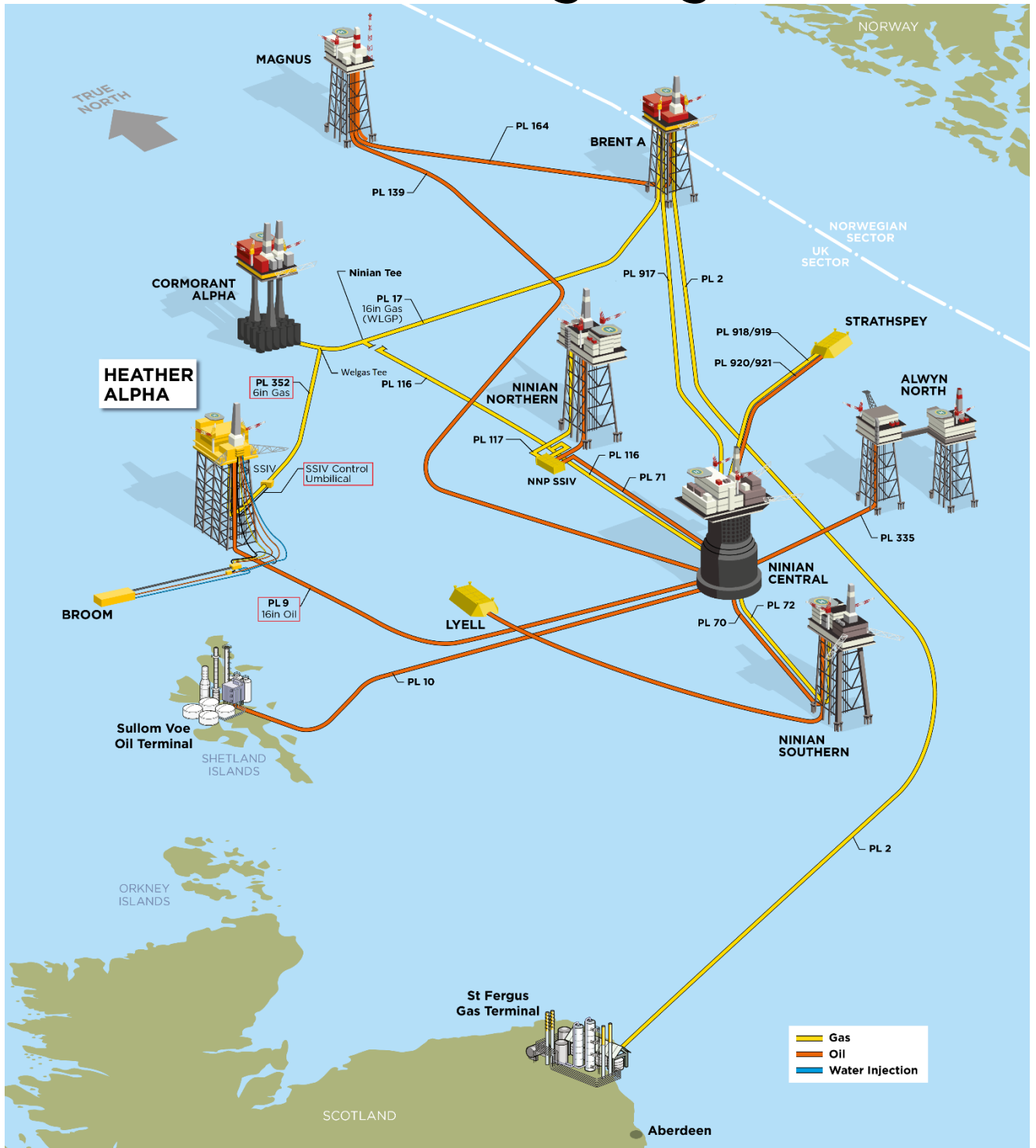


Heather Alpha Pipeline Decommissioning Programme



Consultation Draft

DOCUMENT CONTROL

Document ID:	M3524-ENQ-HEA-DN-0000-REP-0006		
Document Classification:	PUBLIC		
Document Ownership:	Decommissioning		
Date of Document:	22/02/22	Signature	Date
Prepared by:	S. Axon	<i>S. Axon</i>	07/02/23
Reviewed by:	C. Wheaton	<i>C. Wheaton</i>	07/02/23
Approved by:	W. Black	<i>W. Black</i>	07/02/23

REVISION RECORD

Revision No.	Date of Revision	Reason for Issue
A1	17/06/22	Issued for internal and Partners Review
A2	01/11/22	Updated to reflect feedback from OPRED
A3	07/02/23	DRAFT 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 each
Ithaca Oil & Gas Limited	1 electronic
B.G. Great Britain Limited	1 electronic

TABLE OF CONTENTS			INST	P/L
1.	Executive Summary	8		√
1.1	Decommissioning Programme	8		√
1.2	Requirement for Decommissioning Programme	8		√
1.3	Introduction	8		√
1.4	Overview of Pipelines being Decommissioned	9		√
1.5	Summary of proposed Decommissioning Programme	9		√
1.6	Field Location including field layout and adjacent facilities	12		√
1.7	Industrial Implications	19		√
2.	Description of items to be decommissioned	20		√
2.1	Installations	20		√
2.2	Pipelines including stabilisation features	20		√
2.3	Pipeline structures	24		√
2.4	Pipeline crossings	26		√
2.5	Wells	26		√
2.6	Inventory Estimates	27		√
3.	Removal and disposal methods	28		√
3.1	Use of Waste Framework Directive	28		√
3.2	Pipelines	28		√
3.3	Pipeline protection and stabilisation features	31		√
3.4	Pipeline protection structures	35		√
3.5	Pipeline crossings	35		√
3.6	Well Decommissioning	35		√
3.7	Waste streams	35		√
4.	Environmental Appraisal Overview	37		√
4.1	Environmental sensitivities	37		√
4.2	Potential environmental impacts and their management	39		√
5.	Interested party consultations	41		√
5.1	Consultation summary	41		√
6.	Programme Management	42		√
6.1	Project Management and Verification	42		√
6.2	Post-Decommissioning Debris Clearance and Verification	42		√
6.3	Schedule	42		√
6.4	Interim Monitoring and Evaluation	44		√
6.5	Costs	44		√
6.6	Close Out	44		√
6.7	Post-decommissioning monitoring and evaluations	44		√
7.	References	45		√
Appendix A	Public Notice & consultee correspondence	46		√
Appendix A.1	Public Notices	46		√

FIGURES AND TABLES

Figure 1.6.1: Heather Field location in UKCS	12
Figure 1.6.2: Locality of Heather in relation to other infrastructure	13
Figure 1.6.3: Heather approaches	14
Figure 1.6.4: Welgas tee approaches.....	15
Figure 1.6.5: Ninian Central approaches	16
Figure 2.3.1: PL352 ESDV & protection frame (inside Heather 500 m safety zone).....	25
Figure 2.6.1: Pie-chart of estimated material inventory.....	27
Figure 3.3.1: Decommissioning proposals near Heather.....	33
Figure 3.3.2: Decommissioning proposals for PL9 near Ninian Central	34
Figure 3.3.3: Decommissioning proposals for PL352 near Welgas tee	34
Figure 6.3.1: Gantt-chart of project plan	43
Table 1.4.1: Heather Pipelines Being Decommissioned	9
Table 1.4.2: Pipeline Section 29 notice holder details	9
Table 1.5.1: Summary of Decommissioning Programme.....	9
Table 1.6.1: Adjacent facilities (relative to Heather)	17
Table 2.2.1: Pipeline information	20
Table 2.2.2: Pipeline protection & stabilisation features	22
Table 2.3.1: Pipeline structure information	24
Table 2.4.1: Heather pipeline crossing information (PL9 only).....	26
Table 3.2.1: Pipeline decommissioning proposals	28
Table 3.3.1: Pipeline protection & stabilisation features	31
Table 3.4.1: Subsea pipeline structure & stabilisation features.....	35
Table 3.7.1: Waste stream management method	35
Table 3.7.2: Inventory disposition	35
Table 3.7.3: Re-use, recycle & disposal aspirations for recovered material.....	36
Table 4.1.1: Environmental and Societal sensitivities	37
Table 5.1.1: Summary of stakeholder comments	41

TABLE OF ABBREVIATIONS

ABBREVIATION	EXPLANATION
~	Approximately
3LPP	3-Layer Polypropylene, coating used for carbon steel pipelines and pipework
AHV	Anchor Handling Vessel
ALARP	As Low As Reasonably Practicable
Approach	Initial or final stretch of pipeline (or umbilical) as it leaves its point of origin or reaches its destination
BAP	Biodiversity Action Plan
CNR	CNR International (UK) Limited
CSV	Construction Support Vessel
CWC	Concrete Weight Coated (PL9 only)
Cut and lift	The 'cut and lift' method of removing trenched and buried pipelines would involve excavating the pipelines from within the seabed and thereafter cutting the pipeline into recoverable and transportable lengths. This method of removal can be very time-consuming for long pipelines and, would be problematic for concrete coated pipelines. The method is usually only viable for short pipelines
DOL	Depth of Lowering (bottom of pipe in trench)
DP	Decommissioning Programme(s)
EA	Environmental Appraisal
EnQuest	EnQuest Heather Limited
ESDV	Emergency Shutdown Valve
Expansion spool	Pipespool
Exposure	An exposure occurs when the 'crown' of a pipeline or umbilical can be seen. This does not generally mean it is a hazard
GBS	Gravity Based Structure (Steel Reinforced Concrete) (Table 1.6.1)
GMG	Global Marine Group
FBE	Fusion Bonded Epoxy
FishSAFE	The FishSAFE database contains a host of oil & gas structures, pipelines, and potential fishing hazards. This includes information and changes as the data are reported for pipelines and cables, suspended wellheads pipeline spans, surface & subsurface structures, safety zones & pipeline gates (www.fishsafe.eu)
FPSO	Floating, Production, Storage, Offloading (vessel)
FSP	Fixed Steel Platform (Table 1.6.1)
HDPE	High Density Polyethylene
HSE	Health and Safety Executive
HSEA	Health, Safety, Environment & Assurance
HSEQ	Health, Safety, Environment, Quality
", in	Inch; 25.4 millimetres
ICES	International Council for the Exploration of the Sea
ID	Identity (as in tabulated feature)
Ident	Pipeline identification number as used in Pipeline Works Authorisations
IMO	International Maritime Organisation
Installation	Offshore structure, typically comprising topsides and jacket, or a subsea wellhead protection structure, subsea manifold structure, an FPF or FPSO

ABBREVIATION	EXPLANATION
J-Lay	Method used for installing pipelines whereby pipe stalks with a length up to 6 joints are upended and welded to the seagoing pipe in a near vertical ramp. The ramp angle is chosen in such a way that it is in line with the catenary of the pipe to the seabed
km	Kilometre
LAT	Lowest Astronomical Tide
m	Metre(s)
MARPOL	International Convention for the Prevention of Pollution from Ships
MAT, SAT	Master Application Template, Supplementary Application Template
Monel	A nickel alloy, primarily composed of nickel (from 52 to 67%) and copper, with small amounts of iron, manganese, carbon, and silicon
Morgrip connector	Proprietary pipeline connector
MSB	Mean Seabed
MSV	Multipurpose Support Vessel
N,S,E,W	North, South, East, West
n/a	Not Applicable
N/A	(Data) Not Available
Neoprene	A synthetic rubber
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers Organisation Ltd
NORM	Naturally Occurring Radioactive Material
NSTA	North Sea Transition Authority
OD	Outside Diameter (of pipe)
Q1, Q2, Q3, Q4	Quarter 1, Quarter 2, Quarter 3, or Quarter 4 of any given year
OGA	Oil and Gas Authority
OEUK	Offshore Energies UK
OPEP	Oil Pollution Emergency Plans
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
Order of Magnitude	Size difference by factor of 10: one (10^1) means 10-times, two (10^2) means 100-times difference
Piggybacked	Clamped or connected to another pipeline along its length
Pipeline	Pipeline or umbilical
PL, PLU	Pipeline, Umbilical Identification numbers (UK)
PON	Petroleum Operation Notification
Post-trenching	Post-trenching involves cutting, ploughing or jetting a trench underneath the pipeline, such that it is lowered into the seabed.
PWA	Pipeline Works Authorisation
Qualitative	Result determined using judgement and use of risk and impact matrices
Quantitative	Result determined using numerical data and by calculation
RBS	Riser Base Structure
Remediation	For the purposes of this document remediation can mean one of, or a combination of the following: post-trenching, removal of exposures and spans, deposition of additional rock
Reportable span	A reportable span is a significant span which meets set criteria (FishSAFE criteria) of height above the seabed and span length (10m long x 0.8m high).

