CNR International

MURCHISON FIELD DECOMMISSIONING PROGRAMMES

MURDECOM-CNR-PM-REP-00232

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Document Control

Approvals

	Name
Prepared by	M Corcoran/K Nazaruk
Reviewed by	R Aspden
Approved by	J Allan

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Distribution List

Name	Company	No of Copies
D Haywood	CNR International (U.K.) Limited	1
A Edvardsen	Wintershall Norge AS	1

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A. Figures and Tables

B. Appendices

Note that the Environmental Statement (ES) and Comparative Assessment (CA) for pipelines are separately referenced documents in support of this programme (see Section 7) and are therefore not included within the Decommissioning Programme document.

C. Terms and Abbreviations

Abbreviation	Explanation
BTA	Buoyancy Tank Assemblies
CA	Comparative Assessment
CNRI	CNR International (U.K.) Limited
CSV	Construction Support Vessel
DECC	Department of Energy and Climate Change
EDC	Engineer Down and Clean
DPN	Disused Pipeline Notification
EIA	Environmental Impact Assessment
EL	Elevation
FLTC	UK Fisheries Offshore Oil and Gas Legacy Trust Fund Ltd
HLV	Heavy Lift Vessel
IRPA	Individual Risk Per Annum
LAT	Lowest Astronomical Tide
MCAA	Marine & Coastal Access Act
MODU	Mobile Offshore Drilling Unit
NA	Not Available
N/D	No Data
NLGP	Northern Leg Gas Pipeline
OPEP	Oil Pollution Emergency Plan
OGUK	Oil and Gas UK
OPOL	Oil Pollution Operators Liability Fund
OSPAR	Oslo Paris Convention
OSRL	Oil Spill Response Ltd
PL	Pipe Line
PLL	Potential Loss of Life
PON	Petroleum Operations Notice
PSA	Petroleum Safety Authority – Norway
PWA	Pipeline Works Authorisation
ROVSV	Remotely Operated Vehicle Support Vessel
SEPA	Scottish Environmental Protection Agency
SLV	Single Lift Vessel
SSCV	Semi-Submersible Crane Vessel
SSIV	Sub-sea Isolation Valve
TBC	To Be Confirmed
UKCS	UK Continental Shelf

1 EXECUTIVE SUMMARY

1.1 Combined Decommissioning Programmes

This document contains two decommissioning programmes for (1) the Murchison installations and (2) the Murchison pipelines for each set of associated notices served under Section 29 of the Petroleum Act 1998.

1.2 Requirement for Decommissioning Programmes

Installations:
In accordance with the Petroleum Act 1998, CNR International (U.K.) Limited (CNRI) as operator of the Murchison Field and on behalf of the Section 29 Notice Holders (see Table 1.2 and Section 8) is applying to the Department of Energy and Climate Change to obtain approval for decommissioning the installations detailed in Sections 2.1 and 2.2 of this programme.

Pipelines:
In accordance with the Petroleum Act 1998, CNRI as operator of the Murchison Field and on behalf of the Section 29 Notice Holders (see Table 1.4 and Section 8) is applying to the Department of Energy and Climate Change to obtain approval for decommissioning the pipelines detailed in Section 2.3 of this programme.

The decommissioning programmes are submitted in full compliance with national and international regulations and the DECC guidelines. They set out the principles of the removal activities and are supported by both an Environmental Statement and Comparative Assessment.

The schedule for the main project outlined in this document is expected to last up to nine years.

1.3 Introduction

The Murchison Field lies within UK Block 211/19 and extends into the Norwegian Block 33/9 in the Northern North Sea. The Field is approximately 240km northeast of Shetland and the platform stands in 156m of water (see Section 1.6).

The Playfair Field lies approximately 5km north of the Murchison Field and is 100% owned by CNRI. Playfair was developed as an extended reach well drilled from the Murchison platform. The Murchison platform also supports test-production from the Norwegian Delta reservoir which is 100% owned by Wintershall Norge AS (Wintershall) through a single well drilled from the Murchison platform

Murchison was discovered in 1975 and received development approval in 1978 for a single drilling, production and accommodation facility. The platform was installed and production started in 1980, initially from three subsea wells tied back to the main platform.

A Cessation of Production application was submitted in 2011 and approved in 2012. Permanent Cessation of Production took place on 31 March 2014 following a period of one month's given notice to DECC.

The Murchison platform comprises topsides weighing 24,584te supported by an eight leg steel jacket weighing 24,640 tonnes (excluding piles- see section 3.1 and 3.2). The Murchison large steel platform has been subject to a separate derogation application process under OSPAR Decision 98/3 (see Section 3.2 for further information).

Subsea tie-backs to three remote wells were used to support early production until the platform wells were brought on stream. Oil was exported to the Dunlin platform and then onto Cormorant A and finally to Sullom Voe. Fuel gas was imported from a tie in into the NLGP network.

The key elements of the Murchison Field decommissioning programmes are as follows:

1. All platform and subsea wells will be plugged and abandoned in accordance with Oil & Gas UK Guidelines.

2. The platform topside modules will be removed and returned to shore for reuse, recycling or disposal.

3. The jacket will be removed down to the top of footings at 44m above the seabed (EL -112m LAT) and returned to shore for reuse, recycling or disposal. The jacket footings will then be left in place.

4. The drill cuttings pile located within the jacket footings will be left *in situ* to degrade naturally with time.

5. On completion of the decommissioning programmes a seabed survey will be undertaken to identify oilfield related debris within the platform 500m zone and a 200m wide corridor along each pipeline. All items of oilfield debris will be categorised and in consultation with DECC a management and recovery plan will be agreed. Following completion of the recovery plan, verification of seabed clearance by an independent organisation will be carried out.

6. The short early production pipeline bundles and associated subsea equipment will be removed and returned to shore for recycling or disposal.

7. The main oil export line (PL115) which is surface laid will be left *in situ* with remedial rock placement over exposed sections. The main pipeline tie in spools, at either end, will be removed and returned to shore for recycling or disposal.

8. The Murchison gas export/import pipeline (PL165) which forms part of the NLGP system will be isolated at the Murchison subsea riser tie-in spool as part of the Murchison decommissioning programmes. The pipeline (PL165) is owned by the NLGP parties and does not form part of the Murchison decommissioning programmes. The NLGP SSIV control umbilical forms part of the NLGP system. Preparatory work will be undertaken to cut back the control umbilical from the Murchison Platform to the point of its burial/rock cover. Final decommissioning of the control umbilical will be part of the PL165 decommissioning programme.

1.4 Overview of Installations/Pipelines Being Decommissioned

1.4.1 Installations

Table 1.1: Installations Being Decommissioned					
Field Name	Murchison	**Block**	211/19	**Number of platform(s)**	1
		Co-ordinates	61°23'49.004"N 01°44'25.508"E		
Distance from nearest UK coastline (KM)	≈240km	**Distance to Median (if less than 5km)**	2km	**Platform type**	large steel
Number of subsea installations	2	**Number of cuttings piles**	1	**Topside weight (te):**	24,584
		Drill cuttings- Estimated Volume (m^3)	22,545m^3	**Jacket weight (te):**	24,640 (excluding piles)
Number of wells	34	**Production type (Oil/Gas/ Condensate)**	Oil	**Water depth**	156m
Platform:	33				
Subsea	1				

Table 1.2 Installations Section 29 Notice Holders		
Section 29 Notice Holders	**Registration Number**	**Equity Interest**
CNR International (UK) Limited	Reg. No. 00813187	77.8%
Wintershall Norge AS	Reg. No. 985224323	22.2%
A/S Norske Shell	Reg. No. 914807077	0%
Enterprise Oil Norge Ltd	Reg. No. 01682049	0%
Statoil ASA	Reg. No. 923609016	0%
Maersk Oil North Sea UK Limited	Reg. No. 03682299	0%
Exxonmobil Exploration and Production Norway AS	Reg. No 914048990	0%
Exxonmobil Production Norway Inc.	Reg. No 924956917	0%

1.4.2 Pipelines

Table 1.3: Pipelines Being Decommissioned		
Number of Export Pipelines (PL115)	1	(See Table 2.3)
Number of Infield Pipeline Bundles (PL123, PL124 & PL125)	3	

Table 1.4: Pipeline Section 29 Notice Holder Details		
Section 29 Notice Holders	**Registration Number**	**Equity Interest**
CNR International (UK) Limited	Reg. No. 00813187	77.8%
Wintershall Norge AS	Reg. No. 985224323	22.2%
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Exxonmobil Exploration and Production Norway AS	Reg. No 914048990	0%
Exxonmobil Production Norway Inc.	Reg. No 924956917	0%

1.5 Summary of Proposed Decommissioning Programmes

Table 1.5: Summary of Decommissioning Programmes		
Selected Option	**Reason for Selection**	**Proposed Disposal Solution**
1. Topsides		
Complete removal for re-use and recycling	Meets DECC regulatory requirements	Cleaned equipment refurbished for re-use where possible. Equipment which cannot be re-used will be recycled or go to other disposal routes as appropriate.
2. Jacket		
Remove jacket down to top of footings	Murchison jacket meets the OSPAR guidelines as a candidate for derogation. Partial removal to top of footings was confirmed as the preferred option in the comparative assessment based on safety and technical considerations. No objection received to proposal from OSPAR parties	Jacket will be removed down to 112m below LAT, recovered material will be returned to shore for recycling wherever possible. Degradation of the remaining footings will occur over a long period and will be recorded on the FLTC FishSafe system and relevant charts for mariners. MCAA application will be submitted in support of works carried out.
3. Subsea Installations		
Wellhead protection frames will be removed	Meets DECC guidelines to remove all seabed structures to leave a clear seabed	Wellhead protection frames and space frames will be removed and returned to shore for recycling. MCAA application will be submitted in support of works carried out.
4a. Pipelines		
The main oil export line (PL115) will have remedial rock placement with end tie-in spools removed	PL115 was subject to a formal comparative assessment from which remedial rock placement was selected on the basis of minimal seabed disturbance and reduced risk to personnel	The 16 inch pipeline will be left *in situ*, with rock placement at the cut ends and exposed sections of pipeline. The remedial rock placement will match the existing rock profile. Degradation will occur over a long period within the rock cover and is not expected to represent a hazard to other users of the sea. MCAA application will be submitted in support of works carried out.
4b. Flowlines		
The pipeline bundles (PL123, PL124 & PL125) will be removed completely	Bundles meet DECC regulatory requirements for complete removal	The pipeline bundles will be removed and returned to shore for recycling. MCAA application will be submitted in support of works carried out.
5.Wells		
Abandoned in accordance with Oil & Gas UK Guidelines for the Suspension and Abandonment of Wells	Meets DECC regulatory requirements	PON5, PON15 and MCAA applications will be submitted in support of works carried out.
6.Drill Cuttings		
Leave in place to degrade naturally	Cuttings pile falls below the OSPAR 2006/5 thresholds	Left undisturbed on seabed to degrade naturally.
7.Drill Cuttings Interdependencies		
Partial removal of jacket down to top of footings will permit the drill cuttings pile to be left *in situ* to degrade naturally over time.		

1.6 Field Location including Field Layout and Adjacent Facilities

Figure 1.1: Field Location in UKCS

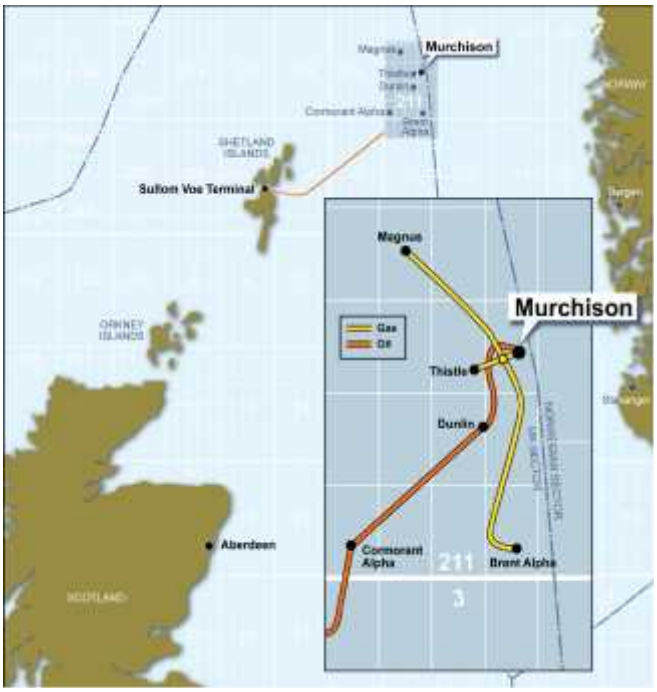


Figure 1.2: Field Layout

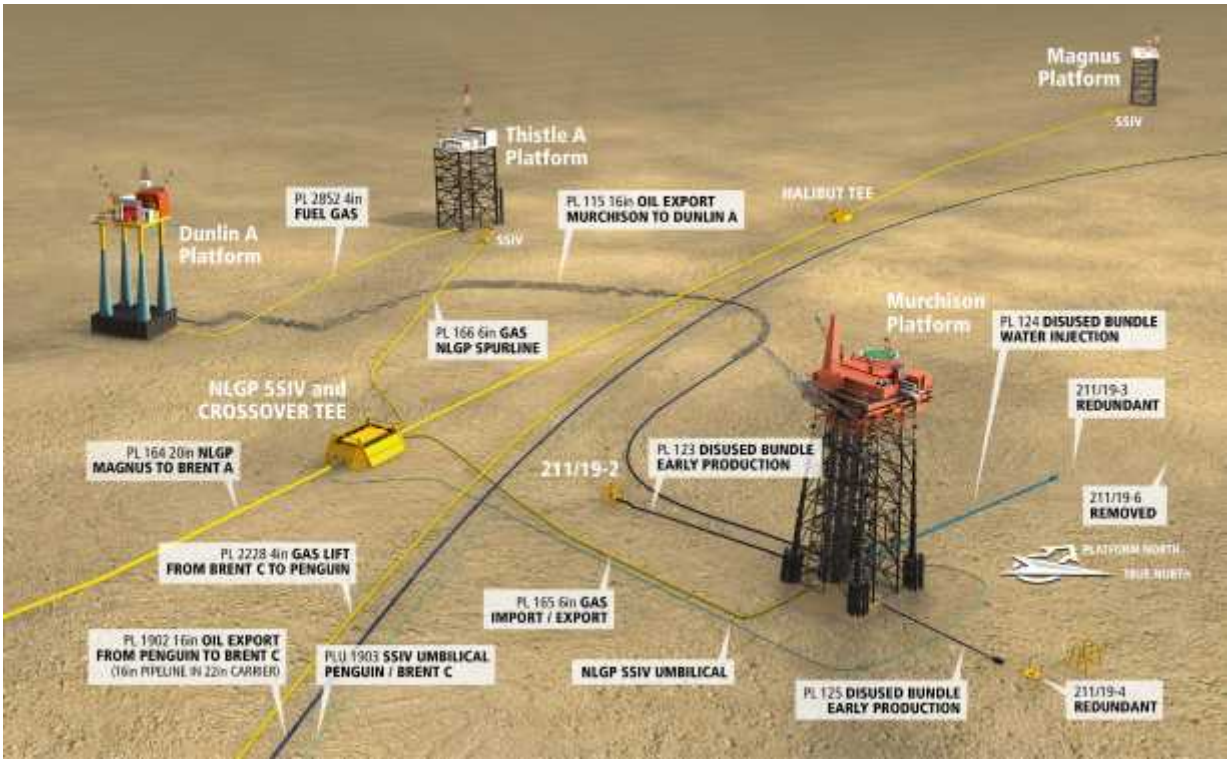


Figure 1.3: Adjacent Facilities

Adjacent facilities refer to those facilities potentially impacted by this programme

