

EGEE 497 Field Dispatch
Afternoon of March 7th, 2018
Nicholas Buczacki

The afternoon commenced with lunch at the Fast and Fresh Bakery Cafe in Taupo, home of New Zealand's highest-rated savory pies. After lunch we drove to the Nga Awa Purua Geothermal Power Station, owned by Mercury Energy, for a tour. Our tour guide was Justin Pogacnik, one of Mercury Energy's reservoir engineers. Justin gave us an overview of the station's capabilities, operations, and his job as a reservoir engineer for Mercury Energy.

The Nga Awa Purua Power Station is New Zealand's second largest geothermal power plant by capacity, and it is home to the world's largest geothermal turbine. The power station has a nameplate capacity of 140MW, and while we were visiting it was running at 140.6MW. The station utilizes a binary cycle in its power generation, first using steam taken directly from subsurface reservoirs in its turbine, and then using hot water also taken from the reservoir to boil a hydrocarbon with a lower boiling temperature than water to produce more steam for the turbine. This cycle increases the plant's efficiency by allowing steam to be generated using water that is not hot enough to boil on its own. Justin explained to us that his job as a reservoir engineer with Mercury encompasses modeling and analyzing the subsurface reservoir from which the power station's wells draw fluid. This helps his company make important decisions regarding where to drill wells, and which wells to decommission.

Following our introduction to the facility's operations and safety procedures, Justin provided our group with personal protective equipment and guided us out to see some of the station's wells.



A view of one of the production wells at Nga Awa Purua

After visiting two of the station's wells, Justin took us back to the plant itself, where we had the opportunity to see the equipment that allows geothermal fluids to be used for power generation.



Some of the students observing the station's operations

After our tour of the power station we returned to the facility's offices, where we returned our PPE and said our goodbyes to Justin. We then returned to the town of Taupo and our hostel, Finlay Jack's Backpackers. Because our visit to Nga Awa Purua was the last scheduled tour for the day, the students were allowed to do what they pleased for the rest of the day. Some of us decided to visit a nearby natural hot spring fifteen minutes away. The hot spring was on the Waikato River, where two geothermally heated waterfalls ran into the Waikato, creating two heated pools that were comfortable to relax in at the end of a long and exciting day.



A view of the hot spring on the Waikato River that some of the students visited to relax in