ABBREVIATION	EXPLANATION
Reel lay	Using the reel-lay method a flexible pipeline or small diameter rigid pipeline is installed from a large reel mounted on a pipelay barge. A pipe is spooled from a drum (reel) straightened with tension applied and laid over a ramp to the seabed
ROV	Remotely Operated Vehicle
ROVSV	Remotely Operated Vehicle Support Vessel
S-lay	A pipelay method whereby sections of pipe are welded together on a horizontal deck, their transition down to seabed taking the form of an elongated "S"
SAC	Special Area of Conservation
SDU	Subsea Distribution Unit
SFF	Scottish Fishermen's Federation
SIMOPS	Simultaneous Operations
SOPEP	Shipboard Oil Pollution Emergency Plan
Span	Similar to an exposure except that the whole of the section of pipeline is visible above the seabed rather than just part of it. Once the height and length dimensions meet or exceed certain criteria the span becomes a reportable span
Splash zone	The wetted area of a riser or structure or riser immediately above and below the mean water level
SSIV	Subsea Isolation Valve
SUTU	Subsea Umbilical Termination Unit
SVT	Sullom Voe Terminal
TAQA	TAQA Bratani Limited
Te	Metric Tonne, 1000 kilogrammes force
TFSW	Trans Frontier Shipment of Waste
TOP	Top of Pipe
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
Umbilical	Flexible pipeline manufactured of various materials including steel and plastics typically used to send electrical power, communication signals, chemicals and hydraulic fluid to a manifold or wellhead. An umbilical will include cables and tubes that are covered with an outer sheath to protect them from damage
UNO	Unless Notified Otherwise
UTM	Universal Transverse Mercator (Coordinate System)
Welgas Tee	Manifold Junction for a number of pi-pipelines, including PL17 (Cormorant Alpha to Brent A), PL114 (from North Cormorant), and PL352 (to Heather Alpha). UTM Coordinates: 388738.758 E, 6770510.069 N
WGS84	World Geodetic System 1984
WLGP	Western Leg Gas Pipeline (PL17)
x	Number of (e.g. 16x = 16 in Number)

1. EXECUTIVE SUMMARY

1.1 Decommissioning Programme

This document presents the Heather Alpha (referred to as Heather) pipeline Decommissioning Programme and is supported by a Comparative Assessment ('CA') and Environmental Appraisal ('EA').

The Heather pipelines include:

- PL9, trenched with multiple exposures, ~32.8 km long
- PL9A, part suspended in water column and now partially buried in drill cuttings, 139 m long
- PL352, trenched and buried, ~19.4 km long
- Umbilical for PL352 Emergency Shutdown Valve ('ESDV'), trenched and buried, ~570 m long.

The topsides and jacket covered by notices under Section 29 of the Petroleum Act 1998 are subject to separate Decommissioning Programmes. The Heather topsides Decommissioning Programme was approved 22 July 2021. The Decommissioning Programmes for the jacket will be submitted at a later stage. The removal of the topsides will not preclude available decommissioning options for the Heather pipelines or the jacket.

Although decommissioning of the Heather pipelines is being treated in this document as part of the Heather project, EnQuest will continue to explore cost saving synergies with other projects.

1.2 Requirement for Decommissioning Programme

Pipelines: In accordance with the Petroleum Act 1998, EnQuest Heather Limited (as operator of the Heather field), and on behalf of the Section 29 notice holders (Table 1.4.2), is applying to the Offshore Petroleum Regulator for Environment and Decommissioning ('OPRED') to obtain approval for decommissioning the Heather pipelines as detailed in Section 2 of this document. Partner Letters of Support will be provided directly to OPRED.

In conjunction with public, stakeholder and regulatory consultation, this Decommissioning Programme document is submitted in compliance with national and international regulations and OPRED guidance notes [5]. The schedule outlined in this document is for a ten-year period¹ to decommission the pipelines beginning in 2025.

1.3 Introduction

The Heather platform is in block 2/5 of the United Kingdom Continental Shelf (UKCS) and is a fixed and fully integrated installation consisting of a modular topside providing manned production, drilling, and utilities facilities and a piled steel jacket. The Heather field is located approximately 458 km NNE of Aberdeen in a water depth of ~143 m.

The Heather platform was installed in 1977, with first oil being produced on 6th October 1978.

A Cessation of Production application for Heather was accepted by the Oil and Gas Authority on 18th June 2020.

Until production ceased in 2020, produced crude oil from the Heather Field was exported to Ninian Central platform using PL9 which is a 16 in concrete weight coated ('CWC') pipeline ~32.8 km long. The oil is then comingled with production from other facilities and transported to the Sullom Voe

¹ Activity window extended as per North Sea Transition Authority ('NSTA') strategy which aspires to combine multiple scopes in a single campaign.

Terminal ('SVT') using PL10, a 36 in pipeline (out of scope).

Processed gas used to be imported from the Western Leg Gas Pipeline ('WLGP') using a 6 in pipeline (PL352) routed between what is commonly referred to as the Welgas Tee to the Heather platform. The pipeline is ~19.4 km long.

The Heather platform is also host to a number of risers and umbilicals associated with the Broom development tied back to Heather. These include PL2693 (formerly PL2003), PL2004, PL3758 (formerly PL2005), PL2006, PL2007² (and PLU2008). These will be subject to separate Decommissioning Programmes and Comparative Assessment. The Broom risers will be removed to facilitate the removal of the Heather topsides under a Preparatory Works Request submitted to OPRED 20 July 2022 and approved 26 September 2022.

The Decommissioning Programmes explain the principles of the decommissioning activities and are supported by a comparative assessment for the pipelines [1] and an environmental appraisal [4].

1.4 Overview of Pipelines being Decommissioned

1.4.1 Pipelines

Table 1.4.1: Heather Pipelines Being Decommissioned		
Number of Pipelines, Cables, Umbilicals	4	Refer Table 2.2.1

1.4.2 Section 29 holders

Table 1.4.2: Pipeline Section 29 notice holder details		
Section 29 Notice Holder	Registration Number	Equity Interest
EnQuest Heather Limited	02748866	37.50%
Ithaca Oil and Gas Limited	01546623	31.25%
BG Great Britain Limited	00909162	31.25%

1.5 Summary of proposed Decommissioning Programme

Table 1.5.1: Summary of Decommissioning Programme	
Proposed Decommissioning Solution	Reason for Selection
1. Pipelines	
<p>All pipelines and chemical cores of the umbilicals will be flushed and cleaned with seawater. All pipelines will be left <i>in situ</i>. Burial under drill cuttings is a factor for leave <i>in situ</i> for some parts of the pipelines. The Heather gas import ESDV and associated protection frames that is located inside the Heather 500 m safety zone will be completely removed. Following removal of the surface laid (and exposed) pipeline ends, the pipelines will be decommissioned as follows: PL9 - leave <i>in situ</i> following deposition of rock on spans (~2.0 km). Monitoring activities will continue</p>	<p>These are the preferred options following comparative assessment [1].</p>

² PL2007 is incorporated within the PLU2008 umbilical.

Table 1.5.1: Summary of Decommissioning Programme

Proposed Decommissioning Solution	Reason for Selection
<p>until spans are no longer found to occur. As a contingency the EA will account for the deposition of rock on ~14 km of exposures (note that this length includes the cumulative length of pipeline spans). Thereafter, the pipeline burial status should continue to be monitored using a Risk Based Inspection regime.</p> <p>Should any further spans occur in future these will be remediated.</p> <p>PL9A - leave the section connected to the PL9 riser on the jacket footings <i>in situ</i> until the fate of the jacket footings has been decided. Leave <i>in situ</i> any part that is buried in the drill cuttings. Completely remove short sections of the pipeline that is not buried in the drill cuttings.</p> <p>PL352 - following removal of any short, exposed sections, leave <i>in situ</i>. Bury remaining pipeline ends in deposited rock.</p> <p>ESDV umbilical - following removal of the section suspended in any short and exposed sections, leave <i>in situ</i>. Bury remaining umbilical ends in deposited rock.</p> <p>The deposition of rock on cut pipeline ends will be kept to a practical minimum. For the purposes of the EA it is assumed that up to 25 Te of rock will be required at each location.</p> <p>If exposed, pipeline stabilisation materials such as concrete mattresses and sandbags at the pipeline ends will be completely removed, otherwise they will be left <i>in situ</i>.</p> <p>Environmental permit applications required for work associated with decommissioning of the pipelines will be applied for.</p>	
2. Risers	
<p>Proposals for the sections of the risers connected to the jacket footings will be addressed in the Decommissioning Programme for the jacket footings. The PL9 riser along with its supports on Ninian Central will be covered under a separate Decommissioning Programme.</p> <p>PL9 - remove upper riser, severing it at a height between 75 m and 85 m below Lowest Astronomical Tide ('LAT') with the lower part remaining <i>in-situ</i> until the fate of the jacket footings has been decided.</p> <p>PL352 - remove upper riser, severing it at a height between 75 m and 85 m below LAT with the lower part</p>	

Table 1.5.1: Summary of Decommissioning Programme

Proposed Decommissioning Solution	Reason for Selection
<p>remaining <i>in-situ</i> until the fate of the jacket footings has been decided.</p> <p>ESDV umbilical - remove the umbilical down to the point where it is buried in drill cuttings and leave the remainder <i>in situ</i>.</p>	
3. Interdependencies	
<p>In order of preference, materials that have been removed will be returned to shore for reuse, recycling or disposal as appropriate.</p> <p>Due to timescales of decommissioning, separate Decommissioning Programmes are submitted for the Heather topsides, Heather jacket and Heather pipelines. The topsides Decommissioning Programme was approved 22 July 2021.</p> <p>Part of PL9 and several mattresses and sandbags associated with PL352 and the ESDV umbilical near the Heather jacket footings are buried under drill cuttings. To minimise disturbance to the drill cuttings it is proposed that these will be left buried <i>in situ</i>.</p> <p>PL9 has been subject to remedial works in the past, where sandbags and grout mats have been installed to reduce spans and support the pipeline. It is proposed that such remediation materials be left <i>in situ</i> and undisturbed.</p> <p>PL9 is connected to the Ninian Central platform, and PL352 is connected to the Welgas Tee and neither of these are owned by EnQuest Heather Limited. The timing of the decommissioning works near Ninian Central in particular, and the effect on the timing of the Close Out report to be agreed with OPRED.</p> <p>A third-party pipeline (PL1526) crosses over PL352 and several third-party pipelines and umbilicals associated with the Broom and Lyell developments cross over PL9.</p> <p>No third-party infrastructure will be directly affected because of the decommissioning proposals although the presence and operating status may influence the efficiency and timing of decommissioning works, particularly near Ninian Central.</p>	

