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POTENTIAL MINERAL RESOURCES

IN

SELECTED D.2 LANDS

POTENTIAL MINERAL RESOURCES IN SELECTED D.2 LANDS

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UNITED STATES DEPARTMENT OF THE INTERIOR

Rogers C. B. Morton, Secretary

BUREAU OF MINES

Elburt F. Osborn, Director

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POTENTIAL MINERAL RESOURCES IN SELECTED D.2 LANDS

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Robert G. Bottge 1/

ABSTRACT

This report discusses the need for Alaska's minerals, the need for surface transportation corridors, and their relationship to planned D.2 withdrawals. On May 4, 1973, thirty-one tracts within the planned D.2 withdrawals were jointly recommended for multiple use including mining by the Geological Survey and the Bureau of Mines. Twenty-one of these tracts of land are analyzed and known mineral deposits and metallogenic provinces are shown. The potential economic value of each tract, its impact upon the State and Nation, and the salient mineral and transportation data for it are summarized.

INTRODUCTION

In December 1971, the United States Congress passed the Alaska Native Claims Settlement Act. Section 17(d)(2) of that Act directs the Secretary of the Interior to withdraw up to 80 million acres of unreserved public lands which the Secretary deems suitable for inclusion in national parks, forests, wildlife refuges, and wild and scenic river systems (the so-called D.2 lands). Thirty-one tracts of land that have been given D.2 status were jointly reported by the Geological Survey and the Bureau of Mines to have high potential value for mineral production. The purpose of this report is to show why these tracts should be left open to mining. If total

1/ Mining Engineer.

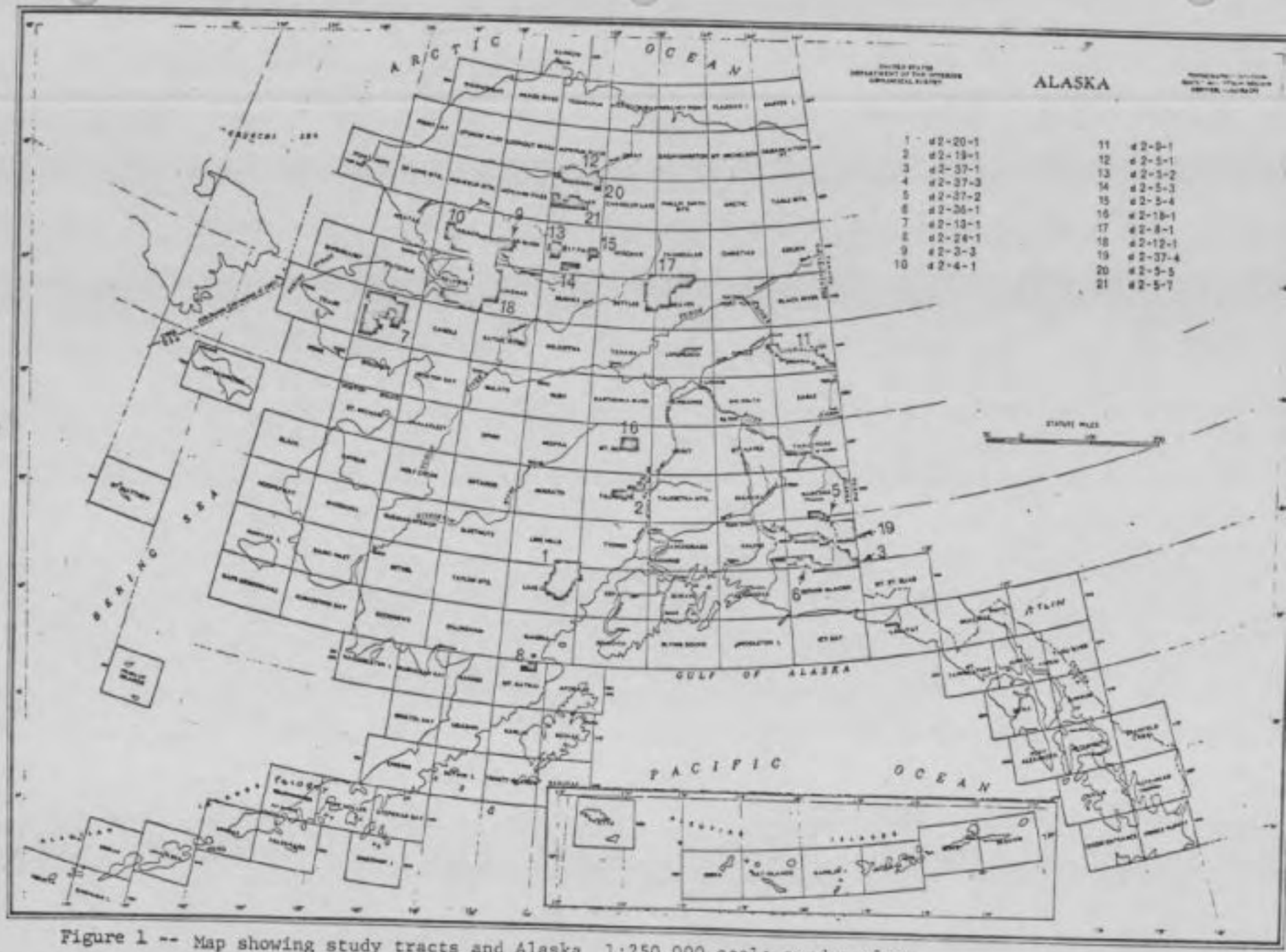

Figure 1 -- Map showing study tracts and Alaska 1:250,000 scale quadrangles.

exclusion from D.2 classification is not advisable, these lands should be classified for multiple use management that permits entry under the mining and mineral leasing laws. The tracts were analyzed in order of estimated priority. The top 21 were completed, figure 1. The remaining 10 will be analyzed when personnel become available.

THE NEED FOR ALASKA'S MINERALS

Table 1 lists minerals that have been or are likely to be found on the tracts being recommended for exclusion from D.2 status or for multiple use classification. The primary quantity of each commodity produced in the United States in 1971 is given and compared with the primary demand. The difference between the two figures was made up by imports or the utilization of scrap. Two projections are given for the production of primary commodities in the United States in the year 2000. One projection assumes the Nation's mineral producers will continue to provide the same percentage of the Nation's projected requirements in 2000 as they did in 1971. The second projection for 2000 is based upon the trend of production for the last 20 years. Finally, the projected demand for 2000 primary production is given. All data is provided by the Bureau of Mines.

The table shows the United States' producers were capable of supplying the 1971 primary demand for only two commodities, coal and molybdenum. If production trends of the last 20 years continue, the Nation's producers will fall even farther behind meeting demands in the year 2000 than they did in 1971, thus requiring greater imports or greater utilization of secondary supplies such as scrap. Obviously, any mineral production from Alaska would help lessen the Nation's dependency upon imports and improve its balance of payments situation.

TABLE 1.- National Supply-Demand Pattern From 1971 - 2000

Mineral	Unit	1971 Primary Production	1971 Primary Demand	2000 Production if 1971 constant ratio prevails	2000 Production if past 20-year trend prevails	2000 Primary Demand
Antimony (Sb)	S.T.	1,853	14,419	6,192	731	48,000
Beryllium (Be)	S.T.	(1)	(1)	874	187	1,770
Bismuth (Bi)	Thousand lb.	(1)	1,769	2,468	1,016	4,000
Chromium (Cr)	Thousand S.T.	0	335	0	0	1,090
Coal	Million S.T.	552	495	1,115	767	1,000
Cobalt (Co)	Thousand lb.	690	13,418	1,260	0	24,700
Copper (Cu)	Thousand S.T.	1,522	1,627	5,049	2,463	5,400
Gas	Billion C.F.	21,610	22,133	47,824	43,752	49,000
Gold (Au)	Thousand T.oz.	1,495	6,562	3,260	1,040	14,300
Iron (Fe)	Million S.T.	54	75	110	57	153
Lead (Pb)	Thousand S.T.	578	945	875	643	1,430
Manganese (Mn)	Thousand S.T.	38	1,170	76	0	2,360
Mercury (Hg)	Thousand Fl.	18	42	34	31	80
Molybdenum (Mo)	Million lb.	110	41	507	190	188
Nickel (Ni)	Million lb.	31	282	85	80	770
Oil	Million Bbl.	4,072	5,550	10,643	6,409	14,500
Platinum (Pt)	Thousand T.oz.	8	333	20	0	820
Silver (Ag)	Million T.oz.	42	102	86	44	210
Tin (Sn)	Thousand L.T.	(1)	50	0	0	90
Tungsten (W)	Thousand lb.	6,900	11,122	45,880	2,648	74,000
Uranium (U)	S.T.	10,945	11,300	60,078	24,500	62,000
Zinc (Zn)	Thousand S.T.	503	1,361	1,147	551	3,100

(1) Confidential company information

Units: S.T. = short tons; lb. = pounds; C.F. = cubic feet; T.oz. = troy ounces; Fl. = flasks; Bbl. = barrels; L.T. = long tons.

Source: U. S. Bureau of Mines Commodity Statements.

WHEN WILL MINING COMMENCE?

Knowing when mineral deposits will be discovered and developed is impossible. The copper deposits near Bornite were first reported in 1898. Kennecott Copper Corporation purchased the property in 1958. Reserves today are estimated to have a value in excess of $2 billion (8) 2/; and yet

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2/ Underlined numbers in parentheses refer to items in the List of References at the end of this report.

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no time for the commencement of mining has been publicized for this major deposit which has been known to exist for 75 years.

Mining will commence in Alaska when it becomes economically profitable. Discovering economic deposits is largely a function of exploration expenditures. In British Columbia during 1970, nearly $250 million was spend on mineral exploration excluding oil and gas; in Alaska $6.9 million was spent (1). In the past 17 years, 17 new copper porphyry deposits have been discovered in British Columbia, seven of which are now in production (6). Three such deposits have been discovered in Alaska during that same time, and none is near production. Clearly, development in Alaska will come with greater mineral exploration expenditures. Keeping the geologically favorable areas open to mining until the time is economically right is imperative.

HOW LONG WILL MINING LAST?

Mineral production will last until it is no longer economically profitable. After a mine opens in an area, exploration expenditures increase to extend the mine's reserves. The facilities needed for one mine can also be expanded for the development of other mines. As rich ores are depleted, leaner ore is mined. Higher prices and improved technology

tend to extend the life of all mines. The Almaden mercury mine in Spain began production about 400 B. C. and is still a major world producer. Copper has been mined at Bingham Canyon, Utah, since 1906. Lead has been produced from southeast Missouri since 1904 (12). So the life of any given new mining district may extend from 1 to 2,000 years or more. For study purposes, 20 years is generally assumed for a mine's life. Most large mining companies will not install a mine in Alaska without blocking out a 15 year's supply of ore. Probably 15 to 20 years might be a minimum time frame for individual mines in Alaska. All mineral reserves are finite, so a mine's life is also finite and is usually determined by economics.

TRANSPORTATION

The development of mineral deposits is dependent upon the development of transportation. Conversely, the construction of any given road depends upon the demonstration of an economic need for that road. The need to connect all towns with a road system is weighed against the need to develop natural resources; both are weighed against the amount of highway funds available.

Highway building programs are established five years in advance; no 20- or 25-year plans are formulated. However, naturally defined highway corridors have been identified for the entire State, figure 2. Highway construction will tend to proceed along these corridor routes as needs arise and priorities are established. Knowing the sequence of corridor development beyond five years is impossible, and so, the sequence of mineral deposit development cannot be predicted. Final land classifications should not preclude the development of highway corridors that could be necessary for mineral resource development.

The mineral deposits now known or reasonably inferred will not by themselves justify building surface transportation systems. If the State decides that the mining industry must bear the cost of building such systems, they will not be built now. If developed reserves, as at Bornite, lie idle too long, companies will become discouraged and cease exploration. The chance to develop sufficient reserves to justify the construction of surface systems, through exploration and discovery, will be lost. The copper deposits at Kennicott in the Wrangell Mountains were among the richest deposits known to exist; and yet a recent study revealed that if these deposits were discovered today, they would be uneconomical without public surface transportation to tidewater (9).

MULTIPLE USES

Mining is a land intensive industry where high commodity values are obtained with relatively little land being disturbed. As of January 1, 1965, only 0.14 percent of the land area in the United States had been disturbed by strip mining (13). In those 12 States where surface mining has been most active, 0.41 percent of the land has been disturbed (13).

With proper planning most other activities can co-exist with mining, particularly when compliance with both State and Federal environmental regulations is observed. For this reason lands can be used variously with mining and need not be mutually exclusive. Once mining is completed, the forests tend to move in to hide previous mining activities; given today's reclamation laws, the surface must be returned to roughly its former contour.

The Kenai National Moose Range is one example of industry co-existing with nature and providing access routes to canoeing and fishing lakes for

the recreationist. This area of 2,700 square miles is administered by The Bureau of Sport Fisheries and Wildlife. A major Alaskan oil producing field is located on public lands which are visited by over one-half million people each year. The area exemplifies the benefits, other than economic, which are derived from a properly controlled industry and a cooperative Federal agency (2).

