

W. THOMAS GOEROLD

314 Parkview Avenue
Golden, Colorado
(303) 526-2362

tgoerold@lookoutmtn.com

EDUCATION

- 1983 **Ph.D., Mineral Economics**, Pennsylvania State University.
 - 1981 **M.S., Economic Geology**, Pennsylvania State University.
 - 1977 **B.S., Dual major, Geology and Economics**, College of William and Mary.
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QUALIFICATIONS

- President of the [Mineral Economics and Management Society \(MEMS\)](#), presidential term 4/2002-4/2003. Nominated for the National Academy of Science (NAS) panel on Oil and Gas Activities on the North Slope in Alaska. Completed coursework for certification as a commercial real-estate appraiser for Colorado.
 - Expertise in the applied economics of environmental, energy and minerals, and electric utility issues. Specialization in economic and financial evaluation. Field, laboratory, and classroom experience as a geologist. Significant expert witness experience.
 - Analytical capabilities include financial analysis, Monte Carlo risk assessment, input/output and cost/benefit analysis, policy analysis, forecasting, regional economic and demographic analysis, resource evaluation, exploratory data analysis, parametric and non-parametric statistics, geographic information systems (GIS), econometrics, and investment and commodity analysis.
 - Publication and oral presentation record covering a diversity of issues and forums ranging from reports written for informed laymen to papers and presentations for technical journals and conferences. Oral and written testimony presented in the U.S. Senate and House, as well as at local and regional venues and planning commission hearings.
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EMPLOYMENT EXPERIENCE

OWNER, [LOOKOUT MOUNTAIN ANALYSIS](#), Golden, Colorado, February 1991 to present.

- Currently operating a consulting firm specializing in multi-faceted quantitative analysis of environmental and energy and mineral issues. Provide research, expert witness testimony, and natural-resource-issue consulting. Clients include U.S. Department of Justice, States of Montana and New Mexico, U.S. Forest Service, Indian Tribes, multinational, regional, and local environmental organizations, municipalities, and others.

SENIOR ASSOCIATE-ECONOMIST, RESOURCE DATA INTERNATIONAL, Boulder, Colorado, January 1997 to July 1998.

- Built linear optimization models to forecast least-cost power production for entire United States for 25 years. Model modules included mine costs, transportation matrix, electric utility boiler BTU and state and EPA pollution allowances and constraints, and other modules.
- Performed economic consulting and modeling related to electric utility and energy issues, e.g., clean air compliance strategies, NO_x emission patterns and allowance forecasting, electric utility deregulation impacts and issues, electric power supply and demand modeling and forecasting, coal and natural gas supply modeling.

CONSULTING GEOLOGIST AND GEOCHEMIST, Geostat Sytems, Golden, Colorado, 1991 to 1997.

- Performed field and office studies using GIS, geochemical sampling and assaying, and interpretations of several Superfund sites including Leadville and Aspen CO, and Anaconda MT.
- Part of a U.S. Justice Department team of expert witnesses to delineate the concentrations and boundaries of Superfund contamination over hundreds of square miles.

EXECUTIVE DIRECTOR, FOUR CORNERS ECOREGION PROJECT, The Wilderness Society, Denver, Colorado, November 1989 to February 1991.

- Responsibilities included planning, writing, implementing, and heading a major program that analyzed the regional economy of the Four Corners states (AZ,CO,NM,UT) and examined the correlations between economic development and environmental protection.
- Conducted and monitored research dealing with regional economics, geographic information systems, and grazing and mining issues in the Four Corners states.

CHIEF ANALYST, ENERGY AND MINERAL RESOURCES, The Wilderness Society, Washington, D.C. and Denver, Colorado, April 1987 to February 1991.

- Director of all policy and technical analysis dealing with energy and minerals and the public lands. Authored many studies.
- Prepared testimony and appeared before Congress as an expert witness on many issues including 1872 Mining Law reform, national energy policy, drilling in Arctic National Wildlife Refuge (ANWR), and other policy issues relating to the exploration for and valuation of energy and mineral resources.

