

could become competitive with other types of fuels. It is obvious from the standpoint of national defense that if the oil shale reserves are to make a significant contribution, there must exist at that time a viable oil shale industry. It is unlikely that sufficient time or resources will be available during a full scale emergency for development of such an industry. In addition, the vast amount of liquid fuels which may be made available through a going oil shale industry will greatly decrease, if not eliminate, any wartime requirement to import conventional fuels by sea. This is of great importance today because present trends indicate the United States is becoming a crude deficient nation and may in the future be forced to rely more and more upon imported fuels to meet even peacetime demands. For these reasons, the Navy fully supports Secretary Udall's five-point program as a sound basis upon which the first steps may be taken toward the orderly development of oil shale on public lands. I will attempt to specifically relate each of the points included in the program to operations on the naval oil shale reserves.

POINT I. ACTION TO CLEAR TITLE TO THE PUBLIC OIL SHALE LANDS IN COLORADO, WYOMING, AND UTAH

Today, the private right to develop the public oil shale lands can only be acquired under the terms of the Mineral Leasing Act of 1920. Large numbers of unpatented mining claims covering the oil shale lands presently make leasing of these lands rife with potential legal difficulties arising out of disputed ownership.

The naval oil shale reserves are now relatively free from title disputes. We are working with the Department of the Interior to clear the few disputed titles remaining on reserve lands and excellent progress has been made to date. The primary interest of the Navy with this part of Secretary Udall's program is that settlement of these disputed claims on public lands will remove an obstacle to the orderly development of an energetic oil shale industry. Not until this industry has been developed will the naval oil shale reserves become a meaningful asset.

POINT II. PLAN TO PERMIT BLOCKING OF OIL SHALE LANDS INTO WORKABLE UNITS

Mr. C. E. Reistle, chairman of the board of Humble Oil & Refining Co., in his speech before the 95th Annual Meeting of AIME (American Institute of Mining, Metallurgical, and Petroleum Engineers) on March 1, 1966, gave some basic indication of the economic parameters limiting the development of a commercial oil shale industry. He said:

There are two major methods that are being studied for getting oil out of the shale: (1) mining and retorting and (2) in situ retorting. Work is going forward on both methods; one or both may ultimately prove to be economically feasible. Using the mining and retorting method, a minimum shale oil plant is believed to be one which will produce at least 50,000 barrels of oil per day. Such an operation involves mining, crushing, and retorting 80,000 tons of shale per day. Capital investment in such a plant, including upgrading facilities, would be in the order of \$100,000,000.

Projecting Mr. Reistle's figures leads one to conclude that an economic unit of shale for commercial retorting would have to include