Juliet Field Decommissioning Programmes

Final Version

Document Control

Approvals

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Revision Control

Revision No	Reference	Changes/Comments	Issue Date
1	First Draft		28/08/18
2	Complete First Draft	Updated with OPRED comments and CA/EA findings	20/12/18
3	Complete First Draft	Updated with OPRED comments	08/03/19
4	Consultation Draft	Updated with OPRED comments	25/03/19
5	Post-Consultation Draft	Updated with comments from public consultation	08/05/19
6	Post-Consultation Draft	Updated with comments from OPRED (post-consultation)	20/05/19
7	Final Version	Updated with Letters of Support	27/06/19
8	Final Version	Updated with Letters of Support	27/06/19

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Content

Terms and Abbreviations

Abbreviation	Explanation
CA	Comparative Assessment
CMS	Caister Murdoch System
CoP	Cessation of Production
CS	Continental Shelf
DECC	Department of Energy and Climate Change
DP	Decommissioning Programme
EA	Environmental Appraisal
E&A	Exploration and Appraisal
EHC	Electro-Hydraulic Control
ES	Environmental Statement
FPAL	First Point Assessment Limited
HSE	Health and Safety Executive
LSA	Low Specific Activity
m	Metre
m^2	Square Metre
m^3	Cubic Metre
MSL	Mean Sea Level
NFFO	National Federation of Fishermen's Organisations
NORM	Naturally Occurring Radioactive Material
OD	Outer Diameter
OGA	Oil and Gas Authority
OGUK	Oil & Gas UK
OPEP	Oil Pollution Emergency Plans
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning, part of the Department for Business, Energy and Industrial Strategy
PETS	Portal Environmental Tracking System
PON	Petroleum Operations Notice
PWA	Pipeline Works Authorisation
RFI	Request for Information

Abbreviation	Explanation
SAC	Special Area of Conservation
SFF	Scottish Fishermen's Federation
SNS	Southern North Sea
Te	Tonnes
TGT	Theddlethorpe Gas Terminal
TOM	Tree On Mudline
UK	United Kingdom
WPS	Wellhead Protection Structure

Figures and Tables

1 EXECUTIVE SUMMARY

1.1 DECOMMISSIONING PROGRAMMES

This document contains the decommissioning programmes for both the Juliet Field subsea installations and Juliet Field pipelines that apply to the following Section 29 (S29) Notices, served under the Petroleum Act 1998:

1. Offshore installations (Juliet manifold and wellhead protection structures) in block 47/14b
2. Juliet Pipelines

1.2 REQUIREMENT FOR DECOMMISSIONING PROGRAMMES

Installations:
In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Juliet field (see Table 1.2) are applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED), part of the Department for Business, Energy and Industrial Strategy to obtain approval for decommissioning the installations detailed in Section 2.1 of this programme. (See also Section 8 - Partner Letters of Support).

Pipelines:
In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Juliet pipelines (see Table 1.4) are applying to OPRED to obtain approval for decommissioning the pipelines detailed in Section 2.2 of this programme. (See also Section 8 – Partner Letters of Support).

In conjunction with public, stakeholder and regulatory consultation, the decommissioning programmes are submitted in compliance with national and international regulations and OPRED guidelines. The schedule outlined in this document allows for a three-year execution window, including the flushing, cleaning and disconnect, for the decommissioning project due to begin in 2019.

As a development in English offshore waters, the Juliet field and associated infrastructure are subject to the National Marine Plan framework developed by the Department for Environment, Food and Rural Affairs (DEFRA) in conjunction with the Marine Management Organisation (MMO) under the Marine and Coastal Access Act 2009. The relevant management plan for the SNS, wherein the project area sits, is the East Offshore Management Plan ("the Plan"), this Plan was adopted in April 2014. The Plan takes a holistic approach to guiding sustainable development in the offshore waters of the SNS. Whilst the Plan does not specifically address decommissioning of oil and gas facilities, it does present the policy objectives which Regulators use as a framework to assess offshore developments and their potential impacts on the UK marine area.

1.3 INTRODUCTION

The Juliet Field is located in Block 47/14b of the UK Southern North Sea some 40km due east from the Humberside estuary and approximately 9km to the south of the Amethyst gas field. Juliet was discovered in December 2008 with well 47/14b-10 and subsequently developed by a two well subsea tieback in a water depth of 55m to the Pickerill A facilities.

Gas from the two Juliet wells is comingled into a subsea manifold and transported back to Pickerill A via a 22 km long 12" pipeline (PL3121). The subsea manifold comprises three production piping slots, two that are used for each of the production wells and one spare designated for future use. The Juliet pipeline ties into the base of the Pickerill A platform via a 12" riser. Control between Pickerill A and the Juliet wells is via a dedicated subsea electro-hydraulic control and chemical injection umbilical (PLU3122). The Juliet pipeline and umbilical were trenched and buried for protection from trawl gear and dragged anchors. On the platform, the gas from Juliet is comingled with the other Pickerill production gases, and then exported through a 24" pipeline back to Theddlethorpe Gas Terminal (TGT).

The Juliet field came into production in January 2014 from 47/14b-G1. 47/14b-G2 well came into production in March 2014. Cessation of Production (CoP) was submitted to the Oil and Gas Authority (OGA) for Juliet in July 2018.

The decommissioning programmes shall be submitted following public, stakeholder and regulatory consultation and in full compliance with OPRED guidelines. The decommissioning programmes explain the principles of the removal activities and are supported by an Environmental Appraisal (EA).

1.4 OVERVIEW OF INSTALLATIONS AND PIPELINES BEING DECOMMISSIONED

1.4.1 Installations

Table 1.1: Installations Being Decommissioned			
Field:	Juliet	**Production Type**	Gas
Water Depth (m)	55	**UKCS block**	47/14b
Subsea Installations		**Number of Wells**	
Number	**Type**	**Platform**	**Subsea**
3	Manifold (x1), Wellhead Protection Structures (x2)	N/A	2
Drill Cuttings piles		**Distance to median**	**Distance from nearest UK coastline**
Number of Piles	**Total Estimated volume (m^3)**	**km**	**km**
Nil	Nil	150 (from Juliet manifold)	40

Table 1.2 Installations Section 29 Notice Holders Details		
Section 29 Notice Holders	**Registration Number**	**Equity Interest (%)**
Neptune Energy International	FR479920134	0%
Neptune E&P UKCS Limited	03386464	81%
HH LAPS Limited	08066733	19%

1.4.2 Pipelines

Table 1.3: Pipelines Being Decommissioned		
Number of Pipelines / Umbilicals	1 pipeline 1 umbilical 2 jumpers (East & West)	See Table 2.2

Table 1.4: Pipelines Section 29 Notice Holders Details		
Section 29 Notice Holders	**Registration Number**	**Equity Interest (%)**
Neptune Energy International	FR479920134	0%
Neptune E&P UKCS Limited	03386464	81%
HH LAPS Limited	08066733	19%

1.5 SUMMARY OF PROPOSED DECOMMISSIONING PROGRAMME

Table 1.5: Summary of Decommissioning Programmes		
Selected Option	**Reason for Selection**	**Proposed Decommissioning Solution**
1. Subsea Installations		
Full removal of manifold and wellhead protection structures from the seabed.	Meets OPRED regulatory requirements. Removes a potential obstruction to fishing operations and maximises recycling of materials.	Recovery of structures from the seabed using an appropriate vessel and lifting equipment. None of the structures are piled. Diver support may be required. Structures to be recovered to shore for reuse or recycling.
2. Pipelines, Flowlines & Umbilicals		
Decommissioning of the Juliet pipeline and umbilical *in situ* with minimal invention works.	Meets OPRED regulatory requirements of a clear seabed as pipeline and umbilical are sufficiently trenched and buried.	The trenched and buried pipeline and umbilical will be left *in situ* and disconnected at both the Juliet and Pickerill ends (where the pipeline and umbilical exits rock placement) and the ends removed (note that the umbilical at Juliet manifold end exits rock placement at the manifold tie-in location, refer to Figure 1.2). The surface laid pipeline/umbilical sections with rock cover shall be left on the seabed. Associated stabilisation features which are buried beneath rock placement shall also be left *in situ*. Any surface laid sections of pipeline and umbilical (such as the tie-in spools) with no rock cover shall be removed, including control jumpers.
3. Wells		
Abandoned in accordance with Oil & Gas UK Guidelines for the Suspension and abandonment of Wells and Neptune standards.	Meets OGA and HSE regulatory requirements.	A PON5/ Portal Environmental Tracking System (PETS)/Marine Licence application under the relevant regulations will be submitted in support of works carried out.
4. Drill Cuttings		
This section is not applicable to Juliet Field as the recent surveys indicate no evidence of a drill cuttings pile.		
5. Interdependencies		
Subsea structure removal can only occur after pipeline flushing and cleaning scope.		