SOFTWARE CONSULTANT, Palisade Corporation, Washington, D.C., March 1986 to present.

- Aided in the design and implementation of a simulation analysis program using Monte Carlo and Latin Hypercube analysis with IBM microcomputers.
- Assisted in the design and testing of a Lotus 1-2-3 software package to give Lotus users mathematical and econometric simulation capabilities.

INDEPENDENT CONSULTANT, Washington, D.C., June 1986 to April 1987.

- Devised and implemented a simulation analysis program that measured the range of expected benefits of petroleum production on public lands in Alaska for The Wilderness Society, as well detailed mineral assessment reports for lands in Utah and California.

ASSOCIATE, ICF Incorporated, 1850 K Street, Washington, D.C., September 1985 to June 1986.

- Prepared a successful proposal to measure statewide energy usage as part of a energy demand analysis for the state of North Carolina.
- Performed analysis on the adequacy of future world fluorine reserves for the production of chlorofluorocarbons (CFCs) and their impact on global climate change.
- Built two different microcomputer models to calculate human health risks from airborne and groundwater hazardous wastes.

INDEPENDENT CONSULTANT, Washington, D.C., July 1984 to June 1986 (part-time).

- Executed study for the U.S. Bureau of Mines using econometric analysis to investigate the causes and magnitude of the decline of United States and world mineral demand.
- Conducted economic consulting concerning the supply and demand of strategic materials for the Department of Defense.

SENIOR ECONOMIC, FINANCIAL, AND POLICY ANALYST, U.S. Synthetic Fuels Corporation, Washington, D.C., November 1983 to September 1985.

- Analyzed and served as a contract manager for studies concerning the tax burden of synthetic fuels, the role of heavy oil in future U.S. energy policy, and others.
- Used microcomputers as well as DEC mainframes to construct and model project finance, and economic and tax analyses of synthetic and conventional energy projects and sectors.

EXPLORATION GEOLOGIST AND GEOCHEMIST, Anaconda Minerals Corporation, Billiton Metals, and Northgate Exploration, May 1980 to September 1982.

- Planned and conducted field surveys for base and precious metals throughout eastern and western U.S.
- Provided geochemical exploration and development services using geostatistical methods to evaluate field and literature surveys.
- Performed geostatistical evaluations of mineral exploration and deposit data.

RESEARCH AND TEACHING ASSISTANT AND FELLOW, Pennsylvania State University, State College, Pennsylvania, Winter 1977 to Fall 1983.

- Taught undergraduate geology and geoscience classes, as well as performed laboratory and library research on geologic, economic, and mineral economic issues.

