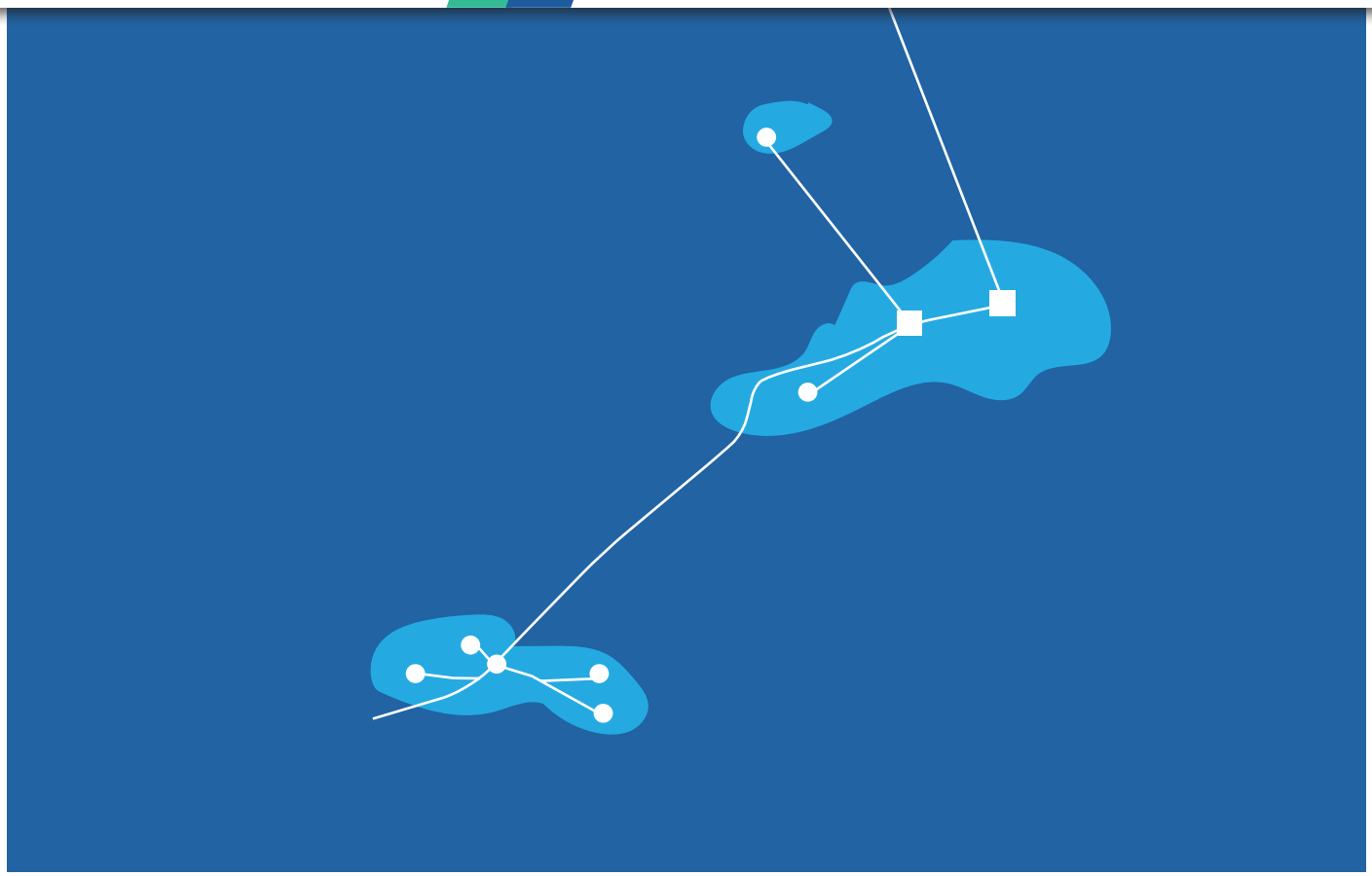
KINSALE ENERGY

Kinsale Area Decommissioning

Response to Request for Further Information



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1 Introduction

On 24th September 2018 The Petroleum Affairs Division, Department of Communications, Climate Action and Environment (DCCAE) wrote to PSE Kinsale Energy Limited (KEL) requesting further information on its application to decommission certain of the Kinsale Head/ Ballycotton gas field facilities and the application by PSE Seven Heads Limited for the decommissioning of certain of the Seven Heads gas field facilities.

KEL has considered the points raised in this letter and encloses herein a response to this further information request. Each of the issues raised by the DCCAE is set out herein, with a detailed response provided to each of the points raised, and with additional documents appended herein.

2 EIAR - Response No.1

2.1 DCCAE Query:

Further information on the description of the baseline marine environment is required highlighting the findings of previous surveys undertaken. Include details of the survey methods used.

2.2 Response:

Extensive survey work has been undertaken in the Kinsale Area since the discovery of the Kinsale Head field in 1971, and the most recent survey information covering the period 2002-2017 has been used in the assessment. This data has been augmented by recent survey data relevant to the Kinsale Area obtained from 3rd parties (e.g. for the Barryroe well), and together these provide a comprehensive source of information on which to characterise the baseline.

The surveys are shown in **Figure 1**and listed in **Table 1**, which briefly indicates their coverage, purpose and scope. The methods employed and output from each of the surveys are summarised below, ordered with the most recent survey first.

2.2.1 Pre-decommissioning baseline survey: Marine Institute (2017)

Overview

The survey was undertaken by the Marine Institute using the RV Celtic Voyager in April 2017. The purpose of the survey was to establish a pre-decommissioning baseline covering the relevant Kinsale Area facilities including Seven Heads, South West Kinsale and Greensand, Ballycotton and Kinsale Head. Samples were taken to characterise the sediment type, contamination status and faunal communities, including the identification of habitats or species of conservation interest. Multibeam survey data was also collected around each of the facilities to characterise the topography at these locations. A number of the sampling stations had previously been investigated in earlier surveys, therefore allowing a temporal comparison.

Methodology

Grab samples were collected from 31 stations using a 0.1m^2 Day grab. A video transect of ca. 25m was taken at each station and still photographs taken every few metres, with a minimum of six being taken along the transect. Two grab samples were collected at each station; one for faunal analysis, and the other for sediment granulometry (wet and dry sieve, >63µm, laser diffraction, <63µm), hydrocarbon (Gas Chromatography Flame Ionisation Detection, GC-FID) and metals (Inductively Coupled Plasma-Mass Spectrometry, ICP-MS and ICP-Optical Emission Spectrometry, ICP-OES) analyses.

Subsamples taken for metals, hydrocarbons and granulometric analyses were stored at -18ºC. Fauna samples were screened on a 1mm sieve and fixed in a 4%

formaldehyde solution. All samples were sent to laboratories for processing which met the requirements stipulated by the Marine Institute.

Multibeam echosounder (MBES) data was collected around subsea infrastructure (Seven Heads, South West Kinsale and Greensand, Ballycotton) and the Kinsale Alpha and Kinsale Bravo platforms, each with an approximate coverage of 400m x 400m.

2.2.1.1 Summary

Sediment granulometry

Across all samples collected across the survey area, most were characterised on the Folk sediment classification as very coarse sand (43%), with the remaining samples being medium sand (27%), coarse sand (20%) and very fine gravel (10%).

Hydrocarbons and metals

Total hydrocarbon concentrations ranged from 0.5-15µg/g^{-1} and n-alkane concentrations were also low ranging from 0.05-0.51µg/g^{-1}. These values were broadly in keeping with other surveys in the area including those for Midleton (Gardline 2015) and Barryroe (Marine Institute 2011). The n-alkanes recorded were generally associated with terrestrial inputs. The Carbon Preference Index (CPI) indicated a predominantly plant-based origin for the alkanes, with slight petrogenic influence in samples with a lower CPI. Similarly, pristane (Pr) phytane (Ph) ratios reflected a largely biogenic source, with two stations in the South West Kinsale area indicating some anthropogenic origin.

Most samples exhibited concentrations of trace metals well within normal ranges for background sediments in Irish waters, with up to 25% of samples having concentrations above background levels for zinc, and to a lesser extent, copper. Elevated concentrations of zinc, copper and lead were noted in samples close to South West Kinsale and Kinsale Bravo, possibly related to use of pipe dopes during drilling.

Fauna

Multivariate analyses of the faunal data indicated three relatively weak clusters of stations which were geographically spread across the survey area and with some overlapping characteristic species. The characteristic species from the clusters included the polychaetes *Spiophanes kroyeri*, *Lumbrineris aniara*, *Mediomastus fragilis*, *Goniadella gracilis*, *Glycera lapidum*, and *Amphitrite cirrata*, the anemone *Edwardsia* sp., unidentified Nematoda and Nemertea, and the echinoderms *Amphiura filiformis* and *Echinocyamus pusillus*. No species indicative of contamination or organic enrichment were recorded and there was no indication of sensitive species or habitats which would be subject to protection under the EU Habitats Directive (92/43/EEC).

2.2.2 Midleton well baseline survey: Gardline (2015)

Overview

An environmental baseline survey was conducted around the Midleton A exploration well and proposed Midleton B appraisal well (subsequently not drilled) in Block 49/11 of the Celtic Sea. The objective of the survey was to obtain baseline physico-chemical data within the site to allow the monitoring of any potential impacts to be undertaken in the future.

Sediment was collected and samples taken to characterise hydrocarbons, metals and organic matter, and sediment particle size. A separate geophysical survey was undertaken to identify obstructions, hazards and shallow geological conditions affecting semi-submersible rig anchoring, and to establish water depths.

Methodology

Grab samples were collected from 11 stations using a 0.1m^2 Day grab, arranged in a cruciform pattern around the well sites accounting for the dominant ENE-WSW tidal current, with one station 5.5km to the SSW of Midleton A to act as a control. Side scan sonar (SSS) data was used to help target the grabs in the event of failed attempts to collect sediment due to the coarse nature of the seabed. The data helped to target areas of lower reflectivity in the event that five consecutive grab sampling attempts failed. Each grab sample was sub-sampled for: particle size analysis by sieving using mesh apertures from 63mm down to 63µm; analysis of total hydrocarbons and n-alkanes by GC-FID with Polycyclic Aromatic Hydrocarbons (PAHs) analysed by GC-MS; analysis of metals using ICP-OES and ICP-MS; and organic matter analyses (by ignition). Photographs were taken of each of the samples within the grab.

A 2.4km x 1km bathymetry and sub-bottom profiler survey was undertaken at the Midleton A well location in addition to a wider shallow geological survey covering 5.8km x 4.1km. Survey equipment included a multibeam echosounder (MBES), side scan sonar (SSS), magnetometer, pinger and sparker.

2.2.2.1 Summary

Sediment granulometry

Mean grain size was variable, ranging from 152 to 2,289µm, with a mean of 948µm, ranging from poorly to very poorly sorted coarse or very coarse sand with the exception of three stations, at which fine to medium sand was recorded (after Wentworth 1922). Following sampling failure at Station ENV2 and ENV11 due to the coarse nature of the sediment, the sampling locations at these stations were slightly altered, which likely resulted in the coarser sediment fraction in this survey being slightly underrepresented.

Organic matter, hydrocarbons and metals

Total Organic Matter (TOM) and Total Organic Carbon (TOC) analyses ranged from 1.9% to 3.8%, and 0.21% to 0.66% respectively. A statistically significant positive correlation between both TOM and TOC with percentage fines was indicated by Spearman's rank correlation, which were highest in samples with a greater proportion of fines.

Total Hydrocarbon Concentrations (THC) ranged between 3.1µg/g^{-1} to 14.8µg/g^{-1}, which were within the range recorded in the previous Aquafact (2004) survey and representative of background concentrations found in similar sediments in the central North Sea. Additionally, n-alkanes did not indicate the presence of any notable source of petrogenic hydrocarbons, and Carbon Preference Index (CPI) and pristane (Pr) phytane (Ph) ratio values were indicative of the presence of biogenically derived aliphatic hydrocarbons.

PAHs indicated a predominance of pyrogenic hydrocarbons likely to have originated from atmospheric fallout and river discharges, and a low level of petrogenic input.

Concentrations of barium were low across all stations (4.4µg/g^{-1} to 23.7µg/g^{-1}) and did not indicate any notable contamination. Spearman's correlation test illustrated all metals other than aluminium, chromium and copper had a positive correlation with sediment particle size, while others showed an increase with depth (Cd, Cr, Ni), TOM and hydrocarbon indicators (Al, Ba, Cr, Cu, Zn) or just hydrocarbons (Ni). The patterns reflect natural variation in sediment characteristics across the survey area.

Seabed topography

Within the survey area water depths varied from 80m on a raised bedform structure in the NE to 84.3m in a gentle depression to the SSE of the Midleton A well. The seabed was generally found to gently deepen from the N and NE to the S, with a WSW-ENE orientated, broad, shallow channel in the southern half of the survey area. Seabed gradients were found to be generally <0.5°, apart from some irregular N-S orientated bedforms (<0.5m high) identified across the survey area, particularly in the channel, which had gradients of approximately 7° at their edges.

The seabed was characterised as gravelly sand with shell fragments, with numerous boulders in the centre and north of the survey area, but largely absent elsewhere. Trawl scars were present, as was a wreck immediately to the SW of the survey area.

2.2.3 Barryroe well 48/24-10 post-drilling ROV sampling and video: Fugro ERT (2012)

Overview

A post-drilling Remote Operated Vehicle (ROV) survey was carried out around the Barryroe Well 48/24-10 in March 2012. The main objective of the survey was to determine the initial impact of cuttings, drilling fluids and cement discharged directly to the seabed during the drilling of the tophole sections of the well by sediment sampling and analysis.

Methodology

The ROV was deployed from the GSF Arctic III semi-submersible drilling rig and samples were collected from 17 stations: at the well head centre and at 20m, 50m, 100m and 150m north, south, east and west of the well location.

The sediment samples were collected in plastic bottles, used as scoops by the ROV to scrape up surface sediments (0 cm to 5 cm) at each station. Samples were analysed to characterise hydrocarbons (by GC and GC-MS), metals (by aqua-regia acid digestion and analysis using ICP-OES, ICP-MS, Cold Vapour Atomic Fluorescence (CVAF) Spectroscopy for mercury and Atomic Absorption Spectroscopy (AAS) for barium and organic matter (by ignition), and sediment particle size (using a combination of sieve analysis and laser diffraction analysis). The ROV system was used both in the collection of samples and in recording video footage of the area out to 150m (the limitation of the ROV tether).

2.2.3.1 Summary

Video assessment

The seabed sediments of the area consisted of coarse to fine sands interspersed with pebbles, shell fragments and occasional bedrock and boulders. Faunal species identified were consistent with those found in previous surveys and included the common starfish (*Asterias rubens*), edible crab (*Cancer pagurus*), hermit crabs (Paguridae spp.) and common octopus (*Octopus vulgaris*). Several fish species were observed including gurnard, John Dory, gadoid species and pleuronectiformes (flatfish) species. The transects surveyed did not indicate any sensitive species or habitats in the area and no species or habitats which would be subject to legal protection under the EU Habitats Directive.

Sediment granulometry

The sediment samples were classified as ranging from very coarse sand to medium silt with the stations 20m east and 20m west of the well head containing a significant portion of material as silt/clay (78.8% and 63.8% respectively), indicative of the deposition of drill cuttings at these locations. Sediments were dominated by medium sands at the remaining stations, varying to coarse or fine at some stations.

Hydrocarbons and metals

Total hydrocarbon levels for the sediment samples ranged from 1.7 $\mu g/g^{-1}$ at station 14 to 351 $\mu g/g^{-1}$ at station 13 (mean 61.5 $\mu g/g^{-1}$). Variation across the stations was high (RSD 174%). Total n-alkanes (nC12 to nC36) ranged from 0.11 $\mu g/g^{-1}$ at station 14 to 56.3 $\mu g/g^{-1}$ at station 13 (mean 7.25 $\mu g/g^{-1}$). Once again, the variation across stations was high (RSD 208%). Total hydrocarbon concentration at station 1 (well head centre) was 217 $\mu g/g^{-1}$ and total n-alkanes (nC12 to nC36) were 37.1 $\mu g/g^{-1}$.