1.6 FIELD LOCATION INCLUDING FIELD LAYOUT AND ADJACENT FACILITIES

Figure 1.1: Field Location in UKCS

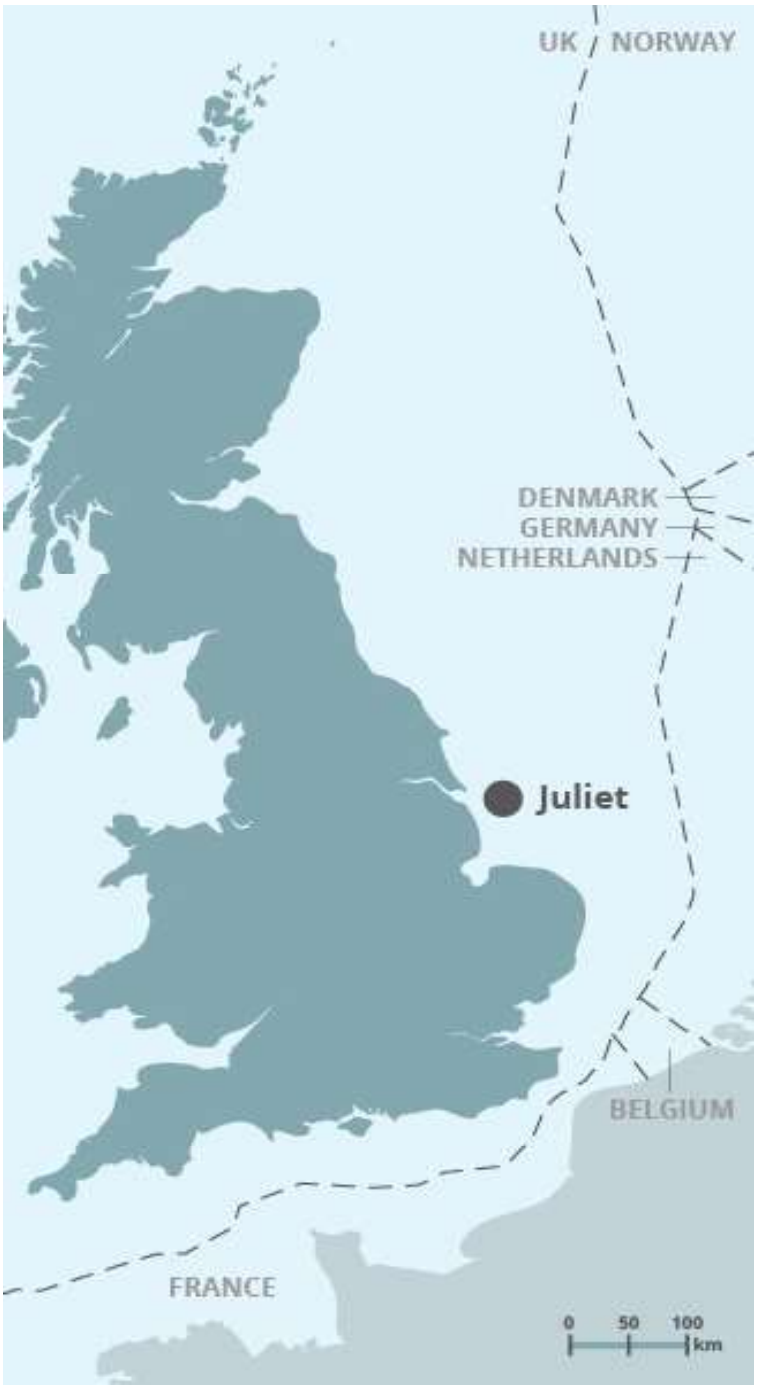


Figure 1.2: Field Layout

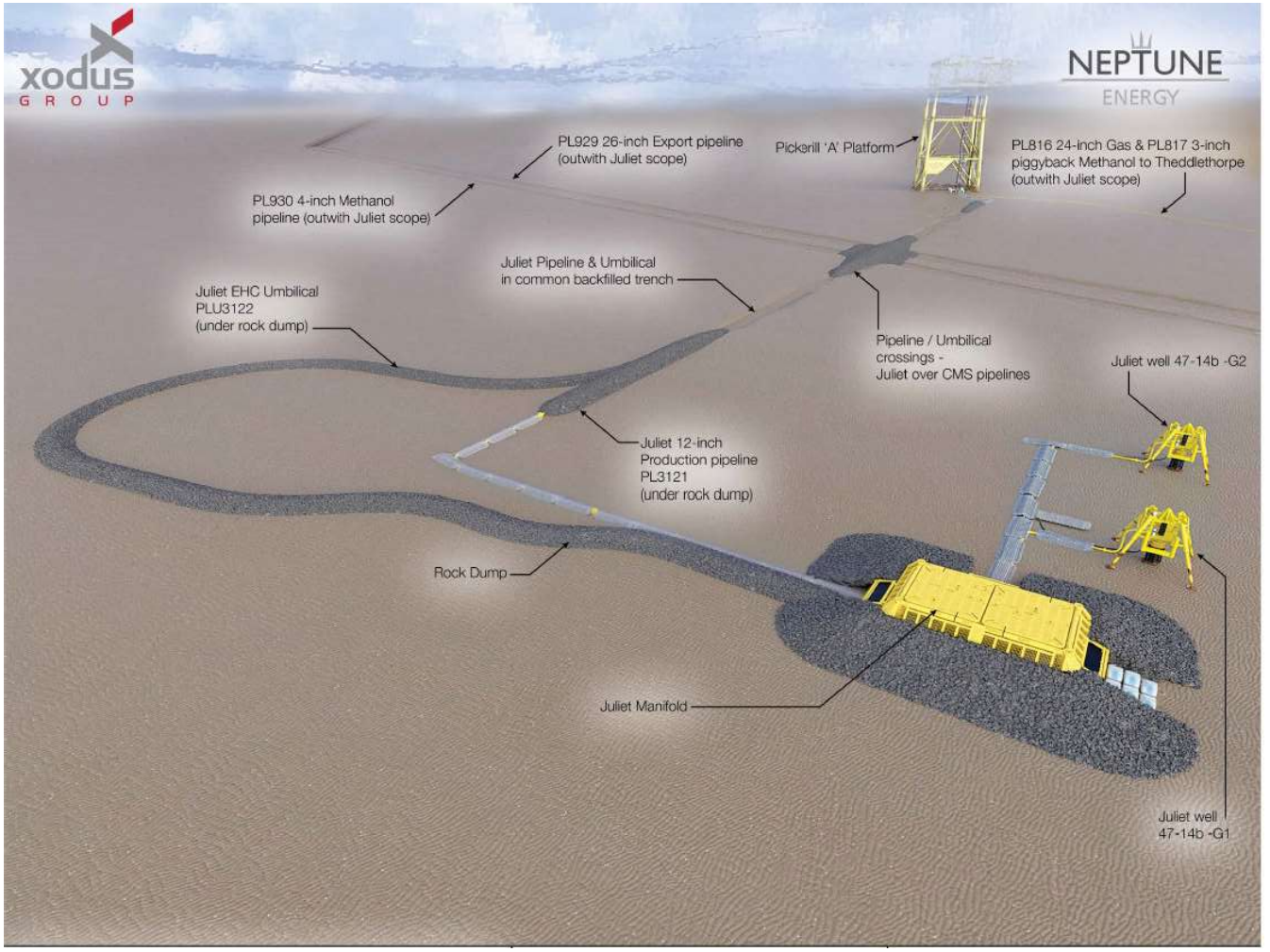
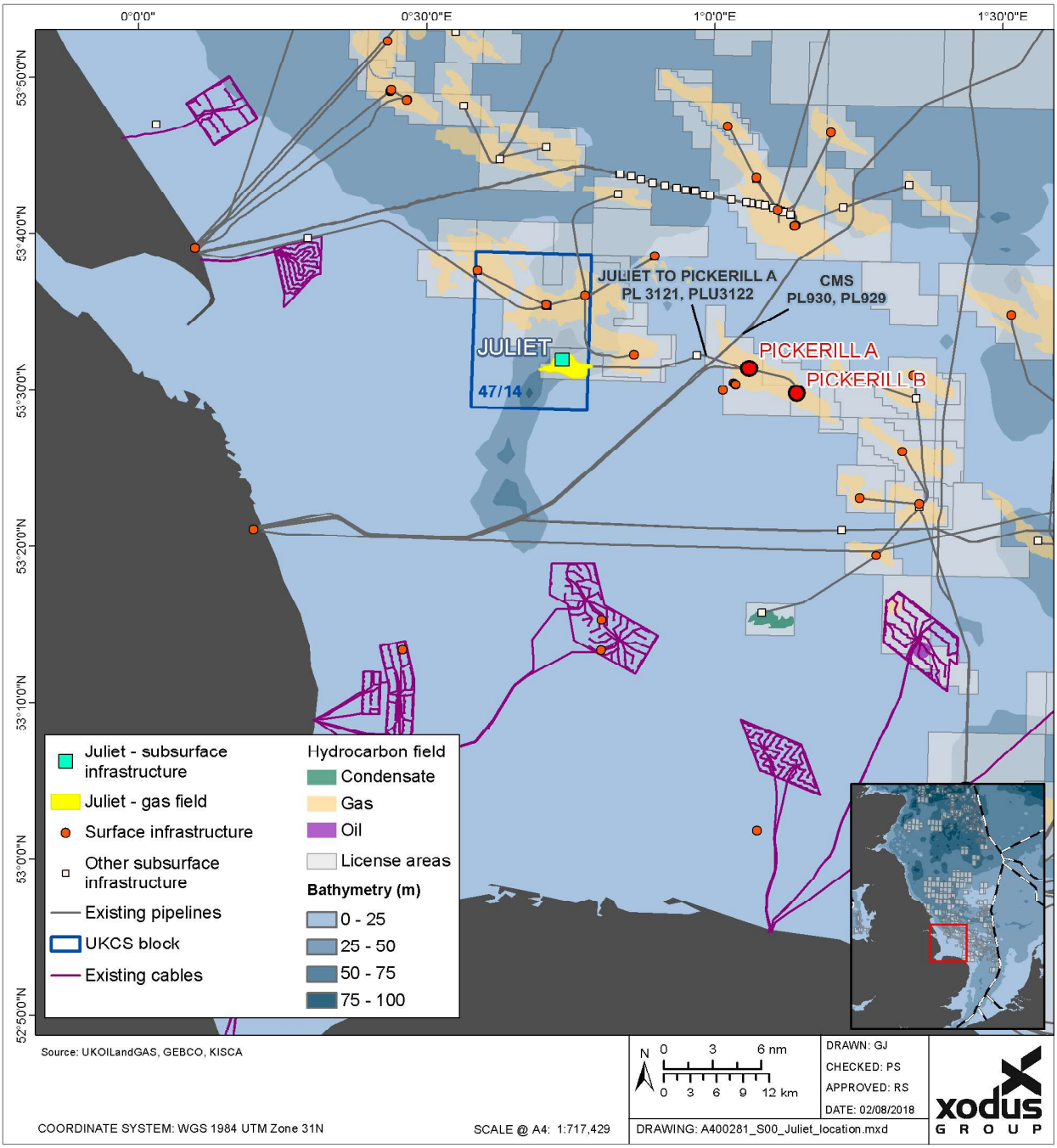