SELECTED PUBLICATIONS, TESTIMONY, AND WORK PRODUCTS

- Goerold, W.T., 2003, (in final preparation), *A Detailed Examination of the Economic and Demographic Impacts of the Energy Industry in the Rocky Mountain States, 1970-2000*, report funded by the William and Flora Hewlett Foundation.
- Goerold, W.T., 2002, *Comments on the Draft Statewide Oil and Gas EIS and Amendment of the Powder River and Billings RMPs*, by the Bureau of Land Management and State of Montana.
- Goerold, W.T., 2002, *Comments on the Draft Environmental Impact Statement and Draft Planning Amendment for the Powder River Basin Oil and Gas Project*, by the Bureau of Land Management, Buffalo (WY) office.
- Goerold, W.T., 2002, *Powder River Basin (PRB) Coalbed Methane (CBM) Financial Model*, presented at the Natural Resources Law Center Coalbed Methane Conference, April 4-5, 2002 (Powerpoint presentation).
- Goerold, W.T., 2002, Written Testimony for Oversight Hearing on “*Oil and Gas Resource Methodology*”, for the Subcommittee on Energy and Mineral Resources, Committee on Resources, U.S. House of Representatives, April 18, 2002.
- Goerold, W.T., 2002, *U.S Oil Imports and Enhanced Oil Recovery (EOR) Technologies and Targets*, report prepared for the Alaska Coalition, April 2002.
- Goerold, W.T., 2002, *An Estimate of the Value of Manning-Family Mining Interests in the Mogollon Mining District, New Mexico*, November 2001 – February 2002, valuation of silver-gold mining interests, proprietary expert witness statements and deposition.
- Goerold, W.T., 2001, *A Brief Examination of the Adequacy of Future U.S. Natural Gas Infrastructure and Resources and the Role of Public Lands in U.S. Natural Gas Production*, prepared for The Wilderness Society.
- Goerold, W.T., 2001, *Some Fundamental Characteristics of the U.S. Energy Sector*, prepared for The Wilderness Society.
- Goerold, W.T., 2001, *Examination and Critique of ARI Report: Undiscovered Natural Gas and Petroleum Resources Beneath Inventoried Roadless and Special Designated Areas on Forest Service Lands Analysis and Results, with Additional Discussion of U.S. Geological Survey and National Petroleum Council Reports*, prepared for The Wilderness Society.
- Goerold, W.T., 2000, *Oil Resources in the 1002 Area of the Arctic National Wildlife Refuge*, Invited oral and written testimony before the United States Senate, Senate Energy Committee, April 5, 2000.
- Goerold, W.T., 2000, *An Analysis of the Impacts of the Troy Mine, ASARCO, Inc., Lincoln County, Montana, and An Examination of ASARCO Corporate Performance, 1974 to Present*, prepared for the Rock Creek Alliance (RCA), 66 pp. Presented to the County Commissioners of Sanders County, Montana.
- Goerold, W.T., 2000, *Preliminary Financial Review of the Proposed McDonald Gold Mine*, prepared for the Blackfoot Legacy.
- Goerold, W.T., 2000, *Review of Conservation Easement Assessment of McDonald Gold Mine*, prepared for the Blackfoot Legacy.
- Goerold, W.T., 2000, *Challenging the Economic Myths: U.S. Energy Policy and Potential Oil Production from the Arctic National Wildlife Refuge*, report prepared for the World Wildlife Fund (U.K.).
- Goerold, W.T., 1998, *Review of the Findings of the May 17, 1998 USGS Report on the Quantities of Economically Producing Oil that May Underlie the Arctic National Wildlife Refuge*, prepared for the Alaska Wilderness League and the Natural Resources Defense Council.
- Goerold, W.T., 1997, *A Critique of Existing Socioeconomic Impact Reports Evaluating the Proposed Crandon Zinc-Copper Mine, Wisconsin*, prepared for the Menominee Indian Tribe of Wisconsin.
- Goerold, W.T., 1997, *The Crown Butte Agreement: An Examination of the Proposed New World Gold Mine Land Exchange*, oral presentation to the Sixth Annual Mineral Economics and Management Society (MEMS), February 27-March 1, 1997, Boulder, Colorado. Printed in *Proceedings of the Mineral Economics and Management Society (MEMS)*, Eighth Annual MEMS Professional Meeting, held in Ottawa, Ontario.
- Goerold, W.T., 1996, *Economic Analysis and Critique of a Report to the Bureau of Indian Affairs on the: Legal and Economic Issues Related to the Re-licensing of the Shawano Hydropower Project*, prepared for the Menominee Indian Tribe of Wisconsin.

