CHRYSAOR

Decommissioning Programmes
LOGGS Satellites, LDP2

Mimas MN, Saturn ND, & Tethys TN & Associated Infield Pipelines

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Abbreviation	Explanation
3LPP	Three-layer polypropylene (coating)
AB	Deprecated term 'Abandoned' but included in document to indicate extent to which wells have been decommissioned (Phase 1, Phase 2, etc.)
ADJL	Adjacent seabed (as may be referred to in the pipeline burial profiles)
approaches	Refer to pipelines as they come nearer to the risers on the installations
BT	British Telecommunications plc
CA	Comparative Assessment (Report)
Chrysaor	Chrysaor Production (UK) Limited
CHS	Circular Hollow Section
Crossing	Pipeline crossing. A pipeline with a higher identification number crosses over the top of a pipeline with a lower identification number. Typically pipeline crossings might be protected with concrete mattresses and overlain with deposited rock
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.
CWC	Concrete Weight Coated
DBBV	Double Block and Bleed Valve arrangement, installed to allow safe isolation and connection or disconnection of pipework
DIA	Diameter (usually outside diameter)
DOC	The blue line on the burial profiles shows the profile of cover. The area between the blue line and maroon line (DOL) shows the depth of sediment above the top of the pipeline
DOL	Pipeline trench profile; depth of lowering to top of pipe
DP	Decommissioning Programme
EA	Environmental Appraisal
EL.	Elevation, usually relative to LAT
EMS	Environmental Management System
Exposed	Visible without protection and recognisable
Exposure	An exposure occurs when the 'crown' of a pipeline or umbilical can be seen. This does not generally mean it is a hazard
ESDV	Emergency Shutdown Valve
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)
FPAL	First Point Assessment Limited (UK)
Freespan	Refer "span"
Full removal	The full removal options for decommissioning the pipelines would involve using the 'cut and lift' method of removal especially for the larger pipeline and the presence of concrete weight coating and piggyback clamps on the platform approaches
GMG	Global Marine Group
HLV	Heavy Lift Vessel
HSE	Health & Safety Executive
Inline Tee	Section of pipeline furnished with additional valves and pipework to allow for the connection of other pipelines. It is typically furnished with a protection structure and protection and stabilisation features such as mattresses and deposited rock
JNCC	Joint Nature Conservation Committee
JUWB	Jack Up Work Barge
kg	kilogram
km	kilometre
KP	Kilometre Point, usually measured from point of origin, the start of the pipeline
LAT	Lowest Astronomical Tide
Leave *in situ*	Leave *in situ* for pipelines would involve leaving trenched and buried pipelines in situ and risk assessing any exposures and spans
LOGGS	Lincolnshire Offshore Gas Gathering System

Abbreviation	Explanation
LOGGS Installation	The LOGGS Installation comprises LOGGS PA, PC, PP, PR, and North Valiant PD. All installations are bridge linked.
LOGGS PA	LOGGS PA Accommodation Platform
LOGGS PC	LOGGS PC Compression Platform
LOGGS PP	LOGGS PP Processing Platform
LOGGS PR	LOGGS PR Riser Platform
m	metres
MAT, SAT	Master Application Template, Supplementary Application Template
MCV	Monohulled Crane Vessel
MCZ	Marine Conservation Zone
MEG	Monoethylene Glycol
MeOH	Methanol
Mimas MN	Installation comprising small topsides and lightweight jacket held in location using 3x piles
n/a	Not Applicable
N,S,E,W	North, South East & West
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers Organisation
NORM	Naturally Occurring Radioactive Material
North Valiant PD	North Valiant (1) PD Platform, bridge linked to LOGGS PP
NTS	Not to Scale
NUI	Normally Unattended Installation
OGA	Oil and Gas Authority
OGUK	Oil and Gas United Kingdom
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	Oslo-Paris Convention
Partial removal	The partial removal decommissioning option for pipelines would involve excavating trenched and buried pipelines local to the exposed ends of the pipeline and thereafter effecting removal of the section of pipeline using the 'cut and lift' method. Typically, the excavated locations and cut pipeline ends in the seabed may need to be remediated in some way, either by back-filling the excavated material or by depositing rock
Piggybacked	Pipeline clamped or connected to another pipeline along its length
Pipeline crossing	A pipeline with a higher identification number crosses over the top of a pipeline with a lower identification number. Typically, pipeline crossings might be protected with concrete mattresses and overlain with deposited rock
PL	Pipeline identification numbers
Platform	Installation, typically comprising topsides and jacket
PON	Petroleum Operations Notice
PWA	Pipeline Works Authorisation
Riser	Pipe that connects the pipeline to the topsides' pipework
SAC	Special Areas of Conservation
SAT	Subsidiary Application Template
Saturn ND	Installation, comprising small topsides and lightweight jacket held in location using 4x piles
Saturn Inline Tee	The Saturn Inline Tee is referred to as the Saturn Inline Tee in the PWA for PL2107 and PL2018, whereas it is referred to as the Tethys Tee in the PWA for PL2234 and PL2235, When referred to in the PWA the Tethys Tee and Saturn Inline Tee are one and the same.
Saturn Area Satellites	Collectively and including Mimas MN, Saturn ND & Tethys TN installations
SFF	Scottish Fishermen's Federation
Shell	Shell U.K. Exploration & Production Limited
SLV	Shear Leg Vessel
SNS	Southern North Sea
SPA	Special Protection Area
Span	Sometimes referred to as a 'freespan'. 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

Abbreviation	Explanation
	reportable span
Spirit Energy	Spirit Energy North Sea Limited
SSCV	Semi-Submersible Crane Vessel
Te	Tonne(s)
Tethys Tee	The Tethys Tee is referred to as the Tethys Tee in the PWA for PL2234 and PL2235, whereas it is referred to as the Saturn Inline Tee in the PWA for PL2107 and PL2018. In the respective PWAs the Tethys Tee and Saturn Inline Tee are one and the same.
Tethys TN	Installation comprising small topsides and lightweight jacket held in location using 3x piles
Template	Protection structure that typically contains wellheads, pipe manifolds, valves, and pipework
TGT	Theddlethorpe Gas Terminal (WGS84 Degrees: 53.362438° N .237783° E)
TOP	Top of Pipe
Trenched and buried	Pipeline installed into a trench and covered in seabed sediment. Refer Figure 1.1.1.
TYP.	Typical
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
UNO	Unless Noted Otherwise
UTM	Universal Transverse Mercator (Coordinate System)
V-fields	Collectively along with the Vulcan (2) UR installation, Vanguard QD, North Valiant (2) SP, South Valiant TD & Vulcan (1) RD are known as the V-fields satellites
WGS84	World Geodetic System 84 is the reference coordinate system used by the Global Positioning System
WHPS	Wellhead Protection Structure
x	Number of (e.g. 16x = 16 in Number)

Figure 1.1.1: The difference between pipeline burial, exposures, and spans[1]

[1] Trench walls may or may not be prominent

1 Executive Summary

1.1 Combined Decommissioning Programmes

This document contains six Decommissioning Programmes, one for each set of notices under Section 29 of the Petroleum Act 1998. The Decommissioning Programmes are:

- Mimas MN installation;
- Mimas MN associated pipelines PL2236 and PL2237;
- Saturn ND installation;
- Saturn ND associated pipelines PL2107 and PL2108;
- Tethys TN installation;
- Tethys TN associated pipelines PL2234 and PL2235.

Collectively the Mimas MN, Saturn ND and Tethys TN installations are known as the LOGGS' Saturn satellites. Although decommissioning of these installations and pipelines is being treated in this document as a standalone project, the operational phase is being carried out as part of a wider decommissioning campaign in the LOGGS area. Chrysaor Production (U.K.) Limited (Chrysaor) shall also continue to explore cost saving synergies with other projects.

1.2 Requirement for Decommissioning Programmes

Installations: In accordance with the Petroleum Act 1998, Chrysaor as operator of the Mimas MN, Saturn ND and Tethys TN Installations, and on behalf of the Section 29 notice holders (Table 1.4.2, Table 1.4.3 and Table 1.4.4), is applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for decommissioning the installations detailed in Section 2 of this document. Partner Letters of Support will be added to the Decommissioning Programmes following statutory consultation.

Pipelines: In accordance with the Petroleum Act 1998, Chrysaor as operator of the Mimas MN, Saturn ND and Tethys TN pipelines, and on behalf of the Section 29 notice holders (Table 1.4.6, Table 1.4.8 and Table 1.4.10), is applying to OPRED to obtain approval for decommissioning the pipelines detailed in Section 2 of this document. Partner Letters of Support will be added to the Decommissioning Programmes following statutory consultation.

In conjunction with public, stakeholder and regulatory consultation, the Decommissioning Programmes are submitted in compliance with national and international regulations and OPRED guidance notes. Partner Letters of Support will be provided directly to OPRED. The schedule outlined in this document is for a decommissioning project which commenced with the pipeline flushing and preparation for removal of the installations from an Accommodation Work Vessel in 2018. Well decommissioning is currently scheduled to commence at the earliest in 2021 and offshore decommissioning activities will continue for a further 7 years until completion by end of 2028.

1.3 Introduction

1.3.1 Overview of LOGGS

Chrysaor's Lincolnshire Offshore Gas Gathering System (LOGGS) was originally developed to process and transport gas from four fields: Vulcan, North and South Valiant and Vanguard, collectively known as the V-fields. Since the initial development, additional Chrysaor fields Jupiter (Ganymede, Europa, Callisto, NW Bell), Vampire, Viscount and Saturn (Saturn, Mimas, and Tethys) were added to the system.

LOGGS comprises a central complex, known as the LOGGS Installation - including the LOGGS PR Riser Platform, LOGGS PC Compression Platform, LOGGS PP Process Platform, LOGGS PA Accommodation Platform, and North Valiant (1) PD Wellhead Platform, and the products from the V-fields and the Saturn satellites used to be imported to the installation. The collected products used to be exported from the LOGGS Installation via PL454, a 36" trunkline to the Theddlethorpe Gas Terminal. Methanol and chemicals used to be imported at LOGGS PP from Theddlethorpe via PL455, a 4" pipeline, and relayed to Saturn via PL2108, a 3" pipeline.

The Jupiter field installations and associated pipelines are addressed in LDP3 & LDP3b Decommissioning Programmes that were approved in May and April 2020, respectively. The Vulcan UR, Vampire OD and Viscount VO installations and associated pipelines are addressed in LDP1 Decommissioning Programmes that were approved in November 2017. The V-fields installations and associated pipelines are addressed in LDP4 Decommissioning Programmes, while the LOGGS Installation and associated pipelines are addressed in LDP5 Decommissioning Programmes. Both sets of Decommissioning programmes are being submitted separately [1], [2].

1.3.2 Mimas MN

Mimas is located in UKCS Block: 48/9a ~13.5 kilometres northwest of the Saturn platform and 55km north-north-west of LOGGS Installation in a water depth ~28.2m.

It was developed using a single installation, Mimas MN. The field first achieved production in 2007. The installation is a normally unattended installation (NUI) and was controlled remotely from the LOGGS installation. The substructure comprises a 3-leg piled steel tower of the 'Sea Harvester' type platform with two well slots. Gas from the Mimas MN installation used to be exported to Saturn ND using PL2236, a 10" concrete coated pipeline. This pipeline is piggybacked by PL2237, a 3" pipeline that used to supply methanol and chemicals to Mimas MN from Saturn ND. The Cessation of Production justification for Mimas was accepted by the Oil and Gas Authority on 16 January 2018.

1.3.3 Saturn ND

Saturn is located in UKCS Blocks 48/10a and 48/10b ~43km northwest of the LOGGS installation in a water depth ~26.2m.

It was developed using a single installation, Saturn ND. The field first achieved production in September 2005. The installation is a 4-slot NUI and was controlled remotely from the LOGGS installation. The substructure comprises a four-leg Vierendeel tower of the 'Sea Harvester' type wellhead platform with four well slots. Gas from Mimas MN installation used to be imported to Saturn ND via PL2236 and Saturn ND used to supply Mimas MN with methanol via PL2237. Gas from Saturn ND and Mimas MN used to be exported using PL2107, a 14" concrete coated pipeline. This pipeline is piggybacked by PL2108, a 3" pipeline that used to supply methanol and chemicals from LOGGS PR. The Saturn (and Mimas) export gas used to comingle with the gas from Tethys TN at the Saturn Inline Tee on the way to LOGGS PR. The Cessation of Production justification for Saturn was accepted by the Oil and Gas Authority on 13 April 2018.

1.3.4 Tethys TN

Tethys is located in UKCS Blocks 49/11b, 48/10a and 48/15c approximately ~30km northwest of the LOGGS installation and ~13km southeast of the Saturn field in a water depth ~30.7m.