Table 1.6 Adjacent Facilities					
Owner	**Name**	**Type**	**Distance/Direction**	**Information**	**Status**
Perenco	Pickerill A	Platform	22km East	Gas processing and onward export to Theddlethorpe Gas Terminal (TGT)	Out-of-use
Conoco Phillips	Caister Murdoch System Crossing	26" Export Pipeline (PL929)	Crossing distance from manifold - 18km East	Juliet pipeline and umbilical cross once above PL929 - export line from Murdoch to TGT	Out-of-use
Conoco Phillips	Caister Murdoch System Crossing	4" Methanol Pipeline (PL930)	Crossing distance from manifold - 18km East	Juliet pipeline and umbilical cross once above PL930 – methanol line from TGT to Murdoch	Out-of-use
Perenco	Amethyst A2D	Platform	8km North-Northeast	Four unmanned satellite platforms supporting production for the Amethyst gas field. Gas is export to the Easington Gas Processing Terminal.	Operational
	Amethyst B1D	Platform	8.2km East-Northeast		Operational
	Amethyst A1D	Platform	6.7km North-Northwest		Operational
	Amethyst C1D	Platform	14.3km North-Northwest		Operational

Impacts of Decommissioning Proposals
The Juliet pipeline flushing and cleaning will be conducted from the Pickerill A platform therefore this scope must be carried out prior to the Pickerill A topsides removal. To minimise the disposal cost, Neptune Energy has proposed the use of one of the Pickerill A wells as a disposal well. The Diving Support Vessel (DSV) will tie-in to the manifold header and commence flushing via the subsea flushing head or launcher, notifying Pickerill A when the pig train is approaching the platform. Hydrocarbon gas returns will be routed to the platform vent with the remaining returned fluids injected into the donor (disposal) well. The flushing shall continue until an acceptable level of cleanliness is achieved. The pipeline will then be disconnected and left in-situ, flooded with seawater. Neptune Energy will submit a Pipelines Safety Regulations (1996) Notification to the HSE, under Regulation 22 "Notification in other cases" prior to pipeline flush, clean and disconnect works.

The Juliet pipeline crosses with the Caister Murdoch System. There is no anticipated impact on the ConocoPhillips facility if the Juliet pipeline is decommissioned *in situ*. Neptune has made cost provisions for decommissioning the CMS crossing pending the Caister Murdoch System decommissioning decision. The CMS crossing decommissioning is excluded from this decommissioning programme.

Figure 1.3: Adjacent Facilities



1.7 INDUSTRIAL IMPLICATIONS

Neptune plans to form collaborating partnerships with the supply chain based on the guiding principles outlined in the Neptune Supply Chain Charter. Principles that are key to this approach are summarised below.

Engagement

- Neptune will make available as much information as practicable to the market by way of share fairs, industry conferences, FPAL, industry media articles, industry forums and RFIs.
- Neptune will define and publicise contact points for handling of supplier enquiries.
- Neptune will enter into early consultation with suppliers on draft strategies, pricing options, specifications, and statements of requirement where appropriate.
- Neptune will provide sufficient time and information for suppliers to respond to the bidding process appropriate for the work.

Trust

- Neptune will treat all parties openly, fairly, with respect and without bias.
- Neptune will protect commercially sensitive information and respect and protect each other's intellectual property.
- Neptune will define objectives and make it clear what expectations of suppliers and potential suppliers.
- Where appropriate, Neptune will collaborate with suppliers to agree common objectives, Key Performance Indicators and share in the success of meeting milestones.
- Neptune will not partake in market abuse or anti-competitive behaviour.
- Neptune will demonstrate the highest professional standards in the award and management of contracts.

Innovation

- Neptune are keen to explore new technologies and will invite suppliers to demonstrate any new technologies and innovations.
- Neptune are open to discussing new commercial models with suppliers.
- Neptune will select the most suitable suppliers for each project using KPI measures and performance reviews.
- Neptune is open to introducing new products and are enthusiastic for new potential partners to present their innovative technologies and products. Neptune recognise that there is no one size fits all approach to each contract and no set supplier for every product.
- Neptune's Supply Chain Department is not biased and will always make selections based on elements of the Neptune Supply Chain Charter in order to continuously enhance the supply chain.

2 DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 INSTALLATIONS: SUBSEA INCLUDING STABILISATION FEATURES

Table 2.1: Subsea Installations and Stabilisation Features

Subsea installations including Stabilisation Features	Number	Size/Weight (Te)	Location		Comments/Status
Wellhead Protection Structures (WPS) Note 1	2	9 x 9 x 7m 1 x 34.9 tonnes (Well 47/14b-G1)	WGS84 Decimal	53.553111°N 0.754111° E	Structures are securely clamped to the associated wellhead conductors
			WGS84 Decimal Minute	53°33.187'N 00°45.247'E	
		9 x 9 x 7m 1 x 34.9 tonnes (Well 47/14b-G2)	WGS84 Decimal	53.553694°N 0.755917°E	
			WGS84 Decimal Minute	53°33.222'N 00°45.355'E	
Manifold	1	16 x 11 x 3m 1 x 97.2 tonnes	WGS84 Decimal	53.553306°N 0.754028°E	The structure is gravity based, held down by rock placement on the skirt
			WGS84 Decimal Minute	53°33.198'N 00°45.242'E	
Wellheads (comprise of Xmas Tree, WPS (see Row 1), Xmas Tree Debris Cap and Tree Cap)	2	19.3 tonnes Well 47/14b-G1	WGS84 Decimal	53.553111°N 0.754111° E	Well construction is a deviated slim-hole design with a conventional 13 ⅝" Dril-Quip Tree On Mudline (TOM) system installed approximately 58.5m below Mean Sea Level (MSL)
			WGS84 Decimal Minute	53°33.187'N 00°45.247'E	
		19.3 tonnes Well 47/14b-G2	WGS84 Decimal	53.553694°N 0.755917°E	
			WGS84 Decimal Minute	53°33.222'N 00°45.355'E	
Rock Placement	N/A	475 tonnes	Around manifold mudmats		Mudmats covered by loose rock placement for stability

