromarty Production Pipeline	PL2030	12	11.869	X65 Steel with 3LPP coating	Gas / gas condensate	Adjacent to the Cromarty Well to the Atlantic Manifold	Trenched and buried. Surface-laid transitions to structures protected by mattresses and concrete tunnels	Out of use	Inhibited river water
Cromarty MEG Pipeline (piggybacked to PL2030)	PL2032	4	11.869	X65 Steel with 3LPP coating	MEG	Atlantic Manifold to adjacent to the Cromarty Well	Trenched and buried. Surface-laid transitions to structures protected by mattresses and concrete tunnels	Out of use	Inhibited river water
Cromarty Umbilical	PLU2034	3.55	11.964	Steel armoured electrohydraulic and chemical injection umbilical	Power / signal / hydraulics	Atlantic Manifold to Cromarty Tree	Trenched and buried. Surface-laid transitions to structures protected by mattresses and concrete tunnels	Out of use	Hydraulic fluid and MEH/water mix



Table 2.8: Cromarty Subsea Pipeline Stabilisation Features

Stabilisation Feature	Total Number	Weight (Te)	Location(s)	Exposed/Buried/Condition
Concrete mattresses 6m x 3m x 0.3m	91	9Te each	17 protecting PL2030/2032 approach to the Cromarty well 15 protecting PLU2034 approach to the Cromarty Well 49 used as upheaval buckling protection along the main route of PL2030/2032 10 at crossings	All mattresses at the approaches to the Cromarty well are surface-laid and presumed to be in good condition The mattresses used for upheaval buckling protection are partially covered but are expected to be visible. Those associated with crossings will be left <i>in situ</i> .
Concrete tunnel segments 3 sections, each 3m x 6.31m x 1.9m 2 sections, each 4.3m x 6.31m x 1.9m	5	Mid sections 9Te each End sections 12Te each	Protecting the tie-in flanges of PL2030 and PL2032 before the trench transition	All tunnel segments are surface-laid and presumed to be in good condition
Grout bags	645	25kg each	Used to support spool and jumper connections to manifold and wells	All grout bags at the Cromarty field are presumed to be surface-laid and in reasonable condition
Rock cover	-	~4900Te	Crossings and additional depth of cover protection for PL2030, PL2032 and PLU2034	Stable rock cover



2.2.3 Cromarty Well

Table 2.9: Cromarty Well Information				
Shell No	DTI No	Designation	Status	Category of Well
Cromarty	13/30a-6z	Production	AB3	SS 3-3-1

2.2.4 Cromarty Drill Cuttings

Only limited quantities of water based mud (WBM) cuttings were discharged when the Cromarty well was drilled. These deposits were well-scattered and do not constitute drill cuttings within the definition in OSPAR Recommendation 2006/5.



2.2.5 Cromarty Inventory Estimates

The total inventory of installation and pipeline materials at the Cromarty Field is 2588.5 tonnes. 8 tonnes of this total relates to installations, with the remaining 2580.5 tonnes relating to pipelines, umbilicals, mattresses and grout bags. In addition, ~4900 tonnes of rock cover is *in situ* protecting PL2030, PL2032 and PLU2034.

The following charts indicate the estimated inventory of material for the Cromarty installations and pipelines. Material inventory excludes rock cover. The previously recovered Cromarty wellhead is not included in the waste inventory provided below.

Table 2.10: Cromarty Material Inventory		
Material	Weight (Te)	% of total
Installations		
Steel	8	100
Copper	0	0
Zinc Alloy	0	0
Concrete	0	0
Plastics	0	0
Haz Mat/NORM	0	0
Other Non-Hazardous	0	0
Installations Total	8	100
Pipelines		
Steel	1610	62
Copper	9	<1
Zinc Alloy	1.6	<1
Concrete	880	34
Plastics	80	3
Haz Mat/NORM	0	0
Other Non-Hazardous	0	0
Pipelines Total	2581	100

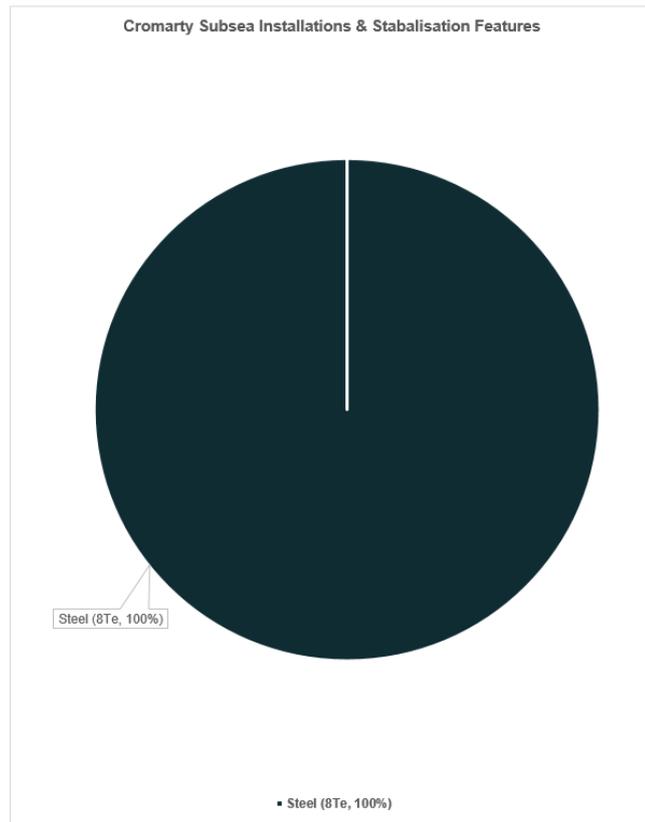


Figure 2.3: Estimated Inventories (Cromarty Installations)

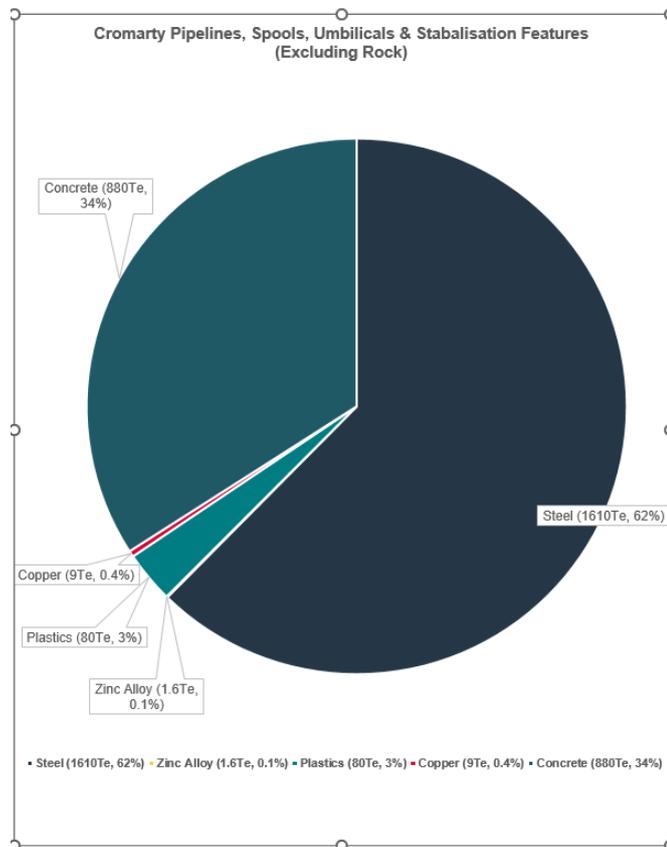


Figure 2.4: Estimated Inventories (Cromarty Pipelines) (excluding rock cover)



3 REMOVAL AND DISPOSAL METHODS

The Atlantic and Cromarty Decommissioning Project will implement Shell’s Safety and Environmental Asset Management (SEAM) standards, supporting a waste management hierarchy that optimises the re-use and recycling of waste and aims to minimise waste disposal in accordance with the EU Waste Framework Directive. The risks associated with waste will be assessed before removal to shore and opportunities to re-use the waste for the same or other purposes or, failing that, to recycle or recover materials will be identified. Waste will be characterised, classified, segregated, stored and transported according to appropriate regulatory requirements.

When removed from its offshore location, the equipment will be transported to a decommissioning contractor’s onshore yard, where different types of material will be segregated with a view to optimising re-use and recycling.

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

The decommissioning contractor’s established arrangements with recycling companies will facilitate optimisation of the quantity of materials that can be sent for recycling. An active project Waste Management Plan (WMP) will be implemented that tracks waste materials through to the recycling end points.

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

3.1 Subsea Installations and Stabilisation Features

Table 3.1 Subsea Installations and Stabilisation Features			
Subsea installations and stabilisation features	Number	Option	Disposal Route (if applicable)
2 x Atlantic wellhead protection structures including trees	2	Full recovery as part of wellhead severance campaign	Returned to shore for recycling and disposal (2017)
1 x Cromarty wellhead protection structure including tree and piping assembly	1	Full recovery as part of wellhead severance campaign	Returned to shore for recycling and disposal (2017) Piping assembly to be returned to shore for recycling and disposal
Atlantic Manifold	1	Full recovery	Return to shore for re-use, recycling or disposal



3.2 Pipelines

A comparative assessment review of the pipeline decommissioning options was performed in accordance with the OPRED Guidance Notes and OEUK Guidelines on Comparative Assessment. At this review, the following options for decommissioning were considered.

