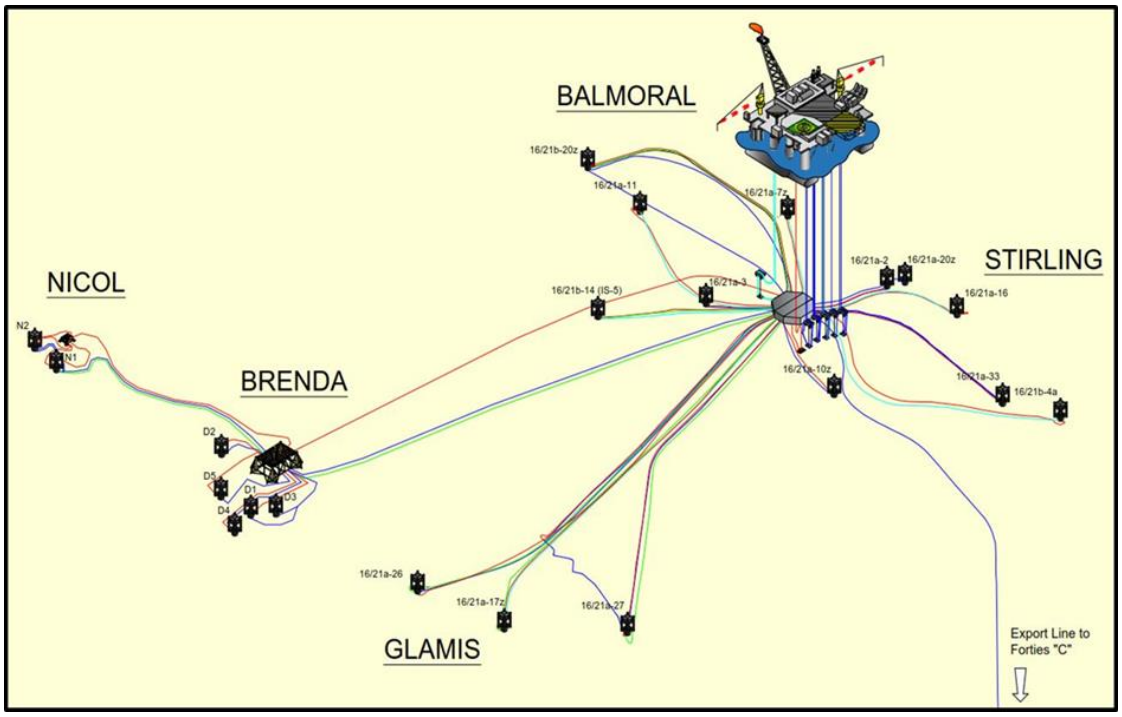

BALMORAL

Decommissioning Programmes

Document No.	AB-BL-PMO-LL-PM-PG-0001
Revision	B02
Status	Issued for Use (Consultation)
Legacy Documents	N/A
Alternative Document Number	N/A
Total Number of Pages (Inc. Cover Page)	59

Approvals

	Name	Date
Prepared by	L Onodi	16/09/2020
Reviewed by	P voor de Poorte	16/09/2020
Approved by	D Farthing	16/09/2020

Revision Control

Revision No	Reference	Changes/Comments	Issue Date
A01	Internal Review	Comments incorporated	Oct 2019
A01	Initial Draft OPRED	OPRED comments incorporated	Nov 2019
A02	2nd Draft to OPRED	Comments incorporated	Dec 2019
A03	Internal and Partner Review	Comments incorporated	Feb 2020
A04	Re-issued for Partner Review	Comments incorporated	May 2020
A05	3rd Draft OPRED Review	-	Aug 2020
B01	Issued for Use (Consultee and Public Consultation)		Sept 2020
B02	Issued for Use (Consultee and Public Consultation)	Additional OPRED comments incorporated	Sept 2020

Distribution List

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OPRED	1
Repsol Sinopec North Sea Limited	1
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Contents

Terms and Abbreviations

Abbreviation	Explanation
Approx.	Approximately
BEIS	Department for Business, Energy & Industrial Strategy
BLLP	Balmoral Late Life Project
CA	Comparative Assessment
CFE	Controlled Flow Excavator
CNS	Central North Sea
CO_2	Carbon dioxide
CoP	Cessation of Production
Dia	Diameter
DoB	Depth of Burial
DSV	Diving Support Vessel
EA	Environmental Appraisal
EMS	Environmental Management System
EMT	Environmental Management Team
ENE	East-Northeast
ENVID	Environmental Issues Identification
ESE	East-Southeast
EUNIS	European Nature Information Systems
FPV	Floating Production Vessel
GVA	Götaverken Arendal
HLV	Heavy Lift Vessel
HSES	Health, Safety, Environment and Security
ICES	International Council for the Exploration of the Seas
i.e.	Id est (“that is”)
JNCC	Joint Nature Conservation Committee
kg/m	Kilogrammes per metre
Km	Kilometre
Km^2	Square kilometre
LAT	Lowest Astronomical Tide
LSA	Low Specific Activity Scale
m	Metre
m^2	Square metre
m^3	Cubic metre
MCDA	Multi Criteria Decision Analysis
MDAC	Methane-Derived Authigenic Carbonate
mm	Millimetre
MPA	Marine Protected Areas
n/a	Not Applicable
NMPI	National Marine Plan Interactive
NORM	Naturally Occurring Radioactive Material

Abbreviation	Explanation
NNW	North-Northwest
NW	Northwest
ODU	Offshore Decommissioning Unit
OGA	Oil & Gas Authority
OGUK	Oil & Gas UK
OPRED	Offshore Petroleum Regulator for Environment & Decommissioning
OSPAR	Oslo Paris Convention – Convention for the Protection of the Marine Environment of the North East Atlantic
PDF	Pre-Delivery Facility
PL	Pipeline
PMF	Scottish Priority Marine Feature
PON	Petroleum Operations Notice
Premier Oil	Premier Oil E&P UK Limited
PWA	Pipeline Works Authorisation
RB	Riser Base
Repsol Sinopec	Repsol Sinopec North Sea Limited
Rockrose	Rockrose UKCS4 Limited
ROV	Remotely Operated Vehicle
S	South
SAC	Special Area of Conservation
SCAP	Supply Chain Action Plan
SEPA	Scottish Environmental Protection Agency
SFF	Scottish Fishermen's Federation
SLV	Single Lift Vessel
SOSI	Seabird Oil Sensitivity Index
SSE	South-Southeast
SSS	Side Scan Sonar
SUTU	Subsea Umbilical Termination Unit
SW	Southwest
TBC	To be confirmed
Te	Tonne
TFSW	Trans Frontier Shipment of Waste
TUTU	Topsides Umbilical Termination Unit
UK/NOR	United Kingdom / Norway (median)
UKCS	United Kingdom Continental Shelf
UKOOA	United Kingdom Offshore Operators Association
W	West
WGS	World Geodetic System
WONS	Well Operations Notification system
WSW	West-Southwest

Figures and Tables

Appendices

1 EXECUTIVE SUMMARY

1.1 Decommissioning Programmes

This document contains the Decommissioning Programmes for the Balmoral Floating Production Vessel (FPV) and Balmoral Field subsea installations and pipelines.

Note that the Balmoral Field decommissioning is part of a programme of decommissioning activities for the Greater Balmoral Area. Each field comprising the Greater Balmoral Area has its own Decommissioning Programme.

1.2 Requirement for Decommissioning Programmes

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

Pipelines:
In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Balmoral field pipelines (see Table 1.4) are applying to OPRED to obtain approval for decommissioning the pipelines detailed in Section 2.3 of this programme. (See also Section 8 – Partner Letters of Support).

In conjunction with public, stakeholder and regulatory consultation, the Decommissioning Programmes are submitted in compliance with national and international regulations and OPRED guidelines. The schedule outlined in this document is for an eight year decommissioning project plan due to begin in 2021.

1.3 Introduction

The Decommissioning Programmes have been prepared to support the decommissioning of the Balmoral Floating Production Vessel (FPV) and Balmoral Field subsea installations and pipelines, which is part of a wider suite of Decommissioning Programmes for the Greater Balmoral Area.

The licensees have submitted to the Oil & Gas Authority (OGA) for consideration a Cessation of Production (CoP) document which demonstrates that all economic development opportunities have been pursued for; the field and associated infrastructure, current and future development opportunities, and consideration of access to current infrastructure.

A Cessation of Production application for the field has been discussed with and submitted to the Oil and Gas Authority, and was approved on the 23rd April 2018.

The Greater Balmoral Area consists of the Premier Oil operated subsea Fields; Balmoral, Brenda, Nicol, Stirling and Glamis, all of which are tied back to the Balmoral FPV. Two further subsea Fields, Burghley and Beauly, which are operated by Repsol Sinopec North Sea Limited, are also tied-back to the Balmoral FPV. Repsol Sinopec North Sea Limited, as operator, will submit Decommissioning Programmes for Burghley and Beauly.

The Balmoral Field and FPV are located approximately 225 km northeast of Aberdeen in UKCS Block 16/21a and 16/21b in a water depth of 145m LAT. The FPV, installed in 1986, is a purpose-built floating platform of the GVA 5000 semi-submersible design and is located on-station by a mooring system made up of eight chain connected to anchor piles. Production from the Balmoral field came online during November 1986. The FPV is the processing centre for the following subsea fields, which are tied back to the FPV: the Premier Oil-operated Balmoral, Brenda, Glamis, Stirling and Nicol Fields; and a further two subsea fields, Beauly and Burghley, which are operated by Repsol Sinopec North Sea Limited. Produced hydrocarbons are exported via the Forties Pipeline System.

The main components of the Balmoral field consist of; the Balmoral FPV, Balmoral Template, 11 template and 10 satellite wells, a riser system, pipelines, umbilicals and cables.

Following public, stakeholder and regulatory consultation, the Decommissioning Programmes are submitted without derogation and in full compliance with OPRED and Oil & Gas UK guidelines. The Decommissioning Programmes explain the principles of the removal activities and are supported by a Comparative Assessment (CA) of decommissioning options and an Environmental Appraisal (EA).

1.4 Overview of Installations/Pipelines Being Decommissioned

1.4.1 Installations

Table 1.1: Installations Being Decommissioned			
Field:	Balmoral	**Production Type (Oil/Gas/Condensate)**	Oil/Gas
Water Depth (m)	145	**UKCS blocks**	16/21a & 16/21b
Surface Installation			
Number	**Type**	**Topsides Weight (Te)**	**Jacket Weight (Te)**
1	FPV	33,977 Te Displacement 19,719 Te Lightweight	N/A
Subsea Installations		**Number of Wells**	
Number	**Type**	**Platform**	**Subsea**
29	1 x Subsea Template 5 x Riser base 5 x Mid-water arch 1 x Pre-delivery facility 1 x Valve skid & mud mats 8 x Anchor piles 8 x Mooring chains	N/A	Template: 11 Satellite: 10
Drill Cuttings pile(s)		**Distance to median**	**Distance from nearest UK coastline**
Number of Piles	**Total Estimated volume (m^3)**	**km**	**km**
1	1,608	29.5 (UK/NOR median)	186.9

Table 1.2: Installations Section 29 Notice Holders Details		
Section 29 Notice Holders	**Registration Number**	**Equity Interest (%)**
Premier Oil E&P UK Limited	02761032	78.12 %
Repsol Sinopec North Sea Limited	01061863	15.13 %
Rockrose UKCS4 Limited	02552901	6.75 %
Premier Oil PLC	SC234781	0 %
Premier Oil UK Limited	SC048705	Exited
Repsol Sinopec Resources UK Limited	00825828	0 %
Idemitsu Kosan Co. Ltd.	JP9010001011318	Exited

1.4.2 Pipelines

Table 1.3: Pipelines Being Decommissioned		
Number of Pipelines	**27**	(See Table 2.3)
Number of Umbilicals	**19**	(See Table 2.3)

Table 1.4: Pipelines Section 29 Notice Holders Details		
Section 29 Notice Holder(s)	**Registration Number**	**Equity Interest (%)**
Premier Oil E&P UK Limited	02761032	78.12 %
Repsol Sinopec North Sea Limited	01061863	15.13 %
Rockrose UKCS4 Limited	02552901	6.75 %
Premier Oil PLC	SC234781	0 %
Premier Oil UK Limited	SC048705	Exited
Repsol Sinopec Resources UK Limited	00825828	0 %
Idemitsu Kosan Co. Ltd.	JP9010001011318	Exited

Table 1.5: Pipelines Section 29 Notice Holders Details (PL4540, PLU4880, PLU4881)		
Section 29 Notice Holder(s)	**Registration Number**	**Equity Interest (%)**
Premier Oil E&P UK Limited	02761032	78.12 %
Repsol Sinopec North Sea Limited	01061863	15.13 %
Rockrose UKCS4 Limited	02552901	6.75 %
Premier Oil PLC	SC234781	0 %
Repsol Sinopec Resources UK Limited	00825828	0 %

1.5 Summary of Proposed Decommissioning Programmes

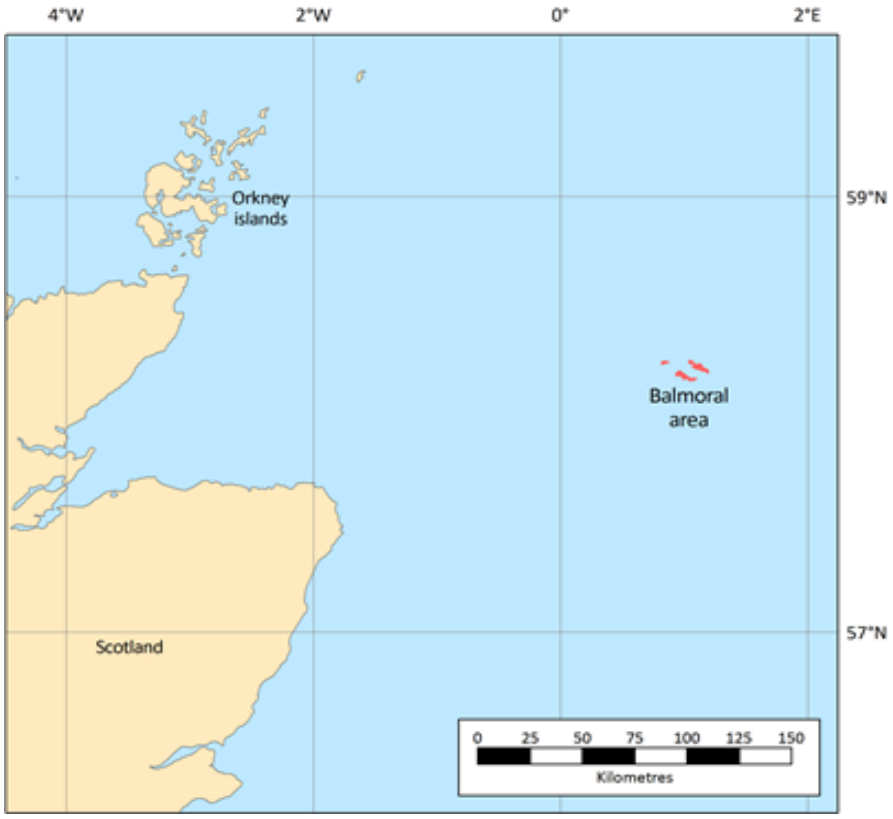
Table 1.6: Summary of Decommissioning Programmes		
Selected Option	**Reason for Selection**	**Proposed Decommissioning Solution**
1. Topsides		
n/a	n/a	n/a
2. Floating Facility		
Remove Balmoral FPV Full Removal.	Meets regulatory requirements	Full Removal. Sale or appropriate treatment and disposal onshore
3. Subsea Installations		
Group 11*: Large Subsea Installation – Balmoral Template Full Removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.
Group 12*: Small Subsea Installations Full removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.
Group 15*: Mooring system including anchor piles	Leaves a clear seabed and meets regulations.	Anchor chains are recoverable to point of burial at the anchor pile. Anchor piles remain *in situ* as top of piles are buried 6m below seabed, and the remaining sections of chains will be sufficiently buried.
4. Pipelines, Flowlines & Umbilicals		
Group 1*: Surface Laid Flowlines & Umbilicals Full Removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.
Group 3*: Trenched & Buried Rigid Flowlines Leave *in situ*.	Comparatively assessed as preferred option. The rigid flowlines are sufficiently trenched and buried and stable posing no risk to marine users. Minimal seabed disturbance, lower energy use, reduced risk to personnel engaged in the activity.	Leave *in situ*. Exposed ends & areas of exposure to be removed & returned to shore for disposal. Local rock placement to mitigate snag hazard from cut ends.
Group 4*: Trenched & Buried Flexible Flowlines & Umbilicals Full removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.
Group 5*: Flexible Jumpers Full removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.
Group 7*: Rigid Spoolpieces Full removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.
Group 13*: Subsea Mattresses – flexible concrete mattresses with polypropylene rope Full removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.