The ratio of odd to even carbon numbered normal alkanes (Carbon Preference Index, CPI) was calculated over various chain length ranges. The CPI (nC12 to nC36) in the sediment samples ranged from 0.85 to 1.64 (mean 1.31) while the pristane/phytane ratios ranged from 0.76 to 3.38 (mean 2.26); the indices both had low variation (19% and 33% RSD, respectively) across the stations. The CPI (nC12 to nC36) at station 1 (well head centre) was 1.15 while the pristane/phytane ratios was 2.5. The low CPI values calculated corroborate the input of drilling-related petroleum hydrocarbons in the Well 48/24-10 sediments.

Similarly, the isoprenoidal alkanes pristane (Pr) and phytane (Ph) were found in each of the sediment samples analysed. The Pr/Ph ratios measured at several of the stations (e.g. stations 10, 4, 8, 9, and 15) suggested that a greater proportion of the phytane present in these sediments was predominantly derived from petrogenic sources.

Aromatic hydrocarbon concentrations in the samples ranged from 0.042 $\mu g/g^{-1}$ at station 14 to 0.467 $\mu g/g^{-1}$ at station 13 (mean 0.210 $\mu g/g^{-1}$). The proportion of petrogenically derived naphthalenes, phenanthrenes and dibenzothiophenes (or NPD) to total aromatic material present in the sediments ranged from 44% at station 15 to 80% at station 11 (mean 59%). The aromatic hydrocarbon concentration for the well head centre sample (station 1) was 0.294 $\mu g/g^{-1}$ while the NPD proportion was 75%.

Total barium levels for the sediment samples ranged from <500 $\mu g/g^{-1}$ at several stations to 56,000 $\mu g/g^{-1}$ at station 13 (mean 7,490 $\mu g/g^{-1}$). The variation across the stations was high (RSD 236%). At station 1 (well head centre), the total barium level was 2,000 $\mu g/g^{-1}$. High levels of total barium were recorded at stations 11 and 13, presumably due to the deposition of barites (weighting agent in drilling muds) on the seabed during drilling operations. Increased concentrations of other metals e.g. cadmium, copper, lead and zinc were typically recorded where sediment barium content was elevated. It is known that barites often contain significant quantities of other trace metals and it is therefore likely that most of these metals would also be associated with drilling mud deposition. Note that detailed comparisons between the metals results from this survey and the pre-well survey (Marine Institute 2011) cannot be made due to the use of different acid digests.

Overall, the information from the physical and chemical analyses of the seabed sediments indicated the presence of drill cuttings derived material on the seabed surface, primarily restricted to an area in the immediate vicinity west, south and east of the well head within a 50m radius.

2.2.4 Barryroe drill site environmental baseline survey: Marine Institute (2011)

Overview

The Marine Institute carried out a geophysical site survey and environmental baseline survey (EBS) over a 4x4km survey grid at the Barryroe well location in block 48/24. The object of the survey was to assess potential hazards for the emplacement of a semi-submersible rig. A habitat assessment survey was also carried out using the data from the geophysical survey together with an investigation of the seabed using a digital stills and video camera system to identify the presence of potentially sensitive habitats, such as those protected under the EU Habitats Directive.

Methodology

12 no. stations for environmental sampling were selected based on the geophysical interpretation of the multi-beam backscatter data.

Stations covered the range of acoustic reflectance classes (e.g. low, medium and high reflectivity) to ensure samples were acquired on each of the seabed types identified at the survey site. Sampling was also undertaken at locations certain distances from the well head and along the axis of the residual current flow (south-west and north-east), and at one control site.

For operational reasons (weather and time constraints) grab samples were acquired at eleven stations. A total of four valid samples were acquired from each station using a 0.1m^2 Day grab. Three grab samples were acquired for the analysis of benthic fauna and the fourth grab was used for sub-samples for sediment granulometry (by sieve analysis and laser diffraction), sediment hydrocarbons (by GC and GC-MS), sediment metals (by ICP-MS and ICP-Atomic Emission Spectrometry, AES) and organics (by ignition).

2.2.4.1 Summary

Seabed topography

The seafloor in the survey area was generally flat with water depths ranging from 97.7–102.8m across the site with no appreciable slope, scarps, depressions or mounds. The seabed within the survey area was characterised with chalk bedrock intermittently exposed with a variable covering of clayey sands. Ribbons of mobile sands crossed the site in a south-west to north-east orientation.

Sediment granulometry

The particle size analysis confirmed that samples were predominantly coarse/medium sand, with two stations demonstrating the highest silt content at 12% and 11% respectively. The samples showed a very good correlation with the results of the acoustic survey, which identified a variably-thick blanket of sand, with patches of coarser or finer sands.

Organic matter, hydrocarbons and metals

Total organic carbon (TOC) concentrations were considered representative of unpolluted sediments of this type and showed ranges between <0.4 and 0.7%. Carbonate content ranged from 3.1% to 5.8%.

Total hydrocarbon concentrations (THC) ranged from 0.6 to 2.9 μg/g^{-1}. Unresolved complex mixture (UCM) concentrations were all less than 2.2 μg/g^{-1}. There appeared to be little evidence of a petrogenic influence in any of the samples. The Carbon Preference Index (CPI, nC12 -36) indicated a typically biogenic source. The pristine/phytane ratios ranged from 1.0 to 3.4, indicating a chiefly biogenic source material. Polycyclic aromatic hydrocarbon (PAH) concentrations were all indicative of background values.

Heavy metal analysis indicated low levels of all trace metals analysed and, for the most part, results were in agreement with background data from non-impacted sites around the Irish coast. Barium concentrations indicative of past drilling were found at one station (1,002mg/kg^{-1}); concentrations at remaining stations were indicative of background coarse sediments (500mg/kg^{-1}).

Fauna

The macrofaunal analysis indicated that the area could be classed as relatively impoverished. A total of 92 taxa were identified from 22 x 0.1m^2 grabs collected from the eleven stations within the survey area. The maximum number of taxa identified from the stations was twenty-nine while the minimum was ten, with an average over the entire sampling area of eighteen.

The variation in faunal constituents at the sites sampled could be attributed to natural processes which reflect the patchy sedimentary habitats encountered. The presence of mobile medium to coarse grained sands from discrete bedforms indicate the area is subject to physical stress, a likely product of dynamic processes, including storm activity, found in the area. The composition of species from the entire sampling area was dominated almost exclusively by polychaete worms. In addition, generalist species with no particular habitat preference were also found e.g. *Scoloplos armiger*. The communities were as expected in such habitats and there was no evidence of any anthropogenic influence based upon the information generated for the surveys. None of the species or habitats observed were considered especially sensitive or of a particular conservation interest.

2.2.5 Kinsale Head Gas Storage Project environmental baseline survey: Ecoserve (2011)

Overview

Ecological Consultancy services were contracted by the Marine Institute to carry out an environmental baseline survey (EBS) to support installation of a gas pipeline and associated umbilical between a landfall at Inch (on the coast to the south east of Cork Harbour) and the gas fields of Ballycotton and South West Kinsale. The aim of the survey was to provide a baseline description of the seabed environment along the proposed pipeline. The EBS included a habitat survey to identify the presence of potentially sensitive habitats, such as protected under the Habitats Directive. The survey was carried out in conjunction with a geophysical survey.

Methodology

15 no. stations were picked for the survey across a range of acoustic reflectance classes e.g. low, medium and high reflectivity, to ensure samples were acquired on each of the seabed types at the survey site. Thirteen stations were sampled along the proposed pipeline and two were only investigated using a drop-down camera where the sediment was determined to be too hard for the benthic gear to penetrate or for a trawl to be towed. At each station three replicates were collected by 0.1 m^2 Day grab for the analysis of benthic fauna and the fourth was used to acquire sub-samples for sediment granulometry (by sieve analysis and laser diffraction), hydrocarbons (Ultra Violet Fluorescence (UVF) spectroscopy and GC-MS), metals (by ICP-OES) and organics (by ignition).

2.2.5.1 Summary

Sediment granulometry

The particle size analysis indicated a variety of sediment types along the proposed pipeline route ranging from gravelly sand through to silty sand. The statistical analysis and particle size results from the grabs identified eight main sediment population types according to the Folk classification: (a) sand, (b) clayey sand, (c) muddy sand, (d) silty sand, (e) sandy silt, (f) sandy gravel, (g) gravelly sand and (h) gravelly muddy sand.

The samples showed a very good correlation with the findings of the associated acoustic survey. No organic carbon was recorded above the limit of detection (0.8%).

Hydrocarbons and metals

Heavy metal analysis indicated low concentrations of all trace metals analysed for and were in agreement with background data from non-impacted sites around the Irish coast.

Total hydrocarbon concentrations (THC) were low and ranged from 1.61 to 13.9µg/g^{-1}. While there was no obvious geographic pattern, there appeared to be a relationship between increasing number of fines and increasing THC. All concentrations recorded were below the background limits for uncontaminated marine surface sediments.

PAH concentrations were all indicative of background values. Bulk hydrocarbon concentrations as well as the distribution of Equivalent Carbon fractions were within characteristics expected in uncontaminated marine sediments. No measurable input of petroleum hydrocarbons were recorded within the study area.

Fauna

The macrofaunal analysis indicated that the area could be classed as relatively diverse. A total of 280 taxa and over 5,200 individuals were identified from 26 x 0.1m^2 grabs collected from 13 stations within the survey area. The maximum number of taxa recorded from a station was 68 while the minimum was 42 with an average over the sampling area of 53 taxa per station. In total 7 subtidal biotopes were identified with overlapping biotopes identified in some areas.

The communities both intertidal and subtidal were as expected in such habitats and there was no evidence of any anthropogenic influence. There did not appear to be any species or habitats observed that would be considered especially sensitive or of a particular conservation interest in the subtidal survey. The intertidal survey identified *Sabellaria alveolata* reefs which are biogenic reefs and an Annex I habitat of the Habitats Directive.

2.2.6 Kinsale Head Gas Storage Project geophysical survey: Marine Institute (2010)

Overview

The Marine Institute were commissioned to carry out a geophysical survey to support installation of a gas pipeline and associated umbilical between a landfall at Inch (on the coast to the south east of Cork Harbour) and the gas fields of Ballycotton and South West Kinsale. The aim of the survey was to provide a

baseline description of the geotechnical properties and location of hazards along the proposed pipeline, including archaeological remains (wrecks). The survey was carried out in conjunction with an environmental baseline survey (EBS), described above (Ecoserve 2011).

Methodology

Multibeam echo sounds and sidescan sonar data were collected to characterise the topography of the seabed and any hazards, for example wrecks, along the corridor of the proposed pipeline route. Pinger, sparker and boomer profiler systems were also used to interpret the shallow geology of the pipeline route. Attempts to collect box core samples were made at 77 locations, with vibrocore and cone penetration test (CPT) samples taken at alternate box core stations. Full sample recovery was not possible at all stations due to the nature of the seabed. 25 of the box cores were chosen as representative of the wider seabed encountered during the survey and were sent for particle size analysis. A further 9 were sent for Atterburg and clay particle analysis.

2.2.6.1 Summary

Sediment granulometry and shallow geology

Field descriptions of sediment collected in the box cores closely matched that with those from laboratory analysis, with sediments ranging from sandy clay to sandy gravel. The CPT analysis showed penetration depths of between 0.19m and 3.05m, with an average of 1.08m, with up to 3 attempts made to reach the target depth of 3m. The tests indicated predominantly dense to very dense granular soils overlying a hard/dense layer on which most tests refused to go any deeper. Cohesive soils were proven to underlie the granular deposits in some areas.

Offshore, seabed sediments are thin, with underlying chalk bedrock occasionally exposed. This chalk bedrock underlies the seabed, with occasional outcrops, for some distance along the route (~16km) before surficial sediments thicken and the bedrock deepens moving onshore. From approximately 30km along the route, bedrock is once again shallowly subcropping the seabed sediments, and closer onshore bedrock intermittently outcrops at the seabed.

Bathymetry

The seabed was generally flat along the proposed pipeline route with no significant topographic features, though there are some minor slopes associated with rock outcrop areas (less than 2m relief), most likely of slightly metamorphosed chalk further offshore, and Carboniferous aged sandstones and mudstones that are closer to shore which also make up the coastal cliffs. Some mobile sediment bands and ripples were noted but these appear to be in flux above a consolidated seabed. The wave geometry showed asymmetric shapes with a slow slope angle and wave height controlled by the prevailing current direction. Depths ranged from a maximum of 93.6m offshore to 0m at Inch beach, with seabed gradients ranging between.

Underwater archaeology

Moore Marine Services Ltd. was commissioned by Arup Consulting Engineers on behalf of Kinsale Energy to carry out a programme of archaeological assessment and real time interpretation of geophysical data acquired during the survey. One confirmed feature of archaeological significance, the U 58, was noted along the proposed pipeline corridor, and the World War I U Boat, UC-42 was noted near the existing export pipeline. The wreck of the Star Immaculate is located 400m to the north of the near-shore alternative route. A survey of this trawler, which sank in 1993, was carried out to successfully identify the location of the wreck in relation to the proposed works. The investigation recorded the location of the wreck in the charted position and also noted that the wreck was in poor condition, with much of the superstructure missing.

2.2.7 Celtic Sea Drilling Programme Seabed Monitoring results – summary report: Hartley Anderson (2006)

Overview

Island Oil and Gas plc drilled 2 wells 48/23-3 and 49/23-1 in the Celtic Sea during 2006. At each well location seabed samples were taken by rig ROV prior to spudding and again at the end of the well operations.

The samples were taken by corer from within 100m of the rig (dictated by the ROV umbilical) and stored deep frozen before analysis. In addition, the results from 5 stations sampled in the vicinity of the 49/23-1 well (made available by the Marine Institute) were used to provide a wider perspective on baseline conditions. The report provides a summary of the monitoring results rather than detailed survey data.

Methodology

Three samples were taken at each well pre and post-drilling. Sediment particle size composition was analysed using sieve and laser particle sizing techniques. Trace and heavy metals (As, Ba, Cr, Cu, Cd, Hg, Pb, Ni, V and Zn) were analysed by inductively coupled plasma emission spectrometry, graphite furnace atomic absorption spectrometry, hydride generation AAS and cold vapour atomic fluorescence (CVAF) as appropriate. Gas chromatography was used to determine total hydrocarbons and gas chromatography mass spectrometry (GC-MS) was used for two to six ring aromatic hydrocarbons.

2.2.7.1 Summary

Sediment granulometry

The sediments around well 48/23-3 were sands with some gravel and silt/clay with no major variation between samples in either the pre or post-drilling samples. In contrast the sediments around the 49/23-1 well were naturally very variable in grain size composition as evidenced by the Marine Institute sample data, with the differences attributed to the presence of sand waves in the area. The post-drilling samples at the 49/23-1 well had significantly greater proportions of silt/clay suggesting the presence of discharged mud and/or cuttings. However, in view of the coarse and current influenced nature of the normal seabed in the area, the

increase in silt/clay content is expected to be short lived, with the material winnowed by currents and widely distributed.

Hydrocarbons and metals

The total hydrocarbon concentrations in sediments were typically low and at background in the pre-drilling and Marine Institute samples. At both wells the total hydrocarbon concentrations found in the post-drilling samples had slightly increased, although not to levels that would be expected to result in organic enrichment or biological impacts. The aromatic hydrocarbons investigated in more detail by GCMS did not show significant increases between pre and post-drilling samples.

Concentrations of heavy and trace metals were fairly uniform in pre-drilling samples. For most metals there was little change in concentrations between pre and post-drilling samples but this was not the case for barium and perhaps zinc. Barium concentrations increased by 2 to 3 orders of magnitude in the post drilling samples from both wells; this increase was expected since large quantities of the naturally occurring dense mineral barite (barium sulphate) was used in the wells as a weighting material to maintain well control.

The nature and concentrations of hydrocarbons and metals recorded in the post-drilling samples from both wells were consistent with those found at other wells and fields in the Celtic and Irish Sea (and elsewhere) where water based muds have been used and discharged.

2.2.8 Environmental monitoring of the seabed at Greensand Well (48/25): AquaFact (2004)

Overview

Aqua-Fact on behalf of Marathon Oil carried out a seabed monitoring survey in the vicinity of the Greensand well in Block 48/25 between 19-20th June 2004. Seven stations were sampled in the vicinity of the well to assess the accumulation of mud and cuttings discharged from the rig.

