Ōhinemutu Village: Geothermal Past, Present & Future

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ABSTRACT

Ōhinemutu, a traditional Māori pā (village), is located in central city Rotorua, and is home to around 200 residents who whakapapa to Ngāti Whakaue, one of the Te Arawa confederation of tribes. Within Ōhinemutu there are three marae, two churches, a community māra kai (garden), urupā (cemetery) and nationally significant geothermal features and heritage buildings.

A proliferation of warm baths, boiling springs and steam to cook food, and warm ground to heat homes and grow crops such as kumara, potato, maize and tobacco, were once a source of wealth amongst the tribe. However, whilst ample heat, hot water and steam continue to exist within Ōhinemutu, successive government policies, regulations and actions (or lack of), coupled with the resultant prohibitive costs of maintaining bores, hot water pipes, infrastructure and consents, now means a majority of whānau within the village have lost their ability to access geothermal home heating, cooking and bathing. This has had significant negative and long-lasting implications on health, social and cultural wellbeing.

This paper shares the Ōhinemutu community's history of living with and using geothermal resources, and their long-lasting relationship with this taonga, as well as how this has changed over time and the consequences of this. The community's goal is to restore their energy security and sovereignty whilst protecting the geothermal taonga, through revitalization of the geothermal features and infrastructure at Ōhinemutu.

1. ŌHINEMUTU GEOTHERMAL AREA

The Ōhinemutu geothermal area is part of the Rotorua Geothermal System in New Zealand's central North Island. The Rotorua Geothermal System underlies Rotorua city from the southwestern end of Lake Rotorua to the Whakarewarewa Valley (Figure 1). Geochemistry indicates that Ōhinemutu is a cooler outflow zone of the same deeper source fluids that feed neighbouring Kuirau Park geothermal features (Mroczek et al, 2002).

Ōhinemutu is framed by Te Utuhina Stream, Lake Rotorua, Kuirau Park and the Rotorua Lakefront (Te Kouramawhitiwhiti). Ōhinemutu area contains extensive tracts of surface geothermal features, including boiling over-flowing springs, warm springs, hot ground and mud pools. Ground and water temperatures exceed 90°C at the surface, and have a pH around 9 (Figure 2).

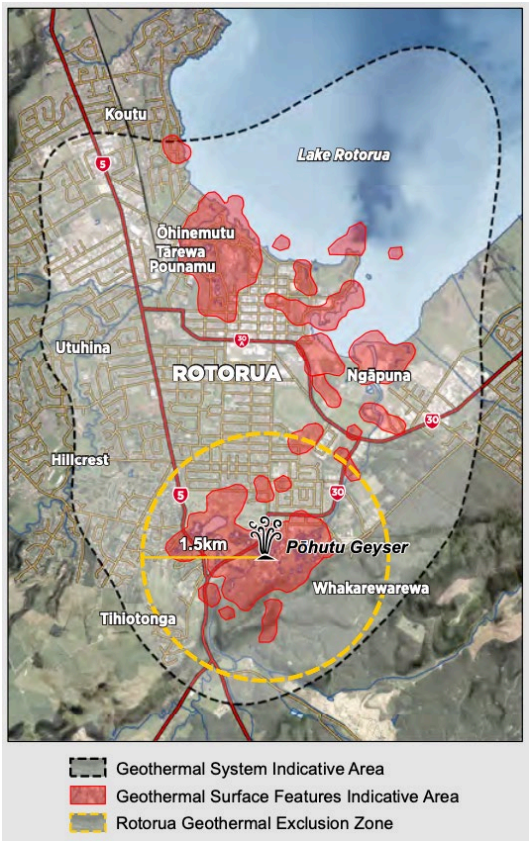

Figure 1. Rotorua Geothermal Field (BOPRC, 2019)

Figure 2. Aerial view of Ōhinemutu, including Te Rūāpeka (a geothermal pool and significant geothermal feature)

2. HISTORICAL USE

Ōhinemutu pā was once regarded as a jewel in the crown of Ngāti Whakaue, due to its abundance of rich natural resources including the plentiful, robust and sustained geothermal

activity which provided energy security and enabled self-sufficiency. Homes were warmed by geothermal heat, kai was regularly cooked in steam boxes, and whānau bathed in natural hot pools for hygiene, relaxation, spiritual nourishment, healing and the treatment of ailments, such as eczema, arthritis, and rheumatism. Mud pools were also used to dye flax and prepare tūpāpaku (the deceased) for internment.

