BP Exploration Operating Company Limited

Report

Schiehallion & Loyal Fields Phase 1 Decommissioning Comparative Assessment

December 12

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GENESIS

deeper understanding

Schiehallion & Loyal Fields Phase 1 Decommissioning Comparative Assessment

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ABBREVIATIONS

CA	Comparative Assessment
CDA	Controls Distribution Assembly
COP	Cessation of Production
CRA	Corrosion Resistant Alloy
DECC	Department of Energy and Climate Change
DP	Decision Paper
DUTA	Dynamic Umbilical Termination Assembly
EDC	Environmental Debris Cap
EoFL	End of Field Life
FPSO	Floating Production Storage and Offloading vessel
FTA	Flowline Termination Assembly
FTP	Fly to Place Connector
IE	Independent Expert
LTC	Lower Tether Clamp
km	Kilometre
m	meter
ML	Multi- Lateral
NGO	Non Government Organisation
NWAD	North West Area Development
PLEM	Pipeline End Manifold
PWRI	Produced Water Re-Injection
RET	Riser End Termination
ROVDB	ROV Deployable Blind
TOR	Terms of Reference
UET	Umbilical End Termination
UKCS	United Kingdom Continental Shelf
UTC	Upper Tether Clamp
VLS	Vertical Lay System
WI	Water Injection

EXECUTIVE SUMMARY

Introduction

This report presents the findings of a Comparative Assessment (CA) of options for Schiehallion & Loyal Fields Phase 1 decommissioning of pipelines, associated apparatus and other subsea infrastructure.

The Schiehallion & Loyal Phase 1 Decommissioning Programmes cover the decommissioning of the existing infrastructure that becomes redundant as part of the Quad 204 Project (Schiehallion FPSO Replacement).

The focus of this CA has been on all subsea infrastructures associated apparatus and other subsea infrastructure including:

- Risers
- Riser End Terminations (RETs)
- Dynamic Umbilicals
- Dynamic Umbilical Termination Assembles (DUTAs)
- Flowlines
- Flowline Termination Assemblies (FTAs)
- Jumpers
- Static Umbilicals
- Umbilical End Terminations (UETs)
- Fly-to-Place connectors (FTPs)
- Controls Distribution Assemblies (CDAs)
- Manifolds
- Pipeline End Manifold (PLEM)
- Other Structures (redundant structures – PWRI pumping skids, Anode skids)
- Pipeline protection and stabilisation (Grout bags and mattresses)

Background

Most of the development work for Schiehallion & Loyal Fields Phase 1 Decommissioning Programmes completed to date has been carried out under the Quad 204 Project (FPSO Replacement) and the associated Schiehallion & Loyal Fields Suspension Project.

Both of these projects have carried out an option selection process and have determined the strategy for the various existing elements of Schiehallion and Loyal infrastructure and decided whether existing facilities are to be;

- Suspended short term and returned to service for Quad 204 duty;
- Suspended Long term, cleaned, preserved, left insitu and monitored until final decommissioning at Quad 204 end of field life (EoFL);
- Decommissioned and recovered during Schiehallion and Loyal Phase 1 Decommissioning programmes.

The CA has been completed on these options, but has also reviewed an additional option of;

- Insitu decommissioning of equipment on the seabed during Schiehallion and Loyal Phase 1 Decommissioning programmes.

Boundaries, Qualifications and Exclusions

The boundaries of this CA include all subsea infrastructures from the point where the risers disconnect from the FPSO to the final connections on the subsea trees at each of the drill centres.

Facilities that are to be suspended and not brought back into service as part of Quad 204 project therefore remain redundant and facilities that are to be decommissioned as part of Schiehallion & Loyal Fields Phase 1 Decommissioning Programmes have been considered in this CA.

Where a Quad 204 Project decision has already been reached to retain and re-use existing equipment for future Quad 204 Project duty, this decision has been accepted by the CA process. The CA has not attempted to judge the efficacy of the decision to re-use nor to assess the fitness for purpose of the facilities being retained for its new duty.

The CA process has not attempted to predict recoverability of the facilities to be re-used for Quad 204 duty at EoFL. This will be assessed at a future date as part of the Quad 204 EoFL Decommissioning Programme(s) development and its specific CA process.

The Schiehallion & Loyal Fields Phase 1 Decommissioning Programmes cover Schiehallion & Loyal Field Suspension activity from existing FPSO sail-away and until the new FPSO comes on station. Any subsea infrastructure decommissioning activity anticipated to be out with this period has not been considered in the CA.

FPSO modifications and the preparation of the FPSO for disconnect (flushing and purging and safe isolations of systems), the subsequent disconnection, FPSO towing and yard activities have not been assessed as part of the CA.

The FPSO mooring systems are considered as part of the FPSO installation and therefore decommissioning plans for this equipment have not been assessed as part of the CA.

The field preparation strategy and wells shut-in i.e. preparation of the Schiehallion and Loyal reservoir for future Quad 204 start-up e.g. continued WI for a period after Cessation of Production (COP) and wells isolation strategy will also not be considered during this CA.

Comparative Assessment

A CA Workshop was held on 11 December 2012 at which the options for treatment of the pipelines and their associated equipment were assessed against technical risk, safety, environmental, societal and economic criteria.

The Workshop participants have were drawn from the engineers and other specialists working on the Quad 204 and Schiehallion Field Suspension projects. GENESIS has introduced independent expert (IE) engineers from Subsea, Technical Safety and Risk, Environmental and Facilities.

During the Workshop options were grouped by subsea system and sub grouped by type of structure and then assessed by a qualitative traffic light approach, recognising that the overall project objective is redevelopment of the fields.

Results

Summary tables of the comparative assessment results by system are provided in Section 4.0

Generally the CA has concluded that re-use of existing infrastructure for Quad 204 duty where technically feasible is the best option. This is the case for the majority of infrastructure and is already the strategy being adopted by the Quad 204 project.

Where existing infrastructure is either not compatible with the Quad 204 duty or where there are concerns over integrity of the equipment for continued long term operation the CA has concluded that to suspend long term and preserve to Quad 204 EoFL is the best option. Suspend long term is favoured over the other remaining options during Phase 1 decommissioning due to potential technical and safety risks imposed on adjacent infrastructure planned to be re-used. i.e. potential damage when working close to or over retained equipment. There are also potentially large environmental impacts, if adjacent live infrastructure (wells) was damaged during execution activities.
By suspending and preserving the redundant equipment, the options to both decommission insitu or recover and recycle remain available at Quad 204 EoFL.
Examples where long term suspension are recommended is the oil production rigid flowlines, static umbilicals and some larger structures.

There are some instances where equipment is to be replaced as part of the Quad 204 project and where the redundant equipment location will impede installation of the replacement equipment. In such cases recovery and recycle of the redundant equipment is the only technically feasible option to clear the area for the new equipment. Examples where recovery and recycle are the only technically feasible option are the risers and associated riser end termination assemblies (RETs) and the dynamic umbilicals and associated dynamic umbilical termination assembly (DUTA). Risks in recovery of these items during Phase 1 decommissioning is less than other infrastructure as they are located local to the FPSO site and away from the drill centres and live equipment.

The CA concluded that decommissioning insitu during Phase 1 decommissioning was not a favoured option for any of the redundant equipment as it was either

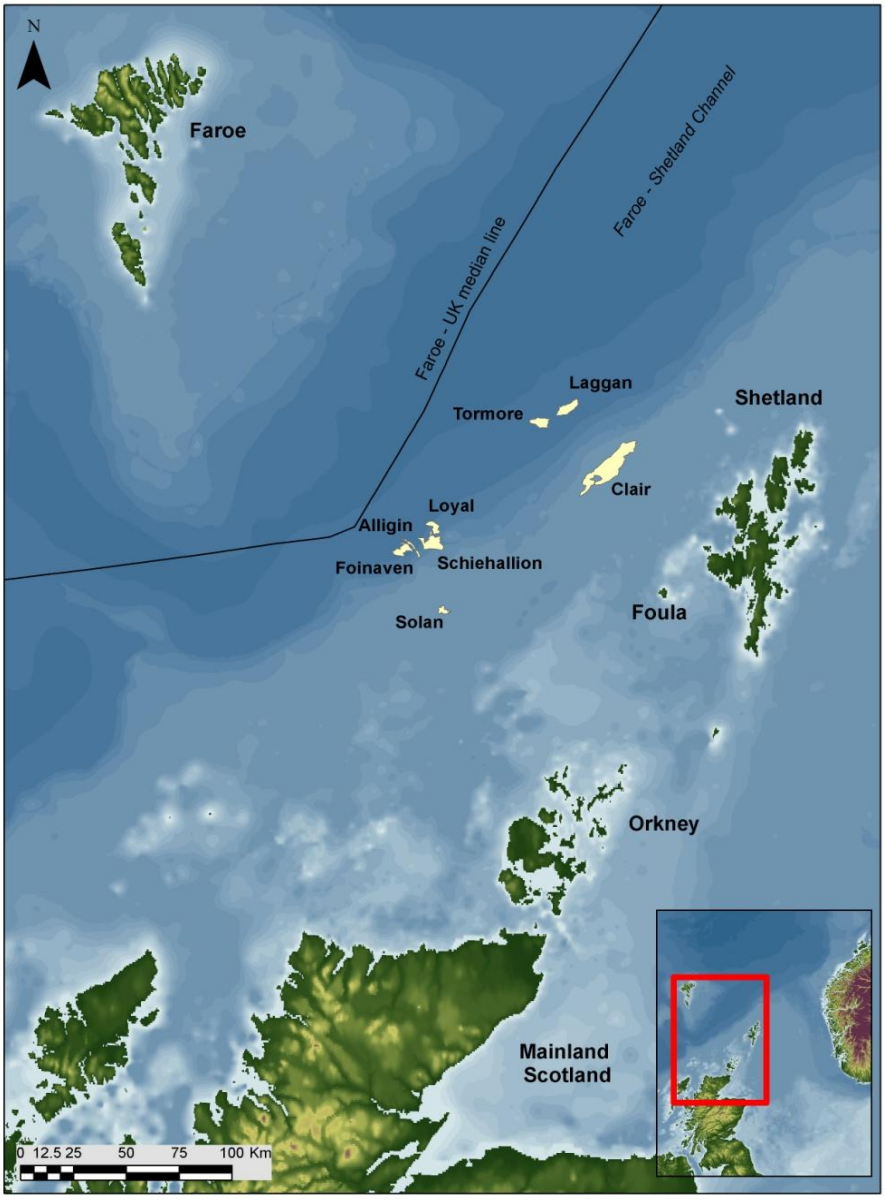
- not technically feasible
- created higher technical and safety risk to adjacent live infrastructure
- removed contingency for future use of the equipment
- removed future decommissioning options at Quad 204 EoFL

1.0 INTRODUCTION

GENESIS was commissioned by BP plc (BP) to facilitate and provide Independent Expert (IE) participation in a CA Workshop to review the options considered for Schiehallion & Loyal Fields Phase 1 Decommissioning Project.

Schiehallion & Loyal fields lie approximately 150 km west of Shetland Islands in Quadrant 204 and 205 of the UKCS.

Figure1.1 Location of Schiehallion and Loyal Fields



The Schiehallion area development lies in a water depth ranging from about 350m to 500m and comprises the following drill centres;

- Central - Production & WI wells;
- West - Production & WI wells;
- North West Area Development(NWAD) - Production & WI wells;
- Loyal - Production & WI wells;

- North – WI well only.
- At the An' Teallach gas disposal structure (near to the west drill centre)

In total there are currently 53 active wells (52 trees) in the field; 26 production wells (25 trees) and 27 water injection. All wells will be shut-in during Field Suspension. All trees are to be retained and re-used at re-commissioning of the new FPSO.

There is also 1 gas disposal well which is currently suspended.

The wells are located at the five drill centres as shown in Table 1-1.

Table 1-1 Existing Production and Water Injection Wells by Drill Centre

Drill centre	No. of production wells	No. of water injection wells
Central	14	9
West	6	9
North West	1 (ML)*	2
North	0	3
Loyal	4	4
*Multi-lateral; 2 wells originating from a single multi-lateral well.		

The Schiehallion Field is scheduled to be further developed and thereafter known as Quad 204. An additional 25 wells are planned (Production and WI) located in the existing drill centres, with five (5) additional/ new flowlines and ten (10) replacement flowlines scheduled to be installed in 2014.

The existing FPSO is scheduled to be removed and towed away in 2013 and replaced in 2015 by a newly built and upgraded FPSO. The new FPSO shall utilise the existing subsea infrastructure when practicably possible.

Figure 1.2 below, shows the existing field layout.

The main items of the existing subsea infrastructure connecting the drill centres to the FPSO is summarised in Table 1.2.

Table 1-2 Existing Flowlines, Umbilicals, Risers, Manifolds and Jumpers

Infrastructure	Quantity
Production flowlines	10
Water injection flowlines	6
Gas lift flowlines	4
Gas import/export flowlines	3
Gas disposal flowline (currently unused)	1
Dynamic umbilicals	3
Static umbilicals	10
Risers	15
Manifolds	23
Flowline Jumpers	100*
*31 of the 100 jumpers are a bundle of 3 jumpers (2 production and 1 gas)	

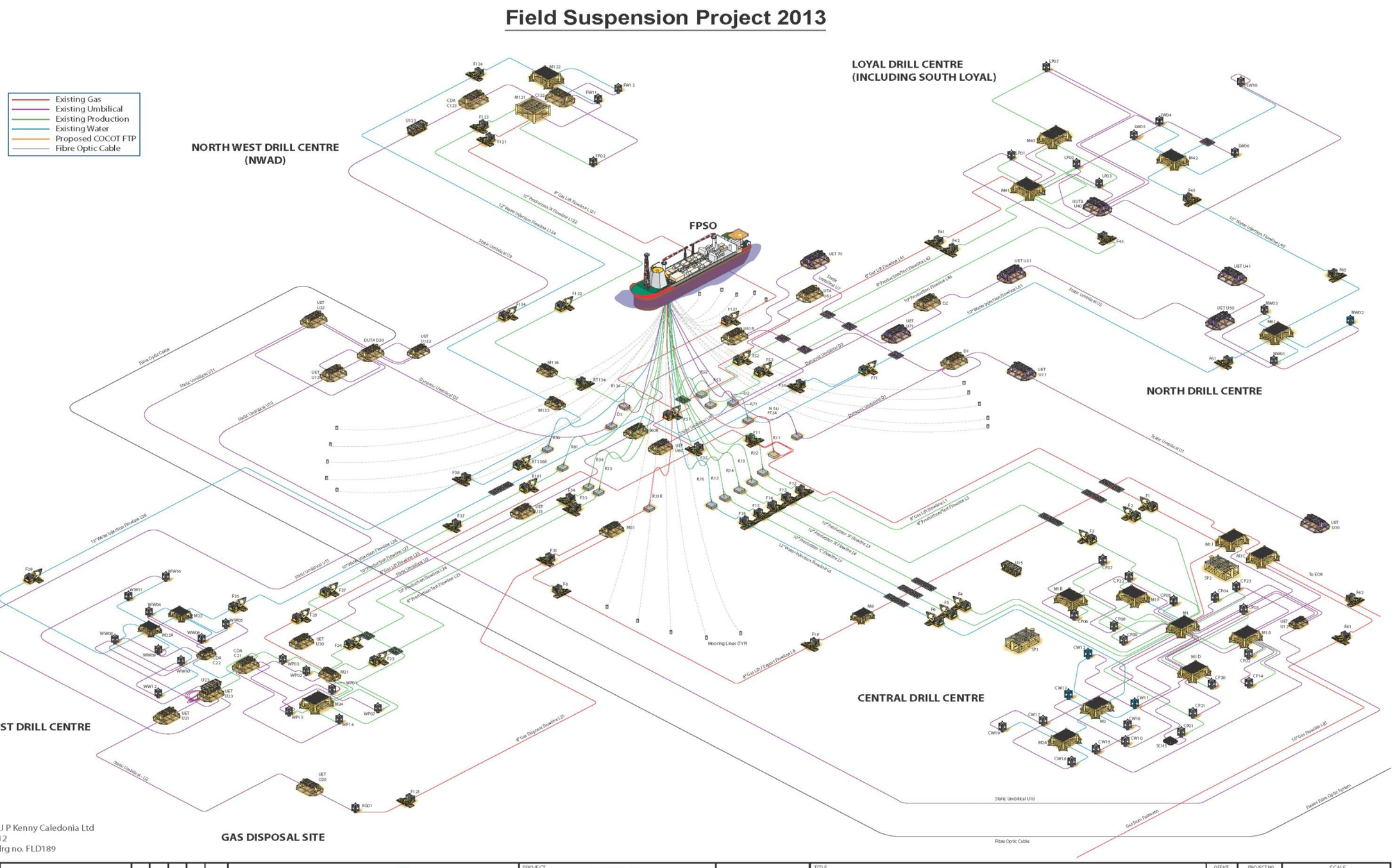
Additional structures include Dynamic Umbilical Termination Assemblies (DUTAs); Fly-to-Place connectors (FTPs), Controls Distribution Assemblies (CDAs), Umbilical End Terminations (UETs), Riser End Terminations (RETs), Flowline Termination Assemblies (FTAs) and a Pipeline End Manifold (PLEM)

Before the existing FPSO is disconnected to be towed away, the field will be fully suspended with the aim of maintaining the existing subsea infrastructure in a preserved and safe condition, this is known as the Field Suspension phase.

The plans for the subsea infrastructure during Field Suspension vary:

- Some facilities will be suspended and preserved short term and then returned to service at the same location when the new FPSO is on station e.g. all gas lift and water injection flowlines and the majority of the flowline jumpers;
- Some facilities will be relocated before being returned to service when the new FPSO is on station e.g. predominantly the FTPs fall into this category;
- Some facilities will be isolated, flushed, cleaned, capped and dosed with preservation fluid, but will be left suspended long term on the seabed - until Quad 204 End of Field Life (EoFL) circa 2035 e.g. the production flowlines and associated FTAs and the static umbilicals;
- Some facilities will be recovered as part of the Field Suspension Project e.g. the risers and some of the flowline jumpers;
- Some facilities will be removed over a number of years as part of the Field Installation Project. However this CA has not assessed any future removals that may occur out with the period of Phase 1 decommissioning.

Figure 1.2 Schematic of Existing Schiehallion and Loyal Field layout – By System



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A1	23/04/2012	Issued for COMPANY Review	AW	TH	JS	SG	

jp kenny

PROJECT	QUAD 204
CLIENT	BP Exploration Operating Company Ltd

Quad 204

TITLE	Field Suspension Project 2013	OFFICE 06 / PROJECT NO 2960.06 / SCALE N/A	DRAWING NUMBER QD-JP-PL-GAS-0046-01 / REV. A2

2.0 BACKGROUND

This section identifies and quantifies the different subsea facilities covered by this CA and expands upon which options have already been proposed by the Field Suspension Project.

2.1 General Infrastructure Description

An itemised list of subsea components together with the Quad 204 project proposals for each component is provided in **Appendix B** of this report.