Key to options assessed:

1. Total removal by:
 - a. Reverse reeling
 - b. Reverse S-lay
 - c. Cut and lift
2. Remediate *in situ* with exposed sections:
 - a. Rock covered
 - b. Trenched and buried
 - c. Cut and removed

Per Section 4.1.2 of the Atlantic & Cromarty Pipelines Comparative Assessment [5] and in compliance with the OPRED Guidance Notes [2], the following are expected to be removed and were therefore excluded from the CA:

- Surface-laid tie-in sections of PL2029 (Ident 1 and 5m section of Ident 2) and PL2031 (Ident 4 and 5m section of Ident 3) - ~45m each
- Surface-laid spools and jumpers at the Atlantic well site:
 - PL2029JAW1, PL2029JAW2, PL2031JAW1, PL2031JAW2, PLU2033JAW1, PLU2033JAW2

Table 3.2: Pipeline or Pipeline Groups Decommissioning Options			
Pipeline / group (as per PWA)	Condition of line/group	Whole or part of pipeline/group	Decommissioning options considered
Group A Rigid pipelines (w/ piggybacked line) PL2030, PL2032	Fully trenched and buried	Whole	1c, 2a, 2b, 2c
Group B Umbilical PLU2034 and sections of PLU2033 buried >0.6m DoC	Trenched and natural backfill, buried to target Depth of Cover over most of route plus intermittent rock cover along the route	Part	1a, 2a, 2b, 2c
Group C Umbilical PLU2033 buried <0.6m DoC	Trenched and natural backfill, buried but not meeting target Depth of Cover	Part	1a



Comparative Assessment Method:

Decommissioning options were assessed in line with the requirements of the OPRED Guidance Notes and largely adopting the guidance provided in Appendix A of the Offshore Energies UK (OEUK) Guidelines for Comparative Assessment in Decommissioning Programmes, Issue 1, as required.

To support the resubmission of the Atlantic & Cromarty Decommissioning Programme (Part 1), a refresh of the original CA prepared in 2016 by BG Group was undertaken, as agreed with OPRED (reference Section 1.3). Following the OPRED Guidance Notes and Offshore Energies UK (OEUK) Guidelines for Comparative Assessment in Decommissioning Programmes, Issue 1, the CA review process followed a six-step process: Scoping, Screening, Prepare, Establish, Evaluate and Report.

The CA was based upon an assessment against five main criteria: Safety, Environmental Impact, Technical, Societal and Economic, which were further split into 13 sub-criteria. See ACDP-EGEN-S-AA-8211-00003, *Atlantic & Cromarty Pipelines Comparative Assessment* for full details of the CA.

Outcome of Comparative Assessment:

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

Table 3.3: Outcomes of Comparative Assessment			
Pipeline or Group	Most Preferred Option	Acceptable Options	Justification
Group A PL2030, PL2032	2a	2b, 2c	Remediation <i>in situ</i> imposes the lowest environmental impact and safety risk. Understanding that the re-trenching of pipelines can be more technically challenging than cut-and-lift, and due to Option 2c requiring similar rock quantities as Option 2a but imposing additional execution scope, Option 2a is the Most Preferred Option However, Options 2b and 2c are also considered to be acceptable options Option 1a was discounted due to higher cost, environmental seabed impact and technical risk than the other options.
Group B PLU2034 and sections of PLU2033	2c	2a, 2b	There was very little difference between the three remediation options (2a, 2b and 2c) with Option 2c (Remediate by Cut and Remove) imposing a lower risk of project failure than 2b (Remediate by Trench and



Table 3.3: Outcomes of Comparative Assessment			
			<p>Bury) and lower impact on Commercial Fishing and Long-Term Habitat than 2a (Remediate by Rock Cover). However, none of the impacts from the three remediation options were considered significant.</p> <p>Reflecting that there are no significant 'showstoppers' identified across any of the options, Shell will carry all options forward to Execution phase C&P tendering, with Shell free to select any of the five options based on feedback from the market and potential synergies with other scopes.</p>
Group C PLU2033	1a	N/A	<p>All other options were screened out during the Comparative Assessment screening and, to leave a clear seabed, this section of PLU2033 will be fully removed to shore for recycling / disposal.</p>

3.3 Pipeline Stabilisation Feature(s)

Table 3.4: Pipeline Stabilisation Features			
Stabilisation feature(s)	Number	Option	Disposal Route (if applicable)
Concrete mattresses	209	Full recovery of accessible mattresses	199 recovered to shore for recycling / disposal and 10 remain <i>in situ</i> as associated with crossings.
Concrete Tunnel	18	Full recovery	Recover to shore for recycling / disposal
Concrete deflector block	1	Full recovery	Recover to shore for recycling / disposal



Table 3.4: Pipeline Stabilisation Features			
Stabilisation feature(s)	Number	Option	Disposal Route (if applicable)
25 kg Grout bags	1,285 approx	Full recovery	1,245 to be recovered to shore for recycling / disposal and 40 remain <i>in situ</i> as covered with rock.
Rock cover	11,500Te approx.	Leave in situ	N/A

Notes

1. In the event of practical difficulties (e.g. poor integrity or fully covered with rock), OPRED will be consulted regarding recovery of mattresses and grout bags.
2. The number of grout bags is estimated.
3. This is the existing rock that is estimated as being present at time of CoP.

3.4 Wells

Table 3.5: Well Plug and Abandonment
<p>The wells have been plugged and made safe to AB3 status in 2017. The wellheads and upper sections of the well completion were removed at the time. No further well decommissioning scope remains.</p> <p>Well conductors were removed to the following cut depths:</p> <ul style="list-style-type: none"> • Atlantic 14/26A-A1Y – 13.9ft / 4.2m below the mudline • Atlantic 14/26A-A2Z – 13.9ft / 4.2m below the mudline • Cromarty 13-30A-6 – 14.9ft / 4.5m below the mudline



3.5 Drill Cuttings

All three wells were drilled in accordance with industry best practice and regulatory requirements. In each case, the top two well sections (36" and 26") were drilled using seawater and bentonite sweeps, with drill cuttings discharged to the seabed. Subsequent sections were drilled using either WBM or low toxicity oil based mud (LTOBM), depending on specific well requirements. WBM cuttings were discharged to sea whereas LTOBM cuttings were transported to shore for treatment and disposal.

The quantity of WBM cuttings discharged to sea was limited, estimated at 398Te in total across the three wells. These deposits were well scattered and do not constitute drill cuttings piles within the definition of OSPAR Recommendation 2006/5. The Atlantic and Cromarty Section 29 Notice Holders therefore do not propose any further work to investigate potential residual effects of WBM cuttings discharges at the Atlantic and Cromarty well sites.



3.6 Waste Streams

Table 3.6: Waste Stream Management Methods	
Waste Stream	Removal and Disposal Method
Bulk Liquids	Not applicable
Marine growth	Marine growth that remains attached to the manifold, piping assembly tie-in spools or stabilisation materials after load-in to the dismantling yard will be removed onshore. It will be disposed of in accordance with the regulations in force at the dismantling yard following the site operator's licenses and procedures
NORM/LSA Scale	There is no historical evidence of NORM at Atlantic and Cromarty and none is anticipated to be encountered during decommissioning. Regardless, all recovered material will be monitored for NORM contamination and, where encountered, managed in accordance with the 2018 Environmental Authorisations (Scotland) Regulations. Low-level radioactive sources within flowmeters were removed with the Atlantic and Cromarty wellheads.
Asbestos	There is no record of asbestos associated with the subsea infrastructure at either Atlantic or Cromarty, however if identified appropriate control and management will be enforced
Other hazardous wastes	Any hazardous waste identified during recovery will be segregated and stored to prevent pollution and/or cross-contamination. Appropriate procedures will be followed for the management of waste, with the waste transferred to a suitably licensed onshore facility.
Onshore Dismantling sites	Selection of (an) onshore dismantling site(s) will be made on the basis of a commercial tender, taking into account Health, Safety, Security, Environmental and Social Performance criteria. Screening, followed by site audits where necessary, will be performed and Shell will only consider sites that are licensed to receive the types and quantities of materials identified in the Materials Inventories for Atlantic and Cromarty. Candidate sites must demonstrate the capability to manage waste streams and disposal through the deconstruction process. The dismantling site operator will have established arrangements with facilities that recycle steel, copper, aluminium and other materials.

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

The material to be removed during decommissioning activities is shown in Table 3.7. The previously recovered wellheads and section of PLU2033 already removed at the Goldeneye Platform are not included in the waste inventory provided below.



Table 3.7: Inventory Disposition			
	Total Inventory Tonnage	Planned tonnage to shore	Planned left <i>in situ</i>
Atlantic			
Installations	204	204	0
Pipelines	1703	1449	254
Cromarty			
Installations	8	8	0
Pipelines	2581	918	1663
Total			
Installations	212	212	0
Pipelines	4284	2367	1917
Total	4496	2579	1917

Of the total materials estimated in the Atlantic and Cromarty Decommissioning Programmes scope, approximately 57% of the inventory tonnage is planned to be recovered. The remaining 43% of the inventory tonnage is proposed to be decommissioned *in situ*.

