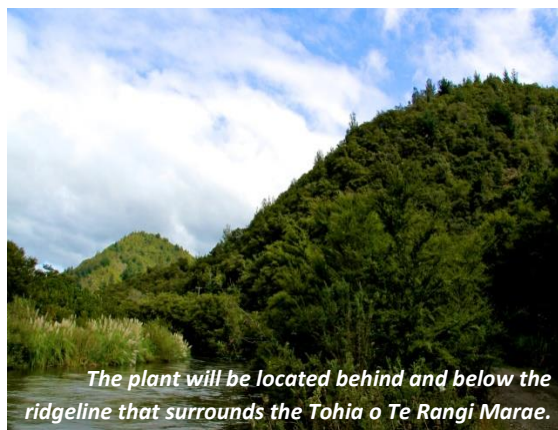


Introduction to the Assessment of Environmental Effects (AEE)

The Te Ahi o Maui Geothermal Project has been granted resource consents to design, build and operate a geothermal power plant on land owned by the Kawerau A8D Ahu Whenua Trust, approximately 2.3km from the centre of Kawerau township.



It is envisaged that the Te Ahi o Maui plant will generate approximately 15-20 MW net of electricity, with around 15,000 tonnes of geothermal fluid extracted daily and a minimum of 75% of this fluid reinjected. The exact injection rate will depend on the final design of the plant.

Resource consent has been granted by the Bay of Plenty Regional Council for the take and discharge of geothermal fluid, the discharge of gas to air and consent to undertake well drilling and testing. The Whakatane and Kawerau District Councils have also granted land use consents.

The Te Ahi o Maui Geothermal Project aims to be sustainable and will strive to ensure minimal impact on the surrounding area. The project partners understand that people in the Kawerau community will want to be sure that there will not be any significant environmental effects from the project. Experts were engaged to determine the anticipated environmental effects of the project, prepare reports and provide evidence to the resource consent hearings that were held in March 2014. These experts have advised that the construction and operation of the Te Ahi o Maui Geothermal Project will have “negligible” (that is, hardly any) effect on the surrounding environment.

The resource consent hearing commissioners heard this evidence, as well as evidence of other submitters and concluded that resource consents could be granted for the project. This has resulted in a set of resource consent conditions that are the same as others geothermal projects on the Kawerau field.

Where will the plant be built?

The plant will be located behind and below the ridgeline that surrounds the Tohia o Te Rangi Marae. A pipeline from the existing well, KA22, will be constructed from the well to the power plant and further pipelines will be required to take fluid from the plant to the reinjection wells at the back of the property. None of the pipelines will cross roads or rail lines. A transmission line will also be built to run from the power plant and connect with existing power lines near Spencer Avenue.

What will the plant look like?

The plant will look very similar to other geothermal power stations in the area, such as the Geothermal Developments Limited plant shown below.



The steam separator, which splits steam from the hot water, is generally made up of a collection of stainless steel pipes and cylindrical towers. This then feeds into the heat exchangers, which are long, tubular stainless steel vessels, and on to the turbine itself. Depending on the final design of the power plant, the turbine may be housed in a shed, much like a tall two-car garage, or simply under a freestanding roof. The turbine and generator are compact and would fit inside a 12 metre container.

Cooling towers, or an array of fans, provide cooling for the plant. These towers and fans are mounted on a steel-framed structure that is similar in size to half a rugby pitch and 10 to 15 metres high.



The transmission lines will be carried by 15-17 metre high poles. These poles will be placed through regenerating bush which will only be cleared where required for the poles.

Will the plant be visible from the marae?

The plant will not be visible from the marae or the Kawerau township and it is very unlikely that it will be visible from State Highway 34, driving into Kawerau. Power lines from the plant will be visible from the marae but their careful placement will minimise visual impact.

Will the plant affect local vegetation and wildlife?

Like many areas in the eastern Bay of Plenty, Kawerau is surrounded by lush native vegetation and exotic forests. The ecological reserves and local forests in the area will not be affected by the gases that are emitted from the Te Ahi o Maui plant.

Wildlife populations including birds, lizards, bats and insects exist (or are likely to exist) throughout the entire Te Ahi o Maui site. During the construction and operation of the project, these species are likely to move to other areas of the site.

Construction of the project will increase the forest edges, which may create valuable foraging space for species that feed along the bush edges.



Will there be any air pollution as a result of the project?

Pollutants

Researchers have carried out specific tests (predictive modeling) to determine the concentration of air pollutants that come from the site. The results of this research show that the levels of air pollutants will be below World Health Organisation (WHO) guideline limits and should not, therefore, cause any health effects or odour issues.

Geothermal fluid (brine) contains less than one percent non-condensable gases and these are mostly carbon dioxide, methane, nitrogen and hydrogen sulphide. Hydrogen sulphide is the gas that you identify with the smell of Rotorua. While the concentration of hydrogen sulphide will be highest next to the plant, and will occasionally smell like Rotorua, it will still be well below WHO guidelines. WHO guidelines recommend that hydrogen sulphide concentration is kept below 15,000 micro grams per cubic metre of air. Around the proposed Te Ahi o Maui plant, the concentration is expected to be less than 500 micro grams per cubic metre of air.

