POLK COUNTY

Geography

Polk County borders Yamhill County on the south and extends westward from the Willamette River to the summits of the Coast Range. The area of the county is 739 square miles. Dallas, the county seat, is located on Rickreall Creek in the eastern foothills of the Coast Range.

The broad Willamette Valley contains numerous rounded hills, the most prominent of which are the Eola Hills in the eastern part of the valley. Higher and steeper hills lie to the west of the valley, and merge into the rugged mountainous area of the Coast Range in the western portion of the county. Elevations range from about 90 feet along the Willamette River to above 3,000 feet along summits of the Coast Range. Except for the western edge of the county, which is drained by the Salmon and Siletz rivers, the drainage is directly or indirectly into the Willamette River on the east by way of the South Yamhill and Luckiamute rivers, and Rickreall, Salt, and Mill creeks.

Agriculture, lumbering, and dairying are the principal industries. Fruit, nuts, and hops are the most important crops. The mineral resources consist of sand, gravel, crushed rock, and limestone. A deposit of manganese has been noted, but has not been explored and apparently is small.

Geology

Baldwin (1947) prepared reconnaissance geologic maps of the Dallas and Valsetz quadrangles located mainly in Polk County. The area covered by these maps consists of a section of the summit and eastern slope of the Coast Range and a portion of the western part of the Willamette Valley. This report was the main source of information for the following description of the general geology of Polk County.

The formations exposed in the Coast Range in Polk County consist of Eocene igneous and sedimentary rocks. Igneous dikes and sills probably of upper Oligocene age intrude these Eocene formations. Oligocene sediments occur in the Willamette Valley in the northeastern part of the county. Miocene basalts cap the Eola Hills. Pleistocene and Recent alluvium and terrace deposits mask many of the older formations in the valley of the Willamette River and along the lower valleys of the other major streams.

The Siletz River volcanic series (lower to middle Eocene) composed of basalt flows, breccia, pillow lavas, and interbedded tuffaceous sediments, is exposed in the highlands west of Dallas and extends southwestward across Polk County into Lincoln County. The series was officially named by Snavely and Baldwin (1948) from exposures along the Siletz River and its tributaries.

Middle Eocene sediments, consisting of sandstones in the basal part and largely shales in the upper part, overlie the Siletz River volcanic series. These sediments were tentatively correlated by Baldwin (1947) with the Umpqua-Tyee sediments of southwestern Oregon, and in part may be correlative to the Burpee formation which occurs farther west in the Coast Range. The limestone deposits in Polk County occur as lenses in the basal part of this series. These sediments extend north, south, and west of Dallas and surround the exposures of Siletz River volcanics.

In the eastern part of the area covered by the Dallas quadrangle, upper Eocene sediments and some basalt flows are exposed. These sediments consist of marine tuffaceous sandstone, siltstone, and shale probably equivalent in age to the Cowlitz, Coaledo, and Spencer formations. The best exposure is along the highway that crosses Cooper Hollow. These sediments are also exposed at Helmick Hill in southeastern Polk County.

East of the Dallas and Valsetz area on the western side of the Willamette Valley, sandstones, shales, and siltstones of the Keasey formation (upper Eocene to lower Oligocene) and younger Oligocene formations occur. At Holmes Gap these younger Oligocene sediments are in contact with the underlying Keasey formation. Oligocene sediments are also exposed in places along the west side near the base of the Eola Hills. These sediments are mainly light-colored tuffaceous sandstones probably correlative with the Pittsburg Bluff formation of Columbia County and the Eugene formation of Lane County.

Stayton lavas (middle Oligocene), correlative with the Columbia River basalts, cap Oligocene sediments in the Eola Hills. Gibbsite and ferruginous bauxite float are found at several localities in these hills.

Sills and dikes of gabbro and diorite have intruded the Eocene rocks in the southwestern part of the Dallas quadrangle and in many places in the Valsetz quadrangle. Sills cap Laurel Mountain, Fanno Peak, Bald Mountain, and some of the other highest peaks and plateaus. A long dike extends from Diamond Peak to Fanno Peak. These intrusives are considered to be upper Oligocene in age.

Pleistocene formations include terrace deposits of weathered gravels, particularly those east and northeast of Dallas along Rickreall and Salt creeks, and silt which covers much of the Willamette Valley plain and lower slopes of adjacent hills. Some glacial erratics of granitic rocks are associated with the silt. Recent floodplain deposits of gravel and sand cover the channels of the present streams.

Mining Properties of Polk County

BUELL LIMESTONE

Lessee: Buell Lime Products Company, A. N. Duncan, president, 12 Ladd and Bush Building, Salem, Oregon.

Owner: H. W. Schmidt, Route 1, Sheridan, Oregon.

Location and area: Secs. 19, 20, 29, and 30, T. 6 S., R. 6 W. The deposit is about 2 miles west of Buell and 3½ miles southeast of Willamina a short distance south of State Highway 22. The property contains 750 acres.

