

Application for Consent to conduct  
Marine Scientific Research

Date: 20<sup>th</sup> May 2019 \_\_\_\_\_

1. General Information

<b>1.1 Cruise name and/or number:</b>
BGS RD2 Trials 2019

<b>1.2 Sponsoring Institution(s):</b>	
<b>Name:</b>	British Geological Survey (BGS)
<b>Address:</b>	The Lyell Centre, Research Avenue South, Edinburgh, EH14 4AP
<b>Name of Director:</b>	Prof John Ludden

<b>1.3 Scientist in charge of the Project:</b>	
<b>Name:</b>	Oliver Peppé
<b>Country:</b>	United Kingdom
<b>Affiliation:</b>	British Geological Survey
<b>Address:</b>	The Lyell Centre, Research Avenue South, Edinburgh, EH14 4AP
<b>Telephone:</b>	0131 4500308
<b>Fax:</b>	
<b>Email:</b>	Oliver.peppe@bgs.ac.uk
<b>Website (for CV and photo):</b>	www.bgs.ac.uk

<b>1.4 Entity(ies)/Participant(s) from coastal State involved in the planning of the project:</b>	
<b>Name:</b>	See above
<b>Affiliation:</b>	
<b>Address:</b>	
<b>Telephone:</b>	
<b>Fax:</b>	
<b>Email:</b>	
<b>Website (for CV and photo):</b>	

2. Description of Project

<b>2.1 Nature and objectives of the project:</b>
<p>The primary objective of the project is to test recent upgrades to BGS's seabed coring system, RD2. As part of this work we will be obtaining seabed core samples which will be used to further BGS Marine Geoscience research.</p> <p>The BGS RD2 system is a remote seabed corer capable of drilling to 55 mbsf in up to 4000m of water. A major upgrade to the system has resulted in a requirement to conduct offshore trials prior to UK and international science projects planned for 2020/2021. The objectives of this project will be to prove that the system is ready for future projects and at the same time obtain cores that will contribute to ongoing BGS science in this region of the UK continental shelf.</p> <p>Coring summary:</p> <ul style="list-style-type: none"> <li>• Coring at various depths across the Celtic Margin, to maximum depths of 55 mbsf:             <ul style="list-style-type: none"> <li>- Approx. 150 mbsf, on the Continental Shelf adjacent to the head of the Dangeard Canyon, which is part of the Whittard Canyon system;</li> <li>- Approx. 2,415 mbsf, located further down the Dangeard Canyon System;</li> <li>- Approx. 3,700 mbsf, located at the deepest point of the Dangeard Canyon</li> </ul> </li> </ul>

system, up-system of the confluence with main Whittard Canyon channels.

Technical objective:

- To test the RD2 seabed drill in a variety of geological settings and water depths, including non-cohesive / clastic sediments, cohesive and muddy sediments, and weak-medium strength bedrock.

Scientific objective:

- The project will aim to address the recent (Quaternary) history of sediment transport from the Continental Shelf to the Abyssal Plain below:
  - Main mechanisms for sediment transport, i.e. particles settling out of suspension (background deposition) vs mass flows;
  - Frequency of sediment density (turbidity) currents;
  - Effects of climate variation on sediment transport regime from Continental Shelf to Abyssal Plain, particularly changes in sea level around the Celtic Margin.

2.2 If designated as part of a larger scale project, then provide the name of the project and the Organisation responsible for coordinating the project:

N/A

2.3 Relevant previous or future research projects:

**CODEMAP (2015):** Gareth Carter (BGS Marine Geoscientist) participated in CodeMAP cruise to the Whittard Canyon, to assess ongoing erosion of the canyon rockwalls. CodeMAP is a Starting Grant project supported by the European Research Council (ERC).

<https://www.codemap.eu/>

<http://www.codemap.eu/cruise/jc125-whittard-canyon/team>

**MESH canyons cruise (2007):** Heather Stewart (BGS Marine Geoscientist) participated in the MESH canyons cruise to map the geology & sedimentology of the Dangeard and Explorer canyons.

