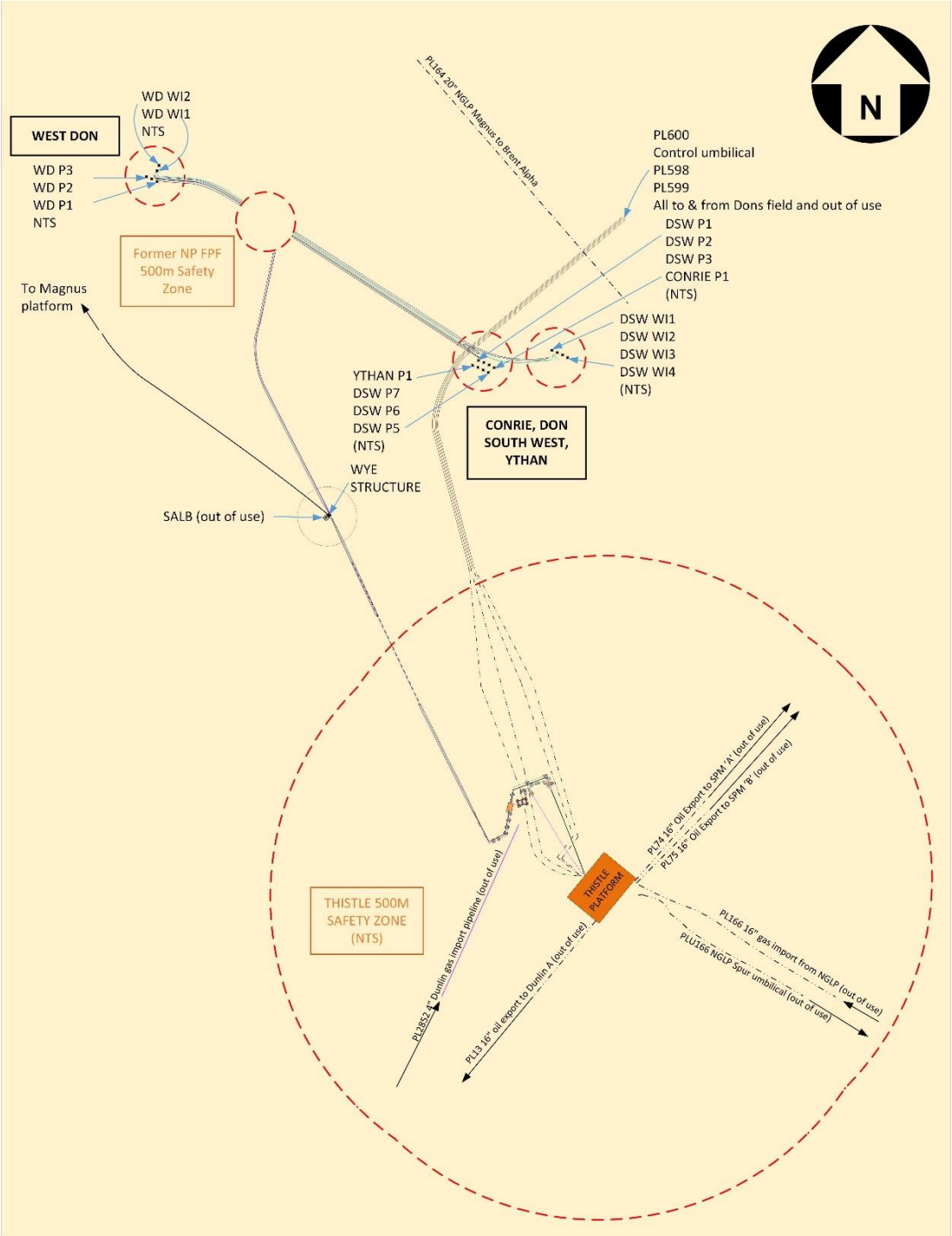
Decommissioning Programmes for Conrie, Don South West, West Don and Ythan Fields



DOCUMENT CONTROL

Document ID:		M4109-ENQ-NPR-DN-00-PRG-0002	
Document Classification:		PUBLIC	
Document Ownership:		Decommissioning	
Date of Document:	27/07/20	Signature	Date
Prepared by:	S. Axon	S. Axon	15/12/20
Reviewed by:	C. Wheaton / J. Davey	C. Wheaton / J. Davey	15/12/20
Approved by:	J. Allan	J. Allan	15/12/20

REVISION RECORD

Revision No.	Date of Revision	Reason for Issue
A1	03/11/20	Issued for review and comment
A2	18/11/20	Issued to OPRED for review and comment
A3	15/12/20	Issued for Statutory Consultation

DISTRIBUTION LIST

Company	No. of copies
Offshore Petroleum Regulator for Environment and Decommissioning	1 electronic
GMG, NFFO, NIFPO, SFF	1 electronic
Partners, etc.	1 electronic

TABLE OF CONTENTS			INST	P/L
1.	**Executive Summary**	**9**	√	√
1.1	Decommissioning Programmes	**9**	√	√
1.2	Requirement for Decommissioning Programmes	**9**	√	√
1.3	Introduction	**9**	√	√
1.4	Overview	**12**	√	√
1.5	Pipelines	**14**	√	√
1.6	Summary of Proposed Decommissioning Programmes	**16**	√	√
1.7	Field Locations including Field Layout and Adjacent Facilities	**18**	√	√
1.8	Industrial Implications	**22**	√	√
2.	**Description of Items to Be Decommissioned**	**23**	√	
2.1	Don South West and West Don Assets	**23**	√	
2.2	Conrie Related Assets	**29**	√	
2.3	Don South West Assets	**33**		√
2.4	West Don Assets	**42**		√
2.5	Ythan Assets	**49**		√
3.	**Removal and Disposal Methods**	**53**		√
3.1	Installations - Subsea Facilities & Stabilisation Features	**53**		√
3.2	Pipelines	**53**		√
3.3	Pipeline Stabilisation Features	**58**	√	√
3.4	Waste Stream Management Methods	**61**	√	
4.	**Environmental Appraisal**	**63**	√	
4.1	Environmental Sensitivities	**63**		√
4.2	Potential Environmental Impacts and their Management	**64**		√
5.	**Interested Party Consultations**	**65**	√	√
5.1	Consultations Summary	**65**	√	√
6.	**Programme Management**	**67**	√	√
6.1	Project Management and Verification	**67**	√	√
6.2	Post-Decommissioning Debris Clearance and Verification	**67**	√	√
6.3	Schedule	**67**	√	√
6.4	Costs	**69**	√	√
6.5	Close Out Report	**69**	√	√
6.6	Post-Decommissioning Monitoring and Evaluation	**69**	√	√
7.	**References**	**70**	√	√
Appendix A	**northern producer Prior to Departure**	**71**	√	√
Appendix A.1	Layout prior to departure of Northern Producer	**71**	√	√
Appendix B	**Layouts of DSW, WD fields, Wye Structure & Thistle 'A'**	**74**	√	√
Appendix B.1	Don South West Production (with Conrie & Ythan)	**74**	√	√
Appendix B.2	Don South West WI	**75**	√	√
Appendix B.3	West Don Production & WI	**76**	√	√
Appendix B.4	Wye Structure & Approaches	**77**	√	√
Appendix B.5	Thistle 'A' Approaches	**78**	√	√
Appendix C	**Public Notice & Consultee Correspondence**	**79**		
Appendix C.1	Public Notices	**79**		

FIGURES AND TABLES

Figure 1.7.1: Northern Producer adjacent fields and surface facilities....18
Figure 1.7.2: Phase 1 DP Scope - Northern Producer and its locality....19
Figure 1.7.3: Phase 2 DP Scope - after completion of Phase 1 DP Scope in 500m Zone....20
Figure 2.1.1: Pie-Chart of Material Inventory for DSW & WD Installation....28
Figure 2.1.2: Pie-Chart of Material Inventory for DSW & WD Pipelines....28
Figure 2.2.1: Pie-Chart of Material Inventory for Conrie Installation....32
Figure 2.2.2: Pie-Chart of Material Inventory for Conrie Pipelines....32
Figure 2.3.1: Pie-Chart of Material Inventory for DSW Installations....41
Figure 2.3.2: Pie-Chart of Material Inventory for DSW Pipelines....42
Figure 2.4.1: Pie-Chart of Material Inventory for WD Installations....48
Figure 2.4.2: Pie-Chart of Material Inventory for WD Pipelines....49
Figure 2.5.1: Pie-Chart of Material Inventory for Ythan Installation....52
Figure 2.5.2: Pie-Chart of Material Inventory for Ythan Pipelines....52
Figure 6.3.1: Gantt Chart of Project Plan....68
Figure A.1.1: Original Northern Producer layout prior to departure (Phase 1 DP scope)....71
Figure A.1.2: Phase 1 - Pipeline cut locations in 500m zone (Phase 1 DP scope....72
Figure A.1.3: Phase 2 – After clearance of NP 500m zone (Phase 1 DP scope completed)....73
Figure B.1.1: Layout Showing DSW, Conrie & Ythan and associated infrastructure)....74
Figure B.2.1: Layout showing DSW WI and associated infrastructure....75
Figure B.3.1: Layout Showing WD Production & Water Injection....76
Figure B.4.1: Layout Showing Wye Structure & Approaches....77
Figure B.5.1: Layout Showing Approaches to Thistle ‘A’....78

Table 1.4.1 Installations Being Decommissioned....12
Table 1.4.2: DSW & WD SAL Installation - Section 29 Notice Holders Details....13
Table 1.4.3: Conrie Installation - Section 29 Notice Holders Details....13
Table 1.4.4: Don South West Installations - Section 29 Notice Holders Details....13
Table 1.4.5: West Don Installations - Section 29 Notice Holders Details....13
Table 1.4.6: Ythan Installations - Section 29 Notice Holders Details....14
Table 1.5.1: DSW & WD Pipelines Being Decommissioned....14
Table 1.5.2: DSW & WD Pipelines - Section 29 Notice Holders Details....14
Table 1.5.3: Conrie Pipelines Being Decommissioned....14
Table 1.5.4: Conrie Pipelines - Section 29 Notice Holders Details....14
Table 1.5.5: Don South West Pipelines Being Decommissioned....15
Table 1.5.6: Don South West Pipelines - Section 29 Notice Holders Details....15
Table 1.5.7: West Don Pipelines Being Decommissioned....15
Table 1.5.8: West Don Pipelines - Section 29 Notice Holders Details....15
Table 1.5.9: Ythan Pipelines Being Decommissioned....15
Table 1.5.10: Ythan Pipelines - Section 29 Notice Holders Details....16
Table 1.6.1: Summary of Decommissioning Programmes....16
Table 1.7.1: Adjacent Facilities....21
Table 2.1.1: DSW & WD Subsea Installation Information....23
Table 2.1.2: DSW & WD Pipeline/Flowline/Umbilical Information....24
Table 2.1.3: DSW & WD Subsea Pipeline Stabilisation Features & Structures....26
Table 2.2.1: Conrie Subsea Installation Information....29
Table 2.2.2: Conrie Pipeline/Flowline/Umbilical Information....30
Table 2.2.3: Conrie Pipeline Stabilisation Features & Structures....30
Table 2.2.4: Conrie Well Information....32
Table 2.3.1: DSW Subsea Installation Information....33
Table 2.3.2: DSW Pipeline/Flowline/Umbilical Information....34
Table 2.3.3: DSW Subsea Pipeline Stabilisation Features & Structures....38
Table 2.3.4: DSW Well Information....41

Table 2.4.1: WD Subsea Installation Information 42
Table 2.4.2: WD Pipeline/Flowline/Umbilical Information 43
Table 2.4.3: WD Subsea Pipeline Stabilisation Features & Structures 45
Table 2.4.4: WD Well Information 48
Table 2.5.1: Ythan Subsea Installation Information 49
Table 2.5.2: Ythan Pipeline/Flowline/Umbilical Information 50
Table 2.5.3: Ythan Pipeline Stabilisation Features & Structures 51
Table 2.5.4: Ythan Well Information 52
Table 3.1.1: Subsea Installations & Stabilisation Features 53
Table 3.2.1: Pipeline Decommissioning Options and Grouping 54
Table 3.2.2: DSW & WD Pipeline Decommissioning Proposals 54
Table 3.2.3: Conrie Pipeline Decommissioning Proposals 55
Table 3.2.4: Pipeline Decommissioning Proposals 55
Table 3.2.5: WD Pipeline Decommissioning Proposals 57
Table 3.2.6: Pipeline Decommissioning Proposals 58
Table 3.3.1: DSW & WD Pipeline Stabilisation Features & Structures 58
Table 3.3.2: Conrie Pipeline Stabilisation Features 59
Table 3.3.3: DSW Pipeline Stabilisation Features & Structures 59
Table 3.3.4: WD Pipeline Stabilisation Features & Structures 60
Table 3.3.5: Ythan Pipeline Stabilisation Features & Structures 60
Table 3.4.1: Waste Stream Management Methods 61
Table 3.4.2: Inventory Disposition 62
Table 3.4.3: Re-use, Recycle & Disposal Aspirations for Recovered Material 62
Table 4.2.1: Key Control and Mitigation Measures 64
Table 5.1.1: Summary of Stakeholder Comments 65

ABBREVIATION	EXPLANATION
~	Approximately
AHV	Anchor Handling Vessel
CNR	CNR International (UK) Limited
CSV	Construction Support Vessel
DBB	Double Block and Bleed (valve arrangement with vent)
DFGI	Dunlin Fuel gas Import (Skid); outside of scope
DP	Decommissioning Programme(s)
DSW	Don South West
EnQuest	EnQuest Heather Limited
ESDU	Extension Subsea Distribution Unit
ESDV	Emergency Shutdown Valve
Expansion spool	Pipespool
FPF	(Northern Producer) Floating Production Facility
FPSO	Floating Production Storage & Offloading Vessel
GMG	Global Marine Group
HSE	Health and Safety Executive
“, in	Inch; 25.4 millimetres
Ident	Pipeline identification number as used in Pipeline Works Authorisations
Installation	Offshore structure, typically comprising topsides and jacket, or a subsea wellhead protection structure, subsea manifold structure, an FPF or FPSO
IMO	International Maritime Organisation
km	Kilometre
m	Metre(s)
MARPOL	International Convention for the Prevention of Pollution from Ships
MAT, SAT	Master Application Template, Supplementary Application Template
MSV	Multipurpose Support Vessel
N,S,E,W	North, South, East, West
n/a	Not Applicable
N/A	(Information) Not Available or specified
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers Organisation Ltd
NORM	Naturally Occurring Radioactive Material
NP	Norther Producer
OGA	Oil and Gas Authority
OPEP	Oil Pollution Emergency Plans
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	Oslo-Paris Convention

ABBREVIATION	EXPLANATION
Phase 1	Phase 1 of the decommissioning activities concern the departure of the Northern Producer Floating Production Facility, removal of the associated riser systems and clearance of the 500m safety zone. The scope of the Phase 1 activities is addressed in a separate Decommissioning Programme document [1]
Phase 2	Phase 2 of the decommissioning works concerns decommissioning of the Conrie, Don South West, West Don and Ythan installations as well as the remaining pipeline infrastructure, and is the subject of this Decommissioning Programme document
Piggybacked	Clamped or connected to another pipeline along its length
Pipeline	Pipeline or umbilical pipeline
P1, P2, WI1	Production (P) or Water Injection (WI) Tree Identifier
PL, PLU	Pipeline, Umbilical Pipeline Identification numbers (UK)
PON	Petroleum Operation Notification
PWA	Pipeline Works Authorisation
Q1, Q2, Q3, Q4	Quarter 1, Quarter 2, Quarter 3, or Quarter 4 of any given year
RBS	Riser Base Structure (part of Phase 1 decommissioning scope as distinct from RBS at Thistle)
RBMS	Riser Base Manifold Structure
ROV	Remotely Operated Vehicle
ROVSV	Remotely Operated Vehicle Support Vessel
SAC	Special Area of Conservation
SAL	Single Anchor Loading
SALB(MB)	Single Anchor Loading Buoy (Mooring Base)
SDU	Subsea Distribution Unit
SFF	Scottish Fishermen's Federation
SIMOPS	Simultaneous Operations
SOPEP	Shipboard Oil Pollution Emergency Plan
SPS	Subsea Protection Systems (www.subseaprotectionsystems.com)
SS	Subsea (in the context of wells which could also be "PL" platform), or, South-South for compass direction
SSIV	Subsea Isolation Valve
SUTU	Subsea Umbilical Termination Unit
TAQA	TAQA Bratani Limited
Te	Metric Tonne, 1000 kilogrammes force
TFSW	Trans Frontier Shipment of Waste
Thistle	Thistle Alpha installation
Topsides	Offshore structure typically furnished with reception and processing equipment for produced hydrocarbons, in this case the Northern Producer FPF
TRBS	Thistle Riser Base Structure
TUTU	Topsides Umbilical Termination Unit

ABBREVIATION	EXPLANATION
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
WD	West Don
WGS84	World Geodetic System 1984
WHPS	Wellhead Protection Structure
WI	Water Injection
WS	Wye Structure
x	Number of (e.g. 16x = 16 in Number)
	PWA Idents of pipelines affected by decommissioning proposals in this document. Refer Table 1.5.1, Table 1.5.5 & Table 1.5.7.

1. EXECUTIVE SUMMARY

1.1 Decommissioning Programmes

This Decommissioning Programme document concerns decommissioning of the Conrie, Don South West, West Don and Ythan installations and associated pipeline infrastructure. This follows the departure of the Northern Producer Floating Production Facility, removal of the associated riser systems and clearance of the 500m safety zone, which were addressed in a separate combined Decommissioning Programme document [1]:

- Don South West (DSW) and West Don (WD) Single Anchor Loading Buoy Mooring Base (SALBMB)
- Don South West and West Don pipelines PL2578, PL2579, PLU2580, PLU2580JSG, and PLU2580JSO;
- Conrie wellhead protection structure (1x), and;
- Conrie pipelines PL2572 (original idents 5 to 8 only), PL2573 (original ident 18 to 21 only) and PLU2576JP4;
- Don South West wellhead protection structures (10x), and;
- Don South West pipelines PL2572 (excluding idents 5 to 8) , PL2573 (excluding idents 18 to 21), PLU2576, PLU2576JP1 through PLU2576JP7, PLU2577, PLU2577JWI2, PLU2577JWI3, PLU2577JWI4, PL2581, PL4262, and PL4557;
- West Don wellhead protection structures (5x), and;
- West Don pipelines PL2582, PL2583, PL2584, PLU2585, PLU2585JP1, PLU2585JP2, PLU2585JP3, and PLU2585JWI1, PLU2585JWI2, and PL4261;
- Ythan wellhead protection structure (1x), and;
- Ythan pipelines PL3749, PL3751, PLU3752, PLU3753, and PLU3754.

Although decommissioning of the installations and pipelines are being treated in this document as a standalone project, on behalf of the Section 29 holders, EnQuest Heather Limited (EnQuest) will also continue to explore cost saving synergies with other projects.

1.2 Requirement for Decommissioning Programmes

Installations: In accordance with the Petroleum Act 1998, EnQuest, as owner and operator of the Don South West & West Don SAL , Conrie, Don South West, West Don and Ythan installations, and on behalf of the Section 29 notice holders (Table 1.4.2, Table 1.4.3, Table 1.4.4, Table 1.4.5, and Table 1.4.6), is applying to OPRED to obtain approval for decommissioning the installations detailed in Section 2 of this document. Partner Letters of Support will be provided directly to OPRED.

Pipelines: In accordance with the Petroleum Act 1998, EnQuest, as owner and operator of the Don South West and West Don, Conrie, Don South West, West Don and Ythan pipelines, and on behalf of the Section 29 notice holders (Table 1.5.2, Table 1.5.4, Table 1.5.6, Table 1.5.8 and Table 1.5.10) is applying to OPRED to obtain approval for decommissioning the pipelines detailed in Section 2 of this document. Partner Letters of Support will be provided directly to OPRED.

Following public, stakeholder and regulatory consultation, the Decommissioning Programmes are submitted in compliance with national and international regulations and OPRED guidance notes. The schedule outlined in this document is for a five-year period due to begin sometime in Q2 2025.

1.3 Introduction

Since May 2009, the Northern Producer Floating Production Facility has provided the export route for the Don South West, Conrie Ythan and West Don fields that are situated within Blocks 211/13b,

211/18a, and 211/18e of the Northern North Sea sector of the United Kingdom Continental Shelf and operated by EnQuest. These fields are located approximately 527km north-north-east of Aberdeen in water depths between ~172m and ~178m. The Cessation of Production documentation for these fields is currently under consideration by the Oil and Gas Authority.

A Riser Base Structure (RBS) used to be installed on the seabed with rigid spool pieces connecting the inter-field pipelines to the RBS. Dynamic flexible risers were installed in a “lazy S” configuration and are being recovered as part of Phase 1 of the decommissioning works. Please refer Figure 1.7.2, Figure A.1.1 and Figure A.1.2.

Processed production fluids from the Fields were initially exported via PL2578, an 8in export pipeline to a submerged Single Anchor Loading Buoy (SALB) to facilitate shuttle tanker oil loading. Crude oil was then exported via the same 8in pipeline – albeit modified, to a Wye connection comingling Northern Producer and Thistle export oil for export to the Magnus Platform via PL4556. Processed gas was used as lift gas for both fields, fuel gas purposes for the installation’s turbines with the excess flared. Additionally, gas is imported, normally to assist with well start-up, via the 3-inch gas pipeline (PL2579) installed between the Northern Producer riser base structure and the Thistle Platform. Between the original RBMS in the NP 500m zone and Thistle PL2579 is piggybacked onto PL2578 as far as the Wye Structure and PL4555 downstream. PL4555 used to be PL2578 before it was modified and transferred to the Thistle owners.

Processed oil from the Conrie, Don South West and Ythan fields used to be transported via PL2572, an 8in pipeline to the Northern Producer while processed gas was imported from the Northern Producer via PL2573 a 3in pipeline. Hydraulic controls and injection chemicals used to be provided from the RBMS in the 500m zone to the DSW Subsea Distribution Unit (SDU) via PLU2576 and from there to the Conrie and DSW production wellheads via PLU2576JP1 through PLU2576JP7. Hydraulic control and injection chemicals were supplied to the Ythan production wellhead from the DSW SDU using PLU3752, PLU3753 and PLU3754. PLU3753 and PLU3574 were connected using an external SDU located next to the DSW P7 production wellhead. Hydraulic control of the four water injection wellheads WI1, WI2, WI3, and WI4 was provided via the DSW SDU using umbilical pipelines PLU2577, PLU2577JWI2, PLU2577JWI3, and PLU2577JWI4, respectively.

Water injection used to be provided from the RBSM to the DSW water injection wellheads WI1 and WI2 using PL2581, an 8in pipeline, although for integrity reasons this pipeline was taken out of service and replaced with PL4262, which is an 8in pipeline routed to DSW WI4.

PL2572 is piggybacked onto PL2573 and both lie in the same trench as PLU2576 and are overlain with deposited rock. PLU2577 and PL2581 were laid separately and trenched and buried in the seabed. PL4262 was surface laid but buried under deposited rock.

Processed oil from the West Don fields used to be transported via PL2583, an 8in pipeline to the Northern Producer while processed gas was imported from the Northern Producer via PL2584 a 3in pipeline. PL2584 is piggybacked onto PL2583. Hydraulic controls and injection chemicals used to be provided from the RBMS in the 500m zone to the WD Subsea Distribution Unit (SDU) via PLU2585 and on to the WD production wells P1, P2, and P3 using PLU2585JP1, PLU2585JP2, and PLU2585JP3, respectively.