It was developed using a single installation, Tethys TN. The field achieved first production in 2007. The installation is a normally unattended installation (NUI) and was controlled remotely from the LOGGS installation. The substructure comprises a 3-leg piled steel tower of the 'Sea Harvester' type platform with two well slots. Gas from the Tethys TN installation used to be exported to the Saturn Inline Tee using PL2234, a 10" concrete coated pipeline. This pipeline is piggybacked by PL2235, a 3" pipeline that used to supply methanol and chemicals from LOGGS PR via the Saturn Inline Tee. From the Saturn Inline Tee, the gas is transported via PL2107- the 14" gas export pipeline from Saturn ND, to LOGGS PR. On approach to the Saturn Inline Tee the Tethys pipelines are each furnished with a double block and bleed valve (DBBV) arrangement and a protection frame. This allows the pipelines to be isolated from the Saturn Inline Tee. The Cessation of Production justification for Tethys was accepted by the Oil and Gas Authority on 17 November 2017.

1.3.5 Submission of Decommissioning Programmes

Following public, stakeholder and regulatory consultation, the Decommissioning Programmes will be submitted without derogation and in full compliance with the OPRED guidance notes [9]. The Decommissioning Programmes explain the principles of the removal activities and are supported by an Environmental Appraisal [3]. The Decommissioning Programmes for the pipelines are also supported by a Comparative Assessment [4].

1.4 Decommissioning Overview

1.4.1 Installations

Table 1.4.1 Installations Being Decommissioned

Field Names		Quad / Block		Surface Installations					Distances	
Fields	Water Depth	Type of Production	UKCS Block(s)	Number	Function	Type	Topsides Weight (Te)	Jacket Weight (Te)[2]	Distance to Median (Netherlands)	Distance from nearest UK coastline
Mimas MN	~28.2m	Gas, Condensate	48/9a	1	Wellhead Platform	Steel Tower (3-Legs)	277.1	431.6	~79.2km	~106.1km
Saturn ND	~26.2m	Gas, Condensate	48/10a & 48/10b	1	Wellhead Platform	Steel Tower (4-Legs)	422.8	664.5	~66.8km	~116.8km
Tethys TN	~30.7m	Gas, Condensate	48/10a, 48/15c & 49/11b	1	Wellhead Platform	Steel Tower (3-Legs)	271.1	515.6	~61.1km	~123.7km

Drill Cuttings			Subsea Installations		Number of Wells	
Field	Drill Cuttings Pile(s)	Total Estimated Volume (m^3)	Number	Type	Platform	Subsea
Mimas MN	n/a	n/a	n/a	n/a	1	n/a
Saturn ND	n/a	n/a	n/a	n/a	4	n/a
Tethys TN	n/a	n/a	n/a	n/a	1	n/a

[2] Includes nominal weight for marine growth and includes weight of piles.

Table 1.4.2: Installation Section 29 Notice Holders Details – Mimas MN		
Section 29 Notice Holders	**Registration Number**	**Equity Interest**
Chrysaor Production (U.K.) Limited (Operator)	00524868	35.0%
Ineos UK SNS Limited	01021338	50.0%
Spirit Energy North Sea Limited	04594558	15.0%
Spirit North Sea Gas Limited	SC182822	0.0%

Table 1.4.3: Installation Section 29 Notice Holders Details – Saturn ND		
Section 29 Notice Holders	**Registration Number**	**Equity Interest**
Chrysaor Production (U.K.) Limited (Operator)	00524868	42.9%
Ineos UK SNS Limited	01021338	35.1%
Spirit Energy North Sea Limited	04594558	22.0%
Spirit North Sea Gas Limited	SC182822	0.0%

Table 1.4.4: Installation Section 29 Notice Holders Details – Tethys TN		
Section 29 Notice Holders	**Registration Number**	**Equity Interest**
Chrysaor Production (U.K.) Limited (Operator)	00524868	25.0%
Ineos UK SNS Limited	01021338	75.0%

1.4.2 Pipelines

Table 1.4.5: Pipelines Being Decommissioned		
Field	**Number of Pipelines**	
Mimas MN	2	Refer Table 2.2.1

Table 1.4.6: Pipeline Section 29 Notice Holders Details – Mimas MN Pipelines		
Section 29 Notice Holders	**Registration Number**	**Equity Interest**
Chrysaor Production (U.K.) Limited (Operator)	00524868	35.0%
Ineos UK SNS Limited	01021338	50.0%
Spirit Energy North Sea Limited	04594558	15.0%
Spirit North Sea Gas Limited	SC182822	0.0%

Table 1.4.7: Pipelines Being Decommissioned		
Field	**Number of Pipelines**	
Saturn ND	2	Refer Table 2.2.1

Table 1.4.8: Pipeline Section 29 Notice Holders Details – Saturn ND Pipelines		
Section 29 Notice Holders	**Registration Number**	**Equity Interest**
Chrysaor Production (U.K.) Limited (Operator)	00524868	42.9%
Ineos UK SNS Limited	01021338	35.1%
Spirit Energy North Sea Limited	04594558	22.0%
Spirit North Sea Gas Limited	SC182822	0.0%

Table 1.4.9: Pipelines Being Decommissioned		
Field	**Number of Pipelines**	
Tethys TN	2	Refer Table 2.2.1

Table 1.4.10: Pipeline Section 29 Notice Holders Details – Tethys TN Pipelines		
Section 29 Notice Holders	**Registration Number**	**Equity Interest**
Chrysaor Production (U.K.) Limited (Operator)	00524868	25.0%
Ineos UK SNS Limited	01021338	75.0%

1.5 Summary of Proposed Decommissioning Programmes

Table 1.5.1: Summary of Decommissioning Programmes	
Proposed Decommissioning Solution	**Reason for Selection**
1. Topsides (Mimas MN, Saturn ND, and Tethys TN)	
Complete removal and recycling. The topsides will be removed and recovered to shore and recycled. Environmental permit applications required for work associated with removal of the topsides will be applied for.	Allows jacket to be removed and maximises recycling of materials.
2. Jackets (Mimas MN, Saturn ND, and Tethys TN)	
Complete removal and recycling. The leg piles will be cut 3.0m below seabed and the jackets will be removed and recovered to shore for recycling. Environmental permit applications required for work associated with removal of the jackets will be applied for.	To comply with OSPAR requirements leaving unobstructed seabed. Removes a potential obstruction to fishing operations and maximises recycling of materials.
3. Pipelines (Mimas MN, Saturn ND, and Tethys TN)	
All pipelines (PL2107, PL2108, PL2234, PL2235, PL2236 and PL2237) have been flushed and will be left buried *in situ*. On approach to the Mimas MN, Saturn ND, Tethys TN and LOGGS PR installations the exposed pipeline ends will be cut where they enter burial and removed. Up to 25Te of rock will be deposited to bury each cut pipeline end, although the amount used will be kept to a practical minimum. Any rock deposits will be overtrawlable by design. The pipeline risers will be fully recovered along with the jackets. The Saturn Inline Tee and Tethys DBBV arrangements and associated local protection features will be completely removed. Other pipeline stabilisation materials such as scour protection concrete mattresses, fronded mattresses, and any grout bags that are buried will be left *in situ*. Exposed grout bags will be removed to shore. Any permit applications required for work associated with pipeline cutting and removal will be submitted.	Outside the 500m safety zones the pipelines will already have been exposed to fishing activity. Most of the pipeline lengths are sufficiently buried and stable. Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in the activity. Historically, all the exposures for piggybacked pipelines PL2107 & PL2108, PL2234 & PL2235 and PL2236 & PL2237 have been found on the final approaches. Should they still exist, they will be removed at the same time as the pipeline ends. Reduces the requirement for the introduction of new material such as deposited rock to the North Norfolk Sandbanks and Saturn Reef Special Area of Conservation (SAC) or the Southern North Sea SAC. Monitoring to confirm the pipelines remain buried will be completed to a schedule agreed with OPRED.
4.Well Decommissioning (Mimas MN, Saturn ND, and Tethys TN)	
All wells will be decommissioned in accordance with the latest version of Oil & Gas UK Well Decommissioning Guidelines and in compliance with HSE "Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996".	Meets the OGA and HSE regulatory requirements.
5. Drill Cuttings (Mimas MN, Saturn ND, and Tethys TN)	
N/A	No drill cuttings piles have been identified by seabed survey.
6. Interdependencies	
The whole of the three installations will be removed. The piles will be cut with seabed sediment being displaced to allow access for cutting. No third-party pipeline crossings will be disturbed as a result of the decommissioning proposals. Notwithstanding the above, any concrete mattresses and grout bags that are removed to gain access to	

Table 1.5.1: Summary of Decommissioning Programmes	
Proposed Decommissioning Solution	**Reason for Selection**
infrastructure will be removed. Those protection and stabilisation features that are buried or not disturbed and still serving a purpose will remain *in situ*. Deposited rock will remain *in situ*.	

1.6 Field Location including Field Layout and Adjacent Facilities

Figure 1.6.1: Location of LOGGS Satellite Installations in UKCS

Figure 1.6.2: Layout of LOGGS' Saturn Satellite Installations in relation to LOGGS Installation

Table 1.6.1: List of Adjacent Facilities							
Owner	**Name**	**Type**	**Direction & Distance from Mimas MN**	**Direction & Distance from Saturn ND**	**Direction & Distance from Tethys TN**	**Information**	**Status**
Spirit Energy	Ann	Subsea Template	E, 30.9km	E, 17.9km	NE, 10.2km	DP Approved April 2018	Out of use
Spirit Energy	Alison	Subsea Template	ESE, 41.6km	SE, 30km	SE, 17.4km	DP Approved April 2018	Out of use
Spirit Energy	Audrey A (WD)	Fixed Steel Jacket	SE, 32.1km	SSE, 22km	S, 12.7km	DP Approved April 2018	Out of use
Spirit Energy	Audrey B (XW)	Fixed Steel Jacket	SE, 27.8km	SSE, 18.1km	SSW, 10.9km	DP Approved April 2018	Out of use
Spirit Energy	Saturn (Annabel)	Manifold	ESE, 16.9km	SSE, 5.2km	W, 9.5km	DP Approved April 2018	Out of use
Shell	Galleon PN	Fixed Steel Jacket	SSE, 34.7km	SSE, 27.9km	SSW, 22km		Operational
Chrysaor	Mimas MN	Fixed Steel Jacket	n/a	W, 13.3km	NWW, 26.3km	Subject of this DP	Out of use
Chrysaor	Saturn ND	Fixed Steel Jacket	E, 13.3km	n/a	NWW, 13.4km	Subject of this DP	Out of use
Chrysaor	Tethys TN	Fixed Steel Jacket	ESE, 26.3km	ESE, 13.4km	n/a	Subject of this DP	Out of use
Chrysaor	Tethys Tee, Saturn Inline Tee	Pipeline Tee Protection Structure	ESE, 26.7km	SE, 14.7km	SSW, 3.9km	Subject of this DP	Out of use
Unknown (formerly BT)	Northsea Offshore Cable No. 1	Telecoms Cable	ESE, 50.4km	SE, 38.8km	SE, 26.1km	PL2107 & PL2108 cross over Weybourne to ACMI MASTER at ~KP10.7	Out of use
Spirit Energy	PL948 Ann control umbilical	Umbilical	ESE, 24.5km	SE, 12.4km	SW, 3.6km	PL2107 & PL2108 cross over PL948 at ~KP12.7	Out of use
Shell	PL1967 20" Carrack QA to Clipper PR gas export pipeline and Clipper PR to Carrack QA PL1968 4" MEG pipeline	Pipeline	ESE, 27.9km	SE, 16km	S, 4.8km	PL2107 & PL2108 cross over PL1967 & PL1968 at ~KP16.4	Operational
Spirit Energy	PL1099, the Audrey B (XW) to Alison control umbilical. The pipeline is out of use	Umbilical	SE, 35.5km	SE, 24.4km	SSE, 13km	PL2107 & PL2108 cross over PL1099 at ~KP25.3	Out of use
Chrysaor	PL27, the Viking AR to TGT Trunk Pipeline and PL161, the 3" MeOH pipeline from TGT to	Pipeline	SE, 39.3km	SSE, 30km	S, 20.4km	PL2107 & PL2108 cross over PL27 & PL161 at ~KP33.6	Out of use

Table 1.6.1: List of Adjacent Facilities							
Owner	**Name**	**Type**	**Direction & Distance from Mimas MN**	**Direction & Distance from Saturn ND**	**Direction & Distance from Tethys TN**	**Information**	**Status**
	Viking						
Spirit Energy	PL496, the Audrey A (WD) to LOGGS PP gas export pipeline and PL497, the 2" LOGGS PP to Audrey A (WD) MeOH pipeline	Pipeline	SE, 45.5km	SSE, 37.5km	S, 28.8km	PL2107 & PL2108 cross over PL496 & PL497 at ~KP42.2	Out of use
Chrysaor	PL454, the LOGGS PP to TGT gas export trunk pipeline and PL455 the TGT to LOGGS PP MeOH pipeline	Pipeline	SE, 45.7km	SSE, 37.7km	S, 29.1km	PL2107 & PL2108 cross over PL454 & PL455 at ~KP42.7	Out of use
Ineos UK SNS	PL2810 12" Clipper South to LOGGS pipeline	Pipeline	SE, 44.2km	SSE, 36.6km	S, 28.5km	Pipeline crossing over PL454 & PL455	Out of use
Ineos UK SNS	PL2810 12" Clipper South to LOGGS pipeline	Pipeline	SE, 55.6km	SSE, 47km	SSE, 36.9km	At LOGGS. Disconnected at LOGGS	Out of use
Impacts of Decommissioning Proposals							
No impact is expected.							