2.4 Previous publications relating to the project:

- **Carter, G. D., Huvenne, V. A., Gales, J. A., Iacono, C. L., Marsh, L., Ougier-Simonin, A., ... & Wynn, R. B. (2018).** Ongoing evolution of submarine canyon rockwalls; examples from the Whittard Canyon, Celtic Margin (NE Atlantic). *Progress in Oceanography*, 169, 79-88.
- **Robert, K., Huvenne, V. A., Georgiopoulou, A., Jones, D. O., Marsh, L., Carter, G. D., & Chaumillon, L. (2017).** New approaches to high-resolution mapping of marine vertical structures. *Scientific reports*, 7(1), 9005.
- **Amaro, T., Huvenne, V.A.I., Allcock, A.L., Aslam, T., Davies, J.S., Danovaro, R., De Stigter, H.C., Duineveld, G.C.A., Gambi, C., Gooday, A.J., Gunton, L.M., Hall, R., Howell, K.L., Ingels, J., Kiriakoulakis, K., Kershaw, C.E., Lavaleye, M.S.S., Robert, K., Stewart, H., Van Rooij, D., White, M., & Wilson, A.M. (2016).** The Whittard Canyon – a case study of submarine canyon processes. *Progress in Oceanography*, 146, 38–57.
- **Stewart, H. A., Davies, J. S., Gulnan, J., & Howell, K. L. (2014).** The Dangeard and Explorer canyons, South Western Approaches UK: Geology, sedimentology and newly discovered cold-water coral mini-mounds. *Deep Sea Research Part II: Topical Studies in Oceanography*, 104, 230-244.
- **Davies, J. S., Howell, K. L., Stewart, H. A., Gulnan, J., & Golding, N. (2014).** Defining biological assemblages (biotopes) of conservation interest in the submarine canyons of the South West Approaches (offshore United Kingdom) for use in marine habitat mapping. *Deep Sea Research Part II: Topical Studies in Oceanography*, 104, 208-229.
- **Davies, J., Gulnan, J., Howell, K., & Stewart, H. (2008).** MESH South West

3. Geographical Areas

3.1 Indicate geographical areas in which the project is to be conducted (with reference in Latitude and longitude in decimal degrees, including coordinates of cruise/track/way points/sampling stations). Please provide coordinates in a separate excel spreadsheet.

- **Site 1, Continental Shelf adjacent to the head of Dangeard Canyon (outside of the JNCC "The Canyons" MCZ area):**
  - Targeting mixed substrata and bedrock on Continental Shelf
  - -9.3445 48.4426 decimal degrees (9°20'40.021"W 48°26'33.2481"N)
  - Approx. 150 mbsl
- **Site 2, approx. midway point down the Dangeard Canyon system (outside of the JNCC "The Canyons" MCZ area):**
  - Targeting mixed substrata (likely to be sands, silts and muds, with occasional lithic clasts, and potentially bedrock)
  - -9.8414 48.2877 decimal degrees (9°50'28.9381"W 48°17'15.6314"N)
  - Approx. 2,415 mbsl
  - Approx. 2° slope gradient
- **Site 3, deepest point down the Dangeard Canyon system (outside of the JNCC "The Canyons" MCZ area), before confluence with main Whittard Canyon channels:**
  - Targeting mixed substrata (likely to be predominantly muds with minor sand and silt beds)
  - -10.0775 48.1048 decimal degrees (10°4'39.0745"W 48°6'17.4096"N)
  - Approx. 3,700 mbsl
  - Approx. 3° slope gradient

3.2 Attach chart(s) at an appropriate scale (1 page, high-resolution) showing the geographical Areas of the intended work and, as far as practicable, the location and depth of sampling Stations the tracks of survey lines, and the locations of installations and equipment.  
See charts below

