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STATE OF OREGON
 OREGON STATE SANITARY AUTHORITY
 STATE OFFICE BUILDING
 1400 S. W. 5TH AVENUE
 PORTLAND 1

MAILING ADDRESS:
 P. O. Box 231
 PORTLAND 7, OREGON
 TELEPHONE:
 CA 6-2161

August 10, 1959

RECEIVED
 AUG 10 1959

STATE ENGINEER
 SALEM, OREGON

Mr. Lewis A. Stanley
 State Engineer
 303 State Office Building
 Salem, Oregon

Re: Chemical analysis
 Lake County well

Dear Mr. Stanley:

Confirming the information given you by telephone the following analyses have been made by our laboratory of the water sample submitted by Mr. A. M. Petska on August 3, 1959, from the well in Warner Valley, Lake County, Oregon.

* All results except for pH are in parts per million.

Task

| | | | |
|----------------------------------|------|------------------------------|------|
| Turbidity | 4* | Arsenic | 0.5 |
| Color | 3 | Copper | 1.0 |
| Total solids | 956 | Nitrate nitrogen | 0.37 |
| Suspended solids | 9 | Phosphate (PO ₄) | 0.58 |
| Carbonate alkalinity | 30.3 | Iron (Fe) | 1.0 |
| Bicarbonate alkalinity | 73.7 | Manganese (Mn) | 1.0 |
| Hardness (as CaCO ₃) | 23.2 | | |
| Chloride (Cl) | 235 | pH | 8.75 |
| Sulfate (SO ₄) | 130 | | |

We are sorry that we were not equipped to make a determination for boron. It will be noted that the arsenic concentration is quite high. This would make the water unsafe for domestic purposes.

Very truly yours,

Kenneth H. Spies

Kenneth H. Spies
 Deputy State Sanitary Engineer

KHS:lb

cc: T. M. Gerow

April 14, 1961

Mrs. T. A. Crump
1624 NE 56
Portland 13, Oregon

Dear Mrs. Crump:

I am sending you copies of the September 1959, June 1960, and August 1960 Ore-Bins so that you will have all the information that we have published about the Crump Geyser.

I check with Charlie every time I get to Lakeview to get the latest report on the activity there. I will continue to check on the area because from strong thermal springs like these we can expect to have erratic events happening.

I have enjoyed working over in the Warner Valley and am looking forward to many more visits there, especially to visit with Charlie Crump.

If I can be of help to you in any other way be sure to let me know.

Sincerely,

NVP:amj

Norman V. Peterson

1624 NE 56
Portland 13, Oregon
April 11, 1961

Mr. Norman Peterson
State Department of Geology and Mineral Industries
P. O. Box 417
Grants Pass, Oregon

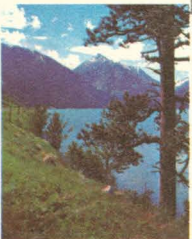
Dear Mr. Peterson:

I have read of your interest in the study of Warner Valley and have been referred to you by the State Department of Geology and Mineral Industries here in Portland. Charles Crump of Adel, Oregon is my husband's brother so we are naturally very interested in all reports on Crump Geyser. I am keeping a scrapbook and would appreciate having duplicate copies of any reports that are available from your work. I have Ore Bin September 1959 and August 1960 and appreciate the material in them very much.

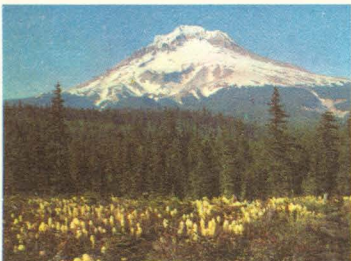
I understand that the first geyser is spouting about every 1 and three fourths hours now.

Sincerely,

Dorothy Crump
Dorothy Crump (Mrs. T. A.)

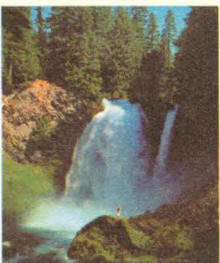


WALLOWA MTS.



MT. HOOD

SAHALIE FALLS



CAPE SEBASTIAN

CRATER LAKE



OREGON *the nation's destination in '59!*

File with Crump Geysers

March 18, 1964

Mr. Jack Peary
Department of Biology
University of Oregon
Eugene, Oregon

Dear Mr. Peary:

I have your letter asking about hot springs in the Lakeview area and I hope that I can give you some information that will be helpful.

