





## Hell's Gate

**Site Number:** SNA35  
**Ecological District:** Rotorua Lakes  
**Source of Information:** Wildland Consultants (2005c, 2007c)  
**Digital Scale:** 1:2,000  
**Data Source:** RDAM 2006  
**Regional Council:** Bay of Plenty  
**1998 Site Number:** NHS No. 35  
**Current Tenure:** Unprotected  
**Site Area:** 32.0 ha  
**Altitude Range:** 320-380 m  
**Bioclimatic Zone:** Lowland  
**Grid Reference:** NZTM E1894865, N5781858

| VEGETATION |   | LANDFORM                        | EXTENT  |
|------------|---|---------------------------------|---------|
| CODE       | TYPE  |                                 |         |
| 1          | Kamahi forest   | Hillslope                       | 6.8 ha  |
| 2          | Radiata pine forest   | Hillslope                       | 2.2 ha  |
| 3          | Radiata pine/kamahi-whauwhaupaku forest   | Hillslope                       | 1.5 ha  |
| 4          | Silver birch ( <i>Betula pendula</i> )/narrow-leaved carpet grass ( <i>Axonopus fissifolius</i> ) treeland.<br>Scattered silver birch trees over mown narrow-leaved carpet grass grassland. Manuka and mingimingi on margins.   | Flat                            | <0.1 ha |
| 5          | Grey willow/ <i>Baumea rubiginosa</i> treeland  | Wetland                         | <0.1 ha |
| 6          | Planted exotic trees/narrow-leaved carpet grass grassland   | Hillslope                       | <0.1 ha |
| 7          | Mingimingi-manuka-kanuka scrub<br>This is the predominant geothermal vegetation type at Hell's Gate and surrounds most of the nonvegetated raw-soilfield, heated geothermal water, and mudpools. Mingimingi is dominant with manuka and kanuka common in the canopy. Scattered wilding radiata pines to c.25 m are present. Scattered plants of prostrate kanuka are found throughout this vegetation type. Kamahi and radiata pines are more abundant towards margins. Patches of <i>Juncus effusus</i> and <i>Sphagnum falcatulum</i> are present in wet areas. Gorse and blackberry are present, particularly towards the northern boundary. | Flat, gently sloping, hillslope | 5.7 ha  |
| 8          | Manuka-mingimingi scrub<br>Manuka dominates with mingimingi also abundant in the canopy. Occasional bracken and prostrate kanuka.   | Flat, gently sloping            | 2.8 ha  |
| 9          | Manuka scrub  | Hillslope, flat                 | 1.9 ha  |
| 10         | Planted manuka-prostrate kanuka scrub   | Flat                            | 0.4 ha  |
| 11         | (Radiata pine)-manuka-mingimingi-bracken scrub  | Hillslope, gully                | 0.8 ha  |
| 12         | Wheki/gorse-manuka scrub  | Hillslope                       | 1.7 ha  |
| 13         | Manuka-bracken- <i>Histiopteris incisa</i> scrub  | Hillslope                       | 0.2 ha  |
| 14         | Mingimingi- <i>Histiopteris incisa</i> -bracken shrubland<br>Patchy mingimingi is common over <i>Histiopteris incisa</i> and bracken surrounding the heated steam that flows through Hell's Gate. This vegetation is surrounded by a canopy of radiata pines and kamahi.  | Stream gully, steep slopes      | <0.1 ha |
| 15         | Manuka/bracken shrubland<br>Scattered manuka over bracken, with local <i>Histiopteris incisa</i> , and rank exotic grass (mostly Yorkshire fog). Some mingimingi present.   | Flat                            | 1.2 ha  |
| 16         | Bracken fernland  | Hillslope                       | 0.4 ha  |
| 17         | Indigenous plantings scrub  | Hillslope                       | 0.7 ha  |
| 18         | <i>Juncus prismatocarpus</i> - <i>Carex geminata</i> rushland<br>A small area of <i>Juncus prismatocarpus</i> , <i>Carex geminata</i> , <i>Carex</i>  | Flat                            | <0.1 ha |

