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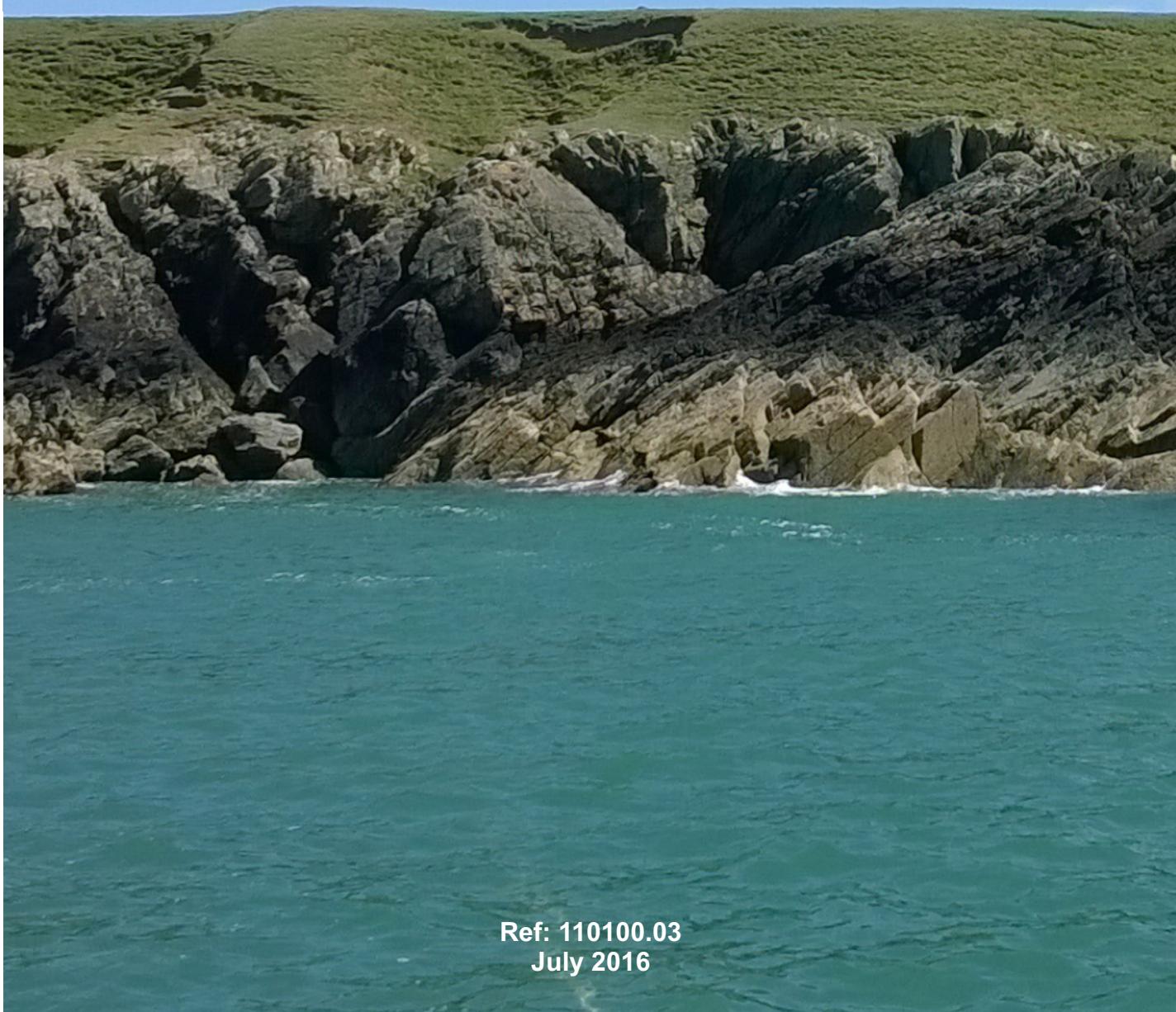
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making sense of heritage

# Wylfa Newydd Proposed New Nuclear Power Station

Marine Archaeological Survey Report



Ref: 110100.03  
July 2016



## **Wylfa Newydd Proposed New Nuclear Power Station**

### **Marine Archaeological Survey Report**

**Prepared for:**

Jacobs U.K. Limited  
1180 Eskdale Road  
Winnersh  
Wokingham  
Berkshire  
RG41 5TU

**On behalf of:**

Horizon Nuclear Power Limited

**Prepared by:**

Wessex Archaeology  
Portway House  
Old Sarum Park  
Salisbury  
SP4 6EB

[www.wessexarch.co.uk](http://www.wessexarch.co.uk)

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# Wylfa Newydd Proposed New Nuclear Power Station

## Marine Archaeological Survey Report

### Contents

Summary .....	iii
Acknowledgements.....	iv
<b>1      INTRODUCTION.....</b>	<b>1</b>
1.1    Project background .....	1
<b>2      METHODOLOGY.....</b>	<b>1</b>
2.1    Potential heritage assets for further assessment .....	1
2.2    Aims and objectives .....	2
2.3    Fieldwork methodology.....	3
2.4    Archaeological assessment.....	3
2.5    Health and Safety.....	4
2.6    Archive .....	4
<b>3      ARCHAEOLOGICAL RESULTS.....</b>	<b>5</b>
3.1    Operational Summary .....	5
3.2 <i>Abbotsford (WA 7033) AEZ</i> .....	5
3.3    WA 7038 – Geophysical Anomaly .....	6
3.4    WA 7042 – Geophysical Anomaly .....	7
3.5 <i>Mary Sutherland Recorded Loss Location</i> .....	7
<b>4      DISCUSSION, CONCLUSION AND RECOMMENDATIONS.....</b>	<b>8</b>
<b>5      REFERENCES.....</b>	<b>8</b>
5.1    Bibliography .....	8
<b>6      APPENDICES.....</b>	<b>10</b>
6.1    Appendix 1: Dive Log .....	10

### Tables

Table 1: Fieldwork Planning Location of Potential Heritage Assets.....	2
Table 2: Confirmed Position of 7038.....	6

### Figures

Figure 1:      Study Area	
Figure 2: <i>Abbotsford (WA 7033) AEZ</i>	
Figure 3:      Geophysical Anomaly <b>WA 7038</b>	

Figure 4: Geophysical Anomaly **WA 7042**

Figure 5: *Mary Sutherland* Recorded Loss location

**Plates**

Plate 1: Metal plate likely associated with the *Abbotsford*

Plate 2a: Side scan sonar image of **WA 7038**

Plate 2b: Photograph of **WA 7038**: bedrock

Plate 3: Bell from the *Mary Sutherland*, at Ye Olde Vigour Hotel, Cemaes

# Wylfa Newydd Proposed New Nuclear Power Station

## Marine Archaeological Survey Report

### Summary

Wessex Archaeology was commissioned by Jacobs U.K. Limited on behalf of Horizon Nuclear Power Limited to undertake a marine archaeological survey of four offshore potential heritage assets, conducted as a diving operation, within the Wylfa Newydd Development Area.

The potential heritage assets identified for further archaeological assessment and the proposed methodology for assessment were described in the *Written Scheme of Investigation for Marine Archaeological Evaluation: Wylfa Newydd Proposed New Nuclear Power Station* (Horizon 2016) and *Site Specific Method Statement (Including Risk Assessment)* (Wessex Archaeology 2016).

Diving operations were carried out over three days, from 14 May to 16 May 2016, in order to increase the understanding of the archaeological potential of the four potential heritage assets. The objectives were to groundtruth, record and characterise two anomalies (**WA 7038** and **WA 7042**) identified in an archaeological assessment of geophysical data (Wessex Archaeology 2011) and to swim-over two areas (1: the overlap between the *Abbotsford* (**WA 7033**) Archaeological Exclusion Zone and the Wylfa Newydd Development Area and 2: the Recorded Loss location of the *Mary Sutherland*).

