State Department of Geology and Mineral Industries

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Portland 1, Oregon

F810

Uranium Occurrences on Little Alvord Creek, Harney County, Oregon.

Location and Ownership: Two adjoining groups of claims have been located on the steep slopes of Little Alvord Creek canyon in secs. 8 and 9, T. 34S, R. 34E. The Timberbeast Mining Company holds 10 claims located in August 1956 on the south side of the creek and Lester Rhoads and associates hold 18 claims on the north. The principle owners of the Timberbeast Mining Company are George Slade, by whom most of the development work has been done, W. C. Teegarden, Glenn C. Young, and Charles Skeeters. The latter has acquired a ½ interest in both groups of claims.

Development: At the time of visit the Timberbeast property was developed by two crosscut adits 270 feet and 70 feet long and numerous small opencuts. No underground work had yet been done on the adjoining Rhoads property. Access roads have been built to most of the prospect workings. A DMEA loan has been applied for by the Timberbeast Mining Co. for continued development.

Geology: The rocks in the vicinity consist of the rhyolites, dacites and interbedded tuffs of the Pike Creek volcanic series and the underlying stratified tuffs, clays and interbedded lenses of chert and conglomerate of the Alvord Creek formation. These rocks were described in detail by Fuller[1] and later were mapped and described by Williams and Compton.[2] On the basis of fossil leaves, Axelrod[3] considered the Alvord Creek formation to be early Pliocene and suggested, due to its stratigraphic position, that the overlying Pike Creek series was also early Pliocene. Williams and Compton divide the Pike Creek series into several components but state that "both the lavas and tuffs in the area are so lenticular that the successions in adjacent canyons differ greatly. This lenticularity is due to the flows having been unusually viscous and to their having issued from a group of local vents-----." One such vent is well exposed near creek level immediately west of one of the more interesting uranium occurrences on the Rhoads property.

Members of the Pike Creek series which are most conspicuous in Little Alvord Creek canyon are massive flows of laminated rhyolite overlain by biotite dacite. Both of these units are hundreds of feet in aggregate thickness and stand in precipitous cliffs. The laminated rhyolite is separated from the overlying biotite dacite by a series of thin interbedded tuffs and flows.

These rocks are intruded by a dike of fine grained basalt or diabase approximately 8 feet wide. The dike strikes N 10°W and dips slightly westward intersecting Little Alvord canyon several hundred feet below its highest known exposure on the steep south wall of the canyon. Because of its relatively poor resistance to weathering, it can be traced by topographic expression for several hundred feet in horizontal distance on either slope of the canyon.

Uranium mineralization has been found in several places within the dike and along its contacts with the adjacent volcanics. High on the south wall of the canyon near the base of the massive biotite dacite flows, the Timberbeast Mining Company has driven two adits to crosscut the dike [redacted]. These adits were driven in bedded tuffs and dacites containing small lenses of granular perlitic material. The upper adit which is 70 feet long and trends S 61°W crosscuts the dike at a depth of approximately 28 feet below the surface. On the west side of the dike was found a 6 to 8 inch seam of clays, "limonite" and manganese oxides. In this seam are small irregular zones of high radioactivity from which selected samples were estimated to contain up to 0.5% U_3O_8. Small quantities of autunite and torbernite are also present both in the dacite and in altered portions of dike adjacent to this seam. No radioactivity was found in the lower tunnel which trends S 45°W for 270 feet and crosscuts the dike about 120 feet south and 90 feet below the upper tunnel.

The portion of the dike exposed in the lower tunnel is considerably less altered than that in the upper tunnel. Though substantiating evidence is incomplete by virtue of the dike being exposed in only two places beneath the surface,

it may be that both the alteration of the dike and the deposition of the uranium are phenomena of weathering rather than of hydrothermal action. If this is true the intensity of alteration and the quantity of associated uranium will undoubtedly decrease with depth.

On the surface, particularly south of the underground workings, occasional zones of high radioactivity have been found along fractures of little or no displacement cutting the volcanics adjacent to the dike. The walls of these fractures are weakly silicified and, because in many of the associated radioactive occurrences no uranium minerals are visible, it seems likely that the uranium is intimately mixed with the silica contained in the fracture walls. In such occurrences the radioactivity rarely penetrates the rock more than one inch and little visible evidence of mineralization other than minor silicification is present. Other surface occurrences do contain visible uranium minerals. One of these occurs in spherulitic tuff near the intersection of a fracture trending N 70°W with one trending N 10°E. Its exposed dimensions are very limited.

