

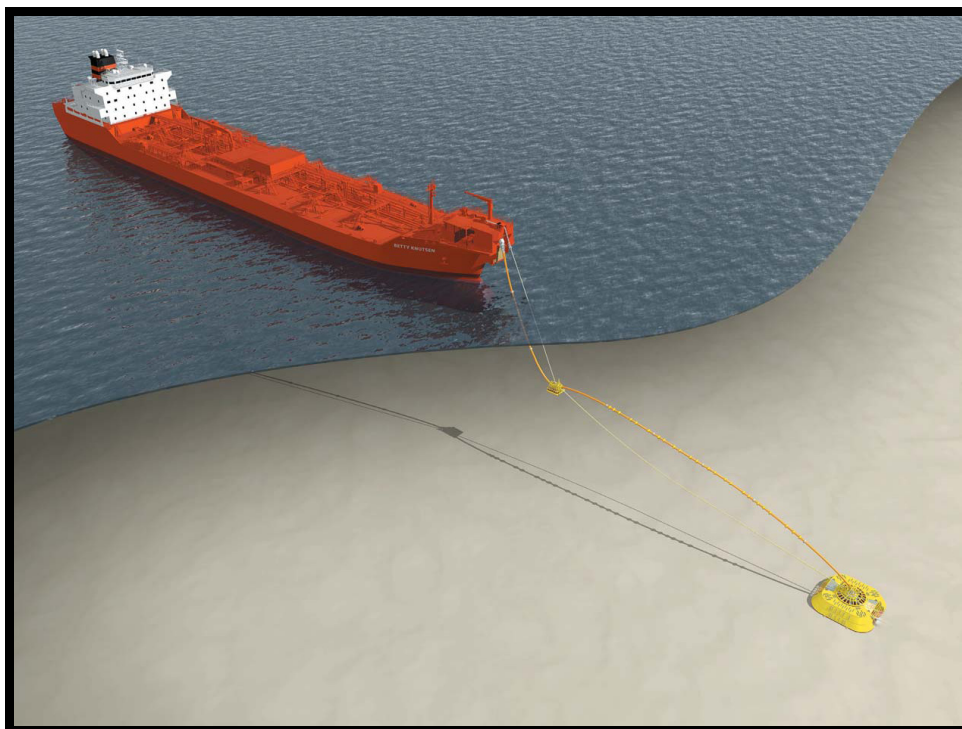


VENTURE
PRODUCTION plc

Kittiwake SAL Export System Decommissioning Programme

Incorporating Decommissioning Programmes for
Pipeline PL2205 and Kittiwake SAL Structure

24th JUNE 2009

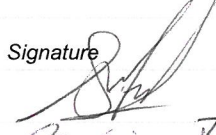
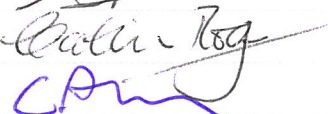




Kittiwake SAL Export System Decommissioning Programme

Incorporating Decommissioning Programmes for
Pipeline PL2205 and Kittiwake SAL Structure

24th JUNE 2009

Document ID:	VPC-PRJ-GKA0028-REP-0001		
Prepared by:	Stewart Ford	Signature 	Date 22/6/09
Reviewed by:	Catrin Rogers		22/6/09
Approved by:	Marshall Allerton		22/6/09

Amendment Record		
Amendment No.	Date Amended	Reason
A1	16/03/09	First Draft Issued for Consultation
A2	24/06/09	Issued for Approval by the Secretary of State



VENTURE
PRODUCTION plc

Our Reference: VPC-PRJ-GKA0028-COR-0007

24 June 2009

Offshore Decommissioning Unit
Department for Energy and Climate Change
3rd Floor
Atholl House
86-88 Guild Street
Aberdeen
AB11 6AR

Dear Sir or Madam

**KITTIWAKE SAL EXPORT SYSTEM DECOMMISSIONING PROGRAMME
PETROLEUM ACT 1998**

We acknowledge receipt of your letter dated 9 June 2009.

We, Venture Production PLC confirm that we authorise Venture North Sea Oil Limited to submit on our behalf an abandonment programme relating to the Kittiwake SAL Export System facilities (including SAL Assembly and pipelines PL2205) as directed by the Secretary of State on 9 June 2009.

We confirm that we support the proposals detailed in the Kittiwake SAL Export System Decommissioning Programme (including SAL Assembly and pipelines PL2205) dated 24 June 2009, which is to be submitted by Venture North Sea Oil Limited in so far as they relate to those facilities in respect of which we are required to submit abandonment programmes under section 29 of the Petroleum Act 1998.

Yours Faithfully

Jonathan Roger
Chief Operating Officer
For and on behalf of Venture Production PLC



Dana Petroleum plc

Group Headquarters:

17 Carden Place
Aberdeen AB10 1UR
Tel: +44 1224 652400
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24 June 2009

Offshore Decommissioning Unit
3rd Floor
Atholl House
86-88 Guild Street
Aberdeen
AB11 6AR

Dear Sir or Madam,

**KITTIWAKE SAL EXPORT SYSTEM DECOMMISSIONING PROGRAMME
PETROLEUM ACT 1998**

We acknowledge receipt of your letter dated 9 June 2009.

We, Dana Petroleum Public Limited Company confirm that we authorise Venture North Sea Oil Limited to submit on our behalf an abandonment programme relating to the Kittiwake SAL Export System facilities (including SAL Assembly and pipelines PL2205) as directed by the Secretary of State on 9 June 2009.

We confirm that we support the proposals detailed in the Kittiwake SAL Export System Decommissioning Programme (including SAL Assembly and pipelines PL2205) dated 24 June 2009, which is to be submitted by Venture North Sea Oil Limited in so far as they relate to those facilities in respect of which we are required to submit abandonment programmes under section 29 of the Petroleum Act 1998.

Yours faithfully,
for and on behalf of Dana Petroleum Public Limited Company

Stuart Paton
Technical and Commercial Director



Dana Petroleum (E&P) Limited

Group Headquarters:

17 Carden Place
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24 June 2009

Offshore Decommissioning Unit
3rd Floor
Atholl House
86-88 Guild Street
Aberdeen
AB11 6AR

Dear Sir or Madam,

**KITTIWAKE SAL EXPORT SYSTEM DECOMMISSIONING PROGRAMME
PETROLEUM ACT 1998**

We acknowledge receipt of your letter dated 9 June 2009.

We, Dana Petroleum (E&P) Limited confirm that we authorise Venture North Sea Oil Limited to submit on our behalf an abandonment programme relating to the Kittiwake SAL Export System facilities (including SAL Assembly and pipelines PL2205) as directed by the Secretary of State on 9 June 2009.

We confirm that we support the proposals detailed in the Kittiwake SAL Export System Decommissioning Programme (including SAL Assembly and pipelines PL2205) dated 24 June 2009, which is to be submitted by Venture North Sea Oil Limited in so far as they relate to those facilities in respect of which we are required to submit abandonment programmes under section 29 of the Petroleum Act 1998.

Yours faithfully,
for and on behalf of Dana Petroleum (E&P) Limited

Stuart Paton
Technical and Commercial Director



24 June 2009

Offshore Decommissioning Unit
3rd Floor
Atholl House
86-88 Guild Street
Aberdeen AB11 6AR
United Kingdom

Dear Sir or Madam

KITTIWAKE SAL EXPORT SYSTEM DECOMMISSIONING PROGRAMME
PETROLEUM ACT 1998

We acknowledge receipt of your letter dated 9 June 2009.

We, Nordic Troll and Trym LLC confirm that we authorise Venture North Sea Oil Limited to submit on our behalf an abandonment programme relating to the Kittiwake SAL Export System facilities (including SAL Assembly and pipelines PL2205) as directed by the Secretary of State on 9 June 2009.

We confirm that we support the proposals detailed in the Kittiwake SAL Export System Decommissioning Programme (including SAL Assembly and pipelines PL2205) dated 24 June 2009, which is to be submitted by Venture North Sea Oil Limited in so far as they relate to those facilities in respect of which we are required to submit abandonment programmes under section 29 of the Petroleum Act 1998.

Yours faithfully
For and on behalf of Nordic Troll and Trym LLC

A handwritten signature in blue ink, appearing to read 'Lars Ola T. Almås', with a stylized flourish at the end.

Lars Ola T. Almås
Attorney in fact

NORDIC TROLL & TRYM L.L.C.
Power of Attorney

KNOW ALL MEN BY THESE PRESENTS that Nordic Troll & Trym L.L.C., a limited liability company organized and existing under the laws of the Republic of the Marshall Islands (the "Company"), has appointed and constituted and by these presents does constitute and appoint **LARS OLA TAN ALMÅS, KENNETH HVID AND STEIN RYNNING** of Teekay Shipping Norway AS and any other persons such attorney-in-fact may in his sole discretion designate (together the "**Attorneys-in-Fact**", and individually the "**Attorney-in-Fact**"), as the Company's true and lawful attorney-in-fact and in the Company's name, place and stead, to do any and every act, exercise any and every power that the Company might or could do and that said attorneys-in-fact for the Company shall deem proper and advisable, insofar as it pertains to the following:

To execute, acknowledge and deliver on behalf of the Company all documents related to the removal of the Company's SAL from the Kittiwake field in the North Sea as carried out by the Kittiwake field license holder Venture North Sea Oil Ltd; and to execute, acknowledge and deliver on behalf of the Company all documents related to storage of the Company's SAL

This Power of Attorney is to extend to all acts of any kind that may be requisite and necessary to be done under the circumstances hereinabove described as fully, to all intents and purposes, as might be done by any officer or officers of the undersigned.

The Company shall at all times ratify and confirm whatever such attorneys-in-fact lawfully do or cause to be done pursuant to this Power of Attorney and shall indemnify and keep such attorneys-in-fact indemnified against all claims, demands, costs, damages, losses and expenses howsoever arising consequent upon the lawful exercise of all or any of the powers and authorities contained herein, unless this Power of Attorney is revoked and proper notice of revocation is given to each and every attorney-in-fact.

IN WITNESS WHEREOF, the Company has caused this Power of Attorney to be validly executed as of the 10th day of June, 2009.

NORDIC TROLL & TRYM L.L.C.

By: Teekay Nordic Holdings Incorporated, its Sole
Member

By: _____

Name: Art Bensler

Title: Director



ENTURE
PRODUCTION plc

DOCUMENT TITLE: KITTIWAKE SAL EXPORT SYSTEM
DECOMMISSIONING PROGRAMME
DOCUMENT NO: VPC-PRJ-GKA0028-REP-0001 REV A2

AMENDMENT RECORD

All amendments to this document shall be recorded on the Amendment Record sheet below.
No changes to this document are to be made without approval from the General Manager.

<u>Date</u>	<u>Incorporated By</u>	<u>Section</u>	<u>Description</u>
A2	Stewart Ford	General Update	Feedback from DECC and consultation process added and general updates.



ABBREVIATIONS

COP	Cessation Of Production
DANA	Dana Petroleum (E&P) Limited and DANA Petroleum Public Limited Company
DECC	Department of Energy And Climate Change
DP	Dynamic Positioning
ESSO	Esso Exploration And Production UK
FRS	Fisheries Research Service
GKA	Greater Kittiwake Area
HSE	Health And Safety Executive
IPR	Interim Pipeline Regime
JNCC	Joint Nature Conservation Committee
KLB	Kittiwake Loading Buoy
NTT	Nordic Troll And Trym LLC
NUI	Normally Unmanned Installation
PAH	Polycyclic aromatic hydrocarbons
PLEM	Pipeline End Manifold
PL2205	Kittiwake Sal Export Pipeline
ROV	Remotely Operated Vehicle
SAL	Single Anchor Loading Assembly
SEPA	Scottish Environment Protection Agency
SFF	Scottish Fishermen's Federation
TOC	Total Organic Content
VENTURE	Venture North Sea Oil Limited and Venture Production PLC
WROV	Work Class Remotely Operated Vehicle

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1 INTRODUCTION

This document relates to the decommissioning of the Kittiwake Single Anchor Loading Export System which comprises an 8" flexible pipeline (PL2205) and a Single Anchor Loading assembly (SAL). Two decommissioning programmes are incorporated into this document covering the following:

- the flexible pipeline (PL2205)
- the SAL assembly

These decommissioning programmes are submitted in accordance with the requirements of the Petroleum Act 1998.

The parties responsible for each decommissioning programme are as follows:

SAL Assembly: Dana Petroleum (E&P) Limited, Dana Petroleum Public Limited Company, Nordic Troll and Trym LLC, Venture North Sea Oil Limited and Venture Production PLC

Pipeline PL2205 Dana Petroleum (E&P) limited, and Venture North Sea Oil Limited

The decommissioning of the SAL and the SAL pipeline will be project managed by Venture on behalf of the other parties.

Both the flexible pipeline and the SAL are to be returned to the owner for reuse. Redundant protection mattresses will be returned to a UK port for disposal by a licensed disposal contractor.

Kittiwake is located in Block 21/18 of the UKCS (Central North Sea). The SAL is located approximately 2.9km northeast of Kittiwake Platform at 6372079N 532535E.



Figure 1.1 A SAL Undergoing Testing Before Delivery

2 EXECUTIVE SUMMARY

2.1 Scope of Decommissioning

The Decommissioning Programmes presented in this document relate to the removal of the Kittiwake Single Anchor Loading Oil Export System. This comprises a flexible pipeline (PL2205) of approximately 3km total length and a Single Anchor Loading Assembly (SAL). Both the pipeline and the SAL are on lease to Venture and will be returned to their owner for reuse.

The export riser and tie-in spool which also form part of PL2205 will be retained for potential reuse. These items, which are both within the Kittiwake 500m safety zone, are presently filled with inhibited seawater.

Redundant mattresses, grout bags and other recovered waste materials will be sent for disposal by a UK based licensed disposal contractor.

A visual survey of the area around the SAL and the pipeline will be undertaken and any significant man-made debris discovered will be recovered and sent for disposal by a UK based licensed disposal contractor.

Once the removal scope is complete, a debris trawl, covering the SAL 500m safety zone and a corridor, along the pipeline route starting at the Kittiwake safety zone, will be carried out to confirm that the seabed is clear of significant debris and safe for the resumption of fishing activities. The corridor along the pipeline will be 200m wide and centred on the pipeline route. This work will be organised by the Scottish Fishermen's Federation and verified by an independent third party. Should debris be recovered by this operation, it will be sent for disposal by a UK based licensed disposal contractor.

Seabed samples will be taken and tested for the presence of hydrocarbons and other pollutants. These, together with samples taken in earlier environmental surveys undertaken in the area, will be used as a basis for discussing and agreeing requirements for further environmental monitoring with DECC.

2.2 Background and Current Status

The SAL export system was brought into service in 2005 to replace the Kittiwake Loading Buoy and was used to offload export crude to shuttle tankers until 2007 when it was replaced by the Greater Kittiwake Area (GKA) export pipeline. The SAL export system is not a storage system. When in operation, the only hydrocarbon inventory was the contents of the riser, pipeline, the pipework in the SAL assembly and the loading hose.

When the SAL export system was taken out of service, the system was thoroughly flushed through to a shuttle tanker and left filled with inhibited seawater. The loading hose and associated recovery rigging were subsequently removed for storage in 2008 and, at the same time, the pipeline was disconnected from the SAL and the Kittiwake tie-in spool and blind flanges fitted.

2.3 Schedule Drivers

The lease agreement for the pipeline and SAL expires in November 2010 by which time these items must be recovered and returned to the owner. However Venture wishes to have the option to remove the Kittiwake SAL Export System, or parts of the system, during the 2009 construction season so that advantage can be taken of existing construction vessel charters.



Early removal of the SAL would provide the potential for the SAL to be reallocated to another field during 2009. The feasibility and timing of this option depends on the availability of a suitable vessel and the commercial impacts to Venture relative to a 2010 removal operation as well as the owner identifying a new customer.

Early removal of the flexible pipeline would be driven by the potential for synergies with other Venture projects by making use of a reel vessel chartered for these projects. The recovery of the pipeline during 2009 is considered to be a low priority relative to these other projects. If circumstances dictate that there is no synergy to be achieved by a 2009 pipeline removal, this scope will be built into Venture's 2010 subsea construction schedule.

Should the removal of the SAL and/or the flexible pipeline be deferred to the 2010 construction season, the timing will be determined to make optimum use of vessel availability commensurate with ensuring that the equipment is delivered to the owner before the expiry of the lease agreement.

The debris trawl will be carried out once all subsea activities have been completed. This is most likely to be during summer 2010 to avoid the risk of encountering bad weather.

3 HISTORY AND BACKGROUND

3.1 Kittiwake Development

VENTURE and Dana acquired Kittiwake from the original owners, Shell U.K. Ltd (Shell) and Esso Exploration and Production UK Limited (Esso) on 26th November 2003.