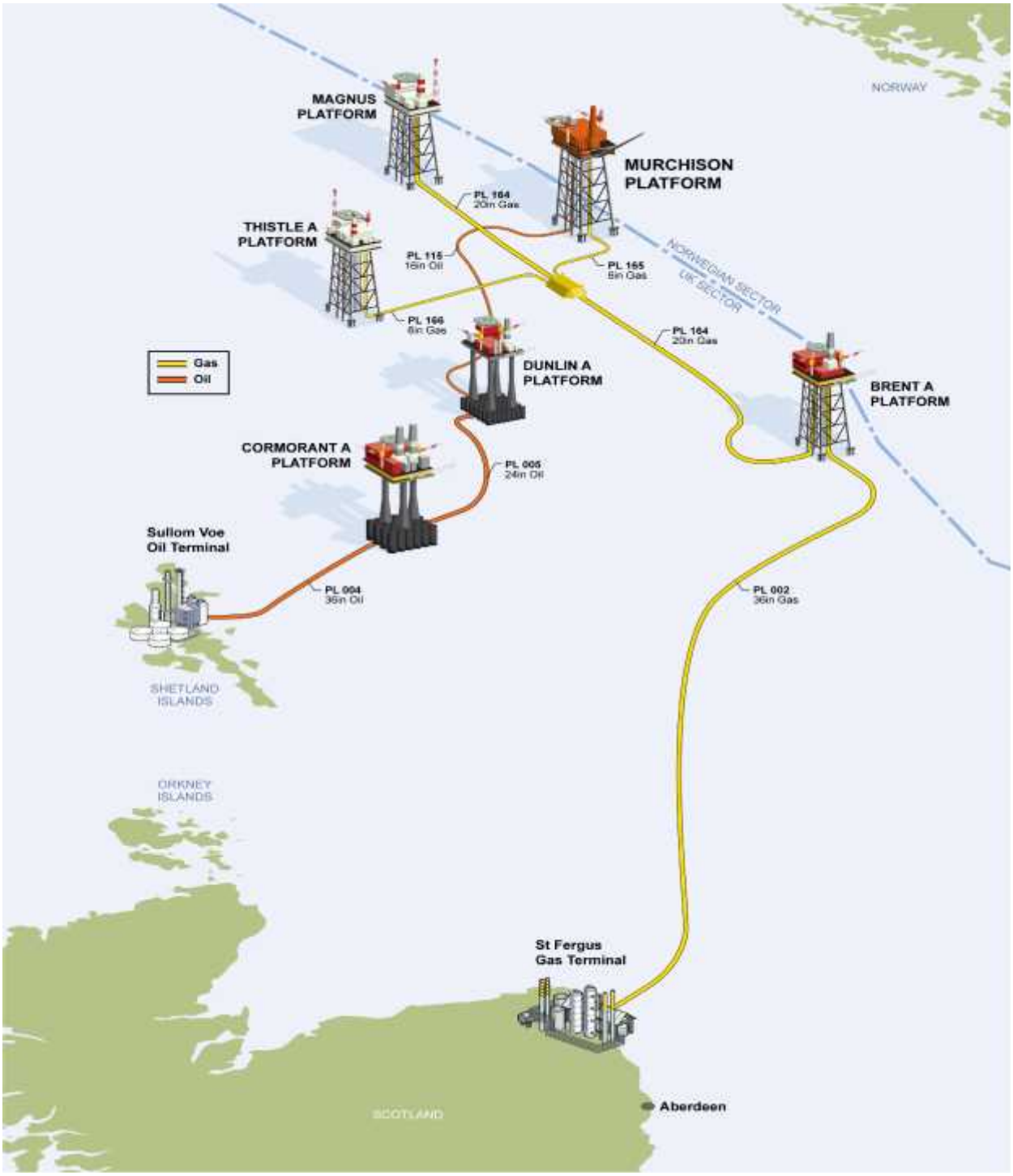


Table 1.6: Adjacent Facilities					
Owner	**Name**	**Type**	**Distance/Direction**	**Information**	**Status**
Fairfield	Dunlin A	Platform	19km South West	Export PL115 tie into Dunlin	Operational
BP/NLGP	PL165	6" Pipeline + Umbilical	From Murchison riser to NLGP SSIV and cross over Tee	Fuel gas import from NLGP to Murchison, the pipeline will be decommissioned by the NLGP System owners	Operational
BP/NLGP	NLGP SSIV Umbilical	Umbilical	From Murchison to NLGP SSIV and cross over Tee	Umbilical crosses over PL125	Operational
BP/NLGP	PL166	6" Pipeline	From Thistle A to NLGP cross over Tee	PL166 crosses over Murchison export line PL115	Operational
BP/NLGP	PL164	20" Pipeline	From Magnus to Brent	PL164 crosses over PL115	Operational
Shell	PL1902	16" Pipeline	Penguins to Brent C	PL1902 crosses over PL115	Operational
Shell	PL2228	4" Pipeline	Brent C to Penguins	PL2228 crosses over PL115	Operational
Shell	PLU1903	SSIV umbilical	Penguins to Brent C	PLU 1903 crosses over PL115	Operational
Fairfield	PL2852	4" Pipeline	Thistle to Dunlin	PL2852 crosses over PL115	Operational
EnQuest	Thistle	Platform	8km West	PL166 6" –pipeline isolation valves at NLGP crossover are controlled from Murchison	Operational

1.7 Industrial Implications

In planning and preparing for executing the Murchison decommissioning contract/procurement strategy, CNRI as operator of the Murchison Field and on behalf of the Section 29 Notice Holders has undertaken:

1. To publish information on the Murchison project and timelines on its decommissioning website: www.cnri-northsea-decom.com

2. Publish project information and contact details on the DECC website: www.gov.uk/oil-and-gas-projectpathfinder

3. CNRI participated in the PILOT Share Fair event in November 2010 providing one-to-one sessions with the supply chain on the Murchison decommissioning programmes and timeline.

4. Representatives of trade associations were invited to the main Stakeholder Engagement sessions held in March and November 2012.

5. CNRI is working closely with Decom North Sea and other industry bodies in engagement sessions with the decommissioning supply chain on issues relating to the Murchison decommissioning programmes and timelines. Specific engagement sessions are summarised in Table 5.2 and more details appear in the Stakeholder Engagement Report.

6. The FPAL database is the primary source for establishing tender lists for contracts/purchases valued at £250,000 and above, although it is also used under this limit.

2 DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Installations: Surface Facilities – Topsides and Jacket

Table 2.1: Surface Facilities Information							
Name	Facility Type	Topsides/Facilities		Jacket			
		Weight (te)	No of modules	Weight (te)	Number of legs	Number of piles	Weight of piles (te)
Murchison	Fixed steel jacket	24,584	26	24,640	8	32	3,007

2.2 Installation: Subsea including Stabilisation Features

Table 2.2: Subsea Installations and Stabilisations Features				
Subsea installations	Number	Size/Weight	Location(s)	Comments
Wellhead	2	No data	211/19-2 & 211/19-4	Guide base and tree on 211/19-2 Guide base only on 211/19-4
Space Frames	2	55 tonnes each excluding piles	Subsea wells 211/19-2 & 211/19-4	Space frame assembly each with 4 – 20 inch dia piles
Protection Frames	2	27 tonnes each	Subsea wells 211/19-2 & 211/19-4	Steel frames supported off the space frame

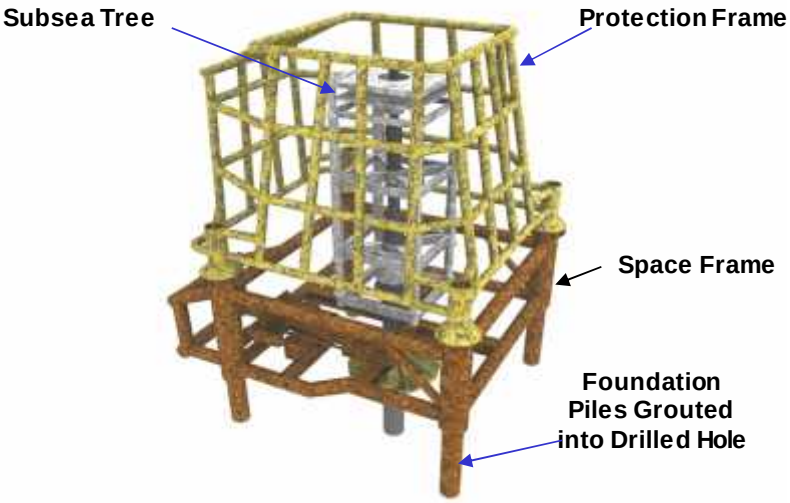


Figure 2.1: 211/19-2 Subsea Installation

Subsea Installation 211/19-4 is similar, but the protection frame is set on the seabed beside the space frame and the subsea tree has been removed.

2.3 Pipeline and Flowlines

Table 2.3: Pipeline/Flowline/Umbilical Information									
Description	Pipeline No. (as per PWA)	Diameter (inches)	Length (km)	Composition	Contents	From - To	Condition	Status	Contents
Oil Export Line	PL115	16"	19.1km	Steel with concrete weight coating	Oil	Murchison to Dunlin	55.5% intermittent rock cover	Operational	Hydrocarbons
Well 211/19-2 flowline	PL123	12.75”	0.75km	Bundle	Oil	211/19-2 to Murchison	Exposed, surface laid	Out of use	Hydrocarbons
Well 211/19-3 flowline	PL124	12.75”	1.99km	Bundle	Water	211/19-3 to Murchison			Flushed
Well 211/19-4 flowline	PL125	12.75”	1.23km	Bundle	Oil	211/19-4 to Murchison			Flushed
Murchison PL165 riser	PL165	6”	Approx 160m	Steel	Gas	Murchison riser to connection at PL165 riser tie in spool	Part of jacket structure	Operational	Gas
NLGP SSIV umbilical	FEPA exempt	4”	2.9km	Composite	Electro-hydraulic	PL165 crossover tee to J-tube on Murchison	J-tube is part of jacket structure, umbilical trenched with rock cover	Operational	Electro-hydraulic

The extent of existing intermittent rock placement along PL115 is specified in Table 5 of the Comparative Assessment Report.

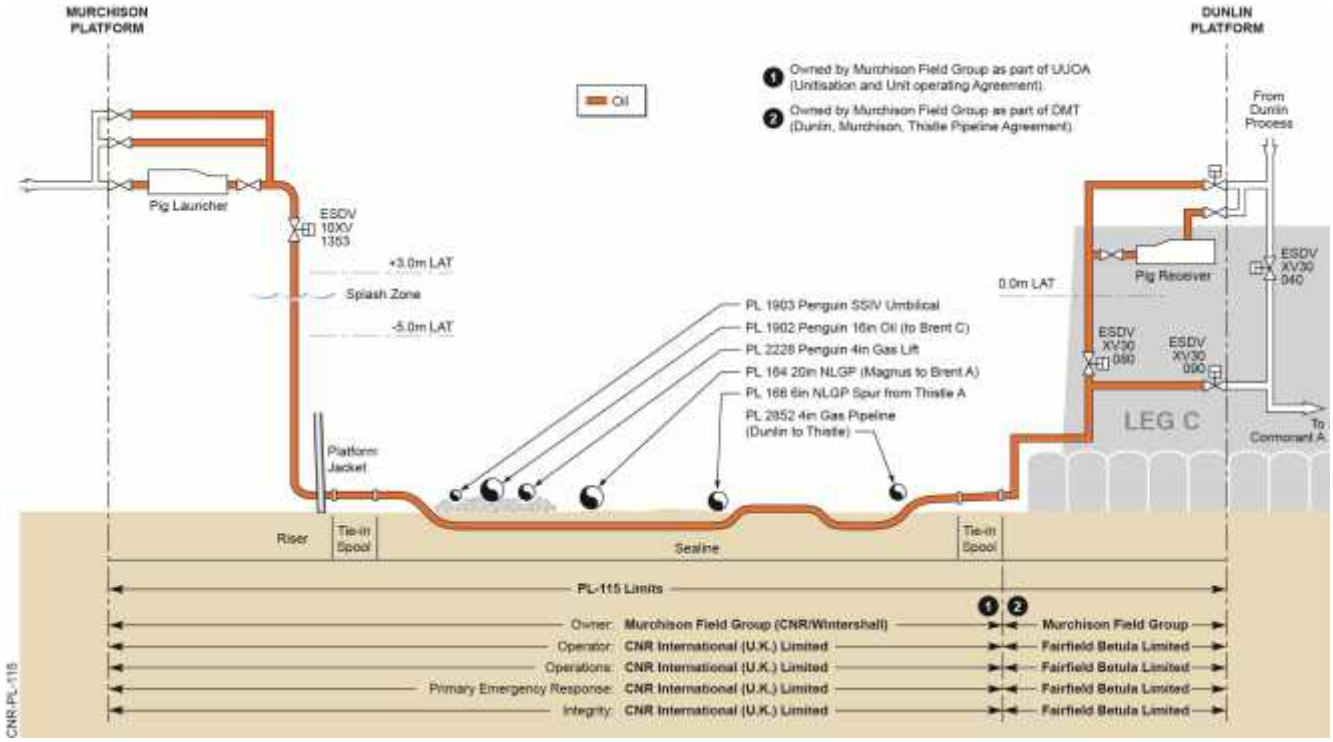


Figure 2.2: PL115 Schematic

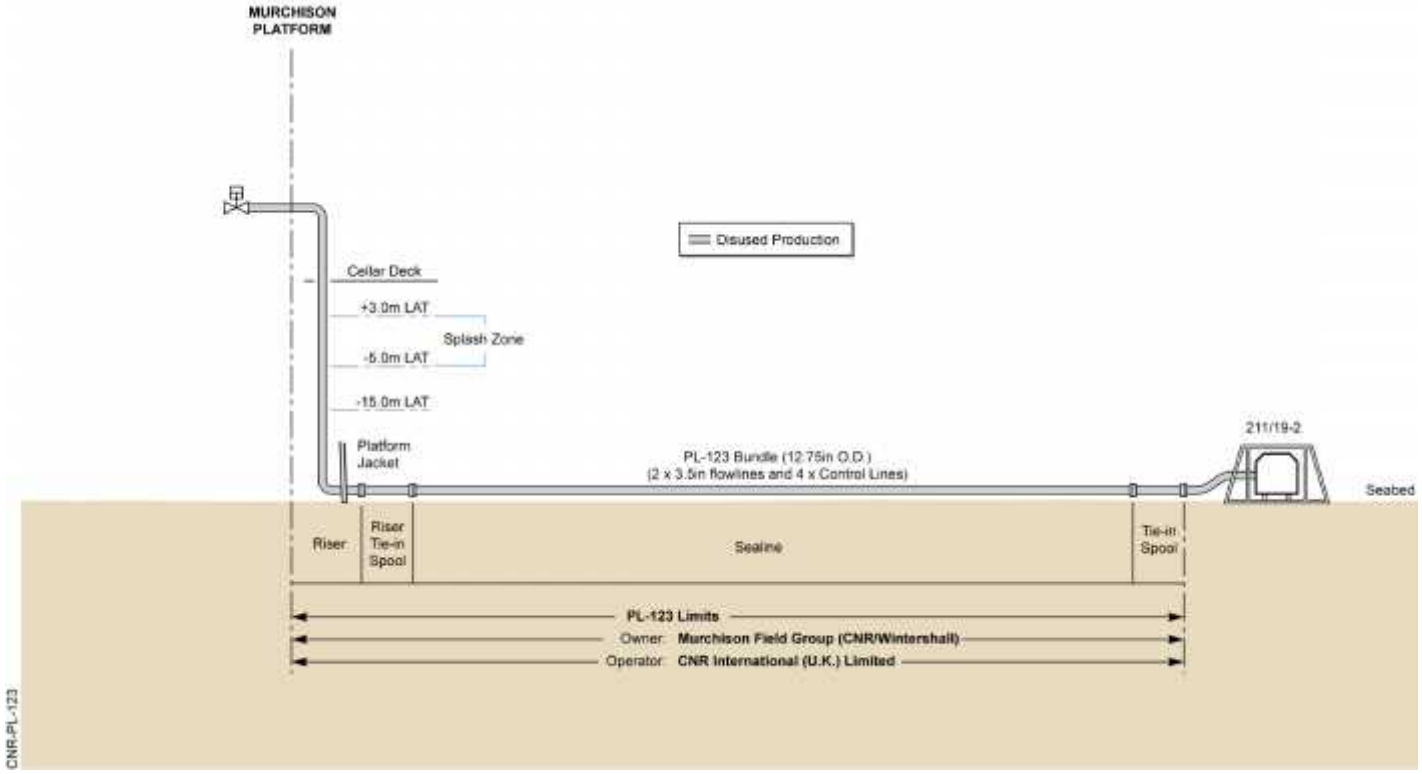


Figure 2.3: PL123 Schematic

PL124 and PL125 are similar but not connected to wellhead.

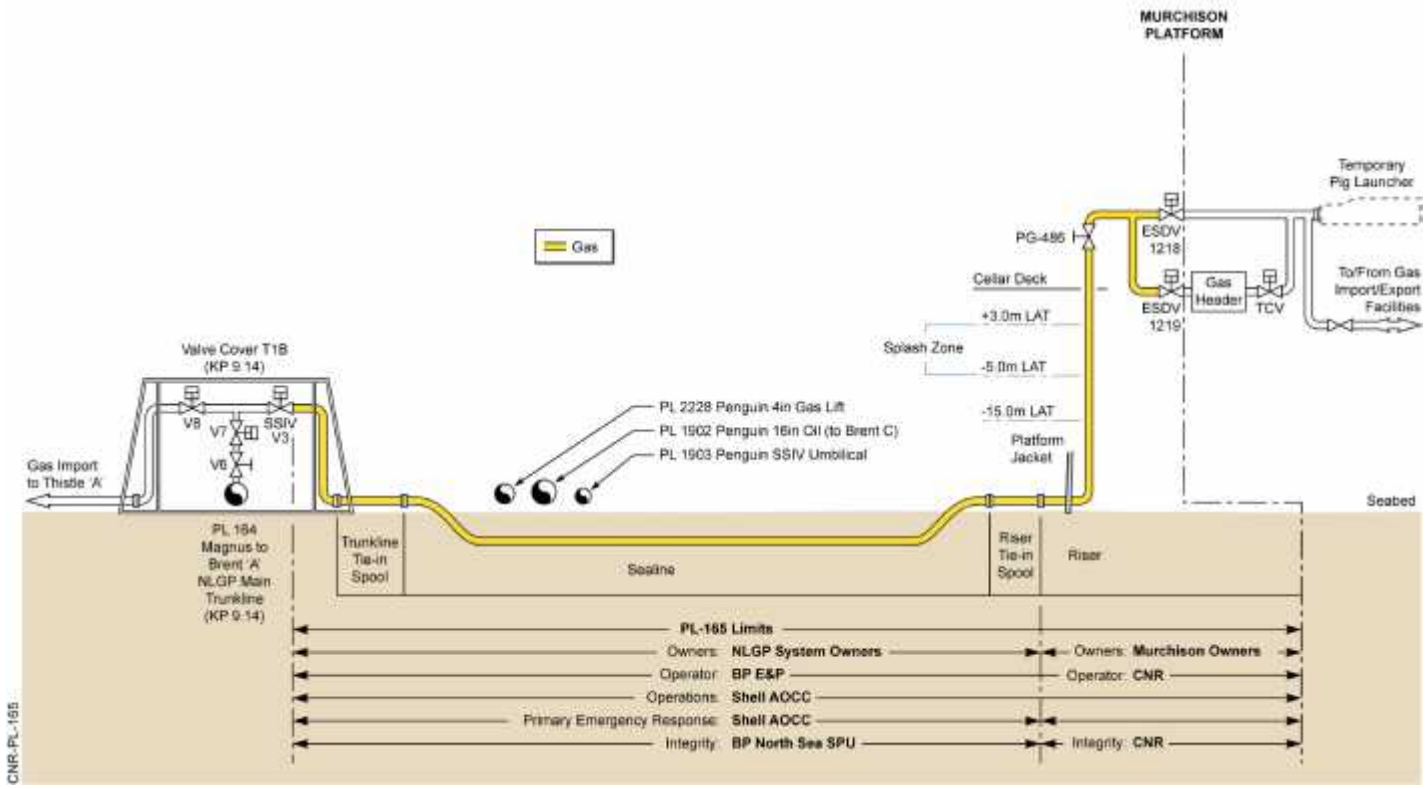


Figure 2.4 PL165 Schematic

The Murchison Riser will be disconnected at the subsea riser tie-in spool as preparatory work for the future decommissioning of PL165. The disconnection will be undertaken by the Murchison Owners as part of this decommissioning programme. After disconnection at the subsea riser tie-in a DPN will be submitted by the NLGP System Owners for PL165. The decommissioning of PL165 is **NOT** part of this decommissioning programme.

