BUCHAN & HANNAY DECOMMISSIONING PROGRAMMES

Final

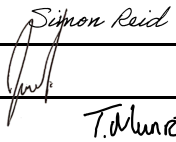
25/11/2020

Repsol Sinopec Resources UK Limited
163 Holburn Street, Aberdeen AB10 6BZ, UK

Tel: +44 (0) 1224 352500
www.repsolsinopecuk.com

Document Control

Approvals

	Name	Signature	Date
Prepared by	Simon Reid		27.11.2020
Checked by	Robbie Dunbar-Smith		27.11.2020
Reviewed by	Teresa Munro		27/11/20
Approved by	Luis Batalla		30/11/2020

Revision Control

Revision No	Reference	Changes/Comments	Issue Date
0.1	1st pre-draft programme	First Issue	31/07/2019
0.2	2nd pre-draft programme	OPRED comments incorporated	29/11/2019
0.3	Consultation draft programme	Further OPRED comments incorporated	04/03/2020
0.4	Post Consultation draft	Further OPRED/RSRUK comments incorporated	10/08/2020
0.5	Final		25/11/2020

Distribution List

Name	Company	No of Copies
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning	1

Contents

Terms and Abbreviations

Abbreviation	Explanation
BAT	Best Available Technique
BEP	Best Environmental Practice
c.	circa
C&P	Contracting & Procurement
CA	Comparative Assessment
CoP	Cessation of Production
DCR	The Offshore Installation and Wells (Design and Construction etc.) Regulations 1996 (SI1996/913)
DP	Decommissioning Programme
E	East
EA	Environmental Appraisal
EMT	Environmental Management Team
EoC	Exchange of Correspondence
ESAS	European Seabirds at Sea
FLT	UK Fisheries Legacy trust Fund
FPAL	First Point Assessment
FPSO	Floating Production Storage and Offloading
FPU	Floating Production Unit
GL	Gas Lifted (well)
H	Height
ICES	International Council for the Exploration of the Sea
IHM	Inventory of Hazardous Materials
JNCC	Joint Nature Conservation Committee
km	Kilometre
KP	Kilometre Post
L	Length
m	Metre
m^3	Cubic Metres
MAT	Master Application Template
MDAC	Methane Derived Authigenic Carbonate
mg/l	Milligrams per litre
MODU	Mobile Offshore Drilling Unit
MWA	Mid Water Arch

Abbreviation	Explanation
N	North
NORM	Naturally Occurring Radioactive Material
N/A	Not Applicable
OGA	Oil and Gas Authority
OGUK	Oil and Gas UK
OPRED	Offshore Petroleum Regulator for Environment and Decommissioning
OSPAR	from Oslo/Paris, the Convention for the Protection of the Marine Environment of the North East Atlantic
OSPAR 2006/5	OSPAR Recommendation on a Management Regime for Offshore Cuttings Piles
P&A	Plug & Abandon
PL	Pipeline (number)
PLEM	Pipeline End Manifold
PLU	Umbilical (number)
PMF	Priority Marine Feature
PON5	Petroleum Operations Notice 5
S29	Section 29
SAT	Subsidiary Application Template
SCAP	Supply Chain Action Plan
SEPA	Scottish Environment Protection Agency
SIMOPS	Simultaneous Operations
SNH	Scottish Natural Heritage
SOSI	Seabird Oil Sensitivity Index
SSIV	Subsea Isolation Valve
Te/ te	tonnes
TFSW	Trans Frontier Shipment of Waste
UKCS	United Kingdom Continental Shelf
UKHO	United Kingdom Hydrographic Office
W	Width
WGS84	World Geodetic System 1984
WHPS	Well Head Protection Structure
£m	Million Pounds

Figures and Tables

1 EXECUTIVE SUMMARY

1.1 Combined Decommissioning Programmes

This document contains four Decommissioning Programmes (DPs) for the installations and subsea infrastructure associated with the Buchan & Hannay fields operated by Repsol Sinopec Resources UK Limited.

A summary of the Buchan Alpha facility, subsea installations, pipelines and umbilicals to be decommissioned is detailed in the Tables in Sections 1.4.1 and 1.4.2.

1.2 Requirement for Decommissioning Programme(s)

Installation(s):
The Buchan Alpha Floating Production Unit (FPU) 'off station' activities were completed in August 2017 under an Exchange of Correspondence (EoC) approved by OPRED 10th May 2016, such that the fields now comprise subsea infrastructure only.

Pipeline(s)/ Structures(s):
In accordance with the Petroleum Act 1998, the Section 29 notice holders of the Buchan & Hannay field pipelines (see Table 1.4) are applying to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) to obtain approval for the decommissioning of the pipelines, umbilicals and structures detailed in Section 2.3 of this programme. (See also Section 8 – Partner Letter(s) of Support).

In conjunction with public, stakeholder and regulatory consultation, the decommissioning programmes are submitted in compliance with national and international regulations and OPRED guidelines. The offshore decommissioning activities started in 2017 with sail away of the Buchan Alpha FPU and are expected to last until 2024 (see Section 6.3).

In addition to the EoC submitted for the removal of the Buchan Alpha FPU, a second EoC was approved by OPRED on 13th October 2016 for the recovery of:

- *19 risers and associated hold back frame and turning gabions;*
- *A Mid-Water Arch (MWA) and its associated tethers and hold down anchors;*
- *A riser base structure associated with the Hannay umbilical riser;*
- *Mattresses and grout bags associated with the above.*

As the installations and infrastructure covered by the EoC's have been removed they do not form part of the supporting EA/CA. They are included as part of the total inventory of materials.

1.3 Introduction

The Buchan field spans blocks 20/5a and 21/1 and is located c. 154km northeast of Aberdeen and c. 103km from the UK/Norwegian median line in a water depth of c.115m. The field was discovered in 1974 and first oil was achieved in May 1981.

In total, 12 wells have been drilled in the Buchan field: seven production wells; two appraisal wells: one exploration well and two water injection wells. The Buchan appraisal wells and exploration well are currently suspended. The remaining nine wells are shut-in and the flow lines have been disconnected. Four of the seven production wells are drilled at a template; the Buchan template; and one production well is drilled next to it. The remaining two production wells and the two water injection wells are located c. 2 km to the west and southwest of the Buchan template and are tied back to the template.

The Hannay field is located in Block 20/5, was discovered in 1996 and commenced production in 2002. The field is located c. 13.5km northwest of the Buchan template in water depth of c. 123m.The Hannay field comprises two production wells which are currently shut-in and disconnected from the flowlines.

Both fields are now in the decommissioning phase, with Cessation of Production (CoP) being formally approved by the Oil and Gas Authority (OGA) on the 27/03/2017. Field life extension options have been considered and were all found to be sub-economic, and consequently the fields are to be decommissioned. In addition, following a feasibility study on the reuse of the Buchan & Hannay infrastructure, no re-use options for the infrastructure in its current location were identified. This has been a key consideration leading to a final decision on the timing of decommissioning.

Figure 1-1 illustrates the field layout during production; the fields were produced via the Buchan FPU. From the FPU the hydrocarbons were transported to the Forties Charlie platform via a *c*. 56.3km export line (comprising PL126 and PL401). Under an EoC, the Buchan Alpha was taken off station in August 2017 such that the decommissioning of the FPU is not captured in these DPs.

Prior to sail away, the fields were connected to the Buchan Alpha FPU via 18 risers: seven production risers; eight gas lift risers; one water injection riser; and two umbilical risers. In addition, one export riser connected the topsides to the export pipeline. As described in Section 1.2, decommissioning of the risers, MWA and associated anchors and tethers, turning gabions and an umbilical riser base structure have been executed under a second EoC and therefore are not captured in these DPs. Figure 1-1 distinguishes the infrastructure associated with the two EoCs and the DPs scope.

Following public, stakeholder and regulatory consultation (Section 5) these DPs will be submitted without derogation and in full compliance with OPRED guidelines. These DPs explain the principles of the removal activities and will be supported by an Environmental Appraisal (EA) and a Comparative Assessment (CA).

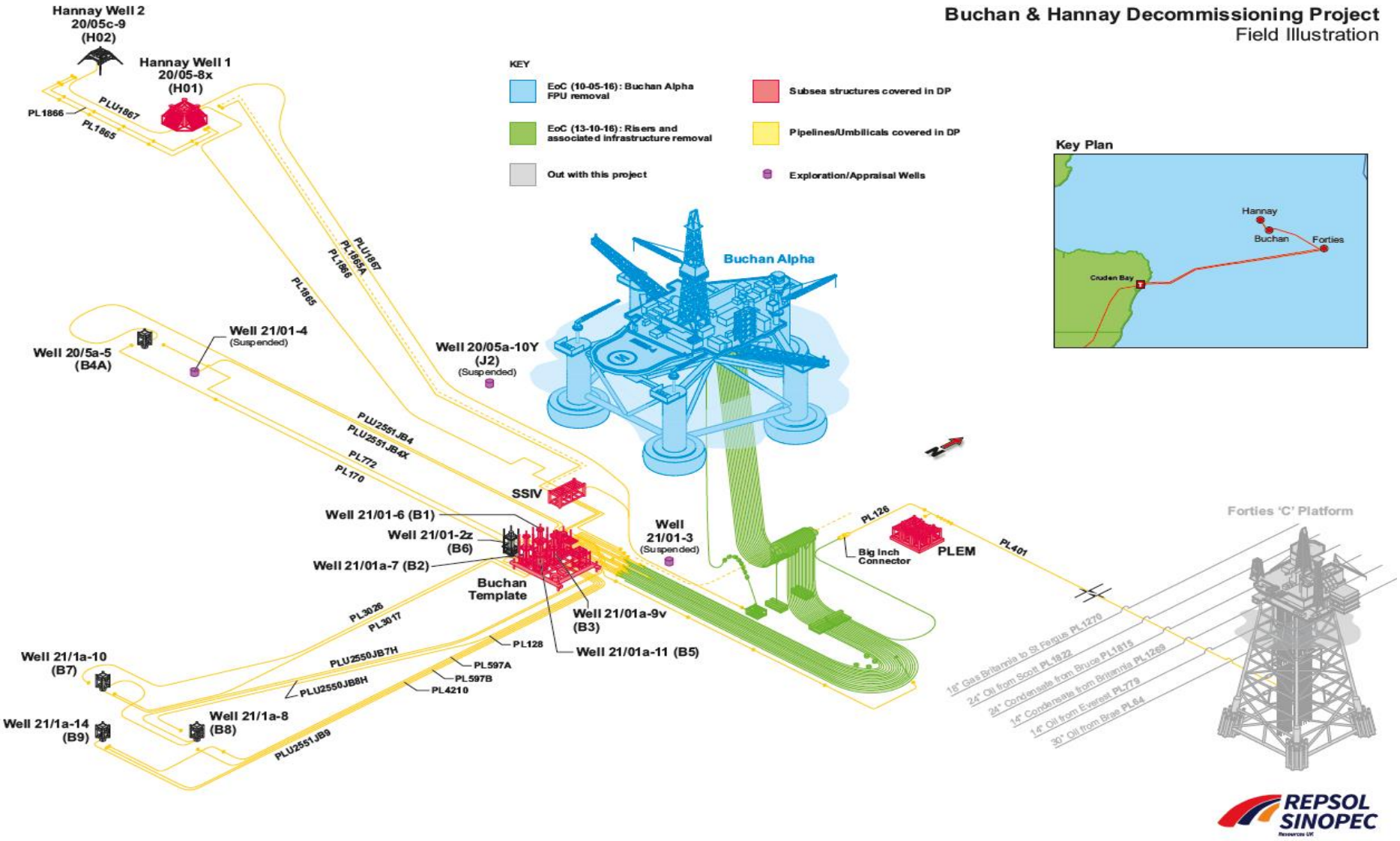


Figure 1-1: Representative schematic of the Buchan and Hannay fields

1.4 Overview of Installation(s)/Pipeline(s) Being Decommissioned

1.4.1 Installation(s)

Table 1-1: Installation(s) Being Decommissioned			
Field(s)	Buchan & Hannay	**Production Type (Oil/Gas/Condensate)**	Oil
Water Depth (m)	115 - 123	**UKCS block**	20/05 and 21/1
Distance to median (km)	103	**Distance from nearest UK coastline (km)**	115
Surface Installation(s)			
Number	Type	Topsides Weight (Te)	Jacket Weight (Te)
1	FPU	11,813	N/A
Subsea Installation(s) – Buchan[1]		**Number of Wells[2]**	
Number	Type	Platform	Subsea
1	Buchan Template (comprises a template base, a manifold and a valve module)	0	12
1	Disused Pipeline End Manifold (PLEM) associated with the export pipeline		
8	Anode Skids		
Subsea Installation(s) – Hannay[1]		**Number of Wells**	
1	Hannay well H1 integrated manifold and Well Head Protection Structure (WHPS)	0	2
1	Subsea Isolation Valve (SSIV)		
Drill Cuttings pile(s)			
Number of Piles	1	Total Estimated Volume (m^3)	828