Methodology

Five sampling stations were chosen along a transect aligned NE-SW from the Greensand well. The sampling stations were positioned approximately 100m, 200m, 400m, 800m, and 1,600m from the well. A sixth station was positioned 800m NW of the well, and a seventh control site was located 5km SE of the well. Three replicate samples were taken at each station with a $0.1m^2$ Day Grab. Four sub samples were collected from each replicate, for hydrocarbons (by GC analysis), solids (by freeze drying), metals (by inductively coupled plasma emission spectrometry, graphite furnace atomic absorption spectrometry, hydride generation AAS and cold vapour atomic fluorescence (CVAF) as appropriate), and granulometric analysis (by sieve and laser particle sizing techniques). No faunal samples were taken as part of the survey.

2.2.8.1 Summary

Sediment granulometry

The sediments were dominated by very coarse to medium sand, with variable proportions of fines or gravel present. Sediment variability was anticipated based on side scan sonar data for the area and results of the baseline survey. In the baseline survey (Aqua-Fact 2003), the sediments in the locality were reported as ranging from medium to coarse sand, with silt-clay dominating in only two areas. The results from the post-drilling survey indicated a higher proportion of coarser material, not evident in the baseline survey. The variation in grain size distribution seen between the two surveys was possibly due to small-scale variations in the local topography rather than the result of drilling activity.

Hydrocarbons and metals

Barium concentrations were highest at station 2 (200m from the well) at a value of 880 $\mu g/g^{-1}$ and lowest at station 7 (control, 5km southeast from the well) at a value of 247 $\mu g/g^{-1}$. The overall barium levels from the baseline survey ranged from 5.1 to 245 $\mu g/g^{-1}$. Only the levels recorded from station 2 were above typical background levels, suggesting a subtle chemical footprint in the vicinity of the well, but the remaining concentrations were typically within background levels. The levels of barium recorded at the stations did not seem to reflect distance or direction from the well and it was also noted that barium did not correlate with hydrocarbons or silt-clay.

The survey report concluded that while a subtle chemical impact from the drilling operations was possibly evident throughout the locality with respect to barium levels, PAH and metal values had changed very little since the baseline survey. The lead and zinc concentrations along with mercury, cadmium, copper, chromium and nickel were all within estimated background levels. A high correlation was evident between silt-clay and hydrocarbons at stations 1 to 4. This correlation was to be expected as organics typically adsorb to fine particles. The lack of change in hydrocarbon concentrations from the baseline to the post-drilling survey, suggested that the drilling operation had not increased hydrocarbon concentrations in the area. Variations between the baseline and post-drilling survey were attributed to small-scale local variability within the sedimentary environment.

2.2.9 Ecological review of ROV video and other seabed survey information for the Seven Heads Gas Field Development: Hartley Anderson (2003)

Overview and methodology

Provides an ecological review of the ROV inspection video of various targets along the Seven Heads pipeline route carried out 19th to 21st August 2002. The ROV inspection targets were identified from sidescan sonar and other information collected during the pipeline route survey. The videos were reviewed for seabed features or species of potential conservation interest, in particular habitats or species listed in the Habitats Directive.

2.2.9.1 Summary

The seabed fauna observed consisted of common and widely distributed species and was consistent with previous surveys in the region. None of the species were regarded as particularly vulnerable or sensitive to the proposed activities associated with field development and operation. Similarly, the sandy seabed habitats and species were not of particular conservation interest under the Habitats Directive. Potential exceptions were the larger rock outcrops and groups of cobbles and boulders, which had well developed sessile and mobile epifauna. Rock outcrops ranged from fully emergent from the seabed to those which were episodically covered by shifting sediments. Development of epifauna on the rock outcrops was variable and believed to reflect the effects of both natural and manmade physical disturbance (e.g. trawling). The review recommended that two rock outcrops with moderately well-developed epifauna be avoided if feasible in pipeline routeing and that anchoring in the vicinity of outcrops was controlled so as to minimise interaction and potential damage.

2.2.10 Seven Heads and Kinsale Head benthic studies 2002/2003: Aquafact (2003)

Overview

Ramco Seven Heads Ltd developed the Seven Heads field, centred on block 48/24 as a subsea tieback to the Kinsale Head gas field. As part of this development, seabed investigations in the Seven Heads field and along the pipeline route to Kinsale Head were required to inform environmental management of the project. Similarly, seabed investigations were required in the vicinity of the Kinsale Head field for the proposed development of the Greensand well. Aqua-Fact was commissioned by Hartley Anderson to carry out the seabed investigations, the main focus of which was to be photographic, with some seabed sampling.

Methodology

The sampling locations for this survey were chosen based on geophysical data. 15 no. samples were taken around the South West Kinsale field and Greensand well area, 5 no. along the pipeline route, 15 no. in the Seven Heads field and a further 10 no. were selected on the basis of seabed textural and topographical information during the survey. A 0.1 m^2 Day grab was used to collect seabed samples. Samples that were not regarded as being adequate for biological analyses (i.e. had less than 5 cm sediment depth in the grab) were used for granulometric and chemical analyses (same methods as Aquafact 2004). Once the grab sampling had been completed, the sediment profile imagery apparatus, including the surface camera, was deployed with 5 no. replicate images taken at each location.

2.2.10.1 Summary

Sediment granulometry

Of the 22 no. samples analysed, only one was dominated by silt and very fine sands (56.5%). The remaining samples were characterised by fine, medium and coarse sands, or coarse/very coarse sands.

Organic matter, hydrocarbons and metals

With regard to the organic carbon of the sediments, results from all stations were low with only three stations returning higher than 3% organic carbon content.

Analysis of the heavy metals in the sediment samples indicated that no elevated levels were found with values corresponding to naturally occurring concentrations found in offshore sediments.

The results of the chemical analyses on sediment collected at the Seven Heads and Kinsale Head fields show little evidence of impact from drilling activities to date.

Fauna

The dominant species throughout the area was *Spiophanes kroyeri* and other characteristic species were *Magelona alleni*, *Ophelia rathkei* and *Echinocyamus pusillus*. The faunal assemblage can be considered as an *Ophelia*-type grouping.

Compared to other areas of the Irish coast e.g. Dublin Bay, Carnsore Point, Kinsale Harbour, Galway Bay, numbers of species and number of individuals in this part of the Celtic Sea were low. The reason for this probably relates to the sediment type present and the low levels of organic carbon present.

Table 1: Kinsale Area Survey Coverage

Block/area	Author	Year	Coverage and Purpose	Scope					
				Bathymetry	Seabed sediments/features	Sediment contaminants	Annex I Habitat Survey	Photographs	Seabed fauna/habitats
48/20, 48/23, 48/24, 48/25, 49/16	Marine Institute	2017	Day grab sampling and drop down camera at 31 locations across the Kinsale Area including at Seven Heads, South West Kinsale and Greensand, Ballycotton and Kinsale Head. Pre-decommissioning baseline survey.	✓	✓	✓	-	✓	✓
49/11	Gardline	2015	Cruciform sampling with Day grab around each of 2 proposed well locations (Midleton A exploration well; Midleton B appraisal well); 11 stations total [1 reference @5.5k; 2 offset x50m locations; 4 cruciform (distances 250 to 593m)	✓	✓	✓	-	-	-

Block/area	Author	Year	Coverage and Purpose	Scope					
				Bathymetry	Seabed sediments/features	Sediment contaminants	Annex I Habitat Survey	Photographs	Seabed fauna/habitats
48/24	Fugro ERT report to Providence resources PLC	2012	Barryroe post-drilling ROV sampling and video; 17 stations in cruciform pattern out to 150m; no ref stn. Depth 101m	-	✓	✓	-	-	✓
48/24	Marine Institute report to Providence	2011	Barryroe pre-drill; EBS; 11 stations with 4 Day grabs/station and video at each station.	-	✓	✓	-	✓	✓
48/9, 48/10, 48/15, 48/20	Ecoserve (contracted by Marine Institute)	2011	EBS for installation of gas pipeline (&umbilical) between Inch and gas fields of Ballycotton and SW Kinsale (client, PSE Kinsale Ltd)	-	✓	✓	✓	✓	✓
48/9, 48/10, 48/15, 48/20	Marine Institute	2010	Covers bathymetry, seabed feature, shallow geology, geotechnical and hazards, in relation to the Kinsale Head gas storage project.	✓	✓	-	-	-	-
48/23, 49/23	Hartley Anderson report to Island Oil and Gas	2006	Celtic Sea drilling programme sediment samples pre-spud and post-well taken by ROV.	-	✓	✓	-	-	-
48/25	Aquafact contracted by HAL (report to Marathon Oil Ireland)	2004	7 stations in vicinity of Seven Head Greensand well for physico-chemical analyses.	-	✓	✓	-	-	-
48/20, 48/24, 48/25	Hartley Anderson report to Ramco	2003	Seabed Environmental Monitoring Programme for Seven Heads Development (5 devt wells); review of ROV video along pipeline route survey.	-	-	-	-	✓	✓

Block/area	Author	Year	Coverage and Purpose	Scope					
				Bathymetry	Seabed sediments/features	Sediment contaminants	Annex I Habitat Survey	Photographs	Seabed fauna/habitats
48/20, 48/24, 48/25	Aquafact contracted by HAL	2002-2003	Baseline survey; combination of seabed photography and quantitative grab sampling. Initial results indicated a variable mixture of mud, sand and gravel supporting a sparse fauna.	-	✓	✓	-	✓	✓

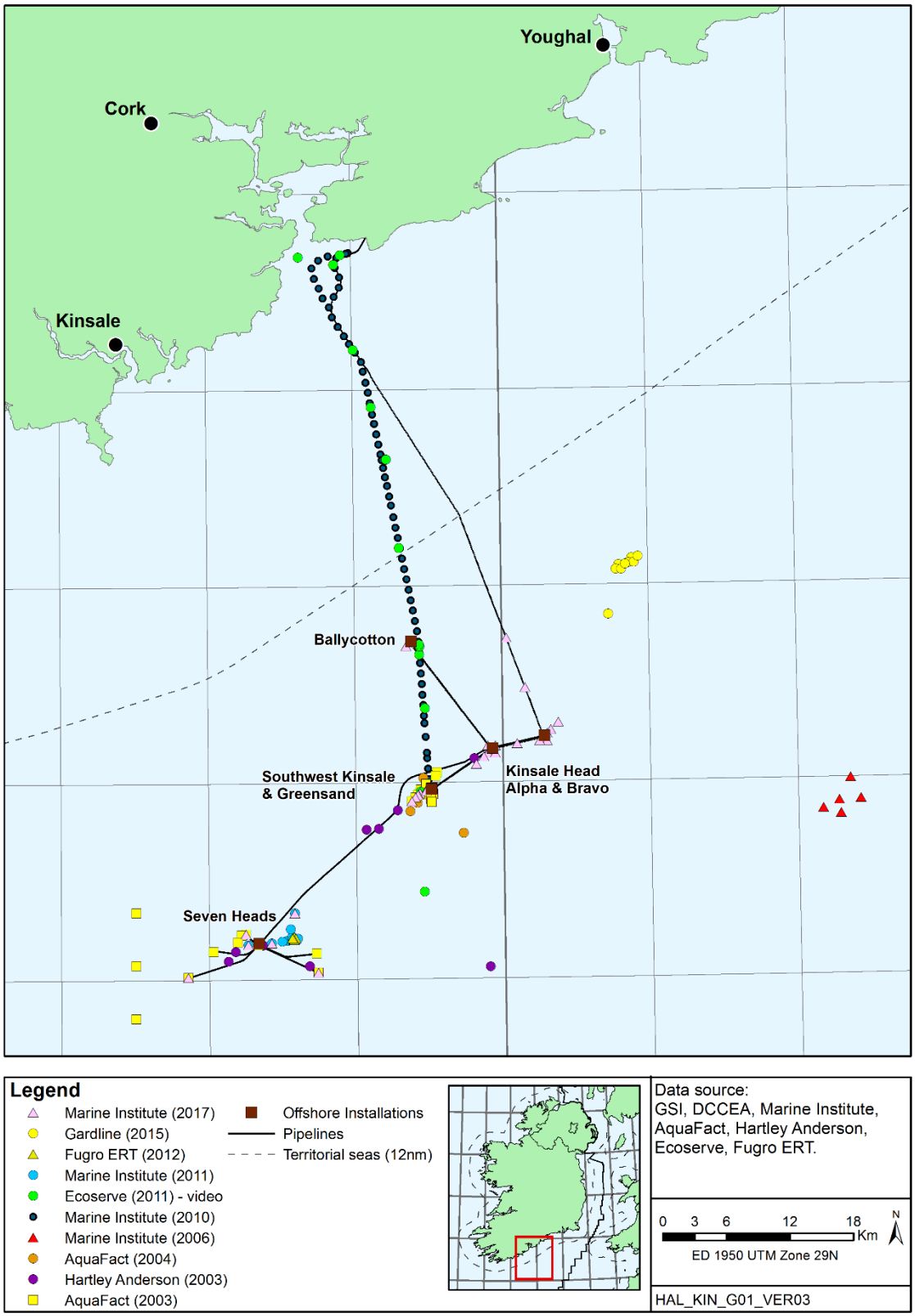


Figure 1: Seabed Survey Coverage

3 EIAR - Response No.2

3.1 DCCAE Query

A draft Environmental Management Plan (EMP) to include but not limited to the following:

The indicative schedule of works as presented in the KADP-EIAR.

Detail mitigation measures as outlined in the KADP-EIAR to be implemented by contractors to manage potential risk of impacts.

The likely sources of natural materials to be used in the works, e.g. topsoil, subsoil, rock armour/ cover. Clarity is required on whether the proposed materials to be used in the project will be classified as a product or a waste.

The relevant sections of the EIAR do not consider risk of accidents associated with decommissioning of the onshore facilities at the Inch Gas Terminal. The draft EMP must consider potential accidental events associated with decommissioning activities proposed for onshore and offshore facilities.

The EMP must include a monitoring programme. The monitoring programme must address the following requirements:

- Clearly describe the monitoring objectives, measures and programme proposed.
- Clearly outline the monitoring measures that are necessary under legislation and those being carried out as best practice.
- State whether the monitoring proposed is sufficient to identify important unforeseen environmental effects.
- State whether monitoring is required to manage residual impacts.
- Outline the responsibilities for the implementation of monitoring, including roles, responsibilities, and resources required.

3.2 Response

A draft Kinsale Area Decommissioning Project EMP is included in **Appendix A** of this report. **Table 2** below indicates where the draft EMP addresses the points raised above.

Table 2: DCCAE issues addressed in the draft EMP

Issue to be addressed in Draft EMP	Section of draft EMP where this is addressed
The indicative schedule of works as presented in the KADP-EIAR.	Section 3.5
Detail mitigation measures as outlined in the KADP-EIAR to be implemented by contractors to manage potential risk of impacts.	Section 7
The likely sources of natural materials to be used in the works, e.g. topsoil, subsoil, rock armour/ cover. Clarity is required on whether the proposed materials to be used in the project will be classified as a product or a waste.	Section 3.7
The relevant sections of the EIAR do not consider risk of accidents associated with decommissioning of the onshore facilities at the Inch Gas Terminal. The draft EMP must consider potential accidental events associated with decommissioning activities proposed for onshore and offshore facilities.	Section 5.4 and 7.10
The EMP must include a monitoring programme. The monitoring programme must address the following requirements: • Clearly describe the monitoring objectives, measures and programme proposed. • Clearly outline the monitoring measures that are necessary under legislation and those being carried out as best practice. • State whether the monitoring proposed is sufficient to identify important unforeseen environmental effects. • State whether monitoring is required to manage residual impacts. • Outline the responsibilities for the implementation of monitoring, including roles, responsibilities, and resources required.	Section 5.3, 7.11 and Appendix B

4 EIAR - Response No.3

4.1 DCCAE Query

The outline Resource and Waste Management Plan (RWMP) referenced in Section 7.7.3.1 must be submitted.

4.2 Response

A draft Kinsale Area Decommissioning Project RWMP is included in **Appendix B** of this report.