The SSIV umbilical controls the subsea valves V8, V7 and V3 from a termination unit and hydraulic power unit located on the Murchison deck. The umbilical and termination unit are owned by the NLGP System Owners. The umbilical will be disconnected from the terminal unit on the Murchison deck, cut subsea at approximately 500m from the Murchison J-tube at the point of burial of the umbilical. The cut section will be recovered to shore for recycling. The final decommissioning of the umbilical will be undertaken as part of the decommissioning programme for PL165 and submitted by the NLGP system owners.

	Table 2.4: Subsea Pipeline Stabilisation Features				
Pipeline	**Stabilisation Feature**	**Number**	**Weight (te)**	**Location(s)**	**Status: Buried/Exposed**
PL115	Concrete mattresses	4 estimated	6 tonnes each	At pipeline crossing points, partly buried	Can only be recovered when relevant cross over lines are decommissioned
PL115	Concrete mattress	1	6 tonne	At KP 0.465	Reasonable endeavours will be used to recover
PL115	Rock placement	13 number of variable length	Estimated 63,000 tonnes	Intermittent along 55% length of PL115. See Table 5 of Comparative Assessment Report for locations/lengths	Will be left *in situ;* existing rock placed between 1985 and 1987
PL115	Other – frond mats	10 estimated	ND	5 located within Dunlin 500m zone and 5 located within Murchison 500m zone	Mats partially buried and will be fully recovered
PL123	No stabilisation features	N/A	N/A	N/A	N/A
PL124	Grout mattress	9	3 tonne each	At KP 0.402; 0.439; 0.521; 0.698; 0.913; 0.985; 1.012; 1.042 & 1.108	Reasonable endeavours will be used to recover
PL124	Frond mats	4	ND	At KP 0.698; 0.985; 1.012 & 1.150	Reasonable endeavours will be used to recover
PL124	Grout bags	4	25Kg each	At KP 1.725	Reasonable endeavours will be used to recover
PL125	No stabilisation features	N/A	N/A	N/A	N/A

2.4 Wells

Table 2.5: Well Information			
Platform Wells	**Designation**	**Status**	**Category of Well (Ref OGUK Guidelines)**
211/19a-M50	Suspended	Suspended	PL 0-4-3
211/19a-M69	Oil Production	Live	PL 1-1-3
211/19a-M49	Oil Production	Live	PL 1-1-3
211/19a-M54	Oil Production	Live	PL 1-1-3
211/19a-M65	Oil Production	Live	PL 1-1-3
211/19a-M14y	Oil Production	Live	PL 1-1-3
211/19a-M74	Oil Production	Live	PL 1-3-3
211/19a-M78z	Oil Production	Live	PL 1-3-3
211/19a-M56	Water Injection	Live	PL 2-3-3
211/19a-M68	Water Injection	Live	PL 1-1-3
211/19a-M46	Oil Production	Live	PL 1-1-3
211/19a-M55z	Oil Production	Live	PL 1-1-3
211/19a-M51	Oil Production	Live	PL 1-1-3
211/19a-M73	Oil Production	Live	PL 3-3-3
211/19a-M45	Oil Production	Live	PL 1-1-3
211/19a-M64	Oil Production	Live	PL 2-2-3
211/19a-M66	Oil Production	Live	PL 1-1-3
211/19a-M77z	Oil Production	Live	PL 1-1-3
211/19a-M6	Water Injection	Live	PL 1-1-3
211/19a-M70	Water Injection	Live	PL 1-1-3
211/19a-M60	Water Injection	Live	PL-2-2-3
211/19a-M63z	Water Injection	Live	PL 2-3-3
211/19a-M75x (DELTA WELL)	Oil Production	Live	PL 1-3-3
211/19a-M67	Water Injection	Live	PL 1-1-3
211/19a-M53	Oil Production	Live	PL 1-1-3
211/19a-M76	Oil Production	Live	PL 1-1-3
211/19a-M16	Suspended	Suspended	PL 4-4-3
211/19a-M40	Oil Production	Live	PL 1-1-3
211/19a-M35z	Water Injection	Live	PL 3-3-3
211/19a-M62	Water Injection	Live	PL 1-1-3
211/19a-M72y	Oil Production	Live	PL 1-1-3
211/19a-M71 (PLAYFAIR FIELD)	Oil Production	Live	PL 1-3-3
211/19a-M47	Water Injection	Live	PL 1-1-3
Subsea Wells			
211/19-MS2	Oil Production	Suspended	SS 4
211/19-MS3	Water Injection	Abandoned	SS 1
211/19-MS4	Oil Production	Abandoned	SS 1

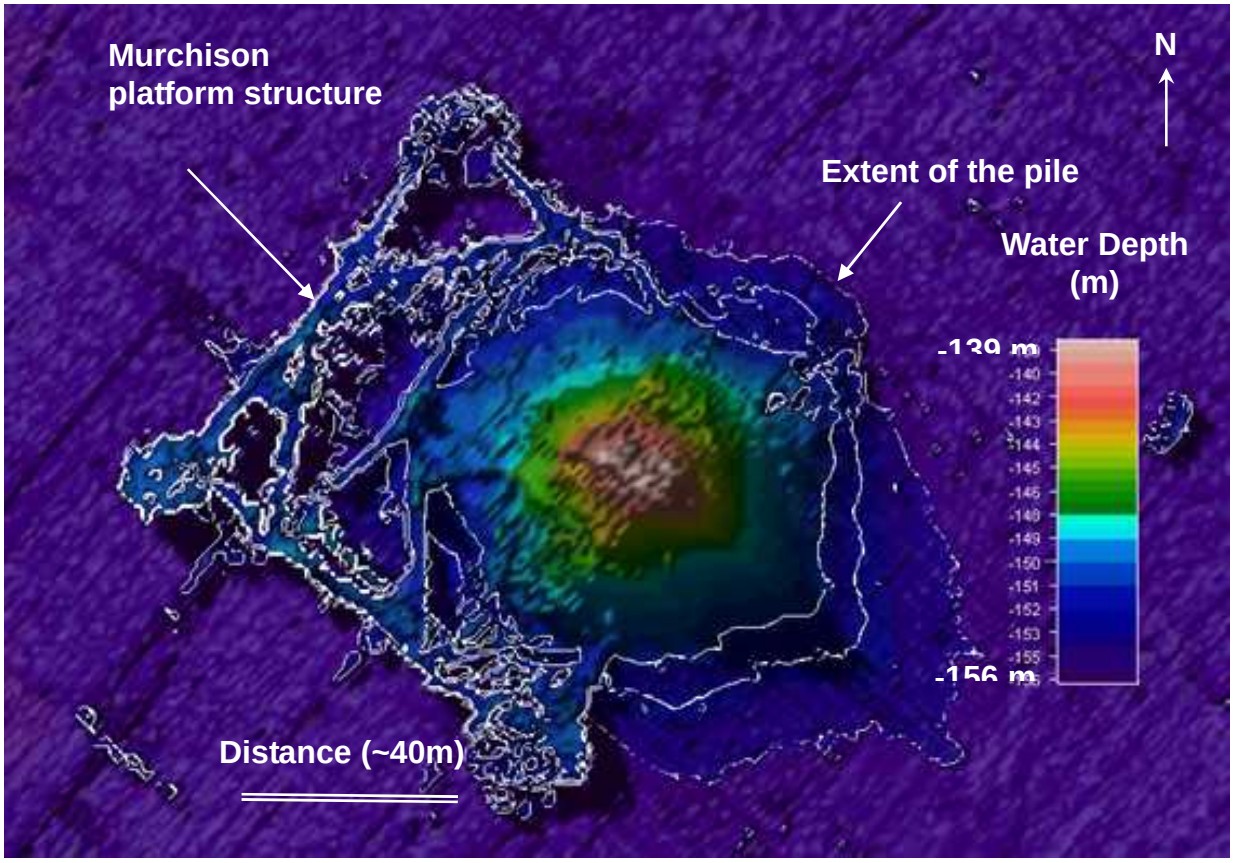
For further details of well categorisation see OGUK Guidelines for the Suspension or Abandonment of Wells – Issue 4 – July 2012.

2.5 Drill Cuttings

(See also Section 3.7 for further information.)

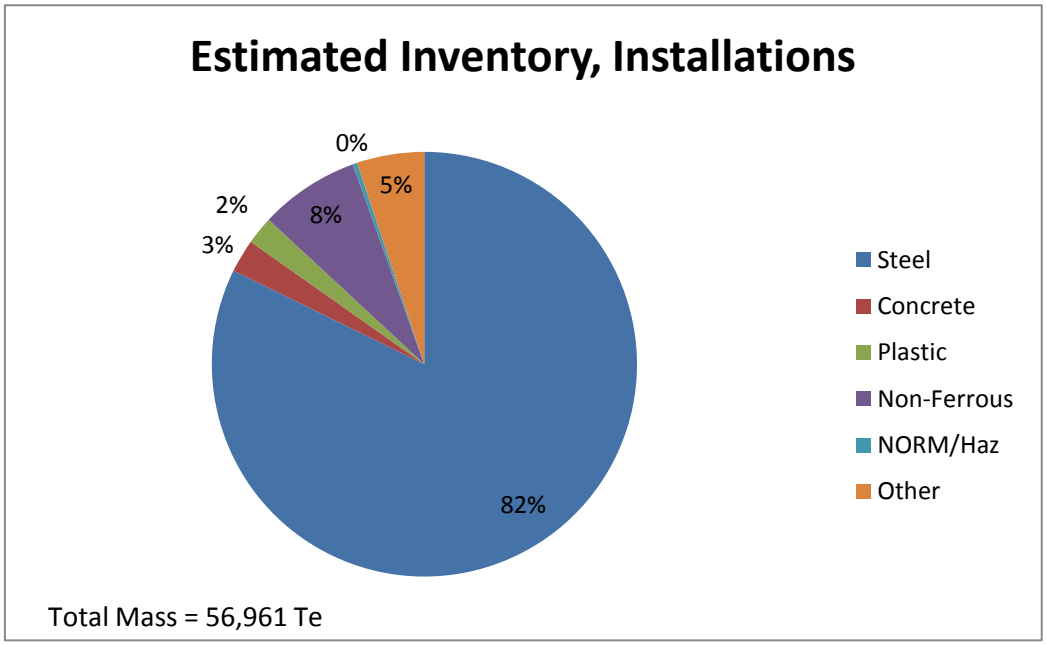
	Table 2.6: Drill Cuttings Pile Information		
Number of drill cuttings piles	Location (latitude/longitude)	Seabed area (m^2)	Estimated volume of cuttings (m^3)
1	Beneath south east edge of the Murchison platform	6,840m^2	22,545m^3

Figure 2.5: Map of Murchison Drill Cuttings Pile using Multibeam Echo Sounder



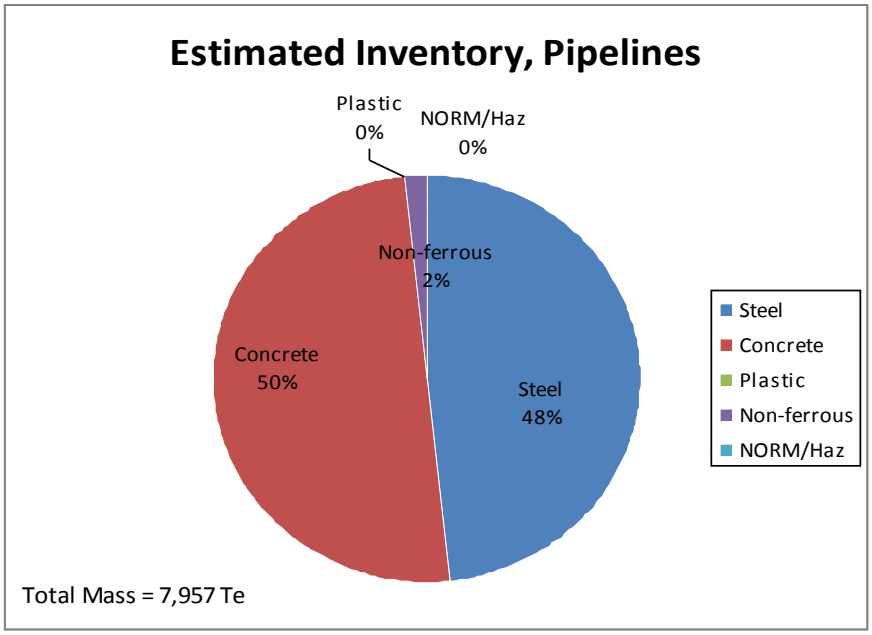
2.6 Inventory Estimates

Figure 2.6: Pie Chart of Estimated Inventories (Installations)



See Tables 4.3, 4.4 and 4.6 in the Environmental Statement for detailed data.
Weights are included for topsides, jackets and wells.
The weight of NORM/Hazardous material is less than 1% of the total inventory and includes the densitometers location in the footings.

Figure 2.7: Pie Chart of Estimated Inventory (Pipelines)



See Table 4.5 in the Environmental Statement for detailed data.
Inventory excludes the existing rock cover to PL115, estimated at 63,000 tonnes.

3 REMOVAL AND DISPOSAL METHODS

In line with the waste hierarchy, the re-use of an installation (or parts thereof) was first in the order of preferred decommissioning options for assessment.

The Murchison Section 29 Notice Holders assessed options for extending the producing life of the platform, utilising it as an infrastructure hub for third party tie backs and enhanced recovery programmes, but none proved commercially viable and a Cessation of Production Application was submitted to DECC in 2011 and approved in 2012.

The Murchison Section 29 Notice Holders then went onto assess options for the relocation of the platform as a producing asset, but concluded that due to its ageing process technology and the high cost of maintaining the fabric and structural integrity of the 35 year old platform, no technically viable reuse option was available.

Alternate uses for the Murchison facilities for power generation using wind energy, wave and tidal energy and reuse for carbon capture and storage were all considered but no alternate use option was economically viable.

Further details of the options for reuse, relocation and alternate use of the Murchison facilities are given in Section 3 of the Comparative Assessment Report.

The Murchison Section 29 Notice Holders have reviewed, and will continue to review, the platform's equipment inventories to assess the potential for adding to their existing asset portfolio spares inventory.

Recovered material will be landed ashore in the window of 2015 to 2021. It is not possible to forecast the wider reuse market with any accuracy or confidence this far forward. The Murchison Section 29 Notice Holders will continue to track reuse market trends in order to seize reuse opportunities at the appropriate time.

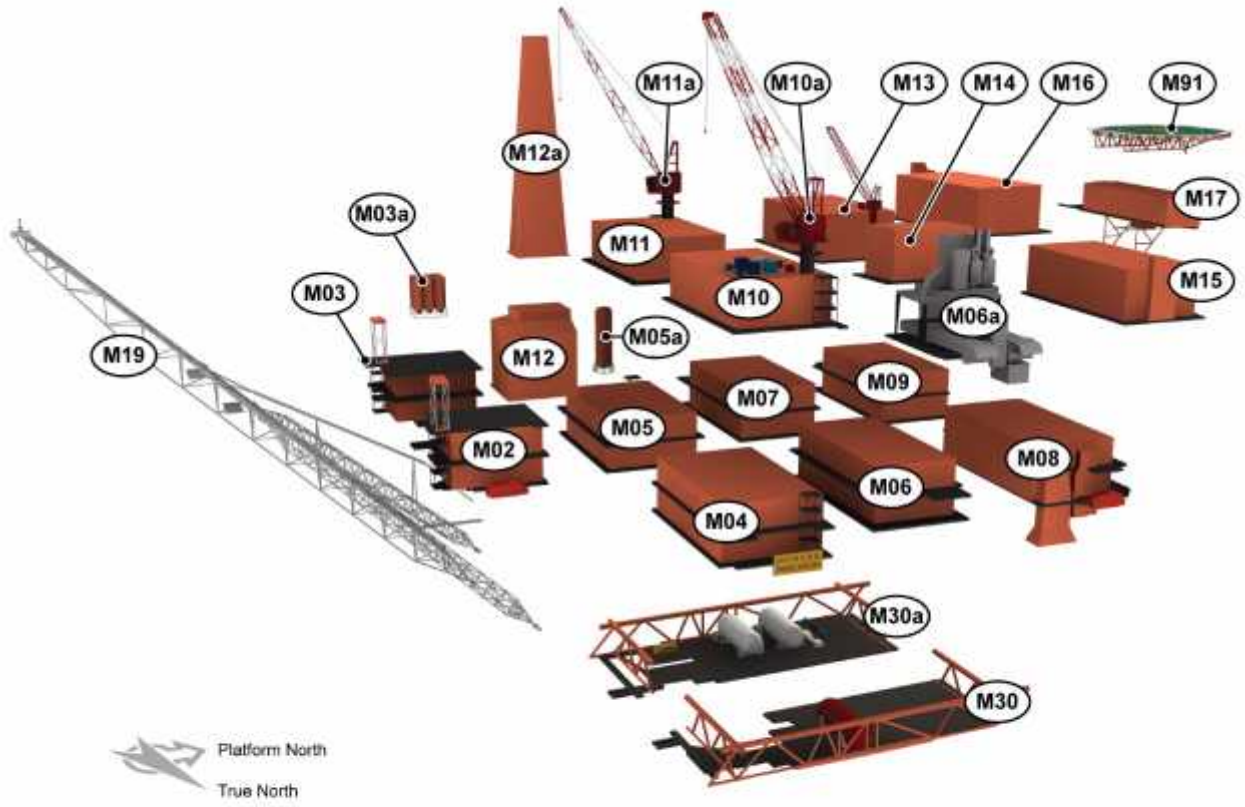
Full details of the Murchison waste hierarchy strategy is reported in detail in Section 3.1 of the Comparative Assessment Report and Section 12 of the Environmental Statement.