[1] Subsea installations associated with EoC approved 13/10/16 are not included, however, are identified for reference only in Section 1.2

[2] All Buchan Wells are tied back to Buchan Template except for wells 20/05a-10Y (J2); exploration well; and 21/01-3 & 21/01-4 which are suspended appraisal wells (see Figure 1-1)

Table 1-2: Installation(s) Section 29 Notice Holders Details		
Section 29 Notice Holder(s)	**Registration Number**	**Equity Interest (%)**
Buchan Installations		
Section 29 Notices Holders who are owners		
Repsol Sinopec Resources UK Limited	00825828	85.024137
Transworld Petroleum (U.K.) Limited	01010787	12.706793
Repsol Sinopec North Sea Limited	01061863	02.269070
Section 29 Notice Holders who are not owners		
N/A	N/A	N/A
Hannay Installations		
Section 29 Notices Holders who are owners		
Repsol Sinopec Resources UK Limited	00825828	80.00
Repsol Sinopec North Sea Limited	01061863	20.00
Section 29 Notice Holders who are not owners		
Repsol S.A.	ESA78374725	0%

1.4.2 Pipeline(s)

Table 1-3: Pipeline(s) Being Decommissioned	
Number of Pipeline(s) Details given in Table 2.3	**35**

Table 1-4: Pipeline(s) Section 29 Notice Holders Details		
Section 29 Notice Holder(s)*	**Registration Number**	**Equity Interest (%)**
Buchan Pipelines:		
Section 29 Notices Holders who are owners		
Repsol Sinopec Resources UK Limited	00825828	85.024137
Transworld Petroleum (U.K.) Limited	01010787	12.706793
Repsol Sinopec North Sea Limited	01061863	02.269070
Section 29 Notice Holders who are not owners		
N/A	N/A	N/A
Hannay Pipelines:		
Section 29 Notices Holders who are owners		
Repsol Sinopec Resources UK Limited	00825828	80.00
Repsol Sinopec North Sea Limited	01061863	20.00
Section 29 Notice Holders who are not owners		
Repsol S.A.	ESA78374725	0%

1.5Summary of Proposed Decommissioning Programmes

Table 1-5: Summary of Decommissioning Programme(s)		
Selected Option	**Reason for Selection**	**Proposed Decommissioning Solution**
1. Topsides		
N/A		
2. Substructures (Jackets/FPSO etc)		
Complete removal and recycling onshore.	Complies with OSPAR requirement for complete removal and maximises recycling of materials.	The FPU has been removed, transported to shore and recycled.
3. Subsea Installation(s)		
Complete removal and recycling onshore.	To comply with OSPAR requirements leaving unobstructed seabed. Removes a potential obstruction to fishing operations and maximises recycling of materials.	Where piles exist, these will be cut to -3m below the seabed.
4. Pipelines, Flowlines & Umbilicals		
Trenched and buried lines will be decommissioned in situ, with remediation of any exposed sections. Surface laid lines will be recovered and returned to shore.	Those lines to be decommissioned in situ are trenched and buried for most of their lengths and will not affect other users of the sea. Surface laid lines will be recovered to shore to prevent future interaction with fishing gear.	The trenched and buried pipelines and umbilicals will be decommissioned in situ. The exposed sections at each line end and at any reported mid-line exposures will be remediated either by: cutting and removing to shore: by trenching and burying; or by covering with rock.

		The surface laid lines will be recovered to shore for treatment in accordance with the waste management hierarchy. All surface laid spools/jumpers will be recovered to shore for treatment in accordance with the waste management hierarchy. The concrete mattresses will be recovered either by grab or dependent on their condition with the use of baskets (filled either by ROV or divers). In the event that a group or series of mattresses are identified that cannot be recovered using a grab, Repsol Sinopec Resources UK Limited will consult with OPRED regarding an alternative approach.
5. Wells		
Wells will be plugged and abandoned to Repsol Sinopec Resources UK Limited standards which comply with "Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996" and align with Oil & Gas UK Guidelines for the Suspension and Abandonment of Wells (Issue 6, June 2018).	Meets HSE regulatory requirements in accordance with O&G UK and OGA.	A Master Application Template (MAT) and the supporting Subsidiary Application Template (SAT) will be submitted in support of activities carried out. A PON5 will also be submitted to OGA for application to abandon the wells. Additionally, planned work will be reviewed by a well examiner to Repsol Sinopec Resources UK Limited standards then submitted to the HSE for review.
6. Drill Cuttings		
Left to degrade naturally following the results of a BAT assessment.	The cuttings pile has previously been determined to be below thresholds for oil loss (<10 te/yr) and footprint persistence (<500 km^2.yr) set by OSPAR Recommendation 2006/5 on the management of offshore cuttings piles. In addition, following any disturbance during recovery of the Buchan template, the oil loss thresholds will not be exceeded as the total hydrocarbon content of the pile is estimated to be < 1 te.	The drill cuttings pile at the Buchan template will be left in situ though a small area may be disturbed during recovery of the structures. The expected maximum volumes of disturbance and the associated impacts are discussed in detail in the supporting EA Report.

7. Interdependencies
Recovery of the Buchan template and Hannay manifold will require plugging & abandonment of the associated wells and Xmas tree recovery to be completed prior to recovery of the structures. There is a small cuttings pile located at the Buchan template which comprises cuttings from wells drilled with water based and oil-based muds. When compared against the OSPAR Recommendation 2006/5 Cuttings Pile Management Regime Stage 1 thresholds, the rate of oil loss and persistence of the Buchan cuttings pile if left undisturbed were found to be below the thresholds considered to be of environmental concern. The removal of the Buchan template will result in some disturbance to the cuttings pile. The level of disturbance will be dependent on the selected recovery method for the Buchan template; however, given the small size of the pile and limited hydrocarbon content, it is expected that following disturbance the pile will remain within the OSPAR thresholds.

1.6 Field Location Including Field Layout and Adjacent Facilities

Figure 1-2: Field Location in UKCS.

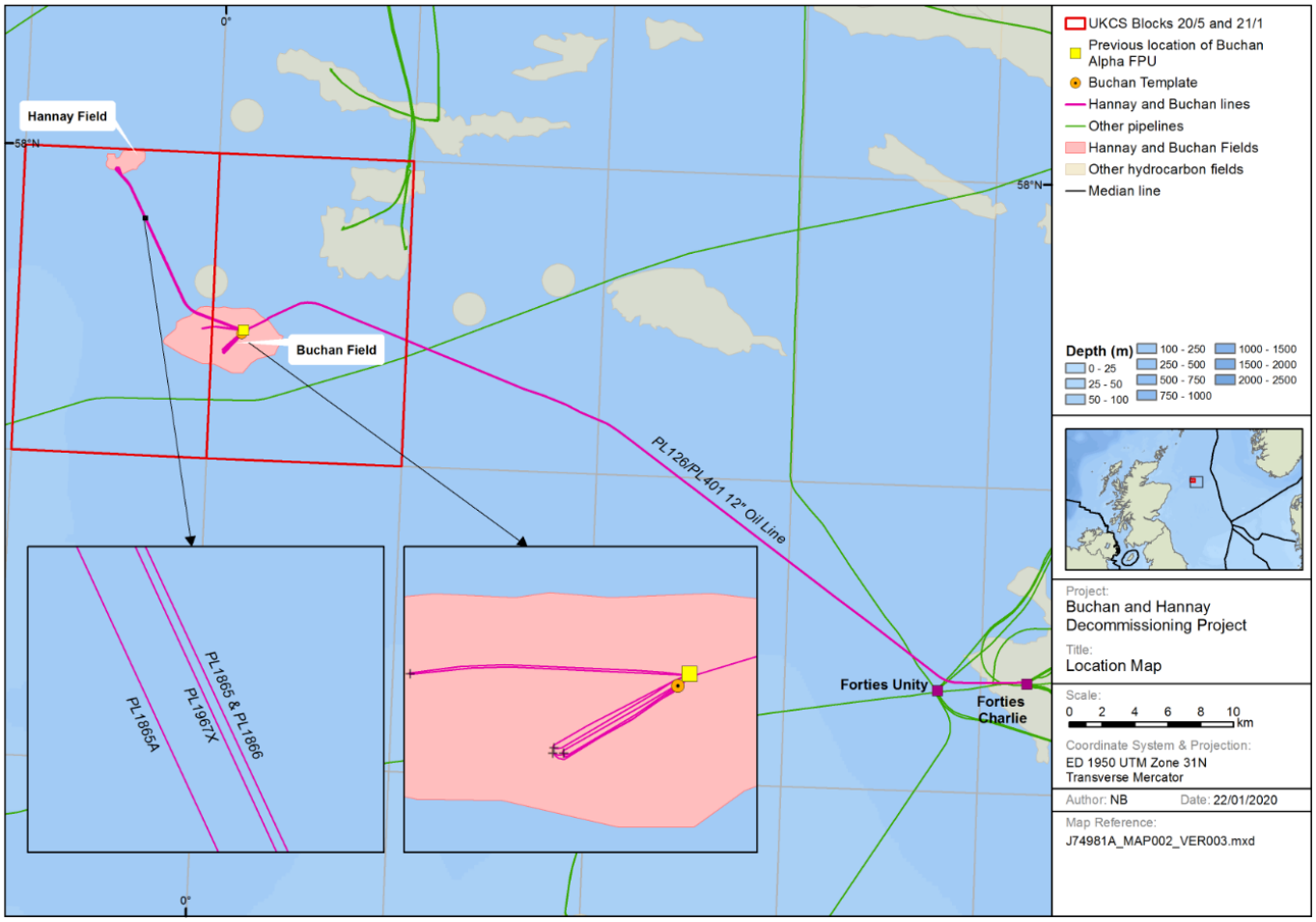


Figure 1-3: Current status field layout.