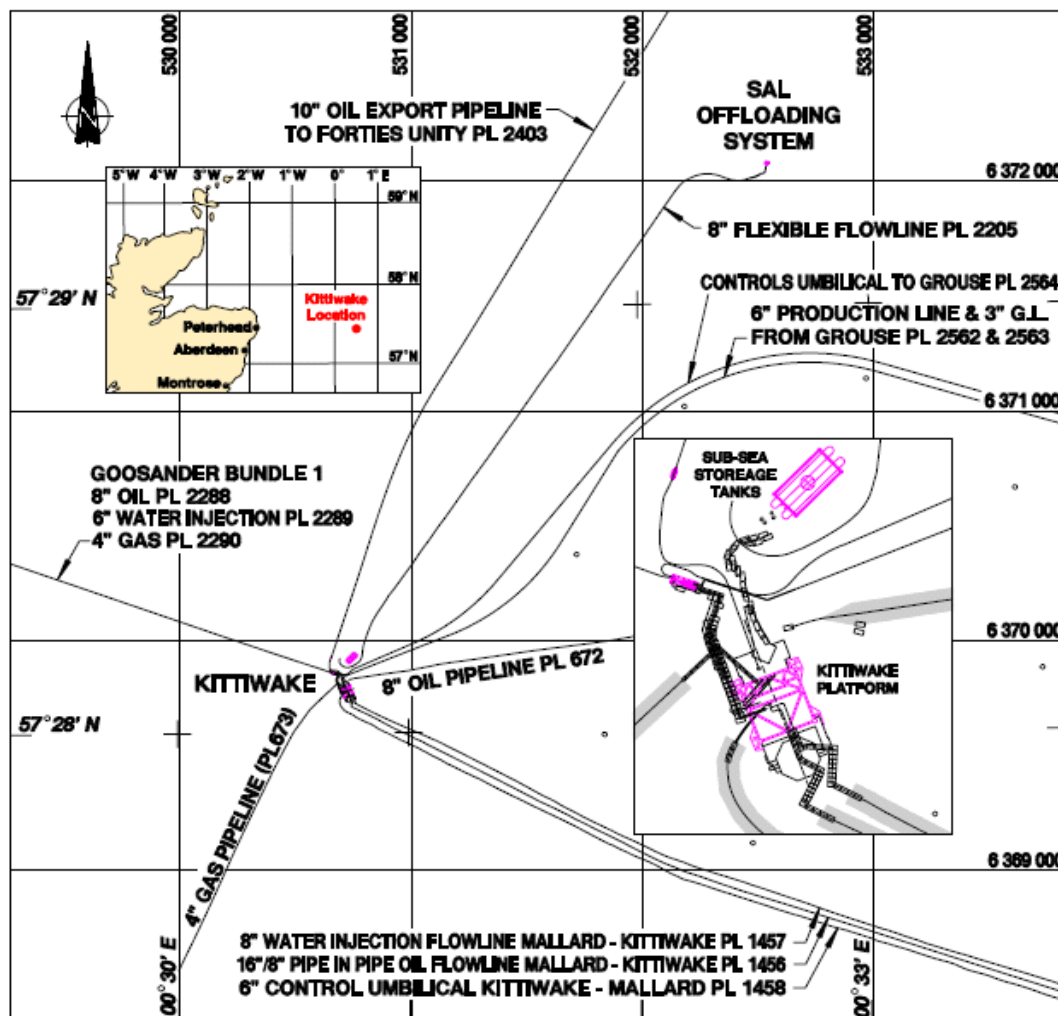


Figure 3.1 Kittiwake Facilities

Kittiwake has been in operation since 1990. Gas is exported to St Fergus via the Fulmar to St Fergus 20" Gas Pipeline. Until 2005, crude oil was exported by shuttle tanker via the Kittiwake Loading Buoy (KLB). During 2005, KLB was taken out of service and replaced by the SAL export system. A new export pipeline was put into service in November 2007 and crude oil is now exported from the Greater Kittiwake Area (GKA) through this pipeline to BP's Unity Platform. KLB was removed from site during 2008 for final decommissioning. The SAL and the flexible pipeline are on lease to Venture and must be returned to their owner by November 2010. Venture wishes to have the option to remove the Kittiwake SAL Export System or part of the system during 2009 to take advantage of existing vessel charters. The SAL and flexible pipeline will be returned to the owner for further use.

and the option to remove the equipment during 2009 may be advantageous with respect to finding another user.

Kittiwake remains the hub for the fields in the Greater Kittiwake Area (GKA) and will continue in production until at least 2018.

Figure 3.1 shows the layout of the Kittiwake facilities.

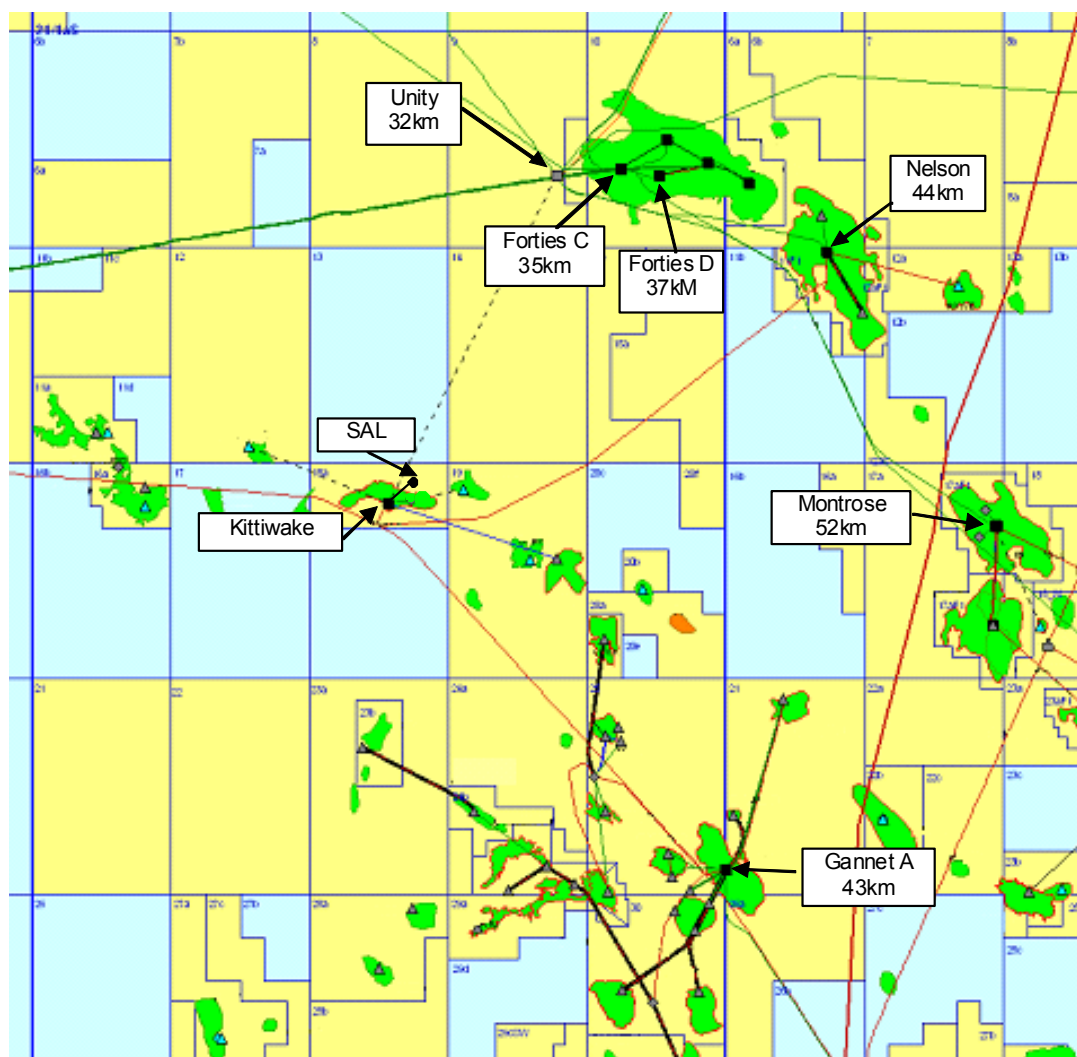


Figure 3.2 Kittiwake and Neighbouring Fixed Installations

3.2 Background Information

Kittiwake is located in Block 21/18 of the UKCS (Central North Sea) and is approximately 135km East of Peterhead. Figure 3.2 shows the position of Kittiwake and SAL relative to the nearest neighbouring fixed installations and indicates the approximate distances from these installations to Kittiwake.

The Kittiwake SAL assembly is located approximately 2.9km North East of Kittiwake Platform at 6 372079N 532 535E. The water depth at SAL is 85m.

3.3 Environmental Data

Environmental data relating to the Kittiwake SAL export system, including wind, wave, current and seabed data can be found in Section 10. "Environmental Impact Assessment".

3.4 Kittiwake Single Anchor Loading Export System

The SAL system was developed by Advanced Production and Loading (APL) as a means of exporting crude oil where providing an export pipeline was not feasible or not economical. It can be readily retrieved and redeployed and is therefore an ideal system for short-term use. The Kittiwake SAL export system was previously in service in the Ardmore field and both the SAL assembly and the flexible pipeline were retrieved from Ardmore in 2005 and redeployed at Kittiwake. The SAL assembly and the flexible pipeline are the property of Nordic Troll and Trym and are on lease to Venture until November 2010.

The system consists of an 8" flexible flowline and a SAL assembly. Tankers were loaded by means of a loading hose and recovery rigging. The pipeline is trenched over its length apart from short lengths at each end. The untrenched portions were protected by concrete mattresses.

The Kittiwake SAL export system is not a storage system but only a means of delivering crude oil from the Kittiwake platform to shuttle tankers. When in use, the only hydrocarbon inventory associated with the system was the contents of the riser, pipeline, SAL pipework and the loading hose. When the system was taken out of service, it was thoroughly flushed through to a shuttle tanker and left filled with inhibited seawater. The loading hose and its rigging were recovered for storage and reuse in 2008. At the same time, the pipeline was disconnected from the SAL and the Kittiwake tie-in spool and blind flanges fitted. The concrete mattresses at the Kittiwake tie-in have been redeployed.

The SAL assembly is secured to the seabed by 4No suction anchors and incorporates a built-in protection structure designed to be overtrawlable. The SAL assembly is designed to be towed to location by means of built in buoyancy tanks supplemented by air trapped in the suction anchor cans to provide buoyancy.

4 SCOPE OF DECOMMISSIONING

See Figure 3.1 for the location of the facilities described in this section.

4.1 Facilities Included in the Scope

4.1.1 Installations

- The SAL assembly.

4.1.2 Pipelines

- The SAL Export Pipeline (PL2205) flexible pipeline.

The items to be removed comprise two separate sections of flexible pipeline. See also 4.2.4 below for the parts of PL2205 that are being retained.

4.1.3 Umbilicals

- None

4.1.4 Risers

- None. See 4.2.4 below.

4.1.5 Materials on the Seabed

- Concrete protection mattresses at the SAL Assembly tie-in.
- Grout bags

Deposition on the seabed of materials of any kind other than protection mattresses and grout bags has never been part of the SAL system operations.

Protection mattresses at the Kittiwake tie-in have been reused for subsequent projects.

4.2 Facilities Excluded from the Scope

4.2.1 KLB Export Pipeline

The KLB pipeline (PL672) is currently part of the Interim Pipeline Regime and will be finally decommissioned at Cessation of Production for the Greater Kittiwake Area. Decommissioning of this pipeline has been deferred to take advantage of the cost benefits of a pipeline decommissioning campaign at CoP as well as to keep the pipeline available for potential reuse.

The pipeline has been left filled with inhibited seawater and is buried for most of its length. When KLB was removed in 2008, this pipeline was left protected by mattresses to ensure that it does not constitute a snagging hazard or other threat to users of the sea. The pipeline is sealed by a blind flange at the Kittiwake (upstream) end, and an ROV installed plug at the downstream end. At the request of SFF, a small quantity of rock was placed on the end of the pipeline at the KLB end to mitigate any opportunity for fishing gear to become fastened on the pipeline.

The pipeline will continue to be routinely inspected to ensure that the protection described above remains in place and effective, the blind flange remains secure (at the Kittiwake end) and that the rock protection at the termination continues to be an effective anti-snagging measure. The next inspection is scheduled for 2010.

4.2.2 Kittiwake Subsea Storage and Pipelines

Kittiwake Subsea Storage was used as temporary crude oil storage to allow production to continue uninterrupted between shuttle tanker operations. This facility is no longer required now that the export pipeline is in operation.

Subsea Storage will be left in place until COP on the basis that it is within the 500m safety zone of a live platform and adjacent to live pipelines. Its early removal presents an unnecessary and unacceptable safety, environmental and business risk.

Now that the GKA Export Pipeline is in service, the storage facility has been thoroughly flushed and filled with inhibited seawater to prevent internal corrosion and the inlet and outlet have been sealed with blind flanges. An appropriate inspection regime has been established to monitor the condition of the facility and its corrosion protection system so that any necessary remedial action can be identified and implemented in good time.

The flexible pipelines PL1633 and 1634 serving the subsea storage tank have been removed.

4.2.3 Greater Kittiwake Area Export Pipeline

The GKA export pipeline (PL2403) came into service in November 2007 and will remain in service until at least 2018.

4.2.4 PL2205 Riser and Tie-in Spool

The riser and spool will be retained for potential reuse. The riser forms part of the Kittiwake structure and the spool lies entirely within the Kittiwake 500m exclusion zone. Both the riser and spool will be decommissioned as part of the Kittiwake decommissioning scope at CoP. The riser and spool are currently filled with inhibited seawater and the spool is sealed with a blind flange.

4.3 Derogations Required (Not Applicable to SAL)

OSPAR Decision 98/3 recognises that it may be appropriate to leave the footings of large steel structures or concrete structures in place. This applies to structures installed before 9th February 1999.

The SAL Oil Export System does not fall into this category and will be removed in its entirety. No derogations are therefore required.

4.4 Reference Drawings

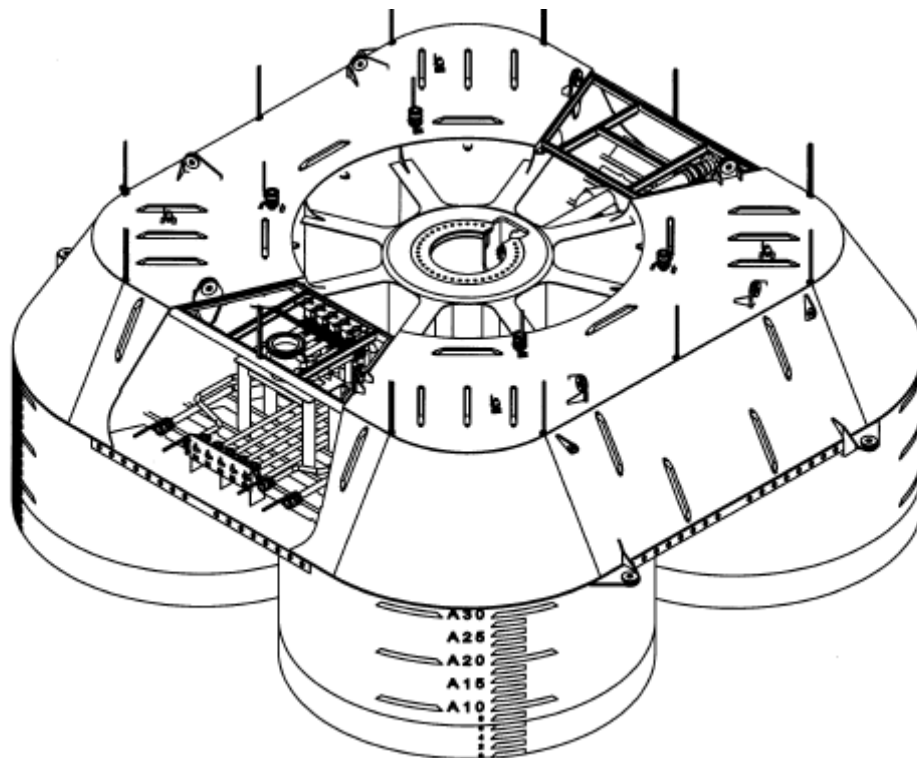
The following drawings are attached in the appendix for reference.

Ref	Drawing No.	Title
[1]	1233-APL-N-XG-BG-0001	Kittiwake SAL: SAL Anchor
[2]	1233-APL-W-XD-MG-0001	Kittiwake SAL: SAL Mooring
[3]	1233-APL-Y-XD-BG-0001	Kittiwake SAL: SAL System
[4]	GKA0009-65-DR-0002	SAL System SAL Location at Kittiwake Field Layout

**5 INVENTORY OF MATERIALS****5.1 List of Materials**

The following materials will be removed as part of this project:

Item	Quantity	Unit	Description
SAL Export Pipeline (PL2205)	2910	m	8" composite flexible pipeline comprising two approximately equal lengths joined mid line by a flanged connection and incorporating 4 No steel flanged terminations.
SAL Assembly	199.5	tonnes	Integral steel structure incorporating: • Structural steel skid incorporating an overtrawable protection structure and 4 No suction anchors. • 8"nb carbon steel piping and manual valve. • Suction/ballast pipework and valves. • 30No Aluminium Alloy Anodes
Concrete Mattresses	11	No	6m x 3m x 0.15m flexible mattresses comprising precast concrete blocks connected by polypropylene rope.
Grout Bags	200	No	25kg grout bags



5.2 Classification

Figure 5.1-A Typical SAL

The SAL pipeline and SAL assembly are to be returned to their owner for further use and are therefore not classified as waste.

Concrete mattresses and grout bags are classified as **GREEN** waste.

5.3 Low Specific Activity Scale

There is no history of the presence of LSA scale being encountered on the Kittiwake platform. When KLB, which served as the export route for 15 years before being replaced by the SAL system, was removed in 2008, the risers and pipework were thoroughly tested for the presence of LSA as a precursor to the cleaning and recycling operation. No trace of radioactive material was detected. Venture is therefore confident that LSA scale is not present in the Kittiwake SAL Export system.

5.4 Trans-Frontier Shipment of Waste Implications

If waste material is taken to an overseas disposal site, it is required to be exported under the Trans-frontier Shipment of Waste Regulations 2007 and the UK Plan for Shipments of Waste (Dec 2006).

Any waste material returned to shore for disposal will be discharged at a UK port and processed by a UK waste management contractor. No waste material shall be discharged outside the UK. As no waste material is being exported, there are no trans-frontier shipment of waste implications.

6 REMOVAL AND DISPOSAL OPTIONS

6.1 SAL Pipeline PL2205

Possible options for decommissioning are:

- Decommission in situ.
- Complete removal.