STUDY TRACTS

The U. S. Bureau of Mines and U. S. Geological Survey on May 4, 1973, agreed on geological evidence that 31 tracts of land having D.2 status may contain potentially valuable mineral deposits and should be kept open to mining. Since that date 21 of these tracts with 13,785,220 acres of land have been studied in more detail to note the occurrence of mineral and fuel commodities and to estimate the potential value of these commodities, figure 1. To accomplish this task, figures were assembled using maps of mineral claims, metallogenic provinces, geology, transportation corridors, oil and gas leases, coal fields and coal leases (4, 5, 11). The maps showing coal, oil, and gas data have been compiled by Bureau of Mines personnel but as yet are unpublished.

Each tract has an accompanying data sheet which gives the location from Anchorage or Fairbanks, its present accessibility and its nearness to future highway corridors, its proximity to labor and supplies, the general geology, and the occurrence of mineral and fuel commodities known or likely to exist by virtue of the tract's location within metallogenic provinces. Finally, the mineral potential is assessed and the potential mineral value estimated. From this the potential benefits to the State and Nation are derived.

The determination of potential mineral values was based on studies which attempted to equate geologic features such as folding, faulting, intrusive and mineral occurrences with known mineralized belts and past production statistics in the Western United States (3, 7). The potential mineral values derived from geostatistical inference were modified by subjective evaluations of the potential of those occurrences. The mineral value determinations for each area are therefore dependent in large degree on the amount of knowledge of that area that has accumulated. Consequently, the relative values may not agree with the priorities established by estimating geological probability. The potential mineral values in this report are believed to represent a minimum that may go upward as new information is obtained.

Using the potential mineral values, one may derive the potential impact that mining could have upon the State and National economies. For example, the potential benefits to the Federal and State governments can be estimated . . . "in terms of taxes, reduced welfare, unemployment insurance, costs, etc., resulting directly from mining operations, mineral transportation, tourism, and business generated for support services, as well as from the multiplier effect of the increased expenditures " (14). The wages generated for supporting industries in Alaska and the rest of the Nation were estimated assuming 20 to 25 percent of the potential mineral value was distributed as wages (10).

TRACT DESIGNATION: D.2-20-1 (Figure 3)

TRACT LOCATION: Lake Clark and Lime Hills quadrangles, 100 air miles west of Anchorage

ACCESSIBILITY: Light plane, trails from Cook Inlet 20 air miles distant; two proposed highways will pass through the tract.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Kenai, 60 air miles to the east.

GEOLOGY: Mostly unmapped; southern one-third is predominately granitic intrusive rocks; the western edge has extrusive volcanics; some metamorphic rocks north of Lake Clark.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT: Cu, Mo, Au, Ag (Pb, Zn)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Mo, Au, Zn, Pb

MINERALS PRESENT WITHIN ONE TOWNSHIP: Cu, Pb, Ag, Zn, Au, Mo

MINERAL POTENTIAL: The tract is located in an area which is highly favorable for the occurrence of high temperature vein and replacement deposits of gold, silver, copper, lead, and zinc. Porphyry deposits of copper and molybdenum and contact metamorphic deposits of copper exist at several locations within the area. Confidential information from mining companies in the area show the existence of a large deposit containing 12 million tons proven ore, 20 million tons probable and 40 million tons possible ore with an average grade in excess of 1 percent copper located just south of Kontrashibuna Lake just south of the withdrawal. A conservative estimate of the resource worth of this deposit alone is 250 million dollars.

POTENTIAL MINERAL VALUE: $2,902,000,000

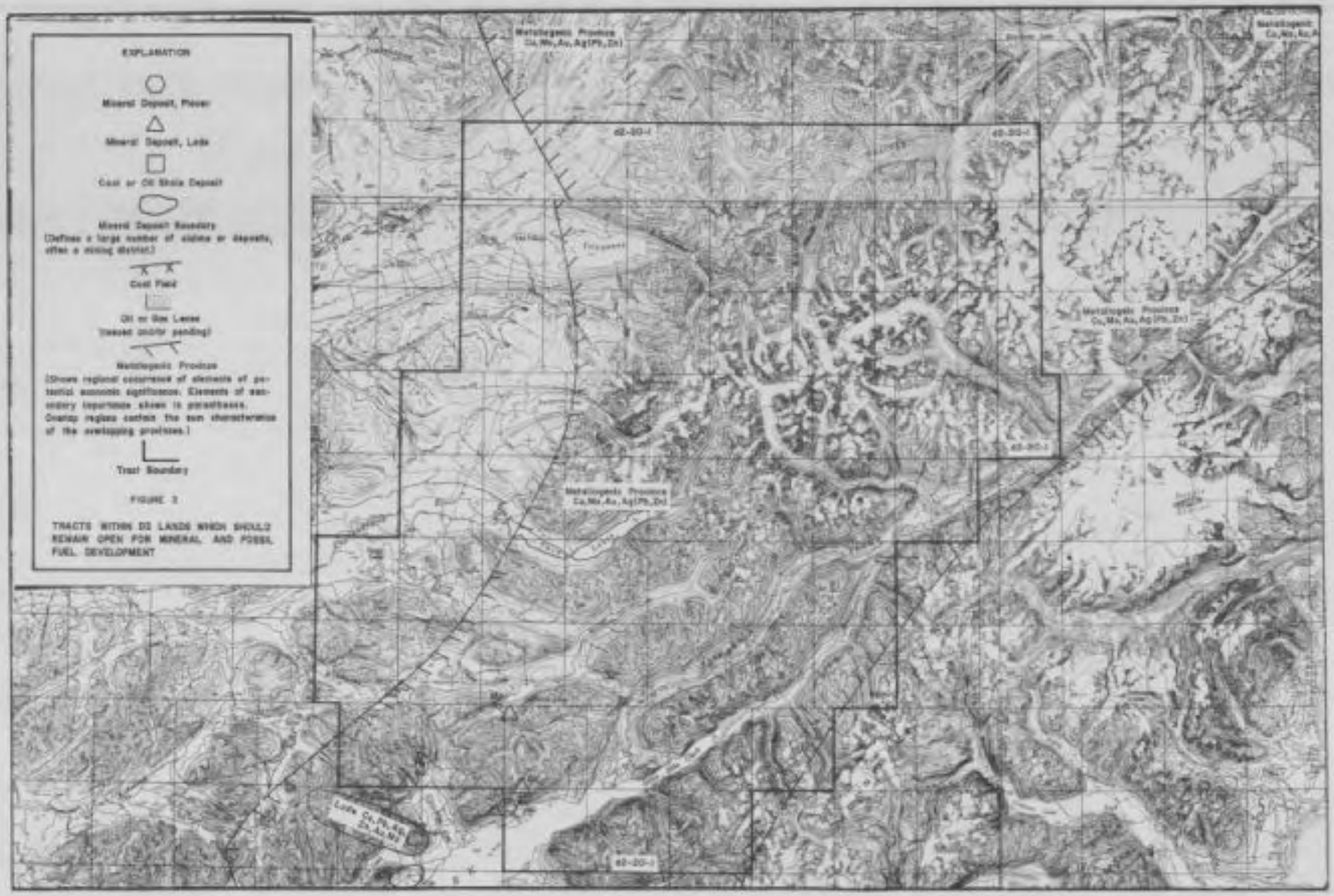
POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $7,254,000,000

POTENTIAL BENEFITS TO ALASKA: $4,352,000,000

POTENTIAL MINING WAGES IN ALASKA: $580,000,000 - $725,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $1,354,000,000 - $1,693,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING: $2,321,000,000 - $2,902,000,000


EXPLANATION
Mineral Deposit, Placer
Mineral Deposit, Lode
Coal or Oil Shale Deposit
Mineral Deposit Boundary
(Defines a large number of claims or deposits, often a mining district)
Coal Field
Oil or Gas Lease
(leased and/or pending)
Metallogenic Province
(Shows regional occurrence of elements of potential economic significance. Elements of secondary importance shown in parentheses. Overlap regions contain the sum characteristics of the overlapping provinces.)
Tract Boundary
FIGURE 3
TRACTS WITHIN D2 LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT
Metallogenic Province
Cu,Mo,Au,Ag(Pb,Zn)
d2-20-I
d2-20-J
d2-20-K
d2-20-L

TRACT DESIGNATION: D.2-19-1 (Figure 4)

TRACT LOCATION: Talkeetna and Mt. McKinley quadrangles, 100 miles north of Anchorage.

ACCESSIBILITY: Light plane, numerous trails, road ends at Petersville, 10 airmiles from tract and 155 road miles from Anchorage.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ population is Palmer, 85 airmiles to the southeast.

GEOLOGY: Mostly sedimentary rocks in southern two-thirds, and granitic intrusives in the northern one-third.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT: #1. Cu, Mo, Pb, Au, Ag, (Zn, Sn) #2. Au, Cu, Ag, Pt, Cr, Ni

MINERALS PRESENT WITHIN TRACT BOUNDARY: Au, Ag, Pt, Coal

MINERALS PRESENT WITHIN ONE TOWNSHIP: Au, Ag, Pt, (Sn, W, Cu, Pb)

MINERAL POTENTIAL: The tract has been an important producer of placer gold indicating significant potential exists for copper, silver, lead, and zinc replacement-type deposits.

POTENTIAL MINERAL VALUE: $544,000,000

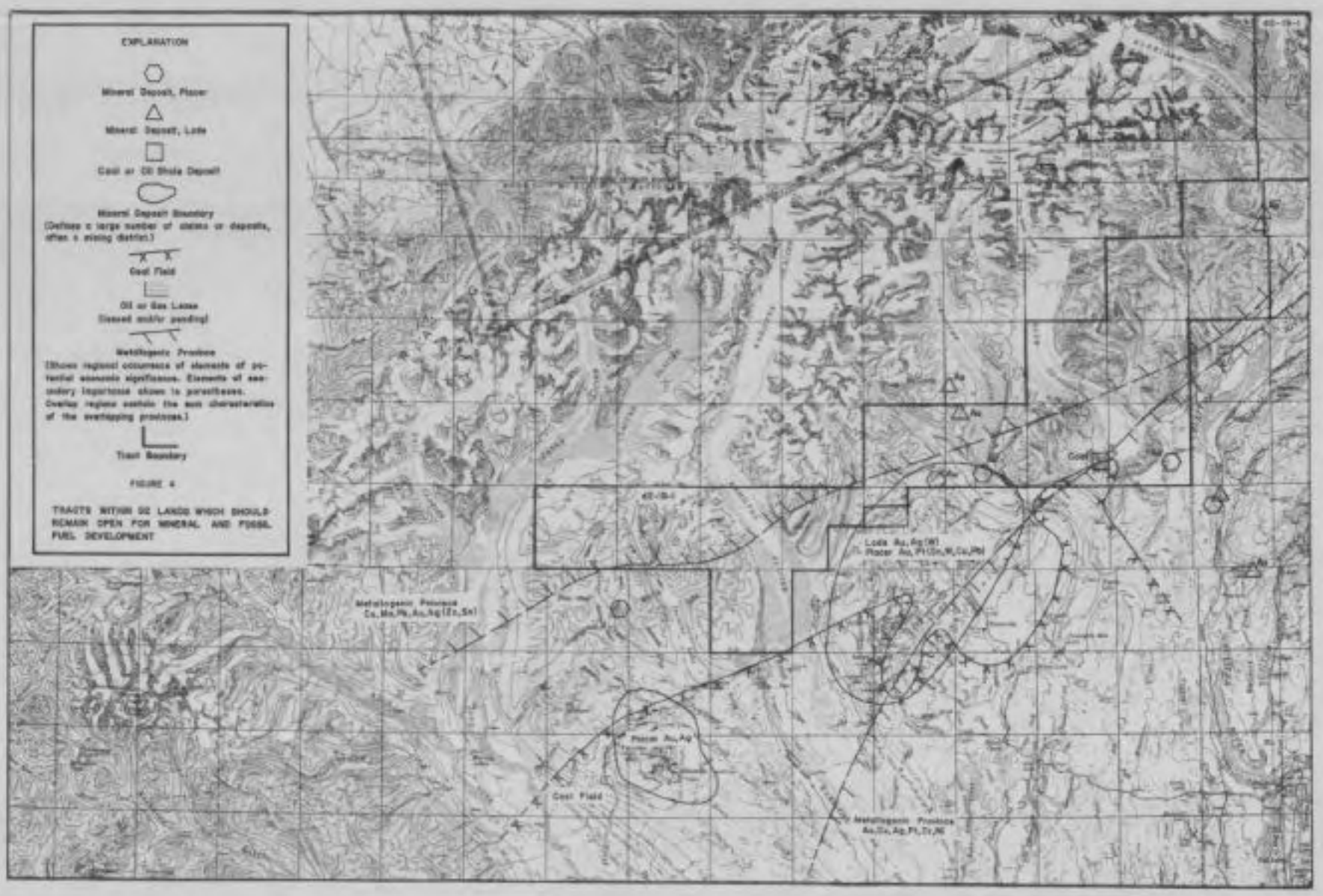
POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $1,360,000,000

POTENTIAL BENEFITS TO ALASKA: $816,000,000

POTENTIAL MINING WAGES IN ALASKA: $109,000,000 - $136,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $254,000,000 - $317,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING: $435,000,000 - $544,000,000


EXPLANATION
Mineral Deposit, Placer
Mineral Deposit, Lode
Coal or Oil Shale Deposit
Mineral Deposit Boundary
(Defines a large number of claims or deposits, often a mining district.)
Coal Field
Oil or Gas Lease
(Issued and/or pending)
Metallogenic Province
(Shows regional occurrence of elements of potential economic significance. Elements of secondary importance shown in parentheses. Overlap regions contain the sum characteristics of the overlapping provinces.)
Tract Boundary
FIGURE 4
TRACTS WITHIN 22 LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT
Metallogenic Province
Co, Mo, Ni, Au, Ag (Zn, Sn)
Placer Au, Ag
Coal Field
Lode Au, Ag (W)
Placer Au, Pt (Sn, W, Cu, PM)
Metallogenic Province
Au, Cu, Ag, Pt, Zr, W

TRACT DESIGNATION: D.2-37-1 (Figure 5)

TRACT LOCATION: Bering Glacier and McCarthy quadrangles, 265 air miles east of Anchorage.

