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INDEX OF REFRACTION OF BASALT SAMPLES FROM GULF OIL CORPORATION PORTER NO. 1

Samples submitted by Paul Day, Gulf Oil Corporation, from Gulf Porter No. 1, sec. 27, T. 14 S., R. 4 W., west of Halsey, Oregon are of several basalt zones encountered in the well.

The samples from 3220 feet to 5670 feet are well cuttings. Basalt was separated from sediments by binocular microscope. Samples from 7127 feet to 7145 feet are taken from a core.

Pure samples of the basalt were fused to glass beads in a carbon arc and index of refraction was determined by becke line method using a polarizing microscope and standard oils. The oils have not been checked recently and a refractometer was not readily available.

The results appear to reveal differences in the basalt formations, however errors could have some effect on the results. These errors could result from inadequate size of sample and insufficient mixing of the pulverized rock. Basalt fragments from several formations could be combined. The glass beads did not always result in a homogenous glass. Sometimes glass of several indices of refraction could be observed in the same bead. In this case the most abundant glass was measured.

The core samples were considerably altered and the percent silica seemed to vary considerably. It is likely that certain zones are silica enriched, while others are leached. For this reason the core sample results were averaged.

Summary and conclusions

Petrographically the material from 3220 feet to 3350 feet is a medium-grained, equigranular intrusive, probably a gabbro. The index of refraction of a glass bead indicates a silica content of 52.5 to 54%. I would judge this to be a gabbro sill, probably intruded during the Miocene or late Oligocene.

The material from 5570 feet to 5670 feet is a fine-grained dark basalt "flow rock" which should be equivalent to the Goble or Nestucca volcanics.

The core samples from 7127 feet to 7145 feet are weathered, leached, and highly altered basalts. They contain calcite and zeolite veins, some pyrite, and some sections are oxidized to a red-brown color. Numerous small slickensides and fractures cut the rocks. The index of refraction of glass beads taken at short intervals vary considerably, probably due to presence of abnormal concentration or the scarcity of certain minerals. Percentages of minerals other than found in normal rock types would give unreliable results by index of refraction of glass.

This material is most likely equivalent to the Siletz River Volcanic Series.

Tabulation of Samples

No.	Depth	Index of refraction	% SiO_2	Average	Age
1	3220	1.573± 002	54	53.2 ave.	Miocene or Pliocene gabbro