Note 1- Assumed dimensions

2.2 PIPELINES INCLUDING STABILISATION FEATURES

Table 2.2: Pipeline/Flowline/Umbilical Information

Description	Pipeline Number (as per PWA)	Diameter	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
Juliet pipeline	PL3121	12"	22	Carbon Steel	Gas	Juliet manifold - Pickerill A Platform (including the Caister Murdoch System Crossing)	Trenched and buried (PL3121 & PLU3122 in the same trench except at approaches at either end) Average DOC over length of pipeline and umbilical generally exceeds the minimum requirements of 0.6 m above top of pipeline as per BEIS guidelines for in-situ decommissioning Average DOC identified as 1.26m in 2017 survey DOC generally increases between the 2013 and 2017 surveys	Operational	Hydrocarbon
Juliet umbilical	PLU3122	138mm OD	22	Umbilical	Chemicals	Juliet manifold - Pickeril A Platform (including the Caister Murdoch System Crossing)		Operational	Chemicals

Table 2.2: Pipeline/Flowline/Umbilical Information

Description	Pipeline Number (as per PWA)	Diameter	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
Manifold Tie-in Spool	PL3121	12"	0.08	Carbon Steel	Gas	Juliet manifold – pipeline flange (manifold end)	Laid on seabed	Operational	Hydrocarbon
Riser Tie-in Spool	PL3121	12"	0.05	Carbon Steel	Gas	Pipeline flange (riser end) – Pickerill A Platform	Laid on seabed	Operational	Hydrocarbon
East Well Spool	PL3121	168.3mm OD	0.06	Carbon Steel	Gas	Juliet Well 47/14b-G2 - manifold	Laid on seabed	Operational	Hydrocarbon
West Well Spool	PL3121	168.3mm OD	0.03	Carbon Steel	Gas	Juliet Well 47/14b-G1 - manifold	Laid on seabed	Operational	Hydrocarbon
EHC Control Jumper (East Well)	PLU3122 GEW	98mm OD	0.08	Umbilical (copper/ thermoplastic)	Chemicals	Juliet Well 47/14b-G2 - manifold	Laid on seabed	Operational	Chemicals
EHC Control Jumper (West Well)	PLU3122 GWW	98mm OD	0.05	Umbilical (copper/ thermoplastic)	Chemicals	Juliet Well 47/14b-G1 - manifold	Laid on seabed	Operational	Chemicals

Table 2.3: Subsea Pipeline Stabilisation Features

Stabilisation Feature	Total Number	Weight (Te)	Location(s)	Exposed/Buried/Condition
Concrete mattresses	8	6 x 3 x 0.15m 49 tonnes	At pipeline crossing point with Caister Murdoch System (CMS) – under Juliet pipeline and umbilical	Buried (under rock placement)
Concrete mattresses	2	6 x 3 x 0.15m 12 tonnes	At pipeline crossing point with Caister Murdoch System (CMS)	Buried (under rock placement)
Concrete mattresses	13	6 x 3 x 0.15m 79 tonnes	Near Pickerill A Platform	Exposed
Concrete mattresses	5	2 x 3 x 0.15m 10 tonnes	Near Pickerill A Platform	Exposed
Concrete mattresses	2	6 x 3 x 0.15m 10 tonnes	Near Pickerill A Platform	Buried (under rock placement)
Concrete mattresses	25	6 x 3 x 0.15m 128 tonnes	At manifold-pipeline tie-in spool and wellhead jumpers	Exposed
Concrete mattresses	18	6 x 3 x 0.15m 92 tonnes	On pipeline/umbilical for stability	Buried (under rock placement)
Concrete mattresses	2	6 x 3 x 0.15m 10 tonnes	Wet stored mattresses near manifold	Exposed
Grout bags	20	20 tonnes	At riser connection at Pickerill A Platform	Exposed

Table 2.3: Subsea Pipeline Stabilisation Features				
Stabilisation Feature	**Total Number**	**Weight (Te)**	**Location(s)**	**Exposed/Buried/Condition**
Grout bags	11	11 tonnes	Surface laid umbilical at manifold end, used for stability	Buried (under rock placement)
Grout bags	10*	10 tonnes	Unused futures connection to the manifold	Partially buried (under rock placement)
Grout bags	20*	20 tonnes	10 bags each at NE and SE corners of the manifold	Partially buried (under rock placement)
Grout bags	1	1 tonne	Wet stored near manifold	Exposed
Grout bags	20*	20 tonnes	At connection to Well 47/14b-GW	Exposed
Sandbags	20	0.4 tonnes	Between mattresses at CMS crossing	Buried (under rock placement)
Rock Placement	n/a	17,650 tonnes	Spot rock placement on pipeline and umbilical at various locations & Blanket rock placement on pipeline and umbilical in untrenched areas (approaches at either end)	Rock is >0.6m over top of pipeline Nominal cover of 0.5m over top of pipeline

* Assumed quantity based on 2017 survey

2.3 WELLS

Table 2.4 Well Information			
Platform Wells	**Designation**	**Status**	**Category of Well**
N/A	N/A	N/A	N/A
Subsea Wells			
47/14b-G1 (West)	Gas Production	Shut-in	SS-3/3/3
47/14b-G2 (East)	Gas Production	Shut-in	SS-3/3/3
E&A Well 47/14b-10	Exploration and Appraisal (E&A)	Abandoned	ML 2.2

2.4 INVENTORY ESTIMATES

The approximate amount of key materials used in the make-up of the Juliet Field infrastructure has been evaluated. Further review of the inventories of materials will be conducted during the detailed engineering phase of decommissioning, summary plots of the estimated material inventories are shown in Figure 2.1 and Figure 2.2. An inventory will be shared with the Environment Agency (EA).

The Environmental Appraisal Report will contain further information on the inventory.

Figure 2.1: Pie Chart of Estimated Inventories (Installations)

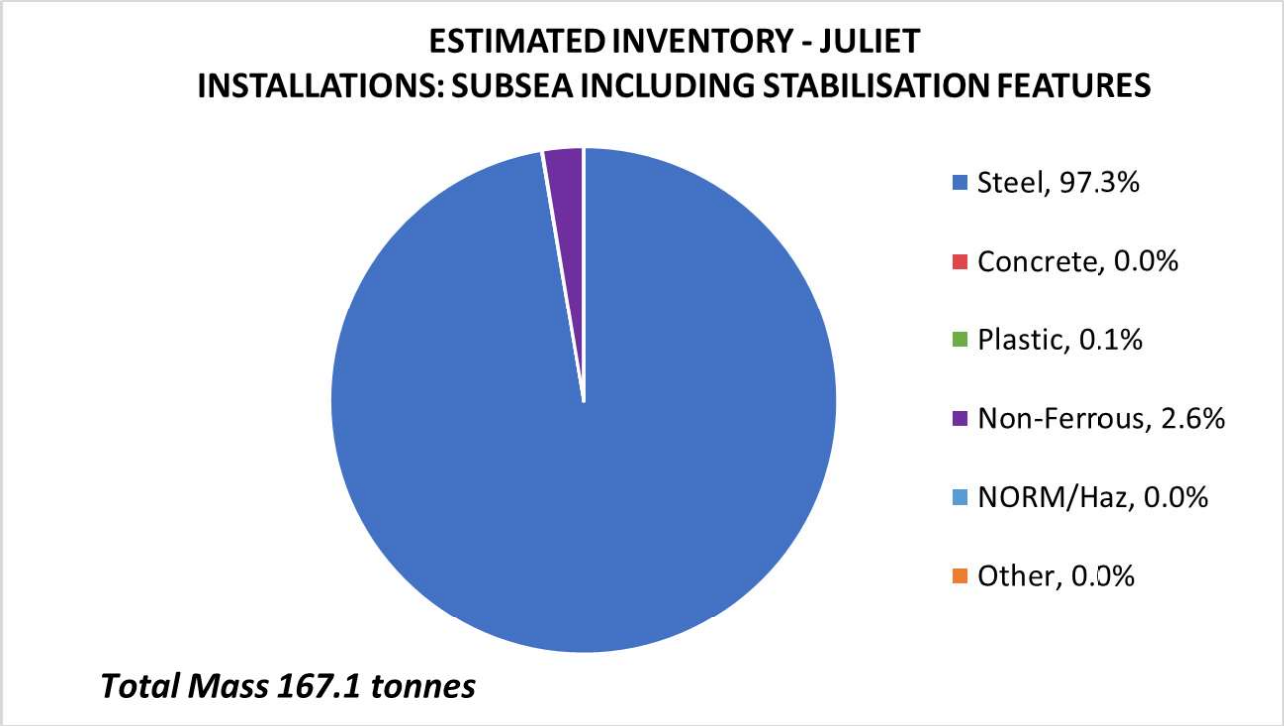
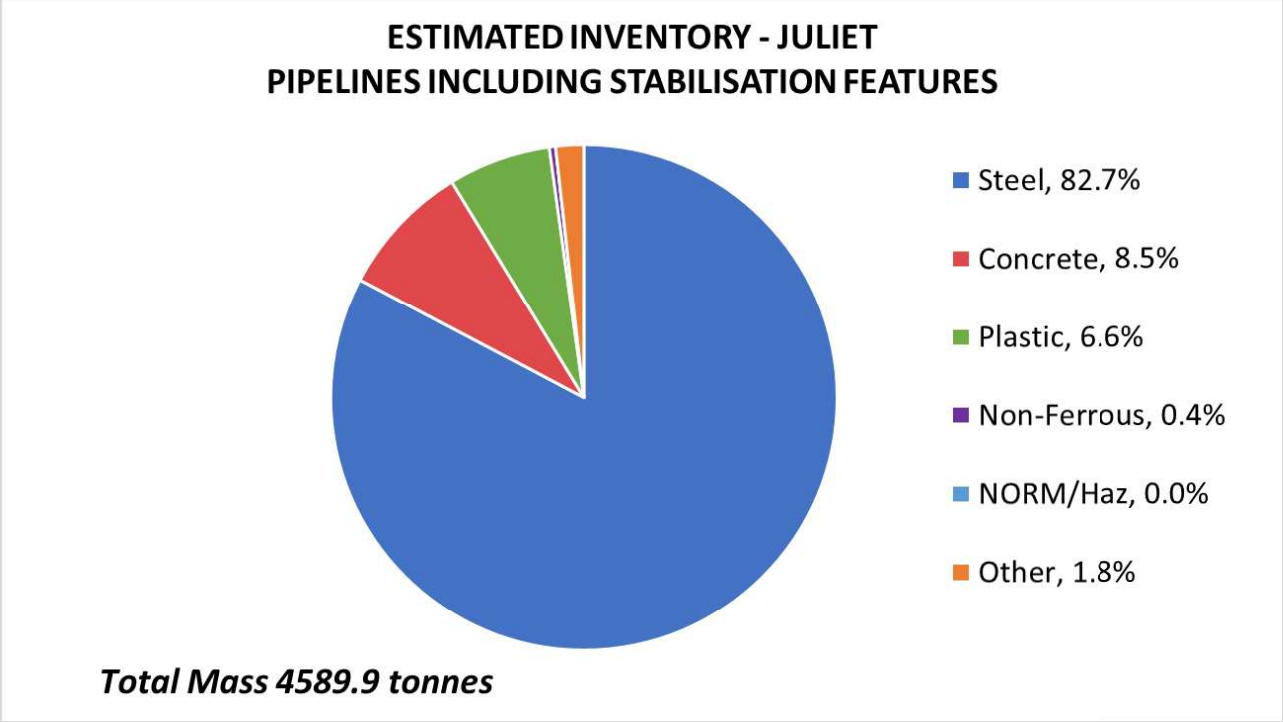