The geology of the immediate area has not been mapped in detail but is included in USGS Map MF 260, Reconnaissance geologic map of the eastern half of the Klamath Falls (AMS) quadrangle, Lake and Klamath Counties, Oregon, by George W. Walker, 1963. Hunters Hot Springs are mentioned in USGS Water Supply Paper 679-B, Thermal springs in the U. S., but there is no detailed local information. There is a good general discussion in this bulletin on the origin of thermal water, source of heat and geologic structures of hot springs.

I am sending along an Ore.-Bin article I wrote on a hot spring area in the Warner Valley. At the time I made this study I visited the Hunter Hot Springs and made a slight mention of them in the article.

Another reference in which the springs are mentioned but not discussed in any detail is: USGS Water Supply Paper 220, Geology and water resources of a portion of south-central Oregon, by G. A. Waring, 1908.

You probably have some of the history but may not have these two references from the Lake County Examiner, 40 years ago column,

10/3/63 "October 4, 1923, A geyser was struck last friday afternoon at the Hunter Hot Springs 1 1/2 miles north of Lakeview by E. H. Williams and Sons, well drillers, which sends a column of boiling water into the air 40' high. Hundreds of cars last Saturday and Sunday and all this week have carried Lake County people out to see this natural phenomenon. About every 6 minutes the geyser sends its column of water into the air."

10/24/63 "October 25, 1923, A third geyser was struck last Saturday at the Hunter Hot Springs about a mile and one-half north of Lakeview. The first geyser developed three weeks ago, as wonderful as it seemed, was nothing in comparison to this mammoth gusher of boiling water. Hundreds of people have visited the grounds since it was struck last Saturday.

At a depth of about 12 feet in a hole drilled in the center of the upper boxed spring the first heavy flow of water was struck, forcing the drillers to stop their work Saturday afternoon. This first flow, which later developed into a powerful geyser, spouting into the air about 10 to 12 feet high, varying only slightly in its constant flow. On Monday, when the wind changed so that the drillers could again work without being scalded by the hot spray, the casing in this well was extended to a depth of 20 feet. In a few minutes after the drills had been removed from the well the geyser shot for the first time. Every 12 to 15 seconds it shot in the same manner and for nearly two days sent its great volume of boiling water from 50 to 75 feet into the air. But now it has again changed its habits and is sending a constant flow into the air about 50 feet high."

I have also noted that the springs were named for Harry A. Hunter, an early Lake County resident. The earliest report of the springs was in the journals of John Work, October 21, 1832. (From Oregon Geographic Names, L. A. McArthur)

If you should need more historical information you could probably get it from the Lake County Historical Society (Mrs. John Orr). They may even have copies of the water analysis. In case they don't the State Engineer's Office in Salem may have analyses.

From my brief observation, the springs occur in the old Goose Lake sediments (quaternary alluvium) and mark the trace of a large fault along the base of the escarpment on the east side of the Goose Lake Valley. The rocks exposed in this steep scarp are a series of volcanic tuffs, and extrusive and intrusive volcanic rocks of varied compositions. Walker has mapped them as lower Miocene in age. The water is probably meteoric and the source of the heat is ? --my views are in the enclosed article. The pencil sketch is one way to explain the hot springs and you can take it for what its worth.

This is all I can think of for now and if it doesn't give you everything you need it may lead you to the information. Good Luck.

Sincerely,

Norman V. Peterson, Geologist

UNIVERSITY OF OREGON

COLLEGE OF LIBERAL ARTS

EUGENE, OREGON

DEPARTMENT OF BIOLOGY

3/16/64

Norman Peterson
State Dept. of Geol.
239 - S.E. - H Street
Grant Pass, Oregon

Dear Mr. Peterson,

Dr. Baldwin of the Geology Dept advised me to contact you for some information I need for my P.H.D. thesis. I am working with the hot springs & thermal algae at Hunter's Hot Spring north of Lakeview, Ore. I want to get some information as to the geology of the area, possible source of the hot water, faults, water analyses — anything to do with the spring.

I've come across papers dealing with thermal areas in neighboring states, but nothing in Oregon. If you know ~~of~~ anything of the Lakeview area I would appreciate very much if you would send me the information.