Figure 1.6.3: Adjacent Facilities in relation to non-oil and gas features and infrastructure)

Figure 1.6.4: Adjacent Facilities (LOGGS' Saturn area satellite installations and pipelines in green)

1.7 Industrial Implications

Principles of the contracting and procurement strategies to be utilised by Chrysaor as operator and on behalf of the other Section 29 notice holders, for the decommissioning of the LOGGS Satellite installations (Mimas MN, Saturn ND, and Tethys TN) and associated pipelines are listed below:

1) Chrysaor participates in the PILOT Share Fair events providing one-to-one sessions with the UK supply chain on the SNS decommissioning programmes and timeline.
2) The First Point Assessment (FPAL) database is the primary source for establishing tender lists for contracts or purchases valued at US$ 100,000 and above, although it is also used under this limit.
3) Chrysaor is committed to competitively bidding all its major contracts where possible and practicable. We are supporters of the UK Supply Chain Code of Practice and our performance in this regard has been acknowledged through Excellence Awards from Oil & Gas UK.
4) Chrysaor are active participants in various industry initiatives including:
    a. Oil & Gas UK Supply Chain Forum;
    b. Inventory sharing initiative (Ampelius);
    c. OGA Decommissioning Board - Supply Chain sub-group.

2 Description of Items to be Decommissioned

2.1 Surface Facilities (Topsides and Jackets)

Table 2.1.1: Surface Facilities Information

Name	Facility Type	Location	Topsides / Facilities		Jacket (if applicable)		
		WGS84 Decimal WGS84 Decimal Minute	Weight (Te)	No of modules	Weight (Te)	No of Legs, Piles	Weight of piles (Te)
Mimas MN	Fixed Steel Jacket	53.762930° N 1.706020° E 53° 45.7758' N 01° 42.3612' E	277.1	1	325.5	3, 3	106.1
Saturn ND	Fixed Steel Jacket	53.725097° N 1.897642° E 53° 43.5058' N 01° 53.8585' E	422.8	1	508.8	4, 4	155.7
Tethys TN	Fixed Steel Jacket	53.650833° N 2.057563° E 53° 39.0500' N 02° 3.4538' E	271.1	1	386.4	3, 3	129.2

Figure 2.1.1: Photograph of the Mimas MN Installation

Figure 2.1.2: Photograph of the Saturn ND Installation

Figure 2.1.3: Photograph of Tethys TN Installation

2.2 Pipelines Including Stabilisation Features

Table 2.2.1: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline No (as per PWA)**	**Diameter (inches)**	**Length (km)[2,3]**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status[1]**	**Pipeline Status**	**Current Content**
14" Gas Export Pipeline	PL2107	14in	43.240	FBE coated steel pipeline with CWC for most of its length, tie-in pipespools coated with 3LPP	Natural gas, condensate, water	ESDV on Saturn ND to LOGGS PR ESDV via Saturn Inline Tee	Trenched and buried with exposures (total ~14m)	Out of Use	Seawater
3" Methanol import Pipeline	PL2108	3in	43.250	3LPP coated steel pipeline	Methanol and corrosion inhibitor	ESDV on LOGGS PR to ESDV on Saturn ND	Trenched and buried, piggybacked to PL2107	Out of Use	Seawater
10" Gas Export Pipeline	PL2234	10in	3.877	FBE coated steel pipeline with CWC for most of its length, tie-in pipespools coated with 3LPP	Natural gas, condensate, water	ESDV on Tethys TN to pipeline flange at Saturn Inline Tee	Trenched and buried with exposures (total ~18m)	Out of Use	Seawater
3" Methanol import Pipeline	PL2235	3in	3.878	3LPP coated steel pipeline	Methanol and corrosion inhibitor	From pipeline flange at Saturn Inline Tee to ESDV on Tethys TN	Trenched and buried, piggybacked to PL2234	Out of Use	Seawater
10" Gas Export Pipeline	PL2236	10in	13.673	FBE coated steel pipeline with CWC for most of its length, tie-in pipespools coated with 3LPP	Natural gas, condensate, water	ESDV on Mimas MN to ESDV on Saturn ND	Trenched and buried with exposures (total ~7m)	Out of Use	Seawater

Table 2.2.1: Pipeline / Flowline / Umbilical Information									
Description	**Pipeline No (as per PWA)**	**Diameter (inches)**	**Length (km)[2,3]**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status[1]**	**Pipeline Status**	**Current Content**
3" Methanol import Pipeline	PL2237	3in	13.606	3LPP coated steel pipeline	Methanol and corrosion inhibitor	ESDV on Saturn ND to ESDV on Mimas MN	Trenched and buried, piggybacked to PL2236	Out of Use	Seawater

NOTES:

1. Refer Appendix 1 for burial profiles and historical information concerning exposures and freespans. The lengths quoted here are the longest found an any of the surveys conducted, and all exposures and spans have been found on the final approaches; none have been found on the infield sections of the pipelines. For pipeline crossings refer Table 2.2.2;
2. PL2107 & PL2108 incorporate the Saturn Inline Tee. The Saturn Inline Tee is referred to as the 'Saturn Inline Tee' in the PWA for PL2107 and PL2018, whereas it is referred to as the 'Tethys Tee' in the PWA for PL2234 and PL2235; when referred to in the PWA, the Tethys Tee and Saturn Inline Tee are one and the same;
3. Pipeline crossing information is contained in Table 2.2.2.

Table 2.2.2: Pipeline Crossing Information				
ID No.	**Pipeline Description**	**KP**	**Protection**	**Comment**
1	PL2107 & PL2108 cross over the Weybourne to ACMI MASTER. This old BT cable is also known as Northsea Offshore Cable No. 1 and is out of use	~10.7	3x concrete mattresses most of which are overlain with deposited rock	This cable no longer operational.
2	PL2107 & PL2108 cross over PL948, the Audrey B (XW) to Ann control umbilical. The pipeline is out of use	~12.7	7x concrete mattresses most of which are overlain with deposited rock	The Decommissioning Programme for PL948 was approved April 2018. PL948 is being left *in situ*.
3	PL2107 & PL2108 cross over PL1967 20" Carrack QA to Clipper PR gas export pipeline and Clipper PR to Carrack QA PL1968 4" MEG pipeline	~16.4	16x concrete mattresses overlain with deposited rock	PL1967 & PL1968 remain operational. Refer Table 1.6.1. The expectation is that the pipeline crossing would remain *in situ* once PL1967 and PL1968 are decommissioned, but this will be confirmed with the pipeline owners. The decommissioning proposals for this pipeline crossing will be revisited when the owners of the crossed pipelines submit their decommissioning proposals for OPRED for

Table 2.2.2: Pipeline Crossing Information				
ID No.	**Pipeline Description**	**KP**	**Protection**	**Comment**
				consideration and eventual approval.
4	PL2107 & PL2108 cross over PL1099, the Audrey B (XW) to Alison control umbilical. The pipeline is out of use	~25.3	7x concrete mattresses most of which are overlain with deposited rock	The Decommissioning Programme for PL1099 was approved April 2018. PL1099 is being left *in situ*. where it is crossed by PL2107 & PL2108.
5	PL2107 & PL2108 cross over PL27, the Viking AR to TGT Trunk Pipeline and PL161, the 3" MeOH pipeline from TGT to Viking. Both pipelines are out of use	~33.6	3x concrete mattresses most of which are overlain with deposited rock	The Decommissioning Programme for PL27 was approved January 2019. PL27 is being left *in situ*.
6	PL2107 & PL2108 crossover PL496, the Audrey A (WD) to LOGGS PP gas export pipeline and PL497, the 2" LOGGS PP to Audrey A (WD) MeOH pipeline	~42.2	7x concrete mattresses most of which are overlain with deposited rock	The Decommissioning Programme for PL496 and PL497 was approved April 2018. Both pipelines are being left *in situ*.
7	PL2107 & PL2108 crossover PL454, the LOGGS PP to TGT gas export trunk pipeline and PL455 the TGT to LOGGS PP MeOH pipeline	~42.7	3x concrete mattresses most of which are overlain with deposited rock	The Decommissioning Programme for PL454 and PL455 was approved April 2021. Both pipelines are being left *in situ*.

NOTES:

1. A higher PL crosses over the top of a pipeline with a lower PL. For example, PL2107 & PL2108 would be crossing over PL27 and PL161;
2. All materials associated with these pipeline crossings – as identified in Table 3.5.1, will be left *in situ*, undisturbed.

Figure 2.2.1: Pipeline Crossing PL2107 & PL2108 over Northsea Cable No. 1

Figure 2.2.2: Pipeline Crossing PL2107 & PL2108 over PL948

Figure 2.2.3: Pipeline Crossing PL2107 & PL2108 over PL1967 & PL1968

Figure 2.2.4: Pipeline Crossing PL2107 & PL2108 over PL1099

Figure 2.2.5: Pipeline Crossing PL2107 & PL2108 over PL27 & PL161

Figure 2.2.6: Pipeline Crossing PL2107 & PL2108 over PL496 & PL497

Figure 2.2.7: Pipeline Crossing PL2107 & PL2108 over PL454 & PL455

Figure 2.2.8: Mimas MN Pipeline Approaches

Figure 2.2.9: Saturn ND Pipeline Approaches

Figure 2.2.10: Saturn Inline Tee, Tethys Tee Pipeline Approaches

Figure 2.2.11: Tethys TN Pipeline Approaches

Figure 2.2.12: LOGGS PR Pipeline Approaches with PL2107 & PL2108

Figure 2.2.13: Saturn Inline Tee, Tethys Tee Approach – 3in DBBV & protection

Figure 2.2.14: Saturn Inline Tee, Tethys Tee Approach – 10in DBBV & protection

Figure 2.2.15: Saturn Inline Tee, Tethys Tee Protection Details

Table 2.2.3: Subsea Structures and Stabilisation Features					
Feature	**Total Number**	**Size/Weight (Te)**	**Location(s) WGS84 Decimal**	**Locations(s) WGS84 Decimal Minute**	**Comments / Status**
Saturn Inline Tee	1	W x L x H 1.4m x 7.5m x 1.7m 73.2Te	53.619592° N 2.031645° E	53.762930° N 1.706020° E	Includes mass of pipe supports within the frame. Clamped to PL2107, protected by 4x concrete blocks and deposited rock.
10in DBBV Protection Structure	1	W x L x H 1.7m x 3m x 1.0m 71.1	Approx. 53.619592° N 2.031645° E	53.762930° N 1.706020° E	Clamped to PL2234 and protected by concrete mattress.
3in DBBV Protection Structure	1	W x L x H 0.6m x 1.7m x 0.5m 71.1	Approx. 53.619592° N 2.031645° E	Approx. 53.762930° N 1.706020° E	Believed clamped to PL2235 and protected by a concrete mattress.
Concrete blocks	4	156.6	Saturn Inline Tee protection. Refer Figure 2.2.15		Two types: 2x36.3Te & 2x42.0Te, sitting on top of a number of foundation mattresses.
Concrete mattresses[1]	12	108.4	Saturn Inline Tee protection. Figure 2.2.10 & Figure 2.2.15		Excludes 3x temporary mattresses on top of the roof of the protection structure.
	2	31.0	10m x 3m x 0.15m. Tethys 10in & 3in DBBV protection Figure 2.2.10, Figure 2.2.13 & Figure 2.2.14		Estimated. On top of DBBV protection structures.
Grout bags, 25kg, 1Te	180 4	8.6	Saturn Inline Tee protection. Refer Figure 2.2.10 & Figure 2.2.15		Estimate. 180x 25kg grout bags in-between and around foundation concrete mattresses and 4x1Te grout bags at entrance to protection structure.
	100	2.5	Tethys 10in & 3in DBBV protection. Refer Figure 2.2.10, Figure 2.2.13 & Figure 2.2.14		Estimate. In and around DBBV protection structures.
Deposited rock[3]	n/a	n/a	On approach to Saturn Inline Tee. Refer Figure 2.2.10 & Figure 2.2.15		Refer Table 2.2.4

NOTES:

1. Sizes of concrete mattresses vary. The most common size used is 6m x 3m x 0.3m. Other size used include 4m x 3m x 0.3m (used at the inline tee assembly) and 10m x 3m x 0.15m. Sizes sometimes estimated;
2. Notional number of grout bags as as-built data are not explicit. Numbers are estimate and based on sketches prepared for inspection activities. As-built data not explicit;
3. Quantity of 25kg grout bags is not specified on any as-built drawings and is a notional figure based on the location of concrete mattresses;
4. Quantity of deposited rock based on as-built data.

