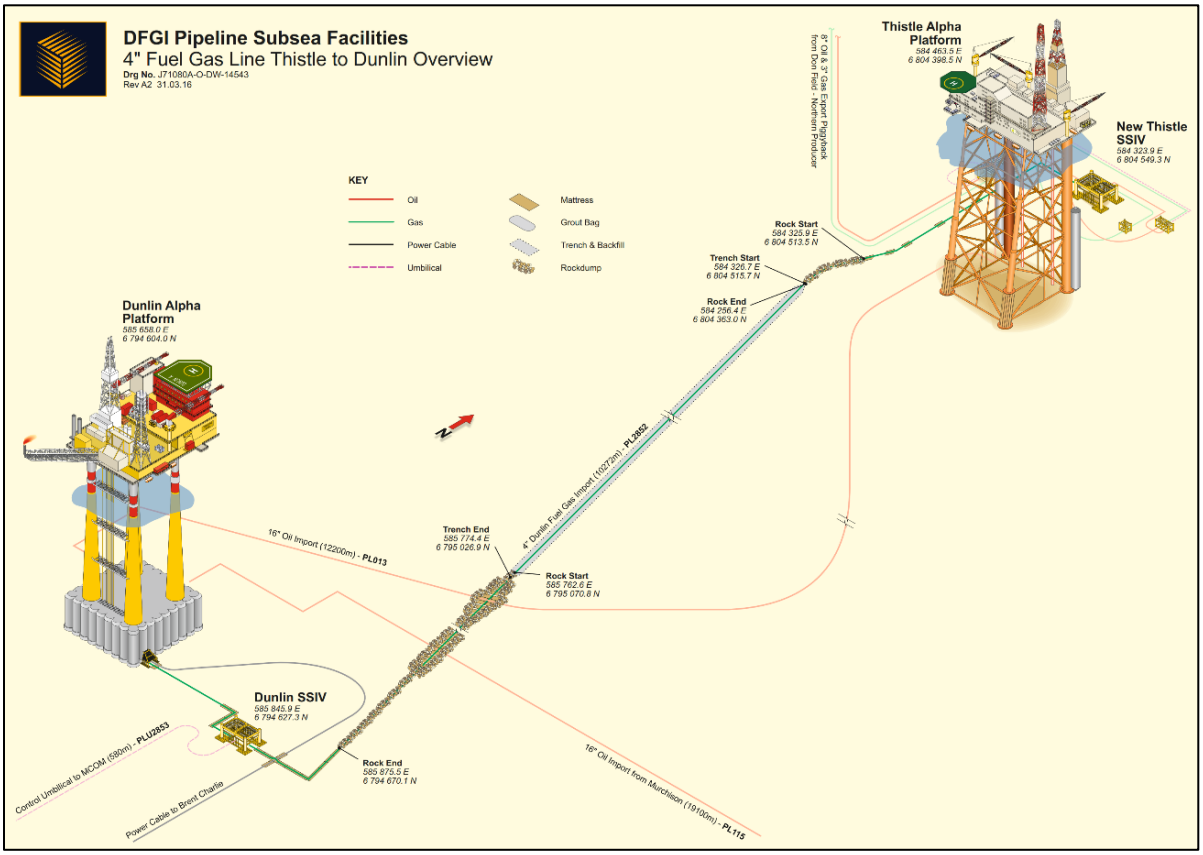
Fairfield Betula Limited

Dunlin Fuel Gas Import (DFGI) and Dunlin Power Import (DPI)
Decommissioning Programmes (DP4)
(Non-Derogation)

Final Version

FBL-DUN-DUNA-HSE-01-PLN-00002



Document Control

Approvals

	Name	Signature	Date
Prepared by	**Jonathan Bird**		8 DEC 2017
Reviewed by	**James Clarkson**	JCL	8/12/17
Approved by	**Peter Lee**	PL	8/12/17

Revision Control

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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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Contents

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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)
DFGI	Dunlin Fuel Gas Import
DP	Decommissioning Programme(s)
DPI	Dunlin Power Import
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
INST	Installation
IPR	Interim Pipeline Regime
JOA	Joint Operating Agreement
LPP	2 or 3 Layer Poly Propylene
LSA	Low Specific Activity (related to NORM)
MCDA	Multi Criteria Decision Analysis
MCOM	Merlin Cross Over Manifold
MER	Maximising Economic Recovery
MoM	Minute of Meeting
N/A	Non Applicable
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers' Organisation Limited
NLGP	Northern Leg Gas Pipeline
NORM	Naturally Occurring Radioactive Material (related to LSA)
OGA	Oil & Gas Authority
OGUK	Oil & Gas UK
OSPAR	Oslo Paris Convention
PETS	Portal Environmental Tracking System
PL	Pipeline
PLU	Pipeline: Umbilical
PMT	Project Management Team
PON	Petroleum Operations Notice

Abbreviation	Explanation
PWA	Pipeline Works Authorisation
RPS	Riser Protection Structure
S29	Section 29 Notices
SFF	Scottish Fishermen's Federation
SSIV	Subsea Isolation Valve
SWFPA	Scottish White Fish Producers Association
TBC	To Be Confirmed
TFSW	Trans-Frontier Shipment of Waste
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
WMC	Waste Management Contractor

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 Dunlin field subsea installations and pipelines that apply to the following Section 29 (S29) Notices:

1. DFGI pipeline (PL2852) and SSIV umbilical (PLU2853) (issued November 2011)
   Note: DPI (PL4334) is an electrical cable and does not have an S29 Notice
2. Dunlin block and subsea facilities (these DPs are for the subsea facilities only).

Note that the Dunlin Alpha installation is subject to a separate Decommissioning Programme reference 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 Dunlin (UK) Ltd. holds a 100% interest in each of the Dunlin Alpha and Dunlin SW licences and is therefore the Owner of all Dunlin and Dunlin SW pipelines. Fairfield Betula Ltd. (FBL) is the appointed licence operator under a Joint Operating Agreement (JOA) in relation to all Dunlin and Dunlin SW licences. FBL is also the 'Lead Operator' under a JOA in relation to all of Dunlin, Merlin and Osprey fields.

FBL and MCX Dunlin (UK) Limited are included as S29 holders of the DFGI 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 Dunlin subsea 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 Dunlin subsea 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 Dunlin Subsea Infrastructure comprising of DFGI and DPI, 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.

A 4 inch Dunlin Fuel Gas Import (DFGI) pipeline was installed in 2012, allowing natural gas to be imported from the EnQuest Thistle Alpha platform for use as fuel gas for the Dunlin Alpha Water Injection primary movers.

In addition, a 5 inch Dunlin Power Import (DPI) cable runs subsea from the Shell operated Brent Charlie platform to the Dunlin Alpha platform and was used as a contingency source of power for the Dunlin Alpha platform.

