Form 3: Initial environmental assessment and sensitive environments contingency plan

Regulation 11(c), Exclusive Economic Zone and Continental Shelf (Environmental Effects–Permitted Activities) Regulations 2013

How to use this form:
This form should be completed by organisations planning to carry out marine scientific research, prospecting, or exploration. It fulfils the initial environmental assessment and contingency plan requirements of Schedule 2 of the Exclusive Economic Zone and Continental Shelf (Environmental Effects – Permitted Activities) Regulations 2013.

This form must be provided to the Environmental Protection Authority (EPA) at least 5 working days before commencing the activity.

Note: Items marked in italics are non-compulsory fields; however, inclusion of this information will assist the EPA in processing this form.

Please note that this completed form, once received and processed by EPA, will be posted on the EPA website.

Submitting in hard copy:
If you wish to provide this form in hard copy, please post your completed form to: Environmental Protection Authority, Private Bag 63002, Wellington, 6140.

Submitting electronically:
If you wish to provide this form electronically, please email your form to: eez.compliance@epa.govt.nz

Any form submitted electronically should be attached to an email that sets out:
- The details of the person undertaking the permitted activity (the operator);
- The name of the person supplying the completed form; and
- A statement that the person is authorised to supply the form on behalf of the operator.

Note: there is an 8 MB limit on electronic files submitted via email.
Operation name:
Name used by operator to reference the activity described in this form: HOBITSSIII - Hikurangi Heat Flow Investigation

Details of person undertaking permitted activity

<table>
<thead>
<tr>
<th>Company name:</th>
<th>GNS Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact person:</td>
<td></td>
</tr>
<tr>
<td>Phone number:</td>
<td></td>
</tr>
<tr>
<td><strong>Mobile number:</strong></td>
<td>Fax number:</td>
</tr>
<tr>
<td>1234567890</td>
<td>1234567890</td>
</tr>
<tr>
<td>Physical address:</td>
<td>Postcode:</td>
</tr>
<tr>
<td>123 Main St.</td>
<td>12345</td>
</tr>
<tr>
<td><strong>Postal address (if different):</strong></td>
<td>Postcode:</td>
</tr>
<tr>
<td>123 Other St.</td>
<td>12345</td>
</tr>
<tr>
<td>Email address:</td>
<td></td>
</tr>
</tbody>
</table>

General description of permitted activity

<table>
<thead>
<tr>
<th>Type of activity: (e.g. marine scientific research, prospecting)</th>
<th>Marine scientific research.</th>
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<tbody>
<tr>
<td></td>
<td>We will undertake research offshore the East Coast of the North Island from north of Poverty Bay to Hawke Bay and in water depths from 100 m to 3400 m.</td>
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<td>Our aim is to document seafloor deformation along the Hikurangi subduction zone where land instruments have recorded tectonic activity crossing the coastline and extending offshore. We have identified sites where marine heat flow will be made to determine the thermal structure of the margin and how it varies along strike.</td>
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<tr>
<td></td>
<td>This activity is supported by MBIE funding to NIWA in support of the RV Tangaroa which is allocated by the Marine Funding Allocation Reference Group (MFARG). GNS Science participation is from Direct Crown Funding and is administered from the Geological Exploration of the New Zealand EEZ programme.</td>
</tr>
<tr>
<td>Description of methods to be used to undertake the activity:</td>
<td>Heat flow measurements</td>
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<td></td>
<td>Heat flow measurements are collected using a multi-penetration heat flow (MPHF) probe (Figure 1) owned by Oregon State University. The MPHF probe consists of a 3.5m, 11 thermistor violin-bow heat flow system. The heat flow operations comprise lowering the MPHF probe tethered to the ship using a trawl wire. The probe is repeatedly lowered into the seafloor, up to 3 m depth, and measurements made over a 30 minute duration before withdrawing from the seafloor. Ship and probe transit to next station and operation repeated. Repeated insertions of the probe allow multiple heat flow measurements to be made with a single transit through the water column. Heat flow measurements will be completed along transects offshore Gisborne and south at offshore Hawke Bay.</td>
</tr>
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Location of permitted activity

Co-ordinates of area where activity will be undertaken: (latitude and longitude)

Activity will be undertaken in the area offshore East Coast Figure 2).

