THE GEOLOGICAL SURVEY OF WYOMING

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WYOMING MINES AND MINERALS 1979

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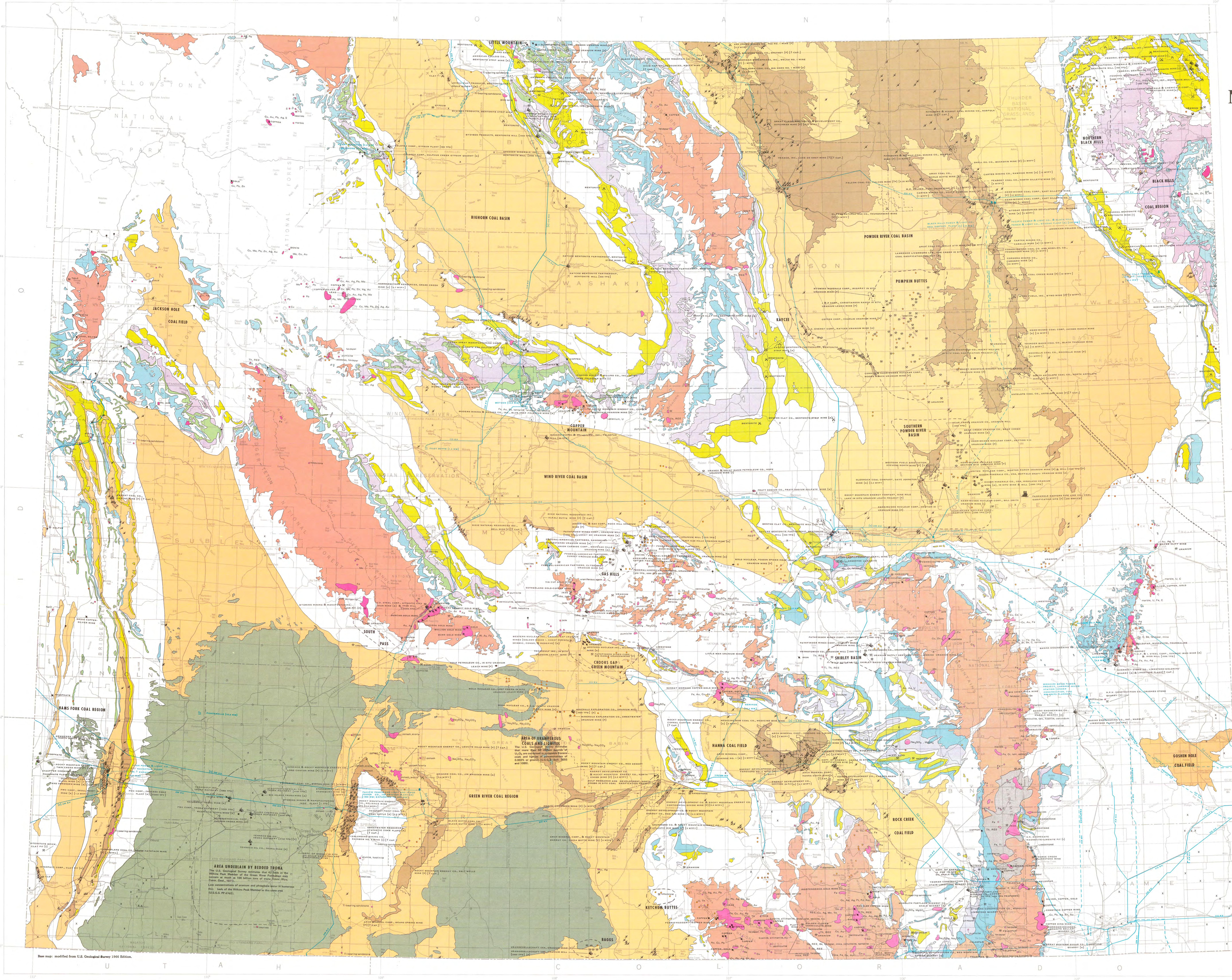
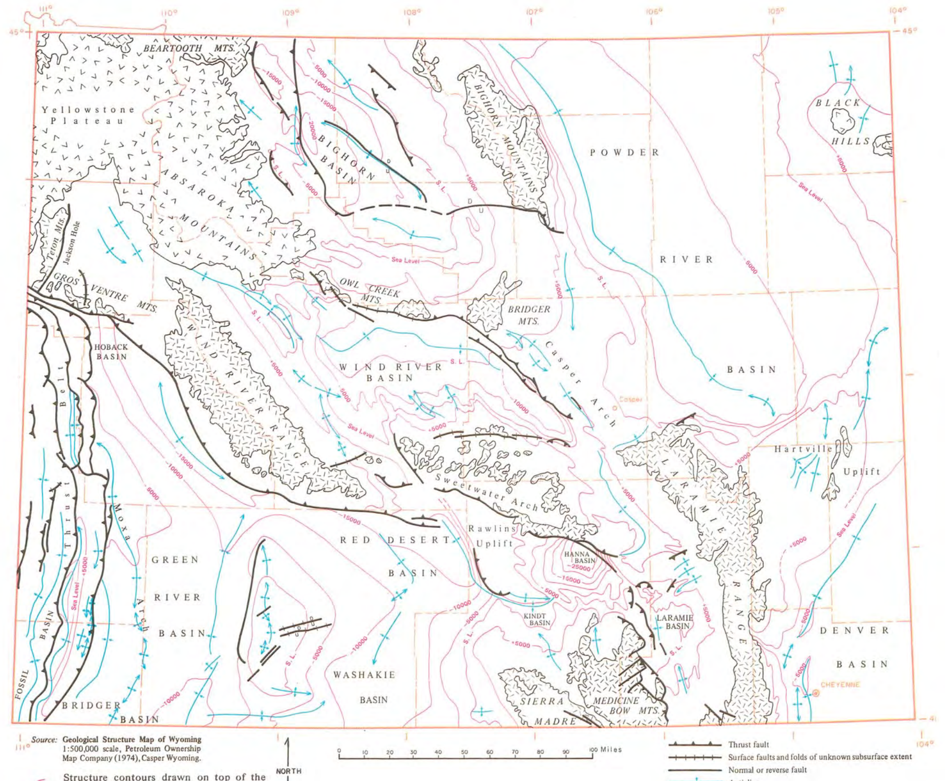
SCALE 1:500,000

