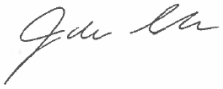
+

PERENCO UK LIMITED
GUINEVERE INSTALLATION
DRAFT DECOMMISSIONING PROGRAMME

Consultation Draft

DOCUMENT CONTROL

Approvals

	Name	Signature	Date
Prepared by	Julie Summerell		11/07/18
Reviewed by	Antoine Salzgeber		11/07/18
Approved by	Antoine Salzgeber		11/07/18

Revision Control

Revision No	Reference	Changes/Comments	Issue Date
0	Draft	For Info to BMT Cordah	08/02/17
1	Draft	For BEIS consultation / review	29/09/17
2	Draft	For BEIS consultation/review – Pipeline and Installation separated into two documents	16/04/18
3	Draft	Minor revisions based on BEIS comments on Rev 2	20/04/18
4	Draft	Draft Issued for Consultation	04/06/18
5	Consultation Draft	Draft Issued for Consultation	09/07/18
6	Consultation Draft	Inclusion of additional information requested by BEIS	11/07/18

Distribution List

Name	Company	No of Copies
Offshore Decommissioning Unit	BEIS	1

CONTENTS

A. TABLE OF TERMS AND ABBREVIATIONS

Abbreviation	Explanation
BEIS	Department for Business, Energy and Industrial Strategy
CA	Comparative Assessment
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
COMOPS	Combined Operations Notification
COP	Cessation of Production
DP	Decommissioning Programme
EA	Environment Agency
EIA	Environmental Impact Assessment
EMT	Environmental Management Team
ESDV	Emergency Shut Down Valve
FPSO	Floating Production, Storage and Offloading System
HAZ	Hazardous
HC	Hydrocarbon
HLV	Heavy Lift Vessel
HSE	Health and Safety Executive
JNCC	Joint Nature Conservation Committee
LAT	Lowest Astronomical Tide
LSA	Low Specific Activity
KM	Kilometres
M	Metres
MAT	Master Application Template
MEG	Monoethylene Glycol
MMO	Marine Mammal Observer
MOD	Ministry of Defence
MOAB	Mobile Offshore Application Barge
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers Organisation
NORM	Naturally Occurring Radioactive Material
NUI	Normally Unattended Installation
OGA	Oil & Gas Authority
OGUK	Oil & Gas UK
OPEP	Oil Pollution Emergency Plan
OSRL	Oil Spill Response Limited

Abbreviation	Explanation
OSPAR	Oslo and Paris Convention
PAM	Passive acoustic monitoring
Perenco	Perenco UK Limited
P & A	Plug and Abandonment
PL	Pipe Line
POB	Personnel on Board
PON	Petroleum Operations Notices
PWA	Pipeline Works Authorisation
QRA	Quantitative Risk Assessment
SAT	Subsidiary Application Template
SCI	Site of Community Importance
SLV	Sheer Leg Vessels
SNS	Southern North Sea
SFF	Scottish Fishermen's Federation
SSIV	Subsea Isolation Valve
TBA	To be Advised
Te	Tonne
UKCS	UK Continental Shelf

B. LIST OF TABLES

C. TABLE OF FIGURES

D. TABLE OF APPENDICES

No appendices attached.

1. EXECUTIVE SUMMARY

1.1 Decommissioning Programme

This document is for the Decommissioning Programme (DP) for the Guinevere gas field installation in the Southern North Sea (SNS). There will be a separate document for the Decommissioning Programme for the two pipelines (PL 874 and PL 875) for the Guinevere gas field. There is a separate programme for each set of S29 notices.

1.2 Requirement for Decommissioning Programme

Installation: In accordance with the Petroleum Act 1998, the section 29 notice holders of the Guinevere Installation (see Table 1.2) are applying to the Department for Business, Energy and Industrial Strategy (BEIS) to obtain approval for decommissioning the installation detailed in Section 2.1 and 2.2 of this programme.

In conjunction with public, stakeholder and regulatory consultation, the decommissioning programme is submitted in compliance with national and international regulations and BEIS guidelines. The schedule outlined in this document is for a five year decommissioning project beginning in 2017.

1.3 Introduction

The Guinevere field was discovered in March 1988 by exploration well 48/17b-5. First gas was in June 1993, five years after discovery. Production ceased in May 2017.

The Guinevere field is located in the Southern Basin of the UKCS, in license block 48/17b, approximately 60km north of the Bacton terminal and 56km east of the Theddlethorpe gas terminal on the Lincolnshire coast. The Guinevere platform was installed in 1993 and exports processed and water separated gas through an 8” line to the Lancelot Platform. On Lancelot the gas is comingled with gas produced on Lancelot, it is then exported to the Bacton Terminal on the Norfolk coast via the PL876 pipeline system.

The Guinevere field is 12km North West of the Thoresby Field. The co-ordinates of the Guinevere Platform are: Latitude: 53° 24' 53" N, Longitude: 01° 16' 25" E. (See Table 2.1).

The Guinevere installation is a Normally Unattended Installation (NUI) with a maximum personnel on board (POB) of 12 and a temporary overnight shelter.

Perenco have explored all avenues for continuing production as described in the Cessation of Production (COP) document and concluded that due to reduction of gas production, continued operations are uneconomical and therefore the COP date was planned for Q4 2017. In preparation for decommissioning COP documentation was submitted to the OGA and approval was granted in December 2016.

The Guinevere installation estimated lift weights are: Topsides 818 tonnes, Jacket 616 tonnes (incl. estimated 107 tonnes of marine growth), Piles 190 tonnes (incl. 5 tonnes of concrete grout). Piles 3.0m below the mudline will be left in situ; therefore, 305 tonnes of the piles will remain in situ and 190 tonnes will be decommissioned.

The Guinevere topside is a conventional carbon steel structure with a cellar deck (+20.5m), mezzanine deck and weather deck (+28.5m). A helideck is situated at the same level as the weather deck (+28.5m) and vent boom. Access between platform levels is provided by ladders and stairways. There are nine well slots of which two have been drilled. The approximate size of the topsides is 31.6m x 21m x 8m high (including helideck).

The Guinevere jacket is a conventional four-legged carbon steel structure with a single 48" tubular pile of approximately 85m overall length installed through each leg. The jacket has a single vertical face to facilitate approach of a jack-up rig; the three other faces have a batter. The jacket is in 18.4m (reference to LAT) of water, the jacket height is 29.0m.

Following public, stakeholder and regulatory consultation, the installation decommissioning programme is submitted without derogation and in full compliance with BEIS guidelines. The decommissioning programme explains the principles of the removal activities and is supported by an Environmental Impact Assessment (EIA).

1.4 Overview of Installation/Pipelines Being Decommissioned

1.4.1 Installation

Table 1.1: Decommissioning Programme			
Field:	Guinevere	**Production Type (Oil/Gas/Condensate)**	Gas
Water Depth (m)	18.4	**UKCS block**	48/17b
Surface Installation			
Number	**Type**	**Topsides Weight (Te)**	**Jacket Weight (Te)**
1	Small Fixed Steel Jacket	818	1111*
Subsea Installation		**Number of Wells**	
Number	**Type**	**Platform**	**Subsea**
0	N/A	2	0
Drill Cuttings pile		**Distance to median**	**Distance from nearest UK coastline**
Number of Piles	**Total Estimated volume (m^3)**	**km**	**Km**
0	0	115	52

* Jacket weight 509 Te, Marine Growth 107 Te, and weight of piles removed with jacket of 185 Te and 5 Te grout. 305 Te of the jacket piles are left in situ.

Table 1.2 Installation Section 29 Notice Holders Details		
Section 29 Notice Holder(s)	**Registration Number**	**Equity Interest (%)**
Perenco Gas (UK) Limited	00715529	75
Hansa Hydrocarbons (LAPS) Limited	08066733	25
Noble Energy (ISE) Limited	SC071090	0
Noble Energy (Oilex) Limited	00797339	0
Perenco UK Limited	04653066	0

1.5 Summary of Proposed Decommissioning Programme

Table 1.3: Summary of Decommissioning Programme		
Selected Option	Reason for Selection	Proposed Decommissioning Solution
1. Topsides		
Complete removal and re-use or recycle	Complies with OSPAR requirements and maximizes recycling of materials.	Decontaminate the topside and remove the topside either by HLV or combination of crane vessel and piece small dismantling. Re-use followed by recycle and then landfill will be the prioritised disposal options for the topside.
2. Jacket		
Complete removal and recycling	Leaves clean seabed, removes a potential obstruction to fishing operations and maximizes recycling of materials, to comply with OSPAR requirements.	Jacket legs will be removed and dismantled at an onshore location. Recycle and then landfill will be the prioritised disposal options. Piles will be severed at least -3.0m below the seabed. If any practical difficulties are encountered Perenco will consult BEIS.
3. Subsea Installations		
None		
4. Pipelines, Flowlines & Umbilical		
Not covered in this Decommissioning Programme		
5. Wells		
Plug and abandoned to comply with the HSE regulation, i.e. “The Offshore Installations and Wells (design and construction etc.) Regulations 1996" , and in accordance with OGUK Guidelines for Abandonment of Wells (Issue 5, July 2015)	Meets HSE regulatory requirements in accordance with OGUK and OGA.	A Master Application Template (MAT) and the supporting Subsidiary Application Template (SAT) will be submitted in support of works carried out. A PON 5 was submitted to the OGA in support of works carried out.
6. Drill Cuttings		
Leave in place to degrade naturally	Cuttings pile is widely dispersed and fall below OSPAR 2006/5 thresholds.	Left undisturbed on seabed.
7. Interdependences		
Whole of jacket can be removed; cuttings pile has little influence on jacket options. Small amounts of sediment and cuttings may have to be displaced to allow pile cutting.		

