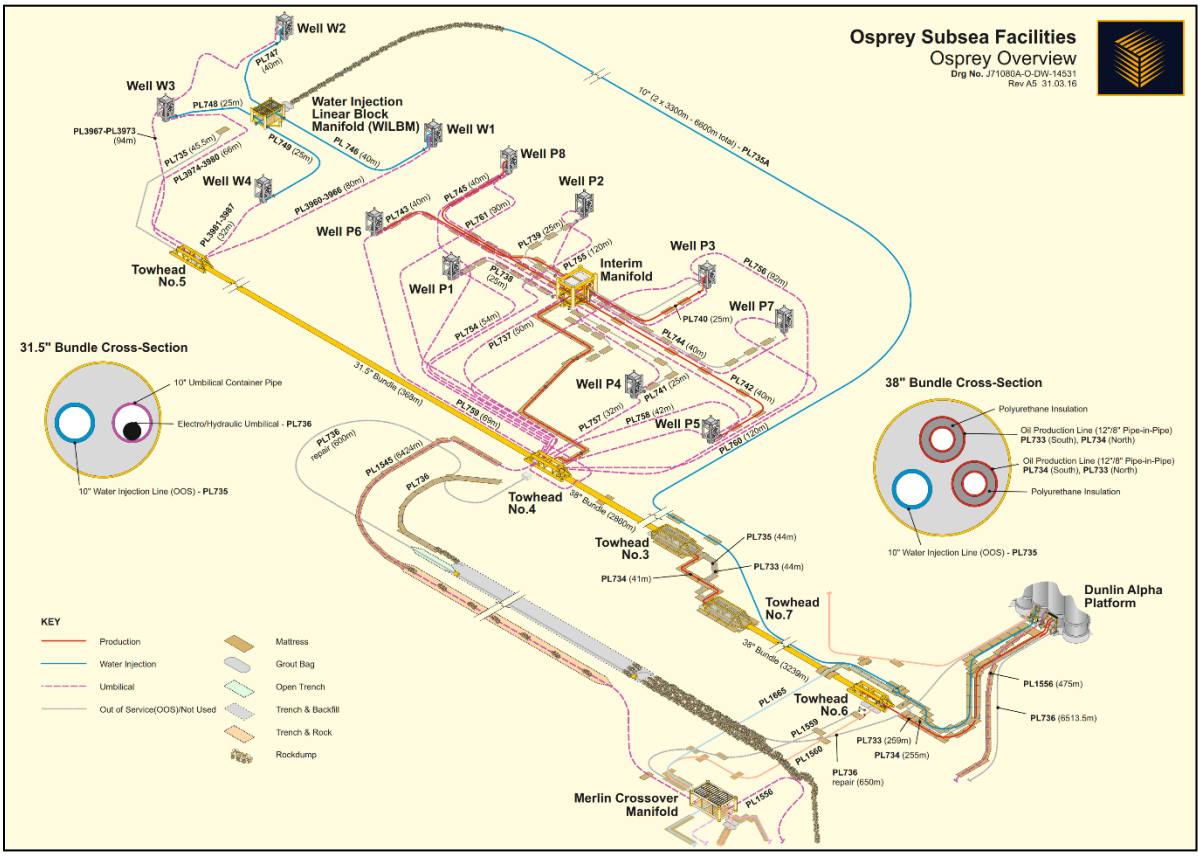
Fairfield Fagus Limited

Osprey Pipelines and Structures Decommissioning Programmes (DP2) (Non-Derogation)

Final Version

FFL-DUN-OSP-HSE-01-PLN-00001



Document Control

Approvals

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Revision Control

Revision No	Reference	Changes / Comments	Issue Date
R1	Issued for Comment	1st draft	27 Jun 2016
A1	BEIS Pre-Consultation Draft	Rev R1 FEL comments included. Issued for BEIS	18 Jul 2016
A2	BEIS Pre-Consultation Draft	Rev A1 FEL / BEIS comments included. Issued to BEIS for review.	28 Sep 2016
A3	Fairfield review of Pre-Consultation Draft	Comparative assessment and environmental impact assessment / environmental statement output added	22 Mar 2017
A4	BEIS Consultation Draft	CA and EIA input	31 Mar 2017
A5	BEIS Consultation Draft	BEIS comments included	2 Jun 2017
A6	Consultation Draft	BEIS comments included	16 Jun 2017
A7	Post Consultation Draft	BEIS comments included	3 Nov 2017
A8	Post Consultation Draft	Stakeholder comments included	17 Nov 2017
A9	Final	Partner Letters of Support	08 Dec 2017

Distribution List

Name	Company	No. of Copies for Formal Consultation
Internal Distribution	Fairfield	FEL DCC
Offshore Decommissioning Unit	Department for Business, Energy and Industrial Strategy (BEIS)	One
Steven Alexander Raymond Hall	Scottish Fishermen's Federation (SFF) (also representing NFFO and NIFPO)	Three
John Wrottesley	Global Marine Systems	One

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Abbreviations

Abbreviation	Explanation
BEIS	Department for Business, Energy and Industrial Strategy (formerly DECC)
CA	Comparative Assessment
CGBS	Concrete Gravity Based Structure
Comms	Communications
COP	Cessation of Production
DCC	Document Control Centre
DECC	Department of Energy and Climate Change (now called BEIS)
DP	Decommissioning Programme(s)
DSV	Diving Support Vessel
EIA	Environmental Impact Assessment
ES	Environmental Statement
FBL	Fairfield Betula Limited
FEL	Fairfield Energy Limited
FFL	Fairfield Fagus Limited
FWMS	Fairfield Waste Management Strategy
GMS	Global Marine Systems
IM	Interim Manifold
INST	Installation
IPR	Interim Pipeline Regime
IVHJ	Isolation Valve Hydraulic Jumper
JIP	Joint Industry Project
JOA	Joint Operating Agreement
LSA	Low Specific Activity (related to NORM)
MCDA	Multi Criteria Decision Analysis
MER	Maximising Economic Recovery
MODU	Mobile Drilling Unit
MoM	Minute of Meeting
N/A	Non Applicable
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers' Organisation Limited
NORM	Naturally Occurring Radioactive Material (related to LSA)
OGA	Oil & Gas Authority
OGUK	Oil & Gas United Kingdom
OOS	Out of Service
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	Oslo Paris Convention
P&A	Plug and Abandon
PBLM	Production Block Linear Manifold
PETS	Portal Environmental Tracking System
PGB	Production Guidebase
PJB	Production Junction Box
PL	Pipeline
PMT	Project Management Team
PON	Petroleum Operations Notice
Prod	Production

Abbreviation	Explanation
PWA	Pipeline Works Authorisation
S29	Section 29 Notices
SAM	Subsea Accumulator Module
SFF	Scottish Fishermen's Federation
SS	Subsea
SWFPA	Scottish White Fish Producers Association
TBC	To Be Confirmed
TFSW	Trans-Frontier Shipment of Waste
TSCJ	Tree Supply Control Jumper
TUTU	Topsides Umbilical Termination Unit
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
UTA	Umbilical Termination Assembly
WI	Water Injection
WIJB	Water Injection Junction Box
WILBM	Water Injection Linear Block Manifold
WMC	Waste Management Contractor
WONS	Well Operations and Notification System

Units of measure

Unit	Explanation
ft	Foot (0.3048 m)
“	Inch (0.0254 m)
m	Metre
km	Kilometre (one thousand metres)
m^2	Square metres
m^3	Cubic metres
%	Percentage
Te	Tonne - mass equal to 1,000 kilograms (SI unit is t)

Figures and Tables

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Appendices

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1 EXECUTIVE SUMMARY

1.1 Combined Decommissioning Programmes

This document contains the Decommissioning Programmes (DPs) for the Osprey field subsea installations and pipelines that apply to the following Section 29 (S29) Notices:

1. Osprey block and subsea facilities (issued August 2008)
2. Osprey pipelines (issued August 2008)
3. Osprey pipelines (issued March 2016).

Note that the Dunlin Alpha installation is subject to a separate Decommissioning Programme FBL-DUN-DUNA-HSE-01-PLN-00001. The Greater Dunlin Area integrated Decommissioning Programmes are described in the Greater Dunlin Area DP Bridging Document FBL-DUN-DAOM-HSE-01-PLN-00001. The latest revision of the decommissioning documents can be found on the Fairfield website:

http://www.fairfield-energy.com

1.2 Requirement for Decommissioning Programmes

MCX Osprey (UK) Ltd. holds a 100% interest in the Osprey licence and is therefore the Owner of all Osprey infrastructure. Fairfield Fagus Ltd. (FFL) is the appointed licence operator under a Joint Operating Agreement (JOA) in relation to all Osprey licences with Fairfield Betula Ltd. (FBL) as the 'Lead Operator' under a JOA in relation to all of Dunlin, Osprey and Merlin fields.

FFL and MCX Osprey (UK) Ltd. are included as S29 notice holders of all Osprey infrastructure.

This project forms part of, and is integrated with, the overall Greater Dunlin Area decommissioning programme. The schedule outlined in this document spans seven years from Cessation of Production (COP) to completion, with execution activities beginning post approval of these DPs. In conjunction with public, stakeholder and regulatory consultation, the decommissioning programmes are submitted in compliance with national and international regulations and DECC guidelines.

1.2.1 Installations

In accordance with the Petroleum Act 1998, the S29 Notice holders of the Osprey installations / field (see Table 1-2) are applying to the Department for Business, Energy and Industrial Strategy (BEIS, formerly DECC) to obtain approval for decommissioning the installations detailed in section 2.1 and 2.2 of this programme (see also section 8 Partner Letter of Support).

1.2.2 Pipelines

In accordance with the Petroleum Act 1998, the S29 Notice holders of the Osprey 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).

1.3 Introduction

These decommissioning programmes have been prepared to support decommissioning of the Osprey Field, which is part of a wider suite of decommissioning programmes for the Greater Dunlin Area.

The Greater Dunlin Area consists of the Dunlin, Dunlin South West, Osprey and Merlin Fields, located in the Shetland Basin of the northern North Sea. The Dunlin Alpha platform served as the production facility for the Greater Dunlin Area and is located in block 211/23a, approximately 137 km north east of Scotland and 11 km from the UK / Norwegian median line, in a water depth of 151 m.

The Dunlin Alpha platform was installed in 1977 and two subsea tiebacks, Osprey and Merlin, were developed in 1991 and 1997 respectively. During its lifetime, over 522 million barrels of oil have been produced from the Greater Dunlin Area.

The Osprey subsea field is located 6 km north west of Dunlin Alpha in blocks 211/23a and 211/18a in a water depth of 159 m, and consists of two subsea templates, complete with eight production wells and four water injection wells respectively. Oil was produced via a subsea production manifold, and transported through two 8" production lines contained within a 38" bundle carrier pipe to Dunlin Alpha platform.

The original 10" water injection pipeline contained within the 38" carrier pipe suffered a loss of integrity in July 2002, after which water injection was supplied by a 10" flexible pipeline via a central Water Injection Linear Block Manifold (WILBM) to the four satellite injection wells.

Termination of Production from the Greater Dunlin Area was announced in May 2015, following achievement of Maximising Economic Recovery (MER) from these oilfields. Termination of Production was agreed with the OGA on 9th July 2015, with Cessation of Production (COP) confirmed by letter dated 15th January 2016, to have occurred on 15th June 2015.

The methodologies required for the decommissioning of infrastructure and pipelines associated with the Osprey field are in compliance with BEIS and Oil & Gas UK (OGUK) guidelines and are subject to full public, stakeholder and regulatory consultation. These are further supported through Comparative Assessment (CA) of removal options and by an Environmental Impact Assessment (EIA) of the preferred option.

1.4 Overview of Installations / Pipelines Being Decommissioned

1.4.1 Installations

Table 1-1: Installations Being Decommissioned			
Field:	Osprey	**Production Type (Oil / Gas / Condensate)**	Oil
Water Depth (m)	159	**UKCS block**	211/23a and 211/18a
Surface Installations			
Number	**Type**	**Topsides Weight (Te)**	**Jacket Weight (Te)**
N/A	N/A	N/A	N/A

Table 1-1: Installations Being Decommissioned			
Subsea Installations		**Number of Wells**	
Number	**Type**	**Platform**	**Subsea**
8	Manifolds (x2), Protection Frames (x4), Dummy Wellheads (x2)	N/A	12
Drill Cuttings Pile		**Distance to median**	**Distance from nearest UK coastline**
Number of Piles	**Total Estimated volume (m^3)**	**(Dunlin Alpha ref. point)**	**(Dunlin Alpha ref. point)**
2	3052	11 km	137 km

Table 1-2: Installations S29 Notice Holders Details		
S29 Notice Holders	**Registration Number**	**Equity Interest (%)** ***If zero show 0%***
Esso Exploration and Production UK Limited	00207426	0%
Fairfield Energy Limited	05562373	0%
Fairfield Fagus Limited	05461823	0%
MCX Osprey (UK) Limited	06451720	100%
Mitsubishi Corporation	BR005199	0%
Shell UK Limited	00140141	0%

1.4.2 Pipelines

Table 1-3: Pipelines Being Decommissioned		
Number of Pipelines	Seventy-Two (72) uniquely numbered lines	(See section 2.3)

Table 1-4: Pipelines S29 Notice Holders Details		
S29 Notice Holders	**Registration Number**	**Equity Interest (%)** ***If zero show 0%***
Esso Exploration and Production UK Limited	00207426	0%
Fairfield Fagus Limited	05461823	0%
MCX Osprey (UK) Limited	06451720	100%
Mitsubishi Corporation	BR005199	0%
Shell UK Limited	00140141	0%

The above table lists the S29 Notice holders for the following pipelines: PL733 to PL761, PL735A, PL1545.1 to .18 and PLU4263.

