Welland Field

Decommissioning Programme

September 2010

PERENCO DOCUMENT CONTROL SHEET

Approvals

	Name	Signature	Date
Prepared by	K Tucker/G Cooper		28/09/10
Reviewed by	P. Cooper		28/09/10
Approved by	J Sewell		30/09/10

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Distribution List

Name	Company	No of Copies
Phil Cooper	Perenco UK Ltd.	2
Simon Grewcock	Tullow Oil UK Ltd.	1
Steve Bowyer	First Oil Ltd.	1
Richard Peace	ExxonMobil	1
Kevin Clarke	DECC	6

Contact Details

Perenco UK Limited
Thamesfield Way
Off Pasteur Road
Great Yarmouth
Norfolk
NR31 0DN

Tel: 01493 414000
Fax: 01493 414001

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DOCUMENT SECTIONS COMPRISING THE JOINT PROGRAMME

For ease of reference the following Table 1.1 identifies the sections in this document covering the 2 decommissioning programmes (installations and pipelines) that make up the joint programme.

	Document Heading	Installations	Pipelines
Assets	Description	Fixed Steel Structures and sub-sea Wellhead Protection Structures	Export, Infield Piggy-backed pipelines and control/electrical umbilical lines
	References	53/4a, 53/4a-5, 49/29b-4 & 49/29b-6	PL674,675,676,677,678,679, 680, & PL681,
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1.0 INTRODUCTION

The decommissioning of offshore installations and pipelines on the United Kingdom Continental Shelf (UKCS) is controlled through the Petroleum Act 1998.

This abandonment programme for the Welland production platform pipelines and wells in blocks 53/4A and 49/29b of the Southern North Sea is submitted by Perenco UK Ltd on behalf of its co-venturers (Perenco UK Limited & Perenco Gas (UK) Limited 55.02%, Tullow Oil PLC / Tullow Oil SK Limited 33.73% and First Oil Expro Limited 11.25%) to DECC for approval in accordance with the requirements of the Petroleum Act 1998.

This programme is a joint submission for ***pipelines*** and ***installations*** and where appropriate pipeline and installation issues are segregated within this document. The table on Page 3 details what information relates to each programme.

2.0 EXECUTIVE SUMMARY

The Welland and Tristan Fields are located in the Southern Basin of the United Kingdom continental shelf in Blocks 49/29b and 53/4a. The Welland field consists of three gas reservoirs with condensate traces, West, North and South and was discovered in 1983 by Arco and received Annex B approval in 1989 for a single platform development remotely operated from Thames platform. The platform was installed in 1990 by Arco using the Heeremac HLV and production started in 1990 with a planned 10 year life. The Tristan platform well was added in 1992. The field ceased production in 2003 due to excessive water rates and equipment failures. Approximately 90% of recoverable reserves have been produced. CoP notification was submitted by ExxonMobil, who were the operators at the time, to DTI in 2004. When Perenco took over the fields in 2007, an assessment was made of whether it was worth re-starting production. It was determined to be uneconomic, due to the high costs of re-instating the Thames riser, re-commissioning the platform and repairing the subsea wells. Pipeline and well isolation standards were improved and the platform & pipeline fabric maintained.

The Welland 16” pipeline (PL674) was flushed and disconnected at the Thames riser in 2004. The three Welland 8” pipelines from subsea wells were flushed in 2010.

Welland Platform is a 1000t topside minimum facilities platform in 37m water depth. It was designed and operated as a normally unattended satellite installation. Gas was exported to the nearby Thames complex.

The installation and infrastructure consists of:-

- the single jacket Welland production platform including processing equipment & piles
- three 8” import pipelines (PL676/7/8) from remote subsea wells totaling 18km and associated umbilicals (PL679/80/81) – not flushed
- a 16” export pipeline (PL674 – flushed) to Thames and 3” MEG line (PL675 – not flushed)
- two platform wells (one of the two platform wells is drilled into the Tristan formation in block 49/29b, which is operated by one of the Welland joint venture partners)
- three remote subsea wells and associated control equipment
- three subsea wellheads and protection frames and associated piling.
- 45 concrete mattresses, 85 frond mats and various grout bags/formworks, located at the 3 subsea wellheads, the jacket base and pipeline crossing points.

The Thames complex provided further processing, prior to export to onshore terminal. Thames also supplied MEG via the 3” piggy-back line.

The preferred decommissioning option for the Welland installations and pipelines is:-

- Jacket, topsides and piles to -3m - removal and transportation to alternate location for re-cycling or re-use. ***The 1000t topsides is scheduled for re-use in 2011 within Perenco.***
- Pipelines and flowlines (already flushed and buried) – survey, and leave in situ
- Umbilicals (already buried) survey and leave in situ
- Three subsea wells – plug, abandon and remove tubulars to 3m below seabed
- Three Subsea wellheads - removal to shore for disposal and recycling
- Three Sub-sea Wellhead Protection Structures and piles to -3m – removal to shore for disposal and recycling
- Two platform wells - plug, abandon and remove tubulars below seabed
- Concrete mattresses and frond mats – an attempt to remove the mattresses safely will be made, if this is not possible a proposal will be submitted to DECC for their consideration.

This is likely to be carried out in 2 Phases

Phase 1 – Welland Platform Wells, Topsides and Jacket
Phase 2 – Subsea Wellheads, Protection Structures and Flowlines and Umbilicals.

An independent Comparative Assessment Report (Annex 2) in conjunction with the Environmental Statement (Annex 3), indicates that the overall impact on the environment, as a result of decommissioning will be low using the programme outlined, when compared to other alternatives. For the most part the methodology proposed for the programme is based on the CA results, however, where two options were closely scored an overriding personnel safety influence was applied to achieve an accumulative “best” option choice. Strategically Perenco has looked at combined methods of removal to provide the best economical solution but with overall consideration for the environmental impacts and safety of personnel.

As the commercial & technological climate develops, alternative removal processes will be evaluated continuously in comparison to HLV methods. Perenco takes the view that decommissioning of its numerous installations is most likely to take place in the face of competition for Heavy Lift Vessel (HLV) resources. This will keep costs high as decommissioning synergy between operators is unlikely to become effective in the foreseeable future.

Potential for reuse has been examined and in the case of the Welland platform topsides and jacket. This preferred decommissioning option has a high probability of being successful due to a request for relocation of these structures to a Perenco subsidiary site.

The decommissioning schedule for the Platform Well Abandonments, Topsides and Jacket removal, and for the remote sub-sea Wells decommissioning as outlined in Section 13 of this document is due to commence in Q2 2010 starting with Platform Well abandonment and then on to Topsides and Jacket removal. Dependant on market conditions and technological development it is hoped to also complete the program of removal of the subsea Wells before end of 2010 to coincide with other activities. The costs associated with the decommissioning options examined are summarised in Section 12 of this document.

A full pipeline and platform subsea survey was conducted to verify the 2006 subsea survey findings (Annex 1) including burial status of pipelines and the condition of the platform. There was little evidence of benthic communities in the area. These surveys, the pipeline work programme, and associated issues have been discussed with the Fishermen’s Federation. Their recommendations on burying pipeline ends and avoiding use of rock dumping will be adhered to. There were no free spans or significant debris along the pipeline. The three well flowlines and umbilicals were buried with no exposures.

3.0 BACKGROUND INFORMATION

3.1 Facilities Layout

The Welland field is located in the Southern Basin of the UK Continental Shelf in blocks 49/29b and 53/4a, approximately 72 km off the coast of Norfolk in licence blocks P39 & P105.

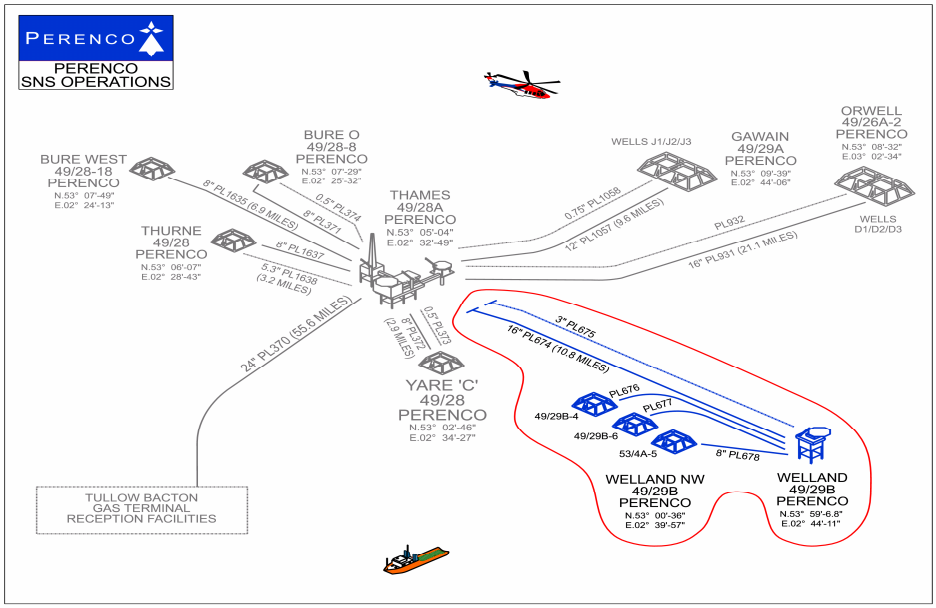


Figure 3.1 : Thames & Welland Field Infrastructure

The Welland field consists of three reservoirs, West, North and South. Additionally the Tristan formation was drilled from the Welland Platform (see Annexe 3, fig 1.1). Two platform wells and three subsea wells access these various reservoirs.