Figure 2.2: Pie Chart of Estimated Inventory (Pipelines)



3 REMOVAL AND DISPOSAL METHODS

Neptune has a Waste Management Plan which details how the waste generated from the Juliet offshore asset during the decommissioning process will be managed in order to comply with environmental legislation and observe the advice outlined in the OPRED Guidance Notes.

The vast majority of the waste being brought ashore will be recyclable providing the infrastructure is appropriately cleaned to remove any residual contaminants e.g. hydrocarbon residues, biological material, etc. Neptune will aspire to recycle 100% of the materials recovered from the Juliet decommissioning activities however it is recognised that this is subject to a range of factors (e.g. contamination of materials). Neptune shall take all reasonable courses of action to prevent waste being sent to landfill and ensure the most environmentally sound route is taken.

3.1 SUBSEA INSTALLATIONS AND STABILISATION FEATURES

Table 3.1: Subsea Installations and Stabilisation Features

Subsea installations and stabilisation features	Number	Option	Disposal Route (if applicable)
Wellhead Protection Structures	2	Full Removal	Return to shore for reuse or recycling Note 2
Manifold	1	Full Removal	Return to shore for reuse or recycling
Template(s)	N/A	N/A	N/A
Protection Frames	2	Full Removal	Return to shore for reuse or recycling Note 2
Concrete mattresses	N/A	N/A	N/A
Grout bags	N/A	N/A	N/A
Rock Placement	475Te	Decommission *in situ*	N/A

Note 2 - Subsea installations to be recovered during the well plug and abandonment campaign

3.2 PIPELINES

Decommissioning Options:

Table 3.2: Pipeline or Pipeline Groups Decommissioning Options

Pipeline or Group (as per PWA)	Condition of line/group	Whole or part of pipeline/group	Decommissioning Options considered
Juliet pipeline (PL3121)	Trenched and Buried	Pipeline and umbilical will be decommissioned *in situ* with some minor intervention activities to cut and rock placement the ends.	Decommission *in situ* with minimal intervention works
			Full removal via deburial and reverse reel
Juliet umbilical (PLU3122)			Full removal via burial pipeline cut and lift and umbilical reverse reel
Manifold Tie-in Spool (PL3121)	Surface Laid	Surface laid spoolpieces and control jumpers will be recovered from the seabed and transported to shore for reuse or recycling.	Full removal
Riser Tie-in Spool (PL3121)	Surface Laid	Surface laid spoolpieces and control jumpers will be recovered from the seabed and transported to shore for reuse or recycling.	Full removal
East Well Spool (PL3121)	Surface Laid	Surface laid spoolpieces and control jumpers will be recovered from the seabed and transported to shore for reuse or recycling.	Full removal
West Well Spool (PL3121)	Surface Laid	Surface laid spoolpieces and control jumpers will be recovered from the seabed and transported to shore for reuse or recycling.	Full removal

Table 3.2: Pipeline or Pipeline Groups Decommissioning Options			
Pipeline or Group (as per PWA)	**Condition of line/group**	**Whole or part of pipeline/group**	**Decommissioning Options considered**
EHC Control Jumper (East Well) (PLU3122)	Surface Laid	Surface laid spoolpieces and control jumpers will be recovered from the seabed and transported to shore for reuse or recycling.	Full removal
EHC Control Jumper (West Well) (PLU3122)	Surface Laid	Surface laid spoolpieces and control jumpers will be recovered from the seabed and transported to shore for reuse or recycling.	Full removal

Comparative Assessment Method:

The CA utilises a Multi Criteria Decision Analysis (MCDA) tool which employs pairwise comparisons of quantitative and qualitative data. The options are assessed against the five main criteria defined in the BEIS decommissioning Guidance Notes (Safety; Environment; Technical; Societal; and Economics) which were equally weighted. These criteria were then subdivided into relevant sub-criteria for the assessment, which are detailed, along with the overall CA process, in the Juliet Comparative Assessment Report [4].

The Juliet CA evaluation considered the pipeline and stabilisation materials; noting that these groups of infrastructure were intrinsically linked i.e. if the pipeline was fully removed then the associated mattresses and grout bags would also be removed. The other infrastructure groups will be fully removed and therefore were excluded from the CA evaluation.

Outcome of Comparative Assessment:

Table 3.3: Outcomes of Comparative Assessment		
Pipeline or Group	**Recommended Option**	**Justification**
Juliet pipeline (PL3121) Juliet umbilical (PLU3122)	Decommissioning *in situ* with minimal intervention works	Recent pipeline surveys (2018) have documented the status of the pipeline and umbilical and concluded that the depth of burial is sufficient to avoid a significant risk to other users of the sea. Minor intervention works will be executed to cut and rock placement at the pipeline ends. Future inspection surveys will be carried out however it is not expected that the pipeline and umbilical burial status will change over time. The existing ends on the seabed section and transition are covered in rock. If the ends were to be buried, the rock would need to be displaced and excavation under the cut pipeline required to lower it. The proposed way forward was to rock dump the cut ends. This results in approximately 500 tonnes of additional rock on the seabed for both ends.
Manifold Tie-in Spool (PL3121)	Full removal	Spoolpiece is exposed and could therefore present a potential risk to other users of the sea. Structure will be removed in line with OPRED regulations which aims to achieve a clear seabed.
Riser Tie-in Spool (PL3121)	Full removal	Spoolpiece is exposed and could therefore present a potential risk to other users of the sea. Structure will be removed in line with OPRED regulations which aims to achieve a clear seabed.
East Well Spool (PL3121)	Full removal	Spoolpiece is exposed and could therefore present a potential risk to other users of the sea. Structure will be removed in line with OPRED regulations which aims to achieve a clear seabed.
West Well Spool (PL3121)	Full removal	Spoolpiece is exposed and could therefore present a potential risk to other users of the sea. Structure will be removed in line with OPRED regulations which aims to achieve a clear seabed.

Table 3.3: Outcomes of Comparative Assessment		
Pipeline or Group	**Recommended Option**	**Justification**
EHC Control Jumper (East Well) (PLU3122)	Full removal	Control jumper exposed and could therefore present a potential risk to other users of the sea. Structure will be removed in line with OPRED regulations which aims to achieve a clear seabed.
EHC Control Jumper (West Well) (PLU3122)	Full removal	Control jumper exposed and could therefore present a potential risk to other users of the sea. Structure will be removed in line with OPRED regulations which aims to achieve a clear seabed.

