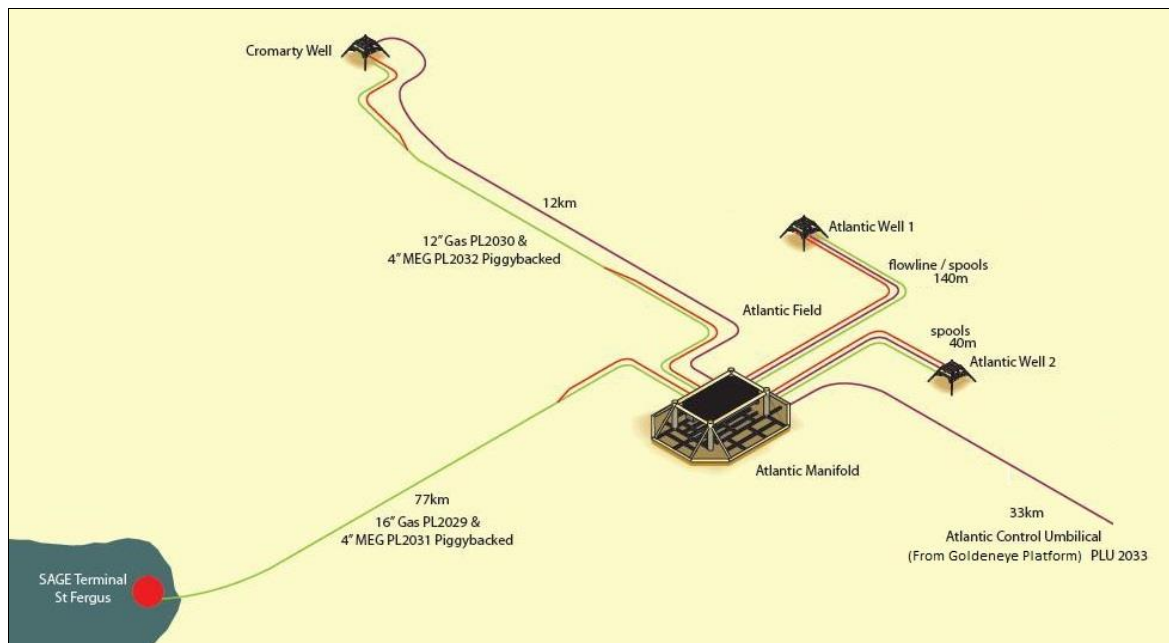


Atlantic and Cromarty Fields Draft Decommissioning Programmes



Document Control**Approvals**

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Revision Control

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Distribution

Company/Organisation
Statutory consultees
Regulatory advisory bodies (decommissioning)
Field Partner
Commercial partners for Atlantic & Cromarty
Other stakeholders with whom contact established in pre-engagement dialogue
The Public (alerted via public notices)

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* INST = Installations; P/L = Pipelines

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Terms and Abbreviations

Term	Explanation
A&C	Atlantic & Cromarty
3LPP	3 Layer Polypropylene
BEIS	Department for Business, Energy and Industrial Strategy
COP	Cessation of Production
CTE	Coal Tar Enamel
C/W	Complete With
CWC	Concrete Weight Coating
DECC	Department of Energy and Climate Change
EIA	Environmental Impact Assessment
EHC	Electro-Hydraulic control and Chemical injection
ESDV	Emergency Shut Down Valve
FBE	Fusion Bonded Epoxy
FPAL	First Point Assessment Ltd., the Achilles scheme which identifies, evaluates and pre-qualifies suppliers for major buyers in oil and gas
FPSO	Floating Production Storage Offloading
HSSE	Health, Safety, Security and Environment
IPR	Interim Pipeline Regime
JAW	Jumpers to Atlantic Well
KP	Kilometre Point
LTOBM	Low Toxicity Oil Based Mud
LSA	Low Specific Activity
MEG	Mono-ethylene glycol, used for the purposes of hydrate control
NDC	Northern Drill Centre (of Golden Eagle Area Development)
NORM	Naturally Occurring Radioactive Material
NUI	Normally Unmanned Installation
OSPAR	Oslo and Paris Convention (for the Protection of the Marine Environment of the North-East Atlantic)
P&A	Plug and Abandonment
PETS	Portal Environmental Tracking System
PL	Pipeline
PLU	Pipeline Umbilical
ppm	parts per million
PON	Petroleum Operations Notice
PUQ	Process, Utilities and Quarters
PWA	Pipeline Works Authorisation
ROV	Remotely Operated Vessel
SAGE	Scottish Area Gas Evacuation
Te	Metric Tonne
TUTU	Topside Umbilical Termination Unit
UKCS	United Kingdom Continental Shelf
WBM	Water Based Mud
WHP	Well Head Protection
WHPS	Well Head Protection Structure
X65 steel	Grade X65 line pipe steel to American Petroleum Institute Specification API 5L

1.0 EXECUTIVE SUMMARY

1.1 Combined Decommissioning Programmes

This document contains 4 decommissioning programmes for the Atlantic and Cromarty fields, consisting of four installations and 12 pipelines, defined by separate notices served under Section 29 of the Petroleum Act 1998, as follows:

Atlantic Installations:

Atlantic field: all subsea equipment including the manifold and wellhead protection structures associated with the Atlantic field.

Atlantic Pipelines:

PL2029	Export pipeline (16-inch) from Atlantic manifold to St. Fergus
PL2029JAW1	Production spoolpiece (8-inch) from Atlantic tree no. 1 to Atlantic manifold
PL2029JAW2	Production spoolpiece (8-inch) from Atlantic tree no. 2 to Atlantic manifold
PL2031	MEG pipeline (4-inch) from St. Fergus to Atlantic manifold
PL2031JAW1	MEG spoolpiece (4-inch) from Atlantic manifold to Atlantic tree no. 1
PL2031JAW2	MEG spoolpiece (4-inch) from Atlantic manifold to Atlantic tree no. 2
PLU2033	EHC umbilical from Goldeneye platform to Atlantic manifold
PLU2033JAW1	EHC umbilical jumper from Atlantic manifold to Atlantic tree no. 1
PLU2033JAW2	EHC umbilical jumper from Atlantic manifold to Atlantic tree no. 2

Cromarty Installations:

Cromarty field: all subsea equipment including the wellhead protection structure associated with the Cromarty field.

Cromarty Pipelines:

PL2030	Export pipeline (12-inch) from Cromarty tree to Atlantic manifold
PL2032	MEG pipeline (4-inch) from Atlantic manifold to Cromarty tree
PLU2034	EHC umbilical from Atlantic manifold to Cromarty tree

It should be noted that while there are no surface installations within the remit of the Atlantic and Cromarty fields, a topside umbilical termination unit (TUTU) and related equipment is located on the Goldeneye platform. The platform is the responsibility of the Goldeneye partners and therefore not detailed within this programme. Removal of the TUTU will be dealt with through commercial agreement with the Goldeneye partners.

1.2 Requirement for the Decommissioning Programmes

Subsea Installations:

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Atlantic and Cromarty fields (see Table 1.2) are applying to the Department for Business, Energy and Industrial Strategy (BEIS - formerly the Department of Energy and Climate Change (DECC)) to obtain approval for decommissioning the subsea installations detailed in Section 2.2 of this programme. (See also Section 8 - Partner Letter of Support.)

Pipelines:

In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Atlantic and Cromarty pipelines (see Table 1.4) are applying to BEIS to obtain approval for decommissioning the pipelines detailed in Section 2.3 of this programme. (See also Section 8 - Partner Letter of Support.)

In conjunction with public, stakeholder and regulatory consultation, the decommissioning programmes are submitted in compliance with national and international regulations and BEIS guidelines. The schedule outlined in this document is for a three-year decommissioning project (plus survey and close out reporting), which could begin as early as 2017 depending on commercial opportunities.

1.3 Introduction

This document, setting out the draft decommissioning programmes for the Atlantic and Cromarty infrastructure and pipelines, has been prepared following stakeholder and regulatory engagement. It is submitted without derogation and in full compliance with BEIS guidelines for public and statutory consultation. The principal supporting documents submitted alongside the decommissioning programmes comprise a Comparative Assessment Report, Environmental Impact Assessment Report and Stakeholder Engagement Report.

1.3.1 Context

The Atlantic and Cromarty fields are located in the outer Moray Firth in UK Continental Shelf (UKCS) Blocks 14/26a, 20/1 (north) and 13/30. The fields lie approximately 79 km northeast of the St Fergus gas terminal on the north east Aberdeenshire coast and approximately 135 km from the median line with Norway. Figure 1.1 shows the location of the fields and their associated subsea infrastructure which tie the fields back to shore.

BG Global Energy Limited ('BG') operates the Atlantic field and Hess Limited ('Hess') operates the Cromarty field; BG operates the joint facilities that serve both fields. BG is submitting the Cromarty Decommissioning Programmes on behalf of Hess.

The fields were developed as gas and gas condensate fields and the installations and pipelines were put in place in 2005, with production starting in 2006. Production from the Atlantic and Cromarty wells was routed to the Atlantic manifold and then, via pipeline, to the Scottish Area Gas Evacuation (SAGE) terminal at St Fergus. Control of the wells was provided via an umbilical from the Goldeneye platform to the Atlantic manifold and onwards to the wells.

The development was designed for a field life of five years (although was not successful in achieving this) and it was anticipated that other opportunities could tie into the infrastructure. Production stopped in 2009, with restart attempts in 2010 proving fruitless. The pipelines were therefore put into a period of disuse (to late 2016) under the Interim Pipeline Regime (IPR) pending investigation of options to extend the useful life of the fields. The Atlantic manifold was also left in place. The options explored included:

- Use of the reservoirs for gas storage;
- Use of the reservoirs for storing carbon dioxide;
- Sale of the facilities and infrastructure to other oil and gas companies.

None of these options has been successful. It is now considered that no specific foreseeable commercial opportunity exists for the re-use of the pipelines and associated subsea infrastructure that would warrant postponing decommissioning. Initial suspension of wells was carried out during 2014.

The wells drilled in the Atlantic and Cromarty fields are not addressed by the Section 29 notices since their plugging and abandonment is covered by separate regulatory requirements. However, for completeness and clarity, the measures planned for plugging and abandoning the Atlantic and Cromarty wells are outlined in this document.

1.3.2 Installations, Pipelines and Umbilicals

The Atlantic field installations comprise the subsea Atlantic manifold and two wells (14/26a-A2Z and 14/26a-A1Y) with associated subsea trees and integral protection structures. Cessation of Production (CoP) of the Atlantic wells was agreed in December 2011 and the wells suspended with initial plugs installed in 2014.

The Atlantic manifold (see Appendix 1 illustration (i)) is comprised of two sections: the manifold structure (weighing 73.8 Te) and the piping skid (89.8 Te). Four piles secure the manifold to the seabed.

The Cromarty field contains a single well (13/30a-6Z) and associated subsea tree with integral protection structure. A subsea piping/valve assembly, supported and protected from the Cromarty tree, was connected between the tree and the Cromarty subsea pipeline tie-in spools. Cromarty CoP was also agreed in 2011, with the subsea piping assembly disconnected and the well suspended in 2014.

The Atlantic and Cromarty wells are completed with subsea trees manufactured by Cameron. All three trees are equipped with integral overtrawlable protection frames. Appendix 1 illustration (ii) shows the tree at the Cromarty well. The diagram shows the tree as fitted with its piping/valve assembly, which is not present on the trees at the Atlantic wells. The piping assembly is disconnected from the tree and from the Cromarty pipelines.

The Atlantic manifold is connected to the onshore St Fergus terminal by a 79 km export pipeline (PL2029) with a piggy-backed MEG pipeline (PL2031). The export pipeline is 16-inch diameter apart from the initial 1.2 km from the beach at St Fergus which is 18-inch diameter. The MEG pipeline is 4-inch diameter apart from the initial 1.2 km from the beach at St Fergus which is 6-inch diameter. The export and MEG pipelines are trenched and mostly buried along their length, apart from a short section at the shore approach, at the approach to the Atlantic manifold, and at crossings which are rock covered. Appendix 1 Illustration (iii) shows a numbering schematic.

The Atlantic manifold is connected to each of the two Atlantic wells via 8-inch production spools (PL2029JAW1 and PL2029JAW2) and 4-inch MEG spools (PL2031JAW1 and PL2031JAW2). The spools are laid directly onto the seabed and protected with concrete mattresses.

Production from the Cromarty well was routed to the Atlantic manifold via a 11.8 km long 12-inch production pipeline. MEG was supplied to the Cromarty tree through a 4-inch pipeline which is piggybacked to the production pipeline. Apart from the approaches to the Cromarty tree and the Atlantic manifold, and the rock covered crossings, these pipelines are trenched and buried throughout their length.

The pipeline and umbilical limits and numbering are shown in the schematic at Appendix 1 illustration iii).

Electrical power and signals, hydraulics and chemical injection capability to the Atlantic and Cromarty wells were provided by a 31.4 km umbilical (PLU2033) from the Goldeneye platform to the Atlantic manifold and a 12 km umbilical from the Atlantic manifold to Cromarty (PLU2034). A satellite link provided communication and control between the Goldeneye platform and the St Fergus gas terminal.

PLU2033 is installed in a J-tube at the (unmanned) Goldeneye platform. Both PLU2033 and PLU 2034 were trenched after installation. Rock cover was installed in a number of areas where the required depth of trench was not achieved. Both umbilicals have short untrenched sections at each end that are covered by concrete mattresses.

The Atlantic well control jumpers (PLU2033JAW1 and PLU2033JAW2) are surface laid and covered by concrete mattresses.

Table 2.3 contains details of the components of the Goldeneye and Cromarty umbilicals (PLU2033 and PLU2034 respectively), shown in cross-section form at Appendix 1 illustration iv), and details of the Atlantic well no. 2 control jumper (PLU2033JAW2). PLU2033JAW1 has a similar makeup.