ACCESSIBILITY: Light plane, numerous trails, road ends at Chitina, 85 air miles from tract and 130 road miles from Valdez; a highway is proposed to the center of the tract.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Valdez, 145 air miles to the west.

GEOLOGY: Marine and nonmarine deposits associated with extrusive volcanics; granitic intrusives occur in south central portion; largely glaciated and unmapped.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT: Cu, Ag (Au, Mo)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Mo, Pb, Zn, Cu, Hg

MINERALS PRESENT WITHIN ONE TOWNSHIP: Cu, Au, Ag, Sb (W)

MINERAL POTENTIAL: The tract lies in an area highly favorable for volcanic and redistributed copper deposits near basaltic units and molybdenum and tungsten deposits near granitic intrusives. Copper deposits similar to those mined near Kennicott probably exist in the western one-third of the tract. The relative scarcity of known deposits is partly due to lack of exploration and difficult access to the tract.

POTENTIAL MINERAL VALUE: $680,000,000

POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $1,701,000,000

POTENTIAL BENEFITS TO ALASKA: $1,021,000,000

POTENTIAL MINING WAGES IN ALASKA: $136,000,000 - $170,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $318,000,000 - $397,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING: $544,000,000 - $680,000,000

TRACT DESIGNATION: D.2-37-4 (Figure 5)

TRACT LOCATION: McCarthy quadrangle; 270 air miles east of Anchorage.

ACCESSIBILITY: Light plane, numerous trails, 85 air miles east of Chitina which is 130 road miles from Valdez; a proposed highway will pass through the tract.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Valdez, 150 air miles to the west.

GEOLOGY: Extrusive volcanic rocks, covered by glacial outwash in part; largely unmapped.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT:
#1. Cu, Ag (Au, Mo) #2. Au, Mo, Cu, (Ag, Pt, Cr, Ni)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Cu

MINERALS PRESENT WITHIN ONE TOWNSHIP: Cu

MINERAL POTENTIAL: The western quarter of this tract is encompassed by a copper belt which contains the Kennecott deposits. This tract is largely unexplored and unmapped and is hidden by the Wrangell lavas. Its general geologic setting indicates it is favorable for the occurrence of metallic mineral deposits.

POTENTIAL MINERAL VALUE: $199,000,000

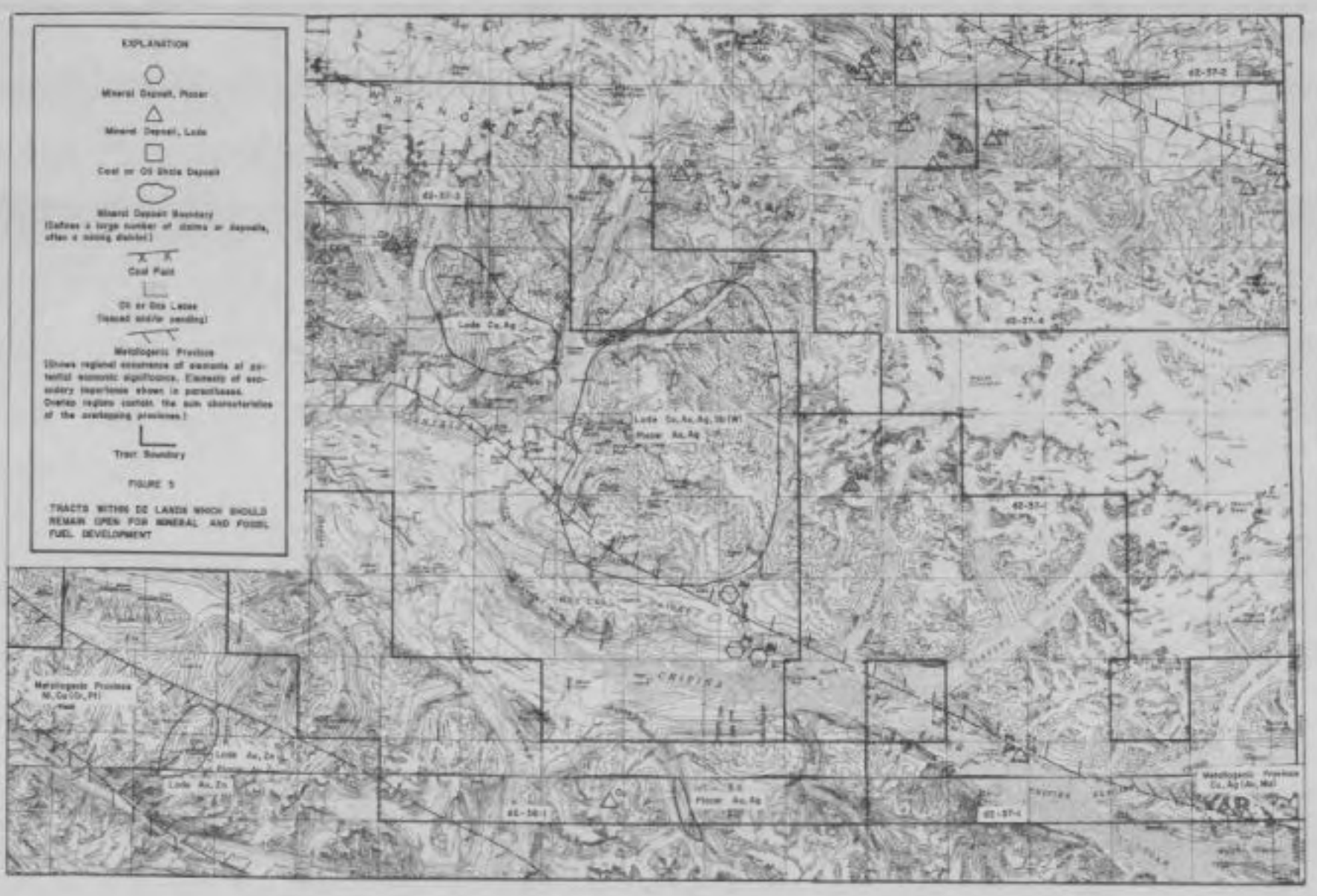
POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $497,000,000

POTENTIAL BENEFITS TO ALASKA: $298,000,000

POTENTIAL MINING WAGES IN ALASKA: $40,000,000 - $50,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $93,000,000 - $116,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING:
$159,000,000 - $199,000,000


EXPLANATION
Mineral Deposit, Placer
Mineral Deposit, Lode
Coal or Oil Shale Deposit
Mineral Deposit Boundary
(Defines a large number of claims or deposits, often a mining district)
Coal Field
Oil or Gas Lease
(leased and/or pending)
Metallogenic Province
(Shows regional occurrence of elements of potential economic significance. Elements of secondary importance shown in parentheses. Overlap regions contain the sum characteristics of the overlapping provinces.)
Tract Boundary
FIGURE 5
TRACTS WITHIN DE LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT
Lode Cu, Ag
Lode Cu, Au, Ag, W
Placer Au, Ag
Lode Au, Zn
Placer Au, Ag
Metallogenic Province
Cu, Ag (Au, Mo)

TRACT DESIGNATION: D.2 - 37-3 (Figure 6)

TRACT LOCATION: McCarthy quadrangle, 210 air miles east of Anchorage.

ACCESSIBILITY: Light plane, numerous trails, road ends at Chitina, 25 air miles from the tract and 130 road miles from Valdez; a proposed highway will pass through center of tract.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Valedz, 90 miles to the southwest.

GEOLOGY: Marine and nonmarine sediments with and overlying older extrusive volcanics; granitic intrusives found in the western end; most of western one-half glacier covered or unmapped.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT: Cu, Ag, (Au, Mo)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Cu, Ag, Au

MINERALS PRESENT WITHIN ONE TOWNSHIP: Cu, Au, Ag, Sb, W (Bi, Fe, Pb)

MINERAL POTENTIAL: A major copper belt crosses the western townships. Molybdenum and tungsten deposits are likely near granitic intrusives. The southern portion is highly favorable for volcanogenic and redistributed copper deposits near basaltic units. Part of the tract contains concealed limestones which could be mineralized by copper deposits similar to those found near Kennicott. There are many known small deposits in the area.

POTENTIAL MINERAL VALUE: $477,000,000

POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $1,192,000,000

POTENTIAL BENEFITS TO ALASKA: $716,000,000

POTENTIAL MINING WAGES IN ALASKA: $95,000,000 - $119,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $223,000,000 - $278,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING: $382,000,000 - $477,000,000


EXPLANATION
Mineral Deposit, Placer
Mineral Deposit, Lode
Coal or Oil Shale Deposit
Mineral Deposit Boundary
(Defines a large number of claims or deposits, often a mining district.)
Coal Field
Oil or Gas Lease
(Issued and/or pending)
Metallogenic Province
(Shows regional occurrence of elements of potential economic significance. Elements of secondary importance shown in parentheses. Overlap regions contain the main characteristics of the overlapping provinces.)
Tract Boundary
FIGURE 4
TRACTS WITHIN BE LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT
Lode Cu, Ag (Au, Mo, Bi Pb, Hg)
Metallogenic Province Cu, Ag (Au, Mo)
Lode Cu, Ag
Lode Cu, Au, Ag, Sb (W
Placer Au, Ag
Metallogenic Province Au, Cu (Pb, Zn, Ag, W)

TRACT DESIGNATION: D.2-37-2 (Figure 7)

TRACT LOCATION: McCarthy and Nabesna quadrangles, 240 air miles northeast of Anchorage.

ACCESSIBILITY: Light plane, numerous trails, road ends at Nabesna, 15 air miles northwest of the tract and 232 road miles from Valdez. A proposed highway will pass along the southern boundary.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Valdez, 130 air miles to the southwest.

GEOLOGY: Largely extrusive volcanic rocks partly burried by glacial deposits; western half is not mapped.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT:
#1. Au, Mo, Cu (Ag, Pt, Cr, Ni) #2. Cu, Ag (Au, Mo)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Cu, Au, Pb, Zn, Ag, Mo (Co)

MINERALS PRESENT WITHIN ONE TOWNSHIP: Cu, Au, Pb, Zn, Ag, Mo

MINERAL POTENTIAL: Several low grade bulk disseminated copper deposits are located within a mineralized belt which encloses the western quarter of the tract and touches the northern boundary to the east. The Orange Hill-Bond Creek copper porphyry deposits lay just to the north of the tract and three additional copper porphyries occur near by; all are very large and low grade with Orange Hill having reserves of 400 million tons of 0.4 percent copper worth $1.6 billion at today's prices. Good potential for non-porphyry deposits also exists.

POTENTIAL MINERAL VALUE: $549,000,000

POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect):
$1,372,000,000

POTENTIAL BENEFITS TO ALASKA: $823,000,000

POTENTIAL MINING WAGES IN ALASKA: $110,000,000 - $137,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $256,000,000 - $320,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING:
$439,000,000 - $549,000,000

FIGURE 7

TRACTS WITHIN DE LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT

TRACT DESIGNATION: D.2-36-1 (Figure 8)

TRACT LOCATION: Bering Glacier, McCarthy, and Valdez quadrangles, 180 air miles east of Anchorage.

ACCESSIBILITY: Light plane, trails, road ends at Chitina, 20 air miles north of the tract and 130 road miles from Valdez; a proposed highway will parallel the northern boundary.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Valdez, 60 air miles to the west.

GEOLOGY: Sandstone, shale, and limestone sedimentary deposits partially buried by glacial outwash, partially unmapped; granitic intrusives in eastern quarter.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT:
#1. Ni, Cu (Cr, Pt) #2. Au, Cu (Pb, Zn, Ag, W)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Cu, Au, Ag

MINERALS PRESENT WITHIN ONE TOWNSHIP: Au, Zn, Cu, Ni

MINERAL POTENTIAL: The tract is in an area which is geologically favorable for the occurrence of metallic mineral deposits. Molybdenum and tungsten-bearing deposits are favorable near granitic intrusives. The western portion lays in a mineralized belt having potential for copper-nickel deposits of the Brady Glacier type. Difficult access to the tract has resulted in much of it having been just cursorily prospected.