Group 14*: Subsea Mattresses Other – Difficult to remove mattresses Full removal.	Leaves a clear seabed and meets regulations.	Full removal. Returned to shore for recycling or appropriate treatment and disposal. Mattresses that are proved to be difficult to remove will be discussed with OPRED.
Group 16*: Flexible Risers Full removal.	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.
Group 17*: Surface Laid & Rock Covered Flexible Flowline	Leaves a clear seabed and meets regulations.	Full Removal. Returned to shore for recycling or appropriate treatment and disposal.
5. Wells		
Wells will be plugged and abandoned to Premier Oil E&P UK Limited standards which comply with "Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996" and align with Oil & Gas UK Guidelines for the Suspension and Abandonment of Wells (Issue 6, June 2018).	Meets HSE regulatory requirements in accordance with O&G UK and OGA guidelines.	A Master Application Template (MAT) and the supporting Subsidiary Application Template (SAT) will be submitted in support of activities carried out. Applications to abandon the wells will be submitted through the Well Operations Notification System (WONS). Additionally, planned work will be reviewed by a well examiner to Premier Oil E&P UK Limited standards, then submitted to the HSE for review.
6. Drill Cuttings		
Screening of cuttings requirements based on desktop exercise and pre-decommissioning environmental survey data.	Compliance with OSPAR Recommendation 2006/5 requirements.	Cuttings pile will be displaced to allow removal of the Balmoral template and then left *in situ* for natural degradation.
7. Interdependencies		
Subsea infrastructure flushing and cleaning to be completed prior to removal of the Balmoral FPV, and prior to commencement of subsea decommissioning operations. Before the template can be removed: • All template wells will need to be plugged and abandoned, and Xmas trees removed • All manifolds embedded within the template require to be removed • Embedded drill cuttings require to be dispersed from the template Decommissioning activities to be coordinated to minimise simultaneous operations (SIMOPS).		

* Refers to the Inventory Group Categories as defined in the Comparative Assessment Report

1.6 Field Location Including Field Layout and Adjacent Facilities

Figure 1.1: Field Location in UKCS



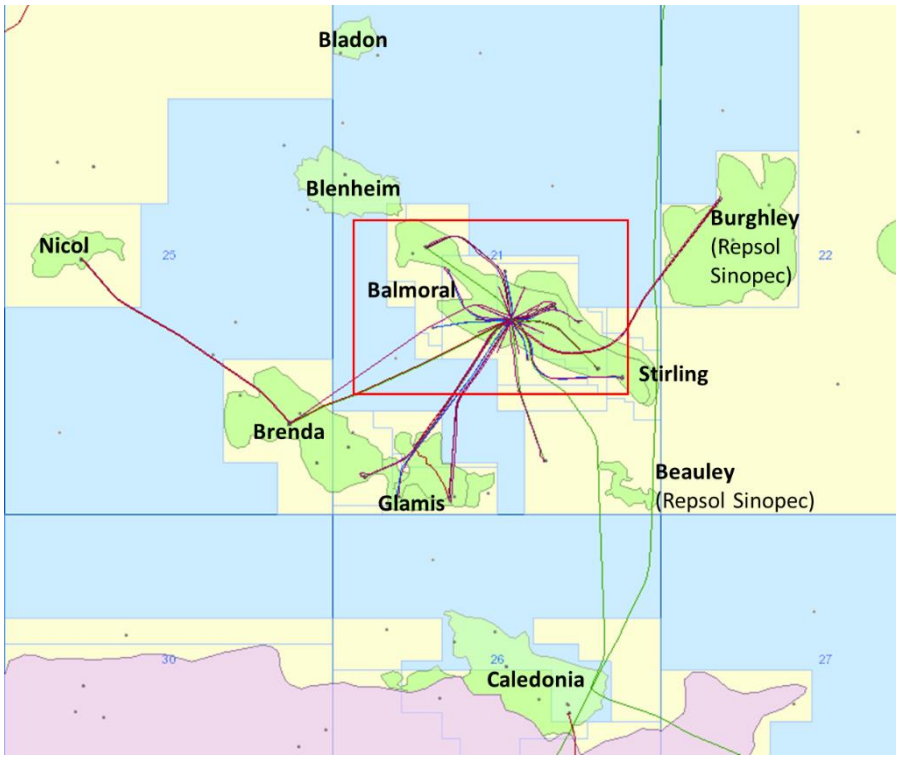
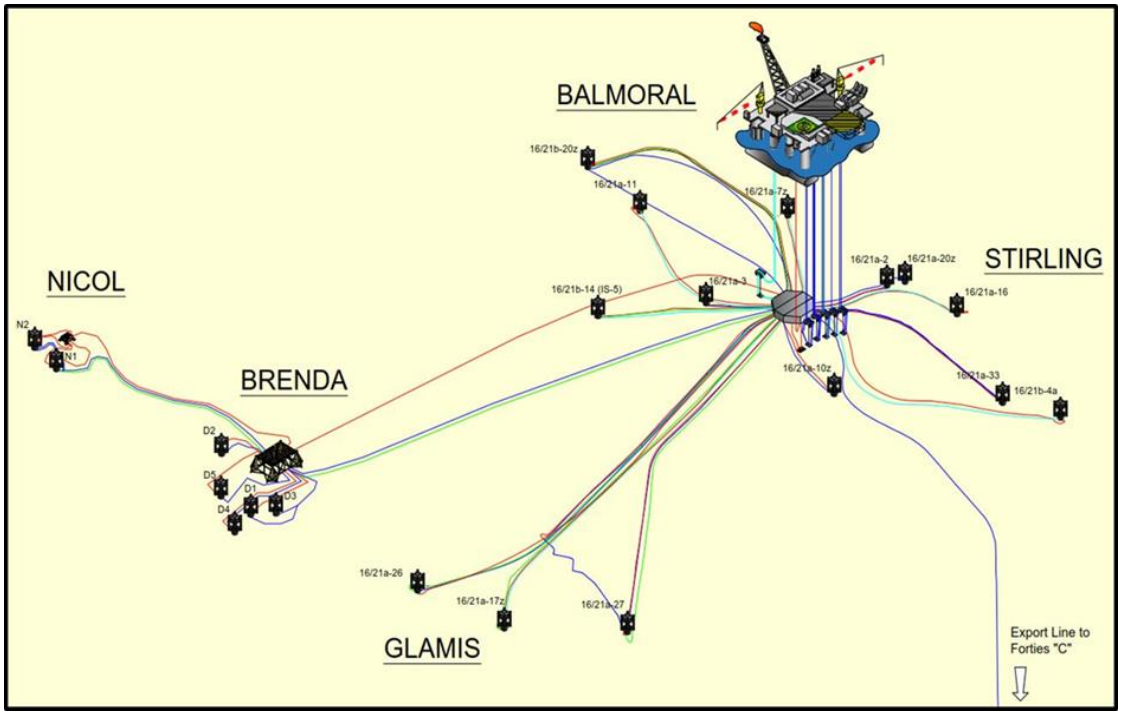


Figure 1.2: Field Layouts



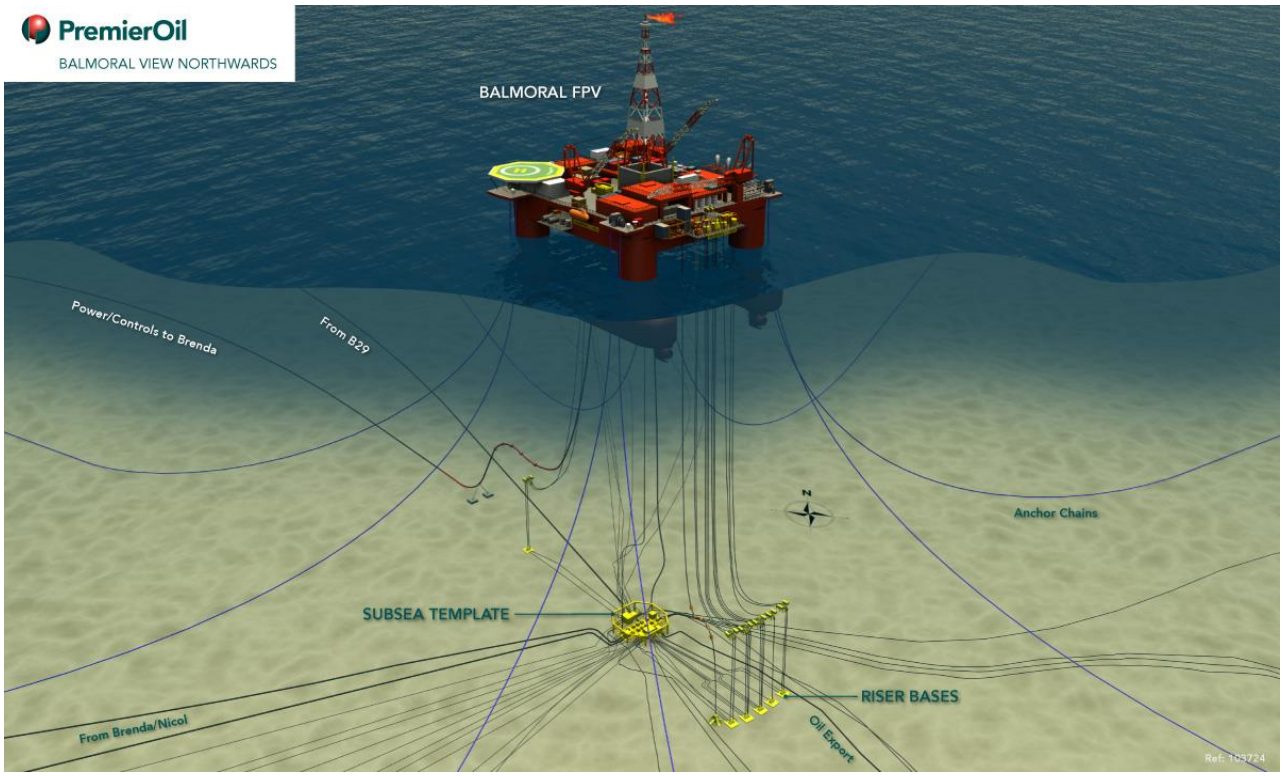
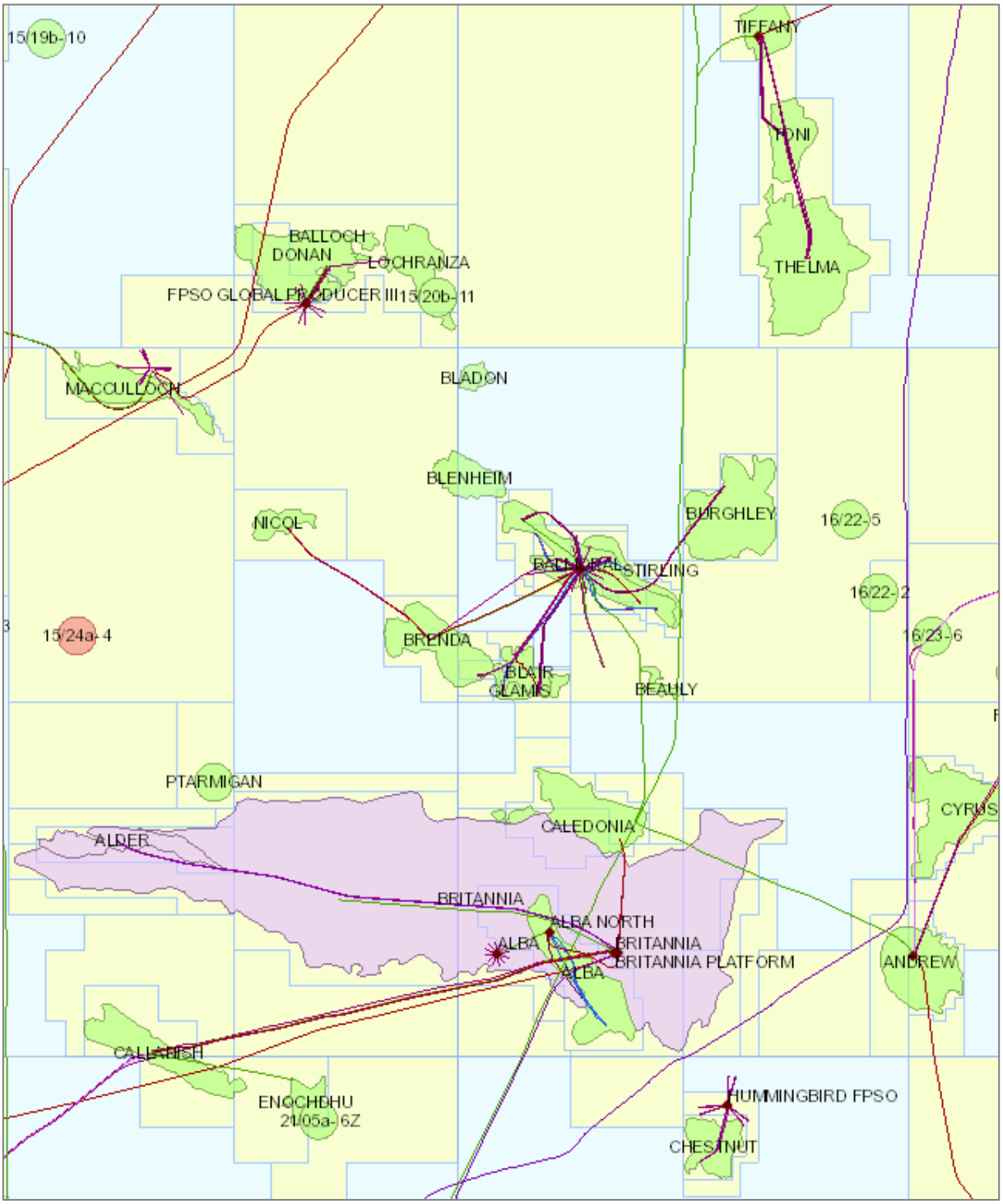


Table 1.7 Adjacent Facilities					
Operator	**Name**	**Type**	**Distance/ Direction**	**Information**	**Status**
Premier Oil E&P UK Limited	Nicol	Subsea	15.5 km, W 280°	Oil & gas production co-mingled with Brenda	Operational
Premier Oil E&P UK Limited	Brenda	Subsea	8.8 km, WSW 247°	Oil & gas production tied back to Balmoral FPV	Operational
Premier Oil E&P UK Limited	Glamis	Subsea	7.5 km, SW 214°	Oil & gas production tied back to Balmoral FPV	Shut-in
Premier Oil E&P UK Limited	Stirling	Subsea	2.8 km, ESE 108°	Oil & gas production tied back to Balmoral FPV	Operational
Premier Oil UK Limited	Caledonia	Subsea	14.3 km, S 173°	Oil & gas production tied back to Britannia platform	Shut-In
Repsol Sinopec North Sea Limited	Beauly	Subsea	5.2 km, SSE 168°	Oil & gas production tied back to Balmoral FPV	Operational
Repsol Sinopec North Sea Limited	Burghley	Subsea	8.6 km, ENE 62°	Oil & gas production tied back to Balmoral FPV	Operational
INEOS	Tap Valve 3 (Forties Pipeline System)	Subsea	13.8 km, SSE 179°	Oil export pipeline from the Forties Charlie platform to Cruden Bay	Operational
Impacts of Decommissioning Proposals					
The Balmoral Field will be decommissioned in a programme of activities comprising the Stirling, Glamis, Brenda and Nicol Fields. Decommissioning activities are planned so they will not affect the decommissioning of other fields or the operation of other developments in the area. The environmental appraisal will consider the potential cumulative implications of decommissioning activities in context of the other activities in the area including oil and gas and other industry.					

Note: Adjacent facilities refer to those potentially impacted by this programme.

Figure 1.3: Adjacent Facilities



1.7 Industrial Implications

The Balmoral decommissioning activities are part of the Balmoral Area Decommissioning Project, which will be managed by Premier Oil in Aberdeen. All decommissioning activities will be planned to realise synergies and efficiencies in offshore execution.

A Supply Chain Action Plan (SCAP) has been produced for these Decommissioning Programmes in accordance with OGA guidance. The SCAP has been submitted to and approved by the OGA. Premier Oil have some pre-existing Master Service agreements with specialist contractors, which were the result of previous tender exercises. These contractors will be asked to quote for services to support the decommissioning activity in the first instance. Other specialist services will be competitively tendered or novated. Suppliers' offers will be assessed along many criterions, among which are capacity to execute the work safely; the commercial offer and experience of carrying out this type of operation on the UKCS.