At the heart of Ōhinemutu lies Te Rūāpeka, one of the village's most significant geothermal features. Fed by multiple ngāwhā—including the largest, Waikite—this pool was traditionally tempered by the cool waters of Lake Rotorua. For generations, Ngāti Whakaue gathered at the warm lagoon, once bordered by a pristine sandy beach, to swim, bathe and hold community events (Figure 3).

The lives of whānau in Ōhinemutu were intimately connected to their geothermal taonga. They lived in harmony with their environment, having developed deep knowledge of how to safely interact with it. The wai ariki (geothermal gifts of the Gods) nurtured the wellbeing of whānau, hapū, and the wider community. More than just a resource, geothermal energy was woven into the fabric of daily life—central to social connection, collective health and the intergenerational transmission of knowledge (Figure 4).

Figure 3: Steam box at Rūāpeka Bay, date unknown (TMHKO)

Figure 4: Preparing food at Ōhinemutu, 1950s (TMHKO)

3. THE INFLUENCE OF GOVERNMENT POLICY

From 1881 onward, laws imposed by the Crown progressively dismantled Māori control over geothermal taonga, enabling state control and exploitation without the consent of iwi and hapū, and resulting in major losses in land, authority and access.

Ōhinemutu became the central hub of the Rotorua region in the early 1870s. In 1880, the Rotorua Township Agreement was signed between Judge Fenton and Te Arawa hapū (primarily ngā uri o Uenukukōpako). While the agreement preserved Ōhinemutu village by placing it outside the official township boundaries, it also transferred ownership of the township's hot springs to the Crown to be held as public reserves—under the management of the town doctor.

The following year, the Thermal Springs Act 1881 recognised hapū and iwi as the rightful owners of the springs and geothermal waters. However, this recognition was short-lived. Subsequent legislation and government actions continued to erode the rangatiratanga of whānau, hapū, and iwi over their geothermal taonga (see Table 1). The cumulative effect of these laws included the Crown's confiscation of lands containing significant geothermal features, the infilling and redirection of geothermal areas and waterways, and the conversion of geothermal lands for commercial and industrial use. These developments occurred without consultation, consent or involvement of the relevant iwi and hapū, particularly those connected to Ōhinemutu.

Table 1: Historical Government legislation and policies affecting Māori governance of geothermal.

Government Action	Impact on Māori
Thermal Springs District Act 1881 & 1883	Facilitating Government control over geothermal areas, to the detriment of Māori rangatiratanga and kawanatanga.
Land Act 1884	Undermining Māori land rights, leading to loss of land control.
Scenery Preservation Act 1903	Prioritising conservation of scenic areas, to the exclusion of Māori relationships with the whenua.
Geothermal Energy Act 1953 & Rotorua City Geothermal Energy Empowering Act 1967	Vested exclusive rights of ownership and access of geothermal to the Crown / NZ Government. Enabling large-scale Government control and exploitation of geothermal resources. No rights given to Māori.
Water and Soil Conservation Act 1967	Inhibiting iwi use and management of water resources.
Ministerial and Cabinet Directives 1986 & 1989	Influencing regulatory controls and use of geothermal resources.
Resource Management Act 1991 & Rotorua Geothermal Regional Plan 1999	Imposing restrictive frameworks for managing geothermal and natural resources, limiting Māori decision-making power / influence.

Unrestricted public and commercial access to geothermal resources led to degradation, pollution and—in some cases—the permanent loss of geothermal springs. Over-extraction further destabilised the Rotorua geothermal field. Collectively, these policies and their consequences undermined the ability of iwi and hapū to uphold their responsibilities and rights over ancestral lands and wai ariki.

3.1 Well Drilling & the Bore Closure Programme

The drilling of geothermal wells in Rotorua began in the 1920s. By 1985, more than 376 wells were operating across the city, significantly impacting surface geothermal features (BOPRC, 1999)—including those in Ōhinemutu—and disrupting traditional methods of accessing and using taonga tuku iho.