POTENTIAL MINERAL VALUE: $525,000,000

POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect):
$1,312,000,000

POTENTIAL BENEFITS TO ALASKA: $787,000,000

POTENTIAL MINING WAGES IN ALASKA: $105,000,000 - $131,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $245,000,000 - $306,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING:
$420,000,000 - $525,000,000


EXPLANATION
Mineral Deposit, Placer
Mineral Deposit, Lode
Coal or Oil Shale Deposit
Mineral Deposit Boundary
(Defines a large number of claims or deposits, often a mining district.)
Coal Field
Oil or Gas Lease
(issued and/or pending)
Metallogenic Province
(Shows regional occurrence of elements of potential economic significance. Elements of secondary importance shown in parentheses. Overlap regions contain the sum characteristics of the overlapping provinces.)
Tract Boundary
FIGURE 8
TRACTS WITHIN SE LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT

TRACT DESIGNATION: D.2-13-1 (Figure 9)

TRACT LOCATION: Bendeleben quadrangle, 50 air miles northeast of Nome.

ACCESSIBILITY: Road skirts western boundary; two proposed highways will pass through the tract.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Nome, 50 air miles to the southwest.

GEOLOGY: Mostly metamorphic rocks surrounding an area of extrusive volcanics; several small areas of marine sediments.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT:
#1. Au (Hg, Pb, Ag, W) #2. Sn, Au, Fl, Be (W)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Au, Ag, Pb, Zn (Mn, Radioactives)

MINERALS PRESENT WITHIN ONE TOWNSHIP: Au, Ag (Sn, Pb, W, Hg, Radioactives, Coal)

MINERAL POTENTIAL: This tract is geologically favorable for the occurrences of metallic mineral deposits. The eastern half is part of a lead-zinc belt. Western and southern areas have been important placer gold producers, the gold coming from veins and wide stringer-type lodes in metamorphic rocks. Much of the tract is favorable for gold and silver or lead-zinc-silver deposits. The geology is varied and complicated.

POTENTIAL MINERAL VALUE: $1,147,000,000

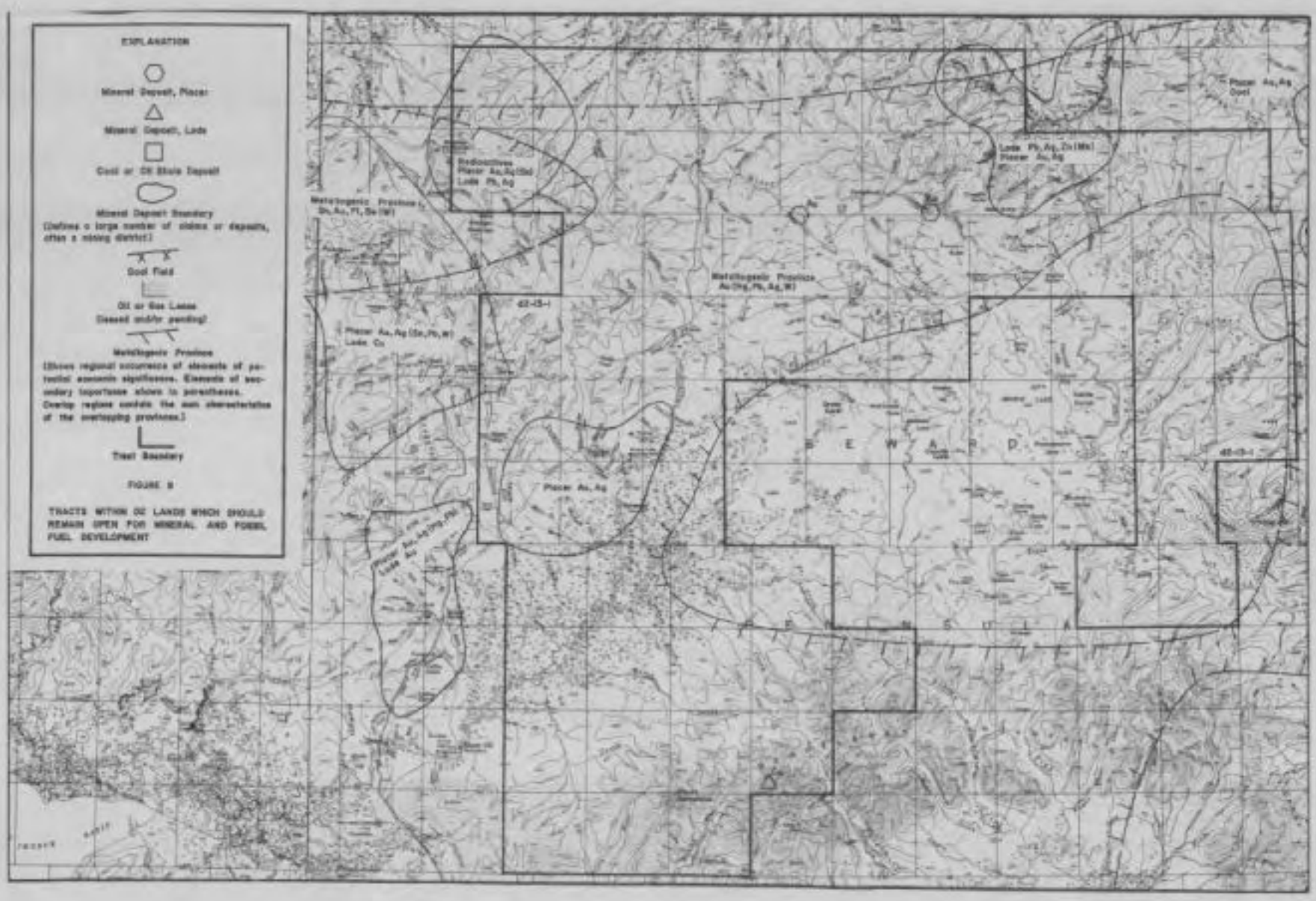
POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $2,866,000,000

POTENTIAL BENEFITS TO ALASKA: $1,720,000,000

POTENTIAL MINING WAGES IN ALASKA: $229,000,000 - $287,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $535,000,000 - $669,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING:
$917,000,000 - $1,147,000,000


EXPLANATION
Mineral Deposit, Placer
Mineral Deposit, Lode
Coal or Oil Shale Deposit
Mineral Deposit Boundary
(Defines a large number of claims or deposits, often a mining district)
Coal Field
Oil or Gas Lease
(Issued and/or pending)
Metallogenic Province
(Shows regional occurrence of elements of potential economic significance. Elements of secondary importance shown in parentheses. Overlap regions contain the sum characteristics of the overlapping provinces.)
Tract Boundary
FIGURE 8
TRACTS WITHIN OR LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT
Placer Au, Ag
Coal
Lode Pb, Ag, Zn (Mn)
Placer Au, Ag
Radioactives
Placer Au, Ag (Sb)
Lode Pb, Ag
Metallogenic Province
Sn, Au, Pt, Sb (W)
Metallogenic Province
Au (Hg, Pb, Ag, W)
42-13-1
Placer Au, Ag (Sn, Pb, W)
Lode Cu
Placer Au, Ag
48-13-1
SEWARD
PENINSULA

TRACT DESIGNATION: D.2-24-1 (Figure 10)

TRACT LOCATION: Iliamna and Mt. Katmai quadrangles, 220 air miles southwest of Anchorage.

ACCESSIBILITY: Light plane, trails from Cook Inlet; a proposed highway will cross the northern tract.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Homer, 120 air miles to the northeast.

GEOLOGY: Mostly granitic intrusive rocks in contact with marine clastic sediments. Partly unmapped.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT: Cu, Mo, Au, Ag (Pb, Zn)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Cu, Au, Fe

MINERALS PRESENT WITHIN ONE TOWNSHIP: Cu, Au, Fe, Ag

MINERAL POTENTIAL: This tract is highly favorable for the occurrence high temperature vein and replacement deposits of gold, silver, copper, lead and zinc. A copper belt encompasses nearly the entire tract.

POTENTIAL MINERAL VALUE: $138,000,000

POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $344,000,000

POTENTIAL BENEFITS TO ALASKA: $206,000,000

POTENTIAL MINING WAGES IN ALASKA: $28,000,000 - $34,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $64,000,000 - $80,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING: $110,000,000 - $138,000,000


EXPLANATION
Mineral Deposit, Placer
Mineral Deposit, Lode
Coal or Oil Shale Deposit
Mineral Deposit Boundary
(Defines a large number of claims or deposits, often a mining district)
Coal Field
Oil or Gas Lease
(leased and/or pending)
Metallogenic Province
(Shows regional occurrence of elements of potential economic significance. Elements of secondary importance shown in parentheses. Overlap regions contain the sum characteristics of the overlapping provinces.)
Tract Boundary
FIGURE 10
TRACTS WITHIN D2 LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT
LIAMNA
KAMISHAK
BAY
Metallogenic Province
Fe, Ti, Cu, Mo, Au, Ag
(Pb, Zn)
Lode Au, Ag, Fe, Cu
Metallogenic Province
Cu, Mo, Au, Ag (Pb, Zn)
42-24-I
Metallogenic Province
Cu, Mo, Au, Ag (Pb, Zn)
42-24-I

TRACT DESIGNATION: D.2-3-3 (Figure 11)

TRACT LOCATION: Ambler River quadrangle,
330 air miles northwest of Fairbanks.

ACCESSIBILITY: Light plane, trails, 260 air miles to proposed Yukon River bridge which is 133 road miles north of Fairbanks; a proposed highway will pass along the western boundary.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Kotzebue, 140 air miles to the west.

GEOLOGY: Northern one-half unmapped; southern one-half underlain by metamorphic rocks.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT:
Cu (Pb, Zn)

MINERALS PRESENT WITHIN TRACT BOUNDARY: None

MINERALS PRESENT WITHIN ONE TOWNSHIP: None

MINERAL POTENTIAL: This tract is highly favorable for the location of copper, lead, and zinc deposits of the massive sulphide type. It lies in the same meneralized belt of metamorphic schists and phyllities found in the Bornite deposits of the Kennecott Copper Corporation.

POTENTIAL MINERAL VALUE: $45,000,000

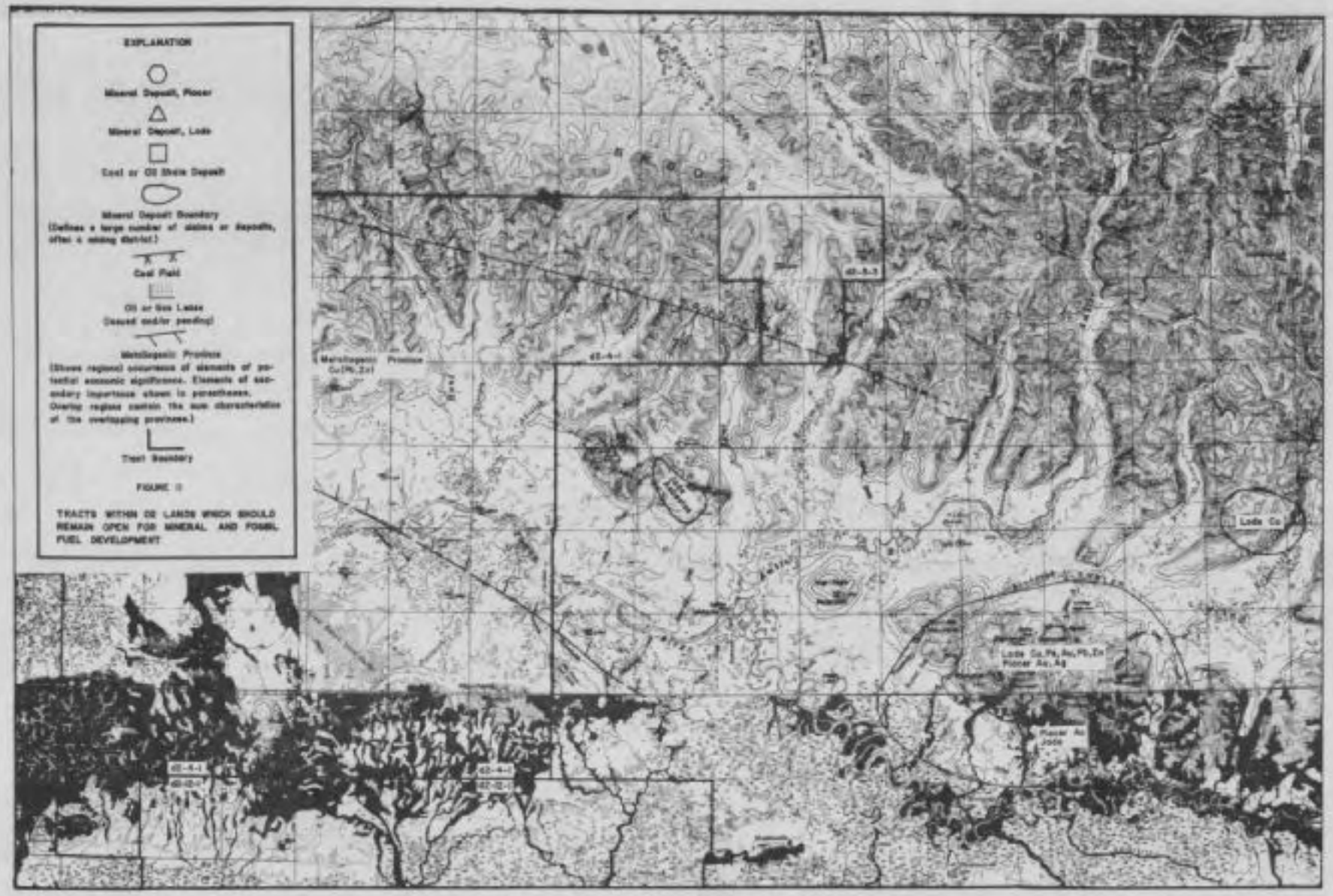
POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect):
$114,000,000

POTENTIAL BENEFITS TO ALASKA: $68,000,000

POTENTIAL MINING WAGES IN ALASKA: $9,000,000 - $11,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $21,000,000 - $27,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING:
$36,000,000 - $45,000,000


EXPLANATION
Mineral Deposit, Placer
Mineral Deposit, Lode
Coal or Oil Shale Deposit
Mineral Deposit Boundary
(Defines a large number of claims or deposits, often a mining district)
Coal Field
Oil or Gas Lease
(Issued and/or pending)
Metallogenic Province
(Shows regional occurrence of elements of potential economic significance. Elements of secondary importance shown in parentheses. Overlap regions contain the sum characteristics of the overlapping provinces.)
Tract Boundary
FIGURE 8
TRACTS WITHIN OIL LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT
Metallogenic Province
Cu(Mo,Zn)
Lode Co
Lode Co Pb,Au,Pb,Zn
Placer Au, Ag

TRACT DESIGNATION: D.2-4-1 (Figure 12)

TRACT LOCATION: Ambler River, Baird Mountains, Selawick, and Shungnak quadrangles; 330 air miles northwest of Fairbanks.