1.3.3 Summary of Recommendations

All infrastructure other than the pipeline options considered within the comparative assessment (see below) will be removed during the decommissioning works, as follows:

- The production wells will be plugged and abandoned; the trees and protection structures will be removed and recovered to shore;
- The tie-in spools and control jumpers from the manifold to the wells, together with their concrete protection features, will be removed and recovered to shore;
- The umbilical within the J-tube at the Goldeneye platform will be removed and returned to shore for recycling;
- The A&C umbilical control equipment on the Goldeneye platform will be removed and returned to shore for recycling;
- The Atlantic manifold will be removed to shore for recycling;
- The Cromarty piping assembly, currently disconnected from the tree and the pipeline, will be removed and returned to shore for recycling;
- It is intended that all mattresses, concrete tunnels and grout bags will be removed to shore; however, in the event of practical difficulties, BEIS will be consulted.

Based on the outcome of the comparative assessment of feasible options, the recommendation for decommissioning the offshore pipelines and umbilicals is to leave these in situ with minimum intervention, i.e. to disconnect them from the Atlantic manifold and Goldeneye platform, cutting and removing them where they emerge from burial and applying remedial rock cover to the cut ends to mitigate against the risk of snagging by other users of the sea.

For the first 10 km of the export and MEG pipeline (described as the nearshore section) comprising trenched, surface laid and rock covered sections according to the seabed characteristics, the recommendation is also to decommission in situ. While there are no spans, the top of the pipeline is exposed in some locations. Recent surveys show there has been considerable natural cover of the pipelines and a reduction in the number and scale of exposures and this trend is expected to continue.

During the comparative assessment workshop for the nearshore section (see Figure 1.4), the Scottish Fishermen's Federation (SFF) advised that their preferred position is for total removal of all decommissioned offshore oil and gas infrastructure: if this position is adopted then there should be no oil and gas related infrastructure to snag on. However, because it is not feasible to remove all sections of the Atlantic and Cromarty nearshore pipelines given the variety of characteristics (variously trenched, surface laid and rock covered), and to avoid potential snag hazards that would arise from a partial (segmented) cut and lift and rock cover solution at numerous points, SFF expressed a preference for continuous rock cover throughout the nearshore section in an attempt to avoid increasing risks to fishermen.

In conjunction with decommissioning the nearshore pipeline in situ, remedial rock cover will be applied at areas of exposure where it can be reasonably predicted that scallop dredging may occur. The size of particle used in any new rock cover will be discussed and agreed with the relevant government departments and the SFF.

Further mitigating actions will be implemented to ensure future risk to other users of the sea is as-low-as-reasonably-practicable (ALARP) – see section 6.2.

1.4 Overview of Installations/Pipelines Being Decommissioned

1.4.1 Installations

Table 1.1 Installations being Decommissioned			
Fields:	Atlantic and Cromarty	Production Type	Gas and Gas Condensate
Water Depth (m)	115 m	UKCS block	Atlantic – 14/26a; 20/1 (north) Cromarty – 13/30a
Surface Installation(s)			
Number	Type	Topsides Weight (Te)	Jacket Weight (Te)
n/a	n/a	n/a	n/a
Subsea Installations		Number of Wells	
Number	Type	Platform	Subsea
4	1 x Manifold (Atlantic) 2 x Atlantic Well Head Protection Structures 1 x Cromarty Well Head Protection Structure (including piping assembly)	n/a	Atlantic Wells – 2 Cromarty Wells - 1 <u>Notes:</u> 1. All three wells were suspended in 2014 2. The Well Head Protection Structures are integral to the subsea trees

Drill Cuttings pile(s)		Distance to median	Distance from nearest UK coastline
Number of Piles	Total Estimated volume (m3)	km	km
n/a	n/a	135	79

Table 1.2 Installations Section 29 Notice Holders Details		
Section 29 Notice Holders	Registration Number	Equity Interest (%) If zero show 0%
Atlantic		
BG Global Energy Limited	01287989	75%
Hess Limited	00807346	25%
Cromarty		
BG Global Energy Limited	01287989	10%
Hess Limited	00807346	90%

1.4.2 Pipelines

Table 1.3 Pipelines being Decommissioned	
Number of Pipelines (see Table 2.3 for full details)	12
Atlantic:	
Pipelines (including jumpers)	6
Umbilicals (including jumpers)	3
Cromarty:	
Pipelines	2
Umbilicals	1

Table 1.4 Pipelines Section 29 Notice Holders Details		
Section 29 Notice Holders	Registration Number	Equity Interest (%) If zero show 0%
Atlantic and Cromarty – all pipelines downstream of the wellhead spool are classed as Joint Facilities with specific equity splits as below		
BG Global Energy Limited	01287989	42.5% (Operator)
Hess Limited	00807346	57.5%

1.5 Summary of Proposed Decommissioning Programmes

Table 1.5 Summary of Decommissioning Programmes		
Selected Option	Reason for Selection	Proposed Decommissioning Solution
1. Topsides		
n/a	n/a	n/a
2. Jacket(s) / floating facility (FPSO etc.)		
n/a	n/a	n/a
3. Subsea installations		
Full removal of: 1 x Manifold (Atlantic) 2 x Atlantic Well Head Protection Structures 1 x Cromarty Well Head Protection Structure (including piping assembly)	To remove all seabed structures and leave a clean seabed.	Disconnect from all pipelines, umbilicals and jumpers; cut piles 2-3m below seabed; recover all manifold components. Removal method to involve either a construction vessel or a diving support vessel
4. Pipelines, flowlines and umbilicals		
Partial removal of: Atlantic to St Fergus pipeline PL2029 with piggybacked pipeline PL2031	Determined by CA process	Exposed pipeline ends at approach to Atlantic manifold to be buried with cut sections removed. Surface laid, buried and rock-covered sections (including crossings) in nearshore to remain in situ with remedial rock cover at scallop-dredged areas of pipeline from KP7.5 to KP10km.
Partial removal of: Cromarty Pipeline PL2030 with piggybacked pipeline PL2032	Determined by CA process	Buried and rock-covered sections (including crossings) to remain in situ, exposed ends to be buried after cutting and cut sections removed.
Partial removal of: Goldeneye to Atlantic Umbilical PLU 2033 PLU2033JAW1 and PLU2033JAW2	Determined by CA process	Trenched and rock-covered sections (including crossings) to remain in situ, exposed ends to be buried after cutting and cut sections removed.
Partial removal of: Cromarty Umbilical PLU2034	Determined by CA process	Trenched and rock-covered sections (including crossings) to remain in situ, exposed ends to be buried after cutting and cut sections removed.
Full removal of: Pipeline and tree tie-in spool pieces, umbilical jumpers PL2029JAW1, PL2029JAW2, PL2031JAW1 and PL2031JAW2 and concrete mattresses	To remove all seabed structures and leave a clean seabed.	To be removed.
5. Wells		
Abandon in accordance with Oil & Gas UK Guidelines for the Suspension and Abandonment of Wells (issue 5, July 2015)	Meets BEIS regulatory requirements	PON5/PETS/Marine Licence applications under the relevant regulations will be submitted in support of works to be carried out.
6. Drill cuttings		
n/a	n/a	n/a
7. Interdependencies		
n/a		

