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**GROUNDWATER EVALUATION
GLOUCESTER INDUSTRIAL ESTATES
South to and Including
ALDERGROVE AND ADJOINING AREAS
LANGLEY, BRITISH COLUMBIA**

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1.0 INTRODUCTION

Brown, Erdman & Turner Ltd. was retained to evaluate the productive potential of the groundwater-bearing sub-surface reservoirs (aquifers) lying beneath and adjacent to the:

Aldergrove Area

Area adjacent to 272nd Street (Between 32nd and 56th Avenues)

Gloucester Industrial Estates

West of Gloucester Industrial Estate

This work consisted of a review of company files and well records and the up-dating of well information since our last study of this area in 1983.

2.0 GROUNDWATER POTENTIAL

2.1 Aldergrove Area - At the present time this area is reportedly producing a maximum of 130 l/sec. (1,700 Igpm or 2,040 U.S. gpm) of groundwater from four wells. These wells are located adjacent to 272 Street from 32nd Avenue southwards to 25th Avenue. The production of this quantity of groundwater from such a limited area could lead to the dewatering of the aquifer during prolonged pumping periods in the future.

The Aldergrove Aquifer lies beneath part of Aldergrove south of the Fraser Highway and extends southeastward across 272 Street past the Reid Collins Nursery wells and on into Matsqui. We originally believed that this aquifer extended northwestwards across the Fraser Highway to 32nd Avenue but test drilling in 1977 disproved this concept. The Aldergrove Aquifer is approximately 800 m (1/2 mile) wide where developed along 272 Street.

Irrigation wells are present to the southeast across the Township boundary in Matsqui. These irrigation wells are reported to be good producers with productive capacities in the 400 to 500 Igpm range. From the above we believe that a well located close to the Township boundary in the vicinity of what would be 22nd Avenue would have an excellent chance of producing 40 l/sec. (525 Igpm) and would not adversely affect either the Aldergrove wells or the nursery wells. Unfortunately, no roads are available for access in this area but right-of-ways might exist.

2.2 Area adjacent to 272 Street between 32nd and 56th Avenues.

Exploration programs have shown that aquifers exist in this area but the groundwater is not potable.

The water from a test well drilled for Gloucester Industrial Estates close to the intersection of 272nd Street and 56th Avenue in 1977 contained 1,045 mg/l of Total Dissolved Solids. The Canadian Drinking Water Standards limit is 500 mg/l. This test well was drilled to a depth of 347 feet or an elevation of approximately 60 feet below sea level. Groundwater-bearing zones most probably exist below this depth but the quality of the groundwater contained in them is unknown.

Any exploration and development program conducted in the area adjacent to 272nd Street between 32nd and 56th Avenues should be designed to explore between a depth of 347 feet and the top of bedrock. Bedrock is believed to lie at a depth of approximately 800 feet or an elevation of 525 feet below sea level beneath this area.

2.3 Gloucester Industrial Estates

Reference to our September, 1983 report entitled Groundwater Development and Evaluation, Gloucester Industrial Estates, etc. will show that based upon information and data available at that time we concluded the following.

2.3.1 The Test-Production Well at 272nd Street and 64th Avenue has a safe productive potential of 6.3 l/sec (83 Igpm or 100 U.S. gpm).

2.3.2 The water from the well is potable.

2.3.3 The pump test run on the Test-Production Well at 272nd Street and 64th Avenue did not affect the water levels in the Test Well at 272nd Street and 56th Avenue.

2.3.4 Specifically designed production wells located on 800 metre (2,600 feet) centres should have safe productive capacities of at least 9.5 l/sec (125 Igpm or 150 U.S. gpm) without affecting the safe productive capacity of the Test-Production Well at 272nd Street and 64th Avenue.