The results are as follows:

- Ŷ No archaeological material was discovered within the overlap of the *Abbotsford* (**WA 7033**) Archaeological Exclusion Zone and the Wylfa Newydd Development Area, however an isolated find of a metal plate was recorded outside of the swim-over area;
- Ŷ **WA 7038** was confirmed to be a bedrock outcrop;
- Ŷ No archaeological material was discovered in the vicinity of **WA 7042**, and the magnetic anomaly likely represents bedrock as part of the geological trend in the area; and
- Ŷ No archaeological material was encountered in Porth y Pistyll Bay near the Recorded Loss location of the *Mary Sutherland* and it is unlikely that any organic material will have survived in the bay.

In conclusion, the archaeological dive survey achieved all of the objectives and no further marine archaeological evaluation is required at these potential heritage assets.

The Archaeological Exclusion Zone for the *Abbotsford* (**WA 7033**) has been amended to remove the area of overlap with the Wylfa Newydd Development Area.

# **Wylfa Newydd Proposed New Nuclear Power Station**

## **Archaeological Dive Survey Report**

### **Acknowledgements**

Wessex Archaeology was commissioned by Jacobs U.K. Limited, on behalf of Horizon Nuclear Power Limited (Horizon), to undertake an archaeological dive survey of four potential heritage assets situated in the offshore area around the Wylfa Newydd Proposed New Nuclear Power Station. Wessex Archaeology would like to thank Jonathan Dempsey, Robert Bromley, Ian Higham and David Bull from Jacobs U.K. Limited for their assistance.

Wessex Archaeology would also like to thank staff of Horizon Nuclear Power Limited for their assistance, including Dave Harries, Dave Morgan, Daron Hodges, Maia Gralewksi, and Emma Beagley.

Diving operations were undertaken from *Seekat-C*, and Wessex Archaeology would also like to thank Jon Shaw, vessel master, and Brian Wootton, crew, for their invaluable assistance and for sharing their local knowledge.

The dive fieldwork team comprised: Graham Scott (Lead Dive Supervisor), Paolo Croce (Dive Supervisor), Andrea Hamel (Project Officer), and Thomas Harrison (Tender), from Wessex Archaeology, and subcontractor Daniel Ryden. The report was written by Andrea Hamel. Kitty Foster prepared the illustrations. The project was managed for Wessex Archaeology by Toby Gane. Quality Assurance was provided by Dan Atkinson and Toby Gane.

# Wylfa Newydd Proposed New Nuclear Power Station

## Marine Archaeological Survey Report

### 1 INTRODUCTION

#### 1.1 Project background

1.1.1 Wessex Archaeology was commissioned by Jacobs U.K. Limited on behalf of Horizon Nuclear Power Ltd. to undertake a marine archaeological survey, conducted as a diving operation, for four potential heritage assets in the offshore area of the Wylfa Newydd Development Area (**Figure 1**).

1.1.2 The potential heritage assets were identified through previous archaeological desk-based assessments and archaeological assessments of geophysical data, comprising:

- Ŷ A desk-based assessment of onshore and offshore archaeology, undertaken by GAT in March 2010 (GAT 2010) and updated in August 2011 (GAT 2011);
- Ŷ An archaeological assessment of marine geophysical data (Wessex Archaeology 2011);
- Ŷ An archaeological desk-based assessment of marine and maritime archaeology associated with the assessment of marine geophysical data that provided further background regarding archaeological potential (Wessex Archaeology 2012); and
- Ŷ A marine archaeological desk-based baseline report (see appendix D11-3a Marine Archaeology Baseline Report, Application Reference Number: 6.4.71) that compiled the results of the previous assessments and included additional research where appropriate.

1.1.3 The potential heritage assets, all of which are located within the Wylfa Newydd Development Area, are described, along with the methodology for further archaeological assessment in the *Written Scheme of Investigation for Marine Archaeological Evaluation: Wylfa Newydd Proposed New Nuclear Power Station* (Horizon 2016) and *Site Specific Method Statement (Including Risk Assessment)* (Wessex Archaeology 2016).

### 2 METHODOLOGY

#### 2.1 Potential heritage assets for further assessment

2.1.1 The Written Scheme of Investigation (WSI) (Horizon 2016) identified the known wrecks, geophysical anomalies of archaeological interest and potential for archaeological discoveries within the wider Marine Study Area, and identified three potential heritage assets for further assessment by dive survey within the Wylfa Newydd Development Area. The potential heritage assets are as follows and are illustrated on **Figure 1**:

- Ŷ **Abbotsford (WA 7033):** The heritage asset of the *Abbotsford* is a known wreck adjacent to the Wylfa Newydd Development Area that is regularly explored by divers, and was provided with an Archaeological Exclusion Zone (AEZ) in the

baseline assessment (see appendix D11-3a, Application Reference Number: 6.4.71) due to its assessment of **Medium to High** importance. The AEZ comprised a 100 m buffer around the recorded position of the wreck site, which fully encompasses all of the wreck material visible in the geophysical survey data (Wessex Archaeology 2011) and was designed to cover any additional material that could be in the vicinity. The AEZ, as illustrated in the baseline assessment (see appendix D11-3a, Application Reference Number: 6.4.71) and WSI (Horizon 2016), overlaps the Wylfa Newydd Development Area, and therefore the diver survey was designed to assess whether any wreck material was, in fact, present within the overlapping area or whether the AEZ could be revised. Only the 'swim-over area', which constitutes the extents of the potential heritage asset, and the area immediately outside was assessed by archaeological dive survey;

- Ŷ **WA 7038:** an area of debris identified during an archaeological assessment of geophysical data (Wessex Archaeology 2011). The debris was described as three small anomalies grouped together, possibly part of the same feature. Two identical dark reflectors and a third approximately 12 m to the north. The feature measured 3.3 x 1 x 0.2 m. The area of debris was classed as an A2 geophysical anomaly, of uncertain origin and possible archaeological interest; and
- Ŷ **WA 7042:** a magnetic anomaly identified during an archaeological assessment of geophysical data (Wessex Archaeology 2011). The potential heritage asset has no surface expression, but comprises a strong magnetic anomaly (111 nT). It was thought to be either ferrous debris or possibly geological in origin as it was located to the southeast of a broad geological trend. The magnetic anomaly was classed as an A2 geophysical anomaly, or uncertain origin and possible archaeological interest.

2.1.2 The WSI excluded the *Mary Sutherland* Recorded Loss location from the diving assessment as although the *Mary Sutherland*, a wooden smack, was recorded to have been stranded in Porth y Pistyll Bay in 1902, no remains of the wreck have been identified on the seabed at this location to date and assessing Recorded Loss locations through diving operations is generally considered to be unproductive. However, due to flexibility in the diving programme it was possible to include this Recorded Loss location in the archaeological dive survey, as a potential heritage asset. The intention was to search a general area within the bay to assess the potential for the preservation of wooden wreck material.

**Table 1: Fieldwork Planning Location of Potential Heritage Assets**

Potential Heritage Asset	Easting	Northing	Survey Type
Abbotsford (WA 7033) AEZ overlap	235322	394413	Swim-over survey of the area centred on the grid reference provided.
<b>WA 7038</b>	234687	394144	Search at point
<b>WA 7042</b>	234714	394117	Search at point
<i>Mary Sutherland</i> Recorded Loss Location	234590	393620	Swim-over survey of the area centred on the grid reference provided.

## 2.2 Aims and objectives

2.2.1 The aim of the archaeological dive survey was to provide a greater understanding of the archaeological nature of four potential heritage assets considered to be subject to potential impacts as a result of the construction activities due to be undertaken within the Wylfa Newydd Development Area.