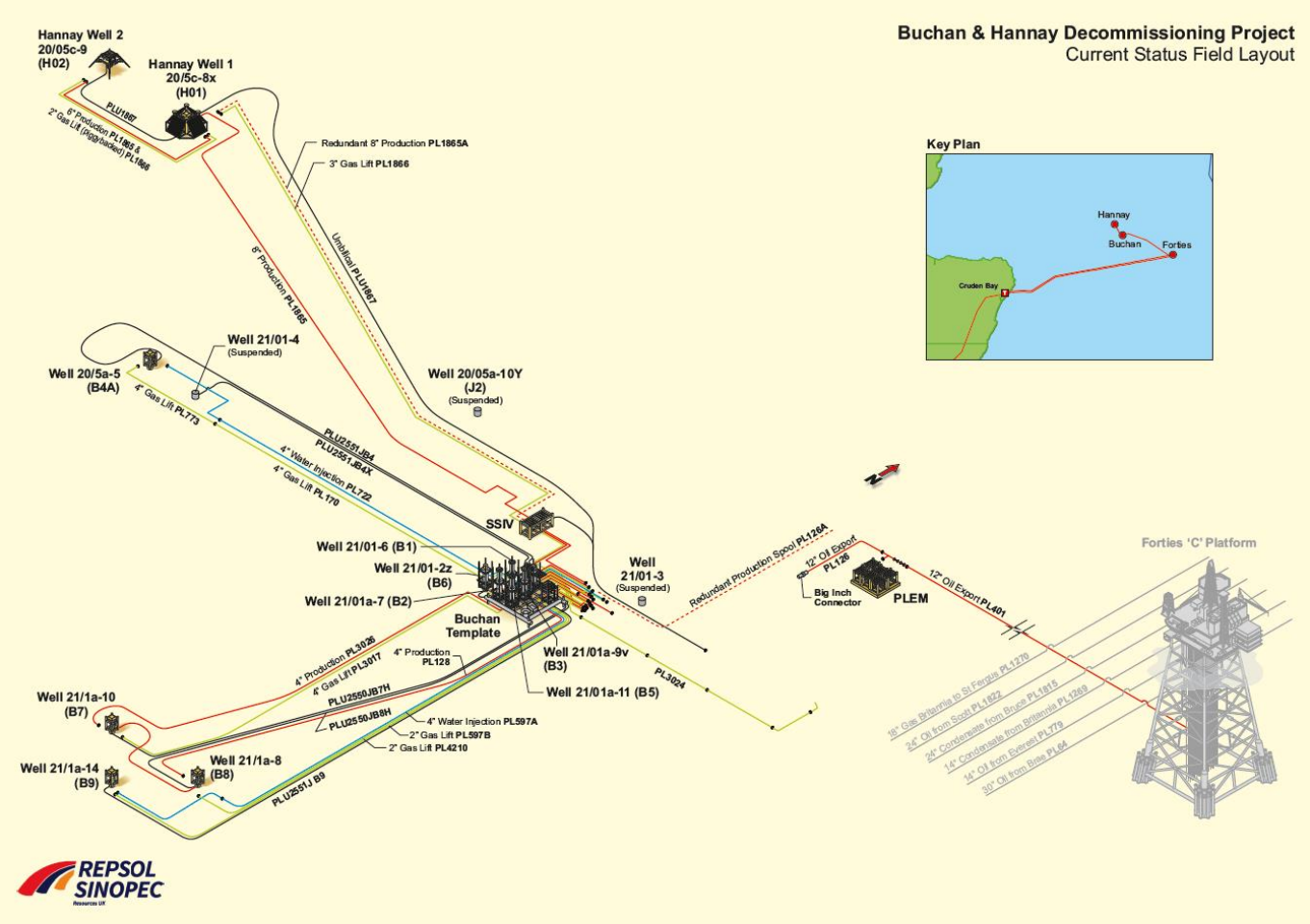
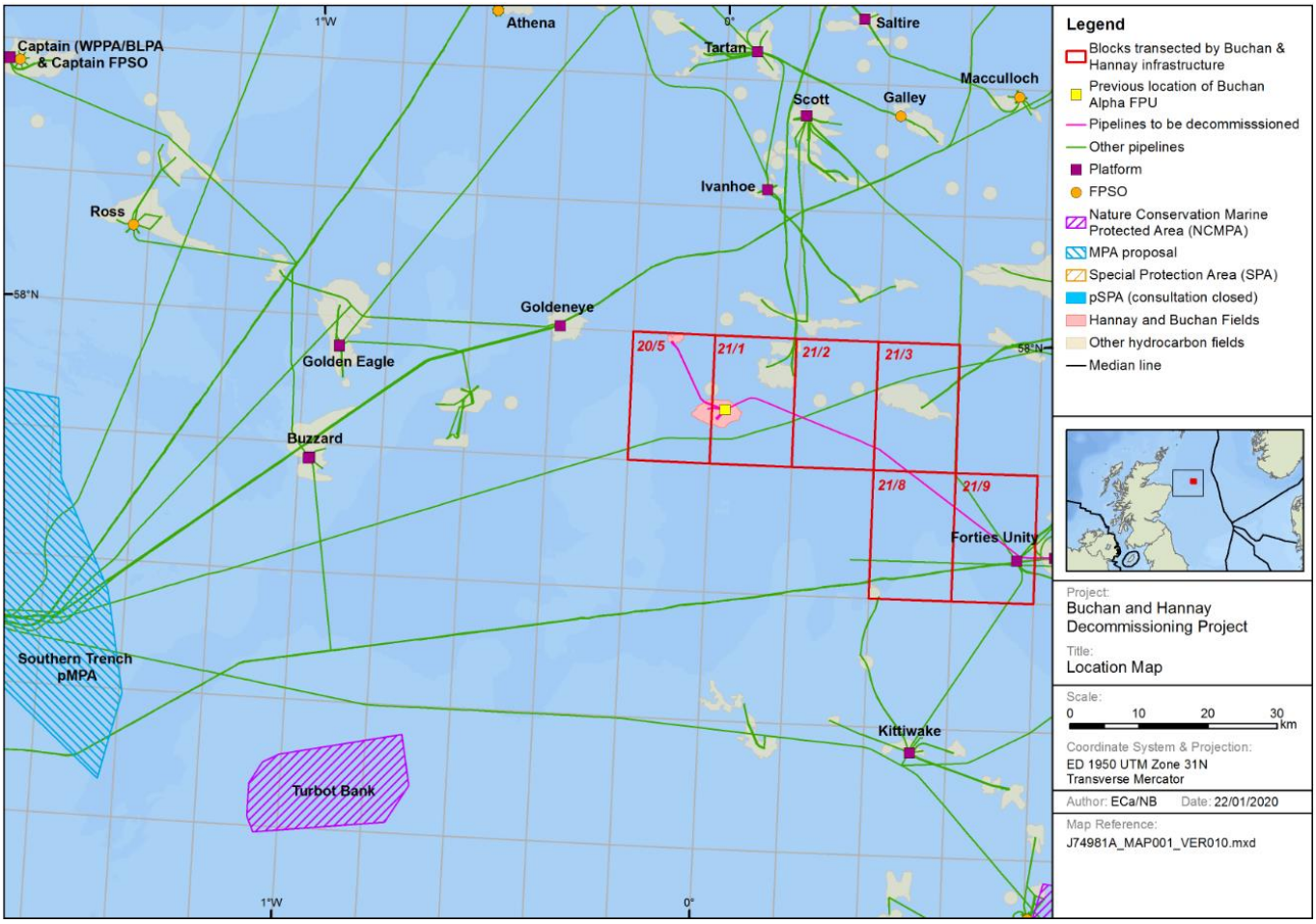


Table 1-6: Adjacent Facilities					
Owner	**Name**	**Type**	**Distance/Direction**	**Information**	**Status**
Chrysaor Limited	PL 1270	18" Gas Trunkline	KP 12.153 335 332 E 6 420 885 N	Britannia to St Fergus; crosses over	Operational
Total E&P UK Limited	PL 822	24" Oil	KP 47.374 364 805 E 6 402 238 N	Scott to Forties Unity; crosses over	Operational
Total E&P UK Limited	PL 815	24" Condensate	KP 49.928 366 863 E 6 400 735 N	Bruce to Forties Unity; crosses over	Operational
Chrysaor Limited	PL 1269	14" Condensate	KP 50.058 366 983 E 6 400 690 N	From Britannia; crosses over	Operational
Chrysaor Limited	PL 779	14" Oil	KP 52.838 369 751 E 6 400 563 N	Everest to Forties Charlie; crosses over	Operational
Rockrose UKCS8 LLC	PL 64	30" Oil	KP 53.358 370 269 E 6 400 567 N	Brae to Forties Charlie; crosses under	Operational
Impacts of Decommissioning Proposals					
Discussion still to be held with adjacent facility operators, timing of decommissioning specifically at these crossings may be affected. As these crossings are overlaid with rock, no further work is expected at these locations.					

Figure 1-4: Adjacent Facilities.



1.7 Industrial Implications

It is Repsol Sinopec Resources UK Limited's intention to develop a contract strategy that will result in an efficient and cost-effective execution of the decommissioning works. Repsol Sinopec Resources UK Limited will also try to combine Buchan & Hannay decommissioning activities with other developments or decommissioning activities to reduce mobilisation and demobilisation costs should the opportunity arise. The decommissioning schedule is intended to allow flexibility for when decommissioning operations are carried out and completed.

Repsol Sinopec Resources UK Limited will demonstrate this intention by:

- Publishing information on the decommissioning project and timelines on its decommissioning website;
- Working closely with OGA and other industry bodies in engagement sessions with the decommissioning supply chain on issues relating to these DPs and timelines, including engaging directly with disposal yards that serve the North Sea;
- Utilising the First Point Assessment (FPAL) database as a source for establishing tender lists for contracts/purchases;
- Competitively tendering all removal scopes, including the onshore disposal scope;
- Aligning supply chain and decommissioning activity, wherever possible, with Operators of adjacent infrastructure to optimise efficiencies and cost reduction;
- Development and submission of the Supply Chain Action Plan (SCAP) to the OGA.

2 DESCRIPTION OF ITEMS TO BE DECOMMISSIONED

2.1 Installation(s): Surface Facilities (Topsides/Jacket(s)/FPSO etc.)

Table 2-1: Surface Facilities Information									
Name	Facility Type	Location		Topsides/Facilities		Jacket (if applicable)			
				Weight (Te)	No of modules	Weight (Te)	Number of legs	Number of piles	Weight of piles (Te)
Buchan[1] Alpha	FPU				1	11,813	N/A	N/A	N/A
[1]Buchan Alpha FPU has been removed under separate approved EOC (10/05/16) and is included for info only and excluded from CA/ EA									

2.2 Installation(s): Subsea including Stabilisation Features

Table 2-2: Subsea Installations and Stabilisation Features					
Subsea installations*including Stabilisation Features	Number	Size(m)/Weight (Te)	Location		Comments/Status
Buchan Template	1	18.1m (L) x 13.8m (W) x 10.9m (H)/ 237.5 te	WGS84 Decimal	57.902931 0.030685	Structure is secured to the seabed by four steel piles and conductor. Xmas trees to be removed during P&A activity.
			WGS84 Decimal Minute	57° 54' 10.553" N 0° 1' 50.467" E	
Oil Export PLEM	1	9.9m (L) x 5.0m (W) x2.13m (H)/ 163.2 te	WGS84 Decimal	57.910005 0.055478	Taken out of service in 1986. The PLEM is a gravity based structure with four concrete blocks used for ballast
			WGS84 Decimal Minute	57° 54' 36.017" N 0° 3' 19.721" E	
Hannay SSIV	1	6.65m (L) x 4.65m (W) x 3.2m (H)/ 47te	WGS84 Decimal	57.903226 0.030737	The SSIV is a gravity based structure with four steel billets used for ballast.
			WGS84 Decimal Minute	57° 54' 11.614" N 0° 1' 50.654" E	
Hannay Well H1 integrated manifold and WHPS	1	13.0m (L) x 13.0m (W) x 6.5m (H)/ 69te	WGS84 Decimal	57.988177 -0.107872	Structure is secured to the seabed by four steel piles.
			WGS84 Decimal Minute	57° 59' 17.437" N 0° 6' 28.338" W	

Table 2-2: Subsea Installations and Stabilisation Features				
Subsea installations*including Stabilisation Features	**Number**	**Size(m)/Weight (Te)**	**Location**	**Comments/Status**
Anode Skids	6	2m (L) x 3m (W) x 1m (H)/ 6 x 5te = 30te	(Infield Lines)	Used to supplement cathodic protection on pipelines
Anode Skids	2	0.8 (L) x 1m (W) x 1m (H)/ 2 x 0.11te = 0.22te	Export Line	Used to supplement cathodic protection on pipelines
Concrete mattresses	0		N/A	