- 2.3.5 Four or five production wells on the 800 metre (2,600 feet) spacing described above can be located on Gloucester Controlled properties while another three or four can be located 800 metres (2,600 feet) to the west of the properties.
- 2.3.6 A well field can be constructed on Gloucester Controlled properties that will have a safe productive capacity of 45 l/sec (595 Igpm or 700 U.S. gpm) with another 30 l/sec (400 Igpm or 475 U.S. gpm) available within 800 metres of these properties for a total of 75 l/sec (1,000 Igpm or 1,175 U.S. gpm).
- 2.3.7 Another groundwater-bearing subsurface reservoir most probably exists above bedrock at an elevation of 150 metres (500 feet) B.S.L. Neither the productivity nor the quality of the water present in this zone is known from site specific drilling and testing.

At the present time, we believe that specifically designed production wells (not a test well converted into a production well) should have safe productive potentials of 13.2 l/sec (174 Igpm or 210 U.S. gpm) if water-bearing sub-surface reservoirs extend to a depth of 500 feet. If these wells are located close to the western edge of Gloucester lands they should produce potable water.

The full geologic section above bedrock must be explored and tested before the groundwater productive potential below Gloucester lands will become known. Such a program will require 800 foot deep test wells.

2.4 West of Gloucester Industrial Estates

A test drilling program conducted by the author in 1961 discovered a highly productive sand and gravel filled buried river channel to the west of Gloucester Industrial Estate. Please see the Index Map attached. Properly located, designed and constructed production wells in this area should produce in the 31.5 l/sec (420 Igpm or 500 U.S. gpm) to 63 l/sec (835 Igpm or 1,000 U.S. gpm) range.

3.0 COST ESTIMATES

Cost estimates for production wells located in the three target areas shown on the attached Index Map follow:

- 3.1 Aldergrove Area - A production well drilled in the vicinity of the Township border and the extension of 22nd Avenue should have the following characteristics.

16-inch diameter surface casing from surface to the static water level.

12-inch diameter production casing from surface to the bottom of the aquifer.

A gravel packed well screen at least 30 feet long.

Such a fully tested successful production well is estimated to cost \$35,000 (April 1988 dollars) including specialist engineering supervision of construction and testing, analysis of data and completion report. The risk capital for an unsuccessful well is estimated to cost \$15,000 (April 1988 dollars).

- 3.2 Area adjacent to 272nd Street between 32nd and 56th Avenues - we do not recommend a drilling and testing program for this area at this time.

- 3.3 Gloucester Industrial Estates - a production well drilled in the target area shown in the accompanying Index Map should have the following characteristics:

16-inch diameter working casing from surface to 250 feet.

12-inch diameter production casing from surface to 500 feet.

Production casing to be withdrawn to expose the sand packed screen.

Working casing to be withdrawn as bentonite/cement seal is placed outside of the 12-inch diameter production casing.

A fully tested successful production well is estimated to cost \$85,000 (April 1988 dollars) including specialist engineering services as above. The risk capital for an unsuccessful well is estimated to cost \$50,000 (April 1988 dollars). The added cost to explore below 500 feet to a total depth of 800 feet is estimated to be \$25,000 (April 1988 dollars).

- 3.4 West of Gloucester Industrial Estate - Wells in this area would be similar to the Aldergrove Well in design but the total depth of these wells would be 250 feet instead of 150 feet and the surface casing would extend to a depth of 65 feet instead of a depth of 35 feet. A fully tested successful well is estimated to cost \$45,000 (April 1988 dollars). The risk capital for an unsuccessful well is estimated to cost \$25,000 (April 1988 dollars).

The water-bearing zones (aquifers) in each well must be drilled and cased by the cable tool method. All cost estimates must be substantiated by tender immediately prior to proceeding with the work and when the well location(s) have been chosen.

4.0 CONCLUSIONS

Three promising target areas are present within the Aldergrove/ Gloucester area. We estimate the chances of successfully developing the indicated quantity of groundwater per well as follows:

AREA	SAFE PRODUCTIVE POTENTIAL	SUCCESS RATING
Aldergrove Township Border and 22nd Avenue	40 l/sec (525 Igpm or 625 U.S. gpm)	95%
Gloucester Estates Area	13.2 l/sec (174 Igpm or 210 U.S. gpm)	80%
West of Gloucester Estates	31.5 l/sec to 63 l/sec (420 Igpm or 500 U.S. gpm to 835 Igpm or 1,000 U.S. gpm)	70%