1.6 Field Location including field layout and adjacent facilities

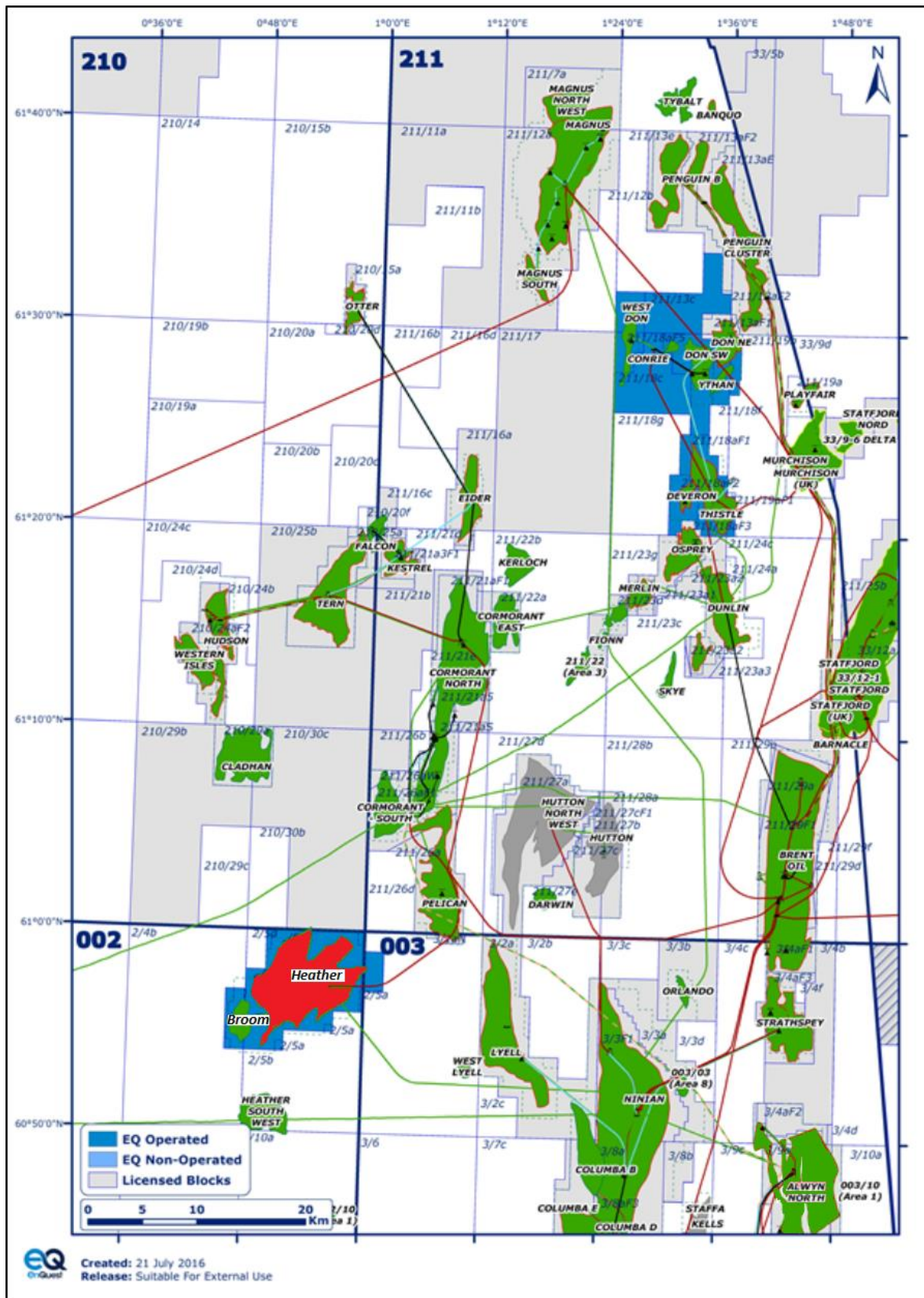


Figure 1.6.1: Heather Field location in UKCS

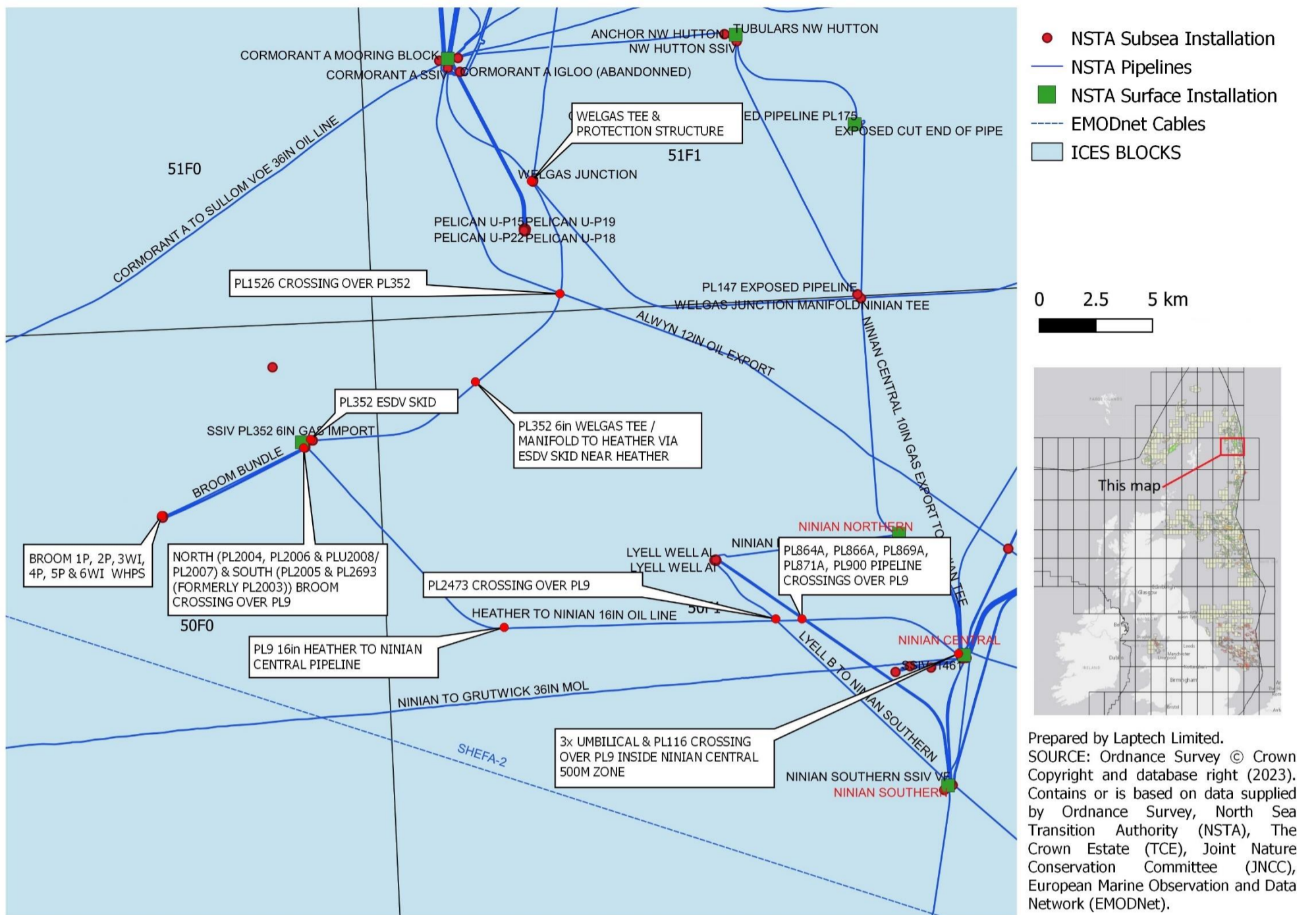


Figure 1.6.2: Locality of Heather in relation to other infrastructure

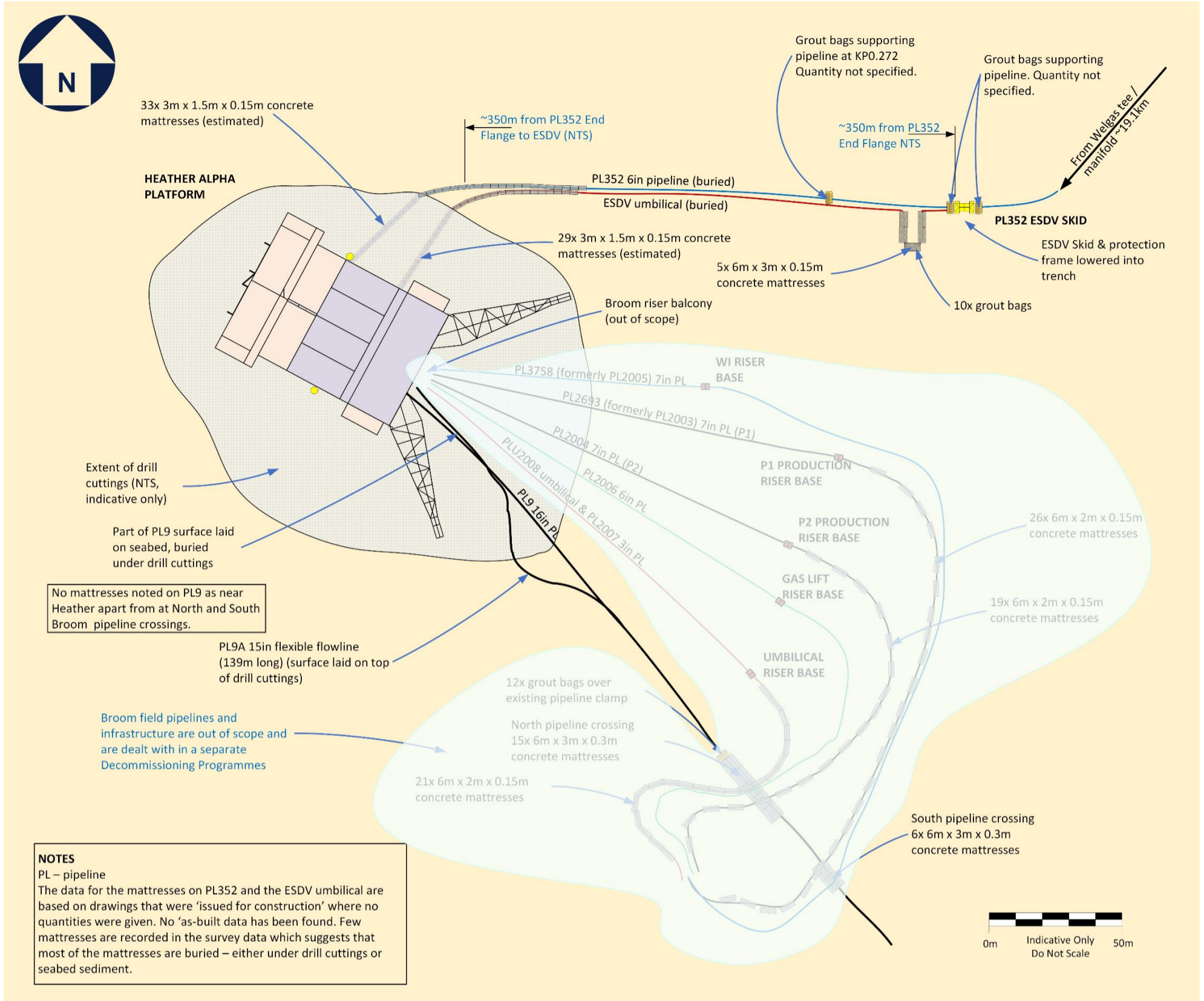
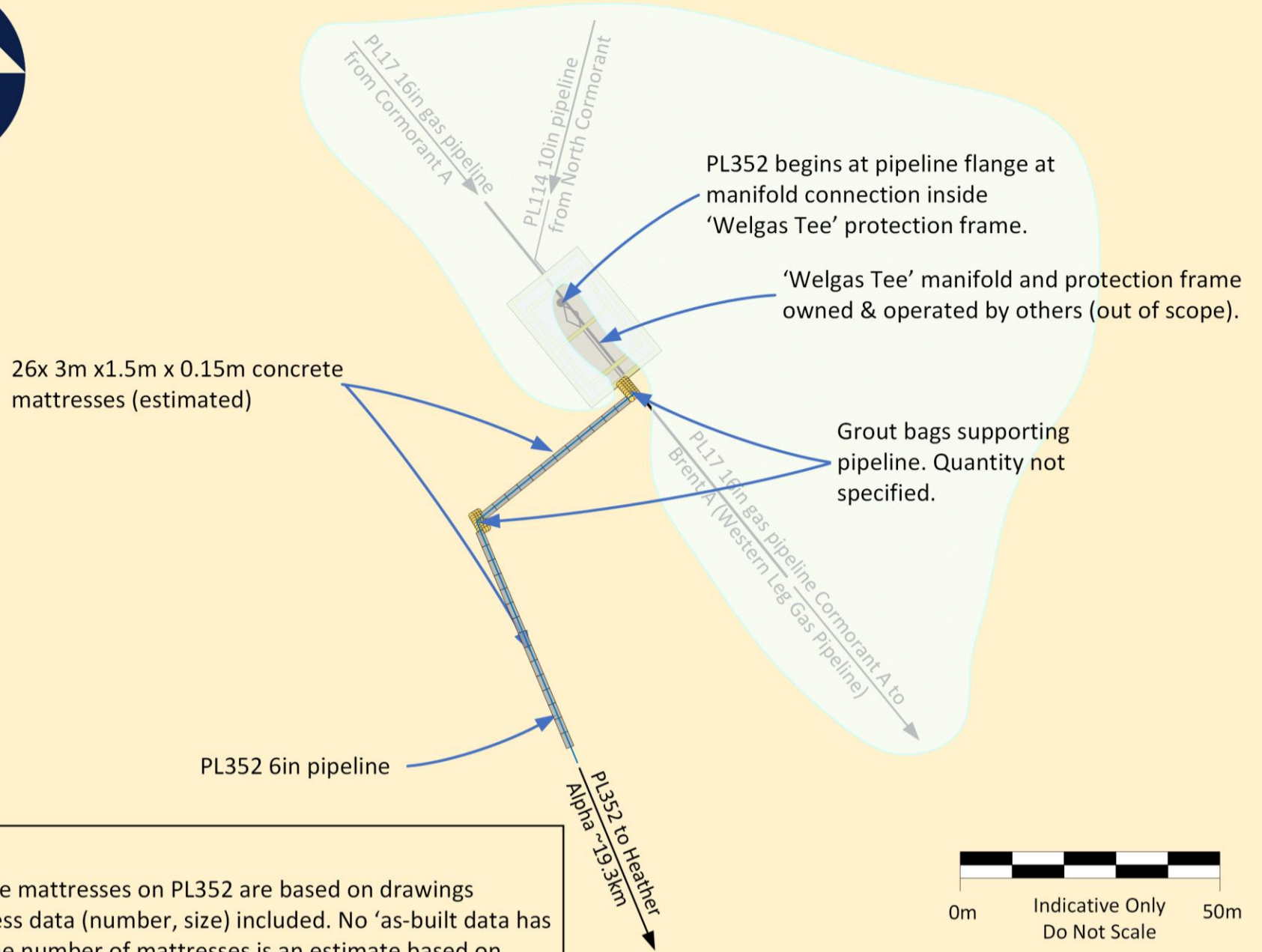


Figure 1.6.3: Heather approaches



NOTE
The data for the mattresses on PL352 are based on drawings without mattress data (number, size) included. No 'as-built data has been found. The number of mattresses is an estimate based on historical survey data.