2 DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Installations: Surface Facilities - Floating Production Vessel

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)
Balmoral FPV	FPV	WGS84 Decimal	58.230713	19,853 Te	N/A	N/A	N/A	N/A	N/A
			1.108569						
		WGS84 Degree Minute	58° 13.727' N						
			01° 06.426' E						

2.2 Installations: Subsea including Stabilisation Features

Table 2.2: Subsea Installations and Stabilisation Features					
Subsea installations including Stabilisation Features	**Number**	**Size (m)/ Weight (Te)**	**Location**		**Comments/Status**
Balmoral					
Balmoral Template	1	L33xW33xH10 1,100 Te (without drill cuttings)	WGS84 Decimal	58.230713 1.108569	Structure is secured to the seabed by three steel piles.
			WGS84 Decimal Minute	58° 13.727' N 01° 06.426' E	
Riser Base 01 (Glamis / Beauly) &	1	L8.25xW7xH3.1 90 Te	WGS84 Decimal	58.229734 1.109473	Concrete filled &
Mid Water Arch Gp1	1	L5.5xW4.5xH6.7 22.5 Te	WGS84 Decimal Minute	58° 13.668' N 01° 06.481' E	Syntactic foam / Steel
Riser Base 02 (Balmoral)	1	L9xW8xH3.1 90.3 Te	WGS84 Decimal	58.229817 1.109656	Concrete filled
Mid Water Arch Gp2	1	L5.5xW4.5xH6.7 27.6 Te	WGS84 Decimal Minute	58° 13.673' N 01° 06.429' E	Syntactic foam / Steel
Riser Base 03 (Balmoral)	1	L9xW8xH3.1 90.3 Te	WGS84 Decimal	58.22991 1.109872	Concrete filled
Mid Water Arch Gp3	1	L5.5xW4.5xH6.7 27.6 Te	WGS84 Decimal Minute	58° 13.679' N 01° 06.505' E	Syntactic foam / Steel
Riser Base 04 (Balmoral Oil Exp.)	1	L8.25xW7xH3.1 68.6 Te	WGS84 Decimal	58.230012 1.110037	Concrete filled
Mid Water Arch Gp4	1	L5.5xW4.5xH6.7 15.9 Te	WGS84 Decimal Minute	58° 13.685' N 01° 06.514' E	Syntactic foam / Steel
Riser Base 06 (Balmoral)	1	L9xW7xH3.1 79.4 Te	WGS84 Decimal	58.231433 1.107134	Concrete filled
Mid Water Arch Gp6	1	L5.5xW4.5xH6.7 21.9 Te	WGS84 Decimal Minute	58° 13.770' N 01° 06.340' E	Syntactic foam / Steel
Oil Export Pipeline Pre Delivery Facility	1	L15xW15xH3.5 50 Te	WGS84 Decimal	58.11213 1.156826	Gravity based
			WGS84 Decimal Minute	58° 06.612' N 01° 09.322' E	
Mooring Chains	8	1,550 m (each) 260 Te (each)	From each anchor pile location to the Balmoral FPV.		Connected to anchor piles
Anchor Pile 1	1	1.58 Dia x H36 63.9 Te	WGS84 Decimal	58.23933 1.09965	Buried to a depth of 6 metres over top of pile
			WGS84 Decimal Minute	58° 14.360’ N 01° 05.979’ E	
Anchor Pile 2	1	1.58 Dia x H36 63.9 Te	WGS84 Decimal	58.23918 1.11543	Buried to a depth of 6 metres over top of pile
			WGS84 Decimal Minute	58° 14.351’ N 01° 06.926’ E	

Table 2.2: Subsea Installations and Stabilisation Features					
Subsea installations including Stabilisation Features	**Number**	**Size (m)/ Weight (Te)**	**Location**		**Comments/Status**
Anchor Pile 3	1	1.58 Dia x H36 63.9 Te	WGS84 Decimal	58.23408 1.12592	Buried to a depth of 6 metres over top of pile
			WGS84 Decimal Minute	58° 14.045' N 01° 07.555' E	
Anchor Pile 4	1	1.58 Dia x H36 63.9 Te	WGS84 Decimal	58.22448 1.12683	Buried to a depth of 6 metres over top of pile
			WGS84 Decimal Minute	58° 13.469' N 01° 07.601' E	
Anchor Pile 5	1	1.58 Dia x H36 63.9 Te	WGS84 Decimal	58.21780 1.11202	Buried to a depth of 6metres over top of pile
			WGS84 Decimal Minute	58° 13.068' N 01° 06.721' E	
Anchor Pile 6	1	1.58 Dia x H36 63.9 Te	WGS84 Decimal	58.21840 1.09878	Buried to a depth of 6 metres over top of pile
			WGS84 Decimal Minute	58° 13.104' N 01° 05.927' E	
Anchor Pile 7	1	1.58 Dia x H36 63.9 Te	WGS84 Decimal	58.22478 1.08713	Buried to a depth of 6 metres over top of pile
			WGS84 Decimal Minute	58° 13.487' N 01° 05.228' E	
Anchor Pile 8	1	1.58 Dia x H36 63.9 Te	WGS84 Decimal	58.23308 1.08737	Buried to a depth of 6 metres over top of pile
			WGS84 Decimal Minute	58° 13.958' N 01° 05.242' E	
Well B29 Production Valve skid & mud mats	1	L3.4xW2.9xH1.5 3.85 Te	WGS84 Decimal	58.25211 1.05539	N/A
			WGS84 Decimal Minute	58° 15.127' N 01° 03.323' E	

2.3 Pipelines Including Stabilisation Features

Table 2.3: Pipelines / Flowlines / Umbilicals /Risers Information										
Description	Pipeline Number (as per PWA)	Diameter (ins)	Length (km)	Description of Component Parts	Product Conveyed	End Points		Burial Status	Pipeline Status	Current Content
						From	To			
Oil export	PL218	14	14.46	Steel	Produced Fluids	Balmoral Template	TV3	Trenched & Buried	In Use	Produced Fluids
Gas Lift	PL219	2.375	1.297	Steel	Gas	Balmoral Template	16/21a-3	Trenched & Buried	Out of Use (Disconnected)	Filtered Seawater
Production	PL220	4.5	1.302	Steel	Produced Fluids	16/21a-3	Balmoral Template	Trenched & Buried	Out of Use (Disconnected)	Filtered Seawater
Gas Lift	PL221	2.375	5.045	Steel	Gas	Balmoral Template	16/21b-29	Trenched & Buried	In Use	Lift Gas
Production	PL222	4.5	5.059	Steel	Produced Fluids	16/21b-29	Balmoral Template	Trenched & Buried	Out of Use (Disconnected)	Filtered Seawater
Production	PL222A	7.539	5.083	Composite Flexible	Produced Fluids	16/21b-29	Balmoral Template	Trenched & Buried	Out of Use	Filtered Seawater
Gas Lift	PL223	2.375	1.693	Steel	Gas	Balmoral Template	16/21a-2	Trenched & Buried	In Use	Lift Gas
Production	PL224	4.5	1.698	Steel	Produced Fluids	16/21a-2	Balmoral Template	Trenched & Buried	In Use	Produced Fluids
A7z Water Injection	PL225	6.875	1.818	Steel	Water	Balmoral Template	16/21a-7z	Trenched & Buried	Out of Use (Disconnected)	Seawater
A10z Water Injection	PL226	6.875	1.625	Steel	Water	Balmoral Template	16/21a-10z	Trenched & Buried	Out of Use (Disconnected)	Seawater
B4a Water Injection	PL227	6.875	5.346	Steel	Water	Balmoral Template	16/21b-4a	Trenched & Buried	Out of Use (Disconnected)	Seawater
A11 Water Injection	PL228	6.875	3.311	Steel	Water	Balmoral Template	16/21a-11	Trenched & Buried	Out of Use (Disconnected)	Seawater

Table 2.3: Pipelines / Flowlines / Umbilicals /Risers Information										
Description	Pipeline Number (as per PWA)	Diameter (ins)	Length (km)	Description of Component Parts	Product Conveyed	End Points		Burial Status	Pipeline Status	Current Content
						From	To			
B14 Water Injection	PL229	6.875	2.91	Steel	Water	Balmoral Template	16/21b-14	Trenched & Buried	Out of Use (Disconnected)	Seawater
A16 Water Injection	PL230	6.875	2.701	Steel	Water	Balmoral Template	16/21a-16	Trenched & Buried	Out of Use (Disconnected)	Seawater
Oil export riserbase	PL231	10.75	0.3131	Composite Flexible	Crude	Balmoral FPV QC/DC	RB 04	Surface laid	In Use	Crude
Devonian riserbase	PL232	6.875	0.3156	Composite Flexible	Produced Fluids	Balmoral FPV QC/DC	RB 02	Surface laid	In Use	Produced Fluids
Paleocene 1 riserbase	PL233	8	0.3198	Composite Flexible	Produced Fluids	Balmoral FPV QC/DC	RB 02	Surface laid	In Use	Produced oil/water/ gas
Paleocene 2 riserbase	PL234	8.875	0.313	Composite Flexible	Produced Fluids	Balmoral FPV QC/DC	RB 03	Surface laid	In Use	Produced Fluids
Test/Kill riserbase	PL235	4.5	0.3174	Composite Flexible	Produced Fluids	Balmoral FPV QC/DC	RB 03	Surface laid	In Use	Produced Fluids
Annulus Monitor riserbase	PL236	3	0.385	Composite Flexible	Service Chemicals	Balmoral FPV QC/DC	RB 02	Surface laid	Out of Use	Service Chemicals
Gas Lift riserbase	PL237	4	0.3663	Composite Flexible	Gas	Balmoral FPV QC/DC	RB 03	Surface laid	In Use	Dry Gas
Water Injection riserbase	PL238	8.875	0.347	Composite Flexible	Water	Balmoral FPV QC/DC	RB 06	Surface laid	Out of Use	Seawater
Water Injection riserbase	PL334	8.875	0.336	Composite Flexible	Water	Balmoral FPV QC/DC	RB 06	Surface laid	Out of Use	Seawater
Redundant B29 Production	PL2565	6.626	3.917	Steel	Produced Fluids	Environmental Seal at Disconnection Point (South)	Environmental Seal at Disconnection Point (North)	Trenched & Buried	Out of Use (Disconnected)	Filtered Seawater

Table 2.3: Pipelines / Flowlines / Umbilicals /Risers Information										
Description	Pipeline Number (as per PWA)	Diameter (ins)	Length (km)	Description of Component Parts	Product Conveyed	End Points		Burial Status	Pipeline Status	Current Content
						From	To			
B29 Production	PL4540	8.39	4.2825	Composite Flexible	Produced Fluids	16/21b-29	Balmoral Template	Surface laid & Rock covered	In Use	Produced Fluid
Production Riser & Riserbase Flowline	PL641	4.5	0.36059	Composite Flexible	Production Fluids	Balmoral Template	Balmoral FPV QC/DC	Surface laid	In Use	Production Fluids
Production Riser Base Flowline	PL642	8.874	0.36363	Composite Flexible	Production Fluids	Balmoral Template	Balmoral FPV QC/DC	Surface laid	In Use	Production Fluids
Chemical Injection Umbilical	PL647 [1] (.1 to.6)	0.5	0.19	Umbilical	Corrosion & Scale Inhibitor	Balmoral FPV	Balmoral Template	Surface laid	In Use	Corrosion & Scale Inhibitor
Dynamic Umbilical	PLU2674	8.74	0.25	Umbilical	Hydraulic/ Corrosion Inhibitor/ Scale Inhibitor/ Signal/ Methanol/ Power	Balmoral FPV Topsides TUTU	SUTU at Riser Base 1	Surface laid	In Use	Corrosion & Scale Inhibitor, Hydraulic, Methanol
Main Control Umbilical	PLU3764	5.236	0.19	Umbilical	Hydraulic/ Power/ Signal	Balmoral FPV Topsides TUTU	Subsea Template SUTU	Surface laid	In Use	Hydraulic, Electric
Chemical Injection Umbilical	PLU3765	3.937	0.19	Umbilical	Hydraulic/ Corrosion Inhibitor/ Scale Inhibitor/ Methanol/ Spare	Balmoral FPV Topsides TUTU	Subsea Template SUTU	Surface laid	In Use	Corrosion & Scale Inhibitor, Hydraulic, Methanol
Auxiliary Signal Cable No. 1	PLU3766	0.768	0.19	Umbilical	Control Signals	Balmoral FPV Topsides TUTU	Subsea Template SUTU	Surface laid	In Use	Electric

[1] PL647 has been assimilated as part of the Balmoral chemical injection umbilical PLU3765. The six chemical hoses (numbered PL647.1 to PL647.6) now form part of the bigger chemical injection umbilical with 34 hoses (PLU3765). In 2015, the whole umbilical was brought into the PWA regime, and all 34 cores now form part of PLU3765.

Table 2.3: Pipelines / Flowlines / Umbilicals /Risers Information										
Description	Pipeline Number (as per PWA)	Diameter (ins)	Length (km)	Description of Component Parts	Product Conveyed	End Points		Burial Status	Pipeline Status	Current Content
						From	To			
Auxiliary Signal Cable No. 2	PLU3767	0.768	0.19	Umbilical	Control Signals	Balmoral FPV Topsides TUTU	Subsea Template SUTU	Surface laid	In Use	Electric
Electric/Hydraulic Bundle	PLU4880	1.024	0.15	Umbilical	Electric/Hydraulic	Balmoral Template Connection	Burghley / Balmoral SUTU Connection	Surface laid	In Use	Electric / Hydraulic
Electric/Signal/ Hydraulic Bundle	PLU4881	1.024	0.15	Umbilical	Electric/Signal/ Hydraulic	Balmoral Template Connection	Burghley / Balmoral SUTU Connection	Surface laid	In Use	Electric/ Signal/ Hydraulic
B29 Logging Cable	PLU4342	0.984	5.182	Logging Cable	Electrical	16/21b-29	Balmoral Template	Surface laid	In Use	Electric
B14 Logging Cable	PLU4343	0.984	3.353	Logging Cable	Electrical	Balmoral Template	16/21b-14	Surface laid	Out of Use (Disconnected)	Electric
Control & Chemical Injection Umbilical	PLU4344	3.059	1.414	Umbilical	Corrosion Inhibitor/ Hydraulic/ Spare	Balmoral Template	16/21a-3	Surface laid	Out of Use (Disconnected)	Corrosion Inhibitor & Hydraulic
Control Umbilical	PLU4345	2.665	3.247	Umbilical	Hydraulic/ Spare	Balmoral Template	16/21b-14	Surface laid	Out of Use (Disconnected)	Hydraulic
Control Umbilical	PLU4346	2.665	3.513	Umbilical	Hydraulic/ Spare	Balmoral Template	16/21a-11	Surface laid	Out of Use (Disconnected)	Hydraulic
Control & Chemical Injection Umbilical	PLU4347	3.059	5.157	Umbilical	Corrosion Inhibitor/ Hydraulic/ Spare	Balmoral Template	16/21b-29	Surface laid	In Use	Corrosion Inhibitor & Hydraulic
Control Umbilical	PLU4348	2.665	2.004	Umbilical	Hydraulic/ Spare	Balmoral Template	16/21a-7z	Surface laid	Out of Use (Disconnected)	Hydraulic

Table 2.3: Pipelines / Flowlines / Umbilicals /Risers Information										
Description	Pipeline Number (as per PWA)	Diameter (ins)	Length (km)	Description of Component Parts	Product Conveyed	End Points		Burial Status	Pipeline Status	Current Content
						From	To			
Control & Chemical Injection Umbilical	PLU4349	3.059	1.736	Umbilical	Corrosion Inhibitor/ Hydraulic/ Spare	Balmoral Template	16/21a-2	Surface laid	In Use	Corrosion Inhibitor & Hydraulic
Control Umbilical	PLU4350	2.665	2.955	Umbilical	Hydraulic/ Spare	Balmoral Template	16/21a-16	Surface laid	Out of Use (Disconnected)	Hydraulic
Control Umbilical	PLU4351	2.665	5.617	Umbilical	Hydraulic/ Spare	Balmoral Template	16/21b-4a	Surface laid	Out of Use (Disconnected)	Hydraulic
Control Umbilical	PLU4352	2.665	1.731	Umbilical	Hydraulic/ Spare	Balmoral Template	16/21a-10z	Surface laid	Out of Use (Disconnected)	Hydraulic

Table 2.4: Subsea Pipelines Stabilisation Features				
Stabilisation Feature	Total Number	Weight (Te)	Locations	Exposed/Buried/Condition
Concrete mattresses (6 x 3 x 0.15m)	46	Approx. 217	Various locations across field infrastructure	Partially covered in sediment, condition varies
Concrete mattresses (5 x 2 x 0.15m)	26	Approx. 68	Various locations across field infrastructure	Partially covered in sediment, condition varies
Link-lok mattresses (Honeycomb shaped)	21	Approx. 109	Over PL218, PL221 and PL222	Partially covered in sediment, condition unknown
Armourflex mattresses	4	Approx. 12.4	Over PL219 and PL220	Partially covered in sediment. All 4 mattresses are in bad condition, due to wire rope issues.
Grout bags	Estimated 1600	40	Various locations across field infrastructure	Exposed, often covered in sediment, condition varies
Concrete protection Tunnel	1	68	On Oil Export line	Exposed
Rock dump	N/A	44,137	Various locations on PL4540	Exposed

2.4 Wells

Table 2.5: Well Information						
Location	Subsea Wells					
	WONS Name Current bore	Premier Oil Well Name	Designation	License	Status	Category of Well
Balmoral Template	16-21a-B1	16-21a-B1	Producer	P201	Completed (Shut In)	SS-3-3-3
	16-21a-B2	16-21a-B2	Producer	P201	Completed Operating	SS-3-3-3
	16-21a-B3	16-21a-B3	Producer	P201	Completed (Shut In)	SS-3-3-3
	16-21a-B4	16-21a-B4	Producer	P201	Completed Operating	SS-3-3-3
	16-21a-B5	16-21a-B5	Producer	P201	Completed (Shut In)	SS-3-3-3
	16-21a-B6	16-21a-B6	Producer	P201	Completed (Shut In)	SS-3-3-3
	16-21a-B7	16-21a-B7	Producer	P201	Completed (Shut In)	SS-3-3-3
	16-21a-B8	16-21a-B8	Development	P201	Plugged	SS-0-3-3
	16-21a-B9	16-21a-B9	Development	P201	Abandoned (Phase 1)	SS-0-3-3
	16-21a-B10	16-21a-B10	Producer	P201	Completed (Shut In)	SS-3-3-3
	16-21a-B11	16-21a-B11	Development	P201	Abandoned (Phase 1)	SS-3-3-3
Balmoral Satellite	16/21a-2	16/21a-2	Producer	P201	Completed (Shut In)	SS-3-3-1
	16/21a-3Z	16/21a-3Z	Producer	P201	Completed (Shut In)	SS-3-3-1
	16/21b-29	16/21b-29	Producer	P344	Completed Operating	SS-3-3-3
	16/21b-4A	16/21b-4A	Injector	P344	Completed (Shut In)	SS-3-3-1
	16/21b-5	16/21b-5	E&A	P344	Abandoned (Phase 1)	SS-0-3-3
	16/21a-7z	16/21a-7z	Injector	P201	Completed (Shut In)	SS-3-3-1
	16/21a-10z	16/21a-10z	Injector	P201	Completed (Shut In)	SS-3-3-3
	16/21a-11	16/21a-11	Injector	P201	Completed (Shut In)	SS-3-3-3
	16/21b-14	16/21b-14	Injector	P344	Completed (Shut In)	SS-3-3-3
	16/21a-16	16/21a-16	Injector	P201	Completed (Shut In)	SS-3-3-1

The well categories are indicative and require to be evaluated in accordance with the OGUK Well Decommissioning Guidelines, Issue 6, June 2018. This work is ongoing at the time of submission.