2.2.2 The objectives of the diving project were to:

- Ŷ Undertake a ground-truthing exercise using diver survey for the archaeological investigation of potential heritage assets that may be subject to potential impact;
- Ŷ Provide recommendations for any post-investigation requirements (if necessary); and
- Ŷ Produce an archaeological report, as detailed in the WSI (Horizon 2016).

## 2.3 Fieldwork methodology

2.3.1 A detailed fieldwork methodology was presented in the *Site Specific Method Statement (Including Risk Assessment)* (Wessex Archaeology 2016). This section provides a brief overview.

2.3.2 The objectives were achieved using *in situ* inspection by specialist marine archaeological divers using Ultra Short Base Line (USBL) acoustic positioning, recorded descriptions, measured survey and still photographic and video recording. At **WA 7042**, a hand held metal detector was used to search for magnetic anomalies.

2.3.3 Diving was undertaken from the diving support vessel (DSV) *Seekat-C*, a local workboat coded for diving operations up to 60 miles from safe haven and licensed for 12 passengers. The vessel was based at Amlwch Port.

2.3.4 Diving operations took place in daylight only, over three days, from Saturday 14 May to Monday 16 May 2016. The diving operations were conducted in accordance with the Diving at Work Regulations and the Health and Safety Executive (HSE) Scientific & Archaeological Diving Approved Code of Practice (ACoP).

2.3.5 The DSV was anchored during diving operations.

2.3.6 Diving operations were carried out when the tidal current and sea state were not strong enough to constitute a risk to the diver. The locations of the potential heritage assets were all very sheltered, and therefore diving was not limited to the predicted high water and low water slacks, but was possible through most of the tidal cycle. The diving operations were vessel-based and carried out using surface supplied diving equipment in accordance with normal working practices for a small dive team, with a dive supervisor, one diver in the water, a surface standby, a tender and an additional tender for archaeological recording or tending the standby diver if required. The gas mixture used was air, and the decompression tables used were US Navy Air Decompression (Rev. 6). Diver deployment and recovery were by transom door and dedicated ladder.

2.3.7 After entering the water, the diver descended down the shot line (a weighted marker on a line dropped from the boat to the seabed) and was directed to the locations of the potential heritage assets using information derived from the USBL tracking and communicated by hard wire voice communications. The diver was positioned using the USBL to ensure coverage of the location of the potential heritage assets.

## 2.4 Archaeological assessment

2.4.1 The assessment of the potential heritage assets incorporates a Level 1b/2a diving assessment, as defined by the *Model Clauses for Archaeological Written Schemes of Investigations* document and are detailed in full in The Crown Estate (2010, Appendix 1). The Levels are defined as follows:

- Ŷ **Level 1b - Direct (field) Assessment:** A basic record based on diving inspection.
- Ŷ **Level 2a - Non-intrusive Assessment:** A limited record based on investigations that might include light cleaning, probing and spot sampling, but without bulk removal of plant growth, soil, debris etc.

2.4.2 For potential heritage assets that were revealed through diver inspection to be of no archaeological interest, assessment to Level 2a was not necessary.

2.4.3 All archaeological recording was undertaken using Wessex Archaeology's bespoke three-dimensional database, 'Diva'. Diva is a real time recording system that works with three-dimensional positional information. It comprises a Microsoft Access database working in conjunction with ESRI ArcGIS 9.0, dGPS and the acoustic tracking system. The database stores the information and the GIS provides a graphic display of georeferenced data.

## 2.5 Health and Safety

2.5.1 All work was carried out in accordance with the Health and Safety at Work Act 1974, the Health and Safety Management Regulations 1992, the SCAUM (Standing Conference of Archaeological Unit Managers) health and safety manual, Health and Safety in Field Archaeology 2007, Construction, Design, and Management Regulations 2007, and all other relevant Health and Safety legislation, regulations and codes of practice in force at the time.

2.5.2 Work was also carried out in accordance with the *Site Specific Method Statement (Including Risk Assessment)* (Wessex Archaeology 2016).

2.5.3 A site induction was attended at the Horizon Wylfa Site Office by all Wessex Archaeology team members on Friday 13 May 2016. Following the general site induction, the Wessex Archaeology team met with Horizon staff to discuss additional concerns and safety procedures.

2.5.4 A vessel safety induction was delivered by the DSV master, including emergency procedures. The project-specific diving methodology and risk-assessment was delivered by the Wessex Archaeology Lead Dive Supervisor. A project induction was delivered by the Wessex Archaeology Project Officer.

2.5.5 Prior to fieldwork commencing each day, contact was made with the people responsible at Horizon Nuclear Power Limited, Jacobs U.K. Limited and Wessex Archaeology. The coastguard was informed when diving was due to commence and when the dive had been completed. A two-way radio was on hand for contact with Horizon security.

2.5.6 All mandatory PPE was used, and additional PPE was on hand if required.

2.5.7 A full diving-specific first aid kit was carried on board in addition to the DSV first aid kit. In addition, an O2 giving set was carried, together with sufficient O2 gas for transfer to a recompression centre/until handover of a casualty to the emergency services. A stretcher was carried on board the DSV.

## 2.6 Archive

2.6.1 The digital data produced during fieldwork operations, including Diva files, GIS data (e.g. shapefiles), digital photographs and video footage have been saved to the project directory on Wessex Archaeology's server. Dive logs have been retained as part of the hard copy paper archive and scanned into the digital archive. The dive logs are backed up by the Diva recording system which facilitates the recording of dive log data in real time.

2.6.2 ArcGIS 9.0 and ArcGIS 10.2.2 were used during the project to manage, display and analyse GIS data. All GIS data will be attributed metadata to MEDIN standards. Data created in WGS84, such as the Diva trackplots, were projected into WGS84 UTM Zone 30N to ensure compatibility with other datasets, and were projected into British National Grid (BNG) to comply with the project archive.

## 3 ARCHAEOLOGICAL RESULTS

### 3.1 Operational Summary

3.1.1 Six dives were undertaken over three days, from 14 to 16 May 2016 (**Appendix 1**), generating a total of 372 minutes on the seabed. The diving operations were conducted from DSV *Seekat-C*. The potential heritage assets were all situated close inshore and were therefore accessible on most states of the tide, and it was possible to dive on all three days, although it was not possible to dive the *Abbotsford* (**WA 7033**) AEZ on the second day due to adverse wind conditions, and therefore Porth y Pistyll bay was investigated instead.

3.1.2 During all three days the diver tracking system performed well, and positions recorded appear to be very accurate. There were a few occasions with poor tracking on the third day when diving on the *Abbotsford* (**WA 7033**) AEZ, when divers were in gulleys and the acoustic signal was attenuated/blocked, or next to cliffs, however the divers could be tracked on the near side.

3.1.3 The surveys of the four potential heritage assets resulted in fairly complete coverage of the areas being archaeologically assessed.

### 3.2 *Abbotsford* (**WA 7033**) AEZ

#### *Potential Heritage Asset Description*

3.2.1 The overlap between the *Abbotsford* (**WA 7033**) AEZ and the Wylfa Newydd Development Area comprises an area 2,730 m<sup>2</sup> (**Figure 2**). However, the dive survey has determined that much of that area consists of cliffs exposed at low tide.

3.2.2 The area exposed at low tide is a high energy environment, and if any wreck material had been washed onto the cliffs it is unlikely to be well preserved. In addition, the Wales Coast Path extends along the top of the cliff, and it is likely that if material from the wreck were visible, it would already be known and recorded.

3.2.3 The cliffs exposed at low tide were not accessible by diving, however the area that was accessible was explored over two dives. The diver trackplots and recorded observations indicated the edges of the cliffs and the area of seabed that was explored.