Water injection used to be provided from the RBSM to the WD water injection wellhead WI1 using PL2582, an 8in pipeline, although for integrity reasons this pipeline was taken out of service and replaced with PL4261, which is also an 8in pipeline routed to WD WI1.

PL2584 is piggybacked onto PL2583 and lie in the same trench. PL2582 and PLU2585 were laid separately and trenched and buried in the seabed except within the original NP 500m zone where they are overlain with deposited rock. PL4261 was surface laid but buried under deposited rock.

Note that there are several items of equipment such as protection and stabilisation features around the Wye Structure that are also used for part of the Thistle ‘A’ pipeline infrastructure (i.e. PL4555) and within the Thistle ‘A’ 500m zone including the Subsea Isolation Valve (SSIV) skid and riser bases.

The decommissioning proposals for these are explained in the relevant sections of the Decommissioning Programmes. Please refer Figure 1.7.3 and various figures in Appendix B for the scope of the Phase 2 Decommissioning Programmes contained herein.

The Decommissioning Programmes explain the principles of the removal activities and are supported by a comparative assessment for the pipelines [2] and an environmental appraisal [3].

1.4 Overview

1.4.1 Installations

Table 1.4.1 Installations Being Decommissioned									
Field Names, UKCS Block(s), Production			**Surface Installations**					**Distances**	
Field Installation ID	**UKCS Block(s)**	**Type of Production**	**Number**	**Function**	**Type**	**Topsides Weight (Te)**	**Jacket Weight (Te)**	**Distance to Median (Norway)**	**Distance from UK coastline**
Conrie	211/18a	Oil	n/a	n/a	n/a	n/a	n/a	~9.7km	~527km NNE of Aberdeen
Don South West	211/18c	Oil	n/a	n/a	n/a	n/a	n/a	~9.7km	
West Don	211/18b	Oil	n/a	n/a	n/a	n/a	n/a	~14.2km	
Ythan	211/18e	Oil	n/a	n/a	n/a	n/a	n/a	~9.7km	
SALB (DSW & WD)	211/18b & 211/18c	n/a	n/a	n/a	n/a	n/a	n/a	~13.2km	~521km NNE of Aberdeen
	Drill Cuttings		**Subsea Installations**			**Number of Wells**			
Field Installation ID	**Drill Cuttings Pile(s)**	**Total Estimated Volume (m^3)**	**Water Depth**	**Number**	**Type**	**Platform**	**Subsea**		
Conrie	n/a	n/a	~174m	1	WHPS	n/a	1		
Don South West	n/a	n/a	~165m to ~174m	10	WHPS	n/a	10		
West Don	n/a	n/a	~172m to ~178m	5	WHPS	n/a	5		
Ythan	n/a	n/a	~174m	1	WHPS	n/a	1		
SALB	n/a	n/a	~170m	1	SALB	n/a	n/a		

1.4.2 Don South West & West Don SAL Installation

Table 1.4.2: DSW & WD SAL Installation - Section 29 Notice Holders Details		
Section 29 Notice Holder	**Registration Number**	**License Equity Interest (%)**
EnQuest Heather Limited	02748866	69.30%
EnQuest PLC	07140891	-
Ithaca Energy (UK) Limited	SC272009	20.00%
Ithaca Alpha (N.I.) Limited	NI073431	10.70%
Ithaca Petroleum Limited	05223667	-

1.4.3 Conrie Installation

Table 1.4.3: Conrie Installation - Section 29 Notice Holders Details		
Section 29 Notice Holder	**Registration Number**	**License Equity Interest (%)**
EnQuest Heather Limited	02748866	60.00%
EnQuest PLC	07140891	-
Ithaca Energy (UK Limited	SC272009	40.00%
Ithaca Petroleum Limited	05223667	-

1.4.4 Don South West Installations

Table 1.4.4: Don South West Installations - Section 29 Notice Holders Details		
Section 29 Notice Holder	**Registration Number**	**License Equity Interest (%)**
EnQuest Heather Limited	02748866	60.00%
EnQuest PLC	07140891	-
Ithaca Energy (UK Limited	SC272009	40.00%
Ithaca Petroleum Limited	05223667	-

1.4.5 West Don Installations

Table 1.4.5: West Don Installations - Section 29 Notice Holders Details		
Section 29 Notice Holder	**Registration Number**	**License Equity Interest (%)**
EnQuest Heather Limited	02748866	78.60%
EnQuest PLC	07140891	-
Ithaca Alpha (N.I.) Limited	NI073431	21.40%
Ithaca Energy (UK) Limited	SC272009	-
Ithaca Petroleum Limited	05223667	-

1.4.6 Ythan Installation

Table 1.4.6: Ythan Installations - Section 29 Notice Holders Details		
Section 29 Notice Holder	**Registration Number**	**License Equity Interest (%)**
EnQuest Heather Limited	02748866	60.00%
EnQuest PLC	07140891	-
Ithaca Gamma Limited	05929104	40.00%
Ithaca Petroleum Limited	05223667	-

1.5 Pipelines

1.5.1 Don South West & West Don Fields – Pipelines

Table 1.5.1: DSW & WD Pipelines Being Decommissioned		
Number of Pipelines, Cables, Umbilicals	5	Refer Table 2.1.2

Table 1.5.2: DSW & WD Pipelines - Section 29 Notice Holders Details		
Section 29 Notice Holder	**Registration Number**	**License Equity Interest (%)**
EnQuest Heather Limited	02748866	69.30%
EnQuest PLC	07140891	-
Ithaca Energy (UK) Limited	SC272009	20.00%
Ithaca Gamma Limited	05929104	10.70%
Ithaca Petroleum Limited	05223667	-

1.5.2 Conrie Field - Pipelines

Table 1.5.3: Conrie Pipelines Being Decommissioned		
Number of Pipelines, Cables, Umbilicals	3	Refer Table 2.2.2

Table 1.5.4: Conrie Pipelines - Section 29 Notice Holders Details		
Section 29 Notice Holder	**Registration Number**	**License Equity Interest (%)**
EnQuest Heather Limited	02748866	60.00%
EnQuest PLC	07140891	-
Ithaca Energy (UK Limited	SC272009	40.00%
Ithaca Petroleum Limited	05223667	-
Ithaca Gamma Limited	05929104	-

1.5.3 Don South West Field - Pipelines

Table 1.5.5: Don South West Pipelines Being Decommissioned		
Number of Pipelines, Cables, Umbilicals	18	Refer Table 2.3.2

Table 1.5.6: Don South West Pipelines - Section 29 Notice Holders Details		
Section 29 Notice Holder	**Registration Number**	**License Equity Interest (%)**
EnQuest Heather Limited	02748866	60.00%
EnQuest PLC	07140891	-
Ithaca Energy (UK) Limited	SC272009	40.00%
Ithaca Gamma Limited	05929104	-
Ithaca Petroleum Limited	05223667	-

1.5.4 West Don Field - Pipelines

Table 1.5.7: West Don Pipelines Being Decommissioned		
Number of Pipelines, Cables, Umbilicals	10	Refer Table 2.4.2

Table 1.5.8: West Don Pipelines - Section 29 Notice Holders Details		
Section 29 Notice Holder	**Registration Number**	**License Equity Interest (%)**
EnQuest Heather Limited	03351775	78.6%
EnQuest PLC	07140891	-
Ithaca Energy (UK) Limited	SC272009	-
Ithaca Alpha (N.I.) Limited	NI073431	21.4%
Ithaca Petroleum Limited	05223667	-

1.5.5 Ythan Field - Pipelines

Table 1.5.9: Ythan Pipelines Being Decommissioned		
Number of Pipelines, Cables, Umbilicals	5	Refer Table 2.5.2

Table 1.5.10: Ythan Pipelines - Section 29 Notice Holders Details		
Section 29 Notice Holder	**Registration Number**	**License Equity Interest (%)**
EnQuest Heather Limited	02748866	60.00%
EnQuest PLC	07140891	-
Ithaca Gamma Limited	05929104	40.00%
Ithaca Petroleum Limited	05223667	

1.6 Summary of Proposed Decommissioning Programmes

Table 1.6.1: Summary of Decommissioning Programmes	
Proposed Decommissioning Solution	**Reason for Selection**
1. Installations	
Complete removal. The Conrie, Don South West, West Don and Ythan installations and Single Anchor Loading Buoy Mooring Base (SALBMB) will be fully removed, taken to shore, dismantled, and recycled unless alternative re-use options are found by the owner to be viable and more appropriate. Note that the SALBMB will be removed at the same time as when decommissioning works associated with the Thistle Wye Structure are carried out. Any permit applications required for work associated with removal of the installations will be submitted to the regulator as required.	To comply with OSPAR requirements. Allows installations to be removed and maximises opportunity for re-use or recycling of materials.
2. Pipelines	
All the surface laid pipelines associated with the Conrie, Don South West, West Don and Ythan infrastructure will be cleaned and flushed and fully removed. This will remove potential snagging hazards from the area. Sections of pipelines that are trenched and buried, either in the seabed (PLU2577, PL2581, PL2582 and PLU2585) or buried under rock (PL2578 & PL2579, PL2572 & PL2573, PL2583 & PL2584, PL4261, PL4262, and PLU2576) will be left *in situ*. The Don South West pipelines cross over the Don field pipelines PL598, PL599, PL600 and the 4" control umbilical. As these are also being left *in situ*, they will be unaffected by the decommissioning of the DSW pipelines (PL2572, PL2573, PLU2577, PL2581, and PL4262. In order to explore synergistic opportunities PLU2580 (which incorporates PLU2580JSO and PLU2580JSG) and associated infrastructure such as riser bases (PLU2580 & PL2579), SSIV skids and pipelines within the Thistle 'A' 500m safety zone will likely be decommissioned at the same time as the Thistle 'A' installation and infrastructure. Note that the protection and stabilisation features associated with PL2579 as it by-passes the Wye Structure also protect and stabilise PL4555 which belongs to the Thistle owners. These features will be left *in situ* until PL4555 is decommissioned. This is explained in the relevant tables in the Decommissioning Programmes herein. The SSIV and Riser Bases at Thistle 'A' will be left *in situ* meantime pending decommissioning of the Thistle pipelines and infrastructure inside the Thistle 'A' 500m safety zone. Any permit applications required for work associated with pipeline pigging, flushing, cutting and removal will be submitted to the regulator as required.	Removes a potential obstruction to fishing operations and maximises recycling of materials.

Table 1.6.1: Summary of Decommissioning Programmes	
3. Wells	
The wells associated with the Don South West, Conrie, Ythan and West Don fields will be decommissioned to comply with HSE "Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996" and in accordance with the latest version of the Oil & Gas UK Well Decommissioning Guidelines. Depending on the complexity of requirements the wells will most likely be decommissioned using a semi-submersible drilling rig. A Master Application Template (MAT) and the supporting Subsidiary Application Template (SATs) will be submitted in support of activities carried out; a PON5 application will be submitted to OGA to decommission the wells.	Meets the OGA and HSE regulatory requirements.
4. Interdependencies	
The decommissioning works will be carried out in two phases. 1) Departure of the Northern Producer and removal of snagging hazards in and around the 500m zone; 2) decommissioning of remaining installations and infrastructure. Phase 1 is being dealt with using separate Decommissioning Programmes. All of the installations will be removed. No third-party pipeline crossings will be disturbed as a result of the decommissioning proposals. Pipeline stabilisation features such as concrete mattresses and any grout bags found that are exposed (i.e. not buried under deposited rock) will be removed as part of the pipeline decommissioning activities. Although some deposited rock may be disturbed during the removal activities, it will remain *in situ*. In order to explore synergistic opportunities and efficiencies in operational activity and cost, it's possible that the pipelines around the Wye structure (PL2578 & PL2579) will be dealt with at the same time as Wye structure and Thistle pipelines PL4555 & PL4556 and within the Thistle 500m safety zone, PL2579, PLU2580, PLU25480JSO and PLU2580JSG will be decommissioned at the same time as the Thistle infrastructure.	

1.7 Field Locations including Field Layout and Adjacent Facilities

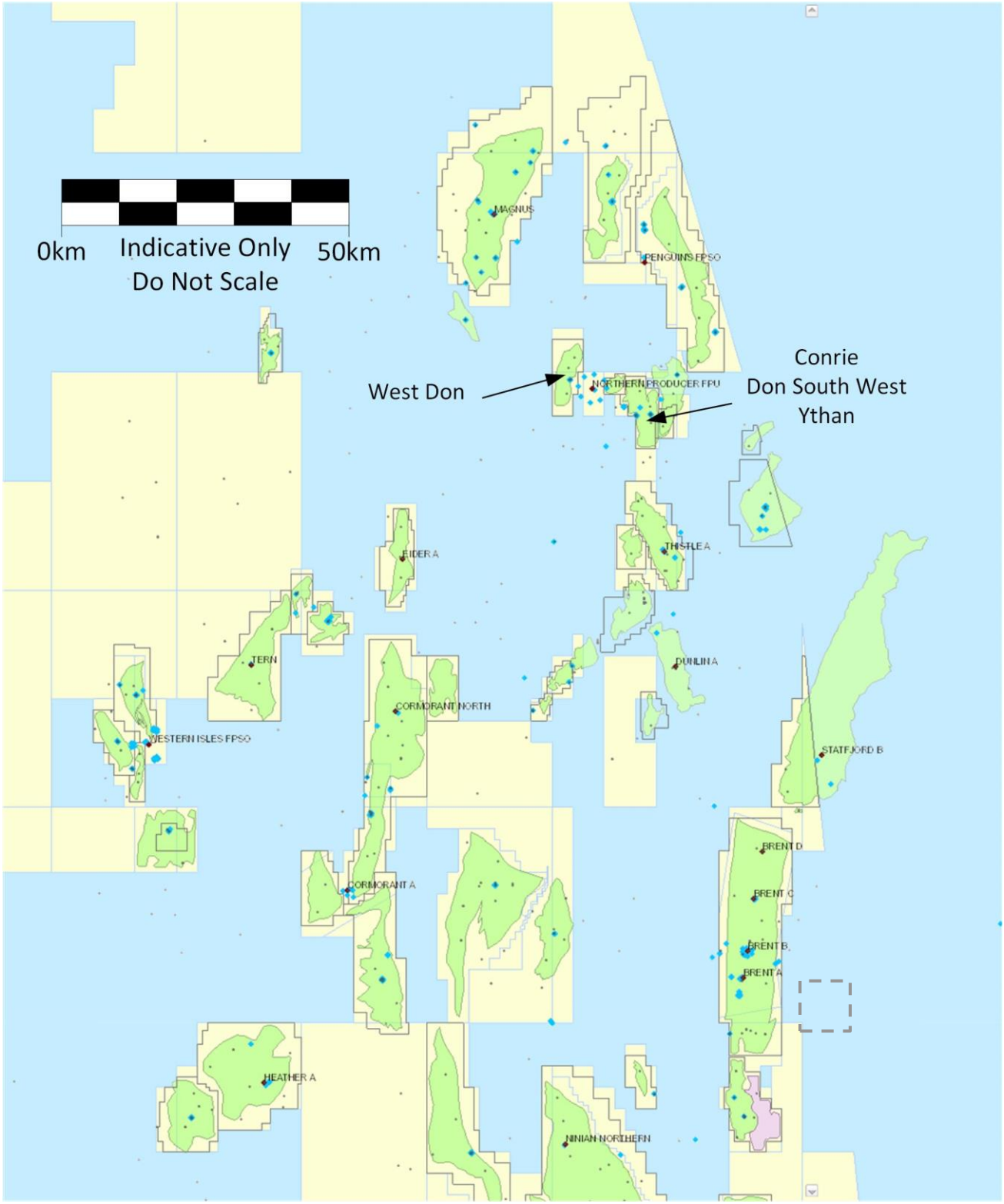
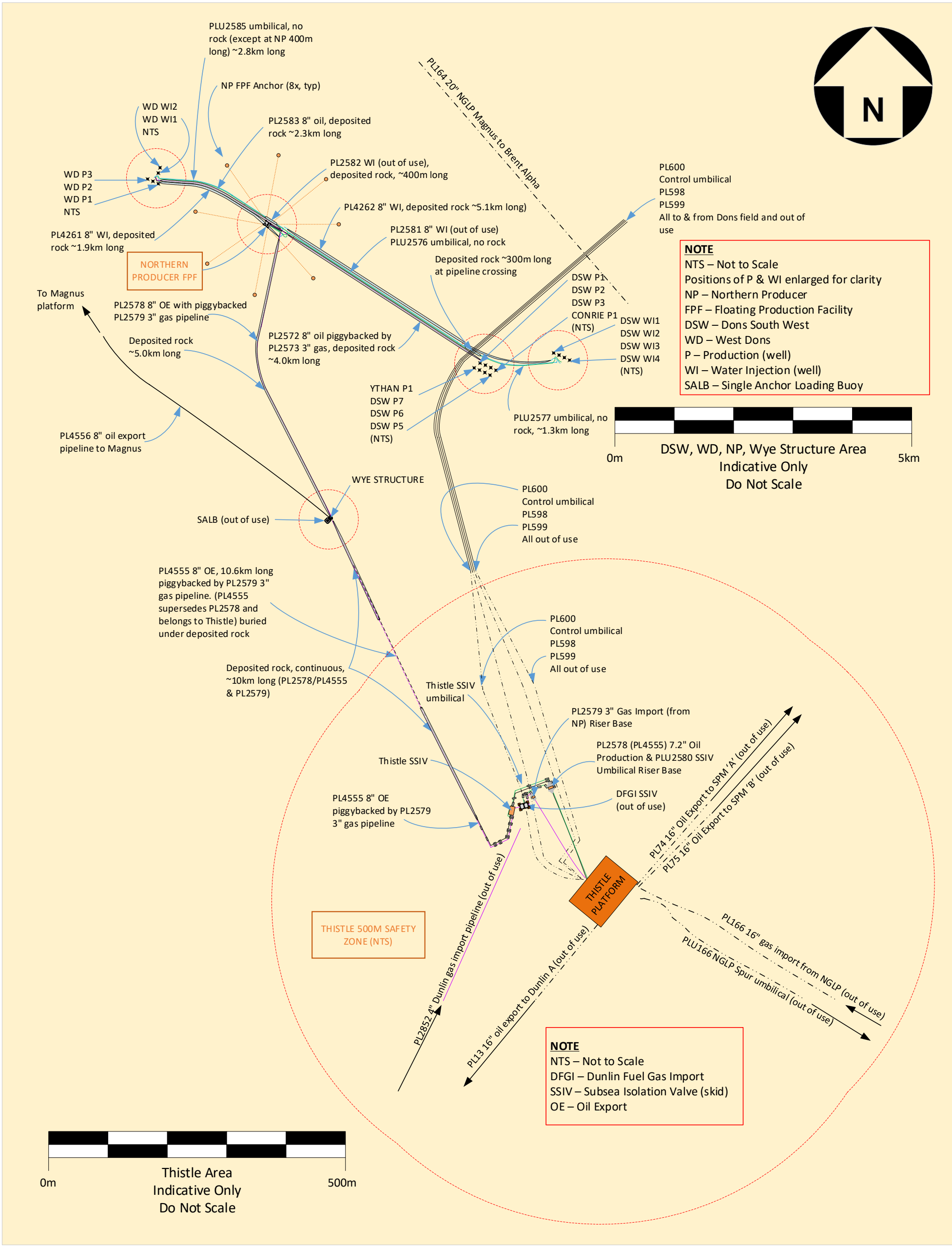


Figure 1.7.1: Northern Producer adjacent fields and surface facilities



NOTE
NTS – Not to Scale
Positions of P & WI enlarged for clarity
NP – Northern Producer
FPF – Floating Production Facility
DSW – Dons South West
WD – West Dons
P – Production (well)
WI – Water Injection (well)
SALB – Single Anchor Loading Buoy

Figure 1.7.2: Phase 1 DP Scope - Northern Producer and its locality

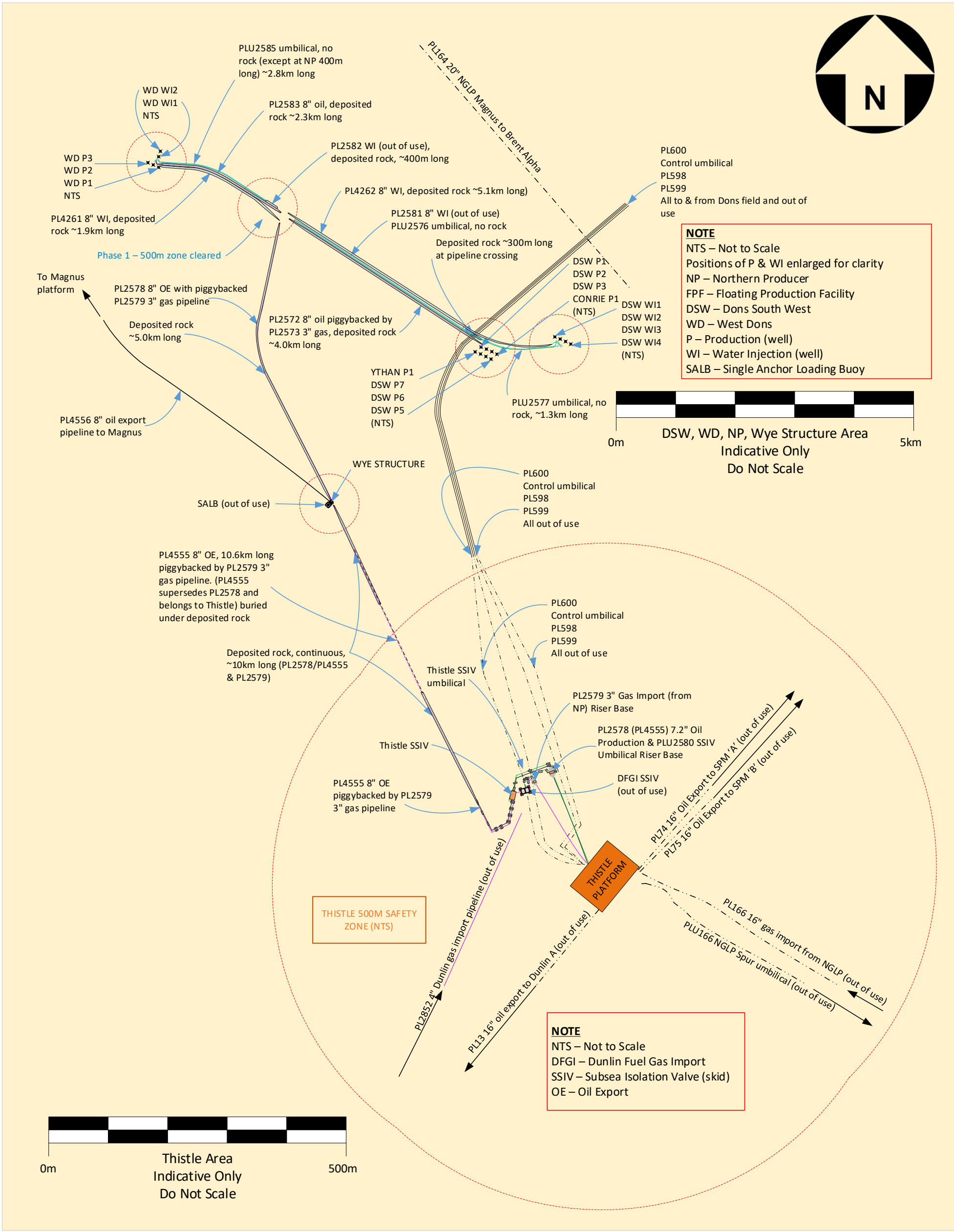


Figure 1.7.3: Phase 2 DP Scope - after completion of Phase 1 DP Scope in 500m Zone

Table 1.7.1: Adjacent Facilities							
Owner	**Name**	**Type**	**Distance and Direction from SALB**	**Distance and Direction from DSW Centre**	**Direction & Distance from WD Centre**	**Information**	**Status**
EnQuest	Don South West	10x WHPS	NE, ~3.7km	n/a	ESE, ~6.7km		Operational
EnQuest	West Don	5x WHPS	NW, ~6.4km	NWW, ~6.8km	n/a		Operational
EnQuest	Conrie	1x WHPS	NE, ~3.7km	n/a	ESE, ~6.7km		Operational
EnQuest	Ythan	1x WHPS	NE, ~3.7km	n/a	ESE, ~6.7km		Operational
EnQuest	SALB	SALB	n/a	SW, 4.1km	SE, 6.4km	Former export route for NP	Non-operational
EnQuest	Wye Structure	Manifold	0km	SW, 4.0km	SE, 6.4km	Most recent export route for NP & Thistle 'A'	Operational
Shell UK Limited	Penguins	FPSO	N, 15.8km	NNW, 12.9km	NNE, 11.5km		Operational
EnQuest	SALM	SALM Base	SE, 9.7km	SSE, 10.5km	SE, 16km	Former export route for Thistle 'A'	Out of Use
EnQuest	Thistle 'A'	Fixed steel jacket	SE, 10.4km	SSE, 12km	SE, 16.7km	Former export route for NP	Non-operational
EnQuest	Magnus	Fixed steel jacket	NW, 21.7km	NW, 21km	NW, 15.3km	Current export route for NP & Thistle 'A'	Operational
CNR & Wintershall Norsk AS	Murchison	Jacket Footings	E, 14.5km	ESE, 13.1km	ESE, 19.8km		Decommissioned
TAQA	Eider	Fixed steel jacket	SW, 19.9km	SW, 23.9km	SSW, 21km	Topsides DP approved April 2020	Non-operational
Impacts of Decommissioning Proposals							
There are no direct impacts on adjacent facilities from the decommissioning works associated with Conrie, Don South West, West Don and Ythan installations and associated pipeline infrastructure. As part of the operational phase any potential environmental impacts will be mitigated in two ways. The first is via direct communication with the parties involved, and the other is via submission of the MATs and SATs.							