During 2008, the flexible pipeline was partially rerouted within the Kittiwake 500m zone to make way for the Grouse flowline. The trench backfill is soft, unconsolidated sand and this operation demonstrated that the pipeline could be easily recovered from its trench without using trenching equipment. As the pipeline has an estimated residual life of 10 years, decommissioning in situ would require the purchase of the pipeline at significant cost. Decommissioning in situ is therefore not considered to be either significantly more cost effective or more practicable in this particular instance than complete removal. The pipeline will therefore be completely removed and returned to its owner for reuse.

Protection mattresses at the Kittiwake end have been redeployed on other projects.

As there are no pipeline projects ongoing around Kittiwake during 2009/10, the protection mattresses at the Sal assembly will be recovered and returned to a UK port for disposal.

6.2 SAL Assembly

OSPAR Decision 98/3 presumes that all installations will be returned to shore for re-use, recycling or final disposal on land. As the SAL assembly is leased equipment, the only available option is to remove it completely and return it to its owner for further use.

As the SAL is designed for reuse, the conceptual method of retrieval is predetermined by the facilities built into the design for that purpose. This removal procedure is described in Section 7.

7 SELECTED REMOVAL AND DISPOSAL OPTION

7.1 SAL Pipeline PL2205

7.1.1 Flexible Pipeline

The SAL pipeline is a flexible pipeline previously used at the Ardmore field. It is approximately 3km long and consists of two lengths with a mid-line flanged connection. Although this pipeline has served two fields, it has a residual service life estimated at 10years and it is the owner's intention to lease it to another client following appropriate inspection and refurbishment. The method of retrieval reflects this intention.

The pipeline will be recovered using the Seven Navica which will be on charter to Venture for other construction projects. This pipelay vessel is a reel vessel capable of handling many kilometres of prefabricated rigid pipeline and is ideal for laying or recovering flexible pipelines. A similar vessel, the Polar Queen, was used to install the SAL pipeline in 2005. Recovery is therefore essentially a reversal of lay. The pipeline is trenched but the backfill is very weak, unconsolidated sand. During 2008 the Kittiwake end of the pipeline was repositioned to make way for the Grouse pipeline. This operation demonstrated that the flexible pipeline could be extracted from its trench without using a tension in excess of that normally required for reeling. It will not therefore be necessary to use a plough or other mechanical means to displace the trench fill.

The first half of the pipeline (approximately 1.5km) will be loaded onto the vessel's lay reel. The mid-line connection will be unfastened and the second section of the pipeline will be loaded onto an Aquatic reel hired for that purpose. The Aquatic reel will be offloaded at the destination port and handed over to the owner of the pipeline. The remaining pipeline will be trans-spooled from the lay reel to another Aquatic reel at the destination port. The pipeline will be stored on the Aquatic reels until they are required for another project.

7.1.2 Concrete Mattresses and Grout Bags

Although the mattresses are relatively new and are likely to be in serviceable condition, there are no pipeline projects ongoing at Kittiwake during 2009/10 for which the mattresses could be redeployed. The mattresses will therefore be recovered along with the grout bags and offloaded at a UK port for disposal by a licensed waste disposal contractor.

7.2 SAL Assembly

The SAL assembly is designed to be reused and is readily retrievable. The Kittiwake SAL assembly was previously used at the Ardmore field and was retrieved from Ardmore, transported directly to Kittiwake, installed and commissioned.

The SAL assembly is an integral structure incorporating pipework, an overtrawlable protection structure, four buoyancy/ballast tanks and four suction anchors in a single package.

The primary function of the suction anchors is to secure the SAL assembly to the seabed and provide sufficient strength to withstand forces from both routine tanker operations and potential accidents. The suction anchors take the form of four fabricated tubes (referred to as "cans") which are open at the bottom and sealed at



the top. Each can has a flanged inlet nozzle which can be used to allow water to escape from the cans, or can be connected to suction pumps to evacuate water from the cans. During installation, the SAL assembly is lowered to the seabed with the can nozzles open. The cans penetrate the seabed under the submerged self weight of the SAL assembly forming a seal around the open bottom edge of each can. The water trapped in the cans is then evacuated by suction pumps. This creates a negative pressure differential between the sea and the inside of the cans and this results in a vertical downward force which progressively drives the suction anchors into the seabed.

Removal of the SAL assembly is essentially a reversal of installation. Water is pumped into the cans, creating a positive differential pressure which progressively forces the cans out of the seabed. At some point during this process, the seal between the soil and the cans will be lost and continuing to pump water into the cans will no longer have any effect. At this point a vessel with a suitable crane (or equivalent lifting facility) will be used to complete the retrieval of the SAL assembly. This process is aided by evacuating the water from the four built-in ballast tanks to make the SAL self-buoyant. The depth at which the seal between the cans and the seabed is lost, and therefore the capacity of the lifting equipment required, depends on the nature of the soil. Alternatives to a vessel with a suitable crane include using an anchor handling tug with a suitable deck mounted winch, the basic procedure, however, is the same.

The secondary function of the suction anchors is that they can be partially filled with air to supplement the buoyancy provided by emptying the ballast tanks. It is therefore possible for the SAL assembly to be towed to location without the need for a transport vessel or barge.



ENTURE
PRODUCTION plc

DOCUMENT TITLE: KITTIWAKE SAL EXPORT SYSTEM
DECOMMISSIONING PROGRAMME
DOCUMENT NO: VPC-PRJ-GKA0028-REP-0001 REV A2

8 WELLS (NOT APPLICABLE TO THIS DECOMMISSIONNG PROJECT)

There are no wells associated with this decommissioning project. This section is therefore not applicable.



9 DRILL CUTTINGS (NOT APPLICABLE TO THIS DECOMMISSIONING PROJECT)

There are no drill cuttings associated with this decommissioning project. This section is therefore not applicable.

10 ENVIRONMENTAL IMPACT ASSESSMENT

10.1 Environmental Legislation

Environmental legislation applicable to the decommissioning of the SAL and Kittiwake SAL is listed in table 10.1

Table 10.1 Environmental Legislation

Legislation	
The Offshore Petroleum Activities (Conservation of Habitats) Regulations (as amended 2007)	These regulations apply the Habitats Directive and the Wild Birds Directive in relation to offshore oil and gas plans and projects wholly or partly on the UKCS. The regulations apply to decommissioning proposals and in the light of the information provided in the EIA, DECC in consultation with the JNCC and/or the Countryside Agencies, will decide whether the proposals are likely to have a significant effect on the habitats and species covered by the regulations, and whether there is a requirement to undertake a more detailed 'Appropriate Assessment'. Applicability to SAL and pipeline removal No Natura 2000 sites have been identified from surveys in the area which could potentially be affected by SAL and Kittiwake –SAL pipeline decommissioning operations. A search of recent video footage by BMT Cordah revealed no protected species on the SAL or seabed in the vicinity.
The Offshore Chemical Regulations 2002	These regulations implement, on the UKCS, OSPAR Decision 2000/2 on a Harmonised Mandatory Control System for the Use and Reduction of the Discharge of Offshore Chemicals. Where it is proposed to use or discharge chemicals during the decommissioning of an offshore installation or pipeline, the Operator will need to apply to DECC for the appropriate permit. Applicability to SAL and pipeline removal There will be a discharge of inhibited seawater from the SAL and pipeline on removal from the seabed. A PON 15C application has been submitted by Venture in connection with these decommissioning discharges. DECC has agreed that this will include the discharge from the SAL as well as the pipeline in this instance.

The Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005	These regulations prohibit the discharge of oil into the sea from an offshore installation or pipeline, except under authority of a permit. Operators will be required to make provision for the removal and recycling of oil recovered during the decommissioning, but it will be possible to apply for a permit for the discharge or reinjection of certain types and quantities of oil.
	Applicability to SAL and pipeline removal The SAL and the Kittiwake- SAL pipeline have been flushed to 30 ppm oil or less and are flanged off and filled with inhibited seawater. An OPPC application has been submitted by Venture for the discharge of the small amount of oil remaining in the inhibited seawater.
The Offshore Combustion Prevention and Control of Pollution Regulations 2003	These regulations implement the Integrated Pollution Prevention and Control (IPPC) Directive for offshore oil and gas installations. Under the regulations a permit is required from DECC if the aggregated thermal capacity of the combustion equipment on the installation exceeds 50 MW(th).
	Not applicable to SAL and pipeline removal
The Greenhouse Gases Emission Trading Scheme (ETS) Regulations 2003	These regulations implement the EU Emissions Trading Scheme. Under the regulations, operators are required to apply to the DECC for a permit covering the emission of greenhouse gases (currently only CO ₂), if the aggregated thermal capacity of the combustion equipment on the installation exceeds 20 MW(th). Such permits will have been issued prior to decommissioning, and must be surrendered when the aggregated thermal capacity falls below the threshold.
	Not applicable to SAL and pipeline removal
The Merchant Shipping (Prevention of Pollution by Garbage) Regulations 1998	All wastes to be segregated and stored and returned to shore for disposal. No garbage to be dumped overboard in a 'Special Area' Food waste can be discharged only if: • Greater than 12 miles from coastline; and • Ground to less than 25mm particle size. Vessels must have a garbage management plan with suitable labelling and notices displayed.



	Applicability to SAL and pipeline removal This will be addressed under the decommissioning contractor's vessel garbage management plan.
MARPOL 73/78 Annex IV Regulations for the Prevention of Pollution by Sewage from Ships (Original international regulations entered into force in September 2003 and the revised annex entered into force in 2005.)	Requirement for ships to discharge sewage only under certain conditions: • Comminuted and disinfected sewage may only be discharges more than 4nm from the coast; • Non-comminuted or disinfected sewage may only be discharged 12nm from the coast;
	Applicability to SAL and pipeline removal This will be addressed under the decommissioning contractor's vessel Environmental Management System .
MARPOL 73/78 Annex VI Regulations for the Prevention of Air Pollution from Ships	The Annex sets limits on sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibits deliberate emissions of ozone depleting substances. It caps 4.5%m/m on the sulphur content of fuel oil. Special SOx emission control areas (SECAS) where sulphur emissions are limited further and sulphur content in fuel oil must not exceed 1.5%m/m or have an exhaust gas cleaning system fitted. The North Sea is one such SECAS.
	Applicability to SAL and pipeline removal This is relevant to the control of emissions from decommissioning vessels and will be addressed by the decommissioning contractor's operating practices.

The Merchant Shipping (Oil Pollution Preparedness, Response and Cooperation convention) Regulations 1998	Under these regulations operators of offshore oil and gas installations and pipelines are responsible for preparing and submitting an Oil Spill Response Contingency Plan (OSCP) to DECC. The expectation is that the OSCP will cover all activities where there is a risk of a hydrocarbon spill, including activities relating to decommissioning. This may be achieved by incorporating decommissioning activities into the existing field OSCP or by producing a decommissioning specific OSCP
	Applicability to SAL and pipeline removal Onsite removal operations are adequately covered by the existing Kittiwake Oil Spill Contingency arrangements. Accidental spills from vessels will be covered in the first instance by the vessel contractor's emergency plans approved by the relevant authority

10.2 Baseline Environment

This section contains a condensed baseline environmental description of the offshore marine environment around the SAL and Kittiwake-SAL pipelines area. Aspects of the environment which have more potential to be affected by the SAL and PL2205 decommissioning activities are described in more detail. Impacts on commercial shipping routes have been summarised in this section but will also be addressed in the Venture safety risk assessment for the Kittiwake SAL system decommissioning.

A number of surveys have been conducted around PL2205 (Kittiwake-SAL pipeline) as shown in figure 1. The baseline environmental section has been derived from recognised sources and the Fugro 2005 survey commissioned by Venture Production plc. The program consisted of pipeline route surveys in the central North Sea, blocks 16/12, 21/12, 21/17, 21/18 and 22/2, February-April 2005 and environmental surveys for Goosander-Kittiwake-Winchat-Wagtail Development in blocks 21/12, 21/17 & 21/18. On the advice of the Fisheries Research Service Venture also conducted a sediment survey in the SAL area in 2007 after an oil spill from the Kittiwake field. This survey concluded that the spill did not have any significant impact upon the baseline environment.

The Grouse pipeline route survey was conducted by Fugro from the Grouse Wellhead to the Kittiwake Platform in May 2008. The survey was carried out using side scan sonar, single and multibeam echo sounders, hull-mounted pinger, magnetometer and environmental seabed sampling. The environmental part of the survey also consisted of seabed photography at three sites and four grab replicates were taken at each station.



Figure 10-1. Surveys conducted within the vicinity of the Kittiwake Field.

The FRS survey (circled) was conducted at the location as the Single Anchor Loading (SAL).

The environmental surveys were carried out to provide baseline data and investigate selected anomalous seabed features identified from the geophysical data, in particular to confirm the presence or absence of active pockmarks and protected species. The surveys also included grab sampling for physico-chemical and biological analysis and seabed photograph and video investigations carried out using ROV-mounted cameras.

10.2.1 Metocean data

There is frequent passage of mobile depressions through this area of the CNS. The wind characteristics at the PL2205 site are variable throughout the year. The SAL and pipeline removal operations are planned to be carried out on an opportunistic basis, making use of vessels chartered for other work. Timing of the operations will therefore depend on the schedule of other Venture projects. Wind data from May and September has been included (figure 10. 2) to cover any uncertainties in the operation schedule.

The predominant wind direction throughout the year is south westerly however during spring the predominant wind direction is northerly.

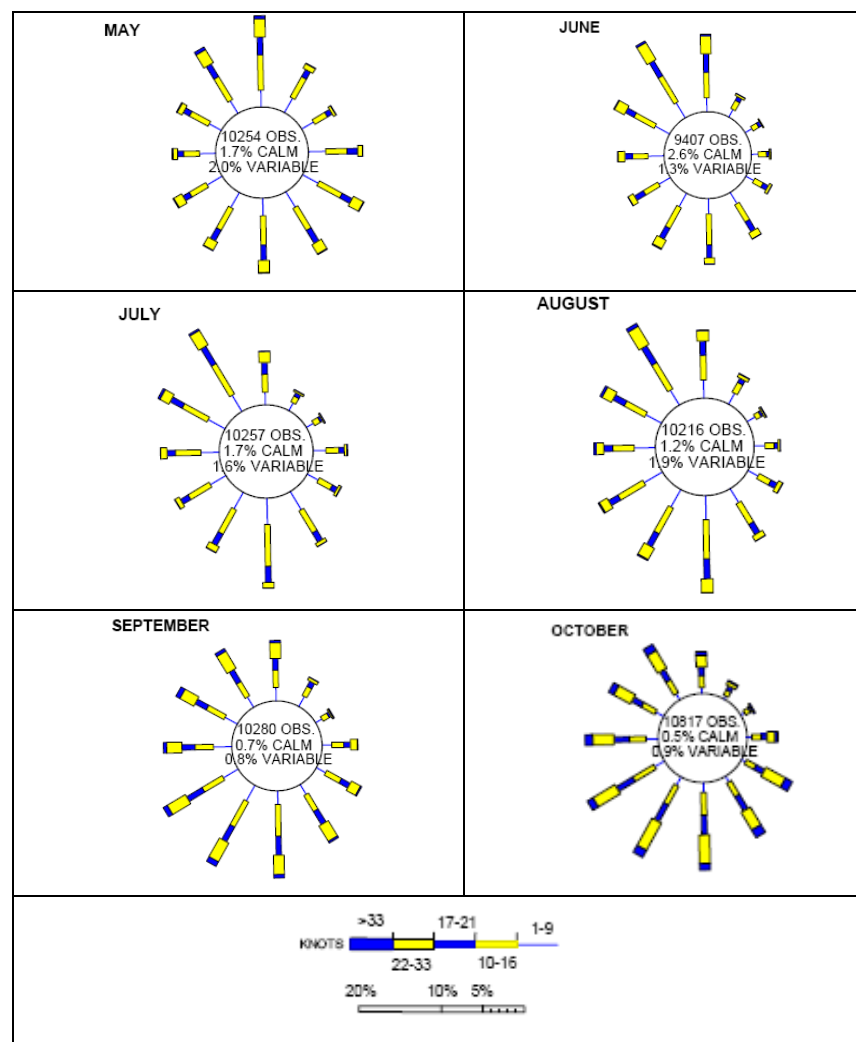


Figure -10-2 wind roses for the Kittiwake area (Meteorological office 2004).

10.2.1.1 Tide and Current

The circulation of water in the North Sea is mainly driven by tides. Tidal stream data from a Kittiwake area survey (Metocean 1989a, Shell 1990) shows the tidal current directions are north to north eastwards on the flood, and south to south westwards on the ebb. Maximum spring and neap tidal currents are 0.7 knots



(0.35m/s) and 0.4 knots(0.2m/s) respectively. Under normal conditions current flow is relatively uniform in the surface and mid water layers. Storm conditions can produce a higher current flow in the surface layer. The tidal range in the Central North Sea is generally about 0.8m. Low-pressure storm surges can increase the range. Tidal measurements from the Kittiwake field are given in table 10-2.

Instrument Depth	Max. spring tide current m/s	Mean spring tide current m/s	Max. residual current
69m	0.64	0.51	0.23
47m	0.63	0.51	0.32
5m	0.43	0.36	0.32

Table 10-2 Summary of current data for the Kittiwake area

10.2.1.2 Waves

Data recorded over the period 1974 to 1987 for conditions in the BP Forties field are considered representative of the Kittiwake area, and have been used in planning SAL and pipeline removal operations. This source gives a 100-year maximum wave height of 26.4m, a non-directional 100-year significant wave height of 12.8m and a maximum wave height of 23.8m. OSPAR reports (2000) give a 50-year extreme wave height for this area of the North Sea as 20-30m with a period of 17 seconds.