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 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 Dunlin Subsea area are in compliance with DECC and Oil & Gas UK (OGUK) guidelines and have been 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:	Dunlin	**Production Type (Oil / Gas / Condensate)**	Oil
Water Depth (m)	151	**UKCS block**	211/23a
Surface Installations			
Number	**Type**	**Topsides Weight (Te)**	**Jacket Weight (Te)**
N/A	N/A	N/A	N/A
Subsea Installations		**Number of Wells**	
Number	**Type**	**Platform**	**Subsea**
2	SSIV structure and Riser Protection Structure	N/A	0

Table 1-1: Installations Being Decommissioned			
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)**
0	N/A	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 Betula Limited	04465204	0%
Fairfield Energy Limited	05562373	0%
MCX Dunlin (UK) Limited	06451712	100%
Mitsubishi Corporation	BR005199	0%
Shell UK Limited	00140141	0%
Siccar Point Energy E&P Limited	01504603	0%
Statoil (UK) Limited	01285743	0%

Note that installations are part of the Dunlin Alpha offshore installation S29 group and are listed above for completeness for the DFGI / DPI infrastructure / system.

1.4.2 Pipelines

Table 1-3: Pipelines Being Decommissioned		
Number of Pipelines	Three (3) 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%***
Fairfield Betula Limited	04465204	0%
MCX Dunlin (UK) Limited	06451712	100%
Mitsubishi Corporation	BR005199	0%

1.5 Summary of Proposed Decommissioning Programmes

Table 1-5: Summary of Decommissioning Programmes		
Selected Option	**Reason for Selection**	**Proposed Decommissioning Solution**
1. Topsides		
N/A	N/A	N/A
2. Jacket / Floating Facility (FPSO, etc.)		
N/A	N/A	N/A
3. Subsea Installations		
DFGI SSIV	Removal of all seabed structures to leave a clear seabed.	Full removal.
Riser Protection Structure	Removal of all seabed structures to leave a clear seabed.	Full removal.
4. Pipelines, Flowlines and Umbilicals[1]		
Group 1a: deposits	Leaves clear seabed and meets regulations.	Full removal.
Group 1b: structures	Leaves clear seabed and meets regulations.	Full removal.
Group 2: buried structures and deposits	Comparatively assessed as preferred option. Leaves clear seabed and meets regulatory requirements.	Full removal.
Group 3: rigid risers	Comparatively assessed as preferred option. The risers are contained within the Dunlin Alpha concrete gravity based structure.	Partial removal.
Group 4: surface laid rigid spools	Leaves clear seabed and meets regulations.	Full removal.
Group 5: trenched and buried pipelines	Comparatively assessed as preferred option. The pipelines 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 6: rock covered surface laid rigid spools	Comparatively assessed as preferred option. Leaves clear seabed and meets regulatory requirements.	Full removal.

[1] FBL-DUN-DUNA-SSP-01-RPT-00002 - Dunlin Subsea Assets (DPI & PL2852), Burial Status.

Group 7: rock covered surface laid umbilicals	Comparatively assessed as preferred option. Leaves clear seabed and meets regulatory requirements.	Full removal.
Group 8: riser cable (Dunlin Alpha)	Comparatively assessed as preferred option. The riser is contained within the Dunlin Alpha concrete gravity based structure.	Partial removal.
Group 9: trenched and buried cable	Comparatively assessed as preferred option. The cable is 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 10: riser cable (third party infrastructure)	Comparatively assessed as preferred option. The riser is contained within the Brent Charlie concrete gravity based structure.	Partial removal.
5. Wells		
N/A	N/A	N/A
6. Drill Cuttings		
N/A	N/A	N/A
7. Interdependencies		
DFGI (PL2852) crosses over both the Thistle Alpha to Dunlin Alpha export pipeline (PL13) and the Murchison to Dunlin Alpha export pipeline (now disconnected PL115), plus crosses over the DPI cable (PL4334). The umbilical (PLU2853) for the DFGI SSIV crosses the Dunlin Alpha to Cormorant Alpha export pipeline (PL5). DPI (PL4334) passes under the DFGI pipeline (PL2852) and crosses over both Magnus to Brent Alpha 20" export pipeline (PL164) and Brent Charlie to Cormorant Alpha 30" export pipeline (PL1).		

