

***Kennemerland
Out Skerries
Shetland***

2014 Diver Survey: Archaeological Report



for

Historic Scotland

CA Project: 770001

CA Report: 14573


December 2014

KENNEMERLAND, OUT SKERRIES, SHETLAND

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Cirencester Building 11 Kemble Enterprise Park Kemble, Cirencester Gloucestershire, GL7 6BQ t. 01285 771022 f. 01285 771033	Milton Keynes Unit 4 Cromwell Business Centre Howard Way, Newport Pagnell MK16 9QS t. 01908 218320	Andover Stanley House Walworth Road Andover Hampshire, SP10 5LH t. 01264 347630
e. enquiries@cotswoldarchaeology.co.uk		

CONTENTS

1.	PROJECT BACKGROUND	1
1.1.	Introduction	1
1.2.	Location.....	1
1.3.	Scope.....	2
1.4.	Objectives.....	2
2.	METHODOLOGY	2
2.1.	Diving	2
2.2.	Position-fixing.....	2
2.3.	Archaeological Recording.....	3
2.4.	GIS and Georeferencing.....	4
3.	RESULTS	6
3.1.	Outline History of the Vessel.....	6
3.2.	Outline History of Work on the Site	7
3.3.	2014 Archaeological Results	9
4.	DISCUSSION	13
5.	REFERENCES	15
5.1.	Published Documents and Grey Literature	15
6.	APPENDIX A: POSITIONS OF ARCHAEOLOGICAL FEATURES RECORDED IN 2014 IN RELATION TO THE POSITIONS ON HISTORIC SITE PLANS.....	17

ILLUSTRATIONS

- Figure 1: Site location
- Figure 2: Summary of previous archaeological work, features and extent of the *Kennemerland* site
- Figure 3: Contexts position-fixed during 2014 dive season
- Figure 4: Comparison between location of features on georeferenced plans of previous archaeological work and positions fixed in 2014
- Figure 5: Plan of lead ingots (KEN1016) numbered 1-11 and anchor (KEN1017)
- Figure 6: Close up of lead ingot (KEN1016.08) with inscriptions
- Figure 7: Diver recording ingots (KEN1016) and anchor (KEN1017)
- Figure 8: Anchors (KEN1005 and KEN1006)
- Figure 9: Cannon within the northern part of the site (KEN1015, formerly Cannon 5).
- Figure 10: Mercury within the central part of the site (KEN1012)



SUMMARY

Project Name: *Kennemerland* - 2014 Diver Survey

Location: Out Skerries, Shetland

Position: 60°25.167'N, 00°45.121'W

In June 2014 a Cotswold Archaeology dive team undertook a survey of the wreck of the *Kennemerland* off the Out Skerries, Shetland. The work was conducted as part of the *Heritage Assessment in Relation to Marine Designation: Scottish, Welsh and Northern Irish Territorial Waters* contract. It was undertaken to a brief supplied by Historic Scotland.

The *Kennemerland* was a ship of the Vereenigde Oost-Indische Compagnie (the Dutch East India Company or VOC). It was wrecked in December 1664 while en route to Batavia. Britain and the United Provinces of the Free Netherlands were on the verge of war at this time and VOC ships were taking the longer route north around Scotland to avoid the risk of interception in the English Channel. The *Kennemerland* was lost when, running ahead of a southerly gale, she struck Stoura Stack at the entrance to the South Mouth, Out Skerries and broke in half. The wreck's forepart foundered in the deep water adjacent to Stoura Stack and the remaining stern portion was swept into the harbour and washed up on Bruray Island before being swept back out to sea on the following tide. The wreck was discovered in 1971 by members of the Aston University Sub Aqua Club and was subsequently subject to several seasons of excavation during the 1970s and 1980s.

Diving operations took place between 8th and 15th June 2014. The primary objective was to locate surviving elements of the wreck, position-fix them and thus achieve an up-to-date plan of seabed remains for comparison against the previous archaeological plans. These objectives were achieved for most of the features shown on the previous plans that were not lifted during the 1970s and 1980s.



KENNEMERLAND, OUT SKERRIES, SHETLAND

2014 DIVER SURVEY: ARCHAEOLOGICAL REPORT

1. PROJECT BACKGROUND

1.1. Introduction

1.1.1. This document was prepared by Cotswold Archaeology for Historic Scotland as part of the *Heritage Assessment in Relation to Marine Designation: Scottish, Welsh and Northern Irish Territorial Waters* contract (hereafter the ‘Dive Contract’). It reports on an archaeological diver survey of the wreck of the *Kennemerland*, a Dutch East Indiaman wrecked off Out Skerries, Shetland in 1664.

1.1.2. The wreck of the *Kennemerland* and the 17th-century wreck of the *Wrangels Palais*, off Bound Skerry, are protected under the Out Skerries Historic Marine Protected Area (HMPA), designated under the Marine (Scotland) Act 2010 (Historic Scotland 2014). The designation covers the two areas comprising the historic wreck sites (Historic Scotland 2013). The HMPA which covers the *Kennemerland* is shown on figure 1.

1.1.3. The work was guided by a brief produced by Historic Scotland (Historic Scotland 2014b). Diving took place between 8th and 15th June 2014. The Cotswold Archaeology team comprised:

- Mark James (MSDS Marine)
- Daniel Pascoe (Pascoe Archaeology)
- Sally Evans (Cotswold Archaeology)
- Douglas McElvogue (TrenDarc)
- Donald Jeffries
- Cy Sullivan

1.1.4. Post excavation and reporting was carried out in November 2014 by Mark James, Daniel Pascoe, Sally Evans and Steve Webster, with the input of Dr Douglas McElvogue.

1.1.5. The smooth running of the fieldwork was greatly aided by a number of people. The team would like to thank the following people: Alice and Gibby Arthur, Anna Henderson, Phil Jamieson, and the rest of the Out Skerries islanders for their help and hospitality and Val Turner of Shetland Amenity Trust for her help and assistance.

1.2. Location

1.2.1. The wreck of the *Kennemerland* is located in the southern approach channel, known as the South Mouth, to Out Skerries, a small group of islands to the east of the Shetland mainland. The wreck lies within the boundary of an HMPA which covers the area of sea spanning a 250m radius around position 60°25.167’ N, 00°45.121’ W (Historic Scotland 2013, Figure 1). The position is given in WGS84 degrees decimal minutes.

WGS84	
60°25.167’ N	00°45.121’ W

1.3. Scope

- 1.3.1. The report comprises an account of the results of the 2014 Dive Contract fieldwork on the HMPA around the wreck of the *Kennemerland*.
- 1.3.2. Where the report refers to the history of the vessel and past work on the site, every effort has been made to ensure that the facts presented are correct. However, a number of primary source documents were not available for inspection and the fieldwork was limited in terms of the time available. As a result factual errors may be present when referring to past works, and comment and discussion on these matters from informed parties would be welcome.

1.4. Objectives

- 1.4.1. The objectives of the project were to:
- Update the site plan of the wreck remains within the boundary of the Historic Marine Protected Area
 - To delineate areas of remaining archaeological potential
 - To enhance the photographic record of the site
 - To install further primary datums in order to facilitate future site monitoring
 - To record and if appropriate recover samples of mercury and other surface archaeological debris identified during the monitoring visit by Dr McElvogue in 2013
 - To provide a designated site assessment report, GIS shapefile information and images of the work

2. METHODOLOGY

2.1. Diving

- 2.1.1. A four-person HSE-compliant dive team was deployed to Out Skerries, Shetland, to undertake diving operations using Self Contained Underwater Breathing Apparatus (SCUBA). All diving took place under the Scientific and Archaeological Approved Code of Practice (ACoP). A local diver and boat crew formed part of the team in order to utilise their knowledge and experience of operating within the area.
- 2.1.2. Diving operations were undertaken from the work boat *Challenger* owned by Tulloch Developments Ltd. Communications were maintained with the divers via through-water communications.
- 2.1.3. Photography and videography were undertaken on the site using Digital SLR and compact cameras and GoPro video cameras (2s and 3s) in underwater housings.

2.2. Position-fixing

- 2.2.1. Position-fixing was achieved using a CSI Wireless DGPS Max DGPs unit attached to a stand-alone laptop running Quantum GIS software. The laptop was loaded with current marine charts and georeferenced historic archaeological site plans. The DGPS unit provides sub-metre horizontal positional accuracy.
- 2.2.2. The attached antenna was kept mobile in order that it could be placed over the positions required. On placement of the antenna it remained on station for a period of time to ensure the most accurate position-fix.

2.2.3. Positions were recorded manually from the DGPS unit and through the GIS software. Where multiple readings were acquired an average position was calculated in ArcGIS during the post- excavation analysis phase.

2.3. Archaeological Recording

2.3.1. As per the brief from Historic Scotland (2014b) the primary objective of diving works were to:

- Update the site plan of the wreck remains within the boundary of the Historic Marine Protected Area.

2.3.2. Further diving objectives that were achieved during the diving campaign were:

- To delineate areas of remaining archaeological potential;
- To enhance the photographic record of the site.

2.3.3. The three objectives were largely achievable concurrently on each dive/feature.

2.3.4. The historic archaeological site plans for the site were georeferenced using ArcGIS and uploaded to a vessel based laptop linked to a DGPS receiver (see section 2.4). Whilst some of the features did not correlate to the modern topography it was possible to use the georeferenced plans to navigate the vessel to an approximate location for most of the features under investigation.

2.3.5. Where features were not visible in the 'hypothesised' location further searches were undertaken using distances and bearings taken from the original plans, prior to georeferencing. Standard underwater search techniques including circular searches and topographical identification were used to locate the features.

2.3.6. Upon location of a feature a photographic record was made and the orientation checked against the original plans. A visual inspection of the condition was undertaken and a note made of any damage that appeared recent.

2.3.7. Due to the relatively shallow nature of the features and diving being undertaken at slack water, positions were acquired using a buoy with a line running straight up and down. GPS positions were taken from on top of the buoy using the vessel based computer and GIS package and a movable waterproof antenna. Where it would not cause a hazard to traffic in the channel the marker buoys were left on station and the position checked over the course of the project.