Note that this excludes the ~11500 tonnes of rock cover which is currently *in situ* and which will remain in place following decommissioning.

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



4 ENVIRONMENTAL APPRAISAL OVERVIEW

4.1 Environmental Sensitivities (Summary)

Table 4.1 summarises the environmental receptors assessed within the Atlantic and Cromarty Environmental Appraisal. For full details, please refer to the EA.

Table 4.1: Environmental Sensitivities	
Environmental Receptor	Main Features
Conservation interests	<p>The nearest protected sites to the Atlantic and Cromarty fields are the Southern Trench Nature Conservation Marine Protect Areas (NCMPA) and the Turbot Bank NCMPA located c. 39 km and c. 58 km respectively from the fields.</p> <p>The Southern Trench NCMPA is designated for a number of features including Burrowed mud; Minke whale; Fronts; Quaternary of Scotland; Shelf deeps; and Submarine Mass Movement.</p> <p>Turbot Bank NCMPA is designated for sandeels.</p> <p>Given the distances from the fields the proposed activities are not expected to impact on any designated sites.</p>
Seabed	<p>The seabed within the Atlantic and Cromarty fields and between the fields and the previous Goldeneye platform location primarily comprises muddy sand with shell fragments. Seabed photography and grab samples identified areas of 'Circalittoral fine mud' (A5.36), and 'Circalittoral muddy sand' (A5.26).</p> <p>The most abundant taxonomic group throughout the A&C area are annelids, with Mollusca being the second most abundant taxonomic group and Arthropoda being the third most abundant.</p>
Fish	<p>A number of fish species use the area for spawning and/or nursery grounds. Of these fish species, anglerfish, blue whiting, cod, herring, ling mackerel, Norway pout, sandeel spurdog and whiting are Scottish Priority Marine Features (PMFs).</p> <p>Cod and haddock are listed as Vulnerable on the International Union for Conservation of Nature (IUCN) red List. The population of spurdog is decreasing and this species is listed as Vulnerable on a global scale but is Endangered in Europe.</p> <p>Cod, spotted ray (also found in the area) and spurdog are on the OSPAR list of threatened and/or declining species.</p>
Fisheries	<p>The A&C field is located within International Council for the Exploration of the Seas (ICES) rectangle 45E8 and 45E9, and on the boundary of 44E9. Shellfish and demersal species are primarily targeted in the area and the area is considered to be of relatively moderate importance to the UK fishing industry.</p>
Marine Mammals	<p>Minke whale, harbour porpoise, killer whale, Atlantic white-sided dolphin and white beaked dolphin have been observed in the area. Of these species, all except killer whale are Scottish PMFs. Harbour</p>



Table 4.1: Environmental Sensitivities	
Environmental Receptor	Main Features
	porpoise is further protected under Annex II of the Habitats Directive. In addition, all cetaceans in UK waters are European Protected Species (EPS) under Annex IV of the Habitats Regulations. Grey seals (considered an Annex II species and a Scottish PMF) are also expected to occur in the area.
Birds	The European Seabirds at Sea data indicate the presence of a range of seabirds in the vicinity of the Atlantic and Cromarty fields. Of the birds known to occur in the area, northern fulmar, blacklegged kittiwake and Atlantic puffin are classed as Vulnerable on the IUCN red list. Arctic skua are Endangered and decreasing in Europe. Common guillemot and European storm-petrel are listed on Annex I of the Birds Directive and black-legged kittiwake are on the OSPAR list of threatened and/ or declining species.
Onshore Communities	At this stage of the project, the onshore dismantling and disposal yards are not yet chosen and therefore it is not possible to describe the specific locations where activities will take place. Shell intends to engage approved dismantling contractors to handle the recovered materials. In addition, approved waste management contractors will be selected to handle, store and dispose of any materials that cannot be recycled or reused.
Other Users of the Sea	Based on available data, shipping activity in the area can be considered relatively low. The closest non-dangerous wreck to the proposed operations is located c. 0.52 km to the south of the Goldeneye to Atlantic umbilical. The field is located in developed oil and gas area and the nearest surface installation is the Golden Eagle installation located c. 5.4 km southeast of the umbilical between the Goldeneye to Atlantic manifold. There are no military exercise areas within the vicinity of the A&C infrastructure (Scottish Government NMPi). The closest offshore wind site is the MarramWind pre-planning site, which is located c. 1 km north of the Goldeneye to Atlantic umbilical. The closest successful Innovation and Targeted Oil & Gas (INTOG) application site is a Flotation Energy site c. 6.7 km south of the Goldeneye to Atlantic umbilical.
Atmosphere	Offshore, emissions to the atmosphere will arise from the vessels used to decommission the Atlantic and Cromarty infrastructure. Onshore emissions will result from the yard activities including recycling of the steel associated with the material returned to shore.



4.2 Potential Environmental Impacts and their Management

Environmental Impact Assessment Summary

An ENVironmental Impact IDentification (ENVID) has been undertaken for the project with the anticipated impacts highlighted in Table 4.2 below. The Environmental Appraisal (EA) covers these potential impacts where appropriate. Decommissioning of the Atlantic and Cromarty infield infrastructure is not anticipated to result in any significant environmental impacts.

Table 4.2: Environmental Impact Management		
Activity	Main Impacts	Management of the Impacts
Decommissioning pipelines, including stabilisation features	<p>Emissions to Air</p> <p>Emissions of CO₂, NO_x, CO and SO₂ associated with vessel operations will contribute to a reduction in air quality</p>	<p>The impact of vessel emissions will be mitigated by:</p> <ul style="list-style-type: none"> • Optimising vessel efficiency (i.e. minimising the number of vessels used and vessel trips required) and hence minimising fuel use and avoiding the unnecessary operation of power generation/combustion equipment. • Shell review of the Offshore Vessel Inspection Database (OVID) as part of the vessel assurance process.
	<p>Physical presence (seabed)</p> <p>Potential for infrastructure decommissioned <i>in situ</i> to interact with demersal fishing gear (e.g. buried pipeline and cable sections decommissioned <i>in situ</i>)</p>	<p>The impact of potential interaction with demersal fishing gear will be mitigated by:</p> <ul style="list-style-type: none"> • There will be no exposed infrastructure left on seabed. • Safe seabed survey will be carried out. • Any rock remaining on the seabed will have an over trawlable profile.
	<p>Seabed Disturbance</p> <p>Some localised disturbance will occur during the removal of the Atlantic and Cromarty pipeline spools and ends, umbilical ends and stabilisation materials. Further localised disturbance may occur where rock-placement is required</p>	<p>The impacts on the seabed will be mitigated by:</p> <ul style="list-style-type: none"> • Cutting / jetting / dredging and lifting procedures will be in place. • Following cut and removal of exposed ends, if available preference will be given to backfilling / reprofiling previously excavated material to remediate the exposed flowline and umbilical cut ends as opposed to adding spot rock cover. • If used, additional rock deposits will be optimised and carefully managed. Size of rock and rock profiles will be in accordance with industry practice. • A fallpipe will be used to lay any rock that may be used on the seabed.



Table 4.2: Environmental Impact Management		
Activity	Main Impacts	Management of the Impacts
		<ul style="list-style-type: none"> • Preference will be given to the use of side scan sonar surveys (or similar) to determine a safe seabed.
	<p><u>Accidental Events</u></p> <p>The potential sources of accidental release associated with the Atlantic and Cromarty decommissioning scope are failures of diesel storage tanks on infield vessels</p>	<p>The impacts of a potential loss of diesel inventory from a vessel will be mitigated via:</p> <ul style="list-style-type: none"> • Vessel assurance inspections. • Pre-hire vessel audits. • Emergency response plans in place including the vessels SOPEPs (Shipboard Oil Pollution Emergency Plan). • SIMOPS (simultaneous operations) will be managed through bridging documents and communications. • All vessels engaged in the project operations will have markings and lightings as per the COLREGS whilst the navigational aids will include radar, lighting and AIS. • Compliance activities will be managed by means of the independently verified Company integrated Safety and Environmental Management System (SEMS).
	<p><u>Waste Generation:</u></p> <p>Recovered material will be classed as waste</p>	<p>The impacts of waste generation will be mitigated by:</p> <ul style="list-style-type: none"> • As part of Shell’s Duty of Care, contract award will be to an established yard with appropriate experience, capability, licences and consents in place. As part of this the sites must demonstrate waste stream management throughout the deconstruction process. • Waste management will follow the waste hierarchy: reduce, reuse, recycle. • All waste will be handled and disposed of in line with regulations which will be detailed in the Waste Management Plan (WMP).



5 INTERESTED PARTY CONSULTATIONS

Pre-Engagement Summary

Pre-engagement with stakeholders commenced in 2014 when the decommissioning project was kicked-off by BG. This included public consultation of the Decommissioning Programmes and supporting documentation in 2016. These covered the emerging decommissioning plans and the scope of the pre-decommissioning environmental baseline survey.