Table 1-5: Pipelines S29 Notice Holders Details		
S29 Notice Holders	**Registration Number**	**Equity Interest (%)** ***If zero show 0%***
Fairfield Fagus Limited	05461823	0%
MCX Osprey (UK) Limited	06451720	100%
Mitsubishi Corporation	BR005199	0%

The above table lists the S29 Notice holders for the following pipelines: PL2837, PL3001JWP1 to PL3001JWP7, PL3001JWP4A, PL3960 to PL3987, PL4337, PLU4336 and PLU4335

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. Jacket / Floating Facility (FPSO, etc.)		
N/A	N/A	N/A
3. Subsea Installations		
Xmas trees will be removed using a MODU. The wellheads may be removed by the MODU or at a later stage using a DSV.	Removal of all seabed structures to leave a clear seabed.	There are no wellhead protection frames or over trawlable structures in place on the wells. Wellheads and associated completion materials will be removed to (minus) -3 m.
Interim Manifold (IM)	Removal of all seabed structures to leave a clear seabed.	Full removal.
WILBM	Removal of all seabed structures to leave a clear seabed.	Full removal.
4. Pipelines, Flowlines and Umbilicals[1]		
Group 1: pipeline and umbilical components	Leaves clear seabed and meets regulations.	Full removal.
Group 2a: deposits	Leaves clear seabed and meets regulations.	Full removal.
Group 2b: structures	Leaves clear seabed and meets regulations.	Full removal.

[1] FBL-DUN-OSP-SSP-01-RPT-00003 - Osprey Subsea Assets, Burial Status.

Table 1-6: Summary of Decommissioning Programmes		
Selected Option	**Reason for Selection**	**Proposed Decommissioning Solution**
Group 3: bundles	Comparatively assessed as preferred option. The bundles are stable, posing no hazard to marine users. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity.	Partial Removal.
Group 4: surface laid flexible jumpers	Leaves clear seabed and meets regulations.	Full removal.
Group 5: flexible and umbilical risers	Comparatively assessed as preferred option. The risers are contained within the Dunlin Alpha concrete gravity based structure.	Partial Removal.
Group 6: surface laid rigid spools	Leaves clear seabed and meets regulations.	Full removal.
Group 7: surface laid flexible pipelines	Leaves clear seabed and meets regulations.	Full removal.
Group 8: trenched and rock covered umbilicals	Comparatively assessed as preferred option. The pipelines and umbilicals are sufficiently buried and stable, posing no hazard to marine users. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity.	Partial Removal.
Group 9: surface laid umbilicals	Leaves clear seabed and meets regulations.	Full removal.
Group 10: surface laid, rock covered pipelines	Leaves clear seabed and meets regulations.	Full removal.
5. Wells		
Abandoned in accordance with OGUK Guidelines for the Abandonment of Wells, issue 5, July 2015	Meets regulatory requirements.	A PON5 will be in submitted through the OGA Well Operations and Notification System (WONS) and Chemical Permit and Marine Licences will be submitted through the Portal Environmental to support the work to be carried out.

6. Drill Cuttings		
Leave in place to degrade naturally.	Cuttings coverage is small, thin and widely dispersed and falls below both of OSPAR 2006/5 thresholds.	Left undisturbed on seabed.
Criteria:	**Osprey Production Wells Cuttings:**	**Osprey Water Injection Wells Cuttings:**
Area (m^2)	5,834	3,092
Volume (m^3)	2,130	922
Average depth of cover (m)	0.60	0.59
Max depth of cover (m)	1.47	2.40
7. Interdependencies		
None		