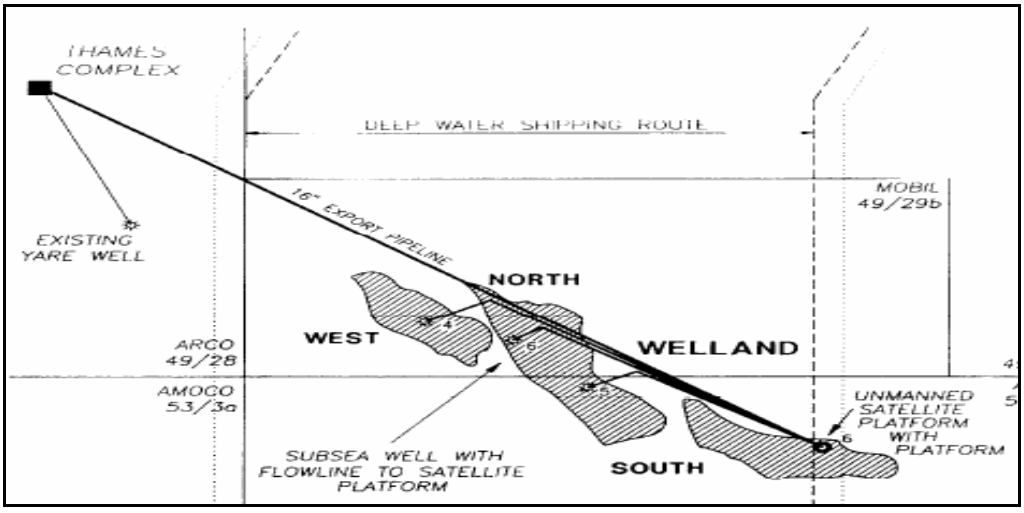


Figure 3.2 : Welland Field Reservoirs

The field was discovered by Arco in 1983 with Annex B approval granted in 1989. The Welland platform was installed in 1990. Arco assets transferred to ExxonMobil in 2001. The platform is a normally unmanned, fixed, three-legged steel jacket installation, owned and operated by Perenco UK Ltd since 2007. The platform has been shut in since 2002 and Cessation of Production notification was submitted by ExxonMobil in 2004.

3.2 Adjacent Facilities

The Thames complex 17km North West of Welland provided further gas/liquids processing, MEG and control system links required for the operation of Welland. Gas/condensate from the Welland field was processed by Thames facilities and exported to Bacton onshore Gas Terminal and the national grid. The 16" Welland pipeline PL674 was flushed clean, disconnected from its Thames riser and the riser re-used for the Arthur field development. The pipeline from Welland to Thames crosses over 2 disused cables and the Sean 30" gas pipeline to Bacton. Within Thames 500m zone the Gawain subsea well umbilical line to Thames crosses over the Welland / Thames pipeline.

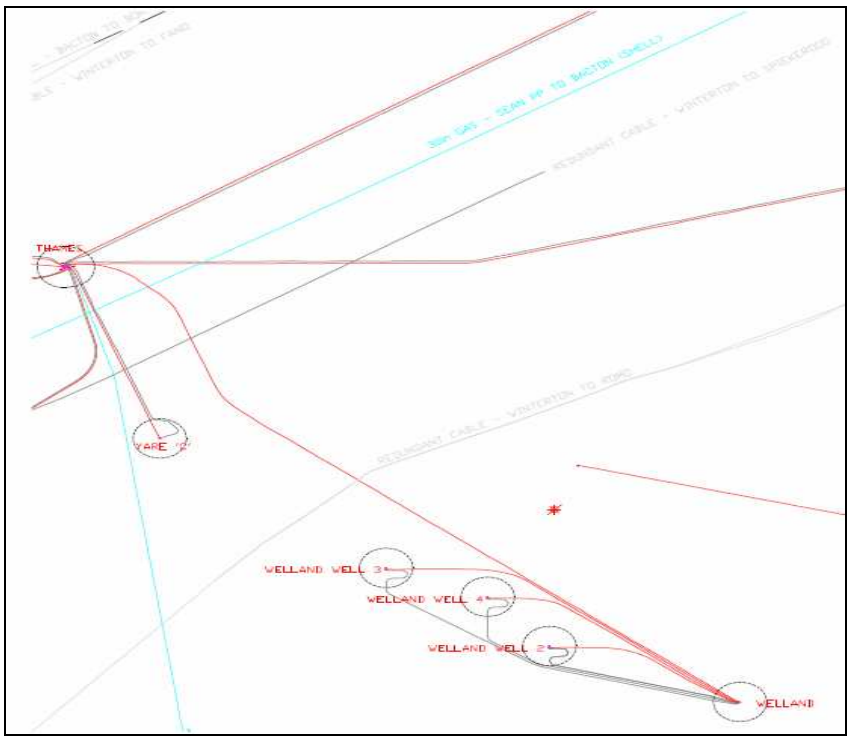


Figure 3.3 : Welland – Thames 16" Main Pipeline Crossings

3.3 Meteorology and Oceanography

Wind direction, strength and persistence vary throughout the year and over different areas of the southern North Sea. In winter the wind is predominantly from the west with winds reaching force 7, Occasional winds of force 8 or greater occur from the northerly quarter. During the spring, calm conditions are common; winds from the southwest and north-east are dominant. In summer winds force 1-3 from the southwest are predominant rising to force 5 in the autumn.

Tidal currents are between 1.5 - 2.0 kts and the residual water current in the area is generally southerly following the overall water circulation pattern of the North Sea. Recent surveys show a sandy seabed with strong current evidence. The surface sea temperatures reach 15℃ in summer and 5 ℃ in winter. In the southern portion of the region, off the Norfolk coast, the generally flat seabed is characterised by water depths of less than 45m. Around the Welland field the water depth is approximately 37m. The seabed sediment varies throughout the region of the southern North Sea and is dominated by sand deposits. The areas closer inshore contain a higher percentage of gravel. Further detail is available in Annexe 3.

3.4 Commercial Fishing and Shipping Activities

The area of the SNS including Welland is used as a spawning ground for several pelagic and demersal fish species including herring, sole, plaice, cod and whiting between February and June. It is also situated in an important area for the North Sea plaice stocks that spawn during February and March. Mackerel also spawn in the area during June and July. Shellfish are a valuable resource in some areas of the eastern English coast: lobster and brown crab occur along most of the north Norfolk coast. Based on DEFRA 2004 records historic fishing activities in the Welland area are concentrated between September and March peaking in January, and average 65 hours activity per month across this period. DEFRA's 2008 VMS Survey of Fishing Vessel presence categorises the surrounding sea area at 80-280 days per year – the lower end of North Sea activity. Techniques are predominantly beam trawling, and catches landed are mainly whelks and crabs with small quantities mussels, brown shrimp, skates, rays and cod.

The Welland field and adjacent sea areas see a relatively low level of fishing activity. Fishing Vessel VMS tracks logged by DEFRA between 2004 and 2008 show far more active fishing grounds 10 miles east, north west and south west of the installation and it's satellite wells. These adjacent areas are concentrated around other platform & pipeline infrastructures namely Davy to the east, Thames to the north west and Horne & Wren to the south west. It is assumed that the relative inactivity around the Welland infrastructure is mainly due to it's location in relation to the Thames/Rhine deepwater shipping channel. VMS tracking in this case gives a representative view of activity and it is recognized following discussions with NFFO that not all vessels below 15m in length are included.

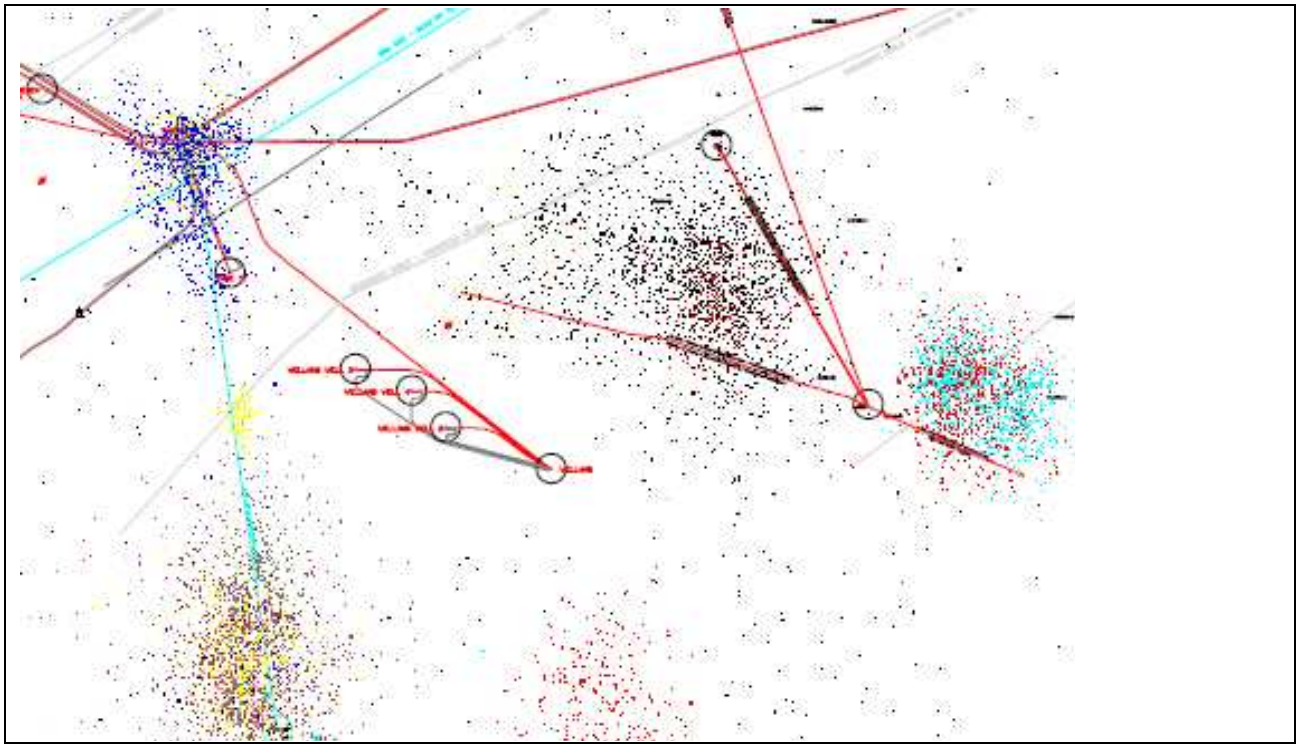


Figure 3.4 : Thames & Welland Field Fishing Activity 2004-2008

The Welland platform is located at the eastern edge of the Thames/Rhine deepwater shipping lane and as such sees moderate volumes of passing vessels including merchant craft, tankers, ferries, standby and supply vessels. The 3 subsea wells tied in to Welland are located directly in the deepwater shipping lane to the west of the platform.