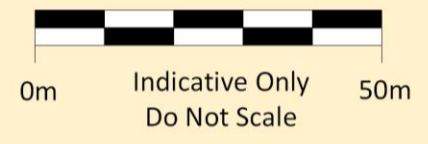


Figure 1.6.4: Welgas tee approaches

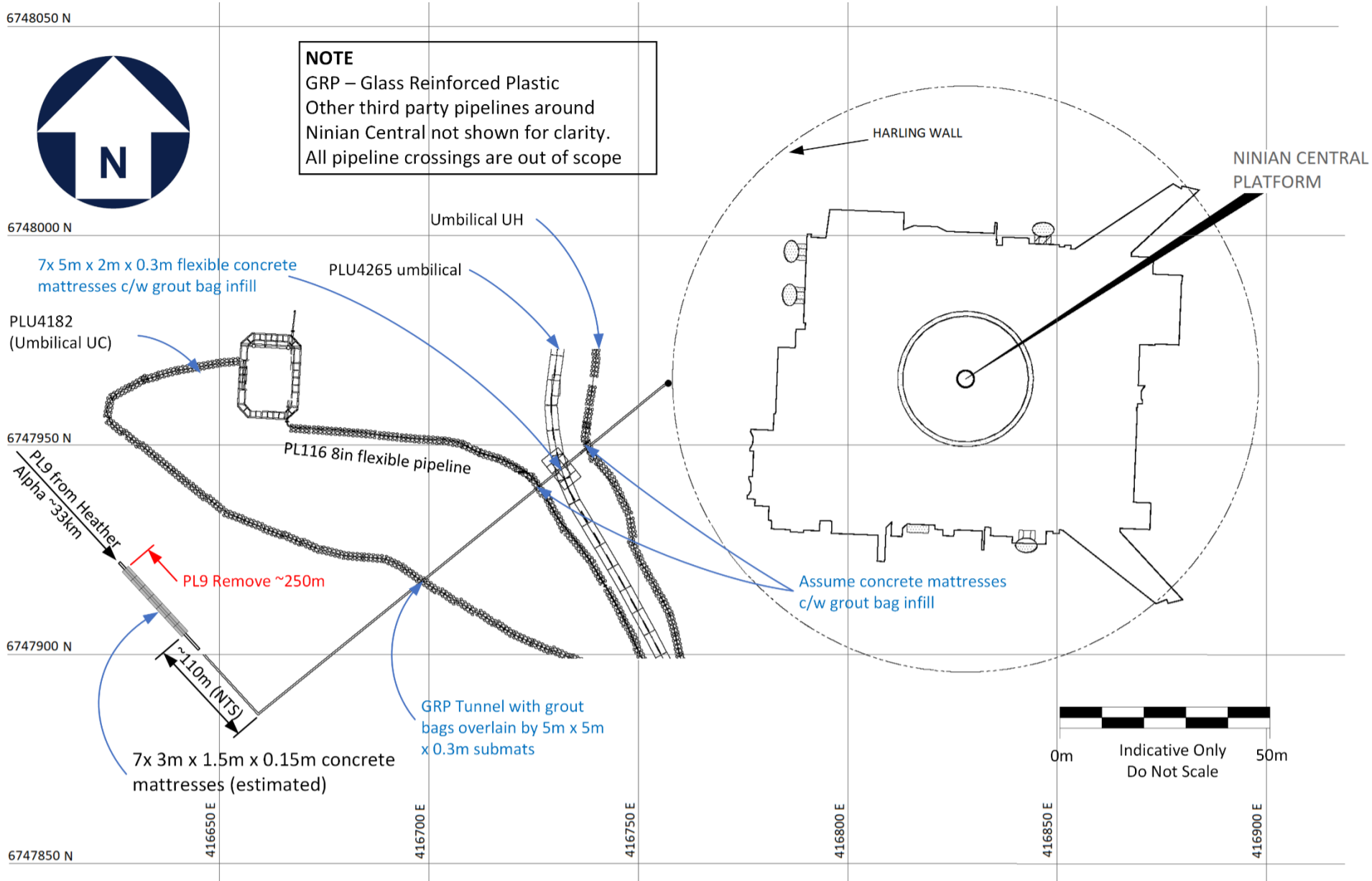


Figure 1.6.5: Ninian Central approaches

Table 1.6.1: Adjacent facilities (relative to Heather)

Operator	Name	Type	Direction & distance	Information	Status
Dana Petroleum	Western Isles	FPSO	NNW, 30.7km		Operational
TAQA	Tern	FSP	NNW, 35.7km		Operational
TAQA	Cormorant North	FSP	N, 33.7km		Operational
TAQA	Cormorant Alpha	GBS	NNE, 18km	DP approved Feb 2022	Out of use
CNRI	Ninian Northern	FSP	E, 26.5km		Decommissioned
CNRI	Ninian Central	GBS	E, 30.6km		Operational
CNRI	Ninian South	FSP	ESE, 32.2km		Decommissioned
EnQuest	PL2007 7in WI	WI Riser at Heather	NNE, 0.2km	Inside Heather 500 m safety zone	Out of use
EnQuest	PL2007 7in WI	WI Riser Base	NE, 0.2km		Out of use
EnQuest	PL2003 7in Production P1	P1 Riser Base	NE, 0.3km		Out of use
EnQuest	PL2004 7in Production P2	P2 Riser Base	NEE, 0.2km		Out of use
EnQuest	PL2006 6in Gas Lift	GL Riser Base	NEE, 0.2km		Out of use
EnQuest	PLU2008 Umbilical	Umbilical Riser Base	NEE, 0.2km		Out of use
EnQuest	Broom Leading Towhead	Bundle Towhead	E, 0.2km		Out of use
EnQuest	Broom Trailing Towhead	Bundle Towhead	SW, 6.9km		Out of use
EnQuest	Broom BR-1P	Subsea WHPS	SW, 6.9km		Out of use
EnQuest	Broom BR-2P	Subsea WHPS	SW, 6.9km		Out of use
EnQuest	Broom BR-3WI	Subsea WHPS	SW, 6.8km		Out of use
EnQuest	Broom BR-4P	Subsea WHPS	SW, 6.8km		Out of use
EnQuest	Broom BR-5P	Subsea WHPS	SW, 6.9km		Out of use
EnQuest	Broom BR-6P	Subsea WHPS	SW, 6.9km		Out of use
TAQA	PL4 (36in Oil)	Pipeline	NW, 10.3km	36in Cormorant to Sullom Voe Pipeline	Operational
TOTAL	PL1526 (12in Oil)	Pipeline	NE, 11.4km	12in Alwyn to Cormorant Oil Export Pipeline	Operational
TOTAL	PL1526 & PL352	Pipeline crossing	NE, 10km		Operational

Table 1.6.1: Adjacent facilities (relative to Heather)

Operator	Name	Type	Direction & distance	Information	Status
EnQuest	PL10 (36in Oil)	Pipeline	SSE, 12.3km	36in Ninian Central to Grutwick Main Oil Line	Operational
Shell U.K.	Welgas Tee	Pipeline manifold	NNE, 15.5km		Operational
EnQuest	Broom PLU2008 & PL9	Pipeline crossing	E, 0.2km	Inside Heather 500 m safety zone	Out of use
EnQuest	Broom PL2006 & PL9	Pipeline crossing	E, 0.2km		Out of use
EnQuest	Broom PL2004 & PL9	Pipeline crossing	E, 0.2km		Out of use
EnQuest	Broom PL2003 & PL9	Pipeline crossing	E, 0.2km		Out of use
EnQuest	Broom PL2005 & PL9	Pipeline crossing	E, 0.2km		Out of use
CNRI	PL2473 & PL9	Pipeline crossing	ESE, 22.3km	PL2473 (12in Production) & PL9 Crossing (Lyell B to Ninian South)	Operational
CNRI	PL900 & PL9	Pipeline crossing	ESE, 22.3km	PL900 Chemical Injection umbilical (Ninian South to Lyell B)	Operational
CNRI	PL869A/PL871A & PL9	Pipeline crossing	E, 23.4km	PL869A/PL871A & PL9 Crossing (Lyell 10in/3in Pipeline)	Out of use
CNRI	PLU4182 (umbilical UC) & PL9	Pipeline crossing	E, 30.5km	Inside Ninian Central 500 m safety zone	Operational
CNRI	PL116 & PL9	Pipeline crossing	E, 30.5km		Out of use
CNRI	PLU4265 & PL9	Umbilical crossing	E, 30.5km		Out of use
CNRI	Umbilical UH & PL9	Pipeline crossing	E, 30.5km		Operational

Impacts of decommissioning proposals

There are no direct impacts on adjacent facilities from the work associated with the Heather pipeline decommissioning activities, except for decommissioning works will be required at the Welgas Tee (PL352) and in the Ninian Central 500 m safety zone (PL9).

1.7 Industrial Implications

It is EnQuest's intention to develop a contract strategy and Supply Chain Action Plan that will result in an efficient and cost-effective execution of the decommissioning works.

The Heather pipeline Decommissioning Programme will be managed by EnQuest to ensure safe, efficient, and legally compliant delivery of the various elements of the decommissioning scope. The intention is to make efficient use of the supply chain to generate value through the application of knowledge, innovation, and technology, explore collaboration opportunities and to employ best practice in the management of the supply chain to deliver a cost effective and reliable service. Where appropriate existing framework agreements may be used for decommissioning activities.

2. DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Installations

n/a

2.2 Pipelines including stabilisation features

Table 2.2.1: Pipeline information									
Description	Pipeline Number (as per PWA)	Diameter (NB) (inches) ¹	Length (km)	Description of Component Parts	Product Conveyed	From - To End Points ²	Burial Status	Pipeline Status	Current Content
Oil export pipeline	PL9	16	32.785	Steel pipeline, coated with 5mm coal tar epoxy and 25mm concrete weight coating	Oil, condensate	Pigtrap on Heather A platform to pigtrap on Ninian Central platform	Trenched with 14km of exposures (2021 survey data)	In service	As product conveyed
Oil export pipeline replacement section	PL9A	466mm	0.139	15in HDPE flexible pipe (replaces 121.8m long section of PL9)	Oil, condensate	Between upstream and downstream Morgrip connectors near the Heather A platform.	Part suspended in water column, part laid on seabed (drill cuttings)	In service	As product conveyed

Table 2.2.1: Pipeline information									
Description	Pipeline Number (as per PWA)	Diameter (NB) (inches) ¹	Length (km)	Description of Component Parts	Product Conveyed	From - To End Points ²	Burial Status	Pipeline Status	Current Content
Gas import pipeline	PL352	6	19.394	Steel pipeline with FBE coating (end sections have asphalt enamel and concrete weight coating)	Gas	Welgas tee on the WLGP to Heather A platform	Trenched and buried	In service	As product conveyed
ESDV umbilical	TBA	81mm	0.570	Steel armoured electrohydraulic umbilical	Power, signals, hydraulics and injection chemicals	Heather A platform to ESDV skid	Trenched and buried	In service	As product conveyed
<p>NOTES</p> <ol style="list-style-type: none"> 1. If diameter is expressed in mm it refers to outside diameter of umbilical or flexible flowline 2. For brevity, the description of the end-to-end points may differ slightly from those consented in the PWA 3. The length of PL9A includes the length of two Morgrip connectors (each 1.5 m long) at each end of the pipeline 4. Reference Pipeline Works Authorisation (PWA) PL9 (PWA dated 23 Sept 1980), PL9 & PL9A (13/V/04), PL352 (PWA dated 27 Aug 1985). A pipeline number for the umbilical will be applied for in due course. 									

Table 2.2.2: Pipeline protection & stabilisation features				
Stabilisation Feature	Total Number	Total Mass (Te)	Location	Exposed/Buried/Condition
HEATHER PIPELINE (PL9 AT HEATHER)				
n/a	n/a	n/a	n/a	n/a
HEATHER PIPELINE PL9 (INFIELD)				
Sand & cement bags (25 kg)	2,590	64.8	Used to remediate pipeline spans at various locations along the pipeline. Most are outside of the Heather and Ninian Central 500 m safety zone.	Most will be underneath or next to the pipeline. Burial status will be determined when decommissioning activities are being carried out.
Deposited rock	1,032	4,863	At various locations along PL9 outside of Heather and Ninian Central 500 m safety zones.	Assume exposed, resting on the seabed.
HEATHER PIPELINE (PL9 AT NINIAN CENTRAL)				
Concrete mattresses 3m x 1.5m x 0.15m	7	6.6	PL9 on approach to Ninian Central. Refer Figure 1.6.5.	Expected to be exposed. Burial status will be determined when decommissioning activities are being carried out.
HEATHER PIPELINE (PL352 AT HEATHER)				
Concrete mattresses 3m x 1.5m x 0.15m; 6 x 3m x 0.3m	41	103.9	PL352 on approach to Heather. Refer Figure 1.6.3.	At least 12x expected to be buried under drill cuttings. 8x used to rectify a pipeline span between at KP0.434 and KP0.452. Leave these <i>in situ</i> . but remove 21x mattresses expected to be exposed. Burial status of the mattresses will be determined when decommissioning activities are being carried out.