2.3.8. The area surrounding each identified feature was searched to identify further features that may have been present but not included on the historic site plans. Where appropriate, sketch plans were created of newly identified features and a photographic record made.

2.3.9. As each identified feature was position-fixed the results were used to assess the accuracy of the georeferenced original site plans, and to inform the dive plans for the next dives.

2.3.10. Two further objectives were not fully achieved during the project:

- To install further primary datums in order to facilitate future site-monitoring;
- To record and if appropriate recover samples of mercury and other surface archaeological debris identified during the monitoring visit by Dr McElvogue in 2013.

- 2.3.11. Although the mercury deposit was not sampled, it was located on site, its position recorded and a photographic record was made.
- 2.3.12. Additional research was undertaken during the period on Out Skerries, the results of which will be detailed in the following sections.

2.4. GIS and Georeferencing

- 2.4.1. In order to assess surviving seabed remains it was necessary to compare these remains with those recorded by previous archaeological investigations.
- 2.4.2. Following the extensive surveys and excavations of the *Kennemerland* site undertaken during the 1970s and 1980s, a series of site plans were produced. These site plans vary in scale and detail with some showing overall diagrammatic representations of the site spread along the South Mouth, and others showing detailed depictions of excavated areas. Overall site plans have been published within the International Journal of Nautical Archaeology (IJNA) in the 1973, 1974 and 1979 volumes (Forster and Higgs 1973, Price and Muckelroy 1974, Price and Muckelroy 1979) and in *Scotland's Historic Shipwrecks* (Martin 1998). Detailed plans showing areas of excavation have been published in the 1974, 1977 and 1991 IJNA volumes (Price and Muckelroy 1974, Price and Muckelroy 1977, Dobbs and Price 1991). Further detailed information and analysis of the *Kennemerland* site is also presented in Muckelroy's 1978 publication *Maritime archaeology*.
- 2.4.3. As a starting point in the production of an updated site plan of archaeological remains surviving on the seabed, previous archaeological plans were georeferenced into the project ArcGIS workspace using the OSGB36 co-ordinate system. These site plans have been previously assessed and the conclusions presented in reports produced prior to the dredging within the South Mouth (McElvogue 2011). Georeferenced plans have been used to produce figure 2 and figure 4, which present summaries of previous archaeological works and the features recorded.
- 2.4.4. Base-mapping within the ArcGIS workspace comprised modern navigational charts with geospatial information, provided by MarineFIND, in addition to polylines from the Ordnance Survey. Geophysical survey data also formed a base layer within the GIS.

Excavation Area Plans

- 2.4.5. The detailed plans recorded during excavations of the site in the 1970s and 1980s depict the primary site datum. The primary datum, shown on plans published in the IJNA 1974 and later volumes, was found during the 2011 inspection of the site (McElvogue 2011) and in 2013 a new primary datum was inserted into the rock within 50mm of the original primary datum (McElvogue 2013b: 18). The primary datum installed in 2013 was located during the 2014 survey (see Figures 2- 4).
- 2.4.6. This primary datum could thus be used to assign spatial information to site plans produced in the 1970s and 1980s. Therefore, during the 2014 survey a GPS position was taken on the primary datum allowing the original site excavation plans to be georeferenced. The datum position was used as one georeferencing point (Figures 2- 4).
- 2.4.7. The results of the geophysical survey undertaken prior to dredging in 2011 show the underwater bathymetry in this area of the site, and were used to further guide the georeferencing of the site plans. This data was used as a guide to rotate and scale the 1970s and 1980s excavation plans, using the correlation between the underwater bathymetry as

depicted in the excavation plans and that shown by the pre-dredge geophysical survey. There was found to be a strong correlation between recorded underwater topographic features on the site plans and geophysical survey results.

- 2.4.8. The third element used to check the accuracy of the georeferencing of the excavation plans was the scale published on the plans themselves. The scale bar on these plans represents a distance of 20m. When the scale bar on the georeferenced plans was measured in ArcGIS the distance proved to be c.20m. This indicates that in terms of scale the georeferencing of these plans is likely to be accurate, while the correlation between the underwater topography depicted on the site plans and geophysical survey results indicates that the location of the georeferenced plans is also accurate. Thus the overall georeferencing of these plans is considered to be accurate.

Overall Site Plans

- 2.4.9. **Georeferencing.** Early on in the georeferencing process it was found that, in most cases, the coastlines represented on the overall site plans did not have a good correlation with the coastlines as mapped on modern navigational charts or polylines of the coastline available from the Ordnance Survey, presenting a problem for georeferencing. The inadequacy of the Ordnance Survey maps available in the 1970s for the purposes of recording the archaeological wreck site led the excavation team to draw up a new map of the whole South Mouth (Price and Muckelroy 1974), explaining the discrepancy between the coastlines depicted.
- 2.4.10. This discrepancy was noted in the majority of the overall site plans, with the exception of those published in the interim report for the fifth season of excavation, published in the IJNA in 1979 (Price and Muckelroy 1979), and in *Scotland's Historic Shipwrecks* (Martin 1998). These plans showed a greater correlation with coastlines and underwater bathymetry as currently mapped. Thus these plans were georeferenced using the coastline.
- 2.4.11. The primary datum is not depicted on any of the overall site plans. However, comparison with the detailed excavation area plans gives an indication as to the location of the datum on some overall site plans. The general underwater bathymetry in the area excavated during the 1970s-1980s is depicted on the overall site plan published in the IJNA, 1973 (Forster and Higgs 1973). This bathymetry, and importantly the point on which the datum is situated, is visible on the overall site plan published within the 1973 IJNA volume (*ibid*). Thus the location of the primary site datum, as represented by the topography shown on the overall site plans, was used as a georeferencing point.
- 2.4.12. As the coastlines on these overall site plans did not match the coastlines shown on modern mapping, they could not be used for accurate georeferencing. No other features of the natural landscape are depicted on these plans. Therefore it was necessary to use archaeological features to georeference the plan.
- 2.4.13. The archaeological features chosen as georeferencing points comprised Anchors 2, 3 and 4, within the southern part of the site. These features were chosen for a number of reasons. Firstly, they lie a considerable distance away from the area dredged in 2011, and thus are unlikely to have undergone disturbance. Secondly, the size of the anchors indicate that they are unlikely to have been moved by seabed processes since the site plans were produced during the 1970s. Finally, despite the problems georeferencing the overall site plans directly their depiction of local areas around features proved relatively accurate and the position of the anchors relative to one another and Stoura Stack was verified as accurate by the 2014 diver surveys.

- 2.4.14. Once the 1973 plan was georeferenced using the primary datum location and anchors within the southern part of the site there was observed to be a good correlation with the later overall site plans georeferenced using the coastline (Martin 1998, Price and Muckelroy 1979), with the same archaeological features on both the 1973 plan and later plans (1979 and 1998) appearing in the same approximate locations in ArcGIS.
- 2.4.15. These plans, comprising those published in 1973 and 1979 in the IJNA, and the plan published in *Scotland's Historic Shipwrecks* (Martin 1988), provided the basis for georeferencing other site plans. The overall site plan published in the 1974 IJNA volume georeferenced poorly (Price and Muckelroy 1974). However, the majority of the features shown are depicted on other plans with a higher accuracy of georeferencing thus the poor success of the georeferencing of this plan is not material to the understanding of the site.
- 2.4.16. **Accuracy.** Following georeferencing of the overall site plans it was noted that the majority of these plans are diagrammatic in nature, and features depicted are not to scale.
- 2.4.17. While the 1973 site plan (Forster and Higgs 1973) does depict the site and archaeological features in more detail, discrepancies between the measurements of features as given within the articles and measurements taken from the georeferenced plan suggest that the plan may not be exactly to scale. However, the discrepancies between measurements recorded on this plan are much lesser than those shown on other overall site plans, and the 1973 plan is thought to be the most accurate (see section 3.3 and 3.4 for discussion). This plan has therefore been used preferentially where comparison was necessary between seabed remains recorded in 2014 and earlier records of the wreck site.
- 2.4.18. Georeferenced plans have been used to produce Figures 2 and 4. These figures depict the locations of archaeological features from previous investigations of the site, during the 1970's and 1980's, according to the georeferencing outlined above. The primary plan used in the production of this figure was the 1973 overall site plan, due to its detail and apparent accuracy.

3. RESULTS

3.1. Outline History of the Vessel

- 3.1.1. The *Kennemerland* was a 17th-century Dutch East Indiaman, owned by the Dutch East India Company (VOC). In 1664 the vessel was en route to the East Indies, passing Shetland in order to avoid conflict in the English Channel.
- 3.1.2. On the 20th December 1664 the *Kennemerland* wrecked on Out Skerries, Shetland. Analysis of the distribution of finds from the *Kennemerland* site give an insight into the wrecking process (Muckelroy 1978).
- 3.1.3. Heavy items, including thousands of Dutch bricks used as ballast/cargo, lead ingots and a number of anchors are all strewn around the area off Stoura Stack, indicating the location at which the ship struck the rocks. From this point her upper section is thought to have been blown by the southerly gale, up into the South Mouth depositing bricks and cargo at the point the channel shallows (Martin 1998).
- 3.1.4. Further items, including cannon, are strewn with a linear distribution reaching northward toward the Holm of Trolsome, indicating the route of the vessel as she broke up (Martin 1998: 86). The local account of the wrecking, which survives in the rhyme "...on Stoura

Stack she broke her back, and into the voe she ca''' (Martin 1998: 84), gives further support to the interpretation of the wrecking event.

3.2. Outline History of Work on the Site

Early Salvage

3.2.1. Immediately following the wrecking of the *Kennemerland* salvage attempts were made, first by the local community on Out Skerries, and then by the laird of Shetland. It is recorded that the latter used grapnels and hooks to scour the seabed for materials, and, amongst other things, recovered chests with coins which had formed part of the cargo of the *Kennemerland* (Martin 1998: 84).

3.2.2. During the early 18th century Shetlander William Irvine is noted to have dived the sites of the *Kennemerland* and the *De Leifde*, another Dutch East Indiaman wrecked on Out Skerries in 1711, and salvaged items from the wrecks (Canmore ID 102891).