This list is grouped first by System:

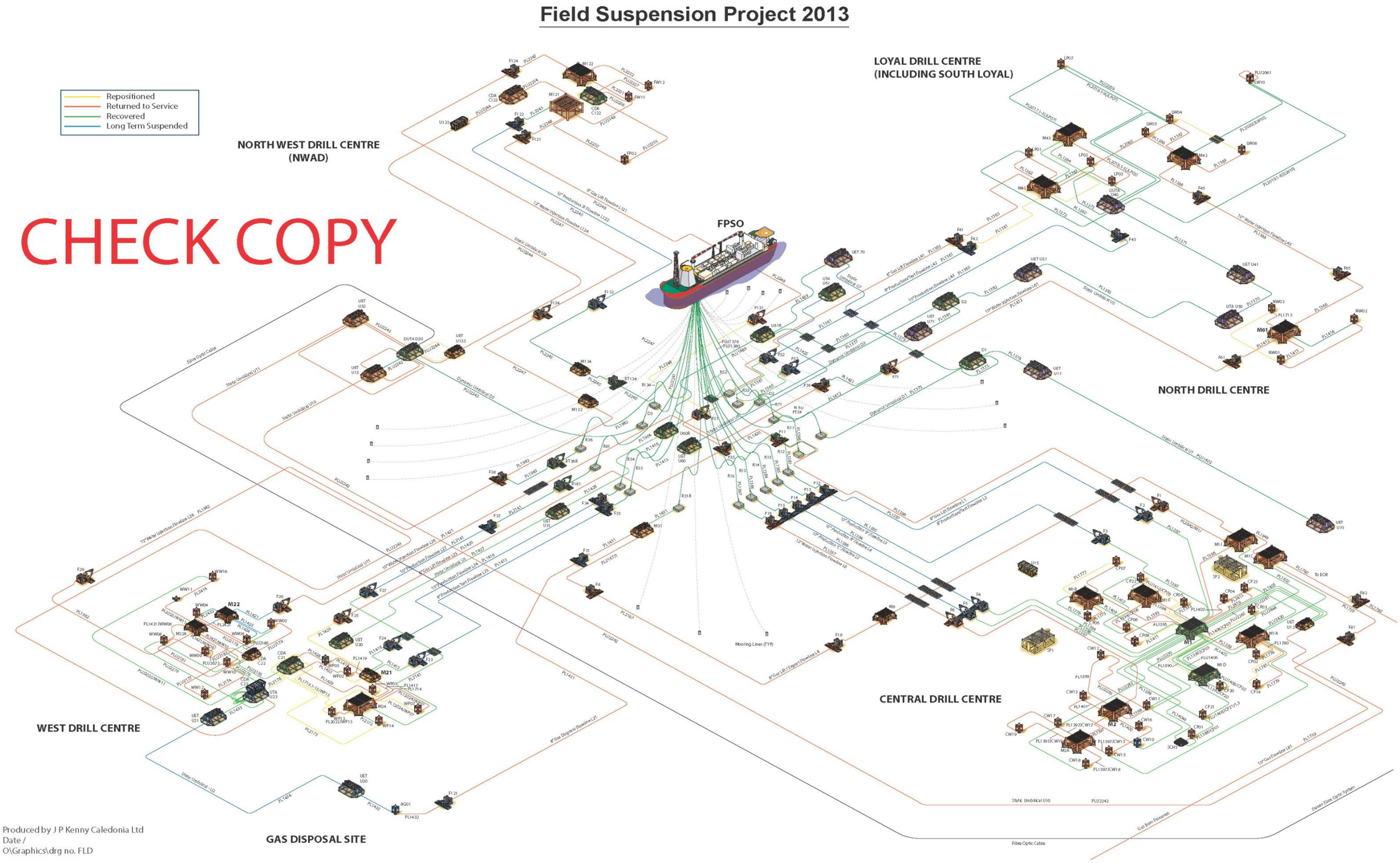
- Oil Production;
- Gas Systems;
- Water Injection;
- Controls;
- Other Structures

The list is then grouped by structure type

- Risers
- Riser End Terminations (RETs)
- Dynamic Umbilicals
- Dynamic Umbilical Termination Assembles (DUTAs)
- Flowlines
- Flowline Termination Assemblies (FTAs)
- Jumpers
- Static Umbilicals
- Umbilical End Terminations (UETs)
- Fly-to-Place connectors (FTPs)
- Controls Distribution Assemblies (CDAs)
- Manifolds
- Other Structures and associated apparatus

Figure 2.1 is a schematic of the existing infrastructure colour coded by current project fate for each structure.

Figure 2.1 Schematic of Existing Schiehallion and Loyal Field layout – By Fate



2.1.1 Flowlines

In total there are 22 rigid flowlines at Schiehallion. Table 1.3 describes the flowline configuration by drill centre and provides overall length of the flowlines.

Table 2-1 Existing Flowlines by Drill Centre

Drill Centre	Production	Water Injection	Gas System
Central (overall length)	4	1	2
	(10,213 m)	(2,548 m)	(2,872 m)
West (overall length)	3	2	1
	(8,196 m)	(6,347 m)	(3,270 m)
NWAD (overall length)	1	1	1
	(2,280 m)	(3,141 m)	(3,041 m)
North (overall length)	0	1	0
	n/a	(2,271 m)	n/a
Loyal (overall length)	2	1	1
	(11,550 m)	(4, 883 m)	(5,979 m)

There is also one (1) Gas disposal flowline which is 6613 m long to the An' Teallach gas disposal structure; near to the west drill centre this flowline is already suspended.

The Quad 204 project has decided to re-use the 6 existing Water Injection flowlines and the 7 existing Gas flowlines (4 Gas lift and 3 gas import/ export) for Quad 204 duty, but have integrity concerns with the 10 oil production flowlines.

These flowlines when installed had a design life of 20 years. The majority of the flowlines started operation in July 1998 giving a target life to 2018. The most recent flowlines at the West development and NWAD started operation in 2005 and 2006 giving a target life of 2025/2026. Inspection records from similar flowlines with similar duty have revealed earlier than anticipated deterioration due to corrosion.
The Quad 204 project has therefore decided to replace all 10 oil production flowlines.

2.1.2 Flowline Jumpers

In total there are 162 flowline jumpers across the field

- 39 WI jumpers
- 46 Gas jumpers
- 1 Gas disposal jumper (currently suspended)
- 76 Oil production jumpers

Whilst all 39 water injection jumpers are dedicated / single jumpers, this is not the case for all of the production and gas lift jumpers. A large proportion of these have been installed as jumper bundles (separate lines loosely bundled and tied together). These bundles are configured with two 6" production lines and one 2" gas lift line in each bundle. There are 31 bundled jumpers in the field accounting for 62 production jumpers and 31 gas jumpers.

There are a further 14 single production jumpers and 15 single gas lift jumpers and one single gas disposal jumper. The gas disposal jumper is currently in a suspended state.

Table 1.4 describes the flowline jumpers' configuration by drill centre and provides overall length of the jumpers.

Table 2-2 Existing Flowline Jumpers by Drill Centre and Service

Drill Centre	Production		Gas Lift		Water Injection Single
	Single	Within bundle	Single	Within bundle	
Central	4	36	7	18	10
	(337 m)	(1,544 m)	(814 m)	(777 m)	(408 m)
West	5	14	0	7	14
	(832 m)	(534 m)	n/a	(267 m)	(869 m)
North West	3	2	2	1	4
	(217 m)	(228 m)	(344 m)	(114 m)	(388 m)
North	0	0	0	0	6
	n/a	n/a	n/a	n/a	(278 m)
Loyal	2	10	2	5	5
	(99 m)	(446 m)	(201 m)	(223 m)	(250 m)

Quad 204 project have decided to re-use 36 of the 39 WI jumpers for Quad 204 duty, but 3 jumpers are to be replaced as they are not the correct length for the revised field configuration.

Quad 204 project have decided to re-use all 15 single gas jumpers, but 6 jumpers that are bundled with production jumpers are to be replaced as they are not the correct length for the revised field configuration.

It is intended to retain the 1 gas disposal jumper in a suspended state longer term as a contingency in case a gas disposal route is required in the future.

Twelve (12) of the 14 single oil production jumpers are not the correct length for the revised field configuration and are to be replaced. Quad 204 have decided to use 25 of the 31 existing bundled jumpers; however 6 are to be replaced as they are not the correct length for the revised field configuration.

2.1.3 Risers and Dynamic umbilicals

There are a total of 15 risers (10 Production, 3 Water Injection & 2 Gas) and 3 dynamic umbilicals in the field.

There were 4 criteria assessed by the Quad 204 project to determine potential for re-use of the existing risers;

- Existing riser integrity;
- Existing riser compatibility with new FPSO Turret requirements, practicality of modification to riser to suit new arrangement;
- Practicalities of riser storage (wet or dry);
- Optimisation of abandonment schedule, dependent on disconnection methods and storage option selected;

The conclusion at the Define Stage of the Quad 204 project was that all 15 existing risers will be replaced with new risers. At least 6 of the existing redundant risers will be assessed for potential re-use as spares once back onshore. The remaining risers will be managed under BP's Waste Management Plan and Waste Hierarchy QD-BP-EV-PLN-002.

Two out of the three existing dynamic umbilicals currently have significant faults and would be due for replacement under the current operating regime if the FPSO was not planned to go off station in the near future. The ability to seal and repack the 3rd umbilical (SECU D3) against water ingress if wet stored on the seabed for future re-use was identified as a major technical risk and subsequent uncertainty of failure of the umbilical due to water ingress

manifesting itself only on Quad 204 start-up would have major commercial implications, by delaying start-up. Recovery of the 3rd umbilical for dry storage and re-use has also been considered. However due to existing issues with the methanol core within the existing umbilical Quad 204 project has decided to replace the umbilical with a new umbilical. The existing SECU D3 umbilical will be retained onshore as an emergency spare.

A total of 15 risers and 3 dynamic umbilicals are to be replaced. (Table 1-5).

Table 2-3 Existing Risers and dynamic umbilicals to be recovered

Line type	Number	Minimum length (m)	Maximum length (m)	Total length (m)
Production riser	10	705	777	7,408
Water injection riser	3	697	777	2,199
Gas lift riser	1	749	749	749
Gas import / export riser	1	721	721	721
Dynamic umbilical (includes 1 suspended)	3	725	1,924	3,389

The risers and umbilicals are fixed to the seabed at two points. Two clamps are located along each riser / dynamic umbilical – an upper tether clamp (UTC) and a lower tether clamp (LTC).

The UTC is fixed to a swivel mechanism which allows for movement of the riser / dynamic umbilical. The UTC swivel mechanism is attached to the seabed by piles.

The LTC is positioned on the risers / dynamic umbilicals just before they connect to the flowlines / static umbilicals and serve to reduce the load where the dynamic structures connect to the static lines. The LTC is attached to the seabed via a suction anchor.

When recovering the risers / dynamic umbilicals the ends that were originally attached to the FPSO - will be winched onboard the vessel and the remainder will be gathered in by reeling the lines back on to a carousel. In order to carry this out the UTC will be attached to the seabed with a temporary clump weight.

Then the UTC is subsequently disconnected from the piled swivel mechanism. The LTC will be disconnected from the suction anchor allowing the risers/ dynamic umbilicals to be reeled in. The temporary clump weight attached to the UTC will remain attached to the risers / umbilicals as they are being reeled in.

None of the suction anchors or piles currently serving to anchor the risers / dynamic umbilicals is to be reused for Quad 204 duty. It is therefore proposed to recover the swivel mechanisms and suction anchors.

Two options were considered for decommissioning the piles associated with the UTC swivel mechanism:

- Option 1 - The piles will be driven about a metre below the surface of the seabed
- Option 2 - The piles will be cut about a metre below the seabed and the upper part will be recovered. This option will involve removing the seabed substrate around the top of the pile either by flushing or dredging.

Option 1 is currently the preferred project option.

Following recovery, the fate of the risers, dynamic umbilicals and anchoring structures will be managed under BPs Waste Management Plan and Waste Hierarchy QD-BP-EV-PLN-002.

2.1.4 Fibre Optic Cable

There is an existing fibre optic cable that connects the FPSO to the Faroes Fibre Optic System via dynamic umbilical W-2U. This cable will be re-used to connect the new FPSO via a new dynamic umbilical. The cable will be disconnected at the FPSO coiled and stored in a basket on the seabed for reconnection to the Quad 204 FPSO when it comes on station. This item has not been part of the CA.

3.0 COMPARATIVE ASSESSMENT METHODOLOGY

GENESIS were engaged to facilitate and provide Independent Expert (IE) participation in a CA Workshop to review the options considered for Schiehallion & Loyal Fields Phase 1 Decommissioning Project - specifically for the subsea infrastructure described in Section 2.0.

The methodology for the CA is based on the DECC Guidance Notes on Decommissioning of Offshore Oil and Gas Installations and Pipelines under the Petroleum Act 1998 (DECC, 2011). These Guidance Notes describe the assessment required for Annex 2 OSPAR derogation candidates. Annex 2 is not directly applicable to the decommissioning of pipelines; however, these requirements have been adapted as a result of DECC's Guidance Notes stating that Decommissioning Programmes for pipelines should also include a CA.

A CA Workshop was therefore convened on 11th December 2012.

The Workshop participants have been drawn from the engineers and other specialists working on the Quad 204 and Schiehallion Field Suspension projects. GENESIS has introduced IE engineers from Subsea, Technical Safety and Risk, Environmental and Facilities. The participants at the Workshop are listed in Table 3-1 below

Table 3.1 Team Composition

Name	Designation	Project or Independent
John Wilson	GENESIS Facilities IE / Workshop Chairman	Independent
Martha O'Sullivan	GENESIS Environmental IE / Scribe	Independent
Jim Blacklaws	BP SPM Decommissioning Team	Project
Douglas Johnston	BP Decommissioning - Subsea Engineer	Project
Calum Myles (Part – Time)	BP Subsea System Lead Engineer	Project
Dave Mayers	BP Quad 204 Subsea Installation Engineer	Project
Lindsay Baxter	BP Pipelines Installation and Equipment Disposal Engineer	Project
Gemma Lang	GENESIS Subsea IE	Independent
Ged Adams	BP HSSE Lead	Project
Mark Haines	BP Field Suspension HSSE Lead	Project
Susan Stephens	GENESIS Tech Safety and Risk IE	Independent
Tim Hollis	BP Environmental Lead	Project
Andrew Foster	BP Quad 204 Environmental Lead	Project
Sean Hayes	GENESIS Environmental Engineer	Project
Keith Mayo	BP Decommissioning Programmes Author	Project

The assessment criteria adopted at the Workshop was to review each system and structure type within the system against four decommissioning options:

- Structures being re-used for Quad 204 duty;
- Structures being Suspended Long Term & preserved on the seabed until Quad 204 EoFL;
- Structures being decommissioned insitu as part of Phase 1 Decommissioning;
- Structures being recovered & recycled as part of Phase 1 Decommissioning;

Each option and structure was subsequently assessed against the following criteria:

- Technical Risk;
- Safety Risk;
- Environmental Impact;
- Societal Impact;
- Economic Risk;

3.1 Assessment Criteria

The assessment criteria and aspects selected for the CA(Table 3.2) were adapted from the suggested matrix in the DECC guidance notes.

Table 3.2 Assessment criteria and aspects for options assessment

Assessment criteria	Aspect
Technical	Risk of major project failure
	Technical complexity and challenges
Safety	Risk to personnel undertaking the decommissioning
	Risk to other users of the sea (e.g. fishing vessels)
	Risk to those on land undertaking the decommissioning
	High consequence events
Environmental	Atmospheric emissions
	Discharges to sea
	Waste management
	Resource consumption/ Recycle Value
	Disturbance to seabed / land
	Accidental spills
	Noise underwater and onshore
Societal	Fisheries impact (long term)
	Community disturbance
	Local employment
	Stakeholder Reaction
Economic	Cost
	Uncertainties

3.2 Comparative Impact

Each of the options was assessed against the assessment criteria/ aspects, with the comparative magnitude for each obtained using the screening criteria shown in Table 3.3

Table 3.3 Comparative impact

Performance	Comparative impact
Best Option	Lowest impact
	Moderate impact
Worst Option	Highest impact

It is important to highlight that the assessment is comparative and that options assed as “high” does not denote high risk or high impact. It merely identified the options being the highest from those available for assessment.

Some infrastructure could not be comparatively assessed across all decommissioning options due to

- There being only one technically feasible option, or;
- Specific options not being applicable

Summary tables in Section 4.0 identify where options could not be assessed.

4.0 COMPARATIVE ASSESSMENT CONCLUSIONS

The following is a summary of the CA conclusions by system and by structure type

4.1 Oil Production System

An overview is provided in sections 4.1.1 to 4.1.4 below. However the summary Table 4-1 in section 4.1.5 provides more information.
Appendix A also provides tabulated outcome from the CA Workshop by criteria.

A list of all existing structures associated with the Oil Production System in the field is included in **Appendix B**

4.1.1 Oil Production Flowlines & FTAs

The flowlines & FTAs cannot be re-used for Quad 204 duty due to long term integrity concerns the re-use option was deemed not applicable to the CA, the options that were assessed were; suspend long term; decommission insitu or recover for recycle.
The conclusion of the CA was that to suspend long term for decommissioning at end of Quad 204 EoFL was the best option for all criteria.

4.1.2 Oil Production Manifold M1D

Re-use is identified as the best option for the manifolds across all assessment criteria. Ten (10) out of the eleven (11) manifolds in the field are to be re-used for Quad 204 duty, only one manifold, M1D near to the Central Drill centre, is currently not identified for re-use.
The size of MID manifold means that it cannot be decommissioned insitu, so this option was deemed not applicable during the CA Workshop.
The options that were assessed were; re-use for Quad 204; suspend long term; recover and re-cycle.
Due to the size, weight and location of the manifold, adjacent to live systems, recovery and recycle was identified as the worst case option for all criteria.
Both re-use and long term suspension options were identified as of equally low risk options, across all criteria.

4.1.3 Oil Production Risers & RETs

Since the risers have already been identified as having current integrity problems and the project decision has been made to replace the re-use option was deemed not applicable. The location of the existing risers and RETs will clash with and impede the installation of the new risers, therefore the options associated with long term suspension and decommission in situ were deemed as not applicable for these structures.
Recovery and recycle is identified as the only technically feasible option for decommissioning of these structures and therefore other options were not comparatively assessed. Observations were made and recorded on the risks involved, with recovery and recycle, for the other criteria and are recorded in the summary Table 4-1 for information.

4.1.4 Production Jumpers

Re-use is identified as the best option for the production jumpers across all assessment criteria. Fifty-eight (58) out of the seventy-six (76) production jumpers in the field are to be re-used for Quad 204 duty, leaving only eighteen (18) jumpers that cannot be re-used as they are not the correct length for the revised field configuration. Where jumpers cannot be re-used, they will be replaced by new longer jumpers

The location of the existing redundant jumpers will clash with and impede the installation of the new jumpers, therefore the options associated with long term suspension and decommission in situ were deemed as not applicable for these structures.
Recovery & recycle is identified as the only technically feasible option for decommissioning of these structures that must be replaced and they were not comparatively assessed. Observations were made and recorded on the risks involved for the other criteria and are recorded in the summary Table 4-1 for information.