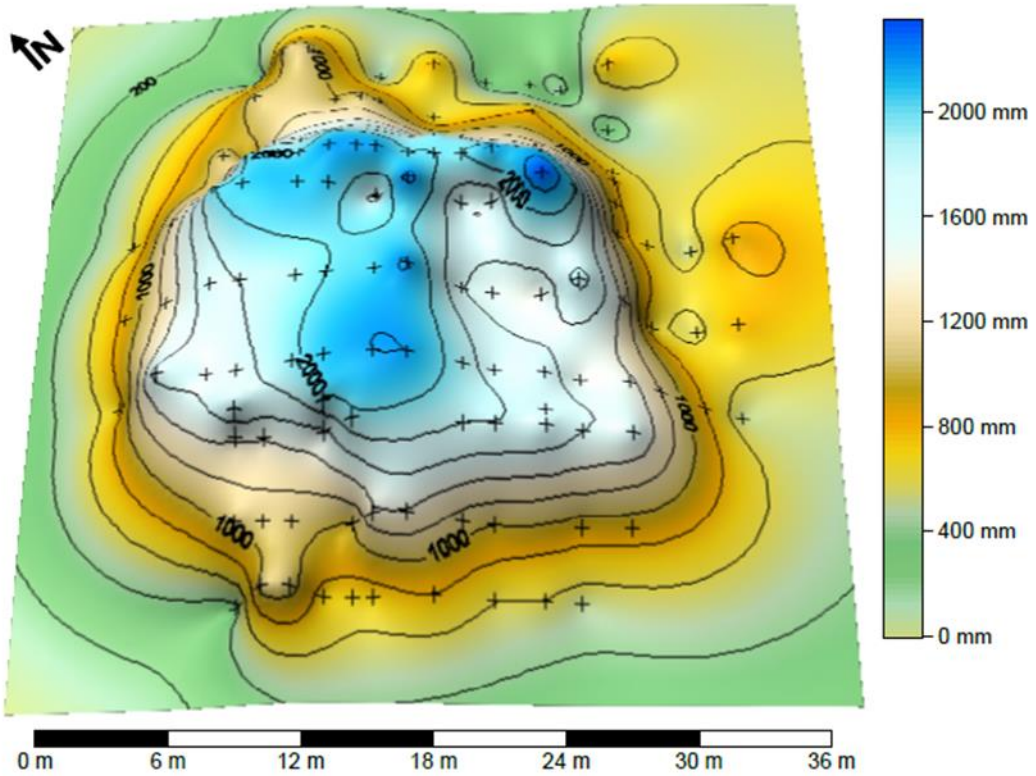
2.5 Drill Cuttings

Decommissioning of the Balmoral template infrastructure will involve the disturbance and resuspension of the template's internal and surrounding drill cuttings material (i.e. cuttings pile) which is comprised of a combination of water-based and oil-based muds from 11 wells.

The cuttings pile has a total volume of 1,610 m^3, with a total mass of 3,860 Te assuming a specific gravity of 2.4 Te/m^3. Table 2.6 describes the cutting pile location and area of coverage, whilst figure 2.1 depicts the cuttings pile contours, which indicate the varying elevation across the pile. See Section 3.7 for further information.

Table 2.6: Drill Cuttings Pile Information		
Location of Pile Centre (Latitude/Longitude)	**Seabed Area (m^2)**	**Estimated volume of cuttings (m^3)**
Within Balmoral Template: 58° 13.727' N 01° 06.426' E	1,764	1,608

Figure 2.1: Balmoral Cuttings Pile Profile – Colour contour Lines



2.6 Inventory Estimates

Tables 2.7, 2.8 and 2.9 provide an estimate of the total weight of materials associated with the Balmoral FPV, subsea installations and pipelines.

A further breakdown of the inventory estimates for the subsea installations and pipelines is provided in Figure 2.2, 2.3 and 2.4 respectively.

Table 2.7: Inventory of materials associated with Balmoral FPV		
Item	**Description**	**Weight Te**
Metals	Ferrous (steel - all grades)	17,562
	Non-Ferrous (copper, aluminium	1,267
Concrete	Aggregates (mattresses, grout bags, sand bags)	0
Plastic	Rubbers, polymers	149
Hazardous	Residual fluids (hydrocarbons, chemicals)	670
	NORM scale	
Other	Ceramics, wood, cork, etc.	71.2
	Total (Tonnes)	19,719.2

Table 2.8: Inventory of materials associated with Balmoral Subsea Installations		
Item	**Description**	**Weight Te**
Metals	Ferrous (steel - all grades)	3,851.7
	Non-Ferrous (copper, aluminium	0
Concrete	Aggregates (mattresses, grout bags, sand bags)	451
Plastic	Rubbers, polymers	56
Hazardous	Residual fluids (hydrocarbons, chemicals)	0
	NORM scale	0
Other		0
	Total (Tonnes)	4,358.7

Table 2.9: Inventory of materials associated with Balmoral Pipelines		
Item	**Description**	**Weight Te**
Metals	Ferrous (steel - all grades)	3,890.4
	Non-Ferrous (copper, aluminium	10.5
Concrete	Aggregates (mattresses, grout bags, sand bags)	474.4
Plastic	Rubbers, polymers	220.6
Hazardous	Residual fluids (hydrocarbons, chemicals)	trace
	NORM scale	trace
Other		0
	Total (Tonnes)	4,595.9

Figure 2.2: Pie Chart of Estimated Inventories (FPV)

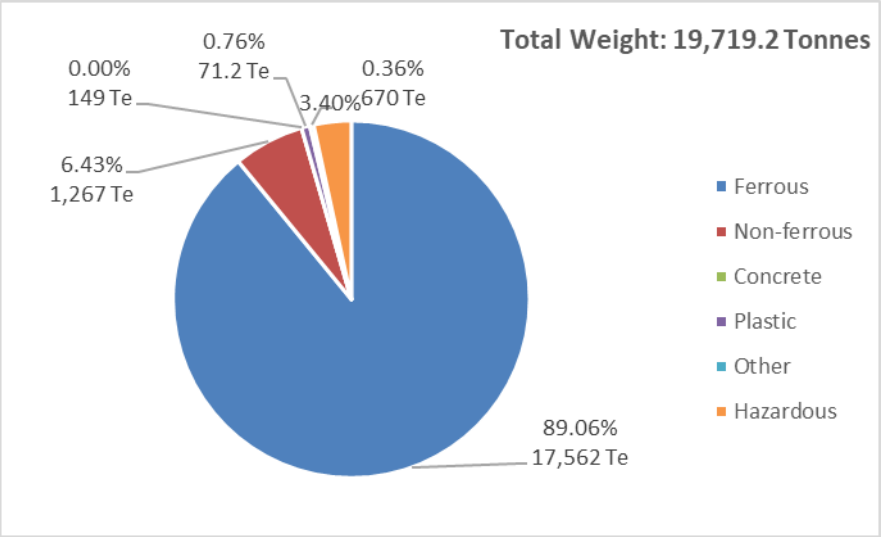


Figure 2.3: Pie Chart of Estimated Inventories (Installations)

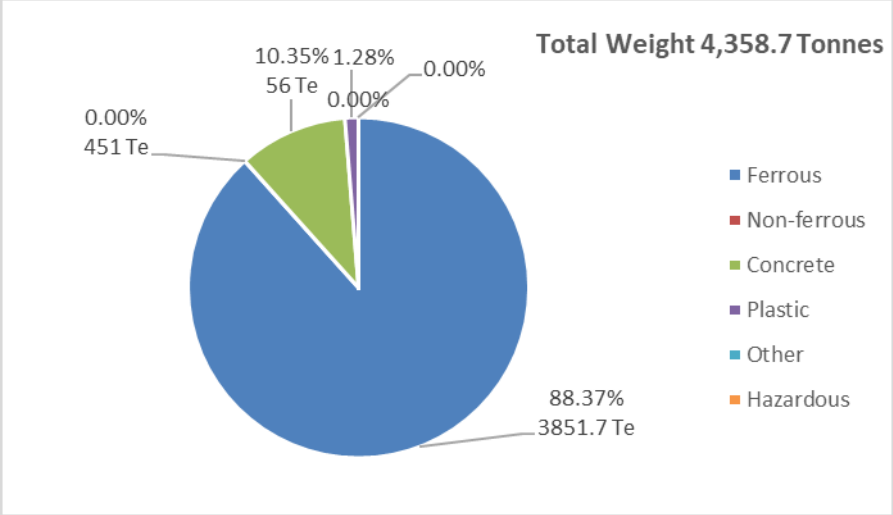
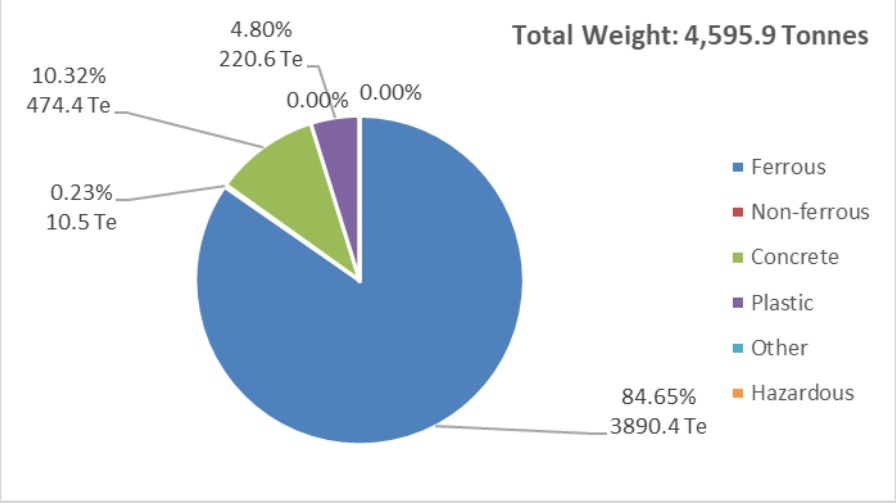


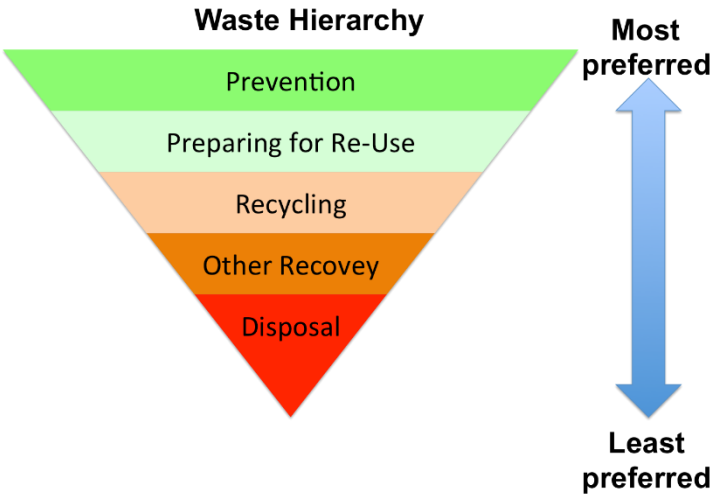
Figure 2.4: Pie Chart of Estimated Inventory (Pipelines)



Please refer the Greater Balmoral Decommissioning Environmental Appraisal for further details.

3 REMOVAL AND DISPOSAL METHODS

Decommissioning of the Balmoral field will generate a quantity of waste. Premier Oil is committed to establishing and maintaining environmentally acceptable methods for managing wastes in line with the Waste Framework Directive and principles of the waste hierarchy:



Recovered infrastructure will be returned to shore and transferred to a suitably licenced waste treatment facility. It is expected that the recovered infrastructure, i.e. flowlines and umbilicals will be cleaned before being largely recycled.

Concrete mattresses and grout bags that are recovered, will be cleaned of marine growth if required, and either reused, recovered as aggregate for infrastructure projects or disposed of in landfill sites.

An appropriately licensed disposal company and yard will be identified through a selection process that will ensure that the chosen facility demonstrates a proven track record of waste stream management throughout the deconstruction process, the ability to deliver innovative reuse / recycling options, and ensure the aims of the waste hierarchy are achieved.

Geographic locations of potential disposal yard options may require the consideration of Trans Frontier Shipment of Waste (TFSW), including hazardous materials. Early engagement with the regulatory authorities will ensure that any issues with TFSW are addressed.

Premier Oil will engage with other companies and industries to identify potential reuse opportunities. However, Premier Oil believes that such opportunities are best achieved through the tendering and selection of a waste management contractor with the expert knowledge and experience in this area.

3.1 Floating Production Vessel (FPV)

FPV Decommissioning Overview
The decommissioning method will be to tow the FPV to a suitable location for re-sale, re-use or recycling / disposal.

Balmoral FPV Description:
The FPV is a purpose-built 33,977Te displacement, 19,719Te lightweight floating platform of the GVA 5000 semi-submersible design. The FPV was the first purpose-built floating production system in the North Sea. The FPV provides accommodation, utilities and hydrocarbon processing and export facilities. The drilling facilities were suspended in 1996 and have not been used since. The installation is located on-station by an eight-point mooring system made up of eight 1,550m chain lengths connected to anchor piles. Thrusters are available to alleviate high mooring chain tensions and reduce vessel motions.

Figure 3.1: Photograph of Balmoral FPV

The FPV will be towed from the field to a suitable quayside location for preparation for re-use or decommissioning, the fate of which will be determined by the owners. The owners will be responsible for taking reasonable measures to assure itself that proposals to re-use the vessel will be credible, and that disposal of the FPV will be in compliance with the IMO Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships.

Preparation/Cleaning:
The methods that will be used to vent and purged the FPV prior to removal to shore are summarised in Table 3.1.

Table 3.1: Cleaning of FPV for Removal		
Waste Type	**Composition of Waste**	**Disposal Route**
Onboard hydrocarbons	Process fluids, fuels and lubricants	Systems flushed and wastes processed by the FPV facilities via identified waste disposal routes
Other hazardous materials	NORM, LSA Scale, Any radioactive material, instruments containing heavy metals, batteries	NORM/LSA disposed of via offshore disposal consents, or, Transported onshore for re-use/disposal by appropriate methods
Original paint coating	Lead-based paint	May give off toxic fumes / dust if flame-cutting or grinding/blasting is used so appropriate safety measures will be taken
Asbestos and Ceramic Fibre		Appropriate control and management will be enforced

Removal Methods:

Table 3.2: FPV Removal Methods	
☐ 1) HLV (semi-submersible crane vessel) ☐ 2) SLV ☐ 3) Piece small **√** 4) Other: **FPV Removal**	
Method	**Description**
Towing	**Following riser flushing and moorings disconnection, the Balmoral FPV will be removed as a complete unit by towing to a port for handover (if re-sold), further cleaning and recycling/disposal.** **If required, all necessary permits and consents for TFSW will be in place, should the FPV leave UK waters.**

3.2 Jacket(s)

Not applicable to Balmoral field decommissioning.

3.3 Subsea Installations and Stabilisation Features

Table 3.3: Subsea Installations and Stabilisation Features			
Subsea installation(s) and stabilisation feature(s)	**Number**	**Option**	**Disposal Route (if applicable)**
Balmoral template	1	Full recovery as part of decommissioning campaign	Return to shore for recycling or disposal.
Riser Base	5	Full recovery as part of decommissioning campaign	Return to shore for recycling or disposal.
Midwater Arch	5	Full recovery as part of decommissioning campaign	Return to shore for recycling or disposal.
Balmoral Pre-Delivery Facility (PDF)	1	Full recovery as part of decommissioning campaign	Return to shore for recycling or disposal.
B29 Well Production Valve Skid & Flexible Support Mud Mats	1	Full recovery as part of decommissioning campaign	Return to shore for recycling or disposal.
Anchor Piles	8	Full recovery as part of decommissioning campaign	Return to shore for recycling or disposal.
Mooring chains	8	Full recovery as part of decommissioning campaign	Return to shore for recycling or disposal.