3.2.4 The seabed comprises bedrock with boulders covered by a very light layer of silty sand. On the NW side of the AEZ overlap, the seabed consists of a slope of rounded, poorly sorted boulders of varying sizes. There is not much marine growth, however some of the boulders have small amounts of green, flat seaweed. Moving into the gully, the boulders are interspersed with areas of small rounded stones. There are two pinnacles with smoothed surfaces, and in some areas there are small patches of seaweed and kelp.

3.2.5 The lack of seabed sediment indicates that the area is unlikely to be conducive for preservation of organic or small archaeological material, and the smooth stones suggest considerable seabed movement in the area.

3.2.6 Although modern debris, including an aluminium bar, a pop can, a metal spring, a fish hook, a fishing weight, a brick and a golf ball were discovered among the boulders and gulleys,

no material of archaeological interest was encountered within the area of overlap between the AEZ and Wylfa Newydd Development Area.

3.2.7 Therefore, the AEZ for the *Abbotsford (WA 7033)* has been amended to remove the area of overlap with Wylfa Newydd Development Area.

*The AEZ beyond Wylfa Newydd Development Area*

3.2.8 A small area to the north and west of the AEZ overlap was archaeologically assessed while confirming the extents of the overlap area. Within 9 m of the NW side of the swim-over area, archaeological material that probably relates to the *Abbotsford (WA 7033)* was located (**Figure 2**). The material included a ferrous metal plate that measured 0.4 m by 0.5 m by 0.004 m. The plate was partially visible beside a boulder slope, and the plate continued underneath and behind the boulders. Three 1" (2.54 cm) rivet holes were visible in the plate. Visibility was poor and photography was not possible, but video stills have been taken for illustration (**Plate 1**). A metal concretion and a metal bar were also identified in the area.

### 3.3 WA 7038 – Geophysical Anomaly

*Potential Heritage Asset Description*

3.3.1 An anomaly on the seabed almost identical to that recorded during the archaeological assessment of geophysical data (Wessex Archaeology 2011) (**Plate 2a**) was clearly visible on the side scan sonar on board the *Seekat-C*. Although situated roughly 15 m to the SSW of the position recorded in the archaeological assessment of geophysical data, the diver was deployed to the new location for the survey (**Figure 3**).

3.3.2 The location of the heritage asset comprises a silty sand seabed with small sand ripples and with some broken shell. At a large bedrock outcrop, flora and fauna included anenomes, sea stars, and seaweeds.

3.3.3 The bedrock outcrop comprises a small ridge (located at the co-ordinates in **Table 2** below). The ridge was covered in a light layer of silt and marine growth, however it was clearly natural. The exposed area of the bedrock outcrop measures approximately 2.60 m in length (SE/NW) by 1 m in width (**Plate 2b**). One side of the ridge is raised off the seabed by approximately 30 cm, but slopes towards the seabed. The measurements compare favourably with the measurements from the archaeological assessment of geophysical data.

**Table 2: Confirmed Position of 7038**

Potential Heritage Asset	Easting	Northing	Survey Type
WA 7038	234681	394129	Point

3.3.4 An area measuring approximately 30 m to the NNE and 40 m ESE/WNW was searched to determine whether any additional features were visible on the seabed, and to ensure coverage of the initial location of the anomaly provided by the geophysical survey data, however only sand was encountered (**Figure 3**).

3.3.5 Geophysical anomaly **WA 7038** has been confirmed as a bedrock outcrop, and therefore is not of archaeological interest. The 15 m difference in location between the archaeological assessment of geophysical data and the confirmed location could be due to a layback error during the geophysical survey.

### 3.4 WA 7042 – Geophysical Anomaly

#### *Potential Heritage Asset Description*

3.4.1 The location of the potential heritage asset comprises a shallow layer of silty sand with small sand ripples and small broken shell, overlying bedrock. The diver covered an area approximately 22 m N/S by 20 m NW/SE, around the position as recorded in the geophysical survey (Wessex Archaeology 2011) (**Figure 4**).

3.4.2 There was a large bedrock outcrop visible on the seabed approximately 1.4 m to the north of the location of the geophysical anomaly (**Figure 4**). The bedrock outcrop was covered in marine growth and a light layer of silt, but was confirmed as rock. The bedrock had a small magnetic signature.

3.4.3 Geophysical anomaly **WA 7042** is likely to represent bedrock, the SE part of a broad geological trend as described in the archaeological assessment of geophysical data (Wessex Archaeology 2011), and therefore is not of archaeological interest.

### 3.5 *Mary Sutherland* Recorded Loss Location

#### *Potential Heritage Asset Description*

3.5.1 Prior to the diver survey, the *Seekat-C* undertook a brief sidescan sonar survey of the bay to assess whether there were any features visible on the seabed. No material of archaeological interest was visible, however a number of upstanding geological features were noted at the entrance to the bay, and it is likely that these would have been navigational hazards for any vessels entering the bay.

3.5.2 The dive search of Porth y Pistyll Bay was limited due to vessel access, as due to weather conditions it was not considered safe to anchor on the western side of the bay or further to the south-east. However, the area assessed provided adequate information for this assessment (**Figure 5**).

3.5.3 The seabed in Porth y Pistyll Bay comprises bedrock with a thin overlay of silty sand. Numerous small bedrock outcrops, small rocks and shells were visible on the surface. Flora and fauna included kelp, other seaweed and occasional sea stars. Closer to the shore large boulders were present.

3.5.4 An area 67 m ESE/WNW by 40 m NNE / SSW was searched for potential archaeological material from the *Mary Sutherland*, a wooden smack recorded as having been stranded in the bay in 1902 (**RCAHMW NPRN 271992**, Wessex Archaeology 2012). Semi-circular searches were undertaken every 5 m out to 35 m from the shot (a weighted marker on a line dropped from the boat to the seabed to mark the starting location of the survey). Nothing of archaeological interest was located.

3.5.5 In addition, because the seabed comprises bedrock overlain with a thin layer of silty sand, which does not afford much in the way of protection for artefacts, it is unlikely that any organic material will have survived in the bay.

3.5.6 Dives were undertaken between 5 m and 6.5 m in depth on a rising tide, with the tide 2 m to 3 m. Therefore, much of the shallower area of the bay is likely to be exposed at Lowest Astronomical Tide. Additionally, the high tide line is visible well up the beach, and if the ship beached at high tide, it would have been easily accessible for salvage.

3.5.7 Notably, there are no reports of archaeological material in the bay, and the ecological diving survey that was undertaken as part of the Wylfa Newydd Proposed New Nuclear Power Station development did not mention the presence of any archaeological material.

3.5.8 On discussing the wreck of the *Mary Sutherland* with Jon Shaw, Master of the *Seekat-C*, he was unaware of any reports of wreck material in the area, however he did recollect that the bell of the *Mary Sutherland* had been recovered and was presently in Cemaes at the Ye Olde Vigour Hotel (**Plate 3**). The land lady of the pub did not have information on the provenance of the bell, but its presence indicates that the wreck location was known at one time, and suggests that other material could also have been recovered from the wreck, however there is no evidence to suggest that the bell came from Porth y Pistyll Bay.

## 4 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

4.1.1 On the basis of the available evidence, Wessex Archaeology does not believe that any further archaeological evaluation is required at any of the locations of the four potential heritage assets that were surveyed.

4.1.2 There is no archaeological material present within the *Abbotsford* (**WA 7033**) AEZ overlap with the Wylfa Newydd Development Area. It is possible that further isolated debris associated with the *Abbotsford*, such as the metal plate that was encountered, could be present outside of the Wylfa Newydd Development Area, however, as it is beyond the Development Area, it is unlikely to be impacted.

4.1.3 Therefore, the AEZ for the *Abbotsford* (**WA 7033**) has been amended to remove the area of overlap with the Wylfa Newydd Development Area.