1.6 Field Location Including Field Layout and Adjacent Facilities

Figure 1.1: Guinevere location within Southern North Sea

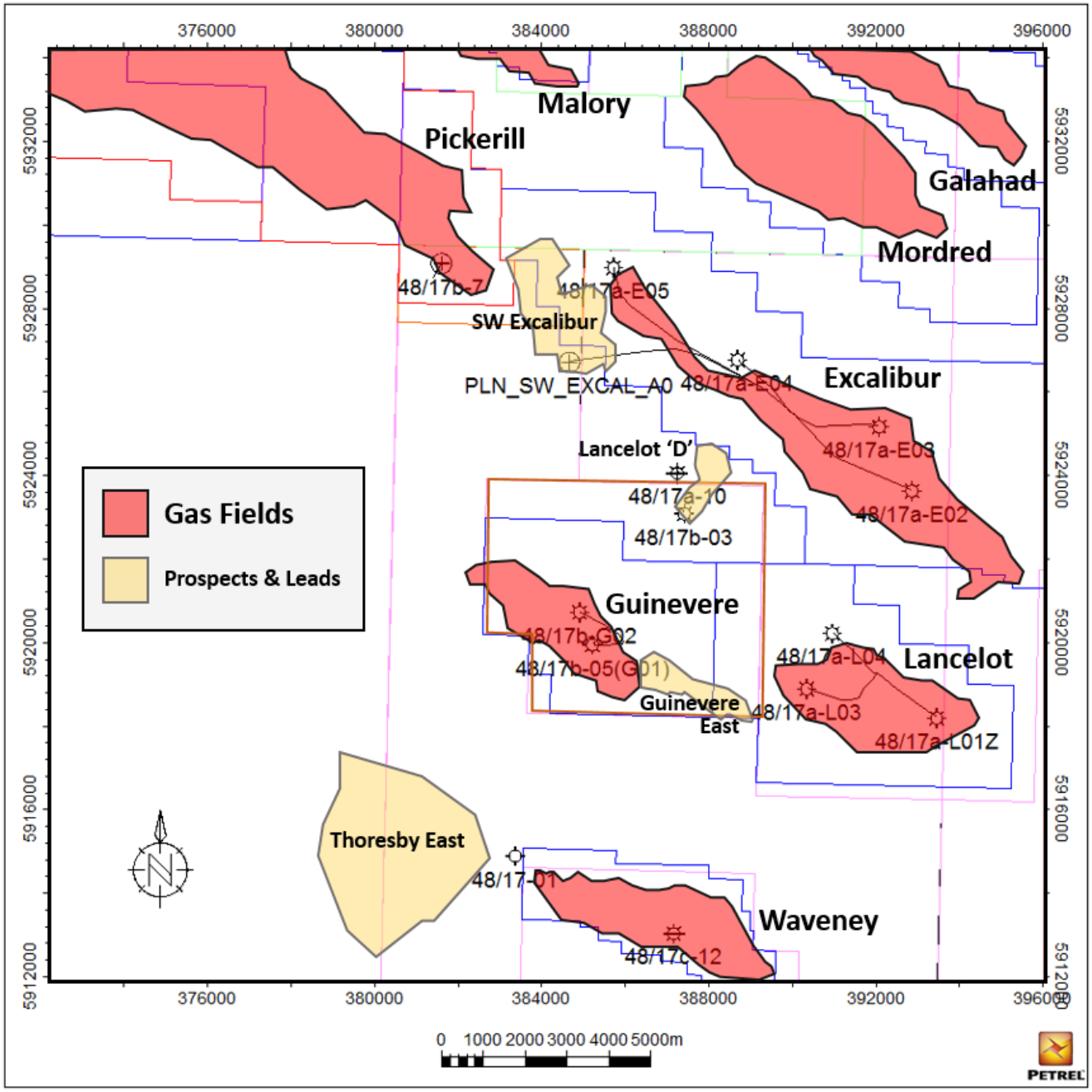


Figure 1.2: Field Layout

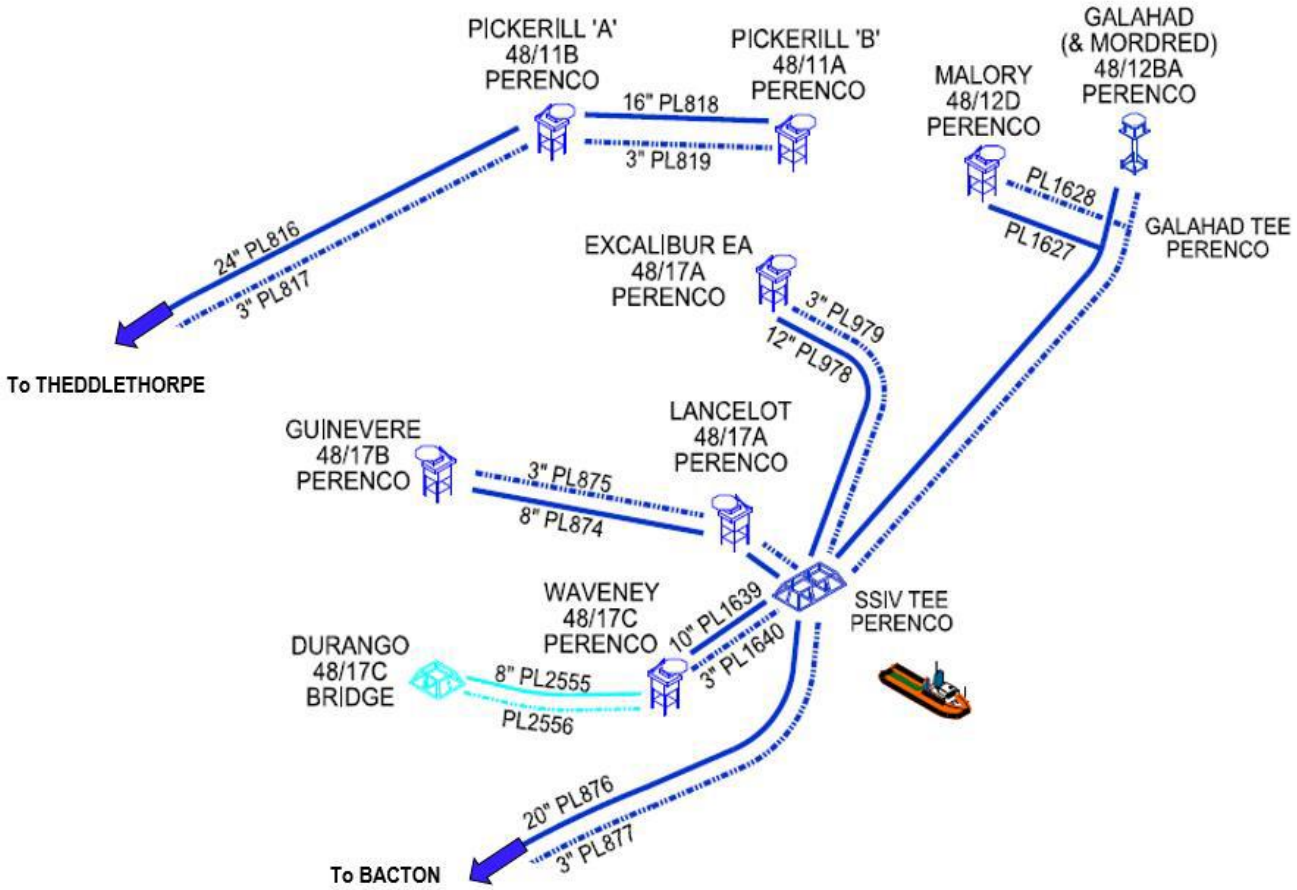
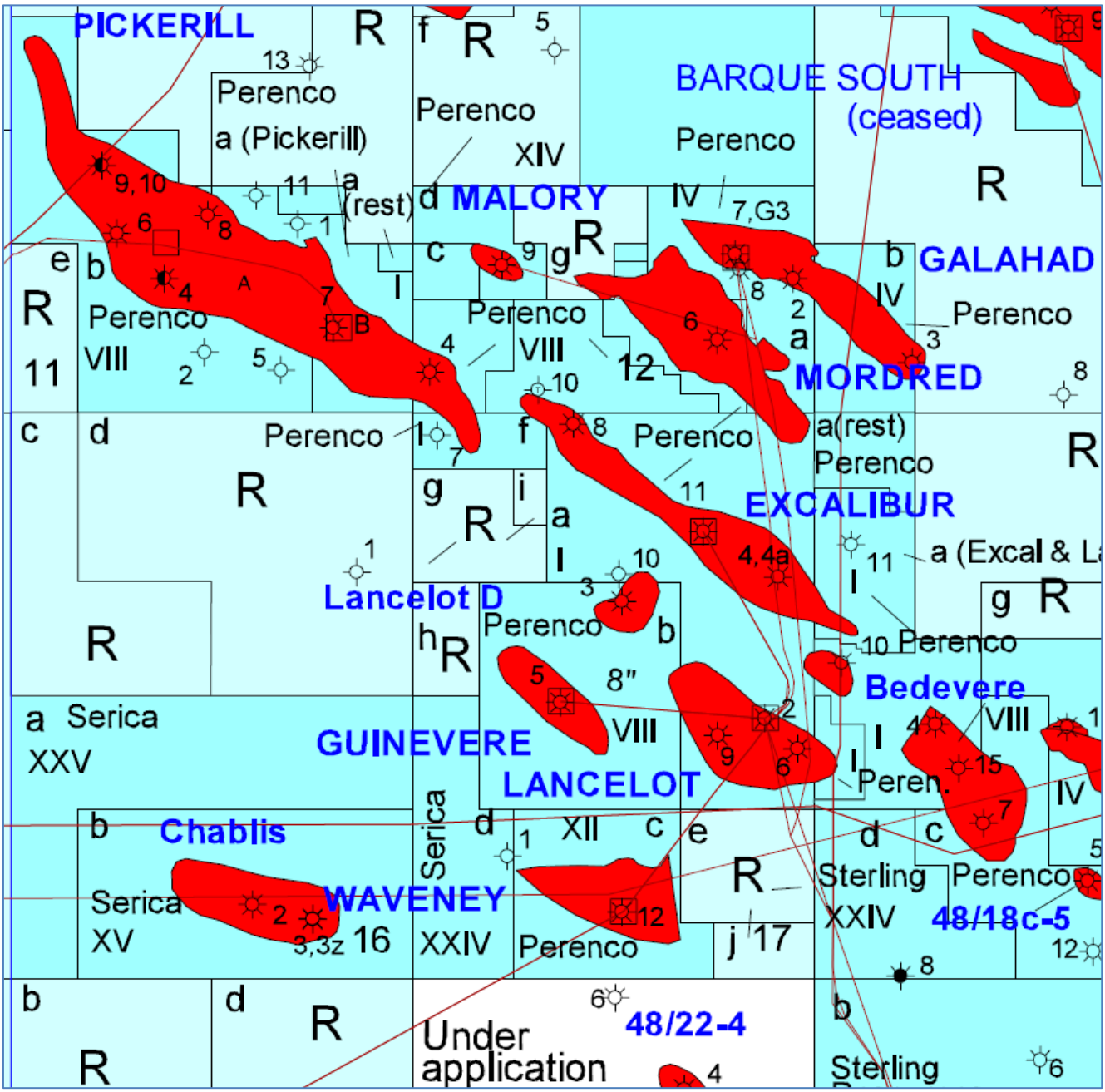