Following the restart of decommissioning project activities in 2023, Shell has engaged with the regulatory community and other stakeholders (e.g. NSTA, JNCC, OPRED Environmental Management Team and the SFF).

HOLD 1

Table 5.1: Summary of Stakeholder Comments		
Points raised during statutory and public consultations		
Stakeholder	Comment	Response
1. Informal Stakeholder Consultations		
2. Public		
3. Statutory Consultations		
National Federation of Fishermen’s Organisations		
Scottish Fishermen’s Federation (SFF)		
Northern Ireland Fish Producers Organisation (NIFPO)		
Global Marine Systems Limited (GMS)		
North Sea Transition Authority (NSTA)	Shell Global LNG Limited has consulted with the NSTA under S29(2A) of the Petroleum Act.	
Public		



6 PROGRAMME MANAGEMENT

6.1 Project Management and Verification

A Project Management team has been appointed to manage suitable (sub)contractors for the disconnection and removal activities. Standard Shell procedures for operational control, hazard identification and hazard management will be used. Where possible the work will be co-ordinated with other decommissioning operations in the Central North Sea to secure schedule and cost efficiencies. This may lead to Atlantic and Cromarty decommissioning scopes being executed in several phases over an extended time. There may be significant periods of inactivity following a phase of work. If it is determined by OPRED ODU that pipeline monitoring is required during a prolonged decommissioning execution period, the results of any such surveys will be submitted to OPRED ODU. Regular Progress Reports, and a final Close Out Report, will be submitted to OPRED.

The process of consents and the consultations required as part of this process have commenced and will be fully managed and monitored throughout the project life-cycle.

In the event of any changes to the detail of the offshore removal programme being required, these would be discussed and agreed with OPRED in advance.

The United Kingdom Hydrographic Office will be notified of any scope with implications for navigation around the Atlantic and Cromarty facilities, per the requirements of the OPRED Guidance Notes.

6.2 Post-Decommissioning Debris Clearance and Verification

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

Any significant oil and gas related seabed debris will be recovered for onshore recycling or disposal in line with existing disposal methods.

Verification of seabed clearance may be confirmed via overtrawl or non-intrusive methods and this will be discussed and agreed with OPRED at the time. This will be followed by a statement of clearance to all relevant governmental departments and non-governmental organisations.

6.3 Schedule

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

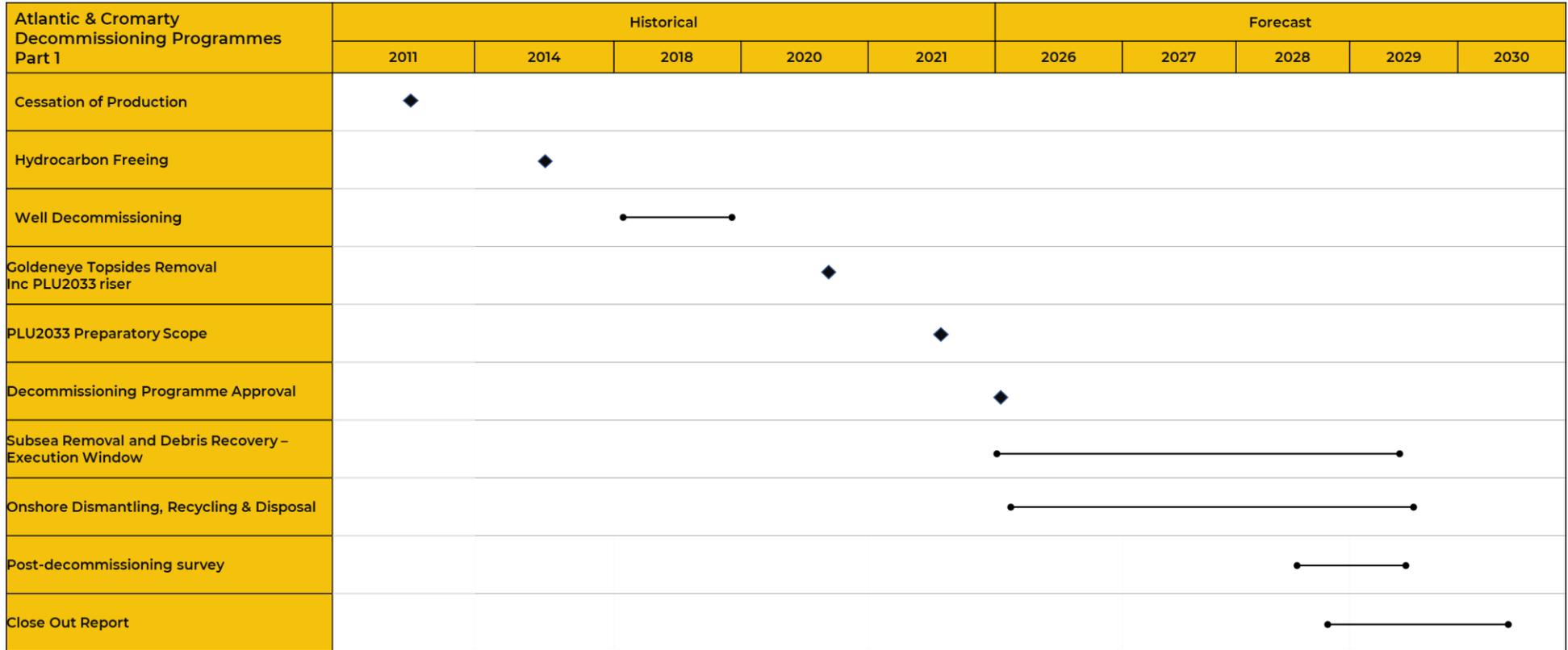


Figure 6.1: Project Plan

Note – as execution dates are uncertain, windows are provided for each activity.



6.4 Costs

A separate version of this document will be provided to OPRED ‘commercial – in confidence’ at public consultation, providing the estimated costs of the Atlantic and Cromarty Decommissioning Project .

6.5 Close Out

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

6.6 Post-Decommissioning Monitoring and Evaluation

A post-decommissioning environmental seabed survey centred on the sites of the former well sites and pipeline / umbilical corridors will be carried out. The survey will focus on any chemical and physical disturbances of the decommissioning activities compared with the pre-decommissioning data. Results of this survey will be forwarded to OPRED.

The former 500m zones centred on the Atlantic and Cromarty well sites, and the Atlantic and Cromarty pipeline routes will be the subject of geophysical surveys when decommissioning activity has concluded. A summary of these surveys will be shared with OPRED and will inform the agreement of a post-monitoring survey regime.

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



7 SUPPORTING DOCUMENTS

Table 7.1: Supporting Documents		
Ref	Document Number	Title
[1]	Chapter 17	The Petroleum Act 1998
[2]	N/A	OPRED Guidance Notes - Decommissioning of Offshore Oil and Gas Installations and Pipelines November 2018
[3]	N/A	Oil and Gas UK Guidelines for Comparative Assessment in Decommissioning Programmes, Issue 1 October 2015
[4]	ACDP-EGEN-S-HX-7180-00004	Atlantic and Cromarty Environmental Appraisal
[5]	ACDP-EGEN-S-AA-8211-00003	Atlantic and Cromarty Pipelines Comparative Assessment

These documents are available as follows:

1. At the Shell website at <https://www.shell.co.uk/sustainability/decommissioning.html>
2. Electronic copies may be requested by emailing SUKEP-Shell-Decommissioning-Correspondence@shell.com or writing to Decommissioning Business Opportunity Manager, Decommissioning Strategy, Shell U.K. Limited, The Silver Fin Building 355 Union Street, Aberdeen AB11 6DB



8 SECTION 29 NOTICE HOLDER LETTERS OF SUPPORT

HOLD 2



APPENDIX 1 – PUBLIC NOTICE

Shell Global LNG Limited

The Petroleum Act 1998

Atlantic & Cromarty Decommissioning Programmes (Part 1)

On 20 November 2025, Shell Global LNG Limited submitted, for the consideration of the Secretary of State for Energy Security and Net Zero, the draft Decommissioning Programmes (Part 1) for the Atlantic and Cromarty Fields in accordance with the provisions of the Petroleum Act 1998. It is a requirement of the Act that interested parties be consulted on such decommissioning proposals.

The Atlantic and Cromarty Fields are located in the outer Moray Firth in UK Continental Shelf (UKCS) Blocks 14/26a, 20/1 (north) and 13/30a. The Fields are both approximately 67km northeast of the St Fergus Gas Terminal in the north east Aberdeenshire coast and approximately 144km and 154km from the median line with Norway, respectively.

Shell Global LNG Limited (Shell) operates the Atlantic Field and Hess Limited (Hess) operates the Cromarty Field. Shell operates the joint facilities that serve both Fields. Shell is submitting the Cromarty Decommissioning Programmes on behalf of Hess.

In 2016, Decommissioning Programmes for the Atlantic and Cromarty Fields were submitted for public consultation by BG Global Energy Limited (now Shell Global LNG Limited). During this consultation, the Carbon Capture Utilisation and Storage community requested that decommissioning proposals for the gas export pipeline PL2029 were put on hold to allow further investigation of the repurposing potential of the line to support CO₂ reinjection. The Decommissioning Programmes were therefore put on hold and the pipelines remained in the Interim Pipeline Regime.