| VEGETATION |  | LANDFORM                      | EXTENT  |
|------------|--|-------------------------------|---------|
| CODE       | TYPE   |                               |         |
| 19         | <p><i>virgata</i> and <i>Isolepis distigmata</i>, with occasional Yorkshire fog. One manuka is present.</p> <p>(Ti kouka)-(grey willow)/raupo-harakeke-manuka/<i>Juncus effusus</i>-<i>Isolepis distigmata</i> reedland</p> <p>A geothermal wetland with emergent ti kouka and grey willow over a reedland dominated by raupo, with local harakeke, and manuka on margins. <i>Isolepis distigmata</i>, <i>Juncus effusus</i>, and <i>Sphagnum falcatulum</i> are also present.</p> | Wetland                       | <0.1 ha |
| 21         | Open water - non geothermal  | Open water                    | <0.1 ha |
| 22         | <p>Nonvegetated raw-soilfield</p> <p>Heated ground, sinter, mud pools. Occasional mingimingi, and prostrate kanuka present.</p>  | Flat, gently sloping, craters | 4.5 ha  |

**Indigenous Flora:** Contains a small population of prostrate kanuka ('At Risk - Naturally Uncommon' in de Lange *et al.* 2009). Other species typical of geothermal habitats are present, including mingimingi, manuka, kanuka, and *Histiopteris incisa*. *Baumea arthrophylla* is also present (Beadel 1996a).

**Fauna:** Common indigenous and introduced species typical of these habitats are present, including bellbird, silveryeye, grey warbler, and goldfinch. New Zealand pipit ('At Risk - Declining' in Miskelly *et al.* 2008) is also present.

**Notes on Overall Condition:** This area contains two relatively large, good quality examples of geothermal vegetation. These are linked by areas of kamahi forest and scrub which have been modified by the planting of exotic and indigenous species.

The geothermal vegetation types present are nationally uncommon as they are different to most other geothermal areas in the region. The vegetation is dominated by mingimingi and has a low species diversity. Taheke geothermal area and the adjacent Paehinahina-Mourea Trust lands also have similar thermal vegetation (Beadel 1996a, Given 1989, Clarkson and Clarkson 1992, Clarkson *et al.* 1990).

The surrounding non-thermal vegetation types provide a protective buffer to the geothermal vegetation and habitat for indigenous bird species. While they contain a large number of pest plants, they have potential for ecological restoration.

**Change Relative to Shaw and Beadel (1998):** The extent and composition of this site appears to be similar to that recorded in 1996. A small fire has been through part of the site in 2006.

**Threats/Modification/Vulnerability:** *Invasive Exotic Plants:* Scattered radiata pine (1-5% cover) are present. Radiata pines have also been recently planted close to geothermal features - particularly to the north of the reserve. If these are not removed they will be prone to blow over during storms and damage the geothermal features present. Other pest plants present include blackberry (1-5% cover), gorse (1-5% cover), and silver birch (1-5% cover).

*Human Impacts:* These geothermal sites are heavily tracked as part of the tourist operations at the site. Some unformed tracks are also present. Part of the site is used as a bathing facility. Some litter at the site.

Part of the Hell's Gate thermal area has been mined for sulphur. Relatively large areas around the shop have recently been cleared, and continued clearance of vegetation is a threat.

It is thought that the Tikitere Geothermal Field may be linked to the Taheke Field, for which a geothermal power plant is proposed. If there is a link then Tikitere could be threatened by this proposal.

The site and vegetation are vulnerable to fire.

- Risk Assessment:** Pest plants: Risk to site - high; Timeframe - high.  
Fire: Risk to site - high; Timeframe - high.
- Significance Level:** National (Appendix 10-Table 1-Criteria 1, 4, 5, 6, 7, 8, 11, 12, 13; Table 2 - Factors N11, N15).
- Significance Justification:** This site is of national significance as it is a good quality representative example of geothermal vegetation. It contains a diverse range of habitats including geothermal wetland, mingimingi-dominated scrub, and small areas of indigenous forest adjacent to the geothermal area. Parts of this site were considered to be of international importance in an assessment of important geological sites and landforms in the Bay of Plenty Region (Kenny and Hayward 1996).
- It also contains c.6.5 ha of an ecological unit which is poorly represented in the existing reserve system (flat-undulating, lowland bioclimatic zone) in Rotorua Lakes Ecological District.
- Fieldwork Required:** No fieldwork is required.
- Notes:** This site was identified as a "Recommended Area for Protection" (RAP No. 35) in the natural area survey of Rotorua Lakes ED (Beadel *et al.* 1998).
- References:** Beadel (1996a); Beadel *et al.* (1996b); Clarkson & Clarkson (1992); Clarkson *et al.* (1990); Given (1978, 1989); Wildland Consultants (2005c).