

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of a submission in respect of the **PROPOSED WAIKATO DISTRICT PLAN** by **AMBURY PROPERTIES LIMITED** pursuant to Clause 6 of Schedule 1 of the Act seeking the rezoning of land at Ohinewai

SUMMARY STATEMENT OF DAVID STAFFORD

1. My name is David Henry Alexander Stafford. I am a Senior Hydrogeologist at the consulting firm Pattle Delamore Partners Ltd, specialists in water resources and environmental engineering. I prepared a statement of evidence dated 9 July 2020, and a statement of rebuttal evidence dated 24 August 2020. The purpose of this document is to summarise those statements.
2. I outlined my qualifications, experience and commitment to comply with the Environment Court Expert Witness code of conduct in my evidence in chief ("EIC").
3. The Tauranga Group, comprising of the Hinuera, Karapiro, Puketoka and upper sand beds of the Whangamarino Formation, is the major aquifer at the site. These more permeable formations generally occur over the interval between 10m and 50m depth beneath the site, increasing in thickness to the north and east of site.
4. The Tauranga Group aquifer is predominantly confined by overlying low permeability silt and clay layer associated with the lower Rotokawau Formation. The upper Rotokawau formation is characterised by peaty layers present across low-lying areas of site (typically < 9 mRL), up to a maximum thickness of approximately 9m along the site's eastern boundary.
5. The Tauranga Group Aquifer is currently used by a small number of permitted groundwater takes across the site and neighbouring Ohinewai township (situated approximately 500m west of the site) for the purposes of domestic and stock water supply. Current aquifer use is minor with respect to the total groundwater resource within the Tauranga Group Aquifer.

6. Development of the site is anticipated to have a negligible impact on overall recharge to the Tauranga Group Aquifer or existing groundwater flow directions due to the presence of the confining lower Rotokawau Formation across site.
7. Negligible change in groundwater levels within the Tauranga Group Aquifer is anticipated. Consequently, there will be no effect on neighbouring groundwater users surrounding the site.
8. The primary sources of recharge to permeable peat beds of the upper Rotokawau Formation is from direct rainfall recharge and hydraulic connection to Lakes Rotokawau and Waikare.
9. There is the potential for minor, localised alteration to rainfall recharge pathways to the Rotokawau peat as a result of increased impervious surfaces associated with the Sleepyhead Estate development. As a result, infiltration may be required in some parts of the site to maintain groundwater levels within the Rotokawau peat to prevent ground consolidation. This consideration is addressed as part of both the Stormwater Management Strategy and Geotechnical Assessment presented by Mr Pranil Wadan and Mr Nick Speight, respectively.
10. There will be no off-site groundwater level reduction within the Rotokawau peat as a result of the development.
11. My rebuttal evidence addresses an issue raised in the evidence of Mr Fergusson and Mr Gray concerning the potential for an open cast coal mine to be located at Ohinewai. Specifically, I address the following:
 - (a) The environmental impact for major dewatering around the proposed pit including the potential impact on lakes Rotokawau and Ohinewai.
12. Mr Fergusson's evidence provides details of a mining scenario prepared by Solid Energy New Zealand ("SENZ") in 2015.
13. That mining proposal requires excavation of a large portion of the APL site to develop pit slopes to access coal seams within the Te Kuiti Group south of Tahuna Road.
14. Mining the coal resource within the Te Kuiti Group would require the full thickness (approximately 80m) of the overlying Tauranga Group to be dewatered.

15. The required groundwater drawdown would therefore result in a widespread cone of depression in groundwater levels around the mine which would have significant implications for ground consolidation and surface water features hydraulically connected to shallow groundwater.
16. Lakes Rotokawau and Ohinewai are hydraulically connected to shallow groundwater within the surrounding peat dominant upper Rotokawau Formation. Dewatering of the Rotokawau formation may therefore result in depletion of these lakes.
17. Mr Fergusson refers to the Weavers Opencast pit which was excavated through similar Tauranga Group soils in close proximity to the Lake Waahi, as a reassuring example of what could be expected at Lakes Rotokawau and Ohinewai. I acknowledge that in the case of the Weavers Pit, Lake Waahi was minimally impacted as it was well sealed by a thick lakebed mud layer. PDP was historically involved in the hydrogeological assessment of effects of Weaver Pit on Lake Waahi.
18. However, Lakes Rotokawau and Ohinewai are significantly 'cleaner' lakes, recharged predominantly through shallow groundwater connection to the surrounding peat. As a result, Lakes Rotokawau and Ohinewai receive a reduced sediment load and therefore a sealing layer of lakebed mud cannot be assumed. Given the hydraulic connection between the Rotokawau peat beds and Lakes Rotokawau and Ohinewai, it is my opinion that dewatering of the peat would impact lake levels to some extent depending on the efficacy of the mitigation measures.
19. It is my view that the dewatering required for opencast mining at Ohinewai could have pronounced groundwater associated effects. This includes significant ground settlement and depletion of groundwater dependant lakes.

David Stafford
9 September 2020