1.6 Field Location Including Field Layout and Adjacent Facilities

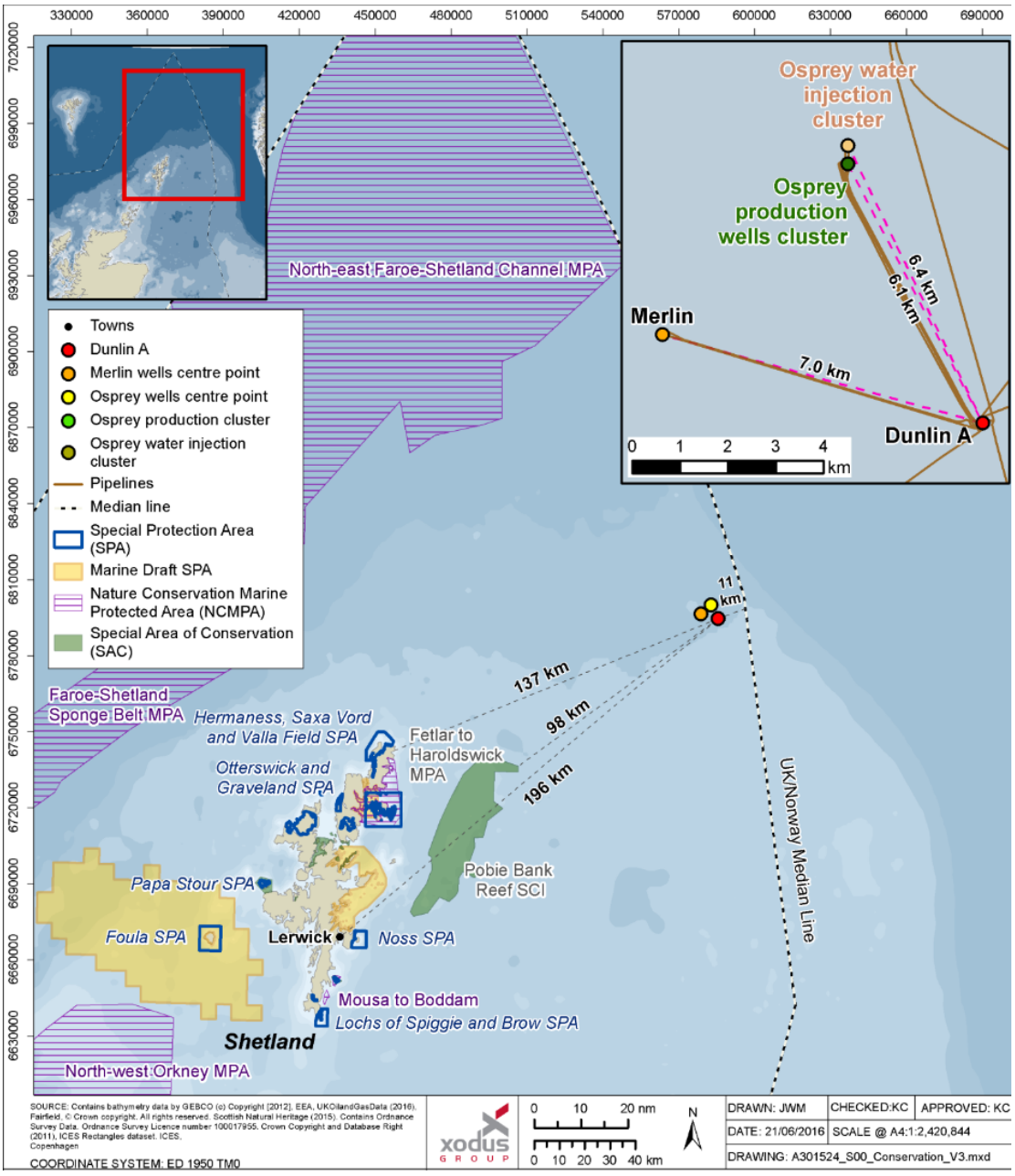

Figure 1-1: Field Location in UKCS

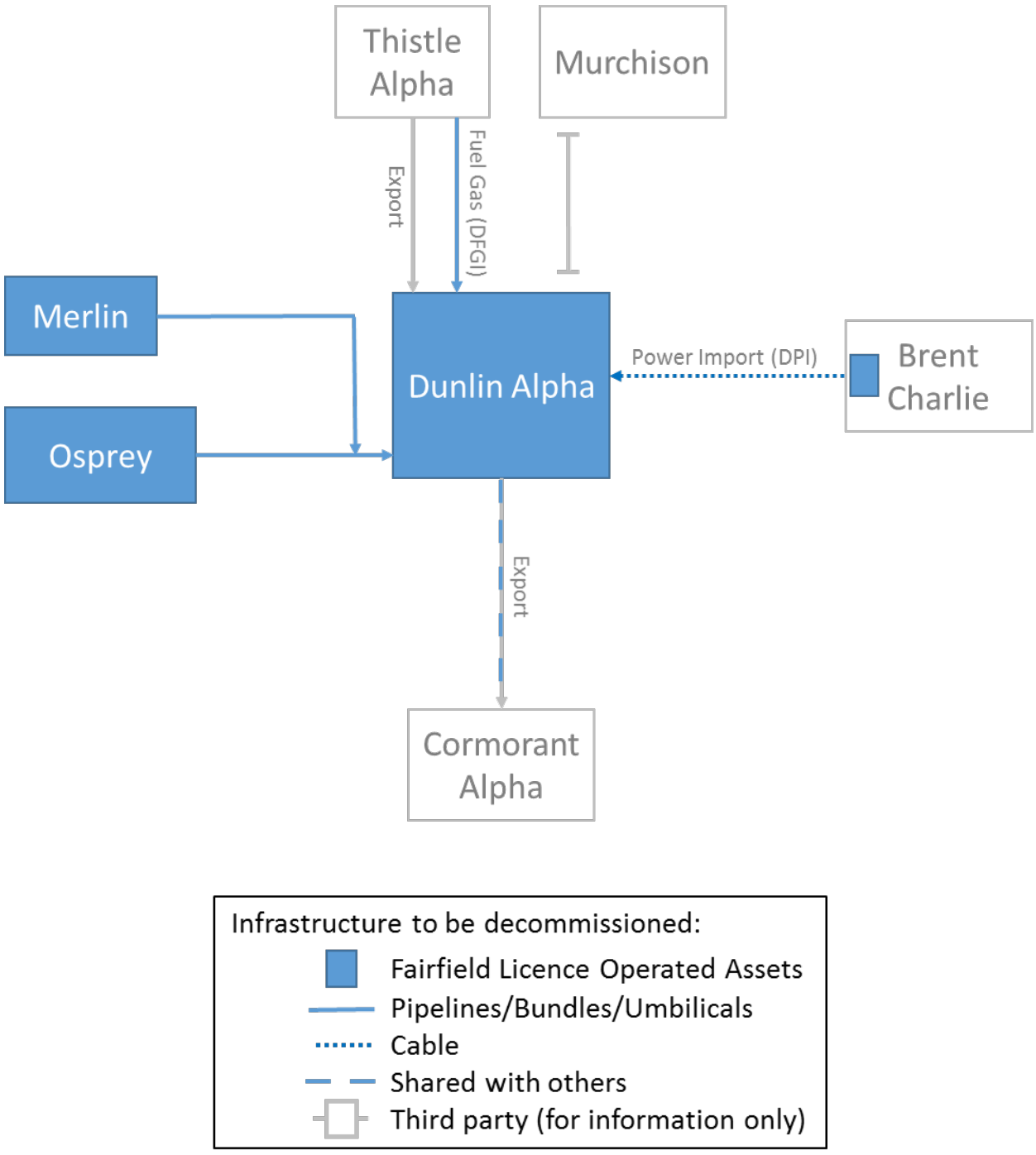

Figure 1-2: Greater Dunlin Area Configuration Map

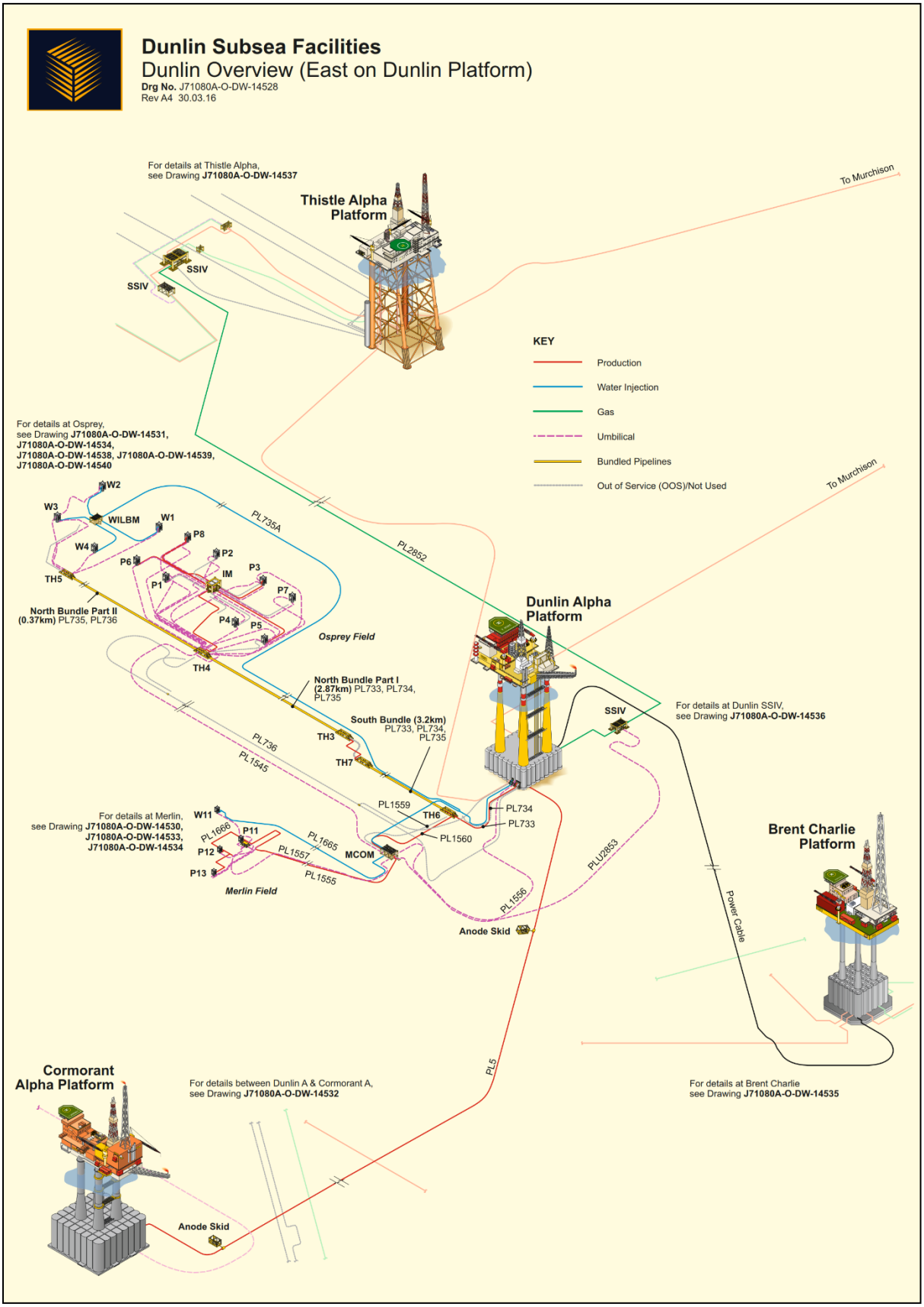

Figure 1-3: Greater Dunlin Area Field Layout

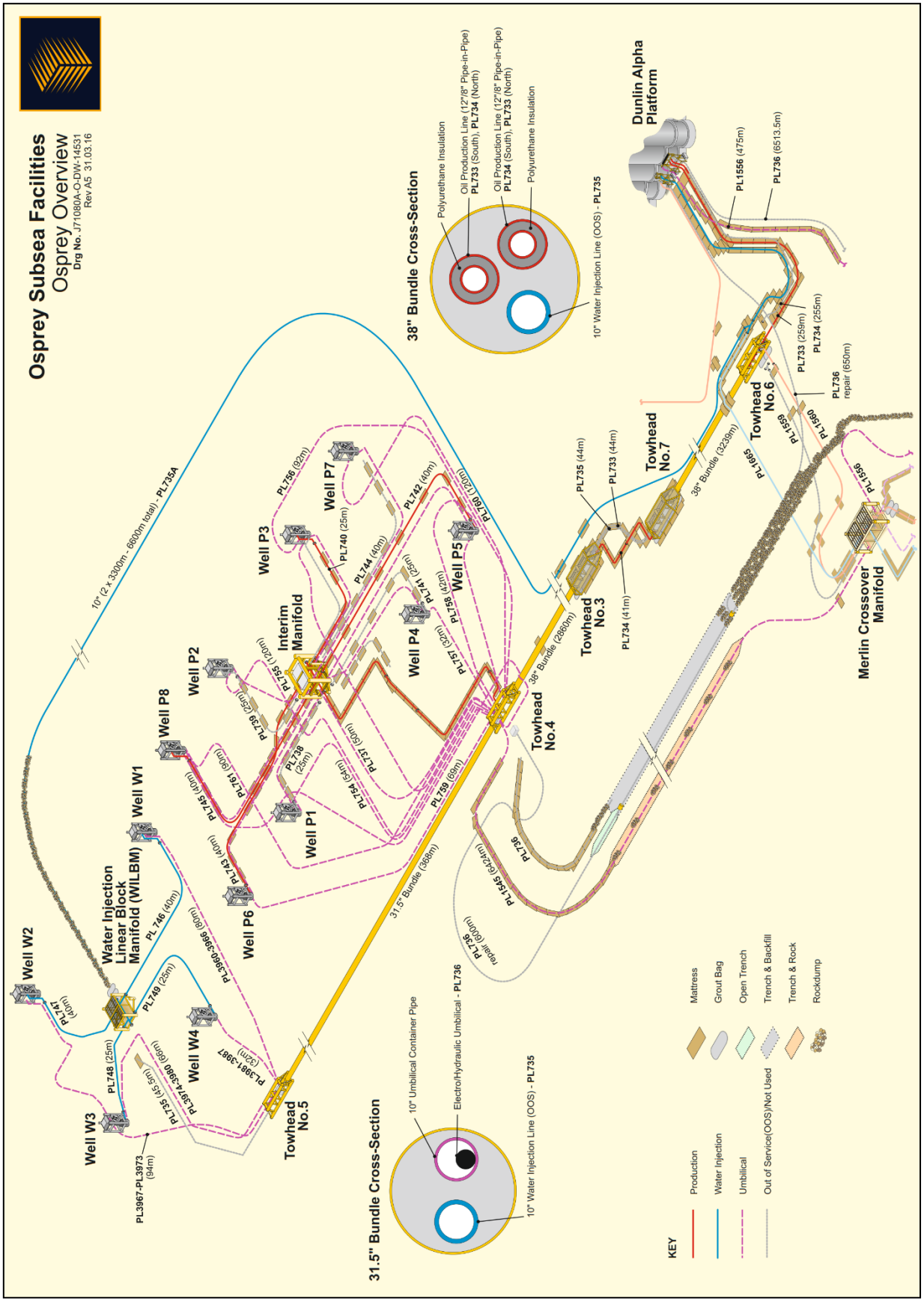

Figure 1-4: Osprey Field Layout

Table 1-7: Adjacent Facilities					
Operator	**Name**	**Type**	**Distance / Direction**	**Information**	**Status**
FBL	Dunlin Alpha	Platform	Osprey - Dunlin Alpha 6.11 km (3.8 miles) south east	Host to Osprey.	COP, provides up and over service to Thistle, exports to Cormorant Alpha.
FFL	Merlin	Subsea	Osprey - Merlin 5.24 km (3.3 miles) south west	Merlin ties into the Osprey system.	COP, out of use.
EnQuest	Thistle	Platform	Dunlin Alpha - Thistle 9.87 km (6.17 miles) north north west	Thistle exports to Dunlin Alpha for up and over services, plus supplied fuel gas for Dunlin Alpha water injection primary movers.	Operational.
TAQA	Cormorant Alpha	Platform	Dunlin Alpha - Cormorant Alpha 34.12 km (21.33 miles) south west	Dunlin exports to Cormorant Alpha.	Operational.
Shell	Brent Charlie	Platform	Dunlin Alpha - Brent Charlie 20.99 km (13.12 miles) south east	Provided electrical power and comms to Dunlin Alpha.	DPI electrical supply is out of use, DPI comms are in use, Brent Charlie is Operational.
CNR	Murchison	Platform	Dunlin Alpha - Murchison 15.89 km (9.93 miles) north east	Being decommissioned. Disconnected from Dunlin Alpha.	Out of use, being decommissioned.
Impacts of Decommissioning Proposals					
The Osprey field will be decommissioned along with Merlin, Dunlin Alpha and associated infrastructure.					

1.7 Industrial Implications

The Greater Dunlin Area Decommissioning Project will be managed by FBL in Aberdeen. There will be a number of specialist contract services required for the execution of the Greater Dunlin Area

Decommissioning Project, including but not limited to; engineering studies, subsea infrastructure decommissioning, topsides preparation for removal, topsides removal, topsides recycling / disposal.

In planning, preparing and executing the decommissioning of the Greater Dunlin Area, FBL will ensure that all contracts are raised and administered in a consistent and effective manner and that they:

- Adhere to the ethical and safety standards of the company
- Meet the requirements of legislation and all other relevant external organisations
- Are processed and awarded with tight and proper controls which will meet all stakeholder requirements
- Are focussed on the maximisation of safe, efficient and cost effective decommissioning service delivery.

FBL will also engage with the supply chain to identify effective technological solutions that are environmentally acceptable and safe.

2 DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Installations: Surface Facilities

Table 2-1: Surface Facilities Information
N/A

2.2 Installations: Subsea including Stabilisation Features

Table 2-2: Subsea Installations and Stabilisation Features					
Subsea installations including Stabilisation Features	**Number**	**Size / Weight (Te)**	**Location**		**Comments / Status**
Wellheads (comprising of Xmas tree, wellhead, flowbase, 30" conductor and 20" casing to (minus) -3 m)	6 (12 in total)	23.1 ft (above seabed) 59.9 Te	WGS84 Decimal	61.32349 01.544973	211/23-P12Z (OU-P1S4) Well is currently closed-in and will undergo plug and abandonment. None of the structure is piled to the seabed.
			WGS84 Decimal minute	61°19.410' N 01°32.698' E	
		23.1 ft (above seabed) 59.9 Te	WGS84 Decimal	61.32346 01.54551	211/23-P8Y (OU-P2S4) Well is currently closed-in and will undergo plug and abandonment. None of the structure is piled to the seabed.
			WGS84 Decimal minute	61°19.408' N 01°32.730' E	
		23.1 ft (above seabed) 59.9 Te	WGS84 Decimal	61.32322 01.54543	211/23-P4Z (OU-P3S1) Well is currently closed-in and will undergo plug and abandonment. None of the structure is piled to the seabed.
			WGS84 Decimal minute	61°19.393' N 01°32.726' E	
		23.1 ft (above seabed) 59.9 Te	WGS84 Decimal	61.32319 01.54483	211/23-P5Z (OU-P4S1) Well is currently closed-in and will undergo plug and abandonment. None of the structure is piled to the seabed.
			WGS84 Decimal minute	61°19.391' N 01°32.690' E	
		23.1 ft (above seabed) 59.9 Te	WGS84 Decimal	61.32307 01.54486	211/23-P13 (OU-P5S3) Well is currently closed-in and will undergo plug and abandonment. None of the structure is piled to the seabed.
			WGS84 Decimal minute	61°19.385' N 01°32.692' E	

		23.1 ft (above seabed) 59.9 Te	WGS84 Decimal	61.32364 01.54494	211/23-P6 (OU-P6) Well is currently closed-in and will undergo plug and abandonment. None of the structure is piled to the seabed.
			WGS84 Decimal minute	61°19.419' N 01°32.696' E	
Wellheads (comprising of Xmas tree, wellhead, flowbase, 30" conductor and 20" casing to (minus) -3 m)	6 (12 in total)	23.1 ft (above seabed) 59.9 Te	WGS84 Decimal	61.32311 01.54542	211/23-P7 (OU-P7) Well is currently closed-in and will undergo plug and abandonment. None of the structure is piled to the seabed.
			WGS84 Decimal minute	61°19.387' N 01°32.726' E	
		18.2 ft (above Seabed) 49.5 Te	WGS84 Decimal	61.32358 01.54548	211/23-P11 (OU-P8) Well is currently closed-in and will undergo plug and abandonment. None of the structure is piled to the seabed.
			WGS84 Decimal minute	61°19.415' N 01°32.729' E	
		23.1 ft (above seabed) 59.9 Te	WGS84 Decimal	61.32631 01.54565	211/23-W1Z (OU-W1S1) Well is currently closed-in and will undergo plug and abandonment. None of the structure is piled to the seabed.
			WGS84 Decimal Minute	61°19.579' N 01°32.741' E	
		23.1 ft (above seabed) 59.9 Te	WGS84 Decimal	61.32679 01.54567	211/23-W2Y (OU-W2S2) Well is currently closed-in and will undergo plug and abandonment. None of the structure is piled to the seabed.
			WGS84 Decimal Minute	61°19.608' N 01°32.741' E	
		23.1 ft (above seabed) 59.9 Te	WGS84 Decimal	61.32671 01.54508	211/23-W3 (OU-W3) Well is currently closed-in and will undergo plug and abandonment. None of the structure is piled to the seabed.
			WGS84 Decimal Minute	61°19.603' N 01°32.705' E	
		23.1 ft (above seabed) 59.9 Te	WGS84 Decimal	61.32646 01.54510	211/23-W4Z (OU-W4S1) Well is currently closed-in and will undergo plug and abandonment. None of the structure is piled to the seabed.
			WGS84 Decimal Minute	61°19.588' N 01°32.706' E	

Manifolds	2	5 m x 4 m x 3 m 18.1 Te	WGS84 Decimal	61.32660 01.54537	WIBLM.
			WGS84 Decimal minute	61°19.596' N 01°32.722' E	
		4 m x 3.5 m x 3 m 24.6 Te	WGS84 Decimal	61.32334 01.54520	Osprey Production IM.
			WGS84 Decimal minute	61°19.401' N 01°32.712' E	
PLBM (manifold)	1	7.2 m x 4.1 m x 4.1 m 65Te	N/A		The PLBM was recovered in 2013, stripped, cleaned and stored.
Dummy wellheads	2	2.6 m x 2.6 m x 2.9 m 6.5 Te (PGB) 30" x 15.6 m 11.4 Te (conductor)	WGS84 Decimal	61.32660 01.54537	WIBLM. Dummy wellhead complete with permanent guidebase and 30" conductor.
			WGS84 Decimal minute	61°19.596' N 01°32.722' E	
		2.6 m x 2.6 m x 2.9 m 6.5 Te (PGB) 30" x 15.6 m 11.4 Te (conductor)	WGS84 Decimal	61.32334 01.54520	Osprey Production IM. Dummy wellhead complete with permanent guidebase and 30" conductor.
			WGS84 Decimal minute	61°19.401' N 01°32.712' E	
Templates	N/A	N/A	N/A	N/A	N/A
Protection Structures	4	5 m x 4 m x 8 m 25.0 Te	WGS84 Decimal	61.27391 01.59507	Osprey Water Injection Protection Structure. The structure is not piled.
			WGS84 Decimal minute	61°16.435' N 01°35.704' E	
		5 m x 8 m x 8 m 29.5 Te	WGS84 Decimal	61.26746 01.59511	Osprey Production Protection Structure. The structure is not piled.
			WGS84 Decimal minute	61°16.048' N 01°35.707' E	
		15 m x 7 m x 1.6 m 13.2 Te	WGS84 Decimal	61.29972 01.56556	Towhead 3 Protection Structure. The structure is not piled.
			WGS84 Decimal minute	61°17.983' N 01°33.934' E	
		15 m x 7 m x 1.6 m 11.6 Te	WGS84 Decimal	61.29934 01.56563	Towhead 7 Protection Structure. The structure is not piled.
			WGS84 Decimal minute	61°17.960' N 01°33.938' E	

Concrete mattresses	N/A	N/A	N/A	N/A
Grout bags	N/A	N/A	N/A	N/A
Formwork	N/A	N/A	N/A	N/A
Frond Mats	N/A	N/A	N/A	N/A
Rock Cover	N/A	N/A	N/A	N/A
Other	N/A	N/A	N/A	N/A

2.3 Pipelines Including Stabilisation Features

Water Injection and production pipelines are listed in the direction of flow.

