



DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

ADMINISTRATIVE OFFICE

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TOM McCALL
GOVERNOR

BOOTH OIL SEEP

Washington County

Location. The Booth property is located in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 33, T. 2 S., R. 2 W., Washington County, on the northeast slope of the Chehalem Mountains.

Owner. Mr. and Mrs. B. Booth, Route 3, Box M80, Sherwood, Oregon.

Summary. Mr. Booth called early in April to report that his water well had become contaminated with oil and was not usable for domestic purposes or for his poultry business. The oil appeared to be coming into the well with the water supply at a depth of 270 feet. Test for bacteria showed no nearby surface pollution was occurring. An examination of oil collected from the water by Charlton Laboratories showed the oil to be in the diesel-to-fuel-oil fraction.

Remarks. Mr. Booth's property was visited on April 14, 1971. A sample of water from the well at that time had an oil odor and a slight film could be seen on the surface of the water. The Booth property is underlain by Columbia River Basalt of Miocene age. The basalt contains several aquifers which probably occur at contacts between successive lava flows.

The attached sheets showing topography and a cross section through the Booth well indicate generally the geologic situation in that area. Dip of the basalt flows can be seen to be down the northeast slope of the Chehalem

Mountains. Outcrops of the aquifer in the well could occur near the point labelled "ridge" on the cross section. Contamination of the water by leakage from an oil tank is certainly a possibility. Many homes are located along the ridge above the Booth property. Tests by Charlton Laboratories show the oil to be of a fuel oil or diesel fraction. Besides the possible outcrop of the water zone updip, there could also be fractures in the basalt which serve as avenues for surface contaminants. Bacterial tests reportedly showed no nearby surface contamination of the well water.

It is possible that the surface seepage has travelled far enough through soils to lower the bacteria count. Clayey soils are known to be good filters for most pollutants.

Rock type and geologic structure in the vicinity of the Chehalem Mountains are favorable for the accumulation of natural petroleum at depth. There is a chance that oil entering the Booth well migrated upward along a fault and reached the water zone. Neighbors of the Booths are said to have noted oil seepage in a small ravine nearby. Presence of natural gas along with the oil would suggest a natural seepage. No gas was observed in the discharge at the time of this visit. Mobil Oil Company has agreed to run tests on the oil to determine if it is a natural hydrocarbon.

If surface contamination appears likely then the matter should be called to the attention of Mr. Chris Wheeler, State Engineer, Salem, Oregon. It is possible that a check could be made of oil tanks on the ridge above the Booth property.

Report by: Vernon C. Newton, Jr.
Geologist - Petroleum Engineer

Date: May 5, 1971

MOBIL RESEARCH AND DEVELOPMENT CORPORATION

Field Research Laboratory

DATE May 4, 1972

TO A. G. Alpha
Mobil Oil Corporation
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TECHNICAL SERVICE JOB NO. 252-5837
HYDROCARBON ANALYSIS: "BOOTH OIL
SEEP", CHEHALEM MOUNTAINS,
NORTHWEST OREGON

Tests of a sample from the "Booth Oil Seep" in the Chehalem Mountains of Northwest Oregon indicate a mixture of hydrocarbons in the diesel to fuel-oil range. This limited range of molecular weights suggests a refinery product rather than a naturally occurring mixture of hydrocarbons.

It is understood that the sample was recovered from well water on the Booth property in Washington County, Oregon. Charcoal samples from Mr. Booth's filtering system were solvent extracted and hydrocarbon compounds similar to those observed in the oil sample were recovered. The oil sample and charcoal extract were stabilized to a constant weight at 40°C. Silica gel chromatography of the stabilized samples resulted in the following distribution of compound types:

	<u>Oil Sample</u>	<u>Charcoal Extract</u>
% Saturated hydrocarbons	64	47
% Naphthene-aromatic hydrocarbons	24	22
% Asphaltic compounds	12	31

Spectral and chromatographic analyses of the saturated fraction indicate a low level of straight-chain or normal paraffins in both samples. Aromatic hydrocarbon mixtures in the samples were very similar. Differences in percentage composition noted above can be accounted for by differing extraction procedures. The oil sample from the Charlton Laboratories was obtained by extraction with petroleum ether. The charcoal submitted to FRL was extracted with a benzene-methanol mixture which resulted in more efficient removal of asphaltic compounds.

Results of our analyses support those of the Charlton Laboratories, dated April 2, 1971, a copy of which was submitted to us with your letter of June 3. It is our opinion that the "Booth Oil" is not naturally occurring and probably results from long-term seepage from fuel tanks in the area.

A. G. Alpha

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May 4, 1972

This completes work to be carried out on Technical Service Job No. 252-5837,
as requested in your letter of June 3, 1971.



K. J. Miller

AJM:yy