

An aerial photograph showing a large-scale geothermal power plant under construction in a densely forested, mountainous region. The central part of the image features a large, circular concrete structure, likely a reservoir or a wellhead, surrounded by cleared areas and construction equipment. The surrounding landscape is covered in thick evergreen forests, with a winding road visible in the distance. The overall scene depicts a significant industrial project integrated into a natural, wooded environment.

A First for Canada?

Work Underway To Confirm the Potential for a Geothermal Power Plant in British Columbia

Drilling is underway at the Western GeoPower Corp. (WGP) site in southwestern British Columbia to confirm its potential to become Canada's first commercial geothermal power facility, with a capacity of 100 to 200 megawatts (MW) of electrical generation.

"Western GeoPower is dedicated to the development of its 100-percent owned, South Meager Geothermal Project, held under a geothermal lease for the commercial production of electricity," says company President and CEO Kenneth McLeod.

The South Meager Geothermal Project is positioned to meet increasing demand for power in British Columbia and across North America. Supply has not kept pace with demand as many existing, aging generation facilities require costly upgrading or replacement, and proposals for new, large-scale hydroelectric and fossil fuel projects are opposed because of their high costs and environmental impacts.

Industry and governments are increasingly looking to alternative energy sources such as geothermal, small-scale hydro, wind, solar and biomass projects to provide new power generation. In

British Columbia, the majority of the province's power currently is generated by major dams built and operated by a government corporation, British Columbia Hydro and Power Authority (B.C. Hydro). The provincial government now requires that new generation should come from private sector Independent Power Producers (IPPs), with up to 50 percent of that from sustainable "green" resources.

Power price and demand are expected to increase substantially in British Columbia. B.C. Hydro has stated that capacity must be increased by 1,200 MW over the next decade to meet projected demand, increasing to an estimated 2,345 MW of new generation by 2023. California is historically a major market for B.C. Hydro. The California Energy Commission estimates demand is increasing in that state by 2 percent annually. The state's energy budget calls for 1,500 to 2,000 MW of new power generation capacity every year.

The geothermal power production potential of the South Meager Geothermal Field—located 90 miles north of Vancouver, B.C. (Fig. 1)—was recognized in the 1980s when B.C. Hydro drilled

International Geothermal Development

Figure 1 – Location of South Meager Geothermal Project.

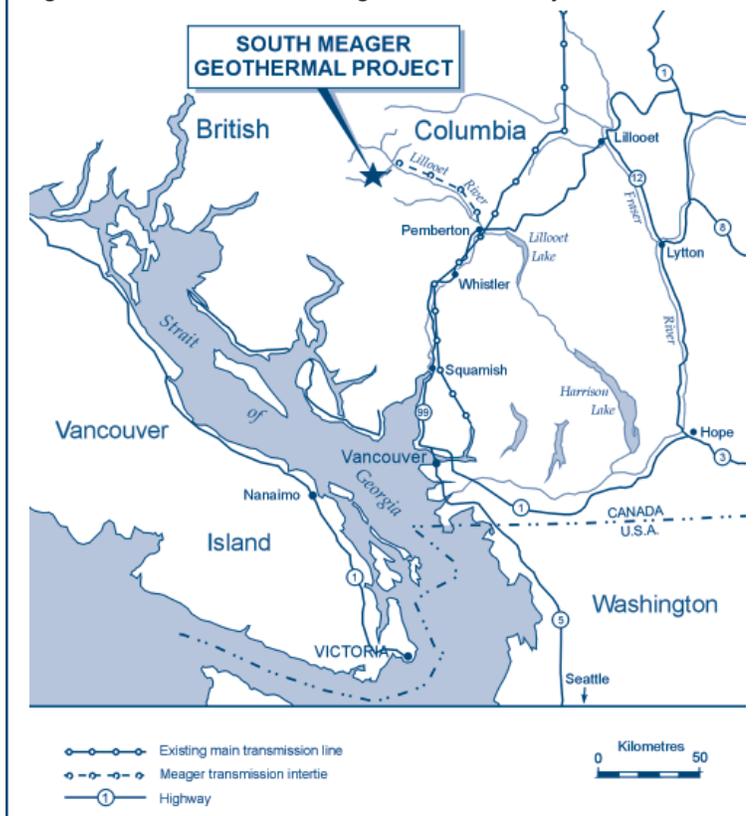
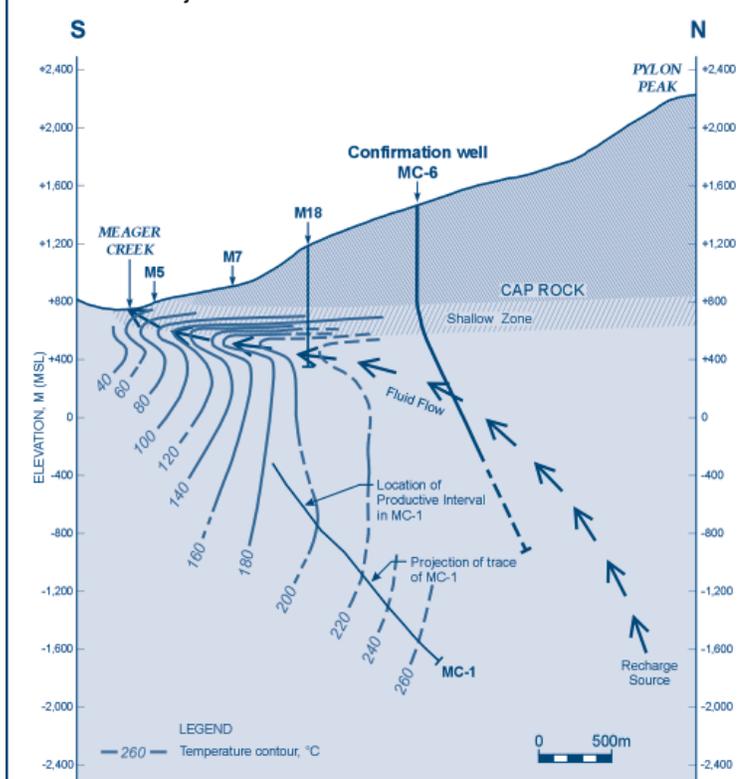