Table 2-3: Pipeline / Flowline / Umbilical Information

Description	Pipeline No. (as per PWA)	Diameter (inches)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
Osprey water injection riser	PL735A	8	0.234	Flexible (polymer/steel)	Water; chemicals	Dunlin Alpha to Wye Piece	Laid on seabed / mattressed / partially within J-tube	Out of use	Flushed with inhibited seawater.
Osprey water injection pipeline	PL735A	8 & 10	0.0035	Rigid wye piece (steel)	Water; chemicals	PL735A Riser to PL735A Pipeline	Laid on seabed / mattressed	Out of use	Flushed with inhibited seawater.
Osprey water injection pipeline	PL735A	10	6.600 (2x 3.300)	Flexible (polymer/steel)	Water; chemicals	Wye Piece to WILBM	Laid on seabed / partial rock cover	Out of use	Flushed with inhibited seawater.
W1 flexible jumper	PL746	6	0.025	Flexible (polymer / steel)	Water; chemicals	WILBM to W1	Laid on seabed	Out of use	Flushed with inhibited seawater.
W2 flexible jumper	PL747	6	0.025	Flexible (polymer / steel)	Water; chemicals	WILBM to W2	Laid on seabed	Out of use	Flushed with inhibited seawater.
W3 flexible jumper	PL748	6	0.025	Flexible (polymer / steel)	Water; chemicals	WILBM to W3	Laid on seabed	Out of use	Flushed with inhibited seawater.

Table 2-3: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline No. (as per PWA)**	**Diameter (inches)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
W4 flexible jumper	PL749	6	0.025	Flexible (polymer / steel)	Water; chemicals	WILBM to W4	Laid on seabed	Out of use	Flushed with inhibited seawater.
Water Injection Line – South Bundle	PL735	10	3.239	Rigid pipeline (steel) - contained within 38” carrier pipe	Water; chemicals	Towhead No.6 to Towhead No.7	Within bundle - Laid on seabed	Out of use	Flushed with inhibited seawater.
Osprey water injection jumper	PL735	8	0.055	Flexible (polymer / steel)	Water; chemicals	Towhead No.7 to Towhead No.3	Laid on seabed / mattressed	Out of use	Flushed with inhibited seawater.
Water Injection Line – North Bundle	PL735	10	3.237	Rigid pipeline (steel) - contained within 38” and 31” carrier pipe	Water; chemicals	Towhead No.3 to Towhead No.5	Within bundle - Laid on seabed	Out of use	Flushed with inhibited seawater.
Osprey water injection jumper	PL735	8	0.055	Flexible (polymer / steel)	Water; chemicals	Towhead No.5 to WILBM	Laid on seabed / mattressed	Out of use	Flushed with inhibited seawater.
P1 production jumper	PL738	6	0.025	Flexible (polymer / steel)	Production fluid	Well P1 to Osprey IM	Laid on seabed / mattressed	Out of use	Flushed / methanol.
P2 production jumper	PL739	6	0.025	Flexible (polymer / steel)	Production fluid	Well P2 to Osprey IM	Laid on seabed / mattressed	Out of use	Flushed / methanol.
P3 production jumper	PL740	6	0.025	Flexible (polymer / steel)	Production fluid	Well P3 to Osprey IM	Laid on seabed / mattressed	Out of use	Flushed / methanol.

Table 2-3: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline No. (as per PWA)**	**Diameter (inches)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
P4 production jumper	PL741	6	0.025	Flexible (polymer / steel)	Production fluid	Well P4 to Osprey IM	Laid on seabed / mattressed	Out of use	Flushed / methanol.
P5 production jumper	PL742	6	0.040	Flexible (polymer / steel)	Production fluid	Well P5 to Osprey IM	Laid on seabed / mattressed	Out of use	Flushed with inhibited seawater.
P6 production jumper	PL743	6	0.040	Flexible (polymer / steel)	Production fluid	Well P6 to Osprey IM	Laid on seabed / mattressed	Out of use	Flushed / methanol.
P7 production jumper	PL744	6	0.040	Flexible (polymer / steel)	Production fluid	Well P7 to Osprey IM	Laid on seabed / mattressed	Out of use	Flushed / seawater.
P8 production jumper	PL745	6	0.040	Flexible (polymer / steel)	Production fluid	Well P8 to Osprey Interim Manifold	Laid on seabed / mattressed	Out of use	Flushed / methanol.
Osprey production pipeline tie-in	PL734	8	0.046	Rigid spools (steel / FBE / SPU coating)	Production fluid	Osprey IM to Towhead No.4	Mattressed / supported on grout piers	Out of use	Flushed with inhibited seawater.

Table 2-3: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline No. (as per PWA)**	**Diameter (inches)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
Production Line – North Bundle	PL733	8	2.871	Rigid Pipeline (Steel) - contained within 12” carrier pipe, located within 38” bundle carrier	Production fluid	Towhead No.4 to Towhead No.3	Within bundle - Laid on seabed	Out of use	Flushed with inhibited seawater.
Production Line – North Bundle	PL734	8	2.871	Rigid Pipeline (Steel) - contained within 12” carrier pipe, located within 38” bundle carrier	Production fluid	Towhead No.4 to Towhead No.3	Within bundle - Laid on seabed	Out of use	Flushed with inhibited seawater.
Osprey production pipeline tie-in	PL734	8	0.050	Rigid spools (steel / FBE / SPU coating)	Production fluid	Towhead No.3 to Towhead No.7	Laid on seabed / mattressed	Out of use	Flushed with inhibited seawater.
Osprey production pipeline tie-in	PL733	8	0.055	Flexible (polymer / steel)	Production fluid	Towhead No.3 to Towhead No.7	Laid on seabed / mattressed	Out of use	Flushed with inhibited seawater.
Production Line – South Bundle	PL733	8	3.239	Rigid Pipeline (Steel) - contained within 12” carrier pipe, located within 38” bundle carrier	Production Fluid	Towhead No.7 to Towhead No.6	Within bundle - Laid on seabed	Out of use	Flushed with inhibited seawater.

Table 2-3: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline No. (as per PWA)**	**Diameter (inches)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
Production Line – South Bundle	PL734	8	3.241	Rigid Pipeline (Steel) - contained within 12" carrier pipe, located within 38" bundle carrier	Production Fluid	Towhead No.7 to Towhead No.6	Within bundle - Laid on seabed	Out of use	Flushed with inhibited seawater.
Osprey production riser	PL734	8	0.255	Flexible (polymer / steel)	Production fluids	Towhead No.6 to Dunlin Alpha ESDV	Laid on seabed / mattressed / partially within J-tube	Out of use	Flushed with inhibited seawater.
Osprey production topside pipework[2]	PL734	8	0.090	Rigid Pipeline (Steel)	Production fluids	Dunlin Alpha ESDV to Pig Receiver	N/A	Out of use	Flushed with inhibited seawater.
Osprey production riser	PL733	8	0.255	Flexible (polymer / steel)	Production fluids	Towhead No.6 to Dunlin Alpha ESDV	Laid on seabed / mattressed / partially within J-tube	Out of use	Flushed with inhibited seawater.
Osprey production topside pipework[3]	PL733	8	0.090	Rigid Pipeline (Steel)	Production fluids	Dunlin Alpha ESDV to Pig Launcher	N/A	Out of use	Flushed with inhibited seawater.

[2] PL734 topside pipework shall be removed as part of the Dunlin Alpha topsides removal and will be included in the Dunlin Alpha Decommissioning Programme.
[3] PL733 topside pipework shall be removed as part of the Dunlin Alpha topsides removal and will be included in the Dunlin Alpha Decommissioning Programme.

Table 2-3: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline No. (as per PWA)**	**Diameter (inches)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
Osprey umbilical riser - repair	PL736 (7 off cores)	3	0.650	Umbilical (polymer / steel / copper / thermoplastic)	Controls fluid	Dunlin Alpha TUTU to 5" Osprey umbilical weak link	Laid on seabed / rock cover / mattressed / partially within J-tube	Out of use	Seawater.
Osprey umbilical	PL736 (15 off cores)	5	6.700	Umbilical (polymer / steel / copper / thermoplastic) Umbilical Termination Assembly (UTA) (steel)	Controls fluid	Dunlin Alpha TUTU to Towhead No.4	Trenched and buried over 6.073 km / partial rock cover	Out of use	Controls fluid.
Osprey umbilical - north repair	PL736 (15 off cores)	5	0.891	Umbilical (polymer / steel / copper / thermoplastic)	Controls fluid	PL736 north splice to Towhead No.4	Laid on seabed / trenched	Out of use	Controls fluid.

Table 2-3: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline No. (as per PWA)**	**Diameter (inches)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
Osprey umbilical – North Bundle	PLU4263 (15 off cores)	5	0.370	Umbilical (polymer / steel / copper / thermoplastic) - contained within 10" carrier pipe, located within 31.5" bundle carrier	Controls fluid	Towhead No.4 PJB to Towhead No.5 WIJB	Within Bundle - Laid on Seabed	Suspended	Potable water as from Q1 2018.
Osprey control umbilical	PL1545 (18 off cores)	4	6.400	Umbilical (polymer / steel / copper) UTA (steel)	Controls fluid	Merlin crossover manifold to UTA (Towhead No.4)	Trenched over 6.121 km / spot rock cover	Suspended	Potable water as from Q1 2018.
P1 TSCJ	PL754 (7 off cores)	3.5	0.054	Umbilical (thermoplastic / copper / steel)	Controls fluid	Towhead No.4 PJB to Well P1	Laid on seabed / sandbagged	Suspended	Controls fluid.
P2 TSCJ	PL755 (7 off cores)	3.5	0.120	Umbilical (thermoplastic / copper / steel)	Controls fluid	Towhead No.4 PJB to Well P2	Laid on seabed / sandbagged	Suspended	Controls fluid.
P3 TSCJ	PL756 (7 off cores)	3.5	0.092	Umbilical (thermoplastic / steel)	Controls fluid	Towhead No.4 PJB to Well P3	Laid on seabed / sandbagged	Suspended	Controls fluid.

Table 2-3: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline No. (as per PWA)**	**Diameter (inches)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
P3 TSCJ (hydraulic / chemical)	(previously PL756) PWA 4/W/90 (5 off cores)	3.5	0.092	Umbilical (steel / thermoplastic)	Controls fluid	Towhead No.4 PJB to Well P3	Laid on seabed / sandbagged	Out of use	Controls fluid.
P4 TSCJ	PL757 (7 off cores)	3.5	0.032	Umbilical (thermoplastic / copper / steel)	Controls fluid	Towhead No.4 PJB to Well P4	Laid on seabed / sandbagged	Suspended	Controls fluid.
P5 TSCJ	PL758 (7 off cores)	3.5	0.042	Umbilical (thermoplastic / copper / steel)	Controls fluid	Towhead No.4 PJB to Well P5	Laid on seabed / sandbagged	Suspended	Controls fluid.
P5 TSCJ (hydraulic / chemical)	(previously PL758) PWA 4/W/90 (5 off cores)	3.5	0.042	Umbilical (steel / copper)	Controls fluid	Towhead No.4 PJB to Well P5	Laid on seabed / sandbagged	Out of use	Controls fluid.
P6 TSCJ	PL759 (7 off cores)	3.5	0.069	Umbilical (thermoplastic / copper / steel)	Controls fluid	Towhead No.4 PJB to Well P6	Laid on seabed / sandbagged	Suspended	Controls fluid.
P7 TSCJ	PL760 (7 off cores)	3.5	0.120	Umbilical (thermoplastic / copper / steel)	Controls fluid	Towhead No.4 PJB to Well P7	Laid on seabed / sandbagged	Suspended	Controls fluid.
P8 TSCJ/IVHJ	PL761 (10 off cores)	3.5	0.135	Umbilical (thermoplastic / copper / steel)	Controls fluid	Towhead No.4 PJB to IM	Laid on seabed / sandbagged	Suspended	Controls fluid.