3.1 Topsides

Topsides Description: The Murchison Topside Structure comprises 26 modules and individual lifts with a total weight of 24,584 tonnes. The topsides construction is of a modular form on two levels, all situated above the cellar deck. Each individual module has a mezzanine level, with modules M15 and M16 (accommodation) having three levels. Module M17 has two floors with a small plant module beneath it. Overall layout of the topsides is illustrated in Figure 3.1 below.

Methodology: Topsides will be completely removed and returned to shore. Possible methods are outlined in Table 3.1 below. A final decision on decommissioning method will be made following a commercial tendering process.

Figure 3.1: Diagram of Topsides



MODULE	DESCRIPTION
M02	Wellbay East (WBE)
M03	Wellbay West (WBW)
M03a	Bulk Storage Tanks (BST)
M04	Separation Module (SEP)
M05	Metering Module (MET)
M05a	Deareator Column (DEA)
M06	Gas Compression Module (GCM)
M06a	Rolls Royce Generators and Exhausts (RRG)
M07	Gas Sales Module (GSM)
M08	Utilities Module East (UME)
M09	Utilities Module West (UMW)
M10	Drilling Power & Fabrication Workshop (DPF)
M10a	East Platform Crane (ECR)

MODULE	DESCRIPTION
M11	Mud Module (MUD)
M11a	West Platform Crane (WCR)
M12	Drilling Substructure (DRS)
M12a	Drilling Derrick (DRK)
M13	MCR and Workshop (MCR)
M14	Power Generation Module (PWR)
M15	Accommodation East (LQE)
M16	Accommodation West (LQW)
M17	Accommodation New (LQN)
M19	Flare Boom (FLB)
M30	Module Support Frame East (MSFE)
M30a	Module Support Frame West (MSFW)
M91	Helideck (HEL)

Removal Methods: Topsides will be completely removed and returned to shore. Possible methods are outlined in Table 3.1 below.

Table 3.1: Topsides Removal Methods	
1) SSCV (semi-submersible crane vessel) ☑ 2) HLV - monohull crane vessel ☑ 3) Single lift vessel SLV ☑ 4) Piece small ☑ 5) Other – briefly describe ☐	
Method	**Description**
Onshore disposal using SSCV	Removal of topsides by module and transport to shore aboard the SSCV for reuse of selected equipment, recycling, break up and/or disposal
Onshore disposal using HLV	Removal of topsides by module and transport to shore for reuse of selected equipment, recycling, break up and/or disposal
Onshore disposal using SLV	Removal of topside in a single lift using a SLV and transport to shore for reuse of selected equipment, recycling, break up, and/or disposal
Onshore disposal using 'piece small'	Remove topsides in small pieces using attendant work barge and transport to shore. Heavy lift may be required for flare boom
Proposed removal method and disposal route	All methods are being carried forward into the tender process. Tender will address any potential trans-frontier shipment of waste issues. **A final decision on decommissioning method will be made following commercial tendering process**

Preparation/Cleaning: Table 3.2 describes the methods that will be used to flush, purge or clean the topsides offshore, **prior to removal to shore.**

Table 3.2: Cleaning and Preparation of Topsides for Removal		
Waste type	**Composition of Waste**	**Disposal route**
On-board hydrocarbons	Process fluids, fuels and lubricants	Flushing of bulk hydrocarbons will be conducted offshore and residues will be disposed of under an appropriate permit. Fuels and lubricants will be drained and transported ashore for re-use/disposal.
Other hazardous materials	Planned use of chemicals for cleaning topsides, pipework and tanks	Discharge of chemicals offshore will be managed under the relevant permit. Waste chemicals will be transported ashore for disposal by appropriate methods.
Original paint coating	Paint containing lead; further survey work is being undertaken to identify other components that may be present	May give off toxic fumes / dust if flame-cutting or grinding/blasting is used so appropriate safety measures will be taken. Painted items will be disposed of onshore with consideration given to any toxic components.
Asbestos and ceramic fibre	Asbestos has been identified by several surveys; further survey work being undertaken	Appropriate control and management will be enforced. Asbestos and ceramic fibres will be contained and shipped ashore for disposal.

3.2 Jacket

3.2.1 Jacket Decommissioning Overview

OSPAR Decision 98/3 prohibits the dumping and leaving jackets wholly or partly in place, but it recognises the difficulties in removing the footings of large steel jackets weighing over 10,000te and installed prior to 9th February 1999. Murchison qualifies for consideration of derogation from OSPAR Decision 98/3 because the jacket weight is greater than 10,000te and it was installed prior to 1999. See section 5 for details of OSPAR consultation.

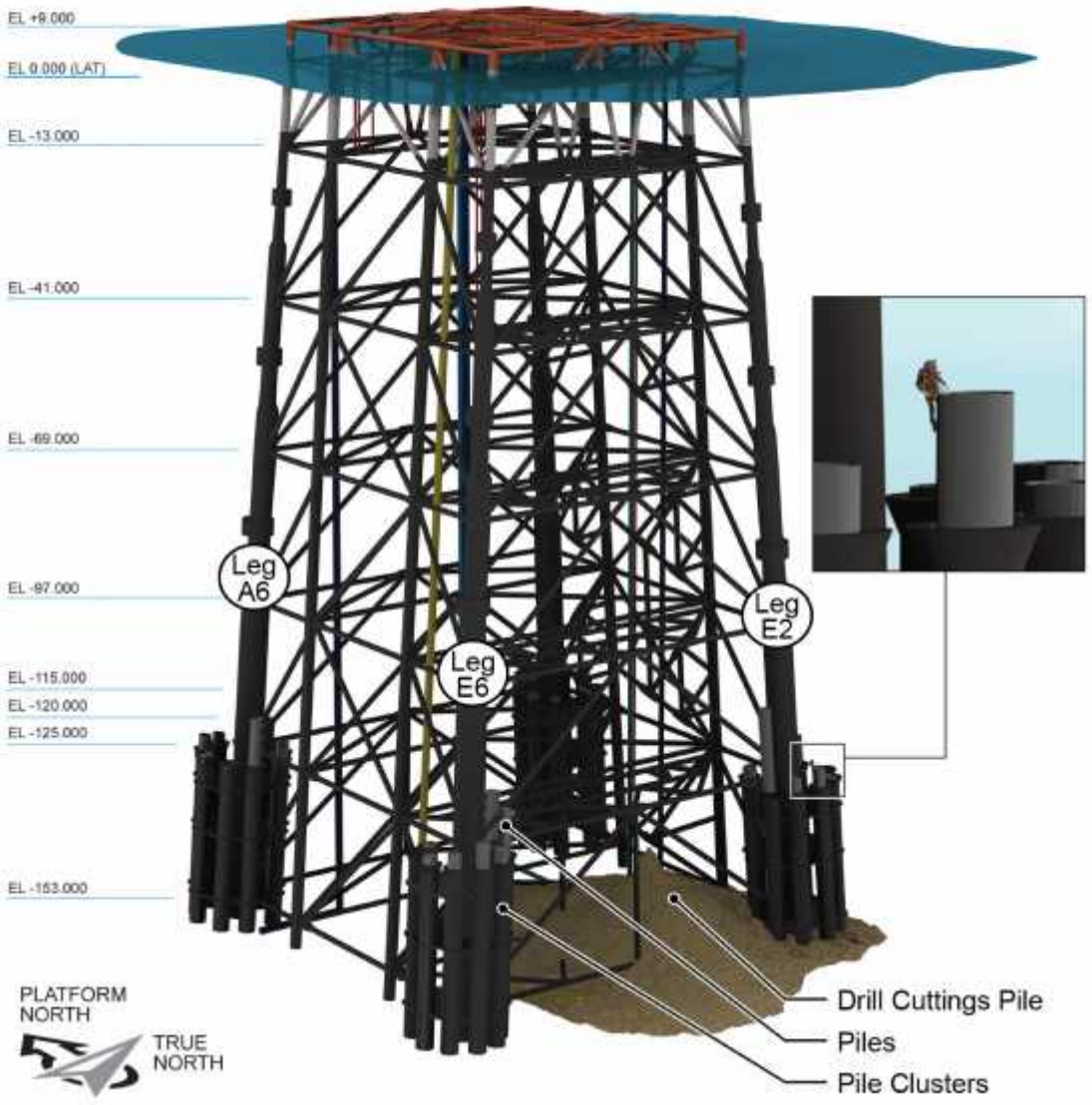
The Murchison Section 29 Notice Holders used a screening and evaluation process to arrive at the options for decommissioning the Murchison jacket. This was designed to assess the technical, safety, environmental, societal and economic impact of each option and is consistent with the DECC Guidance Notes.

Decommissioning of the jacket and drill cuttings pile has been evaluated separately to ensure each was considered on its own merits, although there is an interrelationship factor for complete jacket removal as the cuttings pile would have to be disturbed, displaced or removed to gain access to the base of the footings and seabed brace members.

An application has been submitted to SEPA to reclassify the pile/jacket densitometers as irretrievably lost in that the safety risk to divers in attempting to recover the sources from the deep water confined space of the jacket footings is significantly greater than the environmental risk of leaving the densitometers in place to decay naturally over time. Further details of the jacket densitometer options are described in section 3.3.3.2 of the Comparative Assessment Report.

The comparative assessment was verified independently – see expert verification statement in section 9.

Figure 3.2: Jacket Elevation



Note:
Overall height of jacket is 166m from the seabed.
The height of the footings in the derogation case would be 44m above the seabed (EL -112m LAT).

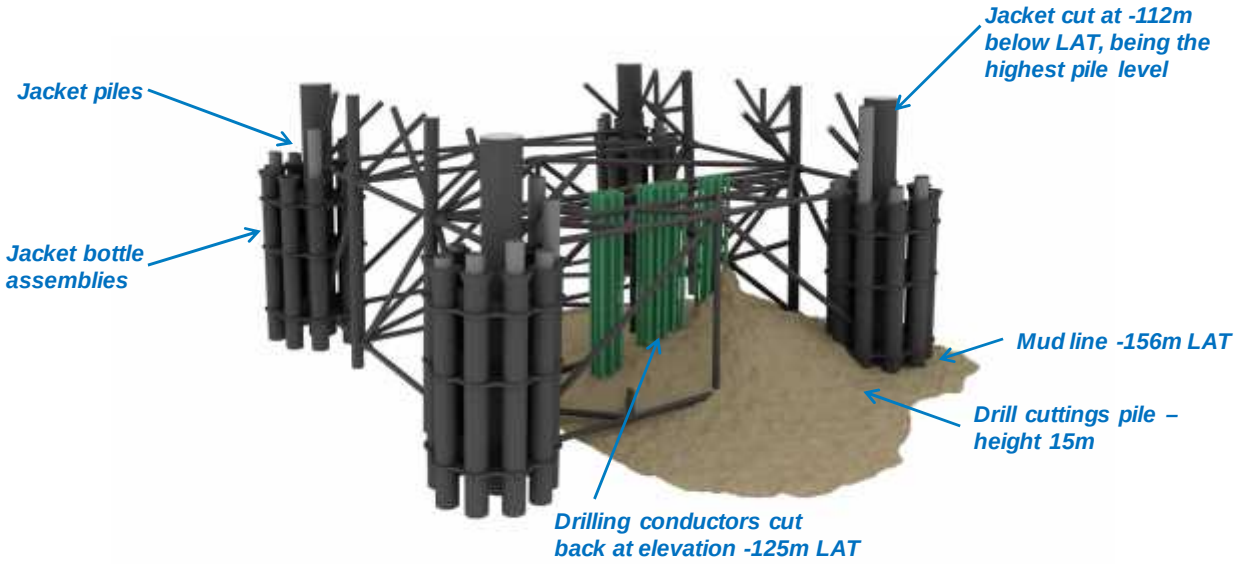


Figure 3.3 Jacket Footings

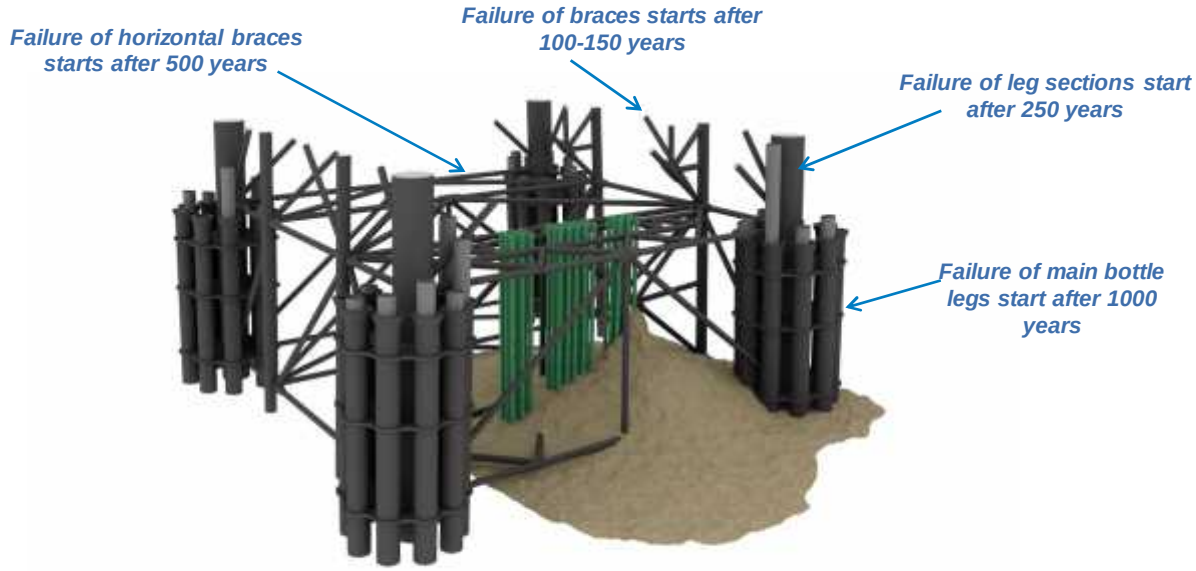


Figure 3.4 Jacket Footings - Predicted Degradation Rate

3.2.2 Jacket Removal Methods

The different methods CNRI are considering for the removal and disposal of the jacket are identified in Table 3.3.

Table 3.3: Jacket Decommissioning Methods	
HLV (semi-submersible crane vessel) (SSCV) ☑	2) Monohull crane vessel (HLV) ☑
3) SLV ☑	4) Piece small ☐
5) Other – briefly describe ☑ – Buoyancy tank assemblies (BTAs)	
Method	**Description**
Total removal of jacket to clean seabed	None of the decommissioning methods assessed could remove the jacket in a single piece. All methods would remove jacket down to top of footings in large sections and then only the SSCV is able to remove the remaining footings in smaller sections.
Remove to top of footings using SSCV	Removal of jacket down to top of footings at 112m below LAT, in three large sections for transportation to onshore site for recycling and disposal.
Remove to top of footings using HLV	Removal of jacket down to top of footings at 112m below LAT, in small sections for transportation to onshore site for recycling and disposal.
Remove to top of footings using SLV	Removal of jacket down to 102m below LAT, in a single large section for transportation to onshore site for recycling and disposal and then using a construction support vessel to remove jacket in small sections down to top of footings at 112m below LAT.
Remove to top of footings using BTAs	Attach BTAs to jacket, cut legs down to 112m below LAT and tow jacket in vertical attitude to a deep-water Norwegian fjord for grounding and final demolition, landing piece small sections ashore for recycling and disposal.
Proposed removal method and disposal route	Tenders for the jacket removal will be asked to nominate an onshore reception facility that is compatible with their removal method. All removal methods, to top of footings, identified above will be carried forward into the tender process. The tender will address any potential trans-frontier shipment of waste issues. **A final decision on decommissioning method will be made following a commercial tendering process.**

Comparative Assessment Method:

A comparative assessment (CA) of jacket removal options was conducted following CNRI's CA procedure, which is based on the OSPAR 98/3 framework. The CA used quantitative and qualitative data to draw a balanced assessment across the main criteria of safety, technical feasibility, environmental impacts, societal impacts and project cost, as described in the Comparative Assessment Report.

Outcome of Comparative Assessment:

Table 3.4 below, summarises the outcome of the Comparative Assessment (CA) process. For detail CA results for each of the four removal methods considered see table 14 (page 83) of the Comparative Assessment Report.

