BONNEVILLE HOT SPRINGS RESORT, NORTH BONNEVILLE, WA

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Bonneville Hot Springs Resort Main Lobby

LOCATION

The Bonneville Hot Springs Resort is located in North Bonneville, Washington some 72 km (45 miles) east of Vancouver, Washington and Portland, Oregon. The resort, located in Skamania County, is in the Columbia River Gorge National Scenic Area.

Historical records indicate the springs were first used by the Native American Indian tribes living in the area and that tribes such as the Rogue River, Chitcoe, Calapoi, Klamath and Makah would travel to this treasured spot, bringing their sick and aged to bathe in, and drink the waters.

Discovery of the spring by European settlers was in 1880 by an old miner, Mr. R. J. Snow. A local merchant, Mr. Thomas Moffett, who was keeping a store at the Cascades at the time, recognized the value of the springs and acquired an interest in the springs. In 1881, Mr. Moffett built the Cascade Springs Hotel and in 1885 began selling the bottled water for 10 cents per bottle.

Cascade Springs Hotel, 1920's

The bottled water was recommended to bar rooms, clubs, restaurants, hotels, etc. By 1890, Mr. Moffett had a thriving business based on chemical analysis performed by prominent Portland, Oregon physician Dr. Rex and subsequently by renown chemist J. H. Fisk and the US Chemical Assayers of Washington DC, who all agreed as to the mineral content and the potential good health qualities. The water was advertised as being helpful for kidney complaints, liver problems, dyspepsia, rheumatism, dropsy, and general debility.

From its early beginnings the spring changed ownership and even name when the town changed from Moffetts, Washington to North Bonneville in 1934. It also saw several episodes of growth including the building of a new hotel in 1932 to replace the original structure that had been destroyed by fire. Sub-sequent development included the addition of a dozen cabins and a 38-acre campground with 75 electrical hookups.

However, by the time the author first visited the site in the late 1970's, there was little remaining of the glory days of the 20's and 30's. Only a few cabins remained and the entire facility was in disrepair and the owners were being sited for health violations due to sewage problems. It seemed that Moffetts Hot Springs/Bonneville Hot Springs would become a historical footnote to the area.

But, in 1990, as has happened so may times before, a new owner – this time an entrepreneurial Russian by the name of Pete Cam – was about to change all of that and Bonneville Hot Springs Resort is once again one of the jewels of the Columbia Gorge.

RESOURCE

North Bonneville Hot Springs Resort is located in the central part of the Columbia River Gorge, near the town of North Bonneville, in the Cascade Range Geologic Province. Only Cenozoic stratigraphy is exposed and is entirely volcanic in origin, except for alluvial and landslide deposits. Small intrusives in the form of volcanic necks and dikes are located nearby as well as a small Quaternary volcanic center and associated deposits (Wise, 1970).

Structure in the area is represented by gentle folds and limited definable faulting. Minor topographic lineations, however, are fairly common and are presumed to represent major tectonic points or faults with minimal displacement.

Moffetts Hot Spring (Bonneville Hot Springs) and St. Martin's Hot Spring to the east near the town of Carson have

temperatures of 32°C (89.6°F) and 49° C (120.2°F) respectively. These hot springs are structurally controlled and are probably located at the intersection of more than one fracture trend (Nielson and Moran, 1980). Recent drilling (2003) near Carson and to the east of the Wind River encountered the highest yet recorded geothermal waters in Washington 81°C (178°F) at 610 meters (2000 plus ft.). The Ohanapeosh Formation underlies the area and is considered to be an aquaclude due to post depositional formations of zeolites and clays.

The only definable fault mapped in the general area of Moffett Hot Springs is located on the south flank of Table Mountain and displaces Grande Ronde Basalts about 15.25m (50 ft.) down to the north on a vertical plane. The trend of the fault, N 70 E, is representative of structural trends to the east in the Klickatat River and from the Wind River to the Klickatat River.