1.6 Field Location Including Field Layout and Adjacent Facilities

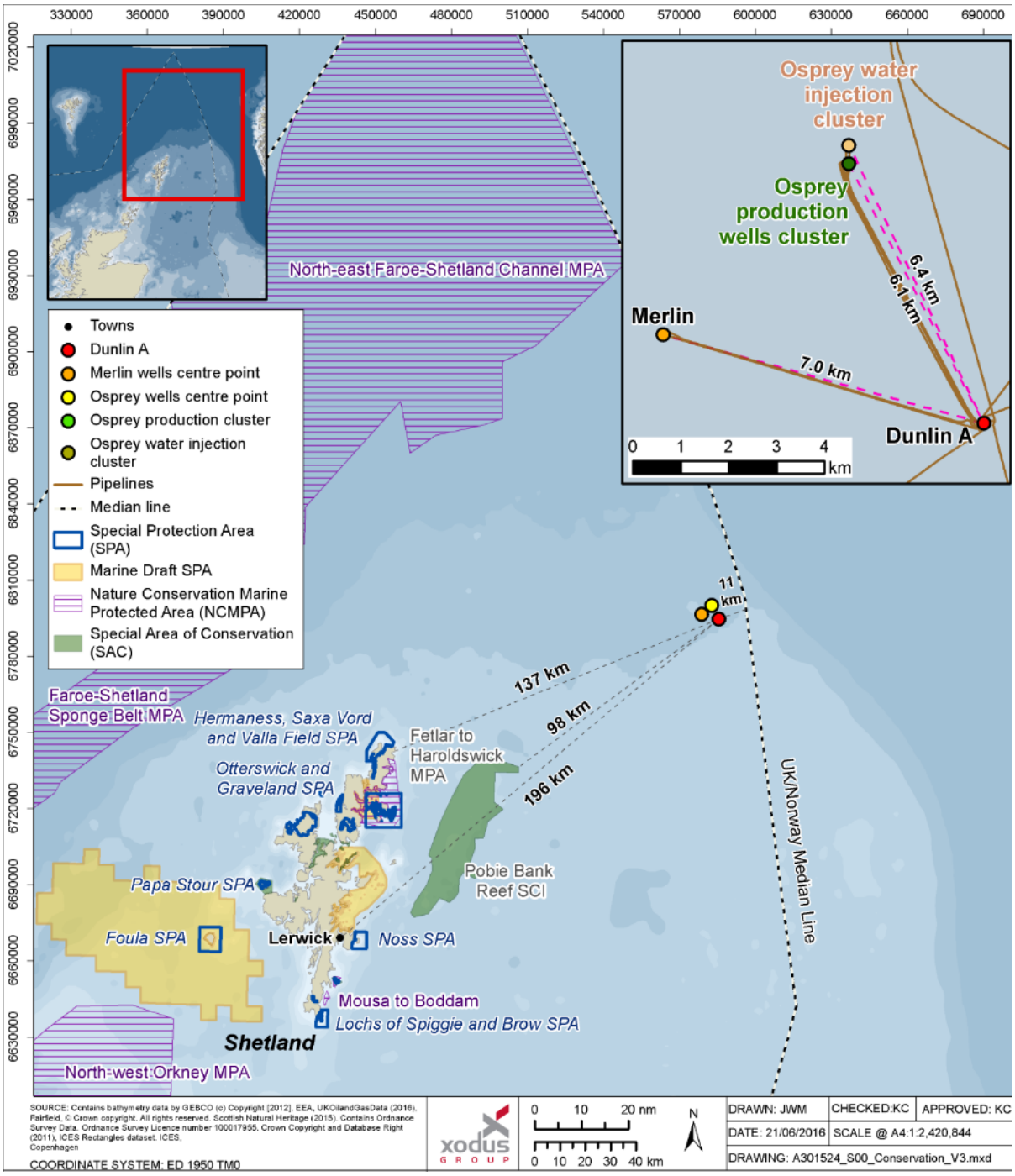

Figure 1-1: Field Location in UKCS

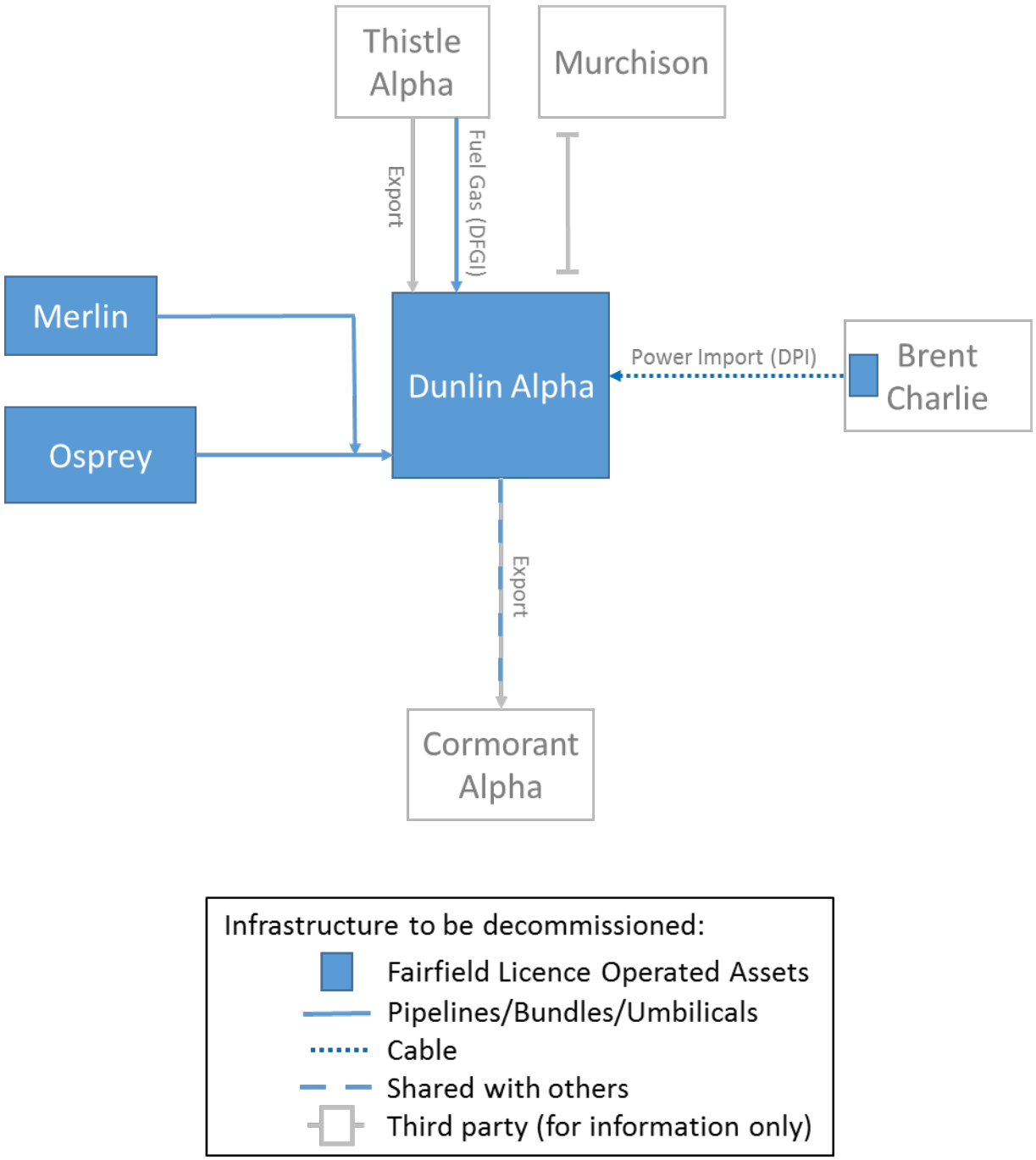

Figure 1-2: Greater Dunlin Area Configuration Map

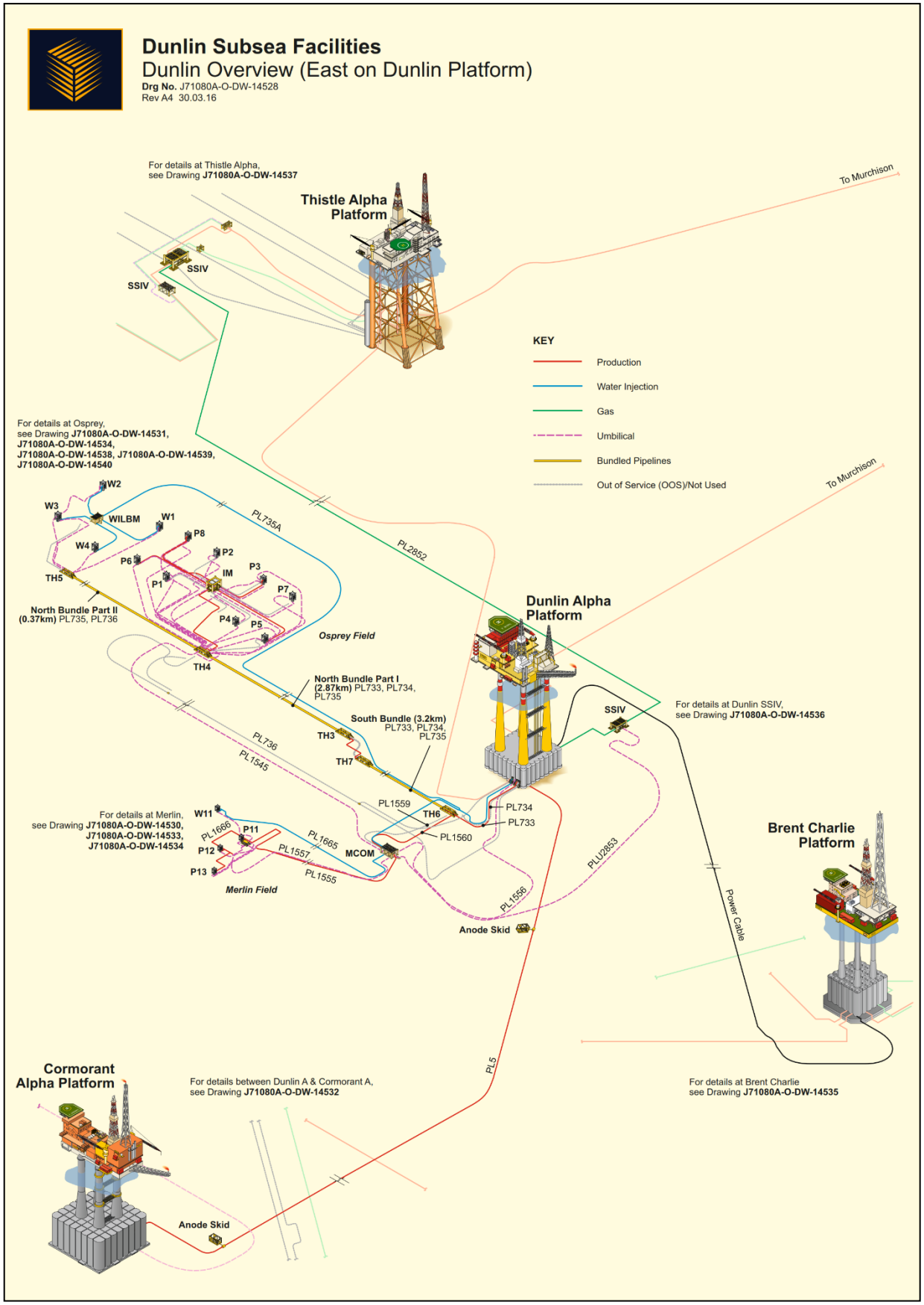

Figure 1-3: Greater Dunlin Area Field Layout

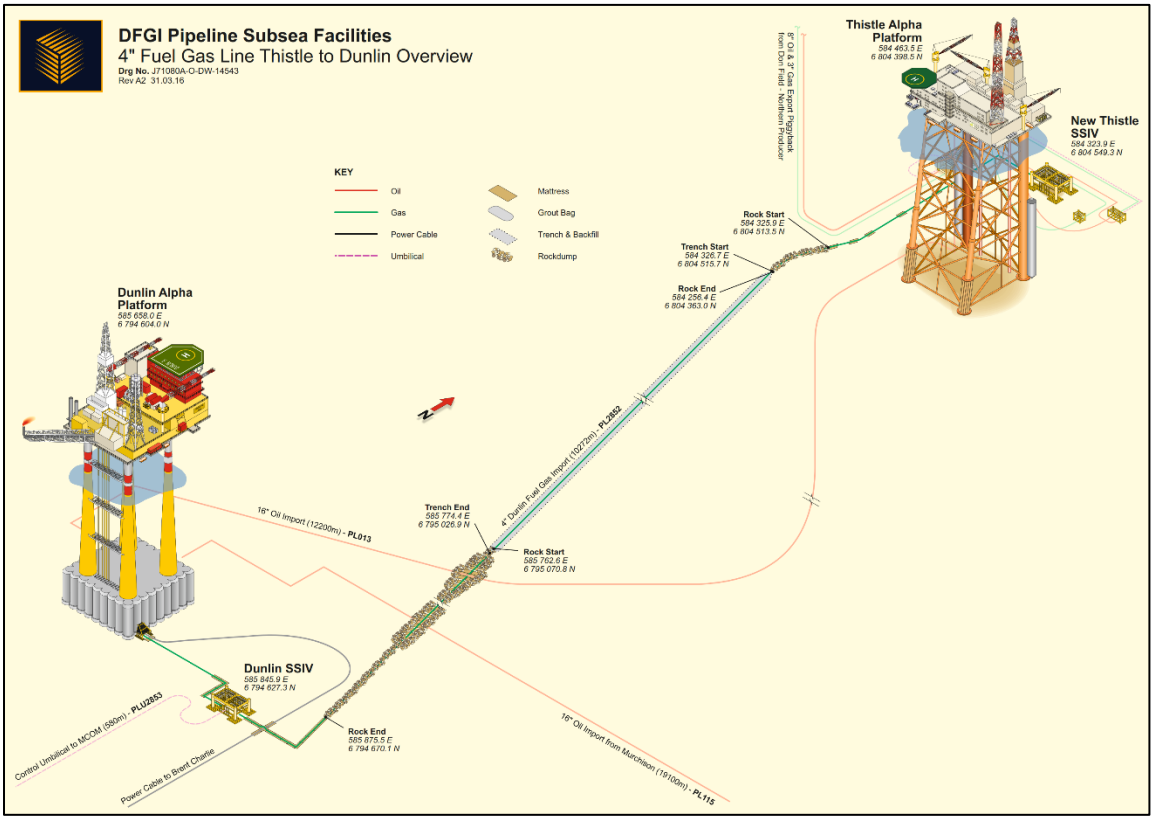

Figure 1-4: Thistle Alpha to Dunlin Alpha DFGI pipeline

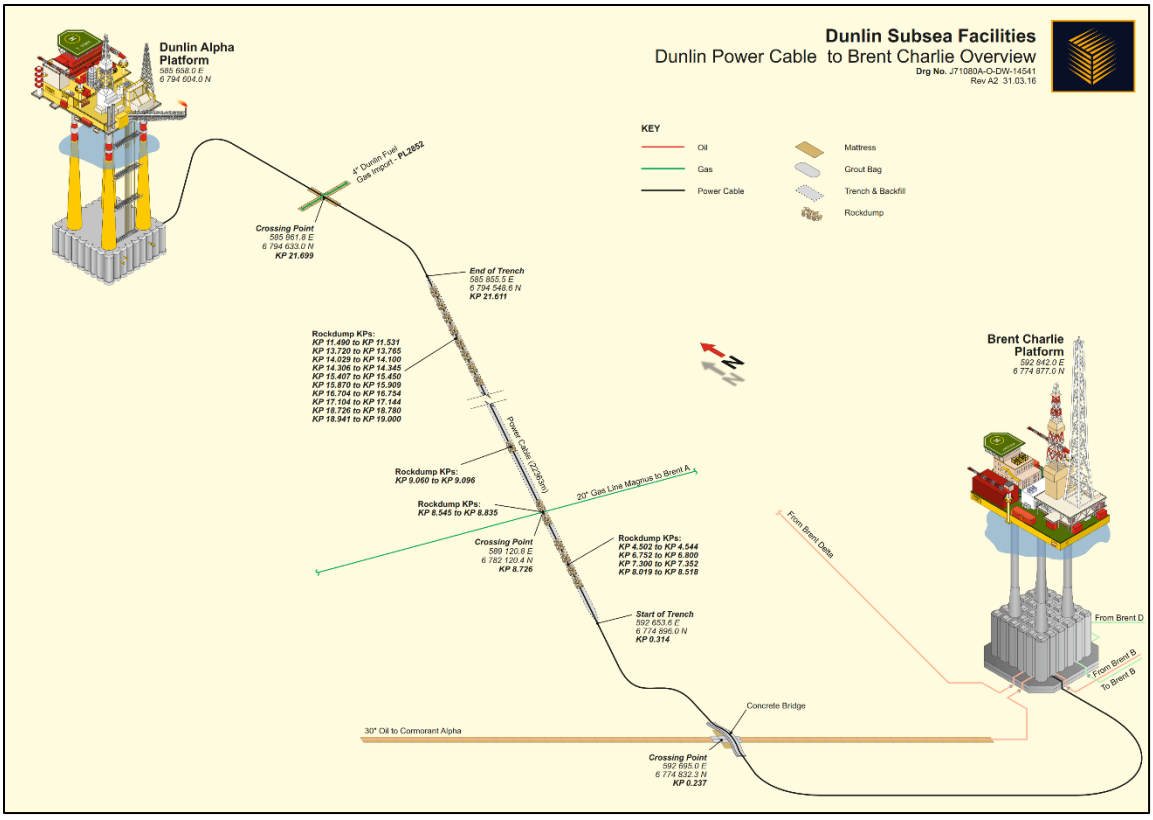

Figure 1-5: Brent Charlie to Dunlin Alpha DPI cable

Table 1-6: Adjacent Facilities					
Owner	**Name**	**Type**	**Distance / Direction**	**Information**	**Status**
FFL	Osprey	Subsea	Osprey - Dunlin Alpha 6.11 km (3.8 miles) south east	Dunlin Alpha is host to Osprey.	COP, out of use.
FFL	Merlin	Subsea	Merlin - Dunlin Alpha 6.98 km (4.36 miles) south east	Dunlin Alpha is host to Merlin.	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 Alpha 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 communications 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 Dunlin subsea infrastructure (excl. the Dunlin Alpha to Cormorant Alpha export pipeline PL5 which will be detailed in Fairfield's DP5) will be decommissioned by Fairfield along with Osprey, 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**
Dunlin DFGI SSIV structure	1	8.4 m x 5.9 m x 3.7 m 34.566 Te	WGS84 Decimal	61.274 01.599	The manifold is gravity based and not piled.
			WGS84 Decimal Minute	61°16.467 35' N 01°35.961 60' E	
DFGI Riser Protection Structure (RPS)	1	11.3 m x 8.9 m x 8.3 m 73.274 Te	WGS84 Decimal	61.274 01.597	The RPS is free standing and not piled.
			WGS84 Decimal Minute	61°16.449 85' N 01°35.825 27' E	
Protection frames	N/A	N/A	N/A		N/A
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