Table 2.2.2: Pipeline protection & stabilisation features

Stabilisation Feature	Total Number	Total Mass (Te)	Location	Exposed/Buried/Condition
Sand & cement bags (25 kg)	574	14.4	PL352 on approach to Heather. Refer Figure 1.6.3.	Of these 250x (estimate) used to remediate 6x spans at various locations, 24x used to remediate span at KP0.447 and 300x (estimate) used to support pipeline at ESDV protection frame. Burial status will be determined when decommissioning activities are being carried out.
HEATHER PIPELINE (PL352 AT WELGAS TEE)				
Concrete mattresses 3m x 1.5m x 0.15m	26	24.5	PL352 on approach to Welgas tee. Refer Figure 1.6.4.	Expected to be exposed. Burial status will be determined when decommissioning activities are being carried out.
Sand & cement bags (25 kg)	100	2.5	PL352 on approach to Welgas tee. Refer Figure 1.6.4.	Expected to be exposed. Burial status will be determined when decommissioning activities are being carried out.
HEATHER PIPELINE (ESDV UMBILICAL)				
Concrete mattresses 3x 1.5m x 0.15m	33	50.9	ESDV umbilical on approach to Heather. Refer Figure 1.6.3.	At least 12x expected to be buried under drill cuttings. The 5x used to protect and stabilise the ESDV umbilical loop near the ESDV protection frame and the remaining 16x on approach to Heather are expected to be exposed. Burial status will be determined when decommissioning activities are being carried out.
Sand & cement bags (25 kg)	10	0.3	ESDV umbilical loop on approach to Heather. Refer	Burial status will be determined when decommissioning activities are being

Table 2.2.2: Pipeline protection & stabilisation features				
Stabilisation Feature	Total Number	Total Mass (Te)	Location	Exposed/Buried/Condition
			Figure 1.6.3.	carried out.
NOTE				
1. The number of sand & cement bags is not always specified within the 'as-built' data or subsequent Inspection, Repair and Maintenance ('IRM') data. The numbers quoted here are based on engineering judgement but will need to be confirmed during decommissioning activities.				

2.3 Pipeline structures

Table 2.3.1: Pipeline structure information					
Pipeline structure incl. stabilisation features	Number	Mass (Te)	Location		Comments / status
		Size (m)	WGS84 Decimal	WGS84 Decimal Minute	
PL352 ESDV & protection structure	1	24	60.955857° N	60°57.3514' N	Not piled; lowered into pipeline trench. Refer Figure 2.3.1.
		7.7x4.2x3.7	0.942545° E	00°56.5527' E	
NOTES					
There are no protection and stabilisation features associated with the PL352 ESDV protection structure itself, but the protection and stabilisation features associated with PL352 and the ESDV umbilical are listed in Table 2.2.2 above.					

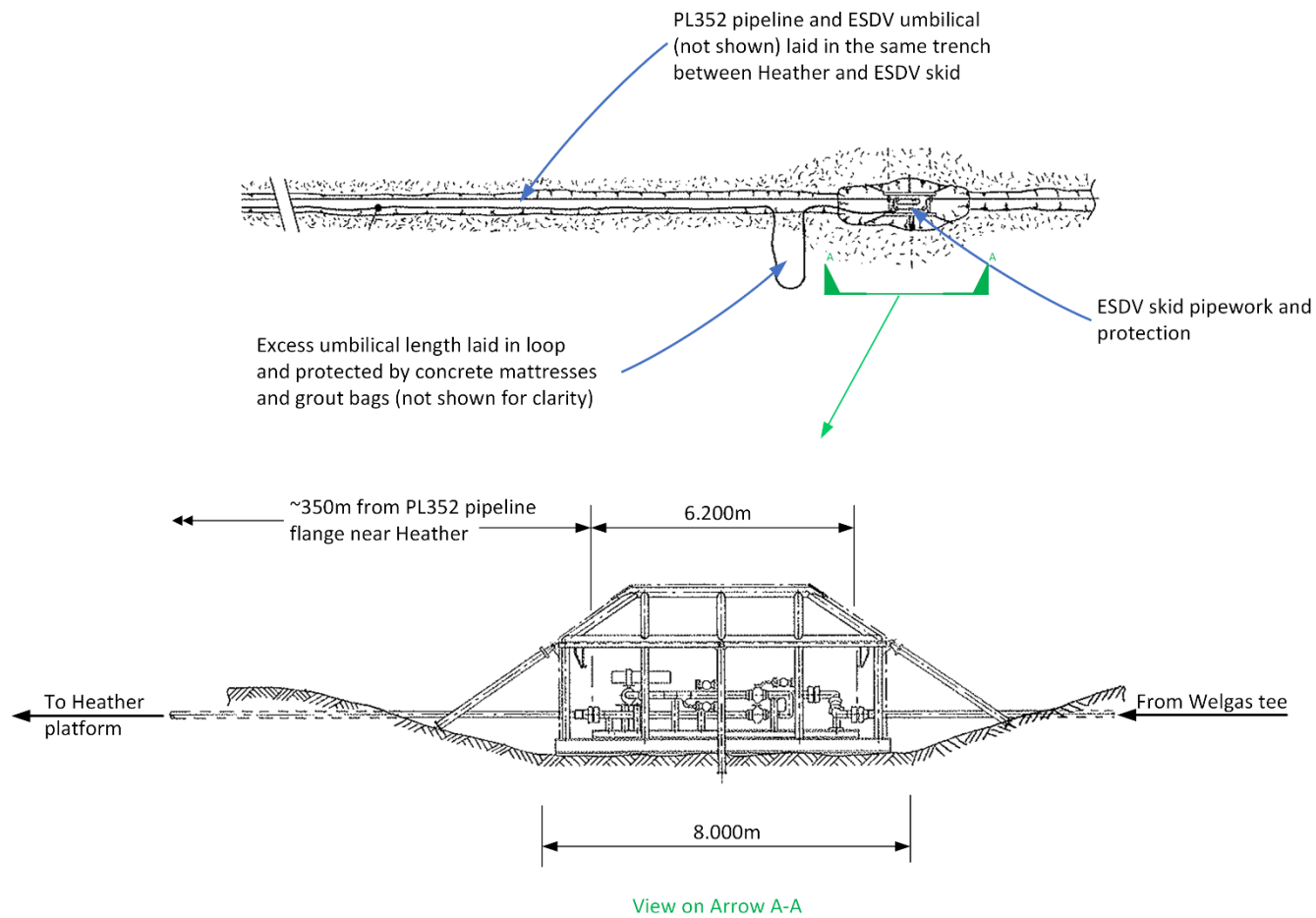


Figure 2.3.1: PL352 ESDV & protection frame (inside Heather 500 m safety zone)

2.4 Pipeline crossings

Table 2.4.1: Heather pipeline crossing information (PL9 only)		
Pipeline, umbilical or cable description	Location	Protection
HEATHER 500 M ZONE		
North crossing (PLU2008/PL2007, PL2006, PL2004) over PL9; all associated with the Broom field.	Heather 500m zone. Refer Figure 1.6.3.	15x 6m x 3m x 0.3m concrete mattresses
South crossing (PL2693 (formerly PL2003), PL2005) over PL9; all associated with the Broom field.	Heather 500m zone. Refer Figure 1.6.3.	6x 6m x 3m x 0.3m concrete mattresses
OUTSIDE 500 M ZONES		
PL1526 crossing over PL352	397010.008E 6764509.652N	Concrete mattresses, deposited rock
PL2473 (12in Production) & PL9 Crossing (Lyell B to Ninian South)	408588.379E 6749884.903N	Concrete mattresses, deposited rock
PL900 Chemical Injection umbilical (Ninian South to Lyell B)	409864.311E 6749819.834N	Concrete mattresses, deposited rock
PL869A/PL871A & PL9 Crossing (Lyell 10in/3in Pipeline)	409864.311E 6749819.834N	Concrete mattresses, deposited rock
PL864A & PL9 Crossing (Lyell 12" Water Injection Pipeline)	409864.311E 6749819.834N	Concrete mattresses, deposited rock
PL866A & PL9 Crossing (Lyell 8" Test Pipeline)	409864.311E 6749819.834N	Concrete mattresses, deposited rock
NINIAN CENTRAL PLATFORM 500 M ZONE		
PLU4182 (umbilical UC) & PL9	416680.510E 6747818.615N	Refer Figure 1.6.5.
PL116 & PL9	416709.010E 6747840.410N	
PLU4265 & PL9	416713.510E 6747844.210N	
Umbilical UH & PL9	416720.510E 6747849.710N	
NOTES		
<ol style="list-style-type: none"> For location please refer Figure 1.6.2; the Universal Transverse Mercator ('UTM') Eastings and Northings are indicative only. All of these crossings are third-party crossings are outside of the scope of this Decommissioning Programme. 		

2.5 Wells

n/a

2.6 Inventory Estimates

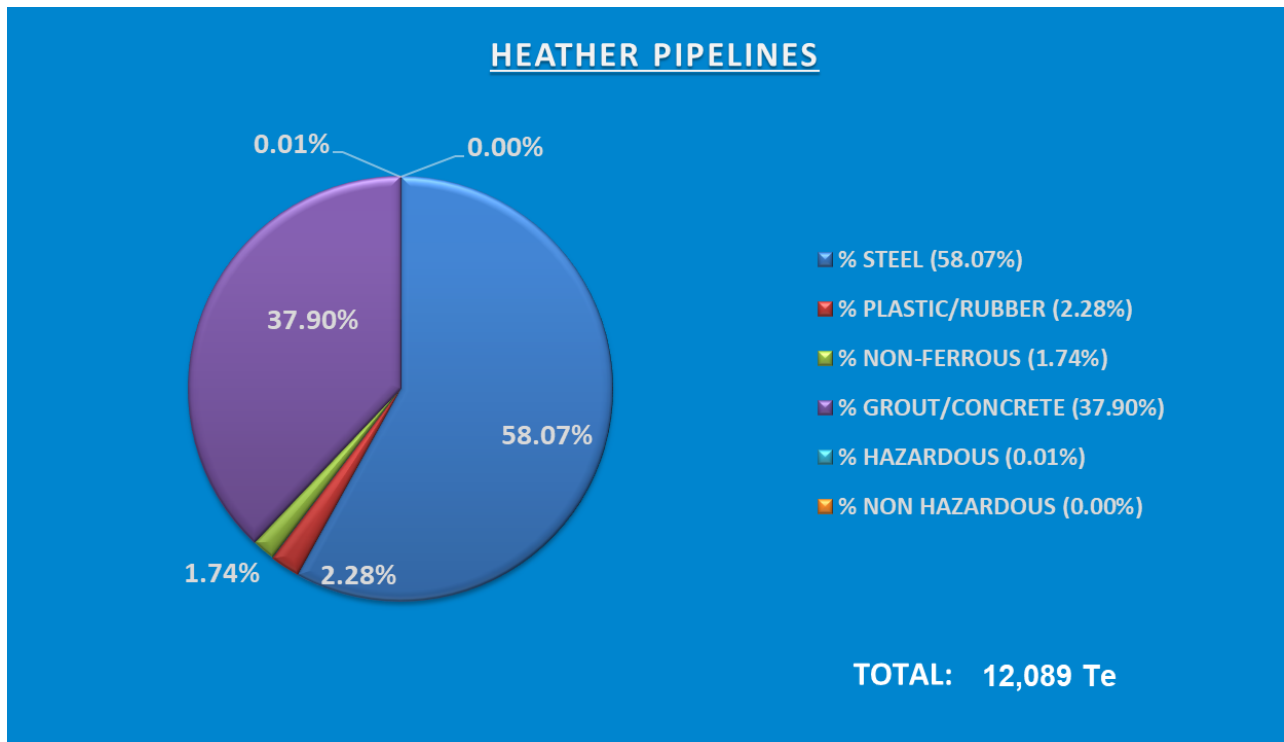


Figure 2.6.1: Pie-chart of estimated material inventory³

³ This figure excludes deposited rock.

3. REMOVAL AND DISPOSAL METHODS

3.1 Use of Waste Framework Directive

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 Transfrontier Shipment of Waste ('TFSW'), including hazardous materials. Early engagement with the relevant waste regulatory authorities will ensure that any issues with TFSW are addressed.

3.2 Pipelines

3.2.1 Decommissioning options

None of the pipelines are candidates for carbon capture, use and storage. There is an implied 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 involves 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 or carrying out remedial work to make the remaining pipeline safe for leaving *in situ*. This option is relevant for those pipelines that are known to have exposures or spans. There will likely be a need to verify their status via future surveys.
- **Leave *in situ*** - This involves leaving the pipeline(s) *in situ* with no remedial works, but possibly needing to verify their status via future surveys.