Table 2.2.4: Subsea Pipeline Protection and Stabilisation Features				
Feature	**Total Number**	**Size/Weight (Te)**	**Location(s)**	**Exposed / Buried / Condition**
Concrete Mattresses 6m x 3m x 0.3m	3	27.0	North Sea Cable No. 1 crossing. Refer Figure 2.2.1	Refer Table 2.2.2 for details
	7	63.0	PL948 umbilical crossing. Refer Figure 2.2.2	Refer Table 2.2.2 for details
	16	144.6	PL1967 & PL1968 pipeline crossing. Refer Figure 2.2.3	Refer Table 2.2.2 for details
	7	63.0	PL1099 umbilical crossing. Refer Figure 2.2.4	Refer Table 2.2.2 for details
	3	27.0	PL27 & PL161 pipeline crossing. Refer Figure 2.2.5	Refer Table 2.2.2 for details
	7	63.3	PL496 & PL497 pipeline crossing. Refer Figure 2.2.6	Refer Table 2.2.2 for details
	3	27.1	PL454 & PL455 pipeline crossing. Refer Figure 2.2.7	Refer Table 2.2.2 for details
Concrete Mattresses 6m x 3m x 0.3m	13	117.5	PL2107 & PL2108 pipeline approach to Saturn ND. Refer Figure 2.2.9	Burial status to be determined during decommissioning works. The expectation is that the fronded mattresses will mostly be buried and indistinguishable from the seabed.
Fronded Mattresses 6m x 3m x 0.15m	16	85.8	PL2236 & PL2237 pipeline approach to Saturn ND. Refer Figure 2.2.9.	
Fronded Mattresses 6m x 3m x 0.15m	2	10.7	PL2107 & PL2108 pipeline entrance to, or exit from, the Saturn Inline Tee. Refer Figure 2.2.10, Figure 2.2.15	
	13	69.7	PL2234 & PL2235 pipeline approach to Tethys TN. Refer Figure 2.2.11	
	21	112.7	PL2234 & PL2235 pipeline approach to Saturn Inline Tee. Refer Figure 2.2.10	
	17	91.2	PL2236 & PL2237 pipeline approach to Mimas MN. Refer Figure 2.2.8	
Grout Bags[2,3] (1Te)	4	4.0	PL2107 & PL2108 pipeline approach to Saturn ND. Refer Figure 2.2.9	Assume grout bags are used for support at riser base. Burial status to be determined at time of decommissioning works. The expectation is that the grout bags supports will be partly covered in seabed sediment.
	15	195.0	PL2107 & PL2108 pipeline approach to LOGGS PR. Figure 2.2.12	
	3	3.0	PL2234 & PL2235 pipeline approach to Tethys TN. Refer Figure 2.2.11	
	3	3.0	PL2236 & PL2237 pipeline approach to Mimas MN. Refer Figure 2.2.8	
	3	3.0	PL2236 & PL2237 pipeline approach to Saturn ND. Refer Figure 2.2.9.	
Grout Bags[2,3] (25kg)	168	4.0	PL2107 & PL2108 pipeline approach to Saturn ND. Refer Figure 2.2.9	Quantity estimated. Grout bags mostly used to fill spaces between mattresses and will mostly be buried.
	460	4.6	PL2107 & PL2108 pipeline approach to Saturn Inline Tee. Refer Figure 2.2.10, Figure 2.2.15	
	144	4.0	PL2234 & PL2235 pipeline approach to Tethys TN. Refer Figure 2.2.11	

Table 2.2.4: Subsea Pipeline Protection and Stabilisation Features				
Feature	**Total Number**	**Size/Weight (Te)**	**Location(s)**	**Exposed / Buried / Condition**
Grout Bags[2,3] (25kg)	192	5.0	PL2236 & PL2237 pipeline approach to Mimas MN. Refer Figure 2.2.8	Quantity estimated. Grout bags mostly used to fill spaces between mattresses and will mostly be buried.
	240	6.0	PL2236 & PL2237 pipeline approach to Saturn ND. Refer Figure 2.2.9.	
Deposited rock[4] (PL2107 & PL2108)	75m	812	PL2107 & PL2108 between KP0.025 and KP0.1. Refer Figure 2.2.9	Exposed
	26m	156	PL2107 & PL2108 between KP0.101 and KP0.127. Figure 2.2.9	
	37m	244	PL2107 & PL2108 UHB Area #01 between KP1.692 and KP1.729	
	200m	2,120	PL2107 & PL2108 North Sea Offshore No.1 Cable Crossing between KP10.622 and KP10.822. Refer Figure 2.2.1	
	202m	2,104	PL2107 & PL2108 Audrey / Ann Control Umbilical Crossing between KP12.614 and KP12.816. Refer Figure 2.2.2	
	30m	211	PL2107 & PL2108 between KP12.95 and KP12.98	
	13m	90	PL2107 & PL2108 between KP13.016 and KP13.029	
	17m	101	PL2107 & PL2108 between KP13.24 and KP13.257	
Deposited rock[4] (PL2107 & PL2108)	28m	148	PL2107 & PL2108 between KP13.732 and KP13.76	Exposed
	250m	3,333	PL2107 & PL2108 Tethys Tee Trench Transitions (2 off) between KP14.951 and KP15.201. also described in Table 2.2.3. Refer Figure 2.2.10	
	230m	4,332	PL2107 & PL2108 Carrack Pipeline Crossing between KP16.243 and KP16.473. Refer Figure 2.2.3	
	200m	2,272	PL2107 & PL2108 Audrey / Alison Control Umbilical Crossing between KP25.167 and KP25.367. Refer Figure 2.2.4	
Deposited rock[4] (PL2107 & PL2108)	18m	208	PL2107 & PL2108 between KP32.368 and KP32.386	Exposed
	22m	115	PL2107 & PL2108 between KP32.578 and KP32.6	
	25m	141	PL2107 & PL2108 between KP32.855 and KP32.88	
	200m	2,691	PL2107 & PL2107 28”/3” Viking VTS Pipeline Crossing between KP33.538 and KP33.738. Refer Figure 2.2.5	
	21m	253	PL2107 & PL2108 between KP35.867 and KP35.888	
	22m	91	PL2107 & PL2108 between KP36.835 and KP36.857	
	24m	194	PL2107 & PL2108 between KP37.956 and KP37.98	
	36m	285	PL2107 & PL2108 between KP38.394 and KP38.43	
	42m	307	PL2107 & PL2108 between KP38.728 and KP38.77	
	41m	406	PL2107 & PL2108 between KP38.969 and KP39.01	

Table 2.2.4: Subsea Pipeline Protection and Stabilisation Features				
Feature	**Total Number**	**Size/Weight (Te)**	**Location(s)**	**Exposed / Buried / Condition**
Deposited rock[4] (PL2107 & PL2108)	180m	731	PL2107 & PL2108 between KP39.38 and KP39.56	Exposed
	584m	5,250	PL2107 & PL2108 Audrey PL496 & PL497 and PL454 & PL455 pipeline crossings between KP42.149 and KP42.733. Refer Figure 2.2.6 and Figure 2.2.7	
	136m	2,606	PL2107 & PL2108 between KP42.733 and KP42.869 on approach to LOGGS PR. Refer Figure 2.2.12	
Deposited rock[4] (PL2234 & PL2235)	131m	1,067	PL2234 & PL2235 between KP0.019 and KP0.15. Refer Figure 2.2.11	Exposed
	7m	192	PL2234 & PL2235 between KP0.674 and KP0.681	
	5m	89	PL2234 & PL2235 between KP1.087 and KP1.092	
	8m	84	PL2234 & PL2235 between KP2.029 and KP2.037	
	5m	69	PL2234 & PL2235 between KP2.123 and KP2.128	
	6m	51	PL2234 & PL2235 between KP2.679 and KP2.685	Exposed
	5m	33	PL2234 & PL2235 between KP3.211 and KP3.216	
	51m	481	PL2234 & PL2235 between KP3.648 and KP3.699 on approach to the Saturn Inline Tee, Tethys Tee. Refer Figure 2.2.10	
Deposited rock[4], (PL2236 & PL2237)	67m	365	PL2236 & PL2237 between KP0.02 and KP0.087. Refer Figure 2.2.8	Exposed
	11m	96	PL2236 & PL2237 between KP0.384 and KP0.395	
	13m	118	PL2236 & PL2237 between KP0.489 and KP0.502	
	11m	143	PL2236 & PL2237 between KP0.559 and KP0.57	
Deposited rock[4], (PL2236 & PL2237)	16m	67	PL2236 & PL2237 between KP0.689 and KP0.705	Exposed
	9m	43	PL2236 & PL2237 between KP0.823 and KP0.832	
	10m	77	PL2236 & PL2237 between KP1.1 and KP1.11	
	6m	33	PL2236 & PL2237 between KP1.853 and KP1.859	
	8m	38	PL2236 & PL2237 between KP2.567 and KP2.575	
	10m	87	PL2236 & PL2237 between KP2.788 and KP2.798	
	15m	48	PL2236 & PL2237 between KP7.517 and KP7.532	
	24m	142	PL2236 & PL2237 between KP7.563 and KP7.587	
	394m	2,255	PL2236 & PL2237 between KP8.513 and KP8.907	
	28m	413	PL2236 & PL2237 between KP9.375 and KP9.403	
	43m	543	PL2236 & PL2237 between KP9.422 and KP9.465	
Deposited rock[4], (PL2236 &	25m	183	PL2236 & PL2237 between KP9.47 and KP9.495	Exposed
	11m	51	PL2236 & PL2237 between KP9.511 and KP9.522	

Table 2.2.4: Subsea Pipeline Protection and Stabilisation Features				
Feature	**Total Number**	**Size/Weight (Te)**	**Location(s)**	**Exposed / Buried / Condition**
PL2237)	30m	175	PL2236 & PL2237 between KP9.53 and KP9.56	
	12m	52	PL2236 & PL2237 between KP10.995 and KP11.007	
	12m	41	PL2236 & PL2237 between KP11.805 and KP11.817	
	27m	289	PL2236 & PL2237 between KP12.955 and KP12.982. Figure 2.2.9	

NOTES:

1. Sizes of concrete mattresses vary. The most common size used is 6m x 3m x 0.3m;
2. Notional number of grout bags as as-built data are not explicit. Numbers are estimate and based on sketches prepared for inspection activities. As-built data not explicit;
3. Quantity of 25kg grout bags is not specified on any as-built drawings and is a notional figure based on the location of concrete mattresses;
4. Quantity of deposited rock based on as-built data.

2.3 Wells

Table 2.3.1: Well Information			
Well ID	**Designation**	**Status**	**Category of well**
Mimas MN			
48/09a-N1	Gas production	Suspended	PL 3-3-3
Saturn ND			
48/10b-N1Z	Gas production	Suspended	PL 3-0-3
48/10b-N2	Gas production	Decommissioned, AB1	PL 3-0-3
48/10b-N3	Gas production	Decommissioned, AB1	PL 3-0-3
48/10b-N4	Gas production	Decommissioned, AB1	PL 3-0-3
Tethys TN			
49/11b-T1	Gas production	Decommissioned, AB1	PL 3-3-3

For details of well categorisation please refer the latest version of the Oil and Gas UK Guidelines for the Decommissioning of Wells.

2.4 Inventory Estimates

Figure 2.4.1: Pie-chart of estimated installation inventory

Figure 2.4.2: Pie-chart of estimated pipeline inventory, excluding deposited rock

3 Removal and Disposal Methods

Waste will be dealt with in accordance with the Waste Framework Directive. The reuse of an installation or pipelines (or parts thereof) is first in the order of preferred decommissioning options. However, given the age of the installations and infrastructure it is unlikely that reuse opportunities will be realised. Waste generated during decommissioning will be segregated by type and periodically transported to shore in an auditable manner through licensed waste contractors. Transfrontier shipment of waste will not be required. Steel and other recyclable metal are estimated to account for the greatest proportion of the materials inventory. Refer to section 5.4 of the Environmental Appraisal [3] for further details concerning disposal of waste.