1.8 Industrial Implications

The activities to disconnect or sever and recover the Conrie, DSW, WD and Ythan installations, surface laid pipelines and associated structures, and protection and stabilisation features will be completed using one or a combination of vessels including ROV Support Vessel (ROVSV), Construction Support Vessel (CSV), Multi Support Vessel (MSV) and Anchor Handling Vessel (AHV).

It is the intention of the respective owners of the installation and pipelines to develop a contract strategy and Supply Chain Action Plan that will result in an efficient and cost-effective execution of the decommissioning works. Where appropriate existing framework agreements may be used for decommissioning of the pipelines and pipeline stabilisation features. EnQuest will seek to combine the decommissioning activities with other development or decommissioning activities to reduce mobilisation costs should the opportunity arise. The decommissioning schedule is extended to allow flexibility for when decommissioning operations are carried out and completed.

2. DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

No surface Installations are being decommissioned as part of the proposals contained herein.

2.1 Don South West and West Don Assets

2.1.1 Subsea Installations including Stabilisation Features

Table 2.1.1: DSW & WD Subsea Installation Information					
Subsea Installations Including Stabilisation Features	Number	Mass (Te) / Size (m)	Location		Comments/ Status
			WGS84 Decimal	WGS84 Decimal Minute	
SALB	1	103.1 13x13x8.1	61.495608° N 01.428825° E	61° 29.7365' N 01° 25.7295' E	Refer Figure 1.7.2 and Figure B.4.1. Note that PL4557 on the SALB is noted on the Section 29 for the DSW owners.
Concrete mattresses	n/a	n/a	n/a	n/a	n/a
Grout bags	n/a	n/a	n/a	n/a	n/a
Formwork	n/a	n/a	n/a	n/a	n/a
Deposited rock	n/a	n/a	n/a	n/a	n/a
Other	n/a	n/a	n/a	n/a	n/a

2.1.2 Pipelines including Stabilisation Features

Table 2.1.2: DSW & WD Pipeline/Flowline/Umbilical Information										
Description	**Pipeline Number (as per PWA)**	**PWA Ident[4]**	**Diameter (NB) (inches)[1]**	**Length (m)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points[2]**	**Burial Status**	**Pipeline Status[5]**	**Current Content[5]**
Oil export pipeline	PL2578	4	8”	5,086	Carbon steel flowline	Oil	RBS Expansion spool flange to WS	Trenched and buried under deposited rock between KP0.002 and KP5.047	Out of use	Seawater
Gas import/export pipeline	PL2579	6	3”	5,086	Carbon steel flowline	Gas	Start & finish of flowline on approach to WS	Same trench as PL2578 buried under deposited rock	Out of use	Seawater
		7	3”	45	Expansion spool	Gas	By-passes WS	Surface laid, covered with concrete mattresses	Out of use	Seawater
		8	3”	10,089	Carbon steel flowline		Downstream of WS to expansion spool upstream of Thistle SSIV	Trenched and buried under deposited rock between KP5.214 and KP15.264		
		9	3”	30	Expansion spools		Between end of flowline and Thistle SSIV	Surface laid, partly covered with concrete mattresses		
		10	3”	7			Between Thistle SSIV and TRBS			
		11	175.9mm	300	Flexible riser		TRBS to Thistle ESDV	Suspended in water column		

Table 2.1.2: DSW & WD Pipeline/Flowline/Umbilical Information										
Description	**Pipeline Number (as per PWA)**	**PWA Ident[4]**	**Diameter (NB) (inches)[1]**	**Length (m)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points[2]**	**Burial Status**	**Pipeline Status[5]**	**Current Content[5]**
Control umbilical	PLU2580	1-4	87mm	300	Static umbilical	Hydraulic fluids	Thistle TUTU to Thistle SSIV SUTU	Suspended in water adjacent to Thistle 'A' installation	Out of u5se	Hydraulic fluids
	PLU2580JSO	1-2	66mm	105	Flexible thermoplastic umbilical	Hydraulic fluids	TRBS to Thistle SSIV	Surface laid and intermittently protected and stabilised by concrete mattresses and grout bags		
	PLU2580JSG	1-2	66mm	105						

NOTES

1. If diameter is expressed in mm it refers to outside diameter of umbilical;
2. For brevity, the description of the end-to-end points may differ slightly from those consented;
3. PL2578 idents 1-3 and PL2579 idents 1-5 are to be removed as part of Phase 1 of the decommissioning works and are therefore not listed here;
4. PWA Idents highlighted in green are affected by proposals in the Decommissioning Programmes that address Phase 1. Decommissioning of the remaining sections of pipelines are addressed by proposals herein;
5. Pipeline status and current content assume that the Northern Producer has departed with the pipeline and umbilicals dealt with accordingly.

Table 2.1.3: DSW & WD Subsea Pipeline Stabilisation Features & Structures					
Stabilisation Feature & Size (m)	**Total Number**	**Total Mass (Te)**	**Location(s)**		**Exposed/Buried/Condition**
			WGS84 Decimal (If quoted):	**WGS84 Decimal Minute (If quoted)**	
Concrete mattresses[1]	46	150.9	**PL2578 (& PL2579)** 13x North of WS; and 1x on approach to WS; **PL2579** 9x South of WS. Refer Figure B.4.1.		Burial status will be determined when decommissioning activities are being carried out. Assumed exposed, resting on seabed.
			PL2579 2x At Thistle Riser Base, 2x between TRBS and DFGI SSIV; 1x between DFGI SSIV and Thistle SSIV; 15x between deposited rock at trench and Thistle SSIV. Refer Figure B.5.1.		
			PLU2580JSO/PLU2580JSG 3x Between TRBS and Thistle SSIV. Refer Figure B.5.1.		Burial status will be determined when decommissioning activities are being carried out. Assumed exposed, resting on seabed.
Grout bags (25kg)[3]	1280	32.0	**PLU2580** 1280x in and around the TRBS. Refer Figure B.5.1.		Burial status will be determined when decommissioning activities are being carried out. Assumed exposed, resting on seabed.
Deposited rock[4]	n/a	18,784	**PL2578 (& PL2579)** between KP0.002 and KP5.047 (i.e. ~5,9km long) upstream of the Wye Structure from the riser bases inside the Northern Producer 500m zone. Refer Figure 1.7.2.		Exposed.
	n/a	38,593	**PL2578[4] (& PL2579)** between KP5.214 and KP10,050 (i.e. ~10.01km long) downstream of the Wye Structure towards Thistle 'A'. Refer Figure 1.7.2.		Exposed.
PL2578 8" Oil Export and PLU2580 Thistle 3" SSIV umbilical riser base and protection structure (6.1m x 2.8m x 0.5m)[6]	1	62.5	61.366030° N 01.577850° E Refer Figure B.5.1	61° 21.9618' N 01° 34.6710' E Refer Figure B.5.1	Burial status will be determined when decommissioning activities are being carried out. Assumed exposed, resting on seabed.
PL2579 3" SSIV & Protection Structure (6m x 3.5m x 3.0m)[6]	1	34.0	61.365680° N 01.576722° E	61° 21.9408' N 01° 34.6033' E	

Table 2.1.3: DSW & WD Subsea Pipeline Stabilisation Features & Structures					
Stabilisation Feature & Size (m)	Total Number	Total Mass (Te)	Location(s)		Exposed/Buried/Condition
			WGS84 Decimal (If quoted):	WGS84 Decimal Minute (If quoted)	
			Refer Figure B.5.1	Refer Figure B.5.1	
PL2579 3" gas import riser base and protection structure (3.8m x 2.8m x 0.5m)[6]	1	29.0	61.365887° N 01.577325° E Refer Figure B.5.1	61° 21.9532' N 01° 34.6395' E Refer Figure B.5.1	

NOTES:

1. Concrete mattresses are 'SPS' type: 6m x 2m x 0.15m (Approx. mass each mattress 3.14Te) or 6m x 3m x 0.15m (Approx. mass each mattress 4.72Te);
2. All concrete mattresses near the Wye Structure and on approach to Thistle 'A' installation will be left *in situ* meantime pending decommissioning of **PL4555** and the Thistle related pipeline infrastructure;
3. Quantity of grout bags is an estimate as the as-built details are not definitive;
4. The quantity of deposited rock is estimated or based on the original deposit consent.
5. The section of PL2578 downstream of the Wye Structure to Thistle 'A' was renumbered **PL4555** with its ownership transferred to the Thistle owners;
6. The SSIV and Riser Bases at Thistle 'A' will be left *in situ* meantime pending decommissioning of the Thistle pipelines and infrastructure inside the Thistle 'A' 500m safety zone.

2.1.3 Material Inventory Estimates

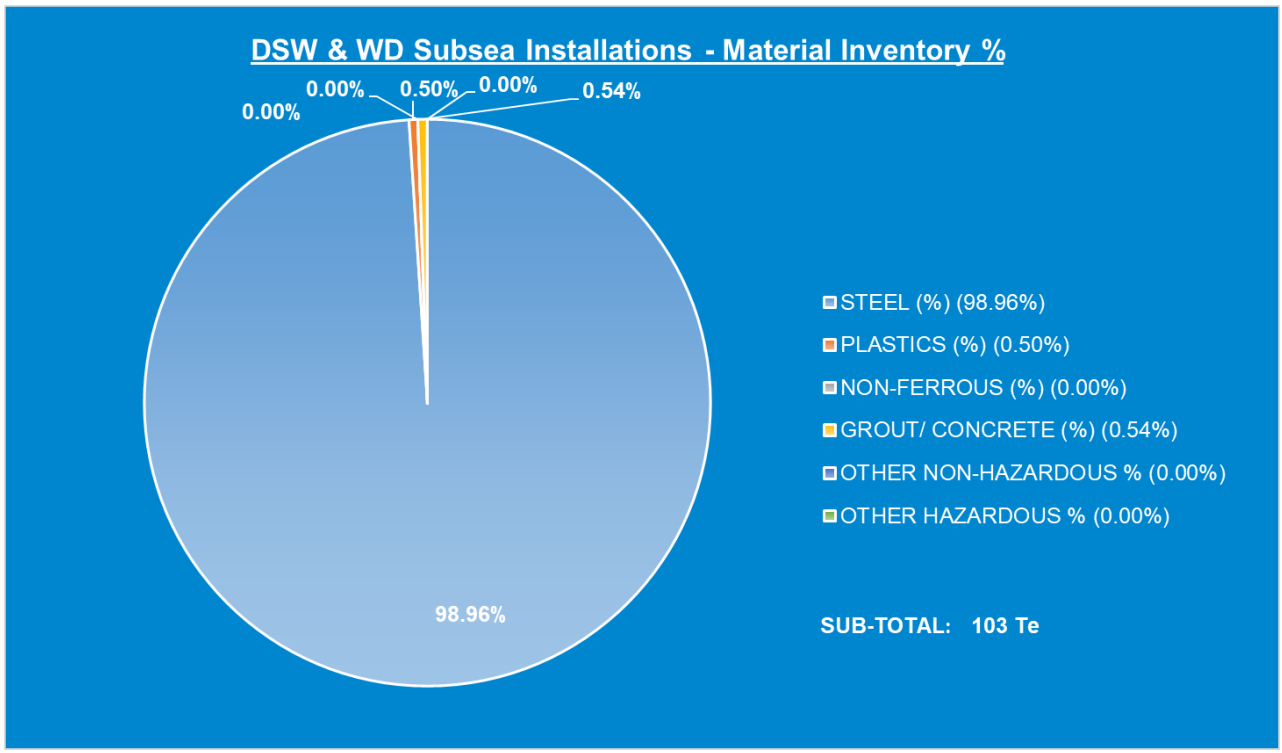


Figure 2.1.1: Pie-Chart of Material Inventory for DSW & WD Installation

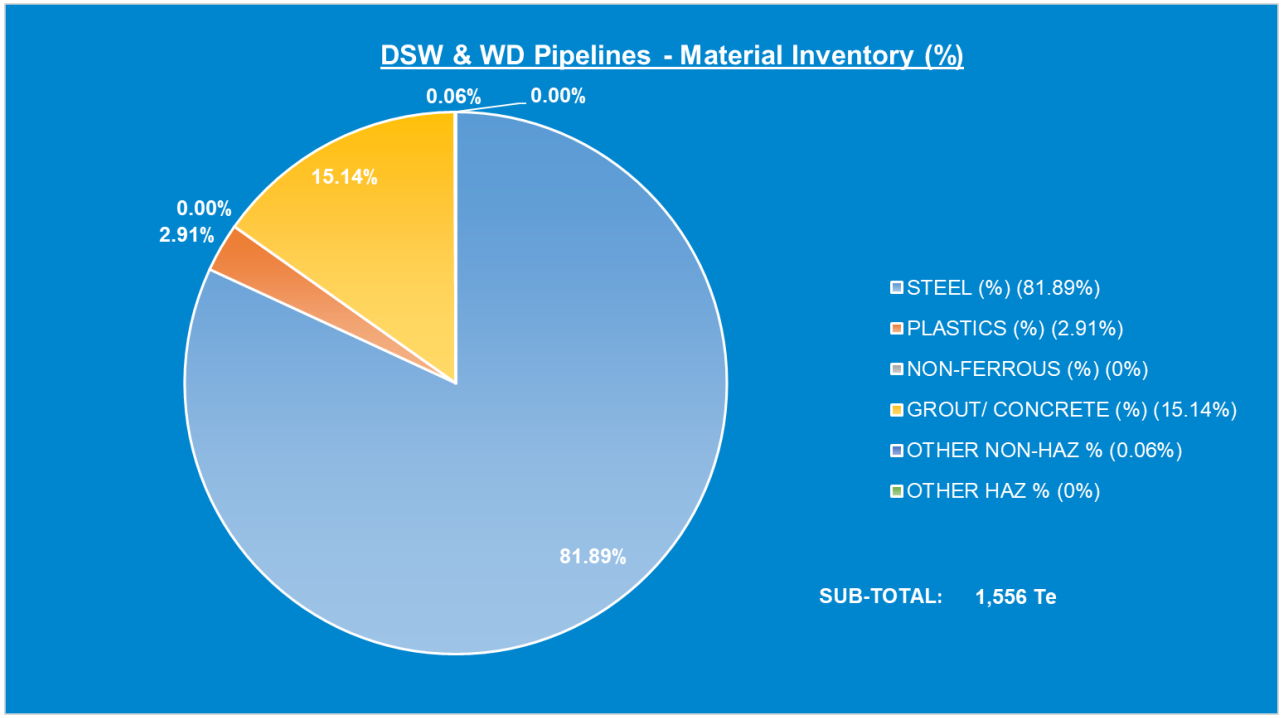


Figure 2.1.2: Pie-Chart of Material Inventory for DSW & WD Pipelines[1]

[1] Material inventory includes Phase 1 materials

2.2 Conrie Related Assets

2.2.1 Subsea Installations including Stabilisation Features

Table 2.2.1: Conrie Subsea Installation Information					
Subsea Installations Including Stabilisation Features	Number	Mass (Te) / Size (m)	Location		Comments/ Status
			WGS84 Decimal	WGS84 Decimal Minute	
Conrie WHPS	1	55.9 8.8m x 9.2m x 6.7m	61.468580° N 01.535337° E	61° 28.1148' N 01° 32.1202' E	
Concrete mattresses	n/a	n/a	n/a	n/a	n/a
Grout bags	n/a	n/a	n/a	n/a	n/a
Formwork	n/a	n/a	n/a	n/a	n/a
Deposited rock	n/a	n/a	n/a	n/a	n/a
Other	n/a	n/a	n/a	n/a	n/a

2.2.2 Pipelines including Stabilisation Features

Table 2.2.2: Conrie Pipeline/Flowline/Umbilical Information									
Pipeline Number (as per PWA)	**PWA Ident**	**Diameter (NB) (inches)[1]**	**Length (m)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points[2]**	**Burial Status**	**Pipeline Status[3]**	**Current Content3**
PL2572	5-8[3]	8”	38m	Pipespool, duplex	Oil	DBBV at DSW P5 production tree to DSW P4 (Conrie) production tree	Surface laid, protected by concrete mattresses	Out of use	Seawater
PL2573	18-21	3”	40m	Pipespool, carbon steel	Gas	DSW P4 (Conrie) production tree to DSW P5 production tree		Out of use	Seawater
PLU2576JP4	1-8	114.5mm	75m	Umbilical jumper	Methanol & hydraulic fluids	DSW SDU to DSW Well P6		Out of use	Seawater

NOTES

1. If diameter is expressed in mm it refers to outside diameter of electrical cable or umbilical pipeline;
2. For brevity, the description of the end-to-end points may differ slightly from those consented;
3. Pipeline status and current content assume that the Northern Producer has departed with the pipeline and umbilicals dealt with accordingly.

Table 2.2.3: Conrie Pipeline Stabilisation Features & Structures				
Stabilisation Feature & Size (m)	**Total Number**	**Total Mass (Te)**	**Location(s)**	**Exposed/Buried/Condition**
Concrete mattresses[1]	17	28.3	**PL2572 (5-8)** 6x between DSW P5 & Conrie Well P1. Refer Figure B.1.1.	Latest survey information suggests the concrete mattresses and grout bags are exposed.
	11	34.6	**PL2576JP4** 11x SDU and Conrie Well P1. Refer Figure B.1.1.	
Grout bags[2]	80	2.0	**PL2572 (5-8)** 40x between P5 and Conrie Well P1. Refer Figure B.1.1.	
			PL2573 (18-21) between Conrie Well P1 & DSW P5, as per **PL2572 (5-8)**. Refer Figure B.1.1.	

Table 2.2.3: Conrie Pipeline Stabilisation Features & Structures				
Stabilisation Feature & Size (m)	**Total Number**	**Total Mass (Te)**	**Location(s)**	**Exposed/Buried/Condition**
			PL2576JP4 40x DSW SDU and Conrie Well P1. Refer Figure B.1.1.	
Deposited rock	n/a	n/a	n/a	n/a

NOTES:

1. Concrete mattresses are 'SPS' type: 6m x 2m x 0.15m (Approx. mass each mattress 3.14Te) or 6m x 3m x 0.15m (Approx. mass each mattress 4.72Te);
2. The quantity of 25kg grout bags is estimated because the as-built data are not explicit.

2.2.3 Well Information

Table 2.2.4: Conrie Well Information			
Well ID	**Designation**	**Status**	**Category of Well**
211/18a-S7	Oil production	Shut in	SS 1-1-1

For details of well categorisation please refer the latest version of the Oil and Gas UK Guidelines for the Decommissioning of wells. Well status is stated on the assumption that Northern Producer has departed.