Table 3.4: Jacket Decommissioning Options Comparative Assessment Summary			
Criteria	**Metric**	**Full removal**	**Partial removal**
Safety[1]	Risk to Personnel (offshore and onshore) Potential Loss of Life (PLL)	0.04 PLL	0.02 PLL
	Risk to other users of the sea Potential Loss of Life per annum (PLL_{pa})	0	1.5×10^{-5} PLL_{pa}
Environmental[1,2]	Energy Consumption Total Energy (GJ)	487,750[4] GJ	570,818[4] GJ
	Emissions to the Atmosphere CO2 Equivalent (tonne)	40,416	45,266
	Marine Impacts	100%	100%
Technical[2]	Technical Feasibility Qualitative Score	50%	100%
	Ease of Recovery From Excursion[3]	87%	100%
	Use of Proven Technology & Equipment	55%	100%
Societal[2]	Commercial impact on fisheries	100%	66%
	Socio-economic impact – amenities	100%	100%
	Socio-economic impact - communities	100%	100%
Economic[1]	Total Project Cost (%)	100%	57%

[1] Calculated scores for PLL, GJ, tonne and cost
[2] Qualitative scores with 100% being the highest outcome
[3] Excursion refers to a forced deviation from plan
[4] The energy and emissions assessment (based on the Institute of Petroleum Guidelines) indicates that partial removal results in greater overall energy and emissions than full removal. This reflects the theoretical `cost' (in energy and emissions) of manufacturing the equivalent weight of the footings in new steel to replace that left on the seabed

Table 3.4 summarises the following key issues:

1. Whilst the safety individual risk per annum (IRPA) for both full removal and partial removal are less than the Health and Safety Executive (HSE) tolerable region of 1 in 1000, the full jacket removal increases the Potential Loss of Life (PLL) by 100% compared to the partial removal option. This increase in risk is unjustifiable as it violates the principle of reducing risks to as low as reasonably practical.

2. Partial removal creates a long term and persistent risk to fishermen from the potential snagging of their fishing gear on the remaining footings. The PLL for fishermen, directly attributable to fishing over the Murchison remains, is 1.5×10^{-5} per annum or 1 in 65,000 years.

3. Whilst both full removal and partial removal options cause some environmental disturbance, this is localised and of short duration. There is no significant difference in the energy and emissions between options when implications of replacing the material left on the seabed are factored in.

4. Full jacket removal is technically more challenging than partial jacket removal in the 156m water depth around Murchison. The equipment and techniques required to remove and recover the Murchison jacket footings, in particular the 3,000te bottle leg assemblies, do not have a demonstrable track record. There is therefore a higher probability of project failure for full jacket removal compared to partial jacket removal.

5. Partial removal of the Murchison jacket does create a physical obstruction for fishing activity. Murchison is not a major fishing ground compared with other areas of the North Sea. The fishing effort in the Murchison area is contained within the ICES rectangle 51F1 (approximately 900nm^2 or 3,091km^2). The obstruction caused by the Murchison footings with a footprint of less than 0.01km^2 is small compared with the size of 51F1.

6. The cost of full jacket removal is 75% higher than that for partial removal.

A full description of the comparative assessment process and outcomes is reported in section 5.2 of the Comparative Assessment Report.

In summary, there is a significant increase in operational safety risk, technical complexity and cost associated with the full jacket removal compared to partial jacket removal. For the partial removal option there will be an increase in snagging risk to fishermen which will be mitigated by supporting the programmes set up by the UK Fisheries Offshore Oil and Gas Legacy Trust Fund (FLTC). FLTC sponsors the FishSafe system that provides up-to-date electronic mapping of oil and gas subsea and surface infrastructure in UK waters which may be a potential hazard to fishing vessels or their equipment.

Proposal:

The jacket will be removed down to the top of the jacket footings (-112m LAT) with recovered top section(s) returned to shore for reuse, recycling or disposal. The jacket footings left in place will be marked on Admiralty charts and entered into the FLTC FishSafe System.

3.3 Subsea Installations and Stabilisation Features

Table 3.5: Subsea Installations and Stabilisation Features			
Subsea installations and stabilisation features	**Number of installations**	**Option**	**Disposal route (if applicable)**
Wellhead	2	Remove well head and guidebase as part of MODU campaign to P&A well 211/19-2 Remove 211/19-4 guidebase using a CSV	Return to shore for reuse or recycling
Space frames	2	Two space frames to 211/19-2 & 211/19-4 recovered using a CSV. The piles were cemented into pre-drilled holes and will be cut at an attainable level below sea bed to ensure they are not a hazard to other users of the sea.[1]	Return to shore for reuse or recycling
Protection frames	2	Two protection frames to 211/19-2 & 211/19-4 recovered using a CSV	Return to shore for reuse or recycling

Weights of installations are given in Table 2.2.

The space frames are founded on four 20" diameter corner piles cemented into 26" diameter drilled holes, with a depth in the order of 30m. The space frame piles provide guide pins for installation of the protection frames. No record of the pile cementing procedure or construction records exists. See section 2.6.1 of the Comparative Assessment Report for further details.

[1] Overtrawl trials will verify that this is the case.

3.4 Pipelines/Flowlines/Umbilicals

Decommissioning Options:

Table 3.6: Pipeline Groups/Decommissioning Options			
Pipeline or group	**Description of group**	**Whole/Part Pipeline**	**Decommissioning options considered**
PL115	Oil export line to Dunlin	In part[1]	5, 6, 7, 8, 9, 10
PL123, PL124, PL125	Pipeline bundles	In whole	10

[1]*PL115 will be left in situ under pipeline crossings, see Table 1.6, and at the Fairfield Operated Tie in at Dunlin until decommissioning of the respective pipelines and the Dunlin platform. See Figure 2.2 for pipeline limits.*

Key to Options:

1) Remove - reverse reeling
2) Remove - Reverse S lay
3) Trench and bury
4) Rock placement
5) Remedial removal
6) Remedial trenching
7) Remedial rock placement
8) Partial Removal
9) Leave in place
10) Other – remove by cut & lift

Comparative Assessment Method:

A comparative assessment (CA) of pipeline decommissioning options for PL115 was conducted following CNRI's CA procedure which is based on the OSPAR 98/3 framework. The CA used quantitative and qualitative data to draw a balanced assessment across the main criteria of safety, technical feasibility, environmental impacts, societal impacts and project cost, as described in Section 5.5 of the Comparative Assessment Report.

In summary, the comparative assessment summarises the following key drivers:

1. Whilst the Individual Risk Per Annum (IRPA) for all options are less than the Health and Safety Executive (HSE) tolerable region of 1 in 1,000, there is significant differences across the various options. The cut and lift of exposed sections had a PLL of 7.19 $x10^{-3}$ which is more than five times the PLL for remedial rock placement PLL of 1.33 x 10^{-3}. This was considered a significant difference.

2. The different decommissioning options have different impacts on the long term snagging risk to fishing. The sections of the pipeline currently covered with crushed rock have a rock profile that is designed to be safely overtrawlable by fishing gear. The rock laid down in 1985 has been found to be stable. For the remedial rock placement the fishing PLL is 3.5 x 10^{-4} pa, compared to removing exposed sections by cut and lift where the fishing PLL is 3.3 x 10^{-4} pa.

3. Remedial rock placement over the exposed sections would physically disturb less than approximately 0.045km^2. The presence of naturally occurring hard substrate at Murchison,

together with the existing rock cover material, suggests that organisms associated with hard substrates will already be present and not be introduced as a result of additional remedial rock placement. There are no Annex 1 habitats within the length of the PL115 pipeline.

4. Remedial rock placement is technically feasible using industry standard operations. The removal of exposed sections by cut and lift also uses standard operations but becomes more complex when considering the large number of cuts required compared to the more conventional single length pipeline repairs. The trench and bury option scored low technically because of concerns over the ability to trench efficiently in the stiff boulder clays at Murchison and the short exposed lengths.

5. Societal criteria were not found to be a driver in the ranking of the PL115 decommissioning options. There would be no long term negative impacts on commercial fisheries from removal operations, or from the remedial rock placement option because it would be designed to be overtrawlable.

6. There was a significant difference in the total cost of the options assessed, with the cut and lift options being the most expensive at ten times the cost for the leave *in situ* option.

In summary, there is a significant increase in safety risk, technical complexity and cost associated with the pipeline cut and lift options compared to the remedial rock placement option. There was found to be no discernable difference in residual fishing risk for these two options but there is a significant increase in risk for the leave *in situ* options.

Full details of the PL115 options are described in Section 5.5 of the Comparative Assessment Report.

PL123, PL124 and PL125 decommissioning options were assessed against DECC Guidelines for infield small diameter pipelines.

Outcome of Comparative Assessment:

Table 3.7 below summarises the outcome of the Pipeline Comparative Assessment and identifies the recommended option and justification for this recommendation.

Table 3.7: Outcome of Comparative Assessment		
Pipeline or Group	**Recommended option**	**Justification**
PL115	Option 7	Line condition makes full removal impractical and results in unacceptable risk to personnel; Recovery of the 17 sections of exposed pipeline requires 746 cuts to lift and handle 720 x 12m long sections. The large number of lifts results in unacceptable risk to personnel with no additional benefit to fishermen. Remedial rock covering will minimise snagging risk for fishermen and results in the lowest risk to operational personnel. For remedial rock material quantities see note below. At Murchison, PL115 will be cut at tie in spool and the spool removed. The PL 115 riser will be cut at or below -112m LAT with the upper riser section removed with the jacket and the lower riser section left *in situ* as part of the jacket footings.
PL123, PL124, PL125	Option 10	Surface laid, small diameter infield pipeline bundles, overlaying stiff boulder clay; removal will eliminate future snagging risk for fishermen. The pipeline bundles will be cut at the tie in spool connection to the towheads. The towheads are attached to the jacket structure and will be left insitu with the jacket footings. The bundle J-tubes will be cut at or below -112m LAT with the upper J-tube sections removed with the jacket and the lower J-tube sections left *in situ* as part of the jacket footings.

The remedial rock cover will use graded crushed rock that matches the existing rock material specification. The graded rock will be placed onto the seabed in a carefully controlled operation using a dedicated rock placement vessel equipped with a dynamically positioned fall pipe. The operation will be monitored by an ROV during placement and after completion to confirm the material is deposited in the correct position on the seabed.

Remedial rock cover will be laid up to existing pipeline crossing stabilisation and protection features. Final details of which will be agreed with the relevant pipeline operators (see Table 1.6)

Fishing over trawl trials will be undertaken on completion of the remedial rock placement work along the PL115 pipeline route to verify over trawl ability of the final rock profile.

It is estimated that up to 52,000 tonnes of graded rock material will be required to cover the exposed pipeline sections which compares to the estimated 63,000 tonnes of rock material placed during the 1985 to 1987 operations. The area of the seabed directly impacted by the rock placement is approximately 8,500m by 5m which is equivalent to 0.043km^2.

3.5 Pipeline Stabilisation Features

Table 3.8: Pipeline Stabilisation Feature(s)			
Stabilisation feature(s)	**Number**	**Option**	**Disposal Route (if applicable)**
Concrete and grout mattresses	14	4 mattresses to remain *in situ* on pipeline crossings.	Removal to shore for landfill disposal
Grout bags	4	Full recovery	To shore for landfill disposal
Formwork	n/a		
Frond Mats	14	Full recovery	To shore for landfill disposal
Rock Dump	63,000	Will remain *in situ*	n/a

3.6 Wells

Table 3.9: Well Plug and Abandonment
The wells which remain to be abandoned, are listed in Section 2.4 (Table 2.5) will be plugged and abandoned in accordance with Oil and Gas UK Guidelines for the Suspension and Abandonment of Wells, Version 4, July 2012. Platform conductor strings will be cut below the footing elevation of -112m LAT and above the lower guide frame elevation of -125m LAT at approximately -124m LAT. Conductor strings will be cut in accordance with Oil and Gas UK Guidelines for the Suspension and Abandonment of Wells, Version 4, July 2012. A PON5/PON15/MCAA application will be submitted in support of any such work that is to be carried out. The M75 Delta well with target in the Norwegian block PL037D will be plugged and abandoned in accordance with the UK Guidelines referenced above. Wintershall will provide relevant details to PSA when the plug and abandonment operations are completed. All platform wells listed in Table 2.5 will be plugged and abandoned in a campaign commencing in 2013. The subsea well MS2 will be plugged and abandoned as part of a mobile offshore drilling unit (MODU) campaign covering a portfolio of subsea assets. A final decision on the MODU campaign and schedule will be made following a commercial tendering process, the timing of which will be between Q2-2016 and Q2-2019 depending on market capacity and availability.

3.7 Drill Cuttings

Drill Cuttings Decommissioning Options:

OSPAR recommendation 2006/5 has indicated that if the oil release rate from a cuttings pile is less than 10te/year and the area persistence is less than 500 km^2years then the best environmental option for the management of the pile is to leave it in place undisturbed to degrade naturally.

Table 3.10 below gives details of the Murchison drill cuttings pile.

Table 3.10: Drill Cuttings Decommissioning Options
How many drill cuttings piles are present? **1**
Review of Pile characteristics: **Pile 1**
How has the cuttings pile been screened? **Actual samples taken**
Date of sampling (if applicable): **April/May 2011**
Sampling to be included in pre-decommissioning survey? **Yes**
Does it fall below both OSPAR thresholds?[1] **Yes**
Will the drill cuttings pile have to be displaced in order to remove the jacket footings? **Yes**
What quantity would have to be displaced/removed? **22,545m^3**
Have you carried out a Comparative Assessment of options for the Cuttings Pile? **Yes**
Tick options examined:
1) Remove and re-inject ☑ 2) Remove and treat onshore ☑ 3) Remove and treat offshore ☑
4) Relocate on seabed ☑ 5) Cover ☐ 6) Leave in place ☑ 7) Other ☐

[1] *Total annual oil loss from the Murchison Pile is predicted to be 1.2 tonnes/year (this value includes both loss to the water column and loss by biodegradation); the persistence (the area of the seabed where the concentration of oil remains above 50mg/kg and the duration that this contamination remains) is predicted to be 25km^2years.*

Comparative Assessment Method:

The Murchison drill cuttings pile falls below both OSPAR Recommendation 2006/5 Stage 1 screening thresholds for which natural degradation is considered the best environmental strategy; however, in order to assess the full removal of the jacket footings it was necessary to consider full removal of the drill cuttings pile and consequently a Stage 2 assessment was required. A comparative assessment of drill cuttings pile management options was conducted following CNRI's CA procedure which is based on the OSPAR 98/3 framework. The CA used quantitative and qualitative data to draw a balanced assessment across the main criteria of safety, technical feasibility, environmental impacts, societal impacts and project cost, as described in the Comparative Assessment Report.

Proposal:

The drill cuttings pile will be left *in situ* to degrade naturally as identified in the Comparative Assessment as the best overall management option.

3.8 Waste Streams

Table 3.11 describes how the main waste streams arising from the proposed programmes would be managed. Table 3.12 describes the planned final disposition of the inventories from the installation and pipeline.

Table 3.11: Waste Stream Management Methods	
Waste Stream	**Removal and disposal method**
Bulk liquids	Flushing of bulk hydrocarbons will be conducted offshore and residues will be removed offshore under an appropriate permit during the EDC phase. Other bulk liquids may be removed from vessels and transported ashore. Vessel pipe work and sumps will be drained prior to removal to shore and shipped in accordance with maritime transportation guidelines. Further cleaning and decontamination will take place onshore prior to recycling/re-use. Pipeline bulk liquids will be pushed down PL115 to Dunlin and onto the Sullom Voe terminal.
Marine growth	Some marine growth will be removed offshore, although the majority will be removed at the onshore disposal site. Disposal options will be managed through a Decommissioning Environmental Management Plan.
Norm	NORM may be partially removed offshore under an appropriate permit. Onshore disposal arrangements will made in accordance with CNRI's Management of Norm Procedure SHE-PRO-332.
Asbestos	Asbestos will be contained and taken ashore for disposal in accordance with CNRI's Waste Management Procedure SHE-PRO-315.
Other hazardous wastes	The majority of hazardous wastes will be taken ashore and disposed of in accordance with CNRI's Waste Management Procedure SHE-PRO-315.
Onshore Dismantling sites	Appropriate licensed sites will be nominated by the platform removal contractor. The nominated facility will demonstrate a proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver innovative recycling options.

For further details of the Murchison Waste Management Plan and CNRI's Corporate Procedures see Section 12 of the Murchison Environmental Statement.

Table 3.12: Inventory Disposition			
	Total inventory tonnage	**Planned tonnage to shore**	**Planned left in situ**
Installations	56,961 tonnes[1]	40,676 tonnes	16,285 tonnes[2]
Pipelines	7,957 tonnes[3]	1,057 tonnes	6,900 tonnes[4]

[1] *Includes topsides, jacket, subsea installations and well completions*
[2] *Includes jacket footings down to -112m LAT and well casings programme beneath the -124m LAT cut level*
[3] *Does not include the 63,000te of existing rock placement material*
[4] *Does not include the total existing and remedial rock placement material together estimated at 115,000te*

Recovered material will be landed ashore in the window of 2016 to 2021. It is not possible to forecast the reuse market with any accuracy or confidence this far forward, so the following is a statement of disposal aspirations. Percentages shown relate to the weight of material which is expected to be recovered to shore.

Table 3.13: Reuse, Recycle & Disposal Aspirations for Recovered Material

	Reuse	Recycle	Disposal
Installations	5 to 10%	85 – 90%	<5%
Pipelines	<5%	90 – 95%	<5%

Further information can be found in the Environmental Statement – Section 12.3.