Archaeological Investigations

3.2.3. Following the re-discovery of the wreck in 1971 by divers of the Aston University Sub Aqua Club the *Kennemerland* site was re-visited over a number of years and detailed archaeological investigations, including excavation, were undertaken. The results of these investigations are summarised on Figure 2, and related to the work undertaken in 2014 on Figure 4.

3.2.4. **1971 Survey and Recovery:** The work in 1971 had established the main foci of wreck remains and had identified numerous larger features including cannon and anchors. Finds recovered from the *Kennemerland* included four cast iron cannon, five anchors, three Bellarmine jugs and Dutch bricks. The results of this investigation were presented in:

- Forster W A and K B Higgs, 1973. 'The Kennemerland, 1971. An interim report', *IJNA*, vol.2, 2: 291-300

3.2.5. **1973 Survey and Excavation:** The site was visited for a second season of diving in 1973 by Aston and Manchester University Sub Aqua Clubs with Richard Price and Keith Muckelroy. Work during this season comprised further surveys aimed at identifying other wreck remains in order to better understand the wrecking process. This resulted in the identification of cannon within the northern part of the site, and an anchor within the southern deepwater part of the site. Excavations were also undertaken (areas A-F, see Fig. 2 for the extent of these excavations) where the South Mouth channel shallows. These excavations aimed to establish an understanding of the type of cargo, stores and equipment associated with a mid-17th century Dutch East Indiaman (Price and Muckelroy 1974).

- Price, R. and K. Muckelroy, 1974. 'The second season of work on the Kennemerland site, 1973. An interim report', *IJNA* vol.3, 2: 257-68

3.2.6. **1974 and 1976 Excavations:** Investigation continued in 1974. During this third season excavation continued in Area F. In 1976 more extensive excavations were undertaken in Area C, and a new area, Area G, was also excavated. The majority of the one hundred and nineteen lead ingots, found off Stoura Stack, were also lifted in 1976 (Price and Muckelroy 1977). The remainder were lifted in 1978. The site was used to understand and discuss filtering processes and scrambling devices on archaeological wreck sites (Muckelroy 1976).

- Muckelroy, K, 1976. 'The integration of historical and archaeological data concerning an historic wreck site: the Kennemerland', *World Archaeology*, vol.7, 3: 280-90
 - Price, R. and K. Muckelroy, 1977. 'The Kennemerland site. The third and fourth seasons 1974 and 1976. An interim report', *IJNA vol.6*, 3: 187-218
 - Price, R., K. Muckelroy and L. Willies, 1980. 'The Kennemerland site, a report on the lead ingots', *IJNA, vol.9*: 7-25
- 3.2.7. **1978 Work:** The fifth season of work was undertaken in 1978. This season focused around conducting metal detector and visual surveys to further determine the extent of the site. Excavations were also conducted around areas A-G, around cannon 3 and anchor 1, and around Stoura Stack. The site was designated under the Protection of Wrecks Act (1973).
- Price, R. and K. Muckelroy, 1979, The Kennemerland site, the fifth season, 1978. An interim report. *IJNA vol.8*: 311-20
- 3.2.8. **1984 and 1987 work:** Keith Muckelroy's death in a diving accident in Loch Tay in 1980 halted operations on the *Kennemerland* site. When work re-commenced in 1984 Chris Dobbs led the excavations, following on from the 1978 season. The seventh season of diving was also led by Chris Dobbs, in 1987. Excavations continued in this season.
- Dobbs, C., T., C. and Price, R, 1991. 'The Kennemerland Site. An interim report. The sixth and seventh seasons 1984 and 1987, and the identification of five golf clubs', *IJNA, vol.20*: 111-22
- 3.2.9. **1988 Work:** During the eighth season in 1988 the site was surveyed. The survey was led by Chris Dobbs. The ADU also visited the site.
- 3.2.10. **1992:** The site was investigated in 1992 prior to the installation of a navigational beacon by the Shetland Islands Council. The *Kennemerland* site was not thought to have been disturbed.
- 3.2.11. **1996 ADU survey:** In 1996 the ADU visited the site, and conducted a video and photographic survey. The site was also investigated using an ROV by the ADU in 2002.
- 3.2.12. **2010 Onwards:** In 2010 a survey license was issued to Dr Douglas McElvogue to conduct surveys prior to dredging of the site by Shetland Islands Council, to allow access along the South Mouth to the Out Skerries ferry during all weathers and tides. This survey recorded archaeological features and the primary datum was relocated (McElvogue 2011). A survey licence report and mitigation survey were produced in 2011. Following these surveys and assessments an archaeological watching brief was conducted within the Sound during dredging operations and controlled explosions (McElvogue 2013a). Impacts upon the *Kennemerland* site were assessed by a post-dredge survey and were found to have been minimal (McElvogue 2013b).
- McElvogue, D. 2011. *Kennemerland site survey*. TrenDarc Unpublished report.
 - McElvogue, D. 2013a. *Kennemerland Watching Brief*. TrenDarc Unpublished report.
 - McElvogue, D. 2013b, *Kennemerland Post-Dredging Survey*. TrenDarc Unpublished report.

3.3. 2014 Archaeological Results

Underwater Work

- 3.3.1. During the course of the project a total of 31hrs and 37mins bottom time was achieved on site over the course of eight working days. Fifteen individual features were located of which 12 were identified on historic site plans.
- 3.3.2. The primary site datum was located and position-fixed at the start of the project to ensure a known and fixed point was used in the georeferencing of the site plans (see section 2.4 for full discussion and Figures 2- 4). The positions of features recorded during the 2014 season are depicted on Figure 3. Orientations of features depicted on Figure 3 recorded during the diver surveys reflect those shown on historic site plans, and therefore have been used to inform orientations depicted on Figure 3. A comparison with the positions of features as shown on georeferenced plans of previous archaeological works is depicted on Figure 4.
- 3.3.3. **KEN1001** is a spread of bricks identified in the general vicinity of those marked on the historic plans (e.g. Forster and Higgs 1973) and lying in proximity to **KEN1002** (Figure 3). The bricks are broadly homogenous in size and appearance. A sample brick was recovered for investigation on the surface, it measured 165mm x 75mm x 27mm, and was yellow/orange in colour with darker patches and pinkish inclusions. The brick showed signs of wear consistent with it having been in a dynamic underwater environment. The brick was returned to site once recorded.
- 3.3.4. **KEN1002** is an iron cannon situated to the east of the spread of bricks (Figure 3). The cannon lies on a rock within a gully and is orientated approximately north-south with the muzzle facing south. The approximate length is 1.5m but the condition is poor with the muzzle either worn or broken into a point. The feature was position-fixed (Figure 3). The cannon was not marked on historic site plans but had been reported by Dr Douglas McElvogue following his 2013 work (McElvogue 2013b, Fig. 7).
- 3.3.5. **KEN1003** is an iron cannon which lies within the shallow-water part of the site. A GPS position was taken on the cannon (Figure 3). The cannon is thought to relate to Cannon 3 on the historic site plans (Figure 2). The orientation of the feature was checked against the existing site plan.
- 3.3.6. **KEN1004** is an anchor. Approximately 1m of the shank is visible before becoming being buried under the rocky seabed, one arm is largely complete with the fluke visible and measures 1.75m from shank to tip. One arm and a portion of the crown has broken off, however the area where the break would have occurred is rounded suggesting a historical, rather than modern, break. The feature was position-fixed (Figure 3), and is thought to be the anchor noted as Anchor 2 on the historic site plans (Figure 2).
- 3.3.7. **KEN1005**, **KEN1006** (Figure 8) and **KEN1017** (Figures 5 and 7) are three anchors. Two anchors, **KEN1017** and **KEN1005** lie approximately east-west, shank to crown, the third anchor **KEN1006** lies approximately north-south with the crown to the north of **KEN1005**.
- 3.3.8. **KEN1017** is the largest of the three anchors but is partially buried by sand and rocks (Figures 5 and 7). Approximately 2m of the shank is exposed, and the angle of the anchor indicates the remainder of the shank is buried further into the seabed. The flukes are buried leaving the crown exposed with a distance of 2m between the ends of the exposed arms. At the widest point the exposed width of the shank is c.250mm and that of the arms is c.200mm.

- 3.3.9. **KEN1005** lies to the west of **KEN1017**, with the crown over the potential buried part of the shank. The anchor measures c.2m from fluke to fluke with c.3m of the shank remaining. At the widest point the diameters of the shank and the arms are c.180-200mm.
- 3.3.10. The third anchor in the group is **KEN1006** which lies north-south with the crown alongside the shank and to the north of **KEN1005**. The anchor is the smallest in the group. Measurements were not taken due to time constraints on the dive.
- 3.3.11. The position for the anchors is taken from the centre of the southernmost arm of **KEN1005** (Figure 3).
- 3.3.12. Two of these anchors are marked as Anchors 3 and 4 on the historic site plans (e.g. Forster and Higgs 1973) (Figure 2), the third is believed to be marked on the 1979 diagrammatic site plan (Price and Muckelroy 1979) but not numbered. This anchor may have been first recorded during the 1978 season, following the removal of boulders from the area of Anchors 3 and 4 (**KEN1005** and **KEN1006**), (Price and Muckelroy 1979: 312).
- 3.3.13. A spread of yellow bricks, **KEN1007**, similar to **KEN1001** was observed on and surrounding **KEN1005** and **KEN1006** (Figure 3). The bricks were yellowish in appearance with inclusions similar to those observed in **KEN1001**. The bricks could originate from the galley, however the distribution across the site may indicate other origins such as cargo or paying ballast as suggested by Price and Muckelroy (1974).
- 3.3.14. **KEN1008** is an anchor. Sufficient time to undertake measurements was not available on the dive but it appears similar in size to **KEN1005**. The anchor (**KEN1008**) was position-fixed (Figure 3) and is located approximately 13m west of the position for Anchor 1 on the georeferenced historic site plans (Figures 2 and 4). A thorough search of the area was undertaken but no evidence of any further anchors was found leading to the conclusion that Anchor 1 was **KEN1008**.
- 3.3.15. An iron pipe, **KEN1009**, partially buried in the sand, was found to the west-south-west of Ceila Stack (Figure 3), in the general vicinity of those marked on the historic site plan (Forster and Higgs 1973). The pipe was not thought to be contemporary with the *Kennemerland*, and the earlier archaeological works noted that the pipes in this area were clearly modern (Forster and Higgs 1973: 296). A GPS position was not taken on the pipe. Its general location is shown on figure 3.
- 3.3.16. An iron knee with cuprous fastenings was located between Peerie Stack and Ceila Stack on a sandy and stony seabed. Iron knees and cuprous fittings are not contemporary with the *Kennemerland* but the position was taken and the feature recorded as **KEN1010** (Figure 3). Both sides of the knee measure c. 1.2m and disappear into the seabed.
- 3.3.17. A second iron knee with cuprous fastenings, **KEN1011**, was identified on the side of a gully in rough proximity to **KEN1010**. The remaining structure is curvilinear, c. 2m in length and is likely to be contemporary with **KEN1010**. A GPS position was not taken for the feature due to other dive objectives, but its general location was noted (Figure 3).
- 3.3.18. **KEN1012** is a pool of mercury (Figure 10) situated under a ledge, toward the southern edge of the shallow-water part of the site (Figure 3). The mercury lies in the same general area as that recorded in 2013 (McElvogue 2013b: 16). The 2013 investigations recorded two pools of mercury which lay c. 2m apart, approximately 32m down the datum line set up from the primary datum in 2013 (McElvogue 2013b: 16). Mercury had also been recorded in this area

by earlier investigations (Forster and Higgs 1973), indicated on the original site plans by the flagons in which it had been stored (Forster and Higgs 1973).