5 EIAR - Response No.4

5.1 DCCAE Query

The Department of Culture, Heritage and the Gaeltacht (DCHG) Development Applications Unit (DAU) submissions (SS0000l/2018 [Kinsale Head] & SS00007/2018 [Seven Heads]) heritage-related observations/recommendations indicated that the KADP-EIAR *'while referring to underwater cultural heritage and archaeological assessment reports completed, does not actually contain any information directly relating to any [Underwater/Archaeological Impact Assessment {UAIA/ undertaken specific to the application in question'*. There is insufficient information contained within the application to conclude that there will be no significant effects on the cultural heritage aspects of the receiving environment. Therefore, Cultural Heritage Assessment is to include the following:

- The Cultural Heritage Assessment to be carried out by a suitably qualified and suitably experienced archaeologist with a track record in the carrying out of Cultural Heritage Assessment for this type of Offshore Project;
- Take into consideration previous Cultural Heritage report findings;
- Consult with up to date **data** since the time of the last Cultural Heritage assessment;
- Consider wrecks identified close to existing well locations at Ballycotton and Southwest Kinsale & Greensand;
- Consider 'uncovered/revealed or relocated, previously known or underwater cultural heritage'; and
- Once updated the revised Cultural Heritage Section should be submitted as Further Information, to the National Monuments Service Underwater Archaeology Unit for consideration and formal response.

5.2 Response

The updated Cultural Heritage Section is included in **Appendix C** of this report.

6 EIAR - Response No.5

6.1 DCCAE Query

Section 1.8 of the KADP-EIAR outlines consultations undertaken with statutory and non-statutory bodies and other interested parties. Kinsale Energy is requested to prepare a brief report outlining the comments, views and feedback of consultees and indicate how and where these were used to scope and inform the KADP- EIAR.

6.2 Response

The EIAR outlines the comprehensive consultation process undertaken in advance of the application being submitted. Further detail in the form of a summary of these consultations including comments, views and feedback received and how these were used to scope and inform the KADP-EIAR is included in **Appendix D**.

7 EIAR - Response No.6

7.1 DCCAE Query

Further details on the transboundary effects on the environment from the transportation of materials to the North Sea dismantling yard.

7.2 Response

Should the Kinsale facilities be dismantled in a yard outside of Ireland, relevant activities include those associated with their transport and offloading. Sources of effect relating to these activities were noted in Table 6.2 of the EIAR, and those relevant to this response are reproduced in Table 3 below, and where relevant have been modified to explicitly reflect the potential for transboundary effects. Overall, it is regarded that the main sources of potential effect are the physical presence, noise and visual intrusion of vessels during transit, and the presence and dismantling of the facilities at the disposal yard, noting that these yards would operate under their own licences (see below). Contracting has not commenced for the disposal contractor. While the exact location of the disposal yard is not known, Section 3.5.7 of the EIAR notes that, for the purposes of assessment it has been assumed that a yard within 700nm of the field would be used. Such a distance would include all of the existing facilities in the Irish Sea and North Sea region, including those in the UK, Netherlands and Norway. The following considers the sources and scale of potential effects from the transport of materials to the extent possible in advance of having a defined yard.

As noted in Section 7.12 of the EIAR, should materials (i.e. part or all of the Kinsale facilities) be transported outside of Ireland this would be undertaken in compliance with the Waste Management (Shipment of Waste) Regulations 2007.

The handling of the Kinsale facilities at existing facilities within the range noted above would represent an increment to their ongoing work associated with wider North Sea decommissioning. A new decommissioning yard will not be required to dismantle the Kinsale facilities. These yards will have been subject to their own assessments and/or be fully licensed for the activities required to dispose of the Kinsale facilities.

Kinsale Energy have made a number of commitments in relation to compliance assurance, contractor management and waste production in Section 8 of the EIAR (issues 1, 3 and 8) to ensure that the disposal contractor, when selected, conducts their operations under the appropriate consents and consistent with the outline Resource and Waste Management Plan, details of which were provided in Section 7.7.3 of the EIAR. Further details are provided in the outline Waste Management Plan which is provided separately as part of this response.

Barge transport of topsides and jackets of both the KA and KB platforms are estimated to range between approximately 6 days each (or 7.5 days with a 25% contingency) for the single lift options, and 24 (30 with contingency) and 36 (45 with contingency) days for the topsides reverse installation and jacket multiple lift options respectively (see Section 3.5.2 of the EIAR). The single lift options

require one barge, whereas the reverse installation and multiple lift require two and three barges respectively, which accounts for the greater number of cumulative days noted for each option. Additionally, up to 24 (30 with contingency) days are required for the transit of subsea materials via a construction support vessel, including the protection materials, pipeline spools and umbilical jumpers, valve skids and manifolds. Whichever yard is chosen for the dismantling of the Kinsale facilities, impacts from their transportation would be transient (the vessels and barges being in motion for the duration of the journey) and temporary.

Potential effects on shipping and fishing activity are restricted to temporary spatial conflict during transit of materials to any yard outside of Ireland. In context of the current moderate to high shipping densities in these areas, established routes to ports, and relevant IMO routeing measures in the Irish Sea, Channel and North Sea, the addition of shipping at the scale associated with the transport of materials from the Kinsale area, is considered to represent a very minor increment. It is not regarded that the transportation of materials to the dismantling yard will result in any significant transboundary effects.

Similarly, interactions of the vessels in transit with sensitive species (e.g. birds, fish and marine mammals) both in terms of physical presence (including lighting) and noise are considered to be minor and not significant. The temporary presence of barges/vessels are anticipated to cause no more than short-term and localised low-level behavioural responses in sensitive species incremental to those from existing shipping operations in the Celtic Sea, Irish Sea, Channel and North Sea, such that significant effects are not predicted. Section 7.12 of the EIAR states that greenhouse gas emissions contribute to global gas loading and are inherently transboundary irrespective of their source.

In the context of transporting the materials to the onshore yard, air quality is of more relevance. Emissions produced during transport will be incremental to those from existing wider shipping activities (e.g. of SO_2) and be subject to MARPOL rules as to its sulphur content (the Channel and North Sea are emissions control areas as defined in MARPOL Annex VI). Additionally, wider controls on discharges and emissions would be in place, made mandatory under MARPOL or by the IMO (see Appendix A and Appendix D of the EIAR) for example in relation to oil, sewage and litter.

In view of existing controls and the scale and duration of activity associated with transporting materials, significant transboundary effects are not predicted.

Table 3: Sources of potential effects, relevant environmental factors and related environmental receptors relevant to the transport of materials to the disposal yard

Environmental Factors		Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive[2]								Land, soil, water, air, climate			Material assets, cultural heritage and landscape						Summary consideration
Activity/Source of Potential Effect	Population & Human Health[1]	Benthic Fauna	Plankton	Fish & Shellfish	Marine Reptiles	Marine Mammals	Waterbirds & Seabirds	Onshore habitats/species	Conservation sites/species	Soils & Seabed	Water Quality	Air & climate	Fisheries/aquaculture	Other Uses & Resources	Shipping	Waste Treatment & Landfill resource onshore	Cultural Heritage	Landscape/seascape	
Vessels associated with the transport of the Kinsale facilities to the disposal yard																			
Transit of supply vessels, barge/ or heavy lift vessels, survey vessel and transport to shore	D4					C4	D4		C4				C4	C4	C4			D4	Vessels in transit have the potential to interact with other users and also generate temporary visual impacts. Vessels will follow established navigation routes. There is the potential for interaction with birds and marine mammals. See Sections 7.2 and 7.9 of the EIAR.
Underwater noise from vessels including DP				D4	D4	C4			C4										Vessels will contribute to wider ambient noise from shipping and other anthropogenic noise sources on route to any dismantling yard. The isolated and transitory nature of this noise source, when considered in relation to wider shipping levels in the Celtic Sea, Irish Sea, Channel and North Sea are regarded to represent a limited increment on impacts to noise sensitive species. See Sections 7.5 and 7.9 of the EIAR.

[1] This topic is largely considered in the context of other environmental factors, for example effects on air quality, climate, other users, landscape/seascape.
[2] Note that interactions between individual components of the biodiversity environmental factor have also been considered, for example effects on supporting habitats of species, or on prey species of other animals.

Vessel and ancillary equipment power generation	D4											C4							Contributes to atmospheric emissions, with the potential to impact local air quality and global greenhouse gas loading. See Section 7.8 of the EIAR.
Drainage, sewage & other discharges			D4	D4							D4								Discharges from vessels will be subject to controls under MARPOL. No significant discharges. See Appendix D of the EIAR.
Litter					D4	D4				D4	D4								
Airborne noise and lighting	D4						D4											D4	Incremental lighting will be temporary and will not significantly add to existing lighting levels along shipping routes and off existing ports. See Appendix D of the EIAR.
Potential for introduction of alien species in ballast, or as external fouling growth		C1	C1																Ballasting will be undertaken in keeping with Ballast Management Plans under the Ballast Water Management Convention. See Appendix D of the EIAR.
Onshore aspects of decommissioning offshore structures																			
Offloading of structures	C4													D4	D4			D4	Structures will be transported to established yards where dismantling will represent an increment to existing activity rather than a new type of activity. There is the potential for interaction with other users, and transient visual impacts, during transport to shore. See Sections 7.2 and 7.7 of the EIAR.
Storage/Dismantling of structures onshore	C3											C3		D3				D3	Potential for minor incremental air quality effects from noise, dust, odour and visual intrusion, though note above that this would be incremental to ongoing activity. See Sections 7.6 in relation to marine growth removal and 7.7 of the EIAR.
Refurbishment and reuse												E4		D4		E4			Minor positive effect from material reuse, offsetting use of primary raw material and avoiding waste to landfill. See Section 7.7 and 7.8 of the EIAR.
Materials recycling												E4		C4		E4			
Onshore waste treatment												C3				C3			All represent a minor increment to waste handling and disposal at existing licensed facilities, and to the transport of such material to these sites for which there may be minor visual intrusion. Disposal of certain wastes may take place outside Ireland. See Section 7.7 of the EIAR.
Landfill of residual waste																C3		C3	
Road transport of waste/materials	C4											D4						D4	
Hazardous materials	C4															C4			

8 EIAR - Response No.7

8.1 DCCAE Query:

Clarification is required as to the difficulties in compiling data/ information to support the assessments. If data/information is lacking Kinsale Energy is requested to clarify the resulting impact to the certainty of the impact assessment and state whether or not additional information is required to inform the assessment and conclusions.

8.2 Response

Overall there were no major difficulties in compiling the relevant information to inform the assessment. This is in part a reflection of the large amount of historical data available resulting from some 40 years of operations and the studies and assessments made for subsea developments tied back to the Kinsale Head platforms or for exploration wells drilled in the region by Kinsale Energy and others. In addition, over this period there has been significant new regional information generated through for example the Marine Institute surveys and the IOSEA programme; these are reflected in the EIAR. Gaps in environmental information and details of the project design were identified early in the EIA process, which were addressed through additional seabed survey, baseline data collection, and information in the form of technical reports and discussion on project basis of design.

Information on the baseline environment, technical aspects of the proposed project and the potential nature of effects were kept under continual review during the preparation of the EIAR.

Contracting for decommissioning services has not commenced which would allow actual vessel names to be given, so technical details of the rig, HLV and other vessels to be used in the assessment are based on typical vessels operating in the North Sea region. The technical reports prepared for KEL that underpin each of the remaining technical solutions provided sufficient information such that information relating to representative vessels could be used, along with worst case estimates of timing in the field (with the addition of a 25% contingency) and therefore related emissions and duration of potential interactions. The nature and timings of vessel operations were scrutinised within KEL and are regarded to provide a robust input to the assessment and no further information was considered necessary.

Noting the further information which has been requested for underwater archaeology and the description of the baseline marine environment, there were no significant challenges in compiling the relevant baseline information to inform the EIA. Previous survey data was considered adequate, and informed the pre-decommissioning survey scope (more details on previous seabed surveys are provided in response to the first point in the request for further information). The remaining baseline information used to characterise the relevant aspects of the

environmental factors was derived from primary and grey literature sources, and was considered of sufficient detail in view of the project scope to define the baseline.

The following are responses are in relation to the 'Appropriate Assessment Screening and Article 12 Assessment Screening.

9 AA Screening and Article 12 - Response No.1

9.1 DCCAE Query

Potential impacts were identified for the Great Island Channel SAC, the Blackwater River SAC, the Roaringwater Bay and Islands SAC, the Cork Harbour SPA and the Old Head Kinsale SPA; these European sites were brought forward in the assessment process. It is unclear however why the remaining twelve SACs and thirteen SPAs as identified in Table 4.1 and Figure 4.1 of the AA Screening Report were excluded from further assessment. For example, the Sovereign Island SPA is one of the closest SPAs to the Subsea wells (33km), pipelines (16) and offshore platforms (46km) and the special conservation interest for the SPA is cormorant, which *is a coastal species cormorant, a coastal species judged* to *be highly sensitive to disturbance by shipping*

(Garthe & H0ppop 2004*). In addition, the Saltee Islands SAC approximately 100km from the offshore decommissioning works, which has been designated for marine mammals (grey seal) has not been considered in the screening report.*

9.2 Response

Table 4.1 in the AA screening document lists all relevant sites and their features within the potential Zone of Influence (ZoI) and their closest distances to elements of the KADP, which illustrates that the majority of sites are tens of kilometres distant. The selection of relevant sites, as noted in Section 4.4, was based on a high-level consideration of the presence of a theoretical impact pathway due to qualifying features habitat use interacting with the marine environment. The main potential sources of effect are outlined in Section 5.1, which includes explanations for why sites which are exclusively designated for habitats are discounted. These include physical disturbance causing likely significant effects is extremely remote due to: (i) the small estimated footprint of physical disturbance; (ii) that all sites are ≥ 8km to such activities; and, (iii) no indication of sensitive species or Annex I habitats in recent surveys of the Kinsale Area. Therefore, sites which are assessed further are those with mobile qualifying features: birds, marine mammals and fish. Sections 5.2.1 to 5.2.6 then provide an evidence-based assessment of the likelihood of significant effects from identified activities/sources of effect on relevant receptors of relevant sites.

Table 5.1 was provided to assist reader orientation by indicating the closest relevant sites; it does not act to pre-empt the assessment and exclude sites prior to them being given further consideration.

Exclusion of the Sovereign Island SPA is based on the ecology of the qualifying interest (cormorant, relative to the small increase in vessel traffic within the wider Kinsale Area which is anticipated to cause no more than temporary and localised disturbance.

From a review of available information on seabird foraging ranges, Thaxter et al. (2012) present the maximum foraging range for great cormorant as 35km, the mean maximum as 25km (± 10km), and the mean as 5.2km (± 1.5km). As a coastal species, much of their foraging movement will occur parallel to the coast rather than far offshore, which, when combined with our understanding of their foraging ranges from colonies, suggests that their occurrence in the vicinity of the Kinsale Area is likely to be minimal. A recent modelling study (Critchley et al. 2018) combined seabird colony counts with a distance-weighted foraging radius to produce predicted foraging ranges of 25 species breeding in Britain and Ireland; mapped outputs highlight the coastal distribution of cormorants with predicted densities decreasing to near zero at distances of 25-30km offshore. Therefore, the only pathway for potential effects on great cormorant qualifying features of Cork Harbour SPA and Sovereign Islands SPA is that of vessel disturbance associated with pipeline works close to shore and vessel movements between the KADP area and adjacent ports, which represent a very small proportion of the overall decommissioning programme. As noted in the AA Screening Report, this small increase in vessel traffic within the wider area and context of existing vessel traffic is anticipated to cause no more than temporary and localised disturbance to a small proportion of the qualifying features, and will not result in likely significant effect on the sites.