History and development: The deposit was noted by Hodge (1938:267) who stated that the Oregon Portland Cement Company investigated the occurrence in 1932. The Buell Lime Products Company obtained a 40-year lease with an option to purchase from H. W. Schmidt about February 1946. This company drilled 13 diamond-drill holes along the strike of the limestone bed. Quarrying operations were begun in March 1946 and have been continuous through 1950. Agricultural limestone has been marketed.

Geology: Limestone crops out in many places on the property on a dip slope south of an intermittent northwest-flowing creek. The limestone bed strikes N. 60° W. and dips 8° N. under a belt of tuffaceous shale which is exposed in the highway cuts and which forms the heavy overburden east of the quarry. On the west the limestone abuts against a basaltic hill. Basalt appears to underlie the limestone disconformably, but no angular relationship could be determined from the available exposures.

Drilling completed by the Buell Lime Products Company indicated that the limestone bed has an average thickness of about 20 feet and is underlain by greenish sandstone.

The Buell deposit is somewhat similar in appearance and composition to the Dallas limestone deposits 10½ miles to the southwest. Although fossils occur in the Buell limestone, no

attempt has been made to identify them. If the Buell deposit occupies a stratigraphic position equivalent to the Dallas limestone, it would be of upper Eocene age.

The limestone is massive and slightly jointed. It is a dense gray rock with both carbonaceous and clastic fragments. The rock weathers brown near the surface and any samples taken from outcrops may have a lower lime content as a result of leaching.

Results of the chemical analysis by L. L. Hoagland, Department chemist, of samples obtained at the quarry are given in the table below.

Sample No.	Description	CaO	MgO	SiO_2	Neutralizing value
P-4525	6½-ft. channel sample from face of quarry	27.72%	2.16%	29.06%	53.91%
P-4526	Specimen taken near middle of above channel	27.42	1.41	37.40	52.14
P-4527	Grab sample taken near hole 1	42.77	1.25	14.10	78.91
P-4528	Grab sample taken near hole 3	28.73	2.84	24.94	57.04
P-4529	Grab sample taken near hole 5	35.93	2.00	18.58	68.17

The Buell Lime Products Company submitted two composite samples of the diamond drill cores from holes 1 to 10 inclusive to Charlton Laboratories of Portland for analysis. The results are listed as follows:

Sample Description	CaO	MgO	Neutralizing value
1. Average material, holes 1 to 10 inclusive	32.0 %	1.47%	61.6 %
2. "High grade" material, holes 1 to 10 inclusive	34.3	1.21	63.6
3. Core from hole 13	43.8	0.95	80.2

Drill cores and outcrops in the vicinity of the drill holes indicate an average thickness of 20 feet of limestone extending over an area of 300 feet by 1,500 feet. Total indicated reserves over this area would be 9,000,000 cubic feet. Measured specific gravity of the limestone from the quarry is 2.3. Thus a total of approximately 646,000 tons of limestone is indicated. By further extension of the area from outcrop indications an inferred tonnage of 1,550,000 tons is obtained.

References: Hodge, 1938:267
Mason and Lowry, 1946

Geology: According to Baldwin (1947:53) the limestone in the vicinity of Dallas occurs as a lens which appears to be a basal member of the Umpqua-Tyee sedimentary series consisting largely of tuffaceous sandstones and shales. He refers to this lens as the "Dallas limestone member." He also states that most of the known limestone deposits in this area, with a few exceptions, rest upon the Siletz River volcanic series. Basalt, probably of this series, is exposed in the floor of the quarry.

The limestone deposit extends from the divide between the quarry and the North Fork of Ash Creek (northeast of the quarry) southwestward beyond Waymire Creek and approximately as far eastward as Liberty Road. The beds strike N. 10° E. in this quarry and nearly due east in the Lime Products Company quarry about half a mile to the south, which indicates a structure plunging to the southeast. The limestone member is limited by an erosion surface up the dip and to the northeast and apparently dips beneath the overlying sediments to the east and south. It is more than 50 feet thick at the quarry.

The rock is an impure, dark gray, tuffaceous, sandy limestone that weathers to a porous, brown sandy material, due to the leaching of the calcium carbonate and alteration of the tuff grains. It consists of many foraminifera tests, fragments of large shells, and calcareous algae intermixed with tuffaceous material. The surface is uneven due to weathering along certain joints.

The limestone varies in composition from less than 50 percent to nearly 90 percent $CaCO_3$. According to J. D. Bywaters, superintendent of the Oregon Portland Cement Company quarry, stone from the quarry averages as shipped about 55 percent $CaCO_3$.

The Oregon Portland Cement Company produces about 400 tons of limestone a day. The ore is crushed and shipped to the company's cement plant at Oswego.

Report by: D.J.W., 1951

References:
Allen, 1946:2-5
Allison, 1933 (unpublished report)
Baldwin, 1947:53
Hodge, 1938:266-267