4.1.5 Summary Table of Comparative Assessment Workshop Outputs – Oil Production System

Key to colours used:

Only technically feasible option	Option NOT APPLICABLE - Cannot be included in Comparative Assessment	Low risk - Better Option	Moderate Risk	High Risk - Worst Option

Table 4-1 Summary of Oil Production System Comparative Assessment

STRUCTURE	CRITERIA	RE-USE AT QUAD204 START-UP	SUSPEND LONG TERM	DECOMMISSION INSITU	RECOVER AND RECYCLE
Flowlines and Flowline Termination Assemblies	TECHNICAL	**Not applicable -** Predicted life of existing flowlines is less than Quad204 requirement (long term integrity). Replace now rather than in future.	Ongoing monitoring only, routine operations.	Would require removal of FTAs and Trenching Flowlines. High - Technical Risk in deep water	High risk - would involve cutting flowlines using heavy shears in deep water
	SAFETY	Not applicable due to technical constraints - option not comparatively assessed	No intervention required, nothing returned to shore. Ongoing monitoring only, routine operations.	More work involved if intervention required (ploughing, trenching, disconnections). Moderate if trenched Low if not. (FTAs would be recovered if flowlines trenched).	High risk due to short term project intervention, though no long term monitoring/intervention required.
	ENVIRONMENTAL	Not applicable due to technical constraints - option not comparatively assessed	Small incremental increase in emissions associated with a monitoring vessel. No incremental increase of discharges to sea, Not losing resources and no additional resources being consumed. No significant seabed disturbance. No activity likely to lead to spills. No activity leading to noise above existing baseline	Depending on type of interventions required, potentially multiple vessels used with associated emissions. Contents of lines are released to sea over time. FTAs would be recovered recycled. Materials left offshore would be lost resource. Increased corridor of seabed disturbance if trenching required. Some noise associated with the cutting of the FTAs	Anticipate more than a season to carry out recovery operations. Contents of lines may be released to sea during recovery. Potential for film of oily waste inside lines being recovered to shore. Increased corridor of seabed disturbance anticipated during recovery. Large number of structures to be recovered. Increased risk of loss of well containment from dropped objects during recovery operations. Risk will reduce at Quad204 EoFL due to wells being abandoned
	SOCIETAL	Not applicable due to technical constraints - option not comparatively assessed	Increase infrastructure on seabed, but in existing corridors. No incremental increase in waste coming onshore. Minimal reaction from stakeholders anticipated.	Potentially trench and bury however would not change from current operations and surrounding infrastructure. FTAs would be removed. Potential for negative stakeholder reaction.	No impacts as lines occur in existing corridors. Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site. Minimal reaction from stakeholders anticipated. Possibility of some additional work created offshore and onshore.
	ECONOMIC	Not applicable due to technical constraints - option not comparatively assessed	Low relative cost	Moderate relative cost	High relative cost

STRUCTURE	CRITERIA	RE-USE AT QUAD204 START-UP	SUSPEND LONG TERM	DECOMMISSION INSITU	RECOVER AND RECYCLE
Manifold M1D	TECHNICAL	Assuming compatibility for new Quad 204 duty, ROV intervention would be required to replumb the manifold.	No intervention Ongoing monitoring required but routine operations.	**Not Applicable** - Manifold structure not permitted to be left insitu	Removes opportunity for future use Access difficulty to lift due to proximity of Quad204 infrastructure
	SAFETY	ROV intervention would be required to replumb manifold, no material handling on deck. No heavy lifts required, nothing returned to shore. No change to current operations. Within 500 m safety zone	ROV intervention would be required to replumb manifold, no material handling on deck. No heavy lifts required, nothing returned to shore. No change to current operations. Within 500 m safety zone	Not applicable due to technical constraints - option not comparatively assessed	Heavy lift- 70 Te manifold potential dropped object/ risk to wells. Risk will reduce at Quad204 EoFL due to adjacent wells being abandoned.
	ENVIRONMENTAL	No significant additional emissions or discharges to sea. No additional resource being used as items will be reused No significant seabed disturbance. No activity likely to lead to spills. No activity leading to noise above existing baseline	Small incremental increase in emissions associated with a monitoring vessel. No incremental increase of discharges to sea, Not losing resources and no additional being consumed. No significant seabed disturbance. No activity likely to lead to spills. No activity leading to noise above existing baseline	**Not Applicable -** due to technical constraints - option not comparatively assessed	Contents of manifold may be released to sea during recovery. Potential for film of oily waste inside being recovered to shore. Increased corridor of seabed disturbance anticipated during recovery. Increased risk of loss of well containment from dropped objects during recovery.
	SOCIETAL	No change to current operations	Increase infrastructure on seabed, but in existing corridors. No incremental increase in waste coming onshore. Potential for some negative stakeholder reaction to long term in field suspension	**Not Applicable -** due to technical constraints - option not comparatively assessed	Potential for chemicals waste inside pipework being recovered to shore. Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site.
	ECONOMIC	Low relative cost	Moderate relative cost	**Not applicable** due to technical constraints - option not comparatively assessed	High relative cost

Table 4-2 Summary of Oil Production System Comparative Assessment (continued)

STRUCTURE	CRITERIA	RE-USE AT QUAD204 START-UP	SUSPEND LONG TERM	DECOMMISSION INSITU	RECOVER AND RECYCLE
Risers and Riser End Terminations	TECHNICAL	**Not applicable -** Current Integrity issues means replacement will be required	**Not applicable -** location will clash and impede installation of new risers/RET's	**Not applicable -** location will clash and impede installation of new risers/RET's	**Only technically feasible option.**
	SAFETY	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	High risk to personnel due long risers and attachments to be handles on deck Moderate risk on land in relative low numbers of risers to be recovered.
	ENVIRONMENTAL	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	Some vessel activity involved in their removal and shipping to shore. Contents of risers may be released to sea during recovery operation, will have been flushed and pigged, but likely to be some oily residue back loaded to shore. Increased noise level If piling is used when decommissioning tether anchors.
	SOCIETAL	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	No impacts on fishermen as lines occur in existing corridors / safety zone. Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site. Possibility of some additional work created offshore and onshore. Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.
	ECONOMIC	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	High relative cost

STRUCTURE	CRITERIA	RE-USE AT QUAD204 START-UP	SUSPEND LONG TERM	DECOMMISSION INSITU	RECOVER AND RECYCLE
Production Jumpers	TECHNICAL	Some can be reused as are of sufficient length for new infrastructure. Others not fully compatible with new duty due to length.	**Not applicable** - Where replacements are necessary, location will clash and impede replacement jumpers installation	**Not applicable** - Where replacements are necessary, location will clash and impede replacement jumpers installation	Optimal technical option for those that cannot be reused.
	SAFETY	Multiple ROV interventions given that some system sections will be suspended. No change to current operations.	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	High risk to deck crew due to High number of jumpers to be recovered. However low consequence of dropped objects damage due to size and weight of jumpers
	ENVIRONMENTAL	No significant additional emissions or discharges to sea. No additional resource being used as items will be reused. No significant seabed disturbance. No activity likely to lead to spills. No activity leading to noise above existing baseline.	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	Contents of jumpers may be released to sea during recovery. Potential for film of oily waste inside being recovered to shore. Increased corridor of seabed disturbance anticipated during recovery.
	SOCIETAL	No change to current operations.	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	No impacts on fishermen as lines occur in existing corridors / safety zone. Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site. Possibility of some additional work created offshore and onshore. Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.
	ECONOMIC	Low relative cost	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	High relative cost

4.2 Controls System

An overview is provided in sections 4.2.1 to 4.2.4 below. However summary Table 4-2 in section 4.2.5 provides more information.
Appendix A also provides tabulated outcome from the CA Workshop by criteria.

A list of all existing structures associated with the Control System in the field is included in **Appendix B**

4.2.1 Control Distribution Assemblies (CDAs)

Re-use is identified as the best option for the CDAs across all assessment criteria. Four (4) out of the eight (8) CDAs in the field are to be re-used for Quad 204 duty; the four (4) that cannot be re-used are not compatible with the new Quad 204 duty and must be replaced.
The location of the existing redundant CDAs will clash with and impede the installation of the new CDAs, therefore the options associated with long term suspension and decommission insitu were deemed as not applicable for these redundant structures.
Recovery & recycle is identified as the only technically feasible option for decommissioning of the CDAs that cannot be re-used and other options were not comparatively assessed. Observations were made on the risks involved for the other criteria on the recovery and recycle option, these are recorded and in summary Table 4-2 below for information.

4.2.2 Fly to Place Connecters (FTPs)

Re-use is identified as the best option for the FTPs across all assessment criteria where they are compatible with the new duty. However only forty-four (44) out of the ninety-four (94) FTPs in the field are to be re-used for Quad 204 duty, leaving fifty (50) FTPs that cannot be re-used as they are either not the correct length for the revised field configuration or do not have the required functionality for the Quad 204 duty. Where FTPs cannot be re-used, they will be replaced by new FTPs
Some redundant FTPs are known to be entangled with other FTPs or jumpers that are to be re-used for Quad 204 duty, in such instances the CA has identified that long term suspension is the best option for the redundant FTPs.
Overall the CA concluded that leaving redundant FTPs in long term suspension was the best option but recognises that the location of some existing redundant FTPs will clash with and impedes the installation of the new FTPs and in these instances recovery and recycle is identified as the best option.

4.2.3 Static Umbilicals & UETs

All Ten (10) static umbilicals and twenty (20) UETs are not compatible to perform the functions required for Quad 204 duty and a project decision has already been made to replace them. The option to re-use these structures has been deemed not applicable for the CA; the options that were assessed were; suspend long term; decommission insitu or recover for recycle.
The conclusion of the CA was that to suspend long term for decommissioning at Quad 204 EoFL was the best option for all criteria.

4.2.4 Dynamic Umbilicals & DUTAs

Since two out of the three existing dynamic umbilicals have existing functioning faults and the 3rd umbilical cannot be stored (wet or dry) without risking damage, the Quad 204 project have decided to replace all 3 dynamic umbilicals, the re-use option is deemed not applicable for these structures.
The location of the existing redundant dynamic umbilicals and DUTA will clash with and impede the installation of the new umbilicals, therefore the options associated with long term

suspension and decommission in situ were also deemed as not applicable for these structures.
Recovery & recycle is identified as the only technically feasible option for decommissioning of these structures, CA was therefore not carried out.

4.2.5 Summary Table of Comparative Assessment Workshop Outputs – Control System

Table 4-3 Summary of Control System Comparative Assessment

STRUCTURES	CRITERIA	RE-USE AT QUAD204 START-UP	SUSPEND LONG TERM	DECOMMISSION INSITU	RECOVER AND RECYCLE
Control Distribution Assemblies	TECHNICAL	4 CDAs are compatible and are being re-used for Quad 204. Remaining 4 CDAs are not compatible with new duty and must be replaced	Location will clash and impede installation of new CDA	Location will clash and impede installation of new CDA, Structures not permitted be left insitu	Inherent dropped object risk to adjacent Quad204 retained infrastructure during recovery
	SAFETY	No change to safety risk	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	Significant material handling on deck and potential for methanol in the pipework,
	ENVIRONMENTAL	No additional emissions, discharges, spills, seabed disturbance or increased noise levels anticipated.	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	Potential discharge to sea, chemicals in pipework to be dealt with onshore, increased seabed disturbance
	SOCIETAL	No change to current operations	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	Potential for chemicals waste inside pipework being recovered to shore. Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site.
	ECONOMIC	Low relative cost	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	Low - due small number and relatively small size of items to be recovered
Fly to Place Connectors	TECHNICAL	Some can be reused as are of sufficient length for new infrastructure. Others not fully compatible with new duty due to length and will be replaced	Small amount of FTPs not easily recovered due to entanglement with other equipment (jumpers) will be left long term suspended. Cannot be lifted up as recovery will damage adjacent infrastructure to be reused for Quad 204.	Location will clash and impede installation of new FTP	No technical difficulties anticipated for majority of FTPs
	SAFETY	No change to safety risk	No change to safety risk	**Not Applicable -** due to technical constraints - option not comparatively assessed	Cores may contain methanol and other chemicals. Increase handling risk on deck and onshore. Increased potential for dropped object in vicinity of drill centres
	ENVIRONMENTAL	No additional emissions, discharges, spills, seabed disturbance or increased noise levels anticipated.	No additional emissions, discharges, spills, seabed disturbance or increased noise levels anticipated.	**Not Applicable -** due to technical constraints - option not comparatively assessed	Potential discharge to sea, chemicals in cores to be dealt with onshore
	SOCIETAL	No change to current operations	Increase infrastructure on seabed, but in existing corridors. No incremental increase in waste coming onshore. Potential for some negative stakeholder reaction to long term in field suspension	**Not Applicable -** due to technical constraints - option not comparatively assessed	Large volume of FTPs to be recovered. Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site.
	ECONOMIC	Low relative cost	Moderate relative cost	**Not Applicable -** due to technical constraints - option not comparatively assessed	High relative cost

STRUCTURES	CRITERIA	RE-USE AT QUAD204 START-UP	SUSPEND LONG TERM	DECOMMISSION INSITU	RECOVER AND RECYCLE
Static Umbilicals & Umbilical End Terminations	TECHNICAL	Option for reuse is limited. Existing umbilicals don't provide full functionality required for Quad204 duty.	Retaining existing umbilicals available on location provides contingency in case of long term failure of new Quad204 umbilicals.	Would require removal of UETs and Trenching umbilicals. Early decommissioning removes contingency for re-use, if failure of Quad204 umbilicals	Technical risks include those associated managing methanol and chemicals trapped cores How could this contained when umbilical is cut Early recovery also removes contingency for re-use, if failure of Quad204 umbilicals
	SAFETY	**Not Applicable -** due to technical constraints - option not comparatively assessed	No change to safety risk	Moderate - handling UETs on deck and onshore and Trenching umbilicals.	Cores may contain methanol and other chemicals. Increase handling risk on deck and onshore. Increased potential for dropped object in vicinity of drill centres
	ENVIRONMENTAL	**Not Applicable -** due to technical constraints - option not comparatively assessed	No additional emissions, discharges, spills, seabed disturbance or increased noise levels anticipated.	Significant disturbance to seabed in trenching and burying, UETs would be recovered.	Potential discharge to sea, chemicals in umbilical cores and Duta pipework to be dealt with onshore. Potential dropped object risk could cause loss of containment at adjacent wellheads
	SOCIETAL	**Not Applicable -** due to technical constraints - option not comparatively assessed	Increase infrastructure on seabed, but in existing corridors. No incremental increase in waste coming onshore. Potential for some negative stakeholder reaction to long term in field suspension	UETs would be recovered.	Potential for chemicals waste inside lines being recovered to shore Large number of structures to be recovered. Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site.
	ECONOMIC	**Not Applicable -** due to technical constraints - option not comparatively assessed	Moderate relative cost	High relative cost	Limited vessel availability and weather window extensive items to be recovered
Dynamic Umbilicals and Dynamic Umbilical Termination Assemblies	TECHNICAL	Not fully compatible with new duty. Also question w.r.t. performance problems already evident in of 2 of the 3 existing umbilicals. Also uncertainty w.r.t maintaining integrity of 3rd umbilical if wet stored or after reeling if recovered for dry storage.	Location will clash and impede installation of new dynamic umbilicals /DUTAs	Location will clash and impede installation of new dynamic umbilicals /DUTAs	**Only technically feasible option.** (existing 3rd umbilical may be retained as a spare onshore)
	SAFETY	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed
	ENVIRONMENTAL	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed
	SOCIETAL	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed
	ECONOMIC	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed

4.3 Gas Systems

A list of existing structures associated with the Gas systems in the field is included in **Appendix B**

This list identifies that the vast majority of existing structures are to be re-used for Quad 204 duty. The structures associated with the gas disposal route, whilst not planned to be re-used at Quad 204 start up are to be retained suspended in place as contingency use for future Quad 204 duty.

There are only two structures in the existing gas system that are not to be reused.

- The 8" dia. Gas Lift Riser from the FPSO to FTAF11 – 749 m long
- The 8" dia. Gas Import/ Export Riser from FPSO to manifold M31 – 721 m long

Similar to the production risers, these gas risers have already been identified as having current integrity problems and the project decision has been made to replace. The location of the existing risers will clash with and impede the installation of the new risers, therefore the options associated with long term suspension and decommission in situ were deemed as not applicable for these structures.
Recovery & recycle is identified as the only technically feasible option for decommissioning of these structures and therefore other options were not comparatively assessed. The observed risks for other criteria recorded in Table 4-1 for the recovery of the production risers will be similar for the gas risers.

4.4 Water Injection System

A list of existing structures associated with the WI system in the field is included in **Appendix B**

This list identifies that the vast majority of existing structures are to be re-used for Quad 204 duty. The only structures in the existing WI system that are not to be reused are;

- 3 water injection risers
- 1 water injection RET
- 3 water Injection Jumpers

An overview of the conclusions from the CA is provided in sections 4.4.1 to 4.4.2 below. However see summary Table 4-4 in section 4.4.3 provides more information.
Appendix A also provides tabulated outcome from the comparative assessment workshop by criteria.

4.4.1 WI Risers & RET

Since the risers have already been identified as having current integrity problems and the project decision has been made to replace, the re-use option was not assessed. The location of the existing risers and RET will clash with and impede the installation of the new risers, therefore the options associated with long term suspension and decommission in situ were deemed as not applicable for these structures.
Recovery & recycle is identified as the only technically feasible option for decommissioning of these structures and therefore other options were not comparatively assessed. The observed risks for other criteria recorded in Table 4-1 for the recovery of the production risers will be similar for the WI risers except for the environmental risks associated with the production risers. Since no hydrocarbons are anticipated in the WI risers the risk of discharges to sea is low.

4.4.2 WI Jumpers

Re-use is identified as the best option for the WI jumpers across all assessment criteria. Thirty-six (36) out of the thirty-nine (39) WI jumpers in the field are to be re-used for Quad 204 duty, leaving only three (3) jumpers that cannot be re-used as they are not the correct length for the revised field configuration. Where jumpers cannot be re-used, they will be replaced by new longer jumpers.

The location of the existing redundant jumpers will clash with and impede the installation of the new jumpers, therefore the options associated with long term suspension and decommission in situ were deemed as not applicable for these structures.

Recovery & recycle is identified as the only technically feasible option for decommissioning these structures and they were therefore not comparatively assessed. Observations were made and recorded on the risks involved for the other criteria and are detailed in Table 4.4 in section 4.4.3.

4.4.3 Summary Table of Comparative Assessment Workshop Outputs – Water Injection System

Key to colours used:

Only technically feasible option	Option NOT APPLICABLE - Cannot be included in Comparative Assessment	Low risk - Better Option	Moderate Risk	High Risk - Worst Option

Table 4-4 Summary of Water Injection System Comparative Assessment

CONTROL SYSTEMS	CRITERIA	RE-USE AT QUAD204 START-UP	SUSPEND LONG TERM	DECOMMISSION INSITU	RECOVER AND RECYCLE
WI RISERS and RET	TECHNICAL	**Not applicable -** Current Integrity issues with the risers means replacement will be required	**Not applicable -** location will clash and impede installation of new risers	**Not applicable -** location will clash and impede installation of new risers	**Only technically feasible option.**
	SAFETY	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Only technically feasible option.**
	ENVIRONMENTAL	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Only technically feasible option.**
	SOCIETAL	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Only technically feasible option.**
	ECONOMIC	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Only technically feasible option.**
WATER INJECTION JUMPERS	TECHNICAL	36 existing WI jumpers are being re-used for Quad204 duty. However 3 jumpers not re-useable as do not have sufficient length for new configuration	Where replacement jumpers are necessary, location of existing jumpers will clash and impede replacement jumpers installation. Therefore cannot be suspended long term	Where replacement jumpers are necessary, location of existing jumpers will clash and impede replacement jumpers installation. Therefore cannot be decommissioned insitu	Recovery of the jumpers is optimal technical option for those that cannot be reused.
	SAFETY	No intervention anticipated for re-used jumpers. Therefore no increased risk levels.	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	Only 3 jumpers to be recovered therefore moderate deck handling risk and risk when returned to shore. No risk reduction to other sea users as recovered jumpers occur in existing corridors and are to be replaced and potential to cause a major event is low.
	ENVIRONMENTAL	No increased emissions, discharges, seabed/land disturbance or increased noise for re-used jumpers.	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	Contents of WI Jumpers are benign. Only 3 jumpers (340m total length) recovered for re-use (spares) or recycle. Some seabed disturbance anticipated during recovery operations, small number of worksites. Localised disturbance and noise from cutting and lifting activity.
	SOCIETAL	No change to current operations.	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	Recovered materials will go to licensed sites. Low key stakeholder reaction anticipated, general acceptance of decomm programme at stakeholder engagement.
	ECONOMIC	Low relative cost	**Not Applicable -** due to technical constraints - option not comparatively assessed	**Not Applicable -** due to technical constraints - option not comparatively assessed	Relatively Low cost as only 3 jumpers recovered. Minor scope with no uncertainties

4.5 Other Structures

There are a number of other structures and associated apparatus that have not been considered as part of Quad 204 Project:

- Grout Bags
- Mattresses
- Redundant PWRI pump skids (2 off) located in the vicinity of the Central Drill centre, but never commissioned
- Redundant Anode Skids (2 off) installed to provide protection to Risers in the vicinity of the FPSO,

These structures were assessed as part of the CA Workshop considering the same options as for other structures. An overview is provided in sections 4.5.1 to 4.5.4 below. However summary Table 4-5 in section 4.5.5 provides more information.
Appendix A also provides tabulated outcome from the comparative assessment workshop by criteria.