2.2.4 Material Inventory Estimates

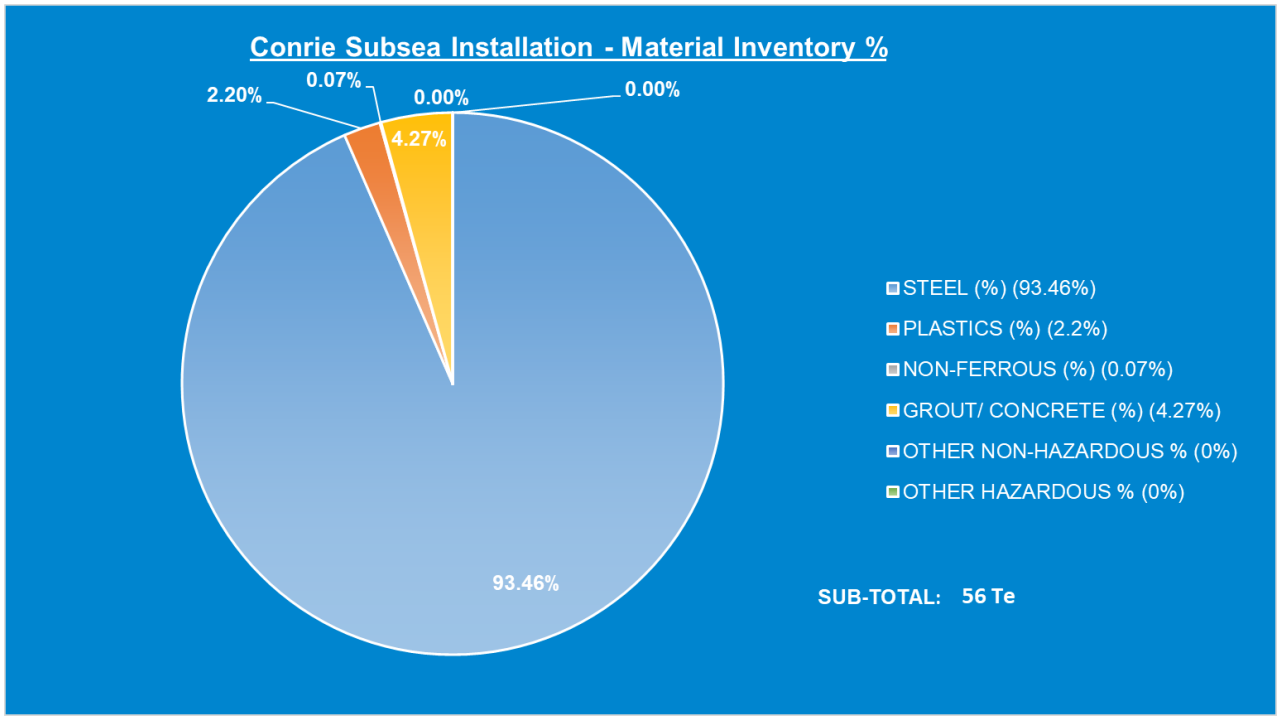


Figure 2.2.1: Pie-Chart of Material Inventory for Conrie Installation

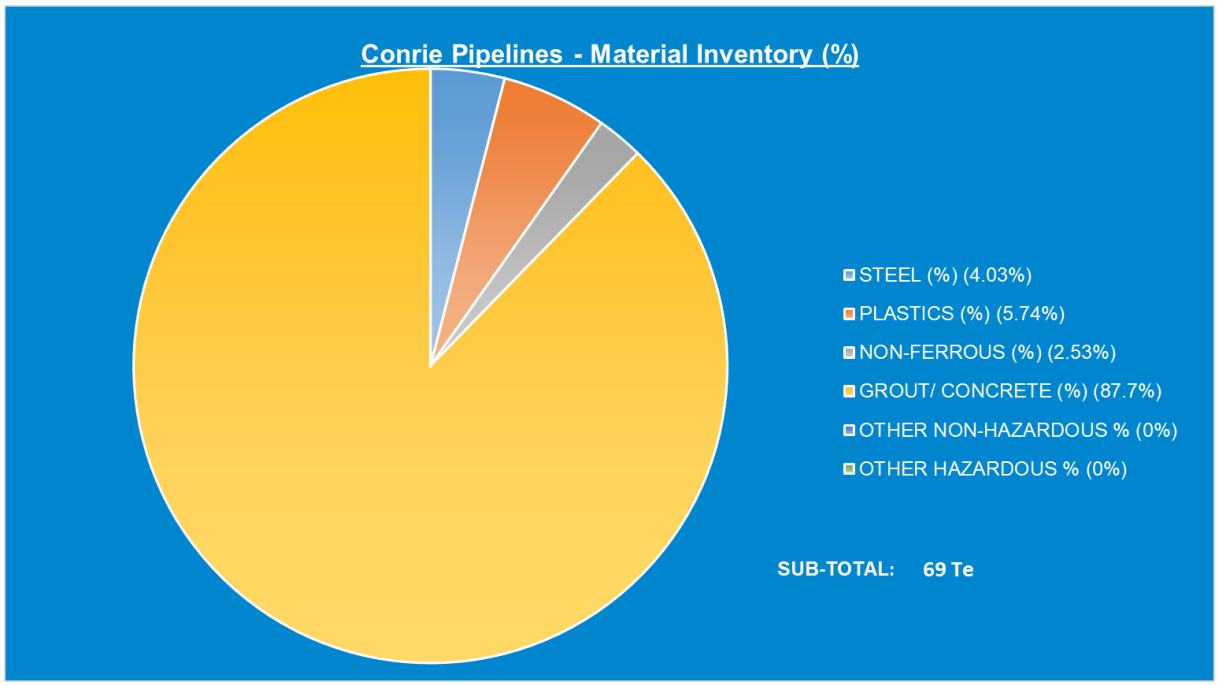


Figure 2.2.2: Pie-Chart of Material Inventory for Conrie Pipelines

2.3 Don South West Assets

2.3.1 Subsea Installations including Stabilisation Features

Table 2.3.1: DSW Subsea Installation Information					
Subsea Installations Including Stabilisation Features	Number	Mass (Te) / Size (m)	Location		Comments/ Status
			WGS84 Decimal	WGS84 Decimal Minute	
DSW P1	1	55.9 8.8x9.2x6.7	61.468730° N 01.533833° E	61° 28.1238' N 01° 32.0300' E	
DSW P2	1	55.9 8.8x9.2x6.7	61.468672° N 01.534322° E	61° 28.1203' N 01° 32.0593' E	
DSW P3	1	55.98.8x9.2x6.7	61.468622° N 01.534825° E	61° 28.1173' N 01° 32.0895' E	
DSW P5	1	55.9 8.8x9.2x6.7	61.468108° N 01.535095° E	61° 28.0865' N 01° 32.1057' E	
DSW P6	1	55.9 8.8x9.2x6.7	61.468155° N 01.534605° E	61° 28.0893' N 01° 32.0763' E	
DSW P7	1	55.9 8.8x9.2x6.7	61.468208° N 01.534083° E	61° 28.0925' N 01° 32.0450' E	
DSW WI1	1	55.9 8.8x9.2x6.7	61.469517° N 01.557117° E	61° 28.1710' N 01° 33.4270' E	
DSW WI2	1	55.9 8.8x9.2x6.7	61.469387° N 01.557450° E	61° 28.1632' N 01° 33.4470' E	
DSW WI3	1	55.9 8.8x9.2x6.7	61.469283° N 01.557767° E	61° 28.1570' N 01° 33.4660' E	
DSW WI4	1	55.9 8.8x9.2x6.7	61.469125° N 01.558122° E	61° 28.1475' N 01° 33.4873' E	
Concrete mattresses	n/a	n/a	n/a	n/a	n/a
Grout bags	n/a	n/a	n/a	n/a	n/a
Formwork	n/a	n/a	n/a	n/a	n/a
Deposited rock	n/a	n/a	n/a	n/a	n/a
Other	n/a	n/a	n/a	n/a	n/a

2.3.2 Pipelines including Stabilisation Features

Table 2.3.2: DSW Pipeline/Flowline/Umbilical Information										
Description	**Pipeline Number (as per PWA)**	**PWA Ident[4]**	**Diameter (NB) (inches)[1]**	**Length (m)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points[2]**	**Burial Status**	**Pipeline Status[5]**	**Current Content[5]**
Oil pipeline	PL2572	1-4 & 9-28 incl.	8”/6”	4,302	Duplex & carbon steel expansion spools & gate valves	Oil	Production Tree P7 to cut point at start of trench	Surface laid, covered with concrete mattresses	Out of use	Seawater
Gas lift pipeline	PL2573	6-33 incl.	3”	4,312	Carbon steel expansion spools & gate valves	Gas	Cut point at start of trench to production Xmas tree P7 via P1,P2,P3,P5,P6	Surface laid covered with concrete mattresses	Out of use	Seawater
Static umbilical	PLU2576	Cores 1 to 8	114.5mm	4,162	Static umbilical jumpers	Chemicals, methanol, hydraulic fluids	Cut point in start of trench to DSW SUTU	Exposed	Out of use	Seawater
Static umbilical	PLU2576	DSW JS1 to 8	114.5mm	10	Static umbilical jumpers	Chemicals, methanol, hydraulic fluids	Between DSW SUTU and SDU	Exposed	Out of use	Seawater
Umbilical jumper	PLU2576JP1	1 to 4 5 to 8	114.5mm	76	Static umbilical jumpers	Chemicals, methanol, hydraulic fluids	DSW SDU to P1	Exposed	Out of use	Seawater
Umbilical jumper	PLU2576JP2	1 to 4 5 to 8	114.5mm	75	Static umbilical jumpers	Chemicals, methanol, hydraulic fluids	DSW SDU to P2	Exposed	Out of use	Seawater

Table 2.3.2: DSW Pipeline/Flowline/Umbilical Information										
Description	**Pipeline Number (as per PWA)**	**PWA Ident[4]**	**Diameter (NB) (inches)[1]**	**Length (m)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points[2]**	**Burial Status**	**Pipeline Status[5]**	**Current Content[5]**
Umbilical jumper	PLU2576JP3	1 to 4 5 to 8	114.5mm	75	Static umbilical jumpers	Chemicals, methanol, hydraulic fluids	DSW SDU to P3	Exposed	Out of use	Seawater
Umbilical jumper	PLU2576JP5	1 to 4 5 to 8	114.5mm	115	Static umbilical jumpers	Chemicals, methanol, hydraulic fluids	DSW SDU to P5	Exposed	Out of use	Seawater
Umbilical jumper	PLU2576JP6	1 to 4 5 to 8	114.5mm	144	Static umbilical jumpers	Chemicals, methanol, hydraulic fluids	DSW SDU to P6	Exposed	Out of use	Seawater
Umbilical jumper	PLU2576JP7	1 to 4 5 to 8	129mm	175	Static umbilical jumpers	Chemicals, methanol, hydraulic fluids	DSW SDU to P7	Exposed	Out of use	Seawater
Static umbilical	PLU2577	Cores 1 to 4	116.5mm	1,312	Static umbilical jumpers	Hydraulic fluids	DSW SDU to DSW WI1	Trenched and buried	Out of use	Seawater
Static umbilical	PLU2577JWI2	Cores 1 to 4	116.5mm	30	Static umbilical jumpers	Hydraulic fluids	DSW WI1 to DSW WI2	Exposed	Out of use	Seawater
Static umbilical	PLU2577JWI3	Cores 1 to 4	116.5	30	Static umbilical jumpers	Hydraulic fluids	DSW WI2 to DSW WI3	Exposed	Out of use	Seawater
Static umbilical	PLU2577JWI4	Cores 1 to 4	116.5	30	Static umbilical jumpers	Hydraulic fluids	DSW WI3 to DSW WI4	Exposed	Out of use	Seawater

Table 2.3.2: DSW Pipeline/Flowline/Umbilical Information										
Description	**Pipeline Number (as per PWA)**	**PWA Ident[4]**	**Diameter (NB) (inches)[1]**	**Length (m)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points[2]**	**Burial Status**	**Pipeline Status[5]**	**Current Content[5]**
Water injection pipeline (disused)	PL2581	1	8”	5,237	Carbon steel pipeline	Seawater	Between expansion spools at pipeline ends	Trenched and buried in seabed except at Dons pipeline crossing where it is buried under deposited rock (between KP3.6 and KP3.92).	Out of use	Treated seawater
		2	8”	27	Expansion spool		Between pipeline end flange and tree at DSW water injection wells	Surface laid, covered with concrete mattresses on approach to Xmas trees		
Replacement water injection pipeline	PL4262	2	228.1mm	5,550	Flexible pipeline	Seawater	RBS to DSW WI1	Surface laid and buried under deposited rock between KP0.12 and KP5.265	Out of use	Seawater
		3-13	8”	109	Pipespools		Between pipeline end flange and each Xmas tree at DSW water injection wells	Surface laid, covered with concrete mattresses on approach to WI trees		

Table 2.3.2: DSW Pipeline/Flowline/Umbilical Information										
Description	**Pipeline Number (as per PWA)**	**PWA Ident[4]**	**Diameter (NB) (inches)[1]**	**Length (m)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points[2]**	**Burial Status**	**Pipeline Status[5]**	**Current Content[5]**
Oil export pipeline	PL4557	1	8”	5	Carbon steel pipespool	Oil	SALB	Mounted on SALB	Out of use	Seawater

NOTES

1. If diameter is expressed in mm it refers to outside diameter of umbilical;
2. For brevity, the description of the end-to-end points may differ slightly from those consented;
3. PL2572 Idents 29-31, PL2573 Idents 1-5, PLU2574, PLU2575, PLU2576JP1-8, PL4262 Ident 1 are to be removed as part of Phase 1 of the decommissioning works and are therefore not listed here;
4. PWA Idents highlighted in green are affected by proposals in the Decommissioning Programmes that address Phase 1. Decommissioning of the remaining sections of pipelines are addressed by proposals herein;
5. Pipeline status and current content assume that the Northern Producer has departed with the pipeline and umbilicals dealt with accordingly.

Table 2.3.3: DSW Subsea Pipeline Stabilisation Features & Structures					
Stabilisation Feature & Size (m)	**Total Number**	**Total Mass (Te)**	**Location(s)**		**Exposed/Buried/ Condition**
			WGS84 Decimal (If quoted):	**WGS84 Decimal Minute (If quoted)**	
DSW SDU & Protection Structure (8.5x5.2x3.5)	1	45.5	61.469280° N 01.534655° E Refer Figure B.1.1.	61° 28.1568' N 01° 32.0793' E Refer Figure B.1.1.	Stabilised and secured using a total of 4x piles. Exposed.
DSW SDU & Protection Structure piles (4x)	1	34.2			
Concrete mattresses[1]	10	79.1	**PL2572** 10x PL599, PL598, Control Umbilical, PL600 pipeline crossing. Refer Figure B.1.1.		Burial status will be determined when decommissioning activities are being carried out. Assumed exposed, resting on seabed.
	59	231.1	**PL2572** 18x (7x+11x) from end of deposited rock to DSW P7; 6x between P1 & P2; 6x between P2 & P3, 7x between P3 & P4; 11x between Conrie & P5; 6x between P5 & P6; and 5x between P6 & P7. Refer Figure B.1.1.		
	12	37.7	**PLU2576** 12x Downstream of trench to DSW SDU; Refer Figure B.1.1.		
	73	229.5	**PLU2576JP1** through **JP7** 12x between DSW SDU & P1, 2x between DSW SDU & P2, 11x between DSW SDU & P3; 13x between DSW SDU & P5; 12x between DSW SDU & P7; and 23x between DSW SDU & P7. Refer Figure B.1.1.		
	47	202.8	**PLU2577** 12x between trench and DSW SDU and 35x between end of mattresses at WI drill centre and DSW WI1. Refer Figure B.1.1 and Figure B.2.1.		
	13	53.4	**PLU2577JWI2** 4x between DSW WI1 and DSW WI2; **PLU2577JWI3** 4x between DSW WI2 and DSW WI3; **PLU2577JWI4** 5x between DSW WI3 and DSW WI4. Refer Figure B.2.1		
	18	84.9	**PL2581** 10x PL599, PL598, Control Umbilical, PL600 pipeline crossing. 18x between end of trench to end of pipeline. Refer Figure B.1.1.		
	7	38.9	**PL4262** 7x Dons pipeline crossings. Refer Figure B.1.1.		

Table 2.3.3: DSW Subsea Pipeline Stabilisation Features & Structures					
Stabilisation Feature & Size (m)	**Total Number**	**Total Mass (Te)**	**Location(s)**		**Exposed/Buried/ Condition**
			WGS84 Decimal (If quoted):	**WGS84 Decimal Minute (If quoted)**	
	17	80.2	**PL4262** 12x between DSW WI1 & WI3 via WI2; 6x between DSW WI3 & WI4; and 1x last end mattress at DSW WI4. Refer Figure A.1.1		
Grout bags (25kg)	400	10.0	**PL2572 & PL2573** 400x between DSW P5 & DSW P6.		Burial status will be determined when decommissioning activities are being carried out. Assumed exposed or in-between concrete mattresses, resting on seabed.
	40	1.0	**PLU2576JP1** 40x between DSW SDU and DSW P1. Refer Figure B.1.1.		Burial status will be determined when decommissioning activities are being carried out. Assumed exposed at the installation or in-between concrete mattresses, resting on seabed.
	40	1.0	**PLU2576JP2** 40x between DSW SDU and DSW P2. Refer Figure B.1.1.		
	80	2.0	**PLU2576JP3** 80x between DSW SDU and DSW P3. Refer Figure B.1.1.		
	320	8.0	**PLU2576JP5** 320x between DSW SDU and DSW P5. Refer Figure B.1.1.		
	240	6.0	**PLU2576JP6** 80x between DSW SDU and DSW P6 and 160x on approach to DSW P6. Refer Figure B.1.1.		
	280	7.0	**PLU2576JP7** 320x between DSW SDU and DSW P5. Refer Figure B.1.1.		
	40	1.0	**PLU2577** 40x between DSW SDU and DSW WI1. Refer Figure B.2.1.		
	40	1.0	**PLU2577JWI2** 40x between DSW SDU and DSW WI2. Refer Figure B.2.1.		
	40	1.0	**PLU2577JWI3** 40x between DSW SDU and DSW WI3. Refer Figure B.2.1.		
	40	1.0	**PLU2577JWI4** 40x between DSW SDU and DSW WI4. Refer Figure B.2.1.		
Grout bags (25kg)[2]	40	1.0	**PL2581** 40x between trench and end of pipeline. Refer Figure B.2.1.		Burial status will be determined when

Table 2.3.3: DSW Subsea Pipeline Stabilisation Features & Structures					
Stabilisation Feature & Size (m)	**Total Number**	**Total Mass (Te)**	**Location(s)**		**Exposed/Buried/ Condition**
			WGS84 Decimal (If quoted):	**WGS84 Decimal Minute (If quoted)**	
	720	18.0	**PL4262** 720x between DSW WI1 & DSW WI3 (via WI2). Refer Figure B.2.1.		decommissioning activities are being carried out. Assumed exposed or in-between concrete mattresses, resting on seabed.
Grout bags (1Te)[2]	3	3.0	**PLU2577JWI4** 3x at DSW P3.		Burial status will be determined when decommissioning activities are being carried out. Assumed exposed, resting on seabed.
Deposited rock	1	~41,000	**PL2572, PL2573 & PLU2576** between KP0.05 and KP4.001 (i.e. ~4km long). Refer Figure 1.7.2 and Figure B.1.1.		Exposed.
	1	~25,090	**PL4262** downstream of riser base structure within former NP 500m safety zone between KP0.12 and KP5.265 (i.e. ~5.1km long). Refer Figure 1.7.2 and Figure B.1.1		Exposed.
	1	~915	**PL4262** at Don pipeline crossings between KP3.877 and KP3.985 (i.e. ~0.1km long). Refer Figure 1.7.2 and Figure B.1.1		Exposed.

NOTES:

1. Concrete mattresses are 'SPS' type: 6m x 2m x 0.15m (Approx. Mass each mattress 3.14Te) or 6m x 3m x 0.15m (Approx. mass each mattress 4.72Te);
2. The quantity of 25kg and 1Te grout bags is estimated because the as-built data are not explicit.

2.3.3 Well Information

Table 2.3.4: DSW Well Information			
Well ID	**Designation**	**Status**	**Category of Well**
211/18a-S2z	Oil production	Shut in	SS 3-1-1
211/18a-S4	Water injection	Shut in	SS 1-1-1
211/18a-S6	Water injection	Shut in	SS 1-1-1
211/18a-S8z	Oil production	Shut in	SS 1-1-1
211/18a-S9	Water injection	Shut in	SS 1-1-1
211/18a-S10y	Oil production	Shut in	SS 1-1-1
211/18a-S11	Oil production	Shut in	SS 1-1-1
211/18a-S12z	Oil production	Shut in	SS 1-1-1
211/18a-S13	Water injection	Shut in	SS 1-1-1
211/18a-S14	Oil production	Shut in	SS 1-1-1

For details of well categorisation please refer the latest version of the Oil and Gas UK Guidelines for the Decommissioning of wells. Well status is stated on the assumption that Northern Producer has departed.

2.3.4 Material Inventory Estimates

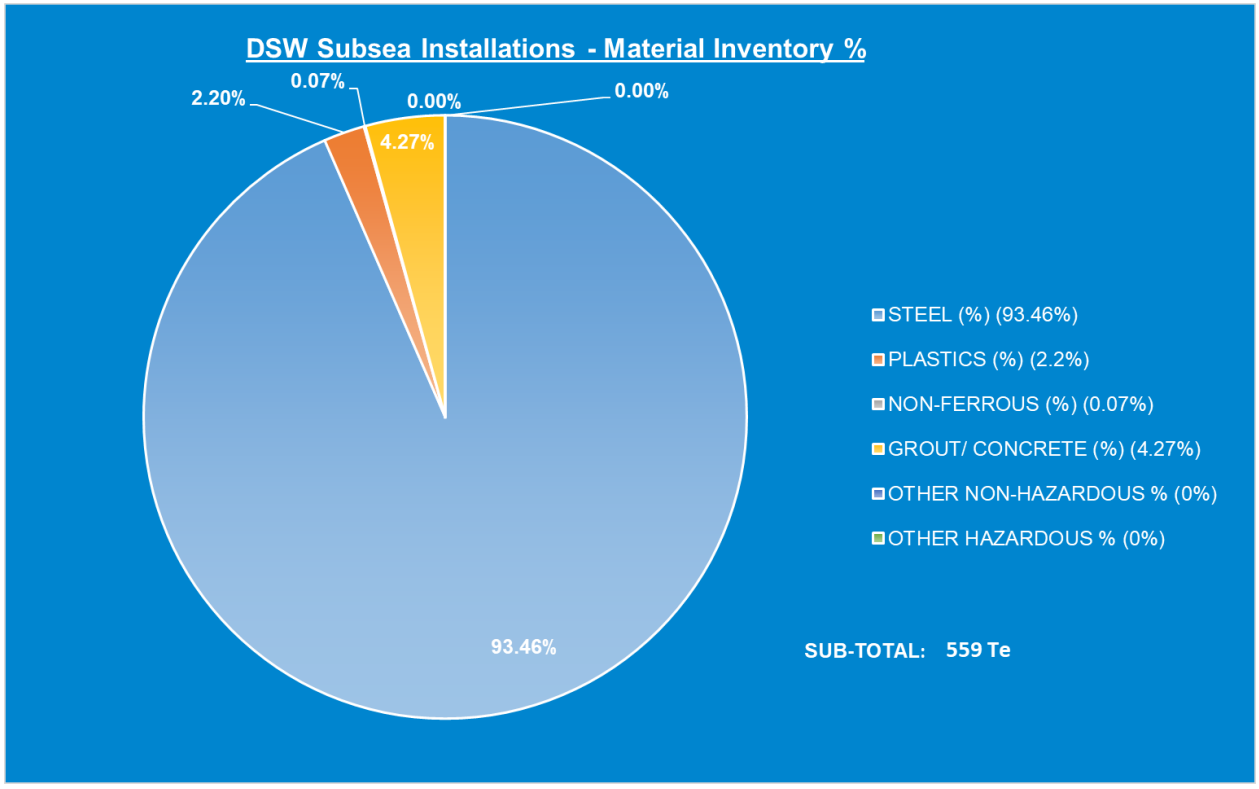


Figure 2.3.1: Pie-Chart of Material Inventory for DSW Installations

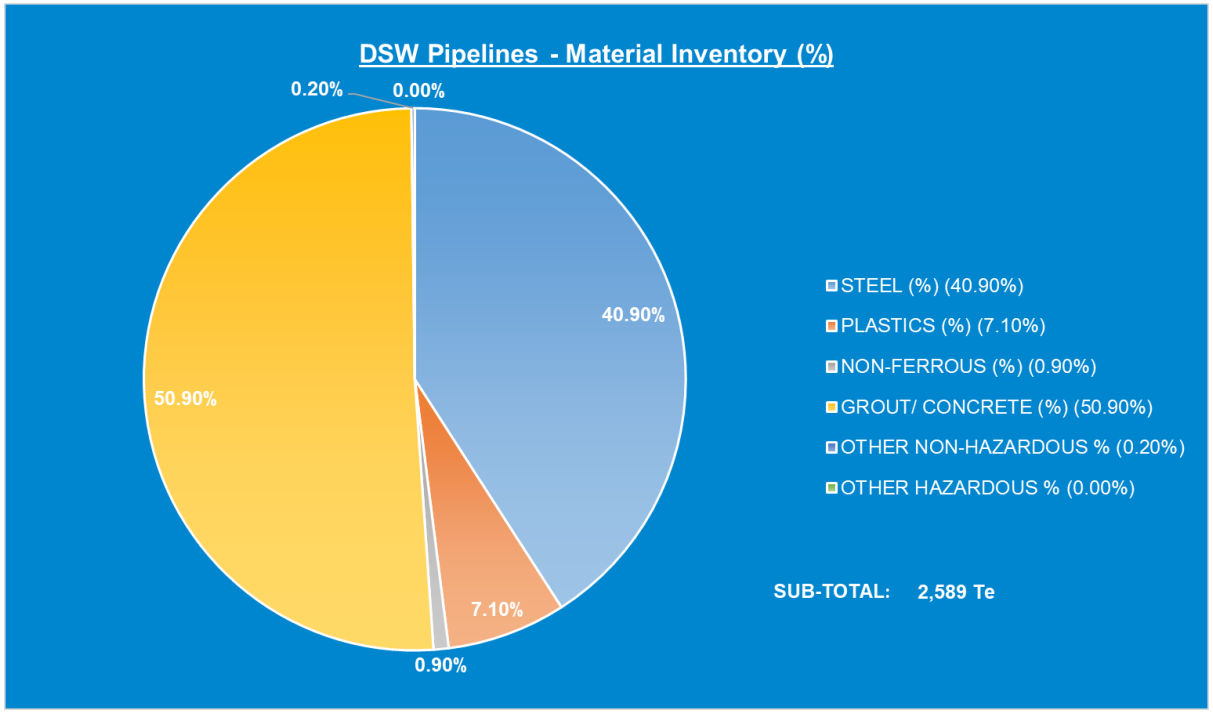


Figure 2.3.2: Pie-Chart of Material Inventory for DSW Pipelines

2.4 West Don Assets

2.4.1 Subsea Installations including Stabilisation Features

Table 2.4.1: WD Subsea Installation Information

Subsea Installations Including Stabilisation Features	Number	Mass (Te) / Size (m)	Location		Comments/ Status
			WGS84 Decimal	WGS84 Decimal Minute	
WD P1	1	55.9 8.8x9.2x6.7	61.495608° N 01.428825° E	61° 29.7365' N 01° 25.7295' E	
WD P2	1	55.9 8.8x9.2x6.7	61.495650° N 01.428355° E	61° 29.7390' N 01° 25.7013' E	
WD P3	1	55.9 8.8x9.2x6.7	61.495775° N 01.427853° E	61° 29.7465' N 01° 25.6712' E	
WD WI1	1	55.9 8.8x9.2x6.7	61.494333° N 01.429630° E	61° 29.6600' N 01° 25.7778' E	
WD WI2	1	55.9 8.8x9.2x6.7	61.494603° N 01.429872° E	61° 29.6762' N 01° 25.7923' E	
Concrete mattresses	n/a	n/a	n/a	n/a	n/a
Grout bags	n/a	n/a	n/a	n/a	n/a
Formwork	n/a	n/a	n/a	n/a	n/a
Deposited rock	n/a	n/a	n/a	n/a	n/a
Other	n/a	n/a	n/a	n/a	n/a