Table 2-3: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline No. (as per PWA)**	**Diameter (inches)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
IM MVHJ	PL737 (4 off cores)	3	0.050	Umbilical (thermoplastic / steel)	Controls fluid	Towhead No.4 PJB to IM	Laid on seabed / sandbagged / mattressed	Suspended	Controls fluid.
P1 IVHJ	PL3001JWP1 (3 off cores)	3	0.024	Umbilical (thermoplastic / steel)	controls fluid	Well P1 to IM	Laid on seabed / mattressed	Suspended	Controls fluid.
P2 IVHJ	PL3001JWP2 (3 off cores)	3	0.024	Umbilical (thermoplastic / steel)	Controls fluid	Well P2 to IM	Laid on seabed / mattressed	Suspended	Controls fluid.
P3 IVHJ	PL3001JWP3 (3 off cores)	3	0.033	Umbilical (thermoplastic / steel)	Controls fluid	Well P3 to IM	Laid on seabed / mattressed	Suspended	Controls fluid.
P3 IVHJ (out of service)	PLU4335 (3 off cores)	3	0.024	Umbilical (thermoplastic / steel)	Controls fluid	Well P3 to IM	Laid on seabed / sandbagged	Not in service	Controls fluid.
P4 IVHJ	PL3001JWP4 (3 off cores)	3	0.033	Umbilical (thermoplastic / steel)	Controls fluid	Well P4 to IM	Laid on seabed / mattressed	Suspended	Controls fluid.
P4 IVHJ (out of service)	PL3001JWP4A (3 off cores)	3	0.033	Umbilical (thermoplastic / steel)	Controls fluid	Disconnected - laid on seabed	Laid on seabed / sandbagged	Out of use	Controls fluid.

Table 2-3: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline No. (as per PWA)**	**Diameter (inches)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
P5 IVHJ	PL3001JWP5 (3 off cores)	3	0.047	Umbilical (thermoplastic / steel)	Controls fluid	Well P5 to IM	Laid on seabed / mattressed	Suspended	Controls fluid.
P5 IVHJ (out of service)	PLU4336 (3 off cores)	3	0.024	Umbilical (thermoplastic / steel)	Controls fluid	Well P5 to IM	Laid on seabed / sandbagged	Suspended	Controls fluid.
P6 IVHJ	PL3001JWP6 (3 off cores)	3	0.047	Umbilical (thermoplastic / steel)	Controls fluid	Well P6 to IM	Laid on seabed / mattressed	Suspended	Controls fluid.
P7 IVHJ	PL3001JWP7 (3 off cores)	3	0.024	Umbilical (thermoplastic / steel)	Controls fluid	Well P7 to IM	Laid on seabed / mattressed	Suspended	Controls fluid.
W1 TSCJ	PL3960 - PL3966 (7 off cores)	3.5	0.080	Umbilical (thermoplastic / copper / steel)	Controls fluid	Towhead No.5 WIJB to W1	Laid on seabed / sandbagged	Suspended	Controls fluid.
W2 TSCJ	PL3967 - PL3973 (7 off cores)	3.5	0.094	Umbilical (thermoplastic / copper / steel)	Controls fluid	Towhead No.5 WIJB to W2	Laid on seabed / sandbagged	Suspended	Controls fluid.
W3 TSCJ	PL3974 - PL3980 (7 off cores)	3.5	0.066	Umbilical (thermoplastic / copper / steel)	Controls fluid	Towhead No.5 WIJB to W3	Laid on seabed / sandbagged	Suspended	Controls fluid.

Table 2-3: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline No. (as per PWA)**	**Diameter (inches)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
W4 TSCJ	PL3981 - PL3987 (7 off cores)	3.5	0.032	Umbilical (thermoplastic / copper / steel)	Controls fluid	Towhead No.5 WIJB to W4	Laid on seabed / sandbagged	Suspended	Controls fluid.
P7 hose	PL2837 (1 off core)	0.5	0.100	Hose (thermoplastic)	Controls fluid	P7 to IM	Laid on seabed / sandbagged	Suspended	Controls fluid.
P8 hose	PL4337 (1 off core)	0.5	0.090	Hose (thermoplastic)	Controls fluid	PJB to Well P8	Laid on seabed / sandbagged	Suspended	Controls fluid.
Not installed	PL750 PL751 PL752 PL753	N/A	N/A	N/A	N/A	N/A	N/A	PLs not installed and removed from PWA via variation 62/V/16	N/A

Table 2-4: Subsea Pipeline Stabilisation Features				
Stabilisation Feature	**Total Number**	**Weight (Te)**	**Location**	**Status**
Concrete mattresses (5 m x 2 m x 0.15 m)	240	864 (3.6 Te each)	PL733 (x19); PL734 (x38); PL735 (x8); PL735A (x20); PL736 (x29); PL738 – PL745 (x75); North Bundle (x2); South Bundle (x11); PL1545 (x38)	Exposed
Concrete mattresses (6 m x 2 m x 0.15 m)	8	34.6 (4.32 Te each)	PL1545 (x8)	Exposed
Concrete mattresses (6 m x 3 m x 0.15 m)	12	81.0 (6.75 Te each)	PL734 (x7); PL735A (x1); North Bundle (x4);	Exposed
Concrete mattresses (6 m x 3 m x 0.3 m)	6	49.8 (8.3 Te each)	PL735A (x6)	Exposed
Grout bags	280	7.0 (25 kg each)	PL733 (x140); PL734 (x140)	Exposed
Sand bags	5,295	132.4 (25 kg each)	PL734 (x4,035); PL735 (x540); PL738 – PL745 (x720)	Exposed
Formwork	N/A	N/A	N/A	N/A
Frond mats	N/A	N/A	N/A	N/A
Rock cover	N/A	18,926 Te in total	PL736 - OOS (3,820 Te); PL735A (4,211 Te); PL1545 (10,895 Te)	PL736 is trenched and buried on its own – rock is above mean seabed level. PL735A is surface laid on its own – rock is above mean seabed level. PL1545 is within its own trench – rock is below mean seabed level.
Other	N/A	N/A	N/A	N/A

2.4 Wells

Table 2-5: Well Information			
Platform Wells	**Designation**	**Status**	**Category of Well**
N/A	N/A	N/A	N/A
Subsea Wells			
211/23-P12Z (OU-P1S4)	Oil Producer	Closed in	SS 3-4-3
211/23-P8Y (OU-P2S4)	Oil Producer	Closed in	SS 3-4-3
211/23-P4Z (OU-P3S1)	Oil Producer	Closed in	SS 3-4-3
211/23-P5Z (OU-P4S1)	Oil Producer	Closed in	SS 3-4-3
211/23-P13 (OU-P5S3)	Oil Producer	Closed in	SS 3-4-3
211/23-P6 (OU-P6)	Oil Producer	Closed in	SS 3-4-3
211/23-P7 (OU-P7)	Oil Producer	Closed in	SS 3-4-3
211/23-P11 (OU-P8)	Oil Producer	Closed in	SS 3-4-3
211/23-W1Z (OU-W1S1)	Water Injector	Closed in	SS 3-4-3
211/23-W2Y (OU-W2S2)	Water Injector	Closed in	SS 3-4-3
211/23-W3 (OU-W3)	Water Injector	Closed in	SS 3-4-3
211/23-W4Z (OU-W4S1)	Water Injector	Closed in	SS 3-4-3

For details of well categorisation see OGUK Guidelines for the Suspension or Abandonment of Wells. Issue 5, July 2015, appendix D.

2.5 Drill Cuttings

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)**
Production drill centre 61° 19.401' N 01° 32.712' E	5,834	2,130
Water injection drill centre 61° 19 .596' N 01° 32.722' E	3,092	922

2.6 Inventory Estimates

Table 2-7 provides an estimate of the total weight of materials associated with the Osprey Pipelines and Structures Decommissioning Programmes, including approximately 708 tonnes of steel associated with the Osprey wellheads, as described in section 2.2.

A further breakdown of the inventory estimates for Subsea Installations and Subsea Pipelines is provided in Figure 2-1 and Figure 2-2 respectively.

All wells will be abandoned in accordance with OGUK Guidelines for the Abandonment of Wells, Issue 5, July 2015. A PON5 will be submitted through the OGA WONS and Chemical Permits and Marine Licences will be submitted via the BEIS Oil Portal (PETS) system to support the work to be carried out. Xmas trees will be removed using a MODU. The wellheads may also be removed by the MODU or at a later stage using a DSV.

Table 2-7: Inventory of material associated with Osprey pipelines and structures removal

Item	Description	Mass (t)
Metals	*Ferrous (steel - all grades)*	6,529
	Non-ferrous (copper; aluminium; zinc; indium)	76.4
Concrete	*Aggregates (mattresses; grout bags; sand bags)*	1,202
Plastic	*Rubbers; polymers*	288
Hazardous	*Residual fluids (hydrocarbons; chemicals; control fluid)*	18.42
	NORM scale	10.1
Other	*Fibre optics*	-
	Total (tonnes)	**8,124**

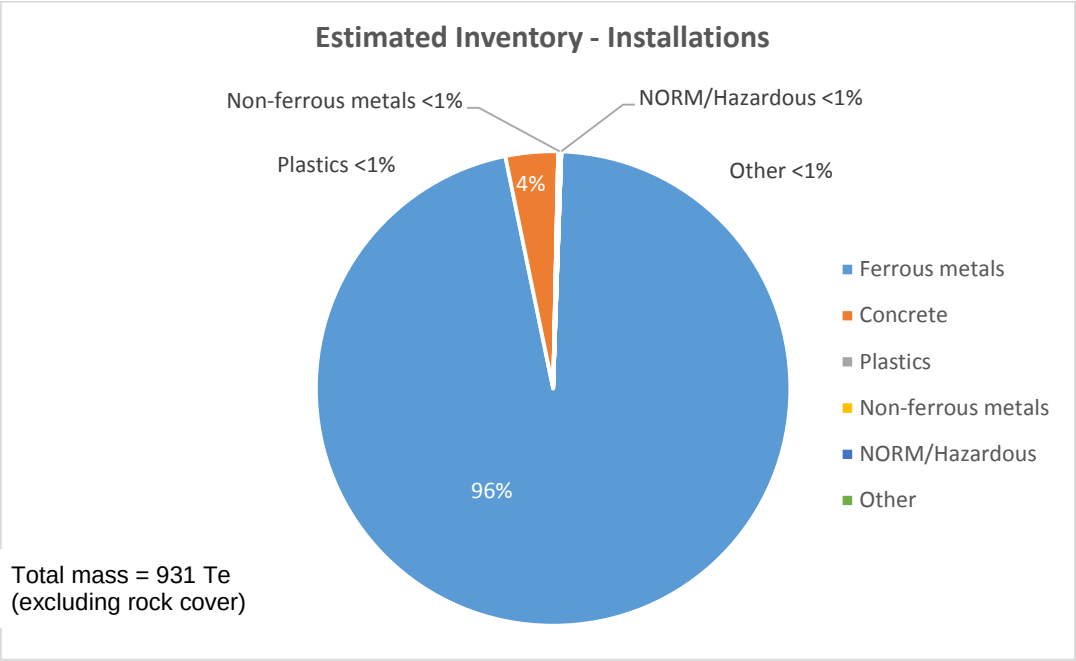

Figure 2-1: Pie Chart of Estimated Inventories (Installations)

Figure 2-1 includes 65 tonnes of steel associated with the Osprey PLBM which was recovered for in 2013.

Please refer to sections 2.1 and 7.1 of the Osprey Subsea Decommissioning Environmental Statement for further details.

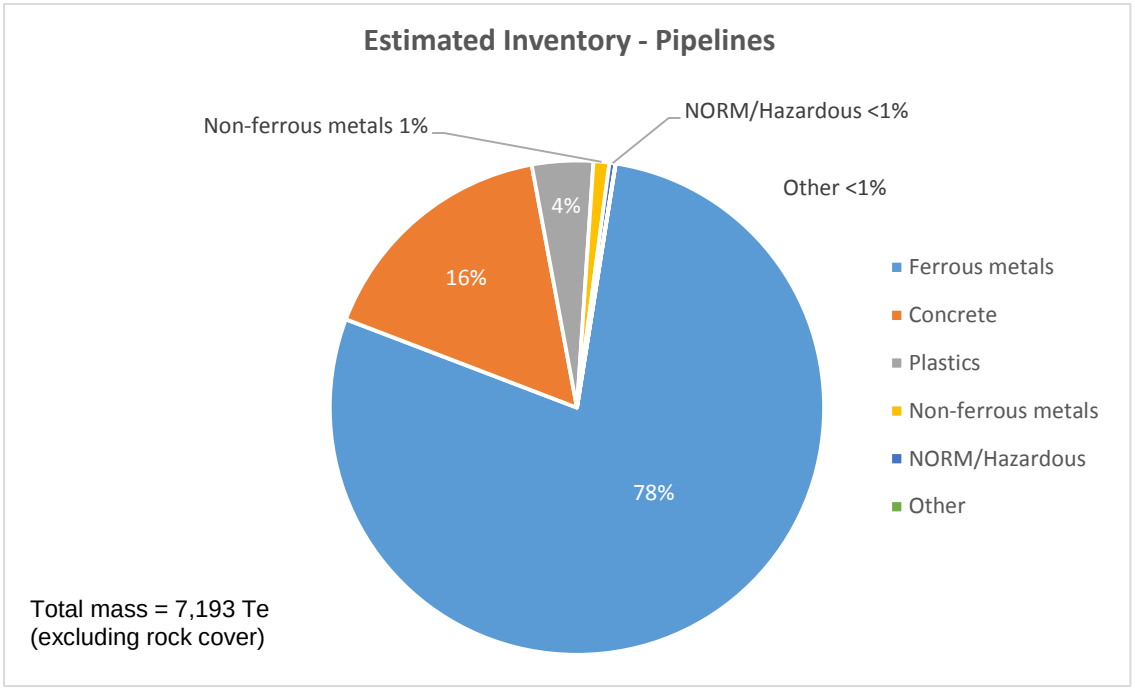

Figure 2-2: Pie Chart of Estimated Inventories (Pipelines)

Please refer to sections 2.1 and 7.1 of the Osprey Subsea Decommissioning Environmental Statement for further details.