- 3.3.19. Alongside **KEN1012**, the mercury, there is a spread of lead musket and pistol shot. It is possible that smaller lead balls noted in the area may be pistol shot worn due to the dynamic environment. The spread has been recorded as **KEN1013** and the position recorded is the same as that for the mercury (Figure 3).
- 3.3.20. During a metal detector search around Anchors 2, 3 and 4 (**KEN1004**, **KEN1005** and **KEN1006**) a number of lead tangles were observed, and their general positions recorded (Figure 3). An individual tangle, **KEN1014**, which was folded in two was sketched on site. The tangle measured c.50-60mm with four identifiable square nail holes. The objects are consistent with those used on-board wooden vessels to make running repairs.
- 3.3.21. At the northern end of the site, within the shallow-water area, one cannon (**KEN1015**) was recorded (Figure 9). A position-fix was taken on this cannon (Figure 3). A group of cannon (named as Cannon 4, 5 and 6) are recorded in this area on the historic plans (e.g. Forster and Higgs 1973), (Figure 2). The group lie in a line along a north-south orientation with a distance of 25m from Cannon 4 to Cannon 6 recorded on historic site plans (Forster and Higgs 1973). The cannon recorded during the 2014 diver survey (**KEN1015**) was located c. 4m from the position of Cannon 5 and the orientations broadly fits with that recorded previously so it would seem likely that **KEN1015** equates to Cannon 5 (Figures 4 and 9).
- 3.3.22. Despite an extensive search along a corridor extending 50m north and south (Figure 3) no further cannons were located. The inability to find the two cannons recorded within this area on the historic site plans may be because the area was covered in a dense blanket of kelp during the 2014 diver survey. Alternatively, it is possible that the cannon which currently lies adjacent to the toilet block at the pier (**KEN1019**) and is thought to have originated from the *Kennemerland* may have derived from this part of the site (see paragraph 3.3.29 for discussion). However, due to the extensive kelp cover the absence of any of the cannon on the seabed cannot be verified.
- 3.3.23. Whilst moving loose surface sediment from **KEN1017** prior to photography, a lead ingot measuring 810mm x 300mm x 110mm was discovered. The ingot is flat, diamond-shaped and similar in appearance to those recovered during previous excavations (Price and Muckelroy 1980). A further ten ingots of varying sizes, but of similar shape, were then identified in the area between the anchor **KEN1017** and the cliff to the east (Figures 5-7). The group of ingots is recorded as **KEN1016** and individually as **KEN1016 (.01-.11)** each ingot is described in table 1 below. It was noted that most of the ingots had markings consistent with those detailed from previous excavations (e.g. Figure 6). No further recording of the markings took place on this project due to time constraints.

Ingot number	Length	Width (end)	Width (middle)	Depth	Notes
KEN1016.01	810	160	300	110	Fully exposed.
KEN1016.02	710	140	240	120	Fully exposed, lying over ingot 03
KEN1016.03	800	120	250	85 - Partially Buried	Lying off crown of anchor, under ingot 01 and 02.
KEN1016.04	250	0	0	65	Lying under the anchor crown on its edge.

Ingot number	Length	Width (end)	Width (middle)	Depth	Notes
KEN1016.05	540	140	210	140	Partially buried ingot, under tip of 02.
KEN1016.06	720	130	270	110	Fully exposed ingot, lying on top of 09.
KEN1016.07	840	90	250	120	Fully exposed ingot, lying on top of 08.
KEN1016.08	600	120	250	90 Partially Buried	Partially buried ingot.
KEN1016.09	660	140	320	100	Partially buried along one side, under 06.
KEN1016.10	730	120	220	125	Partially buried under 09.
KEN1016.11	600 plus	-	-	-	Buried with all but its top face exposed.

Table 1: Dimensions of ingots (in mm)

- 3.3.24. The ingots were recorded off Stoura Stack, at the base of the north-western edge of the underwater cliff (Figures 5 and 7). A plan of the positions of the ingots (**KEN1016**) relative to the anchor (**KEN1017**) and cliff is shown in Figure 5.
- 3.3.25. During a safety stop on top of the cliff directly above **KEN1016** divers noted the presence of concretions and lead shot (**KEN1020**), no further investigation of this took place, but the general position was recorded (Figure 3).
- 3.3.26. A cannon, oriented east-west, was recorded to the south-west of Ceila Stack (**KEN1018**). A GPS position was taken on the cannon (Figure 3). During the previous investigations which have taken place on the site (Price and Muckelroy 1979) a cannon was recorded to the south of Ceila Stack (Figure 2), along the same orientation of the cannon recorded during the 2014 diver survey (**KEN1018**). This may represent the same cannon, however this cannot be verified as the original site plan that depicts the cannon to the south of Ceila Stack is diagrammatic in nature and does not show features to the correct scale (see section 2.4). When georeferenced the 1979 overall site plan depicts the cannon with a length of c. 15m - demonstrating the diagrammatic nature of this plan, and hampering comparison between the exact location of this cannon and cannon (**KEN1018**).
- 3.3.27. To the east of the South Mouth and to the east of Old Man's Stack two cannon (Cannon 1 and 2) and a concretion (Concretion 1) are plotted on the historic site plan (Forster and Higgs 1973), (Figure 2). A limited search of the area was undertaken but no features were identified, potentially due to extensive kelp cover (Figure 3).
- 3.3.28. A comparison between the positions of seabed remains as recorded in 2014 and the georeferenced positions of the corresponding remains from the historic site plans is included in Appendix A, and is shown graphically in Figure 4.

Investigations on Land

- 3.3.29. An iron cannon in very poor condition is located on the east side of the toilet block at the quay (**KEN1019**). The cannon has evidently been out of the water for some time and

discussions with the islanders suggest that it was previously recovered from the water and placed on Grunay, where it was recorded by the ADU (Canmore ID 1401). It is generally accepted on the island that the cannon came from the *Kennemerland* site. It is possible that this cannon represents one of those previously recorded on the seabed that were not found by the 2014 diver survey (Cannon 4, 6, 7 or 8).

- 3.3.30. Further cannons can be found on the island, notably a bronze cannon at a private residence which is understood to be from the wreck of the *De Leifde* and an iron cannon in the church grounds. The former has been recorded, with the owner's permission, by Dr McElvogue during previous work on the islands, the results of which will be published in due course. It is possible that further pieces exist on the island although no structured attempt was made to locate them.
- 3.3.31. The islanders have a keen interest in the maritime history of the islands. The island historical society has a portable display that they exhibit at events in the island's hall. The display includes photographs, descriptions of the island's wrecks and a few artefacts that have been donated to them over the years.

4. DISCUSSION

- 4.1.1. The *Kennemerland* is within a designated Historic Marine Protected Area, under Part 5 of the Marine (Scotland) Act 2010 (Historic Scotland 2013, 2014). The archaeological significance of the site has already been established (Historic Scotland 2013) and therefore will not form part of the discussion.
- 4.1.2. The primary objective was to establish an understanding of the seabed remains of the *Kennemerland* as they survive today. This was achieved through the position-fixing of archaeological features and plotting them within a GIS package. A photographic record was made of the features whose location was the primary objective of the dive. Other features have been photographed and videoed where a camera has been available on the dive and time has allowed.
- 4.1.3. Following the location of the datum, the interpretation of the underwater topography and the positioning of other features, the 2014 diver survey was largely informed by the 1973 plan (Forster and Higgs 1973). During the course of the 2014 work the accuracy of the historic plans, in particular that from 1973 (Forster and Higgs 1973), became apparent. The relative accuracy of the georeferenced site plans (in particular the 1973 plan, and notwithstanding the problems with the later diagrammatic plans) suggests that the features identified are likely to be in or around the given positions should they still exist on the seabed (Appendix A shows a comparison between the results of the 2014 diver survey and previous archaeological works). Any inaccuracies that may exist are unlikely to skew or mis-portray the wrecking event or knowledge gained through previous investigations.
- 4.1.4. During the 2014 work a total of 20 features were investigated and, with the exception of the cannon which lies on the quay, the locations of the features are depicted on Figure 3. Ten features, including the site datum, were recorded using the GPS. Where a GPS position was not taken it was due to the location of the feature not being the primary objective of the dive or the feature represented a spread of artefacts (such as bricks) in a position consistent with the historic site plans. General positions were, however, noted (Figure 3).
- 4.1.5. Of the features dived, only Cannon 1, 2, 4 and 6 were not found. Cannon 1 and 2 may be located under the dense kelp cover (although the area around the given locations was

searched thoroughly), and previous discussion of these cannon suggests they are unlikely to have been from the *Kennemerland* (Price and Muckelroy 1974). The dense kelp cover may also have screened Cannon 4 and 6, but due to the shallow depths in which they lay there remains the possibility that they have been recovered to the surface.