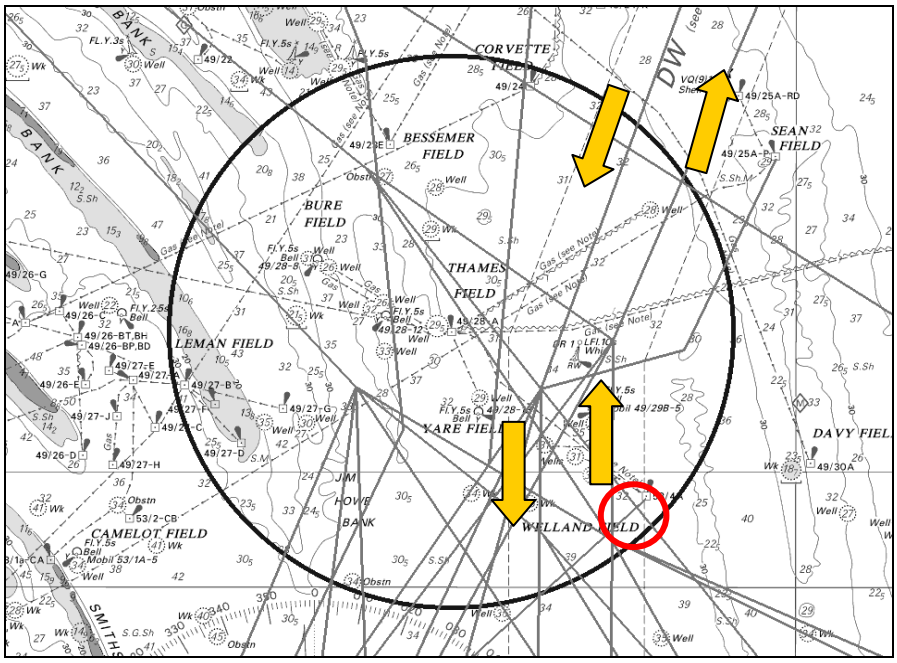


Figure 3.5 : Thames Area Main Shipping Routes

In 2001 some 6981 Vessels transited within a 10 mile radius of the Thames complex. Of this traffic the most common route used was the deepwater shipping lane north/south between Thames and Welland, accounting for just over 4000 of these vessels. More recent traffic volumes through this deepwater route are lower due to the economic climate, but also improved navigation technology enabling some vessels to negotiate shallower & more direct routes.

4. DESCRIPTIONS OF ITEMS TO BE DECOMMISSIONED

4.1 Jacket and Topsides

The Jacket has three tubular steel legs of conventional construction. Each leg has an internal pile cut off at EL + 15.00m. The total weight of the jacket is 570 tonnes and the piles 300 tonnes. Water depth is 37m and marine growth tonnage is estimated at 15Te.

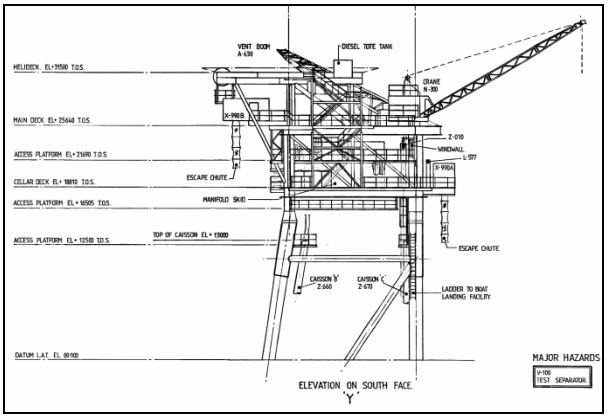


Figure 4.1 : Welland Topsides Elevation

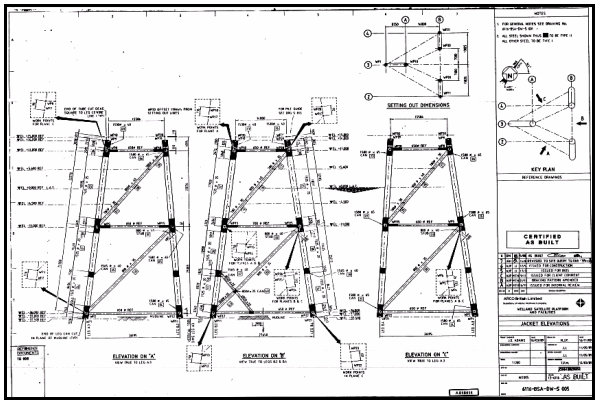


Figure 4.2 : Welland Jacket Elevations

The jacket supports topsides weighing 942 Te. The Topside Structure comprises three levels. The lower level is the cellar deck with process, hydraulic pressure equipment and wells. The 20mx 14m main deck supports the control room, generation and temporary accommodation facilities with a pedestal crane and vent boom. The main deck is 25.6m above LAT sea level. A helideck is located at the upper level.

There are two platform wells and three subsea wells tied back to Welland as listed below.

Platform Wells	**Depth ft MDBRT**	**Date drilled**	**Status**
53/4a-6 (Well 1)	8,291	Jun-84	Suspended
53/4a-10 (Tristan)	14,750	Nov-92	Suspended
Subsea Wells			
53/4a-5 (Well 2)	8,304	Jan-84	Suspended
49/29b-4 (Well 3)	8,440	Jun-86	Suspended
49/29b-6 (Well 4)	8,257	Aug-87	Suspended

Table 4.1 : Welland Field Wells

4.2 Subsea Protection Frames

The three subsea well heads with piled steel protective cages weigh 80 tonnes each. Each protection frame has 4 seabed piles and measures 13.8m x 13.8m x 6m high. Each wellhead has an export valve manifold and a subsea umbilical termination unit with jumper leads. The robust design on the protection cages was considered prudent at conceptual design phase given their intended location within a deepwater shipping lane.

Figure 4.3 : One of three Subsea Wellhead Protection Structures

4.3 Pipelines, Flowlines and Umbilicals

The pipeline and flowlines to be included in the decommissioning program for the Welland complex, including subsea wells are as follows :-

Lengths, diameters, type of construction

Pipeline & flowlines	Number	Diameter	Length, km	Type of construction
Welland - Thames Export line	PL674	16"	17.5	X60 Grade Steel, 65mm concrete & 6 mm coal tar
Welland - Thames MEG line	PL675	3"	17.5	X52 Grade Steel & 0.5mm Fusion Bonded Epoxy
Well 2 Subsea flowline	PL678	8"	4.2	X60 Grade Steel , 42mm Concrete & 550 microns Fusion Bonded Epoxy
Well 2 Subsea control umbilical & MEG line	PL681	4" & 0.75"	4.2	Core of shielded electrical power cables surrounded by a shielded communications cable, six thermoplastic hoses and lead fillers. Cores sheathed in polythene & further protected by armoured (steel wire) jacket and covered in an outer polythene sheath.
Well 3 Subsea flowline	PL676	8"	8.0	X60 Grade Steel , 42mm Concrete & 550 microns Fusion Bonded Epoxy
Well 3 Subsea control umbilical & MEG line	PL679	4" & 0.75"	8.0	Core of shielded electrical power cables surrounded by a shielded communications cable, six thermoplastic hoses and lead fillers. Cores sheathed in polythene & further protected by armoured (steel wire) jacket and covered in an outer polythene sheath.
Well 4 Subsea flowline	PL677	8"	5.8	X60 Grade Steel , 42mm Concrete & 550 microns Fusion Bonded Epoxy
Well 4 Subsea control umbilical & MEG line	PL680	4" & 0.75"	5.8	Core of shielded electrical power cables surrounded by a shielded communications cable, six thermoplastic hoses and lead fillers. Cores sheathed in polythene & further protected by armoured (steel wire) jacket and covered in an outer polythene sheath.

Table 4.2 : Welland Pipeline Infrastructure Details

4.4 Status of Burial and Trenching

All Welland infrastructure pipelines and umbilicals are not in use. The export line has been disconnected at the Thames AW platform. The latest subsea survey in 2009 found :-

- No evidence of original trenching
- The pipelines and umbilicals are buried along their whole length
- Burial depth at top of pipe varies from 0.5m to >1.5m
- Only one short exposed section on 16" PL674 approx 7m length which will be re-surveyed and remedial action planned as appropriate.
- There are no free-spans on pipelines or umbilicals
- There are various rock dump locations on pipelines totaling 1810m length
- There is only one 5m length rock dump on umbilical PL681
- Concrete and Frond mattresses are located at crossings and at end terminations

Further detail of historical and most recent survey findings can be seen in Annex 1. There are approximately 36 Link-lok concrete mattresses of which 5 are deployed at each subsea wellhead, 18 at Welland and 3 at Thames. Additionally there are 85 frond mats of which 22 are deployed at each wellhead, and 19 at Welland.

There are no subsea facilities that form part of the pipeline and the pipeline does not interact with any other users of the sea. All the pipelines are located in the deepwater shipping route and a such have no impact on passing shipping.

4.5 Materials on the Seabed

Results from the 2006 survey indicate there are 94 sites of small isolated debris, but no debris or litter seen on or alongside the pipeline.

5. INVENTORY OF MATERIALS

5.1a Category	Main Source - Installations	Elements	Quantity
Steel .	Topsides	Fe	942 tonnes
	Jacket and Piles	Fe	843.1 tonnes
	Wells	Fe	3186 tonnes
	Subsea Frames	Fe	210 tonnes
Alloys	Helideck	Al	17.05 tonnes
	Jacket Anodes (2-5% Zinc)	Al. Zn & In	26.9 tonnes
Copper	Topside Elec and Instrumentation	Cu	5 tonnes
Stainless Steel	Process & Instrumentation	Fe, Ni,	9.3 tonnes
Batteries	Batteries - sealed lead acid for UPS systems (F & G, Station Control. Comms & Nav Aids) + NiCd from lighting	Pb, H_2SO_4	3 Tonnes
Persistent Synthetics-	Topside Elec and Instrumentation	Various	41.5 tonnes
	Frond Mats	Plastics	42.5 tonnes
Paint & Coating	Topsides & Jacket	Various	4.2 tonnes
	Pipework Cladding	Thermal Blanket	0.5 tonnes
	Insulation Cladding	Rockwool	1 tonne
Concrete	Well Tubular Cementation	Concrete	4046 tonnes
	85 various Frond Mats	Concrete	796.2 tonnes
Bulk Chemicals	Well Drilling Mud	Water & OBM	548 tonnes
5.1b Category	**Main Source - Pipelines**	**Elements**	**Quantity**
Steel	Pipelines	Fe	3782 tonnes
	Umbilicals	Fe	190 tonnes
Alloys	Pipeline Anodes (2-5% Zinc)	Al. Zn & In	69.5 tonnes
Copper	Umbilicals	Cu	9 tonnes
Lead	Umbilicals	Pb	70 tonnes
Persistent Synthetics	Umbilicals	Plastics	35 tonnes
	Frond Mats	Plastics	42.5 tonnes
Paint & Coating	8”Subsea flowlines & 3” MEG P/L	FBE Resin	8.5 tonnes
Concrete	Pipeline Weight Coating	Concrete	6698 tonnes
	43 concrete link-lok mattresses	Concrete	484.3 tonnes
Bulk Chemicals	Pipelines Mono-ethylene Glycol	Glycol	40 tonnes
	Umbilical Mono-ethylene Glycol	Glycol	11.3 tonnes
	Umbilical Hydraulic Fluid	Transaqua	5.4 tonnes
Coal Tar	16” pipelines 6mm coat -135 cu m	Hydrocarbon	148.5 tonnes

Table 5.1 : Welland Field Inventory of Materials

Onboard hydrocarbons in terms of process fluids, fuels and lubricants will be drained and transported ashore for re-use/disposal. Other hazardous materials including radioactive material (ref section 7.4.1), instruments containing heavy metals, batteries etc will be transported ashore for re-use/disposal by appropriate methods. The original paint coating is assumed to contain lead and may give off toxic fumes / dust if flame-cutting or grinding/blasting is used. There is a report indicating that there is presence of some Asbestos and Ceramic Fibre material onboard therefore appropriate control and management will be enforced when dealing with this. .