1.6 Field Location Including Field Layout and Adjacent Facilities

Figure 1.1 Field Location in UKCS

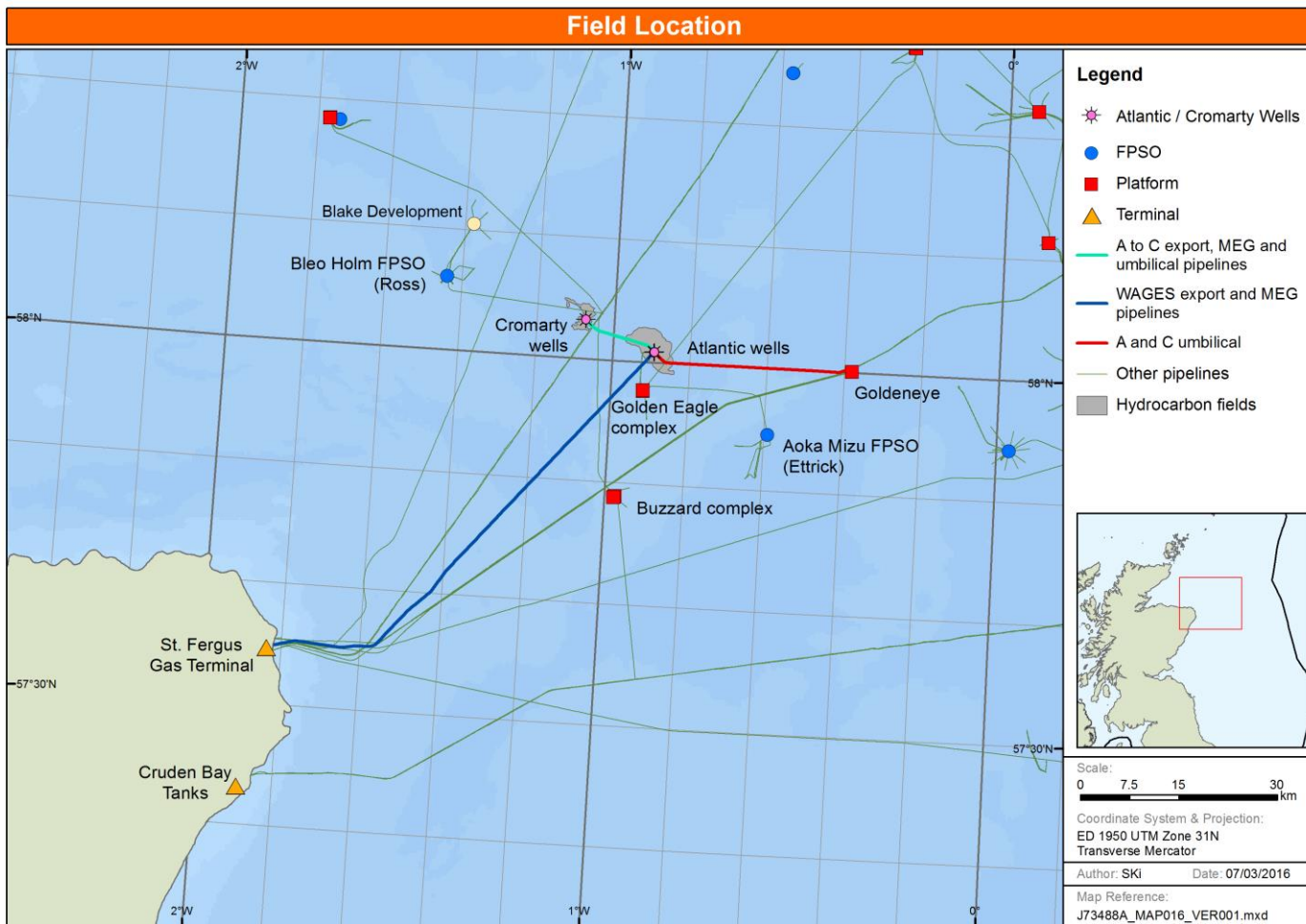


Figure 1.2 Field Layout – 2015 Status

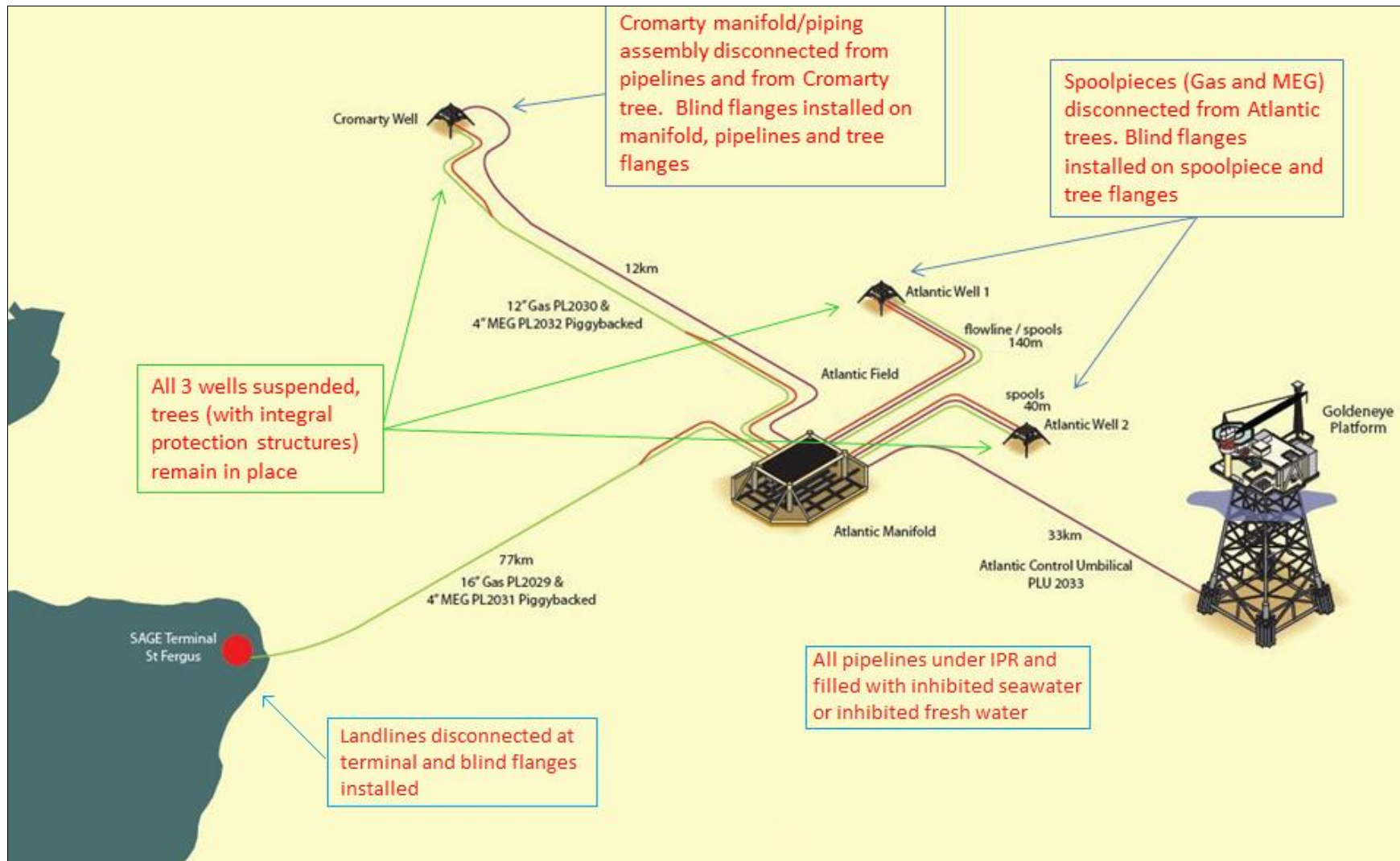


Table 1.6 Adjacent Facilities					
Owner	Name	Type	Distance/ Direction	Information	Status
Atlantic to St Fergus pipeline PL2029 c/w piggybacked pipeline PL2031					
Apache North Sea Ltd	SAGE Gas Terminal, St Fergus	Onshore gas terminal	-	PL2029/PL2031 are routed to the SAGE terminal, which also receives the Britannia and Beryl SAGE pipelines	Active
Britannia Operator Limited	Britannia gas export pipeline to St Fergus (PL1270)	28-inch pipeline, exposed on seabed.	-	PL2029/2031 cross over PL1270 at KP3.287. The crossing is rock-covered	Active
Shell Exploration and Production	Brent Flags pipeline to St Fergus (PL2)	36-inch pipeline, trenched with natural backfill.	-	PL2029/2031 cross over PL2 at KP9.119. The crossing is rock-covered	Active
North Sea Midstream Partners	Frigg to St Fergus 2 South (PL7S)	32-inch pipeline, trenched with natural backfill.	-	PL2029/2031 cross over PL7S at KP14.266. The crossing is rock-covered	Active
	Frigg to St Fergus 1 South (P6S)	32-inch pipeline, trenched with natural backfill.	-	PL2029/2031 cross over PL6S at KP14.415. The crossing is rock-covered	Active
Apache North Sea Ltd	SAGE Beryl pipeline to St Fergus (PL762)	30-inch pipeline, exposed on seabed.	-	PL2029/2031 cross over PL762 at KP16.4. The crossing is rock-covered	Active
Nexen Petroleum UK Ltd	Buzzard gas export pipeline to Captain tee (PL2072)	10-inch pipeline, trenched and buried	-	PL2072 crosses over PL2029/2031 at KP65.3. The crossing is rock-covered	Active
	Golden Eagle to NDC water injection pipeline (PL3172)	8-inch flexible pipeline, trenched.	-	PL3172 crosses over PL2029/2031 at KP74.72. The crossing is rock-covered	Active
	NDC to Golden Eagle production pipeline (PL3168) c/w piggybacked gas lift (PL3169)	8-inch/12-inch pipe-in pipe c/w 4in piggyback, trenched and buried	-	PL3168/3169 cross over PL2029/2031 at KP 74.77. The crossing is rock-covered	Active
	Golden Eagle to NDC control umbilical (PLU3175)	Electrohydraulic control and chemical injection umbilical, trenched	-	PLU3175 crosses over PL2029/2031 at KP74.82. The crossing is rock-covered	Active
Cromarty to Atlantic pipeline PL2030 c/w piggybacked pipeline PL2032					
North Sea Midstream Partners)	Frigg to St Fergus 2 South (PL7S)	32-inch pipeline, trenched with natural backfill.	-	PL2030/2032 cross over PL7S at KP1.384. The crossing is rock-covered	Active
	Frigg to St Fergus 1 South (PL6S)	32-inch pipeline, trenched with natural backfill.	-	PL2030/2032 cross over PL6S at KP1.471. The crossing is rock-covered	Active
Goldeneye to Atlantic umbilical PLU2033					
Shell Exploration	Goldeneye platform	NUI	Approx 31km east of	PLU2033 is installed in a J-tube on Goldeneye platform.	Active

Table 1.6 Adjacent Facilities

Owner	Name	Type	Distance/ Direction	Information	Status
and Production			Atlantic manifold		
	Service pipeline (PL1979) from St Fergus to Goldeneye	4-inch pipeline	-	PLU2033 crosses over PL 1979 at KP0.023.	Active
	Gas export pipeline (PL1978) from Goldeneye to St Fergus	20-inch pipeline	-	PLU2033 crosses over PL 1978 at KP0.023.	Active
BP Exploration Ltd.	Miller to St Fergus gas export pipeline (PL720)	30-inch pipeline		PLU2033 crosses over PL720 at KP0.376. The crossing is rock-covered.	Not in use
Apache North Sea Ltd	SAGE Beryl 'A' pipeline to St Fergus (PL762)	30-inch pipeline, exposed on seabed	-	PLU2033 crosses over PL762 at KP0.456. The crossing is rock-covered.	Active
Nexen Petroleum UK Ltd	Golden Eagle oil export pipeline to Claymore (PL)	14-inch pipeline, trenched		PL3036 crosses over PLU2033 at KP29.01. The crossing is rock-covered.	Active
Nexen Petroleum UK Ltd	Golden Eagle facilities	Platform	Approx. 6km south of Atlantic manifold	The Golden Eagle platform complex (bridged WHP and PUQ) is located in Block 20/1N and commenced operation in 2014.	Active
Cromarty to Atlantic umbilical PLU2034					
Nexen Petroleum UK Ltd	Buzzard gas export pipeline to Captain tee (PL2072)	10-inch pipeline, trenched and buried	-	PLU2034 crosses over PL2072 at KP9.386. The crossing is rock-covered	Active
North Sea Midstream Partners	Frigg to St Fergus 1 South (PL6S)	32-inch pipeline, trenched with natural backfill		PLU2034 crosses over PL6S at KP10.372. The crossing is rock-covered.	Active
	Frigg to St Fergus 2 South (PL7S)	32-inch pipeline, trenched with natural backfill	-	PLU2034 crosses over PL7S at KP10.458. The crossing is rock-covered.	Active
Impacts of Decommissioning Proposals					
<p>The Goldeneye platform activities schedule may have an impact on the Atlantic and Cromarty subsea decommissioning campaign. This may affect the timing of the disconnection of the umbilical from the platform.</p> <p>Decommissioning proposals for third party pipelines at the crossings may impact on A&C pipelines and umbilicals decommissioning methods (and vice versa).</p> <p>There will be no impact on the Golden Eagle platform.</p>					

Figure 1.3 Adjacent Facilities

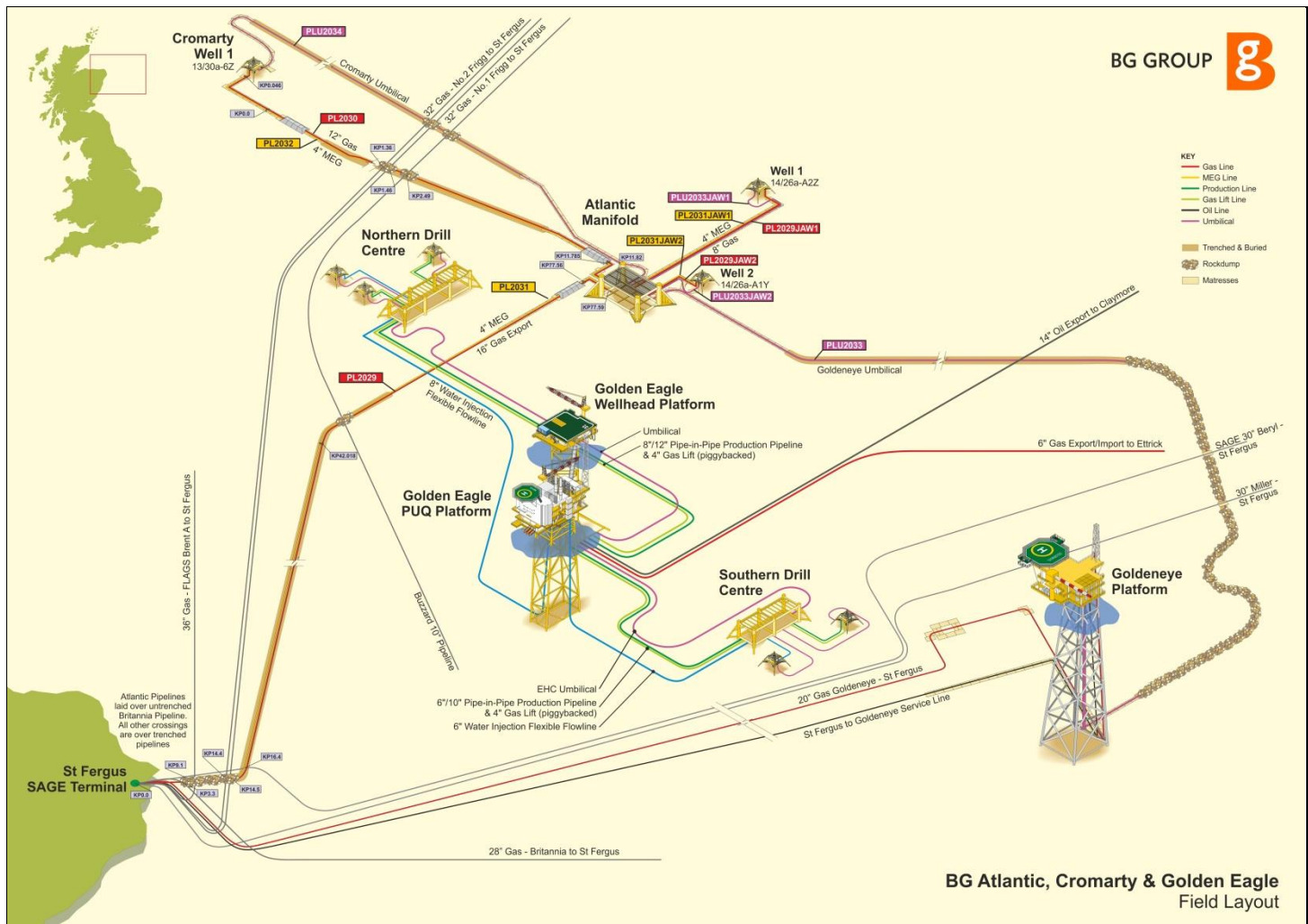
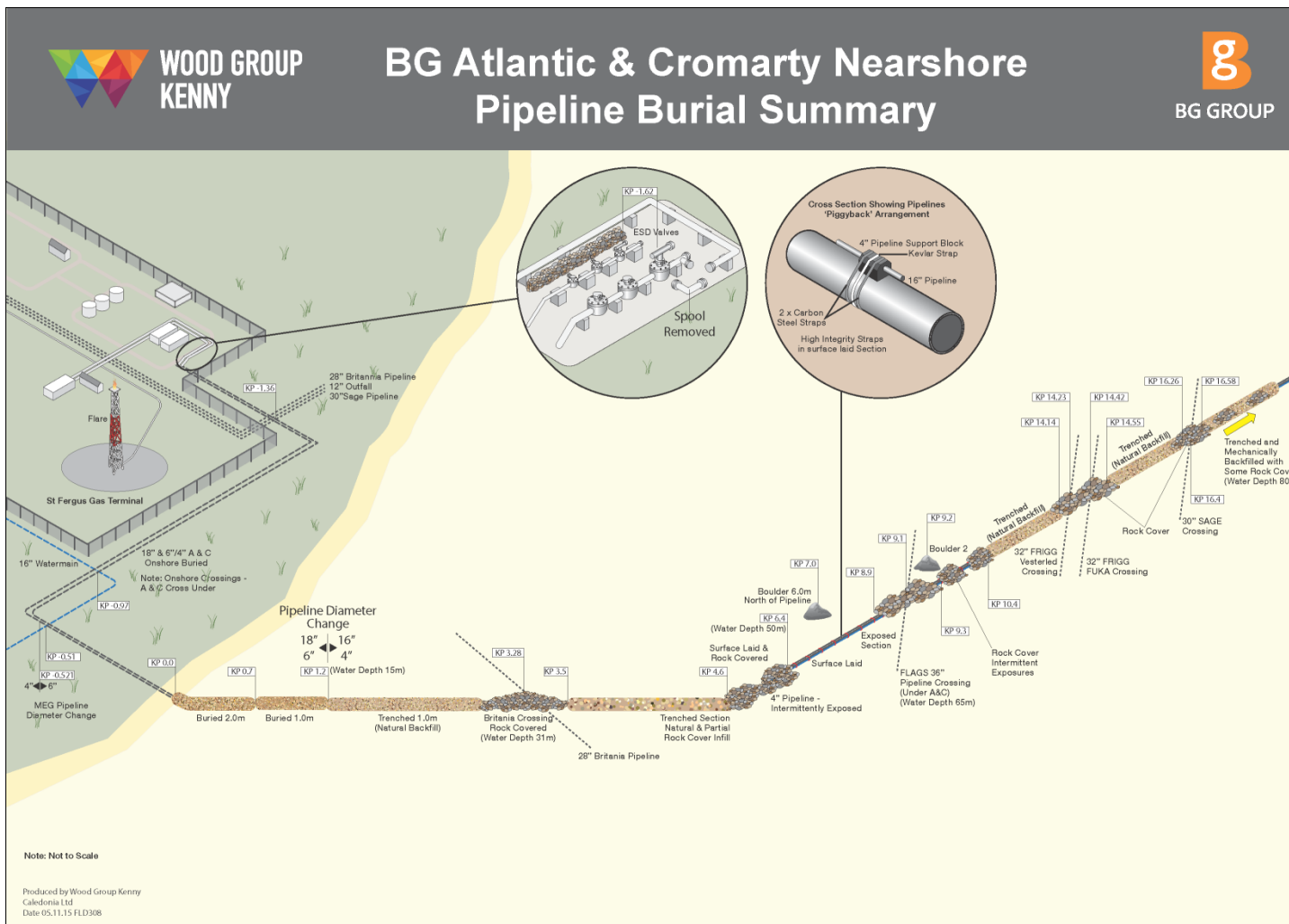


Figure 1.4 Nearshore Pipeline Burial Summary



1.7 Industrial Implications

BG has initiated contact with the supply chain to explore decommissioning execution solutions, including:

- Inviting supply chain companies to present to the BG decommissioning team on their capabilities
- Publishing project information online via the Oil & Gas Authority's Project Pathfinder Portal¹ and Decom North Sea members intranet
- Participation in industry workgroups, events, seminars and conferences;
- Inclusion of trade organisations in stakeholder consultations

BG standards require that all procurement be carried out in accordance with the BG Group Standard for Contracts and Procurement. This includes the required utilisation of FPAL/Achilles for the identification of potential tenderers.