Table 1.4 List of Adjacent Facilities					
Owner	**Name**	**Type**	**Distance/Direction**	**Information**	**Status**
Perenco Gas UK Limited	Lancelot	Platform	From Guinevere to Lancelot is 7km East from Guinevere. 53° 24' 36.61" North 01° 22' 30.91" East	Gas production from Guinevere wells flows into Lancelot	Operational
Perenco Gas UK Limited	Excalibur	Platform	From Guinevere to Excalibur is 12.5km North East from Guinevere. 54° 24' 13.34" North 02° 39' 38.44" East	Adjacent platform	Operational
Perenco Gas UK Limited	Pickerill A	Platform	From Guinevere to Pickerill A is 7km North West from Guinevere 53^0 33' 00" North 01^0 04' 38" East	Adjacent platform	Operational
Perenco North Sea Limited	Waveney	Platform	From Guinevere to Waveney is 8km South West of Guinevere 53^0 21' 11.44" North 01^0 18' 15.66" East	Adjacent platform	Operational
Impacts of Decommissioning Proposals					
Decommissioning of Guinevere installation will have no impact on adjacent facilities.					

Figure 1.3: Adjacent Facilities and Crossings



1.7 Industrial Implications

The project includes the following key activities:

- Well plugging & abandonment
- Removal of platform and jacket

The above activities will need to be planned carefully to recognise synergies and efficiencies; however, the engineering and planning will be completed to understand the possibilities of potential integration of various activities.

All contracts will be tendered according to Perenco procedures. Suppliers' offers will be assessed along many criterions, including: which capacity to execute the work safely, the commercial offer and experience of carrying out this type of operation on the UKCS.

Perenco have engaged with the OGA Supply Chain team, and it has been agreed that a full Supply Chain Action Plan (SCAP) is not required for the Guinevere Installation DP as procurement was already in an advanced stage before the SCAP policy was introduced. However, the OGA will be provided with the Perenco contract strategy and update of major contract awards in respect of this programme.

Current operational contracts for items such as environmental permitting, potential vessel sharing and logistic support will be implemented to support decommissioning activities.

Decommissioning will be undertaken in three main operational stages as described below:

- Hydrocarbon Free Phase - A jack-up barge will attend the platform and carry out pipeline severance, well plugging and abandonment, removing all hydrocarbons from topside pipework / vessels and preparing the platform for heavy lift. The platform will then be left in lighthouse mode for a period of up to 3 years.
- Dismantling Phase - The successful tenderer will remove the topsides and Jacket with an HLV.
- Seabed clearance and verification - a post decommissioning environmental survey will be undertaken following platform removal.

2. DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Installation: Surface Facilities

Table 2.1: Surface Facilities Information								
Name	Facility Type	Location WGS84 Format	Topsides/Facilities		Jacket (if applicable)			
			Weight (Te)	No of modules	Weight (Te)	Number of Legs	Number of piles	Weight of piles (Te)
Guinevere	Fixed steel jacket	53° 24' 53" N 01° 16' 25" E	818	1	616*	4	4	190**

* Jacket weight 509 Te plus estimated Marine Growth of 107 Te
** Piles are 495 Te in total; however, 305 Te from 3.0m below mudline will be left in situ and 190 Te will be decommissioned, incl. 5 Te of concrete grout.

2.2 Installation: Subsea including Stabilisation Features

Table 2.2: Subsea Installations and Stabilisation Features				
Subsea installations and Stabilisation Features	Number	Size/Weight (Te)	Location(s)	Comments/ Status
Wellhead(s)	0	N/A	N/A	
Protection Frame(s)	0	N/A	N/A	
Concrete mattresses	0	N/A	N/A	
Grout bags	0	N/A	N/A	
Frond Mats	0	N/A	N/A	
Rock Dump	0	N/A	N/A	
Formwork	0	N/A	N/A	

2.3 Wells

Table 2.3 Well Information			
Platform Wells	Designation	Status	Category of Well *
48/17b-G1	Gas Production	Level 3 – Abandoned	PL2-2-1
48/17b-G2	Gas Production	Level 3 - Abandoned	PL2-2-1
Subsea Wells			
None	N/A	N/A	N/A

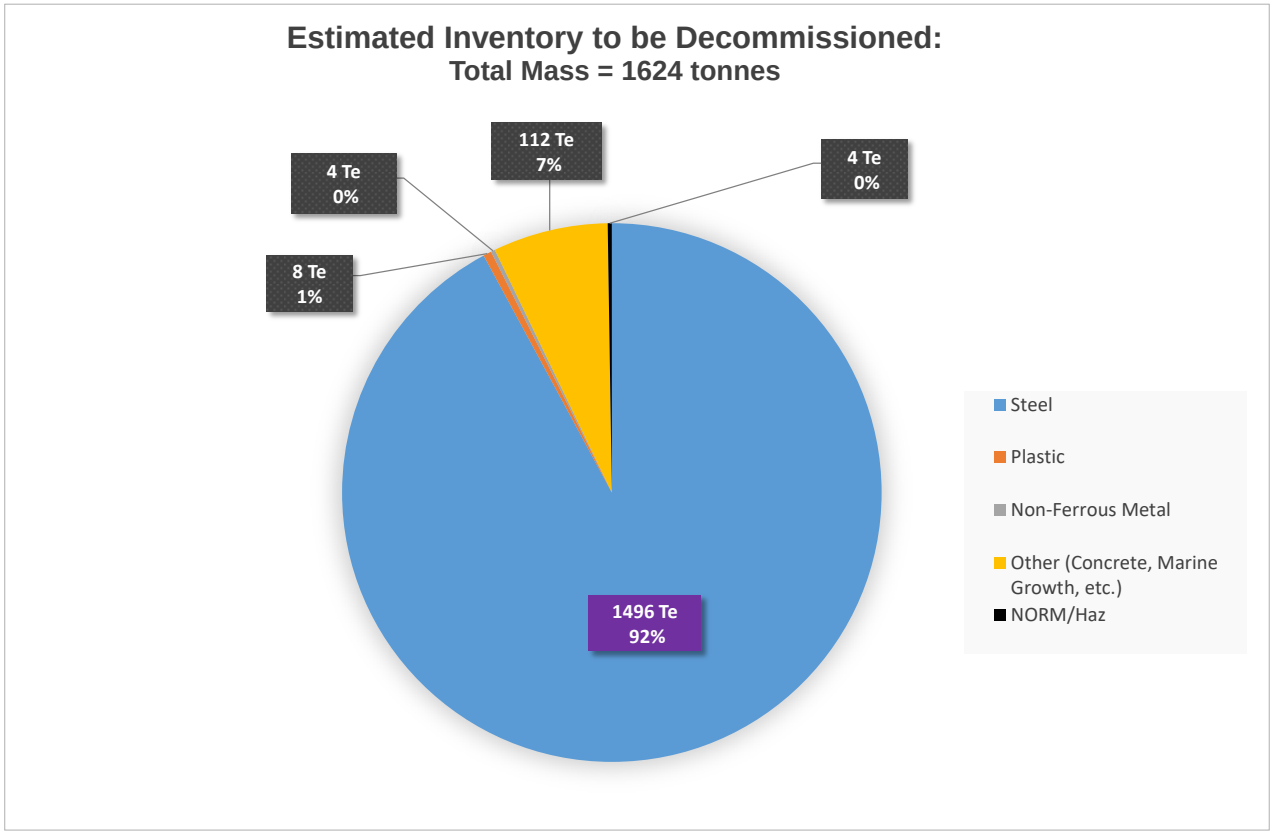
* Category of well as per OGUK Guidelines for the abandonment of wells, Issue 5, July 2015.