4.1.4 Geophysical anomalies **WA 7038** and **WA 7042** have been confirmed as bedrock and therefore are not of archaeological interest.

4.1.5 The geology of Porth y Pistyll Bay comprises bedrock covered with a light layer of silty sand, and is unlikely to be conducive to the preservation of wooden ship remains. Additionally, as no archaeological material has been reported in the bay, and as the bell of the wreck has been recovered (suggesting that the wreck location is, or was, known and that at least some of the material has been salvaged), it is unlikely that remains of the *Mary Sutherland* are present in the bay.

4.1.6 Therefore, the marine archaeological survey recommended in the mitigation measures in the WSI has achieved all of the objectives and no further archaeological work is recommended.

## 5 REFERENCES

### 5.1 Bibliography

Davidson, A. 2010 *Proposed Nuclear Power Station at Wylfa, Anglesey, North Wales: Archaeological & Cultural Heritage Baseline Assessment Report*. Unpublished report. Gwynedd Archaeological Trust. GAT Project No. 2096. Ref: 842.

Gwynedd Archaeological Trust (GAT) 2011 *Wylfa: desk-based impact assessment*. Unpublished reports. Ref: 966 and 967.

Horizon 2016 *Written Scheme of Investigation for Marine Archaeological Evaluation: Wylfa Newydd Proposed New Nuclear Power Station*. DCRM Ref Number: WN034-S5-PAC-REP-00002. Revision 0.2. Prepared by Wessex Archaeology.

The Crown Estate 2010 revised 2014 *Model Clauses for Archaeological Written Schemes of Investigation for Offshore Renewables Projects*. Prepared by Wessex Archaeology.

Wessex Archaeology 2011 *Wylfa Anglesey, Marine Geophysical Assessment: Archaeological Interpretation of Geophysical Data*. Unpublished report. Ref: 78800.01.

Wessex Archaeology 2012 *Wylfa Anglesey, Marine & Maritime Archaeology: Archaeological Desk-based Assessment*. Unpublished report. Ref: 78801.01.

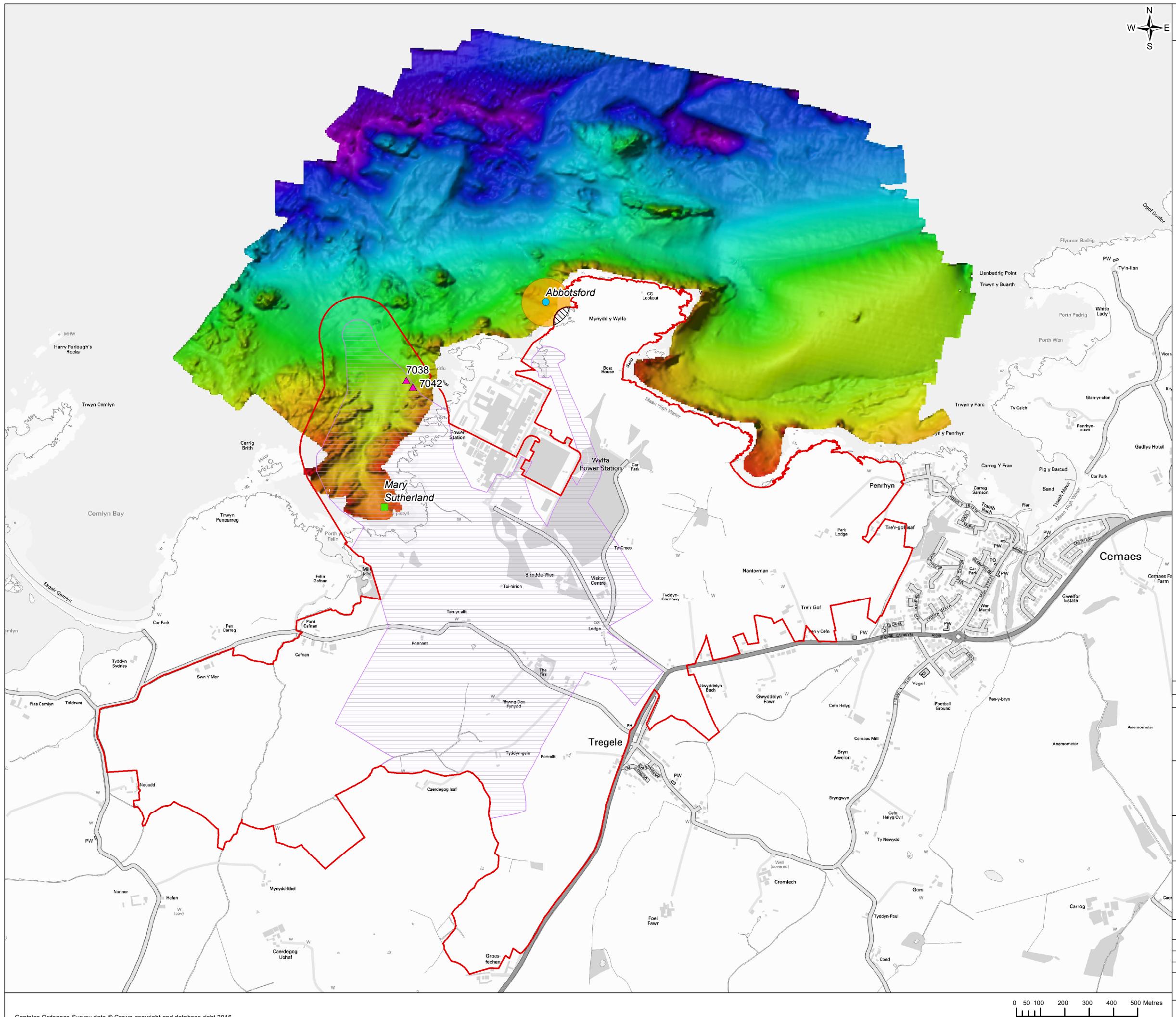
Wessex Archaeology 2016 *Site/Task Specific Method Statement (Including Risk Assessment)*. Project No. 60PO8058.

## 6 APPENDICES

### 6.1 Appendix 1: Dive Log

Dive	Date	Made Bottom	Duration*	Max. Depth (m)	Divers	Task
1001	14/05/2016	13:53	60 mins	12.8	Croce	Groundtruth <b>WA 7038</b>
1002	14/05/2016	15:56	47 mins	14	Ryden	Groundtruth <b>WA 7042</b>
1003	15/05/2016	12:50	71 mins	6.5	Hamel	Assess Porth y Pistyll Bay for potential archaeological material from the <i>Mary Sutherland</i> Recorded Loss location
1004	15/05/2016	14:32	51 mins	5.75	Croce	Assess Porth y Pistyll Bay for potential archaeological material from the <i>Mary Sutherland</i> Recorded Loss location
1005	16/05/2016	10:44	81 mins	12.5	Croce	Assess overlap of the <i>Abbotsford</i> ( <b>WA 7033</b> ) AEZ and development area for potential archaeological material
1006	16/05/2016	13:04	62 mins	10	Scott	Assess overlap of <i>Abbotsford</i> ( <b>WA 7033</b> ) AEZ and development area for potential archaeological material

\* Bottom time in minutes (time from when diver made bottom to when diver left bottom)



## FIGURE 1

## Legend

- Development Area Boundary
- ▨ Power Station Site
- ▲ Geophysical anomalies for groundtruthting (WA 2011)
- *Mary Sutherland* RCAHMW recorded loss location
- Wreck of the *Abbotsford*
- Archaeological Exclusion Zone (AEZ) for the *Abbotsford*
- ▨ Area of AEZ for archaeological assessment