Table 2-3: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline Number (as per PWA)**	**Diameter (inches)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
Thistle SSIV tie-in spool	PL2852	4	0.055	Steel (2LPP)	Fuel gas	Thistle SSIV to DFGI pipeline.	Mattressed	Out of service	Nitrogen.
DFGI pipeline	PL2852	4	10.265	Steel (3LPP)	Fuel gas	Thistle SSIV tie-in spool to Dunlin SSIV tie-in spool.	Trenched (9.795 km) / buried (9.733 km) / rock covered / mattressed	Out of service	Nitrogen.
Dunlin SSIV tie-in spool	PL2852	4	0.048	Steel (2LPP)	Fuel gas	DFGI pipeline to Dunlin SSIV.	Mattressed	Out of service	Nitrogen.
DFGI SSIV[2]	PL2852	4	0.0065	Steel (2LPP)	Fuel gas	Dunlin SSIV tie-in spool to Dunlin riser dropdown tie-in spool	Exposed	Out of service	Nitrogen.
Dunlin riser dropdown tie-in spool	PL2852	4	0.127	Steel (LPP)	Fuel gas	Dunlin SSIV to Dropdown Spool	Rock Covered	Out of Service	Nitrogen.
Dropdown spool	PL2852	4	0.004	Steel (LPP)	Fuel gas	Dunlin Riser Dropdown Tie-	Exposed	Out of Service	Nitrogen.

[2] DFGI SSIV is also listed as a structure in Table 2-2

Table 2-3: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline Number (as per PWA)**	**Diameter (inches)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
						in Spool to DFGI Riser			
DFGI riser	PL2852	4	0.186	Steel	Fuel gas	Dunlin dropdown spool to Dunlin Alpha platform.	Contained within J-tube	Out of service	Nitrogen.
DFGI SSIV control umbilical	PLU2853 (2 off cores)	2.5	0.580	Polymer / steel	Controls fluid	Merlin Crossover Manifold (MCOM) to Dunlin SSIV.	Rock covered / exposed ends mattressed	Suspended	Potable water as from Q1 2018.
DPI cable	PL4334	5	21.883	Polymer / copper / fibre optics	N/A	Brent Charlie platform to DPI riser cable.	Trenched and buried (21.297 km)	Suspended	N/A

Table 2-4: Subsea Pipeline Stabilisation Features				
Stabilisation Feature	**Total Number**	**Weight (Te)**	**Location(s)**	**Status**