2.4 Drill Cuttings

The pre-decommissioning environmental survey found no evidence of drill cuttings associated with the Guinevere installation in the area. Drill cuttings that were generated during drilling activity have been distributed widely since drilling due to the local currents. Although there is no evidence of drill cuttings in the immediate vicinity of the wells, Perenco has carried out post decommissioning sea bed sampling to verify the absence of cutting debris that may affect the environment.

2.5 Inventory Estimates

Figure 2.1: Pie Chart of Estimated Topsides and Jacket Inventories to be Decommissioned (excl. 305 Te of jacket piles left in situ).



Reference the Environmental Impact Assessment (Section 2) for detailed data.

3. REMOVAL AND DISPOSAL METHODS

Waste will be dealt with in accordance with the Waste Framework Directive and all relevant waste authorities will be consulted accordingly.

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

Perenco assessed options for extending the producing life of the platform, utilising it as an infrastructure hub for third party tie backs and enhanced recovery programmes, but none proved commercially viable.

Perenco then assessed options for the relocation of the platform as a producing asset, but concluded that due to its ageing process technology and the high cost of maintaining the fabric and structural integrity of the platform, no technically viable reuse option was available.

Perenco have reviewed, and will continue to review, the platform's equipment inventories to assess the potential for adding to their existing asset portfolio spares inventory or for resale to the open market.

Recovered material will be landed ashore for disposal by a contractor. It is not possible to forecast the wider reuse market with any accuracy or confidence this far forward. Perenco will continue to track reuse market trends in order to seize reuse opportunities at the appropriate time.

In accordance with the Transfrontier Shipment of Waste Regulations 2007 (as amended), a Transfrontier Shipment of Waste (TFSW) permit for Guinevere is likely. In the event that a TFSW is required, Perenco will liaise with the relevant Waste Authority and ensure that all relevant permits and consents are in place.

3.1 Topsides

3.1.1 Topsides Decommissioning Overview

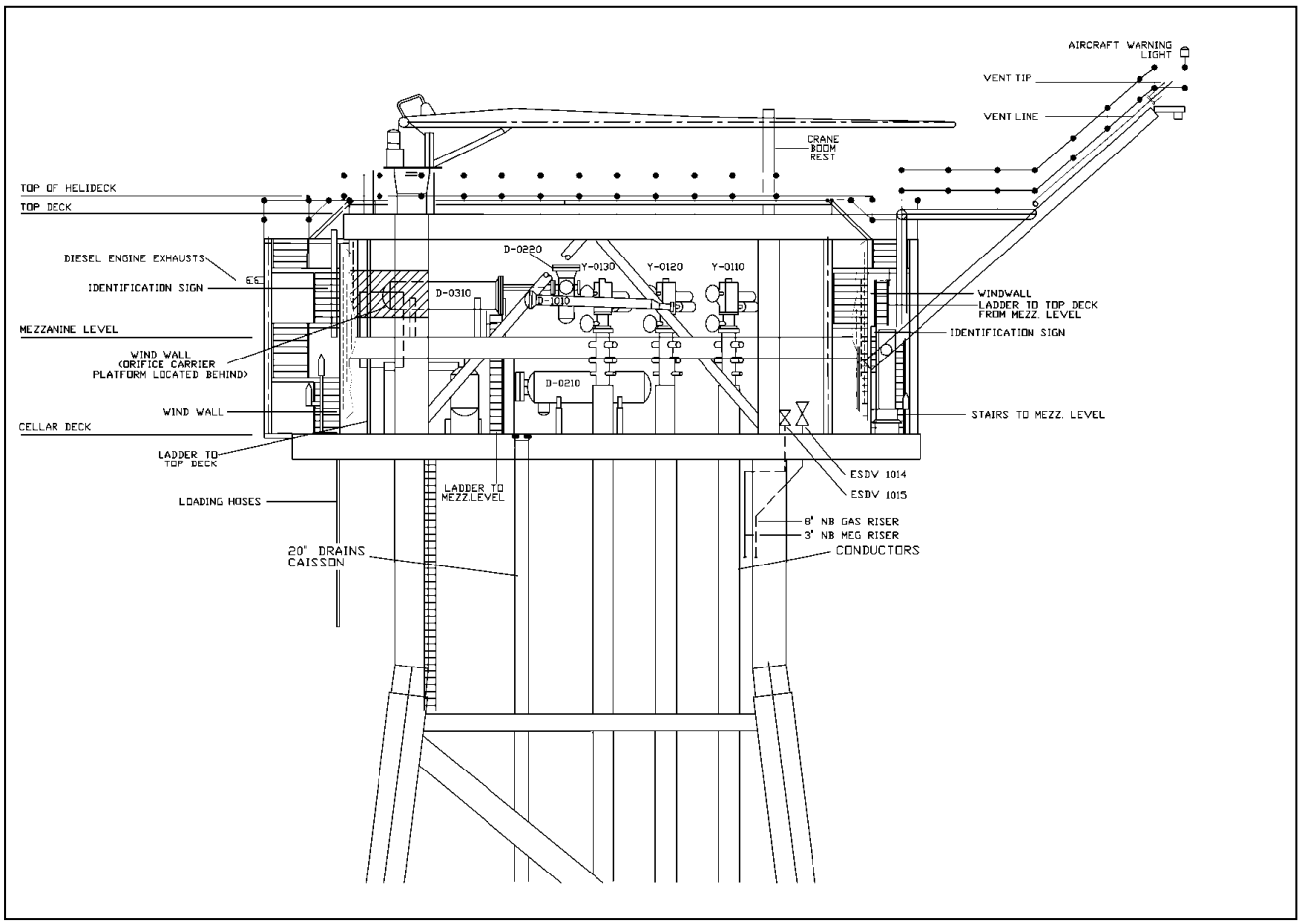
Topsides Description: The Guinevere installation is a Normally Unattended Installation (NUI) in block 48/17b in the Southern North Sea.

The Guinevere topside is a conventional carbon steel structure with a cellar deck (+20.5m), mezzanine deck and weather deck. A helideck is situated alongside the weather deck (+28.5m). Access between platform levels is provided by ladders and stairways. There are nine well slots of which two have been drilled.

The approximate size of the topside is 31.6m x 21m x 8m high (including helideck).

The Guinevere topside estimated lift weight is 818 tonnes.

Figure 3.1: Diagram of Topsides



Preparation/Cleaning:

Table 3.1: Cleaning of Topsides for Removal		
Waste Type	**Composition of Waste**	**Disposal Route**
On-board hydrocarbons	Process fluids, fuels and lubricants	Flushed and drained to tote tanks for transport and appropriate disposal onshore.
Other hazardous materials	NORM, and radioactive material, instruments containing heavy metals, batteries	Transported ashore for re-use/disposal by appropriate methods. A Transfrontier Shipment of Waste (TFSW) permit for Guinevere is likely. In the event that a TFSW is required, Perenco will liaise with the relevant Waste Authority and ensure that all relevant permits and consents are in place.
Original paint coating	Lead-based paints	May give off toxic fumes/dust if flame-cutting or grinding/blasting is used so appropriate safety measures will be taken.
Asbestos and ceramic fibre		Appropriate control and management will be enforced. Transported ashore for disposal by appropriate methods.

Removal Methods:

Table 3.2: Topsides Removal Methods	
1) HLV (semi-submersible crane vessel) ☑ 2) Mono-hull crane vessel ☑ 3) SLV ☑ 4) Piece small ☑ 5) Other ☐	
Method	**Description**
Single lift removal by SLV/HLV	Removal of topsides as complete unit and transportation to shore for re-use of selected equipment, recycling, break up and/or disposal. Single lift dependant on vessel availability.
Modular removal and re-use/recycle by HLV	Removal of parts/modules of topsides for transportation and reuse in alternate location(s) and/or recycling/disposal.
Offshore removal 'piece small' for onshore reuse/disposal	Removal of topsides by breaking up offshore and transporting to shore using work barge. Items will then be sorted for re-use, recycling or disposal.
Proposed removal method and disposal route	Topsides will be removed to shore and disposed of at a selected disposal yard to comply with relevant legislation and company policy. A final decision on the decommissioning method will be made following a commercial tendering process. It is likely that optimum safety/cost topsides removal solution will be single lift removal by SLV/HLV. The removal method illustrated below is based on this option – the final removal solution and methodologies will follow a detailed engineering study.

Note: Preliminary studies have indicated that the following methods are likely to be used.

Guinevere Topsides Removal

It is anticipated that the Guinevere platform removal method will be a reverse of the installation method. A single lift reusing the padeyes. See Figure 3.2 and 3.3.