3.1 Topsides Decommissioning

3.1.1 Mimas MN

Topsides description: the Mimas MN topside structure comprises a Helideck, Weather Deck, Mezzanine Deck, Cellar Deck and ESDV Access Platform as illustrated in Figure 3.1.1 and Figure 3.1.2. Its mass is ~277Te. The overall dimensions of the Cellar Deck are ~16m x 16m and the overall height between the Helideck Deck and LAT is ~32.2m.

Removal methods: the topsides will be completely removed and returned to shore. Possible methods are described in Table 3.1.2.

Figure 3.1.1: View on Mimas MN Topsides Looking North

Figure 3.1.2: View on Mimas MN Topsides Looking East

3.1.2 Saturn ND

Topsides description: the Saturn ND topside structure comprises a Helideck, Weather Deck, Mezzanine Deck, Cellar Deck and ESDV Access Platform as illustrated in Figure 3.1.3 and Figure 3.1.4. Its mass is ~423Te. The overall dimensions of the Cellar Deck are ~20m x 23m and the overall height between the Helideck and LAT is ~32.85m.

Removal methods: the topsides will be completely removed and returned to shore. Possible methods are described in Table 3.1.2.

Figure 3.1.3: View on Saturn ND Topsides Looking West

Figure 3.1.4: View on Saturn ND Topsides Looking East

3.1.3 Tethys TN

Topsides description: the Tethys TN topside structure comprises a Helideck, Weather Deck, Mezzanine Deck, Cellar Deck, and ESDV Access Platform as illustrated in Figure 3.1.5 and Figure 3.1.6. Its mass is ~271Te. The overall dimensions of the Cellar Deck are ~16m x 16m and the overall height between the Helideck and LAT is ~32.235m.

Removal methods: the topsides will be completely removed and returned to shore. Possible methods are described in Table 3.1.2.

Figure 3.1.5: View on Tethys TN Topsides Looking North

Figure 3.1.6: View on Tethys TN Topsides Looking East

Preparation / Cleaning: The methods that have been used to flush, purge and clean the topsides prior to removal to shore are summarised in Table 3.1.1.

Table 3.1.1: Cleaning of Topsides for Removal

Waste Type	Composition of Waste	Disposal Route
Hydrocarbons	Process fluids	Vessels and pipework have been flushed, nitrogen purged vented and made liquid free.
Produced solids	Sand, NORM	Any pipeline debris captured in filter packages has been returned onshore for disposal. Any solids remaining in vessels will be removed and disposed of during the dismantlement of the topsides onshore.
Diesel	Bunkered Diesel fuel	Bunkered diesel has been drained and returned onshore for re-use or disposal.
Lubricating oils	Lubricants for equipment e.g. gearboxes, pumps, pedestal crane compressor skid	Lubricating oils have been drained and returned onshore for re-use or disposal.

3.1.4 Topsides Removal Methods

Table 3.1.2: Topsides Removal Methods	
1) Semi-Submersible Crane Vessel ☑; 2) Monohulled Crane Vessel ☑; 3) Shear Leg Vessel ☑; 4) Jack up Work barge ☑; 5) Piece small or large ☑; 6) Complete with jacket ☑	
Methods Considered	**Description**
Single lift removal along with jacket using SSCV, MCV, or SLV.	Removal of topsides and jacket as a complete unit followed by recovery to shore for re-use, recycling, and disposal as appropriate
Single lift removal using SSCV, MCV, or SLV.	Removal of topsides as a single unit followed by recovery to shore for re-use, recycling, disposal as appropriate
Piece-small or piece large removal using attendant support vessel such as a JUWB	Removal of topsides in a series of smaller sub-units making use of the JUWB used for the well decommissioning activities, followed by recovery to shore for a programme of re-use, recycling or disposal as appropriate
Proposed removal method and disposal route	**Removal of both topsides and jacket individually followed by recovery to shore for reuse, recycling, and final disposal to landfill as appropriate. A final decision on the decommissioning method was made following a commercial tendering process and the removal contract has now been awarded.**

3.2 Jacket Decommissioning

3.2.1 Mimas MN

Jacket description: The substructure is a 3-leg piled steel tower of the 'Sea Harvester' type (Figure 3.2.1). Its mass[3] is ~431.6Te excluding the section of piles penetrating more than 3m into the seabed and excluding any rigging that would be used for lifting operations. The legs will be cut at an appropriate elevation to allow the lifting aids to be installed, and the jackets will ideally each be removed in a single lift[4]. Assuming there would be no technical issues, the piles will be cut from within, 3.0m below the seabed. Should any difficulties be encountered in accessing the piles internally such that an external excavation will be required, OPRED will be consulted before the piles are cut. The jacket will be returned to shore for recycling.

Removal methods: the jacket will be completely removed and returned to shore. Possible methods are described in Table 3.2.1.

Figure 3.2.1: Mimas MN Tower 3D View[5]

[3] The figure includes a nominal mass of 15.2Te for marine growth;
[4] The technique adopted for removal of the jacket will be subject to engineering feasibility and any commercial agreements;
[5] Dimensions given in metres unless noted otherwise. All leg and bracing dimensions are given in mm.

3.2.2 Saturn ND

Jacket description: The substructure is a 4-leg Vierendeel tower of the 'Sea Harvester' type (Figure 3.2.2). Its mass[6] is ~664.5Te excluding the section of piles penetrating more than 3m into the seabed and excluding any rigging that would be used for lifting operations. The legs will be cut at an appropriate elevation to allow the lifting aids to be installed, and the jackets will ideally each be removed in a single lift[7]. Assuming there would be no technical issues, the piles will be cut from within, 3.0m below the seabed. Should any difficulties be encountered in accessing the piles internally such that an external excavation will be required, OPRED will be consulted before the piles are cut. The jacket will be returned to shore for recycling.

Removal methods: the jacket will be completely removed and returned to shore. Possible methods are described in Table 3.2.1.

[6] The figure includes a nominal mass of 23.5Te for marine growth;
[7] The technique adopted for removal of the jacket will be subject to engineering feasibility and any commercial agreements.

Figure 3.2.2: Saturn ND Steel Tower 3D View[4]

3.2.3 Tethys TN

Jacket description: The substructure is a 3-leg piled steel tower of the 'Sea Harvester' type (Figure 3.2.3). Its mass[8] is ~515.6Te excluding the section of piles penetrating more than 3m into the seabed and excluding any rigging that would be used for lifting operations. The legs will be cut at an appropriate elevation to allow the lifting aids to be installed, and the jackets will ideally each be removed in a single lift[9]. Assuming there would be no technical issues, the piles will be internally cut 3.0m below the seabed. If any difficulties are encountered in accessing the piles internally such that an excavation will be required, OPRED will be consulted before the piles are cut. The jacket will be returned to shore for recycling.

Removal methods: the jacket will be completely removed and returned to shore. Possible methods are described in Table 3.2.1.

Figure 3.2.3: Tethys TN Tower 3D View[4]

[8] The figure includes a nominal mass of 18.1Te for marine growth;
[9] The technique adopted for removal of the jacket will be subject to engineering feasibility and any commercial agreements.

3.2.4 Jacket Removal Methods

Table 3.2.1: Jacket Removal Methods	
1) Semi-Submersible Crane Vessel ☑; 2) Monohulled Crane Vessel ☑; 3) Shear Leg Vessel ☑; 4) Jack up Work barge ☑; 5) Complete with topsides ☑	
Methods Considered	**Description**
Single lift removal along with topsides using SSCV, MCV, or SLV.	Removal of the topsides and jacket as a complete unit followed by recovery to shore for re-use, recycling, and disposal as appropriate.
Single lift removal using SSCV, MCV, or SLV.	Removal of the jacket as a single unit followed by recovery to shore for re-use, recycling, disposal as appropriate.
Offshore removal 'piece-small' for onshore disposal	Removal of jacket and dismantlement offshore followed by transportation to shore for disposal and recycling.
Proposed removal method and disposal route	**Removal of jacket as a single unit followed by recovery to shore for re-use, recycling, and final disposal to landfill as appropriate. A final decision on the decommissioning method was made following a commercial tendering process and the removal contract has now been awarded.**

3.3 Pipelines

3.3.1 Decommissioning Options

All exposed pipelines or pipespools on approach to the satellite installations and LOGGS PR associated with the scope in these Decommissioning Programmes will be completely removed.

Having carried out a pre-screening exercise of ten potential decommissioning options for the pipelines. The following options were retained for the comparative assessment and were considered applicable to the pipelines listed in Table 3.3.1:

- Option 1a: Decommission *in situ* – removal of pipeline ends and rock placement/ burial of cut ends only;
- Option 2a: Decommission *in situ* – removal of pipeline ends and rock placement over cut ends and all exposed pipeline sections;
- Option 4: Partial removal - Exposed pipeline sections removed by cut and lift and rock cover over exposed pipeline ends;
- Option 6: Full removal – full pipeline removal by cut and lift techniques.

Table 3.3.1: Pipeline or Pipeline Groups / Decommissioning Options

Pipelines Group 4	Condition of line / group (Surface laid/Trenched/Buried/Spanning)	Whole or part of pipeline/group	Decommissioning Options considered
PL2107 & PL2108	Trenched and buried. Both pipelines exhibit good depth of burial throughout their length except on approach to Saturn ND platform and on approach to the Saturn Inline Tee which are above the seabed. The pipelines cross over a number of pipelines as described in Table 2.2.2.	Whole of 14" and 3" pipelines including the pipeline risers, except for short exposed lengths of welded pipespools on approach to Saturn ND, the Saturn Inline Tee and LOGGS PR.	1a, 2a, 4 & 6
Pipelines Group 3a	**Condition of line / group (Surface laid/Trenched/Buried/Spanning)**	**Whole or part of pipeline/group**	**Decommissioning Options considered**
PL2234 & PL2235 and PL2236 & PL2237	Trenched and buried. All pipelines exhibit good depth of burial throughout their length except on the approaches to the Mimas MN and Saturn ND platforms (PL2236 & PL2237) and at the Tethys DBBVs (PL2234 & PL2235) which are above the seabed.	Whole of 10" and 3" pipelines including the pipeline risers, except for short exposed pipe lengths on approach to Mimas MN and Saturn ND platforms (PL2236 & PL2237) and Tethys DBBVs (PL2234 & PL2235).	1a, 2a, 4 & 6

A comparative assessment of the decommissioning options was carried out in accordance with the OPRED Decommissioning guidance notes. Each decommissioning option was assessed against Safety, Environment, Technical and Societal and Cost using the pair-wise comparison technique. Refer [4] for details.

3.3.2 Outcome of Comparative Assessment

The chosen option is leave *in situ*. The influence of existing infrastructure that had been removed could affect the mobility local seabed. In order to minimise the deposition of additional rock, and to minimise any potential increase in snagging hazards, for example, by removing intermediate exposures or spans, it was considered that leave *in situ* would be appropriate. This means that the pipelines would meantime remain as they are, with any exposures being left *in situ* and monitored, and any existing reportable spans would remain recorded in FishSAFE. Use of historical pipeline survey data with future pipeline surveys would better inform the future strategy for monitoring the pipelines.

Table 3.3.2: Outcomes of Comparative Assessment		
Pipeline or Group	**Recommended Option**	**Justification**
PL2107 & PL2108	The comparative assessment concluded that either Option 1a, Option 2a or Option 4 could be the recommended option. Option 6 was non preferred. Both Option 1a and Option 2a involve removal of the pipelines ends, and additionally option 4 would involve remediating an exposure that occurs near the Saturn Inline Tee and depositing rock over the cut pipeline ends. Leave *in situ*. Therefore, it is recommended that at the Saturn ND and LOGGS PR platforms the pipelines are cut at the risers and where they enter burial, either into deposited rock or under the concrete mattresses. Therefore, at the Saturn ND installation, remove section of 14in and 3in pipeline (max. ~10m long each) between the risers and start of the concrete mattresses. At LOGGS PR, remove section of 14in and 3in pipeline (max. ~8m each) between the riser and the deposited rock. The lengths removed will include any exposures or spans on the final approach. Up to 25Te of rock will be deposited to bury each cut pipeline end, although the amount used will be kept to a practical minimum. Any rock deposits will be overtrawlable by design. Completely remove the section of pipeline(s) associated with the Saturn Inline Tee and remediate the surrounding area by reprofiling the existing rock once the Saturn Inline Tee and associated protection has been removed. The area of seabed vacated by the inline tee and associated structure and protection will be left to remediate naturally. Therefore, except for the removal of the Saturn Inline Tee, the pipeline ends on approach to the platforms and the pipeline risers, the pipelines will be left *in situ* in their current state. The pipelines will be subject to inspection and monitoring to a schedule agreed with OPRED.	Once the exposed ends at Saturn ND and the Saturn Inline Tee have been removed, the pipelines can be expected to remain stable for all of their length. This will result in minimal seabed disturbance, minimises the deposition of additional rock in a sensitive area, lower energy use, and reduced risk to personnel and lower cost; all these aspects contribute to the proposed recommendation. Refer Appendix 1.1 for burial profile.
PL2234 & PL2235	The comparative assessment concluded that for PL2234 & PL2235 option 1a – leave *in situ* with minimum intervention would be preferred. Option 1a involves removal of the pipeline ends, and depositing rock over the cut pipeline ends. Leave *in situ*. It is recommended that at the Tethys TN installation the pipelines are cut at the riser and where they enter burial under the fronded mattresses (max. ~5m long each). The pipelines between the Tethys 10in and 3in DBBV assemblies will be fully removed (length of pipe up to ~40m long) along with the protection structures and local mattress protection and stabilisation features. The lengths removed will include any exposures or spans on the final approach. Each remaining pipeline end may be locally remediated using up to 25Te of deposited rock. Any rock deposits will be overtrawlable by design. Therefore, except for the removal of the exposed ends the pipework associated with the 10" and 3" DBBV	The pipelines are stable for all of their length. This will result in minimal seabed disturbance, minimises the deposition of additional rock in a sensitive area, lower energy use, and reduced risk to personnel and lower cost; all these aspects contribute to the proposed recommendation. Refer Appendix 1.2 for burial profile.