Concrete mattresses (5 m x 2 m x 0.15 m)	3	10.8 (3.6 Te each)	Placed on PL4334 route, under PL2852 crossing	Exposed
Concrete mattresses (6 m x 3 m x 0.15 m)	48	324 (6.75 Te each)	Placed along PL2852 (x36); along PLU2853 route (x12)	Exposed (x36); buried (x12)
Concrete mattresses (6 m x 3 m x 0.3 m)	31	257.3 (8.3 Te each)	Along PL2852 route (x24); along PLU2853 route (x7)	Buried
Grout bags	898	22.45 (25 kg each)	Along PL4334 route (x200); along PL2852 route (x498); along PLU2853 route (x200)	Exposed (698x); buried (200x)
Sand bags	80	2 (25 kg each)	Along PL4334 route (x80)	Buried
Formwork	N/A	N/A	N/A	N/A
Frond mats	N/A	N/A	N/A	N/A
Rock cover	-	21,072	Along PL4334 (11,612 Te); along PL2852 (6,743 Te); along PLU2853 (2,717 Te)	Exposed
Other (concrete arches)	2	30 (15 Te each)	Placed along PL4334 route. 1x over Magnus gas line (PL164) crossing (Buried); 1x within Brent Charlie 500 m over Cormorant Alpha (PL1) crossing (Exposed).	Exposed (x1); buried (x1)

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			
N/A	N/A	N/A	N/A

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)**
N/A	N/A	N/A

2.6 Inventory Estimates

Table 2-7 provides an estimate of the total weight of materials associated with the DFGI / DPI Pipelines and Structures Decommissioning Programmes.

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

Table 2-7: Inventory of material associated with DFGI and DPI pipelines and structures removal		
Item	**Description**	**Mass (t)**
Metals	*Ferrous (steel - all grades)*	702
	Non-ferrous (copper; aluminium; zinc; indium)	226
Concrete	*Aggregates (mattresses; grout bags; sand bags)*	647
Plastic	*Rubbers; Polymers*	112
Hazardous	*Residual Fluids (hydrocarbons; chemicals; control fluid)*	
	NORM Scale	
Other	*Fibre Optic; Jute*	33
	Total (tonnes)	**1,720**

