

14 August 2025

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Halberd Holdings Ltd  
254 Matua Road  
Kumeu 0891

Dear Ian,

## RE: GROUNDWATER DESKTOP MEMO 1080 STATE HIGHWAY 16, WAIMAUKU WEST

### 1.0 INTRODUCTION

CMW has been engaged by Halberd Holdings Limited through Barker and Associates to prepare a memo for existing groundwater information at the Waimauku West site at 1080 State Highway 16. The purpose of this memo is to support the initial fast-track application to the Ministry for the Environment. It is anticipated that investigations of the potential aquifers will take place following issue of this memorandum.

### 2.0 WATER SUPPLY REQUIREMENTS

CMW has been provided information on the average day demand for the development by Bear Enterprises. Based on this, the required water supply is 472 ML per annum for the proposed development.

### 3.0 POTENTIAL AQUIFERS

#### 3.1 Kaipara Sand Aquifer

- The eastern extent of the Kaipara Sand Aquifer is mapped to have a differing range of extents depending on the resource reviewed. Auckland Council Geomaps<sup>1</sup> maps the eastern extent of this aquifer as within the Waimauku West site. However, Land Air Water Aotearoa<sup>2</sup> maps this eastern extent 4 to 5 km west of the site.
- The extent of the Kaipara Sand Aquifer appears to be generally similar to the extent of the Awhitu Group Dunes geological unit. Based on published geological maps<sup>3</sup> and CMW's observations of the site, the Awhitu Group Dunes extend into the site. As such, it is likely that the aquifer also extends to within the site.
- Little public information is available about either the capacity of this aquifer and the current usage of it.

#### 3.2 Kumeu-Hobsonville Aquifer

- The western extent of the Kumeu-Hobsonville Aquifer is mapped<sup>12</sup> to be east of Muriwai Road and South of State Highway 16 within the Waimauku township. However, it should be noted that these maps are unlikely to be accurate with regards to extents and it may well be possible that the aquifer extends below the site.

<sup>1</sup> <https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html>

<sup>2</sup> <https://www.lawa.org.nz/explore-data/auckland-region/water-quantity/groundwater-zones/south-kaipara-groundwater>

<sup>3</sup> <https://data.gns.cri.nz/geology/>

- Based on the current knowledge of this aquifer, it is thought that the total availability of this aquifer is 1,559 ML per annum<sup>2</sup>.
- The current consented draw from this aquifer is 796 ML per annum which is being drawn for a range of activities including irrigation, industrial use and town supply.
- Based on the information above, this aquifer has the availability to service the proposed development.

## 4.0 FUTURE WORK

The following work needs to take place to determine the suitability of either of these aquifers as a water supply for the proposed development:

- Further desktop hydrogeological and geological review to assess the potential for target aquifers.
- Drilling and installing a test pumping well and associated monitoring well, and:
  - Undertaking a step-drawdown aquifer pumping test.
  - Undertaking a constant rate aquifer pumping test.
  - Pumping test analysis.
- Reporting and conclusions/recommendations for additional testing and the viability of groundwater supply/yield and sustainability.

## 5.0 LIMITATIONS

Additional important information regarding the use of your CMW report is provided in the 'Using your CMW Report' document attached to this report.

This report has been prepared for use by Halberd Holdings Limited, Ministry for the Environment and their professional advisers in relation to the Waimauku West project in accordance with the scope, proposed uses and limitations described in the report. Should you have further questions relating to the use of your report please do not hesitate to contact us.

Where a party other than Halberd Holdings Limited seeks to rely upon or otherwise use this report, the consent of CMW should be sought prior to any such use. CMW can then advise whether the report and its contents are suitable for the intended use by the other party.

For and on behalf of CMW Geosciences

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Distribution: 1 electronic copy to Halberd Holdings Ltd via email  
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## USING YOUR CMW GEOTECHNICAL REPORT

Geotechnical reporting relies on interpretation of facts and collected information using experience, professional judgement, and opinion. As such it generally has a level of uncertainty attached to it, which is often far less exact than other engineering design disciplines. The notes below provide general advice on what can be reasonably expected from your report and the inherent limitations of a geotechnical report.

### Preparation of your report

Your geotechnical report has been written for your use on your project. The contents of your report may not meet the needs of others who may have different objectives or requirements. The report has been prepared using generally accepted Geotechnical Engineering and Engineering Geology practices and procedures. The opinions and conclusions reached in your report are made in accordance with these accepted principles. Specific items of geotechnical or geological importance are highlighted in the report.

In producing your report, we have relied on the information which is referenced or summarised in the report. If further information becomes available or the nature of your project changes, then the findings in this report may no longer be appropriate. In such cases the report must be reviewed, and any necessary changes must be made by us.

### Your geotechnical report is based on your project's requirements

Your geotechnical report has been developed based on your specific project requirements and only applies to the site in this report. Project requirements could include the type of works being undertaken; project locality, size and configuration; the location of any structures on or around the site; the presence of underground utilities; proposed design methodology; the duration or design life of the works; and construction method and/or sequencing.

The information or advice in your geotechnical report should not be applied to any other project given the intrinsic differences between different projects and site locations. Similarly geotechnical information, data and conclusions from other sites and projects may not be relevant or appropriate for your project.

### Interpretation of geotechnical data

Site investigations identify subsurface conditions at discrete locations. Additional geotechnical information (e.g. literature and external data source review, laboratory testing etc) are interpreted by Geologists or Engineers to provide an opinion about a site specific ground models, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist due to the variability of geological environments. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. Interpretation of factual data can be influenced by design and/or construction methods. Where these methods change review of the interpretation in the report may be required.

### Subsurface conditions can change

Subsurface conditions are created by natural processes and then can be altered anthropically or over time. For example, groundwater levels can vary with time or activities adjacent to your site, fill may be placed on a site, or the consistency of near surface conditions might be susceptible to seasonal changes. The report is based on conditions which existed at the time of investigation. It is important to confirm whether conditions may have changed, particularly when large periods of time have elapsed since the investigations were performed.

### Interpretation and use by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical report. To help avoid misinterpretations, it is important to retain the assistance of CMW to work with other project design professionals who are affected by the contents of your report. CMW staff can explain the report implications to design professionals and then review design plans and specifications to see that they have correctly incorporated the findings of this report.

### Your report's recommendations require confirmation during construction

Your report is based on site conditions as revealed through selective point sampling. Engineering judgement is then applied to assess how indicative of actual conditions throughout an area the point sampling might be. Any assumptions made cannot be substantiated until construction is complete. For this reason, you should retain geotechnical services throughout the construction stage, to identify variances from previous assumption, conduct additional tests if required and recommend solutions to problems encountered on site. A Geotechnical Engineer, who is fully familiar with the site and the background information, can assess whether the report's recommendations remain valid and whether changes should be considered as the project develops. An unfamiliar party using this report increases the risk that the report will be misinterpreted.

### Environmental matters are not covered

Unless specifically discussed in your report environmental matters are not covered by a CMW Geotechnical Report. Environmental matters might include the level of contaminants present of the site covered by this report, potential uses or treatment of contaminated materials or the disposal of contaminated materials. These matters can be complex and are often governed by specific legislation.

The personnel, equipment, and techniques used to perform an environmental study can differ significantly from those used in this report. For that reason, our report does not provide environmental recommendations. Unanticipated subsurface environmental problems can have large consequences for your site. If you have not obtained your own environmental information about the project site, ask your CMW contact about how to find environmental risk-management guidance.