Table 3.3.2: Outcomes of Comparative Assessment		
Pipeline or Group	**Recommended Option**	**Justification**
	assemblies, and the pipeline risers, the pipelines will be left *in situ* in their current state. The pipeline will be subject to inspection and monitoring to a schedule agreed with OPRED.	
PL2236 & PL2237	The comparative assessment concluded that for PL2236 & PL2237 option 1a – leave in situ with minimum intervention would be preferred. Option 1a involves removal of the pipeline ends, and depositing rock over the cut pipeline ends. Leave *in situ*. It is recommended that at the Mimas MN installation the pipelines are cut at the risers and where they enter burial under the fronded mattresses. At the Saturn ND installation it is recommended that the pipelines are cut at the risers and where they enter burial under the fronded mattresses. At Mimas MN, remove sections of 10in and 3in pipeline (max. ~5m long) between risers and fronded mattresses. At Saturn ND, remove section of 10" pipeline (max. ~5m) between the riser and where they enter burial under the fronded mattresses. The lengths removed will include any exposures or spans on the final approach. Up to 25Te of rock will be deposited to bury each cut pipeline end, although the amount used will be kept to a practical minimum. Any rock deposits will be overtrawlable by design. Therefore, except for the removal of the exposed ends and the risers, the pipelines will be left *in situ* in their current state. The risers at LOGGS will be removed along with the LOGGS installation jackets. The pipelines will be subject to inspection and monitoring to a schedule agreed with OPRED.	The pipelines are stable for all of their length. This will result in minimal seabed disturbance, minimises the deposition of additional rock in a sensitive area, lower energy use, and reduced risk to personnel and lower cost; all these aspects contribute to the proposed recommendation. Refer Appendix 1.3 for burial profile.

3.4 Pipeline Protection Structures & Stabilisation Features

Table 3.4.1: Subsea Pipeline Protection Structures & Stabilisation Features			
Protection or Stabilisation Features	**Number (UNO)**	**Description**	**Disposal Route (if applicable)**
Saturn Inline Tee	1	Structure clamped to PL2107, protected by concrete blocks and deposited rock; refer Figure 2.2.15	Fully recover to shore for recycling or disposal.
10in DBBV protection structure	1	Clamped to PL2234 and protected by concrete mattress; refer Figure 2.2.14	
3in DBBV protection structure	1	Clamped to PL2235 and protected by concrete mattresses; refer Figure 2.2.13	
Concrete blocks	4	Two types, 2x36.3Te & 2x42.0Te resting on top of a number of concrete mattresses used as a foundation	Fully recover to shore for recycling and disposal.
Concrete mattresses	12	Used as foundations for the concrete blocks	Fully recover to shore for recycling or disposal; if buried and undisturbed,
	2	Used as protection on top of each of the 10in and 3in DBBV protection frames	

Table 3.4.1: Subsea Pipeline Protection Structures & Stabilisation Features			
Protection or Stabilisation Features	**Number (UNO)**	**Description**	**Disposal Route (if applicable)**
Grout bags, 25kg, 1Te	180 4	Saturn Inline Tee, Tethys Tee protection. Refer Figure 2.2.10 & Figure 2.2.15	leave *in situ*.
	100	Tethys 10in & 3in DBBV protection. Refer Figure 2.2.10, Figure 2.2.13 & Figure 2.2.14	
Deposited rock	N/A refer	On approach to Saturn inline tee, Tethys Inline tee. Refer Figure 2.2.10 & Figure 2.2.15	Deposited rock will need to be disbursed locally to allow access to the concrete blocks and concrete mattresses, but otherwise left *in situ*.

NOTES:

1. The nature of the removal works is such that it will be unlikely that concrete mattresses and grout bags will remain undisturbed during recovery operations. Therefore, the assumption is that all concrete mattresses and grout bags will be fully recovered. Mattresses and grout bags that are undisturbed or that are buried under deposited rock will remain *in situ*.

3.5 Pipeline Protection & Stabilisation Features

Table 3.5.1: Pipeline Protection & Stabilisation Features			
Protection or Stabilisation Features	**Number (UNO)**	**Description**	**Disposal Route (if applicable)**
Concrete mattresses	3	North Sea Cable No. 1 crossing. Refer Figure 2.2.1	Leave all undisturbed concrete mattresses at the pipeline crossings *in situ*.
	7	PL948 umbilical crossing. Refer Figure 2.2.2	
	16	PL1967 & PL1968 pipeline crossing. Refer Figure 2.2.3	
	7	PL1099 umbilical crossing. Refer Figure 2.2.4	
	3	PL27 & PL161 pipeline crossing. Refer Figure 2.2.5	
	7	PL496 & PL497 pipeline crossing. Refer Figure 2.2.6	
	3	PL454 & PL455 pipeline crossing. Refer Figure 2.2.7	
	13	PL2107 & PL2108 pipeline approach to Saturn ND. Refer Figure 2.2.9	
Fronded mattresses	16	PL2236 & PL2237 pipeline approach to Saturn ND. Refer Figure 2.2.9.	Leave undisturbed fronded mattresses *in situ* otherwise recover to shore for reuse, recycling, and disposal.
Fronded mattresses	2	PL2107 & PL2108 pipeline at entrance or exit to Saturn Inline Tee. Refer Figure 2.2.10, Figure 2.2.15	If undisturbed leave fronded mattresses at entrance to Saturn Inline Tee *in situ* otherwise recover to shore for reuse, recycling, and disposal
	13	PL2234 & PL2235 pipeline approach to Tethys TN. Refer Figure 2.2.11	Leave undisturbed fronded mattresses *in situ* otherwise recover to shore for reuse, recycling, and disposal.
	21	PL2234 & PL2235 pipeline approach to Tethys Tee. Refer Figure 2.2.10	Assume ~12x mattresses local to the DBBV protection structures may need to be removed. If undisturbed leave fronded mattresses on approach to Tethys 10in DBBV and 3in DBBV protection structures *in situ*.
	17	PL2236 & PL2237 pipeline approach	Leave undisturbed fronded mattresses

Table 3.5.1: Pipeline Protection & Stabilisation Features			
Protection or Stabilisation Features	**Number (UNO)**	**Description**	**Disposal Route (if applicable)**
		to Mimas MN. Refer Figure 2.2.8	*in situ* otherwise recover to shore for reuse, recycling, and disposal
Grout bags (1Te)	4	PL2107 & PL2108 pipeline approach to Saturn ND. Refer Figure 2.2.9	If undisturbed, leave 1Te grout bags *in situ*, otherwise fully recover to shore for reuse, recycling, and disposal. Assume 4x will be recovered.
	15	PL2107 & PL2108 pipeline approach to LOGGS PR. Figure 2.2.12	Leave undisturbed 1Te grout bags *in situ*, otherwise fully recover to shore for reuse, recycling, and disposal. Assume 2x will be recovered.
	3	PL2234 & PL2235 pipeline approach to Tethys TN. Refer Figure 2.2.11	Leave undisturbed 1Te grout bags *in situ*, otherwise fully recover to shore for reuse, recycling, and disposal. Assume 3x will be recovered.
	3	PL2236 & PL2237 pipeline approach to Mimas MN. Refer Figure 2.2.8	Leave undisturbed 1Te grout bags *in situ*, otherwise fully recover to shore for reuse, recycling, and disposal. Assume 3x will be recovered.
Grout bags (1Te)	3	PL2236 & PL2237 pipeline approach to Saturn ND. Refer Figure 2.2.9.	Leave undisturbed 1Te grout bags *in situ*, otherwise fully recover to shore for reuse, recycling, and disposal. Assume 3x will be recovered.
Grout bags (25kg)	168	PL2107 & PL2108 pipeline approach to Saturn ND. Refer Figure 2.2.9	Leave undisturbed 25kg grout bags *in situ*, otherwise fully recover to shore for reuse, recycling, and disposal. Assume 10% of quantities listed here will be recovered.
	460	PL2107 & PL2108 pipeline approach to Saturn Inline Tee. Refer Figure 2.2.10, Figure 2.2.15	
	144	PL2234 & PL2235 pipeline approach to Tethys TN. Refer Figure 2.2.11	
	192	PL2236 & PL2237 pipeline approach to Mimas MN. Refer Figure 2.2.8	
	240	PL2236 & PL2237 pipeline approach to Saturn ND. Refer Figure 2.2.9.	
Deposited rock (PL2107 & PL2108)	2,409m	Used for Saturn ND and LOGGS PR platform approaches, Saturn Inline Tee protection, pipeline crossings and to remediate pipeline upheaval buckling in a number of locations.	Deposited rock will be left *in situ*.
Deposited rock (PL2107 & PL2108)	250m	Part (~125m) used for protection on approach to Saturn Inline Tee protection	Some of the deposited rock will be removed or dispersed from the protection structure but left *in situ*. The method used will be based on practicality taking account the sensitivity of the local environment.
Deposited rock (PL2234 & PL2235)	218m	Used for Tethys TN platform approaches, Tethys Tee transition, and to remediate pipeline upheaval buckling in a number of locations.	Deposited rock will be left *in situ*.
Deposited rock, (PL2236 & PL2237)	847m	Used for Mimas MN and Saturn ND platform approaches, and to remediate pipeline upheaval buckling in a number of locations.	Deposited rock will be left *in situ*.

3.6 Wells

Table 3.6.1: Well Decommissioning
The LOGGS' Saturn satellites inventory consists of a total of six wells: Mimas MN: 1 well – 48/09-N1; Saturn ND: 4-wells 48/10b-N1Z, 48/10b-N2, 48/10b-N3 and 48/10b-N4, and Tethys TN: 1 well – 49/11b-T1. The wells listed in Section 2.3 (Table 2.3.1) will be decommissioned in accordance with latest version of the Oil & Gas UK Well Decommissioning Guidelines. A Master Application Template (MAT) and the supporting Subsidiary Application Template (SAT) will be submitted in support of works carried out. An application to decommission the wells will be made via the online Well Operations Notification System (WONS) on the OGA Energy Portal. Well decommissioning is currently scheduled to commence earliest in 2021.

