Geothermal snapshot report

Rotorua surface features

1960 - 2016

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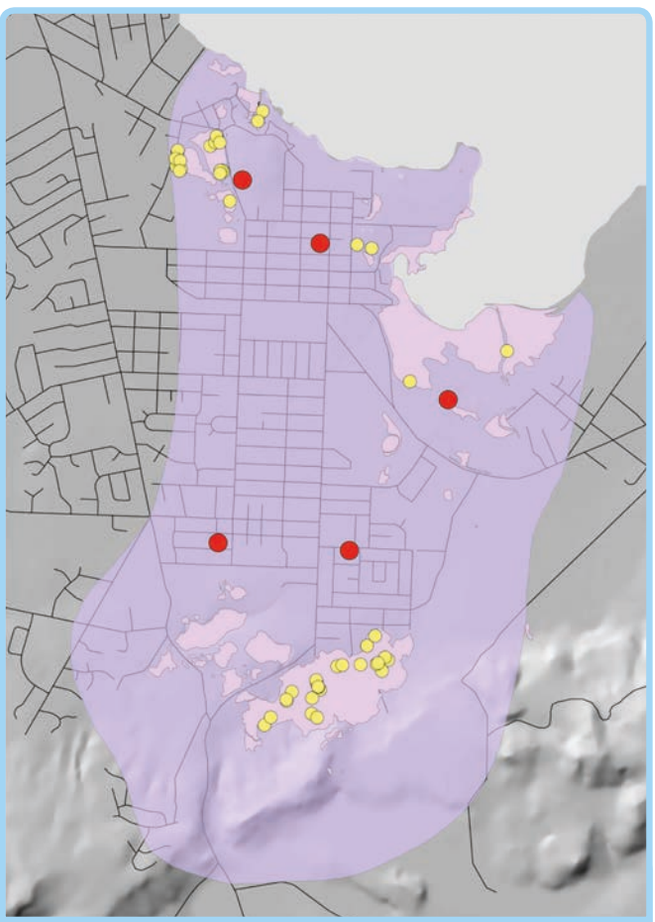
What has happened?

- The 1960s and 1970s saw the demise of many large geysers and thermal springs in Rotorua due to the large volume of geothermal groundwater being taken from bores.
- To save the remaining features a law was introduced to stop groundwater geothermal take from bores within a 1.5km radius of the Pohutu geyser.
- A regional plan was introduced to manage the recovery of the geothermal features. This set an allocation limit of 4400 tonnes per day (net) and required geothermal fluid taken to be returned to its source (deep bore), to maintain fluid volume within the reservoir.
- Surface features have progressively recovered and the field seems to be stable.
- Geothermal springs at Kuirau Park have flows matching those in the early 1960s and it is likely this part of the field is near full recovery. Many surface features now display aspects of their natural variability.
- Spring flows and activity at Whakarewarewa are improving.
- The chloride concentration has increased, indicating geothermal water from depth still reaches the surface in this area.

Key surface features

Rotorua's main types of geothermal features are:

- **Spring pools**
- **Eruptive geysers**
- **Steam vents**
- **Mud pools**
- **Sulphur flats and sinter**
- **Warm ground.**



Rotorua geothermal field extent

Surface feature areas

Monitored geothermal surface features

Geothermal monitoring bores

From left to right: Eruptive geysers, spring pools and steam vents are among Rotorua's key types of surface features.

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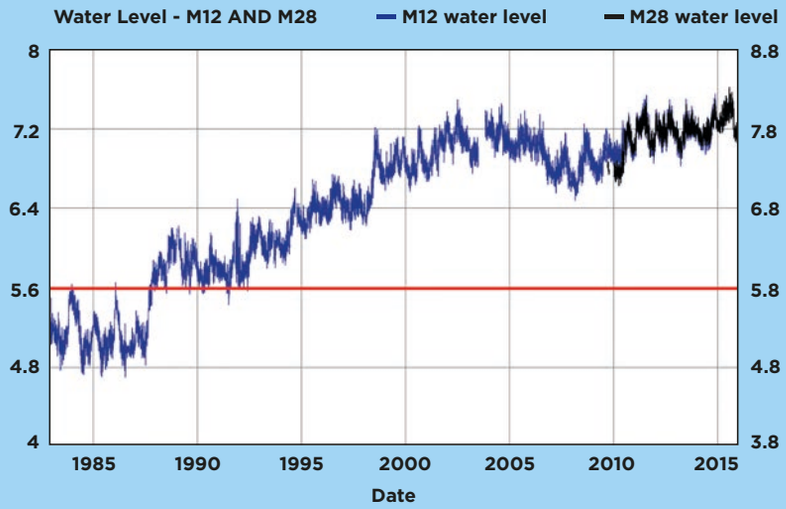
Geothermal groundwater monitoring bores