3.4 Pipelines

Decommissioning Options:

1A - Leave as-is	2A – Remove Exposed Ends/Exposures & Rock Placement	3A – Disconnect & Retrench Entire Line	5B – Reverse Reel No Deburial
1B - Remove Exposed Ends & Local Rock Placement	2B – Remove Exposed Ends/Exposures & Burial	3B – Disconnect & Full Rock Placement	5C – Deburial & Cut and Lift
1C - Remove Exposed Ends & Trench/Bury	2C – Trench/Bury Ends & Exposures	4 – Re-use in New Development	5D – Deburial Lift & Cut on Vessel
1D - Accelerated Decomposition	2D – Rock Placement Ends & Exposures	5A – Deburial & Reverse Reel	5E – Lift & Cut on Vessel

Table 3.4: Pipeline or Pipeline Groups Decommissioning Options			
Pipeline or Group (as per PWA)	**Condition of line/group** (Surface laid/Trenched/ Buried/ Spanning)	**Whole or part of pipeline/group**	**Decommissioning Options considered**
Group 1: Surface Laid Flowlines & Umbilicals PLU4342, PLU4343, PLU4344, PLU4345, PLU4346, PLU4347, PLU4348, PLU4349, PLU4350, PLU4351, PLU4352	Surface Laid	Whole	1A, 3A, 3B, 4, 5A, 5B and 5C
Group 3: Trenched & Buried Rigid Flowlines PL218, PL219, PL220, PL221, PL222, PL223, PL224, PL225, PL226, PL227, PL228, PL229, PL230, PL2565	Trenched & Buried (See burial profile in Appendix II)	Whole	1B, 2A, 3A, 3B and 5C
Group 4: Trenched & Buried Flexible Flowlines & Umbilicals PL222A	Trenched & Buried	Whole	1B, 2A, 3A, 3B, 5A and 5C
Group 5: Flexible Jumpers PL219, PL220, PL221, PL222, PL222A, PL223, PL224, PL225, PL226, PL227, PL228, PL229, PL230, PL231, PL232, PL233, PL234, PL235, PL236, PL237, PL238, PL334, PL641, PL642, PL2329, PL2330, PL4540	Surface Laid	Whole	Full Removal
Group 7: Rigid Spools PL231, PL232, PL233, PL234, PL235, PL236, PL237, PL238, PL334, PL4540	Surface Laid	Whole	Full Removal
Group 16: Flexible Risers PL231, PL232, PL233, PL234, PL235, PL236, PL237, PL238, PL334, PL641, PL642, PL647, PL2329, PL2330, PLU2674, PLU3764, PLU3765, PLU3766, PLU3767, PLU4880, PLU4881	Surface Laid	Whole	Full Removal
Group 17: Surface Laid & Rock Covered Flexible Flowline PL4540	Surface Laid	Whole	Full Removal

Comparative Assessment Method:
Comparative Assessment is integral to the overall planning and approval of decommissioning options. Premier Oil's strategy for the Comparative Assessment process is aligned with the Oil & Gas UK Guidelines for Comparative Assessment in Decommissioning Programmes and OPRED Guidance Notes for the Decommissioning of Offshore Oil & Gas Installations and Pipelines.

Premier Oil has scoped all of the infrastructure into logical groupings. All feasible decommissioning options for each of the infrastructure groups have been identified, assessed, ranked and screened, utilising the OPRED Guidance Notes: Decommissioning of Offshore Oil and Gas Installations and Pipelines to carry forward credible decommissioning options to be assessed through the comparative assessment process.

The comparative assessment process uses five assessment criteria, which are: Safety, Environment, Technical, Societal and Economic to compare the relative merits of each credible decommissioning option for each group of infrastructure. The assessment criteria are equally weighted to balance and represent the views of each of the stakeholders.

An independent consultancy utilising its bespoke Multi Criteria Decision Analysis (MCDA) process was employed to facilitate comparative assessment workshops. The workshops were attended by specialists from the Operator, Field Partners and representatives from key stakeholders namely:

- Scottish Fishermen's Federation
- Joint Nature Conservation Committee
- Marine Scotland
- Oil and Gas Authority
- OPRED EMT
- OPRED ODU (observers)
- Premier Oil E&P UK Limited
- Repsol Sinopec North Sea Limited
- Rockrose UKCS4 Limited
- ConocoPhillips (U.K.) Limited now Chrysaor Production (UK) Limited

At each workshop, each decommissioning option for each infrastructure grouping was assessed against each of the assessment criteria utilising a pairwise comparison system. The relative importance of each of the criteria was assessed in a qualitative way, supported by quantification where appropriate.

The process provides for differentiation between decommissioning options in each infrastructure group taking account of stakeholder views.

Outcome of Comparative Assessment:

Table 3.5: Outcomes of Comparative Assessment		
Pipeline or Group	**Recommended Option**	**Justification**
Group 1: Surface Laid Flowlines & Umbilicals PLU4342, PLU4343, PLU4344, PLU4345, PLU4346, PLU4347, PLU4348, PLU4349, PLU4350, PLU4351, PLU4352, PL4540	Full Removal	Overall, option 5A is assessed as the most preferred option. It was clearly preferred against Technical, Societal and economic criteria and marginally preferred against the Safety and Environmental criteria. Given that option 5A is also the full removal option, this will form the decommissioning option for this group.
Group 3: Trenched & Buried Rigid Flowlines PL218, PL219, PL220, PL221, PL222, PL223, PL224, PL225, PL226, PL227, PL228, PL229, PL230, PL2565	Leave *in situ* and remedial rock dump.	Overall, options 1B and 2A are assessed as the most preferred options. The scores obtained are so close it is impossible to separate them. They have been assessed as the equal most preferred option against the Environmental, Technical, Societal and Economic criteria. Overall given that option 2A eliminates exposures as well as exposed ends, this will form the decommissioning option for this group.
Group 4: Trenched & Buried Flexible Flowlines & Umbilicals PL222A	Full Removal	Overall, Option 5A is assessed as the most preferred option. It has been assessed as the equal most preferred option against the Technical, Societal and Economic criteria. Whilst, overall it is only marginally preferred to options 1B and 2A, given that option 5A is a full removal option, this will form the decommissioning option for this group.
Group 5: Flexible Jumpers PL219, PL220, PL221, PL222, PL222A, PL223, PL224, PL225, PL226, PL227, PL228, PL229, PL230, PL231, PL232, PL233, PL234, PL235, PL236, PL237, PL238, PL334, PL641, PL642, PL2329, PL2565, PL4540	Full Removal	Items are surface laid and recoverable
Group 7: Rigid Spools PL231, PL232, PL233, PL234, PL235, PL236, PL237, PL238, PL334, PL4540	Full Removal	Items are surface laid and recoverable
Group 16: Flexible Risers PL231, PL232, PL233, PL234, PL235, PL236, PL237, PL238, PL334, PL641, PL642, PL647, PL2329, PL2330, PLU2674, PLU3764, PLU3765, PLU3766, PLU3767, PLU4880, PLU4881	Full Removal	Items are surface laid and recoverable

3.5 Pipeline Stabilisation Features

Table 3.6: Pipeline Stabilisation Features			
Stabilisation features	**Number**	**Option**	**Disposal Route (if applicable)**
Concrete mattresses	72	Full recovery - It is intended that the mattresses be recovered to shore, however, in the event of practical difficulties OPRED will be consulted.	Recover and transport ashore for recycling or other waste treatment as appropriate.
Link-lok mattresses	21	Full recovery - It is intended that the mattresses be recovered to shore, however, in the likely event of practical difficulties OPRED will be consulted.	Recover and transport ashore for recycling or other waste treatment as appropriate.
Armourflex mattresses	4	Full recovery - It is intended that the mattresses be recovered to shore, however, in the likely event of practical difficulties OPRED will be consulted.	Recover and transport ashore for recycling or other waste treatment as appropriate.
Concrete protection tunnel	1	Full recovery - It is intended that the mattresses be recovered to shore, however, in the likely event of practical difficulties OPRED will be consulted.	Recover and transport ashore for recycling or other waste treatment as appropriate.
Grout bags	Estimated 1600	Full removal is intended with an option to reuse on location.*	Recover and transport ashore for recycling or other waste treatment as appropriate.
Rock Dump (Te)	44,137	To remain in place.	N/A

*A number of grout bags may be redeployed/repurposed locally as snagging hazard mitigation.

There are a number of concrete mattresses and rock dump associated with the Burghley pipelines' crossings to be accounted for in the Burghley Decommissioning Programmes (to be submitted by Repsol Sinopec North Sea Limited).

3.6 Wells

Table 3.7: Well Plug and Abandonment
The wells for the Field covered by this Decommissioning Programme will be plugged and abandoned, as listed in Section 2.4 (Table 2.5), in accordance with the Oil & Gas UK Well Decommissioning Guidelines, Issue 6, June 2018. A WONs application update will be submitted along with an appropriate suite of permit applications, via the UK Energy Portal, in support of each well abandonment.

3.7 Drill Cuttings

The drill cuttings pile located at the Balmoral Template (as described in Section 2.5) will be resuspended and relocated to the seabed using the TRS2 controlled flow excavator (CFE) tool operated by ROTECH SUBSEA or similar. The CFE of the cuttings pile has the potential to release contaminants into the surrounding marine environment.

The OSPAR (Oslo-Paris Convention) Recommendation 2006/5 (*'Management Regime for Offshore Cuttings Piles'*) has indicated that the best environmental option for the management of a drill cuttings pile is to leave it in place to degrade naturally and allow for a robust cuttings management plan, so long as the following conditions are met:

- The oil release rate from the pile remains less than 10 Te/year; and
- The area of persistence for the pile is less than 500 km^2/year.

Survey work was conducted to ensure the current condition of the cuttings pile is known, however, the most recent sampling campaign conducted in 2019 did not allow for a contemporary estimate of yearly oil loss (Fugro, 2019). Studies undertaken by the UKOOA Drill Cuttings Initiative have determined that the rate of oil release from cuttings, as mediated by erosion, degradation, and leaching, is very slow (i.e. will occur over several to many decades) and constitutes a small fraction (e.g. ca. 5%) of the total hydrocarbons content within cuttings piles which remain on the seabed. It is anticipated that there will be an initial instantaneous release of approximately 7.38 Te of oils into the water column during the CFE of the cuttings, followed by the slow release of oils due to natural degradation, which together fall below the OSPAR threshold of 10 Te/year and will continue to fall in subsequent years.

The total area of seabed covered by the relocation of the cuttings pile is estimated to be 2.01 km^2 when considering a dispersed cuttings sediment thickness of 0.01 mm, which is well below the OSPAR threshold for area of persistence.

Drill Cuttings Decommissioning Options:

Table 3.8: Drill Cuttings Decommissioning Options	
How many drill cuttings piles are present?	***One***
Tick options examined: ☐Remove and re-inject ☐Leave in place ☐Cover ☑Relocate on seabed ☐Remove and treat onshore ☐Remove and treat offshore ☐Other	
Review of Pile characteristics	**Pile 1**
How has the cuttings pile been screened? (**actual samples taken**)	**Yes**
Dates of sampling (if applicable) 1988, 1997, 2016 and 2019	**Yes**
Sampling to be included in pre-decommissioning survey? Ten stations were sampled during the 2019 Balmoral wider cuttings pile survey used to inform the pre-decommissioning works.	**Yes**
Does it fall below both OSPAR thresholds?	**Yes**
Will the drill cuttings pile have to be displaced in order to remove the jacket?	**Yes***
What quantity (m^3) would have to be displaced/removed?	**Up to 1,608 m^3**
Will the drill cuttings pile have to be displaced in order to remove any pipelines?	**No**
What quantity (m^3) would have to be displaced/removed?	**N/A**
Have you carried out a Comparative Assessment of options for the Cuttings Pile?	See below

* The drill cuttings pile will have to be displaced in order to remove the Balmoral template.

Comparative Assessment Screening Phase:
During the initial screening phase for the Balmoral Area Decommissioning Project in 2017, the Balmoral Template and, by association, the drill cutting in and around the template were considered potential candidates for full Comparative Assessment to ascertain the best decommissioning option.
However, given the lack of any environmental drivers to leave the drill cuttings in situ (as per the Drill Cuttings Characterisation Report), or any technical concerns with the ability to remove the Balmoral Template (as per Template Removal Study), the screening phase of the CA process has concluded that the Balmoral Template should be removed in alignment with Decommissioning Guidelines, with the drill cuttings treated in a manner relating to the template removal (and as described above).

3.8 Waste Streams

The Premier Oil Waste Management Strategy specifies the requirements for the contractor waste management plan. The waste management plan will be developed once the contract has been awarded during the project execution phase. The plans shall adhere to the waste stream licensee conditions and controlled accordingly. Discussion with the regulator will ensure that all relevant permits and consents are in place.

Table 3.9: Waste Stream Management Methods

Waste Stream	Removal and Disposal method
Bulk liquids	Bulk flushing/de-oiling by either round-trip flushing from/to the Balmoral FPV or utilising DSVs to flush to the Balmoral FPV. Waste fluids will be processed by the Balmoral FPV and may be discharged to sea under appropriate permit. If line cleaning, tank washings and process wastes cannot be discharged within consents offshore, they will be transported to a licensed onshore facility for treatment. Further cleaning and decontamination may take place onshore prior to recycling / re-use.
Marine growth	Some marine growth may be removed offshore. Onshore disposal will be managed by the selected waste management contractor.
NORM/LSA Scale	NORM contaminated material may be partially removed offshore under the appropriate permit, or returned to shore to be disposed of by the selected onshore waste management contractor.
Asbestos	There is a record of asbestos being present on the FPV (e.g. in gaskets and seals). Premier Oil has completed a Hazardous Materials Inventory survey which will be verified after CoP. If the FPV is to be recycled, asbestos will be contained and appropriately disposed of during the decommissioning work onshore.
Other hazardous wastes	Will be recovered to shore and will be managed by the selected waste management contractor and disposed of under the appropriate permit. The inventory of hazardous materials will identify hazardous materials present and Premier Oil's risk management process will be used to prevent spills offshore.
Onshore Dismantling sites	Appropriate licenced contractor and sites will be selected. Facility selected must demonstrate competence and proven disposal track record and waste stream management & traceability throughout the deconstruction process and (preferably) demonstrate their ability to deliver innovative recycling options.

Table 3.10: Inventory Disposition				
		Total Inventory Tonnage	Planned tonnage to shore	Planned left *in situ*
Installations	Balmoral FPV	19,719.2	19,719.2	Nil
Balmoral	Pipelines	4,595.9	1,692.9	2,903
	Subsea Installations	4,358.7	3,847.5	511.2

All recovered material will be brought onshore for re-use, recycling or disposal. It is not possible to predict the market for reusable materials with any confidence; so, the figures in Table 3.11 are disposal aspirations.

Table 3.11: Recovered Inventory Reuse, Recycle, Disposal Aspirations			
	Reuse	Recycle	Disposal
Pipelines	< 5%	> 95%	< 5%
Umbilicals	< 5%	> 95%	< 5%
Subsea Installations	< 5%	> 95%	< 5%

Please refer to the Greater Balmoral Decommissioning Environmental Appraisal for further details.

4 ENVIRONMENTAL APPRAISAL

4.1 Environmental Sensitivities (Summary)

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Conservation interests	Balmoral is located outside of any conservation sites, the nearest such sites are the Scanner Pockmark SAC (9 km) and the Norwegian Boundary Sediment Plain MPA (29 km). Both of these conservation sites have been designated for the protection of seabed habitats and features: submarine structures formed by leaking gases; and ocean quahog habitat and aggregations, respectively. Whilst there was evidence of some pockmark features and ocean quahog (*Arctica islandica*) presence from the site specific environmental survey data, there was no evidence of submarine structures associated with leaking gases or aggregations of ocean quahog which would constitute OSPAR or Annex I protected features.
Seabed Habitats and Fauna	The water depths across Balmoral fall between roughly 138 m to 152 m (Fugro, 2017a and 2018a). The seabed generally comprises poorly sorted coarse to medium silt with moderate carbonate and low organic content. Hydrocarbon level showed a similar distribution across the survey area and was considered typical of low level weathered petroleum residues commonly found in CNS sediments. The majority of the Balmoral survey area was characterised as the European Nature Information Systems (EUNIS) biotype complex, 'Circalittoral fine mud (A5.35)' (Fugro, 2017b). The Scottish Priority Marine Feature (PMF) 'burrowed mud' and its component habitat 'Seapens and burrowing megafauna in circalittoral fine mud' were prevalent throughout the project area (Fugro, 2017b). There are numerous seabed depressions present across the area, although none of the more than 40 depressions investigated in the Fugro (2018a) and Gardline (2005) surveys were found to support Methane-Derived Authigenic Carbonate (MDAC) or associated communities that could classify these depressions as the Annex I habitat 'Submarine structures made by leaking gases'. Assessment for the presence of the OPSAR protected/threatened habitat, 'seapen and burrowing megafauna communities,' suggested that the seabed surrounding Balmoral is a strong example of this habitat. No other protected habitats were identified (Fugro 2018a). Juvenile ocean quahog were found in low numbers across the majority of stations (the maximum in any single sample was seven individuals). No adults were identified, indicating the survey area is not of particular importance to this species (Fugro, 2018b).