1	JULY 16	Client comments and updated study area	KF	AH	KF	AH
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd



**HORIZON**  
NUCLEAR POWER

WYF A NEWYDD PROPOSED NUCLEAR POWER STATION

## STUDY AREA

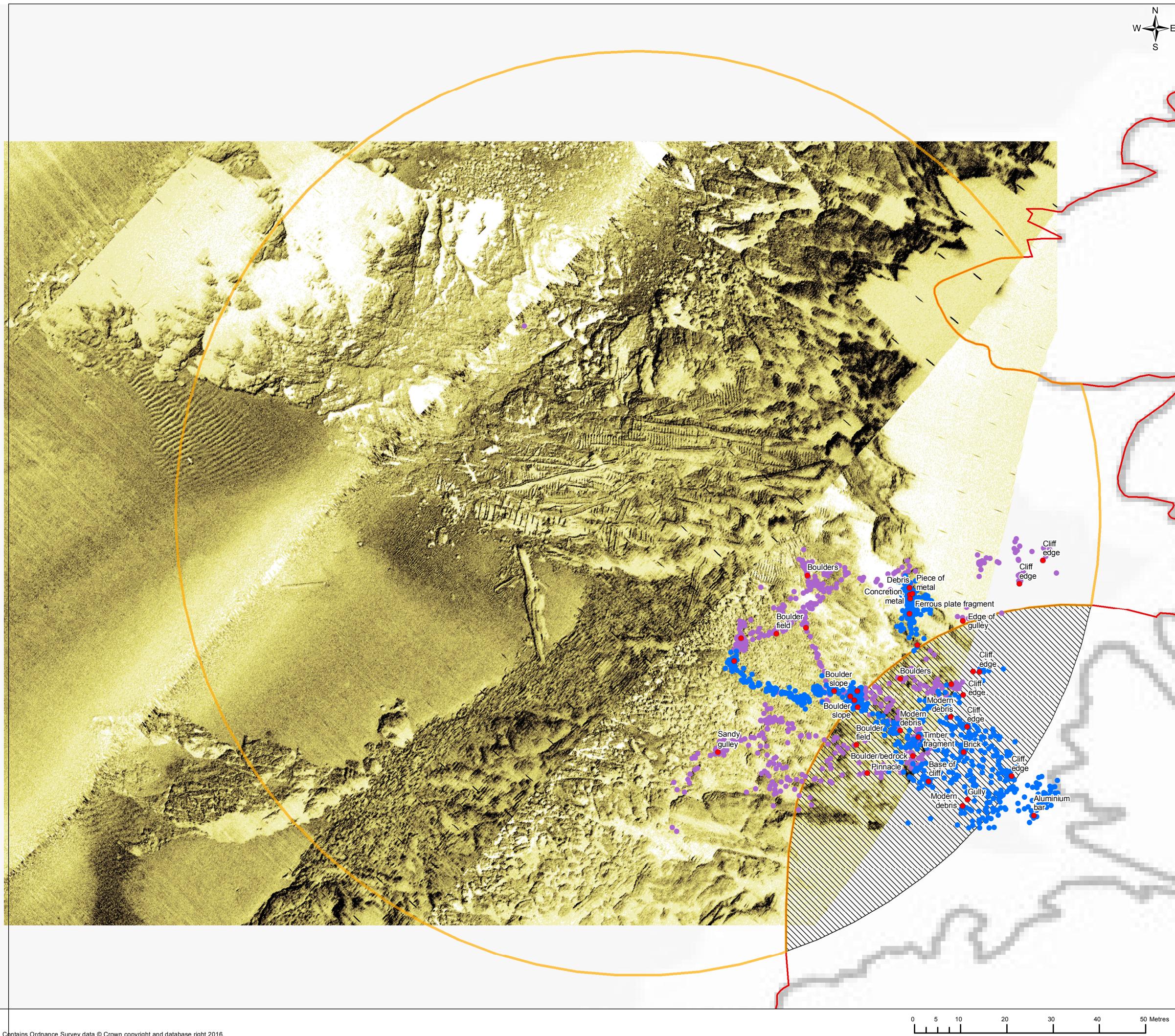
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Client No.		

Drawing No. 110100 Diving Fig01

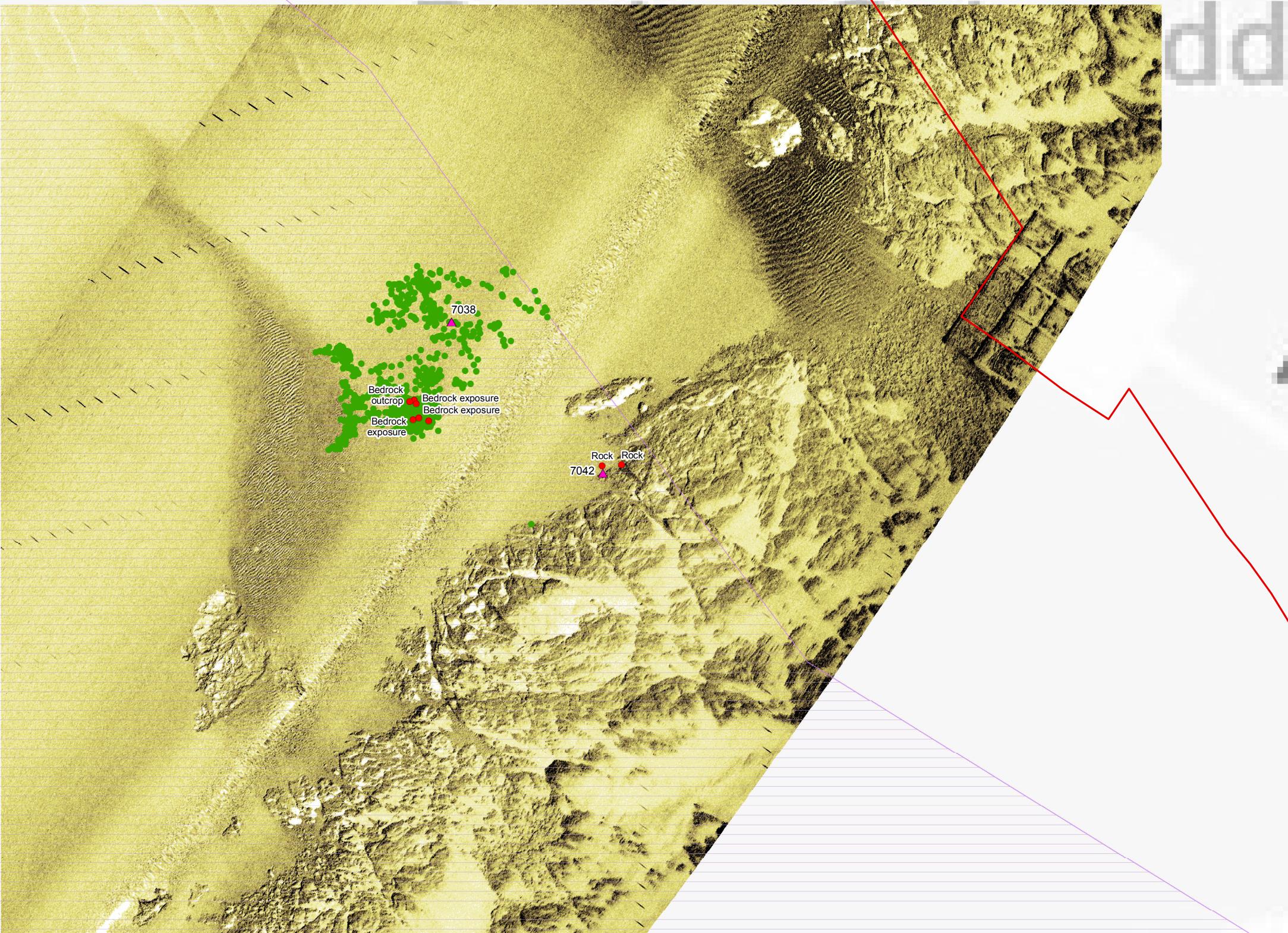
This drawing is not to be used in whole or in part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