4 ENVIRONMENTAL IMPACT ASSESSMENT

The Environmental Statement (ES) presents the findings of the environmental impact assessment (EIA) undertaken by the Murchison Section 29 Notice Holders for the recommended decommissioning option of the Murchison Facilities including the Murchison Platform and associated drill cuttings pile, pipelines and subsea infrastructure.

4.1 Environmental Sensitivities

Table 4.1 describes the important/sensitive features of the receiving environments in the areas in which the decommissioning activities will take place.

Table 4.1: Environmental Sensitivities

Environmental receptor	Main features
Conservation interests	**Annex I Habitats**: there are no known Habitats Directive Annex I habitats in the vicinity of the Murchison Field. **Annex II Species**: the only Habitats Directive Annex II species sighted within the Murchison area is the harbour porpoise.
Seabed	Seabed features are dominated by the Murchison platform, drill cuttings pile and associated pipelines with no evidence of bedrock or biogenic reefs, pockmarks or unusual or irregular bedforms. Total hydrocarbon levels in the wider Murchison area ranged from 1.0 µg/g to 450 µg/g (mean 24.8 µg/g), while those within the drill cutting pile ranged between 1,310 µg/g to 10,100 µg/g. (µg/g = microgram (one millionth of a gram) per gram).
Fish	The Murchison Field is located in spawning grounds for cod (Jan to Apr), whiting (Feb to Jun), haddock (Feb to May), Norway pout (Jan to Apr) and saithe (Jan to Apr) and nursery grounds for herring, ling, mackerel, spur dog, haddock, Norway pout and blue whiting.
Fisheries	The Murchison area is of “low” to “very low” relative value. Fishing effort is “low” to “very low” and dominated by demersal gear types. However, pelagic species historically dominate the landings in the vicinity of the Murchison area targeting mostly mackerel and herring.
Marine mammals	Marine mammals sighted in and around the Murchison area include minke whale, long-finned pilot whale, killer whale, white-beaked dolphin, white-sided dolphin, harbour porpoise and sperm whale.
Birds	Seabird vulnerability to oil pollution in the Murchison area is “high” in March, July, October and November and “moderate” to “low” for the rest of the year.
Onshore communities	An onshore decommissioning facility will be used that complies with all relevant permitting and legislative requirements.
Other users of the sea	**Shipping**: the annual shipping density is high to the west of the Murchison field, and medium to low density to the east. **Oil and gas industry:** See Figure 1.3 and Table 1.6.

	Defence: there is no known military activity in the vicinity of the Murchison Field, nor any recorded munitions dumping grounds. **Telecommunications and cables:** there are no known submarine telecommunication and power cables within the vicinity of the Murchison Field. **Wrecks:** there are no recorded wrecks in the vicinity of the Murchison Field.
Atmosphere	Local atmospheric conditions are influenced by emissions from Murchison operations, vessel use and nearby oil and gas facilities.

Further details on environmental sensitivities are described in Table 1.2 in the Environmental Statement for Decommissioning of the Murchison Facilities.

4.2 Potential Environmental Impacts and their Management (Summary)

Overview:

The Environmental Statement (ES) identifies potential environmental impacts by identifying interactions between the proposed decommissioning activities and the local environment while considering responses from stakeholders. The ES also details mitigation measures designed to avoid and reduce the identified potential environmental impacts and describes how these will be managed in accordance with CNRI's established Environmental Management System (EMS).

Following an assessment of the potential impacts through an environmental impact identification workshop and subsequent risk assessment, the ES concludes that the recommended options to decommission the Murchison Facilities can be completed without causing significant impact to the environment. Those activities that had a potential for a significant impact are summarised in Table 4.2, along with the proposed environmental management.

There will be no planned use of underwater explosives during these activities. We acknowledge that there will be a requirement for an environmental protection plan to be produced and submitted to JNCC should this plan change.

Table 4.2: Environmental Impact Management		
Activity	**Main Impacts**	**Management**
Topsides removal	• Energy use and atmospheric emissions • Underwater noise • Dropped object • Accidental hydrocarbon release	Vessels will be audited as part of selection and pre-mobilisation. Work programmes will be planned to optimise vessel time in the field. Offshore vessels will avoid concentrations of marine mammals. A post decommissioning debris survey will be conducted and any debris recovered. As part of the Murchison OPEP CNRI have specialist oil spill response services provided by Oil Spill Response Ltd. (OSRL) and are members of the Oil Pollution Operators Liability Fund (OPOL).
Jacket removal	• Energy use and atmospheric emissions • Underwater noise • Damage or loss of fishing gear • Dropped object • Accidental hydrocarbon release	See Topsides removal. Underwater cutting is expected to be the highest source of sound, the operation of well-maintained equipment during decommissioning will ensure noise of operating machinery is kept as low as possible. UK Hydrographical Office and Kingfisher will be informed of all activities and any structures left in place. CNRI will establish lines of communication to inform other sea users, including fishermen, of vessel operations during decommissioning.
Subsea installations removal	As jacket	As jacket.
Disposal of pipelines	• Energy use and atmospheric emissions • Underwater noise • Damage or loss of fishing gear • Seabed disturbance • Dropped object • Accidental hydrocarbon release	See Topsides removal The rock placement will be installed from a dedicated rock placement vessel using an ROV controlled fall pipe equipped with cameras, profiles and pipe tracker to ensure accurate placement of rock over the pipeline and minimise seabed disturbance.
Decommissioning stabilisation features	See Disposal of pipelines	See Disposal of pipelines.
Decommissioning drill cuttings	• Long-term presence of hydrocarbons in sediments • Leaching of hydrocarbons from the drill cuttings pile	Characteristics of the Murchison drill cuttings pile were compared against the OSPAR Recommendation 2006/5 Cuttings Pile Management Regime Stage 1 thresholds, were found to be well below the OSPAR rate of oil loss threshold and the persistence threshold.

5 INTERESTED PARTY CONSULTATIONS

5.1 Scope and Form of Consultation

The submission of the *Draft* Murchison Field Decommissioning Programmes to DECC in late May 2013 triggered both statutory and public consultation.

Statutory consultees: consultation was undertaken with statutory consultees both informally during the preparation of the draft programmes and formally within the statutory consultation which ran for over six weeks. Comments received and CNRI's responses are shown within Table 5.1. There were no objections to the proposals

Public consultation: also forming part of the statutory consultation process, public consultation was invited through the placing of public notices in four publications: The Times, Aberdeen Press & Journal, Edinburgh Gazette and Shetland Times. A sample copy of one of the notices appears in Appendix 2. No responses were received.

Other stakeholder consultations: stakeholders with whom CNRI had conducted pre-engagement dialogue (see Table 5.2 for details of the type of communication undertaken) were also invited to comment on the Draft Decommissioning Programmes. Their consultation responses appear in Table 5.3. There were no valid objections to the proposals.

OSPAR review: by virtue of Murchison's size and date of installation rendering the platform a derogation candidate under the terms of OSPAR Decision 98/3, consultation on a separate derogation application was undertaken by the UK government with the OSPAR Contracting Parties. This lasted 16 weeks. Only one comment was received following the review and is included in Table 5.4, while a copy of the correspondence is included at Appendix 3 for completeness.

5.2 Statutory Consultees Engagement and Comment

Table 5.1: Summary of Statutory Consultees' Comments	
Points raised during informal consultations	**Response**
Global Marine Systems	
Invited but did not attend March and November 2012 stakeholder workshops for which all relevant documentation supplied. Alternative meetings offered but not taken up.	n/a
National Federation of Fishermen's Organisations	
No specific comment although attended March 2012 stakeholder workshop and all relevant documentation supplied for this and the November 2012 workshop. Informal contact maintained since.	n/a

Northern Ireland Fishermen's Federation	
Invited but did not attend March and November 2012 stakeholder workshops, for which all relevant documentation supplied. Alternative meetings offered but not taken up.	n/a
Scottish Fishermen's Federation	
Meetings held November 2011 to March 2012 to initially introduce the pre-planning, then to secure input data and receive input assessments for the evaluation sessions prior to the Comparative Assessment workshop held May 2012. Comparative Assessment emerging options explored further during the period July 2012 to October 2012. Attended stakeholder workshops March and November 2012 for which all relevant documentation supplied.	These views were incorporated into CA process and evaluation; follow up to explore views on recommendations from the CA Workshop related to PL115 and subsequent exploration of risk profiles.
Responses to statutory consultations	
Comment	**Response**
Global Marine Systems	
Advised by GMS that they have no comments as they do not expect any cables to be directly affected in immediate vicinity, but that if in the unlikely event that any interaction were unexpectedly to be necessary in the course of engineering the project then liaison with specific cable owners would be needed.	CNRI confirmed no cables should be directly affected but in such an event liaison would be undertaken as required.
Assumption made that Ministry of Defence (MoD) would be consulted or aware of the project and of the operations for any military cables that may be in the region	Advice from DECC is that no additional action is required
Recommendation that when notice to mariners were arranged for the offshore works, then the Kingfisher Fortnightly Bulletin be updated to include details of the works to inform sea users.	CNRI confirmed that information for mariners will be provided to the Kingfisher bulletin.
National Federation of Fishermen's Organisations	
Considers the information and rationale behind the project to be informative and comprehensive.	CNRI gratitude expressed for NFFO's own role in developing the programme.
Believes it imperative to get the correct balance between what is to remain on the seabed and its impact on future fishing operations.	Agreed
The Federations both North and South of the border have expressed concerns on any part of the original structure remaining *in situ* but also understand the adverse environmental impact such complete	Acknowledged

removal would cause, e.g. disturbance of cuttings pile.	
Restate preference for a structure that is visible (above surface) rather than one below sea level, despite understanding restrictions on this matter, commenting that surface marker buoys or a fishing friendly structure could be placed over remaining footings.	Safety implications of this approach highlighted. Idea of a fishing friendly structure would be impractical. False sense of security would arise from surface marker buoys. Marking on Admiralty Charts/FishSafe System, overtrawl trials and word of mouth in fishing community preferred.
Considers that the decommissioning programme has been open, honest and informative and may well be the format for all other decommissioning programmes in the future.	Acknowledged
Northern Ireland Fishermen's Federation	
Advised that they have no comment due to having very few boats in the area.	Noted.
Scottish Fishermen's Federation	
Appreciation of engagement expressed and primary concerns of safety and the physical impact on fishing of the long term presence of oil industry infrastructure highlighted. Pleased to note P&A intentions, also bundle removal.	Acknowledged and SFF's own contribution to the development of the programme recognised.
Derogation application plans noted, restating SFF preference for legs to be cut above sea surface level. Recognition of interrelationship between drill cuttings and footings.	Acknowledged but IMO rules and OSPAR Decision 98/3 override.
Pleased to note that tie-in spools will be removed and are content given the circumstances for remedial rock placement over exposed sections of PL115, and keen for overtrawlability trials to be undertaken on completion of latter.	Intention to conduct overtrawl trials reaffirmed.
Notes plans to isolate gas export/import pipeline which forms part of NLGP and recognises that NLGP decommissioning is outwith the Murchison decommissioning programme.	Acknowledged.
Reaffirmation of continued appreciation of the openness of dialogue to date and the wish to continue to work closely and positively with CNRI and the project team.	Acknowledged, and CNRI's own wish to continue this expressed.
Public Consultation	
No responses received.	n/a

5.3 Communication Methods Summary

This section indicates the methods used to communicate and consult with other, non-statutory stakeholders prior to the formal consultation.

1) Website ☑ 2) Newsletter ☑ 3) Individual Correspondence ☑
4) Stakeholder events ☑ 5) 1-1 meetings ☑ 6) Media information ☐

Table 5.2: Summary of Other Stakeholder Activity			
Informal consultations record			
Activity	**Date**	**Format**	**Key points arising (if any)/description of activity**
Website	May 2011 onwards	1, 3	www.cnri-northsea-decom.com publishing of key documents supporting the decommissioning programme
Environmental Impact Assessment scoping consultation	August & September 2011	3	Introduction to new stakeholder lead and invitation by phone and email to provide input into EIA scoping report offered to stakeholders (Stakeholder Report describes responses fully)
Stakeholder event	March 2012	4	See Stakeholder Report for full list of attendees and also Transcript of Meeting on Website – objective to present and get feedback on Murchison Decommissioning Options.
Stakeholder event	November 2012	4	See Stakeholder Report for full list of attendees and also Transcript of Meeting to be published Website – objective to present and get feedback on Murchison's Recommended Decommissioning Option
Platform crew	Nov 2010 & 2011; Sept 2012	2, 5	Three newsletters issued to platform crew, supported by regular offshore briefing sessions by decommissioning team members
Section 29 Non Equity Holders	November 2010; May 2013	3 & 5	Notification letter sent at start of pre-planning and prior to statutory consultation with follow up contact; presentations made to Maersk in Aberdeen
Aberdeen Grampian Chamber of Commerce	April 2012; February & July 2013	4, 5	Supply chain communication and opportunities explored at meetings; presentation to AGCC members scheduled for June 2013; attended March 2012 stakeholder workshop
DECC Offshore Decommissioning Unit	Approx 15 meetings between Jan 2010 &	3, 4, 5	Regular meetings to report progress on developing the Murchison Decommissioning Programme and seek advice; additional email and telephone contact as required; range of officers attended both

	Feb 2014		stakeholder workshops
Decom North Sea	Regular meetings Aug 2011 & Feb 2014	4, 5	Supply chain communication and opportunities discussed formally; regular participation in extensive programme of events; attended both stakeholder workshops; other informal contact at industry events
Decom North Sea/OGUK Conferences	October 2011, 2012 and 2013	4	Formal presentations and informal engagement at the annual conference and participation in the organising committee each year
UK Fisheries Offshore Oil and Gas Legacy Trust Company Ltd (FLTC)	July 2010, Aug 2011, April & Nov 2012	3, 4, 5	Meetings to discuss FLTC, development in FishSafe system and impact on comparative assessment process and update on Murchison decommissioning project; email and telephone contact as required; attended November 2012 stakeholder workshop
Greenpeace Research Laboratories	April 2012; Jan & April 2013, May & July 2013	3, 5	Meetings to review of material presented at the March 2012 stakeholders events and comments arising; discussion of drill cuttings management options, plus related telephone and email contact
Health and Safety Executive	September 2011	4, 5	Pre-planning discussions pending submission of DP and Cessation of Production; attended both stakeholder workshops
Joint Nature Conservation Committee (JNCC)	Dec 2010; Feb 2011; April, July, Sept & Nov 2012	5	To agree scope for environmental base line survey of Murchison area, results reported back at a meeting in April 2012. Follow up meeting in July and Sept 2012 to report on further studies relating to PL115; attended November 2012 stakeholder workshop
Marine Scotland	Mar, April, June, Nov 2012; March & April 2013; Jan 2014	4 5 5 4 5 5	Update meetings on stakeholder workshop, briefing on emerging decommissioning options from CA workshop; attended stakeholder workshops in March and November 2012; update briefing for new post holder April 2013 and platform visit January2014
NPF North Sea Decommissioning Conferences, Bergen	February 2011, 2012, 2013 & 2014	4	Update to industry of latest status of pre-planning in formal presentations, plus informal engagement; presence on organising committee
PILOT Share Fair	November 2010	4	Supply chain engagement

Royal Society for the Protection of Birds	April & November 2012	5	Review and discussion of material presented to the March 2012 stakeholders event; attended November 2012 stakeholder event
Scottish Environmental Protection Agency	Nov 2011; Dec 2012	3, 5	Meeting to review the management options relating to the Murchison jacket densitometers and related communication
Scottish Oceans Institute	March 2012	3, 5	Review of material presented to the March 2012 stakeholders event, made available survey video footage for review of marine growth habitats
Society of Under-water Technology	Dec 2011; March 2013	4	Updates of latest status of pre-planning in formal presentation at conference/ informal engagement
Subsea UK Lunch and Learn Event	August 2012	4	Presentation of decommissioning options with opportunity for Q and A and informal discussion; publication of presentation on Subsea UK website

5.4 Responses to statutory consultations by interested stakeholders

Table 5.3: Consultations - Summary of Responses (Non-Statutory Consultees)		
Responses to statutory consultations by interested stakeholders		
Who	**Comment**	**Response**
Aberdeen Grampian Chamber of Commerce		
Confirmed no further new observations and that all comments at the (earlier) feedback stage have been addressed and responded to by CNRI.		Acknowledged.
Greenpeace		
Appreciative of opportunity to comment and for CNRI's openness and transparency during stakeholder consultation.		Acknowledged. CNRI appreciation expressed for Greenpeace's own input, notably consideration of the drill cuttings pile.
Reiterates full support for OSPAR Decision 98/3 but does not support OSPAR approach to evaluation of leave in place of drill cuttings piles and takes issue with perceived inadequacies of OSPAR's approach. Own position is full removal of drill cuttings pile where technically feasible unless there are compelling reasons to justify a derogation.		Support for OSPAR Decision 98/3 also reiterated by CNRI. Confirmation given that CNRI has fulfilled its responsibilities as currently required by the international community.