- 4.1.6. Time constraints meant that features not discussed above were not investigated.
- 4.1.7. Of the 20 features investigated, five were not recorded on the historic site plans, although **KEN1002**, **KEN1010** and **KEN1011** (a cannon and two iron knees) were alluded to in previous and more current reports (Forster and Higgs 1973: 296; McElvogue 2013b, Fig 7). The other features, **KEN1013** (lead shot) and **KEN1014** (lead tangles), are common finds on historic wreck sites. The former (**KEN1013**), derive from an area where extensive excavations conducted during the 1970s and 1980s used artefacts such as this to understand formation processes at work on this and other wreck sites (e.g. Dobbs and Price 1991; Muckelroy 1978; Price and Muckelroy 1974). Over 3000 lead shot have previously been found in this part of the site (Price and Muckelroy 1974). Additionally lead sheeting which may have been used on the hull has been recovered from Area A of the excavations (Price and Muckelroy 1974), and in the vicinity of Peerie Stack (Price and Muckelroy 1979: 313).
- 4.1.8. **KEN1016**, the spread of lead ingots, is located to the north-west of Stoura Stack. During the 1976 and 1978 dive seasons the area around Stoura Stack was investigated, and 119 ingots visible in the area at that time were recovered (Price and Muckelroy 1979; Price, Muckelroy and Willies 1980). The investigations during the 1970's also included a metal detector survey which produced a large number of contacts in the area to the north-west of Stoura Stack, possibly relating to further ingots, buried at the time of the metal detector survey (Price, Muckelroy and Willies 1980: 7). The corresponding locations of the contacts recorded by the metal detector survey and the spread of ingots recorded during this seasons diving (**KEN1016**) make it likely that the ingots recently recorded (**KEN1016**) are, at least in part, responsible for the responses seen within the 1970s metal detector survey.
- 4.1.9. The 1977 site plan (Price and Muckelroy 1977: 199) details areas from which ingots have been recovered, primarily from a deep gully to the south of Stoura Stack, but also from the north-west of the stack, adjacent to the area where the spread of ingots were found (**KEN1016**) during this seasons work (Figure 5). There have also been recoveries of partially buried ingots from this general area subsequent to the main phases of lifting, however no excavation has taken place in this area. The ingots recorded during this seasons diving (**KEN1016**) indicates the potential for further ingots to be located in this area, both along the cliff and in the shallows.
- 4.1.10. The ingots lie in close proximity to an anchor (**KEN1017**), oriented with its shank east-west. There have been problems correlating this anchor with those recorded off Stoura Stack by the previous archaeological investigations. This anchor may have been recorded in the 1978 season. The report for the 1978 season of work states that following the removal of boulders from the area of Anchors 3 and 4 (**KEN1005** and **KEN1006**) another anchor was discovered (Price and Muckelroy 1979: 312), which, descriptively speaking, matches the location of anchor **KEN1017**. However, the plan which accompanies this report records only one anchor oriented with its shank east-west. This is thought to represent Anchor 3, also shown along this orientation on other plans (Forster and Higgs 1973), and thus anchor **KEN1017** may be shown on a different orientation to its current position. However, this suggestion is tentative as it is based on comparison with the 1979 plan, whose diagrammatic nature has been discussed above.

- 4.1.11. It is worth noting at this point that the site has been subject to a number of investigations since the creation of the original site plan. There is potential for features to have been moved during excavation works or recovered from the seabed, this is certainly true of **KEN1019**, the cannon on the quay.
- 4.1.12. With the main objective being to establish an understanding of the surviving seabed remains of the *Kennemerland*, the location of features was the primary objective of most dives. Areas of further archaeological potential therefore include those features for which there was no time to investigate. The area investigated is shown on Figure 3.
- 4.1.13. The site has been subject to a number of archaeological investigations, including excavation and survey, in the period since the 1970s (e.g. Price and Muckelroy 1973, Dobbs and Price 1991 and Price and Muckelroy 1979 for extent of previous surveys). Excavation has previously been focused within the shallow water area of the site (e.g. Price and Muckelroy 1977), and as such large areas remain as yet unexcavated. Methodological excavation of these areas has the potential to uncover further archaeological material.
- 4.1.14. Limited investigation in areas that could have been assumed to have been previously searched, the areas around **KEN1017** and **KEN1020** are good examples of this, can still provide archaeological material and on a large scale. Further finds will only add to the archaeological record increasing our understanding of the site.
- 4.1.15. In terms of surveys, while the 1979 plan (Price and Muckelroy 1979) may be more limited in detail when compared with earlier, detailed plans such as the 1973 plan (Forster and Higgs 1973), it does illustrate the areas which had been searched, and those which had not, by 1979 (Price and Muckelroy 1979). This plan indicates that much of the deep-water parts of the site have not been systematically searched, although finds have been made in these areas and some investigation, including the removal of the ingots, had taken place. Systematic investigation of these areas has the potential to contribute further to our understanding of the wreck site.

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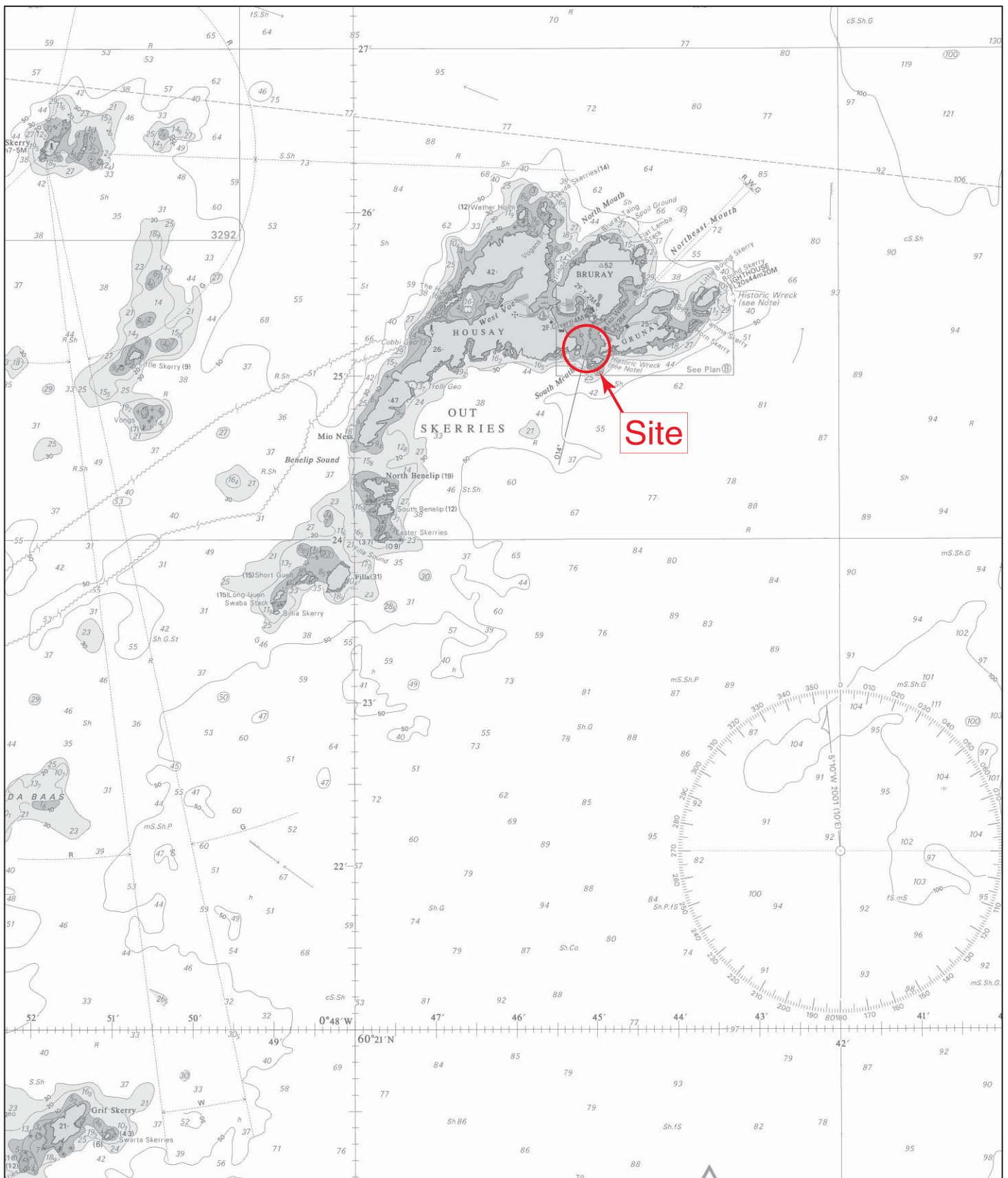
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6. APPENDIX A: POSITIONS OF ARCHAEOLOGICAL FEATURES RECORDED IN 2014 IN RELATION TO THE POSITIONS ON HISTORIC SITE PLANS.