1 inch equals approximately 8 miles



STRUCTURAL INDEX MAP



Source: Geological Structure Map of Wyoming 1:500,000 scale, Petroleum Ownership Map Company (1974), Casper Wyoming.

Structure contours drawn on top of the Lower Cretaceous Dakota Formation or equivalent and on the Pennsylvanian Tensleep Formation in the Bighorn Basin. (Contour interval = 5000 feet)

EXPLANATION

ANORTHOSITE

ANORTHOSITE COMPLEX — Predominately Precambrian anorthositic (high alumina) rocks. Includes layers of anorthosite, noritic anorthosite, feldspathic norite, and olivine anorthosite.

BENTONITE

BENTONITE-BEARING STRATA — Include the Cretaceous Mowry, Thermopolis, Belle Fourche, Frontier, Newcastle, Hilliard, and Aspen formations.

Bentonite mill (operator, capacity in tons per day)

Bentonite strip mine: (operator) (A),(I),(P); Abandoned

COAL

COAL-BEARING STRATA — Include coal-bearing rocks of the Tertiary Wasatch, Evanston, Fort Union, Pinyon, Polecat Bench, Hanna, and Ferris formations; Upper Cretaceous Lance, Medicine Bow, Mesaverde, Almond, Rock Springs, Adaville, and Meeteetse formations, Bacon Ridge Sandstone, and Frontier and Blind Bull formations; and the Lower Cretaceous Bear River Formation and Lakota Conglomerate. Wyoming's remaining identified coal resource to an overburden depth of 3,000 feet is 135.87 billion tons. An estimate including hypothetical resources to an overburden depth of 6,000 feet is 935.87 billion tons (modified from U.S. Geol. Survey Bulletin 1412, 1975).

Area of known thick or abundant coals

Boundary of coal mining permit or permit application

Indefinite boundary of a proposed coal mining project

Coal tipple (operator, capacity in million tons per year)

In situ coal gasification project (project name, operator)

Coal-fired power plant (operator, plant name, capacity in megawatts)

Coal gasification plant site (operator, design capacity in millions of cubic feet per day)

Synthetic coke plant (operator, capacity in tons per day)

Coal strip mine: (operator, mine name) (A),(I),(P) (design capacity in millions of tons per year); Abandoned

Underground coal mine: (operator, mine name) (A),(I),(P) (design capacity in millions of tons per year); Abandoned

Hydroelectric power plant: (plant name, capacity in megawatts)

Transmission line (voltage in kilovolts) 230 KV

GYPSUM

GYPSUM-BEARING STRATA — Include rocks of Triassic to Permian age undivided, and the Permian Forelle-Santanka, Triassic Spearfish and Chugwater, and Jurassic Gypsum Springs and Sundance formations.

Gypsum plant (operator, capacity in tons per day)

Gypsum quarry: (operator, mine name) (A),(I); Abandoned

LIMESTONE

LIMESTONE-BEARING STRATA — Include rocks of Mississippian and Pennsylvanian age undivided, the Mississippian Madison, Pahasapa, Englewood, and Guernsey, the Pennsylvanian Hartville and Casper, the Permian Minnekahta, and the Cretaceous Greenhorn and Niobrara formations.