10.2.1.3 Temperature & Salinity

The temperature of the marine environment affects both the properties of the sea water and the fate of releases into the marine environment. The sea surface water temperature around the SAL flowline area ranges between 6.5°C during winter to 15°C during the summer. The seabed temperature varies between 6.5°C during winter to 8°C during the summer (BODC, 1998). A thermocline forms in the water column during late spring. This separates the warm, less dense surface waters from the rest of the water column. The thermocline increases in depth between May to September and has been recorded to be typically 50m deep (OSPAR, 2000). During the autumn, the wind strength increases causing a mixing of the surface and bottom water and this disrupts the thermocline.

The salinity of the water affects marine organisms and the properties of seawater. The fluctuations in salinity are caused mainly by the increase or decrease of freshwater through natural processes. The salinity at the SAL and PL 2205 location is fairly constant throughout the year however during summer the sea surface salinity decreases slightly from 35.1ppt to 35ppt while the sea bed salinity remained constant at 35.1ppt (BODC, 1998).

10.2.1.4 Seabed sediments

On the basis of sidescan sonar images from the 2005 and 2008 Fugro surveys, the bottom sediments consist predominantly of moderately sorted fine sand with local mega ripples. These are oriented east – west, perpendicular to the current direction. Any features not easily identified were further inspected by ROV video. No pockmarks were identified. Some areas of scattered boulders with encrusting organisms were found.

Sediment sampling by Fugro showed typical Central North Sea Total Organic Content (TOC) values for the sediments 0.7-1.1%. Heavy metal contents were generally uniform over the area and recorded values were as shown in table 10-3. These are not likely to be impacted by SAL and pipeline removal.

Element	Concentration in sediment
barium	147-209 µg/g
arsenic	3-7 µg/g
chromium	15-29 µg/g
copper	3-8 µg/g
lead	10-14 µg/g
nickel	3-10 µg/g
vanadium	16-26 µg/g
zinc	9-30 µg/g

Table 10-3 Heavy metal content of sediments in SAL flowline area

The FRS 2007 survey concluded that the total polycyclic aromatic hydrocarbons (PAH) concentration within the sediment samples was low and there were no signs that the spill in 2007 had caused an effect upon the sediment (FRS, 2007).

It is not considered likely that release of the small amounts of dispersed oil and chemicals in the seawater fill of the SAL and pipeline will have any significant impact on bottom sediment chemistry in the area.

10.2.2 Biological baseline

10.2.2.1 Plankton

Planktonic organisms are species living in the water column. These species are usually microscopic but vary in sizes. Phytoplankton are unicellular or multi cellular plants and zooplankton are animal species. The Zooplankton group contains species which are true plankton and those which pass through the planktonic state as part of their lifecycle (Meroplankton).

The Phytoplankton population peaks twice during the year, once in April and once in September, with the greatest concentrations within the 30-50m zone. The zooplankton populations correspond with this and display a maximum abundance two months after the peak in phytoplankton biomass. These peaks in phytoplankton and zooplankton productivity can influence cetaceans, fish and shellfish numbers and their feeding grounds. Cetaceans and fish are mobile hence they can stay in close proximity with the increased food supply. In July, the abundance and biomass of plankton within the Central North Sea is between 0.3-10g dry weight/m³.

The most dominant phytoplankton species likely to be found within the SAL flowline area are the *Ceratium spp* with *Ceratium fusus* being the most dominant species. Copepods are the most dominate zooplankton species followed by *Calanus traverse* (Table 10-4).

Phytoplankton	Zooplankton
<i>Ceratium fusus</i>	Total copepods ¹
<i>Ceratium furca</i>	<i>Calanus traverse</i>

¹ All the copepods are dominant in the Northern North Sea



Phytoplankton	Zooplankton
<i>Ceratium tripos</i>	<i>Calanus</i> I-IV
<i>Ceratium macroceros.</i>	<i>Para-Pseudocalanus</i> spp.
<i>Ceratium longipes</i>	Echinoderm larvae
<i>Thalassiosira</i> spp.	<i>Acartia</i> spp.
<i>Protoperidinium</i> spp.	Thecosomata spp.
<i>Ceratium horridum</i>	<i>Evadne</i> spp.
<i>Chaetoceros (Hyalochaete)</i> spp.	<i>Oithona</i> spp.
<i>Chaetoceros (Phaeoceros)</i> spp.	<i>Pseudocalanus</i> adult

10.4 Dominant plankton species in the Northern North Sea (SEA-2, 2001)

Note: Although considered to be in the Central North Sea, the SAL flowline (PL2205) and SAL lie in waters classified as Northern North Sea in the SEA 2 report.

10.2.2.1. Benthos

Benthic organisms are organisms living in, or on, bottom substrates in aquatic ecosystems. They may be impacted by any activities which disturb or contaminate seabed sediments. Sessile benthic organisms are prone to smothering. The presence of benthic organisms varies as a consequence of changes in water depth, sediment organic content, sediment particle size, and the degree of particle sorting and sediment mobility, as affected by the strength of the tidal currents. The benthic organisms are categorized by their size ranging from less than 50 µm to more than 1mm (Table 10-5).

Size Categories	Examples of Representative Groups	Feeding Notes
Macrobenthos (>1mm)	Polychaeta (annelid worms)	Plankton, organic material, seaweeds. There are some specialised carnivores
	Crustacea (e.g. crabs)	Carnivores, scavengers. Some, such as barnacles, filter plankton & bacteria
	Echinodermata (sea urchins, starfish and brittlestars)	Starfish & brittlestars are usually carnivorous. Sea urchins graze on algae
	Bivalvia (e.g. mussels)	Bivalves may filter phytoplankton or feed on organic matter in the sediment
	Gastropoda (e.g. limpets)	Gastropods graze using a "radula". May be herbivorous or carnivorous
Meiobenthos (50 µm – 1mm)	Nematoda (roundworms)	May eat algal cells, minute invertebrates or consume mud containing organic material
	Crustacea (e.g. benthic copepods)	Algae, microbes
	Foraminifera (single celled organisms encased in calcium carbonate chambers)	Foraminiferans eat tiny particles of food captured by "pseudopodia" which extend through holes in the chambers
Microbenthos (< 50 µm)	Ciliates (single celled organisms covered in cilia, used for locomotion)	The cilia allow tiny food particles or bacteria to be moved towards the mouth
	Flagellates (single celled organisms using flagellae for locomotion)	Bacteria or tiny food particles
	Bacteria	A variety of sources, one example being organic compounds in sediments

Table 10.5 Categories of benthic organisms

In the area surrounding the Kittiwake SAL export system, survey findings (Fugro 2005) identified 105 infaunal taxa of which 48% were annelids, 21% crustacea, 15% molluscs, 10% echinoderms and 6% other groups. The most abundant taxa were the echinoderms (33% of total abundance). *Echinocyamus pusillus* was the most abundant species and is characteristic of gravel and sand substrates. The survey report concluded that the dominant fauna within the samples are characteristic of fine sandy sediments. There were no clear environmental gradients, suggesting that the Kittiwake area is a relatively homogenous environment.

10.2.2.2 Seabirds

Seabirds are generally not at risk from routine offshore production operations. However they may be vulnerable to pollution from less regular offshore activities such as well testing and flaring, when hydrocarbon dropout to the sea surface can occasionally occur or from accidental discharges such as oil spills.

The Joint Nature Conservation Committee (JNCC) has produced an Oil Vulnerability Index (OVI) for seabirds encountered within each offshore licence block within the Southern, Central and Northern North Sea and the Irish Sea. For each block, an index of vulnerability for all species is given which consists of four factors:

- The amount of time spent on the water
- Total biogeographical population
- Reliance on the marine environment
- Potential rate of population recovery

Each of these factors is weighted according to its biological importance and the OVI is then derived (Williams *et al.*, 1994). The OVI of seabirds within each offshore licence block changes throughout the year (Table 10-6). This is due to seasonal fluctuations in the species and numbers of birds present in an area.

The highest seabird vulnerability in block 21/18 occurs in July and in September to November (very high) with April to June and August showing high vulnerability and July exhibiting high vulnerability. Seabird vulnerability decreases in the offshore waters following the winter period (December to March) when large numbers of seabirds leave the offshore waters returning to their coastal colonies for the breeding season (March to June). During this breeding period, high numbers of breeding seabirds are linked to their colonies and adjacent coastal waters for feeding.

After the breeding season ends in June, large numbers of moulting auks (guillemot, razorbill and puffin) disperse widely away from their coastal colonies and into offshore waters. At this time these high numbers of birds are particularly vulnerable to oil pollution. In addition, kittiwakes, gannets and fulmars are present in sizeable numbers during the breeding season.

Birds are vulnerable to oiling from surface pollution, which is directly toxic through ingestion, and through hypothermia as a result of the birds' inability to waterproof their feathers. Birds are most vulnerable in the moulting season when they become flightless and spend a large amount of time on the water surface.

Block	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
21/14	3	3	4	3	3	4	2	3	1	1	2	ND
21/15	3	3	4	3	3	4	2	3	1	1	2	ND
21/17	3	3	3	2	2	2	1	2	1	1	1	ND
21/18	3	3	3	2	2	2	1	2	1	1	1	3
21/19	3	3	4	3	2	3	2	3	1	1	1	3
21/22	4	3	3	1	1	2	1	2	1	3	1	ND
21/23	3	3	3	1	1	2	1	2	1	3	1	3
21/24	3	3	4	3	2	3	2	3	1	4	1	3
21/25	3	3	4	3	2	3	2	3	1	3	1	3

1 = Very high
 2 = High
 3 = Moderate
 4 = Low
 ND = No data

Table 10.6 Oil Vulnerability Index for seabirds within the proposed development area and its vicinity

Fulmar, guillemot and puffin are particularly vulnerable to surface pollutants as they spend the majority of their time on the surface of the water. Herring gull, kittiwake, and great black-backed gulls are less vulnerable as they spend a larger proportion of their time airborne and therefore spend less time on the sea surface (Stone *et al.*, 1995).

Accidental diesel spills from vessels are unlikely to pose a significant risk to seabirds as they will be rapidly dispersed by wind and currents and will evaporate. The release of inhibited seawater with up to 30ppm dispersed oil in water when the pipeline and the SAL are removed will occur at or near the seabed. The total amount of dispersed oil is very low and is unlikely to reach the surface and therefore poses no significant threat to seabirds.

10.2.2.3 Fish

The central North Sea holds important pelagic and demersal fish stocks. Pelagic species are dominated by herring (*Clupea harengus*) although mackerel (*Scomber scombrus*) and sandeel (*Ammodytes tobianus*) are also common. Demersal stocks are characterized by cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinns*), whiting (*Merlangius merlangus*), plaice (*Pleuronectes platessa*), lemon sole (*Microstomus canicula*), saithe (*Pollachius virens*), dogfish (*Scyliorhinus canicula*), dab (*Limanda limanda*) and anglerfish (*Lophius piscatorius*).

sighted. The Cetacean distribution atlas shows that six species may be present within ICES block 21/18 (Table 10-8).

Species	J	F	M	A	M	J	J	A	S	O	N	D
Atlantic White Sided Dolphin												
White beaked dolphin												
Harbour porpoise												
Minke whale												
Killer whale												
Risso's dolphin												

Rare/none	
Occasional	
Common	
Peak sightings	

Table 10.8 cetacean species and reported occurrences.

The most common cetaceans recorded in proximity to the SAL and Kittiwake -SAL pipeline are white-beaked dolphin (*Lagenorhynchus albirostris*), harbour porpoise (*Phocoena phocoena*), Atlantic white-sided dolphin (*Lagenorhynchus autus*) and minke whale (*Balaenoptera acutorostrata*). Also recorded, although in lower abundances, were the killer whale (*Orcinus orca*) and Risso's dolphin (*Grampus griseus*). Temporal distributions of these species show increased numbers in summer, with peak sightings occurring between June and November (Reid *et al*, 2003). The Kittiwake SAL System decommissioning is a short duration operation and will occur in an area of established oil and gas activity hence it is not expected to cause any significant effect upon the population. The itinerant nature of the cetacean population also means that it is unlikely that there will be any significant impacts from decommissioning operations.

Pinnipeds

The common seal (*Phoca vitulina*) and grey seal (*Haliocherus grypus*) both frequent the North Sea. Both species congregate on the British coast, including northeast Scotland, to breed over the summer months but disperse over a widespread feeding area during the winter and this may include the area around kittiwake SAL System.

Tagging studies of grey seals (McConnell et al. 1999) indicate that they spend the majority of their time in close proximity to haul out sites, with the majority of trips less than 3 days, although they occasionally make much longer trips of up to 100km. Trips by pups have been reported to large areas, for example from the Isle of May up the Norwegian coast and down to the Netherlands (JNCC, 2007). Common seals were shown to predominantly spend much more of their time at or near haul out sites, with short trips to localized areas, with the duration of most trips being less than 12 hours. However, the general pattern of close proximity to haul out sites suggests that these distant trips are uncommon and are possibly made by few individuals (Hammond, 2000). Figure 10-3 which shows the distribution of common seals during August and Figure 10-4 shows the tracks of harbour seals between 2001 and 2005. Figure 10-3 shows only very small colonies along the coast adjacent to the development, however, as can be seen in Figure 10-4 trips were made in the direction of the SAL. It should be noted that the track data relates to 8 locations around the UK which represents a small proportion of the population.

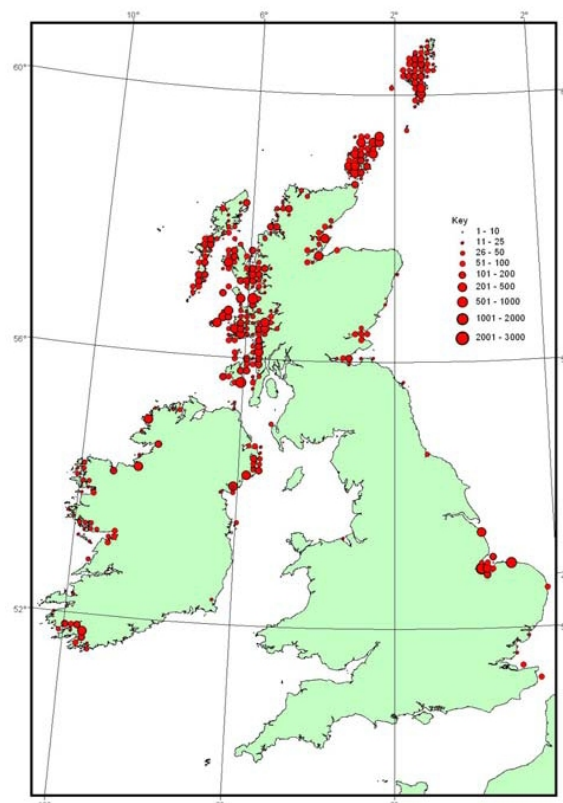


Figure 10-3 August Distribution (10km squares) of *P. vitulina* in Great Britain and Ireland between 2000 and 2006 (JNCC, 2007)

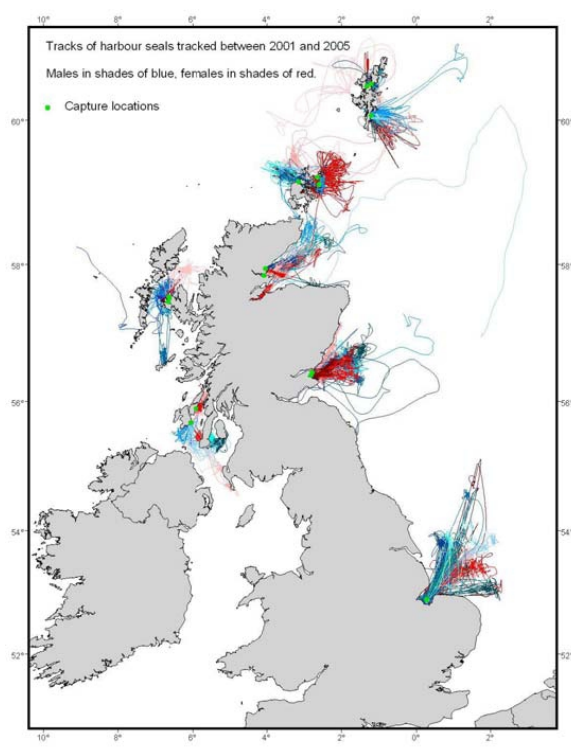


Figure 10-4 Tracks of Harbour Seals tracked between 2001 and 2005 (JNCC, 2007)

Given the distance of the Kittiwake SAL System from the coast (approximately 130km from nearest coastline), it is unlikely that common seals will be observed in the area. However, it is possible that low numbers of grey seals will be occasionally present, though this will only be for a short period of time before they return to their haul out site.

10.2.3. Habitats Directive

The European Community (EC) Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna (the Habitats Directive), and the EC Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive), are the main instruments of the European Union (EU) for safeguarding biodiversity.

The Habitats Directive includes a requirement to establish a European network of important high quality conservation sites that will make a significant contribution to conserving the habitats and species identified in Annexes I and II of the Directive. Habitat types and species listed in Annexes I and II are those considered to be in most need of conservation at a European level (JNCC, 2002). The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 and the Offshore Petroleum Activities (Conservation of Habitats) (Amendment) Regulations 2007 implement the EC Habitats Directive (92/43/EEC) in UK Law. These regulations apply to UK waters and to the UK offshore waters (UKCS).

The UK government, with guidance from the Joint Nature Conservation Committee (JNCC) and the Department of Environment, Food and Rural Affairs (DEFRA), has statutory jurisdiction under the EC Habitats Directive to propose offshore areas or species (based on the habitat types and species identified in Annexes I and II) to be designated as Special Areas of Conservation (SAC). These designations have

not yet been finalised, but will be made to ensure that the biodiversity of the area is maintained through conservation of important, rare or threatened species and habitats of certain species.

