MR-44-11

July 3-4, 1944
Mineral Hill area, Wyoming
near Tinton, South Dakota

Subject: NEPHELINE-SYENITE claims.
Locators: Messrs. Francis Michaud, Custer, South Dakota; W. W. Wright, Newcastle, Wyoming; R. H. Nichols, Casper, Wyoming; Howard Brickle, Rapid City, South Dakota.
Names and dates: The greater part of the nepheline-syenite area is covered by a group of ten claims: "Lookout" #1,2,5,8; "Nick" #1,2,3,5,6; and "Nick". The discovery pit is on "Nick" #2, near the wesern boundary of the nepheline-syenite exposure. When visited the discovery pit had been opened to about 10x12 feet in the course of assessment work. The claims were filed on August & September, 1939.
Location: The nepheline-syenite outcrops in Two. T. 51 N., R. 60 W., Crook County, Wyoming. Most of the claims are in Sec. 20, but some extend into Sections 19 and 29 as well. The claims lie about ½ mile west of Spotted-Tail Gulch and about one mile north of the "Mineral Hill Mine". The hill upon which the nepheline-syenite is best exposed, and upon which the claims themselves lie, is known locally as "Bull" hill.

Observations

The nepheline-syenite, which extends for at least 3/4 sq. miles on "Bull" hill, shows practically continuous exposures on the higher slopes and along the ridge crest. The outcrops of nepheline-syenite are not bold but are sufficiently numerous to ensure continuity of the stocklike mass beneath the surface. The most wide-spead variety of the nepheline-syenite is a massive, phaneritic rock of medium texture (feldspars 1-3 mm.). This rock is grey on fresh fractures, light grey or buff, with a chalky appearance, on the weathered surface. It consists essentially of nepheline, orthoclase (?), albite, and hornblende. The nepheline appears megascopically to be unusally fresh. There is abundant lemon-yellow to brown accessary titanite in the rock.

In most exposures the rock has a pronounced trachytoid structure caused by parallelism of the euhedral, tabular feldspar and prismatic amphibole. This internal orientation gives the rock a definite "rift" or direction of easy parting which might have a bearing on ease of extraction or crushing of the rock. In places, also, the syenite contains a few

hornblendic schlieron and dark colored cognate xenoliths but on the whole these do not seem abundant enough to effect appreciably the uniformity of the mass.

The rock exposed in the discovery pit, and most of that cropping out along the ridge crest is, advantageously, of uniform composition and carries only normal amounts of hornblende. There are a few aplitic stringers cutting into the granitoid rock, these shall dikes being almost entirely devoid of mafics. Locally the rock may be pegmatitic but such masses are irregular in distribution and too small to be worked independently for nepheline. Neither aplite or pegmatite appear to occur in sufficient quantity to be deleterious as regards possible usage as aluminum ore. Here and there among the float are relatively dark gray, fine textured, somewhat saccharoidal differentiates and also some varities which run rather high in hornblende. The latter may contain too much mafic mineral for ceramic use, but such masses probably do not bulk large as compared with the intrusive taken as a whole.

At the surface the nepheline-syenite is neither badly exfoliated nor weathered to more than a few feet. It follows that probably no troublesome amounts of over-burden would have to be stripped,at least along the ridge crest or on the higher slopes. Three major joint systems are developed in the massive rock; two at steep angles, one relatively flat.

Expectable types of ultrabasic and lamprophyric dike rocks such as fourchite, ouachitite and perhaps alnöite,crop out in and near Spotted-Tail Creek and have been prospected on elsewhere in the vicinity. On and near the crest of "Bull" hill, however, no appreciable number of melanocratic dike rocks were observed. Some of the basic dikes are in part igneous breccias, a relation which is quite typical of similar dikes

associated with nepheline-syenite in other type areas like Magnet Cove, Arkansas; Beemerville, New Jersey and the Fen Region of Norway.

Conclusions

There is an abundance of nepheline-syenite of rather uniform texture, structure and composition in the area. The amount of associated light and dark colored dikes cutting the rock are apparently insufficient to be disadvantageous and the uniform quality of the nepheline-syenite may be expected to hold up. Chemical analysis of the rock, especially for Al_2O_3, Na_2O, Fe_2O_3 and FeO would be necessary to establish its usefulness as a possible ore of aluminum or for ceramic purposes. The combined iron, carried chiefly in the amphibole, may be realatively high and should be checked.

The area as a whole is, at present, relatively inaccessible but the eastern portions of some of the claims could be reached without too much difficulty by extension of the Tinton road down and across Spotted-Tail Gulch.

Respectfully submitted,

John C. Haff