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- Goerold, W.T., 1996, *Thornwood Gas Project Environmental Response*, prepared for the Virginia Sierra Club and the Southern Environmental Law Center
- Goerold, W.T., 1996, *Comments on the merits of EPA's economic analysis of proposed NPDES rules on the discharge of oilfield platform wastes*, prepared for the Trustees for Alaska.
- Goerold, W.T., 1996, *Declaration on the merits of a valuable mineral discovery at the Montanore Mine, Montana* in The Wilderness Society and Great Bear Foundation v. Noranda Minerals Corporation +and United States Forest Service, deposition prepared for the Sierra Club Legal Defense Fund.
- Goerold, W.T., 1995, *Supplemental Financial Analysis of a Natural Gas Pipeline System in West Virginia and Virginia Proposed by Thornwood Gas, Incorporated*, prepared for the Virginia Wilderness Committee and Virginia and the West Virginia Sierra Clubs.
- Goerold, W.T., 1995, *Deposition on the projected profitability of the proposed New World Mine*, for Beartooth Alliance, et al., v. Crown Butte Mines, Inc., prepared for the Sierra Club Legal Defense Fund.
- Goerold, W.T., 1995, *Financial Analysis of a Natural Gas Pipeline System in West Virginia and Virginia Proposed by Thornwood Gas, Incorporated*, prepared for the Virginia Wilderness Committee and the Virginia and West Virginia Sierra Clubs.
- Goerold, W.T., 1995, *Review of Arctic National Wildlife Refuge Petroleum Estimates and Methodologies*, prepared for the Alaska Coalition.
- Goerold, W.T., 1995, *Review of Potential Arctic National Wildlife Refuge Petroleum Production Issues*, prepared for the Alaska Coalition.
- Goerold, W.T., 1995, *Financial Analysis of the Proposed New World Project, With a Preliminary Calculation of Potential Buyout Prices*, prepared for the Greater Yellowstone Coalition. Presented to the following U.S. Government Agencies: Department of Interior, Army Corps of Engineers, Bureau of Mines, Geological Survey, National Park Service, Environmental Protection Agency, and Council on Environmental Quality.
- Goerold, W.T., 1995, *An Analysis of the Compatibility of a Proposed Natural Gas Pipeline Project with Historical and Current Economic and Demographic Patterns in Four Counties in West Virginia and Virginia*, report prepared for Virginia Wilderness Committee, and Virginia and West Virginia Sierra Clubs.
- Goerold, W.T., 1993, *Investigation of Trends in Oil and Gas Exploration*, report submitted to the U.S. Forest Service, Rocky Mountain Range and Experimental Station.
- Goerold, W.T., 1992, *Environmental Impacts and the Energy and Mineral Industries*, report submitted to the U.S. Forest Service, Rocky Mountain Range and Experimental Station under contract.
- Goerold, W.T., and Mehrkens, J., 1992, *Quartz Hill Molybdenum Mine: Would Environmental Protection Price It Out of the Market?*, oral presentation by the senior author and published in the *Proceedings of the First Annual Mineral Economics and Management Society (MEMS)*, annual meeting in Washington, D.C., March 19-21, 1992.
- Goerold, W.T., 1992, *Econometric Modeling of the Projected Impact of the Alaska-Juneau and Kensington Gold Mines to Property Values and Property Taxes for Single-Family Homeowners in the City and Borough of Juneau*, prepared for the Southeast Alaska Natural Resources Center.
- Goerold, W.T., 1991, *Financial and Socioeconomic Analysis and Recommendations Regarding Some of the Impacts of the Proposed Alaska-Juneau Mine to Residents of the City and Borough of Juneau*, report prepared for Southeast Alaska Natural Resources Center.
- Goerold, W.T., 1991, *Review of Alaska Oil Reserves/Resources by the General Accounting Office, Comments for the Natural Resources Defense Council, Alaska Coalition, National Wildlife Federation, Wilderness Society, Sierra Club, and National Audubon Society*.
- Goerold, W.T., 1991, *Comments On the Draft Environmental Impact Statement and the Draft Socioeconomic Impact Assessment for the Proposed Alaska-Juneau Mine*, prepared for Southeast Alaska Natural Resources Center.