2.4.2 Pipelines including Stabilisation Features

Table 2.4.2: WD Pipeline/Flowline/Umbilical Information										
Description	**Pipeline Number (as per PWA)**	**PWA Ident[4]**	**Diameter (NB) (inches)[1]**	**Length (m)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points[2]**	**Burial Status**	**Pipeline Status[5]**	**Current Content[5]**
Water injection pipeline	PL2582	2	8”	2,274	Pipeline	Seawater	RBS to WD pipeline flange	Trenched and buried in seabed except under deposited rock between KP1.175 and KP2.23	Out of use	Treated seawater
		3	8”	27	Pipespools		Between pipeline end flange and each Xmas tree at WD WI1	Wet stored local to WD P1		
Oil pipeline	PL2583	1-17	8”/6”	141	Duplex & carbon steel pipespools	Oil	WD production tree P3 and pipeline flange	Surface laid, covered with concrete mattresses on approach to WI Xmas trees	Out of use	Treated seawater
		18	8”	2,300	Pipeline		Pipeline flange on approach to WD P1 and RBS	Trenched and buried under deposited rock between KP0.05 and KP2.3		
Gas injection pipeline	PL2584	5	3”	2,300	Carbon steel flowline		Pipeline flange downstream of RBS to Xmas tree at WD P1 well	Same trench as PL2583 buried under deposited rock		

Table 2.4.2: WD Pipeline/Flowline/Umbilical Information										
Description	**Pipeline Number (as per PWA)**	**PWA Ident[4]**	**Diameter (NB) (inches)[1]**	**Length (m)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points[2]**	**Burial Status**	**Pipeline Status[5]**	**Current Content[5]**
Gas injection pipeline	PL2584	6-22	3”	145	Carbon steel pipespools		Between Xmas tree at WD P1 well through to Xmas tree at WD P3 well	Surface laid, covered with concrete mattresses		
Static umbilical	PLU2585	Cores 1-8	114.5mm	2,600	Static umbilical	Chemicals, methanol, hydraulic fluids	RBS SUTU to WD SUTU	In the same trench as PL2582	Out of use	Seawater
		WD JS1-8	114.5mm	10	Static umbilical jumpers		Between WD SUTU and SDU	Exposed		
Umbilical jumper	PLU2585JP1	1-8	N/A	50	Umbilical jumpers	Chemicals, methanol, hydraulic fluids	WD SDU and WD P1	Exposed	Out of use	Seawater
	PLU2585JP2	1-8	N/A	50			WD SDU and WD P2			
	PLU2585JP3	108	N/A	60			WD SDU and WD P3			
Umbilical jumper	PLU2585JWI1	1-4	N/A	50	Umbilical jumper	Hydraulic fluids	WD SDU and WD WI1	Exposed	Out of use	Seawater
	PLU2585JWI2	1-4	N/A	90			WD SDU and WD WI2			
Water injection pipeline	PL4261	2	228.1mm	2,842	Flexible pipeline	Seawater	RBS to WD WI2	Surface laid and buried under deposited rock between KP0.467 and KP2.348	Out of use	Seawater

Table 2.4.2: WD Pipeline/Flowline/Umbilical Information										
Description	**Pipeline Number (as per PWA)**	**PWA Ident[4]**	**Diameter (NB) (inches)[1]**	**Length (m)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points[2]**	**Burial Status**	**Pipeline Status[5]**	**Current Content[5]**
Water injection pipeline	PL4261	3-7	8”	81	Pipespools		Between pipeline end flange and each Xmas tree at DSW water injection wells	Surface laid, covered with concrete mattresses on approach to WI trees	Out of use	Seawater

NOTES:

1. If diameter is expressed in mm it refers to outside diameter of umbilical;
2. For brevity, the description of the end-to-end points may differ slightly from those consented;
3. PL2582 Idents 1, PL2583 Idents 19-21, PLU2584 Idents 1-4, PLU2585 WD JR1-8, PL4261 Ident 1 are to be removed as part of Phase 1 of the decommissioning works and are therefore not listed here;
4. PWA Idents highlighted in green for the parts of pipelines affected by proposals Decommissioning Programmes that address Phase 1. Decommissioning of the remaining sections of pipelines are addressed by proposals herein;
5. Pipeline status and current content assume that the Northern Producer has departed with the pipeline and umbilicals dealt with accordingly.

Table 2.4.3: WD Subsea Pipeline Stabilisation Features & Structures					
Stabilisation Feature	**Total Number**	**Total Mass (Te)**	**Location(s)**		**Exposed/Buried/Condition**
			WGS84 Decimal (If quoted):	**WGS84 Decimal Minute (If quoted)**	
WD SDU & Protection Structure (8.5x5.2x3.5)	1	45.5	61.494338° N 01.428975° E Refer Figure B.3.1.	61° 29.6603' N 01° 25.7385' E Refer Figure B.3.1.	Stabilised and secured using a total of 4x piles. Exposed.
WD SDU & Protection Structure piles (4x)	1	34.2			

Table 2.4.3: WD Subsea Pipeline Stabilisation Features & Structures					
Stabilisation Feature	**Total Number**	**Total Mass (Te)**	**Location(s)**		**Exposed/Buried/Condition**
			WGS84 Decimal (If quoted):	**WGS84 Decimal Minute (If quoted)**	
Concrete mattresses[1]	46	157.2	**PL2583** 30x on final approach to WD P1; 8x between WD P1 & P2, 8x between WD P2 & P3. Refer Figure B.3.1.		Burial status will be determined when decommissioning activities are being carried out. Assumed exposed, resting on seabed.
	24	75.5	**PLU2585** 24x on final approach to WD SDU. Refer Figure B.3.1.		
	2	6.3	**PLU2585JP1** 2x between SDU & WD P1. Refer Figure B.3.1.		
	5	15.7	**PLU2585JP2** 5x between SDU & WD P2. Refer Figure B.3.1.		
	9	29.9	**PLU2585JP3** 9x between SDU & WD P3. Refer Figure B.3.1.		
Concrete mattresses[1]	4	12.6	**PLU2585JW1** 4x between SDU & WD P1. Refer Figure B.3.1.		Burial status will be determined when decommissioning activities are being carried out. Assumed exposed, resting on seabed.
	13	40.9	**PLU2585JW2** 13x between SDU & WD P1. Refer Figure B.3.1.		
	32	128.9	**PL4261** 32x on final approach to WD WI2. Refer Figure B.3.1.		
Grout bags (25kg)[2]	40	1.0	**PLU2585JP1** 40x between SDU & WD P1. Refer Figure B.3.1.		Burial status will be determined when decommissioning activities are being carried out. Assumed largely exposed at the installation or in-between concrete mattresses, resting on seabed.
	40	1.0	**PLU2585JP2** 40x between SDU & WD P2. Refer Figure B.3.1.		
	40	1.0	**PLU2585JP3** 40x between SDU & WD P3. Refer Figure B.3.1.		
	40	1.0	**PLU2585JW1** 40x between SDU & WD P1. Refer Figure B.3.1.		
	40	1.0	**PLU2585JW2** 40x between SDU & WD P1. Refer Figure B.3.1.		
	1,115	33.4	**PL4261** x on final approach to WD WI1 and between WD WI1 & WI2. Refer Figure B.3.1		
Deposited rock[3]	1	~3,800	**PL2582 & PLU2585** between KP1.75 and KP2.23 (i.e. ~4.8km long). Refer Figure 1.7.2 and Figure B.3.1.		Exposed.
Deposited rock[3]	1	~22,000	**PL2583 & PL2584** downstream of riser base structure within former NP 500m safety zone between KP0.05 and KP2.3 (i.e. ~2.25km long). Refer Figure 1.7.2 and Figure B.3.1.		Exposed.

Table 2.4.3: WD Subsea Pipeline Stabilisation Features & Structures					
Stabilisation Feature	**Total Number**	**Total Mass (Te)**	**Location(s)**		**Exposed/Buried/Condition**
			WGS84 Decimal (If quoted):	**WGS84 Decimal Minute (If quoted)**	
Deposited rock	1	~9,359	**PL4261** downstream of riser base structure within former NP 500m safety zone between KP0.467 and KP2.348 (i.e. ~1.88km long). Refer Figure 1.7.2 and Figure B.3.1.		Exposed.

NOTES:

1. Concrete mattresses are 'SPS' type: 6m x 2m x 0.15m (Approx. mass each mattress 3.14Te) or 6m x 3m x 0.15m (Approx. mass each mattress 4.72Te);
2. The quantity of 25kg and 1Te grout bags is estimated or based on original deposit consent because the as-built data are not explicit;
3. The quantity of deposited rock is estimated or based on the original deposit consent.

2.4.3 Well Information

Table 2.4.4: WD Well Information			
Well ID	**Designation**	**Status**	**Category of Well**
211/18a-W1	Oil production	Shut in	SS 3-1-1
211/18a-W3z	Water injection	Shut in	SS 1-1-1
211/18a-W4	Oil production	Shut in	SS 3-1-1
211/18a-W5	Oil production	Shut in	SS 1-1-1
211/18a-W6	Water injection	Shut in	SS 1-1-1

For details of well categorisation please refer the latest version of the Oil and Gas UK Guidelines for the Decommissioning of wells. Well status is stated on the assumption that Northern Producer has departed.

2.4.4 Material Inventory Estimates

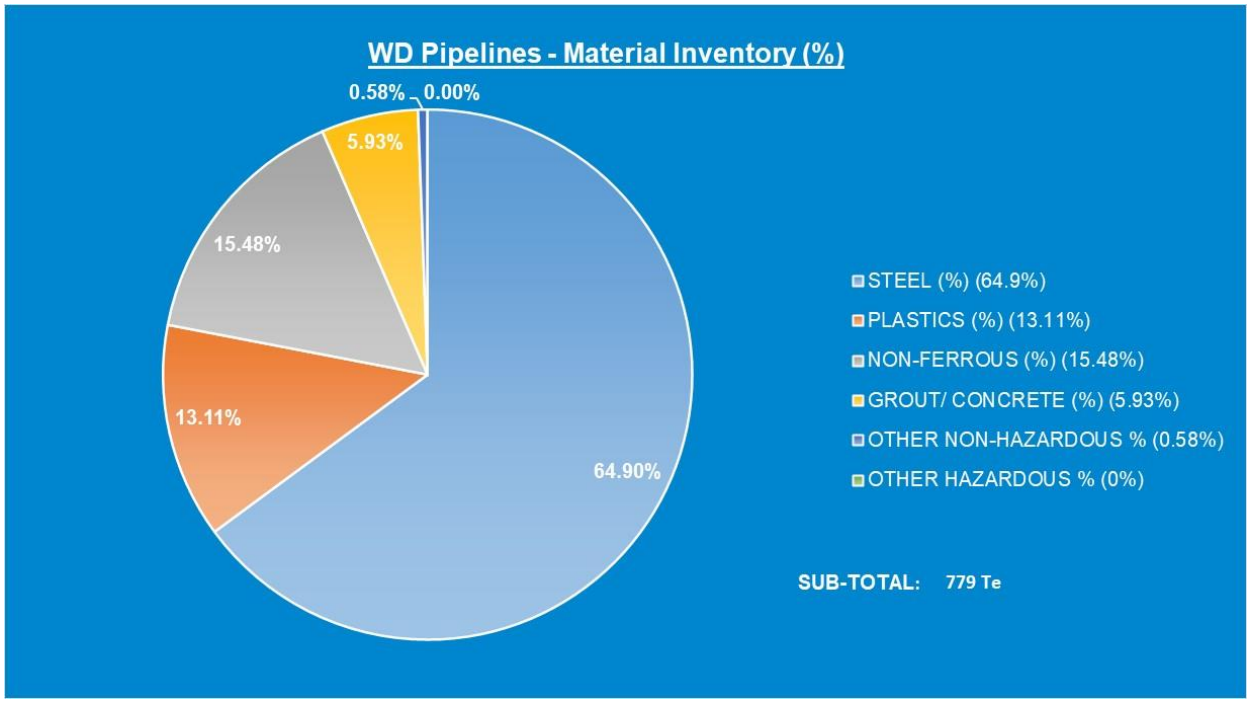


Figure 2.4.1: Pie-Chart of Material Inventory for WD Installations

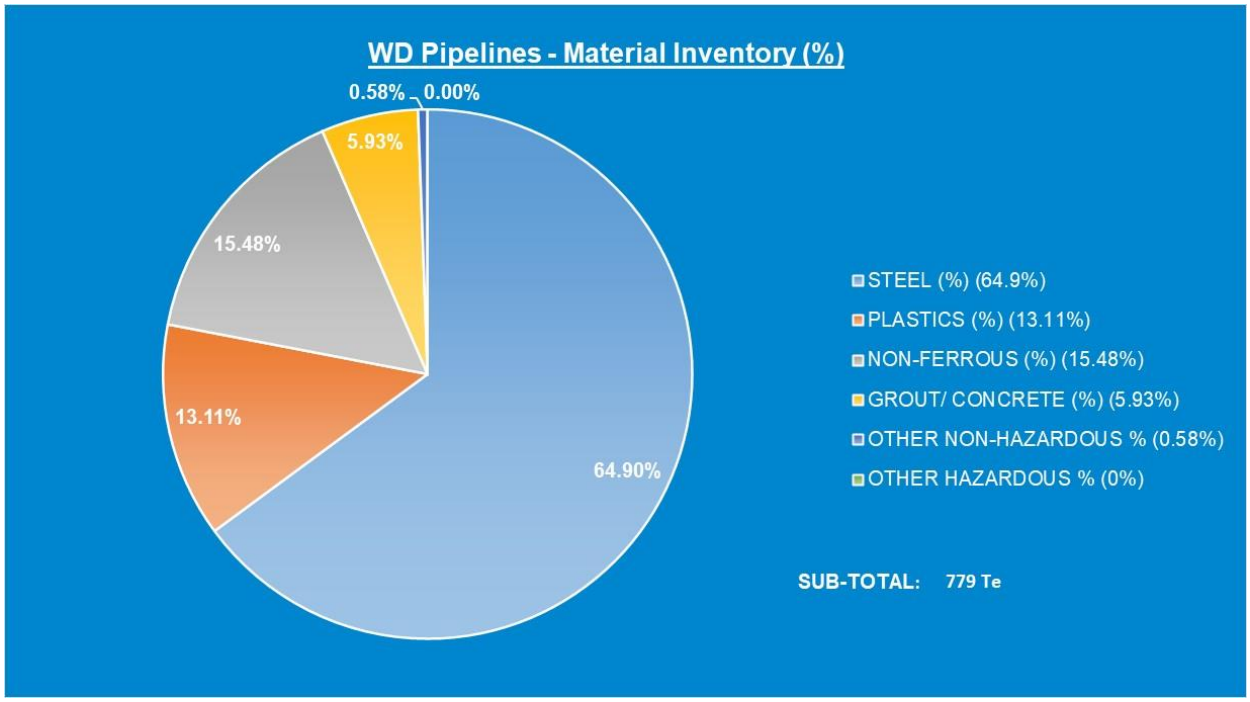


Figure 2.4.2: Pie-Chart of Material Inventory for WD Pipelines

2.5 Ythan Assets

2.5.1 Subsea Installations including Stabilisation Features

Table 2.5.1: Ythan Subsea Installation Information

Subsea Installations Including Stabilisation Features	Number	Mass (Te) / Size (m)	Location		Comments/ Status
			WGS84 Decimal	WGS84 Decimal Minute	
Ythan WHPS	1	55.9 8.8m x 9.2m x 6.7m	61.468145° N 01.533597° E	61° 28.0887' N 01° 32.0158' E	
Concrete mattresses	n/a	n/a	n/a	n/a	n/a
Grout bags	n/a	n/a	n/a	n/a	n/a
Formwork	n/a	n/a	n/a	n/a	n/a
Deposited rock	n/a	n/a	n/a	n/a	n/a
Other	n/a	n/a	n/a	n/a	n/a

2.5.2 Pipelines including Stabilisation Features

Table 2.5.2: Ythan Pipeline/Flowline/Umbilical Information									
Pipeline Number (as per PWA)	**PWA Ident**	**Diameter (NB) (inches)[1]**	**Length (m)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points[2]**	**Burial Status**	**Pipeline Status[3]**	**Current Content[3]**
PL3749	1-4	8”	38.8	Pipespool, duplex	Oil	Ythan Well P1 to DSW Well P7. Figure B.1.1.	Surface laid, protected by concrete mattresses	Out of use	Seawater
PL3751	1-4	3”	46.8	Pipespool, carbon steel	Gas	DSW Well P7 to Ythan Well P1. Figure B.1.1.		Out of use	Seawater
PLU3752	1-2	N/A	165 (115+50)	Electrical umbilical	Power & Signals	DSW SDU to DSW P7 ESDU to Ythan Well P1. Figure B.1.1.		Out of use	Seawater
PLU3753	1	41mm	165	Chemical umbilical	Scale inhibitor	DSW SDU to DSW ESDU at DSW Well P7. Figure B.1.1.		Out of use	Seawater
PLU3754	1	129mm	50	Umbilical jumper	Chemicals & hydraulic fluids	DSW P7 Extension SDU to Ythan Well P1. Figure B.1.1.		Out of use	Seawater

NOTES

1. If diameter is expressed in mm it refers to outside diameter of umbilical;
2. For brevity, the description of the end-to-end points may differ slightly from those consented;
3. Pipeline status and current content assume that the Northern Producer has departed with the pipeline and umbilicals dealt with accordingly.

Table 2.5.3: Ythan Pipeline Stabilisation Features & Structures					
Stabilisation Feature	**Total Number**	**Total Mass (Te)**	**Location(s)**		**Exposed/Buried/Condition**
			WGS84 Decimal (If quoted):	**WGS84 Decimal Minute (If quoted)**	
Concrete mattresses[1]	6	18.9	**PL3749** 6x between DSW P7 & Ythan Well P1. Refer Figure B.1.1.		Burial status will be determined when decommissioning activities are being carried out. Assumed exposed, resting on seabed.
	18	56.6	**PLU3753** 11x between DSW SDU and DSW ESDU at Well P7; 7x between ESDU at DSW Well P7 and Ythan Well P1. Refer Figure B.1.1.		
	6	18.9	**PLU3754** 6x between DSW Well P7 and Ythan Well P1. Refer Figure B.1.1		
Grout bags[2]	480	12.0	**PL3749** 480x between DSW P7 & Ythan Well P1. Refer Figure B.1.1.		Burial status will be determined when decommissioning activities are being carried out. Assumed largely exposed at the installation or in-between concrete mattresses, resting on seabed.
	560	14.0	**PLU3753** 280x between DSW SDU and DSW ESDU at Well P7; 280x between ESDU at DSW Well P7 and Ythan Well P1. Refer Figure B.1.1.		
	560	14.0	**PLU3754** 560x between DSW Well P7 and Ythan Well P1. Refer Figure B.1.1		

NOTES:

1. Concrete mattresses are 'SPS' type: 6m x 2m x 0.15m (Approx. mass each mattress 3.14Te) or 6m x 3m x 0.15m (Approx. mass each mattress 4.72Te);
2. The quantity of 25kg and 1Te grout bags is estimated or based on original Deposit Consents because the as-built data are not explicit.

2.5.3 Well Information

Table 2.5.4: Ythan Well Information			
Well ID	**Designation**	**Status**	**Category of Well**
211/18a-S15	Oil production	Shut in	SS 1-1-1

For details of well categorisation please refer the latest version of the Oil and Gas UK Guidelines for the Decommissioning of wells. Well status is stated on the assumption that Northern Producer has departed.