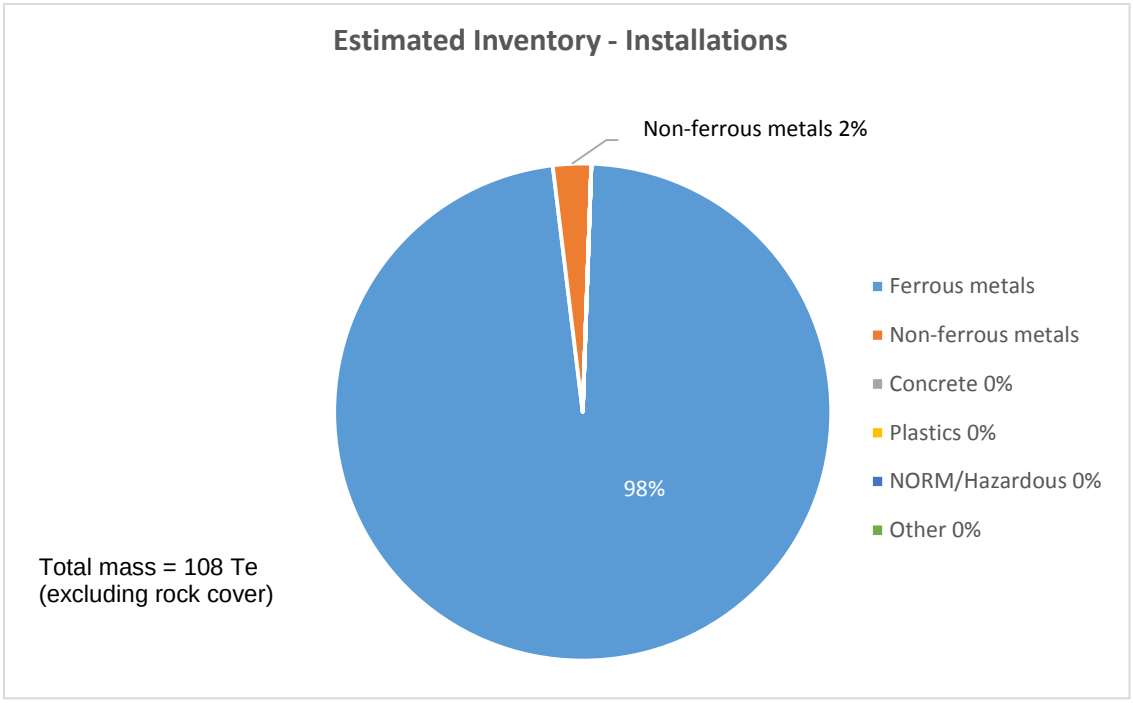

Figure 2-1: Pie Chart of Estimated Inventories (Installations)

Refer to section 2.1 and 7.1 of the Dunlin Subsea Decommissioning Environmental Statement for further details.

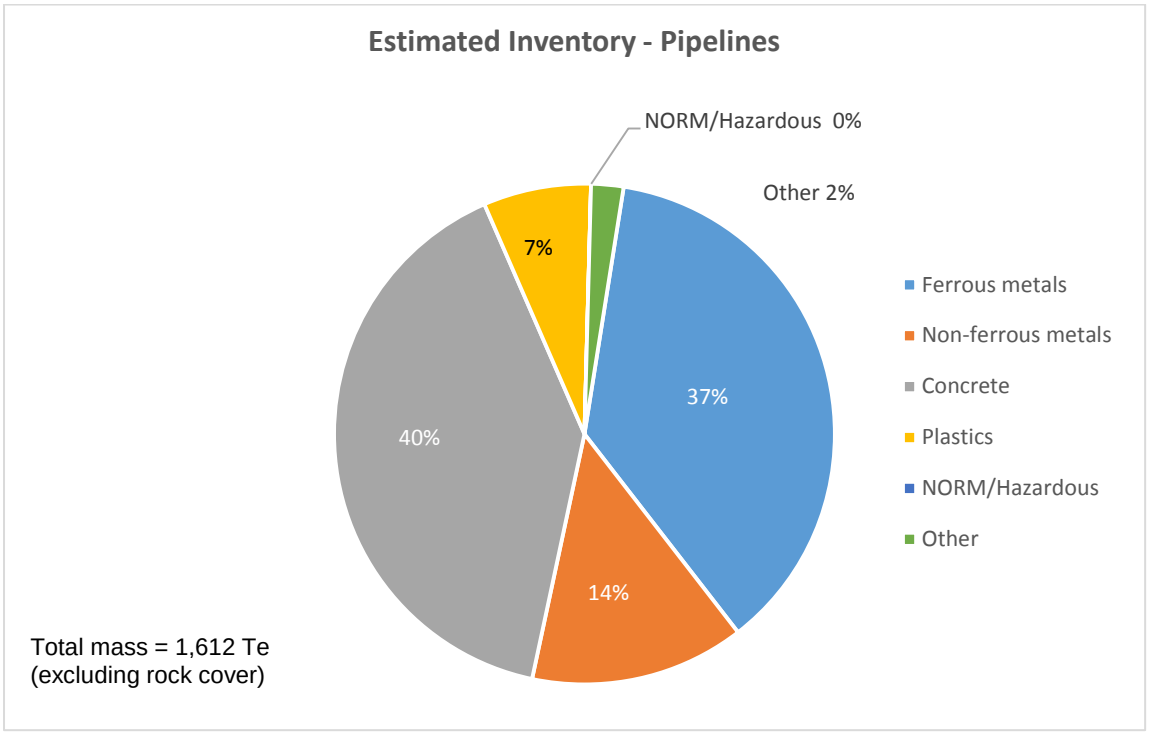

Figure 2-2: Pie Chart of Estimated Inventory (Pipelines)

Refer to section 2.1 and 7.1 of the Dunlin Subsea Decommissioning Environmental Statement for further details.

3 REMOVAL AND DISPOSAL METHODS

In line with 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 the DFGI pipeline was not considered an option due to technical limitations with removal and reinstallation. Reuse of the structures was also dismissed due to 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 structures, 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.

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	N/A	N/A	N/A
Manifolds / structures	2	Full recovery	Return to shore for reuse or recycling
Templates	N/A	N/A	N/A

Table 3-4: Subsea Installations and Stabilisation Features			
Subsea installations and stabilisation features	**Number**	**Option**	**Disposal Route (if applicable)**
Protection frames	N/A	N/A	N/A
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
Other – trawl blocks	N/A	N/A	N/A

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 (describe briefly)
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**
Rigid spools (PL2852)	Surface laid	Part - Thistle SSIV tie-in spool. Part - Dunlin SSIV tie-in spool. Part - dropdown spool.	8 Other (disconnect and recover).
Rigid spools (PL2852)	Rock covered	Part - Dunlin SSIV to dropdown tie-in spool.	8 Other (expose, disconnect and recover), 9.
Rigid pipeline (PL2852)	Trenched / buried	Part - DFGI pipeline.	1, 4, 5, 7, 8 Other (cut and lift), 9.
Rigid risers (PL2852)	Contained within J-tube	Part - DFGI riser.	6, 7, 8 Other (reverse J-tube pull), 8 Other (topside pull).

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**
DFGI SSIV control umbilical (PLU2853)	Rock covered	Whole.	1, 7, 9.
DPI cable (PL4334)	Trenched / buried	Part - cable outside 500 m zones.	1, 3, 4, 5, 7, 8 Other (expose, disconnect and recover), 9.
DPI riser cable (PL4334)	Surface laid/contained within J-tube	Part - cable within 500 m zones.	1, 6, 7, 8 Other (reverse J-tube pull), 8 Other (topside pull), 9.

