

Geothermal Programme Snap Shot Report for 2022

The Geothermal Programme integrates geothermal work streams across Council. This is a snap shot of key outputs for 2022



GEOTHERMAL WORKSHOP

Penny, Jason, Sarah, Jack, and Mariana attended the NZ Geothermal Workshop in November in Tamaki Makaurau. It was the first time we have connected in person with the industry for two years. We were there in force, with four presentations, plus lots of other industry reps referencing the work they have been doing with BOPRC. Our kaupapa was also a bit different to the usual geothermal industry updates, with a focus on sustainability. We also had a great conference dinner at Sky City, and the Weta workshop experience.



STAFF CHANGES

We've seen a few changes in our geothermal roopu this year. Mary is back from Maternity leave (the return of the long phone call), Mariana now has a permanent position as Geothermal Scientist, Danielle left us to head to 4Sight, and Jack Dodd has been dragged into geothermal compliance with Jason. Rochelle G is also stepping in to help with geothermal well mahi. We are so lucky with the support we get across the organisation, and just to name a few special thanks go to GIS, EDS, Te Amorangi, Community Engagement, and Comms.

ANNUAL WAIKATO BAY OF PLENTY FIELD TRIP

Our annual kanohi ki te kanohi hui, with Waikato Regional Council in November, was informative and great fun. For some reason these field trips always have a better turn out than our bimonthly formal catch ups! But the more the merrier and this year we had Elsa and Mark from our Natural Hazards team join us to listen to the presentation by Ted Bertrand and Grant Caldwell from GNS on the MT surveys carried out in the Rotorua Lakes.

We followed up with a brief chat from Penny on the QE Hospital redevelopment and then travelled to Waikite wetland in the Waikato Region to hear from DoC's Paul Cashmore about the restoration of this geothermal wetland. The wetland has temperatures of up to 80 degrees in places and includes rare thermally tolerant vegetation – pretty fascinating!

But it is not all fun and games – we have been working with Blair Dickie from Waikato to formalise our relationship with Waikato through the development of a Local Government Geothermal Practitioners Group. This will include other councils with geothermal resources and give us better recognition as local government experts in geothermal.



LOOKING INTO THE EFFECTS OF REINJECTION OF TOWN SUPPLY WATER IN ROTORUA

We hear a lot about Rotorua being the 'spa city' and this year we engaged GNS to assess the potential effects of reinjection of town supply water, which has been bathed-in, on the geothermal aquifer's chemistry. We figured that if the effects were minor this could open up new opportunities. The results showed that:

- Reinjection of town supply water will have a small effect on the shallow aquifer and this will depend on the size and rate of the reinjection
- Reinjection of water from mineral pools, or surface discharges could release human pathogens. The risk depends on the types of microorganism, volumes and dilutions of water reinjected, and the receiving environment, but treatment using filtering can minimise risks.

We are keen to share this new knowledge with the community!

WHEN WE GET A 'BAD DAY' IN THE OFFICE

There are regular well failures in Rotorua – usually Jason is onsite in a compliance role. But in February one of our own five SOE geothermal monitoring wells (M25) failed, requiring abandonment (eek). Mariana responded to the WorkSafe investigation, with support from Jason – scary stuff!!! The Science team now have:

- A monitoring well maintenance monitoring plan
- New communication protocols with NIWA about maintenance of our wells
- A new well head design and new well heads on all of our geothermal monitoring wells.

Mariana and Rochelle G. are also working on the well replacement for M25, at a site near Ngapuna. It is a huge and costly exercise – but we need this well and the data that it provides.

FLASH NEW MONITORING WELL HEADS

Following on from our M25 failure we realised that our wells were not in great shape, and to comply with best practice we needed a full wellhead change-out. Mariana and Rochelle started this change-out project by re-designing the wellheads to better suit BOPRC monitoring needs and set a high standard for geothermal wells in Rotorua. The valves and fittings are first pressure tested before being installed. They have been working with Ralph Winmill at Contact Energy. They are beautiful things indeed but our end goal is really safety and effective management of our geothermal assets and the geothermal taonga.



WORKING WITH THE COMMUNITY ON THE ROTORUA SYSTEM MANAGEMENT PLAN

We've had a long road engaging with the community on our SMP for Rotorua. Most recently four engagement hui were held on the SMP in June, including one hui-a-iwi, two stakeholder hui, and a targeted hui with Whakarewarewa Village Trust. We updated stakeholders and tangata whenua on the work done to date and our proposed policy direction. Close to 150 people attended these hui.

People always get pretty fired up about geothermal – including our staff of course (see Freya presenting below)! At the hui-a-iwi, Te Arawa were passionate about the geothermal taonga and made it clear that they continue to seek partnership and to be able to exercise kaitiakitanga.

Mostly feedback was very positive, but there was frustration from some that we did not present the final allocation limits (i.e. the numbers). People want to know 'how much there is to use' without damaging surface features. A highlight (for some) was when Penny got a growling and told to sit down by one elderly gentleman!



MODELLING TO SET ALLOCATION LIMITS

We have been working hard to get those numbers for the community and to set allocation limits. The modelling and other technical reports needed to support this has largely been completed. We are now doing some follow up modelling.