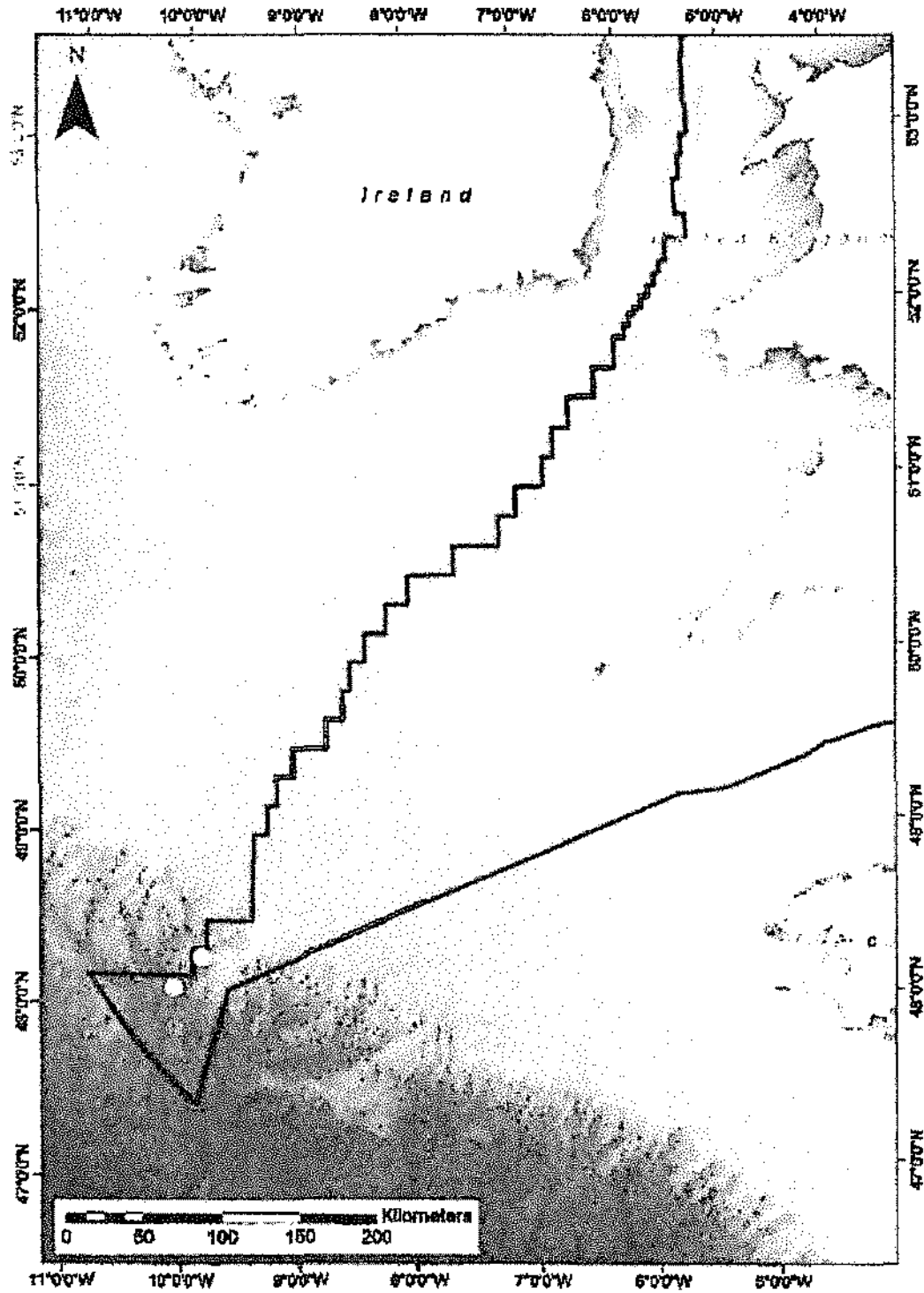


Fig 1: Chart showing location of proposed sites in context of UK EEZ.