3.7 Waste Streams

Table 3.7.1: Waste Stream Management Methods	
Waste Stream	**Removal and Disposal Method**
Bulk liquids	Residual hydrocarbons have been removed from topsides. Further cleaning and decontamination will take place onshore prior to re-use or recycling.
Marine growth	Where necessary and practicable, to allow access some marine growth will be removed offshore under a Marine License application. The remainder will be brought to shore and disposed of according to guidelines and company policies.
NORM	Tests for NORM have been undertaken offshore 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.
Asbestos	Given the age of the installations asbestos can be expected and will be dealt with and disposed of in accordance with guidelines and company policies.
Chromium VI	Given the age of the platforms Chromium VI paints may have been used for corrosion protection. Checks will be done to confirm whether Chromium IV is present on the platform using the correct PPE taking account of COSHH Regulations 2002. The material will be disposed of according to 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				
Asset	**Inventory**	**Total (Te)**	**Planned Materials to Shore (Te)**	**Planned Materials Decommissioned *in situ* (Te)**
Mimas MN	Installation	709	634	75
	Pipelines	2,122	32	2,090
	Deposited Rock	5,074	-	5,074
Saturn ND	Installation	1,087	962	125
	Pipelines	17,820	345	17,475
	Deposited Rock	29,201	-	29,201
Tethys TN	Installation	787	711	75
	Pipelines	1,568	112	1,453
	Deposited Rock	2,066	-	2,066
Sub-total:	**Excl. rock**	**24,093**	**2,796**	**21,294**
Sub-total:	**Incl. rock**	**60,434**	**2,796**	**57,635**

4 Environmental Appraisal Overview

4.1 Environmental Sensitivities (Summary)

Table 4.1.1: Environmental Impact Management	
Environmental Receptor	**Main Features**
Conservation interests	**Sites of Conservation Importance** The LOGGS' satellite infrastructure included within the scope of the Decommissioning Programmes is located within two sites of conservation importance: the North Norfolk Sandbanks and Saturn Reef SAC, and the Southern North Sea SAC. The North Norfolk Sandbanks and Saturn Reef SAC site has been selected for designation due to the presence of the Annex I habitats: sandbanks that are slightly covered by water at all times, and biogenic reef habitats formed by Sabellaria spinulosa. The Conservation Objectives for the North Norfolk Sandbanks and Saturn Reef SAC are for the features to be in favourable condition, thus ensuring site integrity in the long term and contribution to Favourable Conservation Status of Sandbanks and Reefs. This contribution would be achieved by maintaining or restoring, subject to natural change: • The extent and distribution of the qualifying habitats in the site; • The structure and function of the qualifying habitats in the site; and • The supporting processes on which the qualifying habitats rely. The Southern North Sea SAC has been identified as an area of importance for the Annex II species the harbour porpoise. This site includes key winter and summer habitat for this species. The Conservation Objectives of the site are to ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status for Harbour Porpoise in UK waters. In the context of natural change, this will be achieved by ensuring that: • Harbour porpoise is a viable component of the site; • There is no significant disturbance of the species; and • The condition of supporting habitats and processes, and the availability of prey is maintained. Annex II species likely to be sighted within the area of the proposed decommissioning activities include bottlenose dolphins, harbour porpoise, grey seals and common or harbour seals (Environmental Appraisal report [3], Section 4.3 [3]). The total length of pipeline lying within the Southern North Sea SAC is ~53km; The total length of pipelines lying within the North Norfolk Sandbanks and Saturn Reef SAC is ~27km. **Marine Conservation Zones (MCZs)** The installations and pipelines included within the scope of the Decommissioning Programmes do not transect any MCZs. **Special Protection Areas (SPAs)** The installations and pipelines included within the scope of the Decommissioning Programmes do not transect any SPAs.
Seabed	The seabed near the LOGGS infrastructure is predominantly composed of sand with shells and shell fragments, with some gravel and cobbles. Sediments are generally well sorted and uniform.

Table 4.1.1: Environmental Impact Management	
Environmental Receptor	**Main Features**
	The Bathymetry across the area is relatively flat with mega-ripples and sand formations (Environmental Appraisal report [3], Section 4.1). There is no evidence of bedrock, pockmarks or unusual or irregular bedforms. The infaunal community is generally dominated by crustacea and polychaete worms. The species are typical of the sandy sediments of southern North Sea. Whilst epifauna are generally sparse across the area due to the lack of hard substrata, polychaete worms, hermit crabs, fish including sand eels and flatfish, starfish including the common starfish and the sea star, and the soft coral dead mans' fingers are all observed. In terms of habitat classification, most stations within the associated pre-decommissioning baseline survey were categorised as 'infralittoral fine sand', which corresponds to clean sands occurring in shallow water (generally shallower than 20m), either on open coast or in tide swept channels of marine inlets. This is consistent with the protected Annex I habitat 'sandbanks slightly covered by seawater all the time'. There is a high probability of Sabellaria spinulosa across the region. A small fragment of tube structure recovered in a sieve during sampling at the Ganymede ZD location – some 62km away, was considered to have possibly been made by the Ross worm Sabellaria spinulosa aggregations of such tubes can sometimes create reef structures which are of conservation concern. However, no Sabellaria spinulosa were evident either as individuals or as tube aggregations from the survey, and none of the geophysical data suggested the presence of such structures. Seabed imagery did not provide any evidence of any threatened and/or declining species and habitats on the OSPAR (2008) list or any species on the International Union for Conservation of Nature Global Red List of threatened species [7][8].
Fish	The area is located within the spawning grounds of various species including: • cod (January to April; [peak spawning February to March]); • lemon sole (April to September); • Norway lobster (January to December [peak spawning April to June]); • plaice (December to March [peak spawning January to February]); • sandeels (November to February); • sole (December and March to May [peak spawning in April]; • sprat (May to August [peak spawning May to June]); • thornback ray (February to September [peak spawning April to August]); and, • whiting (February to June). Within the area of facilities and infrastructure being decommissioned there is an area of high intensity spawning for plaice. The following species have nursery grounds in the vicinity of the decommissioning works: anglerfish, cod, herring, lemon sole, plaice, sandeel, sprat, mackerel, spurdog, herring, Norway lobster, sole, tope, thornback ray and whiting. Within the decommissioning area is an area of high intensity nursery grounds for cod, herring and whiting.
Fishing Industry	Across wider LOGGS Area (North and South), fishing grounds are fished at varying degrees by the following fleets [6]: • Dutch beam trawlers, demersal otter trawlers, and fly seiners; • UK potters, shrimp beam trawlers, shellfish dredgers, otter trawlers, long-liners, and netters; • Belgian beam trawlers and demersal otter trawlers;

Table 4.1.1: Environmental Impact Management	
Environmental Receptor	**Main Features**
	• Danish sandeelers, midwater and demersal trawlers and seine netters; • Norwegian purse seiners and midwater otter trawlers; • German beam trawlers and demersal otter trawlers; • French otter trawlers (demersal and pelagic); and, • French purse seine netters. The main species targeted are shellfish, with demersal species dominate catch in some areas. The highest number of effort days takes place in the summer months (July-September). Activity is low to moderate except at the Europa platform where fishing intensity is higher (Environmental Appraisal report [3], Section 4.5).
Marine mammals	Cetaceans regularly recorded in the North Sea include the harbour porpoise, bottlenose dolphin, minke whale, killer whale, Atlantic white-sided dolphin, and white-beaked dolphin. Rarer species that are occasionally observed in the North Sea include fin whale, long-finned pilot whale, Risso's dolphin and the short beaked common dolphin. However, harbour porpoise and white-beaked dolphin are the only cetaceans considered as regular visitors in the Southern North Sea throughout most of the year, and minke whale as a frequent seasonal visitor (Environmental Appraisal report [3], Section 4.3.1). Pinnipeds sighted in the area include grey seals, and harbour seals. Grey seals may travel past the infrastructure towards foraging grounds, but densities generally reduce with distance offshore. Harbour seals are more likely to be sighted further offshore, travelling to this area from breeding and haul out sites in The Wash to forage for food (Environmental Appraisal report [3], Section 4.3.2).
Birds	The most common species of seabird found in these areas of the SNS include fulmar, gannet, guillemot, kittiwake, razorbill, puffin, and little auk, as well as numerous species of gull, tern and skua. In the decommissioning area the sensitivity of seabirds to oil pollution, reflected by the Seabird Oil Sensitivity Index, is low between July and September. Between November and March, the Seabird Oil Sensitivity Index is very high to extremely high. There is no data for April to June for many of the blocks, and again for October and November. Note that disturbance of breeding birds is an offence under The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 (as amended). OPRED recommended action for Operators is to undertake a pre-decommissioning survey and if there is found to be nesting birds on a platform to discuss and agree action with OPRED. A Birds Addendum [10] has been prepared that describes the survey effort and results applicable to the decommissioning programmes. Additional ornithological surveys will be planned prior to any removal operations to identify any birds. Chrysaor will not commence any decommissioning operations on LDP2-LDP5 if there are any nests or eggs on any of the installations, unless the specific activities are covered by a Wildlife Licence.
Onshore communities	An onshore decontamination and dismantlement facility will be used that is deemed able to comply with all relevant permitting and legislative requirements. The onshore disposal facility will be based in the UK.
Other users of the sea	**Shipping** Shipping density in the area of the infrastructure to be decommissioned ranges from very low to high. The main contributing factor of very high vessel density in the area closer to shore is the number of large international ports within the region including Hull, Immingham,

Table 4.1.1: Environmental Impact Management	
Environmental Receptor	**Main Features**
	Grimsby and Great Yarmouth (Environmental Appraisal report [3], Section 4.7). **Oil & Gas Industry** The infrastructure is located in the SNS gas basin which is densely populated by various installations. Please refer Table 1.6.1, Figure 1.6.4 and Figure 1.6.3 for information regarding adjacent facilities. Proposed new developments Blythe and Elgood development located ~15km east, and Southward Development located entirely with the North Norfolk Sandbanks and Saturn Reef with installation scheduled for 2021. **Offshore Renewables** The nearest windfarms are Hornsea zone located approximately 10km N of Mimas MN, and East Anglia zone located ~45km SE of Tethys TN, and Dudgeon windfarm site which is located approximately 45km SW of Saturn ND. The Hornsea Project 2 is scheduled to be fully operational by 2022, and The Development Consent Order Application for Hornsea III was submitted in 2018 for which a decision was made 31 December 2020.
Atmosphere	Energy will be used during decommissioning activities and this will result in atmospheric emissions. Once decommissioning has been completed, pipeline surveys will likely be required in future, incurring further use of energy use and the resulting emissions. Refer Environmental Appraisal report [3], Section 3.1.

4.2 Potential Environmental Impacts and their Management

4.2.1 Environmental Impact Assessment Summary

The potential environmental impacts associated with the decommissioning activities have been assessed and it is concluded that the proposed decommissioning of the infrastructure can be completed without causing significant adverse impact to the environment. The EA assesses the potential environmental impacts by identifying interactions between the proposed decommissioning activities and the associated environmental receptors. It also describes the proposed mitigation measures designed to avoid or reduce the identified potential environmental impacts and how these will be managed in accordance with Chrysaor's Environmental Management System (EMS) while considering responses from stakeholders.

Table 4.2.1: Environmental Impact Management		
Activity	**Main Impacts**	**Management**
Topsides removal	Energy use and atmospheric emissions	All engines, generators and combustion plant on the vessels will be well maintained and correctly operated to ensure that they are working efficiently to minimise energy use and gaseous emissions. Vessel operations will be minimised where practical.
	Underwater noise	A noise assessment has been completed to determine the likely impact of noise generated by the proposed operations on marine mammals in the surrounding area. The results of the assessment will be

Table 4.2.1: Environmental Impact Management		
Activity	**Main Impacts**	**Management**
		used during the planning of vessel operations.
	Accidental hydrocarbon release	Hydrocarbon inventories are to be removed from the topsides prior to commencing removal operations. The SNS Oil Pollution Emergency Plan has been updated in agreement with OPRED to include all planned decommissioning operations.
Jacket removal	Energy use and atmospheric emissions	All engines, generators and combustion plant on the vessels will be well maintained and correctly operated to ensure that they are working efficiently to minimise energy use and gaseous emissions. Vessel operations will be minimised where practical.
	Underwater noise	A noise assessment has been completed to determine the likely impact of noise generated by the proposed operations on marine mammals in the surrounding area. The results of the assessment will be used during the planning of vessel operations. There is no intention to use underwater explosives during these activities. In the unlikely event that the requirement changes, project-specific noise modelling may be undertaken to inform the risk of injury in the impact assessment and mitigation requirements. The requirement will be discussed with OPRED Environmental Management Team.
	Accidental hydrocarbon release	The SNS Oil Pollution Emergency Plan has been updated in agreement with OPRED to include all planned decommissioning operations.
	Seabed disturbance and loss of habitat	The decommissioning operations will be carefully designed and executed to minimise the area of seabed that will be disturbed. Loss of habitat through the introduction of new material to the marine environment is to be avoided or minimised throughout the proposed operations.
Pipeline decommissioning	Energy use and atmospheric emissions	All engines, generators and combustion plant on the vessels will be well maintained and correctly operated to ensure that they are working efficiently to minimise energy use and gaseous emissions.
	Underwater noise	A noise assessment has been completed to determine the likely impact of noise generated by the proposed operations on marine mammals in the surrounding area. The results of the assessment will be used during the planning of vessel operations.
	Seabed disturbance and loss of habitat	The operations to remove the pipeline ends, the pipelines within the protection structures, and the Tethys DBBV and Saturn inline tee protections structures will be carefully designed and executed to minimise the area of seabed that will be disturbed. Loss of habitat through the introduction of new material to the marine environment is to be avoided or minimised throughout the proposed operations. The resulting rock berm profile will be overtrawlable.
	Discharges to sea	The pipelines have already been flushed prior to cutting of the pipeline ends or removal of the pipelines within the Tethys DBBV assemblies or Saturn inline tee assembly.