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 DFGI / DPI CA report FBL-DUN-DUNAA-HSE-01-RPT-00002 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 2: buried structures and deposits	Option 8 - removal. Deburial and lift.	The outcome of this decision point is to fully remove the buried structures and deposits. Whilst the options considered had a similar scoring, removal was scored higher from an environmental perspective. Removal shall be performed when the crossed live lines / infrastructure have been decommissioned to a level that will safely allow material recovery: • PLU2853 crosses live PL5 • PL2852 crosses live PL013 and the decommissioned PL115 • PL4334 crosses the live PL1 and PL164 lines. It is currently expected that PL5 and PL013 will be removed from service in 2019. Crossing materials for PL5, PL013 and PL115 will be removed under this decommissioning programme. The remaining crossing materials for PL1 and PL164 will be removed at a future date, and will be subject to separate decommissioning programmes. Responsibility for removal of the crossing materials will be subject to final agreement and commercial arrangements placed with associated third party infrastructure owners. Synergies will be sought to ensure optimised removal of the crossing materials, e.g. execution as part of PL1 decommissioning and PL164 decommissioning.
Group 3: rigid risers (PL2852)	Option 6 - partial removal. Outboard cut and recovery.	Partial removal of the riser, where the outboard and exposed section of the riser is removed, leaving the remainder in the J-tube, was assessed as being the preferred option in all criteria apart from technical and societal (in which it was considered neutral to the other CA options). The outcome of this decision point is therefore to decommission Group 3 in situ by partial removal, having recovered the surface laid / exposed section. The fate of the section within the J-tube will ultimately be determined by the CA covering the fate of the Dunlin Alpha CGBS. The Dunlin - Effect of Riser Remaining Study has been conducted examining the effects of decommissioning the riser in the J-tube and found the consequence on other activities to be negligible.

Table 3-6: Outcomes of Comparative Assessment		
Pipeline or Group	**Recommended Option**	**Justification**
Group 5: trenched and buried pipelines (PL2852)	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, PL2852 is trenched and buried to 0.6 m or greater along the majority of the route. 6,743 t of rock has been used to provide protection at the north and south ends of the line and crossing locations. The line is stable and there is no significant seabed mobility within the vicinity of the line.[3] The CA workshop found partial removal to be the preferred option in all areas except societal where it was considered that there were some minor benefits related to the return of material to shore. The outcome of this decision point is therefore to decommission Group 5 in situ by partial removal. This infrastructure will be decommissioned by removing exposures outside of the defined trench and placing local rock cover at the cut ends and areas of low burial depth. Periodic monitoring and remediation will be carried out at this location as required.
Group 6: rock covered surface laid rigid spools (PL2852)	Option 8 - removal. Deburial, disconnect and recover.	The outcome of this decision point is to fully remove the rock covered surface laid rigid spools. Whilst the options considered had a similar scoring, removal was scored higher from a long term economic and safety perspective.
Group 7: rock covered surface laid umbilicals (PLU2853)	Option 1 - removal. Reverse reeling.	PLU2853 is a surface laid umbilical covered with 0.3 m of rock totalling 2,717 t. The physical properties of the umbilical and its installed configuration are such that reverse reeling, according to desktop engineering studies, is deemed to be feasible, although it still carries some technical risk. The CA identified removal by reverse reeling to be the preferred option against all criteria apart from societal (in which it was neutral) and technical feasibility (in which it was Weaker). Despite the technical feasibility being lower, any negative outcome of experiencing technical challenges will be limited. The outcome of this decision point is therefore to decommission Group 7 by full removal using reverse reeling.

[3] FBL-DUN-DUNA-SSP-01-RPT-00002 Dunlin Subsea Assets (DPI & PL2852), Burial Status.

Table 3-6: Outcomes of Comparative Assessment		
Pipeline or Group	**Recommended Option**	**Justification**
Group 8: riser cable (PL4334)	Option 6 - partial removal. Outboard cut and recovery.	Partial removal of the riser, where the outboard and exposed section of the riser is removed, leaving the remainder in the J-tube, 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 8 in situ by partial removal, having recovered the surface laid / exposed section. The fate of the section within the J-tube will ultimately be determined by the CA covering the fate of the Dunlin Alpha CGBS. The Dunlin - Effect of Riser Remaining Study has been conducted examining the effects of decommissioning the risers in the J-tube and found the consequence on other activities to be negligible.
Group 9: trenched and buried cable (PL4334)	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 and crossing location, the PL4334 cable is trenched and buried along the majority of the route. 11,612 t of rock has been used to provide protection at areas of low cover and the crossing location. The line is stable and there is no significant seabed mobility within the vicinity of the line.[4] The CA workshop identified that partial removal was the preferred option. Whilst it was not the highest scoring for safety and environmental, it scored consistently similar to the other options in most criteria. It offered a less technically demanding solution and provided more economic certainty. The outcome of this decision point is therefore to decommission Group 9 in situ by partial removal. This infrastructure will be decommissioned by removing exposures outside of the defined trench and placing local rock cover at the cut ends and areas of low burial depth. Periodic monitoring and remediation will be carried out at this location as required.

[4] FBL-DUN-DUNA-SSP-01-RPT-00002 Dunlin Subsea Assets (DPI & PL2852), Burial Status.

Table 3-6: Outcomes of Comparative Assessment		
Pipeline or Group	**Recommended Option**	**Justification**
Group 10: riser cable (third party infrastructure) (PL4334)	Option 6 - partial removal. Outboard cut and recovery.	Partial removal of the riser where the outboard and exposed section of the riser is removed, leaving the remainder within the J-tube, 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 10 in situ by partial removal; having recovered the surface laid / exposed section. The fate of the section within the Brent Charlie J-tube will ultimately be determined by the CA covering the fate of the Brent Charlie platform (as submitted by Shell). Fairfield is responsible for the DPI cable up to and including the switch gear located on the Shell operated Brent Charlie platform. Discussions with Shell have indicated that they are aligned with our approach and the Shell DP for Brent Charlie has described that the topsides shall be removed (which would include the switchgear) and the J-tube containing the cable (which is integral with the CGBS) will remain secured in situ.

3.5 Pipelines 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)	3	Full removal - exposed items presenting a hazard to 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 0.15m)	48	Full removal - exposed items presenting a hazard to 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 0.3 m)	31	Full removal - exposed items presenting a hazard to 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	898	N/A	N/A

Table 3-7: Pipeline Stabilisation Features			
Stabilisation features	**Number**	**Option**	**Disposal Route (if applicable)**
Sand bags	80	N/A	N/A
Formwork	N/A	N/A	N/A
Frond mats	N/A	N/A	N/A
Rock cover (Te)	21,072	To remain in place. Along PL4334 (11,612 Te); along PL2852 (6,743 Te); along PLU2853 (2,717 Te)	N/A
Other (concrete arches)	2	Recover both the exposed and buried arches once the pipelines (PL164 and PL1) they cross have been decommissioned.	Recover and transport ashore for disposal.

3.6 Wells

Table 3-8: Well Plug and Abandonment
N/A

3.7 Drill Cuttings

There are no wells associated with DFGI / DPI infrastructure.

Table 3-9: Drill Cuttings Decommissioning Options				
How many drill cuttings piles are present?			Zero	
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)				
Review of Pile characteristics	Pile 1	Pile 2	Pile 3	Pile 4
How has the cuttings pile been screened?	N/A	N/A	N/A	N/A
Dates of sampling (if applicable)	N/A	N/A	N/A	N/A
Sampling to be included in pre-decommissioning survey?	N/A	N/A	N/A	N/A
Does it fall below both OSPAR thresholds?	N/A	N/A	N/A	N/A
Will the drill cuttings pile have to be displaced in order to remove the jacket?	N/A	N/A	N/A	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?	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
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

Not applicable.

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	N/A
Marine growth	Any marine growth returned that is attached to recovered items shall be disposed of onshore by the selected WMC.
NORM / LSA scale	N/A
Asbestos	N/A
Other hazardous wastes	Any 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.