Since the initial public consultation in 2016, all credible opportunities for the wells and installations have been exhausted. However, repurposing options for the export pipeline were the subject of further repurposing assessments. To progress decommissioning of the offshore infrastructure excluding the export pipeline in a timely manner, per regulatory requirements, Shell has agreed with OPRED to split the Decommissioning Programmes for the Atlantic & Cromarty Fields. This document outlines the decommissioning proposals for the Atlantic and Cromarty installations and pipelines up to but excluding the tie-in flanges for the gas export pipeline PL2029 and piggybacked MEG import pipeline PL2031. The remaining sections of these pipelines, along with the associated stabilisation features, will be the subject of a separate Programme to be submitted at a later date.

The Atlantic and Cromarty Draft Decommissioning Programmes (Part 1) covers:

- Installations and subsea infrastructure associated with the Atlantic Field, comprising of the Atlantic Manifold, Atlantic Production Pipeline up to the pipeline tie-in flange, Atlantic MEG Pipeline up to the pipeline tie-in flange, Atlantic Umbilical and associated tie-in spools, jumpers and stabilisation features.
- Installations and subsea infrastructure associated with the Cromarty Field, comprising the Cromarty Production Pipeline, the Cromarty MEG Pipeline, the Cromarty Umbilical and associated stabilisation features.



Public Consultation opened 20 November 2025 and will close on 9 January 2026. For any queries, please email SUKEP-Shell-Decommissioning-Correspondence@shell.com

The Draft Decommissioning Programmes are available for download on the Shell decommissioning website - <https://www.shell.co.uk/about-us/sustainability/decommissioning.html>

20 November 2025

James Blackburn

Business Opportunity Manager, Decommissioning



APPENDIX 2 – DEPTH OF BURIAL CHARTS

Generally, there are two definitions for burial depth; depth of lowering and depth of cover, which are both illustrated in Figure 0-1 below. The depth of cover is the conventional definition of burial depth, which is the depth of backfill or rock on top of the pipeline or cable. The depth of lowering is the depth of the top of the pipeline or cable below the natural mean seabed level. The natural mean seabed level is identified ignoring any berms to the sides of the trench.

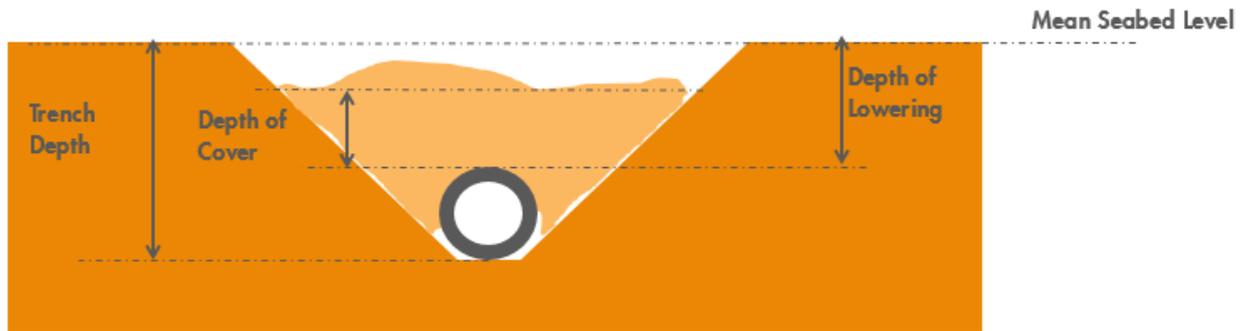


Figure 0-1 – Burial depth definition

The graphics below (Figure 0-2 to 0-6) provide depth-of-cover/burial line graphs presenting the results from historical surveys. Additional depth of burial vs depth of lowering line graphs have been provided to further describe the status of both the Cromarty and Goldeneye umbilical's.

Brief explanatory notes are provided under the graphics.

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

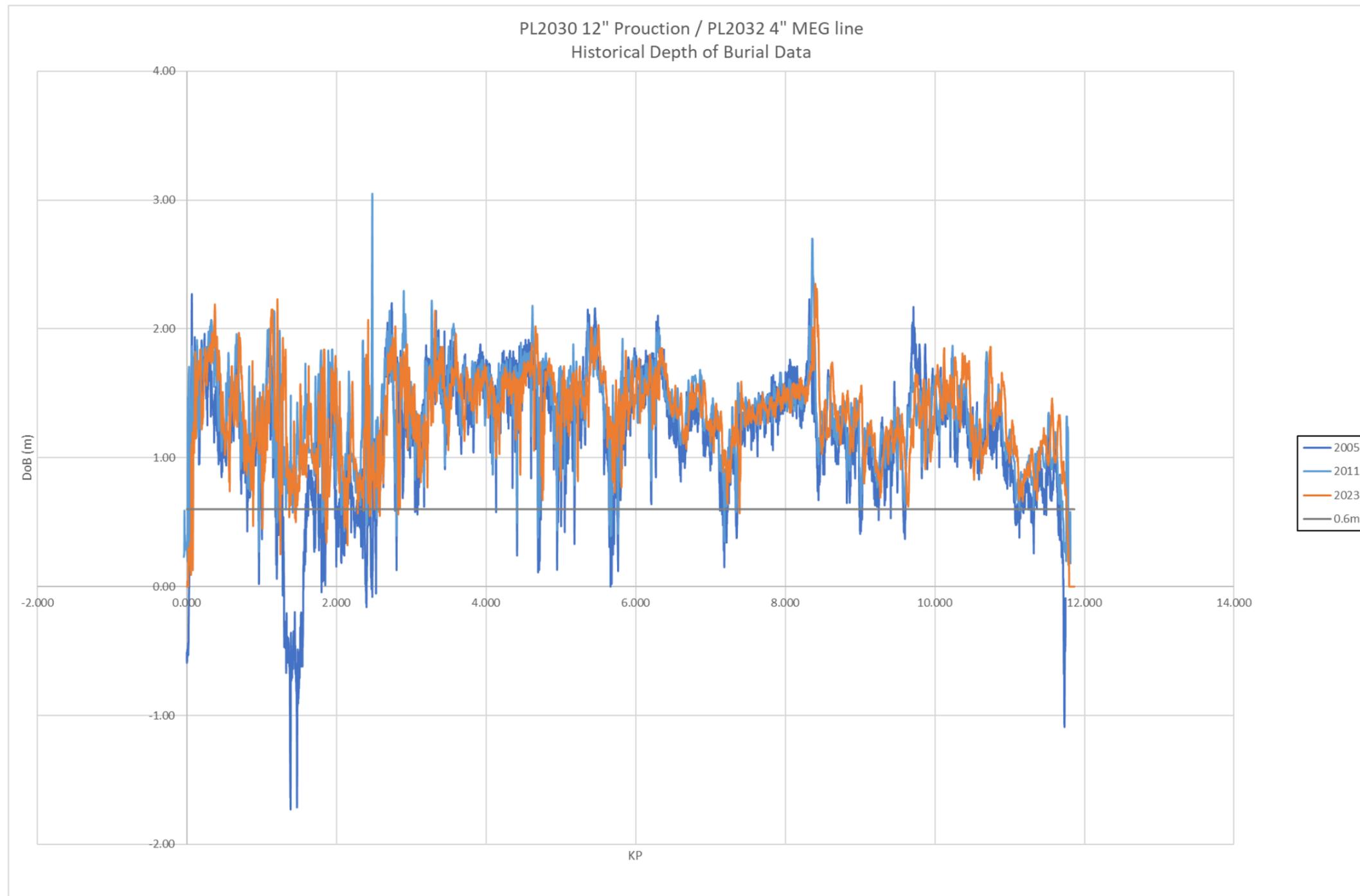


Figure 0-2 – PL2030/2032 Production Pipeline Depth of Burial

Figure 0-2 shows the historical survey depth of burial results for PL2030/PL2032 12” Production and 4” MEG line. Surveys were taken in 2005,2011 and 2023. The average depth of burial is 1.32m. The pipeline has three crossings (2 under and 1 over) at KP1.4 and KP1.5 which are protected by rock. 49 Mattresses were installed at 15 locations along the route to provide additional weight during operations.