Table 4.2.1: Environmental Impact Management		
Activity	**Main Impacts**	**Management**
		A chemical risk assessment will be undertaken, and operations permitted under the Offshore Chemicals Regulations 2002 (as amended). Hydrocarbon discharges during subsea pipeline disconnect operations and removal of the Tethys DBBV and Saturn inline Tee protection structures will be permitted under the Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005 (as amended). Residual hydrocarbons, scale and sediments will be released gradually after through-wall corrosion occurs and the integrity of the pipelines progressively fails. Through-wall degradation is anticipated to begin to occur after many decades (i.e. 60 – 100 years). Pathways from the pipelines to the receptors would be via the interstitial spaces in seabed sediments, overlying deposited rock - where applicable, and the water column. Release would therefore be gradual and prolonged such that the effects on the receiving marine environment are negligible.
	Physical presence of infrastructure decommissioned *in situ*. Snagging hazard of exposed sections of pipeline remaining *in situ*.	The total seabed footprint of the LOGGS' Saturn satellite area pipelines being decommissioned *in situ* is estimated as 0.61km^2, 0.27km^2 of which will be within the North Norfolk Sandbanks and Saturn Reef SAC and 0.53km^2 of which will be within Southern North Sea SAC. This represent 0.009% of the total SAC area. Although it has been assessed that the introduction of additional deposited rock will not change the character of the species typically present in the area as a whole, decommissioning of mattresses and grout bags *in situ* as this will reduce the amount of deposited rock required for remedial works. The presence of decommissioned pipelines will not compromise the integrity of the environmental feature of the seabed in the area. Pipelines decommissioned *in situ* will continue to be shown on Navigational charts and FishSAFE.
Decommissioning of protection and stabilisation features	Physical presence of infrastructure decommissioned *in situ*. Snagging hazard of stabilisation feature associated with pipeline.	Stabilisation features associated with pipelines remain *in situ*. Non-invasive survey techniques owing to the environmental sensitivities of the areas outside of the Saturn 500m zone where stabilisation features predominantly exist and at locations beyond the 500m zones where exposed mattresses may have been identified. Note that the Saturn 500m zone is not in designated environmentally sensitive areas. The presence of decommissioned stabilisation features will not compromise the integrity of the environmental feature of the seabed in the area. Stabilisation features are inherently overtrawlable by design, so they may not need to be verified by overtrawl. when verifying a clear seabed following completion of decommissioning activities.

5 Interested Party Consultations

5.1 General

Table 5.1.1: Summary of Stakeholder Comments		
Stakeholder	**Comment**	**Response**
STATUTORY CONSULTATIONS		
NFFO		
NIFPO		
SFF		
GMG		
Public		

6 Programme Management

6.1 Project Management and Verification

Chrysaor has established a UK Decommissioning organisation as a department to manage and execute decommissioning projects. Chrysaor's existing processes for Operations, Planning, Project Management, Procurement, Health Safety and Environment, will be used and tailored to meet the specific requirements of decommissioning projects. Chrysaor will manage all permitting, licences, authorisations, notices, consents, and consultations.

Any changes to this decommissioning document will be discussed and agreed with OPRED.

6.2 Post-Decommissioning Debris Clearance and Verification

As part of the Decommissioning Programmes the LOGGS' Saturn area installation sites including the 500m safety zone and along a 100m wide corridor along all the pipelines will be subject to clear seabed verification surveys when decommissioning activities have concluded. Due to the sensitive nature of the North Norfolk Sandbank and surrounding area, we would propose to work with OPRED and NFFO to use a non-invasive and evidence-based approach to establish an acceptable clear seabed for the pipelines outside of the existing 500m safety zone.

Any seabed oil and gas debris will be recovered for onshore disposal or recycling in line with existing disposal methods. Verification of a clear seabed will be obtained by working with OPRED and NFFO to agree on using a non-invasive and evidence-based approach. This will be included in the Close Out Report and sent to the Seabed Data Centre (Offshore Installations) at the Hydrographic Office.

Oil and gas debris activity and verification along the remaining pipeline corridor of the infield pipeline sections not subject to actual decommissioning works will be carried out in accordance with OPRED guidance in operation at the time those activities commence. This activity will reflect the environmental setting of the Southern North Sea SAC and the North Norfolk Sandbanks and Saturn Reef SAC.

The outcomes of the surveys in the 500m zones and of the pipelines will be reported in the Close Out Report and sent to the Seabed Data Centre (Offshore Installations) at the Hydrographic Office.

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.

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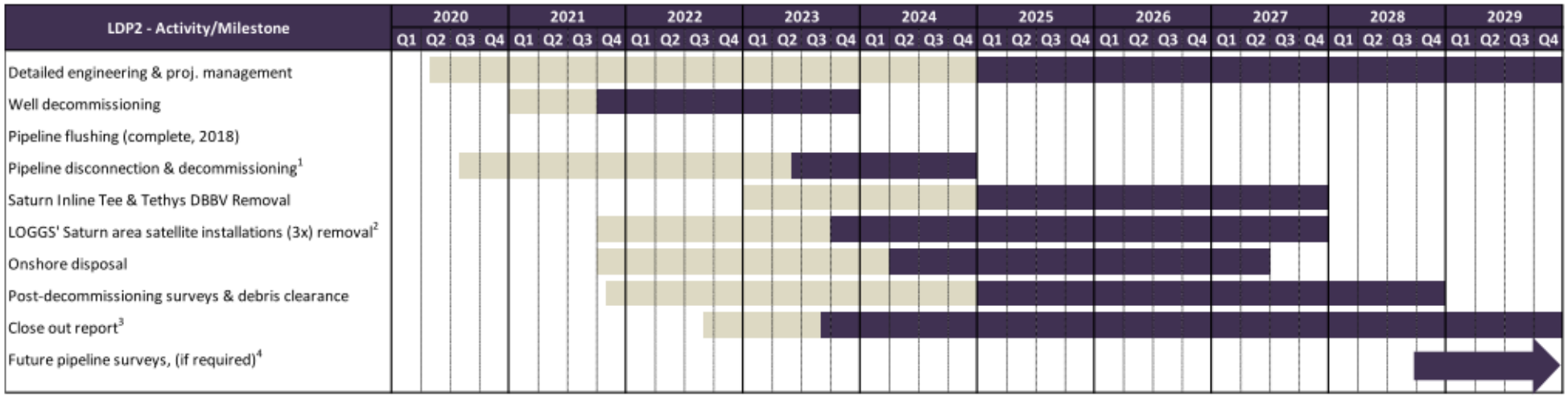

Notes / Key

Earliest potential activity

Activity window to allow for commercial flexibility as well as the necessary regulatory environmental approvals associated with decommissioning activities

1. Current intention is that PL2107 & PL2108 will be decommissioned at LOGGS PR in the same campaign as other decommissioning works at the LOGGS Installation;
2. Includes Mimas MN, Saturn TN, Tethys TN ;
3. The close out report will be prepared on completion of offshore activities. It will contain results of environmental suveys, debris survey (identification/removal) and clear seabed verification survey;
4. The close out report will also explain the strategy based on risk assessments and results of post decommissioning surveys.

Notes for Chrysaor

Window for well decommissioning increased by a year

Pipeline disconnection needs to occur before removal can commence; early start coincident with what was stated in LDP5. Pipellines at LOGGS would be disconnected in the same campaign at LOGGS

Onshore disposal, assume 6 months reuqired to complete

Close out report one year from completion of onshore disposal otherwise swaste accounting may not be acounted for

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

In accordance with OPRED guidelines, a close out report covering the completion of the offshore decommissioning scope of this Decommissioning Programme will be submitted at time agreed by OPRED. The close out report will contain debris removal and verification of seabed clearance, the first post decommissioning environmental survey and explanation of any variations to the approved Decommissioning Programmes.

6.6 Post Decommissioning Monitoring and Evaluation

After decommissioning activities have been concluded, pipeline status surveys and environmental surveys will be completed with the findings being sent to OPRED in the Close Out report. The frequency and scope of future surveys will be agreed with OPRED and supported by a risk assessment. Residual liability will remain with the Section 29 holders identified in section 1.4. Unless agreed otherwise in advance with OPRED, Chrysaor 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.

PIPELINE RISK BASED MONITORING PROGRAMME

All pipeline systems covered within this Decommissioning Document scope will be subject to survey. The post decommissioning pipeline (and associated stabilisation features) monitoring programme, to be agreed with OPRED, will:

- Begin with an initial baseline survey covering the full length of each pipeline;
- Be followed by a risk-based assessment for each pipeline (and associated stabilisation materials) which will inform the minimum agreed extent and frequency of future surveying. This will take account of pipeline burial, exposure and spanning data derived from the initial baseline survey, all available historical survey information and fisheries impact assessment;
- Provide a report of each required survey (with analysis of the findings, the impact on the risk-based assessment and identification of the proposed timing of the next survey in accordance with the agreed RBA approach), for discussion and agreement of OPRED;
- Include provision for remediation in the framework where such a requirement is identified. Appropriate remediation will be discussed and agreed with OPRED;
- Where remediation has been undertaken, a follow up survey of the remediated section(s) will be required;
- In the event of a reported snagging incident on any section of a pipeline, the requirement for any additional survey and/or remediation, will be discussed and agreed with OPRED;
- Will include a further fisheries impact assessment following completion of the agreed survey programme;
- Monitoring will become reactive following completion of the agreed survey programme and OPRED agreement of the analysis of the outcomes;
- Require pipeline information to be recorded on Navigation charts and FishSAFE.

The monitoring programme will also include discussion with OPRED of the long-term pipeline degradation and potential risk to other users of the sea following conclusion of the planned survey programme.

7 Supporting Documents

[1] Chrysaor (2020) LDP4 Decommissioning Programmes for LOGGS Satellites V-Fields Area & Associated Pipelines, CYR-SNS-L-XX-P-PM-12-00001;

[2] Chrysaor (2020) LDP5 Decommissioning Programmes for LOGGS Installation & Associated Pipelines, CYR-SNS-L-XX-P-PM-12-00002;

[3] Chrysaor (2020) Environmental Appraisal LOGGS Area Decommissioning (Decommissioning Programmes LDP2, LDP3, LDP4, LDP5), XOD-SNS-L-XX-X-HS-02-00005;

[4] Chrysaor (2020) Comparative Assessment Report LOGGS Area Decommissioning (Decommissioning Programmes LDP2, LDP3, LDP4, LDP5), XOD-SNS-L-XX-X-HS-02-00003;

[5] ConocoPhillips (2017) Decommissioning Programmes for LOGGS Satellites Vulcan UR, Viscount VO, Vampire OD & Associated Infield Pipelines – LDP1. Weblink last accessed 25 January 2020: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664296/LDP1_Final.pdf

[6] ConocoPhillips (2017). Commercial Fisheries Baseline Characterisation: LOGGS South, LOGGS North and CMS Areas. Report No. BMM-SNS-P-XX-S-HS-02-00001;

[7] Gardline (2015). SNS Decommissioning Survey LOGGS Gas Fields (LOGGS Hub, Mimas MN, Ganymede ZD, South Valiant TD, Europa EZ). Habitat Assessment Report. August 2015. Report No. 10553.1;

[8] Gardline (2015). SNS Decommissioning Survey LOGGS Gas Fields (LOGGS Hub, Mimas MN, Ganymede ZD, South Valiant TD, Europa EZ). Pre-decommissioning Survey Report. August 2015. Report No. 10553.2;

[9] OPRED (2018) Offshore Oil and Gas Decommissioning Guidance Notes. Weblink last accessed 27 Jan 2020: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/760560/Decom_Guidance_Notes_November_2018.pdf

[10] Birds Addendum: Document XOD-SNS-L-XX-X-HS-02-00007

Appendix 1 Pipeline Burial Profiles

Appendix 1.1 PL2107 & PL2108 Seabed & Burial Profile

Figure A1.1.1: PL2107 & PL2108 Seabed & Burial Profile[10]

[10] Pipeline burial data based on 2012 survey data; 2014 data in the 500m zones showed no variance.

Figure A1.1.2: PL2107 & PL2108 Depth of Cover Profile[11]

[11] All historical exposures and freespans were to be found on the final approaches; none have been found on the infield sections.

Appendix 1.2 PL2234 & PL2235 Seabed & Burial Profile

Figure A1.2.3: PL2234 & PL2235 Seabed & Burial Profile

Figure A1.2.4: PL2234 & PL2235 Depth of Cover Profile[11]

Appendix 1.3 PL2236 & PL2237 Seabed & Burial Profile

Figure A1.3.5: PL2236 & PL2237 Seabed & Burial Profile[12]

[12] Pipeline burial data based on 2008 survey data; 2015 data in the 500m zones showed no variance.

Figure A1.3.6: PL2236 & PL2237 Depth of Cover Profile[11]

Appendix 2 Public & Consultee Correspondence

Appendix 2.1 Public Notices

Appendix 2.2 Correspondence with Statutory Consultees

Appendix 3 Partner Letters of Support

To be added on completion of Statutory Consultation and prior to submission for approval.