2.3 Pipelines Including Stabilisation Features

Table 2-3: Pipeline/Flowline/Umbilical Information									
Description	**Pipeline Number**	**Diameter (mm)**	**Length (km)**	**Description of Component Parts**	**Product Conveyed**	**From – To End Points**	**Burial Status**	**Pipeline Status**	**Current Content**
Line connecting export riser to PL401	PL126	323.9	1.697	Carbon steel/ plastic/ alloy & misc. coatings	Oil	Buchan Export Riser Connector to PLEM	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
Redundant section of oil export line, which previously connected export riser to PLEM	PL126A	323.9	0.08	Carbon steel/ plastic/ alloy & misc. coatings	Oil	Cut pipeline end in close proximity to Buchan template to cut pipeline end at big inch mechanical connection	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
Oil Export -pipeline to Forties Charlie	PL401	323.9	54.043	Carbon steel/ plastic/ alloy & misc. coatings	Oil	From PL126 to Forties Charlie	Trenched / natural backfill	Out of use	Inhibited seawater (PRESERVAN 5500)
Production line from Well B7	PL3026 (ex PL127A)	114.3	1.617	Carbon steel/ alloy	Oil	Well B7 to Buchan Template	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
Water injection line to well B4A	PL772 (ex PL170A)	114.3	2.514	Carbon steel/ alloy	Water injection fluids	Buchan Template to Well B4A	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)

Description	Pipeline Number	Diameter (mm)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
Gas lift line to well B4A	PL170 (ex PL170B)	114.3	2.519	Carbon steel/ alloy	Lift gas	Buchan Template to rigid pipeline tie-in flange to PL773	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
Well B8 Production	PL128 (ex PL128A)	114.3	1.856	Carbon steel/ alloy	Oil	Pipeline end flange at Well B8 to Riser spool tie in to PL3026 riser spool	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
Gas lift line to well B7	PL3017 (ex PL127B)	114.3	1.628	Carbon steel/ alloy	Lift gas	Buchan Template to Well B7	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
Gas lift line to well B8	PL4210	97.4	1.850	Carbon steel/ plastic & misc. coatings	Lift gas	Buchan Template to Well B8	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
Gas lift line to well B9	PL597B	114.4	1.990	Carbon steel/ plastic & misc. coatings	Lift gas	Buchan Template to Well B9	Surface laid	Out of use	Produced water re-injection fluids plus SI-4i4N
Water injection line to well B9	PL597A (ex PL128B)	176.1	1.960	Carbon steel/ plastic & misc. coatings	Water injection fluids	Buchan Template to Well B9	Surface laid	Out of use	Produced water re-injection fluids plus SI-4i4N
Umbilical to well B1	PLU2551JB 1	62	0.028	Carbon steel/ zinc/plastic & misc. coatings	Aqualink 300F	SDU mounted on Buchan Template to Well B1	Located in template	Out of use	Aqualink 300F

Description	Pipeline Number	Diameter (mm)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
Umbilical to well B2	PLU2551JB 2	62	0.026	Carbon steel/ zinc/plastic & misc. coatings	Aqualink 300F	SDU mounted on Buchan Template to Well B2	Located in template	Out of use	Aqualink 300F
Umbilical to well B3	PLU2551JB 3	62	0.023	Carbon steel/ zinc/plastic & misc. coatings	Aqualink 300F	SDU mounted on Buchan Template to Well B3	Located in template	Out of use	Aqualink 300F
Umbilical to well B4A	PLU2551JB 4	62	2.750	Carbon steel/ zinc/plastic & misc. coatings	Aqualink 300F	Buchan Template to Well B4A	Surface laid	Out of use	Aqualink 300F
Redundant umbilical to well 21/01-4	PLU2551JB 4X	60	2.930	Carbon steel/ zinc/plastic & misc. coatings	Aqualink 300F	Buchan Template, (to Well 21/01-4,	Surface laid	Out of use	Aqualink 300F
Umbilical to well B6	PLU2551JB 6	62	0.036	Carbon steel/ zinc/plastic & misc. coatings	Aqualink 300F	Buchan Template to Well B6	Surface laid	Out of use	Aqualink 300F
Umbilical to well B7	PLU2550JB 7H	62	1.838	Carbon steel/ zinc/plastic & misc. coatings	Aqualink 300F	Buchan Template to Well B7	Surface laid	Out of use	Aqualink 300F
Umbilical to well B8 (includes 200m jumper to Well B7)	PLU2550JB 8H	62	2.132	Carbon steel/ zinc/plastic & misc. coatings	Aqualink 300F	Buchan Template to Well B8 and onwards to well B7	Surface laid	Out of use	Aqualink 300F

Description	Pipeline Number	Diameter (mm)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
Umbilical to well B9	PLU2551JB 9	62	2.066	Carbon steel/ zinc/plastic & misc. coatings	Aqualink 300F	Buchan Template to Well B9	Surface laid	Out of use	Aqualink 300F
Gas Lift Spool at Well B4	PL773	114.3	0.017	Carbon steel/ plastic & misc. coatings	Lift gas	PL170 pipeline tie in flange to Well B4a	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
G3 Riser Gas Lift Spool	PL3018	60.3	0.0127	Carbon steel/ plastic & misc. coatings	Lift Gas	Flexible riser (G3) to Well B3 Buchan Template	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
G6 Riser Gas Lift Spool	PL3019	60.3	0.0183	Carbon steel/ plastic & misc. coatings	Lift Gas	Flexible Riser (G6) to Well B2 Buchan Template	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
Redundant Riser Spool	PL3020	60.3	0.0096	Carbon steel/ plastic & misc. coatings	Lift Gas	Blind flange to Buchan template	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
G1 Riser Gas Lift Spool	PL3021	60.3	0.016	Carbon steel/ plastic & misc. coatings	Lift Gas	Flexible Riser (G1) to Well B1 Buchan Template	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
P3 Riser Production Spool	PL3022	114.3	0.012	Carbon steel/ plastic & misc. coatings	Oil	Well B3 Buchan Template to Flexible Riser (P3)	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)

Description	Pipeline Number	Diameter (mm)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
P2 Riser Production Spool	PL3023	114.3	0.016	Carbon steel/ plastic & misc. coatings	Oil	Well B2 Buchan Template to Flexible Riser (P2)	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
P6 Riser Production Spool	PL3024	114.3	0.2283	Carbon steel/ plastic & misc. coatings	Oil	Well B2 Buchan Template to Flexible Riser (P2)	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
P1 Riser Production Spool	PL3025	114.3	0.016	Carbon steel/ plastic & misc. coatings	Oil	Well B1 Buchan Template to Flexible Riser (P1)	Surface laid	Out of use	Inhibited seawater (PRESERVAN 5500)
Production line from Hannay	PL1865	219.1	13.461	Carbon steel/ plastic & other non-ferrous	Oil	Hannay well H2 to Hannay well H1 to the Buchan Template	Trenched / buried/ spot rock	Out of use	Inhibited seawater (PRESERVAN 5500)
Out of service production line from Hannay	PL1865A	219.1	13.189	Carbon steel/ plastic & other non-ferrous	Oil	Hannay well H2 to Hannay well H1 to the Buchan Template	Trenched / buried/ spot rock	Out of use	Inhibited seawater (PRESERVAN 5500)
Gas lift line to Hannay	PL1866	105.5	13.408	Carbon steel/ plastic & other non-ferrous	Lift gas	Buchan Template to Hannay well H1 to Hannay well H2	Trenched & buried	Out of use	Inhibited seawater (PRESERVAN 5500)
Hannay Umbilical	PLU1867	140	13.461	Carbon steel/ zinc/plastic & misc. coatings/ copper	Aquaglycol 24, Transaqua and chemical injection fluids	Cut umbilical end on the seabed at Buchan to Hannay subsea well H2 SUTU	Trenched & buried	Out of use	Seawater/ Aquaglycol 24/ Transaqua

Description	Pipeline Number	Diameter (mm)	Length (km)	Description of Component Parts	Product Conveyed	From – To End Points	Burial Status	Pipeline Status	Current Content
Chemical Injection line to Buchan Template	PLU2550	26	0.1	Carbon steel/ zinc/plastic & misc. coatings	Biocide	Hannay SSIV to Buchan Template	Surface laid	Out of use	Aqualink 300F
Buchan Umbilical Riser	PLU2551	207.2	0.005	Carbon steel/ zinc/plastic & misc. coatings	Aqualink 300F	Umbilical laydown point to SDU at Buchan Template	Surface laid	Out of use	Aqualink 300F

Table 2-4: Subsea Pipeline Stabilisation Features				
Stabilisation Feature	**Total Number**	**Weight (Te)**	**Location(s)**	**Exposed/Buried/Condition**
Mattresses	2	6.2	PL126 – PL401 connector spools	Exposed
Concrete Saddle	4	12.4	Concrete saddles at Brae crossing	Buried in rockdump
Mattresses	18	88.2	Buchan Alpha Location	Exposed
Mattresses	44	198	Covering PL1865	Exposed
Mattresses	36	176.4	PL1865a & PL1866	Exposed
Mattresses	32	156.8	Protection at well jumpers	Exposed
Grout bags (25kg)	500	12.5	Buchan template	Exposed
Rock cover[1]	N/A	43,270	PL1865, PL1865a & PL401 crossing at PL64 (Brae)	N/A
[1]Rock volumes associated with 3rd party crossings are not included and therefore not considered within these DPs.				

2.4 Wells

Table 2-5: Well Information			
Platform Wells	**Designation**	**Status**	**Category of Well**
None			
Subsea Wells			
21/01-6 (B1)	GL Producer	Shut-in; flowline disconnected	SS 4/4/3
21/01a-7 (B2)	GL Producer	Shut-in; flowline disconnected	SS 4/4/3
21/01a-9V (B3)	GL Producer	Shut-in; flowline disconnected	SS 4/4/3
20/05a-5 (B4a)	Injector	Shut-in; flowline disconnected	SS 4/4/3
21/01a-11 (B5)	GL Producer	Shut-in; flowline disconnected	SS 4/4/3
21/01-2z (B6)	GL Producer	Shut-in; flowline disconnected	SS 4/4/3
21/01a-10 (B7)	GL Producer	Shut-in; flowline disconnected	SS 4/4/3
21/01a-8 (B8)	GL Producer	Shut-in; flowline disconnected	SS 4/4/3
21/01a-14 (B9)	Injector	Shut-in; flowline disconnected	SS 4/4/3
21/01-3	Appraisal	Suspended	SS 0/4/3
21/01-4	Appraisal	Suspended	SS 0/4/3
20/05a-10Y (J2)	Exploration	Suspended	SS 0/0/1
20/05c-8X (Hannay H1)	GL Producer	Shut-in; flowline disconnected	SS 3/4/3
20/05c-9 (Hannay H2)	GL Producer	Shut-in; flowline disconnected	SS 4/4/3

2.5 Drill Cuttings

Table 2-6: Drill Cuttings Pile(s) Information		
Location of Pile Centre (Latitude/Longitude)	**Seabed Area (m^2)**	**Estimated volume of cuttings (m^3)**
Buchan Template (57° 54' 10.553" N, 0° 1' 50.467" E)	3,731	828

2.6 Inventory Estimates

Figure 2-1: Estimated Inventory – Installations[3]