Figure 3.2: Anticipated Topsides Removal Method

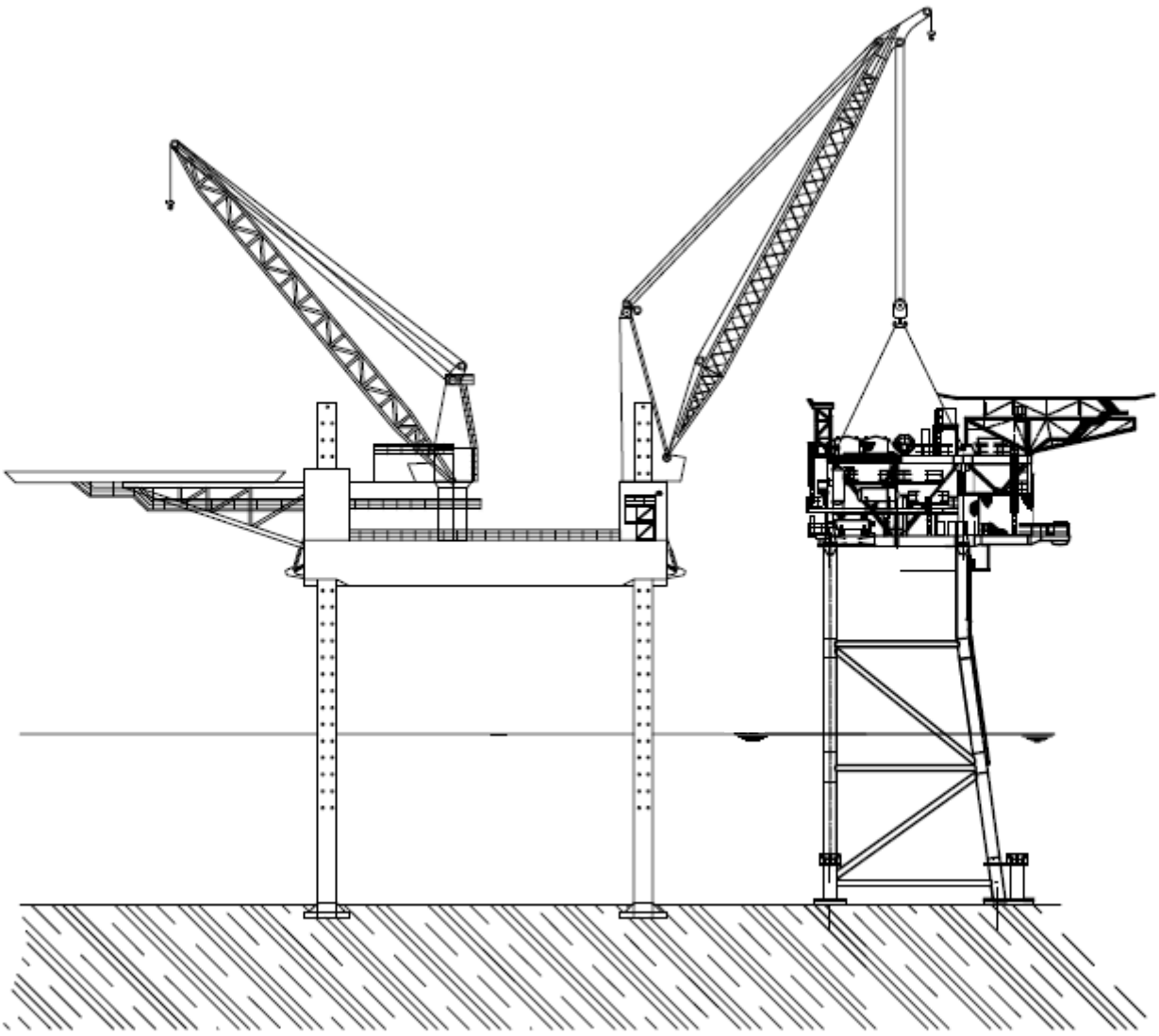
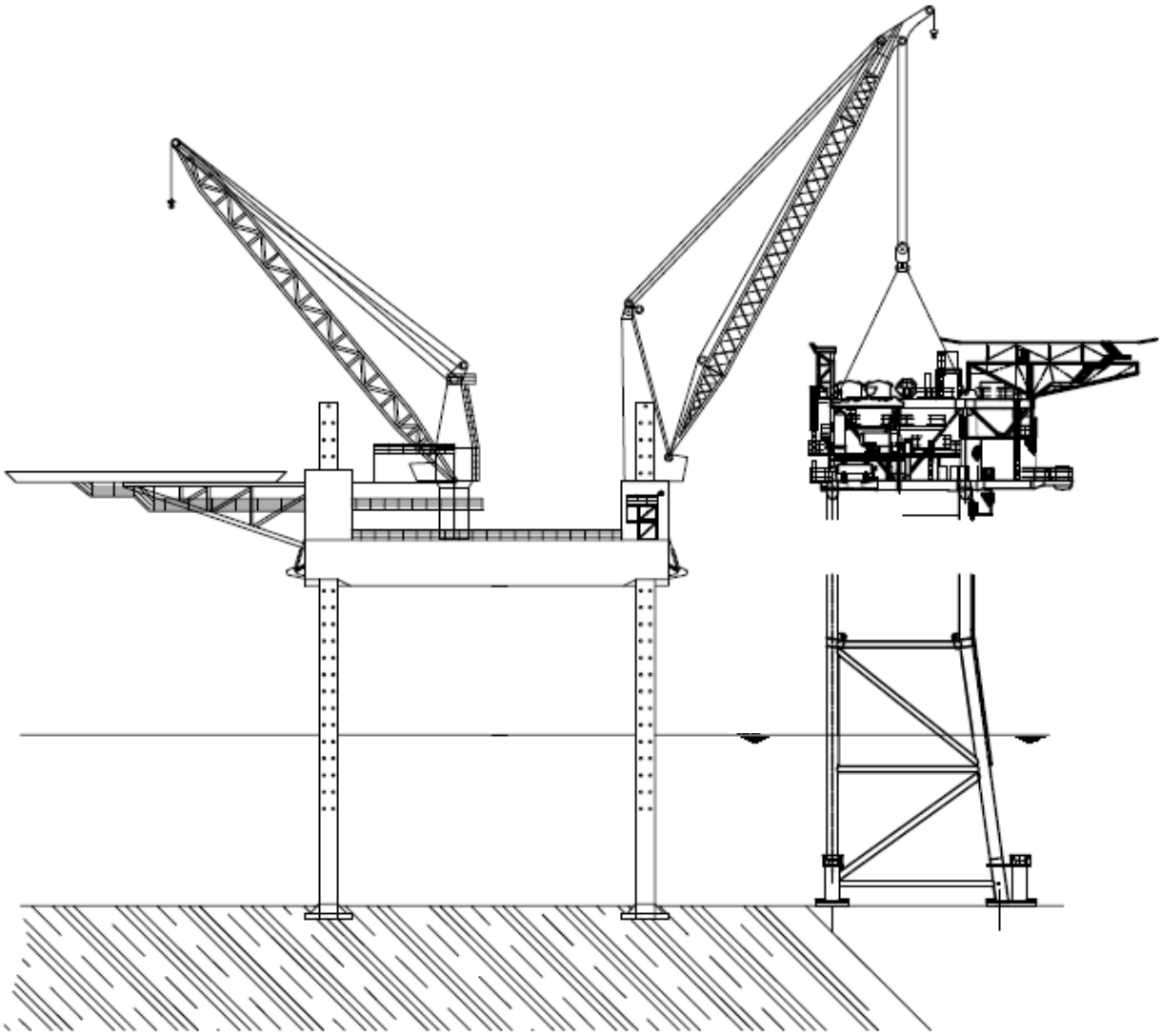


Figure 3.3: Anticipated Topsides Removal



3.2 Jacket

3.2.1 Jacket Decommissioning Overview

The jacket will be removed to shore for cleaning and disposal. The pile cuts will be made below the seabed level at such a depth to ensure that any remains are unlikely to become uncovered. The means of cutting could be diamond wire, oxyacetylene or high pressure abrasive water jet cutting. Figure 3.4 illustrates one of the preferred removal options although the exact cutting points and removal method are subject to detailed engineering and commercial tendering.

Guinevere jacket is a conventional four-legged carbon steel structure. Each jacket leg has an internal pile, 1219 mm diameter, with penetrations into the seabed below mudline of 55m. The annulus between pile and leg is grouted. Pile cut-off is at +12m. The jacket has a single vertical face to facilitate approach of a jack-up rig; the three other faces have a batter. The jacket is in 18.4m (reference to LAT) of water.

The approximate lift weight of the jacket is 806 Te (jacket weight 509 Te, Marine Growth 107 Te, and weight of piles removed with jacket of 185 Te and 5 Te grout).