¹ See BG listing for Atlantic & Cromarty at <https://www.gov.uk/guidance/oil-and-gas-project-pathfinder>

2.0 DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Installations: Surface Facilities

Table 2.1 Surface Facilities Information									
Name	Facility Type*	Location**		Topsides/Facilities		Jacket (if applicable)			
				Weight (Te)	No of modules	Weight (Te)	Number of legs	Number of piles	Weight of piles (Te)
n/a									

2.2 Installations: Subsea including Stabilisation Features

Note: schematics showing the general arrangement of the Atlantic Manifold and the Cromarty tree and piping assembly are shown in Appendix 1.

Table 2.2 Subsea Installations and Stabilisation Features					
Component	No.	Size/ Wt (Te)	Location		Comments/Status
Atlantic manifold	1	203.6	Decimal	58.014180 °N 00.893571 °E	Total weight includes protection structure, roof panels, piping skid, valves and piles. The protection structure is piled to the seabed.
			Decimal Minute	58° 00.85080' N 00° 53.61427' E	
Atlantic wellhead protection structure no. 1 (including tree)	1	47	Decimal	58.015166 °N 00.892350 °E	The well has been suspended with intent to fully abandon in 2017. The wellhead protection structure is integral to the tree.
			Decimal Minute	58° 00.90993' N 00° 53.54102' E	
Atlantic wellhead protection structure no. 2 (including tree)	1	47	Decimal	58.014280 °N 00.893039 °E	The well has been suspended with intent to fully abandon in 2017. The wellhead protection structure is integral to the tree.
			Decimal Minute	58° 00.85602' N 00° 53.58233' E	
Cromarty wellhead protection structure no. 1 (including tree and piping assembly)	1	55	Decimal	58.054083 °N 00.072879 °E	The well has been suspended with intent to fully abandon in 2017. The piping assembly was isolated from the Christmas tree in 2014. The wellhead protection structure is integral to the tree.
			Decimal Minute	58° 03.24495' N 01° 04.37275' E	
Protection frame	n/a				
Concrete mattresses	n/a				
Concrete Protective Structures	1	12.5	At Atlantic Manifold		Deflector block to protect retrofit valve.
Grout bags	n/a				
Formwork	n/a				
Froned Mats	n/a				
Rock Dump	n/a				

2.3 Pipelines Including Stabilisation Features

Table 2.3 Pipeline / Flowline / Umbilical Information									
Description	Pipeline Number (as per PWA)	Diameter (inch)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	P/L Stat-us	Current Content
<i>Pipelines</i>									
Atlantic production pipeline	PL2029	18/16	77.6	X65 Steel with 3LPP, FBE, CTE and CWC	Gas / gas condensate	From tie-in flange at Atlantic manifold to upstream flange of ESDV at SAGE terminal at St Fergus (Note 1)	Predominantly trenched and buried. Burial status varies in nearshore area.	IPR	Inhibited potable water /glycol
Atlantic MEG pipeline (piggybacked to PL2029)	PL2031	6/4	77.6	X65 Steel with 3LPP, FBE, and CTE	MEG	From downstream flange of ESDV at SAGE terminal at St Fergus to tie-in flange at Atlantic manifold (Note 1)	Predominantly trenched and buried. Burial status varies in nearshore area.	IPR	Inhibited potable water /glycol
Atlantic well no.1 production spoolpiece	PL2029JAW1	8	0.143	X65 Steel with 3LPP coating	Gas / gas condensate	From tie-in flange at Atlantic subsea tree no.1 to tie-in flange at Atlantic manifold	On seabed, covered by concrete mattresses.	IPR	Inhibited seawater /glycol
Atlantic well no.2 production spoolpiece	PL2029JAW2	8	0.040	X65 Steel with 3LPP coating	Gas / gas condensate	From tie-in flange at Atlantic subsea tree no.2 to tie-in flange at Atlantic manifold	On seabed, covered by concrete mattresses.	IPR	Inhibited seawater /glycol
Atlantic well no.1 MEG spoolpiece	PL2031JAW1	4	0.144	X65 Steel with 3LPP coating	MEG	From tie-in flange at Atlantic manifold to tie-in flange at Atlantic subsea tree no.1	On seabed, covered by concrete mattresses.	IPR	Inhibited seawater /glycol
Atlantic well no.2 MEG spoolpiece	PL2031JAW2	4	0.04	X65 Steel with 3LPP coating	MEG	From tie-in flange at Atlantic manifold to tie-in flange at Atlantic subsea tree no.2	On seabed, covered by concrete mattresses.	IPR	Inhibited seawater /glycol

(continued overleaf)

Table 2.3 (continued) Pipeline / Flowline / Umbilical Information									
Description	Pipeline Number (as per PWA)	Diameter (inch)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	P/L Stat-us	Current Content
Cromarty production pipeline	PL2030	12	11.869	X65 Steel with 3LPP coating	Gas / gas condensate	From tie-in flange at the Cromarty Tree 13/30a-6Z to the flange at the Atlantic manifold	Trenched and buried.	IPR	Inhibited seawater /glycol
Cromarty MEG pipeline (piggy-backed to PL2030)	PL2032	4	11.869	X65 Steel with 3LPP coating	MEG	Atlantic manifold to Cromarty tree 13/30a-6Z	Trenched and buried.	IPR	Inhibited Seawater /glycol
<i>Umbilicals</i>									
Atlantic control umbilical	PLU2033	3.55 (90.2mm)	31.4	Steel armoured electrohydraulic and chemical injection umbilical	Power / signal / hydraulics	From Goldeneye platform topsides to Atlantic Manifold	Trenched.	IPR	Hydraulic fluid and MEG/water mix
Atlantic well no.1 control jumper	PLU2033JA W1	4.59 (116.5m)	0.147	Electrohydraulic and chemical injection jumper	Power / signal / hydraulics	From Atlantic manifold to Atlantic subsea tree no. 1	On seabed, covered by concrete mattresses.	IPR	Hydraulic fluid and MEG/water mix
Atlantic well no.2 control jumper	PLU2033JA W2	4.59 (116.5m)	0.044	Electrohydraulic and chemical injection jumper	Power / signal / hydraulics	From Atlantic manifold to Atlantic subsea tree no. 2	On seabed, covered by concrete mattresses.	IPR	Hydraulic fluid and MEG/water mix
Cromarty control umbilical	PLU2034	3.55 (90.2mm)	11.97	Steel armoured electrohydraulic and chemical injection umbilical	Power / signal / hydraulics	From Atlantic manifold to Cromarty tree	Trenched .	IPR	Hydraulic fluid and MEG/water mix

Notes:

1. The decommissioning programme covers the offshore Atlantic pipelines from KP0 (situated between Mean Low Water Springs and Mean High Water Springs on the beach at St. Fergus). The onshore pipeline between KP0 and the SAGE terminal at St. Fergus will be addressed separately by its owner at a later date.
2. Actual spool lengths and well locations, notably for Well no. 1, differ slightly from those shown in the PWA Application (Rev H, Dec. 04).
3. See Appendix 2 for umbilical and jumper components.

Table 2.4 Subsea Pipeline Stabilisation Features*[showing 'as-built' details, with PWA details shown where different]*

Stabilisation Feature	Total Number	Weight (Te)	Locations	Exposed/Buried/Condition
Concrete protection and stabilisation mattresses (post-lay)	201 [220 in PWA]	1708.5	Multiple locations throughout the field including Atlantic and Cromarty drill centres, Cromarty pipeline and Goldeneye 500m zone.	Exposed
Concrete mattresses at crossing locations (pre-lay)	40 [57 in PWA]	462.5	Multiple locations at pipeline and umbilical crossings throughout the field.	Rock covered
Sand/grout bags	600 ⁽¹⁾	15	Multiple locations throughout the field.	Exposed/buried
Rock cover	n/a	220,000	Multiple locations throughout the field including Atlantic pipelines shore approach, pipeline and umbilical crossings and Goldeneye 500 m zone.	Rock cover
Concrete Protective Structures	18	180	Three locations i.e. PL2029/2031 at approach to Atlantic manifold, PL2030/2032 at approach to Atlantic manifold, PL2030/2032 at approach to Cromarty tree.	Exposed
Formwork	n/a			
Froned Mats	n/a			

Note:

1: Approximate number based on 25kg per individual sand/grout bag.

2.3.1 Interim Pipeline Regime

The Atlantic pipelines (PL2029 and PL2031) and the Atlantic to Cromarty pipelines (PL2030 and PL2032) were taken out of use in 2012 and cleaned. The pipeline contents, including hydrocarbon gas and liquids, were displaced to the onshore SAGE gas plant at St Fergus. The contents were replaced with treated fresh water (PL2029 and PL2031), or treated seawater (PL2030 and PL2032), and glycol. The treatment chemical (proprietary name RX-5227 at 1000ppm concentration) comprised corrosion inhibitor, oxygen scavenger and biocide to prevent internal corrosion. All chemicals selected were approved by the Offshore Chemicals Notification Scheme.

BG submitted an application to place the pipelines under the Interim Pipeline Regime (IPR) in order that potential third party re-use applications for the pipelines could be identified and re-evaluated. The application was approved by DECC, for a period of five years (to end of December 2016).

2.3.2 Controls Equipment at Goldeneye

The following items of Atlantic and Cromarty equipment, no longer in use, are located on the topsides of the Shell Goldeneye platform:

- Controls container, containing master control station (MCS), uninterruptible power supply (UPS), hydraulic power unit (HPU) controller and controlled environment equipment;
- HPU, including pumps, storage tank and accumulation;
- Topsides umbilical termination unit (TUTU).

The removal schedule for these items is currently subject to discussion with the Goldeneye platform operators.

2.4 Wells

Table 2.5 Well Information			
Platform Wells	Designation	Status	Category of Well
n/a			
Subsea Wells			
Atlantic well 14/26a-A2Z	Production Development	Suspended in June/July 2014	SS-4-4-3*
Atlantic well 14/26a-A1Y	Production Development	Suspended in June/July 2014	SS-3-4-3*
Cromarty well 13/30a-6Z	Production Development	Suspended in June/July 2014	SS-4-4-3*

Note: Details of the well categorisation can be found in the latest revision (July 2015) of the Oil & Gas UK Guidelines for the Suspension or Abandonment of Wells, issue number 5.

2.5 Drill Cuttings

Only limited quantities of water based mud (WBM) cuttings were discharged when the Atlantic and Cromarty wells were drilled, estimated at 398 Te in total for all three wells. These deposits were well-scattered and do not constitute cuttings piles within the definition in OSPAR Recommendation 2006/5. The Section 29 Notice Holders do not, therefore, propose any further work on the drill cuttings.

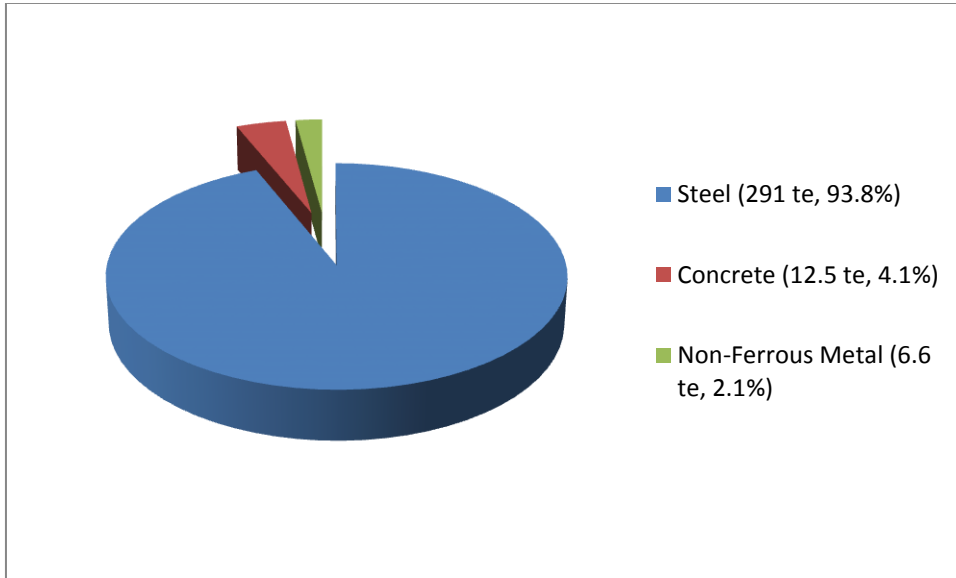
Table 2.6 Drill Cuttings Pile(s) Information		
Location of Pile Centre (Latitude/Longitude)	Seabed Area (m ²)	Estimated volume of cuttings (m ³)
n/a	n/a	n/a

2.6 Inventory Estimates

The pie charts which follow show the inventory estimates for different elements of the decommissioning programmes contained in this document.

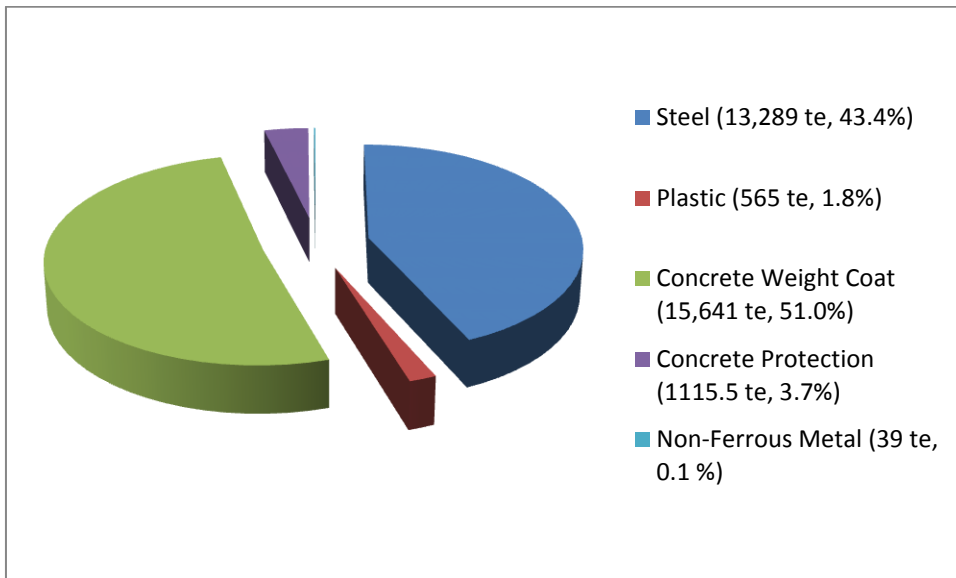
See also Tables 3.9, 3.10, 3.11 and 3.12 for details of material to be recovered from Atlantic and Cromarty installations and pipelines. The Environmental Impact Assessment Report (see s3.6 Waste (General); s6.4 Waste Management and Recycling; s7.4 Waste Management) contains further information.