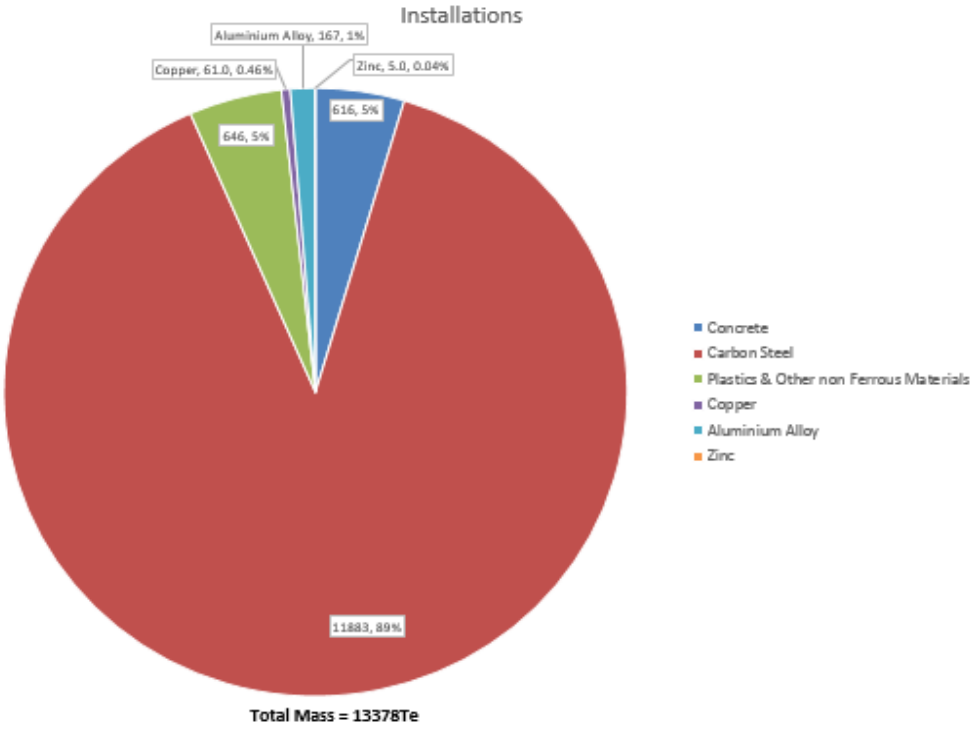
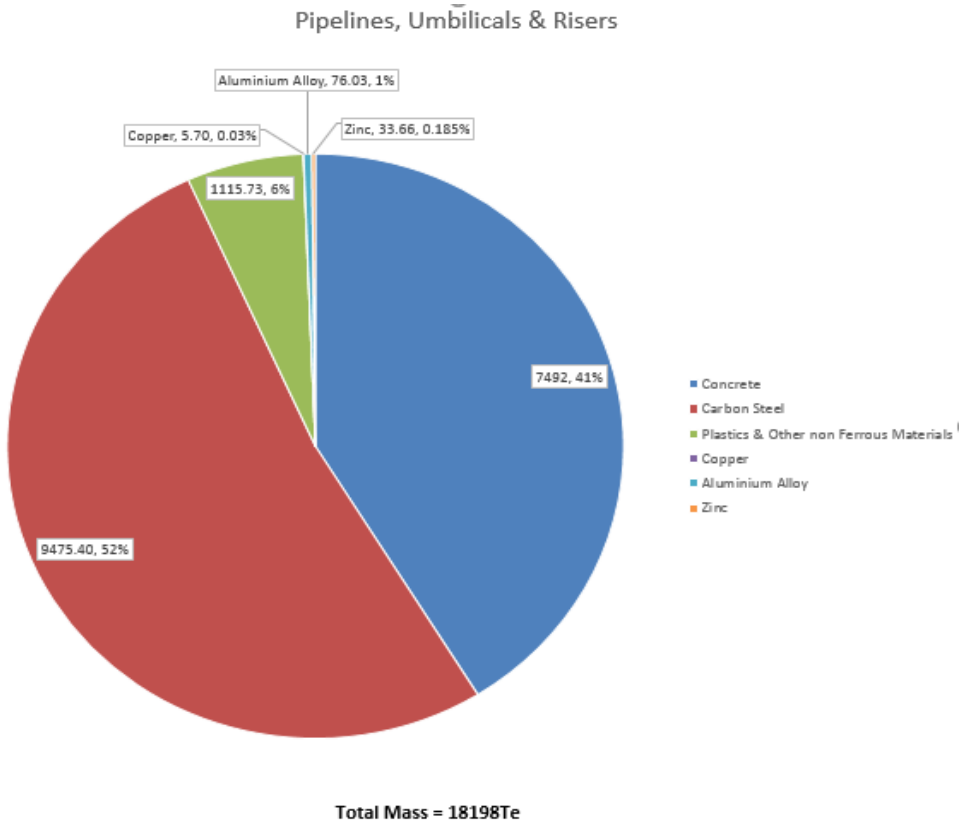


Figure 2-2: Estimated Inventory – Pipelines, Umbilicals & Risers[3]



[3] Inventory weights provided include weights of material recovered under the EoCs.

3 REMOVAL AND DISPOSAL METHODS

In line with the waste management hierarchy, the re-use of an installation (or parts thereof) is first in the order of decommissioning options. Repsol Sinopec Resources UK Limited considered other potential reuse options, however, none yielded a viable commercial opportunity and as such Buchan Alpha FPU was towed to Shetland for decommissioning. At COP options to reuse the remaining infrastructure in-situ for future hydrocarbon development were also assessed and again none yielded a viable commercial opportunity. However, with new licences in place Repsol Sinopec Resources UK Limited are now exploring any reuse opportunities with the new field licensees.

On removal and where practicable, Repsol Sinopec Resources UK Limited will ensure the principles of the waste management hierarchy will be met in the handling of materials from the Buchan & Hannay decommissioning to maximise the amount of material which can be reused or recovered/ recycled.

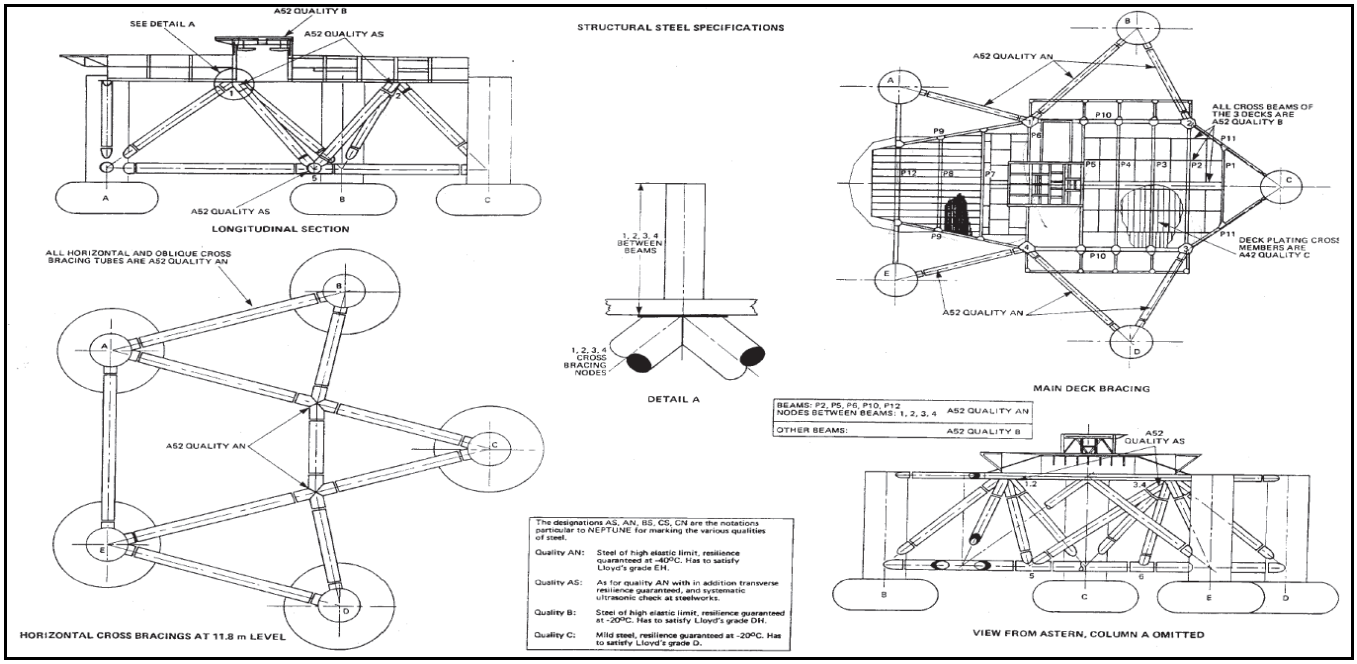
Repsol Sinopec Resources UK Limited and the selected contractor (s) will monitor and review the disposal route of all materials and waste to the point of final reuse, recycling or disposal. As the decommissioning is not scheduled to be completed imminently, Repsol Sinopec Resources UK Limited propose to take advantage of any future advances in technology to aid waste management, including the further reuse, recycle or scrapping of parts of the installations as appropriate.

3.1 Topsides

Topsides Decommissioning Overview:
The Buchan Alpha FPU was towed in August 2017 from the Buchan field to Dales Voe in Shetland for decommissioning. Prior to tow from field the topsides process system was flushed along with the flowlines, risers and umbilicals. The risers and anchoring system were then disconnected, releasing the FPU.

FPU description:
The Buchan Alpha was a pentagon shaped converted semi-submersible drill rig which supported the production, export and utility systems required to handle the well fluids (Figure 3-1).

Figure 3-1: Buchan Alpha structural arrangement



Preparation/Cleaning:

Table 3-1: Cleaning of Topsides for Removal		
Waste Type	**Composition of Waste**	**Disposal Route**
Onboard Hydrocarbons	Process fluids, fuels and lubricants	Hydrocarbons flushed and pumped into export line ahead of export line flushing Fuels and lubricants documented in IHM (inventory of hazardous materials) and managed at decommissioning facility
Other Hazardous Materials	NORM scale, radioactive material, instruments containing heavy metals, batteries	Documented in IHM and managed at decommissioning facility
Original Paint coating	Lead-based paint	Documented in IHM and managed at decommissioning facility
Asbestos and ceramic fibre		Documented in IHM and managed at decommissioning facility

Removal Methods:

Table 3-2: Topsides Removal Methods	
1) HLV (semi-submersible crane vessel) ☐ 2) SLV ☐ 3) Piece small ☐ 4) Other ☑	
Method	**Description**
The Buchan Alpha FPU was released from its moorings with all risers flushed, cleaned and disconnected. The FPU was then towed directly to Dales Voe in Shetland for recycling.	

3.2 Jacket(s)

3.2.1 Jacket Decommissioning Overview:

N/A

3.2.2 Jacket Removal Methods

Table 3-3: Jacket Removal Methods	
1) HLV (semi-submersible crane vessel) ☐ 2) SLV ☐ 3) Piece small ☐ 4) Other	
Method	**Description**
N/A	

3.3 Subsea Installations and Stabilisation Features

Table 3-4: Subsea Installation(s) and Stabilisation Feature(s) decommissioning Options			
Subsea installation(s) and stabilisation feature(s)	**Number**	**Option**	**Disposal Route (if applicable)**
Buchan Template	1	Full Removal	Return to shore for reuse/ recycling/ disposal
Oil Export PLEM and associated concrete ballast blocks	1	Full Removal	Return to shore for reuse/ recycling/ disposal
Anode Skids	8	Full Removal	Return to shore for reuse/ recycling/ disposal
Hannay SSIV	1	Full Removal	Return to shore for reuse/ recycling/ disposal
Hannay well H1 integrated manifold and WHPS	1	Full Removal	Return to shore for reuse/ recycling/ disposal
Wellheads	14	Full recovery as part of P&A campaign	Return to shore for reuse/ recycling/ disposal

3.4 Pipelines

Decommissioning Options:

*Key to Options:

1) Total removal - by reverse reeling
2) Total removal – by reverse S-lay
3) Total removal – cut and lift
4) Remediation in-situ – exposed sections rock covered
5) Remediation in-situ – exposed sections trenched and buried
6) Remediation in-situ – exposed sections cut and lift

Table 3-5: Pipeline or Pipeline Groups Decommissioning Options

Pipeline or Group (as per PWA)	Condition of line/group (Surface laid/trenched/ buried/spanning)	Whole or part of pipeline/group	Decommissioning options* considered
Group A: PL401	Rigid pipeline Concrete coated Trenched (and natural backfill)	ALL	3,4,5,6
Group B : PL126, PL128, PL3026, PL170, PL772, PL3017 and PL597A	Rigid pipeline Surface laid	ALL	1,3,4,5
Group C PL1865A, PL1866 and PL1865	Rigid pipeline Trenched and buried	ALL	1,4,5,6
Group D PL4210, PL597B, PLU2551JB4, PLU2551JB4X, PLU2550JB7H, PLU2550JB8H and PLU2551JB9	Flexible pipeline/ umbilical Surface laid	ALL	1,3,4,5
Group E PLU1867	Umbilical Trenched and buried	ALL	1,4,5,6

Comparative Assessment Method:

A Comparative Assessment (CA) was carried out for all pipelines and umbilicals in line with the recommendations of the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) Guidance Notes. The CA considered Technical, Safety and Environmental Risks and Societal and Economic Impacts. The assessments closely followed the Guidelines on CA's in DPs published by Oil and Gas UK (OGUK).