In response to the degradation, a bore closure programme was introduced in the 1980s, targeting all geothermal wells within a 1.5 km radius of Pōhutu Geyser. The programme resulted in the closure and grouting of 235 wells, including 112 domestic wells serving around 1,110 users, and 123 commercial wells affecting 187 users (BOPRC, 1999; Figure 5). The closures were credited with restoring aquifer pressure and improving the activity of geysers and springs. By 2000, some surface features in areas such as Kuirau Park–Ōhinemutu had recovered to levels not seen since the 1950s.

However, the programme also had lasting negative impacts. Entire suburbs in central Rotorua lost access to geothermal wells traditionally used for home heating and bathing. Despite its aim to preserve the health of geothermal resources, the closure programme disproportionately affected whānau and hapū, who weren't consulted or involved in decision-making and were unable to bear the costs of compliance. This included the decommissioning of over 20 bores at Ōhinemutu (see sections below for consequences of this for the papakāinga).

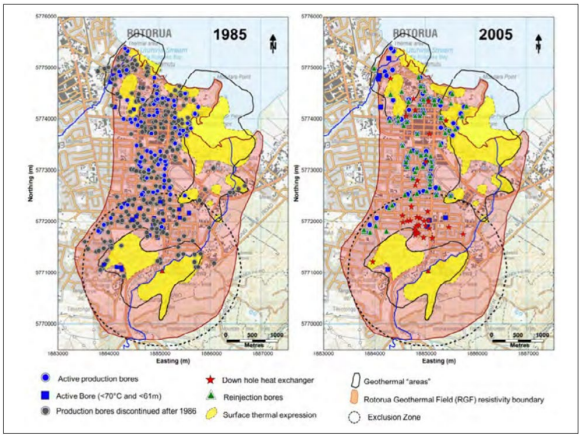

Figure 5: Location of geothermal wells before and after the bore closure (BOPRC, 1999).

Residents were later offered the option to reactivate their wells, but at a prohibitive cost of $18,000 per year—excluding additional maintenance fees. For most domestic users, especially hau kāinga, this was unaffordable. Consequently, geothermal use among local Māori sharply declined, creating a disparity in access between commercial operators—who could afford the costs and profited from the resource—and residential users, who were effectively excluded from the resource their communities had depended on for generations.

3.2 Deed with the Minister of Energy

In March 1990, Ngāti Whakaue ki Ōhinemutu signed a deed with the Minister of Energy. The purpose of this agreement was to waive rental charges for the use of geothermal energy by whānau and hapū for specified bores used in traditional domestic, cultural and spiritual practices. The Deed formally recognised Ngāti Whakaue as "the tangata whenua of Ōhinemutu, possessing a unique position with respect to the use of geothermal energy from the bores at Ōhinemutu." While this agreement acknowledged the mana of Ngāti Whakaue and removed the financial burden of state-imposed rental payments for accessing their geothermal taonga, it did not address the underlying economic hardship facing many whānau and hapū. Most remained unable to afford the costs of maintaining or upgrading geothermal infrastructure, systems and processes—leaving many without reliable access to this ancestral resource.

4. IMPACTS ON THE COMMUNITY

4.1 The Current Status Quo

Ōhinemutu is home to around 114 households, made up of mostly kaumātua and parents with young children. Despite its small size, the village remains a vibrant hub of activity—hosting regular events across its three marae, welcoming tourists who wander through at their leisure, attracting locals who gather along the lakefront for lunch and scenic views, and drawing churchgoers on weekends. Promoted by local and national tourism agencies as a "living Māori village set on the picturesque shores of Lake Rotorua," visitors are encouraged to explore the pā free of charge—to witness geothermal cooking over boiling vents and view the outdoor bathing sheds (NZ Tourism, 2025).

Yet, behind this carefully curated image lies a different reality: a loss of kaitiakitanga and tino rangatiratanga over ancestral lands, waters and geothermal taonga. The papakāinga community, including residents and their wider whānau, have been largely cut off from meaningful access to the natural springs once used for heating, bathing, and cooking.