Monitoring bores record water level and temperature. They show that water levels in the field have risen since the bore closure programme (in the 1.5km exclusion zone) and the discharging of used geothermal fluid back to source. Some reactivation of geothermal features has been observed which can be attributed to the recovery of water levels in the field. The Rotorua regional plan sets water levels that must be maintained in the field to ensure the recovery of surface feature activity.

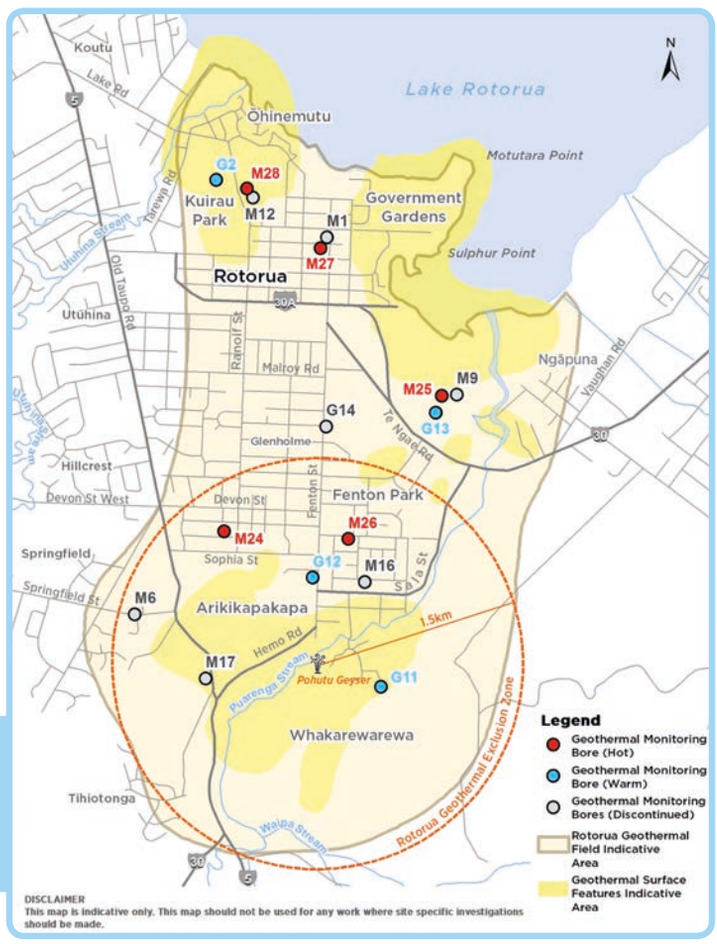


Consents

As at 2015 there were 69 geothermal fluid takes from bores, with this fluid discharged back to its source. Therefore the total volume taken and discharged is a 'closed circuit'. No net loss to the system. There are 27 geothermal fluid takes from bores that are not discharged back to their source. This is the volume removed from the system (2210 tonnes/day). There are 40 bores that use heat, so no fluid is taken from the source.

Allocation

The net limit of geothermal water available for abstraction, without discharge back to source, is 4400 tonnes per day. Only in exceptional circumstances are geothermal water takes not required to be discharged back to source. This maintains the water volume and levels of the field.



Map right: The location of monitoring bores, geothermal features and exclusion zone from the Pohutu geyser. No geothermal fluid is to be taken from a bore in this area.

Rotorua Geothermal Monitoring Bores

For more information on geothermal monitoring undertaken by Bay of Plenty Regional Council, contact the science team on **0800 884 880** or visit **www.boprc.govt.nz/environment/geothermal-resource**

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