Context number	Position-fixed by GPS	Former name e.g. Anchor 1	Georeferenced Plan used for measurement	Distance/bearing from 2014 GPS point to position of feature on georeferenced plan
KEN1001	N	Spread of bricks (in general area of KEN1002)	IJNA 1973 Fig. 3.	Bricks are shown in the general area of KEN1002 on the plan, but no exact position recorded on plan.
KEN1002	Y	New cannon (but see McElvogue 2013b fig 7)	-	-
KEN1003	Y	Cannon 3	IJNA 1977 Fig. 1	c.3m to east
KEN1004	Y	Anchor 2	IJNA 1973 Fig. 3.*	Same position
KEN1005	Y	Anchor 3	IJNA 1973 Fig. 3.*	Same position
KEN1006	N**	Anchor 4	IJNA 1973 Fig. 3.*	Same position
KEN1007	N	Spread of bricks (in general area of KEN1005-6)	IJNA 1973 Fig. 3.	Bricks are shown in the wider area around of KEN1005-6 on the plan, but no exact position recorded on plan
KEN1008	Y	Anchor 1	IJNA 1973 Fig. 3.	c.13m to east
KEN1009	N	Pipes	IJNA 1973 Fig. 3	Metal bolts and iron debris associated with knees shown within the same general area as KEN1009, but no exact position shown on plan
KEN1010	Y	Iron Knee	-	Not shown on previous site plans
KEN1011	N	Iron Knee	-	Not shown on previous site plans
KEN1012	Y	Mercury	McElvogue 2013b (description), and IJNA 1973 Fig. 3.	In same general area as recorded in 2013 (McElvogue 2013b) and c. 8m to NE of Flagon 3.
KEN1013	N**	Lead shot (close to KEN1012)	-	-
KEN1014	N	Spread of tangles around anchors KEN1005-6	-	-
KEN1015	Y	Cannon 5	IJNA 1973 Fig. 3.	c. 4m to east

Context number	Position-fixed by GPS	Former name e.g. Anchor 1	Georeferenced Plan used for measurement	Distance/bearing from 2014 GPS point to position of feature on georeferenced plan
KEN1016	N**	Ingots (between anchor KEN1017 and Stoura Stack)	IJNA 1977 Fig 10.	Ingots are shown in this approximate location
KEN1017	N**	Anchor (with anchors KEN1005-6)	Not shown on detailed plan	-
KEN1018	Y	Cannon south of Ceila Stack	IJNA 1979 Fig. 2.	c. 27m to ENE
KEN1019	N (on quay)	Unknown (possibly Cannon 4, 6, 7 or 8)	-	-
KEN1020	N	-	-	-
*These anchors were used to guide georeferencing				
** Position calculated from position-fixed feature and seabed measurements. Positions generated in GIS.				



○ Historic Marine Protected Area (site)

0 1km

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Cirencester 01285 771022
Milton Keynes 01908 564660
Andover 01264 347630
www.cotswoldarchaeology.co.uk
enquiries@cotswoldarchaeology.co.uk

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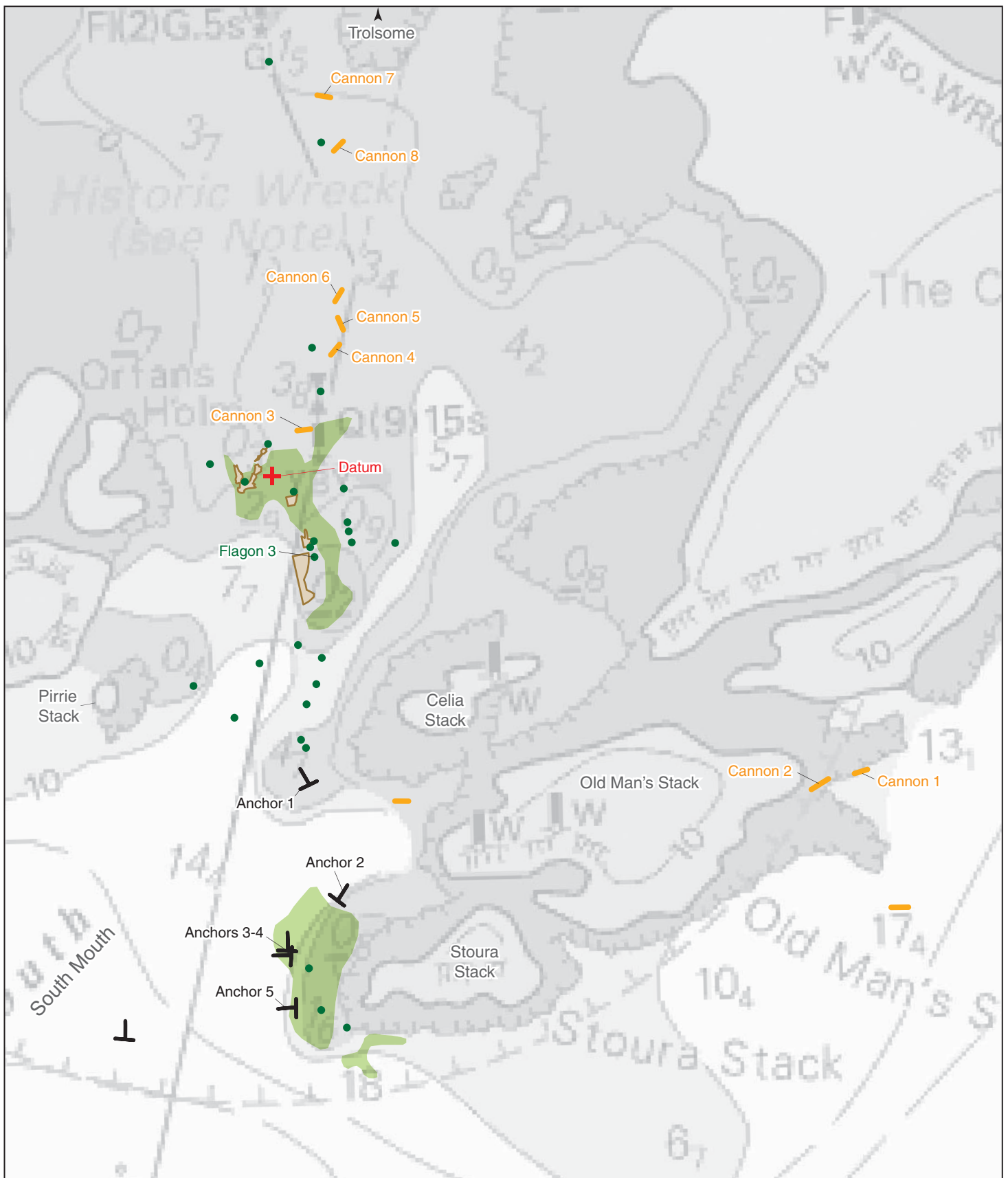
FIGURE TITLE







Site location plan

PROJECT NO. 770001 DATE 01/12/2014
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APPROVED BY JB SCALE@A4 1:25,000

FIGURE NO.

1



-  previous archaeological works
-  spread of finds
-  cannon
-  anchor
-  archaeological find
-  datum



Cirencester 01285 771022
 Milton Keynes 01908 564660
 Andover 01264 347630
www.cotswoldarchaeology.co.uk
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FIGURE TITLE

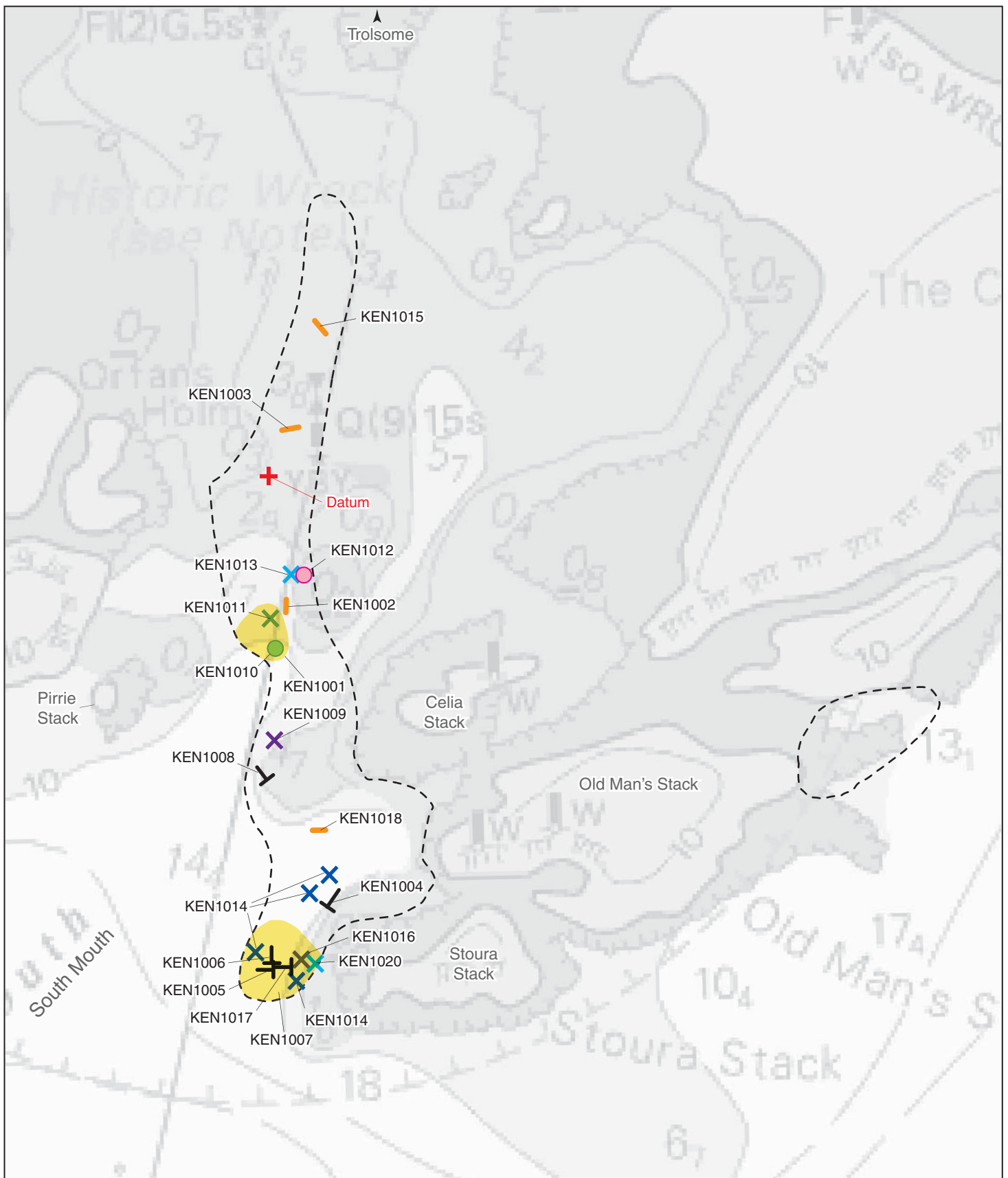
Summary of previous archaeological work, features and extent of the Kennemerland site

PROJECT NO. 770001 DATE 02/12/2014
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FIGURE NO.