Despite deep cultural and historical ties, whānau face ongoing barriers—both financial and regulatory—that prevent them from using geothermal resources as their tūpuna (ancestors) once did. The cost of reactivating wells and maintaining infrastructure is prohibitive, and the regulatory environment often favours commercial interests over communal or cultural use. This has led to the breakdown of communal infrastructure, disrupted intergenerational practices, and contributed to intergenerational deprivation within the community.

Geothermal extraction, infilling, redirection and conversion of geothermal waters and lands across Rotorua have significantly altered surface features and disrupted traditional methods of access and use by Ngāti Whakaue and other hapū and iwi. These changes have impacted not only the physical environment but also the spiritual, cultural, and economic wellbeing of the people. Cumulative effects, driven by external exploitation, and compounded by restrictive regulatory frameworks, have damaged the relationship of Ngāti Whakaue with the geothermal taonga. Longstanding connections once central to daily life and cultural identity have been severed, and the potential for iwi-led development of geothermal resources has been constrained.

4.2 Loss of geothermal features

The Bay of Plenty Regional Council (BOPRC) monitors two geothermal features at Ōhinemutu (Figure 6).

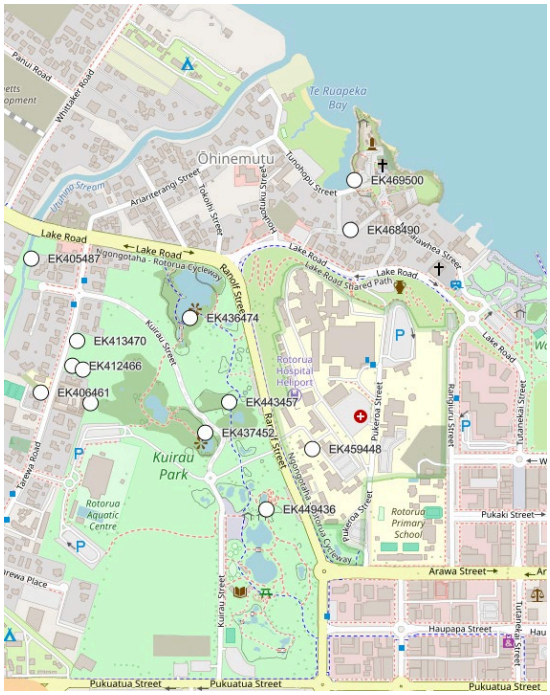

Figure 6: BOPRC monitors two geothermal features at Ōhinemutu: EK469500 (Deer Head Spring) and EK 468490 (Little Waikite) (BOPRC, 2025a)

The natural environment of Ōhinemutu, including lakefront wetlands, sandy beaches, the Utuhina and Te Wairoa streams, Rūāpeka Bay and other geothermal features, has suffered significant degradation over time. Urban expansion, industrial development, tourism and the city's wastewater and stormwater infrastructure have all contributed to the ongoing physical and ecological decline of these taonga.

In 2016, Te Rūāpeka lagoon became completely cut off from Lake Rotorua due to sediment build-up caused by erosion around the lake and its connected waterways (Figure 7, Figure 2). As a result of the blocking of natural in and outflow to the lake, the nationally significant geothermal feature began to overheat and became increasingly polluted by discharges from stormwater drains and nearby bathing facilities, transforming it into a health and safety risk for both residents and visitors.

Ōhinemutu whānau believe sedimentation has smothered natural geothermal vents within Lake Rotorua, leading to the emergence of new hot pools in areas of the village and triggering geothermal eruptions at the entrance to the Rūāpeka. Rising lake levels and elevated temperatures are also thought to be contributing to the erosion of the banks along Muruika Urupā (Soldiers' Cemetery), placing culturally significant sites at further risk.

Unlike their tūpuna, the last two generations of Ōhinemutu whānau have never been able to gather, swim or bathe in the Rūāpeka—a powerful symbol of disconnection from a once-vital source of healing, identity, and communal life.

4.3 Loss of Energy Security and Sovereignty

Geothermal energy was once an accessible, affordable and sustainable source of heating within Ōhinemutu. As a result, most homes were built between the 1940s and 1960s often without insulation, hot water cylinders or showers installed, relying historically on communal geothermal access. Due to the Rotorua bore closure programme and subsequent ongoing bore costs (see section 3.1). today, around 20 bores in the village have been decommissioned or are no longer in use, cutting a majority of whānau access to this heat source.