Figure 2.1 Estimated Inventory – Atlantic Installations



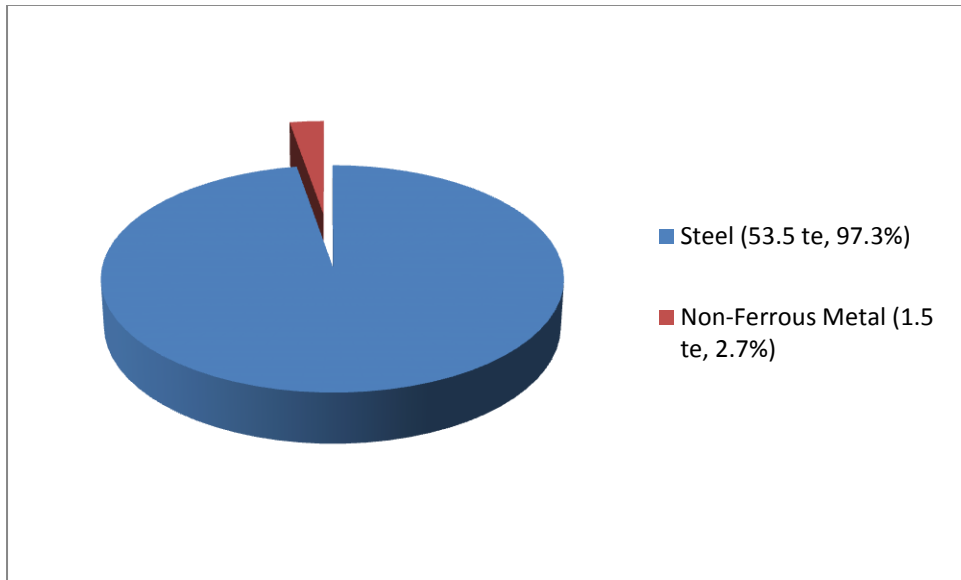
Total Mass: 310.1 tonnes

Figure 2.2 Estimated Inventory – Atlantic Pipelines and Umbilicals



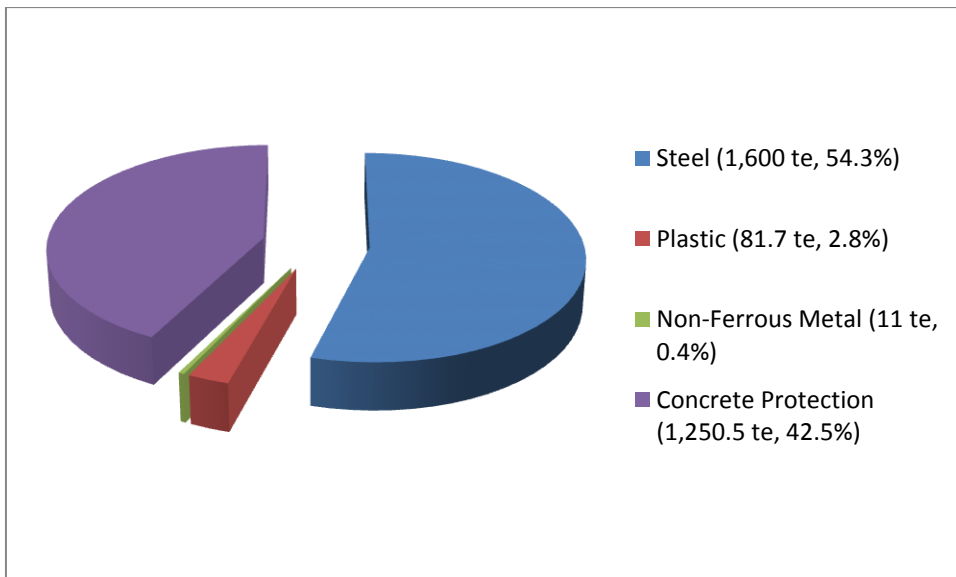
Total Mass: 30,649.5 tonnes

Figure 2.3 Estimated Inventory – Cromarty Installations



Total Mass: 55 tonnes

Figure 2.4 Estimated Inventory – Cromarty Pipelines and Umbilicals



Total Mass: 2,943.2 tonnes

3.0 REMOVAL AND DISPOSAL METHODS

BG's waste strategy for A&C decommissioning adopts a 'reduce, re-use, recycle, recover energy, dispose' waste hierarchy.

Discussions with third parties with a view to re-using the A&C facilities and infrastructure for carbon capture and storage projects or for alternative purposes have not been successful.

Third parties have not expressed an interest in acquiring the pre-used Xmas trees, manifold, spools to be decommissioned from the A&C fields, due in part to technical assurance certification requirements, or in acquiring pre-used concrete mattresses and tunnels.

When removed from the seabed, the equipment will be transported to a decommissioning contractor's onshore yard, where different types of material (e.g. steel, copper) will be segregated with a view to optimising re-use and recycling. The selected decommissioning contractor will advise on the opportunities for re-use of inert materials (e.g. concrete) that are available in the proximity of the decommissioning yard.

The decommissioning contractor's established networks with recycling companies will facilitate optimisation of the quantity of materials that can be sent for recycling. BG will implement a Waste Management Plan that tracks waste materials through to the recycling endpoint.

BG will also track materials for which no re-use or recycling options are available through to disposal in landfill.

3.1 Topsides

It should be noted that while there are no surface installations within the remit of the Atlantic and Cromarty fields, a topside umbilical termination unit (TUTU) and other equipment is located on the Goldeneye platform. The platform is the responsibility of the Goldeneye partners and, therefore, not detailed within this programme. Removal and disposal of the TUTU and two small associated modules will be dealt with through commercial agreement with the Goldeneye partners.

3.2 Jacket(s)

n/a

3.3 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 Mobile Offshore Drilling Unit campaign to P&A wells	Return to shore for re-use or recycling
1 x Cromarty wellhead protection structure including tree and piping assembly	1	Full recovery	Return to shore for re-use or recycling
Atlantic manifold	1	Full recovery	Return to shore for re-use or recycling
Template(s)	n/a		
Protection Frame(s)	n/a		
Concrete mattresses	n/a		
Grout bags	n/a		
Formwork	n/a		
Froned Mats	n/a		
Rock Dump	n/a		
Concrete protection block at Atlantic manifold	1	Full recovery	Return to shore for re-use or recycling

3.4 Pipelines

Decommissioning Options:

At the comparative assessment review, the following options for decommissioning were considered (see also Table 2.3 for more information on current status):

Table 3.2 Pipeline Decommissioning Options			
Pipeline or Group	Condition of line/group	Whole or part of pipeline/group	Decommissioning Options* considered
PL2029/2031 KP 0 – 4.6	Trenched (with Britannia crossing surface laid and rock covered)	Part	1 & 6
PL2029/2031 KP 4.6 – 6.4	Surface laid on rock, with rock cover	Part	2 & 6
PL2029/2031 KP 6.4 – 8.94	Surface laid	Part	1, 2 & 6
PL2029/2031 KP 8.94 – 9.28	FLAGS crossing, with rock cover	Part	6
PL2029/2031 KP 9.28 – 10.4	Surface laid on sand, with rock cover	Part	2 & 6
PL2029/2031 KP 10.4 – 77	Trenched (with crossings surface laid and rock covered)	Part	1, 2, 3, 4, 5, 6
PL2030	Trenched	Whole	1, 2, 3, 4 & 5
PL2032	Trenched, piggybacked to PL2030	Whole	1, 2, 3, 4 & 5
PLU2033	Trenched	Whole	1, 2, 3, 4, 5 & 7
PLU2034	Trenched	Whole	1, 2, 3, 4, 5 & 7
PL2029JAW1	Surface laid, matted	Whole	1
PL2029JAW2	Surface laid, matted	Whole	1
PL2031JAW1	Surface laid, matted	Whole	1
PL2031JAW2	Surface laid, matted	Whole	1
PLU2033JAW1	Surface laid, matted	Whole	1
PLU2033JAW2	Surface laid, matted	Whole	1

*Key to Options:

- | | | |
|-------------------------------------|--------------------------------|-----------------------------------|
| 1) Total removal – cut-and-lift | 2) Rock cover | 3) Partial removal – cut-and-lift |
| 4) Remedial trenching | 5) Minimal removal (ends only) | 6) Leave in situ |
| 7) Total removal – reverse reel-lay | | |

Comparative Assessment Method:

The methodology adopted in assessing the decommissioning options followed a relative assessment process where options were scored 1 for the best and 0 for the worst. Options that lay in between were scored between 0.8 and 0.2. The scoring was based on a mixture of appropriate qualitative and quantitative data. The criteria to be assessed were as per Table 6-1 of the Oil & Gas UK Guidelines for Comparative Assessment in Decommissioning Programmes, amended to project specific requirements per the Comparative Assessment report.

Screening workshops were held to ensure the required information was available for comparative assessment and that relevant studies were available. The comparative assessment workshops themselves were held with subject matter experts and relevant external stakeholders to ensure a robust assessment was completed.

The assessments were arranged by unique geographical and technical conditions.

After the assessment was completed, pre-agreed weightings were applied to ensure the correct emphasis was applied to the more important criteria. A sensitivity check was completed before a recommended option was selected.

Outcome of Comparative Assessment:

Table 3.3 Outcomes of Comparative Assessment		
Pipeline or Group	Selected Option	Justification
PL2029/2031 KP 0 – 4.6	Leave in situ	Fully trenched
PL2029/2031 KP 4.6 – 6.4	Leave in situ	The Comparative Assessment concluded that this option has the lowest safety risk, lowest environmental impact, lowest technical risk and lowest cost.
PL2029/2031 KP 6.4 – 8.94	Leave in situ	The Comparative Assessment concluded that this option has the lowest safety risk, lowest environmental impact, lowest technical risk and lowest cost.
PL2029/2031 KP 8.94 – 9.28 (FLAGS crossing)	Leave in situ	To be addressed via commercial agreement with operator of FLAGS pipeline as part of their decommissioning programme
PL2029/2031 KP 9.28 – 10.4	Leave in situ	The Comparative Assessment concluded that this option has the lowest safety risk, lowest environmental impact, lowest technical risk and lowest cost.
PL2029/2031 KP 10.4 – 77	Leave in situ with minimal removal	The Comparative Assessment concluded that this option has the lowest safety risk, lowest environmental impact, lowest technical risk and lowest cost.
PL2030	Leave in situ with minimal removal	The Comparative Assessment concluded that this option has the lowest safety risk, lowest environmental impact, lowest technical risk and lowest cost.
PL2032	Leave in situ with minimal removal	The Comparative Assessment concluded that this option has the lowest safety risk, lowest environmental impact, lowest technical risk and lowest cost.
PLU2033	Leave in situ with minimal removal	The Comparative Assessment concluded that this option has the lowest safety risk, lowest environmental impact, lowest technical risk and lowest cost.
PLU2034	Leave in situ with minimal removal	The Comparative Assessment concluded that this option has the lowest safety risk, lowest environmental impact, lowest technical risk and lowest cost.
PL2029JAW1	Total removal	Per DECC Guidance Notes, total removal is base case
PL2029JAW2	Total removal	Per DECC Guidance Notes, total removal is base case
PL2031JAW1	Total removal	Per DECC Guidance Notes, total removal is base case
PL2031JAW2	Total removal	Per DECC Guidance Notes, total removal is base case
PLU2033JAW1	Total removal	Per DECC Guidance Notes, total removal is base case
PLU2033JAW2	Total removal	Per DECC Guidance Notes, total removal is base case

3.5 Pipeline Stabilisation Features

Table 3.4 Pipeline Stabilisation Features			
Stabilisation features	Number	Selected Option	Disposal Route (if applicable)
'Pre-lay' concrete mattresses	40	Leave in situ (mattresses are located at crossings, covered by profiled rock berms as part of the overall crossing construction).	n/a
'Post-lay' concrete protection and stabilisation mattresses	201	Full recovery (see Note)	Return to shore for re-use or recycling
Concrete protection structures	18	Full recovery	Return to shore for re-use or recycling
Grout bags (exposed)	Note 2	Full recovery (see Note)	Return to shore for re-use or recycling
Grout bags (rock covered)	Note 2	Leave in situ	n/a
Rock cover	220,000 te	Leave in situ	n/a

Notes

1. It is intended that all mattresses and grout bags will be removed to shore; however, in the event of practical difficulties, BEIS will be consulted.
2. The exact distribution of grout bags (rock covered or exposed) is not known, however it is intended that all exposed bags will be recovered to shore.

3.6 Wells

Table 3.5 Well Plug and Abandonment
<p>The two Atlantic wells and one Cromarty well drilled during the development of the Atlantic and Cromarty Fields (see details in Table 2.5) were suspended in June/July 2014 in compliance with DECC requirements and in accordance with Oil & Gas UK Guidelines for the Suspension and Abandonment of Wells (Issue 4.0).</p> <p>Similarly, the wells will be permanently abandoned in accordance with Oil & Gas UK Guidelines for the Suspension and Abandonment of Wells (Issue 5.0 which were issued in 2015).</p> <p>PON5/PETS/Marine Licence applications will be submitted in support of any such work that is to be carried out.</p>

3.7 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-inch and 26-inch diameter) were drilled using seawater and bentonite sweeps, with drill cuttings discharged to the sea bed. 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 398 Te in total for all three wells. These deposits were well scattered and do not constitute drill cuttings piles within the definition in OSPAR Recommendation 2006/5. The Atlantic and Cromarty Section 29 Notice Holders therefore do not propose any further work to investigate possible residual effects of WBM cuttings discharges at the Atlantic and Cromarty well sites.