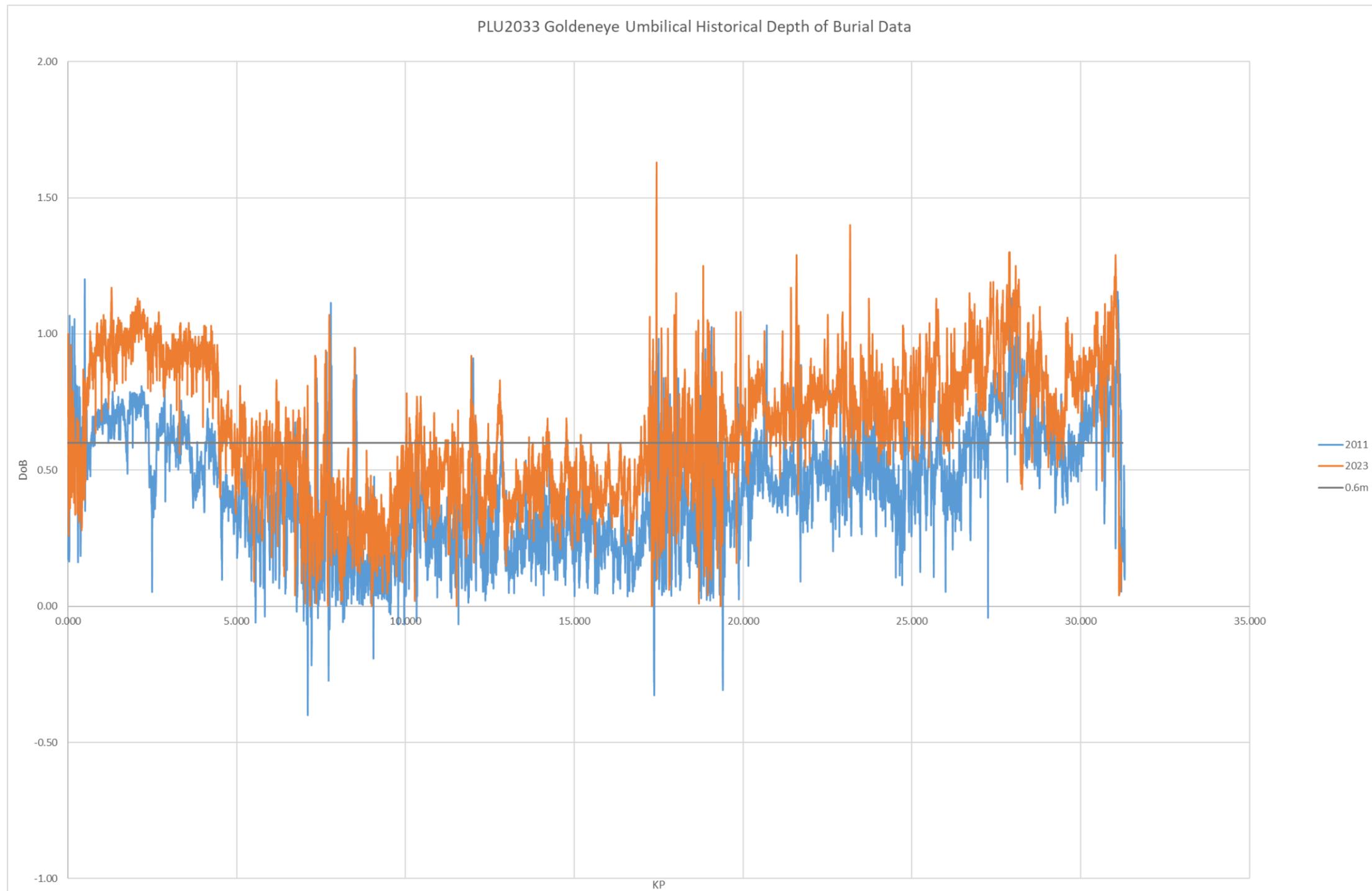


Figure 0-3 – PLU2033 Umbilical Depth of Burial

Figure 0-3 shows the historical survey depth of burial results for PLU2033 Goldeneye Umbilical. The Surveys were taken in 2011 and 2023. The average depth of burial is 0.61m across the whole line. The umbilical has three crossings (2 under and 1 over) at KP0.4 and KP29 which are protected by rock. Rock has been placed at various locations along the umbilical, mainly between KP17.5 and KP19.9. This totals 3,632 Te of rock over approx. 595 m at 29 locations.

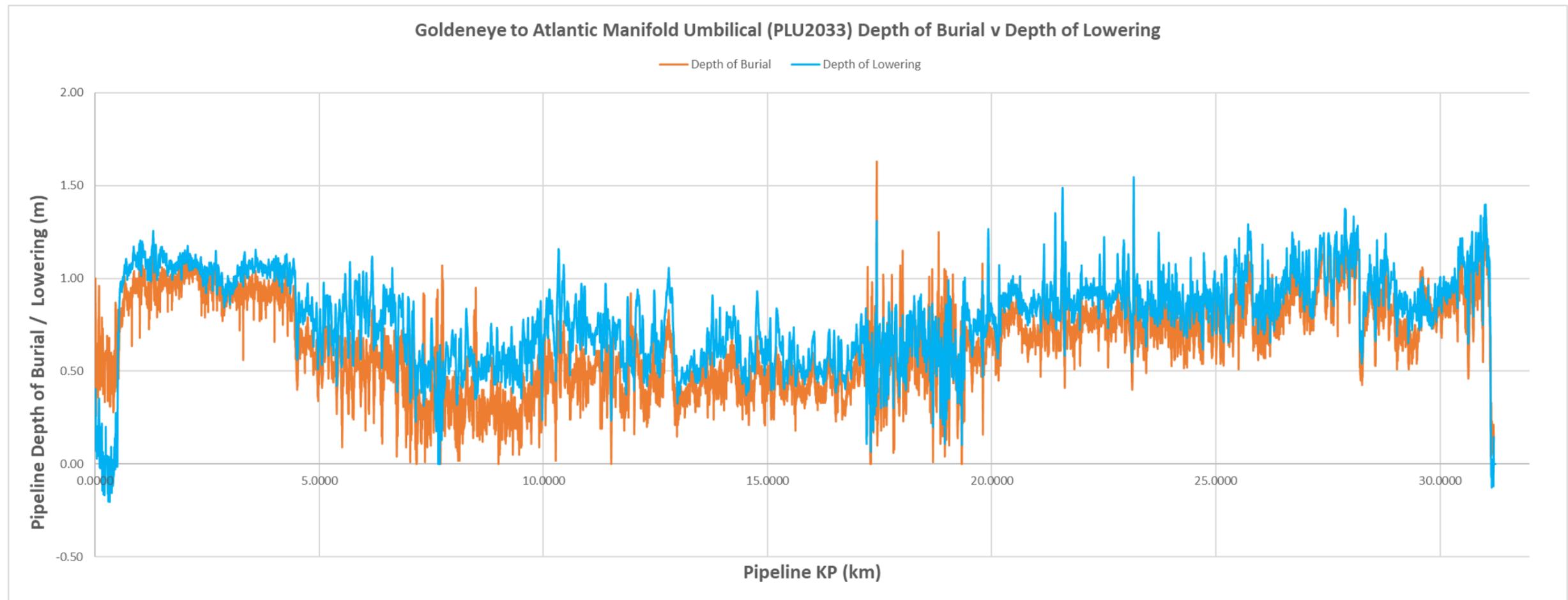


Figure 0-4 – PLU2033 Umbilical Depth of Burial vs Depth of Lowering

Figure 0-4 shows the depth of burial vs depth of lowering results for PLU2033 Goldeneye Umbilical. The graph shows that the umbilical is below the natural seabed, at around 0.5m even at the shallower depth of burial sections. Average depth of lowering over the full length of line is 0.79m.