At one time, Ōhinemutu whānau enjoyed a large number of ngāwhā to bathe within the wai ariki. Now, only a small number of households have access. The deterioration of geothermal infrastructure within the village, combined with the high costs of bore maintenance, has led to the closure of most communal and family baths over the past 30 years, and many family bathhouses are now being used as storage spaces while the community continues to seek funding in the hope of one day restoring energy security and sovereignty.

A small number of whānau in Ōhinemutu continue to have access to cooking areas that use geothermal steam and water. Steam boxes throughout the village are no longer operational due to loss of heat caused by external exploitation of the resource, along with the high costs of maintenance and repair.

Efforts to restore access have been consistently hindered by prohibitive costs. For example, in 1997, six families on Arataua Street were quoted $13,000 each to redrill a shared bore and reconnect their heating, bathing and cooking facilities. Half of the families were unable to contribute towards that cost. By 2024, the average cost to drill a geothermal bore had risen to between $40,000 and $80,000. As a result, those families, including two new generations, have gone without access to geothermal resources in that part of the pā for 27 years.

Figure 7: Te Rūāpeka and Te Wairoa Stream are cut off from Lake Rotorua by an increasing build-up of sediment as a result of erosion occurring around the lake and throughout connected rivers.

In 2018, Te Kuirau marae was forced to shut down its steam boxes and disconnect geothermal radiators and bathing pools due to ongoing bore maintenance costs. Gas is now used for cooking and heating water, and heat pumps are relied on for warmth. All of this imposes significant cost implications for the marae, community, and hapū.

4.4 Energy Poverty

Ōhinemutu is rated Decile 10, the highest level of deprivation on the New Zealand Index of Socioeconomic Deprivation (University of Otago, 2023), with a median household income of just $33,900 (Stats NZ, 2023). The compounded loss of household and communal access to geothermal energy has entrenched energy hardship across the community. Many whānau now live in cold, poorly insulated homes, unable to afford the high and rising costs of alternative heating methods such as gas, oil heaters and heat pumps. Health impacts, including rising rates of respiratory illness and other preventable conditions, have led to declining health amongst children and increased premature deaths amongst kaumātua, with devastating effects on the social fabric of the iwi.

Energy poverty in Ōhinemutu is not a result of lack of resource, but of inequitable access and systemic neglect. While whānau in the pā live without heat, hot water and sometimes power, council geothermal maps show that many non-Māori residents in wealthier suburbs of Rotorua continue to enjoy geothermal heating and bathing in their homes. At the same time, commercial operators, including hotels, motels and holiday parks, are supported to take, use and profit most from the district's geothermal resources. Meanwhile, the hau kāinga of Ōhinemutu are excluded and left disconnected from their ancestral geothermal taonga that have long underpinned their way of life.

4.5 Disruption to Intergenerational Knowledge Transfer

The inability to access geothermal taonga in Ōhinemutu has had a profound impact on the social, cultural, physical, spiritual and economic wellbeing of the hau kāinga. Once central to daily life, shared access to geothermal resources fostered communal gathering, whanaungatanga, and collective care, while promoting the transmission of mātauranga Māori (intergenerational, experiential knowledge gained from immersion in an environment and refined through centuries of lived experience).

The loss of access has disrupted cultural practices of manaakitanga, which traditionally included warm homes and marae to house guests, the use of steam boxes to quickly prepare kai for large gatherings, and the healing and restorative use of ngāwhā for all in need. These practices were fundamental to the identity and mana (strength) of the community.

As communal infrastructure declined, so too did these traditions, contributing to the erosion of cultural practices and the breakdown of social cohesion that once defined life in the pā. The gap in practicing these traditions and the removal of decision-making power over the wai ariki also hindered the transfer of knowledge between generations and limited the ability of whānau and hapū to uphold and evolve specialised knowledge systems.

The mātauranga associated with ngāwhā is historically significant and highly site-specific. It encompasses knowledge of which pools offered rongoā (medicinal benefits), which were suited for cooking or preparing materials such as harakeke (flax), and the tikanga (etiquette) surrounding their communal use. These traditional knowledge systems helped to safeguard the geothermal taonga and ensured the safety, dignity, and wellbeing of those who used them. Today, mātauranga related to traditional access methods, the unique qualities of geothermal waters, mud and pools, and communal practices of bathing and cooking have almost entirely disappeared from daily life in Ōhinemutu.