A full onboard equipment inventory and tag list has been generated and will be available to onshore contractors dealing with re-use/disposal processes. Some of the topsides equipment will be removed for disposal whilst recoverable equipment required at the new location will be refurbished and commissioned for re-use where appropriate.

6. REMOVAL AND DISPOSAL OPTIONS

The Welland field infrastructure has been divided into 7 separate components for consideration of removal and disposal options as follows :-

Installations	***Pipelines***
Jacket and Topsides	*Pipelines and Flowlines*
Subsea Well Protection Frames	*Umbilicals*
(Three subsea wells - see Sect 8)	*Subsea Stabilization Features*
(Two platform wells – see Sect 8)	

Comparative Assessments of all removal options have been carried out independently. The full report is included in Annex 2. The summary assessment tables are detailed below. Platform and subsea wells disposal options are covered in Section 8.

<u>Assessment Scoring Methodology</u>
The scoring process for the options which feed into the summary tables in this section is based on Criteria from the Comparative Assessment (Annex 2 to this document). The scoring methodology can be explained by utilizing the CA tables :-

CA Table A.1 – Potential Impact Assessment criteria. (Appendix 3),
CA Table A.2 - Likelihood Assessment Criteria (below)
CA Table A.3 - Impact and Likelihood Assessment matrix. (below),

Scores for each option were achieved by cross referencing the “Impact Level” (CA table A.1 in app 3) against the “Likelihood Criteria” (CA table A.2 below) utilizing the “Impact and Likelihood” matrix (CA table A3 below).

Every option was reviewed on a “qualitive” basis,, discussed, then scored. An average of the scores for each option was then applied for each of the category headings and is shown in the summary tables in this section. The overall comparative score was then calculated for each option by averaging the category options

Further to the comparative assessment, a “quantitive” assessment was carried out to provide the Potential Loss of Life figures (table 6.9 below). This information was used to assist with decision making where the options were closely matched.

The criteria for determining likelihood are presented in Table A.2. The assumption for operations with a low likelihood is that they have a lower probability of resulting in the associated impact.

Comparative Assessment Report Table A.2 Likelihood Assessment Criteria

	LIKELIHOOD RATING	
Very Low	1	Very low likelihood. Very low level of uncertainty. Detailed definition and understanding of methodology, hazards and equipment.
Low	2	Low likelihood. Low level of uncertainty. High level definition and understanding of methodology, hazards or equipment.
Medium	3	Moderate likelihood. Moderate level of uncertainty. General definition and understanding of methodology, hazards or equipment.
High	4	High likelihood. High level of uncertainty. Basic definition and understanding of methodology, hazards or equipment.
Very High	5	Very high likelihood. Very high level of uncertainty. Limited definition and understanding of methodology, hazards or equipment.

The assessment matrix presented in Table A.3 is used to determine the risk associated with each of the assessment criteria. The assessment matrix provides numerical scores - these are then averaged for each option to provide an overall comparative score.

Comparative Assessment Report Table A.3 Impact and Likelihood Assessment Matrix

LIKELIHOOD	**IMPACT**				
	1.Very Low	**2. Low**	**3. Medium**	**4. High**	**5. Very High**
1. Very Low	**Low 1**	**Low 2**	**Low 3**	**Low 4**	**Medium 5**
2. Low	**Low 2**	**Low 4**	**Medium 6**	**Medium 8**	**Medium 10**
3. Medium	**Low 3**	**Medium 6**	**Medium 9**	**Medium 12**	**High 15**
4. High	**Low 4**	**Medium 8**	**Medium 12**	**High 16**	**High 20**
5. Very High	**Medium 5**	**Medium 10**	**High 15**	**High 20**	**High 25**

6.1 Jacket & Topsides Decommissioning Options

Internal reviews, long term operational strategy requirements and external enquiries indicate that re-use of the jacket or topsides would normally be unlikely, however, on this occasion one of the Perenco subsidiaries has indicated that re-use is a possibility as long as the time frame for removal and transportation is completed by end of 2010. This is therefore being pursued. Four options for disposal of the jacket & topsides have been considered :-,

Jacket and Topside Disposal Options

Option	Description	Reason for consideration
Removal and re-use	Removal of Topsides, and jacket for transportation to alternate site. Removal and disposal/recycling onshore of the bottom 26m and piles to -10ft below sea-bed.	A Perenco subsidiary has indicated that the Welland installation would be suitable for development of a new Well outside UKCS waters.
Onshore Disposal using HLV	Removal of the jacket & topsides as complete units and transport ashore for break up, recycling and/ or disposal. Reuse of selected equipment would take place where practicable	This method has been successfully utilised on a number of occasions in the SNS and is the reverse of installation.
Onshore disposal using 'piece small'	Remove jacket & topsides in several pieces using attendant work barge and transport to shore yard. Heavy lift may be required for jacket.	This method has been used in Norway and various locations world wide, although yet to be proven subsea
Minimal Impact Disposal	Removal of all non-ferrous material and equipment except coatings, thorough cleaning & decontamination. Leave in situ with navigation markers and exclusion zone.	Recognition of lowest local environmental impact, lowest global environmental impact, lowest risk to personnel working offshore and onshore and lowest economic case.

The inclusion of a Minimal Disposal Option has been considered to provide a base-case scenario for comparison. However, Perenco is aware that, in-line with OSPAR Decision 98/3, their disposal at sea or leaving them wholly or partly in place is prohibited. Currently we envisage the jacket & topsides being decommissioned by the same method utilising HLV.

	OPTIONS		
	1	2	3
	Heavy Lift Vessel (HLV)	Piece Small	Minimal Disposal
1. Safety			
Average Safety Value	5.0	4.0	3.7
2. Environmental			
Average Environmental Value	9.5	10.3	8.7
3. Technical			
Average Technical Value	4.3	13.3	1.3
4. Societal			
Average Societal Value	8.0	8.0	17.5
5. Legislative Compliance			
Average Legislative Value	1.0	1.0	25.0
6. **Commercial**			
Average Commercial Value	3.5	4.5	5.0
Overall Comparative Score	**5.23**	**6.86**	**10.2**

Table 6.1 : Comparative Assessment summary of Jacket & Topsides Decommissioning Options

6.2 Subsea Well Protection Frames

Internal re-use of the three well protection frames has been ruled out within PUK due to lack of potential developments which might use such large frames. The three frames were designed early in the subsea development era were over-sized with 4 piles, partly due to their deployment in a deepwater shipping lane. It is unlikely that any 3rd parties would take a different view on this. However, efforts to explore re-use opportunities continue, and would be subject to a re-assessment as an option if a reuse opportunity was presented in the interim before decommissioning.

Subsea Wellhead Protection Frame decommissioning options

Option	Description	Reason for consideration
Remove by drill rig, HLV or vessel with crane	Remove to shore and dismantle for re-cycling or possible (unlikely) re-use	Large submerged structures with future hazard potential to fishing activity.
Leave in situ	Ensure structure is over-trawlable & remove snagging hazards	Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in activity.

	OPTIONS			
	1	2	3	4
	Heavy Lift Vessel (HLV)	Drilling Rig	Vessel with Crane	Leave *in situ*
1. Safety				
Average Safety Value	2.0	3.0	2.0	2.7
2. Environmental				
Average Environmental Value	7.2	7.2	7.2	6.5
3. Technical				
Average Technical Value	5.0	7.3	5.0	1.0
4. Societal				
Average Societal Value	8.0	8.0	8.0	10.5
5. Legislative Compliance				
Average Legislative Value	1.0	1.0	1.0	25.0
6. Commercial				
Average Commercial Value	2.5	2.5	2.5	3.5
Overall Comparative Score	**4.28**	**4.83**	**4.28**	**8.2**

Table 6.2 : Comparative Assessment summary of Subsea WPS Decommissioning Options

6.3 Pipelines and Flowlines

Internal re-use of the pipeline infrastructure has been ruled out internally within PUK due to lack of potential developments in the immediate area and the unsuitability of reservoirs for gas storage or carbon capture initiatives. It is unlikely that any 3rd parties would take a different view on this. However, efforts to explore re-use opportunities continue, and would be subject to a re-assessment as an option if a reuse opportunity was presented in the interim before decommissioning. Pipelines consist of the main 16" export to Thames (currently flooded with seawater), it's 3" piggy-back MEG line (currently containing MEG) and the three 8" subsea flowlines (currently flooded with seawater to OIW levels of 17ppm, 43ppm & 87ppm). There are also three pipeline crossings to be taken into consideration.

Pipeline Disposal Options

Option	Description	Reason for consideration
Remove	Either remove in one piece or in sections. Disposal onshore. .	If surveys indicate spans & exposures present. Avoidance of continuing future inspection burden.
Flush and leave buried in situ	Check burial status and clean/flush (targeting <30ppm) & flood to decrease buoyancy. Bury ends.	Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in activity.
Leave in situ	Check burial status, flood and bury ends	Similar reasons to those above and lower risk to personnel engaged in activity

The summary assessment tables are detailed below for the 16" Export Line, 3 x Pipeline Crossings, 3" Piggyback MEG line and the Three 8" Flowlines. Where applicable the top line descriptors of the methods assessed are grouped by treatment of the internals then subdivided into treatment of the structure. For purposes of clarity 'clean' entails pigging of the tubular network.