Workshops were held by Repsol Sinopec Resources UK Limited (representatives from the safety, environmental and subsea teams present) using established terms of reference, detailed data on field facilities, results were recorded and approved by participants.

Outcome of Comparative Assessment:

Table 3-6: Outcome of Comparative Assessment		
Pipeline or Group (as per PWA)	**Recommended Option**	**Justification**
Group A	Decommission by leaving the trenched sections in situ and remediation of the non-trenched end-sections.	Apart from the end sections, this pipeline was laid in a trench with a depth of around 2m. Pipeline route surveys show that the minimum distance between the top of the pipe and the mean seabed level is 0.5m. Natural backfill has occurred over most of the pipeline with depth of cover being > 0.4m along 34.295km of the trenched section. As the distance from top of pipe to mean seabed level is > 0.5m, those areas where depth of cover is < 0.4m are not considered a hazard. There is no evidence of spans and natural backfill is expected to continue over time. In addition, there is no evidence of snagging on the line over its history. Total removal options were discounted for the trenched section of this pipeline as full removal of the line would be technically challenging, whilst the increased safety risk exposure time to project personnel both offshore and onshore in having to handle large pipeline lengths was a concern. In addition, recovery of the pipeline would result in excessive seabed disturbance. There will be minimum legacy risk, to other users of the sea in leaving the export pipeline in situ as historical surveys have demonstrated that the trenched and buried sections of the pipeline will remain so whilst the area is actively fished with no incidents having being reported. The exposed non-trenched end sections will be remediated by trench and bury or cut and recover as the residual safety risk to other users of the seas if left exposed on the seabed and potential deterioration was deemed unacceptable (Note 1)
Group B	Return to shore for reuse/ recycling/ disposal	These lines are all surface laid. Technical challenges associated with recovering these lines are expected to be minimal, whilst the potential legacy impacts of leaving them in situ could be significant. The environmental impact associated with trenching and burying or rock dumping these lines is considered greater than the impact associated with full removal.
Group C	Decommission by leaving trenched and buried sections in situ and remediating the non-trenched exposed end-sections.	The pipelines in this group were trenched and buried when installed with a minimum depth of cover of around 0.6 m along the buried lines. There is no evidence of spans and there is no evidence of snagging on the pipelines over its history. Total removal options were discounted for these trenched and buried pipelines as full removal of the lines would be technically challenging, whilst the

		increased safety risk exposure time to project personnel both offshore and onshore in having to handle large pipeline lengths was a concern. In addition, recovery of the pipelines would result in excessive seabed disturbance. There will be minimum legacy risk to other users of the sea in leaving these pipelines *in-situ* as historical surveys have demonstrated that the trenched and buried sections of the pipelines will remain so whilst the area is actively fished with no incidents having being reported. The exposed non-trenched end sections will be remediated by trench and bury or cut and recover as the residual safety risk to other users of the seas if left exposed on the seabed and potential deterioration was deemed unacceptable (Note 1).
Group D	Return to shore for reuse/ recycling/ disposal	These lines are all surface laid. Technical challenges associated with recovering these lines are expected to be minimal, whilst the potential legacy impacts of leaving them in situ could be significant. The environmental impact associated with trenching and burying or rock dumping these lines is considered greater than the impact associated with full removal.
Group E	Decommission by leaving trenched and buried sections in situ and remediating the exposed non-trenched end-sections.	This umbilical was trenched and buried when installed. The depth of cover is > 0.5m for most of its length. Along approximately 2km of the umbilical the depth of cover varies from 0.2m to around 0.6m though for the most part along this 2km length depth of cover is > 0.4m. There is no evidence of spans and there is no evidence of snagging on the umbilical over its history. Total removal options for this umbilical were discounted primarily for safety and environmental reasons. The increased safety risk exposure time to project personnel onshore in having to handle large umbilical lengths was a concern. In addition, recovery of the umbilical would result in excessive seabed disturbance. There will be minimum legacy risk, to other users of the sea in leaving the umbilical *in-situ* as historical surveys have demonstrated that the trenched and buried sections of the pipelines will remain so whilst the area is actively fished with no incidents having being reported. The exposed non-trenched end sections will be remediated by trench and bury or cut and recover as the residual safety risk to other users of the seas if left exposed on the seabed and potential deterioration was deemed unacceptable (Note 1).

Note 1 The conclusion of the CA was that there is no significant differentiator on each of the remediation options for the exposed sections of pipelines and umbilical. However, the slight differences have resulted in the remediate in situ options being prioritised for Group A as follows:

- Priority 1 – Trench and bury (Option 2b)
- Priority 2 – Cut and lift (Option 2c)
- Priority 3 – Rock cover (Option 2a)

For Groups C and E, Options 2b and 2c were given equal ranking.
Given that there is no significant differentiator Repsol Sinopec Resources UK Limited intend to carry out a Contracting and Procurement (C&P) engagement exercise and tendering process on all three options and will consult with OPRED should this exercise result in a change in preference of the remediation option.

3.5 Pipeline Stabilisation Feature(s)

Table 3-7: Pipeline Stabilisation Feature(s)

Stabilisation feature(s)	Number	Option	Disposal Route (if applicable)
Mattresses (130 x 4.9te/ 2 x 3.1te)	132	Full recovery of exposed mats It is intended that the mattresses will be recovered to shore, however in the event of practical difficulties during the removal execution, OPRED will be consulted and an alternative method of decommissioning will be examined through a comparative assessment.	Return to shore for reuse/ recycling/ disposal
Grout bags (25kg)	500	Full recovery.	Return to shore for reuse/ recycling/ disposal
Concrete Saddles (3.1te)	4	To remain in place (buried under rock dump).	n/a
Rock cover (Te)	43,270	To remain in place.	n/a

3.6 Wells

Table 3-8: Well Plug and Abandonment

The Buchan field comprise 12 wells; seven production wells; two appraisal wells: one exploration well and two water injection wells, whilst the Hannay field comprises two production wells. The Buchan appraisal wells and exploration well are currently suspended. The remaining 11 wells are shut-in and the flow lines have been disconnected.

The wells (listed in Table 2.5) will be plugged in compliance with the requirements of the Offshore Installations and Wells (Design and Construction, etc.) Regulations 1996 (DCR) and abandoned in accordance with the latest version of the Oil & Gas UK Guidelines; Well Decommissioning Guidelines (Issue 6, June 2018).

3.7 Drill Cuttings

A pre-decommissioning environmental survey carried out in Q3/Q4 2018 identified a small cuttings pile at the Buchan template location

Table 3-9: Drill Cuttings decommissioning Options	
How many drill cuttings piles are present?	1
Tick options examined: ☐Remove and re-inject ☐Leave in place ☐Cover ☐Relocate on seabed ☐Remove and treat onshore ☐Remove and treat offshore ☑Other *partial relocation of the cuttings pile to allow recovery of the Buchan template*	
Review of Pile characteristics	**Pile 1**
How has the cuttings pile been screened? (desktop exercise/actual samples taken)	Samples taken
Dates of sampling (if applicable)	Q3/Q4 2018
Sampling to be included in pre-decommissioning survey?	Yes (was included)
Does it fall below both OSPAR thresholds?	Yes
Will the drill cuttings pile have to be displaced in order to remove the Buchan template?	Yes
What quantity (m^3) would have to be displaced/removed?	234
Will the drill cuttings pile have to be displaced in order to remove any pipelines?	No *
What quantity (m^3) would have to be displaced/removed?	N/A
Have you carried out a Comparative Assessment of options for the Cuttings Pile?	Not required as below OSPAR thresholds
**The pipelines were installed after the drilling operations were completed, hence only minimal disturbance to cuttings are expected during recovery of spools.*	

Comparative Assessment Method:
N/A

Outcome of Comparative Assessment:
N/A

3.8 Waste Streams

Table 3-10: Waste Stream Management Methods	
Waste Stream	**Removal and Disposal method**
Bulk liquids	All the Buchan and Hannay hydrocarbon pipelines have been flushed and cleaned with returns to topside sampling point confirmed as <30mg/l oil in water. Most of the pipelines are currently filled with inhibited seawater containing a corrosion inhibitor (PRESERVAN 5500 dosed at 30 ppm). Two lines: gas lift line PL597B and water injection line PL597A contain produced water reinjection fluids to which a scale inhibitor (SI-4i4N) has been added. The chemical cores within the umbilicals have either been flushed with seawater or contain a water based hydraulic fluids. The hydraulic fluids vary between fields: in the Buchan umbilicals it is Aqualink 300F whilst within the Hannay umbilical cores the hydraulic fluids are either Transaqua or Aquaglycol 24.
Marine growth	Where necessary and practicable to allow access and inspection, some marine growth will be removed offshore. The remainder would be brought to shore for disposal should a recycling route (e.g. potential for use as a fertiliser) not be identified.
NORM	Tests for NORM will be undertaken offshore and work will be carried out in full compliance with all relevant regulations (e.g. Radioactive Substances Act 1993, and The Environmental Authorisations (Scotland) Regulations SSI 2018/2019).
Asbestos	N/A
Other hazardous wastes	Will be recovered to shore and disposed of in full compliance with all relevant regulations.
Onshore Dismantling sites	Appropriate licensed sites will be selected. Dismantling sites must demonstrate waste stream management throughout the deconstruction process and the ability to deliver innovative reuse and recycling options. Existing sites would need a proven track record.

As part of the Contracting Strategy, Repsol Sinopec Resources UK Limited will ensure the selection of competent waste management contractors, experienced in the handling of all wastes associated with the decommissioning of Oil and Gas infrastructure.

The waste management provider's/disposal yards shall follow the waste management hierarchy in the handling of materials from the Buchan and Hannay decommissioning Project to maximize the amount of material from the projects which is reused or recovered/recycled. Repsol Sinopec Resources UK Limited and the selected removal contractor(s) will, monitor and review the disposal route of all materials and waste to the point of final reuse, recycling or disposal and reserves the right to audit to fulfil any Duty of Care responsibilities. Geographic locations of potential disposal yard options may require the consideration of Trans Frontier Shipment of Waste (TFSW), including hazardous materials. Early engagement with the relevant waste regulatory authorities will ensure that any issues with TFSW are addressed.

Table 3-11: Inventory Disposition			
	Total Inventory Tonnage	Planned tonnage to shore	Planned left in situ
Installations	13378	13314	64[1]
Pipelines[2]	18198	1673	16526

[1]refers to piles remaining below seabed level.

[2]includes umbilicals and spools.

4 ENVIRONMENTAL APPRAISAL OVERVIEW

4.1 Environmental Sensitivities (Summary)

Table 4-1: Environmental Sensitivities	
Environmental Receptor	**Main Features**
Conservation interests	There are no designated areas within 40 km of the Hannay and Buchan fields such that the proposed decommissioning activities will not impact on any protected sites.
Seabed	The sediments across the area covered by the pre-decommissioning survey were considered to be relatively homogenous and comprised three main habitats: sublittoral mud (EUNIS A5.3), deep circalittoral mixed sediment (EUNIS A5.45) and circalittoral fine sands (EUNIS A5.25). At the Hannay H1 well location and along the export pipeline route, megafauna burrowing communities were present at a density considered to be representative of the UK Habitat Feature of Conservation Importance of 'mud habitats in deep water'. However, the survey report concluded that it was likely that the burrowing densities were overestimated due to inclusion of non-megafaunal species (polychaetes) and by counting multiple burrow openings made by the same individuals. Pockmarks or depressions were observed at one of the stations along the export pipeline route, however there was no evidence of Methane Derived Authigenic Carbonates (MDAC) such that the pockmarks were not considered to represent the Annex I habitat 'Submarine structures made by leaking gases'.
Fish	Several fish species are known to spawn in the vicinity of the Hannay and Buchan fields including (but not limited to): herring, whiting, lemon sole, Norway pout, sandeels, *Nephrops*, and sprat. Group 0 fish for a number of species have been found in the area indicating it is used as a nursery ground for these species including (but not limited to) whiting, lemon sole, Norway pout, sandeels, hake, *Nephrops*, anglerfish, blue whiting, haddock, cod, mackerel and sprat. Of the fish species identified in the area, herring, whiting, sandeels, anglerfish, cod, mackerel and blue whiting have been assessed by the Scottish Natural Heritage (SNH) and the Joint Nature Conservation Committee (JNCC) as Priority Marine Features (PMFs) in Scotland.
Fisheries	The Buchan and Hannay fields and associated infrastructure occur within International Council for Exploration of the Sea (ICES) rectangles 44E9 and 44F0. Pelagic, demersal and shellfish species are taken from both these rectangles. A preliminary review of the Scottish Government landings data for 2014 to 2108 shows that trawl gear and seine nets are used in both rectangles whilst dredges are also active in rectangle 44E9. In both rectangles pelagic landings generally make up the largest quantity (tonnes) of landings, though the value of the shellfish landings is often higher than the value of the demersal landings.