2.5.4 Material Inventory Estimates

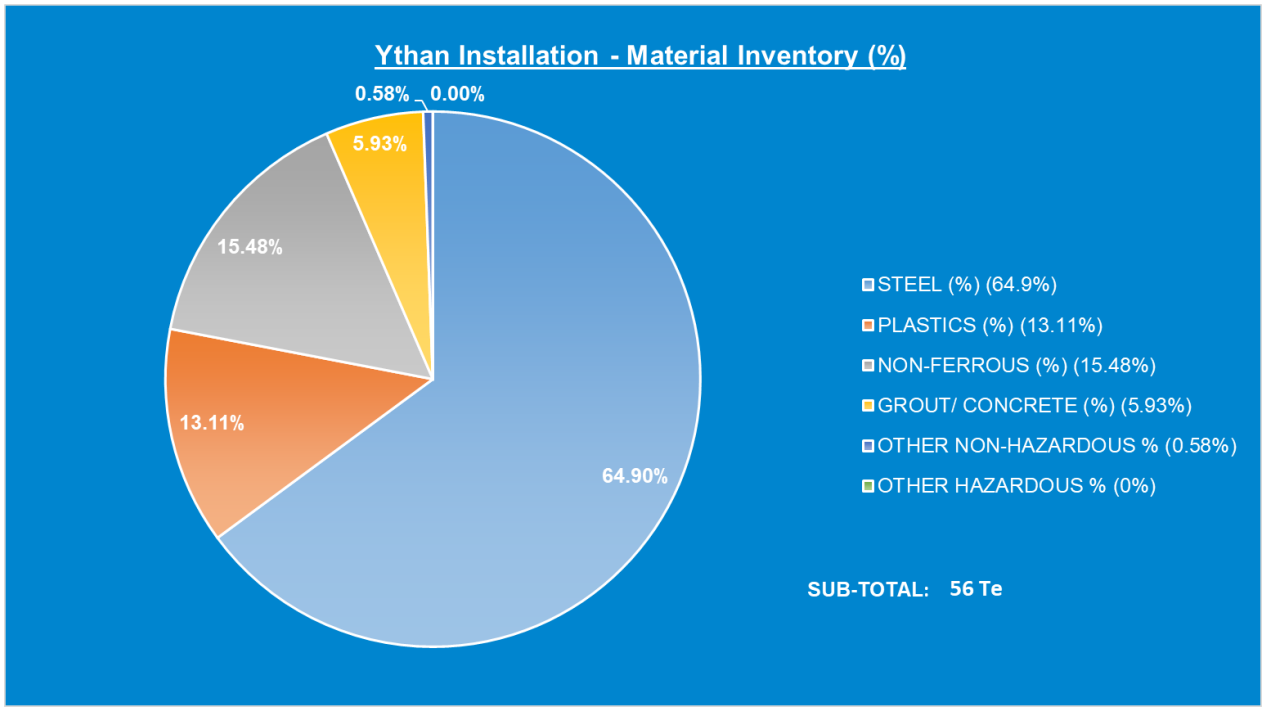


Figure 2.5.1: Pie-Chart of Material Inventory for Ythan Installation

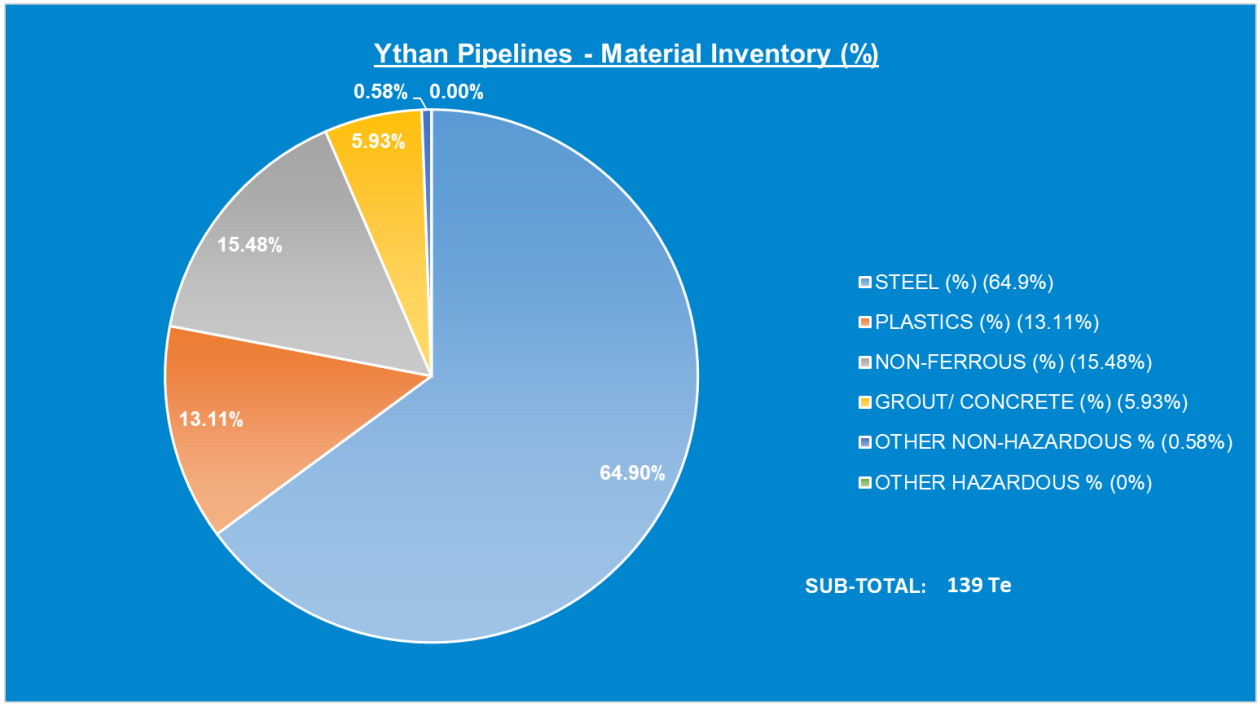


Figure 2.5.2: Pie-Chart of Material Inventory for Ythan Pipelines

3. REMOVAL AND DISPOSAL METHODS

Waste will be dealt with in accordance with the Waste Framework Directive. The re-use of an installation, pipeline, or umbilical pipeline or parts thereof, is first in the order of preferred decommissioning options and such options are currently under investigation. Waste generated during decommissioning will be segregated by type and periodically transported to shore in an auditable manner through licensed waste contractors. Steel and other recyclable metals are estimated to account for the greatest proportion of the materials inventory.

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

In order to explore synergistic opportunities and efficiencies in operational activity and cost, it's possible that the pipelines around the Wye structure (PL2578 & PL2579) will be dealt with at the same time as Wye structure and Thistle pipelines PL4555 & PL4556 and within the Thistle 500m safety zone, PL2579, PLU2580, PLU25480JSO and PLU2580JSG will be decommissioned at the same time as the Thistle infrastructure.

3.1 Installations - Subsea Facilities & Stabilisation Features

Table 3.1.1: Subsea Installations & Stabilisation Features

Subsea installations and stabilisation features	Number	Option	Disposal Route (if applicable)
Conrie installation	1	Complete recovery.	Return to shore for reuse or recycling.
DSW installations	10	Complete recovery.	Return to shore for reuse or recycling.
WD installations	5	Complete recovery.	Return to shore for reuse or recycling.
Ythan installation	1	Complete recovery.	Return to shore for reuse or recycling.

3.2 Pipelines

There is an implicit assumption that options for re-use of the pipelines have been exhausted prior to the facilities and infrastructure moving into the decommissioning phase and associated comparative assessment; therefore, this option has been excluded. The three decommissioning options considered are:

- **Complete removal** – This would involve the complete removal of the pipelines by whatever means would be most practicable and acceptable from a technical perspective;
- **Partial removal or remediation** – This would involve removing exposed or potentially unstable sections of pipelines. Remedial work may need to be carried out to make the remaining pipeline safe for leaving *in situ.* This option is relevant for those pipelines that have known exposures because of poor depth of cover. There will likely be a need to verify their status via future surveys;
- **Leave *in situ*** – This would involve leaving the pipeline(s) *in situ* with no remedial works but possibly verifying their status via future surveys.

All surface laid equipment including pipelines that have not been trenched or buried will be completely recovered from the seabed up to the point where they are buried and taken to shore for re-use or recycling or final disposal. Table 3.2.2 summarises the lengths of pipelines and pipespools being removed, thereby removing potential snagging hazards.

The decommissioning options summarised herein are supported by a comparative assessment where each decommissioning option was comparatively assessed against Technical feasibility and efficacy, Safety concerns, Environmental and Societal impact and Cost [2]. For the purposes of the assessment the pipelines were considered as one of three pipeline groups as summarised in Table 3.2.1:

Table 3.2.1: Pipeline Decommissioning Options and Grouping

Asset	Pipeline ID	Complete removal	Partial removal	Leave *in situ*	Group	Comments
DSW & WD	PL2578 & PL2579	X		X	1	Reasonable depth of cover, no exposures
DSW	PL2572 & PL2573	X		X	1	Good depth of cover, no exposures
DSW	PLU2576	X	X	X	3	Poor cover, numerous exposures; partial removal or remedial works considered
DSW	PLU2577 & PL2581	X	X	X	3	Poor cover, numerous exposures; partial removal or remedial works considered
DSW	PL4262	X		X	2	Good depth of cover, no exposures
WD	PL2582, PLU2585	X	X	X	3	Poor cover, numerous exposures; partial removal or remedial works considered
WD	PL2583 & PL2584	X		X	1	Good depth of cover, no exposures
WD	PL4261	X		X	2	Good depth of cover, no exposures

NOTE:

1. The pipelines listed here excludes those pipelines that were wholly surface laid and covered with concrete mattresses;
2. PLU2577 and PL2581 were trenched into the seabed, deposited rock used to bury all the other pipelines;
3. PL2582 was trenched in the seabed but emerges at the Don pipeline crossings where it is buried under deposited rock.

Decommissioning of the pipeline infrastructure during Phase 1 is addressed in separate Decommissioning Programmes [1].

3.2.1 DSW & WD pipelines - outcome of the Comparative Assessment

Table 3.2.2: DSW & WD Pipeline Decommissioning Proposals

Pipeline or Group	Recommended Option	Justification
PL2578 PL2579	Leave most of the pipelines *in situ*. Remove surface laid sections including those currently protected and stabilised with concrete mattresses, but otherwise leave *in situ*. Removal of surface laid sections of both PL2578 & PL2579 near the Wye Structure (total ~100m each pipeline). For PL2579 at Thistle 'A' this involves removal of ~400m on approach to Thistle.	This results in minimal disturbance to the seabed, lower energy use, reduced risk to personnel, and lower cost. Once decommissioned, the remaining sections of the pipelines can be expected to remain buried and stable throughout their length.

Table 3.2.2: DSW & WD Pipeline Decommissioning Proposals		
Pipeline or Group	**Recommended Option**	**Justification**
PLU2580	Completely remove.	Leaves a clear seabed free of potential snagging hazards. Avoids need for future monitoring activities.
PLU2580JSO		
PLU2580JSG		

NOTES:

1. The decommissioning of the pipeline ends at or near the original NP 500m safety zone is addressed in the Decommissioning Programmes for Phase 1 – the departure of the Northern Producer FPF [1];
2. Note that the protection and stabilisation features associated with PL2579 as it by-passes the Wye Structure also protect and stabilise PL4555 which belongs to the Thistle owners. These features will likely be left *in situ* until PL4555 (formerly PL2578) between Thistle 'A' and the Wye Structure is decommissioned as part of the Thistle 'A' pipeline infrastructure;
3. In order to explore synergistic opportunities PLU2580 (which incorporates PLU2580JSO and PLU2580JSG) and associated infrastructure such as riser bases (PLU2580 & PL2579), SSIV skids and pipelines within the Thistle 'A' 500m safety zone will likely be decommissioned at the same time as the Thistle 'A' installation and infrastructure.

3.2.2 Conrie pipelines - outcome of the Comparative Assessment

Table 3.2.3: Conrie Pipeline Decommissioning Proposals		
Pipeline or Group	**Recommended Option**	**Justification**
PL2572 (5-8)	Completely remove.	Leaves a clear seabed free of potential snagging hazards. Avoids need for future monitoring activities.
PL2573 (18-21)		
PLU2576JP4		

NOTES:

1. The Conrie pipelines are not affected by the proposals for Phase 1 of the decommissioning works, described in [1].

3.2.3 DSW pipelines - outcome of the Comparative Assessment

Table 3.2.4: Pipeline Decommissioning Proposals		
Pipeline or Group	**Recommended Option**	**Justification**
PL2572 except (5-8)	Leave most of the pipelines *in situ*. Remove surface laid sections including those currently protected and stabilised with concrete mattresses or connected to the DSW production wells (total length to be removed ~100m each), but otherwise leave *in situ*.	This results in minimal disturbance to the seabed, lower energy use, reduced risk to personnel, and lower cost. Once decommissioned, the remaining sections of the pipelines can be expected to remain buried and stable throughout their lengths.
PL2573 except (18-21)		

Table 3.2.4: Pipeline Decommissioning Proposals		
Pipeline or Group	**Recommended Option**	**Justification**
PLU2576	Leave most of the pipelines *in situ*. Remove surface laid sections including those currently protected and stabilised with concrete mattresses and connected to the DSW SDU (total length ~100m), but otherwise leave *in situ*.	This results in minimal disturbance to the seabed, lower energy use, reduced risk to personnel, and lower cost. Albeit with poor depth of cover and some exposures, once decommissioned, the remaining section of pipeline is expected to remain mostly buried and stable throughout its length.
PLU2576JP1 to JP7	Completely remove.	Leaves a clear seabed free of potential snagging hazards. Avoids need for future monitoring activities.
PLU2577	Leave most of the pipelines *in situ*. Remove surface laid sections including those currently protected and stabilised with concrete mattresses and connected to the DSW WI wells (total length~200m) and remove part of the buried section up to KP0.070 to remove the anomalous section ~11m long in the trench, but otherwise leave *in situ*.	This results in minimal disturbance to the seabed, lower energy use, reduced risk to personnel, and lower cost. Albeit with poor depth of cover and some exposures, once decommissioned, the remaining section of pipeline is expected to remain mostly buried and stable throughout its length.
PLU2577JWI2 to JWI4	Completely remove.	Leaves a clear seabed free of potential snagging hazards. Avoids need for future monitoring activities.
PL2581	Leave most of the pipelines *in situ*. Remove wet stored pipespools (total length ~27m) as well as surface laid sections including those currently protected and stabilised with concrete mattresses, but otherwise leave *in situ*.	This results in minimal disturbance to the seabed, lower energy use, reduced risk to personnel, and lower cost. Albeit with poor depth of cover and some exposures, once decommissioned, the remaining section of pipeline is expected to remain mostly buried and stable throughout its length.
PL4262	Leave most of the pipelines *in situ*. Remove surface laid sections including those currently protected and stabilised with concrete mattresses and connected to the DSW WI wells (total length ~200m), but otherwise leave *in situ*.	This results in minimal disturbance to the seabed, lower energy use, reduced risk to personnel, and lower cost. Once decommissioned, the remaining section of pipeline can be expected to remain buried and stable throughout its length.
PL4557	Completely remove.	This short section is connected to the SALB. This will also be recovered.

NOTE:

1. Where buried in the seabed local excavations will be required to locate the pipeline cut point. Following severance of the pipeline the excavation will be mechanically backfilled;
2. Where buried in deposited rock, remedial work may be required to bury the end of the pipeline where it protrudes out from the rock. As a contingency measure, small deposits of rock may need to be added to the existing rock to make sure that the pipeline ends remain buried.

3.2.4 WD pipelines - outcome of the Comparative Assessment

Table 3.2.5: WD Pipeline Decommissioning Proposals		
Pipeline or Group	**Recommended Option**	**Justification**
PL2582	Leave most of the pipelines *in situ*. Remove wet stored pipespools (total length ~50m) surface laid sections including those currently protected and stabilised with concrete mattresses, but otherwise leave *in situ*.	This results in minimal disturbance to the seabed, lower energy use, reduced risk to personnel, and lower cost. Albeit with poor depth of cover and some exposures, once decommissioned, the remaining section of pipeline is expected to remain mostly buried and stable throughout its length.
PL2583	Leave most of the pipelines *in situ*. Remove surface laid sections including those currently protected and stabilised with concrete mattresses and connected to the WD production wells (total length ~160m for each pipeline), but otherwise leave *in situ*.	This results in minimal disturbance to the seabed, lower energy use, reduced risk to personnel, and lower cost. Once decommissioned, the remaining sections of pipeline can be expected to remain buried and stable throughout their length.
PL2584		
PLU2585	Leave most of the pipelines *in situ*. Remove surface laid sections including those currently protected and stabilised with concrete mattresses and connected to the WD SDU total length ~175m), but otherwise leave *in situ*.	This results in minimal disturbance to the seabed, lower energy use, reduced risk to personnel, and lower cost. Albeit with poor depth of cover and some exposures, once decommissioned, the remaining section of pipeline is expected to remain mostly buried and stable throughout its length.
PLU2585 JP1 to ‘JP3	Completely remove.	Leaves a clear seabed free of potential snagging hazards. Avoids need for future monitoring activities.
PLU2585JW1 to ‘JW2	Completely remove.	Leaves a clear seabed free of potential snagging hazards. Avoids need for future monitoring activities.
PL4261	Leave most of the pipelines *in situ*. Remove surface laid sections including those currently protected and stabilised with concrete mattresses and connected to the WD WI wells (total length ~120m), but otherwise leave *in situ*.	This results in minimal disturbance to the seabed, lower energy use, reduced risk to personnel, and lower cost. Once decommissioned, the remaining section of pipeline can be expected to remain buried and stable throughout its length.
NOTES: 1. Where buried in the seabed local excavations will be required to locate the pipeline cut point. Following severance of the pipeline the excavation will be mechanically backfilled; 2. Where buried in deposited rock, remedial work may be required to bury the end of the pipeline where it protrudes out from the rock. As a contingency measure, small deposits of rock may need to be added to the existing rock to make sure that the pipeline ends remain buried.		

3.2.1 Ythan pipelines - outcome of the Comparative Assessment

Table 3.2.6: Pipeline Decommissioning Proposals		
Pipeline or Group	**Recommended Option**	**Justification**
PL3749	Completely remove.	Leaves a clear seabed free of potential snagging hazards. Avoids need for future monitoring activities.
PL3751		
PLU3752		
PLU3753		
PLU3754		

3.3 Pipeline Stabilisation Features

All pipeline related structures, concrete mattresses and grout bags will be recovered to shore, except for those associated with the Don pipeline crossings.

3.3.1 DSW & WD pipeline stabilisation features & structures

Table 3.3.1: DSW & WD Pipeline Stabilisation Features & Structures			
Asset	**Number**	**Description**	**Disposal Route (if applicable)**
Concrete mattresses	46	Refer Table 2.1.3, Figure B.4.1 and Figure B.5.1.	Aim to recover all exposed concrete mattresses to shore for re-use, recycling, or disposal.
Grout bags	1,280		Aim to recover all grout bags to shore for recycling & disposal but assume ~80% are recovered for the purposes of estimating as some may be buried.
Deposited rock	2		Leave *in situ*.
Thistle 3" SSIV & Protection Structure (6m x 3.5m x 3.0m) [1]	1		Recover structure to shore for re-use, recycling, or disposal.
8" oil export and umbilical riser base and protection structure, (6.1m x 2.8m x 0.5m) [1]	1		Recover structure to shore for re-use, recycling, or disposal.
3" gas import riser base and protection structure, (3.8m x 2.8m x 0.5m) [1]	1		Recover structure to shore for re-use, recycling, or disposal.
NOTE: 1. Please refer notes 2 & 3 in Table 3.2.2.			

3.3.2 Conrie pipeline stabilisation features

Table 3.3.2: Conrie Pipeline Stabilisation Features			
Asset	**Number**	**Description**	**Disposal Route (if applicable)**
Concrete mattresses	28	Refer Table 2.2.3, Figure B.1.1.	Aim to recover all exposed concrete mattresses to shore for re-use, recycling, or disposal.
Grout bags	80		Aim to recover all grout bags to shore for recycling & disposal but assume ~80% are recovered for the purposes of estimating as some may be buried.

3.3.3 DSW pipeline stabilisation features & structures

Table 3.3.3: DSW Pipeline Stabilisation Features & Structures			
Asset	**Number**	**Description**	**Disposal Route (if applicable)**
DSW SDU & protection structure[2].	1	DSW SDU & Protection Structure (8.5x5.2x3.5) stabilised and secured using a total of 4 piles.	Recover structure to shore for re-use, recycling, or disposal.
Concrete mattresses	256	Refer Table 2.3.2, Figure 1.7.2 and Figure B.1.1.	Aim to recover all exposed concrete mattresses to shore for re-use, recycling, or disposal. Leave the concrete mattresses buried under deposited rock at the Don pipeline crossings *in situ*.
Grout bags (25kg)	2,320		Aim to recover all grout bags to shore for recycling & disposal but assume ~80% are recovered for the purposes of estimating as some may be buried.
Grout bags (1Te)	3		Aim to recover all grout bags
Deposited rock	3		Leave *in situ*.

NOTES:

1. Please refer notes 2 & 3 in Table 2.3.3;
2. Assuming there would be no technical issues, the piles will be internally cut 1.0m below the seabed as the seabed is stable in this area. Should any difficulties be encountered in accessing the piles internally such that an excavation will be required, OPRED will be consulted before the piles are cut.

3.3.4 WD Pipeline stabilisation features & structures

Table 3.3.4: WD Pipeline Stabilisation Features & Structures			
Asset	**Number**	**Description**	**Disposal Route (if applicable)**
WD SDU & protection structure[2].	1	WD SDU & Protection Structure (8.5x5.2x3.5) stabilised and secured using a total of 4 piles.	Recover structure to shore for re-use, recycling, or disposal.
Concrete mattresses	256	Refer Table 2.3.2, Figure 1.7.2 and Figure B.3.1.	Aim to recover all exposed concrete mattresses to shore for re-use, recycling, or disposal. Leave the concrete mattresses buried under deposited rock at the Don pipeline crossings *in situ*.
Grout bags (25kg)	2,320		Aim to recover all grout bags to shore for recycling & disposal but assume ~80% are recovered basis of diminishing returns for the amount of effort required.
Grout bags (1Te)	3		Aim to recover all grout bags
Deposited rock	3		Leave *in situ*.

NOTES:

1. Please refer notes 2 & 3 in Table 2.3.3;
2. Assuming there would be no technical issues, the piles will be internally cut 1.0m below the seabed as the seabed is stable in this area. Should any difficulties be encountered in accessing the piles internally such that an excavation will be required, OPRED will be consulted before the piles are cut.

3.3.5 Ythan pipeline stabilisation features

Table 3.3.5: Ythan Pipeline Stabilisation Features & Structures			
Asset	**Number**	**Description**	**Disposal Route (if applicable)**
Concrete mattresses	30	Refer Table 2.5.3, Figure B.1.1.	Aim to recover all exposed concrete mattresses to shore for re-use, recycling, or disposal.
Grout bags	1680		Aim to recover all grout bags to shore for recycling & disposal but assume ~80% are recovered basis of diminishing returns for the amount of effort required.

3.4 Waste Stream Management Methods

Table 3.4.1: Waste Stream Management Methods	
Waste Stream	**Removal and disposal method**
Bulk liquids	As part of Phase 1 of the decommissioning operations, bulk hydrocarbons will have been exported with any residual hydrocarbons removed from the FPF in accordance with contractual agreements with the vessel owner. Any associated bulk seawater from topsides will have been be cleaned and disposed overboard under permit. The production risers, pipelines and water injection flowlines will have been flushed and left filled with seawater as appropriate prior to being disconnected. Further cleaning and decontamination of materials recovered to shore will take place onshore prior to recycling / re-use or disposal.
Marine growth	Where necessary and practicable to allow access, some marine growth will be removed offshore. The remainder will be brought to shore and disposed of according to guidelines and company policies.
NORM	Based on production records to date, NORM is expected. Tests for NORM will be undertaken offshore and any NORM encountered will be dealt with and disposed of in accordance with guidelines and company policies.
Asbestos	It unlikely that asbestos will be present in the pipeline infrastructure and structures that are being recovered to shore. However, should any such material found will be dealt with and disposed of in accordance with guidelines and company policies.
Other hazardous wastes	Will be recovered to shore and disposed of according to guidelines and company policies and will also take place under appropriate permits.
Onshore Dismantling sites	Appropriately licensed sites will be selected for dealing with materials recovered to shore. The dismantling site must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver re-use and recycling options.

