AVAILABLE MINERAL RESOURCES IN SOUTHERN WYOMING

IMPORTANT TO GLASS MAKING

GLASS SAND:

The sand utilized in the glass industry, being one of the most important raw materials, must meet specific physical and chemical requirements. The physical requirements are that the sand must be free from clay, organic matter, and similar impurities, must be uniform in size and shape of grains and should not be coarser than 20-30 mesh nor finer than 100-120 mesh. The chemical requirements vary with the minimum percentage of silica ranging from 99.8-95.0%, maximum alumina from .05-.5%, maximum iron oxide from .02-1.0%, and maximum calcium and magnesium from .05-.1%.

AVAILABLE GLASS SAND:

Laramie deposit (property of the Union Pacific Railroad). This deposit is located in the east part of section 35, T. 16N. R. 73 W. It is about one mile east of Laramie and is readily accessible although the road to the deposit is relatively poor. U. S. Highway 30 is located about one-half mile south of the deposit. Previous geologic investigations on this deposit were conducted by the U.S.G.S. (Bulletin 364) and an unpublished report for the Wyoming Geological Survey by S. H. Knight.

The sand occurs in the upper part of the Casper formation of Pennsylvanian age. It is exposed in a southeast facing hogback which strikes N. 45° E. and dips approximately 5-10 degrees northwest. Good exposures of the sand are absent except where stripping operations have opened up the face of the hogback for a distance of 400 feet.

The sand is exposed for a vertical distance of 12 feet. A brief stratigraphic section corresponds very closely with that of Knight, 1922.

Red limey cap rock, 2-3 feet.
Cross-laminated calcareous sandstone, 4-5 feet.
Glass sand, white, 3-4 feet.
Brownish friable sand, 4-5 feet.

The lower 15 feet of red sandstone described by Knight is presently not exposed.

The overburden on the sand varies from 0-10 feet thick and the cap rock would probably increase slightly in thickness down dip.

The glass sand is very friable and could be stripped quite easily. The sands above and below could create some problems in mining as there is no sharp break between the separate sands.

Reserve estimates on the amount of glass sand would be difficult to make without further work. The glass sand maintains a fairly constant thickness throughout the limited exposure although it may vary considerably down dip or further along the strike. The outcrop extends for almost a mile, but whether the sand is continuous throughout this distance is not known.

Analysis by the Natural Resource Research Institute in 1946 gave 0.24% $Fe_2O_3$ and 5.13% CaO. Other analyses give $Fe_2O_3$ as 0.73% and 2.01%. These analyses along with the examination of the deposit indicate that it does not have as great a potential as other glass sand occurences. which ones

To completely evaluate the deposit, several shallow core

holes could be located along the hogback. Information gained from these should indicate the true extent and quality of the sand.

Rawlins Deposit: This deposit is located in Tps. 25-26N. Rgs. 85-87-88W. on the southern flank of the Ferris Mountains approximately 35 road miles north of Rawlins. The nearest settlement of any size is Lamont, 10 miles northwest of the sand dunes. Several oil fields including the Mahoney, East Mahoney, and West Ferris, are located in the area Unimproved roads have been built to these fields but vehicular access directly to the dunes is difficult due to numerous steep, elongate eastwest ridges which prevail in the area. The area lies in somewhat of a restricted basin and the topography as a whole is not marked.

Previous geologic investigation has been conducted in the general area by the USGS (Bulletin 756) and masters candidates in geology at the University of Wyoming including D. E. Lawson, E. L. Heisey and L. C. Carpenter. Detailed geologic work has not been done specifically on the dune sand.

The glass sand is found in extensive Quaternary sand dunes which are lying on Cretaceous sedimentary rocks. The dunes are believed to have been derived from the Tertiary sandstones that cover the surface to the west of this district. The present position of the dunes can be ascribed to the prevailing southwesterly winds. The sand is now generally quite stabilized but shows indications of moving northeast.

The actual areal extent of the major dunes can only be estimated. A map in Bulletin 756 indicates sand dunes covering an area of over 200 square miles. Sand does occur over an area this large and extensive dunes probably cover an area less than 20 square miles. The thickness of individual dunes is highly variable but, without actually drilling through them, it is estimated that they average 75 feet in their thickest parts.

