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MEAGER CREEK GEOTHERMAL INVESTIGATION SUMMARY

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BACKGROUND INFORMATION

In 1973 the Government of the Province of British Columbia passed the Geothermal Resources Act by which all the rights to geothermal resources, defined as waters of 121°C (250°F) or higher temperature, are reserved for the Crown.

The British Columbia Hydro and Power Authority (B.C. Hydro) is a Crown Corporation responsible for investigation, generation, and distribution of electric power in the Province of British Columbia and as such has an interest in exploring and developing geothermal resources in this province.

B.C. Hydro at the present time generates and distributes approximately 28,000 GWh of electric energy annually.

Sources of energy supply: Hydroelectric generation - 5500 MW
Other - 1300 MW

Further, approximately 20,000 MW of water power and 20,000 MW of thermal (coal) power are available for development.

INTRODUCTION

Approximately 60 hot springs have been identified in western Canada, of which approximately 90% are located in British Columbia. B.C. Hydro commissioned its first geothermal study program in 1973. The terms of reference for this first study called for identification and assessment of the geothermal potential of southwestern British Columbia.

Five areas within Garibaldi and Pemberton volcanics were identified as having potential for a commercial geothermal development:

1. Meager Creek, 55 km northwest of Pemberton
2. Mt. Cayley and the east side of the Elaho River, 25 km west of Alta Lake
3. Bridge River headwaters, 50 km west of Gold Bridge
4. The Lillooet fault zone, beginning at the north end of the Harrison Lake and extending northwest up the Lillooet River and Billy Goat Creek
5. Wasp Creek, 15 km west of Pemberton

Based on the geological evidence of the geothermal potential, specifically an occurrence of hot springs partially circumscribing a Quaternary volcano, the Meager Creek area was identified as the most promising area and was selected for more detailed study.

Meager Creek - Geography

Meager Creek area is centered on a recent volcanic complex approximately 20 kilometers in diameter and 2000 meters high. Thick forest cover, permanent snow fields, glaciers, and glacial outwash characterize the area. Annual precipitation is up to 500 centimeters. Rugged mountainous terrain and, until recently, no road access influenced the overall exploration cost.

1974-75 STUDY

The principal objectives of this study were to conduct a geophysical program, mainly resistivity surveys and temperature profile measurements in shallow drill holes, sufficient to determine whether or not the area is of continuing interest for geothermal power. Geological mapping of the area was also initiated.

Resistivity Survey

Altogether approximately 50 line miles were surveyed, mostly on the southeast side of the Meager volcanic complex. A dipole-dipole electrode array method was used with an electrode spacing of 152.4m, 304.8m, and 609.6m (500, 1000, and 2000 ft), giving an effective depth of penetration from 52.4 to 2438.4m (500 to 8000 ft).

Drilling

The first well, 74-H-1, was the deepest well drilled, to 347 meters (1140 ft), during the winter of 1974-75. The drill used was a Longyear 34 diamond drill. The following three wells, 75-H-1, 2, and 3, were drilled during September and October 1975, using a Boyles Bros. B BS-1 drill. The diameter of all four holes was 5 cm with a core sample of 2.5 cm in diameter. Bottom hole temperatures were monitored throughout the drilling.

One of the results of the study was to identify a possible geothermal reservoir whose top was within 300 meters of the surface, dipping north towards the heat source, believed to underlie the volcanic complex. Only the southern and southeastern limits of the possible reservoir have been identified.

1976 STUDY

During 1976 the study was limited to a reconnaissance geophysical survey of the eastern and northern parts of the Meager volcanic complex to test for the presence of subsurface geothermal fluids using the electrical self-potential method.

1977-78 STUDY

This and the next year's work will likely involve a more detailed electrical resistivity survey of the northern and eastern parts of the complex, followed by shallow drilling, in order to select the location of one or more possible deep exploratory test wells.