More details of the selected decommissioning options, including an illustration of the 'as left' conditions of the infrastructure, are given in Section 3.4.

3.3 PIPELINE STABILISATION FEATURES

Table 3.4: Pipeline Stabilisation Features

Stabilisation features	Number	Option	Disposal Route (if applicable)
Concrete mattresses	75	Approximately 30 mattresses are fully buried under rock placement and will therefore be decommissioned *in situ* along with the pipeline and umbilical. The remainder are exposed and will therefore be removed from the seabed.	Mattresses destined for 'full removal' will be recovered from the seabed using a suitable vessel and lifting equipment. Diver assistance may be required. Mattresses will be recovered to shore for reuse or recycling.
Grout bags	82	Approximately 11 grout bags are fully buried under rock placement and will therefore be decommissioned *in situ* along with the pipeline and umbilical. The remainder are exposed and will therefore be removed from the seabed.	Grout bags destined for 'full removal' will be recovered from the seabed using a suitable vessel and lifting equipment. Diver assistance may be required. Grout bags will be recovered to shore for reuse or recycling.
Sand bags	20	All sand bags are buried under rock placement at the CMS crossing and will therefore be decommissioned *in situ* along with the pipeline and umbilical.	N/A
Rock Placement (Te)	17,650Te	Decommission *in situ*	N/A

More details of the selected decommissioning options, including an illustration of the 'as left' conditions of the infrastructure, are given in Section 3.4

3.4 COMPARATIVE ASSESSMENT OUTCOME – SELECTED OPTION OVERVIEW

A comparison between the existing Juliet infrastructure and the 'as left' condition based on the proposed decommissioning option is given in Figure 3.1. As the figures show:

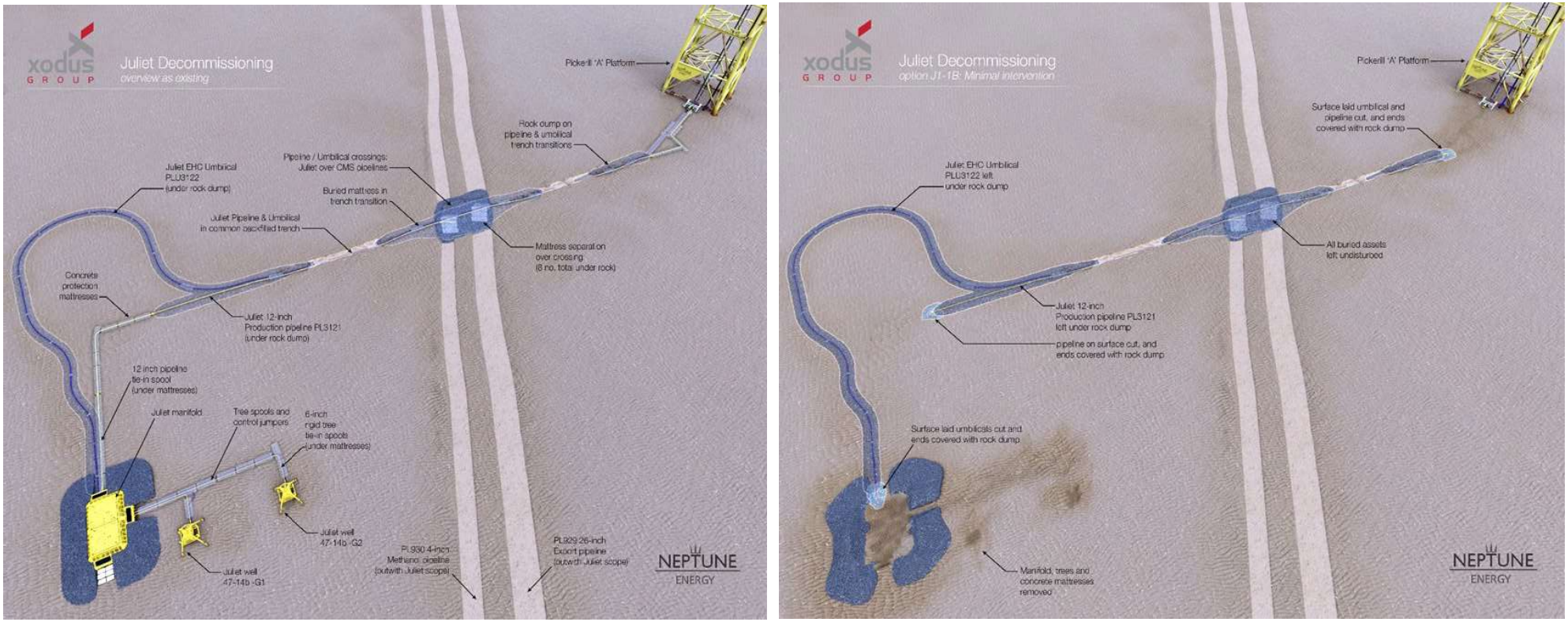
- The Juliet manifold, WHPSs and spools will be recovered to shore;
- The Juliet pipeline and umbilical will be decommissioned *in situ* with some minor intervention works works to remove the surface laid section of pipeline which is not buried beneath rock placement; the surface laid pipeline/umbilical sections with rock cover shall be left on the seabed; and
- Associated stabilisation features which are buried beneath rock placement shall also be left *in situ*- this includes 20 sand bags; approximately 30 mattresses and 11 grout bags. Approximately 45 exposed mattressess and 71 grout bags shall be removed from the seabed and recovered to shore.

The key safety, environmental and societal implications of the selected option are summarised in the following table.

Table 3.5: Summary of Key Safety, Environmental and Societal Implications of Decommissioning Option

Parameter	Value
Life Cycle Emissions	7,187 Te
Vessel Days (Total)	47 (21 operations)
Overall PLL	5.2 e^{-4}
Seabed Disturbance	2.988 km^2
Risk to Fishermen	Low
Vessel CO_2 Emissions	1,251 Te

Figure 3.1: Comparison of Existing Juliet Infrastructure (Left) and 'As Left' Condition (Right)



3.5 WELLS

Table 3.6: Well Plug and Abandonment
The wells which remain to be abandoned, as listed in Section 2.3 (Table 2.4) will be plugged and abandoned in accordance with Oil and Gas UK Guidelines for the suspension and abandonment of wells and Neptune standards. A PON5/Portal Environmental Tracking System (PETS)/Marine Licence application will be submitted in support of any such work that is to be carried out. A Well Notification will be submitted in accordance with the Offshore Safety Directive requirement.

3.6 DRILL CUTTINGS

This section is not applicable to Juliet Field as the recent surveys indicate no evidence of a drill cuttings pile.

3.7 WASTE STREAMS

Table 3.7: Waste Stream Management Methods	
Waste Stream	**Removal and Disposal method**
Bulk liquids	Flushed from subsea infrastructure into Pickerill reservoir via a donor well on the Pickerill A platform.
Marine growth	Removed offshore where possible. Any marine growth brought to shore will be disposed of according to guidelines.
NORM/LSA Scale	NORM may be present during decommissioning. It shall be partially removed offshore under appropriate permit and disposed of in line with guidelines.
Asbestos	No asbestos is expected during decommissioning. If present, it will be recovered and contained in an appropriate manner and handled by qualified personnel with the necessary safety equipment. Recovered asbestos shall be taken onshore for disposal.
Other hazardous wastes	Will be recovered to shore and disposed of under appropriate permit.
Onshore Dismantling sites	Appropriate licenced sites will be selected. Facility chosen must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver innovative recycling options.

Table 3.8 Inventory Disposition			
	Total Inventory Tonnage	Planned tonnage to shore	Planned left *in situ*
Installations	167	167	0
Pipelines	4,116	28.5	4,087.5
Pipeline Stabilisation Features	474	299	175
Total	**4,757**	**494.5**	**4,262.5**

As outlined in Table 3.8, circa 494.5 tonnes of material are expected to be returned to shore. Provided that the appropriate handling and cleaning procedures are observed, the majority of the material is suitable for recycling. In line with the guiding principles of the project Waste Management Plan, Neptune aspire to recycle 100% of the recovered materials however it is recognised that this is subject to a range of factors (e.g. contamination of materials).