SACs are sites that have been adopted by the European Commission and formally designated by the government of each country in whose territory the site lies. Sites of Community Importance (SCIs) are sites that have been adopted by the European Commission but not yet formally designated by the government of each country. Candidate SACs (cSACs) are sites that have been submitted to the European Commission, but not yet formally adopted. Candidate SACs will be considered in the same way as if they had already been classified or designated, and any activity likely to have a significant effect on a site must be appropriately assessed. Possible SACs (pSACs) are sites that have been formally advised to UK Government, but not yet submitted to the European Commission. Draft SACs (dSACs) are areas that have been formally advised to UK government as suitable for selection as SACs, but have not been formally approved by government as sites for public consultation (JNCC, 2006).

In relation to UK offshore waters, four habitats from Annex I and four species from Annex II of the Habitats Directive are currently under consideration for the identification of SACs in UK offshore waters (JNCC, 2002).

10.2.2.5 Annex I habitats:

- Sandbanks which are slightly covered by seawater all the time
- Reefs (bedrock, biogenic and stony)
- Submarine structures made by leaking gases
- Submerged or partially submerged sea caves

Currently in UK offshore waters there are no SACs or SCIs (Sites of Community Importance), there are five c SACs, two pSACs and four dSACs draft offshore site that have not yet been submitted to the European Commission (JNCC, 2009).

According to available data, three of the specified Annex I habitats: 'reefs' (bedrock, biogenic and stony); 'sandbanks which are slightly covered by seawater all the time'; and 'submerged or partially submerged sea caves' are absent from the specified area. However, areas of gas seepage and associated pockmark features in the North Sea, may fall in line with the Annex I definition of 'submarine structures made by leaking gases'. The distribution of pockmarks in the UK North Sea is strongly correlated with that of the Witch Ground and Flags Formation sediments.

The only likely Annex 1 habitat in the Kittiwake SAL system area would be pock marks however this area lies outside the main pockmark location area as identified in SEA 2. Furthermore no pockmarks were identified in the 2005 Fugro survey or in the Grouse 2008 pipeline route survey.

10.2.2.6 Annex II Species

There are four Annex II species present within the UKCS. These are Grey seal, Common seal, Bottlenose dolphin and Harbour porpoise. Grey seal and Common seal are discussed above under section pinnipeds.

The harbour porpoise is widespread throughout the cold and temperate seas of north-west Europe, including the North Sea, the Skagerrak, Kattegat, Irish Sea, the seas west of Ireland and Scotland, northwards to Orkney and Shetland and off the coast of Norway (Jackson and McLeod, 2002; Hammond *et al.*, 1995). Harbour porpoises are highly mobile and well distributed around the UK, with the exception of the English Channel and south-east of England (Reid *et al.*, 2003).

The seasonal movements and migratory patterns of harbour porpoises in the North East Atlantic and North Sea are not well understood. Porpoises may reside within an area for an extended period of time. However, onshore/offshore migrations and movements parallel to the shore are thought to occur (Bjørge and Tolley, 2002). In the North Sea, there may be a general westward movement from the eastern North Sea and possibly from the very northern areas of the North Sea into the western edge of the northern North Sea (along the east coast of Scotland) during April to June and a further influx to the northern North Sea during July to September (Northridge *et al.*, 1995). These seasonal movements are thought to coincide with the calving and mating seasons, respectively.

At present, not enough is known about harbour porpoises to determine whether some parts of their range are more important for breeding than others. Potential calving grounds have been identified in the German North Sea (Sonntag *et al.*, 1999), but there is currently no evidence of specific habitat requirements for mating and calving in UK waters (JNCC, 2002). Although the UK currently has no proposed SACs for harbour porpoises, the UK Government is re-examining distribution data for this species in inshore and offshore waters, in an attempt to identify likely areas as SACs.

The estimated summer abundance of harbour porpoises in North Sea areas during the SCANS (small cetacean abundance in the North Sea) survey in July 1994 was 268,452 (approximate 95% confidence interval of 210,000 – 340,000). This estimate includes shelf waters to the west of Shetland and Orkney (Hammond *et al.*, 2002). The highest densities were observed north of 56°N, mostly in a north-south band between 1°E and 3°E (SMRU, 2001). Numbers of porpoises present in UK waters vary seasonally and more animals are likely to pass through UK waters than are present at any one time (Jackson and McLeod, 2002). However, there is no current evidence to suggest that marine mammal populations are significantly affected by offshore oil and gas operations.

10.2.2.7 Other Protected species

Cold-water coral *Lophelia pertusa* is listed under the Convention on International Trade in Endangered Species (CITES). It forms large reef-like structures on sandy substrates in deep water, most commonly between 200 and 600m, although there are isolated colonies in less than 200m of water. The nearest known colony is 60km from the SAL, off the NE of Scotland (MarLIN 2009). It has also been found as an encrusting organism on some oil and gas production facilities in the North Sea. It is also a protected species under the Habitats Regulations. If it was present and needed to be moved for decommissioning to be carried out then it might be necessary to apply for a permit under CITES. For this reason Venture commissioned BMT Cordah (BMT Cordah 2009) to undertake a search of recent survey videos of the SAL to establish whether or not *Lophelia p.* was present. The surveys were:

- Survey of hose assembly during pressure test HEV to SAL (Video section from 27:20 mins to 30:06 mins)
- As-left survey of Kittiwake SAL and Lower (buoyant) hawser (Video section from 38:15 mins to 51:34 mins)
- Monitoring SAL turret being turned by 90 degrees (Video section from 1 hr 57:13 mins to 2 hrs 14:12 mins)

No evidence of this species was found.

Similarly, no evidence was seen, in sediment surrounding the SAL (as seen on the videos), of any *Sabellaria spinulosa*. *Sabellaria s.* (the Ross Worm) is known to form reef like structures in shallow water when present in large numbers. These structures often have a rich associated fauna and are protected under the Habitats Regulations. They occur widely in the Southern North Sea but are not normally associated with deeper water areas such as the Greater Kittiwake Area . No evidence of *Sabellaria s.* was seen on the videos on the SAL or on adjacent sediments.

10.2.3 Fishing Industry

The main information source for the distribution of stocks comes from commercial catch statistics collated by ICES for statistical source units of 30 nautical miles x 30 nautical miles sea area, as well as fisheries surveys carried out by Fisheries Research Services. The SAL flowline lies in ICES rectangle 43F0 which is an area of low to moderate commercial fishing value (Coull *et al.*, 1998).

Offshore decommissioning activities have the potential to interfere with fishing as the physical presence of vessels may obstruct access to fishing grounds. The decommissioning of structures will have a short term effect on the fishing activities due to the setting up of exclusion zones. However as the removal of the structure will lead to the permanent removal of a 500m exclusion zone and to the removal of a potential snagging hazard (the pipeline), the overall impact of the decommissioning activities for fishing is likely to be beneficial.

10.2.3.1 Fishing Effort

Fishing effort is an indicator of the importance of a sea area to the fishing industry. Effort may vary considerably from year to year. The assessment of commercial fishing in the development area has been compiled using ICES statistical data provided by the Scottish Executive Statistics Department (SE, 2007). UK fishermen are obliged to report catch information when landing their catches. This information includes quantities of species landed, where they were caught and by what method (type of gear/duration of fishing).

According to fisheries statistics, the area, ICES rectangle 43F0, is targeted for mollusc, demersal, crustacean and pelagic species (Table 10-9).

Year	Total Landings	Mollusc	Dermersal	Crustacean	Pelagic
2003	594.4	0.3	56.7	6.9	36.1
2004	351.9	1.0	88.1	10.8	0.1
2005	1749.9	0.3	86.5	0.8	12.5
2006	388.2	0.7	87.6	11.7	0.0

Table 10.9 Percentage Landings 2003 – 2006

Fishing activity around the development between 2003 and 2006 displays seasonal variation and is presented in Figure 10-5.

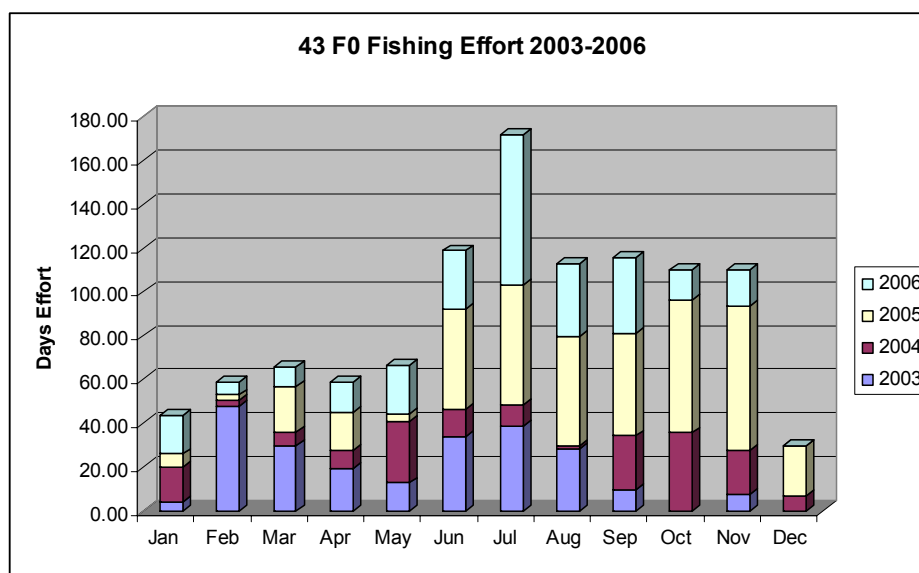


Figure 10-5 Seasonal variation in fishing effort for ICES rectangle 43F0

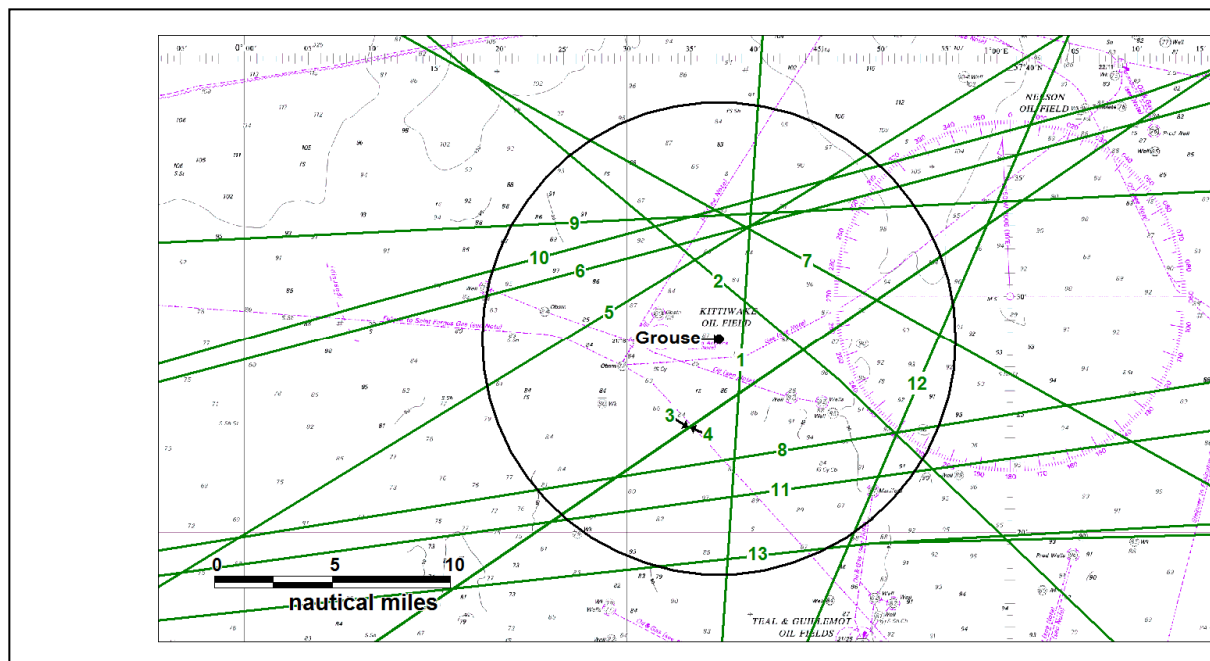
Around the proposed development area the fishing fleet is likely to be most active in between June and November. This coincides with the proposed period for the SAL and Kittiwake -SAL pipeline removal. However any loss of access is likely to be of short duration and is unlikely to significantly affect the fishery.

10.2.4 Commercial shipping

Venture Production plc commissioned the Anatec study (2007) on shipping routes and vessel traffic within 10 nautical miles of Grouse area. This also covers the Kittiwake SAL System location. The shipping routes below were identified using Anatec's Ship Routes database and exclude the movements of 'non-route-based' traffic such as fishing vessels, naval vessels, tugs, dredgers, yachts and offshore service vessels to mobile drilling installations.

The pipeline routes in the Greater Kittiwake Area are shown in figure 10-6 route 5 (Boknafjorden to Tay – 8 ships per year) passes closest to the SAL location.

The location and timing of all Kittiwake SAL system removal operations will be



notified to the marine authorities.

Figure 10-6 Commercial shipping routes

A summary of environmental sensitivities is shown in Table 10-10 below

Summary of Environmental Sensitivities for Kittiwake area											
J	F	M	A	M	J	J	A	S	O	N	D
Benthos and plankton No significant benthic sensitivities identified in the Kittiwake SAL system area. Benthic populations are typical of CNS. No significant sensitivity among the planktonic populations (although vulnerable to hydrocarbon and chemical spills). The main bloom periods are spring and autumn. SAL decommissioning activities is planned to take place in June. The impact should therefore be minimal.											
Fish Fish are vulnerable to pollution, particularly during egg, larval and juvenile stages of their lifecycle. Demersal spawning fish and fish/shellfish that live in close association with seabed sediments are vulnerable to sediment disturbance. The species of fish found in proximity to the Kittiwake SAL system are found throughout the North Sea. The SAL system lies within the spawning ground of the lemon sole, <i>Nephrops</i> and Norway pout. The offshore activities are planned for June which coincides with spawning period of lemon sole and <i>Nephrops</i> however these are not confined to this part of the North Sea therefore should have minimal effect.											

- Discharges to sea
- Emissions from Vessels
- SAL and pipeline disposal
- Transboundary impacts

10.3.1 Disturbance to the Seabed

10.3.1.1 SAL removal

The SAL is held in place by four suction anchors which will require to be dislodged from the bottom sediments for SAL removal. Venture Production plc proposes to do this by reverse installation utilising existing pipework to pump water into the suction piles to raise the internal pressure and release them from the seabed. This will be carried out using untreated pumped seawater.

For details of the SAL, refer to Section 18.1 Reference Drawings. The SAL external dimensions are 13m x 13m by 8m. It currently stands approximately 3.5m proud of the seabed with suction cans buried to approximately 4.5m in soft sediment (clay/sand). The SAL has a seabed footprint of 169m² and within this area are four 6.5 m diameter suction anchors.

On removal, some disturbance of the seabed sediments will be unavoidable over the footprint area. This will also lead to suspension of fine sediment and a temporary deterioration in water quality in the immediate area of and down-current from the SAL lifting activities, in the water column.

10.3.1.2 Kittiwake SAL export pipeline PL 2205 removal

The Kittiwake to SAL export pipeline is a 2.9 km long, ID 208 mm flexible pipeline. It has been flushed and the flanged off of the Kittiwake and SAL end and left filled with inhibited seawater pending removal.

The pipeline is being removed for potential reuse. It has 10 years of design life remaining and the current owner is in discussions with potential users.

When it was installed, the pipeline was trenched. It was also mattresses at both the Kittiwake and SAL ends. It became apparent when lifting the end of the line for disconnection and flanging off that the trench fill consists of unconsolidated mud and sand and that the line was easily lifted from its trench. Therefore the intention will be to lift the line and reel it directly from the seabed onto a reel barge for removal. There will be no requirement for a plough to excavate the pipeline so there will be a minimum of seabed disturbance as the line will essentially unzip from its current trench as it is reeled up.

There will be an area of seabed disturbance over an area of approximately 8730 m² and some temporary suspension of sediment in the water column. The disturbed area will be infilled by natural sediment transport and eventually recolonised by benthic organisms. No significant impact on the seabed is anticipated from removal activities.

Following consultation with the Scottish Fishermens Federation, Venture have proposed conducting a debris trawl of the Kittiwake –SAL pipeline corridor and SAL site, post removal, to confirm that debris has been removed.

10.3.2 Discharges to sea

The Kittiwake -SAL export pipeline was thoroughly flushed prior to disconnection and left filled with inhibited seawater when the pipeline was taken out of service to prevent internal corrosion. Releases of hydrocarbons from the pipeline and SAL pipework are therefore not anticipated. The SAL itself has minimal pipework remaining; a maximum of 4m of 8" ID pipe. This too is flanged off and filled with inhibited seawater.

There will be an unavoidable release of inhibited seawater to sea on recovery of the SAL and the pipeline to the surface. The volume of inhibited seawater that will be released has been calculated as shown in table 10-11 below.

The inhibitor used is TROS 650 (combined biocide, corrosion inhibitor and oxygen scavenger) OCNS silver, at 700ppm concentration. A chemical risk assessment (CRA) was carried out for the PON 15E (Venture, 2008). This chemical is only CHARM able if used as a hydro test chemical. The CRA for this discharge has used the Osborne Adams risk assessment as the release will occur at or near the seabed. The efficacy of the inhibitor will decline over time however a worst case has been modelled assuming that the inhibitor is new and that the release will take place over 24 hours (minimum removal time). It is likely that the removal operation will take longer than this and therefore dilution will be greater. The risk assessment indicated that the chemical discharge is not likely to cause adverse effects on the marine environment.