3.2.2 Jacket Removal Methods

Table 3.3: Jacket Decommissioning Methods

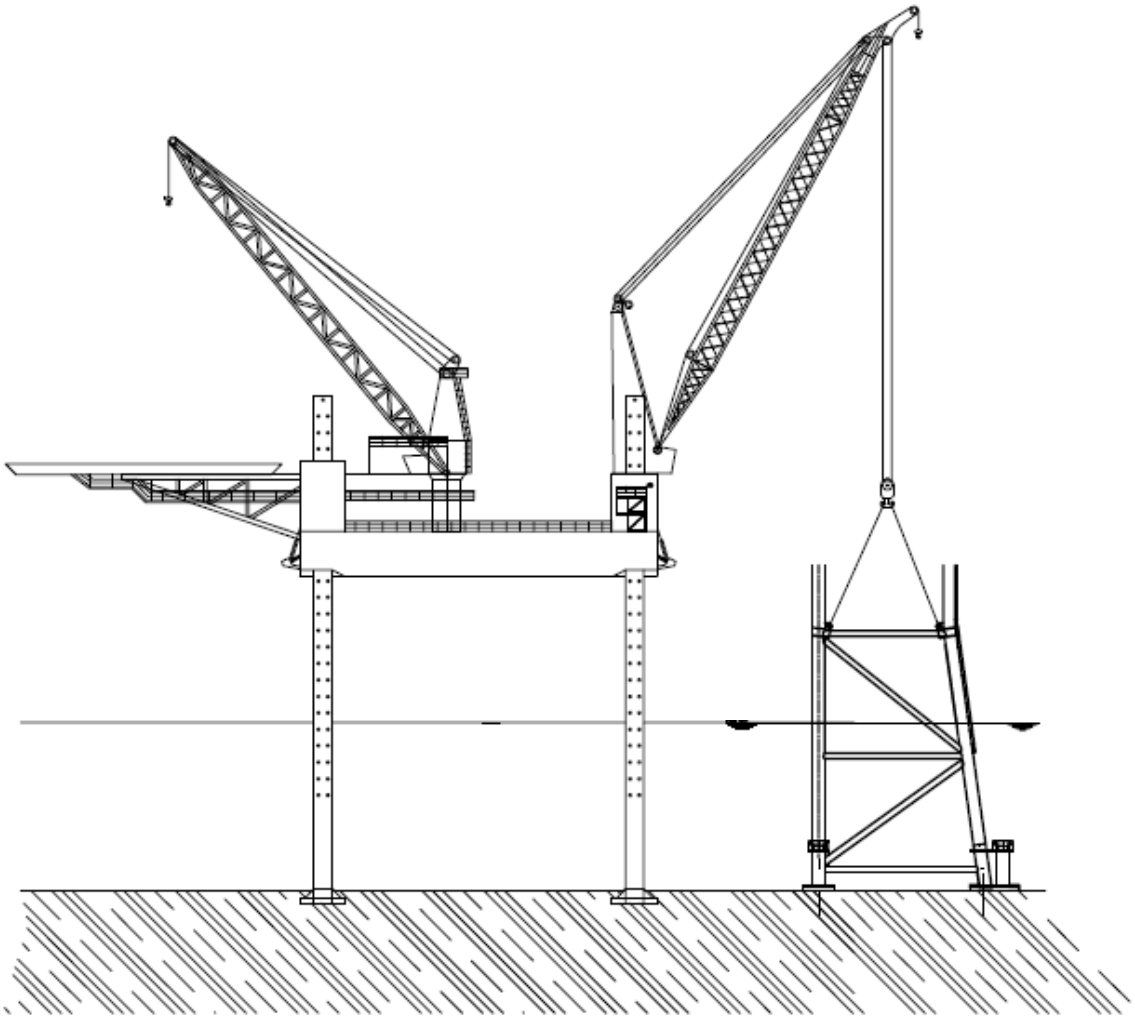
1) HLV (semi-submersible crane vessel) ☑
2) Monohull crane vessel ☑
3) SLV ☑
4) Piece small ☐
5) Other – (describe briefly) ☑

Method	Description
Onshore disposal using HLV, Monohull crane vessel or SLV	Removal of the jacket in a single lift and transport ashore for break up and recycling of steel.
Other	A pull on barge removal method based on a submersible barge which is submerged on one end to the seabed. The jacket will then be pulled on to the barge/vessel by winch and returned to shore for re-use/recycling.
Proposed removal method and disposal route	**The jacket will be removed to shore and disposed of at selected disposal yard to comply with relevant legislation and company policy. The removal method illustrated in the following figures is one of the preferred options. The exact cutting points and removal methodology will follow a detailed engineering study.**

Guinevere Jacket Removal

It is anticipated that the Guinevere jacket removal method will be a reverse of the installation method. A single lift reusing the padeyes see Figure 3.4.

Figure 3.4: Anticipated Jacket Removal Method



3.3 Wells

Table 3.4: Well Plug and Abandonment
The wells which remain to be abandoned, as listed in Section 2.3 (Table 2.3) will be plugged and abandoned in accordance with Oil and Gas UK Guidelines for the suspension and abandonment of wells, and a PON 5 will be submitted. A Master Application Template (MAT) and the supporting Subsidiary Application Template (SAT) application will be submitted in support of any such work that is to be carried out.

3.4 Drill Cuttings

Drill Cuttings Decommissioning Options:

Table 3.5: Drill Cuttings Decommissioning Options				
How many drill cutting piles are present?	None, drill cutting piles widely dispersed			
Tick Options examined				
Remove and re-inject	Leave in place √	Cover		
Relocate on seabed	Remove and treat onshore	Remove and treat offshore		
Other				
Review of Pile Characteristics			Pile 1	Pile 2
How has the cutting piles been screened (desktop exercise)				
Dates of Sampling				
Sampling to be included in pre-decommissioning survey				
Does it fall below both OSPAR thresholds?				
Will the drill cuttings pile have to be displaced in order to remove the jacket				
What quantity (m^3) will have to be displaced/removed				
Will the drill cuttings pile have to be removed in order to remove any pipelines				
What quantity (m^3) will have to be displaced/removed				
Have you carried out a Comparative Assessment of options for the Cuttings Pile?				

Comparative Assessment Method

A comparative assessment was not carried out because no drill cuttings piles were identified during the pre-decommissioning environmental survey.

3.5 Waste Streams

Table 3.6: Waste Stream Management Methods	
Waste Stream	**Removal and Disposal method**
Bulk liquids	Removed from vessels and discharged to tote tanks for transport and appropriate disposal onshore. Vessels, pipework and sumps will be drained prior to removal to shore and shipped in accordance with maritime transportation guidelines. Package filtration equipment for disposal of liquids to sea may be utilised and relevant permits will be sought for such operations.
Marine growth	Removed offshore /onshore. Disposed of according to guidelines.
NORM/LSA Scale	Tests for NORM/LSA will occur offshore and onshore. NORM will be dealt / disposed with according to guidelines and company policies under the appropriate permit.
Asbestos	Tests for asbestos will occur offshore and will be dealt/disposed with according to guidelines and company policies. Guinevere topside is not expected to have any asbestos.
Other hazardous wastes	Detailed survey for other hazardous wastes will be undertaken offshore and will be dealt / disposed with according to guidelines and company policies.
Onshore Dismantling sites	Appropriate licensed sites will be selected. The chosen facility must demonstrate proven disposal track record and waste stream management throughout the deconstruction process and demonstrate their ability to deliver innovative recycling options.

3.6 Inventory Disposition

Table 3.7 Inventory Disposition			
	Total Inventory Tonnage	**Planned tonnage to shore**	**Planned tonnage left in situ**
Installations	1929	1,624	305 (piles from 3.0m below mudline)

Table 3.8 Proposed Fate of Guinevere Infrastructure Materials		
Infrastructure	**Recommended decommissioning option**	**Destination**
Jacket	Complete removal (single lift or piece small) piles under 3.0m below seabed level to remain	100% Recycling
Topside	Full removal * (single lift)	>98% Reuse or Recycle <2%Landfill / Incineration

*Dependent on contract awarded

4 ENVIRONMENTAL IMPACT ASSESSMENT

4.1 Environmental Sensitivities (Summary)

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Conservation interests	**Annex I habitats** - No Annex I habitats are known to occur in the immediate vicinity of the Guinevere facilities. However, two of the three Annex I habitats can be found nearby in Special Areas of Conservation including those designated for " sandbanks slightly covered by seawater all the time" and "Reefs" in the nearby North Norfolk Sandbanks and Saturn Reef SAC (12 kilometres to the east) and Inner Dowsing, Race Bank and North Ridge SAC (20 kilometres to the southwest).
	Annex II species - All four Annex II species (harbour porpoise, bottlenose dolphin, grey seals and harbour seals) listed in Annex II species known to occur in United Kingdom offshore waters have been sighted within Quadrant 48 and surrounding quadrants.
Seabed	**Seabed sediments** - Particle size distribution analysis revealed the majority of samples to be dominated by sand-sized particles, with two stations containing over 98 percent sand. The dominant sediment type throughout the Guinevere pre-decommissioning environmental survey area was interpreted to be Sand, with some stations falling into the gravelly Sand and sandy Gravel categories, according to the Folk classification (Folk, 1954). Fine (muddy) sediments were very scarce in the area, being virtually absent in all the grab locations with the exception of four stations. The high percentage of stations with an absence of fine material suggests a high energy environment within the survey area. A review of the sediment types from seabed photography and video further confirmed sand dominance around the platform, with current-related bedforms, such as sand ripples and megaripples, evident across much of the survey area (Bibby HydroMap, 2017b). **Benthic Fauna** - The European Nature Information System (EUNIS) indicates the Guinevere area habitat type as A5.25 or A5.26 deep circalittoral sand. These habitat types are typically made up of clean fine sands or non-cohesive circalittoral muddy sands with silt content, respectively. These habitats are characterised by a wide range of echinoderms (in some areas including the pea urchin (Echinocyamus pusillus)), polychaetes and bivalves. These circalittoral habitats tend to be more stable than their infralittoral counterparts and as such support a richer infaunal community (EUNIS, 2017). The top 10 dominant species throughout the Guinevere survey area were the amphipod Urothoe elegans followed by the bivalve Abra alba, the polychaete Nephtys cirrosa and a further two crustaceans, Bathyporeia guilliamsoniana and Abludomelita obtusata. The polychaete Sabellaria alveolata was ranked sixth while Bathyporeia tenuipes and Nebalia bipes were ranked eighth and ninth, only separated by the slipper limpet Crepidula fornicata on rank seven. The 10th overall ranked species was the polychaete worm, Ophelia limacine (Bibby HydroMap, 2017a).