ACCESSABILITY: Light plane, winter trails, 260 air miles to proposed Yukon River bridge which is 133 road miles north of Fairbanks; two proposed highways will pass through the tract.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Kotzebue, 60 air miles to the southwest.

GEOLOGY: Partially unmapped; partially covered by beach and terrace deposits; central area is comprised of metamorphic rocks against marine and nonmarine.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT: Cu (Pb, Zn)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Au, Ag, oil, gas.

MINERALS PRESENT WITHIN ONE TOWNSHIP: Au, Pb, Cu, coal, oil, gas.

MINERAL POTENTIAL: The eastern portion of the tract is underlain by metamorphic rocks in the same copper, lead, and zinc belt which contains the massive sulfide deposits of the Kennecott Copper Corporation deposits at Bornite. A mineralized belt of marble and pelitic schist that forms the southern margin of the Brooks Range trends westward through the tract.

POTENTIAL MINERAL VALUE: $1,153,000,000

POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $2,882,000,000

POTENTIAL BENEFITS TO ALASKA: $ 1,730,000,000

POTENTIAL MINING WAGES IN ALASKA: $231,000,000 - $288,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $538,000,000 - $672,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING: $922,000,000 - $1,153,000,000

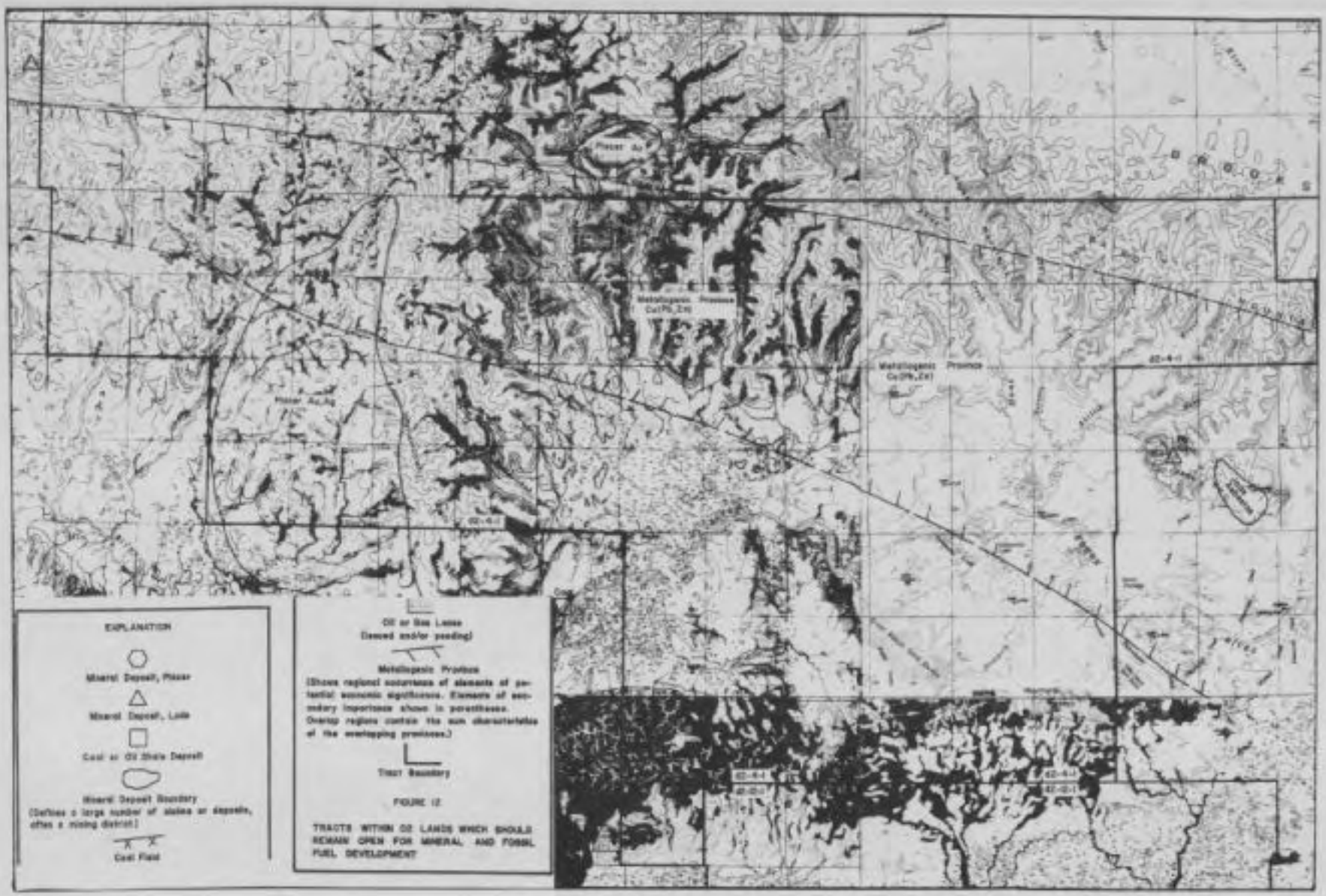


FIGURE 12

TRACTS WITHIN OS LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT

TRACT DESIGNATION: D.2-9-1 (Figure 13)

TRACT LOCATION: Circle and Charley River quadrangles, 120 air miles northeast of Fairbanks.

ACCESSIBILITY: Road skirts the tract on the west boundary; a proposed highway will parallel the southern boundary.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Fairbanks, 140 road miles to the southwest.

GEOLOGY: Predominately marine and non marine sediments in eastern one-half; extrusive volcanics in western one-half; partially covered by beach and terrace deposits.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT:
#1. Fe #2. Sn, W, Au, Pb, An (Cu, Sb, Ag)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Au, Fe, Ag, Barite, oil, gas, coal, oil shale.

MINERALS PRESENT WITHIN ONE TOWNSHIP: Au, coal, oil, gas.

MINERAL POTENTIAL: This tract lies in one of the great gold belts of the world. The belt can be traced from the Klondike in Yukon Territory northwest to Woodchopper Creek, 150 miles inside Alaska. The gold occurs in a conglomerate in an analagous manner to those of the Witwatersrand district in the Transval region of South Africa. The gold potential for this area has not been fully assessed. The southern portion of the tract is highly favorable for the occurrence of gold, tin, tungsten, and molybdenum. Areas of Pre-cambrian rocks containing iron ore may be of future economic significance. The presence of bituminous coal, oil, and gas should be noted.

POTENTIAL MINERAL VALUE: $672,000,000

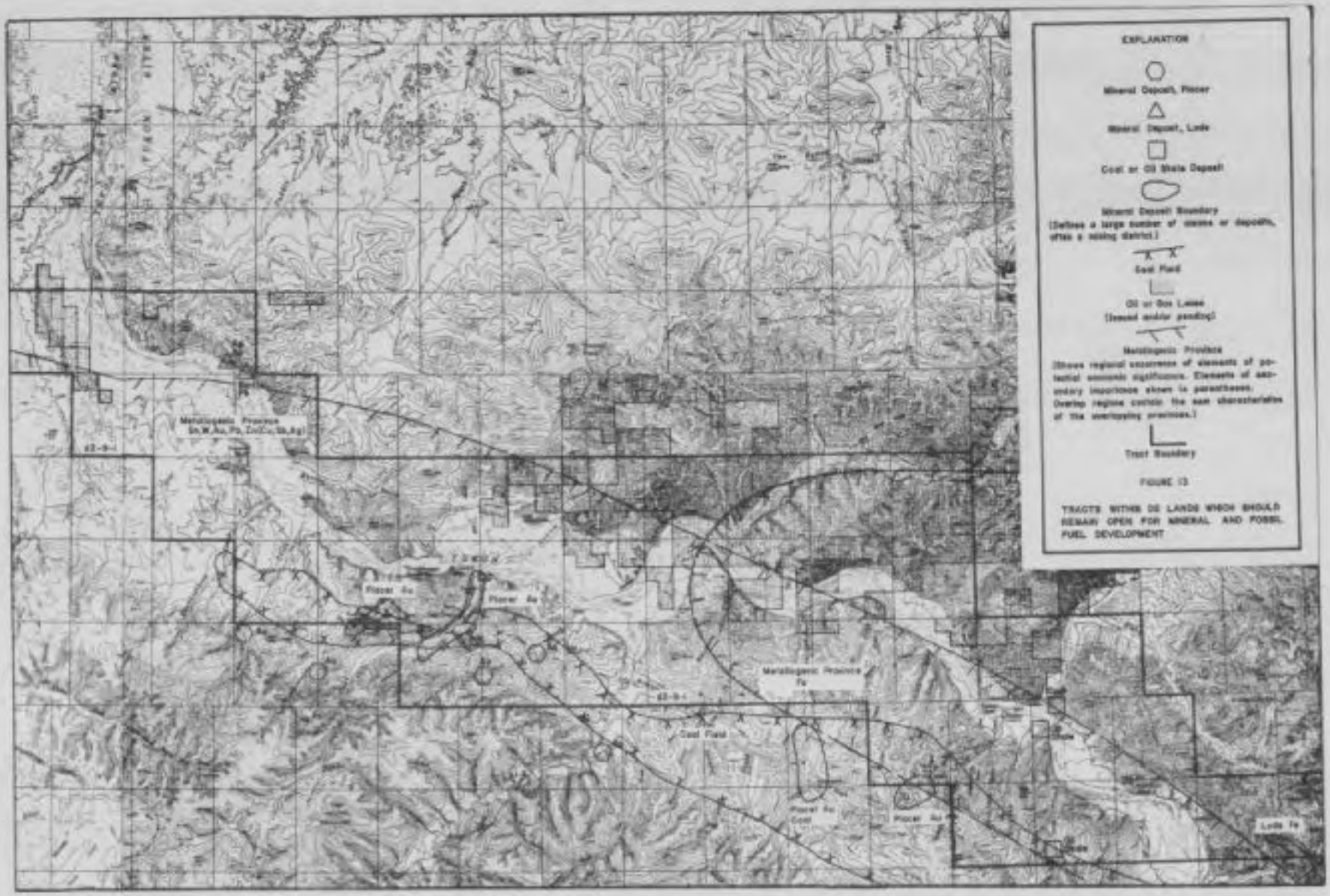
POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $1,681,000,000

POTENTIAL BENEFITS TO ALASKA: $1,009,000,000

POTENTIAL MINING WAGES IN ALASKA: $134,000,000 - $168,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $314,000,000 - $392,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING:
$538,000,000 - $672,000,000


EXPLANATION
Mineral Deposit, Placer
Mineral Deposit, Lode
Coal or Oil Shale Deposit
Mineral Deposit Boundary
(Defines a large number of claims or deposits, often a mining district.)
Coal Field
Oil or Gas Lease
(Issued and/or pending)
Metallogenic Province
(Shows regional occurrence of elements of potential economic significance. Elements of secondary importance shown in parentheses. Overlap regions contain the main characteristics of the overlapping provinces.)
Tract Boundary
FIGURE 13
TRACTS WITHIN OS LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT
Metallogenic Province
Sn, W, Au, Pb, Zn, Cu, Sb, Ag
Placer Au
Placer Au
Metallogenic Province
Fe
Coal Field
Placer Au
Coal
Placer Au
Lode Fe

TRACT DESIGNATION: D.2-5-1 (Figure 14)

TRACT LOCATION: Ikpikpuk River and Killik River quadrangles; 330 air miles northwest of Fairbanks.

ACCESSIBILITY: Light plane, winter trails; 140 air miles southwest of Prudhoe Bay; a proposed highway will pass along the northern boundary.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Kotzebue, 230 air miles to the southwest.

GEOLOGY: Nearly entirely underlain by marine and non marine sediments.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT:

MINERALS PRESENT WITHIN TRACT BOUNDARY: Oil, gas, coal.