The method for decommissioning of the risers or surface laid sections of pipelines and pipeline approaches is the same irrespective of which option is pursued. Therefore, decommissioning of these parts of the pipelines are not included in the assessment. All options include removal of features such as pipespools, surface laid pipelines, jumpers, concrete mattresses, and grout bags in accordance with mandatory guidelines if they are exposed.

3.2.2 Outcome of the comparative assessment

Table 3.2.1: Pipeline decommissioning proposals		
Pipeline or group	Recommended option	Justification
Risers		
PL9, PL352 & ESDV umbilical	The PL9 riser along with its supports on Ninian Central will be addressed in a separate Decommissioning Programme. PL9 - remove upper riser, severing it at a height between 75 m and 85 m below LAT with the lower part remaining <i>in-situ</i> until the fate of the jacket footings has been determined.	Proposals for the sections of the risers connected to the jacket footings will be addressed in the Decommissioning Programme for the jacket footings.

Table 3.2.1: Pipeline decommissioning proposals

Pipeline or group	Recommended option	Justification
	<p>PL352 - remove upper riser, severing it at a height between 75 m and 85 m below LAT with the lower part remaining <i>in-situ</i> until the fate of the jacket footings has been determined.</p> <p>ESDV umbilical - remove the umbilical, severing it at a height between 75 m and 85 m below LAT with the lower part remaining <i>in situ</i> until the fate of the jacket footings has been determined.</p>	
Pipelines		
PL9	<p>Leave most of the pipeline <i>in situ</i> with remedial work to pipeline spans. Refer Figure 1.6.3 & Figure 1.6.5.</p> <p>Leave <i>in situ</i> the sections of pipelines near the Heather platform that are buried under drill cuttings or under seabed sediment.</p> <p>Remove the surface laid sections near the Heather and Ninian Central platforms including those currently protected and stabilised with concrete mattresses, but otherwise leave <i>in situ</i>.</p> <p>The remedial works will involve the deposition of rock on the spans for a length of ~2.0 km based on 2018 survey data). Exposures will be left where they are found and monitored.</p> <p>Thereafter, the pipeline burial status should continue to be monitored using a Risk Based Inspection regime to a frequency and timescale agreed with OPRED.</p> <p>Should any further spans occur in future these will be remediated.</p>	<p>No change to the current situation.</p> <p>An assessment of the historical exposures and span data would suggest that the cumulative length of extent of exposures and spans associated with PL9 has been reducing over time, albeit slowly.</p> <p>This results in minimal disturbance to the seabed, lower energy use, reduced risk to personnel, and lower cost.</p> <p>Taking this approach reduces environmental impact on the seabed and need for extensive pipeline remedial works in the short-term and accounts for the pipeline becoming more extensively buried in future from the natural migration of the seabed.</p>
PL9A	<p>Leave the section connected to the PL9 riser on the jacket footings <i>in situ</i> until the fate of the jacket footings has been decided. Leave <i>in situ</i> any part that is buried in the drill cuttings.</p> <p>Refer Figure 1.6.3. Completely remove short section of the pipeline that is not buried in the drill cuttings.</p>	<p>This results in minimal disturbance to the seabed, lower energy use, reduced risk to personnel, and lower cost.</p>
PL352	<p>Leave most of the pipeline <i>in situ</i>. Refer Figure 1.6.3 & Figure 1.6.4.</p> <p>Remove the surface laid sections near the</p>	<p>No change to the current situation.</p> <p>An assessment of the historical</p>

Table 3.2.1: Pipeline decommissioning proposals

Pipeline or group	Recommended option	Justification
	<p>Heather platform and the Welgas tee including those currently protected and stabilised with concrete mattresses, but otherwise leave <i>in situ</i>.</p> <p>Leave <i>in situ</i> those sections of pipelines (along with the associated protection and stabilisation features) near the Heather platform that are buried under drill cuttings.</p> <p>Subject to survey, leave PL352 <i>in situ</i> without remediation. This on the basis that the number and extent of exposure and spans will have reduced since 2018 and the pipeline will become buried.</p>	<p>exposures and span data would suggest that the cumulative length of extent of exposures and spans associated with PL352 has been reducing over time.</p> <p>This results in minimal to the seabed, lower energy use, reduced risk to personnel, and lower cost.</p> <p>Once decommissioned, the pipeline will continue to be monitored for a period of time to be agreed with OPRED.</p>
ESDV umbilical	<p>Leave most of the umbilical <i>in situ</i>.</p> <p>Refer Figure 1.6.3. Remove the surface laid sections near the Heather platform and adjacent to the ESDV protection frame including those currently protected and stabilised with concrete mattresses, but otherwise leave <i>in situ</i>.</p> <p>Leave <i>in situ</i> those sections of umbilical (along with the associated protection and stabilisation features) near the Heather platform that are buried under drill cuttings.</p> <p>Subject to survey, leave the ESDV umbilical <i>in situ</i> without remediation. This on the basis that the number and extent of exposure and spans will have reduced since 2018 and the umbilical will become buried.</p>	<p>No change to the current situation.</p> <p>The ESDV umbilical is in the same trench as PL352. An assessment of the historical exposures and span data would suggest that the cumulative length of extent of exposures and spans associated with the pipeline has been reducing over time.</p> <p>This results in minimal to the seabed, lower energy use, reduced risk to personnel, and lower cost.</p> <p>Once decommissioned, the umbilical will continue to be monitored for a period of time to be agreed with OPRED.</p>
<p>NOTES:</p> <p>1. Where the pipelines have been cut, for example where they enter the seabed, remedial work may be required to bury the end of the pipeline. As a contingency measure, small deposits of rock up to 25 Te may need to be used to make sure that the pipeline ends remain buried.</p>		

3.3 Pipeline protection and stabilisation features

Table 3.3.1: Pipeline protection & stabilisation features			
Asset description	Number / length	Description	Disposal route (if applicable)
PL9 AT HEATHER			
n/a	n/a	n/a	n/a
PL9 INFIELD BETWEEN HEATHER & NINIAN CENTRAL			
Sand & cement bags (25 kg)	2,590	Used to remediate PL9 pipeline spans at ~KP28.9. Refer Table 2.2.2.	Refer note 1.
Deposited rock	1,032 m	Refer Table 2.2.2	Leave <i>in situ</i> .
PL9 AT NINIAN CENTRAL			
Concrete mattresses 3mx 1.5m x 0.15m	7	Refer Table 2.2.2 & Figure 1.6.5.	Recover all exposed (estimate: 7x) concrete mattresses.
PL352 AT HEATHER			
Concrete mattresses 3mx 1.5m x 0.15m	41	Refer Table 2.2.2 & Figure 1.6.3.	Leave concrete mattresses buried (estimate: 12x) under drill cuttings <i>in situ</i> . Leave concrete mattresses (estimate: 8x) used for remediation of spans <i>in situ</i> . Recover all exposed (estimate: 21x) concrete mattresses. Also refer note 2.
Sand & cement bags (25 kg)	574	Refer Table 2.2.2 & Figure 1.6.3.	Completely remove the grout bags used to support PL352 (estimate: 300x) at the ESDV protection structure. Leave sand & cement bags (estimate: 274x) used for remediation of spans <i>in situ</i> .
HEATHER PIPELINE & CABLE MATTRESSES & GROUT BAGS (PL352 AT WELGAS TEE)			
Concrete mattresses	26	Refer Table 2.2.2 & Figure 1.6.4.	Recover all exposed concrete mattresses (estimate: 26x).
Sand & cement bags (25 kg)	100	Refer Table 2.2.2 & Figure 1.6.4	Recover all exposed sand & cement bags (estimate: 50x) to shore for reuse, recycling, and disposal. Also refer note 1.
HEATHER PIPELINE & CABLE MATTRESSES & GROUT BAGS (ESDV UMBILICAL)			
Concrete mattresses	33	Refer Table 2.2.2 & Figure 1.6.3.	Recover all exposed (estimate: 21x) concrete mattresses. Leave concrete mattresses buried (estimate: 12x) under drill cuttings <i>in situ</i> .
Sand & cement bags (25kg)	10	Refer Table 2.2.2 & Figure 1.6.3.	Recover all exposed sand & cement bags (estimate: 10x). Also refer note 1.
NOTE			

Table 3.3.1: Pipeline protection & stabilisation features

Asset description	Number / length	Description	Disposal route (if applicable)
<ol style="list-style-type: none">1. The number of grout bags is not specified within the 'as-built' data or IRM data and is therefore indicative only except where noted on the schematics. Aim to recover all exposed sand & cement bags to shore for recycling & disposal except for where they were used for remediation of pipeline spans where they will be left <i>in situ</i> and buried under deposited rock used to remediate pipeline spans under these decommissioning proposals.2. Propose to leave mattresses used to remediate spans <i>in situ</i> and buried under deposited rock used to remediate pipeline spans under these decommissioning proposals.3. All materials that are removed will be returned to shore to reuse, recycling or disposal to landfill as appropriate.			