This is not simply a story of energy inequality—it is one of environmental injustice and cultural erasure. Māori relationships with the environment are inherently reciprocal: the wellbeing of the people is tied to the wellbeing of the land and waters. The severing of this connection elevates a sense of loss that extends well beyond practical needs for heating, bathing and cooking. It undermines the social fabric of the community and the cultural sovereignty of Ngāti Whakaue.

5. BARRIERS TO CHANGE

The people of Ōhinemutu have inherent responsibilities as guardians to uphold a duty to protect the mauri of the wai ariki for future generations. In the eyes of hau kāinga, the Rotorua Geothermal System is more than just a resource – it is a taonga tuku iho and a source of pride and cultural heritage: a gift from atua that once provided a foundation for social and cultural wellbeing. There is considerable hurt and feelings of disempowerment, and a drive to change this situation (Kereopa, 2024). However, there are significant barriers to revitalising this taonga (treasure).

A key impediment is that government strategies, policies and plans tend to favour preservation and conservation of geothermal taonga (limiting Māori ability to develop their resources or promote commercial development (by-passing community rights and interests in favour of large-scale commercial resource exploitation).

5.1 Central Government Strategies

The New Zealand Energy Strategy (MBIE, 2023b) was originally due to be published in December 2024. A key area identified within the draft strategy was 'Ensuring Energy Affordability & Energy Equity', and the strategy included development of an Equitable Transitions Strategy; a Community Energy Pilot Programme; and Work to Address Energy Hardship (MBIE, 2023b). It should be noted that neither the Equitable Transitions Strategy nor the New Zealand Energy Strategy sought to enable equitable power sharing, equitable decision-making, or equitable resourcing for iwi, and did not address existing inequities and enable energy resilience building by and for Māori communities. Work to address energy hardship was focused on education programmes aimed at improving energy usage and energy-efficient homes. It did not address the energy hardship inflicted on iwi by geothermal management systems and legislation, which favour corporate interests over indigenous rights.

The Government has recently launched a draft geothermal strategy for New Zealand in July 2025 (Beehive, 2025; NZ Government, 2025). One of three strategic outcomes is to "strengthen regional economies and te Ōhanga Māori [the Māori economy] by advancing geothermal development in collaboration with tangata whenua, and unlock industrial growth, tourism and trade…" The focus on the Māori economy suggests this strategy will prioritise investment in commercial and industrial projects over community-led

aspirations seeking energy resilience and independence, and improved health and cultural outcomes.

5.2 Regional Policies & Plans

Regional policy statements, regional plans and district plans must recognise and provide for Māori cultural values, ancestral connections to land and water, wāhi tapu, and other taonga. However, mana whenua and kaitiaki of the wai ariki, have no official role in regional and local decision-making in relation to the geothermal taonga.

The BOP Regional Policy Statement (2025b) aims to 'manage the resource to support the intrinsic and traditional cultural values while providing for the use of the energy resource'. However, it does this by 'taking a region-wide approach to the geothermal systems in the Bay of Plenty, and providing for the different values at a regional level, rather than trying to provide for all values within each system'. This limits decision making on a local level, for local benefit.

In 2024, the BOPRC approved the Rotorua System Management Plan (SMP, 2024), along with Regional Council policy to guide the overall management of the Rotorua Geothermal System. Council development of the SMP was led "alongside tangata whenua through the establishment of a hau kāinga working group, engagement with iwi entities, and engagement more widely through multiple hui-a-iwi" (BOPRC, 2025c). However, iwi demands to co-draft the SMP policy were ignored, and the scope of iwi input limited by council to:

- Providing hau kāinga perspectives on the health and wellbeing of geothermal taonga within Rotorua;
- Embedding Te Arawa Values into the work;
- Developing provisions for customary takes; and
- Developing mātauranga monitoring.