Fish	Balmoral is located within the spawning grounds of cod (*Gadus morhua*), mackerel (*Scomber scombrus*), Norway lobster (*Nephrops norvegicus*) and Norway pout (*Trisopterus esmarkii*) (Coull *et al*., 1998; Ellis *et al*., 2012). Additionally, the following species have nursery grounds in the vicinity of the project: anglerfish (*Lophius piscatorius*), blue whiting (*Micromesistius poutassou*), cod, European hake (*Merluccius merluccius*), haddock (*Melanogrammus aeglefinus*), herring (*Clupea harengus*), ling (*Molva molva*), mackerel, Norway lobster, Norway pout, sandeel (*Ammodytidae* spp.), spotted ray (*Raja montagui*), spurdog (*Squalus acanthias*), and whiting (Coull *et al*., 1998; Ellis *et al*., 2012). However, fisheries sensitivity maps indicate that the probability of significant aggregations of juveniles of these species in the offshore Project area is low (Ellis *et al*., 2012).
Marine Mammals	Harbour porpoise (*Phocoena phocoena*), bottlenose dolphin (*Tursiops truncatus*), white-beaked dolphin (*Lagenorhynchus albirostris*), white-sided dolphin (*Lagenorhynchus acutus*), and minke whale (*Balaenoptera acutorostrata*) are known to be regular visitors to the waters surrounding the project area (Hammond *et al*., 2017; Reid *et al*., 2003). Seal densities are very low across the region comprising Balmoral due to its distance from shore (SMRU and Marine Scotland, 2017).
Seabirds	The seabird species most commonly observed in the waters surrounding the project area include: northern fulmar (*Fulmarus glacialis*), Manx shearwater (*Puffinus puffinus*), European storm petrel (*Hydrobates pelagicus*), northern gannet (*Morus bassanus*), Arctic skua (*Stercorarius parasiticus*), great skua (*Stercorarius skua*), black-legged kittiwake (*Rissa tridactyla*) and common guillemot (*Uria aalge*). Herring gulls (Larus argentatus), common gulls (Larus canus), and great and lesser black-backed gulls also use the area in winter (Kober *et al*., 2010). The Seabird Oil Sensitivity Index (SOSI) identifies areas at sea where seabirds are likely to be most sensitive to surface pollution; the SOSI values in Blocks 15/25 and 16/21 are classed as low throughout the year, with an increase to medium in Block 15/25 in June (Webb *et al*., 2016). No SOSI data is available during the months of November or December for this region.
Commercial Fisheries	Balmoral is located in International Council for the Exploration of the Seas (ICES) rectangle 45F1 (Scottish Government, 2019). Commercial fishing effort and landings were dramatically higher to the west of the project area than in 45F1, when considering totals and averages for the five most recent fishing years (2014-2018; Scottish Government, 2019). Within this time period, pelagic species comprised the greatest total and average live weight and shellfish made up the largest total and average value of landings for UK and foreign vessels landing into the UK (Scottish Government, 2019). Trawls were the most utilised gear in rectangle 45F1 and was attributable to more than 99% of total fishing effort in the ICES rectangle 45F1, with <1% of fishing effort comprising seine nets (Scottish Government, 2019). Based on the low to moderate levels of demersal trawling across the pipelines associated with Balmoral (Rouse *et al*., 2018), it is likely that these data characterise midwater trawling effort targeting pelagic and some demersal species.

Other Users of the Sea	Across the region comprising Balmoral, sea users other than commercial fisheries mainly relate to offshore Oil and Gas. There are nine surface installations located within 40 km of the Balmoral FPV, the closest of which is the Alba North platform located 19 km to the southwest. Shipping density across the project area is very low and consists mainly of cargo and supply vessels. There are two unknown wrecks in the vicinity of the project area, approximately 5km southeast and 4 km northwest of the project area; additionally, there is one named wreck (Elhanan T) located approximately 8 km from the project area. This wreck is classified as a non-dangerous wreck (NMPi, 2019).
Atmosphere	The majority of atmospheric emissions for the decommissioning of Balmoral relates to vessel use, or are associated with the recycling of material returned to shore. The estimated CO_2 emissions to be generated by the selected decommissioning options will be less than 17,868.5 te, which is the cumulative emissions associated with decommissioning of the five assets associated with the Greater Balmoral Area, including the Balmoral template and FPV. This equates to less than 0.22% of the total UKCS vessel emissions, excluding fishing vessels, in 2017 (7,800,000 te; BEIS, 2019).
Onshore Communities	Waste generated during decommissioning will be transported to shore in an auditable manner through licensed waste contractors, as managed under the Balmoral Late Life Project (BLLP) waste management plan. Wastes will be treated using the principles of the waste hierarchy, as defined in the BLLP, focusing on the reuse and recycling of wastes where possible. Raw materials will be returned to shore with the expectation to recycle the majority of the returned material. There may be instances where infrastructure returned to shore is contaminated (e.g. by NORM, hazardous, and/or special wastes) and cannot be recycled. In these instances, the materials will require disposal. However, the weight and/or volume of such material is not expected to result in substantial landfill use.

4.2 Potential Environmental Impacts and their Management

Environmental Appraisal Summary:

The EA addresses potential environmental and societal impacts by characterising the likelihood and significance of interactions between the proposed decommissioning activities and the local environment, whilst considering stakeholder response. The EA also details mitigation measures designed to abate potential impacts in accordance with Premier's Environmental Management System (EMS) and Health, Safety, Environment and Security (HSES) Policy.

Key potential environmental and societal impacts which were considered to be 'potentially significant', and thus requiring further assessment, were identified through an environmental issues identification (ENVID) workshop; they include: impacts to water quality; seabed impacts; and impacts to commercial fisheries. These potential impacts have undergone detailed assessment within the EA. The following environmental and societal impacts were screened out from further assessment due to existing controls limiting the likelihood of potential significant impacts: emissions to air; vessel presence; underwater noise emissions; resource use; onshore activities; waste; and unplanned events. The justifications for screening out these impact pathways are detailed in the accompanying EA.

The EA concludes that the recommended options to decommission the Balmoral infrastructure and FPV can be completed without causing significant impact to environmental or societal receptors.

Overview:

Table 4.2 describes the potential impact pathways identified from the relevant infrastructure to be decommissioned, alongside the proposed management measures in place to mitigate against them.

Table 4.2: Environmental Impact Management

Activity	Main Impacts	Management
Floating Facility Removal	Seabed impacts from removal of mooring lines between FPV and seabed piles (piles will remain *in situ*). Impacts to commercial fisheries from project activities excluding access to fishing grounds and snagging risk associated with infrastructure decommissioned *in situ*.	Mooring lines will be cut at the mudline and mooring chains will be sent to shore for recycling. Piles are stably buried more than 6 m below the mudline and therefore are not considered a snagging risk. Vessel use will be optimised/minimised for the decommissioning activities and managed per Premier's existing vessel management procedures, including a vessel work programme. Use of established contractors with appropriate capability, licences and maintenance procedures will be selected and audited. Other sea users will be notified in advance of activities occurring and Premier keeps manned bridges.

		Surveys and debris searches will be conducted as part of a programme to ensure a safe seabed is left for other sea users. Fishing activities have the potential to increase in the area once the 500 m safety zones surrounding the existing surface infrastructure (i.e. the FPV) and substructures are re-assessed.
Large Subsea Installations Removal (Balmoral Template (incl. Drill Cuttings)	Seabed impacts from: • CFE of cuttings deposits within and surrounding the Balmoral template; • cut and lift removal; and • overtrawling. Changes in water quality from the CFE of cuttings deposits within and surrounding the Balmoral template. Impacts to commercial fisheries from project activities excluding access to fishing grounds.	Premier will follow best practice by directing the majority of the resuspended cuttings deposit (i.e. through CFE) to the seabed as close to the existing cuttings accumulation as possible. Impacts resulting from the CFE drill cuttings deposits are expected to be minimal given their rapid resettlement and the fact that drill cuttings deposits will be directed to the immediate vicinity of the template, minimising the extent of any seabed disturbance or reduction in water quality. Remediation of any potential impacts on seabed communities will be undertaken, where required. Vessel use will be optimised/minimised for the decommissioning activities and managed per Premier's existing vessel management procedures, including a vessel work programme. The 500 m safety exclusion zone will remain in operation during the decommissioning activities reducing risk of non-project related vessels entering into the area where decommissioning activities are taking place. This safety exclusion zone will be removed following the completion of the relevant decommissioning activities enabling fisheries to regain access to grounds. Fishing activities have the potential to increase in the area once the 500 m safety zone surrounding the Template is re-assessed. Use of established contractors with appropriate capability, licences and maintenance procedures will be selected and audited. Other sea users will be notified in advance of activities occurring and Premier keeps manned bridges. All pipeline routes and installation sites will be the subject of oilfield debris clearance and as-left verification surveys when decommissioning activity has concluded.

Small Subsea Installations Removal (incl. Stabilisation Features)	Seabed impacts from: • CFE of buried infrastructure and stabilisation materials; • cutting of piles below the seabed; • removal of grout bags and stabilisation materials; and • recovery of infrastructure. Impacts to commercial fisheries from project activities excluding access to fishing grounds.	Vessel use will be optimised/minimised for the decommissioning activities and managed per Premier's existing vessel management procedures, including a vessel work programme. The 500 m safety exclusion zone will remain in operation during the decommissioning activities reducing risk of non-project related vessels entering into the area where decommissioning activities are taking place. This safety exclusion zone will be removed following the completion of the relevant decommissioning activities enabling fisheries to regain access to grounds. Fishing activities have the potential to increase in the area once the 500 m safety zones surrounding the existing substructures are re-assessed. Use of established contractors with appropriate capability, licences and maintenance procedures will be selected and audited. Other sea users will be notified in advance of activities occurring and Premier keeps manned bridges. The infrastructure is currently shown on Admiralty Charts and the FishSafe system. When decommissioning activity has been competed, updated information will be made available to update Admiralty Charts and FishSafe system. All pipeline routes and installation sites will be the subject of oilfield debris clearance and as-left verification surveys when decommissioning activity has concluded.
Decommissioning Rigid Flowlines (incl. Stabilisation Features)	Seabed impacts from decommissioning of rigid flowlines *in situ*: • cutting ends and recovery of lengths of flowlines • deposition of new rock armour to protect ends and previously cut exposures (where required); and • overtrawling. Snagging risk associated with pipelines decommissioned *in situ*.	Operations will be conducted as carefully as possible to minimise sediment disturbance, avoiding dragging of items on the seabed where possible. Rock dumping will be carefully managed, e.g. through use of an ROV to limit the areas covered (reducing unnecessary spreading) and depth of coverage to that required to ensure no snagging hazards remain. The infrastructure is currently shown on Admiralty Charts and the FishSafe system. When decommissioning activity has been competed, updated information will be made available to update Admiralty Charts and FishSafe system. Any snagging risk to other sea users will be minimised by continual monitoring of degrading structures or free spans (type and frequency to be determined through a risk-based approach but will be agreed with OPRED). All pipeline routes and installation sites will be the subject of oilfield debris clearance and as-left verification surveys when decommissioning activity has concluded.

Decommissioning Surface-laid and Buried Flexible Flowlines (incl. Stabilisation Features)	Seabed impacts from: • cutting ends and recovery of lengths of flowlines • reverse-reeling of surface-laid and buried flexible flowlines; • removal of stabilisation features; and • overtrawling. Impacts to commercial fisheries from project activities excluding access to fishing grounds.	Operations will be conducted as carefully as possible to minimise sediment disturbance, avoiding dragging of items on the seabed where possible. Excavated areas remediated and any berms created profiled to mitigate snagging risks to other sea users. Vessel use will be optimised/minimised for the decommissioning activities and managed per Premier's existing vessel management procedures, including a vessel work programme. The 500 m safety exclusion zone will remain in operation during the decommissioning activities reducing risk of non-project related vessels entering into the area where decommissioning activities are taking place. This safety exclusion zone will be removed following the completion of the relevant decommissioning activities enabling fisheries to regain access to grounds. Use of established contractors with appropriate capability, licences and maintenance procedures will be selected and audited. Other sea users will be notified in advance of activities occurring and Premier keeps manned bridges. The infrastructure is currently shown on Admiralty Charts and the FishSafe system. When decommissioning activity has been competed, updated information will be made available to update Admiralty Charts and FishSafe system. All pipeline routes and installation sites will be the subject of oilfield debris clearance and as-left verification surveys when decommissioning activity has concluded.
Decommissioning Other – Mattresses and Grout Bags (Difficult Recovery)	Legacy impacts from mattresses and grout bags decommissioned *in situ* include: • snagging risk to commercial fisheries; and • seabed impacts, including from the deposition of new rock armour (where required).	The infrastructure is currently shown on Admiralty Charts and the FishSafe system. When decommissioning activity has been competed, updated information will be made available to update Admiralty Charts and FishSafe system. Rock dumping will be carefully managed, e.g. through use of an ROV to limit the areas covered (reducing unnecessary spreading) and depth of coverage to that required to ensure no snagging hazards remain.

5 INTERESTED PARTY CONSULTATIONS

Consultations Summary:

Table 5.1: Summary of Stakeholder Comments		
Who	**Comment**	**Response**
Informal Consultations		
	Premier Oil has engaged with interested parties and stakeholders who participated in comparative assessment workshops, held 16th November 2017, including: Scottish Fishermen's Federation (SFF), Joint Nature Conservation Committee, Marine Scotland, Oil and Gas UK, OPRED EMT, OPRED ODU (observers), Repsol Sinopec North Sea Limited, Rockrose UKSC4 Ltd, ConocoPhillips (U.K.) Ltd, Premier Oil E&P UK Ltd. In addition, meetings held with SEPA and SFF.	No objections to date
Statutory Consultations		
National Federation of Fishermen's Organisations		
Scottish Fishermen's Federation		
Northern Irish Fish Producers Organisation		
Global Marine Systems Limited		
Public		

6 PROGRAMME MANAGEMENT

6.1 Project Management and Verification

A Project Management team will be appointed to manage suitable contractors for the decommissioning of the Balmoral infrastructure. Standard procedures for operational control and hazard identification and management will be used. The work will be coordinated with other decommissioning operations in the Greater Balmoral Area. The Project Management team will monitor and track the process of consents and the consultations required as part of this process. Any changes in detail to the offshore removal programme will be controlled by the Premier Oil Management of Change processes and discussed and agreed with OPRED.

6.2 Post-Decommissioning Debris Clearance and Verification

During site clearance activities, reasonable endeavours will be made to recover any dropped objects and items subject to any outstanding Petroleum Operations Notices. All recovered seabed debris related to offshore oil and gas activities will be returned for onshore disposal or recycling in line with existing disposal arrangements. A post decommissioning site survey, to verify decommissioning activities have been completed, will be carried out across the designated 500m safety zones of installation sites and 100m corridor (50m either side) along each pipeline over its length.

The clear seabed will be validated by an independent verification trawl over the installation sites and pipeline corridors, non over-trawl techniques such as Side Scan Sonar (SSS)/ROV or by the post decommissioning survey. The methods used will be discussed and finalised with OPRED.

6.3 Schedule

Project Plan:
The high level Gantt chart Figure 6.1 provides the overall schedule for the Greater Balmoral programme of decommissioning activities, which includes the following Fields operated by Premier Oil; Brenda, Nicol, Glamis, Stirling, and Balmoral.
Prior to the removal of the FPV, Premier Oil will also flush the subsea pipelines associated with the Repsol Sinopec North Sea Limited operated Burghley and Beauly fields.

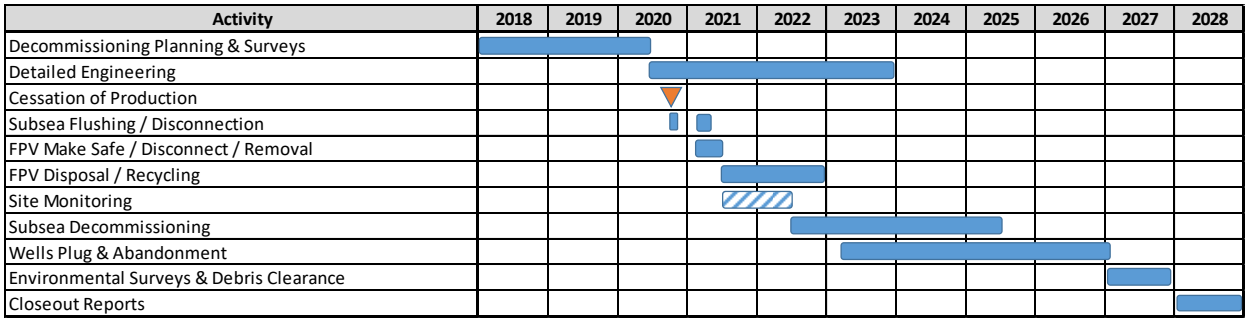


Figure 6.1: Gantt Chart of Project Plan

6.4 Costs

An overall cost estimate following UK Oil & Gas Guidelines on Decommissioning Cost Estimation (Issue 3, October 2013) will be provided to OPRED.

6.5 Close Out

In accordance with the OPRED Guideline Notes, a close out report will be submitted to OPRED and posted on the Premier Oil website, reconciling any variations from the Decommissioning Programme within one year of the completion of the offshore decommissioning scope. This includes debris removal and, where applicable independent verification of seabed clearance, and the first post-decommissioning environmental survey.

6.6 Post-Decommissioning Monitoring and Evaluation

A post-decommissioning environmental seabed survey, centred around the well locations will be carried out. The survey will focus on chemical, physical and biological changes, disturbances and will be compared with the pre decommissioning survey. Results of this survey will be available once the work is complete, with a copy forwarded to OPRED.

All pipeline routes and installation sites will be the subject of oilfield debris clearance and as-left verification surveys when decommissioning activity has concluded.

The main risk from infrastructure remaining *in situ* is the potential for interaction with other users of the sea, specifically from fishing related activities. Where the infrastructure is trenched below seabed level or trenched & buried below, the effect of interaction with other users of the sea is considered to be negligible.

The infrastructure is currently shown on Admiralty Charts and the FishSafe system. When decommissioning activity has been competed, updated information will be made available to update Admiralty Charts and FishSafe system.

When decommissioning activities have been completed, and where applicable, the safety zones around offshore infrastructure will be removed.

The licence holders recognise their commitment to undertake post-decommissioning monitoring of infrastructure left *in situ*. After the post-decommissioning survey reports have been submitted to OPRED and reviewed, a post-decommissioning monitoring survey regime, scope and frequency, will be agreed with OPRED.