4.5.1 Grout Bags

These were installed when the original infrastructure was installed to stabilise and secure FTPs and flexible jumpers.
Re-use is identified as the best option for the Grout bags across all assessment criteria where they do not need to be relocated. However there are technical difficulties in re-use of grout bags in different locations. Grout bags mould and set in location after installed and as such are not appropriate for re-use in other configurations. Where grout bags are installed on equipment to be reused for Quad 204 without modification or relocation then they will be left as is.
If the grout bags are located on structures that are to be removed or relocated it is unlikely they can be re-used. The CA concluded that where grout bags cannot remain in use in existing locations, long term suspension or decommissioning insitu are equally good options for redundant grout bags.
The project intends to recover grout bags associated with other structures being recovered, but will utilise baskets to minimise deterioration and break-up of the bags during recovery.

4.5.2 Mattresses

These were installed when the original infrastructure was installed to stabilise and protect flowlines and other fixed structures and also for support at pipe crossings. It is understood there is approximately 144 mattresses in the field.
Many of the mattresses are supporting or protecting infrastructure that is to be re-used for Quad 204 duty and as such will be re-used.
Others are beneath and supporting structures that are to be left in long term suspension and therefore will be retained in this duty.

The CA concluded that re-use for Quad 204 duty, suspend in place and decommission insitu are all equally good options. Although societal impact in decommissioning insitu is not as good due to no creation in new jobs in recycling mattresses and potentially adverse stakeholder reaction to leaving mattresses on the seabed.
The CA concluded that recovery of mattresses during Phase 1 decommissioning is the worst option, due to potential break up of the mattresses during recovery and the potential for dropped objects resulting in damage to adjacent infrastructure that is planned to be re-used for Quad 204 duty. If mattresses are to be recovered it is better to wait until Quad 204 EoFL, when damage to adjacent infrastructure would not be an issue.

4.5.3 Produced Water Re-injection (PWRI) pump skids

There are two large structural frames (70te each approx) located on the seabed within the existing flowlines corridors at the central drill centre. These structures were installed as part of a PWRI Project that never progressed to the commissioning stage. There are no pumps on the skids and there are no interconnecting facilities to the Schiehallion infrastructure. No hydrocarbons or other chemicals have ever been introduced to these skids. They have been on the seabed in a suspended state for a number of years and it is recorded that the skids were also damaged during installation.

The skids have no functionality and have no potential reuse. The size and location of the skids means that they could not be decommissioned insitu. Therefore re-use and decommissioning insitu were not assessed as options.

The CA has concluded that attempting recovery of these skids with live wellheads in the vicinity and adjacent pipelines planned for re-use by Quad 204 is high risk and that long term and continued suspension of these structures to Quad 204 EoFL is the best option from a technical, safety and environmental point of view.

4.5.4 Anode Skids

There are two large and redundant anode skids (Structural frames) on the seabed near to the existing FPSO location. These structures are of no value to Quad 204 project as they can no longer fulfil their original function. These structures will not be replaced. However their location could impede the installation of the new risers, the only technically feasible option will be to recover and recycle these skids. As a result of this conclusion no CA was therefore carried out.

Although large and heavy structures, once the existing risers have been removed there is no adjacent infrastructure at risk from dropped objects and it is therefore the Quad 204 project plan to recover these skids when the risers are being recovered.

4.5.5 Summary Table of Comparative Assessment Workshop Outputs – Other Structures

Key to colours used:

Only technically feasible option	Option NOT APPLICABLE - Cannot be included in Comparative Assessment	Low risk - Better Option	Moderate Risk	High Risk - Worst Option

Table 4-5 Summary of Other Structures Comparative Assessment

STRUCTURES	CRITERIA	RE-USE AT QUAD204 START-UP	SUSPEND LONG TERM	DECOMMISSION INSITU	RECOVER AND RECYCLE
Grout bags	TECHNICAL	Where grout bags are installed on equipment to be reused for Quad 204 without modification or relocation then they will be left as is. If associated with structures to be removed or relocated it is unlikely they can be reused. Existing Grout bags will not meet required functionality in new locations or on new equipment and therefore new grout bags will be deployed.	Grout Bags potentially deteriorate as can ropes.	Grout Bags potentially deteriorate as can ropes.	Where recovery of FTP/ jumpers is planned, then associated grout bags will be recovered. However Grout bags not designed for recovery (Deterioration over time). Recovery using baskets will be required. . Technically difficult to recover grout bags before Quad 204 EoFL.
	SAFETY	No intervention required. No change to Quad 204 operational envelope. Nothing returned onshore.	No safety risk to personnel as nothing recovered. No change to Quad 204 operational envelope. Nothing returned onshore.	No safety risk to personnel as nothing recovered. No change to Quad 204 operational envelope. Nothing returned onshore.	Some lifting operations (baskets), No real reduction in risk for other sea users as within Quad 204 operational envelope.. Handling, recycling onshore will be difficult. Low risk of major incident
	ENVIRONMENTAL	No significant additional emissions. Benign materials. No increase of discharges to sea. Nothing returned onshore. For re-use read recycle. No seabed or land disturbance. No noise increase anticipated	No significant additional emissions. Benign materials. No increase of discharges to sea. nothing returned onshore. No recycle. No seabed or land disturbance. No noise increase anticipated	No significant additional emissions. Benign materials. No increase of discharges to sea. nothing returned onshore. No recycle. No seabed or land disturbance. No noise increase anticipated	Additional vessel emissions. No increase of discharges to sea, benign materials. Grout likely to be recycled, no significant increase in noise.
	SOCIETAL	No change to current operations. Nothing returned onshore - no community disturbance. No additional employment created. Minimal reaction from stakeholders anticipated.	Increase infrastructure on seabed, but in existing corridors / exclusion zones. Nothing returned onshore - no community disturbance. No additional employment created. Minimal reaction from stakeholders anticipated.	Increase infrastructure on seabed, but in existing corridors / exclusion zones. Nothing returned onshore - no community disturbance. No additional employment created. Potential reaction from stakeholders anticipated.	No impact as grout bags occur in existing corridors / exclusion zones, so no additional fishing area available as a result of their removal. Materials returned to licensed site for disposal. Little additional employment created. Minimal reaction from stakeholders anticipated.
	ECONOMIC	Low relative cost	Low relative cost	Low relative cost	Moderate relative cost
Mattresses	TECHNICAL	Quad 204 project plan to reuse mattresses where possible e.g. in current location. Mattress relocating for reuse could result in mattresses breaking up. Mattresses at crossings or dropped object protection will be left to perform current function.	No technical risk	No technical risk	Possibility of rope failing when trying to recover e.g. potential that could break up during recovery, dropping on to adjacent structures planned for Quad 204 re-use. Moderate
	SAFETY	No intervention required. No change to Quad 204 operational envelope. Nothing returned onshore.	No safety risk to personnel as nothing recovered. No change to Quad 204 operational envelope. Nothing returned onshore.	No safety risk to personnel as nothing recovered. No change to Quad 204 operational envelope. Nothing returned onshore.	Possibility of ropes failing when trying to recover e.g. potential that mattresses could break up during recovery, dropped objects. No real reduction in risk for other sea users as within Quad 204 operational envelope. Handling, recycling onshore will be difficult. Moderate risk of dropping mattress on to adjacent structures planned for Quad 204 re-use
	ENVIRONMENTAL	No significant additional emissions. Benign materials. No increase of discharges to sea. nothing returned onshore. For re-use read recycle. No seabed or land disturbance. No noise increase anticipated	No significant additional emissions. Benign materials. No increase of discharges to sea. nothing returned onshore. No seabed disturbance. No noise increase anticipated	No significant additional emissions. Benign materials. No increase of discharges to sea. nothing returned onshore. No recycling as left offshore. No noise increase anticipated	Additional vessel emissions. No increase of discharges to sea, benign materials can be recycled, no significant increase in noise anticipated.
	SOCIETAL	No change to current operations. Nothing returned onshore - no community disturbance. No additional employment created. Minimal reaction from stakeholders anticipated.	Increase infrastructure on seabed, but in existing corridors / exclusion zones. Nothing returned onshore - no community disturbance. No additional employment created. Minimal reaction from stakeholders anticipated.	Increase infrastructure on seabed, but in existing corridors / exclusion zones. Nothing returned onshore - no community disturbance. No additional employment created. Potential reaction from stakeholders anticipated.	No impacts as mattresses occur in existing corridors, so no additional fishing area available as a result of their removal. Materials can be recycled. Little additional employment created. Minimal reaction from stakeholders anticipated.
	ECONOMIC	Low relative cost	Low relative cost	Low relative cost	Moderate relative cost

Table 4-6 Summary of Other Structures Comparative Assessment (continued)

STRUCTURES	CRITERIA	RE-USE AT QUAD204 START-UP	SUSPEND LONG TERM	DECOMMISSION INSITU	RECOVER AND RECYCLE
Frames for 2 pumping skids initially installed for PWRI (never commissioned)	**TECHNICAL**	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	Have been in this state for many years. No technical risk	**Not applicable** - DECC guidelines require large structures to be recovered	Technically difficult, heavy lift, pump frames are damaged. In close proximity to drill centre.
	SAFETY	**Not applicable** due to technical constraints - option not comparatively assessed	No safety risk to personnel as nothing recovered. Large structures and potential risk to trawlers. Nothing returned onshore, no risk to land users.	**Not applicable** due to technical constraints - option not comparatively assessed	Heavy lift of damaged structures could result in dropped object In close proximity to drill centre potential major escalation. This risk considered sufficient to keep this red overall. Also risk to personnel from potential dropped objects. Early recovery has no real reduction in risk value to sea users as within Quad 204 operational envelope. Large structures would need to be dismantled at quayside before onward transportation for recycle.
	ENVIRONMENTAL	**Not applicable** due to technical constraints - option not comparatively assessed	Some additional emissions monitoring vessel. No increase of discharges to sea. Nothing returned onshore. No seabed or land disturbance. No noise increase anticipated	**Not applicable** due to technical constraints - option not comparatively assessed	Increased risk of loss of well containment from dropped object during recovery operations. Incremental additional vessel emissions during recovery. No increase of discharges to sea, materials can be recycled. No significant increase in noise anticipated.
	SOCIETAL	**Not applicable** due to technical constraints - option not comparatively assessed	Leaving redundant large structures on seabed, but in existing corridors / exclusions zones. Nothing returned onshore - no community disturbance. No additional employment created. Potential for some negative stakeholder reaction to long term in field suspension	**Not applicable** due to technical constraints - option not comparatively assessed	No impacts as structures occur in existing corridors, so no additional fishing area available as a result of their removal. Minimal community disturbance associated with returned materials being recycled. Little additional employment created. Minimal reaction from stakeholders anticipated.
	ECONOMIC	**Not applicable** due to technical constraints - option not comparatively assessed	Low relative cost	**Not applicable** due to technical constraints - option not comparatively assessed	Moderate relative cost
2 anode skids	**TECHNICAL**	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers
	SAFETY	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Only technically feasible option**. - option not comparatively assessed
	ENVIRONMENTAL	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Only technically feasible option**. - option not comparatively assessed
	SOCIETAL	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Only technically feasible option**. - option not comparatively assessed
	ECONOMIC	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Only technically feasible option**. - option not comparatively assessed

5.0 CONCLUSIONS AND RECOMMENDATIONS

The main outcomes of the CA workshop are generally as follows:

- Re-use existing infrastructure for Quad 204 duty where possible and practical;
- Limit disturbance and risk of damage to adjacent retained infrastructure during Phase 1 decommissioning by suspending and preserving redundant equipment until Quad 204 EoFL;
- Suspension must be accompanied with preservation and monitoring to ensure future decommissioning options are not compromised;
- Only recover redundant equipment where it is necessary to do so to create space for new Quad 204 equipment;
- Do not decommission redundant equipment insitu during Phase 1 decommissioning as this could increase risk to damage to adjacent retained equipment and also reduces decommissioning options at Quad 204 EoFL.

6.0 APPENDIX A – OPTIONS ASSESSMENT MATRICES

6.1 OIL PRODUCTION SYTEMS

The CA workshop completed the assessment by criteria for each system. The overall summary sheet is included in Section 4.1.5, Tables 4-1 and 4-2. The summaries were developed from the individual worksheets in this appendix.

6.1.1 Technical Risk

Assessment Criteria	Aspects		FLOWLINES, FTA'S, MANIFOLD			
	Outline Description		**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
TECHNICAL	Risk of Major Project Failure	Flowlines/FTAs	**Not applicable -** Predicted life of existing flowlines is less than Quad204 requirement (long term integrity). Replace now rather than in future.	Ongoing monitoring required but routine operations.	Would require removal of FTAs and Trenching Flowlines. High - Technical Risk in deep water	High risk - would involve cutting flowlines using heavy shears in deep water
		Manifold M1D	Assuming compatibility for new Quad 204 duty, ROV intervention would be required to replumb the manifold.	Ongoing monitoring required but routine operations.	**Not Applicable** - Manifold structure not permitted be left insitu	Removes opportunity for future use Access difficulty to lift due to proximity of Quad204 infrastructure
	Technical Complexity & Challenges	Flowlines/FTAs	**Not applicable -** Predicted life of existing flowlines is less than Quad204 requirement (long term integrity). Replace now rather than in future.	Ongoing monitoring required but routine operations.	Would require removal of FTAs and Trenching Flowlines. High - Technical Risk in deep water	High risk - would involve cutting flowlines using heavy shears in deep water
		Manifold M1D	Assuming compatibility for new Quad 204 duty, ROV intervention would be required to replumb the manifold.	Ongoing monitoring required but routine operations.	**Not Applicable** - Manifold structure not permitted be left insitu	Removes opportunity for future use Access difficulty to lift due to proximity of Quad204 infrastructure

Assessment Criteria	Aspects		RISERS, RETs, PRODUCTION JUMPERS			
	Outline Description		**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
TECHNICAL	Risk of Major Project Failure	Risers/RETs	**Not applicable -** Current Integrity issues means replacement will be required	**Not applicable -** location will clash and impede installation of new risers/RET's	**Not applicable -** location will clash and impede installation of new risers/RET's	**Only technically feasible option.**
		Production jumpers	Applicable where existing are of sufficient length for new infrastructure. Others not fully compatible with new duty due to length - Low risk of major project failure	Where replacements are necessary, location will clash and impede replacement jumpers installation - Low risk of major project failure	Where replacements are necessary, location will clash and impede replacement jumpers installation - Low risk of major project failure	Optimal technical option for those that cannot be reused.
	Technical Complexity & Challenges	Risers/RETs	**Not Applicable** - Integrity related decision that these structures cannot be reused as cannot fulfil duty.	**Not applicable -** location will clash and impede installation of new risers/RET's	**Not applicable -** location will clash and impede installation of new risers/RET's	**Only technically feasible option.**
		Production jumpers	Some can be reused as are of sufficient length for new infrastructure. Others not fully compatible with new duty due to length.	**Not applicable** - Where replacements are necessary, location will clash and impede replacement jumpers installation	**Not applicable** - Where replacements are necessary, location will clash and impede replacement jumpers installation	Optimal technical option for those that cannot be reused.

6.1.2 Safety

Assessment Criteria	Aspects		FLOWLINES, FTA'S, MANIFOLD			
		Options	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
SAFETY	Risk to Personnel	Flowlines/ FTAs (production)	**Not Applicable** - See Technical Risk	Ongoing monitoring only, routine operations.	More work involved if intervention required (ploughing, trenching, disconnections). Moderate if trenched (FTAs would be removed if trenched). Low if not.	High risk due to short term project intervention, though no long term monitoring/intervention required.
		Manifold M1D	ROV intervention would be required to replumb manifold. No material handling on deck.	Ongoing monitoring only, routine operations.	**Not Applicable** - See Technical Risk	High risk due to short term project intervention, though no long term monitoring/intervention required.
	Risk to other Users of the Sea	Flowlines (production)	**Not Applicable** - See Technical Risk	Increase infrastructure on seabed but within existing operations corridors	Potentially trench and bury however would not change to current operations as Quad204 equipment would be in vicinity. FTAs would be removed.	No benefit in risk reduction as lines occur in corridors of Quad204 structures
		Manifold M1D	No change to current operations. Within 500 m safety zone	No change to current operational envelope but increased infrastructure. Within 500 m safety zone	**Not Applicable** - See Technical Risk	No change to current operations. Within 500 m safety zone
	Risk to those on Land	Flowlines/ FTAs (production)	**Not Applicable** - See Technical Risk	Nothing returned to shore	FTAs would have to come back	Everything brought back
		Manifold M1D	Nothing returned to shore	Nothing returned to shore	**Not Applicable** - See Technical Risk	70 te manifold
	Potential for high consequence event, e.g. damage to major oil and gas trunk lines, helicopter accident.	Flowlines/ FTAs (production)	**Not Applicable** - See Technical Risk	No intervention	More work involved. Extra heavy lifts, SIMOPS	More chance of dropped objects, due to increase volumes of infrastructure being removed
		Manifold M1D	No heavy lifts required	No heavy lifts required	**Not Applicable** - See Technical Risk	Heavy lift- potential dropped object/ risk to wells

Assessment Criteria	Aspects		RISERS, RETs, PRODUCTION JUMPERS			
		Options	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
SAFETY	Risk to Personnel	Risers and RETs	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	High due to short term project intervention, though no long term monitoring/intervention required.
		Production jumpers	Multiple interventions given that some system sections will be suspended.	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	High due to short term project intervention, though no long term monitoring/intervention required.
	Risk to other Users of the Sea	Risers and RETs	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	no risk
		Production jumpers	No change to current operations.	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	No difference to current operations (low)
	Risk to those on Land	Risers and RETs	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Moderate (due to limited recovery)
		Production jumpers	No change to current operations.	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Moderate (due to limited recovery)
	Potential for high consequence event, e.g. damage to major oil and gas trunk lines, helicopter accident.	Risers and RETs	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Location of risers remote from drill centres Adjacent equipment flushed before recovery commences - Low risk
		Production jumpers	Low (no interactions)	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Low (likelihood of dropping smaller objects is lower and potential damage is less)

6.1.3 Environmental Impact

Assessment Criteria	Aspects	FLOWLINES, FTA'S, MANIFOLD,PRODUCTION JUMPERS			
ENVIRONMENTAL	Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Atmospheric Emissions	No significant additional emissions	Small incremental increase associated with a monitoring vessel.	Depending on type of interventions required, potentially multiple vessels.	Anticipate more than a season to carry out recovery operations.
	Discharges to Sea (oily water and chemicals, sand)	No incremental increase of discharges to sea	No incremental increase of discharges to sea	Contents of lines be released to sea over time	Contents of lines may be released to sea during recovery operation
	Waste Management	No incremental increase in waste - only shipboard waste	No incremental increase in waste - only shipboard waste	Recovery of ends (e.g. FTAs Manifold) will need be back loaded for recycle	Potential for film of oily waste inside lines being recovered to shore Large number of structures to be recovered
	Resource Consumption/ Recycling Value	No additional resource being used as items will be reused.	Not losing resources and no additional being consumed.	Losing resources	Most redundant structures recovered for re-use (spares) or recycle
	Disturbance to Seabed / Land	No significant additional disturbance.	No significant additional disturbance.	Increased corridor of seabed disturbance if trenching required	Increased corridor of seabed disturbance anticipated during recovery operations Localised disturbance from cutting and lifting activity
	Accidental Spills	No activity likely to lead to spills. Relatively benign inventories or similar to on-going operations	No activity likely to lead to spills. Relatively benign inventories or similar to on-going operations	Option not applicable for manifold. No activity likely to lead to spills. Relatively benign inventories or similar to on-going operations	Unplanned hydrocarbon discharges during flushing/ pigging activity Increased risk of loss of well containment from dropped objects during recovery operations. Risk will reduce at Quad204 EoFL due to wells being abandoned
	Noise Underwater and Onshore	No activity leading to noise above existing baseline	No activity leading to noise above existing baseline	Some noise associated with the cutting of the FTAs.	Cutting activities offshore and onshore.