At over 110km distance to the KADP area, the Saltee Islands SAC is beyond the potential ZoI which is defined in Section 4.1 on the basis of the maximum expected footprint of any impact associated with the project and is considered to be a precautionary approach. Marine usage maps for the UK and Ireland based on extensive tagging data and colony counts suggest a very low occurrence of grey seals in the Kinsale Area, with animals present in waters around the south coast of Ireland focused off southwest Co. Cork (associated with Roaringwater Bay and Islands SAC) and southeast Co. Wexford (associated with Saltee Islands SAC) (Russell et al. 2017). The density of grey seals at sea is elevated (up to 23 seals per 5x5km grid cell) close to the Saltee Islands SAC but drops to ≤ 1 seal per 5x5km grid cell within 20-40km of the site. Consequently, while the wide-ranging nature of the grey seal feature is recognised such that there is the potential for interaction of individuals with KADP activities, given the distance of the offshore works from the Saltee Islands and Roaringwater Bay SACs, it is not considered that there is potential for likely significant effects on the species in the context of site conservation objectives.

10 AA Screening and Article 12 - Response No.2

10.1 DCCAE Query

Section 5.2.6 of the AA Screening Report states the following under Birds: *'Statutory controls and industry best practices, 'including a dust minimisation plan will be implemented during the demolition works' and under Habitats -SACs 'the control measures which will be implemented and the distance of the site from Great Island Channel SAC, no significant impact on the relevant qualifying interests is considered likely'.* Considering the ruling of ECJ **Case** C 323/17, are the statutory controls and industry best practices necessary to conclude a finding of no significant effect on Cork Harbour SPA and Great Island Channel SAC?

10.2 Response

Dust management is utilised on construction sites in accordance with best practice, to avoid nuisance for workers/local population, in the main. The proposal for a dust management plan as indicated in Section 5.2.6 of the AA Screening Report is on that basis. It is not proposed with regard to any potential impacts on the conservation objectives or qualifying interests of any Natura 2000 sites. Even without a dust management plan in place, there will be no likely significant effect on any Natura 2000 site, for the reasons stated below.

The inclusion or otherwise of a dust management plan has no impact on the findings of the Report for Screening for Appropriate Assessment.

Given the size and scale of the proposed works, the results of the bird surveys undertaken at the onshore terminal site and the distance from the Cork Harbour SPA, there will be no significant impacts on the qualifying bird species as a result of the demolition of the Inch terminal.

Similarly, given the size of the existing terminal and the localised and temporary nature of the demolition works, together with the distance of the site from Great Island Channel SAC, there will be no significant impact on the relevant qualifying interests from the demolition of the Inch terminal.

11 AA Screening and Article 12 - Response No.3

11.1 DCCAE Query

As stated in Section 3.4.4.1, *'The overall estimated vessel times for the pipeline, umbilical and protective material decommissioning is between 16 and 104 days (including a 25% contingency) depending on the selected option'*. The consideration of potential effects on Birds under Section 5.2.2 Underwater Noise and Vibration, considers the short -term duration of vessel presence during rock placement activities. Further information is required on the variable effects on birds from duration on site from the different rock placement options given the variable timeframe.

11.2 Response

The variable timescale attributed to rock placement relates to the options to either place rock on the pipeline ends and freespans (16 days) or to place rock on pipeline ends and all exposures (104 days). Active rock placement is estimated to take 5 and 51 days respectively (6.25 and 63.75 days with 25% contingency) for these options, with the remaining activity associated with vessel mobilisation and demobilisation (i.e. portside activities) and transit to the areas to be subject to rock placement. Much of the rock placement activity would take place a significant distance offshore at pipeline and umbilical ends and along infield pipelines, and depending on the selected option up to approximately 34 days could be spent placing rock on the export pipeline.

The precise timing of the rock placement activities is not yet known. Although it is more likely to take place in summer where favourable sea-states are more common, for the purposes of this response, and consistent with the EIAR, it is assumed that it may take place at any time of year. Seasonal variation in bird species and densities occurs both at the coast (e.g. resident and visiting seabird attendance at colonies during the summer breeding season and the presence of overwintering and on-passage waterbirds) and at sea (e.g. during breeding season foraging and post-breeding seabird dispersal). Relevant species are reflected as qualifying features of the majority of the sites listed in Table 4.1 of the AA screening report, the closest being Cork Harbour SPA which is approximately 4km from the export pipeline, and contains a range of breeding seabird and overwintering waterbird features. In relation to the potential effects of noise from the KADP, and specifically rock placement, it is considered that diving seabirds are most exposed (e.g. guillemot, razorbill, puffin), with the closest site of relevance being Old Head of Kinsale SPA (at least 25km distant). Other relevant species such as great-northern diver (Courtmacsherry Bay SPA), grebes and red-breasted merganser (Cork Harbour SPA, Dungarvan Harbour SPA, Courtmacsherry Bay SPA) are coastal features, and with the exception of Cork Harbour SPA (~4km), relevant sites are at least 32km from any of the works associated with the KADP.

For context, while several studies have reported mortality of diving birds in close proximity (i.e. tens of metres) to underwater explosions (Yelverton *et al*. 1973, Cooper 1982, Stemp 1985, Danil & St Leger 2011), mortality of seabirds has not been observed during extensive seismic operations in the North Sea and elsewhere. The noise produced by vessels associated with the KADP will be very substantially lower than such activities, and noise from rock placement is unlikely to be readily discernible over the noise generated by associated vessels in the area. Any incremental effect on diving bird species would therefore be temporarily additive to existing levels of shipping in the area, for example commercial ships, ferries, trawlers etc. which operate on a year-round basis. (indicated in Section 4.5.2 of the EIAR).

Data relating to the potential behavioural disturbance of diving birds due to underwater noise are very limited. As noted in Section 5.2.2 of the AA Screening report, an understanding of hearing sensitivity for a range of diving duck species, red-throated diver and gannet (see Crowell *et al.* 2015) suggests a low potential for disturbance from vessel noise. While seabird responses to approaching vessels are highly variable among species, flushing disturbance would be expected to displace most diving seabirds from close proximity to vessels, particularly among species more sensitive to visual disturbance such as divers and cormorant (Garthe & Hüppop 2004), limiting potential interactions.

In view of the seasonal variation of birds likely to be present in the Kinsale area, there is a greater potential for interaction across a range of species and behaviours from a lengthier rock placement programme of works. It can, however, be concluded that this seasonal variation will not contribute to the generation of a likely significant effect for any qualifying species of sites within the Zone of Influence. This is because of: vessel noise from rock placement activities is the main source of potential effect and significant effects are not predicted; the low potential for either mortality or significant disturbance during the breeding and non-breeding season from vessel activity, and; the minor increment of a vessel in transit or engaged in rock placement for up to 104 days in context of the wider annual vessel.

Shipping activity in the vicinity of the KADP was described in Section 4.5.2 of the EIAR and is expanded here. There are no IMO adopted routeing measures present in the Kinsale area which mark definitive shipping lanes. However, general navigation routes are explained in Admiralty sailing directions for the area and are also visible within Automatic Identification System (AIS) data for the region.

The Celtic Sea has a comparatively low level of shipping compared with the western Irish Sea which includes busy routes and approaches to Dublin, Wexford and Dundalk, in addition to major routes northward towards the North Channel. A shipping study based on Automatic Identification System (AIS) data completed for IOSEA4 (DCENR 2011) indicated that generally up to 300-750 vessels per year were present in waters off the south coast of Ireland and in the vicinity of the Kinsale Area. Highest vessel numbers (=>700 vessels per year) were recorded for a route connecting Cork harbour to the northern end of the IMO traffic separation scheme immediately off the coast of the UK (Cornwall), and which passes some

10km to the north east of the Kinsale Area (see MMO 2014 and subsequent data updates). Other routes visible in the AIS data connecting to Cork harbour are generally coastal and with a frequency of 300-750 vessels per year. Numbers are in the order of 50-300 vessels per year over the Kinsale Area; only authorised vessels are permitted within the exclusion zones around the platforms.

Appendix A

Draft Environmental Management Plan

A1

Appendix B

Draft Waste Management Plan

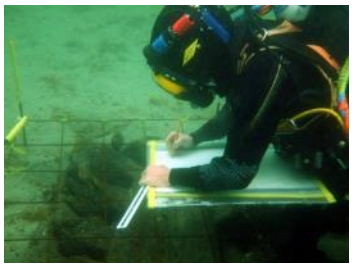
B1

Appendix C

Cultural Heritage

C1

Cultural Heritage Assessment
Kinsale Field Decommissioning

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Cultural Heritage Assessment
Kinsale Field Decommissioning

Report 09 November 2018

Project Director **Niall Brady**

Beverley Studios, Church Terrace, Bray, Co. Wicklow www.adco-ie.com

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CONTENTS

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Abbreviations

ADCO	The Archaeological Diving Company Ltd
DAHG	Department of Arts, Heritage and the Gaeltacht
DCCAE	Department of Communications, Climate Action and Environment
DCHG	Department of Culture, Heritage and the Gaeltacht
E	Easting
EIS	Environmental Impact Statement
IAC	Irish Archaeological Consultancy Ltd
N	Northing
NGR	National Grid Reference
NIAH	National Inventory of Architectural Heritage
NMI	National Museum of Ireland
NPS	Navan Protected Structure
OPW	Office of Public Works
RMP	Record of Monuments and Places
RPS	Record of Protected Structures

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LIST OF FIGURES

1.0 Summary

The Archaeological Diving Company Ltd. (ADCO) was appointed by ARUP on behalf of Kinsale Energy to carry out a Cultural Heritage Assessment based on desk-top review, to inform a Request for Further Information made by the Department of Communications, Climate Action and Environment (DCCAE) on a submission in relation to the decommissioning of certain facilities associated with the Kinsale Field.

The recognition of archaeological risk within the offshore and nearshore environments is cognizant of the diverse range of sources that can enhance the basic Admiralty Chart data sets. It remains to acknowledge the impact of subsea works on the seabed over time, and how activities such as decommissioning can impact on cultural heritage and pose a constraint that needs to be taken into account.

The present report is based on a desk-top review. The distribution of known shipwreck locations highlights the seabed across the Kinsale field as retaining high archaeological potential. When considering particular installations, a clearer picture of the archaeological risk becomes apparent. Four known wrecksites lie within 600m of the existing pipeline and installation facilities: wrecksites W11064, W11077, W08211 and W5519.

Impacts

The decommissioning project will affect all structures associated with the Kinsale Field. The two platforms and all subsea structures will be removed, all wells are to be plugged and abandoned and the onshore terminal will be returned to agricultural use. The pipelines and umbilicals will be decommissioned in place with rock being placed over them where required.

Recommendations

- There is no reason why the works should not proceed.
- Known cultural heritage features should be avoided during all ground and seabed disturbance activities.
- Given that the decommissioning works are restricted to ground that has already been disturbed, there should be no requirement for archaeological monitoring .
- Recommendations are subject to the approval of the National Monuments Service at the Department of Culture, Heritage and the Gaeltacht.

2.0 Introduction

The Archaeological Diving Company Ltd. (ADCO) was appointed by ARUP on behalf of Kinsale Energy to carry out a Cultural Heritage Assessment based on desk-top review, to inform a Request for Further Information made by the Department of Communications, Climate Action and Environment (DCCAE) on a submission in relation to the decommissioning of certain facilities associated with the Kinsale Field.[1] The area of interest is presented on Figure 1, and is concerned with the decommissioning of two offshore platforms, approximately 150km of subsea pipelines and a number of subsea structures. The area includes Seven Heads, Southwest Kinsale and Greensand, Kinsale Head, Ballycotton, and Inch Terminal.

3.0 Cultural heritage background

The consideration of archaeological risk in this offshore environment extends back to 1989, when an environmental report for the Ballycotton Field included an assessment of archaeological sites based on observations recorded on Admiralty Chart data sets.[2] The impact assessment and mitigation sections included no reference to archaeological or cultural heritage matters and were focused on constraints associated with existing fishing grounds and related biological and ecological matters.

By 2002, more detailed assessment was included, and a report for the Seven Heads Gas development committed to including marine geophysical survey data sets as a resource for archaeological assessment.[3] The most recent survey information and any new seabed mapping data would be reviewed by an archaeo-geophysicist and the observations would be taken in account during detailed planning for the development.

In 2011, comprehensive marine geophysical survey was conducted of an offshore pipeline route for the then proposed Kinsale Gas Storage pipeline and associated umbilical, and that work corrected the recorded location of U-boat U58, placing it 200m to the west of the survey centreline.[4]

[1] Correspondence from DCCAE to PSE Kinsale Energy dated 24/09/2018, Item 4.
[2] Anonymous, 'Environmental report of the Ballycotton development', Marathon Petroleum Ireland, 1989, p. 38.
[3] Anonymous, 'Seven Heads gas development, environmental impact statement', RAMCO, 2002, p. 82.
[4] Eoghan Kieran and Benen Hayden, 'Archaeological assessment of offshore pipeline route survey for ARUP on behalf of PSE Kinsale Energy Ltd', Moore Marine, 2011.

As recently as 2015, an EIA for the Midleton Prospect application was able to map the existing known historic shipwreck data in relation to the development and to include a series of mitigation measures to ensure that any cultural heritage features observed during site surveys would be avoided.[5] This is in accordance with section 4.9.3 of the Petroleum Affairs Division (PAD) Rules and Procedures, which notes that the operation will take such steps as are necessary to ensure that such objects are not disturbed or damaged.

Similar assessment of well heads off the west coast of Ireland has begun to identify the additional recommendation that in the event of material of archaeological potential being recovered in the course of operations, the reporting requirements will be as per Section 7 of ISO3/24. Notification will be made to the Department of Culture, Heritage and the Gaeltacht (DCHG), through the Underwater Archaeology Unit of the National Monuments Service, and the Operator will facilitate the statutory authorities in any investigation that they may need to carry out, in accordance with the terms of the National Monuments Acts (1930-1994).[6]

The recognition of archaeological risk within the offshore and nearshore environments has developed since the late 1980s, and while more recent work is cognizant of the diverse range of sources that can enhance the basic Admiralty Chart data sets, it remains to acknowledge the impact of subsea works on the seabed over time, and how activities such as decommissioning can impact on cultural heritage and pose a constraint that needs to be taken into account. The present report should help to address this area.

4.0 Method statement

The present report is based on a desk-top review. The national seabed mapping project, INFOMAR, has been developed over the last number of years and has presented a clear record of known shipwreck locations. This has most recently been absorbed by the National Monuments Service, which has produced an online map of known and recorded shipwrecking events around Ireland.[7] The NMS map will absorb observations made from marine geophysical surveys and diver-truthing and related third-party records, and represents the most robust data set to hand for assessing the archaeological risk of offshore and nearshore environments around the Irish coast.

[5] J. Massey, 'Midleton prospect exploration activities – Environmental Impact Assessment screening report and environmental risk assessment', RPS Document number MGE 050 2RP0 002, 2015, pp 71–73.
[6] Niall Brady, '13D018 Underwater archaeological assessment of 35/8–C Appraisal well drilling, offshore Ireland', ADCO, 2013, p. 12.
[7] Accessible online via: https://dahg.maps.arcgis.com/apps/webappviewer

5.0 Results

5.1 Overview

The distribution of known shipwreck locations is presented on Figure 2 along with the Kinsale Offshore Installations, the Kinsale Wells and the associated subsea pipelines. The present report is concerned with the decommissioning of two offshore platforms, approximately 150km of subsea pipelines and a number of subsea structures.

As highlighted in the 2011 marine geophysical survey report, the seabed across the Kinsale field is regarded as retaining high archaeological potential, and this is indicated by the sheer volume of recorded wrecksites plotted in the direct vicinity of the Field's structures and in the wider area.

5.2 Seven Heads

When focussing in on particular installations, a clearer picture of the archaeological risk becomes apparent. The Seven Heads installation comprises a manifold and a series of five well heads connected to it by a network of some 22km of pipeline (Figure 3). There is a small series of four known wrecksites in the wider vicinity, the closest of which, Wreck W11050, lies 2.7km north of the wells. The name and details of the wreck are not known, as are those of the other wrecks that lie at a further remove.

5.3 Kinsale

The Kinsale installation is larger and more complex and has a series of five known wrecksites in proximity to the installations and wells, and a further wreck site that is closer (Figures 4–5). Wreck W10722 is that of an unknown vessel which lies 1.7km south. Two of the other wrecks are named; W05156 is that of the steamship *San Andreas*, which was lost in 1918 and lies 6.2km northeast, while W10143 is the site of U-boat U-772, which was lost in 1944 and lies 7km south of the westernmost subsea installation.