3 REMOVAL AND DISPOSAL METHODS

In line with the waste hierarchy principles, reuse of pipelines and subsea installations (or parts thereof) was first in the order of preferred decommissioning options for assessment. The reuse of Osprey bundles (PL733 and PL734) complete with integrated towheads was not considered an option due to the technological challenges associated with re-floating and relocating the bundles. The reuse of Osprey pipelines within the bundles was not considered an option as they are past their service life and contain known defects that prohibit continued use. Reuse of manifolds was also dismissed due to the age and bespoke design of this type of equipment.

Recovered infrastructure will be returned to shore and transferred to a suitably licensed decommissioning facility. It is expected that the manifolds, flowlines, spool pieces and control jumpers would be cleaned before being largely recycled.

Concrete mattresses, grout bags, and sand bags will be cleaned of marine growth onshore if required, and either reused, recovered as aggregate for infrastructure projects, or sent to landfill.

An appropriately licensed disposal yard has not yet been selected. However, the selection process will ensure that the chosen facility is able to demonstrate a proven disposal track record and waste stream management throughout the deconstruction process, as well as the ability to deliver innovative reuse /recycling options. Locations of potential disposal yards may require the consideration of Trans-Frontier Shipment of Waste (TFSW), including hazardous materials. Early engagement with the regulatory authority will ensure any issues with TFSW are addressed.

Fairfield will continue to engage with other companies and wider industries to discuss reuse opportunities. However, Fairfield believes that any further reuse or resale opportunities will be best achieved through the tendering and selection of a waste management contractor with the required knowledge and experience in this area.

Final disposal routes and historical performance will be a key consideration within the tendering process to ensure the aims of the waste hierarchy are best achieved.

3.1 Topsides

3.1.1 Topsides Decommissioning Overview

Table 3-1: Cleaning of Topsides for Removal
N/A

Table 3-2: Topsides Removal Methods
N/A

3.2 Jacket

3.2.1 Jacket Decommissioning Overview

Table 3-3: Jacket Decommissioning Methods
N/A

3.3 Subsea Installations and Stabilisation Features

Table 3-4: Subsea Installations and Stabilisation Features			
Subsea installations and stabilisation features	**Number**	**Option**	**Disposal Route (if applicable)**
Wellheads (comprising of Xmas tree, wellhead, flowbase, 30" conductor and 20" casing to (minus) -3 m)	12	Full recovery as part of MODU campaign and DSV removal of the completion to (minus) -3 m, to P&A wells.	Return to shore for reuse or recycling.
Manifolds	2	Full recovery.	Return to shore for reuse or recycling.
PLBM (manifold)	1	Recovered and returned to shore in 2013.	Processed for recycling.
Templates	N/A	N/A	N/A
Protection frames	4	Full recovery.	Return to shore for reuse or recycling.
Concrete mattresses	N/A	N/A	N/A
Grout bags	N/A	N/A	N/A
Formwork	N/A	N/A	N/A
Frond mats	N/A	N/A	N/A
Rock cover	N/A	N/A	N/A
Dummy wellheads	2	Recovery of conductors to (minus) -3 m.	Return to shore for reuse or recycling.

3.4 Pipelines

3.4.1 Decommissioning Options

*Key to options:

1) Remove - reverse reeling
2) Remove - reverse S lay
3) Trench and bury
4) Remedial removal
5) Remedial trenching
6) Partial removal
7) Leave in place
8) Other (as described)
9) Remedial rock cover

Table 3-5: 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**
Flexible jumpers PL733, PL735 (OOS), PL738, PL739, PL740, PL741, PL742, PL743, PL744, PL745, PL746, PL747, PL748, PL749	Surface laid	Whole	8 Other (disconnect and recover).
Bundles - carrier and internal pipework North bundle I (PL735, PLU2463) North bundle II (PL733, PL734, PL735) South bundle (PL733, PL734, PL735)	Surface laid	Part. Towheads to be cut and removed	3, 4, 7, 8 Other (re-float and tow), 8 Other (cut and lift), 9.
Bundles - Towheads 1 to 7	Surface laid	Whole	8 Other (cut and recover).
Flexible risers PL733, PL734, PL735A	Surface laid / partially rock covered / contained within J-tube	Whole	6, 8 Other (reverse J-tube pull), 8 Other (topside pull), 9.
Umbilical risers PL736, PL736 replacement riser	Surface laid / partially rock covered / contained within J-tube	Whole	6, 8 Other (reverse J-tube pull), 8 Other (topside pull), 9.
Rigid spools PL734	Surface laid	Whole	8 Other (disconnect and recover).
Flexible pipelines PL735A	Surface laid / partially rock covered	Whole	1.
Umbilicals PL1545, PL736	Trenched / rock covered	Whole	1, 3, 4, 5, 6, 7, 8 Other (cut and lift), 9.

Table 3-5: 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**
Umbilicals PL736, PL737, PL754, PL755, PL756, PL757, PL758, PL759, PL760, PL761, PL3001JWP1-7, PL3001JWP4A, PL3960, PL3961, PL3962, PL3963, PL3964, PL3965, PL3966, PL3967, PL3968, PL3969, PL3970, PL3971, PL3972, PL3973, PL3974, PL4975, PL3976, PL3977, PL3978, PL3979, PL3980, PL3981, PL3982, PL3983, PL3984, PL3985, PL3986, PL3987, PL2837, PLU4335, PLU4336, PL4337	Surface laid	Whole	8 Other (disconnect and recover).

3.4.2 CA Method

Comparative Assessment is a core part of the overall decommissioning planning and approval process being undertaken by Fairfield for the subsea infrastructure.

Fairfield's strategy for the CA process is aligned with the OGUK guidelines for Comparative Assessment in Decommissioning Programmes (issue 1st October 2015) and DECC's Guidance Notes for the Decommissioning of Offshore Oil and Gas Installations and Pipelines under the Petroleum Act 1998, Version 6, dated: March 2011.

Fairfield has scoped all the associated infrastructure into logical groupings. All feasible decommissioning options for each group have been identified, assessed, ranked and screened to carry forward the credible options to be assessed through the process of CA.

The CA process uses five assessment criteria of Safety, Environment, Technical, Societal and Economic to compare the relative merits of each option. The assessment criteria are equally weighted to balance and represent the views of the associated key stakeholders.

An independent consultancy using its bespoke configurable Multi Criteria Decision Analysis (MCDA) pairwise software was employed to facilitate the CA process. The assessment team comprised of Fairfield specialists and industry / regulatory experts.

For each assessment criteria the team analysed the relative importance of each option against the other options and looked for a differentiator to judge against each other in either a quantitative or qualitative way, using terms such as 'much stronger than' or 'weaker than'. This was input into the software to allow numerical weightings to be derived for the various competing criteria and is a standard part of any MCDA activity. Once all options were assessed and compared, the software completed the ranking to allow the assessment team, including key external stakeholders, to select the preferred decommissioning option per grouping. The CA output is captured in the Osprey CA report FFL-DUN-OSP-HSE-01-RPT-00001 which supports these decommissioning programmes.

3.4.3 Outcome of Comparative Assessment [1]

Table 3-6: Outcomes of Comparative Assessment

Pipeline or Group	Recommended Option	Justification
Group 3: Bundles	Option 6 - partial removal. Removal of towheads, rock placement over open ends.	Full removal by cut and lift scored poorly during the CA due to safety, technical and economic factors as did attempting to trench the bundles to below seabed level. A strong preference was shown in the CA workshop for partial removal, with safety, technical and economics being the driving factors which placed it above the other CA options. The outcome of this decision point is therefore to decommission Group 3 in situ by partial removal. The infrastructure will be decommissioned by removing the towheads and intermediate structures and placing rock cover the cut ends, spans and damage. Periodic monitoring and remediation will be carried out as required. Fairfield will consider an approach to periodically review the bundles with a view to selecting a permanent option in the future, e.g. full removal or full rock placement, dependent on technology advances and an associated step change in safety (relative to the other options). Any permanent solution will be discussed and agreed with BEIS.
Group 5: Flexible and umbilical risers (PL733, PL734, PL735 and 2x PL736)	Option 6 - partial removal. Outboard cut and recovery.	Partial removal of the risers, where the outboard and exposed sections of the riser are removed, leaving the remainder in the J-tubes, was assessed as being the preferred option in all criteria apart from societal (in which it was considered neutral to the other CA options). The outcome of this decision point is therefore to decommission Group 5 in situ by partial removal; having recovered the surface laid / exposed sections. The fate of the sections within the J-tube will ultimately be determined by the CA covering the fate of the Dunlin Alpha CGBS. The Osprey - Effect of Riser Remaining Study has been conducted examining the effects of decommissioning the risers in the J-tubes and found the consequence on other activities to be negligible.

Table 3-6: Outcomes of Comparative Assessment		
Pipeline or Group	**Recommended Option**	**Justification**
Group 8: Trenched and rock covered umbilicals (PL736 and PL1545)	Option 6 - partial removal. Removal of exposed ends, rock placement over snag hazards and areas of low cover.	With the exception of the end sections, PL736 is trenched and buried to 0.6 m or greater along the majority of the route. 3,820 t of rock is located on the southern section of the umbilical. With the exception of the end sections PL1545 is laid within a trench that exceeds 0.6 m along the majority of the route. Spot rock dumped is located within the trench every 20 to 25m, totalling 10,895 t. Both PL736 and PL1545 are stable and there is no significant seabed mobility within the vicinity of the lines. Natural backfill of PL1545 is expected to continue at its current slow rate.[4] All options considered at the CA were similar however; partial removal exhibited lower levels of personnel exposure, requirement for the addition of new materials and technical challenges. As with all operations, Fairfield will look to minimise safety exposure (to all) and the introduction of new material, to the lowest amount required to ensure confidence in the long term future of the decommissioning solution. The outcome of this decision point is therefore to decommission Group 8 in situ by partial removal by removing exposures outside of the defined trench and placing local rock cover at the cut ends and any areas of low burial depth. Periodic monitoring and remediation will be carried out at this location as required.

[4] FBL-DUN-OSP-SSP-01-RPT-00003 Osprey Subsea Assets, Burial Status

3.5 Pipeline Stabilisation Features

Table 3-7: Pipeline Stabilisation Features			
Stabilisation features	**Number**	**Option**	**Disposal Route (if applicable)**
Concrete mattresses (5 m x 2 m x 0.15 m)	240	Full removal - exposed items presenting a hazard to other users of the sea will be recovered to shore. In the event of practical difficulties with these removals, BEIS will be consulted and a CA submitted as appropriate.	Recover and transport ashore for disposal.
Concrete mattresses (6 m x 2 m x 0.15 m)	8	Full removal - exposed items presenting a hazard to other users of the sea will be recovered to shore. In the event of practical difficulties with these removals, BEIS will be consulted and a CA submitted as appropriate.	Recover and transport ashore for disposal.
Concrete mattresses (6 m x 3 m x 0.15 m)	12	Full removal - exposed items presenting a hazard to other users of the sea will be recovered to shore. In the event of practical difficulties with these removals, BEIS will be consulted and a CA submitted as appropriate.	Recover and transport ashore for disposal.
Concrete mattresses (6m x 3m x 0.3m)	6	Full removal - exposed items presenting a hazard to other users of the sea will be recovered to shore. In the event of practical difficulties with these removals, BEIS will be consulted and a CA submitted as appropriate.	Recover and transport ashore for disposal.
Sand bags	5,295	Full removal - exposed items presenting a hazard to other users of the sea will be recovered to shore. In the event of practical difficulties with these removals, BEIS will be consulted and a CA submitted as appropriate.	Recover and transport ashore for disposal.
Grout bags	280	Full removal - exposed items presenting a hazard to other users of the sea will be recovered to shore. In the event of practical difficulties with these removals, BEIS will be consulted and a CA submitted as appropriate.	Recover and transport ashore for disposal.
Formwork	N/A	N/A	N/A
Frond mats	N/A	N/A	N/A
Rock cover (Te)	18,926 Te	To remain in place.	N/A

3.6 Wells

Table 3-8: Well Plug and Abandonment
The wells which remain to be abandoned, as listed in section 2.4 (Table 2-5) will be plugged and abandoned in accordance with OGUK Guidelines for the Abandonment of Wells, Issue 5, July 2015. A WONS / Portal Environmental Tracking System (PETS) / Marine Licence application will be submitted in support of any such work that is to be carried out.

3.7 Drill Cuttings

Drill cuttings decommissioning options:

Table 3-9: Drill Cuttings Decommissioning Options				
How many drill cuttings piles are present?			Two	
Tick options examined: ☐Remove and re-inject ☑Leave in place ☐Cover ☐Relocate on seabed ☐Remove and treat onshore ☐Remove and treat offshore ☐Other (describe briefly) Cuttings from single wells on Osprey will be left in situ.				
Review of pile characteristics	Pile 1 (Prod)	Pile 2 (WI)	Pile 3	Pile 4
How has the cuttings pile been screened?	Samples taken	Samples taken	N/A	N/A
Dates of sampling (if applicable)	13 Feb to 3 Apr 2016	13 Feb to 3 Apr 2016	N/A	N/A
Sampling to be included in pre-decommissioning survey?	Y	Y	N/A	N/A
Does it fall below both OSPAR thresholds?	Y	Y	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	N/A
What quantity (m^3) would have to be displaced / removed?	N/A	N/A	N/A	N/A
Will the drill cuttings pile have to be displaced in order to remove any pipelines?	Y	Y	N/A	N/A
What quantity (m^3) would have to be displaced / removed?	146.5	113.0	N/A	N/A
Have you carried out a CA of options for the cuttings pile?	N/A	N/A	N/A	N/A

3.7.1 CA Method

The cuttings pile survey, sampling and assessment indicated that the cuttings piles on Osprey fall below the OSPAR thresholds and therefore do not require a CA. The Osprey Drill Cuttings are further discussed in the Osprey Environmental Statement (XOD-DUN-HSE-RPT-00004).