Marine Mammals	The Atlas of Cetacean Distribution in Northwest European Waters suggests that moderate to low densities of minke whale, harbour porpoise, Atlantic white-sided dolphin and Risso's dolphin and high to low densities of white-beaked dolphin have been sighted in the immediate vicinity of the Buchan and Hannay infrastructure.
Birds	European Seabirds at Sea (ESAS) data collected over 30 years, indicates the presence of a number of bird species in the area including but not limited to the northern gannet, northern fulmar, black-legged kittiwake, razorbill, European storm-petrel and Atlantic puffin. The Seabird Oil Sensitivity Index (SOSI) indicates that the vulnerability of birds to surface oil pollution in Blocks 20/5 and 21/1 is: high to extremely high from January to April and low to medium from May to November. In December, the vulnerability of birds to surface pollution in Block 21/1 is considered extremely high and in Block 20/5 it is considered medium.
Onshore Communities	Waste generated during decommissioning will be transported to shore in an auditable manner through licensed waste contractors. The waste management hierarchy of 'reduce, re-use, recycle' will be followed. Repsol Sinopec Resources UK Limited intends to engage approved waste management contractors to handle, store and dispose of all waste generated by the decommissioning activities.
Other Users of the Sea	Based on available data shipping activity in the area of the Buchan and Hannay wells is considered very low to low. At the Forties end of the export route it is considered moderate. There are no offshore windfarm developments within the vicinity of the Buchan and Hannay fields. The fields are located in a well-developed oil and gas area with a number of subsea developments in the area including Tweedsmiur (*c*. 7 km northeast of Buchan field) and Brodgar (*c*. 23 km east of Buchan field). The Goldeneye platform is the closest surface installation and is *c*. 27 km west of the Hannay field.
Atmosphere	Emissions to atmosphere offshore will arise from the vessels used to decommission the Buchan and Hannay infrastructure. Onshore emissions will result from the yard activities including recycling of the steel etc. associated with the structures returned to shore.

4.2 Potential Environmental Impacts and their Management

Environmental Impact Assessment Summary:

Table 4-2: Environmental Impact Management		
Activity	**Main Impacts**	**Management**
Topsides Removal	N/A	N/A
Jacket(s)/Floating Facility Removal	N/A	N/A
Subsea Installation(s) Removal	When assessing the impacts associated with recovery of the subsea installations the aspects considered as part of the EA process included: • The physical presence of vessels; • Energy use and atmospheric emissions; • Underwater noise from vessels; • Discharges to sea from vessels; • Temporary disturbance to the seabed (including drill cutting discharges) from activities including: cutting, recovery, trenching and burying; • Permanent disturbance to the seabed should the option to rockdump the exposed pipeline and umbilical ends be selected; • Discharges to sea from the infrastructure during decommissioning operations; • Production of waste materials. Applying the mitigations summarised in this table (detailed in the EA Report) the environmental and societal significance of the	During decommissioning of the subsea installations, a number of mitigation measures will be adhered to, in order to minimise the marine environmental and socio-economic impacts. These are identified in the EA Report and are summarised here: • Repsol Sinopec Resources UK Limited will carry out a detailed assurance process on all vessels prior to contract award and all contractors will originate from countries signed up to the International Maritime Organisation and will adhere to their guidelines. • Vessel use will be optimised. • Flushing and cleaning has been completed in line with BAT/BEP (Best Available Technique/Best Environmental Practice) requirements. • Work procedures will be in place to minimise duration of activities and minimise likelihood of dropped objects. • SIMOPS (simultaneous operations) will be managed through bridging documents and communications. • Cutting/dredging/jetting work plans will be in place. • Internal cutting of the piles where possible. • Preference will be given to the use of side scan sonar surveys to determine a clear seabed. • Post decommissioning survey strategy.

	proposed activities associated with recovering the subsea installations is considered low.	
Decommissioning Pipelines	Recovery of the surface laid pipelines and umbilicals and decommissioning of the buried pipelines and umbilical in situ will cause some disturbance to the seabed and discharges of line contents to the water column. Decommissioning of the buried pipelines and umbilical in situ will require remediation of the exposed pipeline ends. Aspects considered for the decommissioning of the pipelines and umbilicals include those considered for 'Subsea Installation Removal'. In addition, they included: • Legacy impacts. Applying the mitigations summarised in this table (detailed in the EA Report) the environmental and societal significance of the activities associated with decommissioning the pipelines and umbilicals is considered low.	During decommissioning of the pipelines and umbilicals the relevant mitigation measures identified for 'Subsea Installation Removal' (see above) will be applied. In addition: • With respect to remediating the pipeline and umbilical ends trench and bury or cut and recover will be prioritised over the use of rockdump. • If rockdump is used will be minimised and will be laid in profiles aligned with industry standards. • Preference will be given to the use of side scan sonar surveys to determine a clear seabed. • Post decommissioning survey strategy.
Decommissioning Stabilisation Features	The base case is to decommission the existing rockdump in situ and recover the mattresses and grout bags. Aspects considered for the decommissioning of the stabilisation materials include those considered for 'Subsea Installation Removal'. In addition, as for 'Decommissioning of Pipelines' legacy impacts were also considered. Following the mitigations summarised in this table (detailed in the EA Report) the environmental and societal significance of the	During decommissioning of the 'Stabilisation Features' the relevant mitigation measures identified for 'Subsea Installation Removal' (see above) will be applied. In addition: • In the event that any mattresses or grout bags cannot be recovered Repsol Sinopec Resources UK Limited will consult with OPRED to discuss alternative approaches. • A survey strategy will be agreed with OPRED for monitoring any stabilisation features that will be decommissioned in situ.

	activities associated with decommissioning the stabilisation features is considered low.	
Decommissioning Drill Cuttings	Undisturbed the Buchan template cuttings pile falls below the OSPAR 2006/5 thresholds for rate of oil loss and persistence over time. Removal of the Buchan template will result in some disturbance to the cuttings pile. The level of disturbance will be dependent on the selected cutting method i.e. whether it will be internal or external cutting. It is acknowledged that decommissioning the pile in situ could result in: • A long-term presence of hydrocarbons in sediments; and • A low level leaching of hydrocarbons from the drill cuttings pile. However, given the small size of the pile, and the estimated hydrocarbon content (< 1 te), following disturbance the pile will remain within the OSPAR 2006/5 thresholds.	Repsol Sinopec Resources UK Limited have carried out a BAT assessment to determine the optimal approach to managing the cuttings pile. The results suggest that following recovery of the Buchan template, the pile can be decommissioned in situ.

5 INTERESTED PARTY CONSULTATIONS

Consultations Summary:

During the public consultation period, copies of the DPs and supporting documents were forwarded to the Statutory Consultees identified in Table 5-1. The documents were also made available for public consultation. Comments received following this consultation period are captured in the first part Table 5-1.

As part of the informal stakeholder engagement process Repsol Sinopec Resources UK Limited issued a Scoping Report to a number of stakeholders. The Scoping Report provided an overview of the Buchan & Hannay Field, the proposed decommissioning activities and an overview of the impacts to be assessed in this EA. Recipients of the scoping report were invited to comment on the Scoping Report with respect to any concerns they may have. In addition to issuing the Scoping Report, Repsol Sinopec Resources UK Limited held a Stakeholder Engagement Workshop; 07/11/2019; and no major concerns were raised. Table 5.1 summarises points raised by the stakeholders during the informal consultation process whilst full details are provided in the EA Report.

Table 5-1: Summary of Stakeholder Comments

Who	Comment	Response
Statutory Consultations		
National Federation of Fishermen's Organisations	The NFFO advised that due to the geographical location of the Buchan and Hannah assets, they had no comments as they felt that the SFF were better placed to raise any concerns.	N/A
Scottish Fishermen's Federation (SFF)	No comments received following formal consultation. Comments received during informal consultation are provided below.	N/A
Northern Irish Fish Producers Organisation	No comments received following formal consultation.	N/A
Global Marine Systems Limited	No comments received following formal consultation.	N/A
Public	No comments received following formal consultation.	N/A
Informal Stakeholder Consultations		
Oil and Gas Authority (OGA)	Following issue of the DP for public consultation, OGA advised OPRED that they had no comments, other than to remind Repsol Sinopec Resources UK Limited to submit the necessary PWA variations.	Repsol Sinopec Resources UK Limited takes note of the advice provided by the OGA.
OPRED	OPRED Environmental Management Team (EMT) advised that they had no comments on the Scoping Report.	N/A

	OPRED Offshore Decommissioning Unit (ODU) attended the Stakeholder Engagement Workshop and raised no concerns.	
JNCC	In response to the Scoping Report, JNCC provided guidance on information to be included in the EA. In addition, they requested that the amount of additional hard substrate is minimised. At the Stakeholder Engagement Workshop, JNCC asked about the number of crossings on the export line and if they were above or below the line. Following public consultation JNCC, advised that they would welcome information on any stabilisation material that may be added including location and volume of deposits, size/grade of rock to be added, and further impact assessment.	JNCC's guidance with respect to the EA has been noted and applied where relevant. All surface laid pipelines and umbilicals will be recovered. The base case is to trench and bury or cut and recover the exposed sections of the buried pipelines and umbilical. Should the application of rockdump be selected during the C&P process, rock volumes will be minimised and laid in line with industry standards. Repsol Sinopec Resources UK Limited confirmed 4-6 crossings. Only one of these crossings runs under the export line. All with mattresses and then rockdump on top. Repsol Sinopec Resources UK Limited will include details of any stabilisation features to be added in the supporting permit applications.
Scottish Environment Protection Agency (SEPA)	SEPA advised they had no comments on the Scoping Report. Following public consultation, SEPA provided advice on Duty of Care with respect to Wastes and requirements for Trans-Frontier shipment of wastes	Repsol Sinopec Resources UK Limited takes note of the advice provided by SEPA.
United Kingdom Hydrographic Office (UKHO)	In response to the Scoping Report, UKHO advised that they • require five weeks advance notice of offshore activities; • require confirmation that the seabed is clear of debris, or details of and remaining debris/structures; • recommend that a decommissioning area' is added to their charts. Further details are provided in the EA (Chapter 2).	Repsol Sinopec Resources UK Limited have noted UKHO requests/ recommendations and will provide any further information UKHO may require.

Scottish Fishermen's Federation	SFF did not response to the Scoping Report, however raised the following discussion points during the Stakeholder Engagement Workshop: • queried what happens if the cuttings are over trawled and how can we ensure they remain undisturbed if no safety zones in place; • noted that any remaining infrastructure would need to be shown to be over trawlable, and that there will need to be ongoing monitoring to see it remains that way. • queried if there were any anchor scars post the Buchan FPU's removal?	Repsol Sinopec Resources UK Limited explained that there is an Industry Wide Response being prepared by OPRED. SFF then mentioned that it may be the case that the Fishermens preference when consulted would rather see a statutory exclusion zone around cuttings etc, rather than an advisory one. Ongoing concern about how they are communicated to fishermen – FishSafe and UK Fisheries Legacy trust Fund (FLT). Repsol Sinopec Resources UK Limited said there would be a clean seabed survey at the end of the works. In addition, there will be an ongoing monitoring regime agreed with OPRED. Repsol Sinopec Resources UK Limited – during the off-station project, the anchors were removed more easily than expected – no significant depressions were noted when the anchors were removed. The mooring lines were wire as opposed to chain, so less impact observed along the length of the wire. However, Repsol Sinopec Resources UK Limited will revisit during the post decom survey to confirm. SFF supportive of this, as the whole area is still being avoided by the fishermen.
Others	Details of all organisations issued the Scoping Report and invited to the Stakeholder Engagement Workshop are provided in Chapter 2 of the EA.	