	Copy of correspondence made to Defra and DECC to formally consider remarks regarding OSPAR 98/3.
While consideration may be made of the possibilities of drill cuttings' reinjection as an option, this would not be permitted under current regulations.	Agree. Confirmation given that despite consideration of the full range of possible options for drill cuttings, CNRI makes clear in the Comparative Assessment that reinjection would not be permissible under the OSPAR Convention and the London Protocol.
Desire expressed for deeper coring of the drill cuttings pile to inform management options.	CNRI agree that it would be helpful to have a more thorough knowledge of the pile contents and are investigating how and when this might be achieved to help validate the modelling used to predict the long term fate of the pile.
International Marine Contractors Association	
Restated its previously expressed position that while it is relevant for IMCA to be kept abreast of progress on decommissioning, liaison by industry with its members should be outwith the IMCA secretariat's involvement.	Noted and acknowledged.
Marine Conservation Society UK	
Assumption that for well plugging and abandonement (P&A), the Oil & Gas UK Guidelines for this are in line with OSPAR.	Oil & Gas UK Guidelines for are the accepted standard – OSPAR does not have any.
Supports topsides proposals.	Acknowleged.
Supports jacket removal and are disappointed that footings will be left in place, though accept providing it does not prevent access to the drill cuttings.	Drill cuttings pile is largely within the jacket footprint. Removing jacket to top of footings will not change access to cuttings pile at a later date from the sides, but would make access

	from the top easier.
Opposes drill cuttings being left in place and believes that efforts should be made to recover drill cuttings as far as is feasibly possible.	Full assessment was made of options for drill cuttings and consideration given to OSPAR Recommendation 2006/5 (i.e. if oil release rate from a cuttings pile < 10te/yr and area persist-ence < 500km2years then best environmental option for management of the pile is leave in place undisturbed to degrade naturally.
Supports proposals for removing short early production pipeline bundles and associated subsea equipment.	Acknowledged.
Opposes the proposals to leave pipeline PL115 in situ and believes 'such debris, especially oil contaminated debris' should be removed.	Noted; breadth of work to identify leave in situ option reiterated. PL115 will be cleaned prior to the application of rock cover to ensure no hydrocarbon contamination. Debris clearance planned.
Supports development and subsequent implementation of a recovery plan on completion of decommissioning and would like to be consulted on this.	Post decommissioning survey results will be available and MCS input on subsequent surveys and monitoring for discussion with DECC would be welcomed. This will be noted in the Decommissioning Programme action tracker to ensure appropriate approaches are made to the MCS at the right time.

Northern Lighthouse Board	
Make clear that comments relate only to parts relating to Shipping and Navigational Safety.	Acknowledged.
No objection to the preferred option of removal to -112m below LAT with the remaining footings being properly identified on Admiralty Chart BA295 and recorded within the FishSafe information system. Would require that Notice(s) to Mariners, Radio Navigation Warning(s) and publication in appropriate bulletins will be required stating the nature and timescale of any works carried out in the marine environment relating to the decommissioning project.	Acknowledged, with confirmation that CNRI has noted the need for these measures to be taken.
On final completion of the decommissioning operations would require position of any remaining sub-sea structure(s) and pipelines to be communicated to the UKHO in order that the admiralty chart BA295 can be correctly updated as stated above.	Noted, this will be done.
Marking and Lighting will be recommended for each stage of the decommissioning process through the formal DECC application and licensing process, recognising that suspension of decommissioning operations may be required due to seasonal weather and meteorological conditions and therefore request they are informed prior to any suspension to enable proposal of suitable Marking and Lighting regime to inform mariners of any remaining obstructions.	Agreed and noted.
All vessel(s) deployed for programme should be marked and lit as per the International Regulations for the Prevention of Collisions at Sea.	Agreed and noted.
Require that notifications of any movements regarding mobilisation and demobilisation of specialist vessels are sent to the NLB's Edinburgh office.	Agreed and noted.
North Sea Commission	
Wrote to advise that 'Unfortunately we are not able to give a formal comment within the deadline, as we did not adopt a common response within our political group.' Thanked CNRI for provision of information and ask to be kept updated on progress.	Noted.
RSPB Scotland	
Expressed appreciation for the level and nature of public engagement by CNRI.	Acknowledged and appreciation expressed for RSPB's own input during pre-planning consultations.

Reiterates that while RSPB's starting point for consideration of site clearance is that restoration should be to the state existing before development commenced, the Society recognises that such an aspiration may be more hazardous to the environment and to human safety than what is actually proposed, and that Murchison qualifies as a derogation candidate.	Noted.
Asks that RSPB be kept informed of the progress of the project and particularly if any significant changes should arise as a result of this formal consultation.	Agreed.
Exxonmobil, Shell and Statoil (Section 29 Notice Holders)	
All three companies replied in almost identical terms, namely that based on their interpretations of the Petroleum Act 1988, section 29, and Agreement between the Norwegian and UK governments relating to the Exploitation of the Murchison Field Reservoir, the companies have no responsibilities. As such, the companies abstain from commenting on the Murchison Field DP, requesting that it is made clear that it is not submitted on behalf of them.	CNRI advised that DECC lists all three companies as Section 29 Noticeholders and queries about this should be taken up direct with DECC. Contact details provided.
Maersk Oil North Sea UK Limited	
CNRI offer of presentation on the Decommissioning Programme accepted.	Presentation made to Maersk team August 2013.
Fairfield Energy	
Table 1.6 of Decommissioning Programme (DP): preference for reference to 'operator' rather than 'owner' to be used as the heading to column 1 of table.	The format used follows the Standard Decommissioning Programme template required by DECC.
Figure 2.2 of DP: consider annotations numbered 1 and 2 on schematic are unnecessary and potentially confusing; also, that text below the schematic differentiating 'operator, operations, primary emergency response and integrity' to be unnecessary in the context of the DP, suggesting it would be clearer if the annotations 1 and 2 were completely removed and that the descriptions of PL-115 Limits be simplified by removing the limit lines that describe 'operations, primary emergency response and integrity'.	This was added at the request of DECC and reflects the information they have specified.
Minor typos highlighted on p45 and p47.	Noted and corrected.
ConocoPhillips, Marathon, Maersk, OilMac, Shell, TAQA	
Requests made by operators/supply chain for copies of various documents to help inform their own projects.	Copies of documents provided as requested.

Table 5.4: OSPAR Review of Derogation Application - Summary of Responses (see Appendix 3 for copy of correspondence)		
Contracting Party	**Comment**	**CNRI Response**
Norway (Royal Norwegian Ministry of Petroleum and Energy)	Norway assumes that the operator follows up the stated clean-up intentions and that a good and relatively long term environmental monitoring is ensured after the disposal.	Noted

6 PROGRAMME MANAGEMENT

6.1 Project Management and Verification

A CNRI project management team will be appointed to manage the operations of competent contractors selected for the well abandonment, decommissioning, and removal and disposal scopes of work. CNRI Safety, Health and Environmental Management Processes will be used to govern operational controls, hazard identification and risk management. The work will be coordinated with due regard to the interfaces with other operators' oil and gas assets and with other users of the sea. CNRI will control and manage the progress of all permits, licences, authorisations, notices, consents and consultations required. Any changes to this decommissioning programme will be discussed with DECC and approval sought.

The Murchison Decommissioning Programmes will be managed in accordance with CNRI's Project Delivery Process Procedure.

6.2 Post-Decommissioning Debris Clearance and Verification

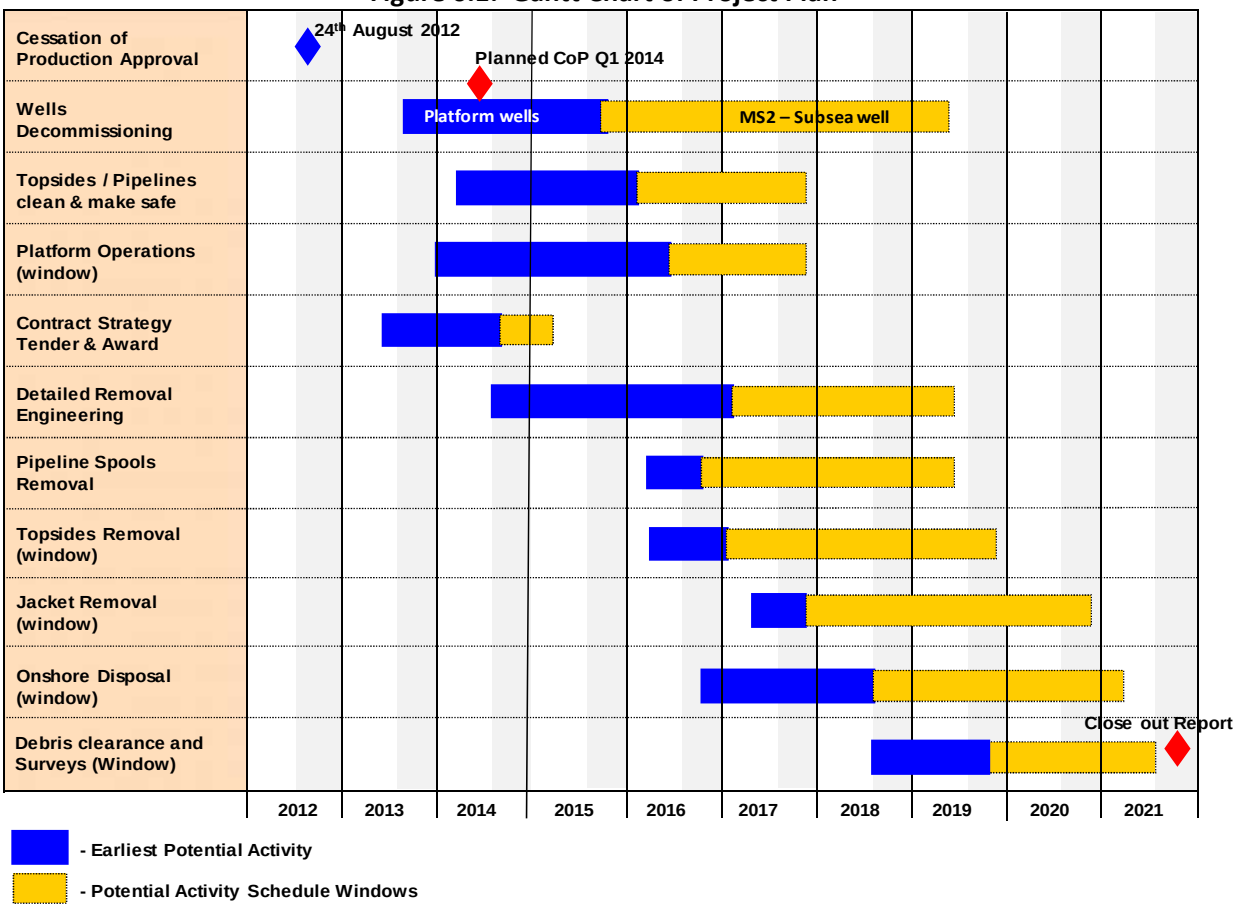
A post decommissioning site survey will be carried out around a 500m radius of installation sites and 200m corridor along each existing pipeline route. Oilfield related seabed debris will be recovered for onshore disposal or recycling in line with existing disposal methods. Debris remaining within the jacket footings footprint will be left *in situ*.

Independent verification of seabed state will be obtained by trawling the platform area outside the jacket footings footprint and including the area of the subsea wellheads. This will be followed by statements of clearance to all relevant government departments and non-governmental organisations.

The post decommissioning survey results will be notified to the UK Fisheries Offshore Oil and Gas Legacy Trust Fund Ltd (FLTC) for inclusion in their FishSafe system, and to the United Kingdom Hydrographic Office (UKHO) for notification and marketing on Admiralty Charts and notices to Mariners.

6.3 Schedule

Figure 6.1: Gantt Chart of Project Plan



6.4 Costs

An overall cost estimates (covering the items shown in table below) will be provided to DECC, following UK Oil and Gas Guidelines on Decommissioning Cost Estimation.

Table 6.1: Provisional Decommissioning Programme Costs	
Item	**Estimated Cost (£m)**
Preparation for Cessation of Production	Provided to DECC in confidence
Well Plug and Abandonment	
Decommissioning Services Contract (Engineer down & clean)	
Removal Services Contract	
Pipelines and Subsea Services Contract	
Operational Support Contract (post CoP)	
Owner Costs including residual liabilities	
TOTAL	**Provided to DECC**

6.5 Close Out

A close out report will be submitted to DECC within four months of the completion of the offshore decommissioning scope, including debris removal and independent verification of seabed clearance and the first post-decommissioning environmental survey.

Any variances from the approved decommissioning programmes will be explained in the close out report.

6.6 Post-Decommissioning Monitoring and Evaluation

A post decommissioning environmental seabed survey, centred on sites of the Murchison platform and the subsea wellheads will be carried out. The survey will focus on chemical and physical disturbances of the completed decommissioning operations and compared with the pre-decommissioning survey.

All pipeline routes and subsea structure sites, including the jacket footings, will be the subject of surveys when decommissioning activity has concluded. Fishing overtrawl trials will be undertaken on completion of the remedial rock placement work along the PL115 pipeline route to verify overtrawlability of the final rock profile. A survey of the condition of the footings and the adjacent seabed will also be undertaken at the end of the removal activities. The footings will be subject to a regular monitoring programme, with survey frequency discussed and agreed with DECC.

Survey results will be available once the work is complete, with a copy forwarded to DECC.

After the surveys have been sent to DECC and reviewed, a post monitoring survey regime will be agreed by both parties, typically one (or more) post decommissioning environmental surveys and structural pipeline surveys.

6.7 Management of Residual Liability

In the close out report described in Section 6.5, the person responsible for the subsequent management of on-going residual liabilities including managing and reporting the results of the agreed post- decommissioning monitoring (described in Section 6.6), evaluation and remedial programme, will be nominated. The nominated person will also be the contact point for any third party claims arising from damage caused by any remains from the Murchison decommissioning programmes. The Murchison footings which are proposed to be left in place remain the property and responsibility of the Murchison Field licensees.

7 SUPPORTING DOCUMENTS

Table 7.1 provides a list of supporting documents that are referenced in the programmes but which are not presented in the Appendices.

Table 7.1: Supporting Documents	
Document Number	**Title**
MURDECOM-BMT-EN-REP-00198	Murchison Facilities Decommissioning - Environmental Statement
MURDECOM-CNR-PM-REP-00225	Murchison Decommissioning - Comparative Assessment Report
MURDECOM-CNR-PM-REP-00233	Murchison Field Decomissioning -Stakeholder Engagement Report
MURDECOM-XDS-PM-REP-00062	Murchison Decommissioning Comparative Assessment – Final IRC Report
MURDECOM-CNR-PM-REP-00005	Murchison Decommissioning – Jacket Derogation Application

Current versions of the supporting documents identified in Table 7.1 are available at: www.cnri-northsea-decom.com (see 'Decommissioning Programme' page).

8 PARTNER LETTER OF SUPPORT

Wintershall Norge AS
Stavanger

wintershall

Offshore Decommissioning Unit
3rd Floor, Atholl House
86-88 Guild Street
Aberdeen AB11 6AR
SCOTLAND

Attn. Mr. Kevin Munro

Our reference
45515/bernds

Our date
Stavanger, 05 May 2014

MURCHISON DECOMMISSIONING PROGRAMMES

PETROLEUM ACT 1998

Dear Mr. Munro,

We acknowledge receipt of your letter dated 30 April 2014.

We, Wintershall Norge AS confirm that we authorise CNR International (UK) Limited ('CNRI') to submit on our behalf abandonment programmes relating to the Murchison Field facilities as directed by the Secretary of State on 30 April 2014.

We confirm that we support the proposals detailed in the Murchison Decommissioning Programmes dated 1 May 2014, which is to be submitted by CNRI 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,
Wintershall Norge AS

Bernd Schrimpf
Managing Director

9 EXPERT VERIFICATION STATEMENT

Xodus Group Ltd
Xodus House / 50 Huntly Street / Aberdeen / AB10 1RS / UK
T +44 (0)1224 628300 E info@xodusgroup.com
www.xodusgroup.com

3 May 2013

Expert Verification Statement

Murchison Decommissioning Comparative Assessment

This statement has been prepared by Xodus Group Ltd (Xodus) in compliance with the UK Department of Energy and Climate Change (DECC) Decommissioning Guidance Notes on independent expert verification (Ref 1).

As Independent Review Consultant (IRC), Xodus undertook a review of the Murchison Decommissioning Comparative Assessment comprising five phases, which can be summarised as:

- Phases 1 and 2 – review studies produced or commissioned by CNRI to inform the Comparative Assessment (CA) process
- Phase 3 - review the approach to CA of Murchison facilities by CNRI, including review of CNRI CA Methods and Procedures (Ref 2 and Ref 3)*, and agree the level of participation as an independent review consultant;
- Phase 4 - review the CA process (pre-CA Report issue) and then review the Draft CA Report prepared by CNRI (Ref 4);
- Phase 5 – produce and publish the final IRC report involving collation of all IRC review work, including this issue of independent certification of CA process undertaken by CNRI for relevant Murchison facilities.

As summarised in its final report [MURDECOM-XDS-PM-REP-00062], Xodus verifies that:

1. For the subjects covered in reports from Phase 1 and 2 studies, there was sufficient information in place for CNRI to support a comparative assessment (CA), and the associated environmental impact assessment (EIA) for Murchison;
2. For the comparative assessment as described in the CNRI Draft CA Report (with the support of earlier informing reports) there is sufficient information in place for CNRI to support the development of a Murchison Decommissioning Programme;
3. CNRI has covered stakeholder consultation/engagement in a thorough and transparent manner throughout the project.

** as already certified by the IRC (26 June 2012) (MURDECOM-XDS-PM-PRO-00206)*

Issued:
Checked:
Approved:

1. DECC, Guidance Notes, Decommissioning of Offshore Oil and Gas Installations and Pipelines under the Petroleum Act 1998, Version 6 March 2011 (p64).
2. CNRI Comparative Assessment Method Statement, Doc No DECCM CNR PM PRO 00081 Rev B1.
3. CNRI Comparative Assessment Procedure, Doc No MURDECOM-CNR PM-PRO-00136 Rev A2.
4. CNRI Murchison Decommissioning Draft Comparative Assessment Report (issued for pre-read for Stakeholder Workshop 8 November 2012), MURDECOM-CNR PM-REP-00225

APPENDIX 1: STATUTORY CONSULTEES CORRESPONDENCE

Copies of letters from statutory consultees and CNRI's responses are provided here.