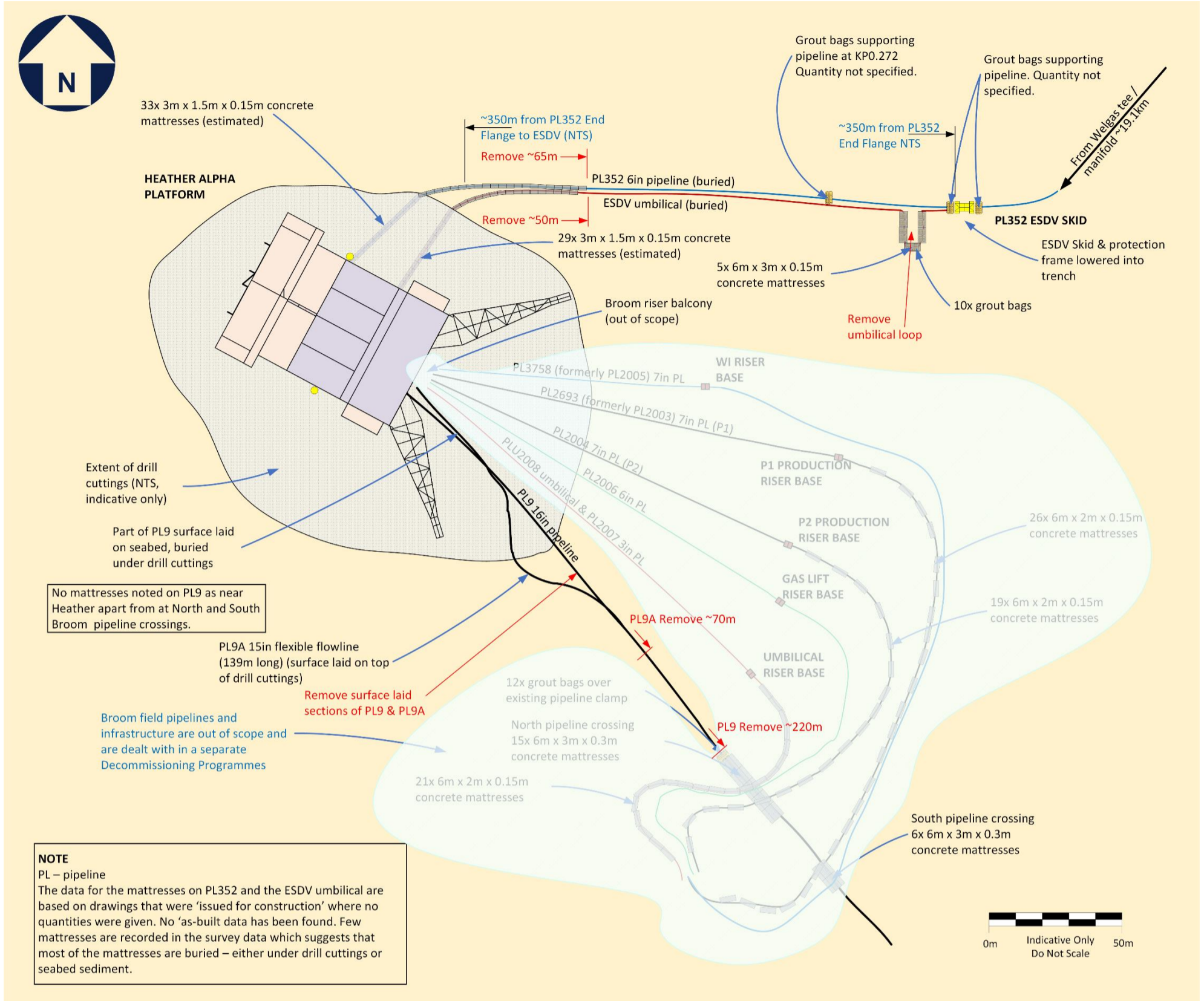


Figure 3.3.1: Decommissioning proposals near Heather

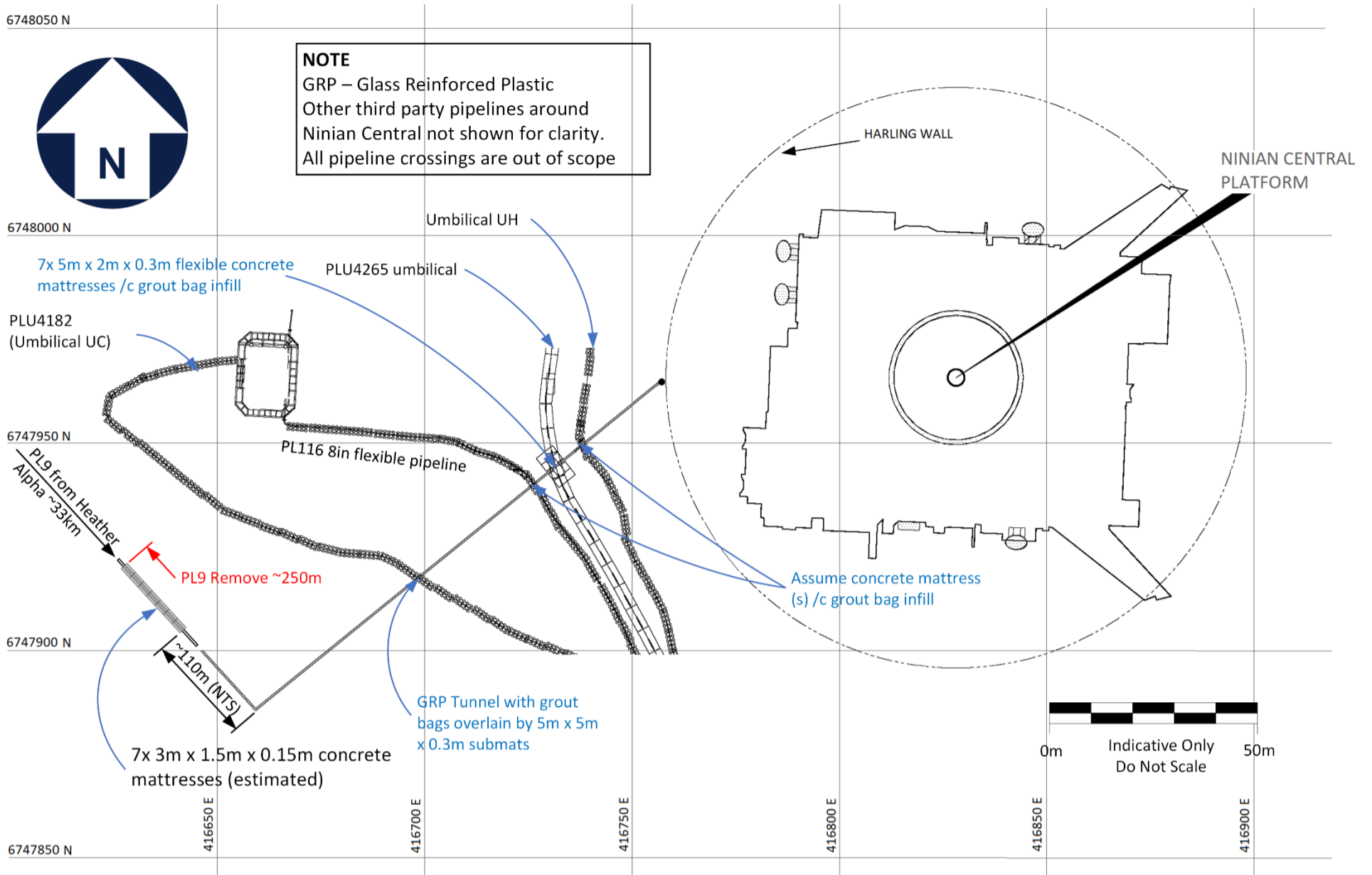


Figure 3.3.2: Decommissioning proposals for PL9 near Ninian Central

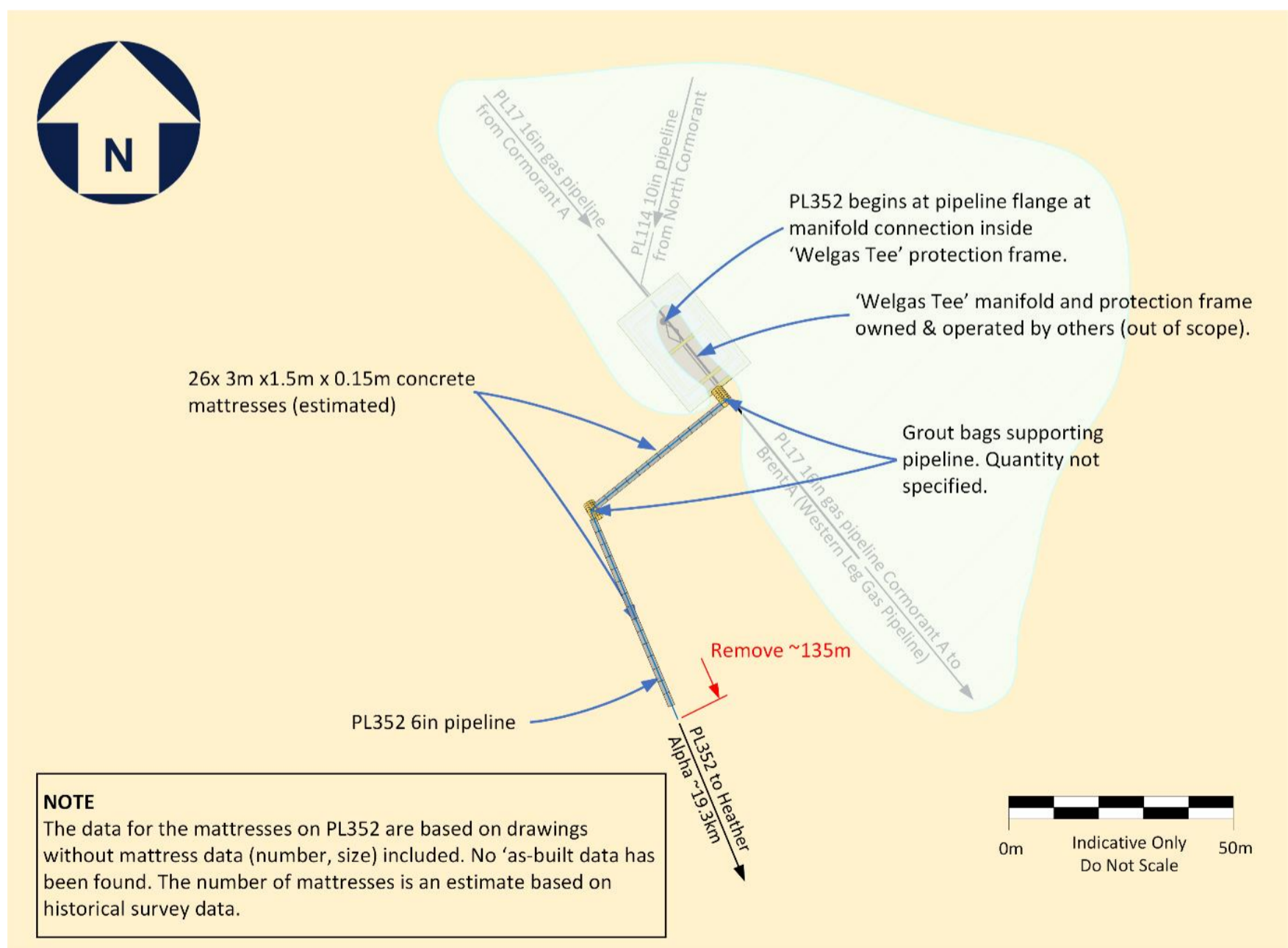


Figure 3.3.3: Decommissioning proposals for PL352 near Welgas tee

3.4 Pipeline protection structures

Table 3.4.1: Subsea pipeline structure & stabilisation features			
Subsea pipeline structure and stabilisation features	Number	Option	Disposal Route (if applicable)
ESDV protection frame	1	Complete removal.	Return to shore for reuse or recycling.

3.5 Pipeline crossings

EnQuest's decommissioning proposals will not affect any pipeline crossing infrastructure. However, the expectation is that the owners of the third -party crossing will liaise with EnQuest regarding any future decommissioning proposals and such proposals will also be discussed and agreed with OPRED.

3.6 Well Decommissioning

n/a

3.7 Waste streams

Table 3.7.1: Waste stream management method	
Waste stream	Removal and disposal method
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 and under appropriate permit.
NORM	Tests for Normally Occurring Radioactive Material ('NORM') will be undertaken offshore on the recovery vessel by the Radiation Protection Supervisor and recorded. Any NORM encountered onshore will be dealt with and disposed of in accordance with guidelines and company policies and under appropriate permit.
Other hazardous wastes	Other hazardous waste will be recovered to shore and disposed of according to guidelines and company policies and under appropriate permit.
Onshore dismantling sites	Appropriate licensed sites will be selected. 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 3.7.2: Inventory disposition			
Inventory	Total inventory (Te)	Planned tonnage to shore (Te)	Planned left <i>in situ</i> (Te)
Heather pipelines	12,089	183	11,906
Deposited rock	4,863	0	4,863
NOTE Heather pipeline inventory excludes deposited rock.			

Table 3.7.2: Inventory disposition			
Inventory	Total inventory (Te)	Planned tonnage to shore (Te)	Planned left <i>in situ</i> (Te)
Table 3.7.3: Re-use, recycle & disposal aspirations for recovered material			
Inventory	Re-use	Recycle	Disposal (e.g. Landfill)
Heather pipelines	<5%	>90%	<10%

All recovered material will be transported onshore for re-use, recycling, or disposal. It is not possible to predict the market for reusable materials with any confidence so the figures in Table 3.7.2 are aspirational.

4. ENVIRONMENTAL APPRAISAL OVERVIEW

4.1 Environmental sensitivities

More details of the environmental sensitivities are discussed in the Environmental Appraisal [4].

Table 4.1.1: Environmental and Societal sensitivities	
Physical Environment	The Heather pipelines and associated infrastructure are in Blocks 2/5, 3/1, 3/2 and 3/3. The water depth across the surveyed area varied from 141.9 m below LAT to 145.3 m below LAT.
Conservation Interests	No adult specimens of ocean quahogs <i>Arctica islandica</i> were recorded, however, one juvenile individual was recorded in macrofauna analysis at a single station. No evidence of <i>A. islandica</i> siphons was observed on any of the video footage. Survey imagery identified evidence of bioturbation and burrowing megafauna communities. The seapen species <i>Virgularia mirabilis</i> and <i>Pennatula phosphorea</i> were observed. Thus, it was concluded that the OSPAR-protected 'Seapen and burrowing megafauna communities' habitat is present within the surveyed area.
Conservation Sites	The Heather Field lies approximately 49 km from any conservation sites. The Fetlar to Haroldswick Nature Conservation Marine Protected Area is located approximately 95 km west, the Hermaness Saxa Vord and Valla Field Special Protection Area is located approximately 94 km west and the Pobie Bank Reef Special Areas of Conservation is located approximately 49 km southwest of the Heather area respectively. The Braemar Pockmarks SAC (Annex I habitat 'Submarine structures made by leaking gases') is around 250 km south of the survey area.
Conservation Species	Harbour porpoise, Atlantic white-sided dolphin, minke whale and white-beaked dolphin have all been observed in the Heather Field. All of which are Scottish Priority Marine Features, European Protected Species and are covered by the UK Biodiversity Action Plan ('BAP'). Grey and harbour seal densities are very low (0-1 individuals per 25 km ²) across the area due to its distance from shore. Both seal species are PMFs and Habitats Directive Annex II protected species.
Benthic Environment	The seabed within the project area is European Nature Information System 'Deep circalittoral sand' (A5.27) and 'Deep circalittoral coarse sediment' (A5.15). Side-scan sonar indicated medium reflectivity attributed to the muddy sand sediment. Particle size analysis identified the sediment to be mainly composed of sand with lesser contributions of fines and gravels. Along PL9 to Ninian Central, the pipeline travels through Deep circalittoral sand' (A5.27) habitat into Deep circalittoral mud (A5.37) before returning to Deep circalittoral sand at the Ninian Central location. The sediment type found throughout the Ninian Central Platform area generally showed low variation with mean diameters ranging from 113 µm to 176 µm and were classified as fine to very fine sands. Samples taken at the Heather cuttings pile contained a greater percentage of cohesive silt and drill cutting material, intermixed with coarse sediment and <i>Mytilus</i> shells. Annelid species made up 45.2% of the total infaunal species recovered, which is expected considering the sediment type. Within the limits of the cuttings pile, Nematoda dominated at all but one station. <i>mirabilis</i> and <i>Pennatula phosphorea</i> was observed. It was concluded that the UK BAP 'Seapen and burrowing megafauna communities' habitat was present at a number of stations in the surveyed area. A low diversity of epifauna was found across the project area due to the nature of the

Table 4.1.1: Environmental and Societal sensitivities

sediment which reduces attachment opportunities, however, survey imagery did identify evidence of bioturbation and burrowing megafauna communities. Additionally, the presence of seapen species such as Virgularia

Fish

The Heather pipelines are in an area of high concentration spawning for Norway pout. Cod, haddock, saithe, sandeel and whiting also use the area for spawning. Additionally, the project area is in a high nursery intensity area for blue whiting. The following species have nursery grounds near the project area: anglerfish; European hake; haddock; herring; ling; mackerel; Norway pout; spurdog; sandeel, and whiting.