Equipment	Volume (m ³)
Kittiwake SAL export pipeline	94.32
SAL pipework	0.30
Total	94.62

Table 10-11 Volumes of inhibited seawater

Prior to filling with inhibited seawater the Kittiwake- SAL pipeline was flushed to remove oil to a maximum level of 30ppm oil in water. The pipeline and SAL will contain (assuming a maximum of 30ppm dispersed oil, for Kittiwake oil: 25.2 mg/l) 2.39 kg of hydrocarbons which will be discharged to sea on uplift of the pipeline and SAL. The oily discharge will be diluted rapidly in the water column. The more toxic aromatic and polar compounds are soluble and will be rapidly diluted. It is not envisaged that this discharge will have any significant or permanent impact on the surrounding environment.

10.3.3 Vessel Emissions

This assessment is based on the assumption that the SAL will be lifted by a DSV with lifting gear; up to 300te lifting capacity), and the pipeline will be reeled directly onto a reel-ship (see Section 7.0). Other vessel spreads are possible but will result in the same total estimates for fuel consumptions and emissions. The anticipated vessel use and duration is shown in table 10-12 below

Vessel emissions from decommissioning of the SAL and pipeline have been calculated on the basis of the vessel use shown in table 10.13 below. A total of 260 tonnes of diesel is estimated to be used. This is based on generic fuel consumption figures for vessel type and will be subject to variation with actual vessel used.

Vessel type	Activity	Duration of use (days)*	Fuel consumption te/day **	Tonnes diesel for duration of use
Reel ship	Pipeline recovery	7	10	70
DSV with 300te crane	SAL recovery	7	10	70
Tugs up to 90 te bollard pull	SAL transit/tow	10 (2 tugs for 5 days)	10	100
Survey vessel	Environmental sampling	0.5	8	4
Survey vessel	Post removal survey	1	8	8
Fishing Vessel	Debris clearance	1	8	8
Total				260

Table 10.12 Anticipated vessel use and fuel consumption

*Includes mob and demob

** Generic fuel consumption averaged to cover steaming and stationary periods

Emissions to air from vessel fuel use have been calculated as 832 tonnes CO₂; 1.04 tonnes SO_x and 15.4 tonnes NO_x using UKOOA factors and a diesel density of 820kg/m³

Diesel te	CO ₂ te	CO te	NO _x te	SO _x te*	CH ₄ te	VOC te
260	832	2.08	15.34	1.04	0.07	0.62

Table 10-13 Vessel exhaust emissions

*This is a maximum based on 0.2% S in fuel, vessels will now be using low sulphur diesel.

10.3.4 SAL and pipeline disposal

The SAL and pipeline will be taken to Norway for storage and refurbishment prior to reuse. The SAL is designed to be towed under its own buoyancy, assisted with supplementary buoyancy if required. There will therefore be some vessel exhaust emissions associated with disposal transport however these will be negligible in relation to overall vessel impacts in the North Sea Area.

The concrete mattresses will also be uplifted from the seabed for disposal at the same time. It is unlikely to be reused and will be taken onshore in the UK for recycling as road metal. There will therefore not be transboundary shipment of waste issues.

10.3.5 Transboundary impacts

The SAL is approximately 95km from the transboundary line and the small volume of oil and chemical discharge is unlikely to have any significant cumulative or transboundary impacts.

10.4 Environmental impact assessment

10.4.1 Methodology

In order to determine the impact that a proposed project may have on the environment it is necessary to conduct an environmental assessment. This should be a structured methodology for the identification and quantification of emissions and discharges in order to determine the significance of the impact on the environment and put in place appropriate mitigation measures to reduce the impacts where required.

Potential impacts are assessed both in terms of their likelihood, how often they occur, and their potential significance.

10.4.2 Likelihood

The likelihood of occurrence of each potential impact was given a score between 1 and 5 based on the duration of the operation or the frequency of occurrence, (see Table 10.-14).

Planned Activities Duration	Accidental Events Frequency	Likelihood Categories
Year to many years	Likely – more than once a year	5
Month to a year	Possible – less than once per year and more than once per 10 years	4
Week to a month	Unlikely – less than once every 10 years and more than once per 100 years	3
Day to a week	Remote – less than once every 100 years and more than once per 1,000 years	2
Less than a day	Extremely remote – less than once every 1,000 years and more than once every 10,000 years	1

Table 10.14 Likelihood of occurrence

10.4.3 Significance

The significance of each potential environmental impact was also rated on a scale of one to five, five being the most severe, as shown in Table 10.15. Where significance appears to fall within 2 categories, the higher category was selected in each case.

Significance		Definition
5	Severe	Change in ecosystem leading to long term (>10 years) damage and poor potential for recovery to a normal state. Likely effect on human health. Long term loss or change to users or public finance.
4	Major	Change in ecosystem or activity over a wide area leading to medium term (>2 years) damage but with a likelihood of recovery within 10 years. Possible effect on human health. Financial loss to users or public.
3	Moderate	Change in ecosystem or activity in a localised area for a short time (<2 years), with good recovery potential. Similar scale of effect to existing variability but may have cumulative implications. Potential effect on health unlikely, may cause nuisance to some users.
2	Minor	Change which is within scope of existing variability but can be monitored and/or noticed. May affect behaviour but not a nuisance to users or public.
1	Negligible	Changes which are unlikely to be noticed or measurable against background activities. Negligible effects in terms of health or standard of living.
0	None	No interaction and hence no change expected.
	Beneficial	Likely to cause some enhancement to ecosystem or activity within existing structure. May help local population.

Table 10.15 Definition of significance of environmental impact

10.4.4 Combining Likelihood and Significance to Establish Risk

The overall environmental risk was assessed as shown in Table 10-16 below.

		Significance				
		5	4	3	2	1
Likelihood of occurrence	5	High	High	Moderate	Moderate	Low
	4	High	High	Moderate	Moderate	Low
	3	High	High	Moderate	Low	Low
	2	High	High	Moderate	Low	Low
	1	High	Moderate	Low	Low	Low

Table 10.16 Environmental risk classification matrix



This process was undertaken for all potential impacts. For those impacts identified as a moderate risk, additional mitigation measures were considered to demonstrate that the risk was as low as reasonably practicable. No high-risk impacts were identified. The results of the impact assessment are shown in table 10-17.

10.4.5 Impact Assessment

Impacts from activities associated with the decommissioning of the Kittiwake SAL export system have been assessed using methodology described in section 10.4. The impacts are identified in table 10.17 along with mitigation and prevention measures in place. A summary of environmental risk is shown in table 10.18

Table 10. 17 Environmental Impact Assessment			
Activity / Source of Potential Impact	Potential Environmental Effects	Prevention, Control & Mitigation Measures	Significance Rating (refer Table 10.16 for key)
1. Removal operations on location			
1.1 Use of DSV vessel(s), reel ship, tugs and support vessels	a. Emission to air :GHG emission and a contribution to acidification and eutrophication from vessels NOx , SOx from fuel combustion	• Efficient well serviced vessels • short duration temporary impact • smaller vessels will be using low sulphur diesel	Negligible (1)
	b. Noise disturbance to marine mammals	• Short duration of operation • Similar levels of noise to commercial shipping and oil industry supply vessels. • Likely that marine mammals will be habituated to the passage of commercial vessels	Negligible (1)
	c. Discharges to sea	• Short duration of operation • grey water only	Negligible (1)
1.2 accidental fuel spills from vessels	a. Oil /diesel spill	• There will be continual monitoring of fuel and visual inspection of the sea surface • Any spills are likely to be minor and will be covered by the decommissioning contractor's Emergency Preparedness Procedures	Negligible (1)
1.3 Removal of the SAL	Area of seabed disturbance,	• Area of seabed which may	Moderate (3)

Table 10. 17 Environmental Impact Assessment			
Activity / Source of Potential Impact	Potential Environmental Effects	Prevention, Control & Mitigation Measures	Significance Rating (refer Table 10.16 for key)
	smothering of benthos, local water quality impacts	potentially be impacted is a circle 169m³ (ref. section 10.3.1. 1) Disturbed bottom sediments will settle rapidly and/or be dispersed by current action The remains of the trench will be filled by natural sediment movement	
1.4 Lifting the Kittiwake to SAL pipeline	Area of seabed disturbance, smothering of benthos, local water quality impacts	- Area of seabed which may potentially be impacted is approximately (ref section 10.3.1.2.) 8730 m². - Disturbed bottom sediments will settle rapidly and/or be dispersed by current action. - The remains of the trench will be filled by natural sediment movement	Moderate (3)
	Impacts on Natura 2000 sites	None have been identified in the SAL or SAL pipeline area	None (0)
	Discharges to sea -chemicals	The pipeline has been flushed and is filled with inhibited	Negligible (1)

Table 10. 17 Environmental Impact Assessment			
Activity / Source of Potential Impact	Potential Environmental Effects	Prevention, Control & Mitigation Measures	Significance Rating (refer Table 10.16 for key)
		seawater. Approximately 94.3m ³ of inhibited seawater will be released during removal. This will contain approximately 75.93 kg of TROS 650	
	Discharges to sea -oil	- The line has been flushed to 30ppm (maximum) - Assuming 30 ppm a maximum of 2.38 kg oil could be discharged to sea on lifting the pipeline.	Negligible (1)
1.5 Presence of DSV, reel vessel and tugs	Access to fisheries issues	Short term loss of access	Negligible (1)
1.6 removal of SAL and Kittiwake-SAL pipeline	Access to fisheries	- Permanent removal of seabed obstruction and snagging hazard - Permanent removal of exclusion zone	Benefit (0)

2. SAL and Pipeline transportation			
2.1 Fuel combustion on vessel	Emissions of GHG and gases contributing to acidification and eutrophication	• Use of well maintained, efficient marine engines. • The vessels use low sulphur diesel Temporary impact	Negligible (1)
2.2 Vessel operation	Discharges	• No use of chemicals is anticipated • Grey water only • Treated sewage	Negligible (1)
	Noise disturbance to marine mammals	• Similar levels of noise to commercial shipping and oil industry supply vessels. • marine mammals are present in low numbers and are itinerant therefore there is unlikely to be any significant disturbance. The passage and presence of commercial vessels not unusual for this area. • Short duration of operations and short time and only one or two vessels • There are no recorded breeding sites for marine mammals in the GKA area.	None (0)

	a. Oil /diesel spill	There will be continual monitoring of fuel and visual inspection of the sea surface Any spills are likely to be minor and will be covered by the decommissioning contractor's Emergency Preparedness Procedures	Negligible (1)
3. Disposal			
3.1 Concrete mattresses	Minor generation and energy use in crushing	These will be removed along with the SAL and taken onshore in the UK for probable crushing and recycling as road metal	None (0)
3.2 SAL	Use /loss of non renewable resources (high grade steel)	The SAL is leased to Venture Production plc and will be returned to its owner for storage and reuse by another operator.	Benefit (0)
3.3 Kittiwake -SAL pipeline	Use /loss of non renewable resources (high grade steel)	The pipeline is leased to Venture Production plc and will be returned to its owner for storage and reuse by another operator.	Benefit (0)

Activity	Impact	Significance	Likelihood	Overall risk
Removal operations on location				
1.1 Use of DSV vessel (s), reel ship, tugs and support vessels	Emission to air	1	3	Low
	Noise	1	3	Low
	Discharges to sea	1	3	Low
1.2 Accidental fuels spills from vessels	Oil/diesel spill	1	3	Low
1.3 Removal of the SAL	Seabed disturbance	1	2	Low
	Discharges to sea	1	2	Low
	Impacts on Natura 2000 sites	1	0	low
1.4 Lifting the Kittiwake to SAL pipeline	Seabed disturbance	1	2	Low
	Discharges to sea			Low
	Impacts on Natura 2000 sites	1	0	Low
1.5 Physical presence of vessels	Access	1	1	Low
SAL and Pipeline transportation				
2.1 Fuel combustion	Emissions to air	1	3	Low
2.2 Vessel operation	Discharges	1	3	Low
	Noise	1	3	Low
2.4 accidental fuel spill	Oil/diesel spill	1	3	Low
Disposal				
3.1 concrete mattresses	Emissions to air			Low
	Energy use			Low
3.2 SAL	Use of non renewable resources	1	0	Low
3.3 Kittiwake-SAL pipeline	Use of non renewable resources	1	0	Low

Table 10. 18 Summary environmental risk assessment

Two moderate impacts were identified, both concerning seabed disturbance. As discussed in section 10.3.1, this affects a small area and any depressions remaining will be filled by natural sediment movement and the area re colonised by benthic organisms. Therefore it is concluded that this will not have any permanent significant impact on the seabed.

11 INTERESTED PARTY CONSULTATION

11.1 The Consultation Process

This section provides a record of the consultation process, the correspondence exchanged with the regulatory authorities, statutory consultees and interested parties, and the extent to which the views expressed in this correspondence was taken into account.

The consultation processes began when the 1st Draft of the Decommissioning Programmes were submitted to DECC and to the statutory consultees for their consideration. At the same time a notice was placed in the Edinburgh Gazette, the Telegraph and the Aberdeen Press and Journal. The Decommissioning Programmes were placed on Venture's website and a copy made available at Venture's office for inspection by members of the public.

Correspondence arising from the consultation process has been added to this section under 11.4 "Record of Consultation", and other updates to the document arising from the process have been incorporated at the appropriate sections. The approved decommissioning programmes will be placed on DECC's website.

11.2 Statutory consultees

The Decommissioning Programmes were sent to each of the statutory consultees with letters inviting them to review and submit comments upon the programmes. These letters, together with any subsequent submissions from the consultees, are contained in Section 11.4 "Record of Consultation".

The statutory consultees are:

- Scottish Fishermen's Federation (SFF)
- National Federation of Fishermen's Organisations (NFFO)
- Northern Ireland Fishermen's Federation (NIFF)
- Global Marine Systems Ltd (GMS)

11.3 Stakeholders and Other Interested Parties

No consultations were received from the public consultation.



11.4 Record of Consultation

Copies of the following are attached:

1. Public Notice published in the Edinburgh Gazette, the Telegraph and the Aberdeen Press and Journal
2. Letter: Venture to DECC 16th March 2009
3. Letter: Venture to SFF 16th March 2009
4. Letter: SFF to Venture 20th March 2009
5. Letter: Venture to NFFO 16th March 2009
6. Letter: Venture to NIFF 16th March 2009
7. E-mail: NIFF to Venture 25th March 2009
8. Letter: Venture to GMS 16th March 2009
9. E-mail: GMS to Venture 5th May 2009



- 1 Public Notice published in the Edinburgh Gazette, the Telegraph and the Aberdeen Press and Journal

PUBLIC NOTICE

The Petroleum Act 1998

KITTIWAKE SAL EXPORT SYSTEM DECOMMISSIONING PROJECT

Venture North Sea Oil Limited has submitted, for the consideration of the Secretary of State for Energy and Climate Change, a draft Decommissioning Programme for the **Kittiwake SAL Export System** in accordance with the provisions of the Petroleum Act 1998. It is a requirement of the Act that interested parties be consulted on such decommissioning proposals.

The items/facilities covered by the Decommissioning Programme are: the **Kittiwake SAL System comprising 1 No Single Anchor Loading (SAL) Assembly and 1 No, 2.91 km long, 8" Flexible Pipeline.**

Venture North Sea Oil Limited hereby gives notice that a summary of the **Kittiwake SAL Export System** Decommissioning Programme can be viewed at: **www.venture-production.com**.

Alternatively a hard copy of the Programme can be inspected during office hours at the address given below.

Representations regarding the **Kittiwake SAL Export System** Decommissioning Programme should be submitted in writing to

Stewart Ford
Project Manager
Kittiwake Loading Buoy Decommissioning Project
Venture North Sea Oil Limited
Kings Close
62 Huntly Street
Aberdeen
AB10 1RS

Representations should be received by **Monday 20th April 2009** and should state the grounds upon which any representations are being made.

Date: 17th March 2009

Venture North Sea Oil Ltd
Kings Close
62 Huntly Street
Aberdeen
AB10 1RS

Jilly Powell
Corporate Communications Manager

2 Letter: Venture to DECC 16th March 2009



Our Reference: VPC-PRJ-GKA0028-COR-0001

16 March 2009

Offshore Decommissioning Unit
Department of Energy and Climate Change
3rd Floor
Atholl House
86-88 Guild Street
Aberdeen
AB11 6AR

For the attention of Mrs Tracey Mackie

Dear Mrs Mackie

**PETROLEUM ACT 1998:
KITTIWAKE SAL EXPORT SYSTEM DECOMMISSIONING PROGRAMME**

We refer to your letter of 13 February 2009 which was addressed to our Managing Director, and the Section 29 notices dated 11 August 2006 (in respect of the Kittiwake Single Anchor Loading System) and 3 March 2006 (in respect of pipeline PL2205). Please find enclosed a draft of the Kittiwake SAL Export System Decommissioning Programme for consideration. Five paper copies and twenty copies on CD are attached.

Copies have been sent to the statutory consultees identified in your E-mail of 11 February 2009. Public notices will appear in the Edinburgh Gazette, the Daily Telegraph and the Aberdeen Press and Journal during this current week. Representations arising from both the statutory and public consultations have been requested by 20th April 2009.

We have not provided costs in the document as this information will be sensitive for some time. We anticipate a cost of the order of £5 million but will be preparing a formal budget in due course.

Venture wishes to thank BERR for their help and advice in connection with preparing this decommissioning programme and look forward to receiving your feedback in due course.

Yours sincerely



Stewart Ford
Project Manager



VENTURE
PRODUCTION plc

DOCUMENT TITLE: KITTIWAKE SAL EXPORT SYSTEM
DECOMMISSIONING PROGRAMME
DOCUMENT NO: VPC-PRJ-GKA0028-REP-0001 REV A2

3 Letter: Venture to SFF 16th March 2009



VENTURE
NORTH SEA OIL LIMITED

Our Ref: VPC-PRJ-GKA0028-COR-0002

16 March 2009

Scottish Fisherman's Federation
24 Rubislaw Terrace
Aberdeen
AB10 1XE

For the attention of Mr M Sutherland

Dear Mr Sutherland

**PETROLEUM ACT 1998:
KITTIWAKE SAL EXPORT SYSTEM DECOMMISSIONING PROGRAMME**

Venture North Sea Oil Limited has submitted a draft of the above decommissioning programme for the consideration of the Secretary of State for Energy and Climate Change. The Scottish Fisherman's Federation has been identified as an organisation which must be consulted on the proposed decommissioning programme therefore a copy of this is contained in the attached CD for your review.