Table 3.6 Drill Cuttings Decommissioning Options			
How many drill cuttings piles are present?	0		
Tick options examined: <input type="checkbox"/> Remove and re-inject <input type="checkbox"/> Leave in place <input type="checkbox"/> Cover <input type="checkbox"/> Relocate on seabed <input type="checkbox"/> Remove and treat onshore <input type="checkbox"/> Remove and treat offshore <input type="checkbox"/> Other			
Review of pile characteristics	Pile 1	Pile 2	Pile 3
How has the cuttings pile been screened? (desktop exercise/actual samples taken)	n/a	n/a	n/a
Dates of sampling (if applicable)	n/a	n/a	n/a
Sampling to be included in pre-decommissioning survey?	n/a	n/a	n/a
Does it fall below both OSPAR thresholds?	n/a	n/a	n/a
Will the drill cuttings pile have to be displaced in order to remove the jacket?	n/a	n/a	n/a
What quantity (m3) would have to be displaced/removed?	n/a	n/a	n/a
Will the drill cuttings pile have to be displaced in order to remove any pipelines?	n/a	n/a	n/a
What quantity (m3) would have to be displaced/removed?	n/a	n/a	n/a
Have you carried out a Comparative Assessment of options for the Cuttings Pile?	N	N	N

3.8 Waste Streams

Table 3.7 Waste Stream Management Methods	
Waste Stream	Removal and Disposal Method
Bulk liquids	n/a
Marine growth	Removed onshore. Disposed of according to guidelines.
NORM/LSA Scale	No NORM has previously been discovered and none is expected but testing will be carried out offshore and a Radioactive Substances Act (RSA) authorisation will be in place to allow storage on the vessel if required; cleaning and disposal onshore will be to a permitted facility. Procedure BG-UKU-PROC-HSSE-00021 will be followed for the management of any radioactive waste.
Asbestos	n/a
Other hazardous wastes	Any hazardous waste identified will be segregated and stored to prevent pollution and/or cross-contamination. The waste will be consigned as special waste and transferred to a suitably licensed facility onshore. Procedure BG-BMS-PROC-HSSE-0517 will be followed for the management of waste. Discharge of any chemicals to sea will be done through the appropriate permitting and approval process.
Onshore Dismantling sites	Appropriate licensed sites will be selected. Facility chosen by removal contractors must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver innovative recycling options.

Table 3.8 Inventory Disposition			
	Total Inventory (Te)	Planned to shore (Te)	Planned left in situ (Te)
Atlantic installations	310.1	278.8	31.3 ⁽¹⁾
Atlantic pipelines and spools	29,534.6 ⁽²⁾	64.5 ⁽³⁾	29,470.1
Cromarty installation	55	55	0
Cromarty pipelines and spools	1692.3 ⁽²⁾	31 ⁽⁴⁾	1661.3
Concrete protection	2366	1898.5 ⁽⁵⁾	467.5 ⁽⁶⁾

Notes:

1. Comprises manifold pile sections to be left in situ (buried).
2. Pipelines and umbilicals, excluding concrete protection.
3. 100m (to be confirmed by final survey) to be removed at end of PL2029/2031 at Atlantic, plus all spools and well spools/jumpers, plus ends of PLU2033 at Goldeneye (on seabed and in J-tube), and Atlantic.
4. 60m each end (to be confirmed by final survey) at ends of PL2030/2032 at Atlantic and Cromarty, plus all spools, plus ends of PLU2034 at Atlantic and Cromarty.
5. Comprises post-lay mattresses (Atlantic and Cromarty), concrete tunnels and (nominal) 10te of grout bags.
6. Comprises pre-lay mattresses plus (nominal) 5te of grout bags (mattresses and grout bags rock covered at crossings).

The Section 29 Notice Holders have developed a Waste Management Strategy for the Atlantic and Cromarty decommissioning project, based on the waste hierarchy and underpinned by the commitment to comply with legal requirements.

Naturally occurring radioactive materials (NORM) occurs in some oil and gas developments, typically as low specific activity (LSA) scale. NORM has never been detected in the Atlantic and Cromarty developments. However, materials transported to land for re-use, recycling or disposal will be surveyed for NORM as a precaution.

The material to be removed during decommissioning activities is shown in Tables 3.9 to Table 3.12.

Table 3.9 Material to be Recovered from Atlantic Installations					
Description	Total Mass Steel (Te)	Total Mass Concrete (Te)	Total Mass Plastic (Te)	Total Mass Copper (Te)	Anode (Te)
Manifold structure (including roof)	70.2	12.5	n/a	n/a	3.6
Atlantic wellhead protection structure no. 1 and tree	45.5	n/a	Note 2	Note 2	1.5
Atlantic wellhead protection structure no. 2 and tree	45.5	n/a	Note 2	Note 2	1.5
Piping skid (including piles) ⁽¹⁾	98.5	n/a	Note 2	Note 2	n/a
Total material	259.7	12.5	Note 2	Note 2	6.6

Notes:

1. Assuming approx. 6 m length of each pile removed (comprising pile above and below the seabed, with 21.1 m of each pile remaining buried in situ).
2. The structures contains minor amounts of plastics and metals other than steel, these will all be recovered to shore for recycling or disposal.

Table 3.10 Material to be Recovered from Atlantic Pipelines and Umbilical

Description	Total Mass Steel (Te)	Total Mass Concrete (Te)	Total Mass Plastic (Te)	Total Mass Copper (Te)	Anode* (Kg)
PL2029	21.9	18.7	0.6	n/a	400
PL2029JAW1	6.0	n/a	0.22	n/a	n/a
PL2029JAW2	1.7	n/a	0.06	n/a	n/a
PL2031	2.1	0.0	0.1	n/a	40
PL2031JAW1	2.3	n/a	0.12	n/a	40
PL2031JAW2	0.7	n/a	0.03	n/a	20
PLU2033 at Goldeneye (200m)	1.5	n/a	1.3	0.1	n/a
PLU2033 at Atlantic (120m)	1.6	n/a	0.40	0.15	n/a
PLU2033JAW1	2.2	n/a	1.44	0.04	n/a
PLU2033JAW2	1.05	n/a	0.41	0.01	n/a
Concrete protection structures	n/a	60	n/a	n/a	n/a
Concrete protection mattresses	n/a	629	n/a	n/a	n/a
Grout bags	n/a	2.5	n/a	n/a	n/a
Total:	41.05	710.2	4.68	0.3	500

* Nominal weights – will be reduced by anode consumption over field life.

Table 3.11 Material to be Recovered from the Cromarty Installation

Description	Total Mass Steel (Te)	Total Mass Concrete (Te)	Total Mass Plastic (Te)	Total Mass Copper (Te)	Anode (Te)
Wellhead protection structure including tree and piping assembly	53.5	n/a	n/a	n/a	1.5

Table 3.12 Material to be Recovered from Cromarty Pipeline and Umbilical

Description	Total Mass Steel (Te)	Total Mass Concrete (Te)	Total Mass Plastic (Te)	Total Mass Copper (Te)	Anode* (kg)
PL2030	22.6	n/a	0.7	n/a	385
PL2032	3.3	n/a	0.2	n/a	80
PLU2034 at Cromarty	1.3	n/a	0.3	0.1	n/a
PLU2034 at Atlantic	1.9	n/a	0.5	0.1	n/a
Concrete protection Structures	n/a	120	n/a	n/a	n/a
Concrete protection Mattresses	n/a	1079.5	n/a	n/a	n/a
Grout bags	n/a	2.5	n/a	n/a	n/a
Total	29.1	1202.0	1.7	0.2	465

* Nominal weights – will be reduced by anode consumption over field life.

4.0 ENVIRONMENTAL IMPACT ASSESSMENT

4.1 Environmental Sensitivities (Summary)

Table 4.1: Environmental Sensitivities	
Environmental Receptor	Main Features
Conservation interests (At its nearest point, the closest is c. 11 km from PL2029 and piggy-backed PL2031)	<p>There are no Special Areas of Conservation (SACs) in the vicinity of the Atlantic and Cromarty (A&C) infrastructure.</p> <p>The Atlantic to St. Fergus pipelines do pass through the Southern Trench possible Marine Protected Area (pMPA). This pMPA is under consideration for designation as a Nature Conservation MPA (NCMPA) for biological and geological features: hydrographic fronts; shelf deeps; sub-glacial tunnel valleys and moraine; burrowed mud; minke whale and white-beaked dolphin. It should be noted that the geological features of interest which are located north of St. Fergus and the pipelines do not pass through this part of the pMPA. The nearest designated NCMPA to the A&C infrastructure is Turbot Bank, located c.66 km south of the A&C manifold/wells. The Turbot Bank NCMPA includes part of the shelf bank and mound known as 'Turbot Bank', an area where important sandeel communities live buried in the sand for months at a time.</p> <p>The nearest onshore protected sites are the Buchan Ness to Collieston Coast Special Protection Area (SPA) and the Troup, Pennan and Lion's Heads SPA. Both are designated for their seabird assemblages of international importance.</p> <p>The Buchan Ness to Collieston Coast SPA is located c. 11 km from the nearshore end of PL2029 and piggy-backed PL2031. During the breeding season, the Buchan Ness to Collieston Coast SPA supports up to 95,000 individual seabirds including guillemot, kittiwake, herring gull, shag, puffin and fulmar.</p> <p>The Troup, Pennan and Lion's Heads SPA is located c. 25 km from the nearshore end of the pipelines. The area supports up to 150,000 seabirds during the breeding season, including razorbill, kittiwake, herring gull, fulmar and guillemot (JNCC, 2001b).</p> <p>It is anticipated that the impact on protected areas from the proposed activities will be of low significance.</p>
Seabed	<p>The seabed within the A&C fields and between the fields and the Goldeneye platform primarily comprise muddy sand with shell fragments. Sediment granulometry along the route of PL2029 and piggy-backed PL2031 is variable. Mud content increases with depth. Three biotope complexes occur along the route:</p> <ul style="list-style-type: none"> • The majority of the area comprises sandy mud with varying quantities of shell fragments and is classified as a Circalittoral Muddy Sand biotope complex. • Areas of high sonar reflectivity occur and are found to comprise mixed sediments with quantities of shell material, gravel, pebbles, cobbles and in some places areas of numerous boulders. • The southwestern end of the export pipeline route has areas of the biotope 'Sabellaria spinulosa on stable Circalittoral Mixed Sediment' amongst areas of Circalittoral Muddy Sand'. <p>It is anticipated that the impact on the seabed from the proposed activities will be of low significance.</p>
Fish	<p>Several fish species use the area for nursery and/or spawning grounds at different times of the year.</p> <p>The A&C infrastructure (including pipelines and structures) occurs within nursery grounds for species including Norway Pout, <i>Nephrops</i>, lemon sole, sandeel, whiting, sprat, blue whiting, haddock, anglerfish, mackerel, plaice, and spotted ray. Many of</p>

	<p>these species are also know to spawn in the area: Norway pout, <i>Nephrops</i>, lemon sole, sandeel, whiting, sprat, haddock and blue whiting.</p> <p>As fish species found within the North Sea tend to be widely distributed with large, scattered spawning and nursery grounds, it is anticipated that the impact on fish populations from the proposed activities will be of low significance.</p>
Fisheries	<p>Creel fishing, bottom (demersal) otter trawlers and scallop dredging takes place in the nearshore area of the export pipeline. Pair trawling, twin rig otter trawling and seine netting are undertaken near the offshore area of the pipeline and at the A&C fields. Commercial fishing data for the A&C area has been compiled using International Council for the Exploration of the Sea (ICES) statistical data provided by the Scottish Government. The infrastructure occurs across a number of ICES rectangles: 44E8, 44E9, 45E8, 45E9 and 41F2. Fishing effort across these rectangles equates to around 3.0 % of total fishing effort in the UK in 2014.</p> <p>The Scottish Fishermen’s Federation (SFF) have been consulted throughout the project. BG proposes to follow their recommendations such that the impact on fishing activities of the proposed activities is anticipated to be of low significance.</p>
Marine Mammals	<p>Atlantic white-sided dolphin, common dolphin (primarily inshore), harbour porpoise, minke whale and white-beaked dolphin have been recorded in the area of the A&C fields and pipelines.</p> <p>Two species of seal live and breed in UK waters: the grey seal (<i>Halichoerus grypus</i>) and the harbour (also called common) seal (<i>Phoca vitulina</i>). Both species are considered to be Annex II species protected under the European Union (EU) Habitats Directive.</p> <p>The foraging range of the harbour seal is typically within 40-50 km and for the grey seal typically within 100 km of the coastline. A low density of harbour seals is anticipated at the nearshore end of the pipelines. In addition small numbers of grey seals are known to occur in the vicinity of the A&C fields with an increased density inshore.</p> <p>It is anticipated that the impact on marine mammals from the proposed activities will be of low significance.</p>
Birds	<p>Seabird vulnerability to surface pollution within each UKCS block is measured using the Joint Nature Conservation Committee (JNCC) Offshore Vulnerability Index (OVI). Within each block, the vulnerability of seabirds varies throughout the year due to seasonal fluctuations, such as the number and species of birds present. Overall annual seabird vulnerability in the area of the A&C infrastructure ranges from high to very high.</p> <p>Given that the A&C infrastructure is currently hydrocarbon free it is anticipated that the impact on bird populations associated with the area from the proposed activities is anticipated to be of low significance.</p>
Onshore Communities	<p>Waste generated during decommissioning will be segregated by type and periodically transported to shore in an auditable manner through licensed waste contractors. The waste management hierarchy of ‘reduce, re-use recycle’ will be followed.</p> <p>BG intends to engage approved waste management contractors to handle, store and dispose of all waste generated by the decommissioning activities.</p> <p>Given BG’s commitment to follow the waste hierarchy and to use approved waste management contractors, the impact on inshore communities from the proposed activities is anticipated to be of low significance.</p>
Other Users of the Sea	<p>Shipping activities in the North Sea are categorised by BEIS to have either: very low; low; moderate; high; or very high shipping density. The A&C infrastructure is located across Blocks 19/11, 19/12, 19/13, 19/8, 19/9, 19/10, 19/5, 20/1, 13/30, 14/26, 14/27, 14/28 and 14/29. Shipping activity in these blocks ranges from very low to moderate.</p> <p>There are no renewable energy developments or wind farm zones in the vicinity of the</p>

	<p>A&C infrastructure.</p> <p>Blocks 19/12 and 19/13 are noted as of concern to the Ministry of Defence because they lie within training ranges.</p> <p>It is anticipated that the impact on other users of the sea from proposed activities will be of low significance.</p>
<p>Atmosphere</p>	<p>Emissions to atmosphere will arise from the vessels used to decommission the A&C infrastructure. The impacts are expected to be localised and there are no identified areas of sensitivity to atmospheric emissions in the area.</p> <p>It is anticipated that the impact on the atmosphere from proposed activities will be of low significance.</p>

4.2 Potential Environmental Impacts and their Management

Environmental Impact Assessment Summary

The environmental impact of decommissioning the Atlantic and Cromarty infrastructure includes atmospheric emissions and disturbance by noise from vessels deployed during the short duration of the decommissioning operations. Use of explosives is not proposed. Due to the scale and limited duration of the emissions and noise, these aspects of the project were assessed as being of low significance.