Assessment Criteria	Aspects	RISERS, RETs,			
ENVIRONMENTAL	Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Atmospheric Emissions	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Some vessel activity involved in their removal, shipping to shore and movements onshore.
	Discharges to Sea (oily water and chemicals, sand)	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Contents of lines may be released to sea during recovery operation, but will have been flushed and pigged.
	Waste Management	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Risers flushed, pigged and cleaned before disconnection, but likely to be some oily residue, material to be recycled
	Resource Consumption/ Recycling Value	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Risers recovered to shore for recycling
	Disturbance to Seabed / Land	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Minor corridor of seabed disturbance resulting from laying down, removal and storing activity
	Accidental Spills	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Risers flushed, pigged and cleaned before disconnection. No change to normal operations from vessels used.
	Underwater noise associated with removal of UTC and pile	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	If piling is used - High, But if cut away - Moderate. Assuming worst case - High.

6.1.4 Societal Impact

Assessment Criteria	Aspects	FLOWLINES, FTA'S, MANIFOLD, PRODUCTION JUMPERS			
SOCIETAL	Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Fisheries Impact	No change to current operations	Increase infrastructure on seabed, but in existing corridors.	Potentially trench and bury however would not change from current operations and surrounding infrastructure. FTAs would be removed.	No impact as lines occur in existing corridors
	Community Disturbance - impacts onshore.	No incremental increase in waste coming onshore (only shipboard waste)	No incremental increase in waste coming onshore (only shipboard waste)	Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site.	Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site.
	Workforce Welfare & Local Employment	No new jobs will result from this option	No new jobs will result from this option	No new jobs will result from this option	Possibility of some additional work created offshore and onshore
	Stakeholder Reaction	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.	Potential for negative stakeholder reaction	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.

Assessment Criteria	Aspects	RISERS, RETs			
SOCIETAL	Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Fisheries Impact	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	No impact as lines occur in existing corridors / safety zone
	Community Disturbance - impacts onshore.	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site.
	Workforce Welfare & Local Employment	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Possibility of some additional work created offshore and onshore
	Stakeholder Reaction	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.

6.1.5 Economic

Assessment Criteria	Aspects		ALL STRUCTURES			
ECONOMIC		Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Cost	Flowlines/ FTAs	**Not Applicable** - See Technical Risk	Moderate relative cost	Moderate relative cost	High relative cost
		Manifold M1D	Low relative cost	Moderate relative cost	**Not Applicable** - See Technical Risk	High relative cost
		Risers/ RETs	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	High relative cost
		Production Jumpers	Low relative cost	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	High relative cost
	Uncertainty	Flowlines/ FTAs	**Not Applicable** - See Technical Risk	Low	Moderate	High - Limited vessel availability and weather window extensive items to be recovered
		Manifold M1D	Low	Low	**Not Applicable** - See Technical Risk	Low - due to single item to be recovered only
		Risers/ RETs	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	High - Limited vessel availability and weather window extensive items to be recovered
		Production Jumpers	Low	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Low - due small number and relatively small size of items to be recovered

6.2 CONTROL SYSTEMS

The CA workshop completed the assessment by criteria for each system. The overall summary sheet is included in Section 4.2.5, Table 4-3. The summary was developed from the individual worksheets in this appendix.

6.2.1 Technical Risk

Assessment Criteria	Aspects		CDAs, FTPs			
TECHNICAL RISK		Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Risk of Major Project Failure	Dynamic umbilicals / DUTAs	**Not Applicable** - Not fully compatible with new duty. Also question w.r.t. performance problems already evident in of 2 of the 3 existing umbilicals. Also uncertainty w.r.t maintaining integrity of 3rd umbilical if wet stored or after reeling if recovered for dry storage.	**Not applicable -** location will clash and impede installation of new dynamic umbilicals /DUTAs	**Not applicable -** location will clash and impede installation of new dynamic umbilicals /DUTAs	**Only technically feasible option**. (existing 3rd umbilical may be retained as a spare onshore)
		CDAs	No risk of major project failure	**Not applicable -** location will clash and impede installation of new CDA	**Not applicable -** location will clash and impede installation of new CDA	High - due to inherent dropped object risk to adjacent Quad 204 retained infrastructure during recovery
		FTPs	No risk of major project failure	FTPs not easily recovered due to entanglement with other equipment (jumpers) will be left long term suspended. Cannot be lifted up as recovery will damage infrastructure to be reused for Quad 204. - Still Low risk	**Not Applicable** - FTPs not permitted be left insitu	Low. Optimal option for those that cannot be reused and can be reused.
	Technical Complexity & Challenges	CDAs	4 CDAs are compatible and are being re-used for Quad 204. Remaining 4 CDAs are not compatible with new duty and must be replaced - Low	**Not applicable -** location will clash and impede installation of new CDA	**Not applicable -** location will clash and impede installation of new CDA	High Risk - due to inherent dropped object risk to adjacent Quad 204 retained infrastructure during recovery
		FTPs	Low. Some can be reused as are of sufficient length for new infrastructure. Others not fully compatible with new duty due to length and will be replaced	Small amount of FTPs not easily recovered due to entanglement with other equipment (jumpers) will be left long term suspended. Cannot be lifted up as recovery will damage infrastructure to be reused for Quad 204. - Still Low risk	**Not Applicable** - FTPs not permitted be left insitu	No technical difficulties anticipated for majority of FTPs
						6

Assessment Criteria		Aspects	STATIC UMBILICALS, UETs			
TECHNICAL RISK		Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
		Risk of Major Project Failure	No risk of major project failure	No risk of major project failure	No risk of major project failure	No risk of major project failure
		Technical Complexity & Challenges	High - Option for reuse is limited. Existing umbilicals don't provide full functionality required for Quad204 duty.	Retaining existing umbilicals available on location provides contingency in case of long term failure of new Quad204 umbilicals.	Would require removal of UETs and Trenching umbilicals. Moderate - Technical Risk Removes contingency for re-use, if failure of Quad204 umbilicals	Moderate technical risks include those associated with methanol and chemicals trapped in chemical cores (How is this contained) Removes contingency for re-use, if failure of Quad204 umbilicals
						6

6.2.2 Safety

Assessment Criteria	Aspects	Options	RE-USE AT QUAD204 START-UP	SUSPEND LONG TERM	DECOMMISSION INSITU	RECOVER AND RECYCLE
SAFETY	Risk to Personnel	Dynamic umbilicals / DUTAs	**Not Applicable** - Not fully compatible with new duty. Also question w.r.t. performance problems already evident in of 2 of the 3 existing umbilicals. Also uncertainty w.r.t maintaining integrity of 3rd umbilical if wet stored or after reeling if recovered for dry storage.	**Not applicable -** location will clash and impede installation of new dynamic umbilicals /DUTAs	**Not applicable -** location will clash and impede installation of new dynamic umbilicals /DUTAs	**Only technically feasible option.** (existing 3rd umbilical may be retained as a spare onshore)
		FTPs	No safety risk.	No safety risk.	**Not applicable -** location will clash and impede installation of new CDA	Chemical cores may contain methanol and other chemicals. Increase handling risk on deck of vessel - High
		CDAs	No safety risk.	Low. ROV operations only - low risk	**Not Applicable** - FTPs not permitted be left insitu	High Risk - significant material handling on deck and potential for methanol in the pipework
	Risk to other Users of the Sea	Dynamic umbilicals / DUTAs	**Not Applicable** - Not fully compatible with new duty. Also question w.r.t. performance problems already evident in of 2 of the 3 existing umbilicals. Also uncertainty w.r.t maintaining integrity of 3rd umbilical if wet stored or after reeling if recovered for dry storage.	**Not applicable -** location will clash and impede installation of new dynamic umbilicals /DUTAs	**Not applicable -** location will clash and impede installation of new dynamic umbilicals /DUTAs	**Only technically feasible option.** (existing 3rd umbilical may be retained as a spare onshore)
		FTPs	no change to current operations. (Low)	no change to current operations. (Low)	**Not applicable -** location will clash and impede installation of new CDA	No impact (Low)
		CDAs	No change to current operations. Within 500 m safety zone (Low)	No change to current operational envelope but increased infrastructure. Within 500 m safety zone (Low)	**Not Applicable** - FTPs not permitted be left insitu	No change to current operations. Within 500 m safety zone (Low)
	Risk to those on Land	Dynamic umbilicals / DUTAs	**Not Applicable** - Not fully compatible with new duty. Also question w.r.t. performance problems already evident in of 2 of the 3 existing umbilicals. Also uncertainty w.r.t maintaining integrity of 3rd umbilical if wet stored or after reeling if recovered for dry storage.	**Not applicable -** location will clash and impede installation of new dynamic umbilicals /DUTAs	**Not applicable -** location will clash and impede installation of new dynamic umbilicals /DUTAs	**Only technically feasible option.** (existing 3rd umbilical may be retained as a spare onshore)
		FTPs	. Low	Low	**Not applicable -** location will clash and impede installation of new CDA	High potential methanol in the cores
		CDAs	. Low	Low	**Not Applicable** - FTPs not permitted be left insitu	High (potential methanol)
	High consequence event, e.g. damage to major oil and gas trunk lines, helicopter accident	Dynamic umbilicals / DUTAs	**Not Applicable** - Not fully compatible with new duty. Also question w.r.t. performance problems already evident in of 2 of the 3 existing umbilicals. Also uncertainty w.r.t maintaining integrity of 3rd umbilical if wet stored or after reeling if recovered for dry storage.	**Not applicable -** location will clash and impede installation of new dynamic umbilicals /DUTAs	**Not applicable -** location will clash and impede installation of new dynamic umbilicals /DUTAs	**Only technically feasible option.** (existing 3rd umbilical may be retained as a spare onshore)
		FTPs	Low (no interactions)	Low (no intervention)	**Not Applicable** - See Technical Risk	Moderate (some lifting operations)
		CDAs	No heavy lifts required. Low	No heavy lifts required. Low	**Not Applicable** - See Technical Risk	Moderate (some lifting operations, differs to manifolds as further from well heads)

Assessment Criteria	Aspects	STATIC UMBILICALS, UETs			
	Options	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
SAFETY	Risk to Personnel	Option for reuse is limited. Don't have full functionality required. (Low)	Ongoing monitoring but will be of low risk. Routine operations. Low	Would require removal of UETs (handling on deck) and Trenching umbilicals. Moderate	Chemical cores may contain methanol and other chemicals. Increase handling risk on deck of vessel - High
	Risk to other Users of the Sea	No change to current operations. (Low)	Increase infrastructure on seabed but within existing corridors (Low)	Potentially trench and bury however not change would risk from current operations (Other adjacent equipment being reused or Quad 204). Low	In general no benefit as lines occur in corridors where Quad204 equipment is being retained For two umbilicals removal may clear existing corridors. Low
	Risk to those on Land	Nothing returned	Nothing returned	UETs would have to come back- Moderate	Chemical cores may contain methanol and other chemicals. Increase handling risk onshore. Everything brought back - High
	High consequence event, e.g. damage to major oil and gas trunk lines, helicopter accident	Low (no interactions)	Low (no intervention)	More work involved. Extra heavy lifts, SIMOPS (e.g. trenching) Moderate	High - increased potential for dropped object in vicinity of drill centres, due to increase volumes of infrastructure being removed.

6.2.3 Environmental Impact

Assessment Criteria	Aspects	CDAs, FTPs, Static Umbilicals and UETs			
ENVIRONMENTAL	Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Atmospheric Emissions	No significant additional emissions	Small incremental increase associated with a monitoring vessel.	**Not Applicable** - See Technical Risk	Relatively easily recovered if not obstructed by other subsea infrastructure.
	Discharges to Sea	No incremental increase of discharges to sea	No incremental increase of discharges to sea	**Not Applicable** - See Technical Risk	Contents of lines may be released to sea during recovery operation
	Waste Management	No incremental increase in waste - only shipboard waste	No incremental increase in waste - only shipboard waste	**Not Applicable** - See Technical Risk	Potential for chemicals waste inside lines being recovered to shore Large number of structures to be recovered
	Resource Consumption - focused on loss of resources (material not recovered)	No additional resource being used as items will be reused.	Not losing resources and no additional being consumed.	**Not Applicable** - See Technical Risk	Most redundant structures recovered for re-use (spares) or recycle
	Disturbance to Seabed / Land	No significant additional disturbance.	No significant additional disturbance.	**Not Applicable** - See Technical Risk	Increased corridor of seabed disturbance anticipated during recovery operations Localised disturbance from cutting and lifting activity
	Accidental Spills	No activity likely to lead to spills. Relatively benign inventories or similar to ongoing operations	No activity likely to lead to spills. Relatively benign inventories or similar to ongoing operations	**Not Applicable** - See Technical Risk	Increased risk of loss of well containment from dropped objects during recovery operations Will reduce at EoFL due to wells being abandoned etc.
	Noise Underwater and Onshore	No activity leading to noise above existing baseline	No activity leading to noise above existing baseline	**Not Applicable** - See Technical Risk	Cutting activities offshore and onshore.

Assessment Criteria	Aspects	DYNAMIC UMBILICALS, DUTA			
ENVIRONMENTAL	Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	All Aspects	**Not Applicable** - Not compatible with new duty. Also question w.r.t. performance problems already evident in of 2 of the 3 existing umbilicals. Also uncertainty w.r.t maintaining integrity of 3rd umbilical if wet stored or after reeling if recovered for dry storage.	**Not applicable -** location will clash and impede installation of new dynamic umbilicals /DUTAs	**Not applicable -** location will clash and impede installation of new dynamic umbilicals /DUTAs	**Only technically feasible option**. (existing 3rd umbilical may be retained as a spare onshore)

6.2.4 Societal Impact

Assessment Criteria	Aspects	CDAs, FTPs, STATIC UMBILICALS AND UETs			
SOCIETAL	Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Fisheries Impact	No change to current operations	Increase infrastructure on seabed, but in existing corridors.	**Not Applicable** - See Technical Risk	No impacts as lines occur in corridors, so no additional fishing area available as a result of their removal.
	Community Disturbance - impacts onshore.	No incremental increase in waste coming onshore (only shipboard waste)	No incremental increase in waste coming onshore (only shipboard waste)	**Not Applicable** - See Technical Risk	Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site.
	Workforce Welfare & Local Employment	Re-use would result in no new jobs	Suspend long term would result in no new jobs	**Not Applicable** - See Technical Risk	Some work associated with the removal and deconstruction.
	Stakeholder Reaction	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.	Potential for some negative stakeholder reaction to long term in field suspension	**Not Applicable** - See Technical Risk	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.

6.2.5 Economic

Assessment Criteria	Aspects		CDAs, FTPs, Static Umbilicals and UETs			
ECONOMIC		Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Cost	CDA's	Low relative cost	Moderate relative cost	**Not Applicable** - See Technical Risk	High relative cost
		FTP's	Low relative cost	Moderate relative cost	**Not Applicable** - See Technical Risk	High relative cost
		Static Umbilicals/UET's	**Not Applicable** - See Technical Risk	Moderate relative cost	Moderate relative cost	High relative cost
	Uncertainty	CDA's	Low	Low	**Not Applicable** - See Technical Risk	Low - due to single item to be recovered only
		FTP's	Low	**Not Applicable** - See Technical Risk	**Not Applicable** - See Technical Risk	Low - due small number and relatively small size of items to be recovered
		Static Umbilicals/UET's	**Not Applicable** - See Technical Risk	Low	Moderate	High - Limited vessel availability and weather window extensive items to be recovered

6.3 WATER INJECTION SYSTEMS

The CA workshop completed the assessment by criteria for each system. The overall summary sheet is included in Section 4.4.5, Table 4-4. The summary was developed from the individual worksheets in this appendix.

6.3.1 Technical Risk

Assessment Criteria	Aspects		ALL STRUCTURES			
TECHNICAL RISK		Structure Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Risk of Major Project Failure	WI Risers and RETs	**Not applicable -** Current Integrity issues with the risers means replacement will be required	**Not applicable -** location will clash and impede installation of new risers	**Not applicable -** location will clash and impede installation of new risers	**Only technically feasible option.**
		WI Jumpers	Low risk of major project failure	Low risk of major project failure	Low risk of major project failure	Low risk of major project failure
	Technical Complexity & Challenges	WI Risers and RETs	**Not applicable -** Current Integrity issues means replacement would be required	**Not applicable -** location will clash and impede installation of new risers	**Not applicable -** location will clash and impede installation of new risers	**Only technically feasible option.**
		WI Jumpers	36 existing WI jumpers are being re-used for Quad204 duty. However 3 jumpers not re-useable as do not have sufficient length for new configuration	Where replacement jumpers are necessary, location of existing jumpers will clash and impede replacement jumpers installation. Therefore cannot be suspended long term	Where replacement jumpers are necessary, location of existing jumpers will clash and impede replacement jumpers installation. Therefore cannot be decommissioned insitu	Recovery of the jumpers is optimal technical option for those that cannot be reused.

6.3.2 Safety

Assessment Criteria	Aspects		ALL STRUCTURES			
SAFETY		Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Risk to Personnel	WI Risers and RETs	**Not applicable -** Current Integrity issues means replacement would be required	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Only technically feasible option.
		WI Jumpers	36 existing WI jumpers are being re-used for Quad204 duty. No intervention anticipated.	Where replacement jumpers are necessary, location of existing jumpers will clash and impede replacement jumpers installation. Therefore cannot be suspended long term	Where replacement jumpers are necessary, location of existing jumpers will clash and impede replacement jumpers installation. Therefore cannot be decommissioned insitu	Only 3 jumpers to be recovered therefore moderate deck handling risk
	Risk to other Users of the Sea	WI Risers and RETs	**Not applicable -** Current Integrity issues means replacement would be required	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Only technically feasible option.
		WI Jumpers	36 existing WI jumpers are being re-used for Quad204 duty. Re-used jumpers are within existing operational corridors - no change to risk levels	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	No improvement to risk level as recovered jumpers occur in existing corridors and are to be replaced
	Risk to those on Land	WI Risers and RETs	**Not applicable -** Current Integrity issues means replacement would be required	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Only technically feasible option.
		WI Jumpers	36 existing WI jumpers are being re-used for Quad204 duty. Re-used jumpers therefore not returned onshore	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Only 3 jumpers (340m total length) to be recovered therefore moderate during onshore disposal
	Potential for high consequence event, e.g. damage to major oil and gas trunk lines, helicopter accident.	WI Risers and RETs	**Not applicable -** Current Integrity issues means replacement would be required	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Only technically feasible option.
		WI Jumpers	36 existing WI jumpers are being re-used for Quad204 duty. No intervention anticipated.	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Low risk - Only 3 jumpers to be recovered.

6.3.3 Environmental Impact

Assessment Criteria	Aspects	WI JUMPERS			
ENVIRONMENTAL	Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Atmospheric Emissions	No significant additional emissions	Where replacement jumpers are necessary, location of existing jumpers will clash and impede replacement jumpers installation. Therefore cannot be suspended long term	Where replacement jumpers are necessary, location of existing jumpers will clash and impede replacement jumpers installation. Therefore cannot be decommissioned insitu	Potentially multiple vessels involved in the removal
	Discharges to Sea (oily water and chemicals, sand)	No incremental increase of discharges to sea	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	No incremental increase in releases to sea, contents of WI Jumpers is benign
	Waste Management	No incremental increase in waste - only shipboard waste	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Recovered jumpers will be recycled where possible.
	Resource Consumption/ Recycling Value	No additional resource being used as items will be reused.	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	3 jumpers (340m total length) recovered for re-use (spares) or recycle
	Disturbance to Seabed / Land	No significant additional disturbance.	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Some seabed disturbance anticipated during recovery operations small number of worksites. Localised disturbance from cutting and lifting activity
	Accidental Spills	No activity likely to lead to spills. Benign inventories or similar to on-going operations	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	No activity likely to lead to spills. Relatively benign inventories, vessel activities similar to on-going operations.
	Noise Underwater and Onshore	No activity leading to noise above existing baseline	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Cutting activities on and offshore.