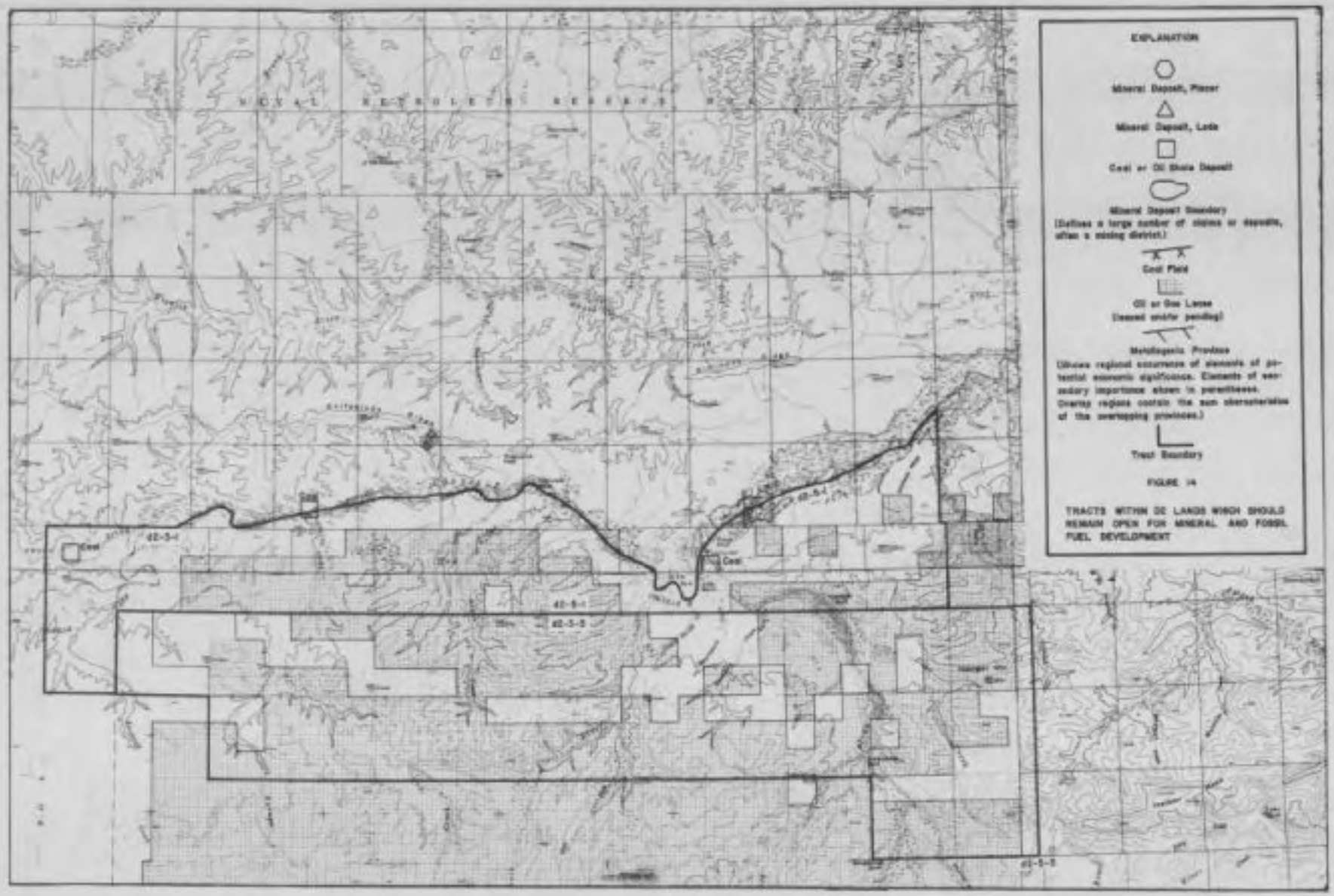
MINERALS PRESENT WITHIN ONE TOWNSHIP: Oil, gas.

MINERAL POTENTIAL: The geology of this tract makes it unfavorable for the occurrence of metallic mineral deposits. The Lower Cretaceous rocks contain significant coal and gas resources. The north-central part of the tract includes a gas seep on the Aupuk Anticline which probably flows from the same rocks that contain bitumen in wells on the next anticline to the north outside the tract. The marine sandstone reservoir rocks in the Umiat oil field just to the northeast of the tract probably extend over anticlines in the area.

POTENTIAL MINERAL VALUE: $308,000,000

POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $770,000,000

POTENTIAL BENEFITS TO ALASKA: $462,000,000


EXPLANATION
Mineral Deposit, Placer
Mineral Deposit, Lode
Coal or Oil Shale Deposit
Mineral Deposit Boundary
(Defines a large number of claims or deposits, often a mining district)
Coal Plan
Oil or Gas Lease
(leased and/or pending)
Metallogenic Province
(Shows regional occurrence of elements of potential economic significance. Elements of secondary importance shown in parentheses. Overlap regions contain the sum characteristics of the overlapping provinces.)
Tract Boundary
FIGURE 14
TRACTS WITHIN DC LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT
42-5-1
42-5-2
42-5-3
Coal
Coal

TRACT DESIGNATION: D.2-5-2 (Figure 15)

TRACT LOCATION: Survey Pass quadrangle;
270 air miles northwest of Fairbanks.

ACCESSIBILITY: Light plane, winter trails, 180 air miles to proposed Yukon River bridge which is 133 miles north of Fairbanks; a proposed highway will pass 40 air miles to the south.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Kotzebue, 195 miles to the east.

GEOLOGY: Largely unmapped; probably underlain by metamorphic and igneous rocks.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT:
Au (Sb, W)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Au, Ag

MINERALS PRESENT WITHIN ONE TOWNSHIP: Au, Sb, Cu, Ag

MINERAL POTENTIAL: Two large granite plutons intrude schist, marble, and partly metamorphosed clastic and carbonate sediments. Mineralization is evident in a zone 5 to 10 miles wide around the northwestern and western contacts of the western pluton. This area is highly favorable for massive sulfide type copper-zinc deposits.

POTENTIAL MINERAL VALUE: $162,000,000

POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect):
$405,000,000

POTENTIAL BENEFITS TO ALASKA: $243,000,000

POTENTIAL MINING WAGES IN ALASKA: $32,000,000 - $40,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $76,000,000 - $94,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING:
$130,000,000 - $162,000,000

TRACT DESIGNATION: D.2-5-3 (Figure 15)

TRACT LOCATION: Survey Pass quadrangle;
230 miles northwest of Fairbanks.

ACCESSIBILITY: Light plane, winter trails, 145 air miles to proposed Yukon River bridge which is 133 road miles north of Fairbanks; a proposed highway will pass within 20 miles to the south.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Kotzebue, 215 air miles to the east.

GEOLOGY: Predominately metamorphic rocks, schists.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT:
Cu (Pb, Zn)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Au

MINERALS PRESENT WITHIN ONE TOWNSHIP: Cu, Au

MINERAL POTENTIAL: Large copper prospects occur just south and west of the tract in the 10-mile-wide belt of pelitic schist that forms the southern part of the Brooks Range. Seven miles west of the tract are five large groups of recent claims along a strike length of 20 miles, the most active being Arctic Camp, where Bear Creek Mining Co. has developed a large tonnage of ore. Copper occurs for 45 miles along strike. The rocks that include this mineralized zone strike into the tract and cross it. Except for a little placer gold reported in the Alatna valley, no mineralization is known in the schist belt within the tract. However, the probability of mineralization is high.

POTENTIAL MINERAL VALUE: $92,000,000

POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect):
$231,000,000

POTENTIAL BENEFITS TO ALASKA: $139,000,000

POTENTIAL MINING WAGES IN ALASKA: $18,000,000 - $23,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $43,000,000 - $54,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING:
$74,000,000 - $92,000,000

TRACT DESIGNATION: D.2-5-4 (Figure 15)

TRACT LOCATION: Survey Pass and Wiseman quadrangles; 230 air miles northwest of Fairbanks.

ACCESSIBILITY: Light plane, winter trails, 140 air miles to proposed Yukon River bridge which is 133 road miles north of Fairbanks; a proposed highway will pass 25 miles to the east.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Fairbanks, 230 air miles to the southeast.

GEOLOGY: Marine limestone and dolomite.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT: Cu (Pb, Zn)

MINERALS PRESENT WITHIN TRACT BOUNDARY: None noted or staked.

MINERALS PRESENT WITHIN ONE TOWNSHIP: Au

MINERAL POTENTIAL: The tract is located in a mineralized belt which is highly favorable for the occurrences of copper-zinc deposits of the massive sulfide type. Large copper prospects occur just south and west of the tract in the 10-mile-wide belt of pelitic schist that forms the southern part of the Brooks Range. Seven miles west of the tract are five large groups of recent claims along a strike length of 20 miles, the most active being Arctic Camp, where Bear Creek Mining Co. has developed a large tonnage of ore. Copper occurs for 45 miles along strike. The rocks that include this mineralized zone strike into the tract and cross it. Except for a little placer gold reported in the Alatna valley, no mineralization is known in the schist belt within the tract. However, the probability of mineralization is high.

POTENTIAL MINERAL VALUE: $88,000,000

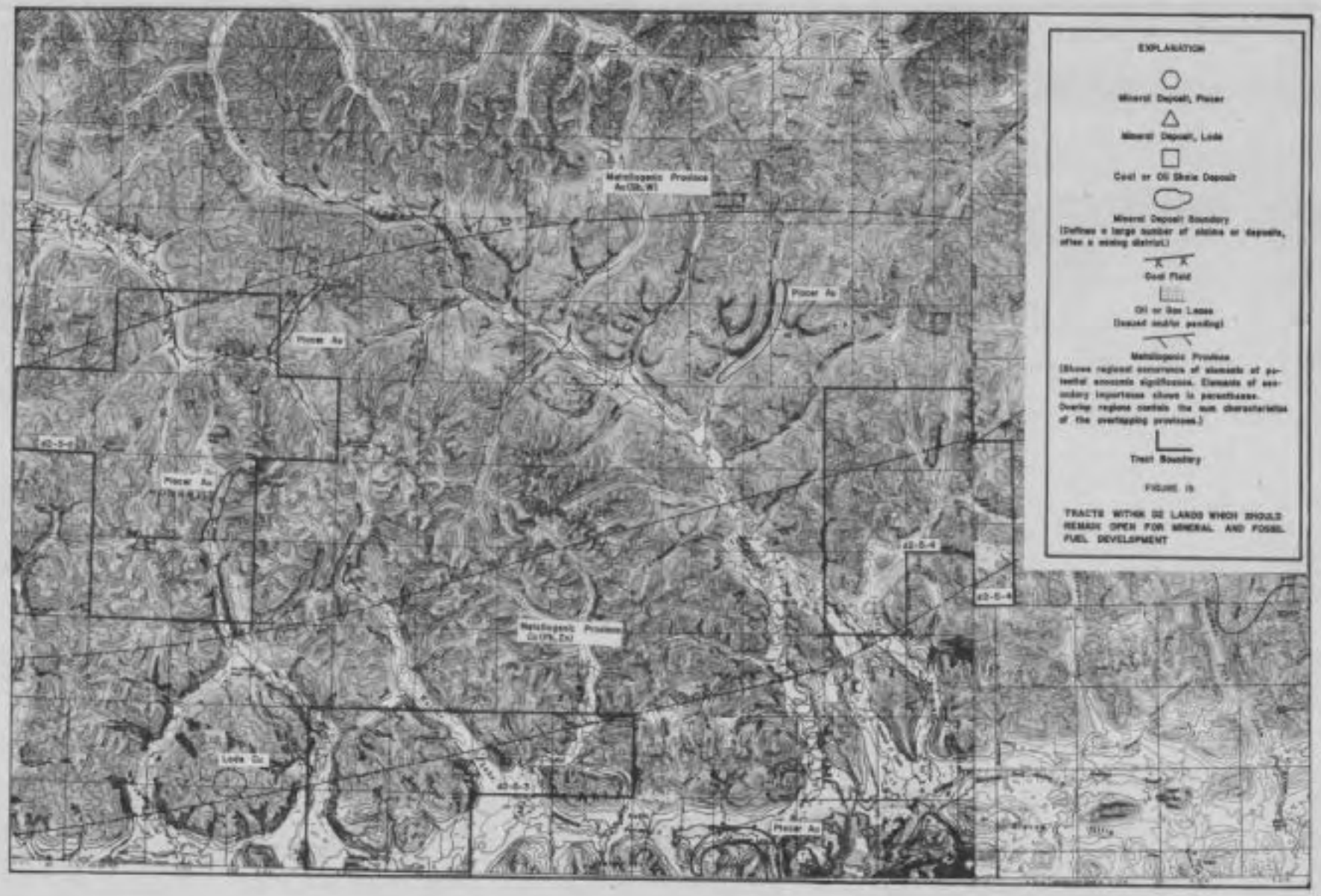
POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $219,000,000

POTENTIAL BENEFITS TO ALASKA: $131,000,000

POTENTIAL MINING WAGES IN ALASKA: $18,000,000 - $22,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $41,000,000 - $51,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING: $70,000,000 - $88,000,000


EXPLANATION
Mineral Deposit, Placer
Mineral Deposit, Lode
Coal or Oil Shale Deposit
Mineral Deposit Boundary
(Defines a large number of claims or deposits, often a mining district.)
Coal Field
Oil or Gas Lease
(Issued and/or pending)
Metallogenic Province
(Shows regional occurrence of elements of potential economic significance. Elements of secondary importance shown in parentheses. Overlap regions contain the sum characteristics of the overlapping provinces.)
Tract Boundary
FIGURE 15
TRACTS WITHIN D2 LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT
Metallogenic Province
Au (Sb, W)
Placer Au
Placer Au
Placer Au
Metallogenic Province
Placer Au
Lode Cu
Placer Au

TRACT DESIGNATION: D.2-18-1 (Figure 16)

TRACT LOCATION: Mt. McKinley quadrangle;
110 air miles south of Fairbanks.