The wreck W11064 lies closer to the installations, and is located at a distance of 700m from them, and some 190m north of the pipeline that connects the two manifolds (Figure 5). This must be regarded as being very close to the installations. All decommissioning works must be mindful to avoid all impacts with the charted position and in proximity to the charted position. Unfortunately, the wrecksite is unnamed and no details are available online about the nature of the vessel.

5.4 Ballycotton

The Ballycotton installation lies northwest of the Kinsale Head installations and is connected to it by some 12km of pipeline (Figures 4, 6). There are several wrecksites to the north and west of the installation but all are located 5km and further from it, with the exception of one site, W11077, which is located 268m southeast of a wellhead (Figure 7). The charted location of the wrecksite is also 30m east of the pipeline. The wrecksite is unnamed and further information is not readily available on it. All decommissioning works must be mindful to avoid all impacts with the charted position.

5.5 Pipeline to shore

There are several charted wrecksite locations that lie close to the export pipeline as it runs northwards from the Kinsale Field inshore (Figures 4, 8). Wreck W1076, close to the Kinsale Field, lies 700m east of the pipeline. It is an unnamed wreck. Wreck W08054, lies closer inshore. It is the *Carrabin*, which is a wrecked sailing ship that was lost in 1917, and its charted located is 680m east of the pipeline. The site of U-boat U058 (Wreck W10138) lies 4.2km west of the pipeline.

There are two wrecksites inshore that lie close to the pipeline (Figure 9). Wreck W08211 is the wreck of a ketch, the *Elizabeth Jane*, which was lost in 1916. It lies within 600m of the pipeline to its east. Wreck W5519 lies only 30m east of the pipeline and is the site of a German submarine, UC-42, which was lost in September 1917 while attempting to lay mines across the mouth of Cork harbour. The submarine measures 5m wide, 45m long, 3.7m in maximum height and lies on its port side, orientated NW-SE, at a depth of 27m.[8] All decommissioning works must avoid all impacts with the charted position.

At the shoreline itself, there are no known archaeological sites at Inch terminal. The closest site is that of a house in Ballintra East townland, located 200m West (Sites and Monuments Record number CO100-036). A prehistoric lithics scatter is also identified in Inch townland, located 250m east of the terminal (CO100-043).

6.0 Impacts and Impact Assessment

The decommissioning project will affect all structures associated with the Kinsale Field. The two platforms and all subsea structures will be removed, all wells are to be plugged and abandoned and the onshore terminal will be returned to agricultural use. The pipelines and umbilicals will be decommissioned in place with rock being placed

[8] See: https://jetstream.gsi.ie/iwdds/delivery/Shipwrecks/PDF/UC42_Final.pdf

over them where required. The impacts and the impact assessment are summarised in Table 1.

Impact	Impact Assessment	Archaeological Mitigation
The demolition of Inch terminal will take place within the confines of the existing terminal facility.	Demolition works can provide the opportunity to record sub-surface levels and record any features of cultural heritage interest that may be exposed at depth. However, it is likely that the construction works have already removed any archaeological levels. The potential to expose new material would only occur if the demolition works extended to unexcavated ground.	• Assuming the demolition works are restricted to ground that is already disturbed, there should be no further archaeological requirement.
The preferred decommissioning alternative for the pipelines and control cables involves leaving the facilities *in situ* and applying rock cover to the ends, any remaining protection materials, and any pipeline freespans.	It is unlikely that these works will incur any necessity for archaeological intervention, assuming they leave installation materials *in situ.*	• None.
The platform jacket legs will be cut from their pile foundations at seabed level using either an internal or external pile cutting tool.	It is unlikely that these works will incur any necessity for archaeological intervention, assuming they leave installation materials *in situ.*	• None.
All other subsea infrastructure, including manifolds associated with satellite fields, wellhead protection structures and the upper portions of the wells (to 3m below seabed) will be entirely removed with no materials left *in situ*.	These works will impact with the seabed but are restricted to ground that has already been disturbed.	• None.
Physical disturbance of the seabed will be generated by any anchoring of vessels (including a rig and heavy lift vessels), the removal of protection materials (concrete mattresses), connecting spool pieces and control cables around platforms and subsea structures, the removal of subsea	To reduce the impact potential with known cultural heritage sites, decommissioning works are to take place largely within the original footprint of disturbance of the wider Kinsale area field developments	• None.

Impact	Impact Assessment	Archaeological Mitigation
structures and platform jackets (including excavation of jacket piles and recovery of large items of debris post removal), remedial rock placement and the removal of onshore terminal foundations.		

Table 1: Impact, Impact Assessment and Archaeological Mitigations for the decommissioning works associated with the Kinsale Field.

7.0 Recommendations

There is no reason why the works should not proceed.

Known cultural heritage features should be avoided during all ground and seabed disturbance activities. This is in accordance with section 4.9.3 of the Petroleum Affairs Division (PAD) Rules and Procedures, which notes that the operation will take such steps as are necessary to ensure that such objects are not disturbed or damaged.

Given that the decommissioning works are restricted to ground that has already been disturbed, there should be no requirement for archaeological monitoring.

PLEASE NOTE: the above observations and conclusions are based on the archaeological information and information supplied for the Kinsale Field decommissioning project. Should any alteration occur, further assessment may be required.

PLEASE NOTE: These recommendations are subject to the approval of the National Monuments Service at the Department of Culture, Heritage and the Gaeltacht.

8.0 Acknowledgements

ADCO thanks Paul Brady of ARUP for providing background information and project mapping data. The report has been written and edited by Dr Niall Brady.

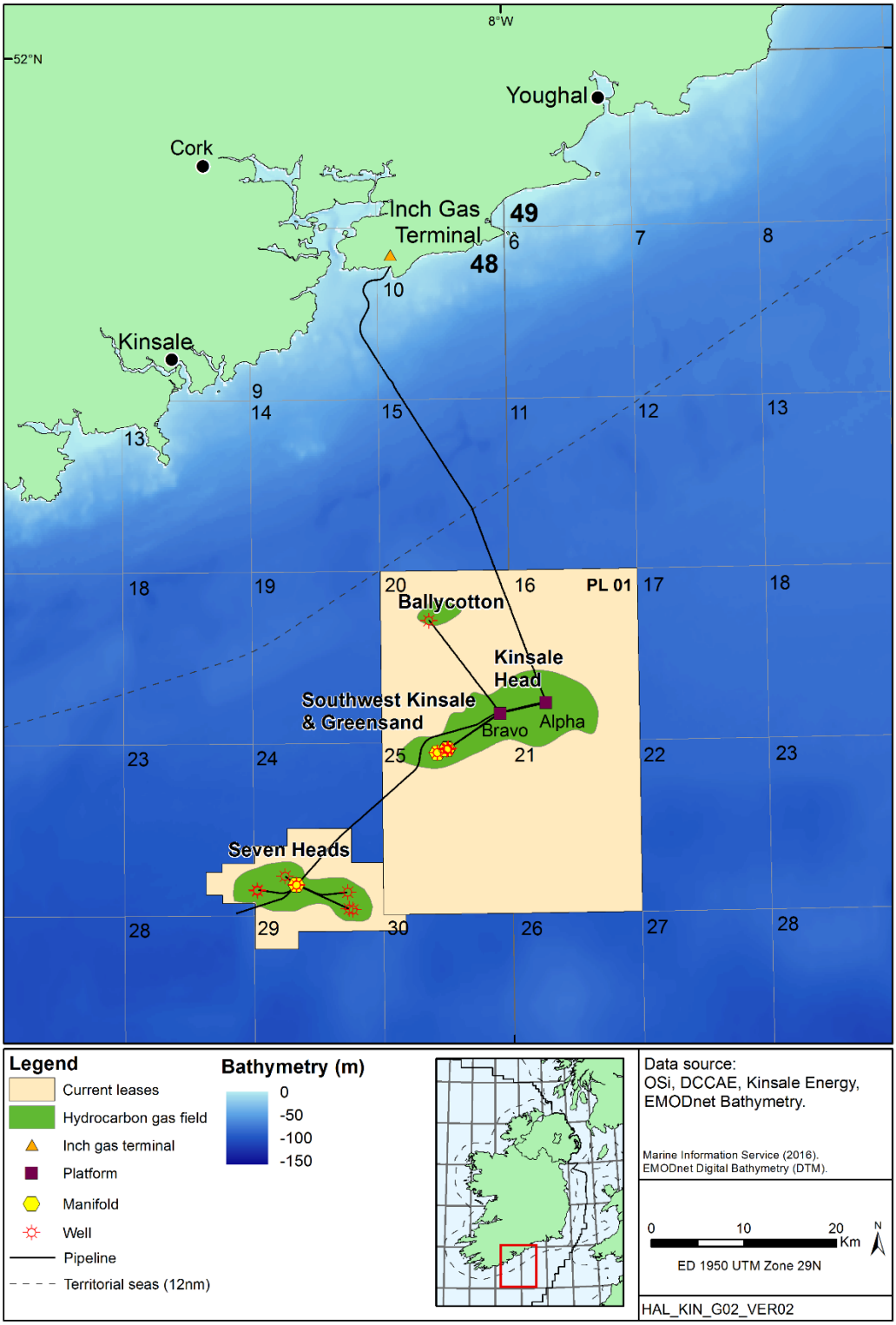

Figure 1: Location map showing the extent of the Kinsale Field.

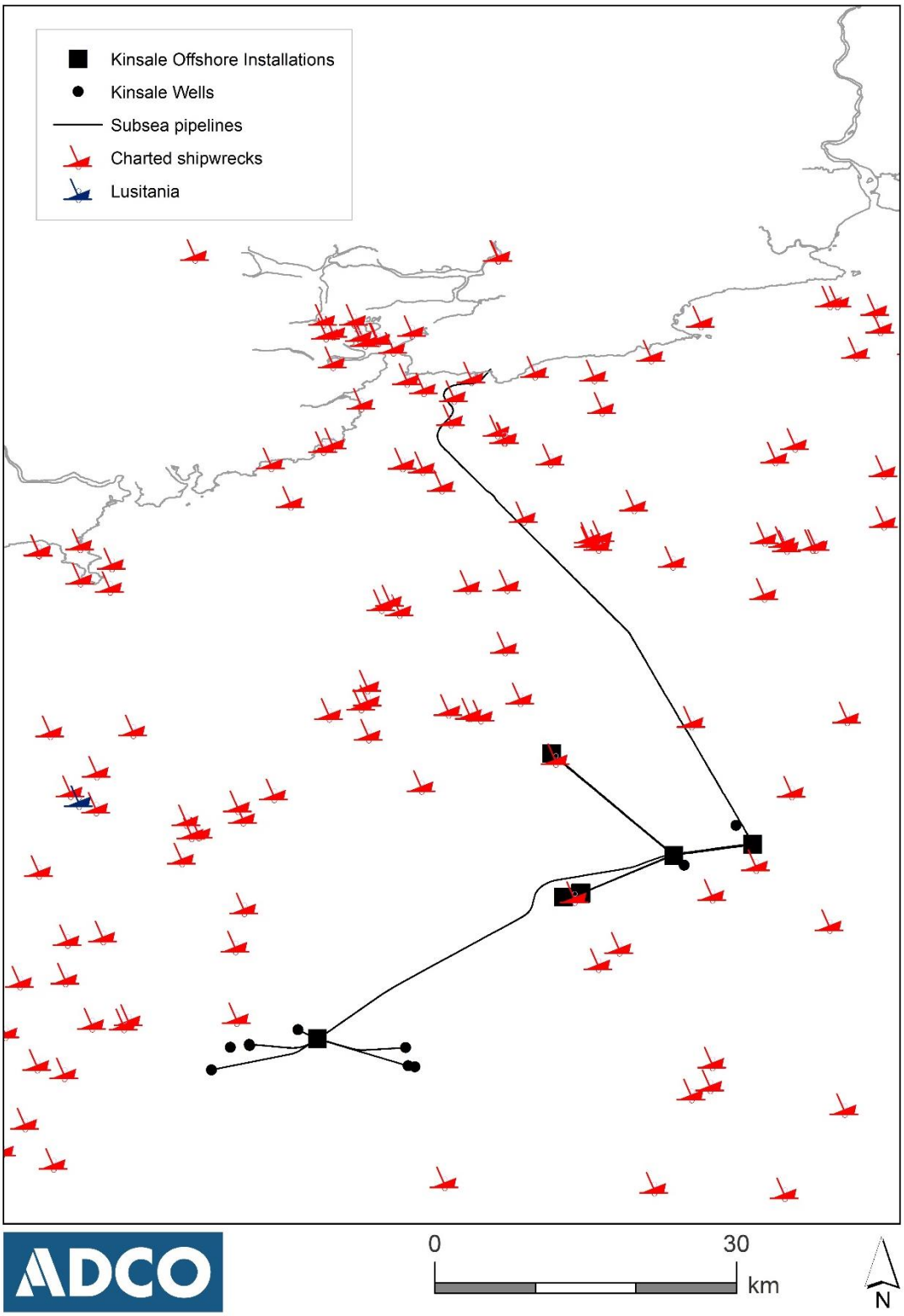

Figure 2: Distribution of known wrecksites in the vicinity of the Kinsale Field.

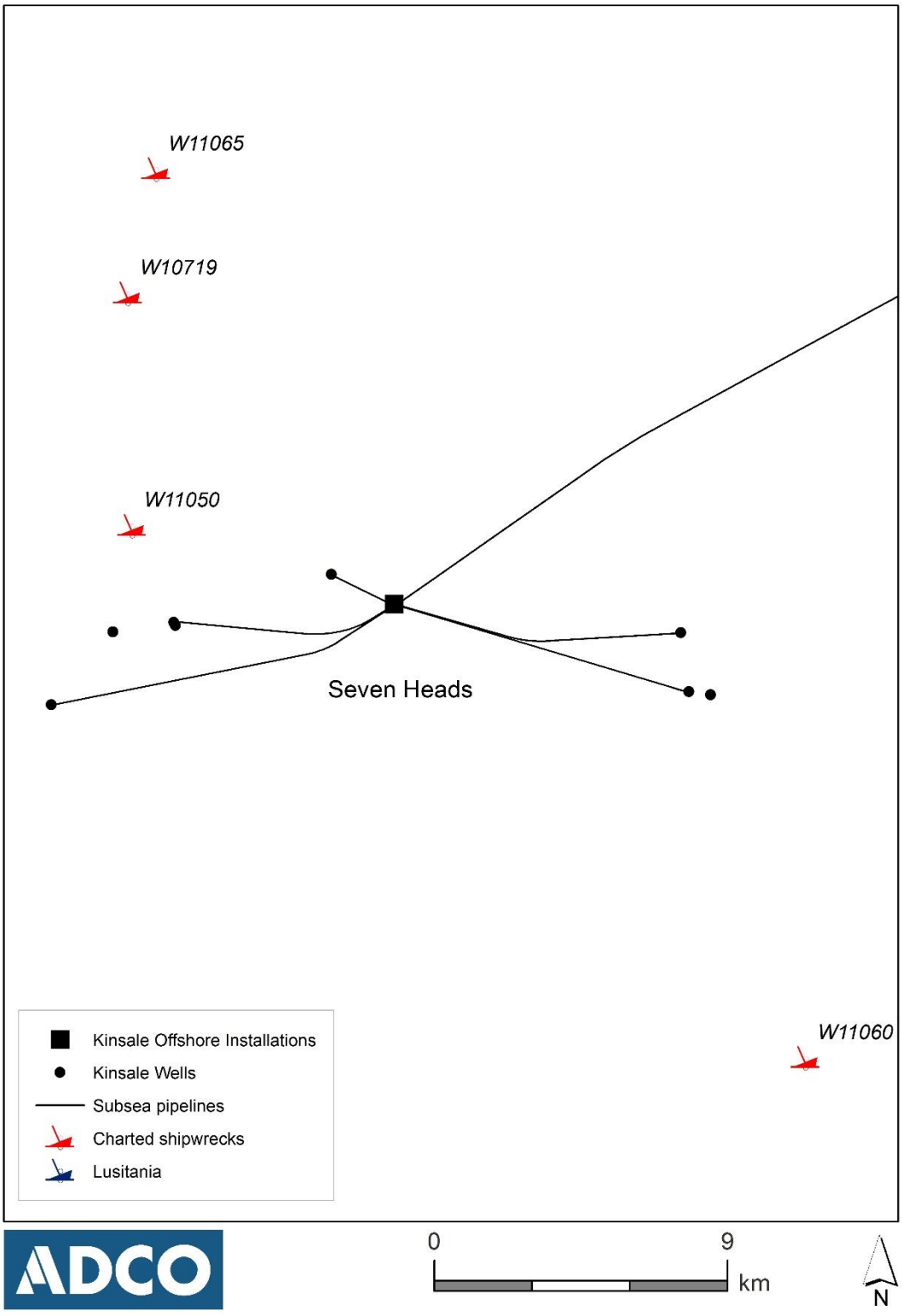

Figure 3: Distribution of known wrecksites in the vicinity of the Seven Heads installation.