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Fisheries	**Plankton -** The phytoplankton community in the Southern North Sea area is dominated by the dinoflagellate genus Ceratium (C. fusus, C. furca, C. lineatum), along with higher numbers of the diatom, Chaetoceros (subgenera Hyalochaete and Phaeoceros) than are typically found in the northern North Sea (DECC, 2001). The zooplankton community is dominated by copepods including Calanus helgolandicus, C. finmarchicus, Paracalanus and Pseudocalanus spp., Acartia spp., Temora spp. and cladocerans such as Evadne spp. (BEIS, 2016). The planktonic assemblage in the vicinity of the Guinevere facilities is not considered unusual. **Fish spawning areas** – The Guinevere facilities coincides within spawning grounds for herring (Clupea harengus); lemon sole (Microstomus kitt); mackerel (Scomber scombrus), sandeels (Ammodytidae spp.), sole (Solea solea) and whiting (Merlangius merlangus;) (Coull et al., 1998; Ellis et al., 2010). **Fish nursery areas** - Guinevere facilities coincides within nursery grounds for cod, haddock (Melanogrammus aeglefinus), herring, horse mackerel (Trachurus trachurus), lemon sole, mackerel, plaice (Pleuronectes platessa), sprat (Sprattus sprattus), sole, sandeels and whiting. There is a high probability of Age 0 group fish for sole and sprat and a moderate probability of Age 0 group fish for cod and herring, horse mackerel, and mackerel within the Guinevere Area, (Aires et al., 2014; Coull et al., 1998; Ellis et al., 2010). **Commercial fisheries** - Landings and value range from low to moderate within International Council for the Exploration of the Sea rectangles 35F1. The total number of days' effort in ICES rectangle 35F1 was 767 days in 2013 and 572 days in 2014, with no data available for 2015 or 2016 (MMO, 2017). The fishing effort was dominated by pots and traps (MMO, 2017). Relative quantity and value of fish landed from ICES rectangle 35F1 in 2015 was low for pelagic and demersal species and moderate for shellfish species. Between 2013 and 2016, the annual total live weight of fish landed ranged from 928 tonnes in 2015 to 1,411 tonnes in 2013 and total annual value from £1,157,009 in 2015 to £1,286,988 in 2014 (MMO). Shellfish species dominated the catch (98 to 100%) in 2014 to 2016, with demersal species accounting for one to 2% of the catch (MMO, 2017). Catch composition by weight of UK landings from UK and foreign vessels in ICES rectangle 35F1 for 2016 was dominated by crabs, lobsters and whelks. Crabs and lobsters made up 15% and 35% respectively, and whelks 60% of the catch in 35F1 during this period (MMO, 2017). Fishing gear types include harvesting machines, traps and trawls. Vessel Monitoring Systems (data for all UK vessels greater than 15 metres in length landing into UK ports (2009 to 2013), shows that mobile demersal fishing activity was low within the blocks of interest and an area of high activity for lobster fishing lies in the northwest of International Council for the Exploration of the Sea Rectangle 35F1.
Marine Mammals	**Cetacean species** - The main cetacean species occurring in UKCS Quadrant 48 and surrounding quadrants are minke whale (Balaenoptera acutorostrata), long-finned pilot whale (Globicephala melas), bottlenose dolphin (Tursiops truncates), common dolphin

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
	(Delphinus delphis), white-beaked dolphin (Lagenorhynchus albirostris), white-sided dolphin (Lagenorhynuchus acutus) and harbour porpoise (Phocoena phocoena), with the most sightings occurring in the summer months (Reid et al., 2003; UKDMAP, 1998). The three species recorded throughout the year within Quadrant 48 where the majority of the decommissioning activities will take place are white-beaked dolphin, white-sided dolphin and harbour porpoise. **Pinnipeds species** - The grey seal (Halichoerus grypus) and the harbour seal (Phoca vitulina) are both resident in UK waters and occur regularly over large parts of the North Sea (SCOS, 2016). Density mapping by Jones et al., (2015) indicates a high grey seal concentration around the mouth of the Humber River, Humber Estuary Special Areas of Conservation (SAC) and close to the Donna Nook National Nature Reserve (Natural England, 2017a). Seals may travel past the Guinevere facilities to the north and on into their offshore foraging grounds. In the offshore regions of Block 48/17, between zero and one grey seals per 25 km2 could be present at any one point in time. The main species of conservation interest have been discussed in detail above in the earlier section.
Birds	The seabird sensitivity to oil pollution in Block 48/17, where the Guinevere infrastructure is located, and in surrounding blocks varies from low to extremely high throughout the year (Oil & Gas UK, 2016). The most sensitive times of year for birds in the Guinevere area are January to March and October to December, with extremely high vulnerability within Block 48/17 in October. The most common species of seabird found in the Guinevere area of include: Fulmar, Gannet, Guillemot, Kittiwake, Razorbill, Puffin, Little Auk; as well as numerous species of gull, tern and skua.
Onshore Communities	All waste produced from the Guinevere decommissioning activities will be transported to an onshore decommissioning facility. Perenco will ensure the chosen site(s) comply with all relevant permitting and legislative requirements. No onshore communities are expected to be affected by the decommissioning program.
Other Users of the Sea	**Shipping** - Overall shipping density in the vicinity of the Guinevere facilities is considered moderate (BEIS, 2016). **Oil and Gas Industry** - The Guinevere facilities are located in the southern North Sea gas basin, which is densely populated by various installations The closest platforms and pipelines, located within approximately 15 km from the Guinevere infrastructure, are: Lancelot A Platform, Excaliber EA Platform, Waveney Production Platform, Pickerill B Platform, Malory Platform and Galahad Platform. The closest platform is Lancelot A Platform which is 6.9 km East of the Guinevere platform. (UK Oil and Gas Data, 2017). **Offshore Wind Farms** - There are four known windfarms located in the vicinity of the Guinevere facilities. The nearest operational wind farm is the Dudgeon Wind Farm, 12.7 km South East of the Guinevere platform (Crown Estate, 2016). The Sheringham Shoal wind farm is located 31 kilometres south and a further consented wind farm will be located at Triton Knoll, 17 kilometres to the west. The Hornsea project wind export cable is located 28 kilometres to the north.

Table 4.1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
	Dredging and aggregate extractions - the nearest active dredging site is the Outer Dowsing located 3.5 km west from the Guinevere platform (Crown Estate 2016). **Carbon Capture and Storage Projects** - There is only one offshore gas storage facility currently in operation in the UK and it is located in the southern North Sea; the Rough 47/8 Alpha facility. Other licences have been granted such as ENI's Deborah field located in Block 48/29 in the southern North Sea, 47 km southeast of the Guinevere platform. **Agreement to lease has been granted for the Endurance Carbon capture storage (CCS), 71 km North of the Guinevere area.** The use of existing storage facilities and associated infrastructure is unlikely to have a significant environmental impact, although the release of hypersaline water in the production of salt caverns may have some localised effects (Scottish Government, 2017). **Military Activity** - No military activities occur in Block 48/17. There is a license condition obliging the license holder to notify the MoD prior to any activities in this block. **Wrecks** - No designated historical wrecks have been recorded in Block 48/17. There are 70 wrecks classed as dangerous by the United Kingdom Hydrographic Office in the vicinity of the Guinevere Decommissioning area, the closest one is located 3.9 kilometres to the west. **Telecommunications** - No telecommunication cables are present in block 48/17.
Atmosphere	Local atmospheric emissions will be influenced by vessel movements and associated activities during the proposed decommissioning operations. It is expected that these emissions will be localised to the area of interest.

4.2 Potential Environmental Impacts and their Management

The Environmental Impact Assessment provides a review of the key features of the environment in the proposed Guinevere Decommissioning Programmes Area in block 48/17b in the southern North Sea (SNS).

A key consideration when planning and finalising the decommissioning of the Guinevere installation and pipelines is a clear understanding of the surrounding environment. In order to understand the potential for the project to interact with the environment, so that appropriate controls can be adopted to mitigate negative impacts, the physical, biological and socio-economic environments have been assessed.

Environmental Impact Assessment Summary:

Table 4.2 Environmental Impact Assessment Summary		
Activity	**Main Impacts**	**Management**
Topside Removal	Atmospheric emissions	• All engines, generators on the vessels will be well maintained and correctly operated to ensure that they are working efficiently to minimise energy use and gaseous emissions. • Vessels will be audited as part of selection and pre-mobilisation. • Vessel operations will be minimised where practical, with work programmes planned to optimise vessel time in the field.
	Underwater noise	• A noise assessment will be undertaken 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. • Offshore vessels will avoid concentrations of marine mammals. • A trained Marine Mammal Observer (MMO) will be present during decommissioning operations should the need be required.
	Solid waste	• Materials are reused and recycled where possible. • Compliance with UK waste legislation and duty of care. • Use designated licensed sites only. • Permits and traceable chain of custody for waste management, shipment, treatment and onshore disposal. • Waste Management Plan will be implemented.
	Other users of the sea	• Cutting and lifting operations will occur within the Guinevere platform 500 m exclusion zone. • A vessel corridor approach will be used. UK Hydrographical Office and Kingfisher will be informed of all activities. • A post decommissioning debris survey will be conducted and any debris recovered.
	Accidental hydrocarbon release	• Hydrocarbon inventories are to be removed from the topsides prior to commencing removal operations. • Guinevere Decommissioning Oil Pollution Emergency Plan (OPEP) and Communications and Interface Plan will be in place. • Perenco have UKCS membership with Oil Spill Response (OSRL) for Tier 2/3 incidents.
	Dropped object(s)	• A post decommissioning debris survey will be conducted and debris recovered in line with BEIS regulations. • Adhere to lifting and handling procedures and use of certified equipment for lifting. • Retrieve items of debris from the seabed after operations, in compliance with relevant legislation.