	16" Export Line OPTIONS								
	1	1a	1b	2	2a	2b	3	3a	3b
	Clean, Flush & De-pressure			Flush & De-pressure			De-pressure only		
	Cut on Seabed & Remove in sections	Remove, cut into sections on surface	Leave *in situ*, ends buried	Cut on Seabed & Remove in sections	Remove, cut into sections on surface	Leave *in situ*, ends buried	Cut on Seabed & Remove in sections	Remove, cut into sections on surface	Leave *in situ*, ends buried
1. Safety									
Average Safety Value	4.7	4.7	2.3	4.7	4.7	2.3	4.7	4.7	2.3
2. Environmental									
Average Environmental Value	14.5	14.5	11.3	15.3	15.3	12.0	17.7	17.7	13.3
3. Technical									
Average Technical Value	15.0	8.3	5.0	14.0	7.8	4.5	14.0	7.8	2.8
4. Societal									
Average Societal Value	10.5	10.5	2.0	10.5	10.5	2.0	10.5	10.5	2.0
5. Legislative Compliance									
Average Legislative Value	1.0	1.0	4.0	1.0	1.0	4.0	1.0	1.0	6.0
6. Commercial									
Average Commercial Value	8.0	6.5	5.0	8.0	6.5	5.0	8.0	6.5	5.0
Overall Comparative Score	**8.95**	**7.58**	**4.93**	**8.91**	**7.58**	**4.96**	**9.31**	**8.03**	**5.23**

Table 6.3 : Comparative Assessment summary of 16"Export Pipeline Decommissioning Options

	OPTIONS	
	1	2
	Remove	Leave *in situ*
1. Safety		
Average Safety Value	6.7	1.3
2. Environmental		
Average Environmental Value	12.8	5.7
3. Technical		
Average Technical Value	9.8	1.0
4. Societal		
Average Societal Value	5.5	2.0
5. Legislative Compliance		
Average Legislative Value	1.0	6.0
6. Commercial		
Average Commercial Value	6.5	2.0
Overall Comparative Score	**6.25**	**3.00**

Table 6.4 : Comparative Assessment summary of Pipeline Crossings Decommissioning Options

	3" Piggyback MEG Line OPTIONS					
	1	1a	1b	2	2a	2b
	Flush & De-pressure			De-pressure only		
	Cut on Seabed & Remove in sections	Remove, cut into sections on surface	Leave *in situ*, ends buried	Cut on Seabed & Remove in sections	remove, cut into sections on surface	Leave *in situ*, ends buried
1. Safety						
Average Safety Value	3.0	3.0	2.3	3.0	3.0	2.3
2. Environmental						
Average Environmental Value	6.5	6.5	7.2	8.0	8.0	8.7
3. Technical						
Average Technical Value	13.0	11.5	4.0	14.0	11.5	2.8
4. Societal						
Average Societal Value	8.0	8.0	2.0	8.0	8.0	2.0
5. Legislative Compliance						
Average Legislative Value	1.0	1.0	4.0	1.0	1.0	6.0
6. Commercial						
Average Commercial Value	3.5	5.0	4.0	2.0	3.5	4.0
Overall Comparative Score	**5.83**	**5.83**	**3.91**	**6.00**	**5.83**	**4.3**

Table 6.5 : Comparative Assessment summary of 3"MEG Piggyback Line Decommissioning Options

8 " Flowline OPTIONS									
	1	1a	1b	2	2a	2b	3	3a	3b
	Clean, Flush & De-pressure			Flush & De-pressure			De-pressure only		
	Cut on Seabed & Remove in sections	Remove, cut into sections on surface	Leave *in situ*, ends buried	Cut on Seabed & Remove in sections	Remove, cut into sections on surface	Leave *in situ*, ends buried	Cut on Seabed & Remove in sections	Remove, cut into sections on surface	Leave *in situ*, ends buried
1. Safety									
Average Safety Value	3.7	3.7	2.3	3.7	3.7	2.3	3.7	3.7	2.3
2. Environmental									
Average Environmental Value	13.7	13.7	11.3	14.5	14.5	12.0	15.3	15.3	12.7
3. Technical									
Average Technical Value	17.0	9.3	6.5	16.0	8.8	5.5	15.0	8.3	3.8
4. Societal									
Average Societal Value	10.5	10.5	2.0	10.5	10.5	2.0	10.5	10.5	2.0
5. Legislative Compliance									
Average Legislative Value	1.0	1.0	2.5	1.0	1.0	2.5	1.0	1.0	3.5
6. Commercial									
Average Commercial Value	8.0	6.5	6.0	8.0	6.5	5.0	8.0	6.5	5.0
Overall Comparative Score	**8.98**	**7.45**	**5.10**	**8.95**	**7.50**	**4.88**	**8.91**	**7.55**	**4.88**

Table 6.6 : Comparative Assessment summary of 8" Flowlines Decommissioning Options

6.4 Umbilicals

Internal re-use of the umbilical infrastructure has been ruled out within PUK due to lack of potential developments in the immediate area. Technical and commercial evaluations are being undertaken to establish whether industry re-use is a viable option. Any identified re-use opportunity would be subject to a re-assessment, however, current discussion results are that operators would not take the potential production & cost risk, together with the subsequent environmental and safety risk of re-using a retrieved umbilical with uncertain integrity and possible failure exposure. The umbilicals consist of three 4" multi-core control lines containing hydraulic fluid and MEG, extending from Welland platform to each of the 3 subsea wells. All are fully buried to a depth in excess of >0.5m with no exposures.

Umbilical Disposal Options

Option	Description	Reason for consideration
Remove for disposal	Either remove in one piece or sections & disposal onshore.	If surveys indicate spans & exposures present. Avoidance of continuing future inspection burden.
Remove for re-use	Establish a requirement, remove in one piece by reverse-lay technique	Re-use option balances negative impacts of extraction
Leave in situ	Check burial status & bury ends	Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in activity. Components are not commercially recyclable. If re-use is not viable, bulk material will go to landfill therefore there would be no benefit in removal.

Control Umbilical OPTIONS						
	1	1a	1b	2	2a	2b
	Flush & De-pressure			De-pressure only		
	Remove, cut into sections on surface	Remove in one piece reeled	Leave *in situ*, ends buried	Remove, cut into sections on surface	Remove in one piece reeled	Leave *in situ*, ends buried
1. Safety						
Average Safety Value	1.7	1.7	2.3	1.7	1.7	2.3
2. Environmental						
Average Environmental Value	10.5	10.5	9.5	12.0	11.2	10.2
3. Technical						
Average Technical Value	10.3	7.8	5.0	9.3	5.8	3.5
4. Societal						
Average Societal Value	10.5	10.5	2.0	10.5	10.5	2.0
5. Legislative Compliance						
Average Legislative Value	1.0	1.0	4.0	1.0	1.0	4.0
6. Commercial						
Average Commercial Value	3.5	3.5	5.0	3.5	3.5	5.0
Overall Comparative Score	**6.25**	**5.83**	**4.63**	**6.33**	**5.61**	**4.5**

Table 6.7 Comparative Assessment summary of Control Umbilical Decommissioning Options

6.5 Subsea Stabilisation Features

Subsea stabilization features constitute 45 concrete mattresses, 85 frond mats and various grout bags/formworks, located at the 3 subsea wellheads, the jacket base and pipeline crossing points. Internal re-use of subsea stabilization features is unlikely within PUK due to lack of potential developments which might use features. Opportunistic 3rd party re-use for such a relatively small amount of concrete blocks is unlikely to occur.

There are doubts regarding the integrity of the mattresses which may cause break-up during removal and problems with the handling/lifting points, therefore various alternative options have been considered.

Mattress decommissioning options

Option	Description	Reason for consideration
Leave in situ	Confirm absence of snagging hazards & ensure overtrawlability	Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in activity.
Bury in situ	Water jet burial in place along with any underlying features	Avoidance of lifting hazards, lower energy usage, reduced risk to personnel engaged in activity.
Move and bury	Collect from locations and bury in single location	Only if representing a hazard in current location
Subsea re-use	Recover to surface & deploy on another development	Avoidance of disposal on land
Coastal re-use	Recover to surface and deploy to designated convenient coastal construction location	Re-use opportunity without need for onshore handling
Move to shore	Recover to surface & transport to shore for landfill or convenient civil engineering use.	Slight re-use opportunity

OPTIONS			
	1	2	3
	Remove	Bury *in situ*	Minimum Disposal Option (Leave On Site)
1. Safety			
Average Safety Value	1.7	2.3	2.0
2. Environmental			
Average Environmental Value	9.7	9.7	5.7
3. Technical			
Average Technical Value	10.5	3.8	1.0
4. Societal			
Average Societal Value	10.5	1.5	1.5
5. Legislative Compliance			
Average Legislative Value	1.0	4.0	8.0
6. Commercial			
Average Commercial Value	3.5	3.5	3.5
Overall Comparative Score	**6.15**	**4.13**	**3.61**

Table 6.8 : Comparative Assessment summary of Mattresses Decommissioning Options

Whilst the analysis and comparative assessment findings indicate that leaving the mattresses buried on the seabed would be the preferred option by an overall magnitude of almost two, there is however a preference by some interested parties to remove them. Therefore, removal will be attempted in the initial stages of the programme to validate the assumptions.

If the attempted removal proves to be comparatively safe for personnel compared with other methods and the cost and economical impact is not as great as estimated then the Mattresses will be removed and sent to shore for disposal. If the mattresses cannot be removed safely, a proposal will be sent to DECC for consideration.

The current estimated cost difference is however quite substantial due to the amount of seabed work required for the removal option :-.

- Removal - £5.6M
- Bury in situ - £1.1M

The calculated Potential loss of Life figures between the two options has a magnitude of five and shows the removal option to be much less safe for personnel :-

- Removal – 1.33×10^{-2} (0.0133)
- Bury in situ – 2.58×10^{-3} (0.00258)

6.6 Initial Quantative Risk Comparison

In addition to the comparative assessments carried out for the options reviewed an additional assessment of Potential Loss of Life has been completed by way of QRA (Quantified Risk Assessment). This data has been used to provide more detail for personnel safety issues associated with the options.