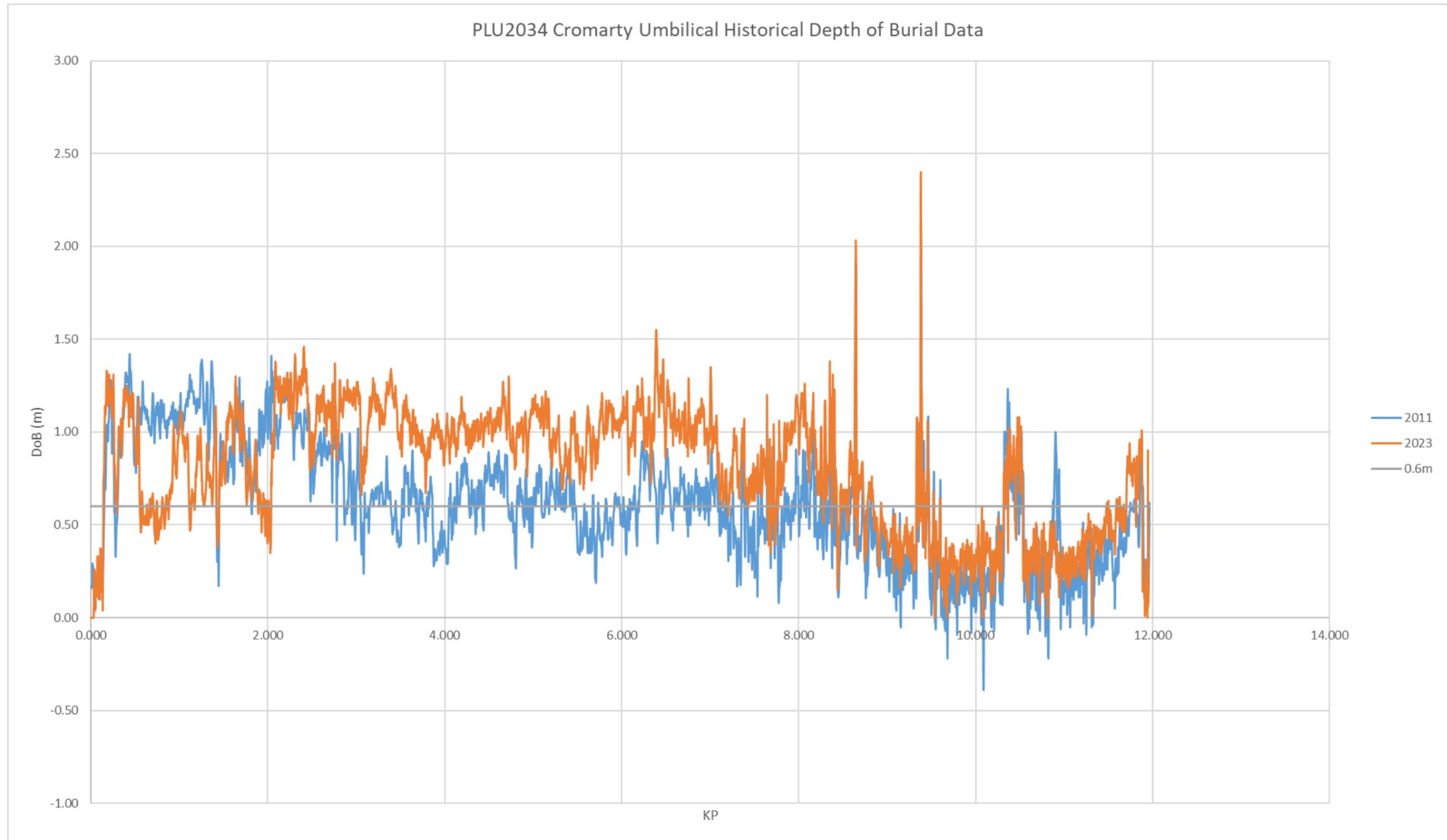


Figure 0-5 – PLU2034 Umbilical Depth of Burial

Figure 0-5 shows the historical survey depth of burial results for PLU2034 Cromarty Umbilical. The Surveys were taken in 2011 and 2023. The average depth of burial is 0.81m across the whole line. The umbilical has three crossings (2 under and 1 over) at KP9.4 and KP10.4 which are protected by rock.

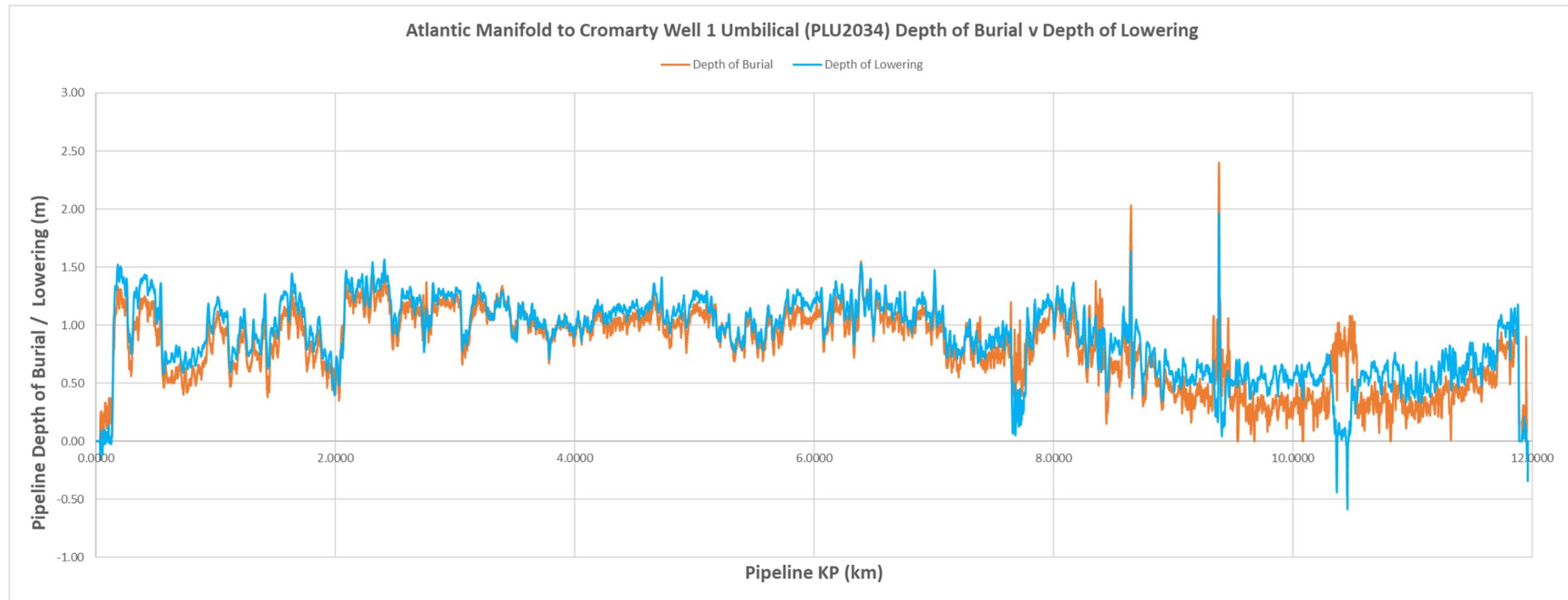


Figure 0-6 – PLU2034 Umbilical Depth of Burial vs Depth of Lowering

Figure 0-6 shows the depth of burial vs depth of lowering results for PLU2034 Cromarty Umbilical. The graph shows that the umbilical is below the natural seabed, at around 0.6m even at the shallower depth of burial sections. Average depth of lowering over the full length of line is 0.91m.

**APPENDIX 3 – PREPARATORY WORKS REQUEST**

Unrestricted
 Stewart Welsh
 Senior Decommissioning Manager
 Offshore Decommissioning Unit
 Offshore Petroleum Regulator for Environment &
 Decommissioning
 Department for Business, Energy and Industrial Strategy
 3rd Floor, AB1 Building (Wing C), Crimon Place
 Aberdeen
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Shell U.K. Limited
 1 Altens Farm Road
 Nigg
 Aberdeen
 AB12 3FY
 United Kingdom
 Tel +44 122488 2000
 Internet <http://www.shell.co.uk>

22nd February 2021

Atlantic & Cromarty Decommissioning – Preparatory Works Request

Dear Stewart,

This Preparatory Works Request (PWR) is submitted by Shell U.K. Limited on behalf of the Atlantic and Cromarty Joint Facilities co-venturers and Atlantic Pipelines Section 29 Notice Holders, being the same parties. The Section 29 Notice Holders are listed in Table 1 below. Shell Global LNG Limited is a member of the Shell Group and is the legal entity that operates the Atlantic Pipelines, and operates the Atlantic and Cromarty Joint Facilities. Throughout this document the terms 'Owners', 'We' and 'Our' refer to all the Section 29 Notice Holders.

Section 29 Notice	Notice Holder	Equity Share
Atlantic Pipelines Your Ref: RDBF/002/00429C	Shell Global LNG Limited (Operator) Registered Company No: 01287989	42.5%
	Hess Limited Registered Company No: 00807346	57.5%

Table 1 – Atlantic Pipelines Section 29 Notice Holders

Atlantic and Cromarty are two gas and gas condensate subsea fields located in the outer Moray Firth on the UK Continental Shelf (UKCS) Blocks 14/26a, 20/1 (North) and 13/30. The fields lie approximately 79km North East of the St Fergus Gas Terminal on the North East Aberdeenshire coast. Figure 1, for illustrative purposes and not to scale, shows the general locations of the fields and associated subsea infrastructure, including the Atlantic and Cromarty Joint Facilities.

