The study area lies in southwest Douglas County 5 kilometers south from Camas Valley and is accessible by state highway 42. The purpose of the study was to map the geology at a 1:31,250 scale, determine the stratigraphy, study the petrology of the formations, and determine the provenance within a tectonic setting.

Structural features that control the map pattern of the northwest quarter of the Dutchman Butte quadrangle are a syncline and anticline which trend to the northwest.
Both folded structures are truncated by the east trending Canyonville fault zone within the area mapped. The last movement in the fault zone occurred in the middle Eocene and was down-to-the-north.

Petrology of the rocks within the study area, with the exception of a few minor serpentinite bodies, is sedimentary. Clast composition of the coarse-grained sedimentary rocks is a varied composition of basaltic-andesite, andesite, quartzite, phyllite, chert, mudstone, sandstone, and conglomerate. Grain compositions of the fine-grained sedimentary rocks reflect a similar source.

The oldest formations within the study area are the late Jurassic Dothan Formation and the late Jurassic to early Cretaceous Riddle and Days Creek Formations of the Myrtle Group. These formations are within and to the south of the Canyonville fault zone. The Eocene Roseburg, Lookingglass, and Flournoy Formations are overlying the Mesozoic formations. Stratigraphic thickness for the pre-Tertiary formations was not determined due to severe structural deformation of the units, however, an estimation of 1 kilometer or more was made. Thickness for the Eocene formations was calculated from measured sections to be at least 900 meters. Primary sedimentary structures including rip ups, flute casts, trough sets, cross-bedding, ripple marks, and channel scour and fill are common throughout the study area. These structures, analyzed in conjunction with the geometry of the planar
and lenticular bedding, are interpreted to have been formed within a pro-deltaic to deltaic depositional environment on a continental shelf, slope, or in a tectonic basin. Paleocurrent directions were determined to be from the south-southwest and southeast. Composition of the sedimentary rocks indicate a volcanic-arc source, possibly the Rogue Formation which lies to the south of the study area. Paleocurrents of south-southwest and basaltic rock fragments in some outcrops indicate a second possible source from the Mt. Bolivar igneous complex in the adjacent Bone Mountain quadrangle.