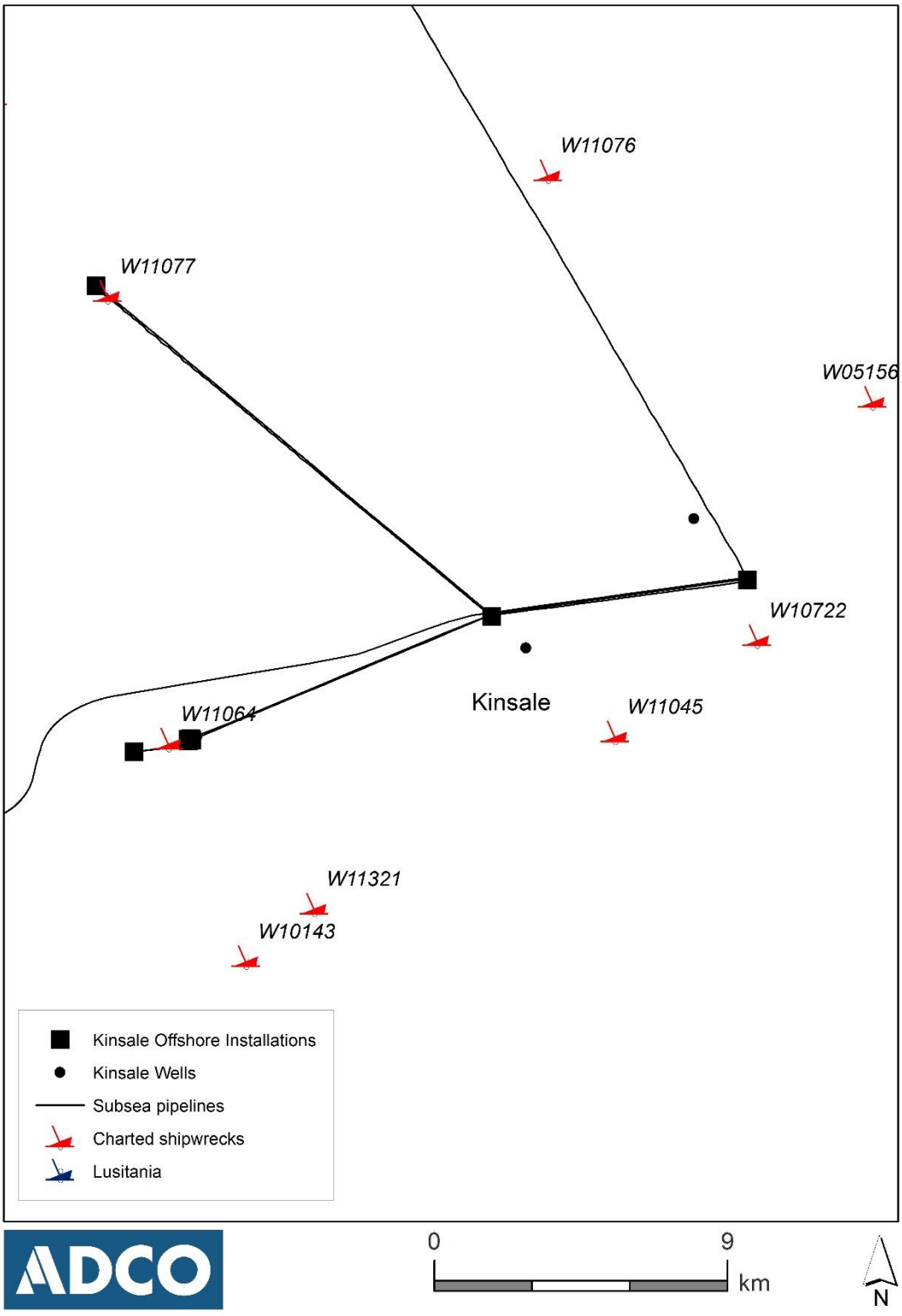

Figure 4: Distribution of known wrecksites in the vicinity of the Kinsale installation.

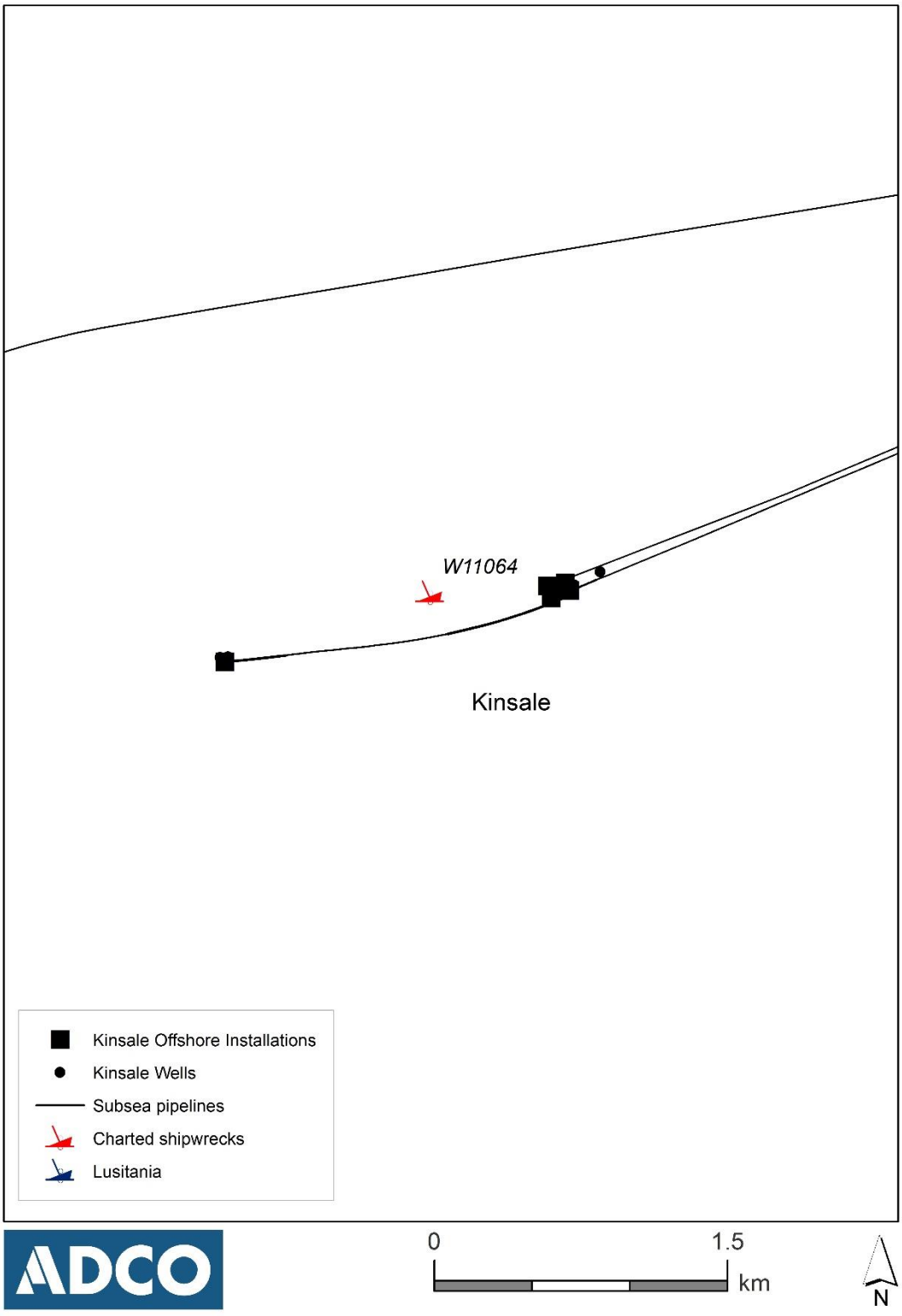

Figure 5: Distribution of known wrecksites in the vicinity of the Greensand installation

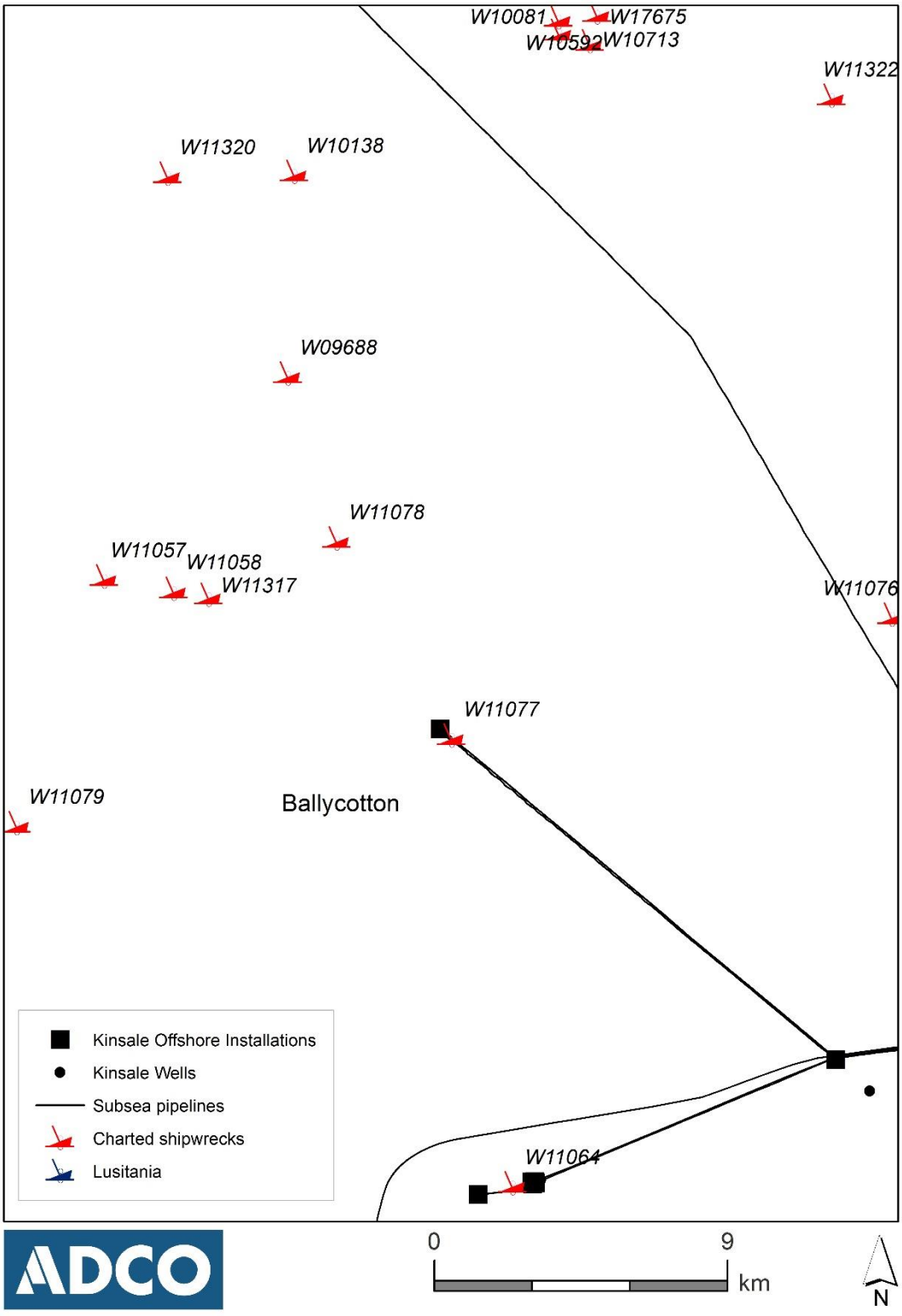

Figure 6: Distribution of known wrecksites in the vicinity of the Greensand installation

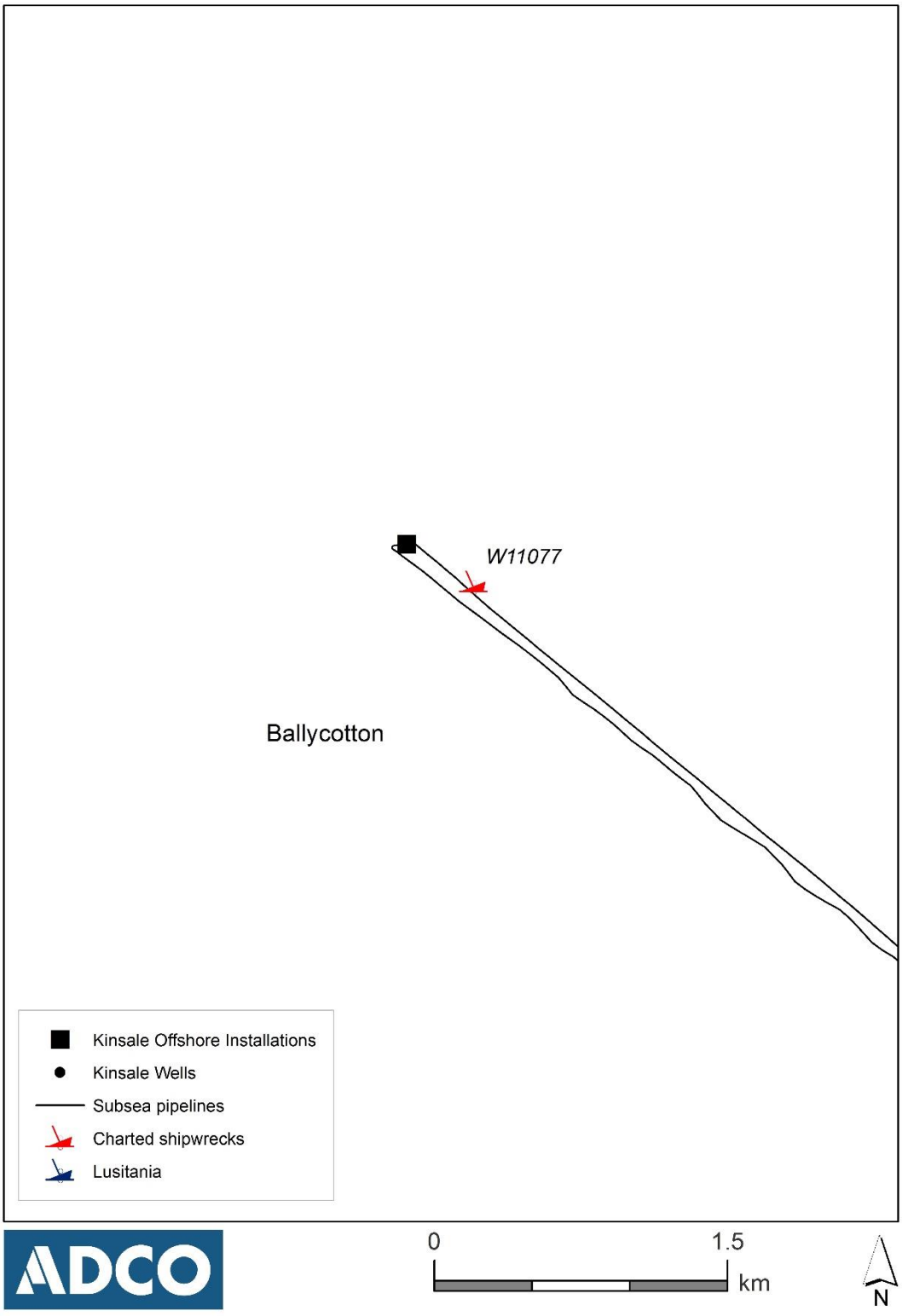

Figure 7: Detail view of known wrecksites in the vicinity of the Ballycotton installation