		Jacket & Topsides	Subsea Wellhead Protection Structures	16" Export Pipeline	3" MEG Piggyback Pipeline	Pipeline Crossings	8" Subsea Flowlines	Subsea Control Umbilicals	Mattresses
Options (refer to Table 1.1 for details of options)	1	9.26E-03	7.92E-03	3.22E-02	2.53E-03	1.37E-02	3.72E-02	1.82E-02	1.33E-02
	1a			2.29E-02	2.53E-03		2.60E-02	1.25E-02	
	1b			7.28E-03	1.47E-03		1.02E-02	7.41E-03	
	2	5.16E-02	1.04E-02	3.15E-02	2.46E-03	0.00E+00	3.62E-02	1.49E-02	2.58E-03
	2a			2.21E-02	2.46E-03		2.50E-02	9.33E-03	
	2b			6.51E-03	1.05E-03		9.16E-03	4.32E-03	
	3	1.51E-03	6.52E-03	2.81E-02			3.40E-02		1.75E-04
	3a			1.87E-02			2.28E-02		
	3b			3.17E-03			6.97E-03		
	4		0						

Table 6.9 : QRA PLL (Potential Loss of Life) results for each of the Decommissioning Options Assessed

7. SELECTED REMOVAL AND DISPOSAL OPTIONS

Category	Selected Option	Reason for Selection
Jacket and Topsides	Removal and re-use	One of the Perenco subsidiaries has indicated that the Welland installation would be suitable for development of a new Well outside UKCS waters. (refer to annex 3 section 2.4.1)
Pipelines and Flowlines	Flush and leave buried in situ	Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in activity. (refer to annex 3 section 2.4.3)
Umbilicals	Leave in situ - buried	Minimal seabed disturbance, lower energy usage, reduced risk to personnel engaged in activity. Components are not commercially recyclable If re-use is not viable, bulk material will go to landfill. (refer to annex 3 section 2.4.4)
Subsea Well Protection Frames	Remove by drill rig, HLV or vessel with crane	Large submerged structures with future hazard potential to fishing activity. (refer to annex 3 section 2.4.2)
Subsea Stabilisation Features	Removal	Preferred by NFFO and DECC environmental unit (refer to table 6.8) although not by Comparative Assessment. It is anticipated that mattress lift points and linkages will not support their weight and lifting may become very hazardous. If the mattresses cannot be removed safely, a proposal will be sent to DECC for consideration.

Table 7.1 : Selected Removal and disposal Options

7.1 Re-use and re-cycling of Jacket, Topsides and Protection Frames

It is not envisaged that removal of the topsides by HLV and transportation to alternate location will present significant problems provided adequate preparation and planning has been carried out. Both methods are now standard practice for marine contractors.

The topsides will be cleaned and equipment refurbished for re-use where possible and will then be removed wholly by HLV. Equipment which cannot be re-used together with dismantled components will be recycled or will go to landfill or other disposal routes as appropriate under the control of normal Perenco Transportation of Goods Procedures.

The jacket legs may need to be cut at the -11m level (26m above sea-bed) to allow re-use at the proposed new location. Although the full engineering process is not yet finalised it is envisaged that the Legs will be removed with piles in completeness and then cut on the Vessel/barge decks or at an onshore location to the required length. The final decision will be dependent on the engineering difficulties associated with the lower portion retrieval for which engineering studies are still being carried out. The lower 26M of the jacket and piles and the subsea wellhead protection frames will be transported ashore for recycle.

The subsea wellhead protection frames will be removed along with the top sections of their piles. level. All piles for wellhead protection structures and jacket structure will be removed to 3 metres below seabed in accordance with Section 16.

Perenco will consider disposal sites throughout the southern North Sea. The chosen shore facility must demonstrate a proven disposal track record, a proven waste stream management throughout the deconstruction process and imaginative recycling options.

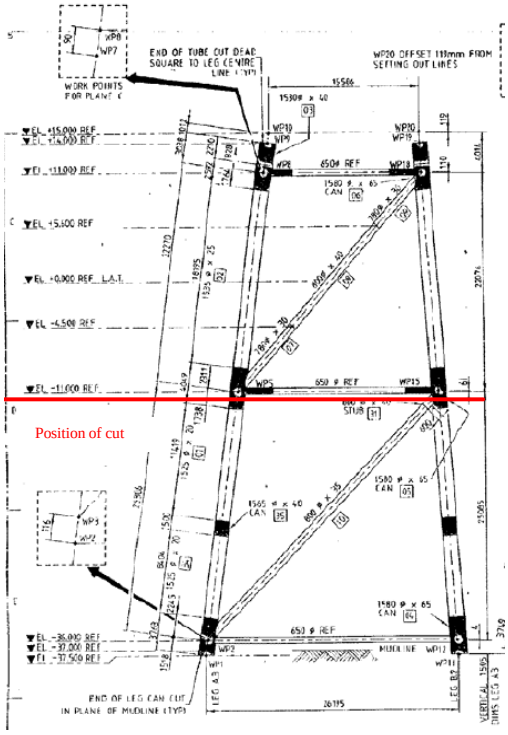


Figure 7.1 : Diagram to indicate "cut" point of Jacket :

7.2 Leave pipelines and umbilicals buried in situ

The 16 inch pipeline, 3inch piggy-back line, three 8 inch flowlines and three 4" umbilicals) will be left in situ, with the cut ends re buried as recommended by the Fishermen's Federation. If the mattresses cannot be removed safely, a proposal will be sent to DECC for consideration, as mentioned in Section 6.5. Rock dumping will not be carried out.

7.3 Cleaning and Decontamination

Bulk liquids will be removed from vessels and transported ashore immediately prior to decommissioning. Vessels pipework and sumps will be drained prior to removal to shore and shipped in accordance with maritime transportation guidelines. Further cleaning & decontamination will take place onshore prior to recycling / re-use. It is envisaged that marine growth on subsea components will be removed onshore and disposed of accordingly.

7.4 Project Waste Management Strategy

The planned waste management and proposed re-use and/or refurbishment, recycling, treatment and/or disposal strategy for each individual waste stream during the recovery and disposal of the Welland installation will be critical in the selection of the onshore disposal site operator. They will work jointly in the following areas:

7.4.1 Identification of Waste Streams

The precise waste streams and respective quantities will be identified during a waste inventory. This survey will identify the existence and quantity of any

hazardous, toxic or radioactive substances. No LSA or NORM have been reported although ongoing inspections will take place during dismantlement. All authorisations required for the disposal of these substances are covered under the Permits & Consents Applications Register for the decommissioning project,

7.4.2 Waste Removal Procedure

Any waste that arises from the deconstruction of Welland would be treated in accordance with all relevant legislation and company policy. The wastes will be categorised and handled in such a manner as to not present any threat to the local environment. Generally, special wastes will be transported from the site in sealed containers. Procedures for NORM, LSA scale and radioactive components will be handled in accordance with company procedures

7.4.3 Waste Stream Disposal Options

In order to maximise the reuse, recovery and recycle rate for the platform wastes; and to minimise the amount of materials destined for landfill or incineration, segregation of individual wastes as far as is reasonably practical is necessary. Segregating wastes will also reduce the energy used in transporting materials to recycling facilities or reuse locations as the material inventories may be moved in single movements. Each individual waste stream shall be assessed in order to develop the most favourable disposal option.

7.5 Materials Remaining on Seabed

Pipelines and subsea stabilisation features will remain buried beneath seabed as listed in Sections 5 and 7. Water clearances above such items will effectively be seabed to surface depths. It is expected that materials remaining buried will remain stable and immobile during the period of degradation due to their relative density. Historic seabed surveys indicate that the pipelines will remain buried with flooding adding to overall density. Degradation of pipelines will occur over a long period within the seabed sediment and is not expected to represent a hazard to other users of the sea. Precise corrosion rates are difficult to generate due to coatings and concrete encapsulation but structural breakdown of tubulars may occur between 300 and 500 years. Umbilical cables will remain within sedimentary layer for several hundred years. More precise marine degradation rates of modern plastics and polymers are not available.

8. WELLS

There are two platform wells and three subsea wells in the Welland Field. Well details are given in Section 4. All 5 wells will be abandoned in accordance with Oil & Gas UK Guidelines for the Suspension and abandonment of Wells. A PON5 will be submitted in support of works carried out.

All Well abandonment will be completed utilizing a MODU. The Appendix contains a typical well abandonment completion diagram (attachment 1) describing the intended design of the abandonment completion status.

9. DRILL CUTTINGS

There are no drill cuttings associated with the installation in the area. Drill cuttings that were generated during drilling activity are considered to have been distributed widely during drilling due to the local currents. Although there is no evidence of drill cuttings in the immediate vicinity of the Wells Perenco will be carrying out sea bed sampling to verify the absence of cutting debris that may affect the environment.

Should any evidence of drill cuttings be discovered, Perenco will contact DECC to review findings and extent and agree any necessary remedial actions.

10. ENVIRONMENTAL IMPACT ASSESSMENT

The identification and control of environmental impacts associated with all Perenco activities and operations form an integral part of managing the business. Potential impacts are identified during the planning stages of all operations, and the risks assessed and managed via a structured process, which is embedded in Perenco's HSE Management System (MS). The MS complies with corporate requirements and international and UK standards.

The application of the MS during the Welland decommissioning project ensures that Perenco's Health, Safety and Environmental (HSE) Policy is followed and that the Company's responsibilities under all relevant regulations are met. This Environmental Statement documents the environmental assessment as applied to the Welland decommissioning project. During the assessment, Perenco has conducted informal consultation with DECC and NFFO and will continue to liaise with the Consultees outlined in Table 1.1. Other key facets of the MS include effective contractor management, emergency preparedness and response, measuring, monitoring and reporting, and audit and review. The Perenco MS will be interfaced with the management systems of the main contracting parties participating in the Welland decommissioning project. A full environmental impact assessment id detailed in Annexe 3

In conclusion, although there is expected to be some environmental impact during the decommissioning of the Welland infrastructure (53/4a, 49/28a and 49/29b), long term environmental impacts from the decommissioning operations are expected to be negligible. In addition, incremental cumulative impacts and trans-boundary effects associated with the planned decommissioning operations are expected to be negligible.

There will be no planned use of explosives during these activities. We acknowledge that there will be a requirement for an environmental protection plan to be produced and submitted to DECC should this plan change.

SOURCE OF IMPACT		POTENTIAL ENVIRONMENTAL SENSITIVITIES														
		Air Quality	*Coastal Processes*	*Water Column*	*Seabed Sediments*	*Benthos*	*Marine Mammals*	*Fish*	*Seabirds / Shorebirds*	*Protected Sites*	*Shipping*	*Local Population*	*Fisheries*	*Local Resource Use*	*Archeology*	*Tourism*
Physical Presence	Jack-up Rig		■		■	■			■		■		■	■	■	
	Heavy Lift Vessel		■		■	■			■		■		■	■	■	
	Support Vessels / Tugs								■		■		■	■		
	Helicopter Movements	■							■		■	■				
Atmospheric Emissions	Jack-up Rig power generation	■														
	Vessels/tugs/helicopter Emissions	■														
	Platform Power Generation	■														
Aqueous Discharges	Drilling muds & cuttings			■	■	■		■					■		■	
	Wastewater discharges			■				■								
Solid Waste	Construction, domestic & scrap - returned to shore											■				
Noise	Well Plugging Operations						■	■	■				■			
	Lifting Operations						■	■	■				■			
Accidental Discharges	Fuel/chemical spills		■	■	■	■	■	■	■	■	■	■	■	■		■

Table 10.1 : Potential Impact summary associated with Welland Decommissioning

11. INTERESTED PARTY CONSULTATIONS

The consultation process including communication with relevant statutory bodies, has taken the form of a website dedicated to the Welland decommissioning programme within the Perenco UK website, plus Press publications, as well as face to face discussions where appropriate. Perenco has had discussions and corresponded with the Fishermen's Federation and their recommendations on pipelines are included as part of this programme plus numerous informal discussions with interested parties. Comments on the programme have been invited, but none received as a result of press or internet publications. Of the statutory consultees contacted prior to submission of programme only the NFFO replied with comments as follows :-

> The outline of your plan would appear to address the points listed under the NFFO Decommissioning Policy as documented in the enclosed paper. On that basis we feel there is no further comment necessary plan at this stage.
>
> That said, safety of fishermen during any decommissioning operations is paramount for us.
>
> The dismantling process or partially dismantled structures and associated equipment presents an ongoing danger to fishermen therefore we would request Perenco to ensure an arrangement is in place which provides an ongoing and constantly updates risk assessment based upon potential threat to other users until the area has been deemed safe and free from any debris.
>
> At this stage we feel we can offer some support to the principles of your outline decommissioning plan.