Assessment Criteria	Aspects	RISERS and RET			
ENVIRONMENTAL	Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Atmospheric Emissions	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Only technically feasible option.
	Discharges to Sea (oily water and chemicals, sand)	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Remaining contents of lines (which will have been flushed and pigged) may discharge during recovery operations
	Waste Management	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Risers flushed, pigged and cleaned before disconnection, plan for materials to be recycled.
	Resource Consumption/ Recycling Value	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Redundant material recovered to be recycled
	Disturbance to Seabed / Land	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Minor seabed disturbance resulting from laying down, storing and removal activities
	Accidental Spills	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Risers flushed, pigged and cleaned before disconnection. No change to normal operations from vessels used.
	Underwater noise associated with removal of UTC and pile	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	If piling is used - High, But if cut away - Moderate. Assuming worst case - High.

6.3.4 Societal Impact

Assessment Criteria	Aspects	WATER INJECTION JUMPERS			
SOCIETAL	Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Fisheries Impact	No change to current operations	Where replacement jumpers are necessary, location of existing jumpers will clash and impede replacement jumpers installation. Therefore cannot be suspended long term	Where replacement jumpers are necessary, location of existing jumpers will clash and impede replacement jumpers installation. Therefore cannot be decommissioned insitu	No impact as recovered lines occur in existing corridors and are being replaced
	Community Disturbance - impacts onshore.	No incremental increase in waste coming onshore (only shipboard waste)	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site.
	Workforce Welfare & Local Employment	No new jobs will result from this option	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Possibility of some additional work created offshore and onshore
	Stakeholder Reaction	Low key reaction anticipated, general acceptance of decomm programme at stakeholder engagement.	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Low key reaction anticipated, general acceptance of decomm programme at stakeholder engagement.

Assessment Criteria	Aspects	RISERS and RET			
SOCIETAL	Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Fisheries Impact	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Only technically feasible option.
	Community Disturbance - impacts onshore.	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site.
	Workforce Welfare & Local Employment	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Possibility of some additional work created offshore and onshore
	Stakeholder Reaction	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	**Not applicable** due to technical constraints - option not comparatively assessed	Low key reaction anticipated, general acceptance of decomm programme at stakeholder engagement.

6.3.5 Economic

Assessment Criteria	Aspects		ALL STRUCTURES			
ECONOMICS		Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
	Cost	WI Risers and RETs	**Not applicable -** Current Integrity issues means replacement would be required	**Not applicable -** location will clash and impede installation of new risers	**Not applicable -** location will clash and impede installation of new risers	**Only technically feasible option.**
		WI Jumpers	36 existing WI jumpers are being re-used for Quad204 duty. However 3 jumpers not re-useable as do not have sufficient length for new configuration	Not applicable due to technical constraints - option not comparatively assessed	Not applicable due to technical constraints - option not comparatively assessed	Relatively Low cost as only 3 jumpers recovered
	Uncertainty	WI Risers and RETs	**Not applicable -** Current Integrity issues means replacement would be required	**Not applicable -** location will clash and impede installation of new risers	**Not applicable -** location will clash and impede installation of new risers	**Only technically feasible option.**
		WI Jumpers	36 existing WI jumpers are being re-used for Quad204 duty. However 3 jumpers not re-useable as do not have sufficient length for new configuration	Not applicable due to technical constraints - option not comparatively assessed	Not applicable due to technical constraints - option not comparatively assessed	Minor scope with no uncertainties

6.4 OTHER STRUCTURES

The CA workshop completed the assessment by criteria for each system. The overall summary sheet is included in Section 4.5.5, Table 4-5. The summary was developed from the individual worksheets in this appendix.

6.4.1 Technical Risk

Assessment Criteria	Aspects		OTHER STRUCTURES			
		Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
TECHNICAL RISK	Risk of Major Project Failure	Grout bags	Low risk of causing major project failure	Low risk of causing major project failure	Low risk of causing major project failure	Low risk of causing major project failure
		Mattresses	Low risk of causing major project failure	Low risk of causing major project failure	Low risk of causing major project failure	Possibility of rope failing when trying to recover e.g. potential that could break up during recovery, dropping on to adjacent structures planned for Quad 204 re-use. Resulting damage could delay start up.
		Frames for 2 pumping skids initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	Low risk of causing major project failure	**Not applicable** - DECC guidelines require large structures to be recovered	Technically difficult, heavy lift, pump frames are damaged. In close proximity to drill centre.
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers
	Technical Complexity and Challenges	Grout bags	Where grout bags are installed on equipment to be reused for Quad 204 without modification or relocation then they will be left as is. If associated with structures to be removed or relocated it is unlikely they can be reused. Existing Grout bags will not meet required functionality in new locations or on new equipment and therefore new grout bags will be deployed.	Grout Bags potentially deteriorate as can ropes.	Grout Bags potentially deteriorate as can ropes.	Where recovery of FTP/ jumpers is planned, then associated grout bags will be recovered. However Grout bags not designed for recovery (Deterioration over time). Recovery using baskets will be required. . Technically difficult to recover grout bags before Quad 204 EoFL.
		Mattresses	Quad 204 project plan to reuse mattresses where possible e.g. in current location. Mattress relocating for reuse could result in mattresses breaking up. Mattresses at crossings or dropped object protection will be left to perform current function.	No technical risk	No technical risk	Possibility of rope failing when trying to recover e.g. potential that could break up during recovery, dropping on to adjacent structures planned for Quad 204 re-use. Moderate
		Frames for 2 pumping skids initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	Have been in this state for many years. No technical risk	**Not applicable** - DECC guidelines require large structures to be recovered	Technically difficult, heavy lift, pump frames are damaged. In close proximity to drill centre.
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers

6.4.2 Safety

Assessment Criteria	Aspects		OTHER STRUCTURES			
		Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
SAFETY	Risk to Personnel	Grout bags	Where grout bags are installed on equipment to be reused for Quad 204 without modification or relocation then they will be left as is. No intervention required	No safety risk to personnel as nothing recovered.	No safety risk to personnel as nothing recovered.	Some lifting operations (baskets)
		Mattresses	Quad 204 project plan to reuse mattresses where possible e.g. in current location. Mattress relocating for reuse could result in mattresses breaking up. Mattresses at crossings or dropped object protection will be left to perform current function. No intervention required	No safety risk to personnel as nothing recovered.	No safety risk to personnel as nothing recovered.	Possibility of ropes failing when trying to recover e.g. potential that could break up during recovery, dropped objects.
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	No safety risk to personnel as nothing recovered.	**Not applicable** - DECC guidelines require large structures to be recovered	Some lifting operations of damaged structures, potential dropped objects on deck
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technical feasible option**. Would expect them to be recovered at same time as risers
	Risk to other Sea Users	Grout bags	Grout bags are generally located at FTPs and Jumpers and are therefore local to drill centres. No change to Quad 204 operational envelope.	Grout bags are generally located at FTPs and Jumpers and are therefore local to drill centres. No change to Quad 204 operational envelope.	Grout bags are generally located at FTPs and Jumpers and are therefore local to drill centres. No change to Quad 204 operational envelope.	Although recovery reduces total inventory on seabed, No real reduction in risk as within Quad 204 operational envelope.
		Mattresses	Quad 204 project plan to reuse mattresses where possible e.g. in current location. Mattresses at crossings or dropped object protection will be left to perform current function.	Redundant Mattresses will be Quad 204 operational envelope. No additional risk.	Redundant Mattresses will be Quad 204 operational envelope. No additional risk.	Although recovery reduces total inventory on seabed, No real reduction in risk as within Quad 204 operational envelope.
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	Large structures and potential risk to trawlers	**Not applicable** - DECC guidelines require large structures to be recovered	Recovery reduces risks to trawlers
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers
	Risk to those on Land	Grout bags	Nothing returned onshore, no risk	Nothing returned onshore, no risk	Nothing returned onshore, no risk	Where recovery of FTP/ jumpers is planned, then associated grout bags will be recovered. However Grout bags are not designed for recovery (Deterioration over time). Handling, recycling onshore will be difficult.
		Mattresses	Nothing returned onshore, no risk	Nothing returned onshore, no risk	Nothing returned onshore, no risk	Possibility of rope failing when transporting e.g. potential that mattresses could break up. Difficult to handle and recycle onshore
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	Nothing returned onshore, no risk	**Not applicable** - DECC guidelines require large structures to be recovered	Large structures would need to be dismantled at quayside before onward transportation for recycle.
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technical feasible option**. Would expect them to be recovered at same time as risers
	High consequence event, e.g. damage to major oil and gas trunklines, helicopter accident	Grout bags	Where grout bags are installed on equipment to be reused for Quad 204 without modification or relocation then they will be left as is. No intervention required.	Grout Bags potentially deteriorate as can ropes.	Grout Bags potentially deteriorate as can ropes.	Although Grout bags not designed for recovery, low risk due to size and weight of bags
		Mattresses	Quad 204 project plan to reuse mattresses where possible e.g. in current location. Mattress relocating for reuse could result in mattresses breaking up. Mattresses at crossings or dropped object protection will be left to perform current function. No intervention required	No risk to personnel as nothing disturbed	No risk to personnel as nothing disturbed	Possibility of rope failing when trying to recover e.g. potential that mattresses could break up during recovery, dropping on to adjacent structures planned for Quad 204 re-use.
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	No risk to personnel as nothing disturbed	**Not applicable** - DECC guidelines require large structures to be recovered	Heavy lift, large pump frames are damaged. In close proximity to drill centre. Could result in major escalation.
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers

6.4.3 Environmental Impact

Assessment Criteria	Aspects		OTHER STRUCTURES			
		Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
ENVIRONMENTAL	Atmospheric Emissions	Grout bags	No significant additional emissions	No significant additional emissions, monitoring not required	No significant additional emissions, monitoring not required	Potentially multiple vessels offshore, road transport onshore and machinery used for recycling.
		Mattresses	No significant additional emissions	No significant additional emissions, monitoring not required	**Not Applicable** - DECC guidance is for removal of mattresses.	Potentially multiple vessels offshore, road transport onshore and machinery used for recycling.
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	Additional monitoring vessel emissions	**Not Applicable** - DECC guidelines require large structures to be recovered	Potentially multiple vessels offshore, road transport onshore and machinery used for recycling.
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered and recycled (where possible) at same time as risers
	Discharges to Sea	Grout bags	No increase of discharges to sea, benign materials	No increase of discharges to sea, benign materials	No increase of discharges to sea, benign materials	No increase of discharges to sea, benign materials
		Mattresses	No increase of discharges to sea, benign materials	No increase of discharges to sea, benign materials	**Not Applicable** - DECC guidance is for removal of mattresses.	No increase of discharges to sea, benign materials
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	No increase of discharges to sea	**Not Applicable** - DECC guidelines require large structures to be recovered	Only discharges to sea associated with vessel activities.
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers
	Waste Management	Grout bags	Nothing returned onshore - no waste	Nothing returned onshore - no waste	Nothing returned onshore - no waste	Benign materials can be recycled
		Mattresses	Nothing returned onshore, no risk	Nothing returned onshore - no waste	**Not Applicable** - DECC guidance is for removal of mattresses.	Benign materials can be recycled
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	Nothing returned onshore - no waste	**Not Applicable** - DECC guidelines require large structures to be recovered	Benign materials can be recycled
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers

Assessment Criteria	Aspects		OTHER STRUCTURES			
		Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
ENVIRONMENTAL (Continued)	Resource Consumption/Recycling - focused on loss of resources (material not recovered)	Grout bags	No additional resource being used as items will be reused.	Not losing resource and no additional being used.	**Not Applicable** - DECC guidance is for removal of mattresses.	Recovered onshore for recycling.
		Mattresses	No additional resource being used as items will be reused.	Not losing resource and no additional being used.	Nothing returned onshore, no recycle	Recovered onshore for recycling.
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	Not losing resource and no additional being used.	**Not Applicable** - DECC guidelines require large structures to be recovered	Recovered onshore for recycling.
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers
	Disturbance to Seabed / Land	Grout bags	No disturbance	No disturbance	No disturbance	Minimal additional disturbance on seabed as recovery occurs at FTPs and jumpers etc already being removed. Minimal disturbance on land as disposal recycle.
		Mattresses	No disturbance	No disturbance	No disturbance	Minimal additional disturbance on seabed as recovery occurs at FTPs and jumpers etc already being removed. Minimal disturbance on land as disposal recycle.
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	No disturbance	**Not Applicable** - DECC guidelines require large structures to be recovered	Moderate short term disturbance on seabed anticipated due to size and weight of structures
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	Not Applicable - Potentially would impede new riser terminations installation low	Not Applicable - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers
	Accidental Spills	Grout bags	Solid Structures / Benign Materials, vessel activity similar to normal operations.	Solid Structures / Benign Materials, vessel activity similar to normal operations.	Solid Structures / Benign Materials, vessel activity similar to normal operations.	Solid Structures / Benign Materials, multiple vessels likely to be involved in removal.
		Mattresses	Solid Structures / Benign Materials, vessel activity similar to normal operations.	Solid Structures / Benign Materials, vessel activity similar to normal operations.	**Not Applicable** - DECC guidance is for removal of mattresses.	Solid Structures / Benign Materials, multiple vessels likely to be involved in removal.
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	Multiple vessels likely to be involved in removal.	**Not Applicable** - DECC guidelines require large structures to be recovered	Multiple vessels likely to be involved in removal. Increased risk of loss of well containment from dropped object during recovery operations.
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers
	Noise Underwater and Onshore	Grout bags	No increase anticipated	No increase anticipated	No increase anticipated	No activity leading to noise above existing baseline offshore, some increase in noise associated with recycling (crushing)
		Mattresses	No increase anticipated	No increase anticipated	**Not Applicable** - DECC guidance is for removal of mattresses.	No activity leading to noise above existing baseline offshore, some increase in noise associated with recycling (crushing)
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	No increase anticipated	**Not Applicable** - DECC guidelines require large structures to be recovered	No activity leading to noise above existing baseline offshore, some increase onshore associated with dismantling activity.
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers

6.4.4 Societal Impact

Assessment Criteria	Aspects		OTHER STRUCTURES			
		Outline Description	**RE-USE AT QUAD204 START-UP**	**SUSPEND LONG TERM**	**DECOMMISSION INSITU**	**RECOVER AND RECYCLE**
SOCIETAL	Fisheries Impact	Grout bags	No change to current operations	Increase infrastructure on seabed, but in existing corridors / over trawlable.	Increase infrastructure on seabed, but in existing corridors.	No impact as grout bags occur in existing corridors / exclusions zones, so no additional fishing area available as a result of their removal.
		Mattresses	No change to current operations	Increase infrastructure on seabed, but in existing corridors / over trawlable.	**Not Applicable** - DECC guidance is for removal of mattresses.	No impact as grout bags occur in existing corridors / exclusions zones, so no additional fishing area available as a result of their removal.
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	Leaving redundant large structures on seabed, but in existing corridors / exclusions zones.	**Not Applicable** - DECC guidelines require large structures to be recovered	No impact as structure is in existing corridors / exclusions zones, so no additional fishing area available as a result of their removal.
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers
	Community Disturbance - impacts onshore.	Grout bags	No incremental increase in waste coming onshore (only shipboard waste)	No incremental increase in waste coming onshore (only shipboard waste)	No incremental increase in waste coming onshore (only shipboard waste)	Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site
		Mattresses	No incremental increase in waste coming onshore (only shipboard waste)	No incremental increase in waste coming onshore (only shipboard waste)	**Not Applicable** - DECC guidance is for removal of mattresses.	Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	No incremental increase in waste coming onshore (only shipboard waste)	**Not Applicable** - DECC guidelines require large structures to be recovered	Movements of waste onshore and noise associated with deconstruction. However, will use licensed onshore site
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers
	Waste Management	Grout bags	No new jobs will result from this option	No new jobs will result from this option	No new jobs will result from this option	Potential benefit is marginal due to quantity of structures recovered
		Mattresses	No new jobs will result from this option	No new jobs will result from this option	**Not Applicable** - DECC guidance is for removal of mattresses.	Potential benefit is marginal due to quantity of structures recovered
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	No new jobs will result from this option	**Not Applicable** - DECC guidelines require large structures to be recovered	Potential benefit is marginal due to quantity of structures recovered
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers
	Workforce Welfare & Local Employment	Grout bags	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.	Potential for some negative stakeholder reaction to insitu decommissioning	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.
		Mattresses	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.	Potential for some negative stakeholder reaction to insitu decommissioning	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	Potential for some negative stakeholder reaction to long term in field suspension	**Not Applicable** - DECC guidelines require large structures to be recovered	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers

Assessment Criteria	Aspects		OTHER STRUCTURES			
	Outline Description		RE-USE AT QUAD204 START-UP	SUSPEND LONG TERM	DECOMMISSION INSITU	RECOVER AND RECYCLE
SOCIETAL (Continued)	Stakeholder Reaction	Grout bags	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.
		Mattresses	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.	Potential for some negative stakeholder reaction to insitu decommissioning	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	Potential for some negative stakeholder reaction to long term in field suspension	**Not applicable** - DECC guidelines require large structures to be recovered	Minimal reaction from stakeholders anticipated, general acceptance of decomm programme at stakeholder engagement.
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers

6.4.5 Economic

Assessment Criteria	Aspects		OTHER STRUCTURES			
		Outline Description	RE-USE AT QUAD204 START-UP	SUSPEND LONG TERM	DECOMMISSION INSITU	RECOVER AND RECYCLE
ECONOMIC	Cost	Grout bags	Low relative cost	Low relative cost	Low relative cost	Moderate relative cost
		Mattresses	Low relative cost	Low relative cost	Low relative cost	Moderate relative cost
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	Low relative cost	**Not applicable** - DECC guidelines require large structures to be recovered	Moderate relative cost
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers
	Uncertainties	Grout bags	No uncertainties	No uncertainties	No uncertainties	Ability to recover due to integrity of grout bags - may collapse when moved
		Mattresses	No uncertainties	No uncertainties	No uncertainties	Ability to recover due to integrity of mattresses - may collapse when moved
		Frames pump skids, initially installed for PWRI, never commissioned.	**Not Applicable** - No functionality for Quad204 use and not connected to Schiehallion systems. No potential reuse.	No uncertainties	**Not applicable** - DECC guidelines require large structures to be recovered	Extent of existing damage to the frames may preclude recovery
		2 anode skids	**Not Applicable** - Redundant equipment near to the risers. No functionality for Quad204.	**Not Applicable** - Potentially would impede new riser terminations installation low	**Not Applicable** - classed as debris	**Only technically feasible option**. Would expect them to be recovered at same time as risers