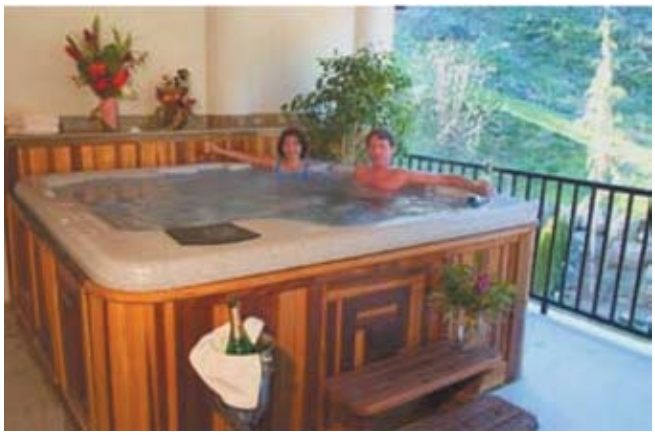
A strong linear correlation exists from the alignment of the saddle in Table Mountain, the 244 m (800 ft.) scarp in the Eagle Creek Formation exposed in Red Bluffs, the position of Grays Hot Springs, and a small saddle above Carson Creek to the east. A parallel trend can be observed by constructing a line from Moffetts Hot Springs through St. Martin's Hot Springs.

Moffetts Hot Springs is located about 3 km (2 miles) northeast of North Bonneville and has a surface temperature of 32°C (89.6°F) with a predicted reservoir temperature of less than 80°C (176°F) (Schuster et al., 1978).

A temperature gradient hole drilled about 3 km (2 miles) to the southwest of North Bonneville at the mouth of McCord Creek on the south shore of the Columbia had a calculated gradient of about 50° C/kilometer (145°F/mile) consistent with the gradient of the region (Nielson and Moran, 1980).

USE

The Bonneville Hot Springs Resort, Spa and Conference Center was completed in 2002. The 1,115 square meter (12,000 sq. ft.) facility is located on the site of the original Moffetts Hotel and Bottling Works. The resort has conference facilities, cocktail lounge, and restaurant, and is accented by a three-story fireplace in the lobby.



Bonneville Hot Springs Resort Balcony Hot Tub

Bonneville Hot Springs Resort

There are 74 deluxe rooms and four spacious suites. Sixteen of the rooms have private hot tubs filled with the natural hot spring waters.

There were originally four wells drilled at the site from 24.5 meters to 49 meters (80-160 ft.) deep. The wells flowed artesian until there was a major natural gas explosion caused by a rupture of a nearby major gas transmission line. The present owner drilled two new wells 183 meters (600 ft.) and 335 meters (1,100 ft.) in the late 1990's and early 2000's and retained one of the four original wells. They now pump 6.3-9.5 L/s (100-150 gpm) of 36°C (97°F) geothermal water using line shaft pumps.

The geothermal water is used directly in some of the soaking tubs and the large pools. As needed, the temperature is boosted using geothermal heat pumps. Heating for the facility is also provided through the use of geothermal heat pumps with heat being distributed through a forced-air system.

Resort Indoor Lap and Soaking Pools

OPERATING COSTS

No cost figures could be obtained as the facility was originally designed and constructed to maximize the use of the geothermal resource. No comparison costs were developed.

REGULATORY/ENVIRONMENTAL ISSUES

The main regulatory/environmental issues were related to obtaining water rights and water disposal. Application for water rights were made in 1995 and it wasn't until the late 1990's that water right issues were finally resolved. Water disposal was also an issue. Waters that are not used for swimming or bathing are returned to a nearby stream at ambient temperature; other waters have to be treated. Health concerns have also been a major issue for development of geothermal spas in Washington State and except for those facilities where the water is not for "public use" or there is sufficient flow through, the Department of Health generally requires chlorination. This is true at Bonneville where chlorination of waters used in "public" areas is employed.

PROBLEMS AND SOLUTIONS

The resort has experienced few real problems since opening to the pubic in 2002. One major problem did occur prior to opening when in the process of drilling they were forced to cement the hole and reduce the diameter of the hole from an originally planned 30 cm (12 inch) casing to 15 cm (6 inch) final completion. This of course had an impact on potential flow and pump selection.

Other problems have occurred relative to one of the line shaft pumps. The problem was overcome and pumps no longer seem to be a problem area.

Copper tubing was tried but was not suitable considering the chemistry of the geothermal fluids and now the geothermal is isolated through the use of stainless steel heat exchangers.

CONCLUSION

The rebuilding of the Bonneville Hot Springs Resort on the site of the original 1881 Moffett Hot Springs Hotel continues over a century of geothermal use in this scenic area of the Columbia River Gorge. When the author first met the present owner, almost 14 years ago, it seemed like he was about to try to do the impossible. Now his enthusiastic spirit and commitment to excellence have created one of the jewels of the Columbia River Gorge.

The geothermal hot springs provide for most of the energy needs of the facility, and numerous spa treatments also use the natural hot spring mineral water.

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