Dust

During the construction stage, earthworks may create some dust but this is unlikely to cause problems because the site is some distance away from any populated areas. During construction, dust will be controlled using modern techniques used in building roads or on construction sites.

How much extra noise will there be?

Due to the location of the site, much of the noise will be screened by the natural terrain - the hills and mountain ranges that surround the Kawerau area. The plant is located in the same general area as a number of existing operations that can be noisy, including other geothermal power stations and the Kawerau pulp and paper mill.

Experts have carried out tests to predict the expected level of noise created during well drilling and construction works, as well as on-going operation of the plant. In the worst case scenario, only a low level of background noise is likely to be heard at any occupied site in the area, including the marae.



Once the plant is operational only low levels of noise will be obvious in the local area, if at all. This is because noise from the plant heard outdoors at the closest sites will be similar to sitting in a quiet room with a modern refrigerator, which is a low murmur of sound at a level of 40dB. It is not expected that anyone in the residential areas of Kawerau will hear any noise from the plant.

During the construction and drilling stages, special precautions including acoustic mufflers and barriers will be in place to minimise noise from the loudest equipment. The construction and drilling noise will be more noticeable than usual in the area, but only for a short time. Drilling noise is mostly from engine sounds and is fairly constant in volume. Noise heard at the closest dwellings during drilling will be at a level consistent with the sound of wind rustling through the treetops.

At all times during the construction and operation of the Te Ahi o Maui project, the noise levels will comply with New Zealand standards and limits set out in the Whakatāne and Kawerau District Plans.

Will there be any subsidence of the land?

In some old geothermal sites, the fluid has not been re-injected back into the land correctly. This has caused subsidence, a term used to describe the sinking of the earth's surface. You can see subsidence when the land looks like the outside of a golf ball – slightly dimpled. The Te Ahi o Maui Geothermal Project will re-inject fluid at the correct rate to ensure subsidence does not occur.

Will there be any extra traffic?

During construction, there will be some extra traffic in the area. However, this will be less than during a mill shut or during previous power station builds.

What will happen with all the earthworks?

Sediment control plans will be in place during construction, especially for periods of heavy rainfall. All earthworks and sediment control are planned in accordance with Bay of Plenty Regional Council rules.

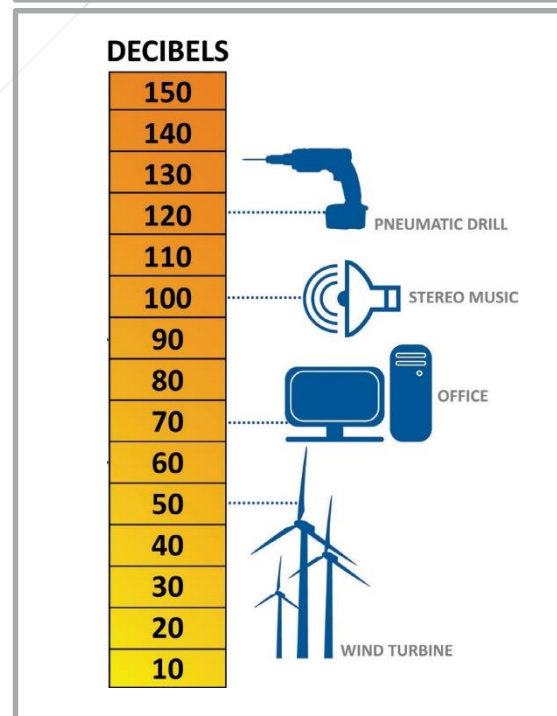
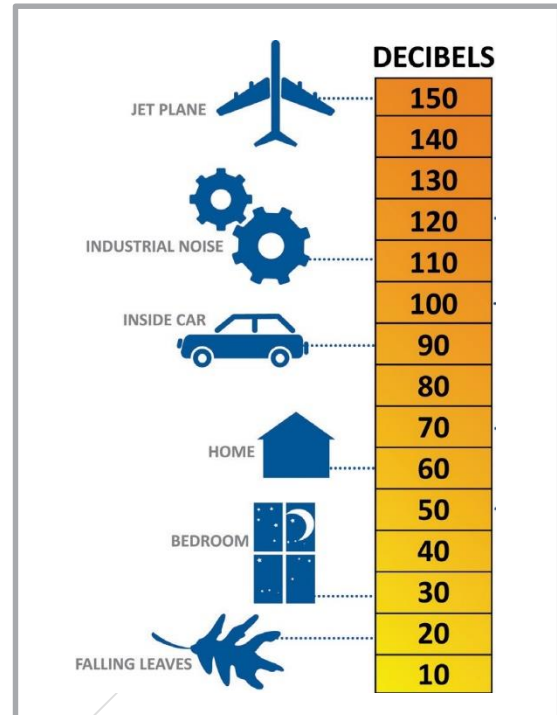


Figure 1 - Decibel levels (dBA) associated with everyday noise

Questions? Please contact us

Visit www.teahiomaui.co.nz or call 07 308 2574