The decommissioning activities involve minimal intervention and will cause only very localised seabed disturbance in an area with no identified sensitivities. The proposed removal of facilities will not introduce pollutants to the seabed. The contents of cut pipelines have been assessed by Adams-Osborne calculation as being environmentally acceptable. The planned minimum intervention involves rock placement over the cut ends of pipe for safety reasons. This will introduce extremely localised spots of hard substrate in the muddy sand sediment at the A&C fields. It also involves placing the minimum amount of rock cover to make exposed sections of pipeline safe. In the nearshore environment, rock cover will contrast less sharply with the existing mixed sediment seabed. When decommissioning is complete, the seabed will be available to species for recolonisation and is expected to recover rapidly so the long-term environmental impact has been assessed as being of low significance.

Decommissioned equipment and infrastructure will be transferred to an onshore decommissioning yard equipped to contain discharges. Waste management will optimise the opportunities for re-use and recycling over disposal. The EIA therefore assessed the impact of waste generated by the decommissioning operations as being of low significance.

The fields are too distant from the nearest median line for the decommissioning activities to involve trans-boundary effects.

An environmental management plan will be developed before decommissioning starts.

Table 4.2 Environmental Impact Management		
Activity	Main Impacts	Management
Topsides removal	n/a	n/a
Jacket(s)/ floating facility removal	n/a	n/a
Subsea installations removal	Removing the manifold and Xmas trees is likely to disturb approximately 0.1 hectares of seabed in the Atlantic 500m zone and 0.025 hectares in the Cromarty 500m zone. Vessels will generate noise and emit exhaust gases on a small scale temporarily during the decommissioning works. The installations will be transferred as waste to an onshore decommissioning yard.	All works are within the A&C 500m zones. The manifold is hydrocarbon free and cement barriers will be set in the wells before Xmas tree removal. Vessel presence in the field will be temporary (approx. one month). Waste will be brought to a licensed decommissioning yard. Any available re-use and recycling options will be preferentially considered. Remotely operated vessel (ROV) images suggest structures have little marine growth, some of which may be removed offshore; the remainder will be disposed of locally to the yard.
Decommissioning pipelines	Removing surface laid pipelines will further disturb the same areas of seabed disturbed by removing concrete mattresses/tunnels (see below). Vessels will temporarily generate noise/ emit exhaust gases on a small scale during the works. Rock cover over cut pipe ends on the seabed will introduce <1 hectare of hard substrate. Pipe removed will be transferred as waste to an onshore disposal yard. Rock cover on exposed sections of the nearshore pipeline will affect 2.5 ha of mixed sediment seabed (sand, gravel, cobble).	All the works are within the A&C 500m zones. The manifold is hydrocarbon free and cement barriers will be set in the wells before Xmas tree removal. Vessel presence in the field will be temporary for about one month. Waste will be brought to a licensed decommissioning yard. Any available re-use and recycling options will be preferentially considered.
Decommissioning stabilisation features	Removing concrete mattresses and tunnels is likely to disturb 0.4 hectares of seabed in the Atlantic 500m zone, 0.15 hectares in the Cromarty 500m zone and 0.05 hectares in the Goldeneye 500m zone. Vessels will generate noise and emit exhaust gases on a small scale temporarily during the decommissioning works.	All works are within the A&C and Goldeneye 500m zones. Mattresses/tunnels removed will be transferred as inert waste to an onshore disposal yard. Any available re-use and recycling options will be preferentially considered. ROV images suggest the mattresses and tunnels have little marine growth, some of which may be removed offshore and the remainder disposed of locally.
Decommissioning drill cuttings	n/a	n/a

5.0 INTERESTED PARTY CONSULTATIONS

Table 5.1 Summary of Stakeholder Comments		
Points raised during informal consultations (for full details see supporting 'Stakeholder Engagement Report')		
Stakeholder	Comment	Response
1. Statutory Consultees		
Scottish Fishermen's Federation	<p>Regular meetings with the SFF began January 2015.</p> <p>In August 2015, advice was given by the SFF on characteristics of the nearshore and offshore environment for incorporation into planning for the Pre-Decommissioning Environmental Baseline Survey. Discussions were also held regarding the nearshore section of the export pipeline and piggybacked MEG line in terms of whether or not any options for comparative assessment could be clearly ruled out in order to assist with options screening and relevant assumptions to ensure the correct studies could be commissioned without waste.</p> <p>A further meeting was held in October 2015 with the results of the remotely operated vehicle video survey of the export pipeline. Comparison video from 2011 survey was shared with SFF in January 2016 to indicate trends of cover of the export pipeline. SFF highlighted that uncertainty over fish types and thus fishing locations in the future make long-term risks harder to predict in the context of decommissioning planning and any solution needs to be tempered with the possibility that changes to fishing and seabed characteristics may require a revised approach to monitoring and mitigation in the future.</p> <p>Three representatives of SFF attended the November Stakeholder Workshop.</p> <p>Two representatives of SFF were present at the Comparative Assessment (CA) workshop in February 2016 for the nearshore section of the export pipeline and contributed to the discussion and scoring. SFF advised that while their preferred solution was for total removal, in the context of the CA which scored a leave in situ solution most highly, rock cover should be used to mitigate safety risks on areas of pipeline exposed or potentially exposed to scallop dredgers.</p>	<p>Ongoing dialogue enabled incorporation of SFF advice regarding inputs to CA process and survey activities.</p> <p>SFF's inclusion in the CA scoring workshop for the nearshore section of the export pipeline enabled full consideration of comments and informed scoring.</p> <p>Comments received from the SFF on the CA Emerging Options report were used to make the SFF position clearer.</p> <p>BG to liaise with relevant government departments and the SFF on rock cover specifications and overtrawl trials post-decommissioning works.</p>
Global Marine Systems Limited	<p>The only existing cable relevant to the decommissioning of the A&C fields and export pipeline route is the Peterhead-Alexandrovsk cable (in service 1915-1930, now out of use).</p> <p>Review of future cable proposals should be undertaken prior to execution.</p> <p>By way of general information to cable owners and other sea users in the nearby vicinity of decommissioning operations, notices to mariners should be arranged and the Kingisher Fortnightly Bulletin advising of any offshore works taking place. The UK Hydrographic Office and any cable owners should be kept informed at execution stage if any interactions are likely.</p>	Noted for action.

Table 5.1 Summary of Stakeholder Comments (continued)

Points raised during informal consultations
(for full details see supporting 'Stakeholder Engagement Report')

Stakeholder	Comment	Response
2. Other Stakeholders		
All parties	<p>All stakeholders (including those with whom contact already established) were approached by email in June 2015 with details of the decommissioning planning process and meetings/discussions set up as required.</p> <p>Invitations were issued to all parties to attend stakeholder workshop in November 2015 in order to capture views ahead of comparative assessment. Pre-reads issued to participants. Report of workshop proceedings and related materials issued to all stakeholders (irrespective of attendance) with opportunity to comment further.</p> <p>Report of proceedings issued December 2015 to all stakeholders with opportunity to comment or raise queries.</p> <p>All stakeholders were issued with the Emerging Recommendations from the CA process in March 2016 for comment.</p>	Account taken of interactions and comments for comparative assessment preparation and outcomes. Responses are covered in detail in the Stakeholder Engagement Report which supports this document. Environmental interactions also appear in the Environmental Impact Assessment Report.
DECC Offshore Decommissioning Unit (ODU)	<p>Quarterly meetings held to report on progress of pre-planning.</p> <p>Intermittent additional contact undertaken by telephone and email where further guidance needed.</p>	n/a
DECC Environmental Management Team (EMT)	<p>Meeting held with DECC EMT and ODU in August 2015 to understand the precise definitions of pipeline regulation jurisdictions and also to understand approaches to different pipeline decommissioning options in the past.</p> <p>Reference made to DECC EMT at various stages to clarify regulatory and other requirements for input into CA process.</p>	DECC clarification and guidance used to inform development of CA and programme.
DECC EMT, Marine Scotland and Joint Nature Conservation Committee (JNCC), SNH (represented by JNCC at meeting)	<p>Meeting held May 2015 to discuss proposals for the Pre-Decommissioning Environmental Baseline Survey to seek accord on the scope of work for this.</p> <p>Full report of the survey was provided to all parties in March 2016 with offer of presentation and/or discussion if required.</p> <p>Marine Scotland and JNCC attended Stakeholder Workshop.</p>	The scope of work for the survey was modified to include additional sampling points in accordance with the requirements of the regulatory agencies expressed at and after the meeting.
Scottish Environmental Protection Agency (SEPA)	<p>Introductory meeting held May 2015 for familiarisation purposes.</p> <p>Attended Stakeholder Workshop.</p>	Clarification provided by SEPA on the offshore permitting required in association with the eventual programmes.
Operators of pipelines intersecting with A&C pipelines and St Fergus Terminal	Meeting held in September 2015 to discuss interactions with respect to pipeline and umbilical decommissioning.	Any close working to others' pipelines will be subject to proximity agreements as per normal working practice. Further discussion to take place when draft DPs published.

Table 5.1 Summary of Stakeholder Comments (continued)		
Responses to Statutory and Public Consultations (to be completed post-consultation)		
	Comment	Response
1. Statutory Consultees		
National Federation of Fishermen's Organisations		
Scottish Fishermen's Federation		
Northern Irish Fish Producers Organisation		
Global Marine Systems Limited		
Public		

6.0 PROGRAMME MANAGEMENT

6.1 Project Management and Verification

A BG Project Management team will be appointed to manage suitable sub-contractors for the removal activities. BG standard procedures for operational control and hazard identification and management will be used. Where possible the work will be coordinated with other decommissioning operations in the Central North Sea. BG will monitor and track the process of consents and the consultations required as part of this process. In the event of any changes in the detail of the offshore removal programme being required, these would be discussed and agreed with BEIS in advance.

6.2 Post-Decommissioning Debris Clearance and Verification

A post decommissioning site survey will be carried out within a 500m radius of the site of the Atlantic and Cromarty installations and a 200m corridor width along each existing pipeline and umbilical route where decommissioning interventions have occurred (adding a margin of 100m at the ends of each section).

Arrangements for surveying within the 500 m safety zone of the Goldeneye platform remain to be determined but are expected to be dealt with by commercial agreement. Any significant seabed debris will be recovered for onshore disposal or recycling in line with existing disposal methods.

Independent verification of seabed state will be obtained by overtrawl trials in the areas where decommissioning activity has occurred and within the 500 m safety zones. This will be followed by a statement of clearance to all relevant governmental departments and non-governmental organisations, including notifications to permit the appropriate updating of Admiralty Charts and advice to other users of the sea (e.g. Notices to Mariners) via the Kingfisher Bulletin and FishSafe services.

6.3 Schedule

Figure 6.1 Gantt Chart of Project Plan

	2011	2014	2015	2016				2017				2018				2019				2020				2021	
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Cessation of Production Approval	■																								
Hydrocarbon free offshore	■																								
Wells - mechanical plugging		■																							
Wells – P&A (earliest potential dates)									■	■	■	■	■	■	■	■	■	■							
Works at Goldeneye									■	■	■	■	■	■	■	■	■	■	■						
Contract strategy tender & award					■	■	■	■	■	■	■	■	■	■											
Detailed engineering									■	■	■	■	■	■											
Pipeline/spools removal/debris clearance/overtrawl trials									■	■	■	■	■	■	■	■	■	■	■	■					
Manifold/WHPS removal/debris clearance/overtrawl trials									■	■	■	■	■	■	■	■	■	■	■	■					
Export line decommissioning									■	■	■	■	■	■	■	■	■	■	■	■					
Onshore disposal									■	■	■	■	■	■	■	■	■	■	■	■	■				
Post-decom environm'tal surveys x 2*																					■	■	■		
Post-decom pipeline surveys x 2*																					■	■	■		
Close-out report																							■	■	

* Timing of *post-decommissioning* surveys to be discussed and agreed with BEIS

6.4 Costs

An overall cost estimate is being provided to BEIS in confidence, following UK Oil and Gas Guidelines on Decommissioning Cost Estimation. Updated estimates will be provided to BEIS at the 'define' stage as appropriate.

Table 6.1 Provisional Decommissioning Programmes Costs	
Item	Estimated Cost (£m)
Pipeline and umbilical decommissioning	Provided to BEIS in confidence
Subsea Installation and stabilisation features	
Well abandonment	
Owners costs including residual liabilities	
TOTAL	

6.5 Close Out

In accordance with the DECC guidelines, a close out report will be submitted to BEIS explaining any variations from the Decommissioning Programmes (normally within four months of the completion of the offshore decommissioning scope) including debris removal and independent verification of seabed clearance and the first post-decommissioning environmental and pipeline surveys.

6.6 Post-Decommissioning Monitoring and Evaluation

A post-decommissioning environmental seabed survey centered on the sites of the manifold and wellhead protection structure locations and the pipeline/umbilical corridors of the Atlantic and Cromarty Fields will be carried out. The survey will focus on chemical and physical disturbances of the decommissioning and compared with the pre-decommissioning survey. Results of this survey will be available once the work is complete, with a copy forwarded to BEIS. All pipeline routes and structure sites will be the subject of surveys when decommissioning activity has concluded. After the surveys have been sent to BEIS and reviewed, a post monitoring survey regime will be agreed by both parties, typically two post-decommissioning environmental surveys and structural (as left) pipeline surveys.