**FIGURE 2**



1	JULY 16	Client comments and updated study area	KF	AH	KF	AH
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	App'r'd
<b>HORIZON</b> NUCLEAR POWER						
Project						
WYLFA NEWYDD PROPOSED NUCLEAR POWER STATION						
Drawing Title						
ABBOTSFORD (WA 7033) AEZ						
Drawing Status						
Scale @ A3	1:800	DO NOT SCALE				
Jacobs No.	60PO8032					
Client No.						
Drawing No.	110100_Diving_Fig02					
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**FIGURE 3**



**Legend**

- Development Area Boundary
- Power Station Site
- Geophysical anomalies for groundtruthing (WA 2011)
- 7038 Dive
- Diver observations



1	JULY 16	Client comments and updated study area	KF	AH	KF	AH
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	App'r'd



**HORIZON**  
NUCLEAR POWER

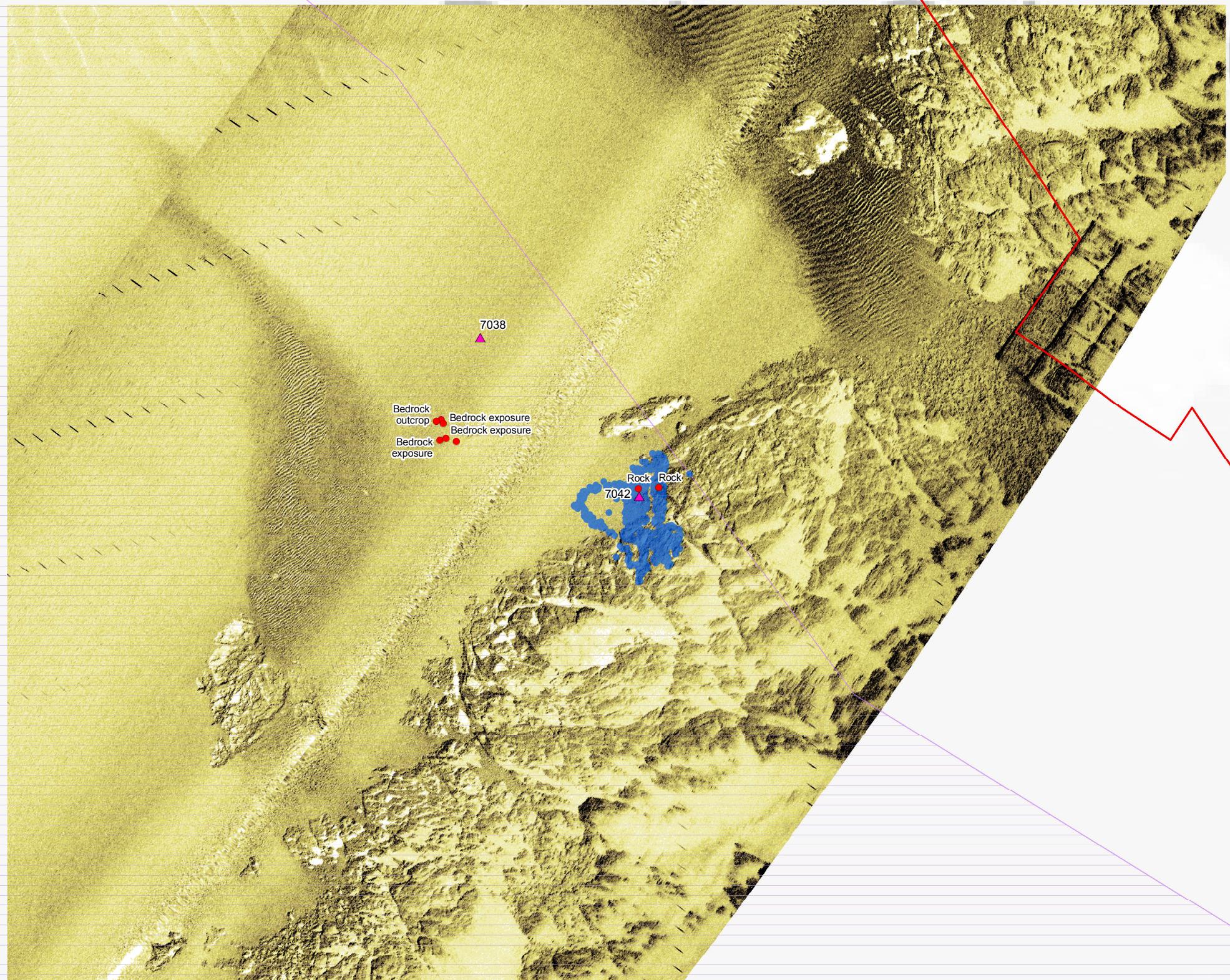
Project  
WYLFA NEWYDD PROPOSED NUCLEAR POWER STATION

Drawing Title  
GEOPHYSICAL ANOMALY WA 7038

Drawing Status  
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Jacobs No. 60PO8032  
Client No.  
Drawing No. 110100\_Diving\_Fig03

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**FIGURE 4**



**Legend**

- Development Area Boundary
- Power Station Site
- Geophysical anomalies for groundtruthing (WA 2011)
- 7042 Dive
- Diver observations



1	JULY 16	Client comments and updated study area	KF	AH	KF	AH
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	App'r'd



**HORIZON**  
NUCLEAR POWER

Project  
WYLFA NEWYDD PROPOSED NUCLEAR POWER STATION

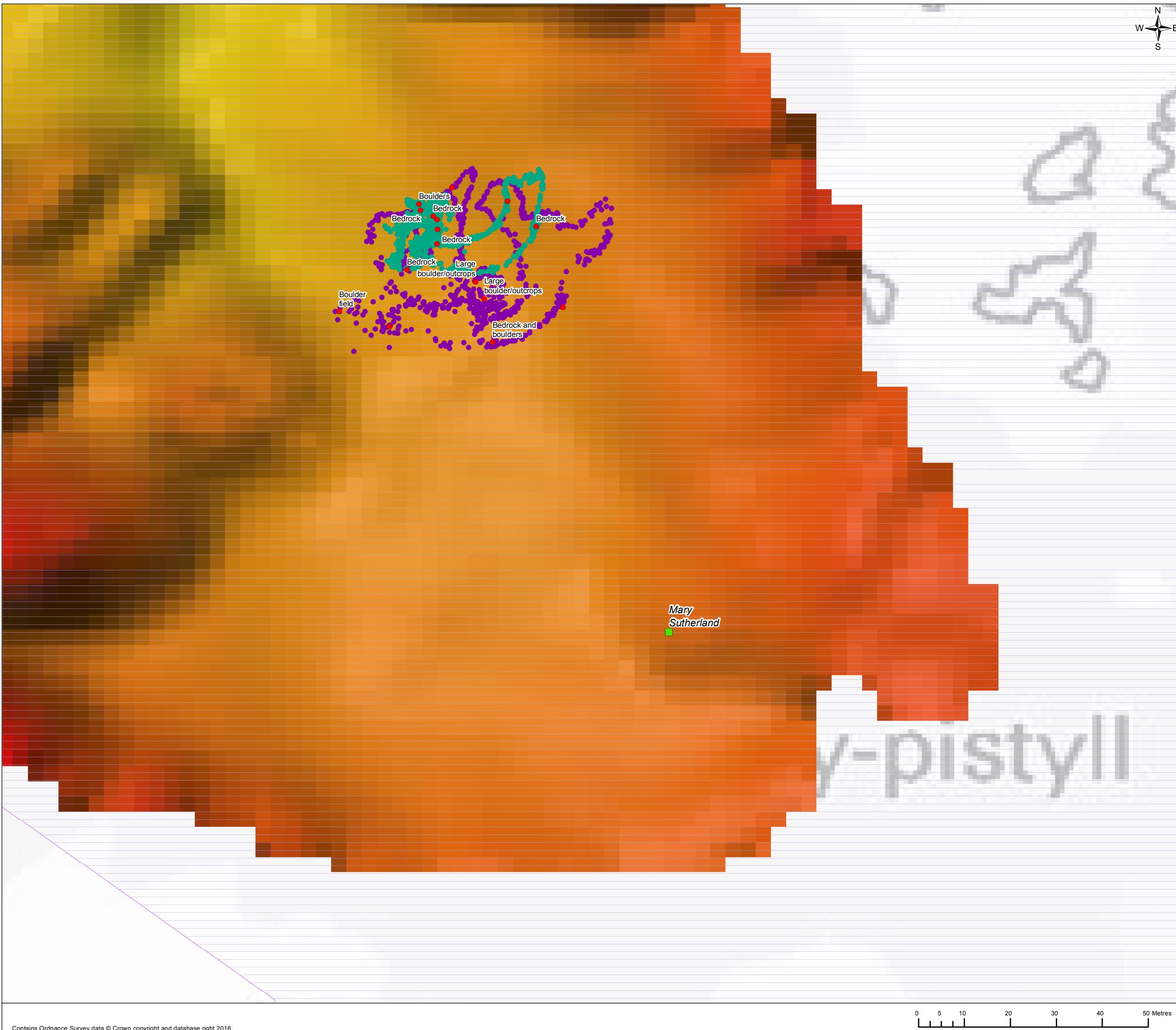
Drawing Title  
GEOPHYSICAL ANOMALY WA 7042