Table 3.4.2: Inventory Disposition				
Inventory	**Total inventory (Te)**	**Phase 1 planned to shore (Te)**	**Phase 2 planned to shore (Te)**	**Left *in situ* (Te)**
Installations				
Don South West & West Don[1]	103	-	103	-
Conrie	56	-	56	-
Don South West	663	-	663	-
West Don	280	-	280	-
Ythan	56	-	56	-
Pipelines & Stabilisation				
Don South West & West Don	1,556	449	310	797
Conrie	69			69
Don South West	2,589	114	1,356	1,119
West Don	783	49	216	518
Ythan	139	-	139	0
SUB-TOTAL (excl. rock)	**6,295**	**612**	**3,179**	**2,504**
Deposited Rock				
Don South West & West Don	58,000	-	-	58,000
Conrie	-	-	-	-
Don South West	72,705	-	-	72,705
West Don	35,159	-	-	35,159
Ythan	-	-	-	-
TOTAL DEPOSITED ROCK	**165,864**	**-**	**-**	**165,864**

NOTES:

1. The inventory associated with the Northern Producer is dealt with in the Decommissioning Programmes for Phase 1 [1] and is excluded here.

Table 3.4.3: Re-use, Recycle & Disposal Aspirations for Recovered Material			
Inventory	**Re-use**	**Recycle**	**Disposal (e.g. Landfill)**
Installations	<5%	>95%	<5%
Pipelines & structures	<5%	>95%	<5%

All recovered material will be transported onshore for re-use, recycling, or disposal. The expectation is that any synthetic materials associated with the pipelines will be shredded and recycled. It is not possible to predict the market for re-usable materials with any confidence so the figures in Table 3.4.3 are aspirational.

4. ENVIRONMENTAL APPRAISAL

4.1 Environmental Sensitivities

The environmental characteristics and sensitivities are such that the seabed area is stable with relatively homogenous community. It is typical of sandy sediments, generally diverse and evenly distributed community with low taxonomic dominance.

Generally uniform and background hydrocarbon and metal concentrations typical of the northern North Sea, concentrations of hydrocarbons and metals were below recognised toxicity thresholds and were not found to have exerted any notable influence on the macrofaunal community structure.

The closest SAC or Annex 1 feature is the Pobie Bank Reef that is ~109km south-west of NP.

Impact from operations from the NP are not significant as there are no discharges from drilling, and seabed impacts from anchors can be considered minimal.

Commercial fishing activity in the area can be considered **low**.

The reference sources used for this assessment are as follows:

- Environmental Baseline Survey (Don SW and SW to Thistle) & Habitat Investigation (W. Dons) UKCS Block 211/18. May-July 2007;
- Fugro Pipeline Route Survey. Dons West. July 2010;
- Gardline Environmental Baseline & Habitat Assessment, East Dons Site Survey. UKCS 211/18 and 211/19. June 2012;
- Environmental Baseline & Habitat Assessment. Dunlin By-pass. July 2018;
- Using data taken from either an adjacent month or adjacent block, seabird sensitivity except for January, November or December of any given year, seabird vulnerability is considered low;
- Sand discharges have been minimal offshore;
- There is only one wreck located within Block 211/18 designated under the Protection of Military Remains Act 1986 ‘war graves’.
- There are no historical Marine Protected Areas in the vicinity of the Northern Producer FPF.

4.2 Potential Environmental Impacts and their Management

4.2.1 Overview

The significance of any environmental impacts and risks (potential impacts) associated with each element of the project activities are described in Table 4.2.1.

4.2.2 Key control and mitigation measures

Table 4.2.1: Key Control and Mitigation Measures
Underwater Noise
• A SIMOPS plan for vessel activity in the field will be put in place • Vessel, cutting and trenching operations will use standard methods and equipment. No explosives used.
Discharges to Sea
• All contracted vessels will operate in line with IMO and MARPOL regulations • Pipelines and spool are to be flushed, filled with seawater, and isolated prior to disconnection All discharges will be permitted under applicable UK legislation.
Accidental Events
• All contracted vessels will have a ship-board oil pollution emergency plan (SOPEP) in place • A Collision Risk Management Plan will be developed and implemented • Agreed arrangements in place with oil spill response organisation for mobilising resources in event of a spill • Existing field OPEP in place to reduce the likelihood of hydrocarbon release and define spill response in place • Lifting operations will be planned to manage the risk • Recovery of any dropped objects will take place • Vessel contactors will have procedures for fuel bunkering that meet EnQuest's standard • Where practicable, re-fuelling will take place during daylight hours only.
Physical Presence of Infrastructure & Vessels
• All vessels will comply with standard marking conditions and consent to locate conditions • If required, a specific SIMOPS plan for vessel activity in the field will be put in place, noting that a standard DSV SIMOPS Guideline already exists for the asset • All seabed infrastructure will be fully protected on the seabed in the interim period between Phase 1 & 2 • If full seabed clearance of the FPF 500m zone is not completed, a guard vessel hired by EnQuest will remain on site • Small quantities of rock may be required where exposed pipeline ends remain after severance at existing deposited rock; • Seabed clearance certificate issued if an overtrawl survey is carried out, otherwise survey findings will be described in the close out report.
Atmospheric Emissions & Energy Use
• Time vessels spend in the field will be optimised, with a SIMOPS plan in place • Reuse or recycling of materials will be the preferential option.
Waste
• Onshore treatment will take place at waste management site with appropriate permits and licenses • UK waste disposal sites will be used where practicable.
Seabed Disturbance
• Activities which may lead to seabed disturbance planned, managed, and implemented in such a way that disturbance is minimised. A Marine License will be in place for any planned operational disturbance • Mechanical backfill of the excavated areas, but no remedial seabed levelling of pipeline corridors • Debris survey undertaken on completion of the activities and where possible resultant debris will be recovered • Minimising disturbance to seabed from overtrawl through liaison with fishing organisations and regulator.

Following the environmental assessment and implementation of additional control and mitigation measures where necessary, the level of environmental risk from the planned and unplanned decommissioning operations, is **low**. In addition, any cumulative impacts limited to seabed disturbance have been assessed and also considered to be **low**. Therefore, the decommissioning of the Conrie, Don South West, West Don and Ythan installations, pipelines and associated stabilisation features can be completed without causing significant impact to the environment.

5. INTERESTED PARTY CONSULTATIONS

5.1 Consultations Summary

Table 5.1.1: Summary of Stakeholder Comments		
Who	**Comment**	**Response**
INFORMAL CONSULTATIONS		
GMG		
ITHACA	Issued to Ithaca 03 November 2020.	No adverse comments were received.
NFFO	The recommendation from the comparative assessment and the decommissioning proposals contained herein were sent to NFFO by email 05 November 2020.	No adverse comments were received with NFFO being happy to defer to SFF as the decommissioning activities would be carried out in Scottish waters.
NIFPO	The recommendation from the comparative assessment and the decommissioning proposals contained herein were sent to NFFO by email 05 November 2020.	No adverse comments were received with NIFPO being happy to defer to SFF as the decommissioning activities would be carried out in Scottish waters.

Table 5.1.1: Summary of Stakeholder Comments		
Who	**Comment**	**Response**
SFF	The recommendation from the comparative assessment and the decommissioning proposals contained herein were presented to SFF in an MS Teams meeting 30 October 2020.	• SFF had no adverse comment to make concerning the Phase 2 decommissioning proposals relating to the departure of the Northern Producer and clearance of the 500m zone; • SFF would be inclined to prefer pipelines and umbilicals being left with exposures and non-reportable spans rather than multiple spans being removed leaving cut ends in situ, even though the cut ends would be remediated by reburial or deposition of additional rock; • SFF would be inclined to avoid the deposition of additional rock if the area be demonstrated as safe by a successful overtrawl; • Use of a chain-mat could be optional and the more usual trawl gear could be used if no snagging hazards appear to be present; • There remains a source of tension regarding the requirement to overtrawl and the demonstration of a clear seabed, with the SFF and NFFO arguing that they can only really be satisfied that the seabed is safe for fishing by their having carried an overtrawl rather than it being demonstrated for example by Side Scan Sonar and ROV survey. The idea of avoiding an overtrawl originally arose as a result of concerns of damage to environmentally sensitive areas such as North Norfolk sandbanks in the southern North Sea where JNCC and EMT in particular, has argued against the use over overtrawl. • EQ confirmed that any local excavation work would be backfilled; any rock displaced for local excavation work would be reinstated.
STATUTORY CONSULTATIONS		
NFFO		
NIFPO		
SFF		
GMG		
Public		

6. PROGRAMME MANAGEMENT

6.1 Project Management and Verification

An EnQuest project management team will manage the operations of competent contractors selected for all decommissioning activities. The team will ensure the decommissioning is executed safely, in accordance with legislation and EnQuest Health and Safety principles. If required, changes to the Decommissioning Programmes will be discussed with OPRED with any necessary approvals sought.

6.2 Post-Decommissioning Debris Clearance and Verification

The 500m safety zones will be subject to clear seabed assessment when the decommissioning activities have concluded.

As indicated in Figure 6.3.1, it is proposed that post decommissioning surveys near the Wye Structure (i.e. SALB) and Thistle 500m zone will be addressed and reported as part of Thistle decommissioning activities.

It is proposed that EnQuest will work with OPRED and SFF on behalf of the Section 29 Holders to investigate use of an evidence-based approach to establish an acceptable clear seabed for the 500m zone. As the seabed is not in an environmentally sensitive area, an overtrawl will be carried out to verify the pipeline corridor and condition of the seabed after decommissioning activities have been completed. The overtrawl will be supported by a Certificate of Clearance. Evidence of a clear seabed will also be included in the Close Out Report and sent to the Seabed Data Centre (Offshore Installations) at the Hydrographic Office.

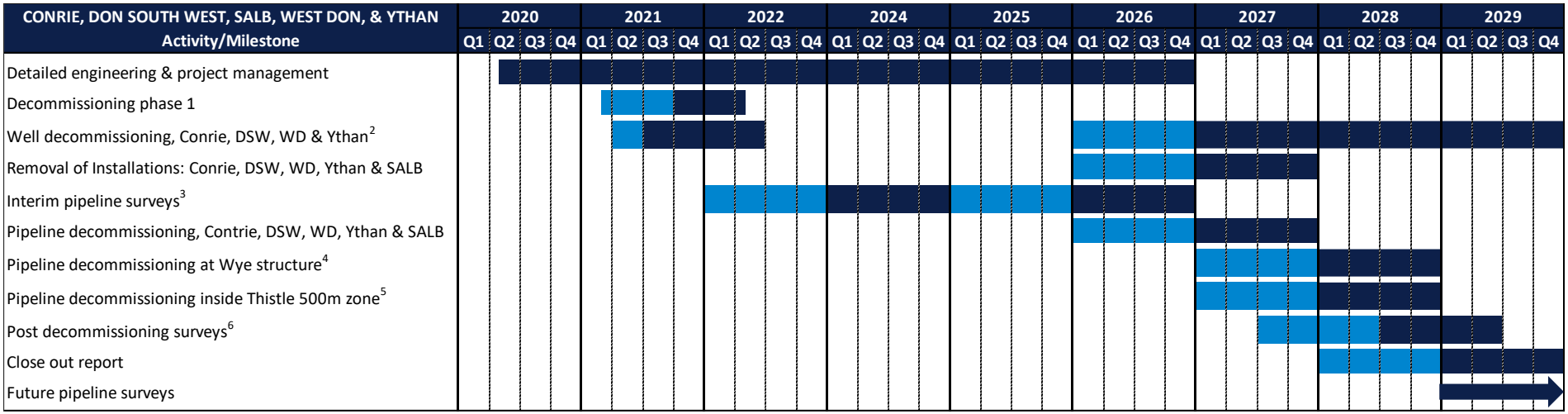
Following completion of decommissioning activities an ‘as-left’ environmental survey will be carried out, with the main findings documented in the final Close Out Report.

Any oil and gas debris will be recovered from the seabed for onshore disposal or recycling in line with existing disposal methods.

6.3 Schedule

A proposed schedule is provided in Figure 6.3.1. The activities are subject to the acceptance of the Decommissioning Programmes presented in this document and any unavoidable constraints (e.g. vessel availability) that may be encountered while executing the decommissioning activities. Therefore, activity schedule windows have been included to account for this uncertainty.

The commencement of offshore decommissioning activities will depend on commercial agreements and commitments. EnQuest will examine the possibility of including the offshore work in a wider campaign of subsea works to reduce costs.



Notes / Key

Most likely period of activity

Activity window to allow campaigning flexibility associated with decommissioning activities

1. Current indications are that NP FPF sailaway & Phase 1 of the decommissioning will be carried out early Q2 2021;
2. The first phase of well decommissioning will address wells with known integrity issues;
3. Most recent surveys were conducted in 2019. Timing and frequency of interim pipeline surveys to be agreed with OPRED
4. Decommissioning of pipelines and infrastructure at Wye structure (i.e. PL2578 & PL2579) will likely be carried out in the same campaign as PL4555 & PL4556; both these pipelines are part of the Thistle pipeline infrastructure;
5. Decommissioning of pipelines (i.e. PLU2580, PLU2580JSO, PLU2580JSG, and PL2579) and associated infrastructure on approach to Thistle 'A' will likely be carried out in the same campaign as PL4555 and other pipelines associated with Thistle.
6. Post decommissioning surveys near the Wye Structure (i.e. SALB) and Thistle 500m zone will be addressed and reported as part of Thistle decommissioning activities.

Figure 6.3.1: Gantt Chart of Project Plan

6.4 Costs

Decommissioning costs will be provided separately to OPRED and OGA.

6.5 Close Out Report

In accordance with OPRED guidelines, a Close Out Report will be submitted to OPRED explaining any variations from the DP, normally within 12 months of completion of the offshore decommissioning scope.

As indicated in Figure 6.3.1, it is proposed that the close out for the areas near the Wye Structure (i.e. SALB) and inside the Thistle 'A' 500m zone will be addressed and reported as part of Thistle 'related decommissioning activities.

6.6 Post-Decommissioning Monitoring and Evaluation

The frequency of future surveys and the requirement for legacy and liability management will be described in the Close Out report and agreed with OPRED. The approach will be supported with a risk assessment.

It is proposed that residual liability for individual pipelines remaining *in situ* following the decommissioning works associated with these Decommissioning Programmes will remain with the respective DSW & WD, DSW and WD Section 29 holders identified in Section 1.5 (Table 1.5.2, Table 1.5.6, and Table 1.5.8 respectively). Unless agreed otherwise in advance with OPRED, EnQuest will remain the focal point for such matters, such as any change in ownership, for example.

The requirement for legacy and liability management will be described in more detail in the Close Out report.

7. REFERENCES

[1] EnQuest (2020) Combined Decommissioning Programmes for Northern Producer FPF Float-off and Disconnection of Risers and Pipelines, M4109-ENQ-NPR-DN-00-PRG-0001;

[2] EnQuest (2020) Don South West and West Don Pipeline Decommissioning Comparative AssessmentM4109-ENQ-NPR-DN-00-REP-0001;

[3] Xodus (2020) Conrie, Don South West, West Don, and Ythan Decommissioning Environmental Appraisal, M4109-X0D-DPR-SA-00-REP-0001.

APPENDIX A NORTHERN PRODUCER PRIOR TO DEPARTURE

Appendix A.1 Layout prior to departure of Northern Producer

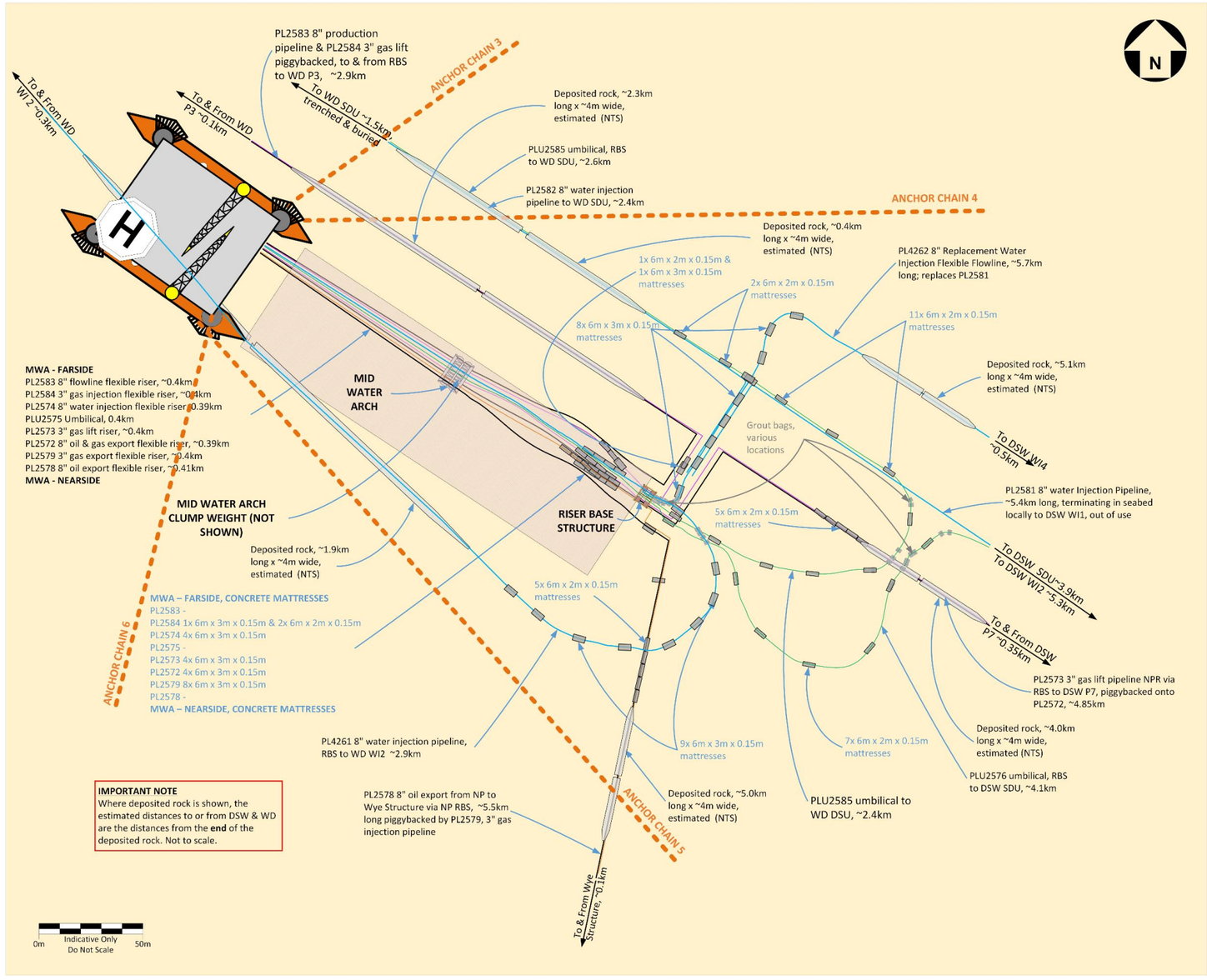


Figure A.1.1: Original Northern Producer layout prior to departure (Phase 1 DP scope)