Letter received from NFFO is shown in Appendix 2

12. COSTS

Decommissioning Costs Summary

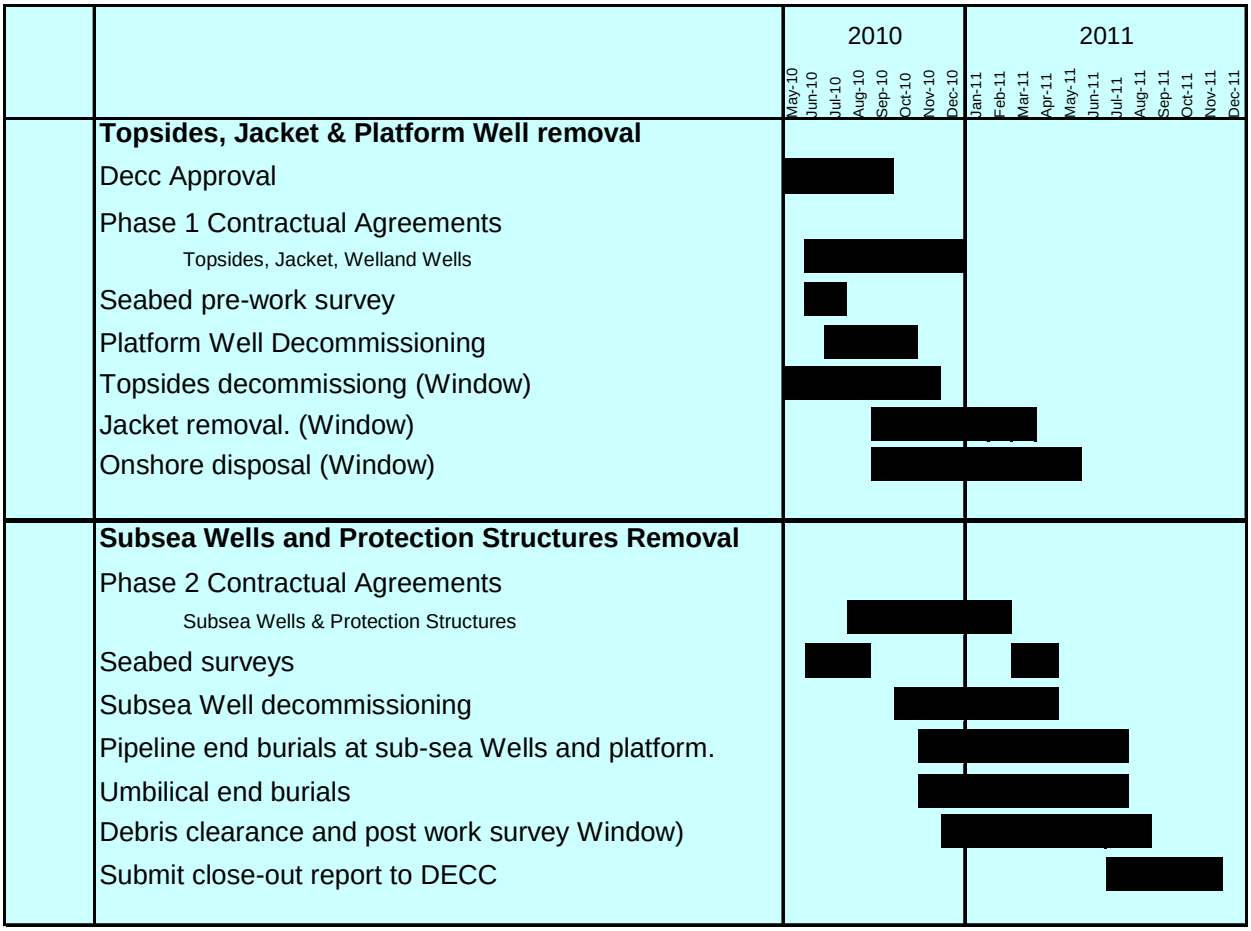
Perenco has prepared an initial estimate of the total cost of the decommissioning programme, based on the assumption that all work would be carried out and completed by the middle of 2011. The final cost of the whole programme will be heavily dependent on the specific contracts awarded and the synergies that might be available with similar offshore programmes that coincide with the timetable for Welland. As such a precise breakdown to element level at this stage may not be accurate. Estimates are in accordance with UK Oil and Gas Guidelines on Decommissioning Cost Estimation document

Item	Estimated Cost (£m)
Pipeline and Umbilical Infrastructure Decommissioning	5.76
Platform and Jacket Preparation and Removal	10.82
2 Platform and 3 Subsea Well Abandonments	13.94
Subsea Wellhead Protection Structure Removal	2.70
TOTAL	**33.22**

Table 12.1 Summary of the estimated cost of the Welland decommissioning programme.

13. SCHEDULE

It is proposed that the platform be removed from the Welland field in Q3 2010 to meet the deadline of the receiving location, followed by the sub-sea Wells in before year-end weather and resources permitting. The final date for removal will be dependent on a removals contract and opportunities for the best economical case.



14. PROJECT MANAGEMENT AND VERIFICATION

A Perenco Project Management team will be appointed to plan with contractors for the removal of the installation in 2010. Perenco standard procedures for operational control and hazard identification and management will be used. Where possible the work will be coordinated with existing decommissioning operations in the SNS.

A record is being maintained to 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 with respect to the use of a HLV will be discussed with DECC. The well abandonment programme will be completed by 2011

Perenco UK will submit a report, detailing how the programme was carried out within four months of completion of the decommissioning work, including debris clearance and the results of post-decommissioning surveys and future survey plans.

15. DEBRIS CLEARANCE

On completion of platform removal and sub-sea Well removal, a site survey will be carried out. The survey will be conducted around a 500m radius of installation sites and a 200m corridor along each existing pipeline route.

All significant seabed debris logged will be recovered for onshore disposal or recycling in line with existing platform disposal methods. Independent verification of the seabed state will be obtained by a trawler commissioned to trawl the platform area. This will be followed by a statement of clearance to all relevant governmental departments and non- governmental organisations.

16. PRE- AND POST-DECOMMISSIONING MONITORING AND MAINTENANCE

It is intended to remove the platform completely. The jacket, wells and sub-sea protection structures will be removed to 3.0m or greater below the existing seabed.

A post decommissioning environmental seabed survey, centred around sites of the wellheads and installation, will be carried out. The survey will focus on chemical and physical disturbances of the decommissioning and compared with the pre decommissioning survey. Results of this survey will be available once the work is complete, with a copy forwarded to DECC.

All pipeline routes and structure sites will be the subject of surveys when decommissioning activity has concluded. After the surveys have been sent to DECC and reviewed, a post monitoring survey regime will be agreed by both parties.

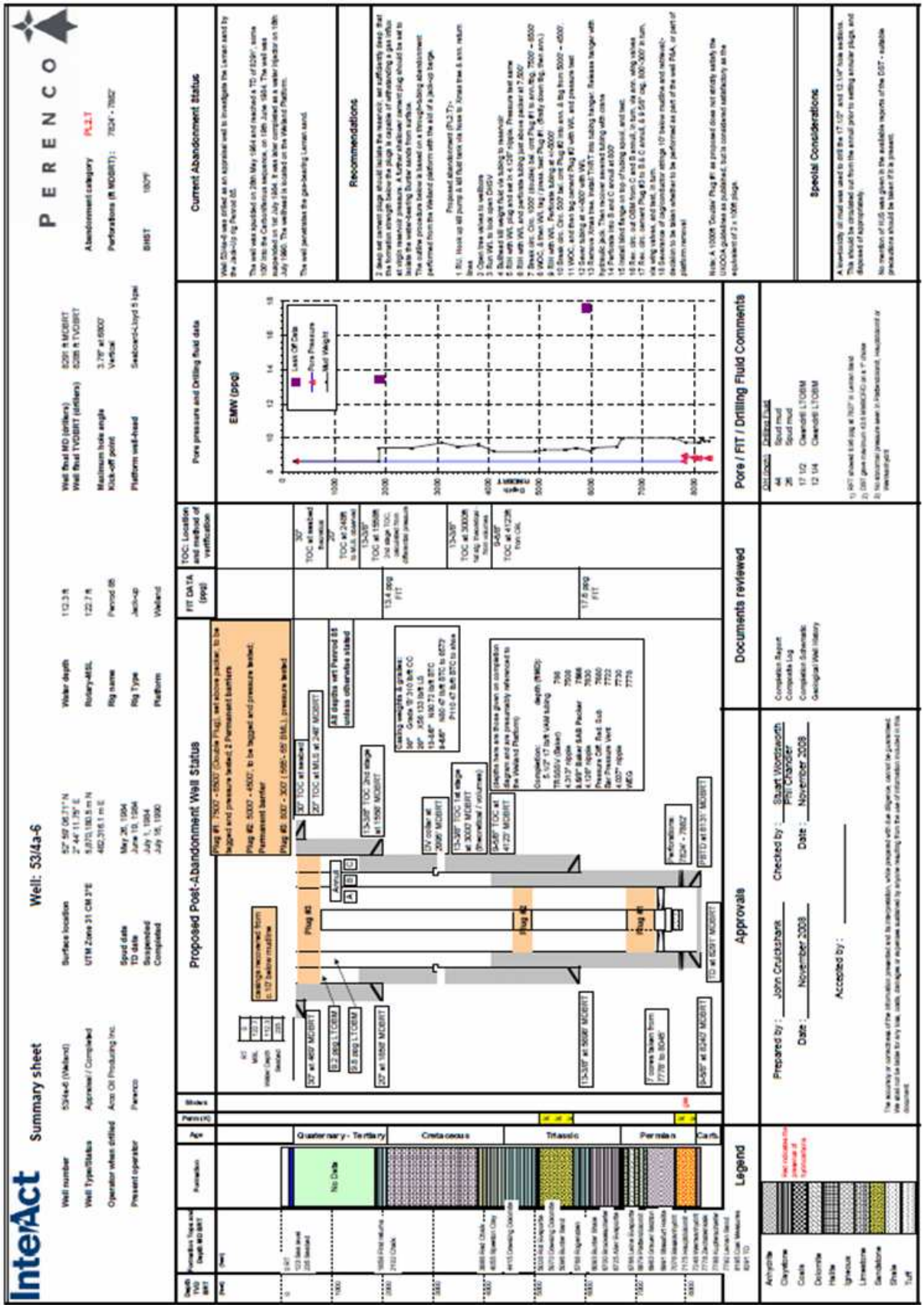
17. SUPPORTING STUDIES

Draft Guidelines for Decommissioning, URN09D/734, DECC 2009
Pipeline Protection & Stabilisation Features, BR05021/BP-157-A/Rev C, Boreas 2005
Fishing Patterns Southern North Sea 2004-09, Perenco UK, 2009
Thames Field Traffic Survey, ST-8892-CO-1-Rev 01, Safetec, 2001