Comments on the decommissioning proposal should be made in writing to:

Stewart Ford
Project Manager
Kittiwake SAL Removal Project
Venture North Sea Oil Ltd
Kings Close
62 Huntly Street
Aberdeen
AB10 1RS

In the event that you have no comments to make on the decommissioning programme, it would be greatly appreciated if you would confirm this, either in writing to the above address or by e-mail to sford@venture-production.com.

We look forward to your feedback on the decommissioning programme which should be received by close of business Friday 20 April 2009. If you should have any queries or require any clarification, please do not hesitate to contact the undersigned at 01224 619161.

Yours sincerely

Stewart Ford
Project Manager



VENTURE
PRODUCTION plc

DOCUMENT TITLE: KITTIWAKE SAL EXPORT SYSTEM
DECOMMISSIONING PROGRAMME
DOCUMENT NO: VPC-PRJ-GKA0028-REP-0001 REV A2

4 Letter: SFF to Venture 20th March 2009



SCOTTISH FISHERMEN'S FEDERATION

24 Rubislaw Terrace · ABERDEEN · AB10 1XE

Telephone: 01224 646944 · Fax: 01224 647058
e-mail: sff@sff.co.uk
Website: www.sff.co.uk

Your ref: VPC-PRJ-GKA0028-COR-002

Our ref: L18/09/MJS/ag

20 March 2009

Stewart Ford
Project Manager
Kittiwake SAL Removal Project
Venture North Sea Oil Ltd
Kings Close
62 Huntly Street
ABERDEEN
AB10 1RS

Dear Mr Ford

Petroleum Act 1998

Kittiwake Sal Export System Decommissioning Programme

I refer to your letter and enclosures of 16 March 2009 your reference (VPC-PRJ-GKA0028-COR-002) concerning the above.

As you know we have been in constant and regular dialogue with Venture through your good self and during this dialogue we have made a number of points in respect of the draft of the initial Decommissioning Programme. Having viewed the latest version of the same, we note that you have taken several of our points on board. Accordingly we have no particular substantive comments, nor objections to offer to the programme.

You will recall that we agreed to stay in regular contact particularly in relation to the post Decommissioning Trawl Sweep Operations and in this respect we are content that the dialogue is continuing.

Yours sincerely

Michael J Sutherland
Director of Operations



VENTURE
PRODUCTION plc

DOCUMENT TITLE: KITTIWAKE SAL EXPORT SYSTEM
DECOMMISSIONING PROGRAMME
DOCUMENT NO: VPC-PRJ-GKA0028-REP-0001 REV A2

- 5 Letter: Venture to NFFO 16th March 2009
NFFO were contacted but no feedback was received.



VENTURE
NORTH SEA OIL LIMITED

Our Ref: VPC-PRJ-GKA0028-COR-0003

16 March 2009

National Federation of Fishermen's Organisations
30 Monkgate
York
YO31 7PF

For the attention of Mr D Bevan

Dear Mr Bevan

**PETROLEUM ACT 1998:
KITTIWAKE SAL EXPORT SYSTEM DECOMMISSIONING PROGRAMME**

Venture North Sea Oil Limited has submitted a draft of the above decommissioning programme for the consideration of the Secretary of State for Energy and Climate Change. The National Federation of Fishermen's Organisations has been identified as an organisation which must be consulted on the proposed decommissioning programme therefore a copy of this is contained in the attached CD for your review.

Comments on the decommissioning proposal should be made in writing to:

Stewart Ford
Project Manager
Kittiwake SAL Removal Project
Venture North Sea Oil Ltd
Kings Close
62 Huntly Street
Aberdeen
AB10 1RS

In the event that you have no comments to make on the decommissioning programme, it would be greatly appreciated if you would confirm this, either in writing to the above address or by e-mail to sford@venture-production.com.

We look forward to your feedback on the decommissioning programme which should be received by close of business Friday 20 April 2009. If you should have any queries or require any clarification, please do not hesitate to contact the undersigned at 01224 619161.

Yours sincerely

Stewart Ford
Project Manager



ENTURE
PRODUCTION plc

DOCUMENT TITLE: KITTIWAKE SAL EXPORT SYSTEM
DECOMMISSIONING PROGRAMME
DOCUMENT NO: VPC-PRJ-GKA0028-REP-0001 REV A2

6 Letter: Venture to NIFF 16th March 2009



ENTURE
NORTH SEA OIL LIMITED

Our Ref: VPC-PRJ-GKA0028-COR-0004

16 March 2009

Northern Ireland Fishermen's Federation
1 Coastguard Cottages
The Harbour
Portavogie
Co. Down
BT22 1EA

For the attention of Mr R James

Dear Mr James

**PETROLEUM ACT 1998:
KITTIWAKE SAL EXPORT SYSTEM DECOMMISSIONING PROGRAMME**

Venture North Sea Oil Limited has submitted a draft of the above decommissioning programme for the consideration of the Secretary of State for Energy and Climate Change. The Northern Ireland Fishermen's Federation has been identified as an organisation which must be consulted on the proposed decommissioning programme therefore a copy of this is contained in the attached CD for your review.

Comments on the decommissioning proposal should be made in writing to:

Stewart Ford
Project Manager
Kittiwake SAL Removal Project
Venture North Sea Oil Ltd
Kings Close
62 Huntly Street
Aberdeen
AB10 1RS

In the event that you have no comments to make on the decommissioning programme, it would be greatly appreciated if you would confirm this, either in writing to the above address or by e-mail to stford@venture-production.com.

We look forward to your feedback on the decommissioning programme which should be received by close of business Friday 20 April 2009. If you should have any queries or require any clarification, please do not hesitate to contact the undersigned at 01224 619161.

Yours sincerely


Stewart Ford
Project Manager



VENTURE
PRODUCTION plc

DOCUMENT TITLE: KITTIWAKE SAL EXPORT SYSTEM
DECOMMISSIONING PROGRAMME
DOCUMENT NO: VPC-PRJ-GKA0028-REP-0001 REV A2

7 E-mail: NIFF to Venture 25th March 2009

From: NIFPO [nifpo@btconnect.com]
Sent: 25 March 2009 13:44
To: Stewart Ford
Subject: Kittiwake Decommissioning Programme

Dear Sir,

Your Ref VPC-PRJ-GKA0028-COR-0004

Further your letter of 16th March, we have no issues.

R.H James
NI Fishermen's Federation



ENTURE
PRODUCTION plc

DOCUMENT TITLE: KITTIWAKE SAL EXPORT SYSTEM
DECOMMISSIONING PROGRAMME
DOCUMENT NO: VPC-PRJ-GKA0028-REP-0001 REV A2

8 Letter: Venture to GMS 16th March 2009



ENTURE
NORTH SEA OIL LIMITED

Our Ref: VPC-PRJ-GKA0028-COR-0005

18 March 2009

Global Marine Systems Ltd
New Saxon House
1 Winsford Way
Boreham Interchange
Chelmsford
Essex
CM2 5PD

For the attention of Mrs Caroline Wilson

Dear Mrs Wilson

**PETROLEUM ACT 1998:
KITTIWAKE SAL EXPORT SYSTEM DECOMMISSIONING PROGRAMME**

Venture North Sea Oil Limited has submitted a draft of the above decommissioning programme for the consideration of the Secretary of State for Energy and Climate Change. Global Marine Systems Ltd has been identified as an organisation which must be consulted on the proposed decommissioning programme therefore a copy of this is contained in the attached CD for your review.

Comments on the decommissioning proposal should be made in writing to:

Stewart Ford
Project Manager
Kittiwake SAL Removal Project
Venture North Sea Oil Ltd
Kings Close
62 Huntly Street
Aberdeen
AB10 1RS

In the event that you have no comments to make on the decommissioning programme, it would be greatly appreciated if you would confirm this, either in writing to the above address or by e-mail to sford@venture-production.com.

We look forward to your feedback on the decommissioning programme which should be received by close of business Friday 20 April 2009. If you should have any queries or require any clarification, please do not hesitate to contact the undersigned at 01224 619161.

Yours sincerely



Stewart Ford
Project Manager



VENTURE
PRODUCTION plc

DOCUMENT TITLE: KITTIWAKE SAL EXPORT SYSTEM
DECOMMISSIONING PROGRAMME
DOCUMENT NO: VPC-PRJ-GKA0028-REP-0001 REV A2

9 E-mail: GMS to Venture 5th May 2009

From: Wrottesley, John [John.Wrottesley@globalmarinesystems.com]
Sent: 05 May 2009 16:24
To: Stewart Ford
Cc: Catrin Rogers
Subject: RE: Kittiwake SAL Decommissioning Programme

Dear Mr Ford,

I received the document this morning and have reviewed it with our charting department.

According to our records there are no in service cables in the immediate vicinity, and the nearest is approximately 13.5 nm north of the platform that we are aware of. Obviously we cannot comment on cables owned by the Ministry of Defence and you may need to get in touch with them separately in this regard. Therefore I do not think that we have any further comments or feedback at this time.

Please let me know if this is not the feedback that you require or if I can be of further assistance.

Best regards,

John Wrottesley
Permitting Manager
Global Marine Systems Ltd



12 COSTS

The outline budgets for each of the two decommissioning programmes covered by this document are as follows:

SAL Assembly	£3.1million
Pipeline	£2.9million

13 SCHEDULE

13.1 Project Key Dates

Figure 13.1 gives a summary schedule for the project. The final detailed schedule will depend on the availability of suitable vessels and the co-ordination of the work with other construction activities on and around Kittiwake. The detailed schedule will be developed during the early part of the contract.

The key dates for the project are:

Discussions with DECC Started	11 th Feb 2009
Decommissioning Programmes 1 st Draft Submitted	13 th March 2009
Consultation Process Start	17 th March 2009
Consultation Process Finish	17 th April 2009
Decommissioning Programmes Final Draft Target Submission	1 st May 2009
Decommissioning Programmes Target Approval	15 th June 2009
Remove SAL Assembly - Earliest	August 2009
Removal SAL Assembly - Latest	September 2010
Remove Flexible Pipeline - Earliest	August 2009
Remove Flexible Pipeline - Latest	September 2010
Project – Earliest Finish	December 2009
Project – Latest Finish	February 2011

13.2 Schedule Drivers

The earliest date for the removal of the SAL would provide the potential for the SAL to be reallocated to another field during 2009. The feasibility and timing of this option depends on the availability of a suitable vessel and the commercial impacts to Venture relative to a 2010 removal operation.

The earliest opportunity for the removal of the flexible pipeline is driven by the potential for synergies with other Venture projects by making use of a reel vessel chartered for these projects. The recovery of the pipeline during 2009 is considered to be a low priority relative to these other projects. If circumstances dictate that there is no synergy to be achieved by a 2009 pipeline removal, this scope will be built into Venture's 2010 subsea construction schedule.

The latest dates for the removal of the SAL and the flexible pipeline are based on the work being done during the 2010 construction season. The timing will be subject to making optimum use of vessel availability commensurate with ensuring that the equipment is delivered to the owner before the expiry of the lease agreement.

Notwithstanding the above, as decommissioning operations involve no commercial benefit, detail scheduling of each operation will be driven by achieving minimum cost to Venture.

13.3 Post Removal Activities

All post removal activities (survey/debris removal, debris trawl and seabed sampling will be completed within the Project Finish Dates given in 13.1.

14 PROJECT MANAGEMENT AND VERIFICATION

14.1 Project Organisation

Figure 14.1 illustrates the project organisation.

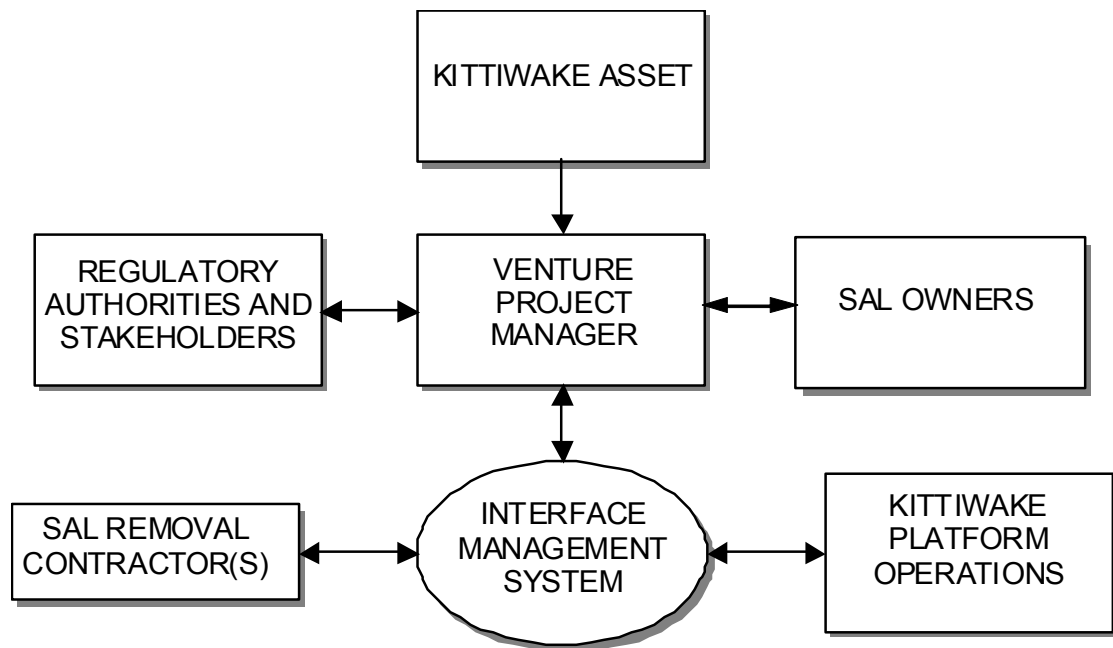


Figure 14.1 Project Organisation

14.1.1 Venture Project Management Team

The Venture Project Manager is responsible for:

- preparing and submitting draft Decommissioning Programme(s) to DECC
- liaising with DECC and other authorities
- initiating and co-ordinating the public consultation process
- Maintaining the Consents and Notifications Register and ensuring that it is acted upon
- reviewing and revising the Decommissioning Programmes if necessary
- overseeing the decommissioning contract(s)
- ensuring that an effective Interface Management is in place and is efficiently and effectively operated by all parties affected by the project
- ensuring that the project objectives are met

- reporting back to the Venture Oil Asset Manager on cost and progress
- ensuring that the audit and verification schedule is met
- ensuring that the project is closed out in accordance with Venture procedures and that all necessary documentation is complete and in place.

14.1.2 Kittiwake Platform Operations

Petrofac is the duty holder for the Kittiwake platform and are responsible for operations in the Greater Kittiwake Area and as such have a key role during the removal process. As there may be other projects ongoing during the time that the SAL marine operations are underway, Petrofac will be responsible for co-ordinating the activities of these projects. Petrofac maintain an integrated plan of Kittiwake offshore activities and the SAL marine activities will be included on this.

14.1.3 Other Kittiwake Contractors

Other contractors will be present on the Kittiwake platform at the time of the SAL marine operations. Although they are unlikely to be affected by the SAL work, it is nevertheless essential that effective communications are established. As these contractors are under the direct control of the Kittiwake operations personnel, communications to these contractors shall be routed through, and co-ordinated by, the platform,

14.1.4 Interface Management

Effective interface management is essential to ensuring that this project, and the other projects going on in parallel, is performed efficiently, effectively and, above all, safely. An Interface Document will be developed to ensure effective communication and management of interfaces between all parties.

14.2 Project Planning

Venture is responsible for determining and communicating the key dates and objectives for the project. These dates and objectives form the basis of detailed plans required to control the project.

The SAL Removal contractor will be responsible for establishing and maintaining a detailed plan for all activities associated with the marine construction work including the transportation of the SAL assembly and pipeline to its destination.

Petrofac will include the SAL offshore activities in their integrated plan for Greater Kittiwake Area.

14.3 Audit / Verification Schedule

Venture will use their existing processes and procedures on this project. These systems are subject to a rolling of audits. System audits applied to other projects are equally applicable to SAL and actions arising from these audits shall be applied to SAL.

The offshore activities will be subject to review and approval by a Marine Warranty Surveyor.

14.4 Decommissioning Close-Out Report

A close out report will be assembled and issued to DECC within four months of the completion of the offshore work. This will include:

- An “as implemented” record of the project describing how the key milestones were achieved, any issues that arose and how such issues were resolved.
- A description and explanation of any variances to the programmes and any additional permits required as a result,
- The results of debris clearance and any monitoring that was undertaken (ref Section 15.),
- Actual versus forecast costs together with an explanation of the variances.
- This report will be placed on the Venture website.

15 DEBRIS CLEARANCE

The design of the SAL is such that it will be removed as a single piece. Peripheral materials such as the loading hose and associated rigging were removed during 2008. The only loose materials associated with the SAL and the flexible pipeline are therefore the flexible concrete mattresses together with grout bags used to support the pipeline tie-in at the SAL and deployed around the suction anchor skirts.

The SAL Removal contractor will be responsible for ensuring that the mats and grout bags are removed. He will also carry out a visual survey of the area and remove any other materials that are discovered that are within the capabilities of his available equipment. In the unlikely event that he discovers significant oilfield debris that he is not able to recover with the equipment available at the time, the location of this material will be noted for later retrieval. A photographic record will be kept of any materials removed or identified for later recovery.