The 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 Dunlin 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	108	108	0
Pipelines	1,612	686	926
Total	1,720	794	926

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 Dunlin 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%

* Other recovery refers to materials used as construction aggregate or energy from waste.

** 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 Dunlin 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 Dunlin area; the closest designated site, the European Site of Community Importance 'Pobie Bank Reef' lies approximately 98 km to the south west of Dunlin, off the east coast of Shetland.
Seabed	The habitat assessment undertaken for the Dunlin 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 Dunlin 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 Dunlin 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 Dunlin 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 Dunlin 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 Dunlin area.

Table 4-1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Birds	The Dunlin 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 Dunlin 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 Dunlin 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 Dunlin 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 Dunlin 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 Dunlin 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 Dunlin 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	None.	N/A

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 DFGI / DPI subsea equipment. Standard procedures for operational control and hazard identification and management will be used. Where possible the work will be coordinated with other decommissioning operations in the northern North Sea. The PMT 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 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, FBL 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 / cable 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, FBL 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 DFGI / DPI Project Schedule

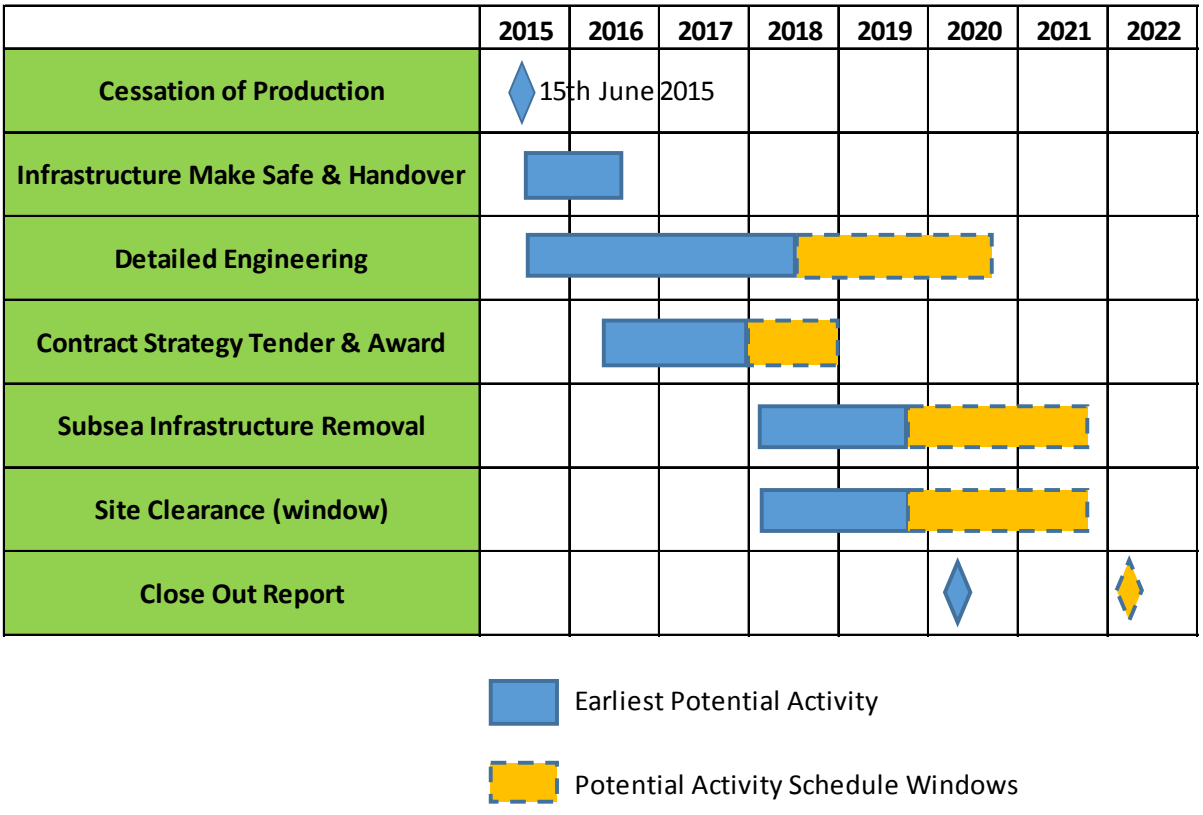

Figure 6-1: Gantt Chart of Project Schedule

6.4 Costs

FBL 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
Pipeline Decommissioning	Provided to BEIS separately
Subsea Installations and Stabilisation Features	Provided to BEIS separately
Well Abandonment	N/A
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 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. After the surveys have been sent to BEIS and reviewed, a post-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 fully trenched and buried or contained within the limits of the Dunlin Alpha Platform or the Shell Brent Charlie platform the effect on other sea users is considered to be negligible. Risks to fishermen were evaluated for the DPI cable, based on criteria including 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. areas of low cover, spans, exposures, etc. The potential loss of life due to snagging, after decommissioning the DPI cable, is in the order of 5.50E-07 (fatality frequency of 1 in 1,818,181 years).

[5] A-301649-S01-TECH-008 Dunlin – Long Term Materials Degradation Study
[6] A-301649-S01-TECH-011 Dunlin – Effect of Leaving Riser Section Within J-tube
[7] A-3910-XG-RA-1 Dunlin, Osprey & Merlin Subsea Infrastructure Decommissioning Fishing Risk Assessment

The infrastructure is currently shown on Admiralty Charts and the FishSafe system. Once decommissioning activities are complete, updated information on the Dunlin subsea infrastructure, 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.

The infrastructure to remain in situ, out with the Dunlin Alpha Platform, is fully trenched and buried and will be confirmed as such during decommissioning. Due to the location and low seabed mobility, infrastructure remaining in situ is unlikely to become exposed. 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 or deferred, until such time as access can be achieved, 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 or deferred would be reviewed and any necessary remedial action undertaken to ensure it does not pose a risk to other sea users. Arrangements for final removal of the deferred infrastructure shall be put in place with the associated third party infrastructure operators. Further details are provided within the ES section 6.2.3.

7 SUPPORTING DOCUMENTS

Table 7-1: Supporting Documents	
Document Number	**Title**
1) FBL-DUN-DUNAA-HSE-01-RPT-00002	*DFGI / DPI Comparative Assessment Report*
2) XOD-DUN-HSE-RPT-00003 (Xodus)	*DFGI /DPI Environmental Statement*
3) FBL-DUN-DUNA-HSE-01-RPT-00003	*DFGI / DPI 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 DUNLIN (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

DECOMMISSIONING PROGRAMMES
DUNLIN FUEL GAS IMPORT (DFGI) & DUNLIN POWER IMPORT (DPI)

We, MCX Dunlin (UK) Limited, confirm that we authorise Fairfield Betula Limited to submit on our behalf the Dunlin Fuel Gas Import and Dunlin Power Import Decommissioning Programmes dated 8th December 2017 as directed by the Secretary of State in November 2011.

We confirm that we support the proposals detailed in the Dunlin Fuel Gas Import and Dunlin Power Import Decommissioning Programmes dated 8th December 2017 which are to be submitted by Fairfield Betula 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 Dunlin (UK) Limited

9 APPENDIX 1 – STATUTORY CONSULTEE CORRESPONDENCE

Global Marine Systems Ltd (GMS)

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