APPENDICES

Attachment 1 :	Typical Well Abandonment Completion Diagram
Attachment 2 :	Correspondence
Attachment 3 :	Potential Impact Assessment Criteria from Comparative Assessment Report

Appendix 1 : Typical Welland Well Abandonment Completion



Appendix 2 : Correspondence

Tullow Oil SK Limited
3rd Floor, Building 11, Chiswick Park, 566 Chiswick High Road, London, W4 5YS
Tel: +44 (0)208 996 1000 Fax: +44 (0)208 994 5332

Perenco (UK) Decommissioning Team
Thames House,
Thamesfield Way,
Gt Yarmouth
Norfolk NR31 0DN

30th September 2010

Re: WELLAND FIELD DECOMMISSIONING PROGRAMME

Dear Sir/Madam,

We acknowledge receipt your decommissioning programme for the Welland Field facilities.

We, Tullow Oil SK Limited confirm that we support the proposals detailed in the Welland Field decommissioning programme dated 30th September 2010 which will be submitted to DECC by Perenco on behalf of Perenco and Partners under the requirement of section 29 of the Petroleum Act 1998.

Yours faithfully,
Simon Crawcock

For and on behalf of Tullow Oil SK Limited

Registered in England and Wales: Number 5287330
Registered Office as above

Tullow Oil plc
3rd Floor, Building 11, Chiswick Park, 566 Chiswick High Road, London, W4 5YS
Tel: +44 (0)208 996 1000 Fax: +44 (0)208 994 5332

Perenco (UK) Decommissioning Team
Thames House,
Thamesfield Way,
Gt Yarmouth
Norfolk NR31 0DN

30th September 2010

Re : WELLAND FIELD DECOMMISSIONING PROGRAMME

Dear Sir/Madam,

We acknowledge receipt your decommissioning programme for the Welland Field facilities.

We, Tullow Oil PLC confirm that we support the proposals detailed in the Welland Field decommissioning programme dated 30th September 2010 which will be submitted to DECC by Perenco on behalf of Perenco and Partners under the requirement of section 29 of the Petroleum Act 1998.

Yours faithfully,
Simon Grewcock

For and on behalf of Tullow Oil PLC

Registered in England and Wales: Number 3919249
Registered Office as above

First Oil Expro

1 Queens Terrace
Aberdeen AB10 1XL

Tel: 01224 624666
Fax: 01224 624880
Email: info@firstoilexpro.com

Perenco (UK) Decommissioning Team
Thames House,
Thamesfield Way,
Gt Yarmouth
Norfolk NR31 0DN

30th September 2010

Re : WELLAND FIELD DECOMMISSIONING PROGRAMME

Dear Sir/Madam,

We acknowledge receipt of your decommissioning programme for the Welland Field facilities.

We, First Oil Expro Limited, confirm that we support the final proposals detailed in the Welland Field decommissioning programme dated 30 September 2010 which will be submitted to DECC by Perenco on behalf of Perenco and it's Partners under the requirement of section 29 of the Petroleum Act 1998.

Yours faithfully,

Steven D. Bowyer

For and on behalf of First Oil Expro Limited

Registered Office: 21 Regatta House, 32 Twickenham Road, Teddington, Middlesex, TW11 8AZ
Registered Number: 01021486

National Federation of Fishermen's Organisations

Thames & Welland Field Decommissioning

20 April 2010

Keith Tucker
Perenco UK
Thamesfield Way
Off Pasteur Way
Gt Yarmouth
NR31 0DN

Dear Keith

Re; **Thames & Welland Decommissioning Plan**

Thank you for the email dated 15th April 2010 re the Thames & Welland Field Decommissioning Plans.

Having considered the detail the Federations response is as follows;

The outline of your plan would appear to address the points listed under the NFFO Decommissioning Policy as documented in the enclosed paper. On that basis we feel there is no further comment necessary plan at this stage.

That said, safety of fishermen during any decommissioning operations is paramount for us.

The dismantling process or partially dismantled structures and associated equipment presents an ongoing danger to fishermen therefore we would request Perenco to ensure an arrangement is in place which provides an ongoing and constantly updates risk assessment based upon potential threat to other users until the area has been deemed safe and free from any debris.

At this stage we feel we can offer some support to the principles of your outline decommissioning plan.

Thank you for providing the information and early consultation. We look forward to playing an active role in the consultation process and future communication on the decommissioning program.

Yours sincerely

Dave Bevan
NFFO

NFFO. 30 Monkgate, York, YO31 7PF

Appendix 3 (Table A.1 Potential Impact Assessment Criteria from Comparative Assessment Report)

Assessment Criteria	IMPACT LEVEL 1 Very Low	2 Low	3 Medium	4 High	5 Very High
1. Safety					
1.1 Risk to offshore personnel (during ops)	Refer to QRA range table	Refer to QRA range table	Refer to QRA range table	Refer to QRA range table	Refer to QRA range table
1.2 Risk to other users of the sea (post ops)	No Risk	Potential snagging hazard if protection deteriorates or is moved /	Loss of fishing gear / vessel infringes tow exclusion zone	Vessel Collision / Damage to vessel	Loss of vessel
1.3 Risk to those on land (during ops)	FAC or no specific treatment	MTC/RWC	RWC/Day Away from Work Case	Fatality or long term injury	Multiple fatalities or long term injuries
1.4 Risk to 3rd party assets / vessels (during ops)	No Risk	Standard operations required in 500m zones	Crossing 3rd party assets	Impact with 3rd party asset – no loss of containment	Impact with 3rd party asset – loss of containment
2. Environmental					
2.1 Chemical discharge	No or negligible changes (<10 litres)	Changes which are unlikely to be measureable against background activities (10-100 litres)	Change in ecosystem leading to medium term damage but with good recovery potential (100ltr- 10m^3)	Change in ecosystem leading to long term damage but with good recovery potential (10-100m^3)	Change in ecosystem leading to long term damage but with poor recovery potential (>100m^3)
2.2 Hydrocarbon discharge	Oil <1 litre Gas <10m^3	Oil 1-10 litres Gas 10-50m^3	Oil 10-100 litres Gas 50-100m^3	Oil 100ltr – 1m^3 Gas 100-200m^3	Oil >1m^3 Gas >200m^3
2.3 Seabed Disturbance	None	Localised disturbance (0-100% of equipment footprint)	Localised disturbance (100% of equipment footprint)	Wider area of disturbance (100-200% of equipment footprint)	Wide area of disturbance (>200% of equipment footprint)
2.4 Carbon Footprint	< 200Te CO_2	200 – 500Te CO_2	500-800Te CO_2	800-1,500Te CO_2	>1,500Te CO_2
2.5 Material Recovery	>90%	60-90%	40-60%	10-40%	<10%
2.6 Reuse of recover material	>90% of recovered material recycled	60□90% of recovered material recycled	40□60% of recovered material recycled	10□40% of recovered material recycled	<10% of recovered material recycled
2.7 Disposal of non-recycled material	Direct to Landfill	Cleaned prior to disposal	Cleaned of Hydrocarbons prior to disposal	Specialist cleaning required prior to disposal	NORM decontamination and disposal
3. Technical					
3.1 Technical Challenge	Regular construction task using generic procedures	Regular construction task using detailed procedures	Non-routine task. High level of historical experience	Non-routine task. Low level of historical experience	Novel technique or equipment. No industry experience
3.2 Level of Diving Intervention	<10 days	10-20 days	20-30 days	30-40 days	>40 days
3.3 Weather Sensitivity	General operations relying only on ability to launch ROV	Standard operations experiencing expected operational downtime for time of year	Requires specific weather window for small number of tasks. Non schedule critical	Requires specific weather window for certain tasks. Schedule can be optimised to accommodate	Requires specific weather window for prolonged period. Operation on critical path
3.4 Risk of Major Project failure	Existing, proven equipment used for specific task for which it was designed	Existing, proven equipment used for new application.	Technology research and development required.	Unable to complete operation in scheduled timeframe. Re□work required prior to revisit.	Potential catastrophic failure of major component.
4. Societal					
4.1 Fisheries Access (post ops)	Free, unrestricted access to site	Unrestricted access to site □ noted seabed disturbance	Access to site with over-trawlable charted obstructions	Access to site with charted obstructions	Site remains restricted
4.2 Communities	Benefit to onshore communities (creation of jobs/ infrastructure)	No impact	Low, transient impact to onshore communities (waste handling/ transfer)	Low, long-term impact to onshore communities (waste handling/ landfill)	Acute impact to oshore communities (pollution/ loss of amenity)
5. Legal Compliance					
5.1 OSPAR 98/3	Fully Compliant	N/A	Compliant with derogation	N/A	Non-compliant
5.2 NNFO Guidance	Total removal of infrastructure	Burial >0.6m below natural seabed	Burial but not to depth required	Exposed at some locations	Totally exposed
6. Commercial					
6.1 Economic	<£1M	£1-5M	£5-10M	£10-15M	>£15M
6.2 Ongoing Liability	No ongoing liability	Reactive survey regime	Survey inspection at increasing intervals	Bi□annual survey inspection + ongoing remedial work	Annual surveys + ongoing remedial work