1. Letter from the National Federation of Fishermen's Organisations (NFFO)
2. Letter from CNRI to the NNFO
3. Letter from the Scottish Fishermen's Federation (SFF)
4. Letter from CNRI to the SFF
5. Letter from Global Maritime Systems (GMS)
6. Letter from CNRI to GMS

From: Alan Piggott [mailto:Alan@nffo.org.uk]
Sent: 18 July 2013 08:25
To: Carol Barbone
Subject: Murchison Decom

Morning Carol
Please excuse my tardiness on this topic and see comments below;

The Federation has been involved with the decom program of the Murchison Platform and infrastructure and found the information and rational behind the project to be informative and comprehensive.

We believe it to be imperative to get the correct balance between what is to remain on the seabed and its impact on future fishing operations.
The Federations both North & South of the boarder has expressed their concerns on any part of the original structure remaining in situ but also understand the adverse environmental impact such complete removal would cause (disturbance of cutting piles ect).

As practical fishermen we would rather have a structure we could see (above surface) than one below sea level, understanding the restrictions on this matter our only comment would be to suggest surface marker buoy's or a fishing friendly structure to be placed over the remaining leg stumps of the Murchison.

Having said that the Federation feels that this program of decommissioning has been open, honest and informative and may well be the format for all other decom programs in the future.

Best Regards

Alan Piggott

General Manager

National Federation of Fishermen's Organisations
30 Monkgate
York
YO31 7PF

Tel: +44 (0) 1904 635432
Fax: + 44 (0) 1904 635431
Mobile: +44 (0) 7803 607330
Email: apiggott@nffo.org.uk
Website: www.nffo.org.uk

CNR International

Mr Alan Piggott
General Manager
National Federation of Fishermen's Organisations
30 Monkgate
York YO31 7PF

14 August 2013

Dear Alan

Murchison Draft Decommissioning Programmes Consultation

Further to my earlier email acknowledging receipt of your response to the draft Murchison Decommissioning Programmes, I am writing now to respond formally to your points.

We thank you for your comments describing the information and rationale behind the decommissioning programme as informative and comprehensive and we are grateful for the role which you have played in enabling us to achieve this through your participation in discussions over the last two years. We are also appreciative of your remarks regarding the approach we have taken during the development of the plans and suggestion that this may set a precedent for others.

With regard to achieving the correct balance for the programme and its impact on future fishing operations, your understanding of the balance to be struck between fishing impacts from any elements of the structure which may remain on the seabed and the adverse impacts that complete removal would cause is helpful.

However, while we understand your preference for a visible (above surface) structure despite the restrictions which prevent this, we would have serious reservations about the safety implications of the rapid deterioration of the structure at the splash zone and subsequent collapse and the potential for more serious damage to vessels just below the water line once it were no longer visible.

We do not consider the idea of a fishing friendly structure to be a practical one in the case of Murchison, not least because of the longevity such a structure would need to have. Similarly, surface marker buoys could do more harm than good by providing a false sense of security because of the 'drift' that might occur as a result of tidal differences and the very deep water of the Murchison Field.

As such, we consider that safety of all users of the sea would be better served by ensuring proper marking of Admiralty Charts, with entry of data on any elements of the structure left behind into the FishSafe System and, following the overtrawl trials we intend to carry out through word-of-mouth between fishermen involved in the trials and their peers.

Please do come back to me if you would like to discuss this further or if you would find it helpful to meet again in person.

Kind regards

Carol Barbone
Stakeholder & Compliance Lead

CNR INTERNATIONAL (U.K.) LIMITED Registered No 813187 England
St Magnus House, Guild Street, Aberdeen, Scotland, AB11 6NJ United Kingdom Switchboard +44(0)1224 303600
Registered office: 5 Old Bailey, London, EC4M 7BA Fax +44(0)1224 303888

SCOTTISH FISHERMEN'S FEDERATION

Our Ref:

Your Ref:

20th June 2013

Scottish Fishermen's Federation
24 Rubislaw Terrace
Aberdeen, AB10 1XE
Scotland UK

T: +44 (0) 1224 646944
F: +44 (0) 1224 647068
E: sff@sff.co.uk

www.sff.co.uk

Carol Barbone
Decommissioning Consultant
CNR International (U.K.) Limited
St. Magnus House
Guild Street
Aberdeen
AB11 6NJ

Dear Carol,

CNR International:
Murchison Field Decommissioning Programme (Consultation Draft Programme – May 2013)

I refer to CNR International's Murchison Decommissioning Programme and the Consultation Draft Programme – May 2013 documentation.

As per our recent meeting of 5th June 2013 and the presentation provided by CNR, we once again place on record our appreciation of the general updates received to date and also the clear explanation of the processes that has led CNR to make its Murchison Field decommissioning recommendations.

The concerns of fishermen remain primarily that of safety and the physical impact on the fishing grounds of the long term presence of oil industry infrastructure on the seabed.

We are pleased to note that the associated subsea and platform wells are to be plugged and abandoned and that the short early production pipeline bundles and related items will also be removed.

We note that the Murchison steel platform itself will be subject to a separate derogation application under OSPAR Decision 98/3, where CNR's recommendation is for the jacket to be removed down to the top of footings at 44m above the seabed. We fully recognise the reasons provided for leaving the footing in situ on this particular occasion, but as stated during the course of our recent meeting, the SFF's preference in cases where Platform footings are not deemed feasible for removal is for the legs to be cut above sea surface level.

In relation to the drill cuttings pile located within the jacket footings, we note that the cuttings are within OSPAR thresholds for remaining in situ to degrade naturally with time and recognise the linkage here with the jacket.

With regard to the 19km main oil export pipeline (PL115), we are pleased to note that the tie-in spools at either end will be removed and are content given the circumstances (crosses under 4 other live pipelines and an umbilical crossing, wall thickness concerns plus 56% of pipeline already rock covered) for this surface laid line to be left in situ with remedial rock placement over exposed sections. Ideally, we would appreciate if fishing overtrawlability trials could be undertaken on completion of the remedial rock placement work.

It was further noted that the Murchison gas export/import pipeline which forms part of the Northern Leg Gas Pipeline (NLGP) system will be isolated at the Murchison subsea riser tie-in spool as part of the Murchison decommissioning work, but that the pipeline (PL165) is owned by the NLGP parties and does not form part of the Murchison decommissioning programmes.

The Federation having stated the above position, would reaffirm its continued appreciation of the openness of the dialogue hitherto and its wish to continue to work closely and positively with CNR International and your Project Team, as you work through the challenges before you.

Yours sincerely,

Steven Alexander
Director of Marine Operations

cc: SFF Sustainable Fisheries Committee

CNR International

Mr Steven Alexander
Director of Marine Operations
Scottish Fishermen's Federation
24 Rubislaw Terrace
Aberdeen AB10 1XE

14 August 2013

Dear Steven

Murchison Draft Decommissioning Programmes Consultation

Further to my earlier email acknowledging receipt of your response to the draft Murchison Decommissioning Programmes, I am writing now to respond formally to your letter.

We are grateful for your appreciation of the dialogue between our two organisations to date and are particularly aware of the value of the SFF's own role in contributing extensive knowledge to the development of our plans.

We fully understand that the concerns of fishermen remain primarily that of safety and the physical impact on the fishing grounds of the long term presence of oil industry infrastructure on the seabed. This has been incorporated at every stage of the development of the Decommissioning Programmes, most particularly in the comparative assessment process.

Your recognition of the interrelationship between the jacked footings and the drill cuttings pile is helpful. However, while noting the SFF's preference for the jacket legs of derogation structures to be cut above sea surface level, we are bound by OSPAR Decision 98/3 and International Maritime Organisation rules on this. Furthermore, we would have serious reservations about the safety implications of the rapid deterioration of the structure and subsequent collapse at the splash zone and the potential for more serious damage to vessels just below the water line once it were no longer visible.

With regard to the main oil export pipeline, PL115, we have taken on board your request for fishing overtrawlability trials to be undertaken on completion of the remedial rock placement work and this has been written into our Decommissioning Programme for the pipeline.

Like the Federation, we would also like to reaffirm our continued appreciation of the openness of the dialogue hitherto and our own wish to continue to work closely and positively with the SFF, whose experience has been of such importance in informing our understanding, as our project moves forward.

Yours sincerely

Carol Barbone
Stakeholder & Compliance Lead

CNR INTERNATIONAL (U.K.) LIMITED
Registered No 813187 England
St Magnus House, Guild Street, Aberdeen, Scotland, AB11 6NJ United Kingdom
Registered office: 5 Old Bailey, London, EC4M 7BA
Switchboard +44(0)1224 303600
Fax +44(0)1224 303656

From: Wrottesley, John (GMSL) [mailto:John.Wrottesley@globalmarinesystems.com]

Sent: 18 July 2013 11:16

To: Carol Barbone

Subject: RE: MURCHISON DECOMMISSIONING - STATUTORY CONSULTATION

Hi Carol,

Many thanks for your email – my sincere apologies that you have had to chase but it's been a very busy period lately, but fortunately I have no significant response for this programme.

I have not received any further comments from colleagues, and don't have any specific comments on the programme of works itself as no cables should be directly affected in the immediate vicinity, and if any interaction were unexpectedly to be necessary in the course of engineering the project, then it would be necessary to liaise with specific cable owners. However I think it is unlikely due to the proximity of the platform from any current known cables. I assume that the MoD would be consulted or aware of the project and would be aware of the operations for any military cables that may be in the region.

I would recommend that when notice to mariners were arranged for the offshore works, then the kingfisher fortnightly bulletin be updated to include details of the works to inform sea users.

If you require anything else from myself then please let me know – I will be available today and tomorrow and will ensure I respond quickly if you need anything else.

Kind regards,

John

CNR International

Mr John Wrottesley
Permitting Manager
Global Marine Systems Ltd
New Saxon House
Winsford Way, Boreham Interchange
Chelmsford
Essex CM2 5PD

14 August 2013

Dear John

Murchison Draft Decommissioning Programmes Consultation

Further to my email acknowledging receipt of your response to the draft Murchison Decommissioning Programmes, I am writing now to respond formally on how we are addressing the points you covered.

I can confirm that your expectation that no cables should be directly affected in the immediate vicinity of the area where works will be carried out concurs with our own, and that if any interaction were unexpectedly to be necessary in the course of engineering the project then liaison with specific cables would be undertaken.

Meanwhile, we are taking advice from DECC with regard to consultation and briefing of the Ministry of Defence to ensure that they are both aware of the proposed decommissioning programmes and associated works with respect to any military cables that might be in the region.

As far as notice to mariners is concerned ahead of offshore works, we will arrange for provision of information to the Kingfisher fortnightly bulletin to ensure that users of the sea are kept informed. A note to this effect confirms this intention in the post-consultation Decommissioning Programme.

Thank you once again for your comments which are helpful in refining the decommissioning proposals.

Kind regards

Carol Barbone
Stakeholder & Compliance Lead

APPENDIX 2: PRESS NOTICE FOR PUBLIC CONSULTATION

The Secretary
Northern Lighthouse Board
84 George Street
Edinburgh
EH2 3DA
navigation@nlb.org.uk

National Federation of
Fishermens' Organisations
30 Monkgate
York
YO31 7PF
Alan@nffo.org.uk

Scottish Fishermen's Federation
24 Rubislaw Terrace
Aberdeen
AB10 1XE
j.watt@sff.co.uk

Any other persons or bodies known or believed by the applicant to own or otherwise possess interests in the seabed or subsoil along or within 100 metres either side of the proposed course of the pipeline, **including licensees of blocks to be traversed by the line.**

Details (inc. email addresses) of any other person or bodies served notices should be supplied to DECC. (27)

PUBLIC NOTICE

THE PETROLEUM ACT 1998

MURCHISON FIELD DECOMMISSIONING PROJECT

CNR International (UK) Limited has submitted, for the consideration of the Secretary of State for Energy and Climate Change, a draft Decommissioning Programme for the Murchison Field 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 items/facilities covered by the Decommissioning Programme are:

The Murchison installation and associated facilities located 150km north east of the Shetland Islands in UK Block 211/19 of the United Kingdom Continental Shelf, 2km from the UK/Norway median line. The field extends into Norwegian Block 33/9. The facilities comprise a steel platform and drill cuttings pile and the pipelines installed to export hydrocarbons.

CNRI International (UK) Limited hereby gives notice that a summary of the Murchison Decommissioning Programme can be viewed online at www.cnri-northsea-decom.com (see 'Decommissioning Programme' page).

Alternatively, a CD version of the programme can be requested or hard copy inspected at the following location during office hours:

CNR International (UK) Limited
St Magnus House
Guild Street
Aberdeen AB11 6NJ

Contact: Carol Barbone 01224 303102
carol.barbone@cnrinternational.com

Representations regarding the Murchison Decommissioning Programme should be submitted in writing to Carol Barbone at the above address where they should be received by the consultation closing date, 12 July 2013, and should state the grounds upon which any representations are being made.

31 May 2013

Carol Barbone
Stakeholder and Compliance Lead (Decommissioning)
CNR International (UK) Limited
St Magnus House, Guild Street
Aberdeen AB11 6NJ

CNR International

(28)

Environment

Environmental Protection

East Ayrshire Council

PLANNING AND ECONOMIC DEVELOPMENT

THE TOWN AND COUNTRY PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) SCOTLAND REGULATIONS 2011

NOTICE UNDER REGULATION 17

The proposed development at Windshields, Darvel, East Ayrshire is subject to assessment under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011.
Notice is hereby given that an environmental statement has been submitted to East Ayrshire Council by e-Gen Partners Ltd relating to the planning application in respect of the erection of 1 wind turbine, 53.7 metres to tip height and associated infrastructure notified to you under the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2008 on 19 November 2012.

Possible decisions relating to the application are:

(i) approval of the application without conditions;
(ii) approval of the application with conditions;
(iii) refusal of the application.

A copy of the environmental statement, the associated application and other documents submitted with the application may be inspected at all reasonable hours at the place where the register of planning applications is kept by the planning authority for the area at The Johnnie Walker Bond, 15 Strand Street, Kilmarnock, KA1 1HU and at http://eplanning.east-ayrshire.gov.uk/online/ during the period of 28 days beginning with the date of this notice.
Copies of the environmental statement may be purchased from The Energy Workshop Ltd.,The Media Centre, 7 Northumberland Street, Huddersfield, West Yorks, HD1 1RL at a cost of £50 for paper copies and is available on CD.
Any person who wishes to make representations to East Ayrshire Council about the environmental statement should make them in writing within that period to the Council at The Johnnie Walker Bond, 15 Strand Street, Kilmarnock, KA1 1HU or at http://eplanning.east-ayrshire.gov.uk/online/ quoting reference 12/0505/PP.

Alan Neish, Head of Planning & Economic Development, The Johnnie Walker Bond,15 Strand Street, Kilmarnock, KA1 1HU Tel: (01563) 576790 Fax: (01563) 554592 (29)

Isleburn

POLLUTION PREVENTION AND CONTROL (SCOTLAND) REGULATIONS 2012

In accordance with paragraph 8 of schedule 4 to the Pollution Prevention and Control (Scotland) Regulations, notice is hereby given that Isleburn has applied to the Scottish Environment Protection Agency (SEPA) for a Permit under Regulation 13 of the regulations. This is in respect of activities being carried out namely to undertake Metal Coating in an installation at Nigg Energy Park, Nigg, Ross-shire, IV19 1QY.
The application contains a description of any foreseeable significant effects of emissions from the installation on the environment and on human health.
The application may be inspected, free of charge, at SEPA Graesser House, Fodderty Way, Dingwall, IV15 9XB from Monday to Friday between 9.30am and 4.30pm. Please quote reference No PPC/B/1111498.

Please note that the application contains details of:

- The applicant and the site;
- The activities carried out;
- The installation and any directly associated activities;
- The raw and auxiliary materials, other substances and energy to be used or generated;
- The nature, quantities and source of foreseeable emissions from the installation;
- The techniques for preventing, reducing and rendering harmless emissions from the installation;
- How the best available techniques are applied to the operation of the installation;

APPENDIX 3: OSPAR CONTRACTING PARTY CORRESPONDENCE

ROYAL NORWEGIAN
MINISTRY OF PETROLEUM AND ENERGY

Department of Energy & Climate Change
Atholl House
86-88 Guild Street
Aberdeen AB11 6AR

Your ref	Our ref	Date
	12/180	19.03.2014

Consultation of the issue of a permit under paragraph 3 of OSPAR decision 98/3 for disposal of the footings of the Murchison steel jacket

The Ministry of Petroleum and Energy refers to the letter of 27 November 2013 from Department of Energy and Climate Change regarding consultation of a permit for disposal of the footings of the Murchison steel jacket at their current location in the Murchison field.

Norway assumes that the operator follows up the stated clean up intentions and that a good and relatively long term environmental monitoring is ensured after the disposal. Norway has no further comments regarding the disposal of the footings of the Murchison steel jacket.

Yours sincerely,

Olaf Røsnes
Deputy Director General

Jan Roth Johnsen
Senior Adviser

Copy:
Royal Norwegian Ministry of Labour and Social Affairs
Royal Norwegian Ministry of Climate and Environment
Royal Norwegian Ministry of Transport and Communication
Royal Norwegian Ministry of Trade, Industry and Fisheries
Royal Norwegian Ministry of Foreign Affairs
Norwegian Petroleum Directorate

Postal address
PO Box 8148 Dep
0033 Oslo
postmottak@oed.dep.no

Office address
Akersgata 59

http://www.oed.dep.no/

Telephone*
+47 22 24 90 90
Visit no.
977 61 600

Oil and Gas Department

Our officer
Jan Roth Johnsen
+47 2224 9223