Table 4.2 Environmental Impact Assessment Summary – cont'd		
Activity	**Main Impacts**	**Management**
Jacket Removal	Atmospheric emissions	• All engines, generators on the vessels will be well maintained and correctly operated to ensure that they are working efficiently to minimise energy use and gaseous emissions. • Vessels will be audited as part of selection and pre-mobilisation. • Vessel operations will be minimised where practical, with work programmes planned to optimise vessel time in the field.
	Underwater noise	• A noise assessment will be 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. • Offshore vessels will avoid concentrations of marine mammals. • Underwater cutting could be a potential source of sound, the operation of well-maintained equipment during decommissioning will ensure noise of operating machinery is kept as low as possible. • An MMO/ PAM operator will be on-board the vessel during cutting operations, should the need be required.
	Seabed impacts	• The decommissioning operations will be carefully designed and executed so as to minimise the area of seabed that will be disturbed. • The introduction of new material to the marine environment is to be avoided or minimised throughout the proposed operations.
	Other users of the sea	• Cutting and lifting operations will occur within the Guinevere platform 500 m exclusion zone. • A vessel corridor approach will be used. UK Hydrographical Office and Kingfisher will be informed of all activities. • A post decommissioning debris survey will be conducted and any debris recovered.
	Damage or loss of fishing gear	• A post decommissioning debris survey will be conducted and any debris recovered. • Locations of any remaining footprint of the structure will be accurately mapped and information disseminated via the Hydrographic Office and Kingfisher notification system.
	Solid waste	• Materials are reused and recycled where possible. • Compliance with UK waste legislation and duty of care. • Use of designated licensed sites only. • Permits and traceable chain of custody for waste management, shipment, treatment and onshore disposal. • Waste Management Plan will be implemented.
	Accidental hydrocarbon release	• Guinevere Decommissioning Oil Pollution Emergency Plan (OPEP) and Communications and Interface Plan will be in place. • Perenco have UKCS membership with Oil Spill Response (OSRL) for Tier 2/3 incidents.

Table 4.2 Environmental Impact Assessment Summary – cont'd		
Activity	**Main Impacts**	**Management**
	Dropped object(s)	• Adhere to lifting and handling procedures and use of certified equipment for lifting. • Retrieve items of debris from the seabed after operations, in compliance with relevant legislation. • A post decommissioning debris survey will be conducted and any debris recovered.
Subsea Installations Removal	Not applicable	Not applicable.
Decommissioning Drill Cuttings	Not applicable	Not applicable.
Decommissioning Pipelines (left in situ)	Atmospheric emissions	Not included in this Decommissioning Programme.
	Underwater noise	
	Seabed impacts	
	Marine discharges	
	Other users of the sea	
	Damage or loss of fishing gear	
	Accidental hydrocarbon release	
	Dropped object(s)	
Decommissioning Stabilisation Features	• Potential snagging hazards to other users of the sea. • Long term degradation of pipeline and release of degraded material to the environment	Not included in this Decommissioning Programme.

5 INTERESTED PARTY CONSULTATIONS

Consultations Summary:

(This section will be updated when the consultation phase is completed).

Table 5.1 Summary of Consultee Comments		
Who	Comment	Response
INFORMAL CONSULTATIONS		
OGA	OGA were provided an outline of the decommissioning programme as part of the COP notification. In addition, they are provided regular updates on the decommissioning programme.	COP notification approved.
JNCC	During preparation of the EIA, the views of the JNCC were solicited by an informal scoping letter and a copy of the Environmental baseline survey report was forwarded.	The JNCC recommended that more recent site-specific environmental data needs to be provided to aid in the understanding of the current ecology of the area where operations occur and justify environmental assessment conclusions. The JNCC noted the following: Explosives - advised that the proposed decommissioning operation take into the consideration the conditions outlined in the 2010 JNCC Guidelines for minimising the risk of injury and disturbance to marine mammals from using explosives are followed at all times during the proposed operations. • Protection material - a substantial amount of rock may be used to protect the Seafox 1 Jack-up legs from scouring and/or bury exposed ends or section of pipeline. The long-term effect of the introduction of small areas of substratum into naturally sandy or muddy sea beds is not fully understood at present, and should be carefully considered by the regulators. • Environmental Survey Data - there is the potential for the Annex I habitats 'Sandbanks which are slightly covered by sea water all the time' and biogenic 'Reefs' to be present in this area of the southern North Sea. The presence of potential Annex I habitats has been investigated during the Guinevere site survey, however the JNCC have not had sight of this report.

Table 5.1 Summary of Consultee Comments		
Who	Comment	Response
INFORMAL CONSULTATIONS		
BEIS EMT	BEIS EMT were consulted on the environmental impacts identified for the detailed assessment for the EIA.	BEIS EMT supports the majority of the environmental impacts identified for detailed assessment during the EIA process. They reiterated the need to focus the EIA on significant impacts and present those key issues in the decommissioning EIA. BEIS EMT noted the following: Seabed impact of jacket cutting and any potential excavation operations to provide access to the seabed sediment line has not been identified as a potential disturbance. • The potential noise impact from vessels should be considered in the EIA assessment, although the outcome may not show significant impact. • Department accepted the use of explosives to perforate the production tubing, but would expect Perenco to utilise standard cutting equipment to remove well casing and conductors.
HSE	Liaised with regarding the Lighthouse Phase Safety Case, associated COMOPS and the high level plan for the dismantlement of the platform.	Both the Lighthouse Safety Case and COMOPS were accepted by the HSE.
EA	Perenco is currently in discussion with the Environment Agency concerning waste management for Perenco decommissioning programmes, and we will formally advise the EA that we plan to apply for Transfrontier Shipment of Waste permit for Guinevere.	N/A
MOD	During preparation of the EIA, the views of the MOD were solicited.	The MOD confirmed that they have no objection to the Guinevere decommissioning operations.
CEFAS	During preparation of the EIA, the views of CEFAS were solicited.	No response received.

Table 5.1 Summary of Consultee Comments		
Who	Comment	Response
INFORMAL CONSULTATIONS		
NFFO	During preparation of the EIA, the views of NFFO were solicited.	No response received.
STATUTORY CONSULTATIONS		
NFFO		
SFF		
NIFPO		
Global Marine Systems		
Public		

6 PROGRAMME MANAGEMENT

6.1 Project Management and Verification

A Perenco Project Management team will be appointed to manage suitable sub-contractors for the removal of the Guinevere installation. Perenco 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. Perenco will monitor and track the progress 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 BEIS.

6.2 Post-Decommissioning Debris Clearance and Verification

A post decommissioning site survey will be carried out in 500m radius of the Guinevere installation site. Oil and gas seabed debris will be recovered for onshore disposal or recycling in line with existing disposal methods. Independent verification of seabed state will be obtained by carrying out an overtrawl survey for the platform area. This will be followed by a statement of clearance to all relevant governmental departments and non-governmental organisations.

6.3 Schedule

Project Plan:

Perenco intend to progress the decommissioning of Guinevere in stages. The intent is to perform activities on Guinevere platform so that a Hydrocarbon free status can first be achieved. Perenco would then look to complete the removal of the topside and jacket within the project timeframe as declared in Section 1.2 but at such time that would be most efficient and cost effective to the project. The schedule indicates the earliest and latest dates the heavy lift removal is estimated to take place.

The completion dates for the project are driven by the availability of the heavy lift vessel for the lift, favourable weather windows, and market opportunities.

Figure 6.1: Gantt chart of Project Plan

Year	2017				2018				2019				2020				2021				2022			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
HC Free																								
Pre-engineering / planning																								
Develop Decom Programme & EIA																								
Decom Programme Preparation & Consultation																								
Approval of DP																								
Drifting tubing, setting bridge plugs in wells																								
Pipeline pigging																								
Jack-up barge arrival																								
Well rig-less P & A																								
Purge topsides and leave platform black																								
Verify hydrocarbon free																								
Dismantling																								
Pre-engineering / planning																								
HLV arrival																								
Topsides and jacket removed																								
Site clearance																								
Approval of completion																								
Contingency																								

Legend

Earliest date task could be completed

Period in which task is to be completed

6.4 Costs

Table 6.1 – Provisional Decommissioning Programme costs	
Item	**Estimated Cost (£m)**
Platform /Jacket - Preparation / Removal and Disposal	Provided to BEIS
Well Abandonment	Provided to BEIS
Continuing Liability – Future Pipeline and Environmental Survey Requirements	Provided to BEIS
TOTAL	Provided to BEIS

6.5 Close Out

In accordance with the BEIS Guidelines, a close out report will be submitted to BEIS explaining any variations, from the Decommissioning Programme (normally within 12 months of the completion of the offshore decommissioning scope) including debris removal and independent verification of seabed clearance and the post-decommissioning environmental survey. In the close out report, the company responsible for the subsequent management of on-going residual liabilities for any infrastructure left in-situ will be detailed. That company will also be the contact point for any third party claims arising from damage caused by any remains from the Guinevere decommissioning programme.

6.6 Post-Decommissioning Monitoring and Evaluation

A post decommissioning environmental seabed survey will be carried out around the 500m zone of the Guinevere installation. The survey will focus on chemical and physical disturbances of the decommissioning area and be compared with the pre-decommissioning survey, which has been carried out before decommissioning commences. Results of this survey will be forwarded to BEIS. After the survey results have been sent to BEIS and reviewed, the post-decommissioning monitoring regime will be discussed and agreed with BEIS. Typically a minimum of minimum of two post decommissioning environmental survey are expected.

7 SUPPORTING DOCUMENTS

Table 7.1: Supporting Documents	
Document Number	**Title**
1	Guinevere Environmental Impact Assessment

8 PARTNER LETTERS OF SUPPORT

[Partner Letter of Support to be obtained post-consultation. The Partner is kept informed of progress on the decommissioning programme on a regular basis and is supportive of the proposed approach].