2





- Approximate position**
- approx. area covered by divers in 2014 survey
 - spread of bricks
 - iron knee
 - lead shot
 - lead tingles
 - ingot
 - pipe

- GPS position**
- datum
 - cannon *
 - anchor *
 - iron knee
 - mercury

* not to scale (illustrative representation)



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Milton Keynes 01908 564660
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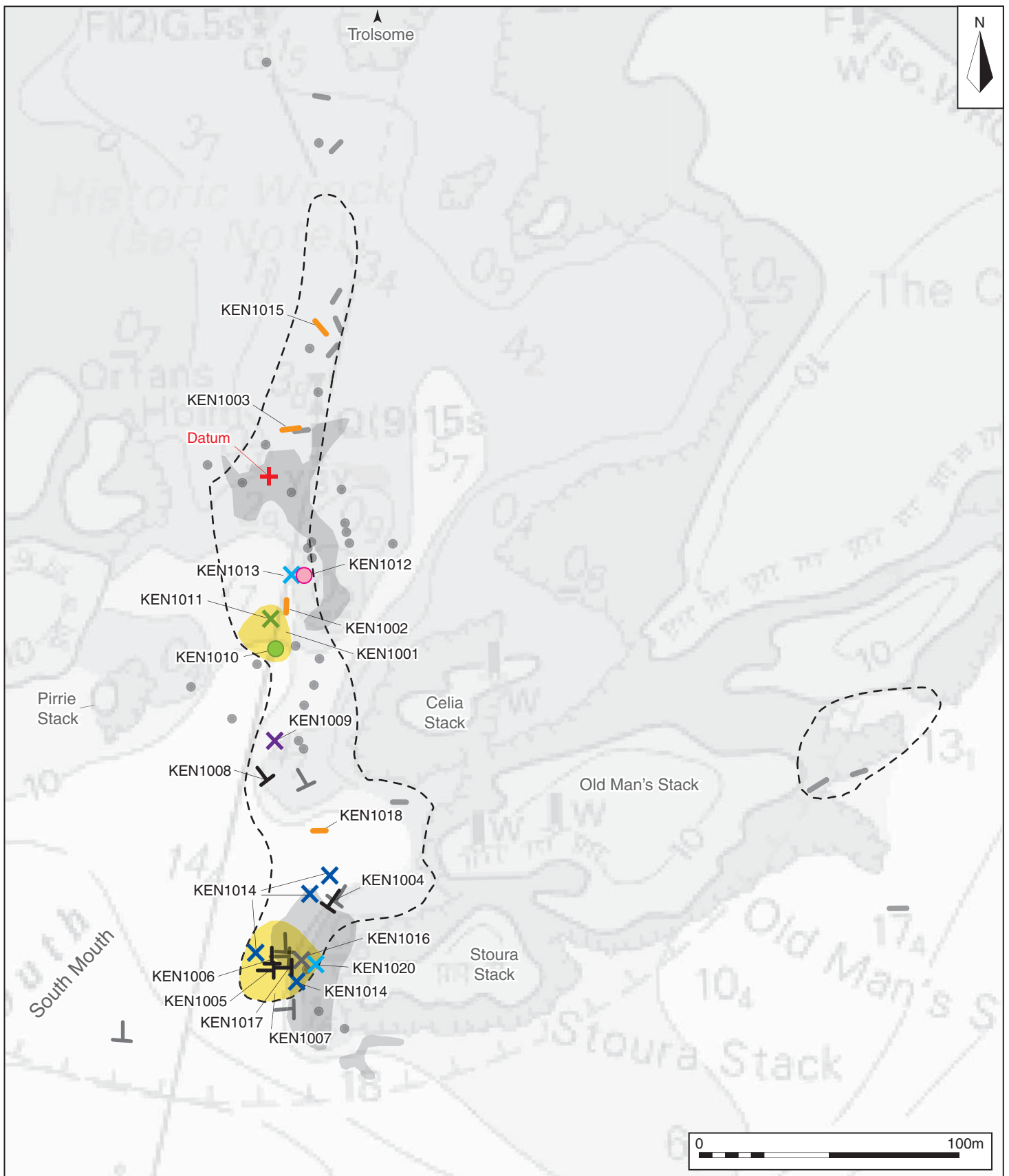
FIGURE TITLE

Contexts fixed during 2014 dive season

PROJECT NO. 770001 DATE 18/12/2014
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FIGURE NO.

3



Previous archaeological work	Approximate position	GPS position
spread of finds	approx. area covered by divers in 2014 survey	datum
cannon	spread of bricks	cannon
anchor	iron knee	anchor
archaeological find	lead shot	iron knee
	lead tangles	mercury
	ingot	
	pipe	

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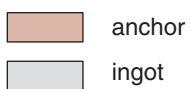
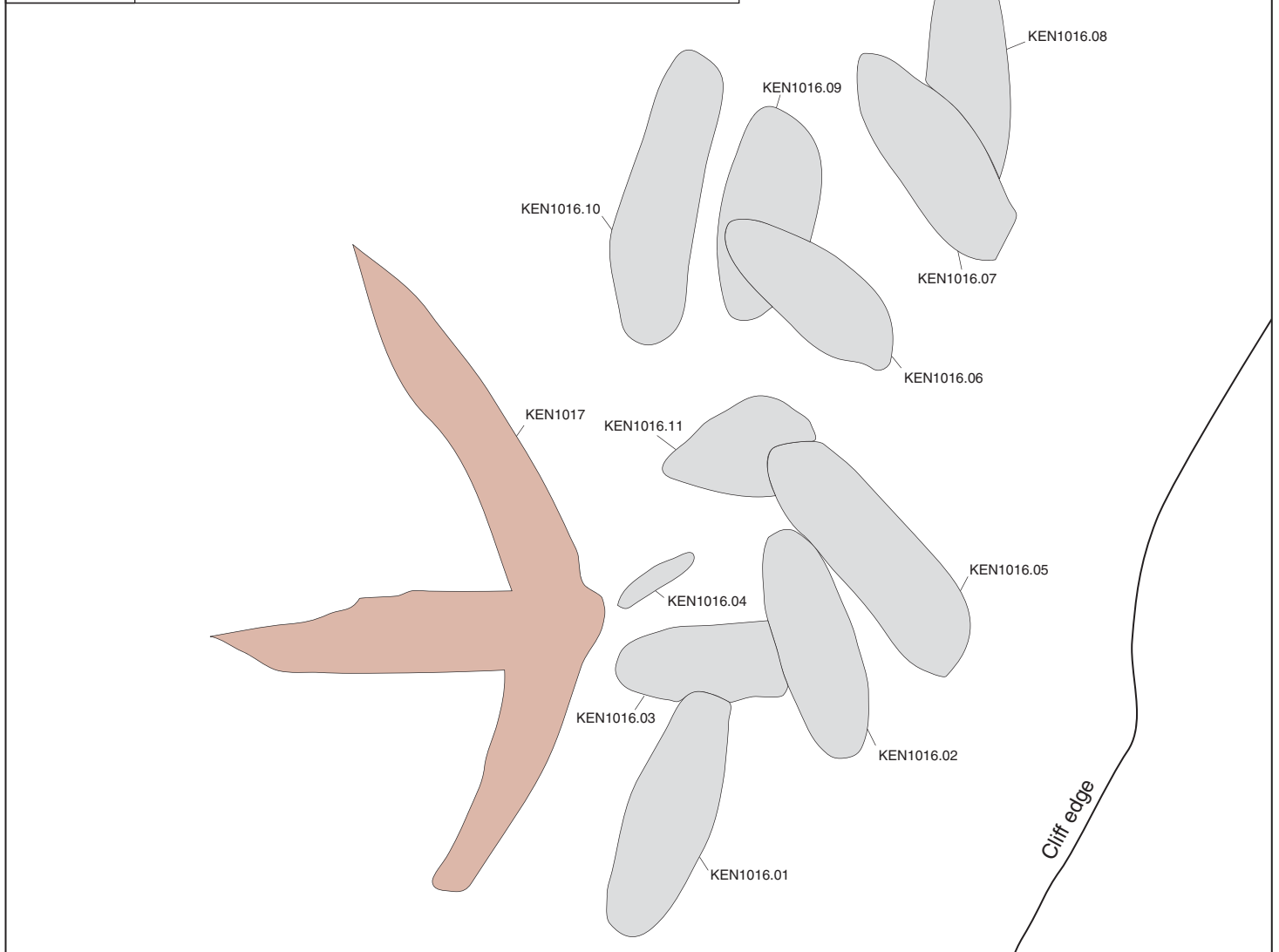
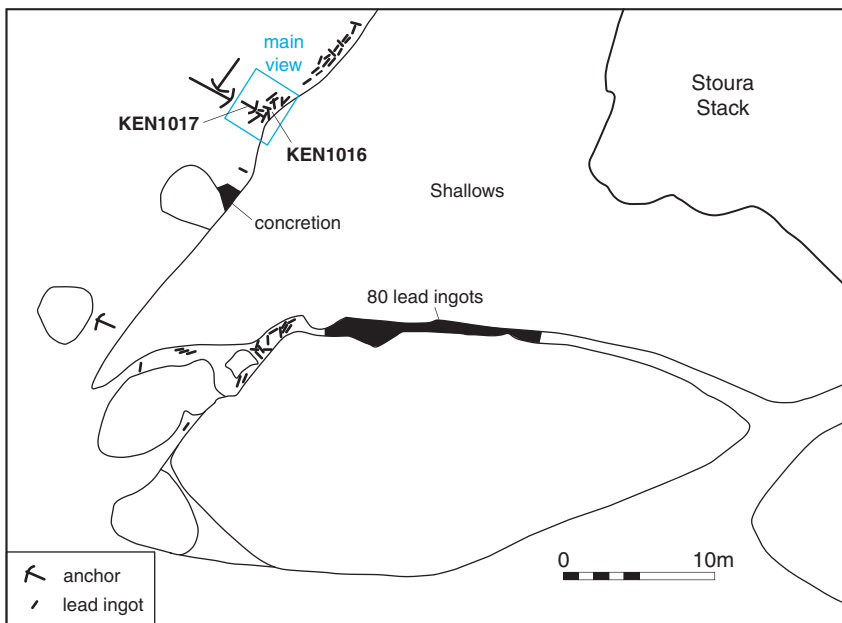
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FIGURE TITLE
 Comparison between location of features on georeferenced plans of previous archaeological work and positions fixed in 2014