7.0 APPENDIX B – FIELD INFRASTRUCTURE DETAILS

7.1 OIL PRODUCTION STRUCTURES - Returned to Service at Quad 204 Start-Up

7.1.1 OIL Production Jumpers

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1778/1-3	Central	Jumper (Bundle)	Production	6x6x2	23	In Service	Isolated at XT & M1A then flushed locally with glycol / potable water	Return to Service
PL1779/1-3	Central	Jumper (Bundle)	Production	6x6x2	23	In Service	Isolated at XT & M1A then flushed locally with glycol / potable water	Return to Service
PL1389/1-3	Central	Jumper (Bundle)	Production	6x6x2	47	In Service	Isolated at M1A & M1 then flushed locally with glycol / potable water	Return to Service
PL1775/1-3	Central	Jumper (Bundle)	Production	6x6x2	25	In Service	Isolated at XT & M1B then flushed locally with glycol / potable water	Return to Service
PL1393/1-3	Central	Jumper (Bundle)	Production	6x6x2	72	In Service	Isolated at M1B, & M1 then flushed locally with glycol / potable water	Return to Service
PL1394JCP08/1-3	Central	Jumper (Bundle)	Production	6x6x2	26	In Service	Isolated at XT & M1F then flushed locally with glycol / potable water	Return to Service
PL1394JCP22/1-3	Central	Jumper (Bundle)	Production	6x6x2	25	In Service	Isolated at XT & M1F then flushed locally with glycol / potable water	Return to Service
PL1394/1-3	Central	Jumper (Bundle)	Production	6x6x2	45	In Service	Isolated at M1F & M1 then flushed locally with glycol / potable water	Return to Service
PL2415	Central	Jumper (Bundle)	Production	6x6x2	52	In Service	Isolated at XT CP04, CP23 & M1 then flushed locally with glycol / potable water	Return to Service
PL2419	Central	Jumper (Bundle)	Production	6x6x2	100	In Service	Isolated at XT CP04, CP23 & M1 then flushed locally with glycol / potable water	Return to Service
PL1392/1-3	Central	Jumper (Bundle)	Production	6x6x2	22	In Service	Isolated at XT CP05, & M1 then flushed locally with glycol / potable water	Return to Service
PL1395/1-3	Central	Jumper (Bundle)	Production	6x6x2	26	In Service	Isolated at XT CP09, & M1 then flushed locally with glycol / potable water	Return to Service
PL1417/1-3	West	Jumper (Bundle)	Production	6x6x2	24	In Service	Isolated at XT then flushed locally with glycol / potable water	Return to Service
PL1419/1-3	West	Jumper (Bundle)	Production	6x6x2	27	In Service	Isolated at XT then flushed locally with glycol / potable water	Return to Service
PL1418/1-3	West	Jumper (Bundle)	Production	6x6x2	53	In Service	Isolated at XT then flushed locally with glycol / potable water	Return to Service
PL1714/1-3	West	Jumper (Bundle)	Production	6x6x2	46	In Service	Isolated at M24 & M21 then flushed locally with glycol / potable water	Return to Service
PL2021JWP07/1-3	West	Jumper (Bundle)	Production	6x6x2	45	In Service	Isolated at XT then flushed locally with glycol / potable water	Return to Service
PL2022JWP13/1-3	West	Jumper (Bundle)	Production	6x6x2	38	In Service	Isolated at XT then flushed locally with glycol / potable water	Return to Service
PL1362/1-3	Loyal	Jumper (Bundle)	Production	6x6x2	25	In Service	Isolated at XT then flushed locally with glycol / potable water	Return to Service
PL1363/1-3	Loyal	Jumper (Bundle)	Production	6x6x2	25	In Service	Isolated at XT then flushed locally with glycol / potable water	Return to Service
PL1364/1-3	Loyal	Jumper (Bundle)	Production	6x6x2	50	In Service	Flush, isolate at M43 and M1 then recover and cross over test and prod and redeploy	Return to Service
PL1361R	Loyal	Jumper (Bundle)	Production	8	55	In Service	Flushed, pigged and suspended then relocated from F42 to M44	Return to Service
PL2016.1-3(JLP03)	Loyal	Jumper (Bundle)	Production	6x6x2	62	In Service	Isolated at XT then flushed locally with glycol / potable water	Return to Service
PL2250	NWAD	Jumper (Bundle)	Production	6x6x2	114	In Service	Isolated at XT then flushed locally with glycol / potable water	Return to Service
		Total No	**70**	**Total Length (m)**	**3040**	Bundles have 3 Jumpers 2x Oil + 1x Gas in each bundle		

7.2 OIL Flowline Jumpers - to be suspended, but not recovered within Phase 1 Decomm window (recovery post 2015)

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1774/1-3	Central	Jumper (Bundle)	Production	6x6x2	23	In Service	Isolated at XT & M1B then flushed locally with glycol / potable water	Brought onshore 2021
PL2017.1-3(JLP07)	Loyal	Jumper (Bundle)	Production	6x6x2	61	In Service	Isolated at XT LP07 & M43 then flushed locally with glycol / potable water	Brought onshore 2018
		Total No	**6**	**Total Length (m)**	**252**	Bundles have 3 Jumpers 2x Oil + 1x Gas in each bundle		

7.3 CONTROL STRUCTURES - Returning to Service after Quad 204 Start-Up

7.3.1 CONTROL Fly to Place Connector (FTP)

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
X	North	FTP	Controls	n/a	112	In Service	Isolate & Suspend	Return to Service
X	North	FTP	Controls	n/a	79	In Service	Relocated from UET U50 to CDA C30 in 2014	Return to Service
X	North	FTP	Controls	n/a	76	In Service	Relocated from XT NW01 to CDA C29 in 2014	Return to Service
X	FPSO	FTP	Controls	n/a	49	In Service	Relocated from DUTA D3 to DUTA D30 in 2015 (Parked 2013 - Hooked up 2015)	Return to Service
X	Loyal	FTP	Controls	n/a	68	In Service	Relocated from XT LW04A to CDA C31 in 2014	Return to Service
PL1429	West	FTP	Controls	n/a	110	In Service	Relocated from C21 to C21R (Parked 2013 - Hooked up 2014)	Return to Service
PL1430	West	FTP	Controls	n/a	80	In Service	Relocated from C21 to C21R (Parked 2013 - Hooked up 2014)	Return to Service
PL1428	West	FTP	Controls	n/a	48	In Service	Relocated from C21 to C21R (Parked 2013 - Hooked up 2014)	Return to Service
PL2024JWP 07/1-11	West	FTP	Controls	n/a	130	In Service	Relocated from WP13 to C21R in 2014	Return to Service
PL1715.1-13JWP13	West	FTP	Controls	n/a	92	In Service	Relocated from C21 to C21R (Parked 2013 - Hooked up 2014)	Return to Service
PLU2175	West	FTP	Controls	n/a	114	In Service	Relocated from C21 to C21R (Parked 2013 - Hooked up 2014)	Return to Service
PL1780/1-3	Central	FTP	Controls	n/a	60	Out of service	REMOVED 2012?? Relocated from C1A to C35 in 2014	Return to Service
PLU1406JCP03/1-3	Central	FTP	Controls	n/a	61	In Service	Relocated from C1D to C35 in 2014 (Parked 2013 - Hooked up 2014)	Return to Service
PL1781/1-3	Central	FTP	Controls	n/a	70	In Service	Relocated from C1A to C35 in 2014	Return to Service
PL1408/1-3	Central	FTP	Controls	n/a	60	Out of service	REMOVED 2012?? Relocated from C1P to C35 in 2014	Return to Service
PL1407/1-3	Central	FTP	Controls	n/a	39	In Service	Relocated from C1P to C1PR in 2014	Return to Service
PL1411/1-3	Central	FTP	Controls	n/a	60	In Service	Relocated from C1P to C1PR in 2014	Return to Service
PLU1410JCP08/1-3	Central	FTP	Controls	n/a	94	In Service	Relocated from C1P to C1PR in 2014	Return to Service
XX	Central	FTP	Controls	n/a	9	In Service	Relocated from C1P to C1PR in 2014	Return to Service
PL1777/1-3	Central	FTP	Controls	n/a	42	In Service	Relocated from C1B to C36 in 2014	Return to Service
PLU2283	Central	FTP	Controls	n/a	68	In Service	Flush, preserve & suspend	Return to Service
XX	Central	FTP	Controls	n/a	64	In Service	Isolate & suspend	Return to Service
XX	Central	FTP	Controls	n/a	84	In Service	Isolate & suspend	Return to Service
XX	Central	FTP	Controls	n/a	70	In Service	Isolate & suspend	Return to Service
XX	Central	FTP	Controls	n/a	94	In Service	Isolate & suspend	Return to Service
XX	Central	FTP	Controls	n/a	TBD	In Service	Isolate & suspend	Return to Service
XX	Central	FTP	Controls	n/a	TBD	In Service	Isolate & suspend	Return to Service
XX	Loyal	FTP	Controls	n/a	56	In Service	Isolate & suspend	Return to Service
XX	Loyal	FTP	Controls	n/a	56	In Service	Isolate & suspend	Return to Service
XX	Loyal	FTP	Controls	n/a	74	In Service	Isolate & suspend	Return to Service
PLU2060	Loyal	COCOT FTP	Controls	n/a	91	In Service	Isolate & suspend	Return to Service
PLU2061	Loyal	COCOT FTP	Controls	n/a	30	In Service	Isolate & suspend	Return to Service
PLU2244	FPSO for NWAD	FTP	Controls	n/a	TBD	In Service	Flush, preserve, disconnect and wet store for D30 hook-up in 2015	Return to service
PLU2244	NWAD	FTP	Controls	n/a	TBD	In Service	Isolate & suspend	Return to Service
PLU2549	NWAD	FTP	Controls	n/a	152	In Service	Isolate & suspend	Return to Service
PLU2176	West	FTP	Controls	n/a	54	In Service	Flush, preserve, disconnect and wet store for C25 hook-up	Return to Service
PLU2177	West	FTP	Controls	n/a	52	In Service	Flush, preserve & suspend	Return to Service
PLU2178	West	COCOT FTP	Controls	n/a	81	In Service	Isolate & suspend	Return to Service

CONTROL Fly to Place Connector (FTP) continued

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PLU2179	West	COCOT FTP	Controls	n/a	81	In Service	Isolate & suspend	Return to Service
PLU2180	West	COCOT FTP	Controls	n/a	43	In Service	Isolate & suspend	Return to Service
PLU2181	West	COCOT FTP	Controls	n/a	108	In Service	Isolate & suspend	Return to Service
PLU2182	West	MARS FTP	Controls	n/a	50	In Service	Isolate & suspend (MARS??)	Return to Service
PLU2243	West	FTP	Controls	n/a	TBD	In Service	Isolate & suspend	Return to Service
XX	West	FTP	Controls	n/a	40	In Service	Isolate & suspend	Return to Service
XX	West	FTP	Controls	n/a	74	In Service	Isolate & suspend	Return to Service
XX	West	FTP	Controls	n/a	53	In Service	Isolate & suspend	Return to Service
XX	West	FTP	Controls	n/a	70	In Service	Isolate & suspend	Return to Service
PLU2673	West	MARS FTP	Controls	n/a	20	In Service	Isolate & suspend (MARS??)	Return to Service
PLU2981	Central	FTP	Controls	n/a	93	In Service	Isolate & suspend	Return to Service
PLU2982	Central	FTP	Controls	n/a	93	In Service	Isolate & suspend	Return to Service
PLU2935	Loyal	FTP	Controls	n/a	60	In Service	Isolate & suspend	Return to Service
		Total No	**51**	**Total Length (m)**	**3264**			

7.3.2 Controls Distribution Assembly (CDA):

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
XX	Central	CDA	Controls	n/a	n/a	In Service	Flushed & suspend	Return to Service
XX	Central	CDA	Controls	n/a	n/a	In Service	Flushed & suspend	Return to Service
XX	Central	CDA	Controls	n/a	n/a	In Service	Suspend	Return to Service
XX	Central	CDA	Controls	n/a	n/a	In Service	Isolate & Suspend	Return to Service
		Total No	**4**	**Total Length (m)**	**n/a**			

7.4 GAS SYSTEM STRUCTURES Returning to Service after Quad 204 Start-Up

7.4.1 GAS Flowlines

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1396	Central	Flowline	Gas Lift	8	2872	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
PL1759	Foinaven	Flowline	Gas Import / Export	10	6767	In service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	In Service
PL1760	Sullom Voe	Flowline	Gas Import / Export	12	16803	In service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	In Service
PL2167	Central	Flowline	Gas Import / Export	8	2628	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
PL1365	Loyal	Flowline	Gas Lift	6	5979	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
PL2248	NWAD	Flowline	Gas Lift	8	3041	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
PL1420	West	Flowline	Gas lift	6	3270	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
		Total No	**7**	**Total Length (m)**	**41360**			

7.4.2 GAS Flowline Termination Assemblies (FTAs)

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1396	Central	FTA	Gas Lift	8	5	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
PL1420	FPSO for Central	FTA	Gas Lift	8	5	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
PL1420	West	FTA	Gas Lift	6	5	In Service	Isolated at FTA F25, M21, F35 & flushed locally with glycol / water	Return to service
PL1420	FPSO for West	FTA	Gas Lift	6	5	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
PL1365	Loyal	FTA	Gas Lift	6	5	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
PL1365	FPSO for Loyal	FTA	Gas Lift	6	5	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
PL1760	Central	FTA	Gas Export	10	5	In Service	Isolated at M1J manifold and M1C & flushed locally with glycol / water	In Service
PL2167	FPSO for GE	FTA	Gas Import / Export	8	5	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
PL2167	Central	FTA	Gas Import / Export	8	5	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
PL2248	NWAD	FTA	Gas Lift	8	5	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
PL2248	FPSO for NWAD	FTA	Gas Lift	8	5	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
XX	Central	FTA	Gas Export	n/a	n/a	In Service	Isolated at M1J manifold and M1C & flushed locally with glycol / water	In Service
XX	Foinaven	FTA	Gas Export	n/a	n/a	In Service	In Service	In Service
		Total No	**13**	**Total Length (m)**	**55**			

7.4.3 Gas Jumpers

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1759	Central	Gas Jumper	Gas	8	78	In Service	Isolated at M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to Service
PL1760	Central	Gas Jumper	Gas	8	75	In Service	Isolated at M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to Service
PL2842JM1J	Central	Gas Jumper	Gas	8	65	In Service	Isolated at M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to Service
PL1849	Central	Gas Jumper	Gas	8	94	In Service	Isolated at M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to Service
PL1396	Central	Gas Jumper	Gas	8	107	In Service	Isolated at M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to Service
PL2167J2	Central	Gas Jumper	Gas	6	360	In Service	Isolated at M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to Service
PL2843JM8	Central	Gas Jumper	Gas	8	35	In Service	Isolated at M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to Service
PL1420	West	Gas Jumper	Gas	6	72	In Service	Isolated at M25,M21 & F25, flushed & then disconnect and hook up from M21 to M25	Return to Service
PL1365	Loyal	Gas Jumper	Gas	6	87	In Service	Isolated at XTs,M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to Service
PL2248	NWAD	Gas Jumper	Gas	8	69	In Service	Isolated at XTs,M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to Service
PL1420	FPSO to GL	Gas Jumper	Gas	6	104	In Service	Isolated at XTs,M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to Service
XX	FPSO to Loyal	Gas Jumper	Gas	6	114	In Service	Isolated at XTs,M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to Service
PL2248	FPSO to GL	Gas Jumper	Gas	6	275	In Service	Isolated at XT's, M31, F11 , M1J & M1C & then disconnect and hook up from F131 to M32	Return to service
PL2167J1	FPSO to GI / GE	Gas Jumper	Gas	6	90	In Service	Isolated at M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to Service
PL1431	FPSO to Disposal	Gas Jumper	Gas	8	41	In Service	Isolated at M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to Service
		Total No	**15**	**Total Length (m)**	**1666**			

7.4.4 GAS Manifolds

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1849	Central	Manifold	Gas Import / Export / Lift	n/a	n/a	In Service	Isolated at XTs, M31, F31 & F21 then flushed locally with glycol / potable water	Return to service
PL2843M8	Central	Manifold	Gas Import / Export	n/a	n/a	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
XX	Central	Manifold	Gas Import / Export	n/a	n/a	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
PL1431	FPSO	Manifold	Gas Import / Export	n/a	n/a	In Service	Isolated at XT's, M31, F11 , M1J & M1C then flushed locally with glycol / potable water	Return to service
		Total No	**4**	**Total Length (m)**	**n/a**			

7.4.5 GAS Pipeline End Manifold

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
XX	Foinaven	PLEM	Gas Export	n/a	n/a	In Service	In Service	In Service

7.5 WATER INJECTION STRUCTURES - Returning to Service after Quad 204 Start-Up

7.5.1 WI Flowlines

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1397	Central	Flowline	Water Injection	12	2548	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1366	Loyal	Flowline	Water Injection	10	4883	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1412	North	Flowline	Water Injection	10	2271	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL2247	NWAD	Flowline	Water Injection	12	3141	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1421	West	Flowline	Water Injection	10	3507	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1982	West	Flowline	Water Injection	12	2840	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
		Total No	**6**	**Total Length (m)**	**19190**			

7.5.2 WI Flowline Termination Assembly (FTA)

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1397	Central	FTA	Water Injection	10	5	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1397	FPSO for Central	FTA	Water Injection	10	5	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1421	West	FTA	Water Injection	10	5	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1421	FPSO for West	FTA	Water Injection	10	5	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1982	West	FTA	Water Injection	8	5	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1982	FPSO for West	FTA	Water Injection	10	5	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1366	Loyal	FTA	Water Injection	10	5	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1412	North	FTA	Water Injection	10	5	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1366	North	FTA	Water Injection	10	5	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1412	FPSO for North	FTA	Water Injection	10	5	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL2247	NWAD	FTA	Water Injection	10	5	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL2247	FPSO for NWAD	FTA	Water Injection	10	5	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
		Total No	**12**	**Total Length (m)**	**60**			

7.5.3 WI Jumper

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1397J CW17	Central	Water Inj Jumper	Water Injection	6	29	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1397J CW18	Central	Water Inj Jumper	Water Injection	6	37	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1397J CW19	Central	Water Inj Jumper	Water Injection	6	28	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1397J CW15	Central	Water Inj Jumper	Water Injection	6	52	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1397	Central	Water Inj Jumper	Water Injection	10	45	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1398	Central	Water Inj Jumper	Water Injection	6	31	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1399	Central	Water Inj Jumper	Water Injection	6	44	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1401	Central	Water Inj Jumper	Water Injection	6	24	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1400	Central	Water Inj Jumper	Water Injection	6	35	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1397	Central	Water Inj Jumper	Water Injection	10	83	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service

WI Jumper continued

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1421J WW08	West	Water Inj Jumper	Water Injection	6	25	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1421J WW09	West	Water Inj Jumper	Water Injection	6	21	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1421J WW10	West	Water Inj Jumper	Water Injection	6	58	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL2023J WW11	West	Water Inj Jumper	Water Injection	6	42	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL2414	West	Water Inj Jumper	Water Injection	6	26	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL2174	West	Water Inj Jumper	Water Injection	6	35	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1982	West	Water Inj Jumper	Water Injection	12	67	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1421	West	Water Inj Jumper	Water Injection	10	48	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1422	West	Water Inj Jumper	Water Injection	6	34	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1423	West	Water Inj Jumper	Water Injection	6	23	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1424	West	Water Inj Jumper	Water Injection	6	28	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1421	West	Water Inj Jumper	Water Injection	10	38	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1368/1-3	Loyal	Water Inj Jumper	Water Injection	6	48	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1367/1-3	Loyal	Water Inj Jumper	Water Injection	6	36	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1369/1-3	Loyal	Water Inj Jumper	Water Injection	6	32	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1366	Loyal	Water Inj Jumper	Water Injection	10	52	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL2251	NWAD	Water Inj Jumper	Water Injection	6	36	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL2252	NWAD	Water Inj Jumper	Water Injection	6	38	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL2247	NWAD	Water Inj Jumper	Water Injection	10	59	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1713	North	Water Inj Jumper	Water Injection	6	35	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1413	North	Water Inj Jumper	Water Injection	6	28	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1412	North	Water Inj Jumper	Water Injection	10	55	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1366	North	Water Inj Jumper	Water Injection	10	48	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL1982	FPSO to West	Water Inj Jumper	Water Injection	10	244	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
PL2247	FPSO to NWAD	Water Inj Jumper	Water Injection	10	255	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to Service
		Total No	**35**	**Total Length (m)**	**1819**			

7.5.4 WI Manifold

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1397	Central	Manifold	Water Injection	n/a	n/a	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1397	Central	Manifold	Water Injection	n/a	n/a	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1421	West	Manifold	Water Injection	n/a	n/a	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1421	West	Manifold	Water Injection	n/a	n/a	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1366	Loyal	Manifold	Water Injection	n/a	n/a	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL1412	North	Manifold	Water Injection	n/a	n/a	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL2247	FPSO	Manifold	Water Injection	n/a	n/a	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
PL2247	NWAD	Manifold	Water Injection	n/a	n/a	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Return to service
		Total No	**8**	**Total Length (m)**	**n/a**			

7.6 WI Flowline Jumper to be suspended, but not recovered within Phase 1 Decomm window (recovery post 2015)

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1414	North	Water Inj Jumper	Water Injection	6	34	In Service	Isolated at XT NW02 & M61 then flushed locally with glycol / potable water	Brought onshore 2018