Existing outcomes of Council management of geothermal to date include:

- Loss and degradation of geothermal features and their associated ecosystems due to unchecked urban and industrial development;
- Loss of control, protection, and access by mana whenua to geothermal home heating, cooking, bathing/healing and other cultural uses;
- Loss of mātauranga, intergenerational knowledge, connection, and practices of mana whenua associated with those uses listed above;
- Loss of health and wellbeing by mana whenua as a result of losing energy security;
- Meanwhile, commercial use now accounts for around 85% of the total volume of geothermal water and energy allocated.

In 2018, hapū prepared a draft resource consent application to dredge the opening of Te Rūapeka in an attempt to reconnect the taonga with Lake Rotorua. BOPRC commissioned GNS Science to undertake a geothermal hazard assessment associated with the removal of the sediment. The completed report indicated that health and safety concerns could not be mitigated to a satisfactory level to support dredging.

The BOPRC was reviewing the 1999 Rotorua Geothermal Plan (BOPRC, 1999), and the geothermal chapter of the Regional Natural Resources Plan (BOPRC, 2023) with a view to combine these through a Plan Change, into a single geothermal chapter in the Regional Natural Resources Plan. However, at the time of writing, following the Government's announcement to suspend all plan changes until the new Resource Management Act replacement legislation comes into force, BOPRC are no longer proceeding with the Draft Geothermal Plan Change (PC11) for the Rotorua Geothermal System.

5.3 Lack of Government Funding

The mis-alignment of Government policies and strategies with local needs and aspirations has flow on effects for Government funding priorities.

A number of commissioned reports and studies have been undertaken to inform pathways to restoring energy sovereignty in Ōhinemutu.

- In 1990, Ngāti Whakaue leaders commissioned the "Feasibility Study Report on the Ōhinemutu Village Geothermal System Upgrading" for Ngāti Whakaue and the Ministry of Commerce to consider and develop cost proposals for "upgrading geothermal energy usage for the Ngāti Whakaue ki Ōhinemutu." The study considered localised district heating as part of an efficiency improvement scheme.
- In 2009, Pukeroa Oruawhata Trust, on behalf of Ngāti Whakaue, commissioned the "Ōhinemutu Geothermal Power Plant Feasibility Study" to consider the feasibility and economics of the generation of electricity from the geothermal resources available beneath Ōhinemutu village using a new 'lower cost' UTC binary cycle unit.
- In 2021, Te Manatōpū Hau Kāinga o Ōhinemutu, a collective of resident whānau representatives from the pā, made an application to the third round of the Māori and Public Housing Renewable Energy Fund to restore geothermal heating infrastructure to all homes within the village. Despite this proposal being shortlisted, it was ultimately declined based on cost.

All of these studies and endeavours failed to secure government support for implementation. Government-funded energy projects have tended to favour those projects requiring the use of electricity. For example, projects funded by the Community Energy Pilot Programme focused on small-scale new housing development with a priority on solar energy. The Māori and Public Housing Renewable Energy Fund supported the build of only one geothermal heating project: a small-scale 15-home Whakapoungakau Iwi Geothermal Energy Grid (MBIE, 2023a).

6. GEOTHERMAL REVITALISATION

Mauri is reciprocal. Mauri of the people is filled up by the mauri of wai, and the ngāwhā and puia will also begin to heal when the connections and relationships are restored. When the giving and taking of mauri does not occur, neither can heal. If hau kāinga are improving and restoring relationships with the ngāwhā and puia, then the people are giving back in

some way to the mauri of these geothermal taonga – both aspects are connected and cannot be considered in isolation.

In 2021, Te Arawa launched Te Ara ki Kōpū: Te Arawa Climate Change Strategy (Te Arawa Lakes Trust, 2021) which identified energy security and sovereignty as a priority for whānau, hapū and iwi. One of the aims highlighted within this strategy is "Our whānau use our ngāwhā to heat our homes, cook our kai, and to bathe in." Achieving this goal requires that whānau, hapū, and papakāinga communities are resourced and supported to regain control of energy sources to meet their own needs in this time of climate breakdown.

Te Manatōpū Hau Kāinga o Ōhinemutu (TMHKO; an incorporated society, formed in 2021) are a collective of whānau and marae representatives from within Ōhinemutu village. The majority of Ōhinemutu residents are of Ngā Whakaue descent who remain actively connected with their marae and te ao Māori (the Māori world). The collective vision of villagers is to overcome and manage challenges impacting on village life identified by the community, while also celebrating the unique place. This means balancing the natural and built environment, visitor experiences, and safety and respect for the pā.