Figure 2 – Temperature cross-section of the South Meager Geothermal Project.



three production-size test wells and operated a 20-kilowatt demonstration plant for 21 months as part of an exploration program conducted with the Geological Survey of Canada. However, there was no immediate effort to confirm the potential for commercial geothermal power production because of the then-existing supply of low-cost hydroelectric power.

“With the recent energy crisis exemplified by the California power brownouts and blackouts in 2001 and a change in B.C. Hydro’s status to that of a net importer of electricity over the past four years, the South Meager Geothermal Project became an attractive proposition,” says McLeod. Exploratory drilling of three slimhole test wells in 2002 (M17-18-19) recorded temperatures between 200° to 224° C at relatively shallow depths of 1,500 to 2,700 ft. These are the highest temperatures at this depth ever reached by any well drilled in Canada (Fig. 2).

Technical data assembled over 20 years of exploration were analyzed by GeothermEx, Inc. (Richmond, CA)—a global leader in geothermal assessments. Their work suggests that the South Meager Geothermal Field has an initial capacity of 100 MW and a potential capacity of 200 MW or more. GeothermEx classifies South Meager as a “high-temperature” field (200° C or higher) and a potential major geothermal power development site (defined as a site with a capacity of at least 100 MW—enough to service approximately 80,000 homes).

The GeothermEx report was prepared by company President Dr. Subir Sanyal and Manager of Field Operations (State of California) James Lovekin, P.E. Their knowledge of the South Meager Geothermal Project is very extensive, with involvement in the project’s development for over a decade. WGP has placed technical development of the project under their direction. Estimated cost of drilling an initial confirmation well, including site preparation and other required activities, is C\$7.75 million.

In their report summary, GeothermEx commented: “Upon the successful completion and testing of the confirmation wells, this geothermal field should become as attractive a development target as any available today in North America, particularly considering the recent commitment of the British Columbia Hydro and Power Authority to renewable energy, recent interest in geothermal energy resources, the trend of increasing natural gas prices, and the forecast of high power prices in the Pacific Northwest and California.”

To confirm South Meager as a commercially viable geothermal resource, WGP initiated a drilling program in July 2004. Two production wells will be used to determine if the host rock is permeable enough to allow the free flow of hot water to the surface. Analysis of results are expected in October from the first well, MC-6, and shortly thereafter from the second well, MC-7 (Fig. 3).

Acting on positive results achieved from the 2002 tests, the company has initiated a series of environmental and socioeconomic studies of the project area. In addition, the WGP has an assessment of potential routes for a 230-kilovolt trans-

mission line that would tie in with B.C. Transmission Corp.'s main line near the community of Pemberton, B.C., 45 miles to the south.

These studies will be incorporated into an application for project certification from the British Columbia government's Environmental Assessment Office, expected to be submitted in early 2005. The WGP application will trigger a federal-provincial environmental and socioeconomic assessment, which will require consultation with senior government agencies, regional governments and special interest groups, such as property owners in the transmission corridor.

WGP will also prepare an economic feasibility study to identify not only the technical parameters of the project, but also the construction and operating costs, sources of financing for estimated C\$276 million capital costs, a market for the generated power, and a potential rate of return for investors. If the feasibility study is positive and recommends commercial production, the next step for the company would be to secure a power sales contract and proceed with project financing and plant design. WGP's objective is to commence construction of power plant facilities in 2005, leading to commercial production by 2007.