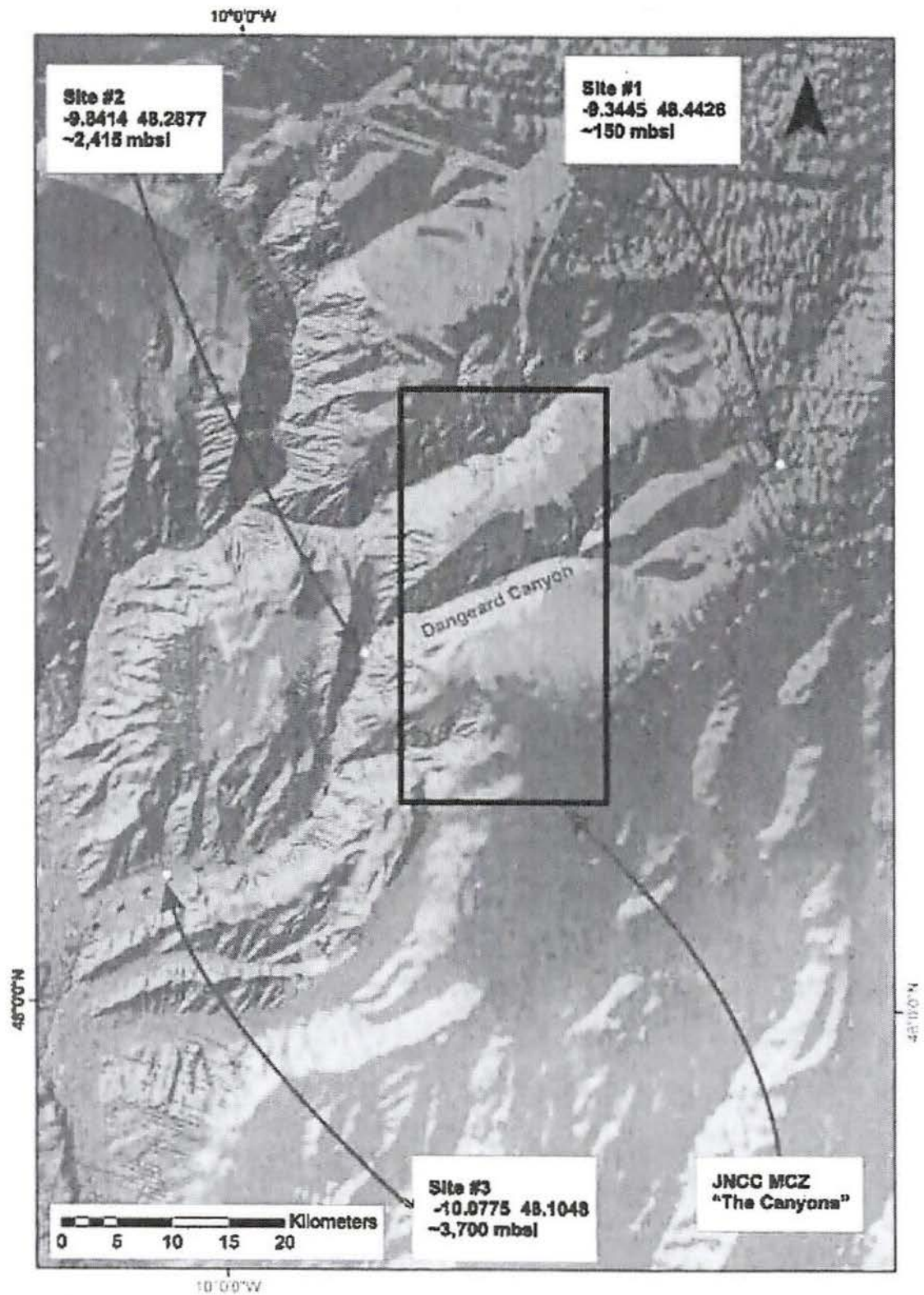


Fig 2: Chart showing detailed location of proposed sites

#### 4. Methods and means to be used

4.1 Particulars of vessel:	
Name:	ILV Granualle
Type/Class:	B – Other cargo Ship (Aids to Navigation Service & Buoy Laying vessel)
Nationality (Flag State):	Irish
Identification Number (IMO/Lloyds No.):	IMO: 9192947 / LR 9192947
Owner:	Commissioners of Irish Lights
Operator:	Commissioners of Irish Lights
Overall length (meters):	79.69m
Maximum draught:	Operational: 4.60m / Max: 5.20m (Summer)
Displacement/Gross Tonnage:	Disp: 3903 / GT: 2625
Propulsion:	X 2 1,100 KW INDAR var. speed AC motors driving x 2 Schottel rudder propellers type SRP 1010 ZSFP
Cruising & maximum speed:	Maximum Speed: 13 knots / Cruising 10 knots
Call sign:	EIPT
INMARSAT number and method and capability of communication (including emergency frequencies):	+01-5133023  FURUNO FELCOM 18  2182KHZ / 2187.5KHZ MF/ HF
Name of Master:	Harry McClenahan / Dermot Gray
Number of Crew:	16
Number of Scientists on board:	-

4.2 Particulars of Aircraft:	
Name:	n/a
Make/Model:	
Nationality (flag State):	
Website for diagram & Specifications:	
Owner:	
Operator:	
Overall Length (meters):	
Propulsion:	
Cruising & Maximum speed:	
Registration No.:	
Call Sign:	
Method and capability of communication (including emergency frequencies):	
Name of Pilot:	
Number of crew:	
Number of scientists on board:	
Details of sensor packages:	
Other relevant information:	

4.3 Particulars of Autonomous Underwater Vehicle (AUV):	
Name:	n/a
Manufacturer and make/model:	
Nationality (Flag State):	
Website for diagram & Specifications:	
Owner:	
Operator:	
Overall length (meters):	
Displacement/Gross tonnage:	
Cruising & Maximum speed:	
Range/Endurance:	

Method and capability of communication (including emergency frequencies):	
Details of sensor packages:	
Other relevant information:	