Venture is not aware of any significant debris in the vicinity of the SAL and does not anticipate that any will be found. In order to confirm that the area is free of significant debris and safe for the resumption of fishing activities, an area with a minimum radius of 500m from the centre of SAL and a corridor, a minimum of 200m wide, centred on the pipeline route, will be subject to a debris trawl. The debris trawl will be organised by SFF and witnessed and verified by an independent third party. If significant oil field debris is discovered that cannot be retrieved by the equipment available, its position will be noted for further action.

The debris trawl will be undertaken after all subsea operations are completed. The earliest opportunity for this is late September 2009 but it is more likely that this work will be deferred until summer 2010 to minimise the risk of bad weather.

In the unlikely event that further action is required, Venture intends to take advantage of vessels engaged for other projects to carry out this work. A photographic record will be kept of any subsequent recovery operation as evidence that the work has been completed.

All debris recovered by the processes described above will be disposed of in an environmentally responsible manner using a UK based licensed disposal contractor.

A report, detailing the results of the debris clearance operations will be prepared and submitted to DECC. This report will be included as part of the Close-Out Report (see Section 14.4).

16 MONITORING AND MAINTENANCE

16.1 Seabed Monitoring

The nature of the SAL is such that there has been minimal impact on the seabed resulting from her installation and operation. There is no cuttings pile or any other potentially detrimental deposits associated with the SAL system. The removal operation is simple and does not involve any processes likely to pollute the seabed. There is therefore no reason to believe that the seabed within the safety zone of the SAL has in any way suffered detrimental change as a consequence of the presence of SAL.

A number of environmental surveys have been undertaken in the area and these provide a baseline for monitoring the seabed in the vicinity of the SAL and the SAL pipeline. These are discussed in Section 10. Further sampling will be done following the removal of the SAL and the SAL pipeline. The results of these tests will be used to determine any ongoing monitoring requirements.

The proposed scope of seabed sampling is given in Section 16.2. Following the completion of this work, the need for ongoing monitoring will be discussed and agreed with DECC. Any ongoing monitoring will be undertaken as part of Venture's ongoing routine biannual integrity surveys undertaken for the Greater Kittiwake Area.

16.2 Environmental Survey

The environmental survey shall include seabed photography, sampling and processing for later macrobenthic and physico-chemical analysis.

Samples will be taken from 4-5 stations in the vicinity of the SAL.

A total of four grab replicates will be taken at each station; one sample will be sub sampled for physico chemistry; the remaining replicates over 500µm will be processed for possible future macrofaunal determination. A photographic record will be kept of each station.

This work will be done on an "opportunistic" basis to take advantage of synergies with other projects. This will be done by including this scope of work as part of a survey "campaign". However, the sampling will be completed within the overall timescale of the project as given in 13.1.

17 SUPPORTING STUDIES AND REFERENCES

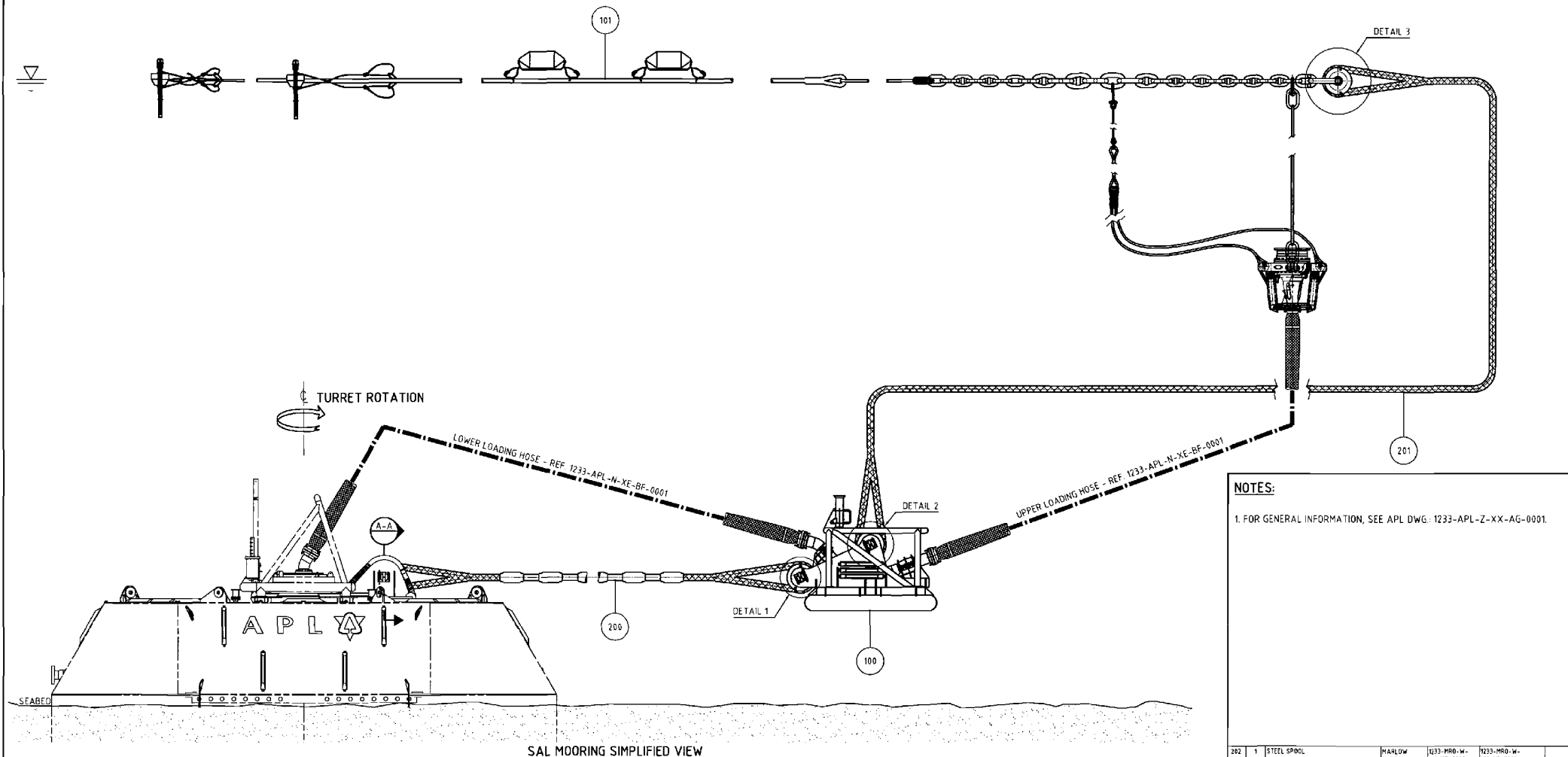
- Anatech (2007). Grouse *location shipping traffic survey*. Anatech, Aberdeen.
- BMT Cordah (2009) Review of ROV footage from the Kittiwake SAL export system
Report No A VEL 024: 20 02 09
- BODC (1998). United Kingdom Digital Marine Atlas, 3rd Edition. British Oceanographic Data Centre, Birkenhead.
- Coull, K. A., Johnstone, R. & Rogers, S.I. (1998). Fisheries Sensitivity Maps in British Waters. Published and Distributed by UKOOA Ltd.
- Grass S.E. and Roberts J.M. 2006 The occurrence of the cold water coral *Lophelia pertusa* (Schleractinia) on oil and gas platforms in the North sea : colony growth, recruitment and environmental controls on distribution
- Fugro (2005) Pipeline route surveys UKCS Blocks 16/12, 21/12, 21/17, 21/18 and 22/2, report number 688305 Volume 3A, Kittiwake – Goosander – Winchat – Wagtail Development.
- Fugro (2008) CNS survey programme: Grouse to Kittiwake Pipeline Route Survey.
Report no 9623 V1 June 2008
- Hammond, P. (2000). Personal Comments Made About Movements and Behaviour of Both Grey and Common Seal in the North Sea. Sea Mammal Research Unit, Gatty Marine Laboratory, University of St. Andrews.
- Judd, A.G. (2001). Pockmarks in the UK sector of the North Sea. Technical report produced for Strategic Environmental Assessment-Dti TR_002.
- McConnell, B. J., Fedak, M. A., Lovell, P. & Hammond, P. S. (1999). Movements and Foraging Areas of Grey Seals in the North Sea. Journal of Applied Ecology, vol. 36, p. 573-590.
- MarLIN (2009) [http://www.marlin.ac.uk/biotopes/Bio dist COR.Lop.htm](http://www.marlin.ac.uk/biotopes/Bio%20dist%20COR.Lop.htm)
- OSPAR Commission (2000). Quality Status Report 2000, Region II – Greater North Sea. OSPAR Commission, London.
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- Sonntag, R. P., *et al.* (1999). *Identification of the first harbour porpoise (Phocoena phocena) calving ground in the North Sea*. J. Sea Res. 41(3):225-232.
- Stone, C.J., Webb, A., Barton, C., Ratcliffe, N., Reed, T. C., Tasker, M. L., Camphuysen, C. J. & Pienkowski, M. W. (1995). An atlas of seabird distribution in north-west European waters. Joint Nature Conservation Committee, Peterborough.
- Venture production plc. (2008) PON 15E application ; removal of Kittiwake to SAL flowline (PL 2205)
- Williams, J. M., Tasker, M. L., Carter, I. C. & Webb, A. (1994). A Method of Assessing Seabird Vulnerability to Surface Pollutants. Seabirds and Cetaceans Branch, Joint Nature Conservation Committee



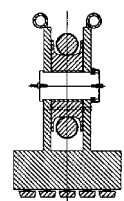
18 APPENDIX

18.1 Reference Drawings

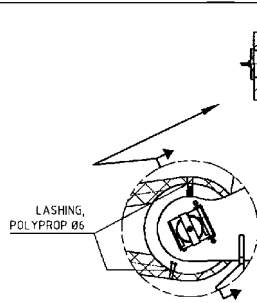
Ref	Drawing No.	Title
[1]	1233-APL-N-XG-BG-0001	Kittiwake SAL: SAL Anchor
[2]	1233-APL-W-XD-MG-0001	Kittiwake SAL: SAL Mooring
[3]	1233-APL-Y-XD-BG-0001	Kittiwake SAL: SAL System
[4]	GKA0009-65-DR-0002	SAL System SAL Location at Kittiwake Field Layout



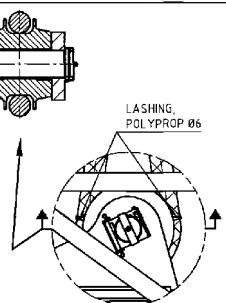
SAL MOORING SIMPLIFIED VIEW



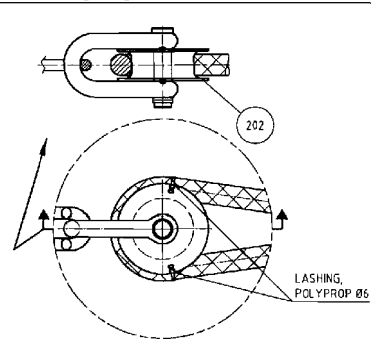
SECTION A-A
SCALE 1:20



DETAIL 1
SCALE 1:20



DETAIL 2
SCALE 1:20



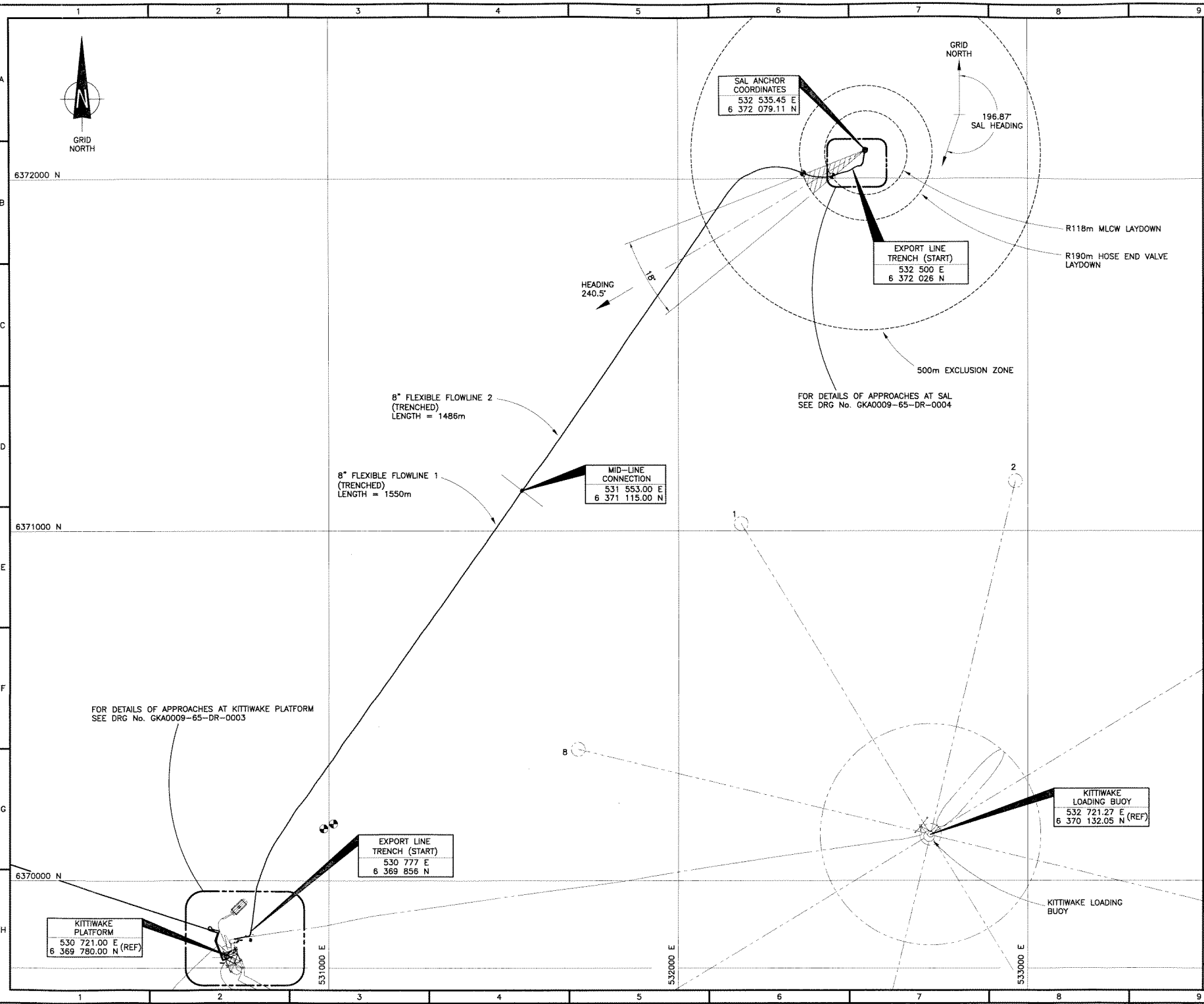
DETAIL 3
SCALE 1:20

NOTES:

1. FOR GENERAL INFORMATION, SEE APL DWG: 1233-APL-Z-XX-AG-0001.

Qty	City	Description	Material / Coating	Dimension	kg / m³
202	1	STEEL SPOOL	MARLOW ROPES	1233-MRO-W-XX-MP-0002	
201	1	UPPER ROPE SEGMENT	MARLOW ROPES	1233-MRO-W-XX-MP-0001	
200	1	LOWER ROPE SEGMENT	MARLOW ROPES	1233-MRO-W-XX-MP-0001	
101	1	SAL PICK-UP SYSTEM	APL	1233-APL-W-XD-BP-0001	
100	1	MOORING LINE CLUMP WEIGHT (MLCW)	APL	1233-APL-W-XG-MG-0003	18575

Reference:		SAL SYSTEM ASS: 1233-APL-Y-XD-BG-0001		101
Surface roughness: R _a 6.3	Tolerance when not specified: H7/g6	Standard reference: MIL-STD-1916 D17	File Spec No: 302-APL-C-SA-0002	Weight: kg
Project: KITTIWAKE SAL				
Z	06.10.05	AS BUILT	SH	
Rev.	Date	Reason for issue/Ref. DEN No.	Traced by	Checked
06.10.05	06.10.05	AB/AR0	1:50	
Reference: APL		APL		
SAL SYSTEM ASSEMBLY		SAL MOORING ASSEMBLY		
Replacement for: 302-APL-W-XD-MG-0001		Replaced by:		Rev: 1233-APL-W-XD-MG-0001 Z
NOT TO BE REPRODUCED AND/OR MADE AVAILABLE TO A THIRD PARTY WITHOUT APL WRITTEN CONSENT				



NOTES:

1. ALL CO-ORDINATES ARE BASED ON INTERNATIONAL SPHEROID 1924 USING ED50 DATUM. GRID CO-ORDINATES ARE IN TRANSVERSE MERCATOR (TM) PROJECTION, USING A CENTRAL MERIDIAN OF 0 DEGREES.

- REFERENCE DRAWINGS:**
- GKA0009-65-DR-0003 - APPROACHES AT KITTIWAKE PLATFORM
 - GKA0009-65-DR-0004 - APPROACHES AT SAL LOCATION

Venture Production (North Sea Developments) Limited
Supplier Document Review

1	Reviewed and Accepted
2	Reviewed and Accepted subject to incorporation of comments. Re-submit. Work may proceed.
3	Review incorporating comments. Re-submit. Work may not proceed.
4	Information Only

MPC Eng. Sign _____ Date _____



Z1	01.02.06	AS-BUILT	ADM	PS	MD
A1	26.10.05	I.D.C.	ADMAB	JA	
REV	DATE	REASON FOR ISSUE	DRN BY	D.O. CHK BY	END CLKD BY APP APP



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CLIENT: VENTURE PROJECT: GKA0009-SAL System

TITLE: **SAL SYSTEM
SAL LOCATION AT KITTIWAKE
FIELD LAYOUT**