4 ENVIRONMENTAL APPRAISAL

4.1 ENVIRONMENTAL SENSITIVITIES (SUMMARY)

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Conservation interests	The Juliet infrastructure is located15.9 km NNE of the Inner Dowsing, Race Bank and Norfolk Ridge SAC, 38.6 km ENE of the Saltfleetby-Theddlethorpe Dunes and Gibraltar Point SAC, 38.3 km ENE of the Humber Estuary SAC and 28.8 km NNW of the Southern North Sea SAC. There are two SPA located < 50 km from the Juliet infrastructure: the Greater Wash SPA (offshore – 9 km SW) and the Humber Estuary SPA (inshore – 38 km WSW). There are three MCZs located < 50 km from the Juliet infrastructure: Silver Pit Recommended MCZ (rMCZ) (0 km) Holderness Offshore rMCZ (10.5 km NNE) Holderness Inshore MCZ (34.2 km WNW)
Seabed	Seabed sediments around the Juliet Field are a mixture of coarse sands, gravels and mixed coarse sediments (cobbles and pebbles). There are no observed reefs within the proximity of the Juliet Field. There is bedrock located 1.5 km N of the project area. The seabed in the Juliet Field specifically has EUNIS habitat classifications which predict the presence of: deep circalittoral course sediment (A5.15); circalittoral coarse sediment (A5.14); and circalittoral mixed sediments (A5.44). Benthic fauna are characteristic for this region of the SNS.
Fish	The following species have spawning grounds which have been identified near the Juliet Field: cod, herring, lemon sole, plaice, sole, sprat and sandeel. High intensity nursery grounds have been identified as likely to occur around the project area for both cod and whiting. The following species are likely to have low intensity nursery grounds around the project area: herring, haddock, plaice, lemon sole, mackerel, sandeel and sprat.
Fisheries	Fishing effort within the vicinity of the Juliet Field is high with traps being the dominant fishing type. UK commercial fishing landings in ICES Rectangle 36F0 are comprised almost wholly of shellfish. The shellfish fishery traps for crabs, whelks, *Nephrops* and lobsters. Dredgers and harvesters are also employed target scallops and shrimps, as well as some demersal trawl vessels and pelagic mobile gears (i.e. hooks and lines and seine nets), though catches from these fisheries contribute substantially less.

Table 4.1: Environmental Sensitivities

Environmental Receptor	Main Features
Marine Mammals	Three species of marine mammal have been identified within the vicinity of the Juliet infrastructure: Harbour porpoise, White-beaked dolphin and Minke Whale. The recorded sensitivities associated with these mammals are shown below.

Month	J	F	M	A	M	J	J	A	S	O	N	D
Harbour porpoise	L	L	M	L	L	M	M	M	M	L	L	L
White-beaked dolphin						M		L	L	L		
Minke whale									L			

Birds	The most common species of seabird found in these areas of the SNS include: Fulmar, Gannet, Guillemot, Kittiwake, Razorbill, Puffin, Little Auk; as well as numerous species of gull and tern. There are two important breeding seabird colonies along the coastline to the west of the project: The Wash and North Norfolk Coast; as well there is an important breeding waterfowl site, The Humber Estuary, to the west of the project.

Month	J	F	M	A	M	J	J	A	S	O	N	D
Seabird vulnerability	3	3	2	5	5	5	5	3	5	2	1	2

Onshore Communities	All onshore yards at which decommissioned material will be handled already deal with potential environmental issues as part of their existing site management plans. There is anticipated to be no change in potential for impact as a result of any of the material proposed for recovery. Whilst the yard(s) is yet to be selected, this will be in the UK. They will be selected on the basis that they can demonstrate the ability to handle the materials landed.
Other Users of the Sea	Recreational vessel activity varies across the project area, with low-moderate potential for motor boat and boat angling activity. Shipping density in the project area ranges from moderate (501-1,000 vessels) at the manifold end to high (1,001-10,000 vessels) along the western edge of the Juliet Field. Vessels are primarily in transit between Grimsby and other ports and offshore locations. Several offshore platforms surround the Juliet Field, these include: Amethyst A1D (6.7 km NNW), A2D (8 km NNE), B1D (8.2 km ENE), C1D (14.3 km NNW) and Pickerill A (22km E) platforms. The Race Bank Inter Array cable passes within 24 km S of the Juliet Field. The Juliet infrastructure is approximately 26 km E of an MOD Danger and Exercise Area (DEA) near Grimsby and approximately 15 km NE and 14.5 km SE of two active aggregate dredging areas operated by Hanson and Cemex, respectively. The Humber Gateway (29.5 km NW), Race Bank (24.5 km S) and the recently consented Triton Knoll (2.5 km S) windfarms are located within the vicinity of the project area. No designated historical wrecks recorded in the immediate vicinity of the project. However, there are two shipwrecks located SW of the Juliet Field: Umpire submarine (approximately 48 km) and Vortigern Destroyer (approximately 65 km).

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Atmosphere	A review of previous decommissioning ES shows that atmospheric emissions are generally concluded to have no significant impact and are usually extremely small in the context of UKCS/global emissions, especially when considering subsea tieback decommissioning scopes. The majority of emissions relate to the vessel time or the hypothetical remanufacture of material decommissioned *in situ*. As the decommissioning activities proposed are of such short duration this aspect is not anticipated to result in significant impact.

4.2 POTENTIAL ENVIRONMENTAL IMPACTS AND THEIR MANAGEMENT

Environmental Impact Assessment Summary:

Although there is expected to be some environmental impact as a result of the Juliet asset decommissioning activities, the long terms effects will be minimised through appropriate planning, impact mitigation and environmental management (see Table 4.2). The project environmental impact assessment considered the effects of the decommissioning works in terms of the Juliet operations is isolation as well as the potential cumulative and transboundary implications.

Table 4.2: Environmental Impact Management

Activity	Main Impacts	Management	Residual Environmental Risk (post-mitigation)
Subsea Installations Removal	Seabed disturbance from decommissioning activities	All activities which may lead to seabed disturbance will be planned, managed and implemented in such a way that disturbance is minimised. A debris survey will be undertaken at the completion of the decommissioning activities. Any debris identified as resulting from oil and gas activities will be recovered from the seabed where possible. The area that requires an overtrawl assessment will be optimised through discussion with the relevant fishing organisations and regulators.	Negligible
	Discharges to sea	The decommissioning of offshore developments has the potential to introduce raw materials, such as hydrocarbons, plastics or metals, into the marine environment. Management measures to prevent hydrocarbon spills are in place, along with control and mitigation measures in the unlikely event of an accidental spill, as covered in the OPEP and by Neptune's marine procedures.	Medium

Table 4.2: Environmental Impact Management			
Activity	**Main Impacts**	**Management**	**Residual Environmental Risk (post-mitigation)**
Decommissioning Pipelines and Stabilisation Features	Seabed disturbance from decommissioning activities	All activities which may lead to seabed disturbance will be planned, managed and implemented in such a way that disturbance is minimised. A debris survey will be undertaken at the completion of the decommissioning activities. Any debris identified as resulting from oil and gas activities will be recovered from the seabed where possible. The area that requires an overtrawl assessment will be optimised through discussion with the relevant fishing organisations and regulators.	Negligible
	Residual risk of materials decommissioned *in situ*	All material decommissioned *in situ* will be accurately mapped at the point of decommissioning and these details will be shared with mariners and the UK Hydrographic Office. Additionally a long-term monitoring programme will be discussed and agreed with OPRED, and will be continually reviewed based on the performance of the pipelines burial status over time.	Negligible
	Discharges to sea	The decommissioning of offshore developments has the potential to introduce raw materials, such as hydrocarbons, plastics or metals, into the marine environment. Management measures to prevent hydrocarbon spills are in place, along with control and mitigation measures in the unlikely event of an accidental spill, as covered in the OPEP and by Neptune's marine procedures.	Medium

5 INTERESTED PARTY CONSULTATIONS

Pre-Engagement Summary

As part of the Juliet Decommissioning Project, Neptune began pre-engagement with the key regulatory and statutory stakeholders early in 2018. During this time, Neptune held regular meetings with regulators (OPRED, OGA) to keep them informed of the project progress, findings and proposed recommendations.

Neptune hosted a Comparative Assessment workshop on Thursday 20th September 2018 where representatives from BEIS, OPRED and OPRED's Offshore Decommissioning Unit (ODU) were in attendance. Representatives from the National Federation of Fishermen's Organisations (NFFO) were invited but unfortunately were unable to attend. A copy of the Comparative Assessment Report was issued on 25th September 2018 to the NFFO for review and they had no further comments.

Consultations Summary

Following Public Consultation during April 2019, no specific comments with respect to the decommissioning of subsea installations or pipelines have been received.

Table 5.1 Summary of Stakeholder Comments

Who	Comment	Response
Statutory Consultations		
Joint Nature Conversation Committee (JNCC)	The Joint Nature Conservation Committee (JNCC) notified Neptune of the change in the Southern North Sea conservation area status from Candidate SAC to SAC.	Table 4.1 of these DPs has been updated to reflect this change in designation, as well as the supporting documentation.

6 PROGRAMME MANAGEMENT

6.1 PROJECT MANAGEMENT AND VERIFICATION

A Project Management team will be appointed to manage suitable sub-contractors for the removal of the installation. Standard procedures for operational control and hazard identification and management will be used. Where possible the work will be coordinated with other decommissioning operations in the SNS. The Management team will monitor and track the process of consents and the consultations required as part of this process. Any changes in detail to the offshore removal programme will be discussed and agreed with OPRED.