Key areas of focus are:

- Mana motuhake
- Ensure residents voices are at the forefront of decision making
- Protect taonga and history
- Improve the hauora (health) of the wai and ngawha, including Te Rūāpeka, Utuhina stream, Te Wairoa stream, Te Rotorua nui a Kahumatamomoe and other significant waiariki dotted throughout the pā
- Climate resilient homes and marae
- Improved safety and security
- Emergency preparedness
- Traffic and tourist management

TMHKO aim to use geothermal resources to uplift the socioeconomic future of the residents. This means revitalising the geothermal features for the use of hapū and future generations and re-instating the geothermal infrastructure to provide safe and warm homes to improve the hauora (health) of whanau, particularly kaumatua (elders) and tamariki (children). Flow on effects will include improved geothermal safety, upskilling of whanau, and revitalisation of knowledge. The residents seek opportunities that will provide better connection with the natural environment aiming for a future where the village is a thriving, safe, ecologically diverse, healthy, sustainable, inviting and beautiful place (e.g. Figure 8).

6.1 Ōhinemutu Housing Infrastructure Project

In 2022, TMHKO secured a small grant from the Māori and Public Housing Renewable Energy fund to complete a feasibility study on restoring geothermal heating within homes in Ōhinemutu village (Dobbie, 2023). Options for accessing geothermal heat include the use of production/reinjection bores, down-hole heat exchangers, or large flowing surface features. The condition of the 25 production bores in the village is unknown, with only five consented for use, however these five consented bores have a combined take in excess of 200 tonnes/day. A group heating scheme (using production/reinjection bores) is estimated to require a daily peak of 150 tonnes/day, making this a viable heating option. Alternatively, downhole heat exchangers are also viable, whilst minimising impact on the reservoir.

Figure 8: Ōhinemutu development plans include restoration of the geothermal environment (from Ngāti Whakaue Tribal Lands, 2019)

The cost to install a group scheme for 120 homes was estimated to cost around $8M, with a pilot scheme for 10-12 homes estimated to cost around $1M. Ongoing operating and maintenance processes will be needed, adding additional cost.

The next step in this project is to complete a housing infrastructure scope, and to seek partnerships and funding.

Key challenges going forward include:

- Funding and partnerships
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- Regulatory processes
- Infrastructure sourcing

7. CONCLUSION

The Ōhinemutu community have a long history of living with and using geothermal resources. However, while ample heat, hot water and steam still exist within Ōhinemutu, successive government policies, regulations and actions (or lack of), coupled with the resultant prohibitive costs of maintaining bores, hot water pipes, infrastructure and consents, now means a majority of whānau within the village have lost their ability to access geothermal home heating, cooking and bathing. This has had significant negative and long-lasting implications on health, social and cultural wellbeing. The community's goal is to restore their energy security and sovereignty whilst protecting the geothermal taonga, through revitalization of the geothermal features and infrastructure at Ōhinemutu.

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GLOSSARY OF MĀORI TERMS

Te Reo Maori	Meaning
hau kāinga	Home. Local people of a marae, home people. Also known as hunga kāinga
kaitiakitanga	Guardianship, stewardship, trusteeship
mana	Prestige, authority, status
mana motuhake	autonomy, self-government, self-determination, independence, sovereignty, authority
mana whenua	Territorial rights, power from the land
manaakitanga	/hospitality, kindness, generosity, support - the process of showing respect, generosity and care for others.
mauri	The essential life force, energy or principle that tangata whenua believe exists in all things in the natural world, including people.
ngāwhā	A hot or boiling pool, including hot springs and mud holes
puia	geyser
rangatiratanga	Right to exercise authority, chiefly autonomy, sovereignty, principality, self-determination
rongoā	Medicines, remedies
tangata whenua	Local people
taonga	Treasure, property; taonga are prized and protected as sacred possessions of the tribe
taonga tuku iho	Heirloom, treasure handed down, cultural property, heritage
tūpuna	ancestors
wai ariki	Geothermal. Chiefly water / waters from the gods. A term to also describe a warm pool that doesn't boil.