ACCESSIBILITY: 214 road miles to tract from Fairbanks; a proposed highway will pass through the center of the tract.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Fairbanks, 110 air miles to the north.

GEOLOGY: Predominately Pre-Cambrian metamorphic rocks with some igneous rocks; partially covered by beach and terrace deposits.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT:
#1. Sb, Au, Ag (Pb, Zn, Hg) #2. Cu, Mo, Au, Ag, Sb (Pb, Zn, Hg)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Au, Pb, Ag, Zn, Cu, Sb, W (Mn)

MINERALS PRESENT WITHIN ONE TOWNSHIP: Au, Ag, W, Sb, Pb

MINERAL POTENTIAL: This tract has been an important past producer of placer gold. The area is highly favorable for the occurrence of high temperature vein and replacement deposits of gold, silver, copper, lead, and zinc. High grade antimony ores have been mined in and near the tract, and the potential exists for significant additional reserves.

POTENTIAL MINERAL VALUE: $196,000,000

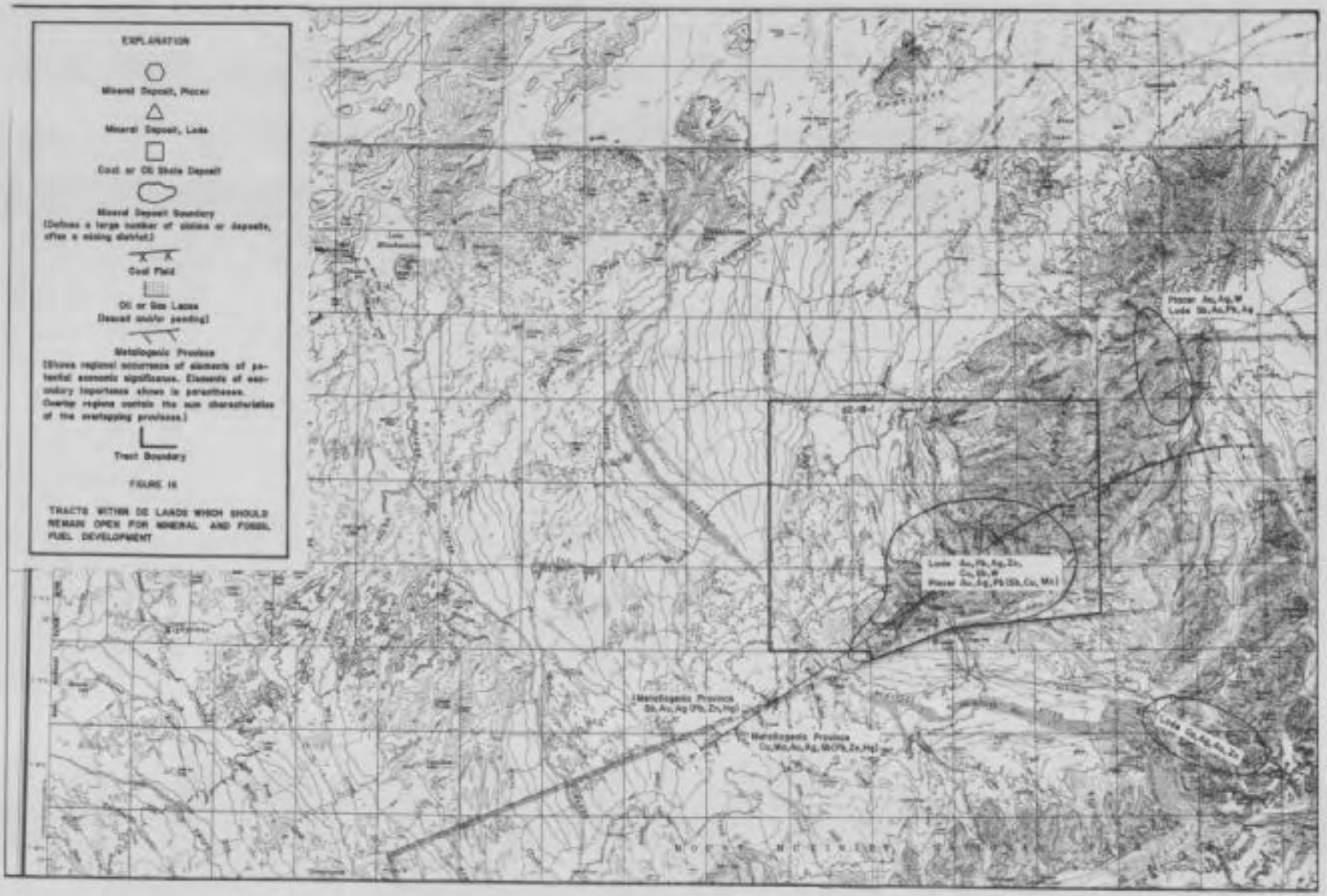
POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect):
$490,000,000

POTENTIAL BENEFITS TO ALASKA: $294,000,000

POTENTIAL MINING WAGES IN ALASKA: $39,000,000 - $49,000 000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $92,000,000 - $114,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING:
$157,000,000 - $196,000,000


EXPLANATION
Mineral Deposit, Placer
Mineral Deposit, Lode
Coal or Oil Shale Deposit
Mineral Deposit Boundary
(Defines a large number of claims or deposits, often a mining district)
Coal Field
Oil or Gas Lease
(Issued and/or pending)
Metallogenic Province
(Shows regional occurrence of elements of potential economic significance. Elements of secondary importance shown in parentheses. Overlap regions contain the sum characteristics of the overlapping provinces.)
Tract Boundary
FIGURE 15
TRACTS WITHIN OIL LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT
Placer Au, Ag, W
Lode Sb, As, Pb, Ag
Lode Au, Pb, Ag, Zn, Cu, Sb, W
Placer Au, Ag, Pb (Sb, Cu, Mo)
Metallogenic Province
Sb, As, Ag (Pb, Zn, Hg)
Metallogenic Province
Cu, Mo, As, Ag, Sb (Pb, Zn, Hg)
Lode Cu, As, Au, Zn
MOJAVE MINERAL BELT

TRACT DESIGNATION: D.2-8-1 (Figure 17)

TRACT LOCATION: Bettles, Beaver, Chandalar, and Wiseman quadrangles; 130 air miles north of Fairbanks.

ACCESSIBILITY: Light plane, winter trails, 40 air miles north of proposed Yukon River bridge which is 133 road miles north of Fairbanks; a proposed highway will pass along the north and west borders.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Fairbanks, 130 air miles to the south.

GEOLOGY: The interior portion is unmapped; the northern border is underlain by granitic intrusives and metamorphic rocks; the southwestern corner by metamorphic rocks.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT:
#1. Au, (Sb, W) #2. Sn, W, Au, Pb, Zn (Cu, Sb, Ag)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Au, Mo, Zn, Pb

MINERALS PRESENT WITHIN ONE TOWNSHIP: Au, Coal

MINERAL POTENTIAL: This tract, lying on the south flank of the Brooks Range, has been an important producer of placer gold. Geochemical anomalies in an area of rhyolites associated with intrusive complexes, and known mineral occurrences adjacent to the tract to the southwest give this tract a high potential for massive sulfide copper-zinc deposits.

POTENTIAL MINERAL VALUE: $954,000,000

POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $2,385,000,000

POTENTIAL BENEFITS TO ALASKA: $1,431,000,000

POTENTIAL MINING WAGES IN ALASKA: $191,000,000 - $238,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $445,000,000 - $556,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING:
$763,000,000 - $954,000,000

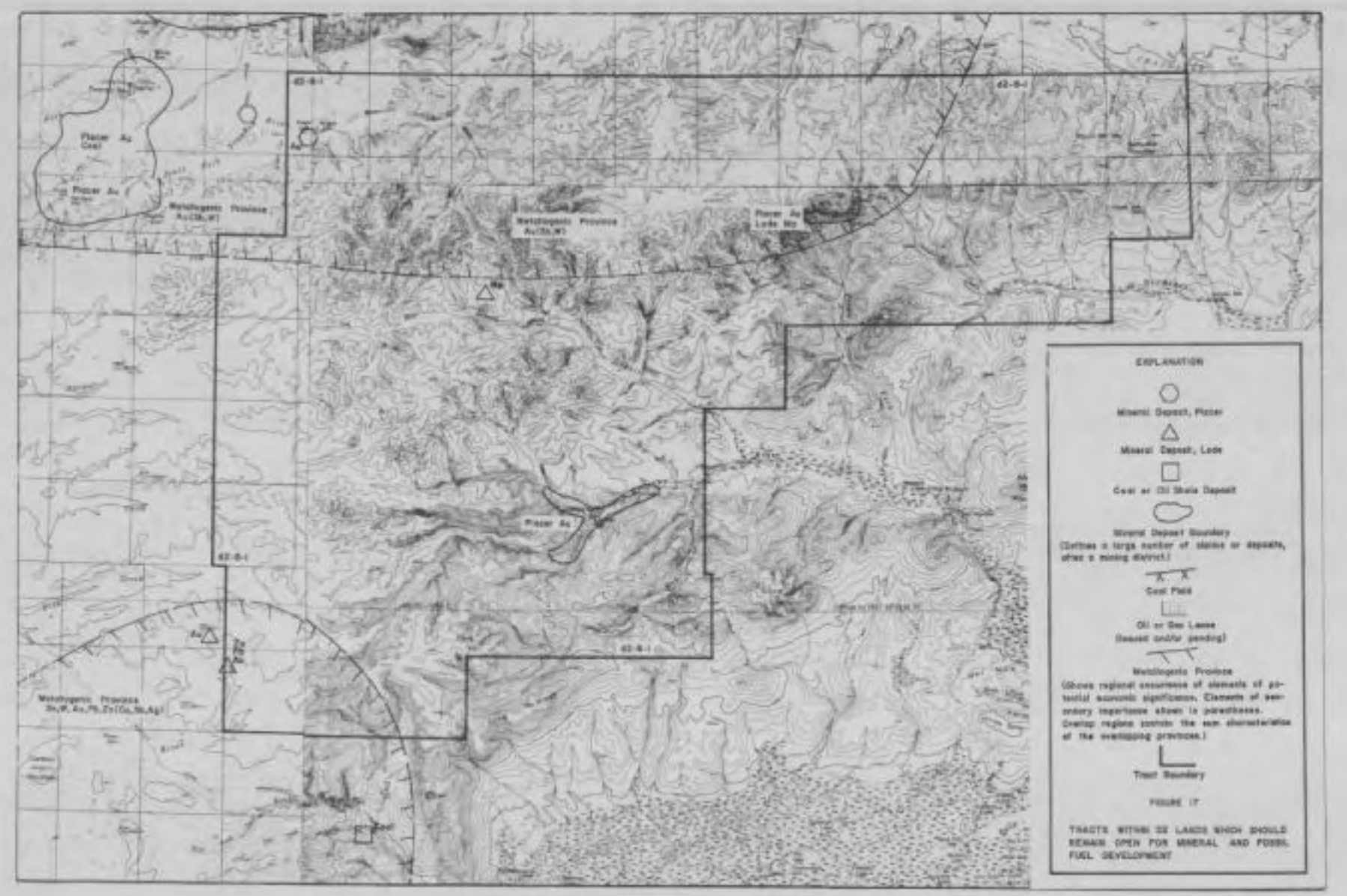


FIGURE 17

TRACTS WITHIN 22 LEASE WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT

TRACT DESIGNATION: D.2-12-1 (Figure 18)

TRACT LOCATION: Selawick and Shungnak quadrangles;
310 air miles northwest of Fairbanks.

ACCESSIBILITY: Light plane, winter trails, 240 air miles to proposed Yukon River bridge which is 133 miles north of Fairbanks; two proposed highways will pass through the tract.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Kotzebue, 60 air miles to the northwest.

GEOLOGY: Largely unmapped, covered by beach and terrace deposits.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT: Au, Pb, Ag, U, Th, Re (Mo, Cu)

MINERALS PRESENT WITHIN TRACT BOUNDARY: Zn, Pb.

MINERALS PRESENT WITHIN ONE TOWNSHIP: Au, oil, gas.

MINERAL POTENTIAL: The eastern one-third and western panhandle of this tract are geologically favorable for the occurrence of metallic mineral deposits. Part of this tract covers the Hogatza trend, a plutonic-volcanic complex which offers favorable prospects for metallic minerals.