6.2 POST-DECOMMISSIONING DEBRIS CLEARANCE AND VERIFICATION

A post decommissioning site survey will be carried out around 500m radius of installation sites and 100m corridor along each existing pipeline route (50 m either side). Any seabed debris related to Juliet offshore oil and gas activities will be recovered for onshore disposal, where safe to do so, or recycling in line with existing disposal methods. Independent verification of seabed state will be obtained by trawling the installation sites and pipeline corridors. This will be followed by a statement of clearance to all relevant governmental departments and non- governmental organisations.

6.3 SCHEDULE

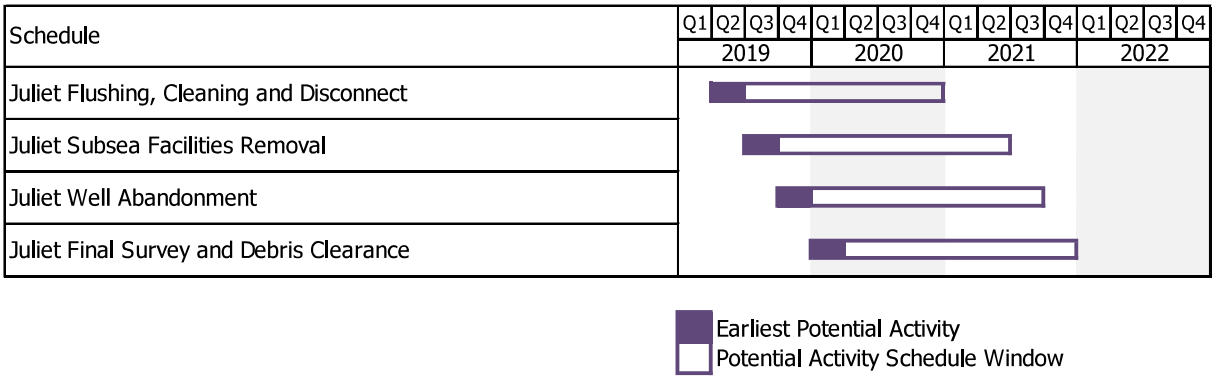


Figure 6.1: Gantt Chart of Project Plan

6.4 COSTS

Table 6.1 Provisional Decommissioning Programme costs	
Item	**Estimated Cost (£m)**
Pipelines Decommissioning	Provided to OPRED in confidence
Subsea Installations and Stabilisation Features	
Well Abandonment	
Continuing Liability – Future Pipeline and Environmental Survey Requirements	
TOTAL	

6.5 CLOSE OUT

Within 12 months of the completion of the Juliet decommissioning scope, a close out report will be submitted to OPRED and posted on the Neptune Energy website explaining any significant variations from the Decommissioning Programme, in accordance with the OPRED requirements at that time. This shall include debris removal and independent verification of seabed clearance and the first post-decommissioning environmental survey.

6.6 POST-DECOMMISSIONING MONITORING AND EVALUATION

Neptune Energy will discuss and agree the post-decommissioning monitoring schedule with OPRED as part of this decommissioning programme. Based on the types of infrastructure involved and the proposed decommissioning strategy, Neptune Energy propose to conduct two further pipeline surveys post- decommissioning. The timing of these surveys shall be discussed and agreed with OPRED and determined using a risk-based approach, with survey results informing the future frequency and extent of further surveys.

Neptune Energy will carry out a post-decommissioning environmental survey after completion of the decommissioning activities. The outcomes of the survey, and the need for any further surveys, will be discussed and agreed with OPRED.

7 SUPPORTING DOCUMENTS

Table 7.1 Supporting Documents

Document Number	Title
1	Oil & Gas UK Guidelines for Comparative Assessment in Decommissioning Programmes, Issue 1, Final Draft, June 2015
2	Guidelines for the abandonment of Wells, Issue 5, Oil and Gas UK, July 2015
3	OPRED Guidelines - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/704675/Offshore_Oil_and_Gas_Decommissioning_Guidance_Notes_May_2018.pdf
4	Juliet Comparative Assessment Report, Document No.: JF00-09-AA-72-00001
5	Juliet Decommissioning Environmental Appraisal, Document No.: JF00-09-EB-72-00001

8 PARTNER LETTERS OF SUPPORT

HH LAPS Limited

Attention: Tracey Mackie
Decommissioning Manager
Offshore Petroleum Regulator for Environment and Decommissioning
Department for Business, Energy and Industrial Strategy
3rd Floor, AB1 Building (Wing C)
Crimon Place
Aberdeen, AB10 1BJ

28 June 2019

Dear Ms Mackie,

PETROLEUM ACT 1998
JULIET SUBSEA INSTALLATIONS AND JULIET PIPELINES DECOMMISSIONING PROGRAMMES

We, HH LAPS Limited, confirm our support of the proposals detailed in the Neptune Energy E&P UK Limited Juliet Decommissioning Programmes dated 27 June 2019 (the "Decommissioning Programmes").

We also authorise Neptune Energy E&P UK Limited to submit on our behalf the Decommissioning Programmes to the Secretary of State for approval under section 29 of the Petroleum Act 1998.

Yours sincerely,

WS Tortike.
Director.

Tel: 07958 148048
Email: simon.tortike@hhlaps.com

CC: Pierre Girard, Neptune Energy E&P UK Limited
David Hunt, Neptune Energy E&P UK Limited

NEPTUNE
ENERGY

Attention: Tracey Mackie

Decommissioning Manager

Offshore Petroleum Regulator for Environment and Decommissioning

Department for Business, Energy and Industrial Strategy

3rd Floor, AB1 Building (Wing C) Crimon Place

Aberdeen, AB10 1BJ

19th July 2019

Dear Ms Mackie,

PETROLEUM ACT 1998 JULIET SUBSEA INSTALLATIONS AND JULIET PIPELINES DECOMMISSIONING PROGRAMMES

Neptune International (Company Number FR479920134) confirms support of the proposals detailed in the Neptune Energy E&P UK Limited Juliet Decommissioning Programmes dated 27th June 2019 (the "Decommissioning Programmes").

We also authorise Neptune Energy E&P UK Limited to submit on our behalf the Decommissioning Programmes to the Secretary of State for approval under Section 29 of the Petroleum Act 1998.

Yours Sincerely,

James Lynn House

Chief Executive Officer

Cc: WS Tortike, HH Laps Limited

David Hunt, Neptune Energy E&P UK Limited

NEPTUNE ENERGY INTERNATIONAL
9-11 Allee DE L'ARCHE TOUR EGEE
92400 Courbevoie

9 APPENDIX 1 – PIPELINE AND UMBILICAL HISTORICAL INSPECTION SUMMARY

A summary of the most recent pipeline and umbilical inspection findings are given in the following tables. Please note that the 2017 decommissioning survey shows that the depth of cover is not less than 0.6m, excluding the trench transitions, which shall be removed.

Table 9.1 Historical Inspection Summary for PL3121

Year	Length Surveyed (km)	Exposed Length/ Pipeline Length	Rock Cover/ Pipeline Length	Mattress Cover/ Pipeline Length	No. Spans	Total Span Length (m)
2017	22.449	0.1%	10.2% Note 4	0.6%	1 Note 5	13
2013	22.036	0.0% Note 3	11.5%	0.6%	0 Note 3	0

Note 3: The Juliet pipeline is protected by trenching and burial using material from spoil heaps and rock placement in certain regions. In September 2013, spans and several exposures and areas of thin backfill were noted during the as-built and as-backfilled pipeline surveys up to a span height of 0.47 m and exposure length of 758 m respectively. In November 2013, a survey was completed on the pipeline, indicating the depth of cover over the pipeline and umbilical was found to have increased particularly over sections which were non-backfilled. The pipeline was shown to have naturally backfilled due to mobility of surficial sediment within the Juliet field. Rock placement was however still required over spot locations along the length of the pipeline where cover was not at the required 1.1 m above the pipeline (Neptune, 2016).

Note 4: The rock cover was estimated based on observations from the survey data. The decrease in perceived rock cover is most likely explained by the shifting sediment in the area covering some of the rock material obscuring its presence.

Note 5: This span has been removed by depositing additional rock on the exposed section of pipeline and umbilical in Q1 of 2018.

Table 9.2 Historical Inspection Summary for PLU3122

Year	Length Surveyed (km)	Exposed Length/ Pipeline Length	Rock Cover/ Pipeline Length	Mattress Cover/ Pipeline Length	No. Spans	Total Span Length (m)
2017	21.369 [KP0.138 to KP21.507]	0.1%	9.0%	0.0%	1 Note 5	15
	22.418 [KP-0.354 to KP22.064	0.1%	11.8%	0.2%	1 Note 5	15
2013	21.369 [KP0.138 to KP21.507]	0.0% Note 3	10.5%	0.5%	0 Note 3	0