RESOURCES APPRAISAL STUDIES (OIL SHALE AND MINERALS)

Objective

The objective of this program is to provide geologic and engineering information and analyses of data on the oil-shale resources in relationship to their location, extent, quality, physical and chemical properties, and inclusive up-to-date technology. These data will be necessary to both industry and Government as a basis for decisions in the planning for the commercial production of shale oil as a supplement to petroleum and natural-gas supplies. The geologic data become input to additional economic and technologic appraisal and feasibility studies of the mining, processing, and marketing of these resources; such as the location of industrial operations; the size and accompanying technologic-economic factors in mining, processing, and production; present and future markets and transportation; and the effects on other resources.

A 10-year program is proposed on oil-shale resource appraisal studies requiring $24 million.

Program

The principal initial studies to appraise oil-shale deposits will be concentrated on the Nation's largest and most nearly commercial deposits in Colorado. Previous studies have led to rough estimates of extent, thickness, and approximate quality of the oil shales in the Piceance Basin. More precise knowledge of the deposits, essential to general planning for utilization, will be sought, as well as determination of the extent and quality of the deposits in Utah and Wyoming, which are less well known.

Work Plan

The program of appraisal will consist of integrated topographic and geologic quadrangle mapping as a basis for detailed planning and engineering appraisal; drilling for geologic information necessary to better define oil-shale thickness and grade trends in the basins as a whole; the relations of oil shale to associated saline deposits such as nahcolite, dawsonite, and salt; and to oil and gas accumulations, gilsonite, and tar sands; drilling for engineering uses such as the specific oil-shale content of selected areas; economic analysis and treatment tests; and related topical investigations. During the 10-year period the principal oil-shale deposits of Colorado, Utah, and Wyoming will be studied in sufficient detail to permit the evaluation of their production potential. Quadrangle mapping will upgrade existing geologic maps, which are on planimetric or other low quality base maps, as well as provide detailed coverage of the several potentially valuable mineral deposits that are thus far unmapped except in reconnaissance. Geologic core drilling, supplemented by drilling done for reserve determination or economic appraisal, will provide information necessary for understanding and appraisal of the basins as geologic units. This coring and sampling will be correlated with other coring and sampling proposed under other projects of this program. Geochemical investigations will be made of other valuable resources, such as sodium minerals, and geophysical investigations will be made to determine physical properties of both the economic deposits and the adjacent wallrocks; ground water and brines within the oil-shale bearing rocks will be appraised to determine their relationship and possible uses and effects on mineral utilization.

Utilization of oil-shale depends on many factors such as grade properties, thickness, and depth of the formation. The surrounding rock formations, the locality and mine-sites access, haulage, and suitable plant sites are all of prime importance.

Coring and sampling of the Piceance Basin is proposed as the major initial part of a 10-year national coring and sampling project. The first three years of the 10-year technical studies will be in the Piceance Basin on Government lands. Private ownership of the western oil-shale lands has been concentrated on those areas where the shales crop out. The very much larger deposits deep underground, away from the outcrop areas, have remained in the possession of the Federal Government and less is known about them. Some broad estimates are that about 80 percent of the Green River oil shale is in public domain. Delineation of these deep lying deposits by means of coring and logging is necessary to assess their extent and quality. Selection of specific areas for mining projects requires development drilling at closer intervals to verify tonnage and grade estimates that are now based only on widespaced exploration drilling.