7.0 SUPPORTING DOCUMENTS

Table 7.1 Supporting Documents	
Document Number	Title
AC-ACD-HS-RE-3017	Atlantic & Cromarty Fields Draft Decommissioning Programmes: Environmental Impact Assessment Report
AC-ACD-W-RE-3018	Atlantic & Cromarty Fields Draft Decommissioning Programmes: Comparative Assessment Report
AC-ACD-W-RE-3016	Atlantic & Cromarty Fields Draft Decommissioning Programmes: Stakeholder Engagement Report

These documents are available as follows:

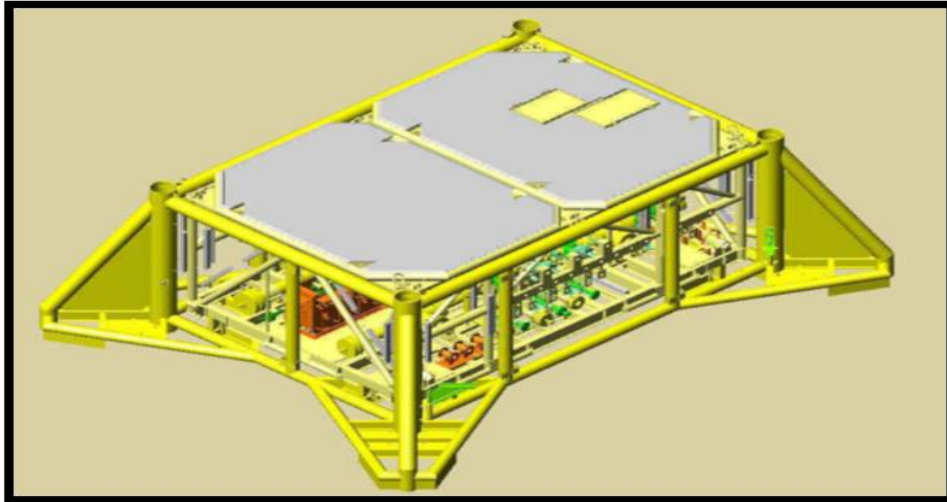
1. At the BEIS webpage at <https://www.gov.uk/guidance/oil-and-gas-decommissioning-of-offshore-installations-and-pipelines> (see 'Table of draft decommissioning programmes under consideration').
2. By email from Carol Barbone, Stakeholder Relations Manager, BG Group, at carol.barbone@bg-group.com, 01224 202169, M 0777 552 3091.
3. For inspection during the statutory and public consultation period (20 September to 20 October 2016) at 27 Albyn Place, Aberdeen AB10 1YL.

8.0 PARTNER LETTER OF SUPPORT

A copy of the Partner Letter of Support will be inserted into Final Decommissioning Programmes (post-consultation), with the original submitted to BEIS.

APPENDIX 1 - SCHEMATICS

i) Atlantic Manifold



General Arrangement - dimensions approximately L18m x W14m x H5m (above seabed)

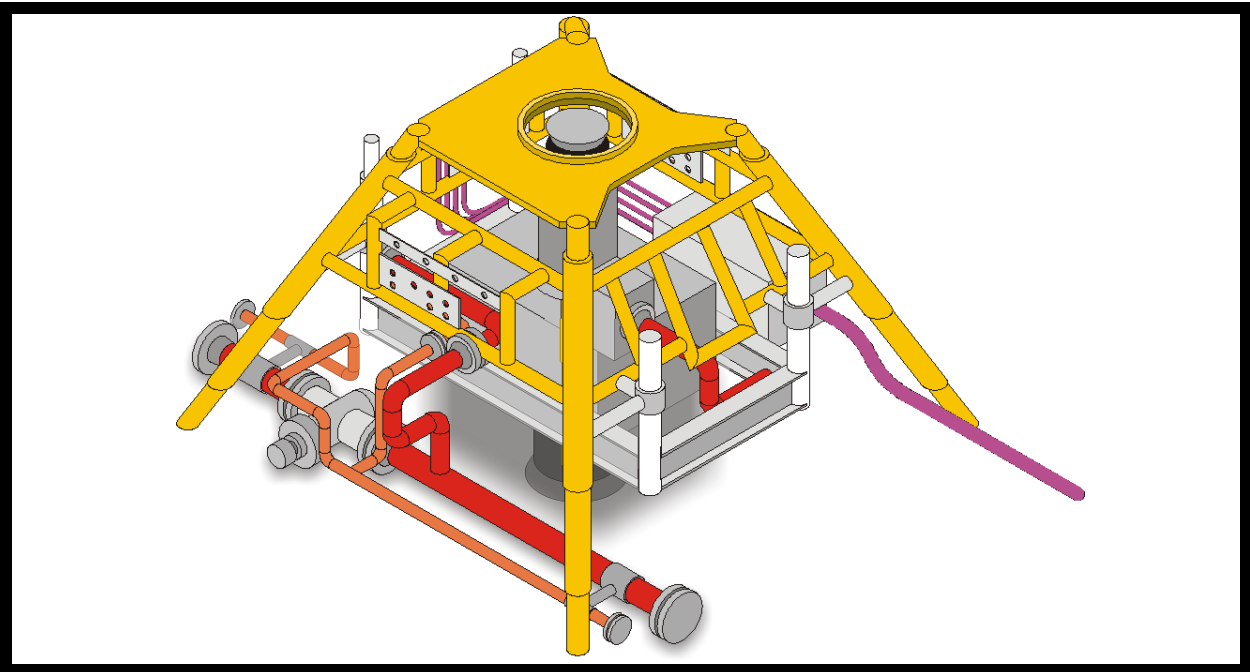


Atlantic Manifold Protection structure (piled at each corner)



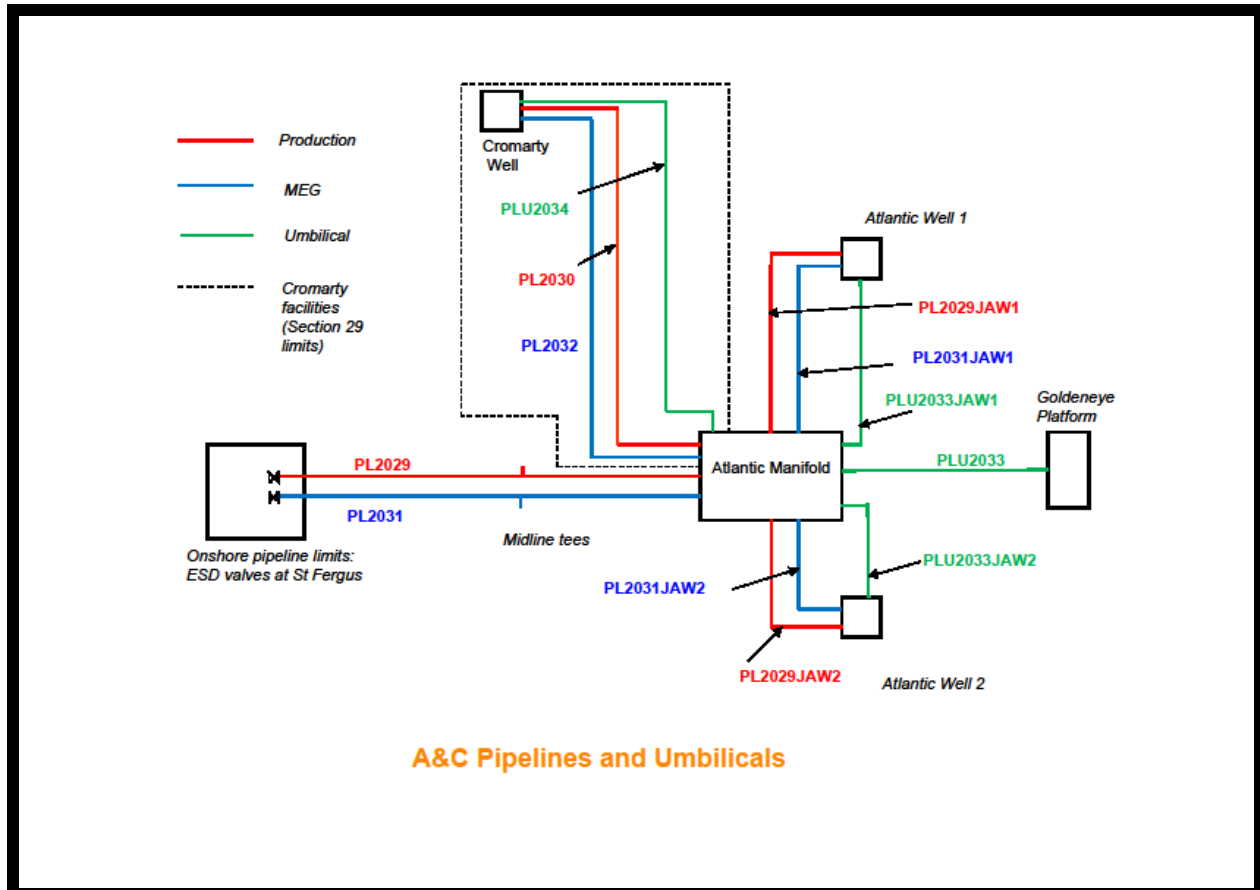
Atlantic Manifold Piping Skid (fits inside protection structure)

ii) Cromarty Subsea Tree Schematic (including Cromarty Piping Assembly)

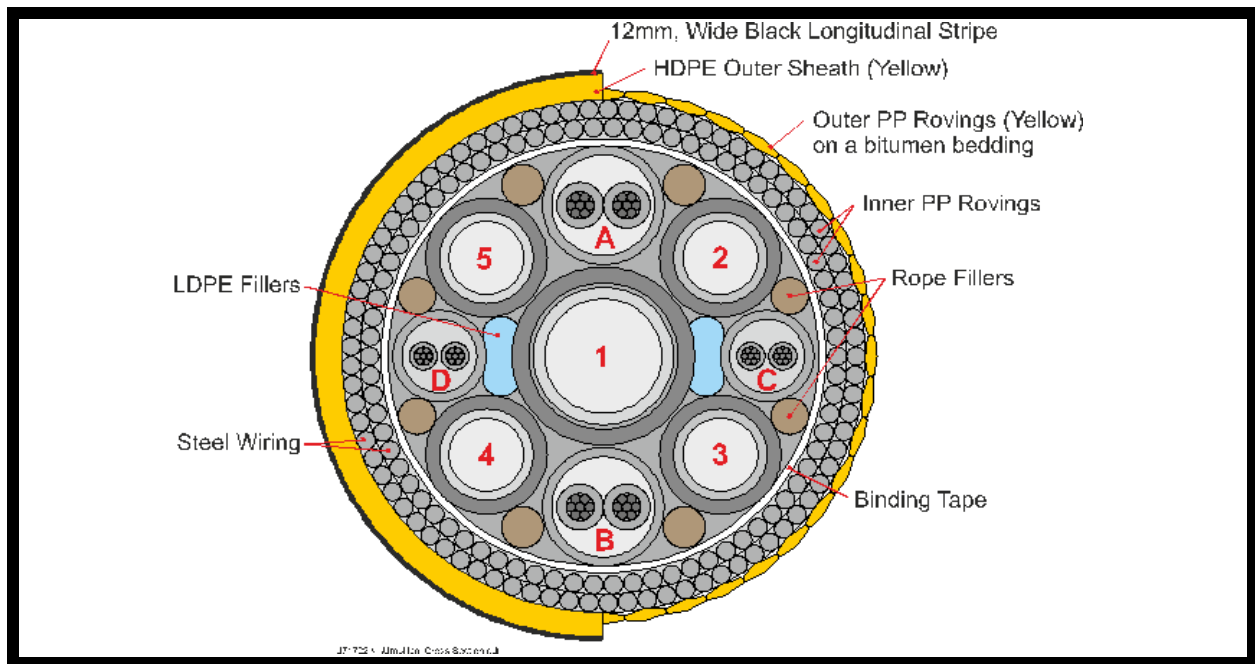


Dimensions are approximately L7.5m x W7.5m x H 5.5m

iii) Pipelines and Umbilical's Numbering Schematic



iv) Umbilicals Cross Section (PLU2033 & PLU2034)



APPENDIX 2 – UMBILICAL AND JUMPER COMPONENTS

i) Umbilical Component Details

Umbilical Component Details (PLU2033 & PLU2034)						
Line no.	Quantity	Type	Size	Rating	Function	Service Fluid
1	1	Ducoflex	¾ inch	3000 psi	Hydraulic-return	HW443R
2	1	Ducoflex	½ inch	5000 psi	Hydraulic A	HW443R
3	1	Ducoflex	½ inch	5000 psi	Hydraulic-B	HW443R
4	1	Ducoflex	½ inch	5000 psi	Chem Injection	50/50 MEG/water
5	1	Ducoflex	½ inch	5000 psi	Spare	HW443R
A	1	Copper (TSP)	2 x 16mm ²	0.6-1 kV	Power cable (A)	n/a
B	1	Copper (TSP)	2 x 16mm ²	0.6-1 kV	Power cable (B)	n/a
C	1	Copper (TSP)	2 x 6mm ²	0.6-1 kV	Signal cable (A)	n/a
D	1	Copper (TSP)	2 x 6mm ²	0.6-1 kV	Signal cable (B)	n/a

ii) Umbilical Component Details

Atlantic Well Umbilical Jumper (PLU2033JAW1) Component Details						
Line no.	Quantity	Type	Size	Rating	Function	Service Fluid
1	1	Nylon 11 hose	¾ inch	5000 psi	Hydraulic Return	HW443R
2	1	Nylon 11 hose	½ inch	5000 psi	Chemical Injection	50/50 MEG/water
3	1	Nylon 11 hose	½ inch	5000 psi	Hydraulic-A	HW443R
4	1	Nylon 11 hose	½ inch	5000 psi	Hydraulic-A	HW443R
A	1	Copper (TSP's)	2 x 16mm ²	0.6-1 kV	Power	n/a
B	1	Copper (TSP's)	2 x 16mm ²	0.6-1 kV	Power	n/a
C	1	Copper (TSP's)	2 x 16mm ²	0.6-1 kV	Signals	n/a
D	1	Copper (TSP's)	2 x 16mm ²	0.6-1 kV	Signals	n/a

Note: Component details are similar for PLU2033JAW2.