4.4 other craft in the project, including its use:  
n/a

4.5 Particulars of methods, full description of scientific instruments to be used (for fishing gear specify type and dimension) and location

Types of samples and Measurements:	Methods to be used:	Instruments to be used:	To be carried out within 12nm (yes or no):
Seabed cores to max 55mbsf.	Wireline drilling	BGS RD2	no

4.6 Indicate nature and quantity of substances to be released into the marine environment:  
None

4.7 Indicate whether drilling will be carried out. If yes, please specify:  
Yes. (See also 4.5 above.)

Cores taken in UK EEZ will have a total volume <math><1\text{ m}^3</math>, to comply with Marine Licence exemption under Article 17A of The Marine Licensing (Exempted Activities) (Amendment) Order 2013.

(The hole diameter drilled by RD2 is 98mm, resulting in maximum 0.41m<sup>3</sup> removal for a 55m bore hole)

The expected maximum core depths for the 3 sites are:  
 Site 1: 25mbsf  
 Site 2: 25mbsf  
 Site 3: 55mbsf

4.8 Indicate whether explosives will be used. If yes, please specify type and trade name, Chemical content, depth of trade class and stowage, size, depth of detonation, frequency of Detonation, and position in latitude and longitude:  
None

## 5. Installations and Equipment

Details of installations and equipment (including dates of laying, servicing, method and Anticipated timeframe for recover, as far as possible exact locations and depth, and Measurements):  
None

## 6. Dates

6.1 Expected dates of first entry into and final departure from the research area by the research vessel and/or other platforms:  
5<sup>th</sup> August 2019 – 11<sup>th</sup> September 2019.  
Note that cruise dates are not yet finalised. The period above covers the entire potential

window for the work. The actual offshore work, including transit to and from port is expected to last about 2 weeks within this period, with the ship operating on station within the UK EEZ for only ~ 10 days.

6.2 Indicate if multiple entries are expected:

Not expected, but operational conditions may dictate that we leave the UK EEZ work area to go to International Waters then return to UK EEZ work area.

## 7. Port Calls

7.1 Dates and Names of intended ports of call:

Mobilisation and demobilisation are expected to be from an Irish port – probably Cork. No other port calls are expected. Earliest mobilisation dates: 5<sup>th</sup> – 8<sup>th</sup> August. Latest demobilisation dates: 12<sup>th</sup> – 15<sup>th</sup> September.

7.2 Any special logistical requirements at ports of call:

N/A

7.3 Name/Address/Telephone of shipping agent (if available):

N/A

## 8. Participation of the representative of the coastal State

8.1 Modalities of the participation of the representative of the coastal State in the research Project:

The project is being sponsored and staffed by members of the coastal state (UK). UK personnel will be on board throughout the project.

8.2 Proposed dates and ports for embarkation/disembarkation:

See 7.1 above.

## 9. Access to Data, Samples and Research Results

9.1 Expected dates of submission to coastal State of preliminary report, which should include The expected dates of submission of the data and research results:

1 month after completion of the cruise (latest submission 15<sup>th</sup> October)

9.2 Anticipated dates of submission to the coastal State of the final report:

6 months after completion of the cruise (latest submission 15<sup>th</sup> March 2020)

9.3 Proposed means for access by coastal State to data (including format) and samples:

Reports will be filed at BODC

All RD2 data will be made available through the National Geoscience Data Centre (NGDC) and Medin Data Archive Centre at BGS.

Physical samples to be stored at BGS Core Store in Keyworth.

9.4 Proposed means to provide coastal State with assessment of data, samples and Research results:

Coastal state will have access via normal BGS channels.



9.5 Proposed means to provide assistance in assessment or interpretation of data, samples  
And research results:  
Via BGS National Capability funding.

9.6 Proposed means of making results internationally available:  
Primary objectives for cruise is to test seabed drill equipment.  
Any scientific results will be made available through publication in peer-reviewed journals.

10. Other permits Submitted

10.1 Indicate other types of coastal state permits anticipated for this research (received or  
Pending):

No other permits are expected to be required.

We have confirmed with UK MMO that the sampling is exempt from Marine Licence activities,  
subject to notification of the activity prior to work commencing. This notification is pending  
approval of diplomatic clearance.

11. List of Supporting Documentation

11.1 List of attachments, such as additional forms required by the coastal State, etc.:

1. Excel list of sampling station coordinates

Signature:



Contact information of the focal point: Commissioners of Irish Lights

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