Assuming an average overall thickness of 50 feet covering an area of 10 square miles would indicate an approximate reserve of 70 million cubic yards of sand. The sand in the dunes has been analyzed and contains 99.79% quartz and 0.21 iron minerals. A washing operation is stated to have reduced the Fe2 03 to .04%. The sand is very clean except for minor amounts of trash and consists of many transparent angular grains and rounded frosted grains. The ratio is approximately 40 transparent to 60 frosted. From all outward indications this sand appears to be suitable for all qualities of glassware up to and including second quality flint glass containers and tableware and should easily meet the proposed American Ceramic Society specifications for sheet glass. No size analyses has been run on the sand as yet, but the bulk will probably be caught on a 120 mesh screen.

Much of this land covered by the dunes is under lease by oil companies, however, the surface minerals such as the sand, are not affected by the lease and can be acquired under separate

lease.

To completely evaluate the sand deposits as to quality and extent would require mapping them on a fairly small scale and the drilling of several shallow (about 50') test holes. The dunes would stand out on aerial photographs due to their striking white color and could be mapped with only a slight amount of field work to check specific locations and take samples. Access roads, oil fields, etc. could also be located very easily on the photographs. The usefulness of the sand in making glass could probably best be proved by utilizing some of it in an actual batch.

Other occurrences of glass sand have been reported in the Freezeout Hills 25 miles north of Medicine Bow, Bull 45 in sand dunes north of Superior and in consolidated outcrops 45 miles east of Rawlins near the highway. Not as suitable for direct charging glass sand,

AVAILABLE SODA ASH:

Westvaco area approximately 20 miles west of Green River. The mine is owned and operated by the Westvaco Company; the plant by Intermountain Chemical Company. Trona occurs as a horizontal bed at a depth of 1500 feet. It averages 10 feet thick and is underlain by 8 feet of oil shale and overlain by several hundred feet of thin bedded shale. The Trona deposit covers about 30 square miles in which an estimated 250 million tons may be available. This could yield 170 million tons of soda ash.

The Trona is processed at the mine (1000 tons soda ash per day) and is sold either as light ash or dense ash. A typical

analysis shows the light to be 96.1% Na2 C03 and the dense 4.1%. Fe2 03 maximum is 0.15%.

AVAILABLE LIMESTONE:

Rawlins Quarry: This source of limestone is located in the Rawlins uplift in T. 21, N., R. 83 W. All of the limestone quarried is located within ten miles of Rawlins and is readily accessible. Reserve estimates indicate that 10 million tons are available in the area. Analysis of the limestones indicates a Ca C03 content ranging from 97.88% to 99.03%. Insoluable material averages about .45% and Mg C03 about .45%. Other currently non-producing areas of limestone are probably available and this material should not create a problem in the manufacture of glass.

AVAILABLE FELDSPAR:

Feldspar has been mined in several prospects within Laramie County. These deposits are located near Horsecreek approximately 40 miles northwest of Cheyenne. Nearly 20,000 tons of microcline (potash feldspar) has been shipped from this area. Estimates on present reserves is not known but is reported to be quite high.

A prospect containing a considerable tonnage of feldspar has been reported in Sec. 1, T. 13 N. R. 84 W. near Encampment. Numerous rather large pegmatites containing much feldspar with quartz are present in Tps. 13-14 N. R. 81 W. southeast of Encampment.

Feldspar reserves estimated at 200,000 tons are located in Tps. 31 and 32 N., R. 7[illegible], W. Converse County. Fourteen or

fifteen cars have been shipped from this area.

Some feldspar probably exists in the Precambrian of the Rawlins Uplift, but no detailed geologic work has been conducted in this area.

Natural gas available for fuel is abundant in nearly all of southern Wyoming and would create no problem.

Conclusion: Material for the manufacture of glass are readily available in large quantities in Southern Wyoming. Development of these raw materials will, therefore, depend upon other economic factors.

References noted in this report can be referred to in Bulletin 45 of the Wyoming Geological Survey.

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Specific references should be quoted in places marked "Ref."