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PRELIMINARY REPORT - GEOLOGY OF THE RED MOUNTAIN ULTRAMAFIC COMPLEX, SELDOVIA, ALASKA

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This report is a summary of observations and inferences made while mapping at Red Mountain (Kenai chrome) in June, 1985. An outline of planned and recommended future work is included. We wish to thank, at this time, the Seldovia Native Corporation for permitting access to the property and the Anaconda Minerals Company for sharing data, maps, and thin sections.

INTRODUCTION

High snow levels, which covered more than 2/3rds of the area and blocked access to the Union Carbide adit, prevented examination of much of the property. Nevertheless, critical parts of the deposit were exposed and successfully sampled and mapped. Destruction of the Anaconda drill core storage facility by the snow burden prevented study of the drill core, which could have provided much needed information from depth.

CONCLUSIONS

From our preliminary mapping efforts, we have made the following conclusions: 1) The Red Mountain ultramafic complex is considerably more deformed than is indicated by previous reports, 2) this deformation may have had a significant impact on the estimates of likely chrome resources in the complex, and 3) considerable additional study is required to sort out the deformational history of the complex.

We also have concluded that the Red Mountain complex is similar in origin to other ultramafic complexes on the same regional trend in the Chugach Mountains. These include Eklutna and Wolverine. The conclusion is based on similarities in mineralogy, stratigraphy, and mineral textures. Additional studies of Red Mountain would be of considerable value in understanding the chrome resources of the Chugach Mountains.

DISCUSSION

Earlier workers have treated the layering of chromite- and pyroxene- rich bands as due to magmatic processes, and have assumed that the original magmatic layering is still intact. Because of this assumption, the chromite layers have been assumed to have grade continuity along strike.

Our mapping indicates that a pervasive deformational fabric is present throughout the complex. Detailed examination usually demonstrates the presence of "pull-apart" textures and tight, isoclinal folds of both chromite and pyroxene layers. Isoclinal folding of the chromite layers has resulted in thickening along fold hinges and thinning along fold limbs. Because of this complex structural deformation, the possibility exists that major structural repeats are present and that chromite grade continuity is likely to be ilaterally quite variable.

Individual chromite layers tend to have shapes more like "flattenned cigars" than sheets. We estimate the typical chrome ore body to have dimensional ratios of about 100 (strike) : 2 (dip) : 0.1 (thickness).
Chromite layers may well resemble "stringer zones" caused by structural stretching of originally more continuous magmatic layers. Consequently their grade continuity would be variable, but could be predictable, given knowledge of detailed variations in the enclosing structures.

The structural complexity may have produced several high-grade ore bodies of moderate size (.01 to .5 million tons) which are not presently known. This could be the case because the drilling exploration assumed lateral continuity of chromite zones. Such bodies would be found in the hinges of major isoclinal folds and be oriented parallel to local lineation fabrics. Detailed structural analysis over the entire complex would be necessary to assist locating such targets.

One important mineralogic discovery was made at Red Mountain. The presence of essentially unreported orthopyroxene layers in the ultramafic rocks bears important information about the petrotectonic setting of the Red Mountain ultramafic body, and reenforces the hypothesis that Red Mountain is similar to the other ultramafic bodies in the Chugach Mountains.

PROPOSAL

We propose to undertake three additional studies of the Red Mountain complex.

1) Given permission from landholders and assuming available funds, we would like to perform a gravity study of the complex along with additional mapping and sampling of areas not covered by the present study. The gravity survey was regarded as essential for determination of subsurface configuration by Anaconda Company geologists, but was never performed.

2) With existing samples, we plan on undertaking detailed microscopic study of mineralogy and mineral textures in order to better understand the geologic history of the complex. Funds permitting, we plan to undertake electron microprobe studies on minerals from the complex. This work would help in understanding the degree of structural deformation in the complex as repeats in layering from structure would presumably be accompanied by repeats in compositional patterns of minerals in the complex.

3) We intend to compile all mineralogical, compositional, and mapping studies performed to date including that of Toth, 1981, Anaconda Minerals Co., 1982, and U.S. Bureau of Mines, 1983. This compilation will assist in resolving structural and magmatic problems and pinpoint areas which require further mapping and sampling