6 PROGRAMME MANAGEMENT

6.1 Project Management and Verification

Repsol Sinopec Resources UK Limited has established a multi-disciplinary team lead by a Project Manager responsible for the implementation of activities and co-ordination of all services. An execution plan will align with established Repsol Sinopec Resources UK Limited Health, Safety and Environment policies and meet all relevant legislative requirements. A contracting strategy will be based on Repsol Sinopec Resources UK Limited procurement and contracts policies, including competitive tendering for all contractor services. Where possible, activities will be co-ordinated with other decommissioning operations and take account of any initiatives promoted by the OGA. Repsol Sinopec Resources UK Limited will report regularly on the execution of the DPs to OPRED and discuss any changes in plans in advance.

6.2 Post-Decommissioning Debris Clearance and Verification

A pre-decommissioning survey has been completed to identify debris within the installations' 500 m zones and within the 100 m pipeline corridors. Any seabed debris related to offshore oil and gas activities will be recovered for onshore recycling or disposal in line with existing waste management policies. The clear seabed will either be validated by an independent verification trawl over the installation sites and pipeline corridors or by the post decommissioning survey. All pipeline routes and installation sites will be the subject to oilfield debris clearance and as-left verification surveys when decommissioning activity has concluded. The main risk from infrastructure remaining in situ is the potential for interaction with other users of the sea, specifically from fishing related activities. Where the infrastructure is trenched below seabed level or trenched & buried below, the effect of interaction with other users of the sea is considered to be negligible. The infrastructure is currently shown on Admiralty Charts and the FishSafe system. When decommissioning activity has been competed, updated information will be made available to update Admiralty Charts and FishSafe system. When decommissioning activities have been completed, and where applicable, the safety zones around offshore infrastructure will be removed.

The licence holders recognise their commitment to undertake post-decommissioning monitoring of infrastructure left in situ. After the post-decommissioning survey reports have been sent to OPRED and reviewed, a post-decommissioning monitoring survey regime, scope and frequency, will be agreed with OPRED.

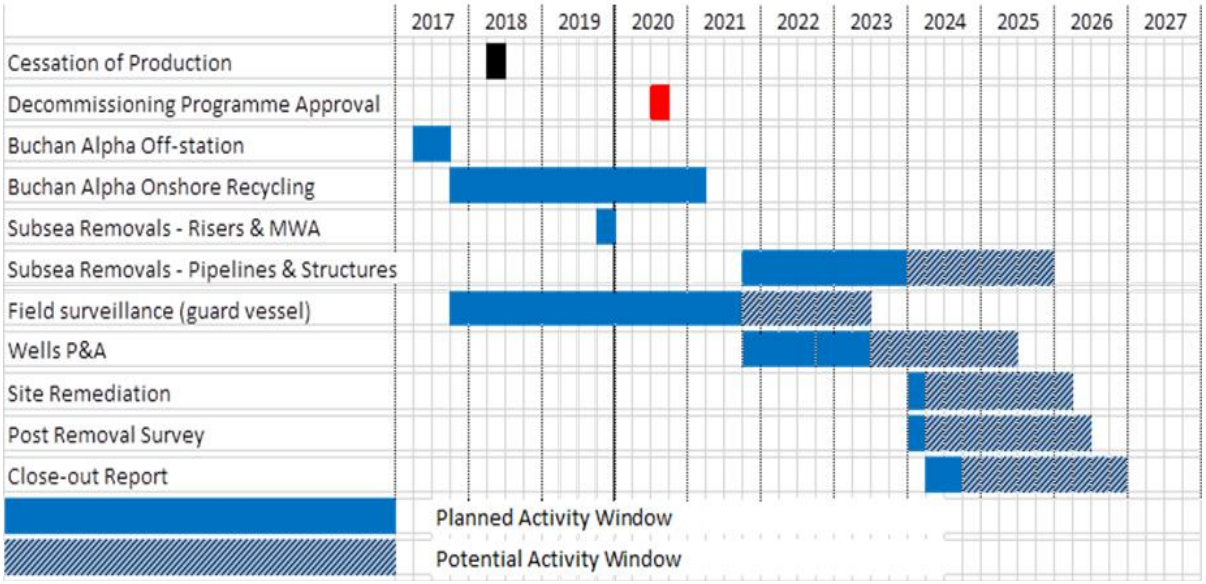
6.3 Schedule

The main milestones on the Buchan & Hannay DP's are:

- Wells abandonment
- Subsea infrastructure removal
- Post removal survey

The schedule may change to maximise economic recovery or to exploit opportunities to minimise decommissioning impacts by combining other decommissioning activities within our portfolio into campaigns, or by combining Buchan & Hannay decommissioning operations with third party decommissioning. The schedule for the Buchan & Hannay DP's is outlined in Figure 6.1.

Figure 6-1: Gantt Chart of Project Plan



6.4 Costs

Table 6-1: Provisional Decommissioning Programme(s) costs	
Item	**Estimated Cost (£m)**
Platform(s)/Jacket(s) - Preparation/Removal and Disposal	Will be provided to OPRED[1]
Pipeline(s) Decommissioning	Will be provided to OPRED[1]
Subsea Installation(s) and Stabilisation Feature(s)	Will be provided to OPRED[1]
Well Abandonment	Will be provided to OPRED[1]
Continuing Liability – Future Pipeline and Environmental Survey Requirements	Will be provided to OPRED[1]
TOTAL	Will be provided to OPRED[1]

[1] Estimated Costs are confidential and will be provided separately to OPRED

6.5 Close Out

A close out report will be submitted to OPRED within 12 months of the completion of decommissioning completion, including debris clearance and post-decommissioning surveys. The close out report will notify OPRED of any variances to outcomes that have been detailed in these DPs.

6.6 Post-Decommissioning Monitoring and Evaluation

A post decommissioning environmental seabed survey, covering pipeline routes and sites of wellheads and installations, will be carried out when decommissioning activity has been concluded. The survey will focus on chemical and physical disturbances due to the decommissioning and be compared with the pre-decommissioning survey. Results of the survey will be forwarded to OPRED to enable a post monitoring survey regime to be agreed by both parties.

7 SUPPORTING DOCUMENTS

Table 7-1: Supporting Documents	
Document Number	**Title**
RP-DTABUC001-HS-0093	Buchan and Hannay Environmental Appraisal. Repsol Sinopec Resources UK Limited
RP-DTABUC001-SS-0081	Buchan and Hannay Comparative Assessment Report. Repsol Sinopec Resources UK Limited

8 PARTNER LETTER(S) OF SUPPORT

REPSOL SINOPEC RESOURCES
UK LIMITED

163 Holburn Street
Aberdeen
AB10 6BZ

T +44 (0)1224 352500
F +44 (0)1224 353400
W www.repsolsinopecuk.com

7 December 2020
Our Ref: 20GEN001/LC

Offshore Petroleum Regulator for Environment and Decommissioning
Department for Business, Energy & Industrial Strategy
3rd Floor, Wing C
AB1 Building
Crimon Place
Aberdeen
AB10 1BJ

Dear Sir or Madam

BUCHAN AND HANNAY DECOMMISSIONING PROGRAMMES
PETROLEUM ACT 1998

We acknowledge receipt of your letters dated 23 November 2020

We, Repsol Sinopec Resources UK Limited on behalf of ourselves, Repsol Sinopec North Sea Limited, Transworld Petroleum (U.K.) Limited and Repsol S.A. hereby submit the Buchan and Hannay Decommissioning Programmes dated 25 November 2020 as directed by the Secretary of State on 23 November 2020.

The Buchan and Hannay Decommissioning Programmes dated 25 November 2020, are submitted by Repsol Sinopec Resources UK Limited on behalf of the Section 29 Notice Holders, Repsol Sinopec Resources UK Limited, Repsol Sinopec North Sea Limited, Transworld Petroleum (U.K.) Limited and Repsol S.A. under section 29 of the Petroleum Act 1998.

Yours faithfully

For and on behalf of **Repsol Sinopec Resources UK Limited**

Director

TRANSWORLD PETROLEUM (U.K.) LIMITED

163 Holburn Street
Aberdeen
AB10 6BZ

T +44 (0)1224 352500
F +44 (0)1224 353400
W www.repsolsinopecuk.com

7 December 2020
Our Ref: 20GEN001/LC

Offshore Petroleum Regulator for Environment and Decommissioning
Department for Business, Energy & Industrial Strategy
3rd Floor, Wing C
AB1 Building
Crimon Place
Aberdeen
AB10 1BJ

Dear Sir or Madam

BUCHAN AND HANNAY DECOMMISSIONING PROGRAMMES
PETROLEUM ACT 1998

We acknowledge receipt of your letters dated 23 November 2020

We, Transworld Petroleum (U.K.) Limited confirm that we authorise Repsol Sinopec Resources UK Limited to submit on our behalf abandonment programmes relating to the Buchan installations and pipelines as directed by the Secretary of State on 23 November 2020.

We confirm that we support the proposals detailed in the Buchan and Hannay Decommissioning Programmes dated 25 November 2020, which is to be submitted by Repsol Sinopec Resources UK Limited in so far as they relate to those facilities in respect of which we are required to submit an abandonment programme under section 29 of the Petroleum Act 1998.

Yours faithfully

For and on behalf of **Transworld Petroleum (U.K.) Limited**

Director

REPSOL SINOPEC NORTH SEA LIMITED

163 Holburn Street
Aberdeen
AB10 6BZ

T +44 (0)1224 352500
F +44 (0)1224 353400
W www.repsolsinopecuk.com

7 December 2020
Our Ref: 20GEN001/LC

Offshore Petroleum Regulator for Environment and Decommissioning
Department for Business, Energy & Industrial Strategy
3rd Floor, Wing C
AB1 Building
Crimon Place
Aberdeen
AB10 1BJ

Dear Sir or Madam

BUCHAN AND HANNAY DECOMMISSIONING PROGRAMMES
PETROLEUM ACT 1998

We acknowledge receipt of your letters dated 23 November 2020

We, Repsol Sinopec North Sea Limited confirm that we authorise Repsol Sinopec Resources UK Limited to submit on our behalf abandonment programmes relating to the Buchan and Hannay installations and pipelines as directed by the Secretary of State on 23 November 2020.

We confirm that we support the proposals detailed in the Buchan and Hannay Decommissioning Programmes dated 25 November 2020, which is to be submitted by Repsol Sinopec Resources UK Limited in so far as they relate to those facilities in respect of which we are required to submit an abandonment programme under section 29 of the Petroleum Act 1998.

Yours faithfully

For and on behalf of **Repsol Sinopec North Sea Limited**

Director

REPSOL

Offshore Petroleum Regulator for Environment and Decommissioning
Department for Business, Energy & Industrial Strategy
3rd Floor, Wing C
AB1 Building
Crimon Place
Aberdeen
AB10 1BJ

1st December 2020

Dear Sir or Madam

BUCHAN AND HANNAY DECOMMISSIONING PROGRAMMES
PETROLEUM ACT 1998

We acknowledge receipt of your letters dated 23 November 2020.

We, Repsol S.A. confirm that we authorise Repsol Sinopec Resources UK Limited to submit on our behalf abandonment programmes relating to the Hannay installations and pipelines as directed by the Secretary of State on 23 November 2020.

We confirm that we support the proposals detailed in the Buchan and Hannay Decommissioning Programmes dated 25 November 2020, which is to be submitted by Repsol Sinopec Resources UK Limited in so far as they relate to those facilities in respect of which we are required to submit an abandonment programme under section 29 of the Petroleum Act 1998.

Yours faithfully,

Name: Jose Carlos de Vicente Bravo
Position in Company: ED Europe, Africa, Asia, Brazil & Venezuela

For and on behalf of **Repsol S.A.**