Paul has been pulling out all stops to help us set allocation limits for the Rotoura System. This is no easy task – it involved reviewing modelling and other technical reports, consolidating all of the findings, and identifying the implications for consent holders. We have work-shopped his recommendations, and discussed the uncertainty around the modelling as well as the level of risk that we are willing to take. Mariana is now working with modellers to further refine this work and firm up allocation limits for taking of heat.

This is tricky stuff, we expect that there will be some difficult messaging to the community about having realistic expectations of the system as a source of cheap energy.

GEOTHERMAL WEBPAGE REFRESH

Our refreshed geothermal webpages are now live for viewing on the BOPRC site. What an improvement, thanks to Julie and Freya!

Geothermal

Surface features

Hazards

Values of Geothermal Systems

Managing our geothermal systems

Classifying geothermal systems

Geothermal systems

Geothermal glossary and reports

Geothermal plan change

Surface features

Geothermal Origins

Values of Geothermal Systems

Economic

GEYSER MONITORING

One of the most exciting projects that has been started this year is a joint project with GNS and Te Puia on a trial for continuous monitoring for the Pohutu and Te Tohu (Prince of Wales Feathers) geysers in Whakarewarewa. We are all a bit jealous of Mariana, who gets to spend way more than her fair share of time with the geysers.

GNS is providing expertise, instrumentation and installation. BOPRC is providing the observational data and coding to quickly derive the parameters (percentage of the day in eruption, frequency, and duration). If successful, this will become ongoing and possibly extended to other geysers. Te Puia provided site access and sees the project as an opportunity to improve the educational side of visits to the manuhiri.



CHANGES COMING TO KAWERAU

To be fair, consenting the big geothermal users at Kawerau is not the glamorous side of geothermal, but it is core business for Council and Kawerau is a multi billion dollar geothermal operation. A lot of our work this year has been administering existing consents, and annual reporting led by Jason. But we have seen a major shift with a consent order being signed for NTGAs consent application to extend their discharge of geothermal fluid (20,000 t/day!) to the Tarawera River. The original decision was appealed by NTGA, but through the appeal process Ngāti Awa and NTGA have agreed to discharges continuing for 5 years provided NTGA will not apply for a change of conditions or a new consent in the future.

DRILLING AT TĀHEKE

Everyone has been sitting on the edge of their seats to hear what is happening with the potential new development being explored at Taheke. The Joint venture project between Eastlands and Tāheke 8C was a topic of interest at the Geothermal Workshop. While the data is treated as commercially sensitive, well tests have indicated a steam dominated system, which means it is high enthalpy (ie can produce lots of power) but can also be fragile and collapse quickly.

The developers have applied to have the application to develop the power plant processed under COVID Fast Track Legislation. We are feeling our way with this, as it is only the second Fast Track application we have dealt with. But Mary is going to be kept busy with this one!



WELL MAINTENANCE

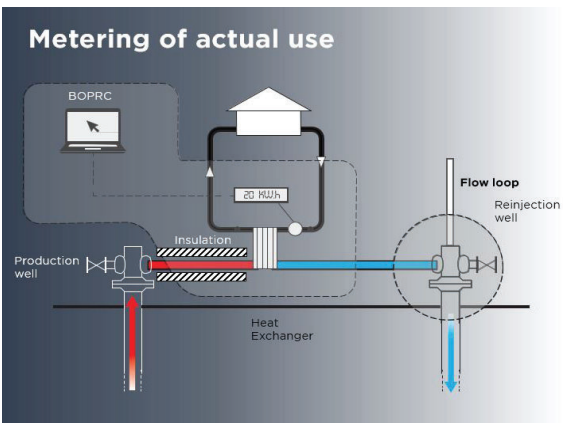
Geothermal compliance, especially in Rotorua, is still a big part of the workload for Compliance. The MoU with WorkSafe and RLC is working well after a year, and we have pretty regular catch ups

Jack Dodd is joining Jason to help out and upskill around Rotorua Geothermal, and is also involved with our geothermal mahi in Tauranga. It is all part of our plan to make sure we have depth of knowledge across the programme and make sure we have continuity (on the off-chance that Jason retires earlier than planned!)

METERING OF USE

We got there... well nearly! After years of working to fill our data gap around actual use of geothermal in Rotorua our whole team has agreed (after a LOT of debate and going around in circles) on an approach to install continuous metering for around 30 users. It has been such a huge cross council effort and something we can all be proud of.

We are now at implementation phase and Mary and Jason have been working with the 30 users to move them to continuous metering over reasonable timeframes and in some cases with a financial contributions from BOPRC. This transition wont be completed overnight but we are on the way.



2023?

It is time to celebrate all of the work we have all got through this year and have a good break (and a few weeks free of dreams about reservoir models, SMPs, and geysers!). 2023 will not be for the faint hearted – we have a plan change to notify, which means lots of work for everyone. And yes, THIS year, we WILL do it!

Thanks to Julie and Trish from Kaiwhakatinana who support all this work quietly in the background – arranging hui, managing the geothermal pages of the website, taking minutes, helping with ppt presentations and generally keeping us on our toes!