Drawing Status  
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Client No.

Drawing No.  
110100\_Diving\_Fig04

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**FIGURE 5**



1	JUNE 16	Client comments and updated study area	KF	AH	KF	AH
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	App'r'd

**HORIZON**  
NUCLEAR POWER

Project  
WYLFA NEWYDD PROPOSED NUCLEAR POWER STATION

Drawing Title  
MARY SUTHERLAND RECORDED LOSS LOCATION

Drawing Status

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Jacobs No.	60PO8032	
Client No.		

Drawing No.  
110100\_Diving\_Fig05

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## PLATES



Plate 1. Metal plate with three 1" rivet holes, likely associated with the *Abbotsford*

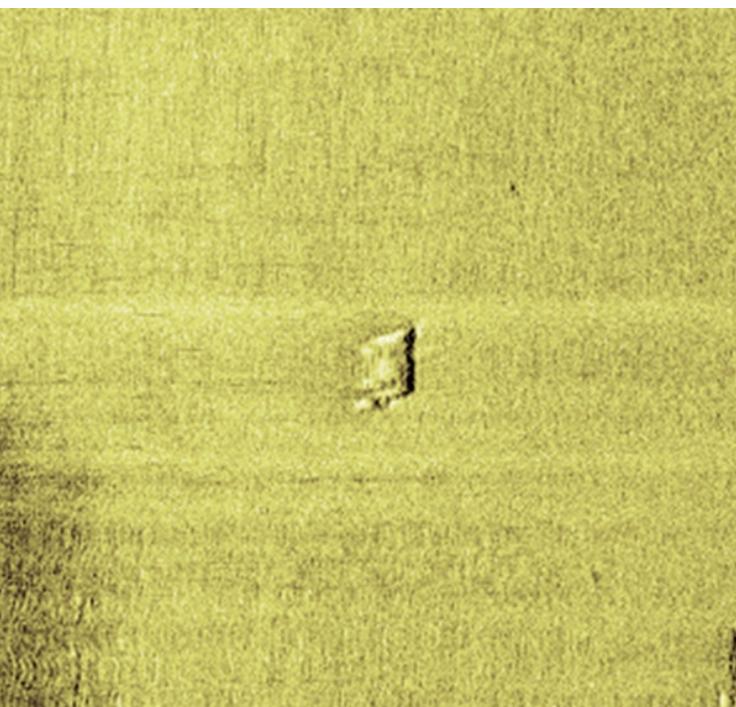


Plate 2a. Side scan sonar image of 7038

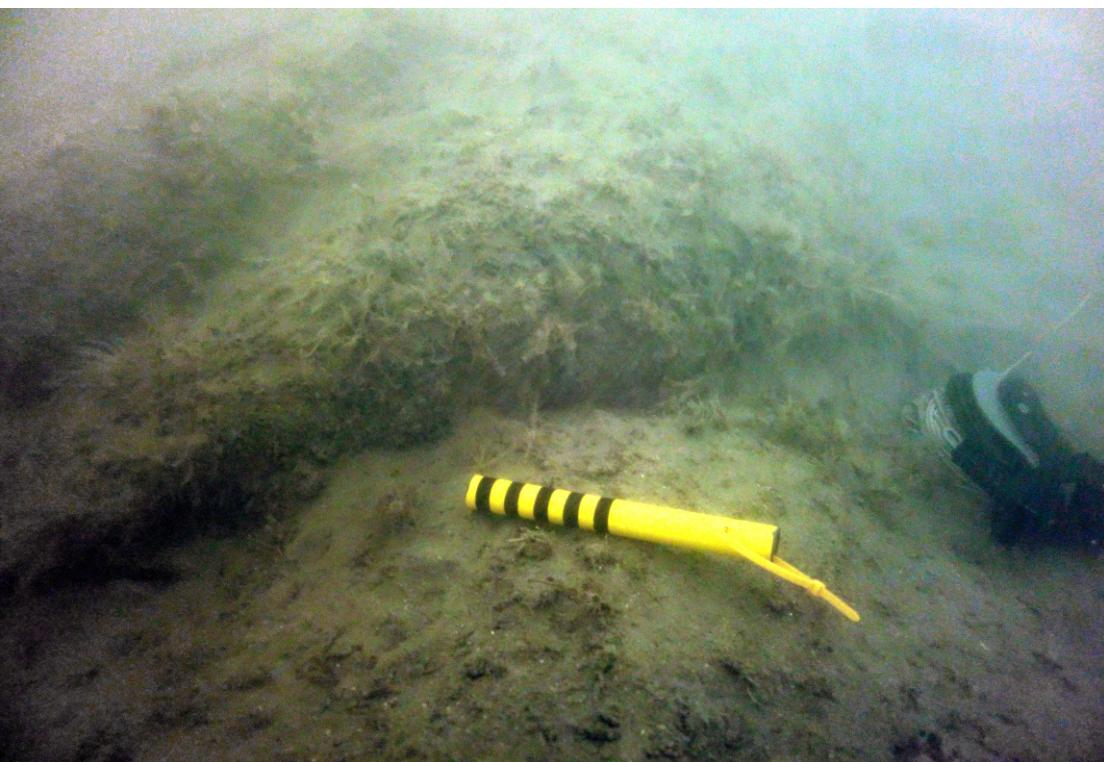


Plate 2b. Photograph of 7038: bedrock



Plate 3. Bell from the *Mary Sutherland*, at Ye Olde Vigour Hotel, Cemaes

0	JUNE 16	Initial Issue	KF	AH	KF	AH
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	App'd



**HORIZON**  
NUCLEAR POWER

WYLFA NEWYDD PROPOSED NUCLEAR POWER STATION

Drawing Title

PLATES

Drawing Status

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Jacobs No.	60PO8032	

Client No.

Drawing No.

110100\_Diving\_Plates

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Wessex Archaeology Ltd registered office Portway House, Old Sarum Park, Salisbury, Wiltshire SP4 6EB  
Tel: 01722 326867 Fax: 01722 337562 [info@wessexarch.co.uk](mailto:info@wessexarch.co.uk) [www.wessexarch.co.uk](http://www.wessexarch.co.uk)



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