Limestone or cement plant (operator, capacity in tons per day)

Limestone quarry: (operator, mine name) (A),(I); Abandoned

Underground limestone mine: Abandoned

OIL SHALE

OIL SHALE-BEARING STRATA — The outlined area depicts oil shale occurrences only; no implication as to quantity and quality of the resource is intended. Oil shale occurrence is restricted stratigraphically to the Lumen Tongue, Fontenelle Tongue, Tipton Tongue, Tipton Shale Member, Wilkins Peak Member, and Laney Shale Member of the Green River Formation of Eocene age (U.S.G.S. Prof. Paper 496-A, 1964). The U.S. Geological Survey estimates Wyoming's oil shale resource at 320 billion barrels in rock of 15 gallons-per-ton or more in the Green River and Washakie basins (U.S.G.S. Prof. Paper 820, 1973). For further information concerning Wyoming's oil shale, contact the Laramie Energy Technology Center in Laramie, Wyoming.

U.S. Department of Energy oil shale core-hole

PHOSPHATE

PHOSPHATE-BEARING STRATA — Include phosphate-bearing rocks of the Permian Phosphoria Formation.

Phosphate plant (operator, capacity in tons per day)

Phosphate quarry: Abandoned

URANIUM

Uranium occurrences are found in rocks of nearly every geological age, in Wyoming. These uranium-bearing rocks include the Tertiary North Park, Browns Park, Arikaree, White River, Green River, Wagon Bed, Wasatch, Hanna, Battle Spring, Wind River, Willwood, and Fort Union formations, including the Absaroka volcanics; Upper Cretaceous Mesaverde, Lance, Fox Hills, Laramie, Frontier and Erickson formations; Lower Cretaceous Cloverly and Inyan Kara groups; Jurassic Morrison Formation; Permian Phosphoria Formation; Pennsylvanian Casper Formation; Mississippian Madison Limestone; Cambrian Deadwood Formation; and Precambrian plutonic and metamorphic rocks. Wyoming's projected uranium resources to 1990 are: 205 million pounds of yellowcake at a selling price of \$50/lb.; 245 million pounds at \$75/lb.; 315 million pounds at \$100/lb. (After: Report to Wyoming Department of Economic Planning and Development, prepared by Quality Development Associates, Inc., Sept. 30, 1978.)

BAGGS — Uranium mining district

Uranium mill (operator, capacity in tons per day)

Uranium occurrence (circle indicates region of insufficient area for outline at map scale)

Underground uranium mine: (operator, mine name) (A),(I),(P); Abandoned

Open pit uranium mine: (operator, mine name) (A),(I),(P); Abandoned

In-situ uranium leach mine: (operator, mine name) (A),(I),(P)

PRECAMBRIAN ROCKS

UNDIFFERENTIATED PRECAMBRIAN ROCKS EXPOSED AT THE SURFACE.

MISCELLANEOUS MINERAL OCCURRENCES AND SYMBOLS

Mineral occurrence

Ag, Cu, C — Mineral occurrence as noted (circles indicate region of insufficient area for outline at this scale)

asbestos — Mineral occurrence as noted

Mine symbol

Approximate area of extensive mining operations

Gravel pit

IRON, LEAD — Abandoned mine (mine name if known, principal commodity mined)

GEOTHERMAL SPRINGS

Spring with water above mean annual surface temperature, and associated travertine deposits.

SYMBOLS AND ABBREVIATIONS

Ag = Silver	Cu = Copper	Ni = Nickel	U = Uranium
As = Arsenic	F = Fluorite	Pb = Lead	V = Vanadium
Au = Gold	Fe = Iron	Pd = Palladium	W = Tungsten
Ba = Barium	Li = Lithium	Pt = Platinum	Zn = Zinc
Be = Beryllium	$MgSO_4$ = Magnesium sulfate	REE = Rare earth elements	
Bi = Bismuth	Mn = Manganese	S = Sulfur	
C = Graphite	Mo = Molybdenum	Sn = Tin	(A) = Active Mine
Co = Cobalt	Na_2CO_3 = Sodium carbonate	Th = Thorium	(I) = Inactive Mine*
Cr = Chromium	Na_2SO_4 = Sodium sulfate	Ti = Titanium	(P) = Proposed Mine

*Mine with active mining permit on file with Wyoming Department of Environmental Quality but no known plans to resume or start mining within the near future.

Fred H. Porter and Dennis N. Grasso, Cartographers, The Geological Survey of Wyoming.
Pikes Peak Lithographing Company, Colorado Springs, Printer.

Information on mineral occurrences and mines posted through November 1, 1978.