Most of the known radioactive occurrences are within a few tens of feet of the dike but on the Rhoads property north of the creek small deposits have been found in fractures several hundred feet from its projected course.

The discovery now being developed by Rhoads occurs near the canyon floor on the north side of the creek. Here the dike intersects what may be the upper part of Alvord Creek formation. However the deposit appears to be confined to rocks derived from the vent immediately to the west. Due probably to the close proximity of the vent, the flows of rhyolite breccia and glass dip steeply south in contrast to the normal gently westward dip of the surrounding rocks. The deposit occurs along the walls of an open fracture cutting an exposed layer of rhyolite breccia in contact with underlying layered tuffs. The breccia strikes N 50°W and dips 45°SW. The open fracture which trends N 40°E is about 3 feet wide and is filled with soil and loose rock. An open cut about 20 feet long has been driven between the walls of

the fault and into the underlying tuff. Evidence of the fault ends abruptly at the contact between the tuffs and the overlying rhyolite indicating possibly that the slab of rhyolite breccia is either in fault contact with the tuff or is merely a slump block.

That the walls of the fault were spread apart subsequent to the deposition of the uranium is indicated by matching distribution of radioactivity on the two walls of the fault. The wall rocks have been partially altered to clay and small quantities of "limonite", manganese oxides, and silica have been introduced. Several spots along the adjacent walls of the fault contain the radioactive equivalent of in excess of 0.5% U_3O_8 and occasional secondary uranium minerals have been found. The main concentration occurs in small knots, up to 2 inches in diameter, of soft dark grey to black material of indefinite composition. The radioactivity decreases sharply and rarely penetrates the wallrocks more than an inch or two.

A dike believed to be that with which the uranium mineralization is associated south of the creek is exposed in an open cut less than 15 feet west of the mineralized fault. Weak radioactive anomalies are said to occur at various points along the topographically indicated course of the dike north of the creek but where exposed in the open cut no radioactivity was found.

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(1) Axelrod, D. I., 1944, The Alvord Creek Flora, in Chaney, R. W. (editor), Pliocene floras of California and Oregon: Carnegie Inst. Washington Pub 553.

(2) Fuller, R. E., 1931, The geomorphology and volcanic sequence of Steens Mountain in southeastern Oregon: Washington Univ. (Seattle) Pub. in Geology, vol. 3, no. 1, pp. 43-121.

(3) Williams, Howell and Compton, Robert R., 1953, Quicksilver Deposits of Steens Mountin and Pueblo Mountains, Southeast Oregon, U. S. Geol. Surv. Bull. 995-B.

Reported by: H. C. Brooks -- February 6, 1958

Date of Exam; October 2, 1957.

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Progress report on the exploratory development of the Timberbeast Mining Company uranium prospect, on Little Alvord Creek, Harney County, Oregon.

Addendum to report by H. C. Brooks, February 6, 1958.
Date of previous exam - October 2, 1957.

During the winter of 1957-1958 about 270 linear feet of drifting was done from the lower adit under contract with the D.M.E.A. A drift was driven along the west side of the dike for 180 feet to intersect a fault trending S 85° E along which minor uranium mineralization had been found on the surface. A drift was then driven eastward along the fault for about 90 feet. The south extension of the dike is offset to the east along the fault about 9 feet on the surface and 15 feet at the adit level, which according to Slade is roughly 260 feet vertically below the surface exposure. Underground west of the dike the fault is narrow and exhibits little evidence of strong movement. East of the dike, lenses of wet clayey gouge (some several feet in width) have been exposed and the walls of the drift are wet and highly altered. The fracture dips roughly 65° south.

No ore grade material has been developed and uranium minerals are rarely distinguishable. Small discontinuous zones of weakly radioactive material occur along fractures in the volcanics adjacent to the dike and in the gouge zones along the intersecting fracture. The radioactivity is generally associated with thin, but in places numerous and closely spaced, seams of ilsemenite. However, much of the ilsemenite bearing material is now radioactive.

Work was terminated about June 1, 1958 pending the decision of the D.M.E.A. as to whether further exploratory work would be allowed under the D.M.E.A. contract. About 350 feet of development work remains to be done in the second stage of the contract in the event the work is justifiable.

Little additional work has been done on the Rhoades property.

Report by: Howard C. Brooks, July 8, 1958.

Date of exam: June 15, 1958.