POTENTIAL MINERAL VALUE: $1,070,000,000

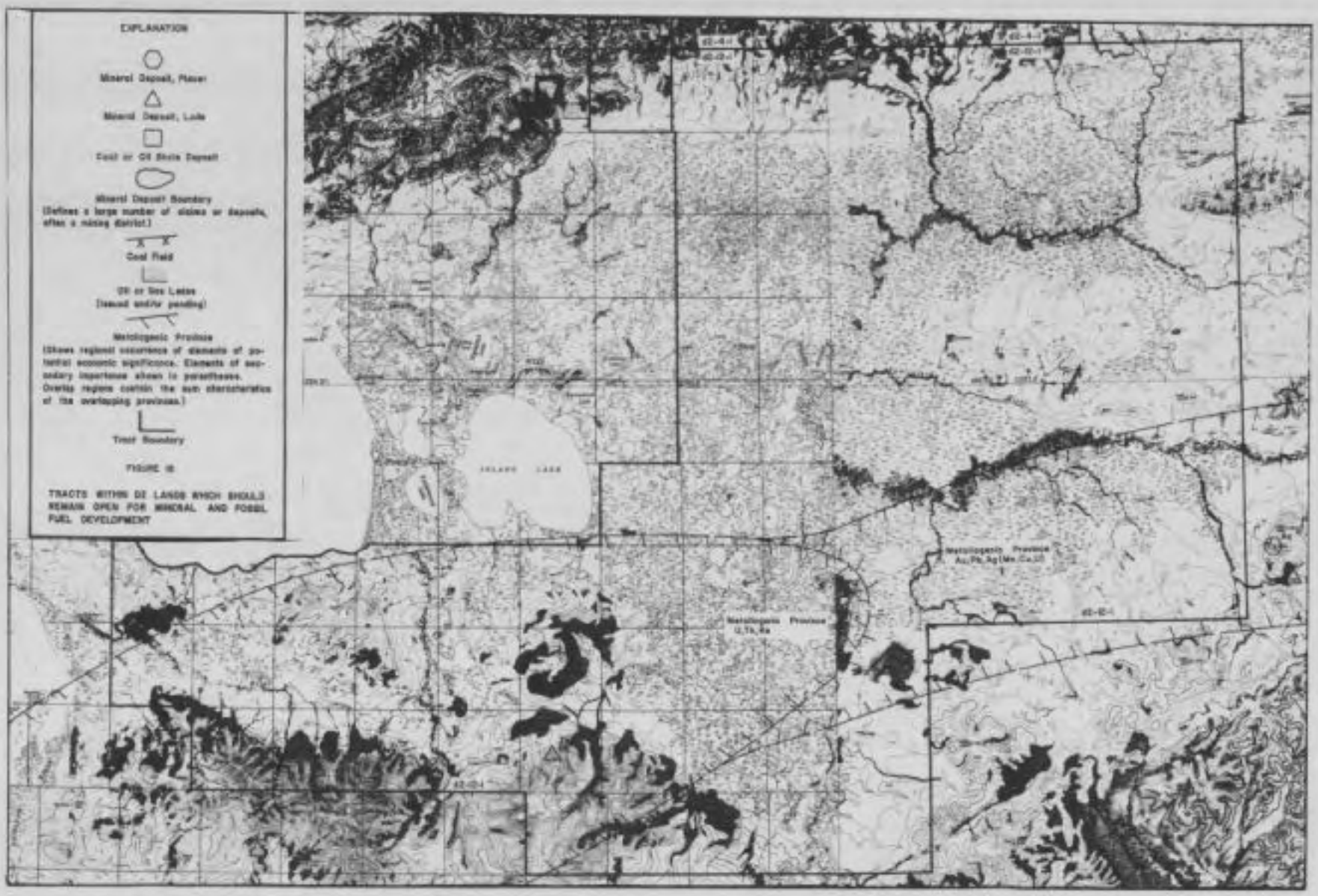
POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $2,675,000,000

POTENTIAL BENEFITS TO ALASKA: $1,605,000,000

POTENTIAL MINING WAGES IN ALASKA: $214,000,000 - $268,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $499,000,000 - $624,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING: $856,000,000 - $1,070,000,000


EXPLANATION
Mineral Deposit, Placer
Mineral Deposit, Lode
Coal or Oil Shale Deposit
Mineral Deposit Boundary
(Defines a large number of claims or deposits, often a mining district.)
Coal Field
Oil or Gas Lease
(issued and/or pending)
Metallogenic Province
(Shows regional occurrence of elements of potential economic significance. Elements of secondary importance shown in parentheses. Overlap regions contain the sum characteristics of the overlapping provinces.)
Tract Boundary
FIGURE 18
TRACTS WITHIN DE LONGS RANGE SHOALS REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT
ISLAND LAKE
Metallogenic Province
U,Th,Ra
Metallogenic Province
Au,Pb,Ag(Mn,Cu,U)

TRACT DESIGNATION: D.2-5-5 (Figure 19)

TRACT LOCATION: Chandler Lake and Killik River quadrangles; 310 air miles northwest of Fairbanks.

ACCESSIBILITY: Light plane, winter trail, 145 air miles south of Prudhoe Bay; a proposed highway will pass within 10 air miles to the nort.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Kotzebue, 230 air miles to the southwest.

GEOLOGY: Almost entirely underlain by marine and non marine sediments.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT: None.

MINERALS PRESENT WITHIN TRACT BOUNDARY: Oil, gas.

MINERALS PRESENT WITHIN ONE TOWNSHIP: Oil, gas.

MINERAL POTENTIAL: The Lower Cretaceous rocks in the northeastern part of this tract contain inferred reserves of one billion tons of bituminous and subbituminous coal at depths of less than 1,000 feet with an additional billion tons at depths of 1,000 to 3,000 feet. The potential for oil and gas is quite favorable.

POTENTIAL MINERAL VALUE: $303,000,000

POTENTIAL BENEFITS TO THE NATIONAL AND STATE ECONOMIES (Multiplier effect): $758,000,000

POTENTIAL BENEFITS TO ALASKA: $455,000,000

POTENTIAL MINING WAGES IN ALASKA: $61,000,000 - $76,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $141,000,000 - $177,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING: $242,000,000 - $303,000,000

TRACT DESIGNATION: D.2-5-7 (Figure 19)

TRACT LOCATION: Killik River quadrangle; 290 air miles northwest of Fairbanks.

ACCESSIBILITY: Light plane, winter trail, 190 air miles southwest of Prudhoe Bay; a proposed highway will pass 40 miles north of the tract.

PROXIMITY TO LABOR, SUPPLIES: Closest town of 1,000+ is Kotzebue, 210 air miles to the southwest.

GEOLOGY: Underlain by marine and non marine sediments.

MINERALS LIKELY WITHIN METALLOGENIC PROVINCE(S) WHICH CONTAINS THE TRACT: None

MINERALS PRESENT WITHIN TRACT BOUNDARY: Oil, gas.

MINERALS PRESENT WITHIN ONE TOWNSHIP: Oil, gas.

MINERAL POTENTIAL: Up to nine feet of phosphate beds occur two miles east of this tract with estimated reserves of 25 to 500 million tons. The phosphatic member extends westward across the tract, but has not been mapped separately from the rocks, so the tract shows definite phosphate potential. The northern portions of this tract are quite favorable for the occurrence of oil and gas.

POTENTIAL MINERAL VALUE: $198,000,000

POTENTIAL BENEFITS TO THE FEDERAL AND STATE ECONOMIES (Multiplier effect): $495,000,000

POTENTIAL BENEFITS TO ALASKA: $297,000,000

POTENTIAL MINING WAGES IN ALASKA: $40,000,000 - $50,000,000

POTENTIAL OTHER WAGES IN ALASKA DUE TO MINING: $92,000,000 - $116,000,000

POTENTIAL OTHER WAGES OUTSIDE ALASKA DUE TO MINING: $158,000,000 - $198,000,000

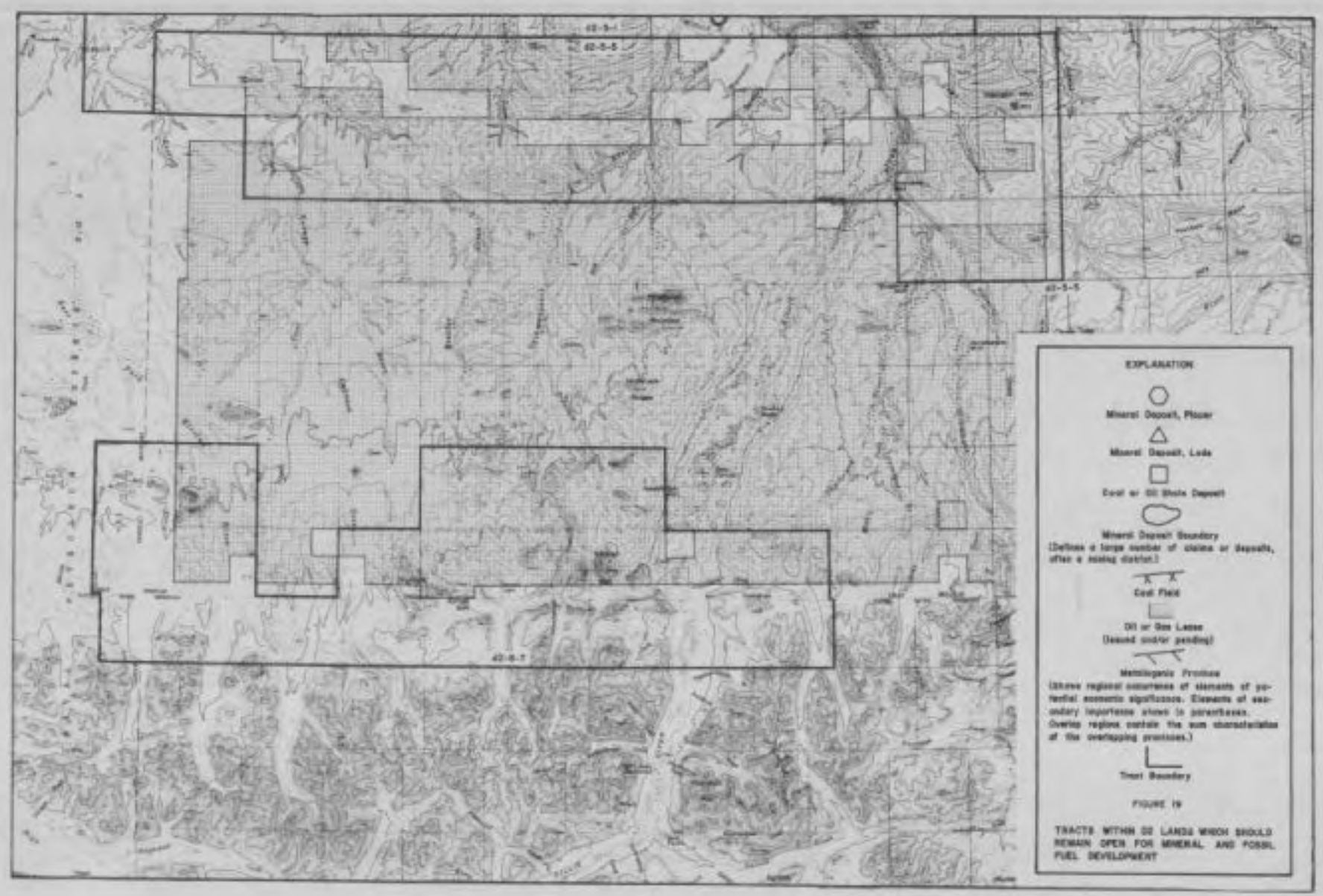


FIGURE 19

TRACTS WITHIN DE LANDS WHICH SHOULD REMAIN OPEN FOR MINERAL AND FOSSIL FUEL DEVELOPMENT

POTENTIAL IMPACT FROM MINERAL RESOURCE DEVELOPMENT

The cumulative potential impact from the development of the 21 tracts is as follows:

Potential mineral value: $12,402,000,000

Potential benefits to Federal and State economies

(Multiplier effect): $31,003,000,000

Potential benefits to Alaska: $18,003,000,000

Potential mining wages in Alaska: $2,419,000,000 - $3,022,000,000

Potential other wages in Alaska due to mining:

$5,644,000,000 - $7,053,000,000

Potential other wages outside Alaska due to Mining:

$9,673,000,000 - $12,094,000,000

These values while seemingly large are really quite modest. The development of one copper porphyry having 400 million tons of 0.4 percent copper such as is known to exist at Orange Hill just north of tract D.2-37-2 would alone generage $1.6 billion in mineral values. Discovery and development of copper deposits similar to those near Bornite just to the east of tracts D.2-4-1 and D.2-3-3 may mean over $2 billion in mineral values. The benefits to the State and Nation is sizable, all of course would be potentially lost if the lands are not reserved for development.

CONCLUSIONS

The Bureau of Mines and the Geological Survey on May 4, 1973, jointly recommended that 31 tracts of land currently having D.2 status be kept open for mining. Twenty-one of these tracts have since been studied to determine their mineral potential. These tracts generally are within known metallogenic provinces and have a very high potential for the occurrence of metals, and in some cases, fossil fuels. Geological exploration has been cursory at best when compared to the exploration activity in British Columbia. The lands should be kept open to mining so their potential can be realized.

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