Aires et al. provides modelled spatial representations of the predicted distribution of juvenile fish (less than one year old). The probability of juvenile aggregations of anglerfish, blue whiting, European hake, haddock, herring, mackerel, horse mackerel, Norway pout, plaice, sprat, and whiting occurring is very low.

Seabirds

The following species could be found within the project area: northern fulmar; razorbill; lesser black-backed gull; European storm-petrel; northern gannet; great skua; black-legged kittiwake; great black-backed gull; herring gull; common guillemot; little auk, and Atlantic puffin. The Seabird Oil Sensitivity Index identifies areas at sea where seabirds are likely to be most sensitive to surface pollution. Seabird sensitivity in Blocks 2/5, 3/1, 3/2 and 3/3 is low throughout the year.

Societal Receptors

Commercial Fisheries

Vessel Monitoring System data from 2009-2013 indicates that fishing intensity within Block 2/5 is low for shellfish species, moderate for pelagic species (mackerel/herring), and high for demersal species.

In 2020, fishing effort in International Council for the Exploration of the Sea ('ICES') rectangle 50F0 was highest in October, accounting for 18% of the total number of days fished, followed by the period running from August to November contributing for 51% of fishing effort. Fishing efforts for ICES rectangle 50F1 was highest in June and January, accounting for 26% of the total number of days fished, followed by the period running July to August contributing 23% of fishing effort. In September, November and December the effort was lower, accounting for 15% of the annual effort. Trawls were the most used gear in rectangle 50F0 accounting for 77% of the total number of days fished and 90% of the total number of days fished for in rectangle 50F1. Other gear type used include hooks and lines, seine nets and gill nets and entangling nets.

The five top landed species in rectangle 50F0 in 2020 in terms of weight included hake, saithe, mackerel, herring and whiting, while the top five landed species in rectangle 50F1 in 2020 in terms of weight included saithe, whiting, haddock, hake and cod.

Other Sea Users

Shipping activity is assessed to be 'low' in Blocks 2/5, 3/1, 3/2 and 3/3. There are seven third-party surface installations within 40 km of the Heather installation; the closest being the Cormorant Alpha platform operated by TAQA (18 km northeast of Heather).

The nearest active cable is located 105 km east of the Heather installation. There are some historic cables near the project location - though disused, sections of these cables may remain on the seabed. Blocks 2/5, 3/1, 3/2 and 3/3 are all in an area of concern to the Ministry of Defence as it lies within training ranges. There are no renewable energy sites within 100 km of the project area. The nearest wreck is located approximately 10 km north-east of the project area and is classified as 'non-dangerous'.

4.2 Potential environmental impacts and their management

An Environmental Appraisal has been prepared in accordance with the OPRED Decommissioning Guidance Notes [5] and Decom North Seas EA Guidelines for Offshore Oil and Gas Decommissioning [1]. The Environmental Appraisal focusses on the key issues related to the specific activities proposed and the narrative is proportionate to the scale of the project and the environmental sensitivities of the area.

The EA has been informed by several different processes, including the identification of potential environmental issues through project engineer and marine environmental specialist review in an Environmental Identification ('ENVID') screening workshop and consultation with key stakeholders.

The impact assessment screening identified ten potential impact areas based on the proposed EIS decommissioning activities:

- Atmospheric emissions
- Seabed disturbance
- Physical presence of infrastructure decommissioned *in situ*
- Physical presence of vessels in relation to other sea users
- Underwater noise
- Discharges to sea
- Resource use
- Waste
- Disturbance to nesting seabird; and,
- Accidental events.

Of these, two were taken forward for assessment based on the potential severity and/or likelihood of their respective environmental impact: seabed disturbance and physical presence of infrastructure decommissioned *in situ*.

- Impact on physical presence of infrastructure decommissioned *in situ*
- Seabed disturbance

The environmental impact assessment of these aspects is summarised below.

Impact on physical presence of infrastructure decommissioned *in situ*

Following full assessment of this aspect, taking into consideration fishing, vessel, and shipping activity within ICES Rectangle 50F0 and 50F1, along with industry and EnQuest mitigation measures, the overall assessment was reduced to 'Low'. While the Magnitude of this aspect could not be lowered, both Consequence (spatial extent) and Probability were reduced to 'Low'.

Seabed disturbance

Following full assessment of this aspect, taking into consideration the benthic environment, seabed characteristics, commercial fishing, relatively small size of disturbance area along with industry and EnQuest mitigation measures, the overall assessment was reduced to 'Low'. While the Probability of this aspect could not be lowered, both Magnitude and Frequency were reduced to 'Low'.

The Environmental Appraisal has considered the relevant Marine Plans, adopted by the UK and Scottish Governments to help ensure sustainable development of the marine area. EnQuest consider that the proposed decommissioning activities are in alignment with its objectives and policies.

Having reviewed the project activities within the wider regional context and taking into consideration the mitigation measures to limit any potential impacts, the findings of the

Environmental Appraisal conclude that the activities do not pose any significant threat to environmental or societal receptors within the UKCS.

There will be some planned environmental impacts arising from decommissioning of the Heather pipelines. Long-term environmental impacts from the decommissioning operations are expected to be low. Incremental cumulative impacts and trans-boundary effects associated with the planned decommissioning operations are also expected to be low.

For further details please refer Environmental Appraisal [4].

5. INTERESTED PARTY CONSULTATIONS

5.1 Consultation summary

Table 5.1.1 will be updated when the statutory consultation is completed.

Table 5.1.1: Summary of stakeholder comments		
Stakeholder	Comment	Response
GMG		
NFFO		
NIFPO		
SFF	A meeting was held with SFF 06 June 2022 where the outcome of the comparative assessment was presented and discussed.	In principle the SFF were supportive of the proposed outcome of the comparative assessment but would provide further and more formal comments in receipt of the formal documents issued for the Statutory Consultation. In addition, SFF expressed a more general concern over the degradation of concrete coated pipelines over the longer-term, presenting snag hazard for fishermen.
CONSULTATIONS		
Stakeholder	Comment	Response
GMG		
NFFO		
NIFPO		
SFF		
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 HSEA Policy and Principles.

6.2 Post-Decommissioning Debris Clearance and Verification

This Decommissioning Programme covers Heather pipelines PL9, PL9A, PL352 and the ESDV umbilical. Once the pipelines have been decommissioned, a post-decommissioning site survey will be carried out.

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 sections of pipeline within the 500 m safety zone. As the seabed is not in an environmentally sensitive area, where it is safe to do so, 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.

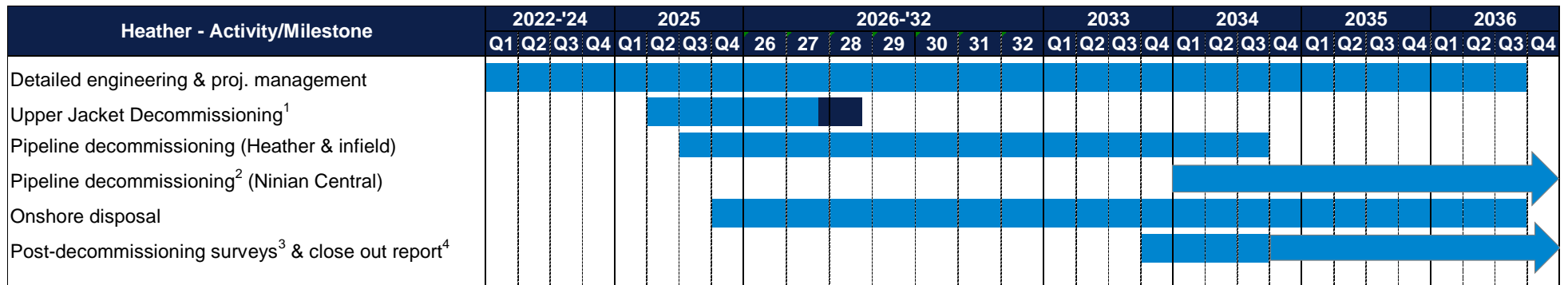
Any oil related debris that is found with the pipeline corridor will be recovered and returned to shore for recycling or appropriate disposal.

The post-decommissioning survey results will be notified to the UK Fisheries Offshore Oil and Gas Legacy Trust Fund Limited for inclusion in the FishSAFE System, and to the United Kingdom Hydrographic Office for notification and marking on Admiralty charts and notices to mariners.

6.3 Schedule

A proposed schedule is provided in Figure 6.3.1. The activities are subject to the acceptance of the Decommissioning Programme 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.



Notes / Key

Activity window extended as per NSTA strategy which aspires to combine multiple scopes in a single campaign;
 Activity window to allow commercial flexibility associated with well decommissioning and decommissioning activities;

1. Jacket & topsides' decommissioning subject to separate Decommissioning Programmes. The topsides' Decommissioning Programme was approved 22 July 2021;
2. Decommissioning activities at Ninian Central cannot be completed until the pipeline and umbilicals crossing over PL9 are out of use; decommissioning at Ninian Central will be carried out a later date in discussion and agreement with the respective operator;
3. Post decommissioning surveys to follow completion of decommissioning activities;
4. Close out report within 1 year of completion of offshore activities.

Figure 6.3.1: Gantt-chart of project plan

6.4 Interim Monitoring and Evaluation

The proposals in this pipeline Decommissioning Programme assume that the jacket footings will be left *in situ* as the Heather jacket is a candidate for derogation from the requirements of OSPAR Decision 98/3. EnQuest has already carried out a comparative assessment for the jacket in support of this approach. However, the application process is undergoing a pause while the regulatory process is reviewed, and this could take several years.

A separate Decommissioning Programme will be prepared for the upper jacket to provide certainty and allow it to be removed as part of the wider campaign of decommissioning work. The jacket footings will be subject to a separate Decommissioning Programme that will be submitted as part of the application to derogate from the requirements of OSPAR Decision 98/3.

All risers connected to the jacket footings will continue to be subjected to risk based Inspection, Repair and Maintenance campaigns to ensure that they do not pose a hazard to mariners.

If footings are removed, and parts of pipelines are no longer buried under drill cuttings, EnQuest will discuss and agree any action required with OPRED.

Monitoring of the pipelines will continue until the pipelines and ESDV umbilical are decommissioned at a frequency to be discussed and agreed with OPRED.

6.5 Costs

Decommissioning costs will be provided separately to OPRED.

6.6 Close Out

After the pipelines have been decommissioned, OPRED will be notified, and a decommissioning close out report will be submitted within 1 year following the completion of the offshore scope including debris removal and independent verification of seabed clearance and the first post-decommissioning environmental survey.

Any variances from the approved Decommissioning Programme will be explained in the close out report.

6.7 Post-decommissioning monitoring and evaluations

EnQuest will carry out a post-decommissioning environmental survey, centred on the Heather pipelines. A survey of the status of the pipelines and adjacent seabed will be undertaken at the end of the decommissioning activities. As it is proposed to leave the pipelines *in situ*, these will be subject to a monitoring programme agreed between EnQuest and OPRED.

A copy of the survey results will be provided to OPRED. After these have been reviewed, a future monitoring regime will be agreed by both parties and take account of ongoing liability, the status and findings of previous surveys and a risk-based approach to frequency and scope. The risk-based approach will cover the commitment that monitoring activities will continue until spans are found to no longer occur.

Residual liability for the pipeline will remain with the Section 29 holders identified in section 1.4. Unless agreed otherwise in advance with OPRED, EnQuest will remain the focal point for this including any change in ownership.

Once the wider Heather Area has been decommissioned the plans for legacy and liability management will be documented and described in more detail in the final close out report.

7. REFERENCES

- [1] Decom North Sea (2018). Environmental Appraisal Guidelines: Offshore Oil and Gas Decommissioning
- [2] EnQuest (2022) Heather Pipeline Comparative Assessment, M3524-ENQ-HEA-DN-0000-REP-0001
- [3] EnQuest (2021) Heather Alpha Topsides Decommissioning Programme, M3524-ENQ-HEA-DN-0000-REP-0007
- [4] EnQuest (2021) Heather Pipeline Decommissioning Environmental Appraisal, M3524-XOD-HEA-DN-0000-REP-0001
- [5] OPRED (2018) Guidance Notes, Decommissioning of Offshore Oil and Gas Installations and Pipelines under the Petroleum Act 1998, Version 6, Department of Business, Energy, and Industrial Strategy. Weblink last 19 May 2021: [OPRED Guidance Notes](#).

APPENDIX A PUBLIC NOTICE & CONSULTEE CORRESPONDENCE

Appendix A.1 Public Notices