-40 55.7874  179 09.5357
-38 25.4023  180 19.7162
-38 33.7829  178 36.5025
-38 55.6108  178 09.8058
-39 06.8191  178 14.3761
-39 21.7576  178 08.9655
-39 29.3271  177 57.7385
-39 38.2441  177 26.1588
-40 12.2748  177 10.1901
-40 55.7874  179 09.5357

Figure 1. Oregon University multi-penetration heat flow (MPHF) probe. The probe is lowered and recovered to the seafloor on a trawl wire.

Figure 2. Location map, region encompasses East Coast of the North Island from north of Poverty Bay to offshore Hawke Bay. Heat flow probe will be deployed at locations within the polygon to determine the thermal structure of the margin and how it varies along strike.
Description of the current state of the area and the surrounding environment, including any known sensitive environments:

Mixed rocky and soft sea bottom. Reefs, thickets, gardens or beds of organisms are not expected (not obtained in previous seabed sampling in the region).

Description of the likely effects of the activity on the environment:

Transient and very localised seabed disruption at the point of heat flow probe instrument deployment on the seabed. Sediment and any organisms will immediately settle and the likely effects of our proposed activity are less than minor. No instruments remain on the seafloor and the MPHF probe is recovered. No samples of the seabed are collected.

Identification of sensitive environments

Describe any sensitive environments likely to exist in the area where the activity will be undertaken:

From previous dredging experience in the area (for example during TAN1114) the seafloor comprises grey mud and more compacted mudstone on ridge tops. Biological samples recovered during TAN1114 were a mixture of seaweed, tubeworms, and gastropods. None of the samples were identified as coming from sensitive environments.

Methane or cold seeps are present in the region, on the shelf, with 119 available records of taxa reported to date (e.g. Baco et al., 2010; Bowden et al., 2013). Specifically, cold seeps and their associated chemosynthetic fauna have been observed along the offshore ridges. NIWA’s archive (National Invertebrate Collection database) contains records of stony coral species (n=22), sea pens (n=12), and sponges (n=166) reported for the region and have been observed in relatively high densities in seafloor photographs taken at cold seep sites. However, we will locate heat flow measurements away from vent sites or carbonate ridge tops if we observe tell-tale vent plumes on ships echo-sounder.

Should heat flow measurement activities indicate the presence of sensitive environments the survey plan will be redesigned to minimise and, wherever possible, avoid further contact with these environments.


Contingency plan

Specify measures that could be taken to avoid, remedy, or mitigate the adverse effects of the activity on sensitive environments:

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| a) Can the activity be undertaken in another place? | Yes / No*  
  Explain: The type of seismicity and earth deformation that occurs offshore Gisborne is unique. Our seafloor heat flow measurements will give scientific insight about that specific region. No other area can be monitored to undertake this research. |
| b) Can the activity be undertaken in a way that reduces the amount of contact with the seabed? | Yes / No*  
  Explain: Our heat flow probe comprises a lance that penetrates the seabed at each measurement site only, but, has overall less than minor impact on the environment. This is currently the only method available to record heat flow offshore Gisborne. |
| c) Can different methods be used in undertaking the activity to lessen its effects on the sensitive environment? | Yes / No*  
  Explain: There are no known sensitive environments in the survey area apart from the shelf edge, known to contain cold vent sites. However, if we observe tell-tale vent plumes on ships echo-sounder we will locate heat flow measurements away from vent sites. |
| d) Can the activity be undertaken in a way that lessens its effects in the sensitive environment? | Yes / No*  
  Explain: There are no known sensitive environments in the survey area apart from the shelf edge, known to contain cold vent sites. However, given the limited sampling offshore Gisborne, the absence of records does not mean that sensitive environments do not occur. It is likely that sensitive taxa are present on suitable habitats in the form of inner shelf cold seep enviroms and hard substratum ridges at depths of ~720 - 2500 m. Heat flow measurements will not be conducted in areas of known or observed cold vent sites and hard ridges will be avoided. |

* Select one

7 June 2016

Signature of authorised contact person    Date

Name: [Redacted]  
Title: [Redacted]

Note: A signature is not required for electronic (email) forms.