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**EXPLORATION OF VOLCANIC GEOTHERMAL ENERGY
RESOURCES BASED ON RHEOLOGICAL TECHNIQUES**

Second Technical Status Report

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Brief Restatement of Objectives

Elementary considerations indicate that rheological methods may be useful in the detection and delineation of volcanic geothermal resources, in particular, those connected with subsurface molten or quasi-molten plutons such as may possibly be the case in the Oregon-Washington Cascades. The processes of main interest are the deformations or flows caused by (1) seasonal snow-ice load, (2) tidal strain and (3) seismic surface waves from moderate to high energy earthquakes. We propose to carry out an initial physical-analytic and field study of the general applicability of the rheidity sensing techniques in the Oregon-Washington Cascade region.

PROGRESS REPORT FOR THE PERIOD JULY 1, 1978 TO SEPTEMBER 30, 1978

Personnel

Ansel G. Johnson, and Cynthia Veen, Portland State University, have each devoted 2-1/2 months to the project during this period. Gunnar Bodvarsson was not on appointment on the project during the period.

Progress Summary

We itemize our efforts during the report period as follows:

(1) Completed ordering equipment for 2 tilt meter installations, 2 water level recording systems, and three strain systems. All equipment received has been assembled, (electronics for three strain meters).

(2) Planned the installation of three strain meters for testing proposed at Klamath Falls.. Installation of the shells, tubing, etc., for October 4-7, 1978.

Problems Encountered

(1) Strainmeter Bases from Malmburg Engineering have been waiting for a companion order from the USGS including some specifications, but now are due within 1 - 2 weeks.

(2) The fiberglass culverts, ordered in June were not completed until September and therefore delayed the strainmeter installation.

(3) Delivery of some of the electronics has been delayed because some parts are difficult to find, or made specially for the USGS strain system. (USGS will supply parts for us on loan once the strain bases are obtained). We will then give them our parts when they arrive. (See item 1 above for delay item for strain meters).

Plan for the period October 1, 1978 to December 31, 1978

(1) Install culverts and tubing for strain meters at Klamath Falls. After receiving the strain bases, take the strain system to the USGS for fill-in missing parts, adjustment of the electronics, then installation and operation at Klamath Falls.

(2) Install shells near Mount Hood, so the strain systems can be moved to Mount Hood after testing in Klamath Falls.

(3) If the tilt meters are received before the end of the year, install them at Klamath Falls for testing, then move them to the Mount Hood area. Note both strain and tilt can occupy the same pit and steel pipes.

(4) Tilt at Newberry Crater will have to wait till early next summer due to weather considerations, and the delay in receiving the tilt meters.

(5) Theoretical work will be continued during the period October 1, 1978 to December 31, 1978.