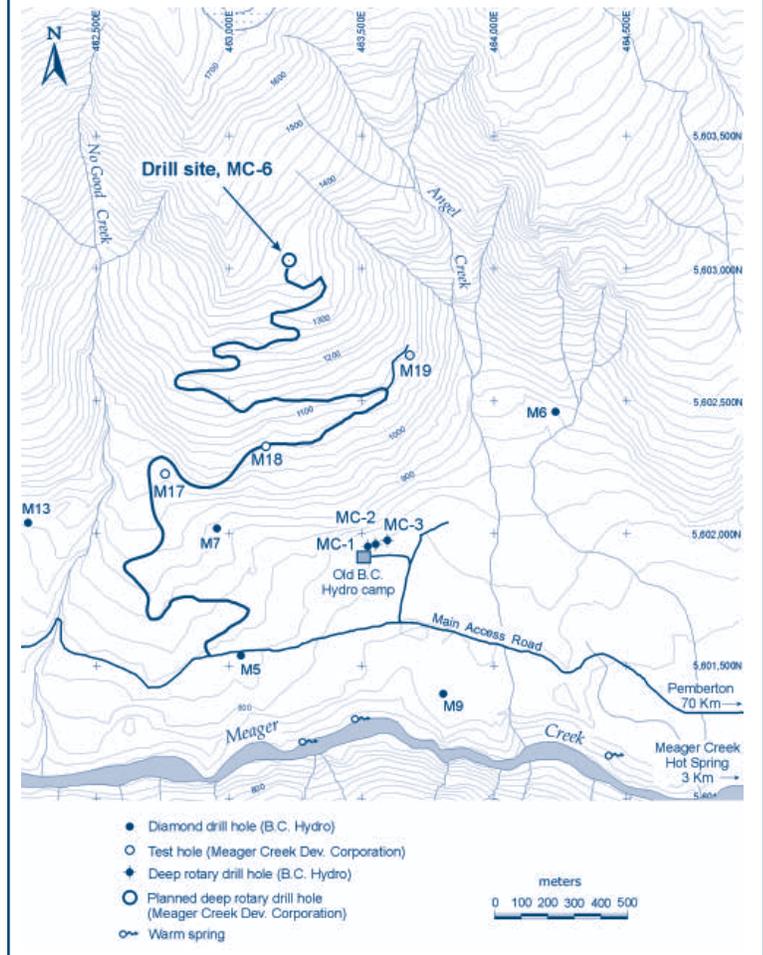
This ambitious program is directed by a senior management team backed by a Technical Advisory Committee. Heading up the team is WGP Chairman John Darch, who has over 20 years experience in international resource exploration and development. WGP President and CEO MacLeod bolsters that record with more than 20 years experience in resource development, project financing and management in North America, Asia and Africa.

Advisory Committee members include Domenic J. Falcone, former vice president of Pacific Gas & Energy Services Corp. and former executive vice president of Geothermal Resources International Inc.; Dr. Subir K. Sanyal, President, GeothermEx Inc.; Dr. Mory M. Ghomshei, Adjunct Professor at the University of British Columbia, who has been engaged in the exploration and development of the South Meager field for more than 20 years; and Brian D. Fairbank, P.E., President of Fairbank Engineering Ltd., a geological engineer with 30 years experience in geothermal engineering.

Factors influencing investor and industry interest in the project include attractive economics that give power generated from South Meager a projected cost of C\$0.05 per kilowatt-hour. In addition, the project has excellent market potential, with proximity to a B.C. Transmission Corp. main line that ties into the Bonneville Power Authority grid in the United States.

More generally, there is growing recognition of the positive aspects of geothermal energy production technology. Geothermal-generated electricity is very stable, with a 90- to 95-percent reliability rate, compared with 60 percent for hydroelectric generation and about 30 percent for sources such as wind power. WGP plans to build a "closed cycle" system geothermal power plant based on binary power conversion technology, which condenses process steam and returns it to the subterranean reservoir.

Figure 3 – Drill hole locations, South Meager Geothermal Project.



Figures: GeothermEx, Inc.

Of particular importance to the British Columbia government and public interest groups is the clear environmental advantage represented by geothermal over both large-scale hydroelectric facilities and fossil-fuel power production facilities. Though they provide renewable energy, hydroelectric dams require damming and flooding of thousands of acres of land to provide water storage. And fossil-fuel power plants are notorious for air pollution. With their small footprint and lack of air and water pollution, geothermal such systems are environmentally sound, in addition to boasting a long operating lifespan.

There also is considerable interest by government and the public in potential spin-off enterprises such as aquaculture and greenhouse operations utilizing process steam and water from geothermal power plants. WGP plans to commission the University of British Columbia's Centre for Environmental Research in Minerals, Metals and Materials (CERM-3) to research potential downstream benefits of the South Meager Geothermal Project. (WGP)

For more information, contact Western GeoPower by phone at: (604) 662-3338. Call toll-free in the United States and Canada at: (866) 662-3322. Email: info@geopower.ca.