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

Scoter & Merganser Decommissioning – Preparatory Works Request

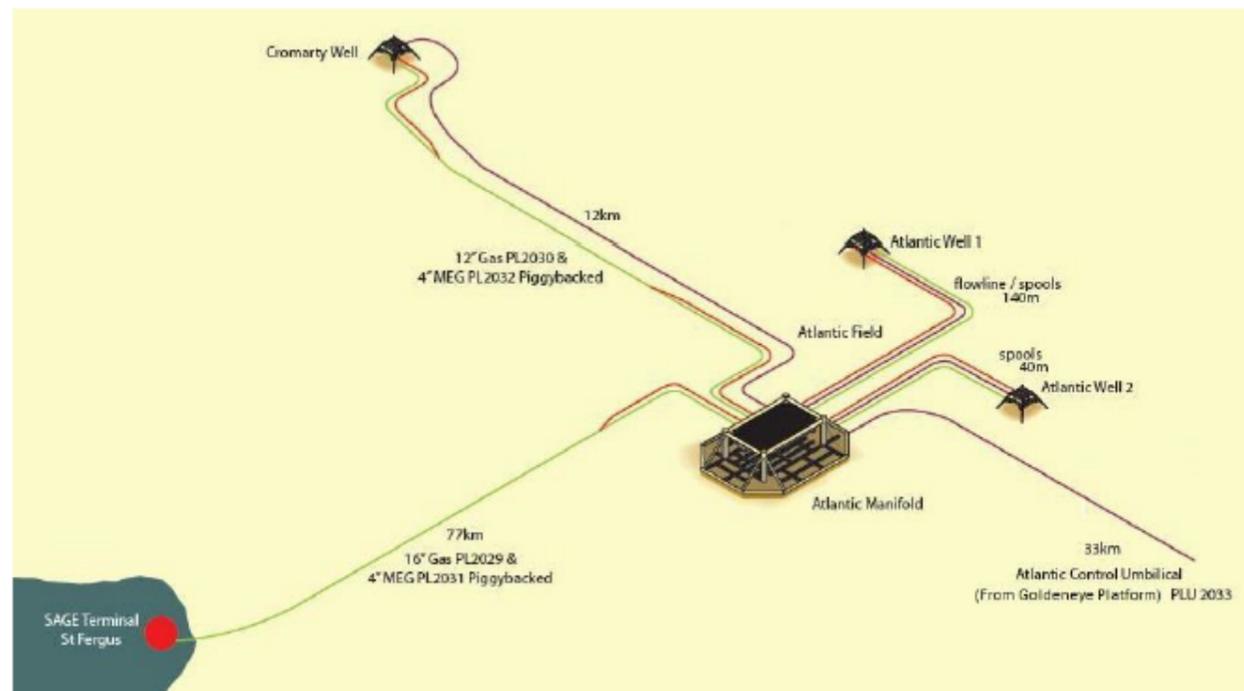


Figure 1 – Atlantic & Cromarty Fields Schematic

Shell Global LNG Limited is the Operator of the Atlantic field and Hess Limited is Operator of the Cromarty field. The Atlantic and Cromarty Joint Facilities are operated by Shell Global LNG Limited. Production from both fields started in 2006 and ceased in 2009, with the pipelines placed in an Interim Pipeline Regime (IPR) in 2010. Draft Decommissioning Programmes for Atlantic and Cromarty were issued for public consultation by Shell in October 2016 but submission for final approval has been postponed to allow for the Carbon Capture Utilisation and Storage (CCUS) potential of the pipelines and reservoir to be investigated.

The Atlantic and Cromarty wells were initially suspended in 2014, then plugged and made safe in 2018.

Electro-hydraulic control and chemical supply was provided to the Atlantic and Cromarty fields from the Goldeneye Platform via the 33km-long Atlantic Control Umbilical (PLU2033). The umbilical was disconnected from the Atlantic Manifold during the campaign to plug and make safe the Atlantic wells. The release of the umbilical contents was permitted as part of this campaign.

In November 2019, OPRED approved Decommissioning Programmes, submitted by Shell U.K. Ltd, for the removal of the Goldeneye Platform topsides and jacket, and the removal of the surface-laid tie-in infrastructure within the Goldeneye 500m safety zone. The scope contained within the Goldeneye Decommissioning Programmes necessitates the removal of elements of Atlantic and Cromarty Joint Facilities detailed below, therefore we are submitting this Preparatory Works Request to seek OPRED's approval to remove the items listed, ahead of submitting the Atlantic and Cromarty DPs at a later date.

Scope of Work

This scope of work will detail the base case methodology for removing the Atlantic and Cromarty infrastructure that is intrinsically associated with the Goldeneye Platform.



Shell U.K. Limited, as Operator of the Goldeneye field, will undertake two campaigns to execute the scope of the Goldeneye Decommissioning Programmes:

1. Removal of the Goldeneye Platform topsides and jacket, including the associated risers;
2. Removal of the subsea tie-in infrastructure within the Goldeneye 500m zone.

Scope 1 will be executed by the end of 2021 and will include the removal of the following equipment associated with the Atlantic and Cromarty Joint Facilities:

- PLU2033 Atlantic Control Umbilical riser from the base of the jacket to the Topsides Umbilical Termination Unit (TUTU);
- Controls container, containing master control station (MCS), uninterruptible power supply (UPS), hydraulic power unit (HPU) controller and controlled environment equipment;
- Hydraulic Power Unit (HPU), including pumps, storage tank and accumulation;
- Topsides Umbilical Termination Unit (TUTU).

Scope 2 will be executed by the end of 2023 and will include the removal of the section of PLU2033 highlighted in Figure 2 below. The umbilical will be cut at the base of the Goldeneye Jacket and where it enters the rock berm, with approximately 43m of umbilical between the two cut points removed.

Additional rock cover will be required to protect the cut end of PLU2033 at the existing rock berm.

Approximately 10 concrete mattresses and 100 grout bags associated with this section of umbilical will also be removed. All removed infrastructure will be recovered and returned to shore for recycling / disposal in line with Shell's waste hierarchy.

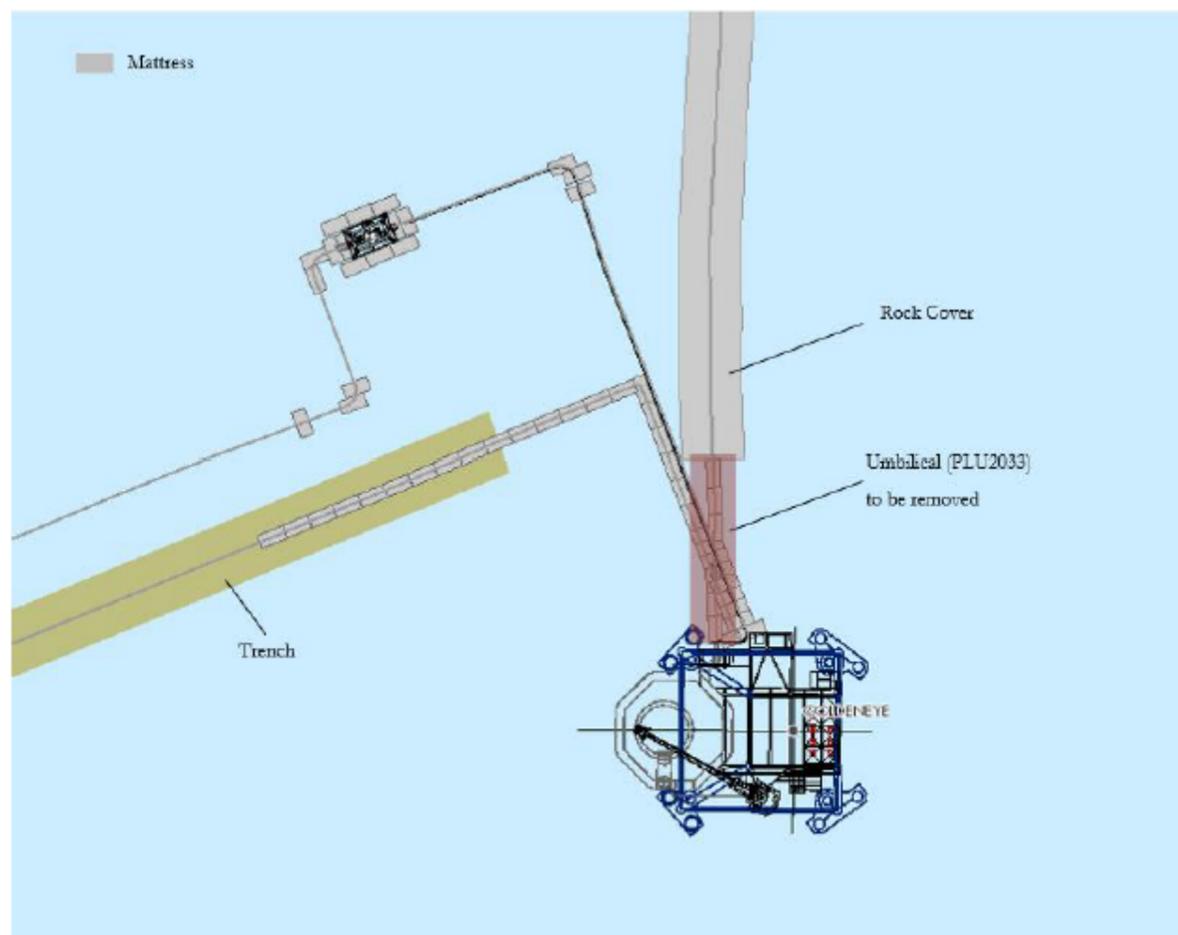


Figure 2 – Section of PLU2033 to be removed



Permits and Consents

Shell will issue PWA variations for PWA 6/W/04 to the OGA for approval. Further permit requirements will be identified by the project Permits and Consents Register including but not necessarily limited to:

- Deposit Consents, per Petroleum Act 1998
- Marine Licence, per Marine and Coastal Act 2009
- Notifications to the Hydrographics Office
- EEMS Reporting, per Environmental Impact Assessment Regulations 1999 and Offshore Chemical Regulations 2002

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

Decommissioning Programmes

The development of the Atlantic and Cromarty Decommissioning Programmes is on hold pending the development of CCUS policy by the UK Government.

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

Impact on Future Decommissioning

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

Approval Request

The Section 29 Notice Holders as listed in Table 1 are submitting this PWR to seek OPRED's approval to remove the infrastructure identified in the Scope of Work above.

Yours sincerely,
Shell U.K. Limited

James Blackburn
Decommissioning Business Opportunity Manager
Shell U.K. Limited

DocuSigned by:
Howard Lotgering Jones
12CDFAE8CE96488...

Howard Jones
UK Finance Manager
Shell Global LNG Limited