3.7.2 Outcome of CA

Not applicable.

3.8 Waste Streams

The Fairfield Waste Management Strategy (FEL-DUN-HSE-STR-00003) specifies the requirements for the contractor waste management plan. This will be developed as appropriate once the contract is awarded throughout 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 3-10: Waste Stream Management Methods

Waste Stream	Removal and Disposal method
Bulk liquids	Residual fluids within subsea pipelines and associated infrastructure will be discharged in compliance with the appropriate permitry.
Marine growth	Any marine growth returned that is attached to recovered items shall be disposed of onshore by the selected WMC.
NORM / LSA scale	NORM / LSA scale will be transported to shore and disposed of by a selected WMC at an appropriately licensed facility.
Asbestos	N/A
Other hazardous wastes	All hazardous waste will be shipped to shore and disposed of at an appropriately licensed facility.
Onshore dismantling sites	An appropriately licensed disposal yard has not yet been selected. However, the selection process will ensure that the chosen facility is able to demonstrate a proven disposal track record and waste stream management throughout the deconstruction process, as well as the ability to deliver innovative reuse / recycling options. Locations of potential disposal yards may require the consideration of Trans-Frontier Shipment of Waste (TFSW), including hazardous materials. Early engagement with the regulatory authority will ensure any issues with TFSW are addressed.

Table 3-11 summarises the disposition of materials planned for recovery to shore and materials to be left in situ. Further details can be found within the Osprey Field Infrastructure Comparative Assessment Report.

Table 3-11: Inventory Disposition

	Total Inventory Tonnage (Te)	Planned tonnage to shore (Te)	Planned left in situ (Te)
Installations	931	931	0
Pipelines	7,193	1,442	5,751
Total	8,124	2,372	5,751

Table 3-12 indicates Fairfield's disposal aspirations for materials recovered to shore. Steel and other recyclables will account for the majority of materials to be removed and disposed of and a high rate of recycling (95%) is anticipated. Recycling / other recovery rates for concrete will be dependent on the condition of mattresses and the availability of infrastructure projects. Please refer to section 7.4 of the Osprey Subsea Decommissioning Environmental Statement for further information.

Table 3-12: Waste Disposal Aspirations

Waste Stream	Reuse	Recycle	*Other Recovery	Landfill
Ferrous metal	0 to 15%	95 to 98%	0%	0 to 5%
Non-ferrous metal	0%	95 to 98%	0%	0 to 5%
Concrete (aggregates)	0 to 50%	0%	50 to 100%	0 to 25%
Plastics	0%	50 to 75%	15 to 40%	0 to 10%
Residual hydrocarbons	0%	0%	85 to 100%	0 to 15%
NORM scale	0%	0%	0%	**100%
Marine growth	0%	0%	75 to 100%	0 to 25%

* Reuse opportunities will be dependent on availability of infrastructure projects.

** NORM scale may be sent for incineration prior to landfill in order to reduce volume.

4 ENVIRONMENTAL IMPACT ASSESSMENT

4.1 Environmental Sensitivities (Summary)

Table 4-1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Conservation interests	None of the survey work undertaken in the Osprey area has identified any seabed habitats or species that are of specific conservation significance, apart from low numbers of juvenile ocean quahog, which is a threatened species. There are no designated or proposed sites of conservation interest in the Osprey area; the closest designated site, the European Site of Community Importance 'Pobie Bank Reef' lies approximately 99 km to the south west of Osprey, off the east coast of Shetland.
Seabed	The habitat assessment undertaken for the Osprey area determined the sediments to be mainly muddy sand and mixed sediment. The visible animals found across the survey area included polychaete worms and bivalve crustaceans. Species were generally considered to be intolerant of hydrocarbon contaminations. Surveys showed the seabed to host a relatively diverse range of species, with little variation across the area.
Fish	The fish populations in the Osprey area are characterised by species typical of the northern North Sea, including long rough dab, hagfish and Norway pout. Basking shark, tope and porbeagle are all also likely to occur in small numbers. The Osprey area is located within the spawning grounds of cod, haddock, Norway pout and saithe; meaning that these species use the area for breeding. Nursery grounds, where juvenile fish remain to feed and grow, for blue whiting, European hake, haddock, herring, ling, mackerel, Norway pout, spurdog and whiting are also found in the wider area.
Fisheries	Saithe and mackerel (often targeted by the larger pelagic vessels in January and February) are the key commercial species landed from the Osprey area. However, they are of relatively low value when compared to total landings into Scotland. Combined, landings of these species from the wider area, within which the Osprey area sits, comprise only 0.06% of the value of landings into Scotland. Other species of commercial value include megrim, cod and monks / anglers.
Marine mammals	Spatially and temporally, harbour porpoises, white-beaked dolphins, minke whales, killer whales and white-sided dolphins are the most regularly sighted cetacean species in the North Sea. Given the distance to shore, species such as the bottlenose dolphin and grey and harbour seals are unlikely to be sighted in the Osprey area.

Table 4-1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Birds	The Osprey area is important for fulmar, northern gannet, great black-backed gull, Atlantic puffin, black-legged kittiwake and common guillemot for the majority of the year. Manx shearwaters are present in the vicinity of the Osprey area between the spring and autumn months. European storm petrels are present during September and November. Great skua, glaucous gull, Arctic skua and little auk may be present in low densities for the majority of the year. The seasonal vulnerability of seabirds to oil pollution in the immediate vicinity of the Osprey area has been derived from Joint Nature Conservation Committee data; the months of March, July, October and November are those when seabird species in the Osprey area are considered most vulnerable to surface pollution. Overall annual seabird vulnerability is reported to be low.
Onshore communities	Decommissioned infrastructure removed from the seabed will be delivered to one or more onshore dismantling sites. Although the dismantling site has not yet been selected, it will be chosen from existing disposal yards and no new facilities will be required. Onshore dismantling yards will be required to have appropriate management plans in place to manage potential impacts from noise and odour, as well as ensuring no local air quality issues occur.
Other users of the sea	There is very little shipping activity in the Osprey area, and no site of renewable or archaeological interest. There is also limited infrastructure related to other oil and gas developments.
Atmosphere	Using energy to power vessels results in emissions to the air, which can contribute to local air quality issues; the absence of vulnerable receptors in the offshore area means this is not an issue for the Osprey area. However, emissions to air can act cumulatively with those from other activities (such as onshore power generation and use of cars) to contribute to global climate change. These emissions may come from vessel use but also through linked activities such as the recycling of materials brought onshore.

4.2 Potential Environmental Impacts and their Management

4.2.1 EIA Summary

The planned operations have been rigorously assessed through the CA and EIA processes, resulting in a set of selected options which are thought to present the least risk of environmental impact whilst satisfying safety, technical, societal and economic requirements. Based on the findings of the EIA and the identification and subsequent application of the mitigation measures identified for each potentially significant environmental impact (which will be managed through the Fairfield Environmental Management System), it is concluded that operations associated with the decommissioning of Osprey subsea infrastructure and pipelines will result in no significant environmental impact.

4.2.2 Overview

Table 4-2: Environmental Impact Management		
Activity	**Main Impacts**	**Management**
Topsides removal	N/A	N/A
Jacket / floating facility removal	N/A	N/A
Subsea installations removal	Discharges to sea when disconnecting equipment.	Pipelines have been flushed and equipment will be flushed to remove residual fluids to the lowest practicable achievable level prior to removal. Planned discharges of chemicals and residual hydrocarbons will be under an approved permit or consent.
	Seabed disturbance from equipment removal / rock coverage.	Dredging to enable recovery of infrastructure on the seabed will be localised and controlled by diver or ROV. Rock will be placed using a flexible fall pipe, assisting with positional accuracy and controlling the spread of the material.
	Underwater noise from vessel usage and cutting operations.	The duration of the noise emitting activities will be limited by deploying vessels only where necessary and limiting the number of cuts as far as is practicable. A campaign approach will be prepared allowing vessels to undertake multiple tasks.
Subsea installations removal	Atmospheric emissions from vessel usage.	Operations planning to reduce vessel numbers and durations. Onshore facilities will have appropriate management procedures in place to ensure that atmospheric emissions are below levels that could affect local air quality.
	Impacts on other users.	Infrastructure decommissioned in situ will be buried to a sufficient depth. Over-trawls to verify that the seabed has been left in a condition that does not present a hazard to commercial fishing will be undertaken.
Decommissioning pipelines	See subsea installations removal above.	See subsea installations removal above.
Decommissioning stabilisation features	See subsea installations removal above.	See subsea installations removal above.
Decommissioning drill cuttings	Long-term presence of hydrocarbons in sediments. Leaching of hydrocarbons from the drill cuttings pile.	Characteristics of the Osprey drill cuttings pile were compared against the OSPAR Recommendation 2006/5 Cuttings Pile Management Regime Stage 1 thresholds. These were found to be below the OSPAR rate of oil loss and persistence thresholds. Cuttings coverage is small, thin and widely dispersed. Leave in place to degrade naturally.

5 INTERESTED PARTY CONSULTATIONS

5.1 Consultations Summary

Table 5-1: Summary of Stakeholder Comments		
Consultee	**Nature of Engagement**	**Status**
Statutory Consultations		
National Federation of Fishermen's Organisations	Alan Piggott contacted and consulted on decommissioning scope of work.	National Federation of Fishermen's Organisations (NFFO) to be represented and updated by the Scottish Fishermen's Federation (SFF).
Scottish Fishermen's Federation	SFF participated in the Comparative Assessment process and had a series of face to face engagements during the compilation of the decommissioning programmes. Written comments received during formal consultation period.	Meeting held with Steven Alexander and Raymond Hall in September 2017 to address comments received during the formal consultation period. Written response provided to SFF in December 2017.
Northern Ireland Fishermen's Federation	Dick James contacted and consulted on decommissioning scope of work.	Northern Ireland Fishermen's Federation (NIFF) to be represented and updated by the Scottish Fishermen's Federation (SFF).
Global Marine Systems Limited	John Wrottesley contacted and consulted on decommissioning scope of work.	No impact to other users of the sea in the geographical area.
Other Consultations		
UK Fisheries Legacy Trust Fund (FLTC)	Clarifications requested on the scope and timing of the decommissioning proposals.	Meeting held in July 2017 and requested details provided.
Scottish National Heritage (SNH)	Confirmation received from SNH that proposals are outwith SNH jurisdiction, being outside Scottish Territorial Waters (12nm)	No action required.
World Wide Fund for Nature (WWF)	Written comments received during formal consultation period (submitted jointly with WDCS)	Detailed written response provided to WWF and a follow-up engagement meeting held in December 2017.
Whale & Dolphin Conservation Society (WDCS)	Written comments received during formal consultation period (submitted jointly via WWF)	Detailed written response provided via World Wide Fund for Nature (WWF).
Public	Fairfield Energy Limited website & email address used for decom materials: http://www.fairfield-energy.com/ stakeholder.mailbox@fairfield-energy.com	No outstanding queries.

6 PROGRAMME MANAGEMENT

6.1 Project Management and Verification

A Project Management Team (PMT) has been appointed to manage suitable subcontractors for the removal of the Osprey subsea equipment. Standard procedures for operational control and hazard identification and management will be used. Where possible the work will be co-ordinated with other decommissioning operations in the northern North Sea. The PMT will monitor and track the progress of consents and the consultations required as part of this process. Any changes in detail to the offshore removal programme will be controlled by Fairfield via the Management of Change processes and discussed and agreed with BEIS.

6.2 Post-Decommissioning Debris Clearance and Verification

During site clearance activities, FFL will undertake reasonable endeavours to recover any dropped objects subject to any outstanding Petroleum Operations Notices (PON). All recovered seabed debris related to offshore oil and gas activities will be returned for onshore disposal or recycling in line with existing disposal methods. A post decommissioning site survey will be carried out around 500 m radius of installation sites and 200 m corridor along each existing pipeline route (100 m either side). Independent verification of seabed state will be obtained by overtrawling the installation site. This will be followed by a statement of clearance to all relevant governmental departments and NGOs. For the pipeline corridors, FFL will conduct a geophysical survey and any oilfield related objects/debris identified will be removed by an ROV. Evidence of a clear seabed will be submitted to OPRED in place of a clear sea bed certificate.