PROJECT NO. 770001	DATE 19/12/2014	FIGURE NO. 4
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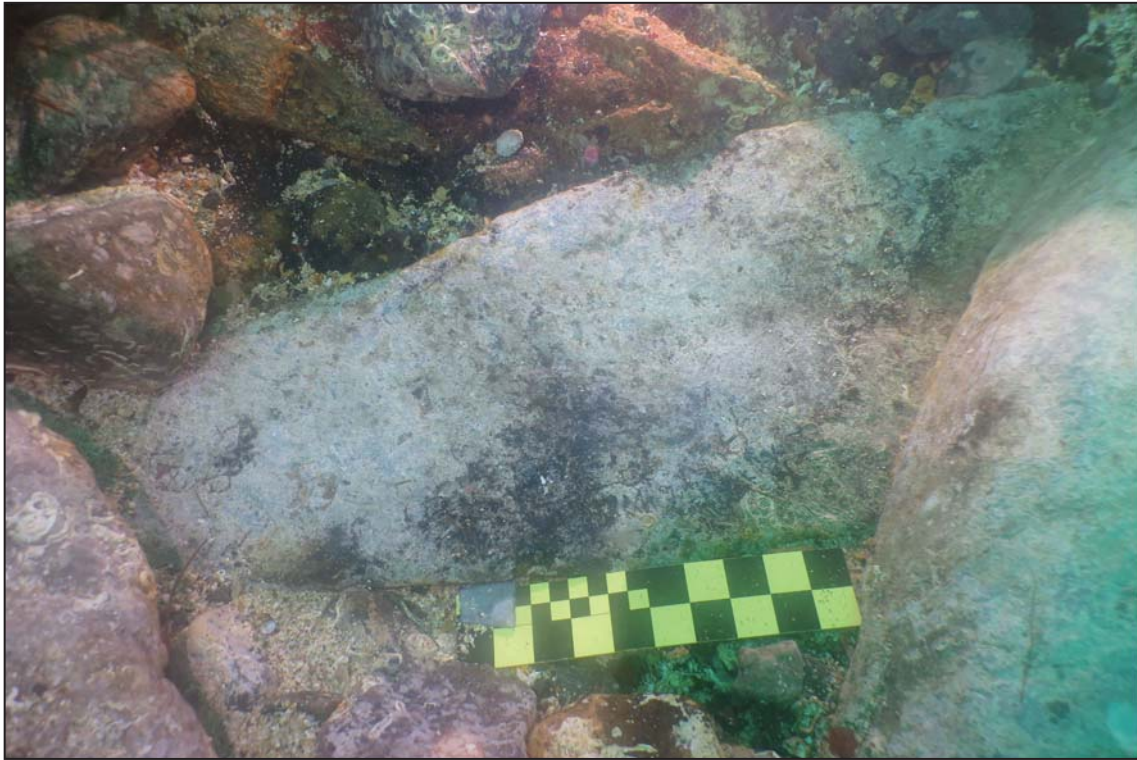
FIGURE TITLE

Plan of lead ingots (KEN1016)
 numbered 1-11 and anchor (KEN1017)

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FIGURE NO.

5



6



7

6 Close up of lead ingot (KEN1016.08) with inscriptions

7 Diver recording ingots (KEN1016) and anchor (KEN1005)



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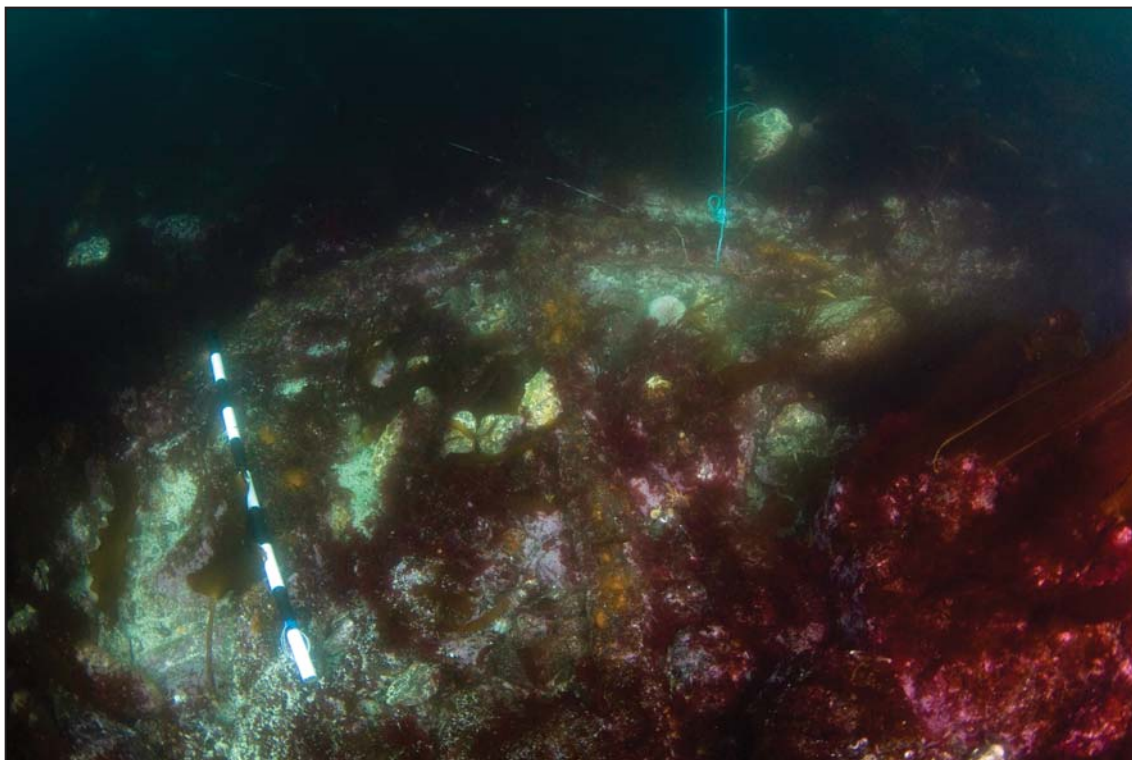
FIGURE TITLE

Photographs

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FIGURE NO.

6 & 7



8

8 Anchors (KEN1005 and KEN1006)



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 www.cotswoldarchaeology.co.uk
 enquiries@cotswoldarchaeology.co.uk

PROJECT TITLE

Kennemerland, Out Skerries, Shetland

FIGURE TITLE

Photograph

PROJECT NO.	770001	DATE	18/12/2014	FIGURE NO.
DRAWN BY	LJH	REVISION	01	8
APPROVED BY	JB	SCALE@A4	N/A	



9

9 Cannon within northern part of the site (KEN1015, formerly cannon 5)



Cirencester 01285 771022
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 Andover 01264 347630
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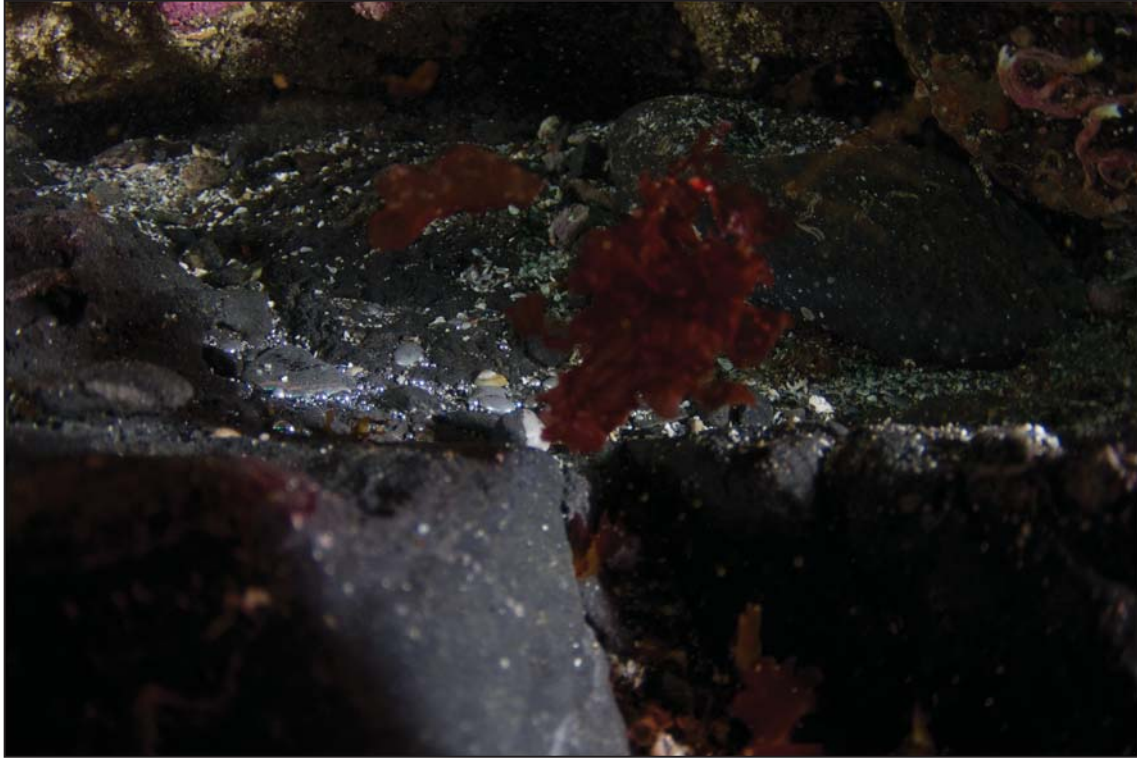
PROJECT TITLE

Kennemerland, Out Skerries, Shetland

FIGURE TITLE

Photograph

PROJECT NO.	770001	DATE	02/12/2014	FIGURE NO.
DRAWN BY	LJH	REVISION	00	9
APPROVED BY	JB	SCALE@A4	N/A	



10

10 Mercury within the central part of the site (KEN1012)



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FIGURE TITLE

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FIGURE NO.

10