7 SUPPORTING DOCUMENTS

Table 7.1: Supporting Documents

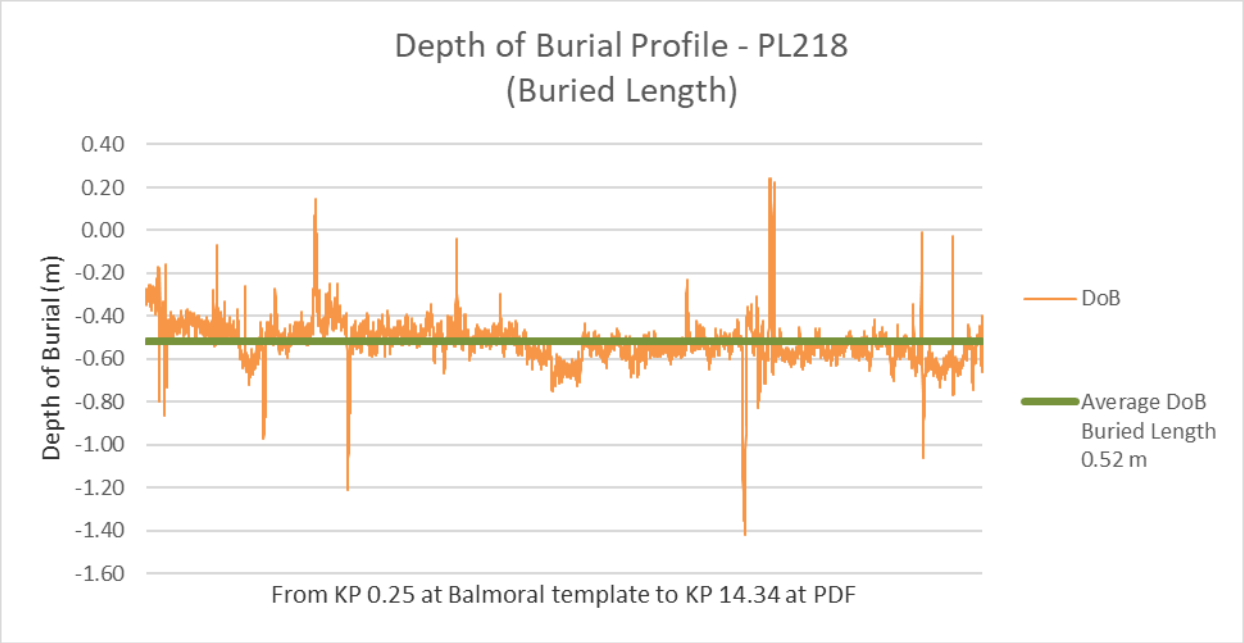
Document Number	Title
AB-BL-XGL-LL-SE-RP-0001	Greater Balmoral Area Decommissioning Environmental Appraisal
AB-BL-XGL-LL-ZZ-RP-0004	Greater Balmoral Area Decommissioning Comparative Assessment Report

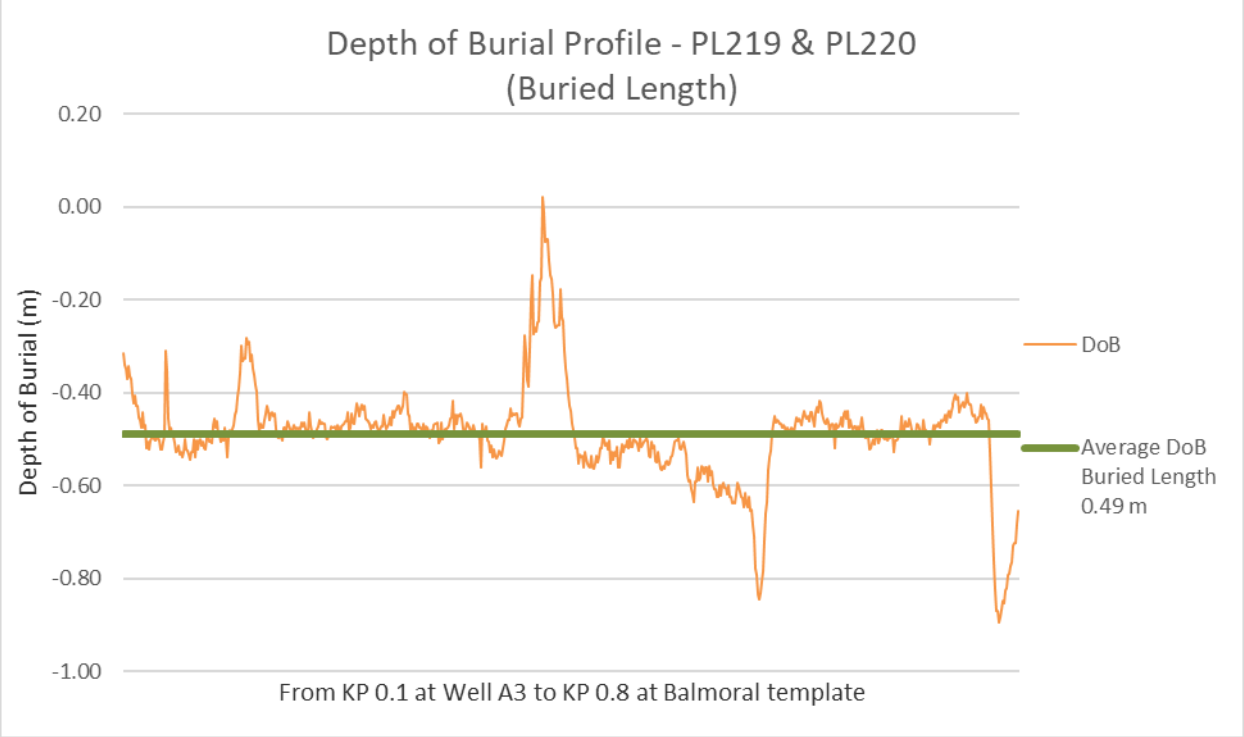
8 PARTNER LETTER(S) OF SUPPORT

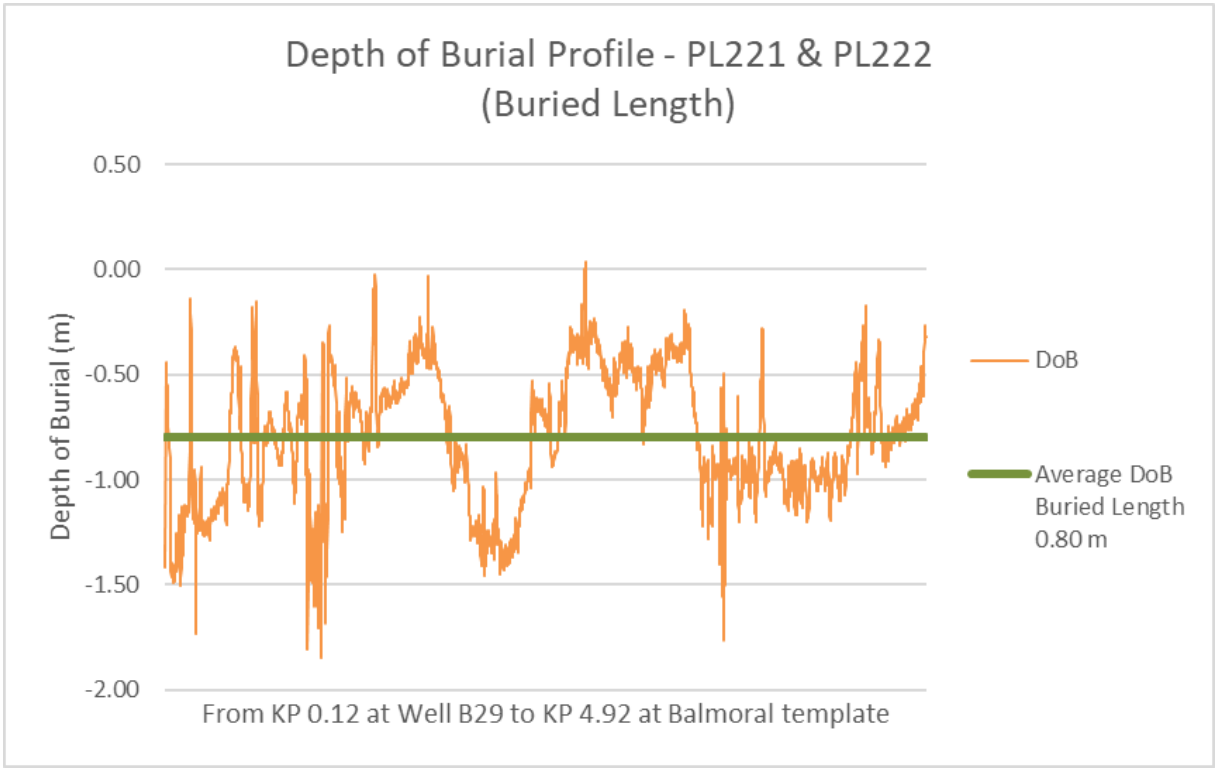
Will be submitted with final version of the Programme