Sincerely yours

Jack Peary



251 FINANCE BUILDING
170 12TH STREET S.E.

STATE OF OREGON
STATE ENGINEER
WATER RESOURCES DEPARTMENT
SALEM

REFER TO
FILE No. _____

September 9, 1959

State Department of Geology
and Mineral Industries
239 Southeast H Street
P. O. Box 417
Grants Pass, Oregon

ATTENTION: Mr. Norm Peterson, Geologist

Dear Norm:

Thank you for your letter of September 3 and the enclosed picture. I am sorry to say that we have not yet received a well log from the Nevada Thermal Power Company for the Crump well. Mr. Stanley is going to follow this up with a second request for this data.

We did have the water analyzed and I am enclosing a copy of Mr. Spies letter showing the water analyzes. You will note that the pH is strongly alkaline; of particular note is the arsenic content of the water. Based on the quantity of 300 to 500 gallons per minute of constant flow the well is yielding approximately a pound to a pound and one-half of arsenic per day. An agricultural agent has stated that the use of this water for one year would be fatal to cattle.

A few weeks back we made an attempt to determine the velocity of the water in the well column and an average velocity was computed at 67 feet per second and the average discharge was between 300 and 500 gallons per minute. Water temperature at the edge of the casing was about 200 degrees. The velocity determination was made by photographing the rise of a lath released at the top of the casing with a movie camera using 16 frames per second. The well's discharge varies according to position within the casing. The north side of the casing seems to have the strongest flow. The south side the next strongest and the east side has the least flow. Velocities were quite variable, some being computed as high as 88 feet per second and the lowest about 51 feet per second.

Explore Oregon... Centennial Exposition June 10-September 17... 1959

Mr. Norm Peterson, Geologist Page 2 September 9, 1959

This is all the information we have at present and as soon as the log becomes available we will get a copy of it to you. It will be interesting to see the growth of an ice mountain during the coming winter season. Perhaps we can form a pool to determine on what date the Adel-Plush road will be closed to traffic.

I expect to be in Lakeview sometime in the later part of October to follow up on the artesian wells south of town.

Wes Carr sends his regards. Thank you again for the picture.

Very truly yours,

LEWIS A. STANLEY
State Engineer

By *Wm. S. Bartholomew*
Wm. S. Bartholomew
Geologist

WSB:vf
Enc: 1

COPY

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

September 3, 1959

Mr. Lewis A. Stanley, State Engineer
170 - 12th Street, S.E. (Room 251)
Salem, Oregon

Dear Mr. Stanley:

I have asked Norm Peterson, our geologist working in the Lakeview area, to prepare a short geologic description of the geyser on the Grump ranch in southern Lake County. This article will be used in the September issue of our monthly publication, THE ORE.-BIN.

In obtaining data on this well, I have asked Norm to contact your Mr. Jack Sceva for information on depth of well, log, water analyses, and the like. Any information that you can furnish Norm will be greatly appreciated. If you have data on nearby wells, that too would help round out the geologic picture.

Perhaps Mr. Sceva might wish to cooperate with Norm on this. In any event, information supplied by the State Engineer will be given due credit. As the manuscript for this article must be in the Portland office by September 21, it would be appreciated if you will answer Mr. Peterson's inquiries promptly.

Thank you for your cooperation in this respect.

Sincerely yours,



Hollis M. Dole
Director

HMD:jr
cc Jack Sceva
bc Norm Peterson

What do you think?

July 17, 1975

Mr. Marshall Reed
U. S. Geological Survey
345 Middlefield Road
Menlo Park, Calif. 94025

Dear Mr. Reed:

Here is the well log I put together back in 1959 from an incomplete set of well cuttings from the Crump Valley #1 well. Hope this will be helpful.

Best regards,

Norm Peterson

NVP:rep
Encl: Log (2 sheets)



File *Crump Geyser*

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Area Geothermal Supervisor
Conservation Division
345 Middlefield Road
Menlo Park, California 94025

July 28, 1975

Norm Peterson
Oregon Department of Geology and Mineral Industries
521 N.E. "E" Street
Grants Pass, Oregon 97526

Dear Mr. Peterson:

Thank you very much for your analysis of cuttings from the "Crump Valley" 1 well. Your descriptions and interpretations were quite helpful in my review of the local geology. Your log of well cuttings is enclosed.

Sincerely Yours,

Marshall Reed

Marshall Reed

Enclosure