6.3 Schedule

6.3.1 Osprey Project Schedule

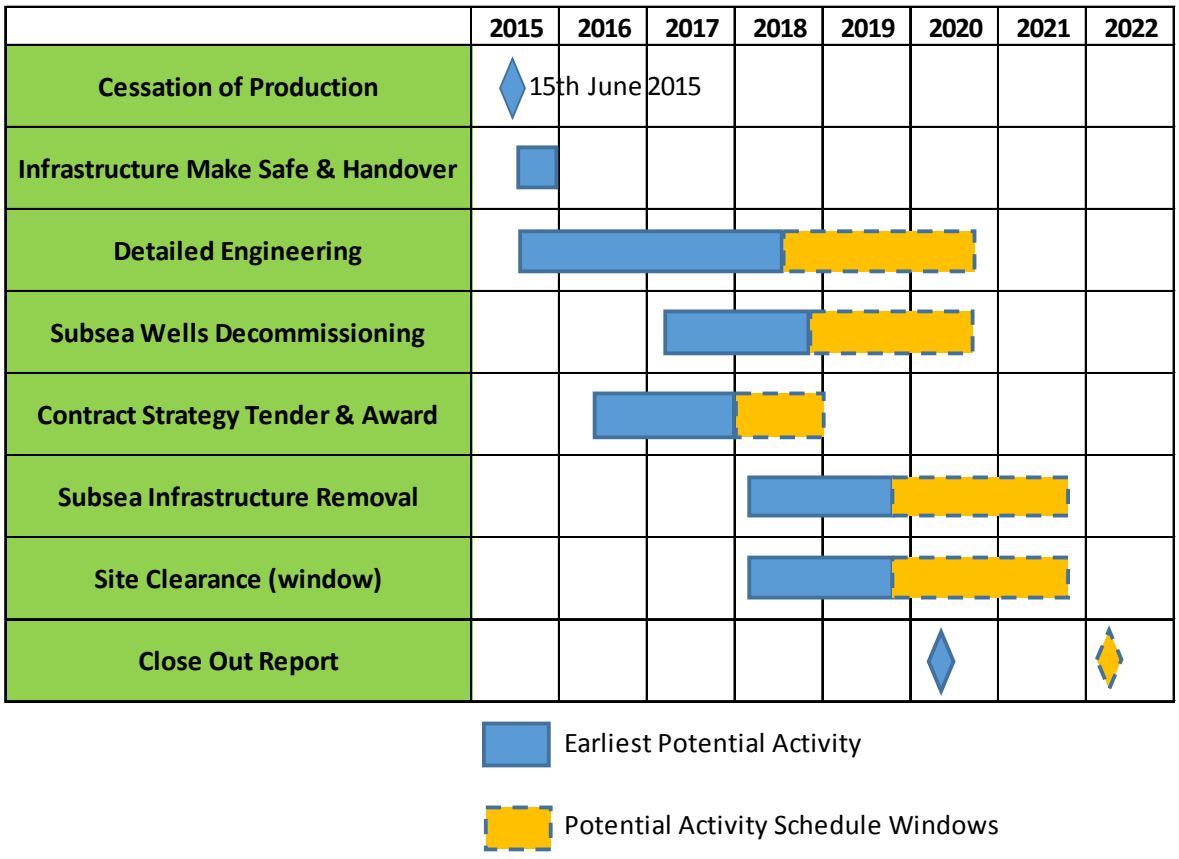

Figure 6-1: Gantt Chart of Project Schedule

6.4 Costs

FFL are following OGUK Guidelines on Decommissioning Cost Estimation (Issue 3, September 2013) for the decommissioning of the Greater Dunlin Area.

Table 6-1: Provisional Decommissioning Programmes costs	
Item	**Estimated Cost (£m)**
Platform preparation / removal and disposal	N/A
Pipelines decommissioning	Provided to BEIS separately
Subsea installations and stabilisation features	Provided to BEIS separately
Well abandonment	Provided to BEIS separately
Continuing liability - future pipeline and environmental survey requirements	Provided to BEIS separately
TOTAL	Provided to BEIS separately

6.5 Close Out

Following completion of the Greater Dunlin Area offshore decommissioning scope, a close out report will be submitted to BEIS and posted on the Fairfield website explaining any variations from the Decommissioning Programmes, in accordance with the requirements in operation at that time. This includes debris removal and 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 sites of the wellheads and installations will be carried out. The survey will focus on chemical and physical disturbances of the decommissioning scope of work and be 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 installation sites will be the subject of surveys when decommissioning activity has concluded. In addition a baseline survey of the bundle sections shall be undertaken to establish the existing mechanical properties. After the surveys have been sent to BEIS and reviewed, a post monitoring decommissioning survey regime will be agreed by both parties. Typically a minimum of two post-decommissioning environmental surveys and structural pipeline surveys are expected.

The main risk from infrastructure remaining in situ, is the potential for interaction with other sea users, specifically from fishing related activity. Fairfield has conducted material degradation studies that reviewed the anticipated material breakdown of infrastructure left in situ and the effect this could have on other sea users[5/6]. Where the infrastructure is trenched below seabed level, trenched and buried or contained within the limits of the Dunlin Alpha Platform the effect on other sea users is considered to be negligible. With regards to the bundle sections that are exposed on the seabed, the effect of interaction is more noted. The bundle sections are designed to be over-trawlable however; as the material degrades snag hazards may become evident. It is estimated that snag hazards may appear between 30 and 65 years after decommissioning, dependent on the location along the bundle.

[5] A-301649-S01-TECH-001 Osprey - Long Term Materials Degradation Study
[6] A-301649-S01-TECH-004 Osprey - Effect of Leaving Riser Section Within J-tube

Risks to fishermen have been evaluated, based on the type of fishing activity undertaken within the area, number of crossings made over the infrastructure while actively fishing and the seabed condition due to the installation features of the infrastructure[7], e.g. construction berms, areas of low cover, exposed sections, etc.

For the trenched infrastructure the potential loss of life due to snagging, after decommissioning, is in the order of 2.85E-06 (fatality frequency of 1 in 350,877 years).

For the trenched and buried infrastructure the potential loss of life due to snagging, after decommissioning, is in the order of 3.78E-07 (fatality frequency of 1 in 2,645,502 years).

For the exposed bundle infrastructure the potential loss of life due to snagging, after decommissioning, is in the order of 4.14E-06 (fatality frequency of 1 in 241,545 years) for the North Bundle and 3.02E-05 (fatality frequency of 1 in 33,112 years) for the South Bundle.

The infrastructure is currently shown on Admiralty Charts and the FishSafe system. Once decommissioning activities are complete, updated information on the Osprey subsea area, i.e. which infrastructure remains in situ and which has been removed, will be made available to allow the Admiralty Charts and the FishSafe system to be updated and the subsea 500 m zones to be removed.

Due to the location and low seabed mobility, infrastructure remaining in situ that is trenched or trenched and buried is unlikely to become exposed. For the exposed bundle sections, excessive spanning is unlikely to occur. Should future surveys find evidence of any exposures, spans or interactions that exceed the FishSafe criteria, these will be submitted for inclusion within the FishSafe database.

Fairfield recognises its commitment to monitor any structures decommissioned in situ and therefore intends to set up arrangements to undertake post-decommissioning monitoring on behalf of the licence owners. The frequency of required monitoring will be agreed with BEIS and future monitoring will be determined through a risk-based approach based on the findings from each subsequent survey. During the period over which monitoring is required, the status of the infrastructure decommissioned in situ would be reviewed and any necessary remedial action undertaken to ensure it does not pose a risk to other sea users. Further details are provided within the ES section 6.2.3.

On an annual basis for a period of 10 years post-decommissioning programme approval, FEL will submit a report to OPRED detailing Osprey bundle removal feasibility, assessment and evaluation for consideration by OPRED Decommissioning Unit representatives.

In addition FEL will contribute in the development of techniques to remove to shore large diameter subsea pipeline bundles of the size of the Osprey Field pipeline bundle and will actively participate in opportunities for JIP and any other relevant approaches, to stimulate the supply chain with respect to removal techniques for such large diameter subsea pipeline bundles.

[7] A-3910-XG-RA-1 Dunlin, Osprey & Merlin Subsea Infrastructure Decommissioning Fishing Risk Assessment

7 SUPPORTING DOCUMENTS

Table 7-1: Supporting Documents	
Document Number	**Title**
1) FFL-DUN-OSP-HSE-01-RPT-00001	*Osprey Comparative Assessment Report*
2) XOD-DUN-HSE-RPT-00004 (Xodus)	*Osprey Environmental Statement*
3) FFL-DUN-OSP-HSE-01-RPT-00002	*Osprey Cost Summary Report (confidential, issued to BEIS only)*
4) FBL-DUN-DAOM-HSE-01-PLN-00001	*Greater Dunlin Area DP Bridging Doc*

For latest document versions see http://www.fairfield-energy.com/

8 PARTNER LETTER OF SUPPORT

MCX OSPREY (UK) LTD.
Mid City Place, 71 High Holborn
London, WC1V 6BA, United Kingdom

December 11, 2017

Offshore Petroleum Regulator for Environment & Decommissioning
Offshore Decommissioning Unit
AB1 Building
Crimon Place
Aberdeen
AB10 1BJ

FAO: Ms. Debbie Taylor, Senior Decommissioning Manager

Dear Ms. Taylor

OSPREY DECOMMISSIONING PROGRAMMES

We, MCX Osprey (UK) Limited, confirm that we authorise Fairfield Fagus Limited to submit on our behalf the Osprey Pipelines and Structures Decommissioning Programmes dated 8th December 2017 as directed by the Secretary of State in August 2008 and August 2016 respectively.

We confirm that we support the proposals detailed in the Osprey Pipelines and Structures Decommissioning Programmes dated 8th December 2017 which are to be submitted by Fairfield Fagus Limited in so far as they relate to those facilities in respect of which we are required to submit an abandonment programme under Section 29 of the Petroleum Act 1998.

Yours Sincerely,

Jiro Mukai
Director
MCX Osprey (UK) Limited

9 APPENDIX 1 – STATUTORY CONSULTEE CORRESPONDENCE

Global Marine Systems (GMS) Ltd.

Point of contact: John Wrottesley

Summary - Introduction made on 13th May 2016, follow up made on 20th May 2016, Greater Dunlin Area Decommissioning has no impact to others in the geographical area.

Scottish Fishermen's Federation, incorporating:

Anglo-Scottish Fishermen's Association
Clyde Fishermen's Association
Fife Fishermen's Association
Fishing Vessel Agents & Owners Association (Scotland) Limited
Mallaig and North-West Fishermen's Association Limited
Orkney Fisheries Association
Scallop Association
Scottish Pelagic Fishermen's Association Limited
Scottish White Fish Producers' Association Limited (SWFPA)
Shetland Fishermen's Association

Point of contact: Steven Alexander / Raymond Hall

Summary of meetings:

Jan 2010 (21st)	Workshop	Introduction to Greater Dunlin Area
May 2010	Document	Reuse report
June 2010 (8th)	Meeting	Briefing
Jul 2010	Document	Re-float report #1
May 2011 (12th)	Meeting	Briefing
Jun 2011	Document	Cell contents Impact Assessment
Jul 2011	Document	Access to legs and cells report
Aug 2011	Document	Re-float report #2
Oct 2011 (7th)	Meeting	Briefing
Oct 2011	Document	In situ decom options
Nov 2011	Document	In situ decom options
Dec 2015 (22nd)	Meeting	Consultation
Mar 2016 (4th)	Meeting	Subsea CA option coarse screening
Dec 2016 (8th)	Meeting	CA briefing session
Jan 2017 (10th)	Workshop	Comparative Assessment
Sept 2017 (8th)	Meeting	Clarifications to public consultation documentation
Nov 2017 (30th)	Letter	Formal correspondence to public consultation SFF letter

National Federation of Fishermen's Organisations (NFFO)

Point of contact: Alan Piggott

Summary – Introduction made on 31st May 2016, NFFO requested to be represented and updated by SFF.

Northern Ireland Fishermen's Federation

Point of contact: Dick James

Summary - Introduction made on 31st May 2016, NIFPO requested to be represented and updated by SFF.

General Public

Identified external stakeholders / organisations have been emailed to raise awareness of the Greater Dunlin Area decommissioning programmes. Notifications made through applicable press releases. Formally engaged with general public upon submission of the Consultation Draft of the Decommissioning Programmes prior to the 30 day public consultation period.

10 APPENDIX 2 – PUBLIC NOTICES

The Shetland Times printed June 23rd 2017:

PUBLIC NOTICE

The Petroleum Act 1998

GREATER DUNLIN AREA SUBSEA DECOMMISSIONING PROGRAMMES

Fairfield Betula Limited and Fairfield Fagus Limited have submitted, for the consideration of the Secretary of State for Business, Energy and Industrial Strategy, consultation draft Decommissioning Programmes for the Dunlin Area subsea satellite fields infrastructure and associated field utility lines in accordance with the provisions of the Petroleum Act 1998. It is a requirement of the Act that interested parties be consulted on such decommissioning proposals.

The facilities covered by the subsea infrastructure Decommissioning Programmes in the Greater Dunlin Area (Blocks 211/18a, 211/23a and 211/23b), Northern North Sea, are:

1. Merlin subsea manifold and associated infrastructure
2. Osprey subsea manifolds and associated infrastructure
3. Dunlin Fuel Gas Import (DFGI) and Dunlin Power Import (DPI) lines

Fairfield Betula Limited and Fairfield Fagus Limited hereby give notice that the Decommissioning Programmes above can be viewed online at **www.fairfield-energy.com/public-consultation** for 30 days from today's date.

Alternatively, a digital copy of the Decommissioning Programmes can be requested from, or hard copies inspected at:

Reception
Fairfield Energy Limited
19 Abercrombie Court,
Prospect Road,
Arnhall Business Park,
Westhill, Aberdeen, AB32 6FE.
Tel: 01224 320500

Representations regarding the Greater Dunlin Area Subsea Decommissioning Programmes should be submitted to **stakeholder.mailbox@fairfield-energy.com** before the consultation closing date (23rd July 2017) and should state the grounds upon which any representations are being made. Representations can also be made in writing to Peter Lee, Environment, Health, Safety and Asset Integrity Manager, at the above address.

23rd June, 2017.

The Press and Journal printed June 23rd 2017:

PUBLIC NOTICE

The Petroleum Act 1998

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23rd June 2017

The Edinburgh Gazette printed 26th June 2017, number 27888 (available online 21st to 25th June 2017):

ENVIRONMENT & INFRASTRUCTURE

ENVIRONMENT & INFRASTRUCTURE

ENERGY

THE PETROLEUM ACT 1998
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23rd June 2017 (2809926)

The Guardian printed 26th June 2017:

PUBLIC NOTICE

The Petroleum Act 1998

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23rd June 2017