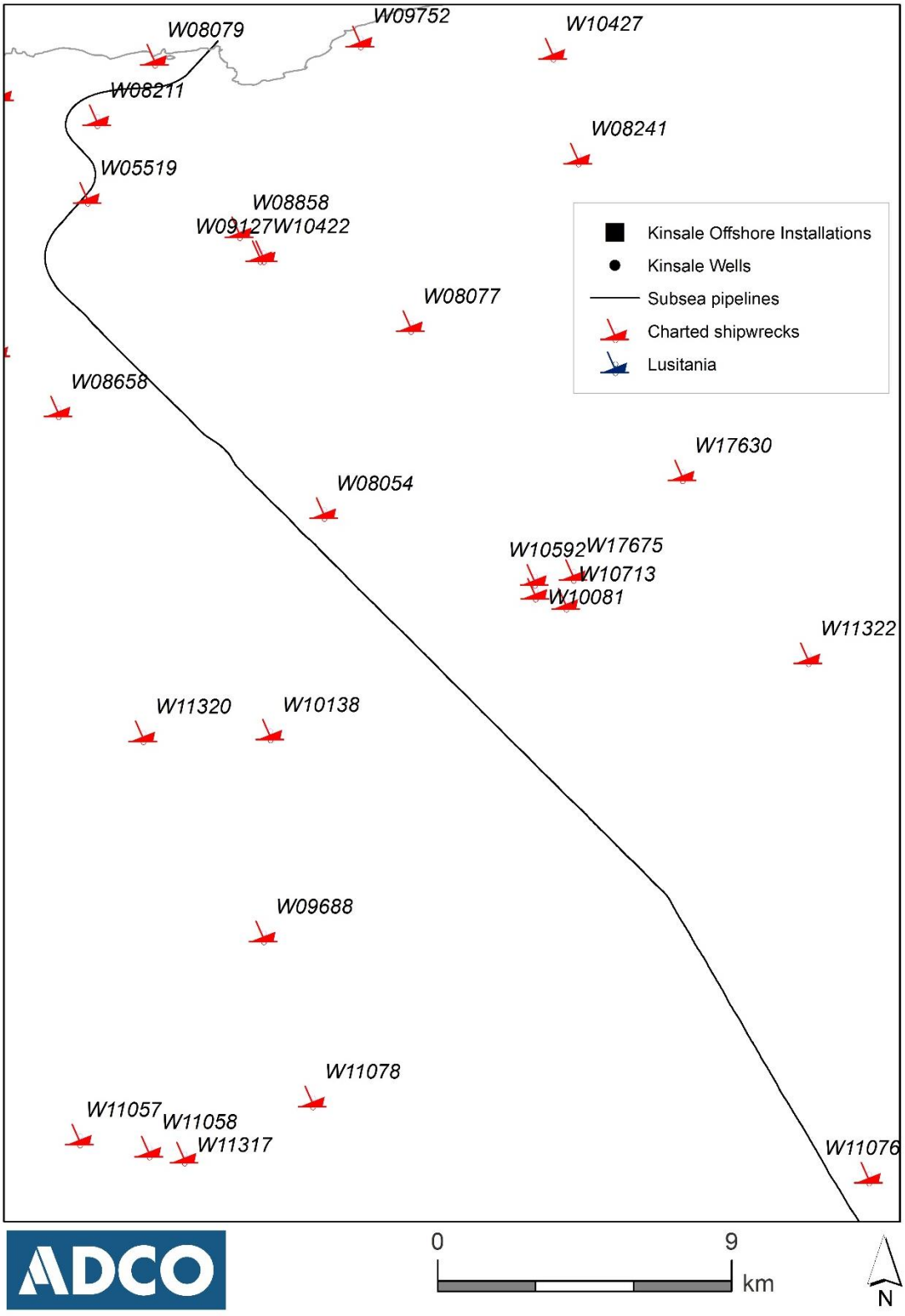

Figure 8: Distribution of known wrecksites in the vicinity of the pipeline heading inshore.

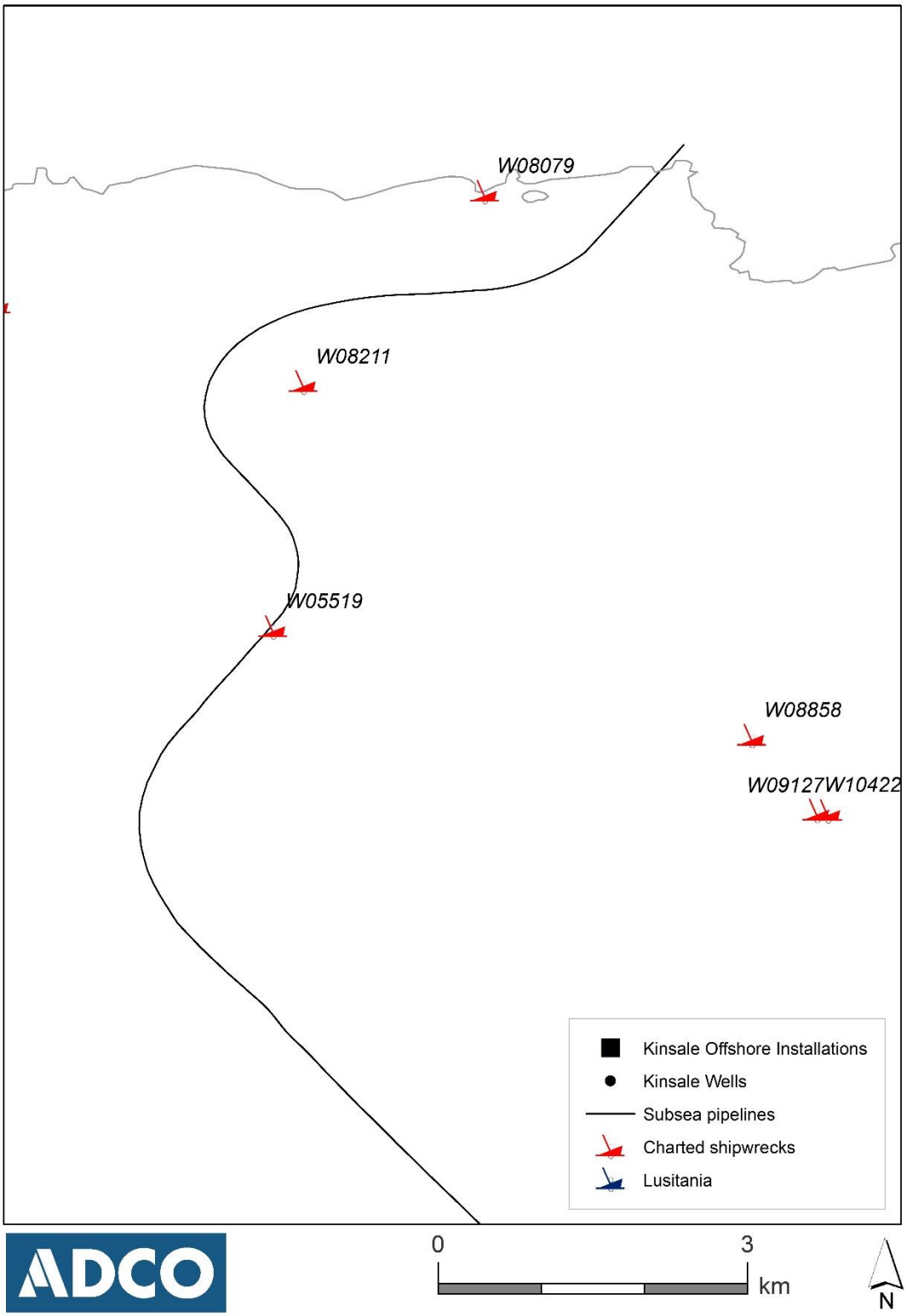

Figure 9: Distribution of known wrecksites in the vicinity of the pipeline close inshore.

Appendix D

Summary of Consultations

D1

Kinsale Energy Decommissioniong Project
Consultations - Summary Table

Stakeholder	Type of Consultation	Comments/Views and Feedback	How was this used to scope and inform the EIAR.
Commission for Regulation of Utilities (CRU)	Meeting	No observation on consent application	n/a
Marine Planning and Foreshore Unit - DHPLG	Telephone and Email	No feedback received	n/a
Cork County Council - Director of Services / Chief Executive	Meeting	General supppрt for project	n/a
Cork County Council - Planning Department	Meeting	Discussed exisiting planning consent for Inch Terminal. No comments on overall project.	n/a
TFS Office, Dublin City Council	Meeting	Confirmed TFS requirements for transfrontier shipping.	n/a
National Parks and Wildlife - DAU - DAHRRG	Meeting	NPWS requested that the following was also considered: • To consult with the IWDG for data on cetaceans. • To consider the Marine Institute's Fisheries Ecosystems Advisory Services (FEAS) survey data, in particular marine mammal and seabird observations made during the Celtic Sea herring and ground fish surveys.	Subsequent to the meeting, useful information was obtained from both the IWDG and FEAS publications which has been reflected in the KADP EIAR. See Section 4.4.7 of the EIAR for reference to IWDG data. FEAS data was used in a number of places in the EIAR including sightings data from the Celtic Sea Herring Acoustic Surveys (including reference to Cronin & Barton 2014, Nolan et al. 2014, O'Donnell et al. 2008, 2011, 2012, 2013, 2015, 2016, 2017) in the elasmobranchs (4.4.4), marine reptiles (4.4.5), birds (4.4.6) and marine mammals (4.4.7) sections. Groundfish trawl survey data (Marine Institute 2012) was used to inform the fish and shellfish section (4.4.4) and additionally, the stock book produced by FEAS (Marine Institute 2016, 2017) was used to inform the fisheries section.
Department of Culture, Heritage and the Gaeltacht - Underwater Archaeology Unit - National Monuments Service	Emails	The following was received from National Monuments: We note that it is your intention to carry out an EIAR, and our recommendations for that would be that it would contain a dedicated section on the underwater cultural heritage (UCH) and terrestrial heritage (to address any land-based archaeology that could be affected by the proposed decommissioning of the landward facility). The Cultural Heritage section of the EIAR should contain the results of a dedicated Underwater Archaeological Impact Assessment (UAIA) as laid out below. It is advised that this should cover all proposed gas and oil field areas that will be the subject of planned or potential decommissioning in the future. All areas of the seabed, foreshore and landward side that will be the focus of clearance or where impacts could occur should be assessed by way of UAIA. • The UAIA shall be carried out by a suitably qualified underwater archaeologist, who shall have suitable experience and a track record in the undertaking of such UAIA for inshore and offshore projects. • The UAIA to comprise desktop study that consults with all the relevant sources, including the National Monuments Service Wreck Viewer and Wreck Inventory of Ireland Database (WIID). • Terrestrial, foreshore/intertidal inspection should be undertaken along any routes that will have the potential of being impacted by decommissioning works (including actual works or indirect impact from works traffic). • All results from other surveys, etc. such as ROV results, geophysical survey results, if carried out shall be made available to the archaeologist for consideration, with results included in their UAIA report. The UAIA shall be licenced by this Department and a detailed method statement shall accompany the licence application. Once completed, the archaeologist shall write the UAIA report, with detailed results and shall submit same to the Underwater Archaeology Unit for further consideration and comment.	The environmental assessment has had due regard to underwater archaeology. A UAIA was carried as part of the RFI.
The Irish Coast Guard (IRCG)	Email and meeting	No feedback received	n/a
Irish Maritime Operations Centre (NMOC) of the Irish Coast Guard - (Marine Rescue Co-Ordination Centre (MRCC) of the Irish Coast Guard)	Covered by IRCG meeting	No feedback received	n/a
Sea Fisheries Protection Authority	Email/Telephone	No observations	n/a
Marine Institute (Galway) - DCCAE Environmental Adviser	Telephone	Marine Institute are aware of decomm plans through vessel operations group; no specific comments received	n/a
Commissioners of Irish Lights (CIL)	Meeting	CIL advised requirements for marking etc. during decommisioning and any scenario where jackets left in-situ	n/a
Ervia	Meeting	Ervia wish to retain some of the KEL facilities for a possible future CCUS project.	The possible future use of the facilities for CCUS was included in Section 3.3 of the EIAR.
Gas Networks Ireland	Meeting	The final reinstatment of Inch Terminal was discussed. KELs current plans are to return it to agricultural use.	n/a
Naval Operations (Cork)	Email and telephone	No feedback received	n/a
Cork Port Operations	Meeting	No feedback received	n/a
Cork Chamber of Commerce	Meeting	No feedback received	n/a
DAA	Letter	A written response was also received from Dublin Airport Authority (DAA) stating that DAA has no observations to make on the KADP.	n/a
Cork City Council	Meeting	No feedback received	n/a
Irish South & West Fish Producer Organisation (IS&WFPO)	Telephone	No feeback received	n/a
Irish South & East Fish Producer Organisation (IS&EFPO)	Telephone	No observations.	n/a
South West Regional Fisheries Forum / (Regional Inshore Fisheries Forum)	Telephone	Concern regarding the possible increase in vessel traffic during the project. SWRFF suggested a pre-agreed corridor could be used.	No update to the EIAR but ongoing liaison will continue with the fishing bodies up to and during the decommissioning operations.
South Eest Regional Fisheries Forum / (Regional Inshore Fisheries Forum)	Telephone	No observations.	n/a
Irish Fish Producers Organisation (IFPO)	Telephone	No observations. IFPO to be kept informed about the project.	n/a
Killybegs Fishermen Organisation (KFO)	Telephone	No observations.	n/a
Bord Iascaigh Mhara	Telephone	No observations. To be kept informed of the project especially in the run up to the works.	n/a
RNLI Ballycotton & Cortmacsherry	Telephone	Requested to be advised of marine ops at time of actual offshore works taking place	n/a
Eirgrid	Possible route of subsea cable landing discussed.	No onservations on project.	n/a
ESB	Possible future use of facilities for CCUS discussed.	Requested some facilities to be retained for future CCUS project.	The possible future use of the facilities for CCUS was included in Section 3.3 of the EIAR.
SEAI	Email	No feedback received	n/a
Cork Energy Hub / Energy Cork	Email	No feedback received	n/a
Irish Refining	Email	No feedback received	n/a
BGE (Bord Gais Energy)	Email	No feedback received	n/a
Providence Resources	Email	No feedback received	n/a
Landsdowne Oil & Gas	Email	No feedback received	n/a
San Leon Energy	Email	No feedback received	n/a
Irish Offshore Operators Association	Email	No feedback received	n/a
Sunningdale Oil & Gas	Email	No feedback received	n/a
Landowner - Pipeline	Meeting	No Feedback received	n/a

Kinsale Energy Decommissioniong Project
Consultations - Summary Table

Stakeholder	Type of Consultation	Comments/Views and Feedback	How was this used to scope and inform the EIAR.
General Public	Two Public Information meetings were held. These were advertised in the local newspaper and on local radio. A letter drop and call to houses was also carried out by the KEL team to the houses surrounding Inch Terminal.	**First Information Evening:** Location - Clayton Hotel Cork City, 18th April Time: 4pm to 8pm. Approximately 18 people attended. The feedback was generally positive among those who attended and most people took copies of the project information leaflet with them when they left. **Second Information Evening:** Location: Aghada Community Centre , 19th April Time: 6pm to 8pm Approximately 27 people attended.. • The feedback was generally positive and there was plenty of engagement and good conversations throughout. No feedback forms completed.	Details of the consultation was included in section 1.8 and Appendix F of the EIAR. No changes to the EIAR required.
Irish Whale and Dolphin Group	Letter	A consultation response was received from the Irish Whale and Dolphin Group (IWDG) noting the need to ensure that the decommissioning works will not disturb or degrade the marine habitat for cetaceans.	The proposed decommissioning scope of work and the environmental assessment has had due regard to the concerns regarding the protection of cetaceans and ensures that potential adverse effects are minimised. See Section 4.4.7 of the EIAR , Marine Mammals.
Birdwatch Ireland	Email	No feedback received	n/a
Coastwatch	Email	No feedback received	n/a
Local TDs and Councillors	Various: Telephone/email/meeting	Local TDs and councillors were informed of the project. No observations made.	n/a