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- Goerold, W.T., and Mehrkens, J., 1991, *Economic Feasibility of the Proposed Quartz Hill Molybdenum Mine In Southeast Alaska*.
- Goerold, W.T., 1990, *Economic and Demographic Overview of the Four Corners States*, report published by The Wilderness Society.
- Goerold, W.T., 1990, *Royalty and Fee Provisions of S. 1126, A Bill to Provide for the Disposition of Hardrock Minerals on Federal Lands*, invited oral and written testimony presented to the U.S. Senate, Senate Energy and Natural Resource Committee's Subcommittee on Mineral Resource Development and Production. September 13, 1990.
- Goerold, W.T., 1989, *The Energy and Mineral Sector in Utah*, report published by The Wilderness Society, also excerpted in *Wilderness on the Edge*, 1991, Utah Wilderness Association.
- Goerold, W.T., 1989, *The Effect of the California Desert Protection Act, S. 11, on the Nonfuel Minerals Industry in the California Desert*, testimony presented to the U.S. Senate, Senate Energy Committee, October 2, 1989.
- Goerold, W.T., 1989, *The Energy and Mineral Sector in Arizona*, report published by The Wilderness Society.
- Goerold, W.T., 1989, *Mining and the California Desert*, and *Rare Earth Minerals, Superconductivity, and the California Desert*, oral and written report in the proceedings of the *California Desert Mineral Symposium*, U.S. Bureau of Land Management and the South Coast Geological Society, March 3 and 4, 1989.
- Goerold, W.T., 1988, *A Simulation Model to Determine the Probability of Finding Economically Producing Petroleum in the Arctic National Wildlife Refuge (ANWR), Alaska*, printed in the proceedings of *Competition, Profitability, and Policy in the Energy Industries*, International Association for Energy Economics (IAEE) conference, October 31-November 2, 1988, p. 386-397. *At one time used as a case study in natural resource valuation at the John F. Kennedy School of Government at Harvard University.*
- Goerold, W.T., 1987, *Petroleum Economics of the United States and the Arctic National Wildlife Refuge*, written testimony prepared for Joseph L. Fisher, Distinguished Professor of Political Economy, George Mason University, before the U.S. Senate, Senate Energy and Natural Resources Committee, October 25, 1987.
- Goerold, W.T., 1987, *Environmental and Petroleum Resource Conflicts: A Simulation Model to Determine the Benefits of Petroleum Production in the Arctic National Wildlife Refuge, Alaska*, published in *Materials and Society*, v. 11, number 3, p. 279-307. *At one time used as a case study in natural resource valuation at the John F. Kennedy School of Government at Harvard University.*
- Goerold, W.T., 1987, *Minerals and the New Mexico Wilderness Proposals*, report issued August 7, 1987.
- Goerold, W.T., 1987, *Do We Need Oil from the Arctic National Wildlife Refuge?*, oral and written testimony given before the U.S. House of Representatives, House Water and Power Subcommittee of the House Interior and Insular Affairs Committee, May 28, 1987.
- Goerold, W.T., 1986, *Preliminary Mineral Resource Assessment of Wilderness Study Areas Proposed under the California Desert Conservation Area and The California Desert Protection Act*, prepared for The Wilderness Society, November 4, 1986.
- Goerold, W.T., 1986, *Preliminary Report Reviewing the Potential Energy and Mineral Production for Selected Areas Reported in the Utah BLM Statewide Wilderness Draft Environmental Impact Statement*, prepared for The Wilderness Society, July 30, 1986.
- Faucett, J.G., Chmelynski, H.J., Goerold, W.T., 1986, *Changes in Worldwide Demand for Metals*, U.S. Bureau of Mines Open File Report 92-86.
- Goerold, W.T., 1983, *The Effect of the Recent Gold Price Rise on Gold Mine Production, Exploration, and Investment in the United States and South Africa*, Doctor of Philosophy thesis in Mineral Economics, Pennsylvania State University, 217 pp.
- Goerold, W.T., 1981, *Geology and Geochemistry of Tin Occurrences in Southwestern New Mexico*, Master of Science thesis in Economic Geology, Pennsylvania State University, 131 pp.