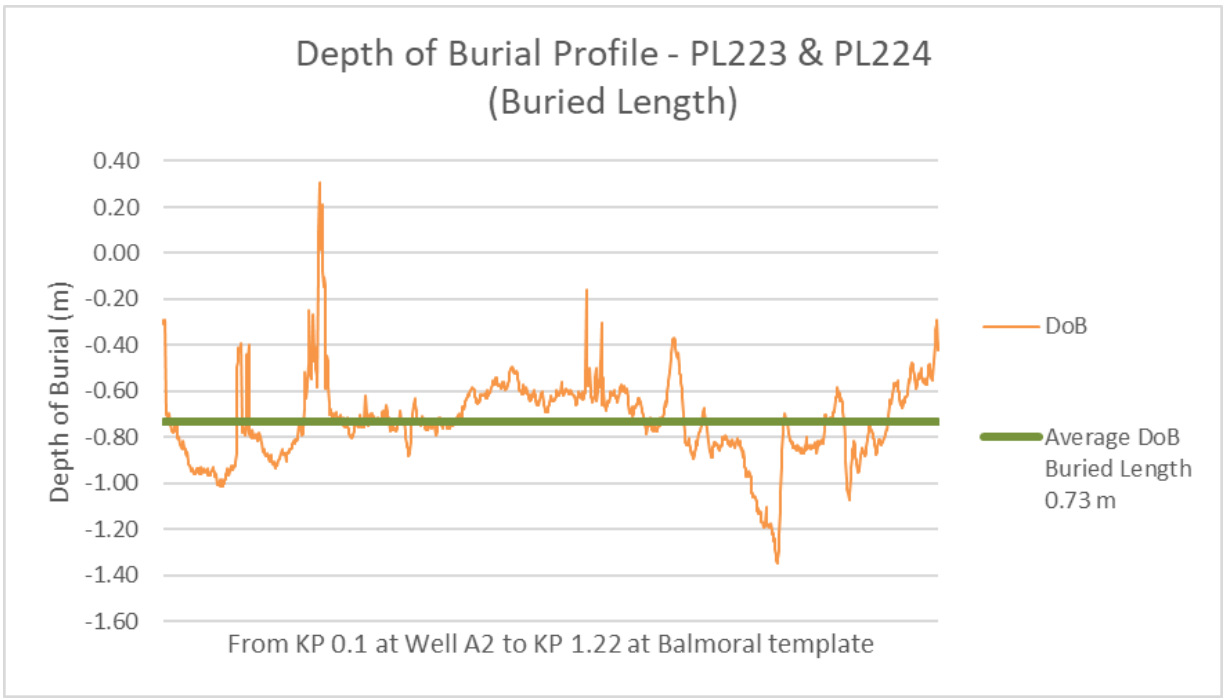
APPENDIX I - COPIES OF THE PUBLIC NOTICE AND CORRESPONDENCE

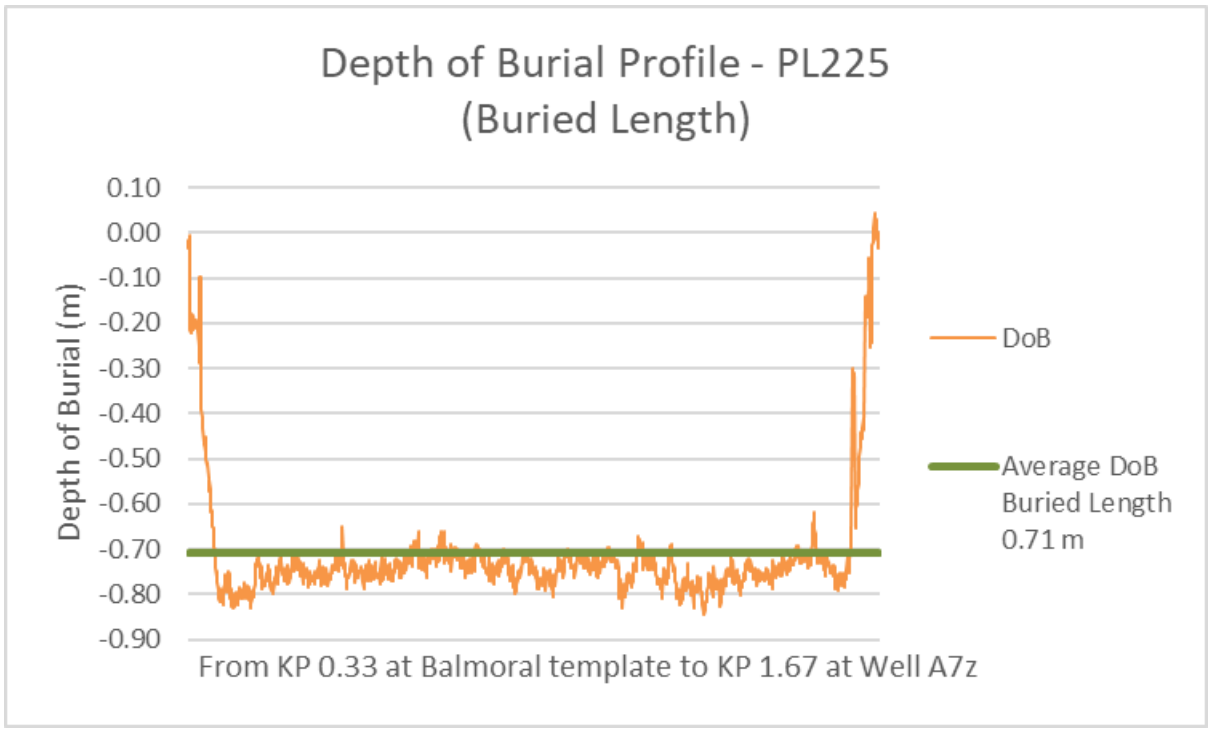
APPENDIX II – DEPTH OF BURIAL PROFILES

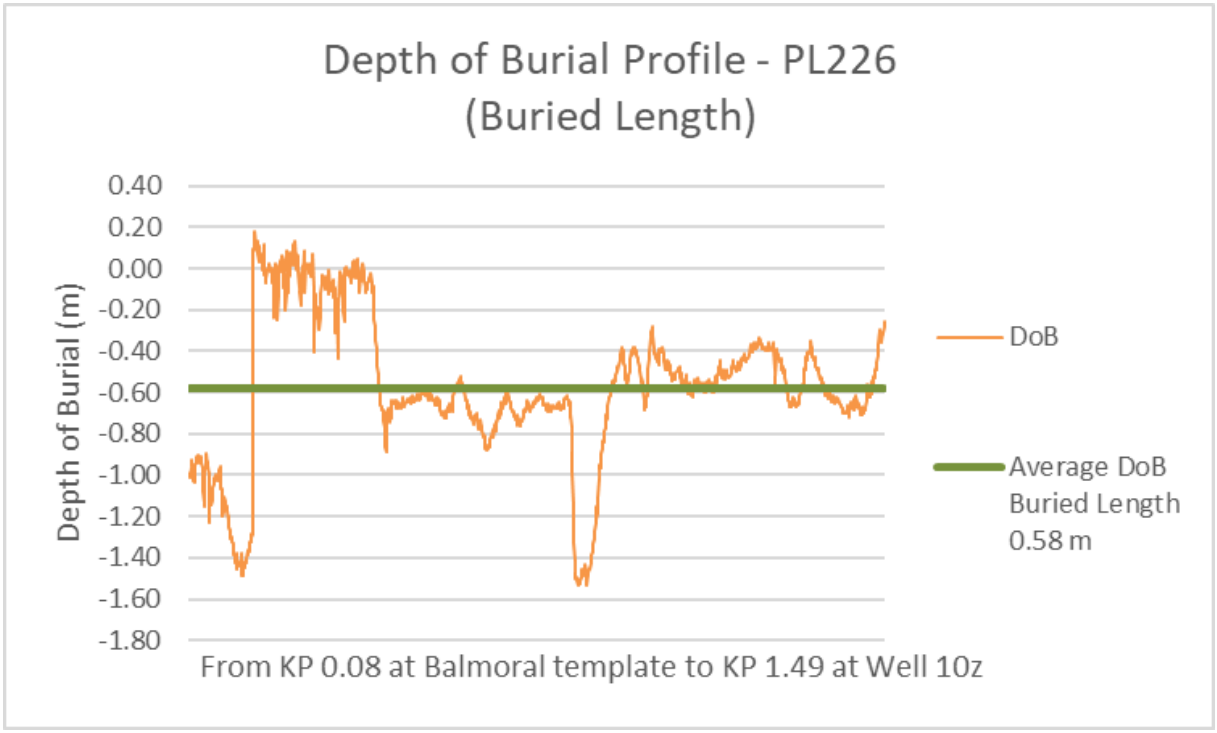


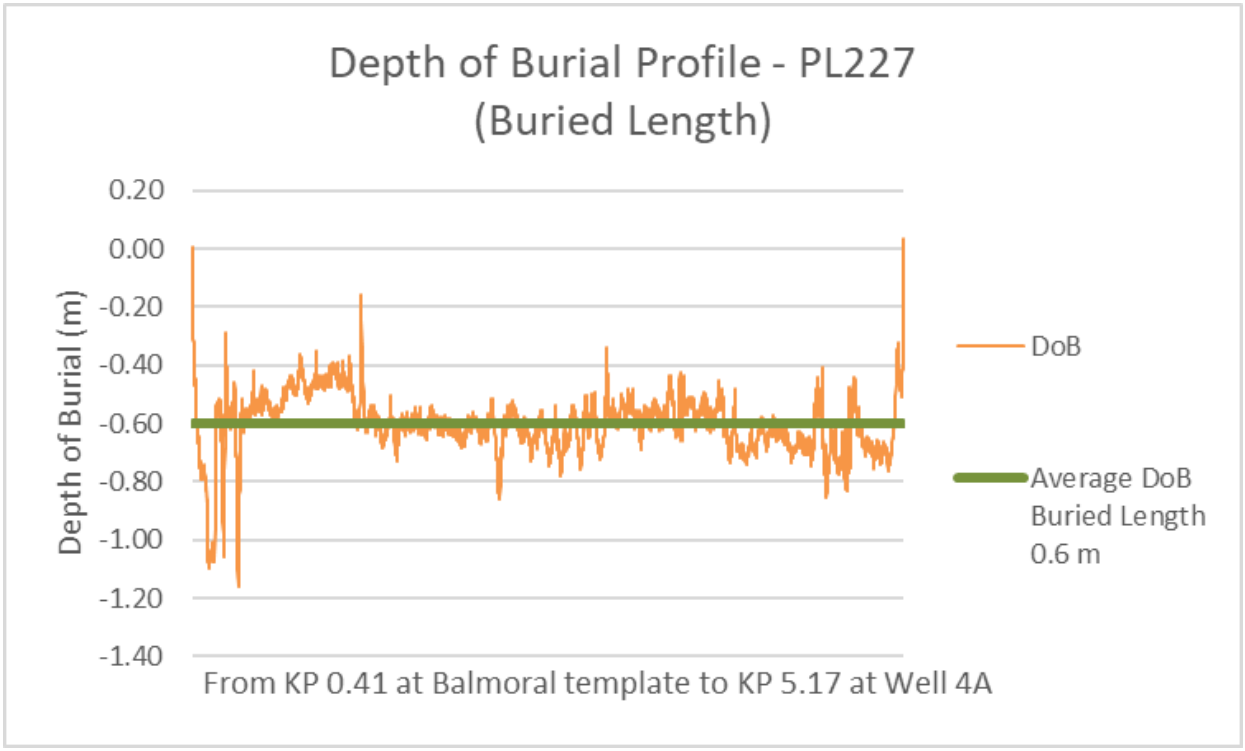


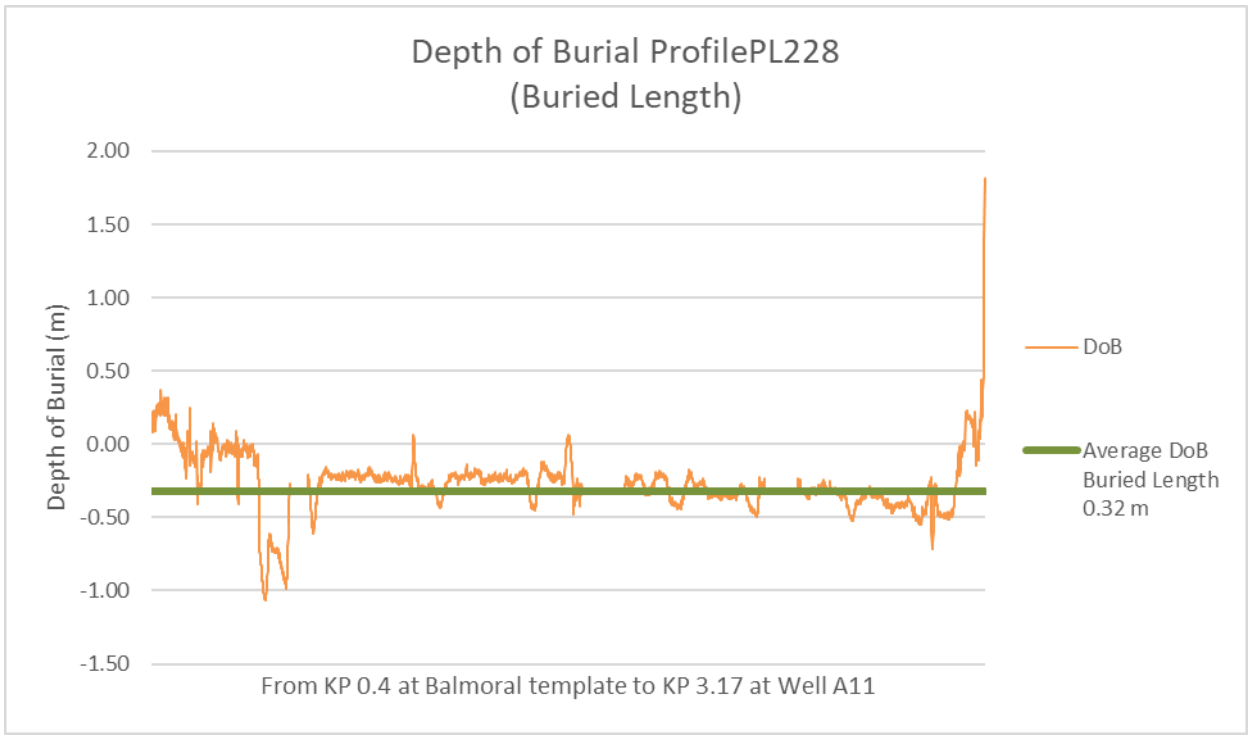

Depth of Burial Profile - PL221 & PL222
(Buried Length)
0.50
0.00
-0.50
-1.00
-1.50
-2.00
Depth of Burial (m)
From KP 0.12 at Well B29 to KP 4.92 at Balmoral template
DoB
Average DoB
Buried Length
0.80 m

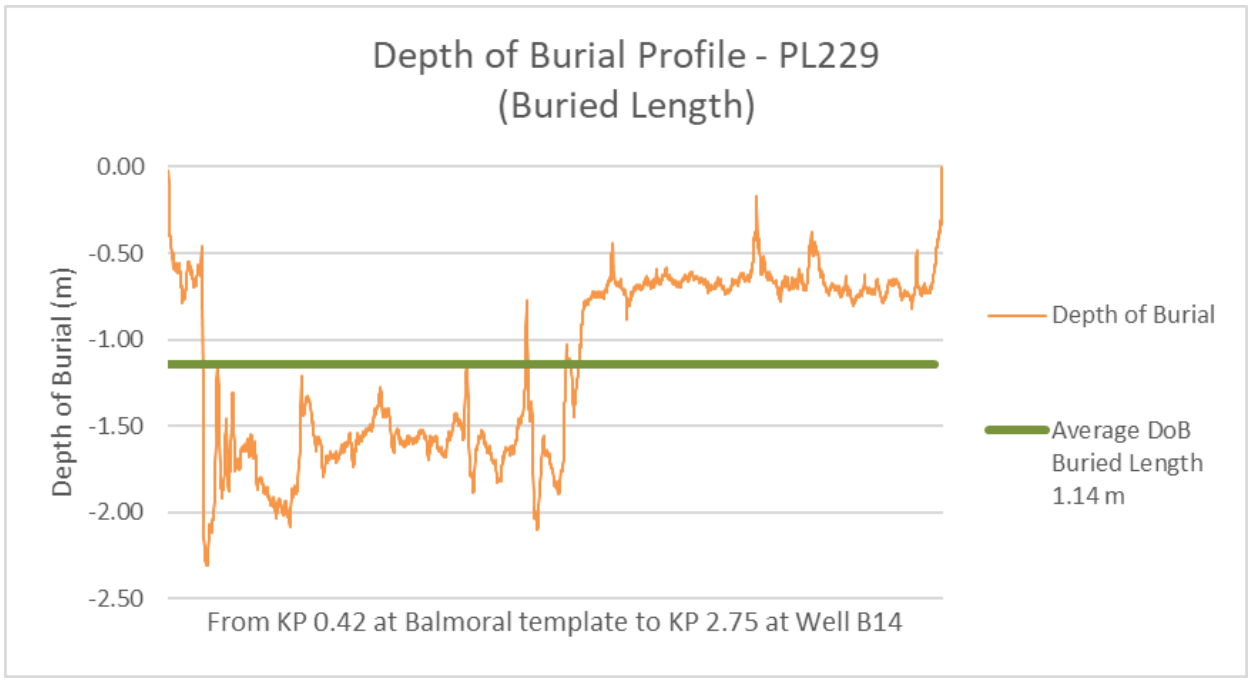

Depth of Burial Profile - PL223 & PL224
(Buried Length)
0.40
0.20
0.00
-0.20
-0.40
-0.60
-0.80
-1.00
-1.20
-1.40
-1.60
Depth of Burial (m)
From KP 0.1 at Well A2 to KP 1.22 at Balmoral template
DoB
Average DoB
Buried Length
0.73 m

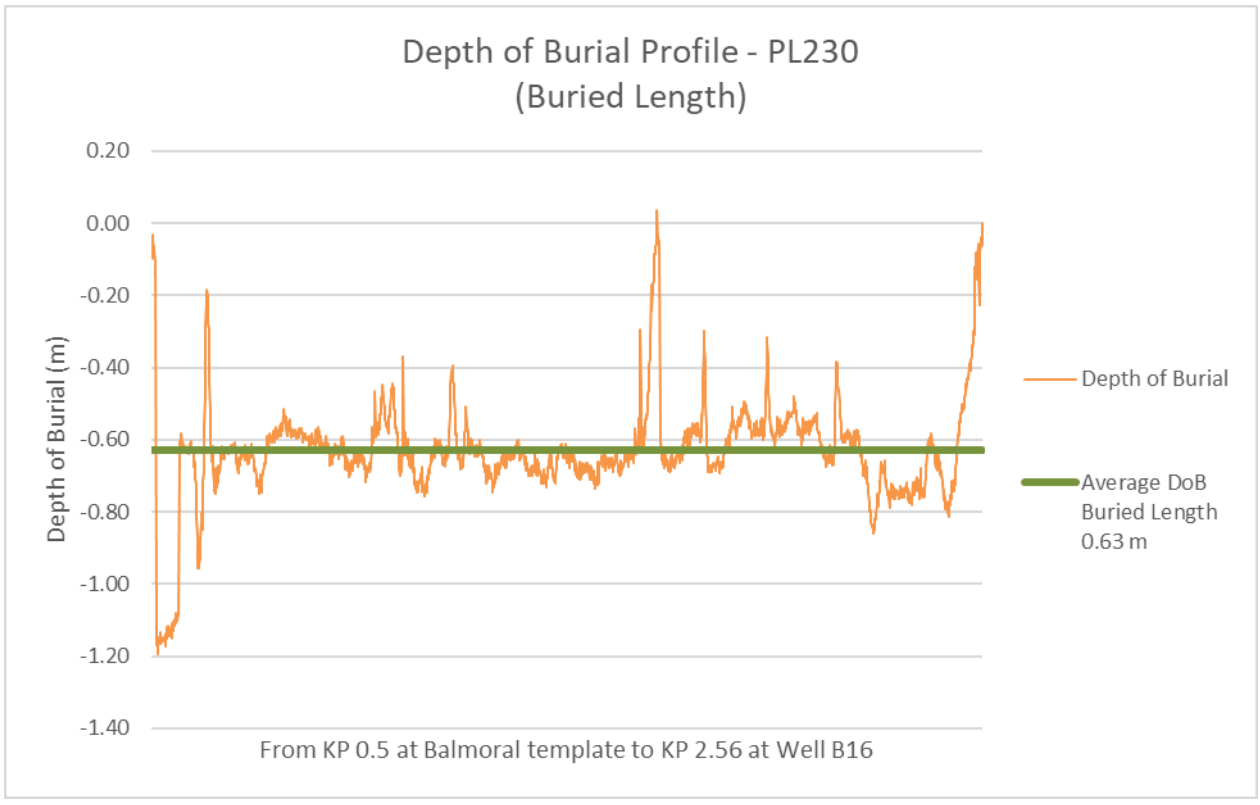

Depth of Burial Profile - PL225
(Buried Length)
Depth of Burial (m)
0.10
0.00
-0.10
-0.20
-0.30
-0.40
-0.50
-0.60
-0.70
-0.80
-0.90
DoB
Average DoB
Buried Length
0.71 m
From KP 0.33 at Balmoral template to KP 1.67 at Well A7z

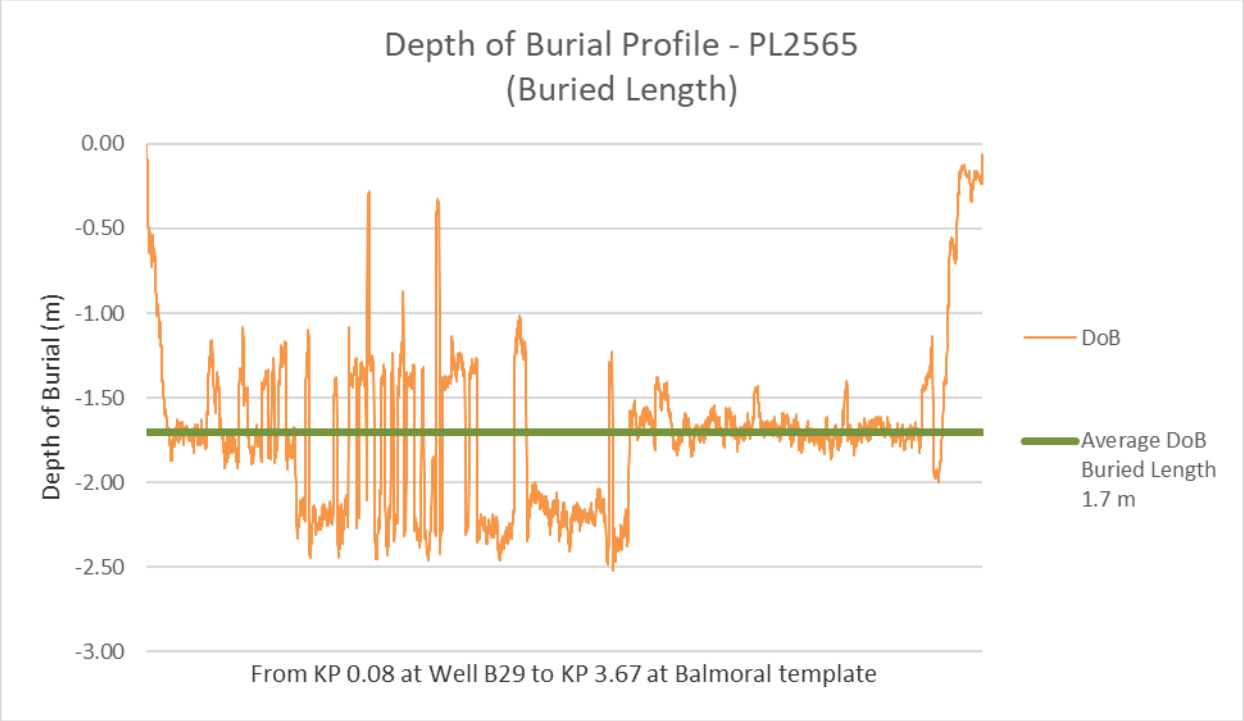

Depth of Burial Profile - PL226
(Buried Length)
Depth of Burial (m)
0.40
0.20
0.00
-0.20
-0.40
-0.60
-0.80
-1.00
-1.20
-1.40
-1.60
-1.80
DoB
Average DoB
Buried Length
0.58 m
From KP 0.08 at Balmoral template to KP 1.49 at Well 10z


Depth of Burial Profile - PL227
(Buried Length)
0.20
0.00
-0.20
-0.40
-0.60
-0.80
-1.00
-1.20
-1.40
Depth of Burial (m)
DoB
Average DoB
Buried Length
0.6 m
From KP 0.41 at Balmoral template to KP 5.17 at Well 4A


Depth of Burial ProfilePL228
(Buried Length)
2.00
1.50
1.00
0.50
0.00
-0.50
-1.00
-1.50
Depth of Burial (m)
DoB
Average DoB
Buried Length
0.32 m
From KP 0.4 at Balmoral template to KP 3.17 at Well A11


Depth of Burial Profile - PL229
(Buried Length)
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
Depth of Burial (m)
From KP 0.42 at Balmoral template to KP 2.75 at Well B14
Depth of Burial
Average DoB
Buried Length
1.14 m


Depth of Burial Profile - PL230
(Buried Length)
0.20
0.00
-0.20
-0.40
-0.60
-0.80
-1.00
-1.20
-1.40
Depth of Burial (m)
From KP 0.5 at Balmoral template to KP 2.56 at Well B16
Depth of Burial
Average DoB
Buried Length
0.63 m


Depth of Burial Profile - PL2565
(Buried Length)
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
-3.00
Depth of Burial (m)
From KP 0.08 at Well B29 to KP 3.67 at Balmoral template
DoB
Average DoB
Buried Length
1.7 m