7.7 OIL PRODUCTION STRUCTURES – LONG TERM SUSPENSION

7.7.1 OIL Flowlines

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1384	Central	Flowline	Production	10	2550	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1385	Central	Flowline	Production	10	2554	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1386	Central	Flowline	Production	10	2530	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1387	Central	Flowline	Production	8	2579	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1361	Loyal	Flowline	Production	8	5795	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1360	Loyal	Flowline	Production	10	5755	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL2245	NWAD	Flowline	Production	10	2820	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1415	West	Flowline	Production	8	2867	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1416	West	Flowline	Production	10	2822	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL2141	West	Flowline	Production	10	2507	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
		Total No	**10**	**Total Length (m)**	**32779**			

7.7.2 OIL Flowline Termination Assemblies (FTA's)

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1387	Central	FTA	Production	8	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1385	Central	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1387	FPSO for Central	FTA	Production	8	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1385	FPSO for Central	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1384	Central	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1386	Central	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1384	FPSO for Central	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1386	FPSO for Central	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1415	West	FTA	Production	8	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1416	West	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1415	FPSO for West	FTA	Production	8	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1416	FPSO for West	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL2141	West	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL2141	FPSO for West	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1361	Loyal	FTA	Production	8	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1361	Loyal	FTA	Production	8	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1360	Loyal	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL1360	Loyal	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL2245	NWAD	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
PL2245	FPSO for NWAD	FTA	Production	10	5	In Service	Flushed, Pigged, Treated and Suspended	Suspended & Monitor
		Total No	**20**	**Total Length (m)**	**100**			

7.7.3 OIL Manifold

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
XX	Central	Manifold	Production & GL	n/a	n/a	In Service	Isolated at XTs & M1D, flushed locally with glycol / potable water and suspended	Suspended & Monitor

7.8 CONTROL STRUCTURES – LONG TERM SUSPENSION

7.8.1 CONTROL Static Umbilical

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PLU2242	Central	Static Umbilical	Controls	10	4750	In Service	Flush, preserve & suspend	Suspended & Monitor
PL1402/1-5	Central	Static Umbilical	Controls	10	2800	Suspended	Suspended & Monitor	Suspended & Monitor
PL1379/1-7	FPSO	Static Umbilical	Controls	10	250	Suspended	Suspended & Monitor	Suspended & Monitor
PL1425/1-7	FPSO	Static Umbilical	Controls	10	200	Suspended	Suspended & Monitor	Suspended & Monitor
PL1434/1-2	Gas Disposal	Static Umbilical	Controls	10	3679	In Service	Flush, preserve & suspend	Suspended & Monitor
PL1371/1-5	Loyal	Static Umbilical	Controls	10	4812	In Service	Flush, preserve & suspend	Suspended & Monitor
PL1383/1-5	North	Static Umbilical	Controls	10	2382	In Service	Flush, preserve & suspend	Suspended & Monitor
PLU2244	NWAD	Static Umbilical	Controls	10	3977	In Service	Flush, preserve & suspend	Suspended & Monitor
PLU2243	West	Static Umbilical	Controls	10	3441	In Service	Flush, preserve & suspend	Suspended & Monitor
PL1427/1-6	West	Static Umbilical	Controls	10	2986	Suspended	Suspended & Monitor	Suspended & Monitor
		Total No	**10**	**Total Length (m)**	**29277**			

7.8.2 CONTROL Umbilical End Termination (UET)

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PLU2242	Central	UET	Controls	n/a	n/a	In Service	Flush, preserve & suspend	Suspended & Monitor
PL1402/1-5	Central	UET	Controls	n/a	n/a	Suspended	Suspended & Monitor	Suspended & Monitor
PL1379/1-7	FPSO	UET	Controls	n/a	n/a	Suspended	Suspended & Monitor	Suspended & Monitor
PL1425/1-7	FPSO	UET	Controls	n/a	n/a	Suspended	Suspended & Monitor	Suspended & Monitor
PL1434/1-2	Gas Disposal	UET	Controls	n/a	n/a	In Service	Flush, preserve & suspend	Suspended & Monitor
PL1371/1-5	Loyal	UET	Controls	n/a	n/a	In Service	Flush, preserve & suspend	Suspended & Monitor
PL1383/1-5	North	UET	Controls	n/a	n/a	In Service	Flush, preserve & suspend	Suspended & Monitor
PLU2244	FPSO for NWAD	UET	Controls	n/a	n/a	In Service	Flush, preserve & suspend	Suspended & Monitor
PLU2243	FPSO for Gas Disposal	UET	Controls	n/a	n/a	In Service	Flush, preserve & suspend	Suspended & Monitor
PL1427/1-6	West	UET	Controls	n/a	n/a	Suspended	Suspended & Monitor	Suspended & Monitor
PLU2242	Central	UET	Controls	n/a	n/a	In Service	Flush, preserve & suspend	Suspended & Monitor
PL1402/1-5	Central	UET	Controls	n/a	n/a	Suspended	Suspended & Monitor	Suspended & Monitor
PL1379/1-7	FPSO	UET	Controls	n/a	n/a	Suspended	Suspended & Monitor	Suspended & Monitor
PL1425/1-7	FPSO	UET	Controls	n/a	n/a	Suspended	Suspended & Monitor	Suspended & Monitor
PL1434/1-2	Gas Disposal	UET	Controls	n/a	n/a	In Service	Flush, preserve & suspend	Suspended & Monitor
PL1371/1-5	Loyal	UET	Controls	n/a	n/a	In Service	Flush, preserve & suspend	Suspended & Monitor
PL1383/1-5	North	UET	Controls	n/a	n/a	In Service	Flush, preserve & suspend	Suspended & Monitor
PLU2244	NWAD	UET	Controls	n/a	n/a	In Service	Flush, preserve & suspend	Suspended & Monitor
PL1427/1-6	West	UET	Controls	n/a	n/a	Suspended	Suspended & Monitor	Suspended & Monitor
PL1434/1-2	Gas Disposal	UET	Controls	n/a	n/a	In Service	Flush, preserve & suspend	Suspended & Monitor
		Total No	**20**	**Total Length (m)**	**n/a**			

7.8.3 CONTROLS Fly to Place connector (FTP)

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1435/1-2	Gas Disposal	FTP	Controls	n/a	82	In Service	Flush, preserve & suspend	Suspended & Monitor
PLU2258	NWAD	FTP	Controls	n/a	152	Out of use	Out of use - within IPR (Brought onshore 2013????)	???
PL1426/1-6	FPSO	FTP	Controls	10	190	Suspended	Suspended & Monitor	Suspended & Monitor
PLU1889	FPSO	FTP	Controls	10	255	Suspended	Suspended & Monitor	Suspended & Monitor
		Total No	**4**	**Total Length (m)**	**679**			

7.9 GAS SYSTEM STRUCTURES – LONG TERM SUSPENSION

7.9.1 GAS Flowlines

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1431	Gas Disposal	Flowline	Gas Disposal	8	6613	Suspended	Isolated at XT, M31, F31 & F21 then flushed locally with glycol / potable water	Suspended & Monitor

7.9.2 GAS Flowline Termination Assemblies (FTAs)

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
XX	Disposal	FTA	Gas Disposal	8	5	Suspended	Isolated at XT, M31, F31 & F21 then flushed locally with glycol / potable water	Suspended & Monitor
PL1431	FPSO for Disposal	FTA	Gas Disposal	8	5	Suspended	Isolated at XT, M31, F31 & F21 then flushed locally with glycol / potable water	Suspended & Monitor
		Total No	**2**	**Total Length (m)**	**10**			

7.9.3 Gas Jumper

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1432	Disposal	Gas Jumper	Gas Disposal	8	45	Suspended	Flush ,Treat & Locally then Suspend	Suspended & Monitor

7.10 WATER INJECTION SYSTEM STRUCTURES – LONG TERM SUSPENSION

No WI structures identified for long term suspension.

7.11 OIL PRODUCTION SYSTEM STRUCTURES – RECOVER AND RECYCLE

7.11.1 Oil Risers

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1384	FPSO	Riser	Production	10	733	In Service	Flushed, Pigged & then Recovered after FPSO is off station	Brought onshore 2013
PL1385	FPSO	Riser	Production	10	741	In Service	Flushed, Pigged & then Recovered after FPSO is off station	Brought onshore 2013
PL1386	FPSO	Riser	Production	10	738	In Service	Flushed, Pigged & then Recovered after FPSO is off station	Brought onshore 2013
PL1387	FPSO	Riser	Production	8	732	In Service	Flushed, Pigged & then Recovered after FPSO is off station	Brought onshore 2013
PL1904	FPSO	Riser	Production	10	725	In Service	Flushed, Pigged & then Recovered after FPSO is off station	Brought onshore 2013
PL1361	FPSO	Riser	Production	8	750	In Service	Flushed, Pigged & then Recovered after FPSO is off station	Brought onshore 2013
PL1360	FPSO	Riser	Production	10	777	In Service	Flushed, Pigged & then Recovered after FPSO is off station	Brought onshore 2013
PL2245	FPSO	Riser	Production	10	705	In Service	Flushed, Pigged & then Recovered after FPSO is off station	**Condition at Quad 204 Start-Up**
PL1415	FPSO	Riser	Production	8	734	In Service	Flushed, Pigged & then Recovered after FPSO is off station	Brought onshore 2013
PL1416	FPSO	Riser	Production	10	773	In Service	Flushed, Pigged & then Recovered after FPSO is off station	Brought onshore 2013
		Total No	**10**	**Total Length (m)**	**7408**			

7.11.2 OIL Riser End Terminations (RET)

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1904	FPSO for West	RET	Production	10	3	In Service	Flushed, Treated, Abandoned & then Recovered after FPSO is off station	Brought onshore 2013
PL2245	FPSO for NWAD	RET	Production	10	3	In Service	Flushed, Treated, Abandoned & then Recovered after FPSO is off station	Brought onshore 2013
		Total No	**2**	**Total Length (m)**	**6**			

7.11.3 OIL Production Jumpers

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1390JCP03/1-3	Central	Jumper (Bundle)	Production	6x6x2	45	In Service	Isolated at XT CP20, CP03 & M1 then flushed locally with glycol / potable water	Brought onshore 2014
PL1390JCP20/1-3	Central	Jumper (Bundle)	Production	6x6x2	22	In Service	Isolated at XT CP20, CP03 & M1 then flushed locally with glycol / potable water	Brought onshore 2014
PL1390/1-3	Central	Jumper (Bundle)	Production	6x6x2	50	In Service	Isolated at M1D, & M1 then flushed locally with glycol / potable water	Brought onshore 2014

OIL Production Jumpers continued

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1388JCP01/1-3	Central	Jumper (Bundle)	Production	6x6x2	35	In Service	Isolated at XT CP21, CP01 & M1 then flushed locally with glycol / potable water	Brought onshore 2014
PL1388/1-3	Central	Jumper (Bundle)	Production	6x6x2	116	In Service	Isolated at XT CP21, CP01 & M1 then flushed locally with glycol / potable water	Brought onshore 2014
PL1386	Central	Prod Jumper	Production	10	94	In Service	Flushed, Pigged & Isolated at M1	Brought onshore 2014
PL1387	Central	Prod Jumper	Production	8	86	In Service	Flushed, Pigged & Isolated at M1	Brought onshore 2014
PL1384	Central	Prod Jumper	Production	10	82	In Service	Flushed, Pigged & Isolated at M1	Brought onshore 2014
PL1385	Central	Prod Jumper	Production	10	75	In Service	Flushed, Pigged & Isolated at M1	Brought onshore 2014
PL1416	West	Prod Jumper	Production	10	47	In Service	Flushed, Pigged & then Recovered	**Condition at Quad 204 Start-Up**
PL1415	West	Prod Jumper	Production	8	52	In Service	Flushed, Pigged & then Recovered	Brought onshore 2013
PL2173	West	Jumper (Bundle)	Production	6x6x2	34	In Service	Flushed, Disconnected & then Recovered (fit FTC to flow base)	Brought onshore 2014
PL2141	West	Prod Jumper	Production	10	285	In Service	Flushed, Pigged & Suspended	Brought onshore 2014
PL1360	Loyal	Prod Jumper	Production	10	44	In Service	Flushed, Pigged & then Recovered	Brought onshore 2014
PL2245	NWAD	Prod Jumper	Production	10	55	In Service	Isolated at XTs & M121 then flushed locally with glycol / potable water	Brought onshore 2014
PL2245	FPSO to NWAD	Prod Jumper	Production	10	99	In Service	Flushed, Pigged & then Recovered after FPSO is off station	Brought onshore 2013
PL2245	FPSO to NWAD	Prod Jumper	Production	10	63	In Service	Flushed, Pigged & then Recovered after FPSO is off station	Brought onshore 2013
PL2141	FPSO to West	Prod Jumper	Production	10	188	In Service	Flushed, Pigged & then Recovered after FPSO is off station	Brought onshore 2013
		Total No	**30**	**Total Length (m)**	**2076**	Bundles have 3 Jumpers 2x Oil + 1x Gas in each bundle		

7.12 CONTROL SYSTEM STRUCTURES – RECOVER AND RECYCLE

7.12.1 CONTROL Dynamic Umbilical

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1380/1-7	FPSO	Dynamic Umbilical	Controls	8	740	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU2241	FPSO	Dynamic Umbilical	Controls	12	1924	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1375/1-7	FPSO	Dynamic Umbilical	Controls	8	725	Suspended	Recover 2013 (sealed)	Brought onshore 2013
		Total No	**3**	**Total Length (m)**	**3389**			

7.12.2 CONTROL Dynamic Umbilical Termination Assembly (DUTA)

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1375	FPSO	DUTA	Controls	n/a	n/a	Suspended	Recover 2013 (sealed)	Brought onshore 2013

7.12.3 CONTROL Fly to Place connector (FTP)

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1403/1-5	Central	FTP	Controls	n/a	149	Out of use	Out of use - within IPR (recover and brought onshore 2013)	Brought onshore 2013
PL1403/1-5	Central	FTP	Controls	n/a	90	Out of use	Out of use - within IPR (recover and brought onshore 2013)	Brought onshore 2013
PL1403/1-5	Central	FTP	Controls	n/a	TBD	Out of use	Out of use - within IPR (recover and brought onshore 2013)	Brought onshore 2013
PL1404a/1-3	Central	FTP	Controls	n/a	90	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1405/1-3	Central	FTP	Controls	n/a	66	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1406/1-3	Central	FTP	Controls	n/a	66	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1409/1-3	Central	FTP	Controls	n/a	110	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1410/1-3	Central	FTP	Controls	n/a	82	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1776/1-3	Central	FTP	Controls	n/a	40	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1850.1-10	Central	FTP	Controls	n/a	98	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU1406JC P20/1-3	Central	FTP	Controls	n/a	31	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU1406JC P21/1-3	Central	FTP	Controls	n/a	60	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU2242	Central	FTP	Controls	n/a	TBD	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU2260	Central	FTP	Controls	n/a	104	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013

CONTROL Fly to Place Connector (FTP) continued

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PLU2261	Central	FTP	Controls	n/a	112	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU2270	Central	FTP	Controls	n/a	145	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU2283	Central	FTP	Controls	n/a	200	In Service	Hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
XX	Central	FTP	Controls	n/a	280	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
XX	Central	FTP	Controls	n/a	70	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU2283	Central	FTP	Controls	n/a	TBD	Suspended	Hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU2282	Central	FTP	Controls	n/a	164	In Service	Hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU2420	Central	FTP	Controls	n/a	60	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU2734	Central	FTP	Controls	n/a	135	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU2844	Central	FTP	Controls	n/a	146	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1382/1-5	FPSO	FTP	Controls	n/a	54	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1440	FPSO	FTP	Controls	n/a	90	Out of use	Recover 2013 (sealed)	Brought onshore 2013
PL1376/1-6	FPSO	FTP	Controls	n/a	40	Out of use	Recover 2013 (sealed)	Brought onshore 2013
PL1439	FPSO	FTP	Controls	n/a	60	Out of use	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
XX	FPSO	FTP	Controls	n/a	TBD	Out of use	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1372/1-3	Loyal	FTP	Controls	n/a	130	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1373/1-3	Loyal	FTP	Controls	n/a	90	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1374/1-3	Loyal	FTP	Controls	n/a	88	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL2018.1-9(JLP07)	Loyal	FTP	Controls	n/a	138	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL2019.1-6(JLW10)	Loyal	FTP	Controls	n/a	120	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
XX	Loyal	FTP	Controls	n/a	94	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU2059	Loyal	COCO T FTP	Controls	n/a	125	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1370/1-5	North	FTP	Controls	n/a	89	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL2025JWW 11/1-13	West	FTP	Controls	n/a	166	Out of use	Recovered or recovered in 2013???	Brought onshore 2013
PLU2183	West	FTP	Controls	n/a	78	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013

CONTROL Fly to Place Connector (FTP) continued

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PLU2243	West	FTP	Controls	n/a	TBD	In Service	Recover 2013 (chemical cores flushed, hydraulic fluid left)	Brought onshore 2013
PLU2278	West	FTP	Controls	n/a	90	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PLU2279	West	FTP	Controls	n/a	147	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1433	West	FTP	Controls	n/a	30	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
XX	West	FTP	Controls	n/a	87	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
XX	West	FTP	Controls	n/a	130	In Service	Chemical cores flushed, hydraulic fluid left in situ and recovered 2013	Brought onshore 2013
PL1377/1-6	FPSO	FTP	Controls	10	170	Suspended	Suspended & Recovered in 2015	Brought onshore 2015
PL1381/1-6	FPSO	FTP	Controls	10	145	Suspended	Suspended & Recovered in 2013	Brought onshore 2013
PLU2934	Loyal	FTP	Controls	n/a	73	Out of use	Recovered in 2013	Brought onshore 2013
		Total No	**48**	**Total Length (m)**	**4532**			

7.12.4 Controls Distribution Assembly (CDA):

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PLU2254	NWAD	CDA	Controls	n/a	n/a	In Service	Flushed and preserved	Brought onshore 2014
XX	West	CDA	Controls	n/a	n/a	In Service	Flushed and preserved	Brought onshore 2014
	Central	CDA	Controls	n/a	n/a	In Service	Flushed and preserved	Brought onshore 2014
XX	Central	CDA	Controls	n/a	n/a	In Service	Flushed & suspend	Brought onshore 2014
		Total No	**4**	**Total Length (m)**	**n/a**			

7.13 GAS SYSTEM STRUCTURES – RECOVER AND RECYCLE

7.13.1 Gas Risers

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1396	FPSO	Riser	Gas Lift	8	749	In Service	Flushed, Treated & then Recovered after FPSO is off station	Brought onshore 2013
PL1431	FPSO	Riser	Gas Import / Export	8	721	In Service	Flushed, Treated & then Recovered after FPSO is off station	Brought onshore 2013
		Total No	**2**	**Total Length (m)**	**1470**			

7.14 WATER INJECTION SYSTEM STRUCTURES – RECOVER AND RECYCLE

7.14.1 WI Riser

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1397	FPSO	Riser	Water Injection	10	697	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Brought onshore 2013
PL1412	FPSO	Riser	Water Injection	12	777	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Brought onshore 2013
PL1982	FPSO	Riser	Water Injection	12	725	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Brought onshore 2013
		Total No	**3**	**Total Length (m)**	**2199**			

7.14.2 WI Riser End Termination (RET)

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL1982	FPSO for West	RET	Water Injection	10	3	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Brought onshore 2013

7.14.3 WI Jumper

DECC Pipeline Number	Field Location / Drill Centre	Type	Process	Nominal Diameter (in)	Length (m)	Current Status	Field Suspension Status	Condition at Quad 204 Start-Up
PL2020 (JLW10)	Loyal	Water Inj Jumper	Water Injection	6	82	In Service	Flushed, Treated & then recovered in 2014 after setting M45	Brought onshore 2014
PL1982	FPSO to West	Water Inj Jumper	Water Injection	12	180	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Brought onshore 2013
PL1421	FPSO to North	Water Inj Jumper	Water Injection	10	78	In Service	Flushed with filtered inhibited seawater & then isolated at XTs,F71, F16 & F38	Brought onshore 2013
		Total No	**3**	**Total Length (m)**	**340**			