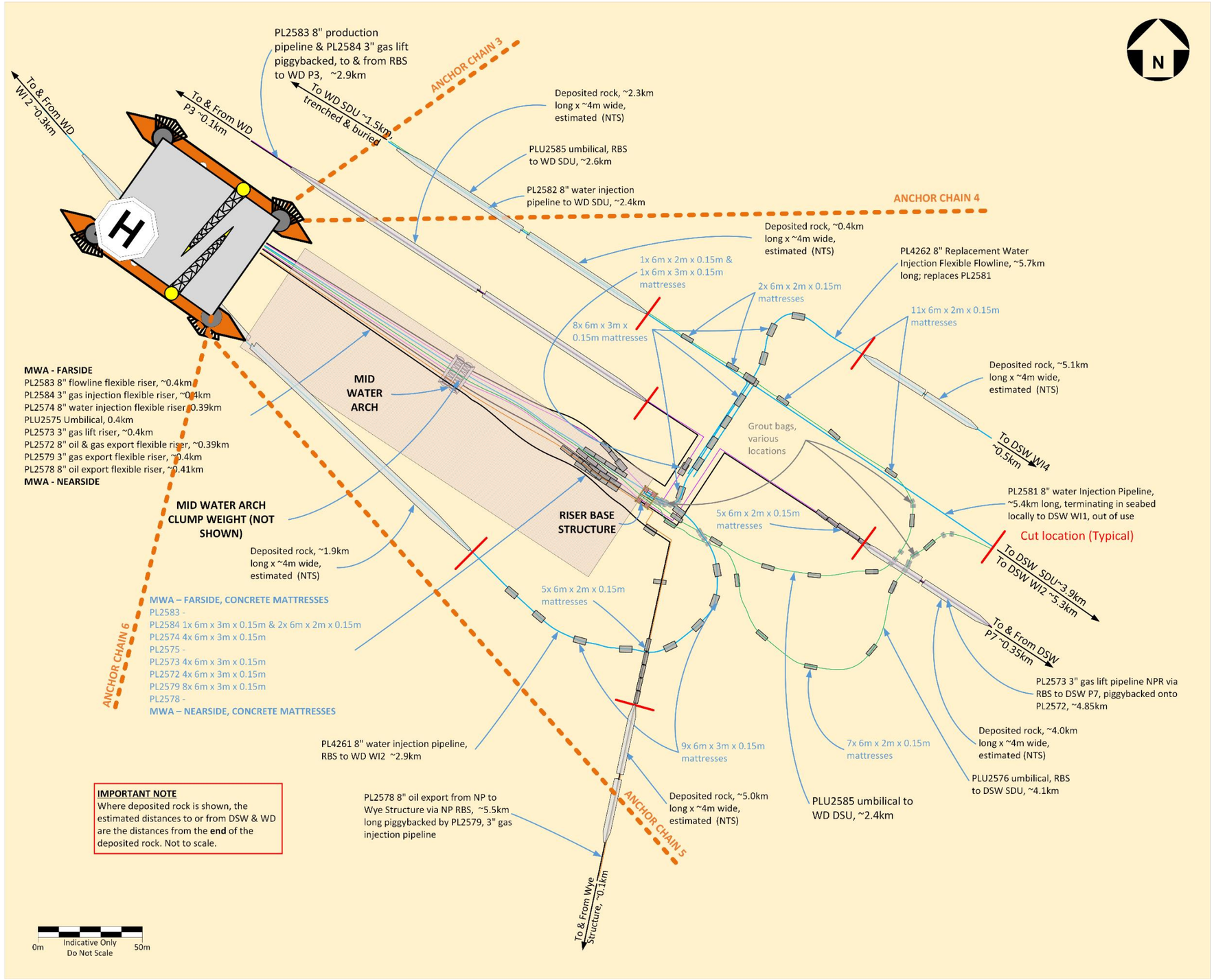


Figure A.1.2: Phase 1 - Pipeline cut locations in 500m zone (Phase 1 DP scope

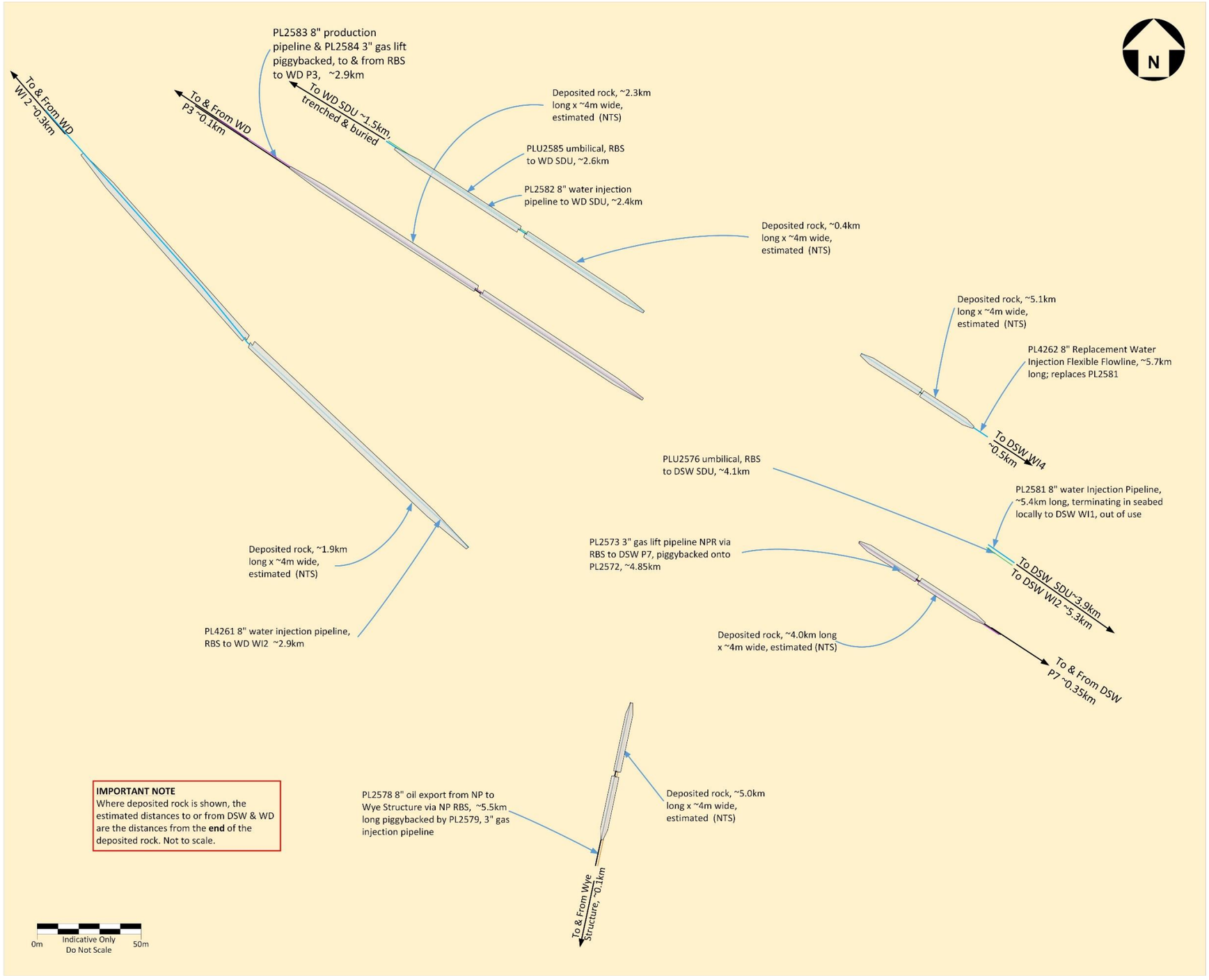


Figure A.1.3: Phase 2 – After clearance of NP 500m zone (Phase 1 DP scope completed)

APPENDIX B LAYOUTS OF DSW, WD FIELDS, WYE STRUCTURE & THISTLE 'A'

Appendix B.1 Don South West Production (with Conrie & Ythan)

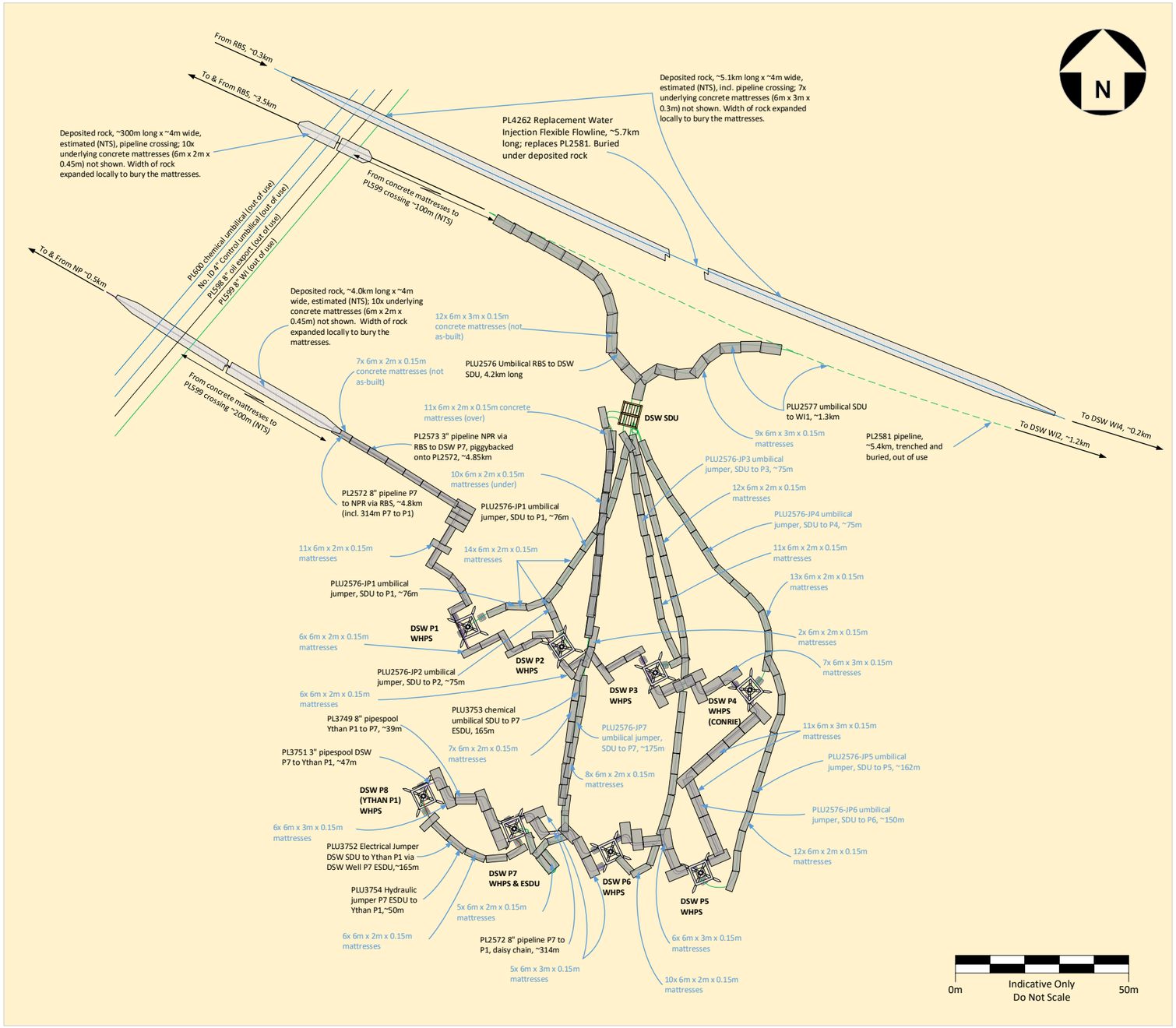


Figure B.1.1: Layout Showing DSW, Conrie & Ythan and associated infrastructure)

Appendix B.2 Don South West WI

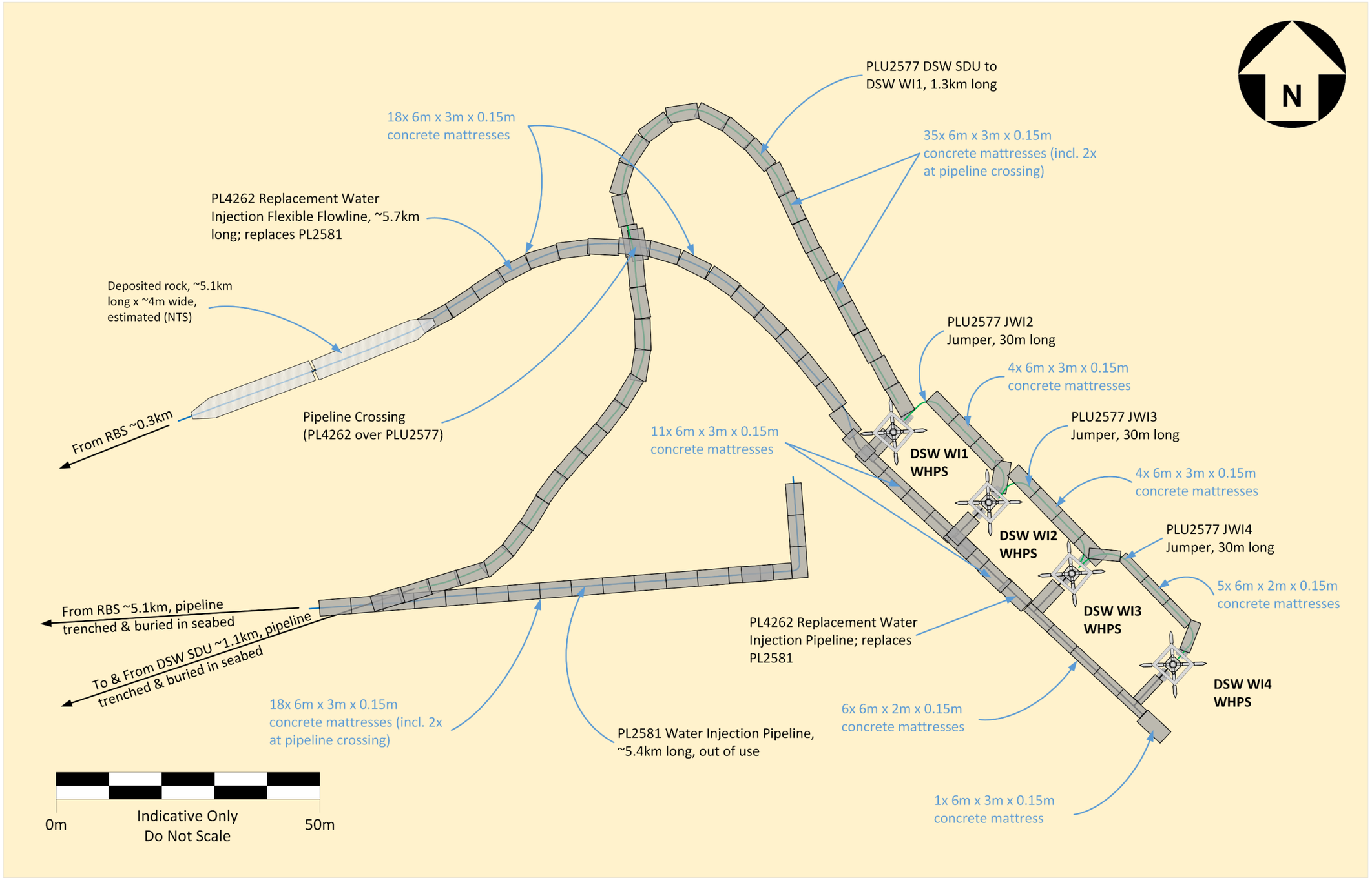


Figure B.2.1: Layout showing DSW WI and associated infrastructure

Appendix B.3 West Don Production & WI

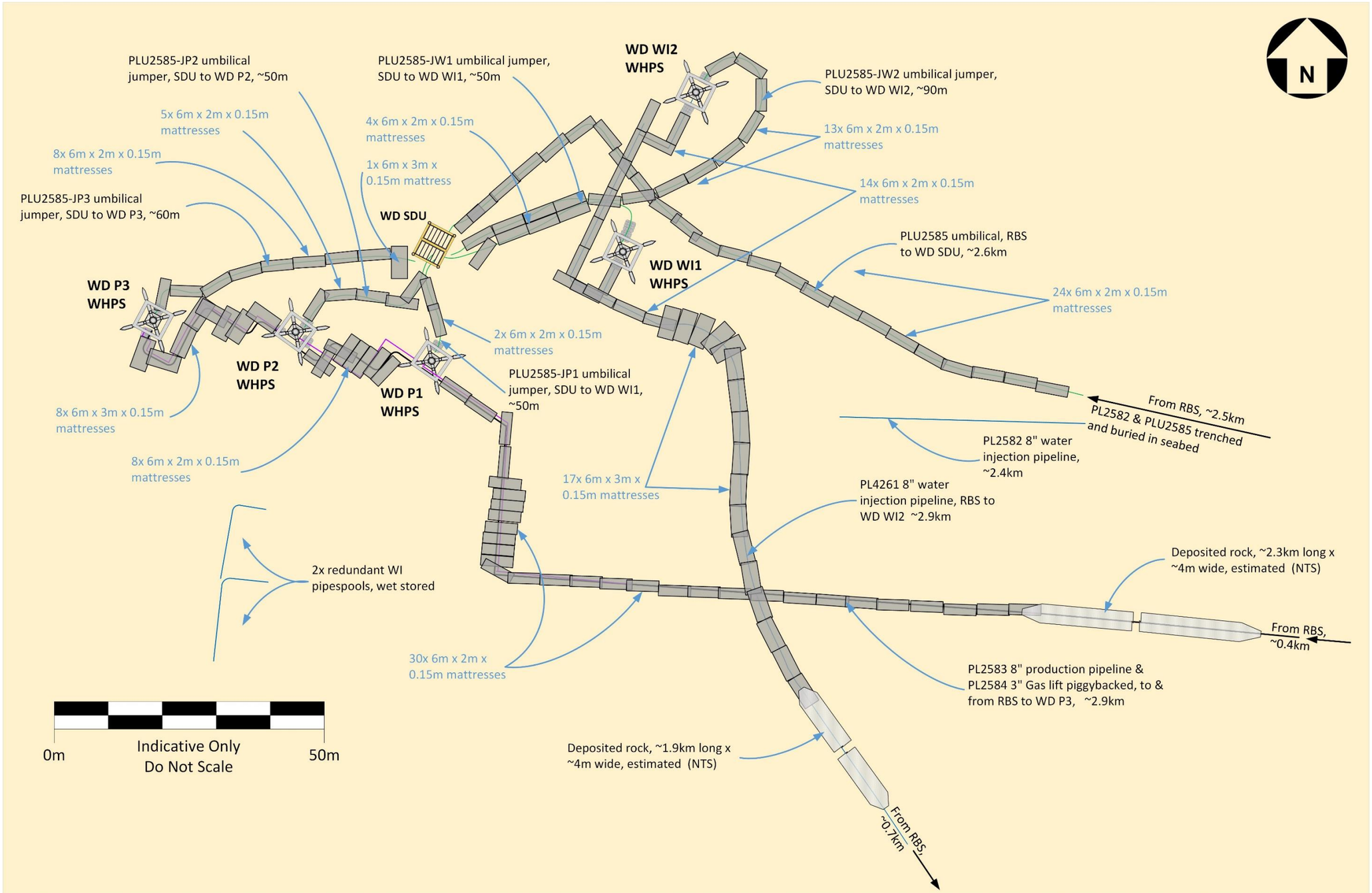


Figure B.3.1: Layout Showing WD Production & Water Injection

Appendix B.4 Wye Structure & Approaches

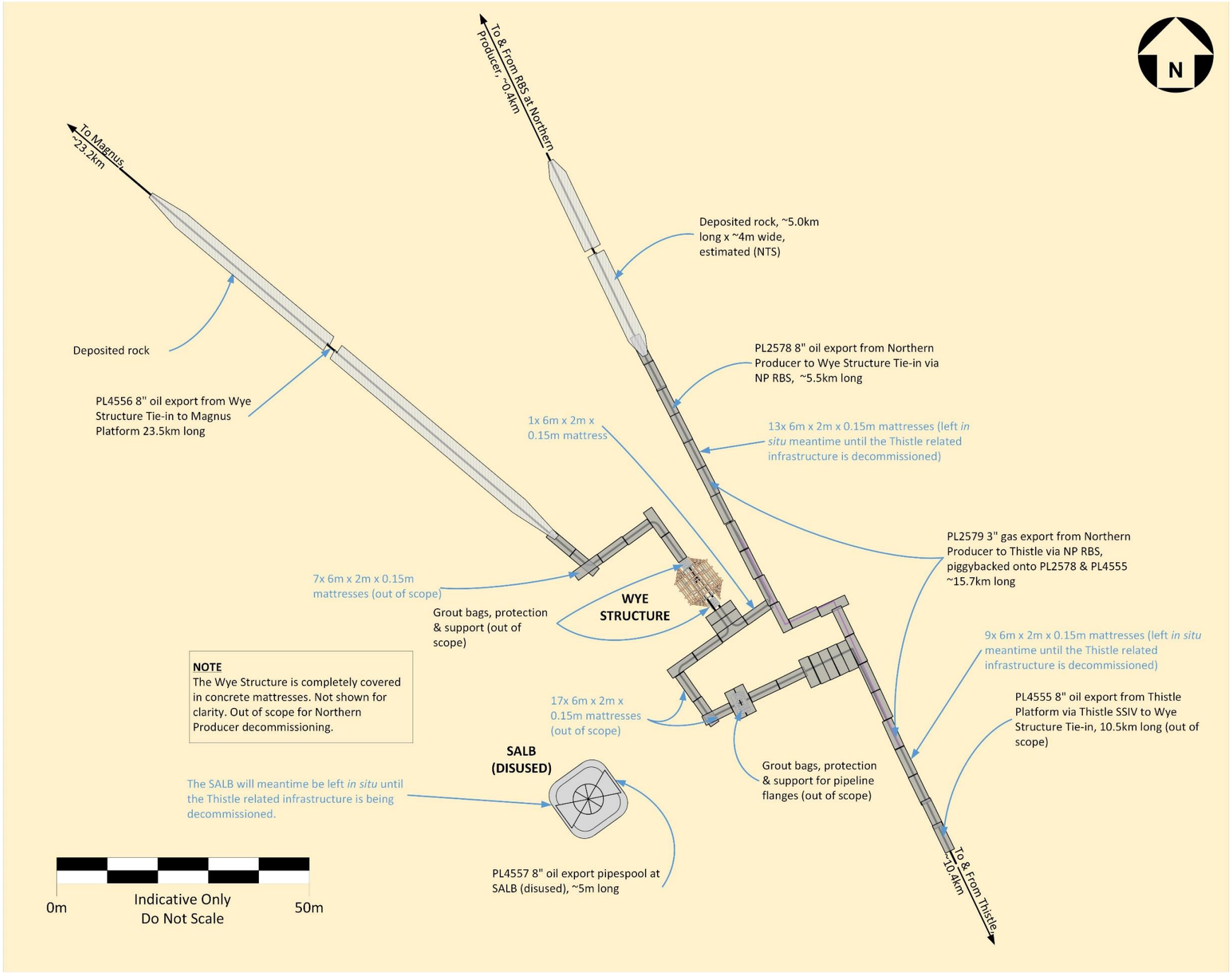


Figure B.4.1: Layout Showing Wye Structure & Approaches

Appendix B.5 Thistle ‘A’ Approaches

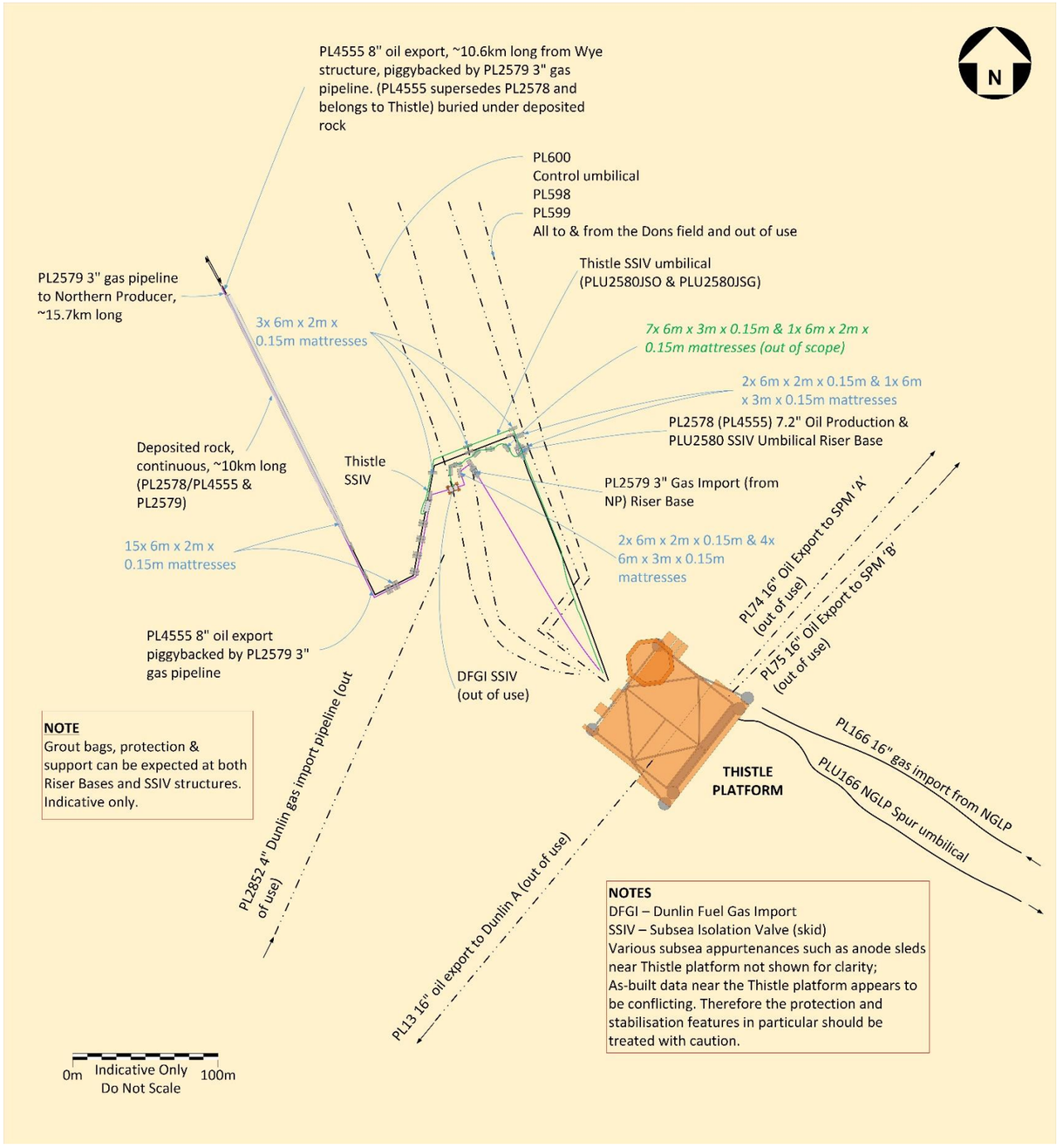


Figure B.5.1: Layout Showing Approaches to Thistle ‘A’[2]

[2] This figure should not be relied upon for details concerning infrastructure relating to Thistle ‘A’ installation.

APPENDIX C PUBLIC NOTICE & CONSULTEE CORRESPONDENCE

Appendix C.1 Public Notices