
From: Dugan [dugan@wavecom.net]
Sent: Tuesday, February 23, 2010 8:47 PM
To: Burrows, Ronald
Subject: Oglala Sioux Tribe Request for Extension of Time to Request Hearing; Need for 90-Day Extension; Expert Review; CV Dr. Robert Moran
Attachments: Oglala Sioux Tribe Request for Extension of Time to Request Hearing.doc; Need for 90-Day Extension, Dewey-Burdock License Application; Expert Review.pdf; CV Dr. Robert Moran.DOC
Importance: High

Dear Mr. Burrows:

Attached please find:

- 1) Oglala Sioux Tribe Request for Extension of Time to Request Hearing;
- 2) Need for 90-Day Extension, Dewey-Burdock License Application; Expert Review;
- 3) Curriculum Vitae, Dr. Robert Moran

If you have any questions or comments, please contact me. Thank you.

Grace Dugan
307.202.0703

Received: from mail2.nrc.gov (148.184.176.43) by OWMS01.nrc.gov
(148.184.100.43) with Microsoft SMTP Server id 8.1.393.1; Tue, 23 Feb 2010
20:47:19 -0500

X-Ironport-ID: mail2

X-SBRS: 5.3

X-MID: 13102460

X-fn: Oglala Sioux Tribe Request for Extension of Time to Request Hearing.doc,
Need for 90-Day Extension, Dewey-Burdock License Application;
Expert Review.pdf, CV Dr. Robert Moran.DOC

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23 Feb 2010 20:47:16 -0500

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sodium.vcn.com (Postfix) with ESMTP id 6AB53A7BD4 for
<Ronald.Burrows@nrc.gov>; Tue, 23 Feb 2010 18:47:10 -0700 (MST)

Message-ID: <4247153EB3F941209B0A540A52FE6D42@toshibauser>

From: Dugan <dugan@wavecom.net>

To: "Burrows, Ronald" <Ronald.Burrows@nrc.gov>

Subject: Oglala Sioux Tribe Request for Extension of Time to Request Hearing; Need for 90-
Day Extension: Expert Review; CV Dr. Robert Moran

Date: Tue, 23 Feb 2010 18:46:50 -0700

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Disposition-Notification-To: "Dugan" <dugan@wavecom.net>

X-MimeOLE: Produced By Microsoft MimeOLE V6.00.2900.5579

Return-Path: dugan@wavecom.net

Gonzalez Law Firm
522 7th Street
Rapid City, SD 57701
307.202.0703
dugan@wavecom.net

February 23, 2010

Via Electronic and First Class Mail

Ronald A. Burrows
Project Manager, Uranium Recovery Licensing Branch
Division of Waste Management and Environmental Protection
Office of Federal and State Materials and Environmental Management Programs
U.S. Nuclear Regulatory Commission
Washington, DC 20555

**RE: Request for extension of time to file request for hearing on License Application
Request of Powertech (USA) Inc. Dewey-Burdock In Situ Uranium Recovery
Facility in Fall River and Custer Counties, SD, Docket No.: 040-09075; NRC-2009-
0575**

Dear Mr. Burrows:

The Oglala Sioux Tribe of the Pine Ridge Indian Reservation respectfully requests a 90-day extension of time to file a request for hearing in the above-referenced License Application Request. As indicated in the Tribe's recent request for Sensitive Unclassified Non-Safeguards Information (SUNSI), Powertech's proposed Dewey-Burdock in situ leach uranium recovery facility project has the potential to directly and negatively impact the interests of the Tribe and its members.

The bases for the Tribe's request for an extension of time include: (1) the need to fully review the voluminous environmental and technical reports (with appendices and attachments) submitted by the applicant, much of which presents relevant data in a disordered manner; (2) the need to fully review the SUNSI documents and coordinate any contentions the Tribe may wish to raise; (3) the need for Tribal Government review and approval of any intervention application and associated contentions; and (4) the fact that the Tribe has associated new legal counsel in this matter, who need additional time to review the application and advise the Tribe.

First, with respect to the need for additional time to review the technical information in the applicant's license application documents, the attached letter from our expert, Dr. Robert Moran, describes the difficulty in conducting such a review, given the format of the application. A copy of Dr. Moran's letter and his curriculum vitae are attached. As Dr. Moran notes in his letter:

After reviewing a large portion of the approximately 6000 pages of relevant documents [Technical Report is 3103 pg.; Environmental Report is 2615 pg.; Supplement is 66 pg.], I find it is not possible to provide a meaningful expert review and technical comment on the adequacy of the documents within the time provided because they are quite disorganized, often with little consistency between the various documents, and frequently presenting information and interpretations in a technically inadequate manner. More importantly, the reports fail to provide the most important information necessary to commenting intelligently on these matters. Further details are presented below.

As such, in my professional judgment, in order for a qualified expert to have a meaningful opportunity to fully review, assess, and provide technical comment on the submitted Application, a minimum of an additional 60 days past the current contention submission deadline of March 8, 2010 is required. Failure to provide such an extension of the submittal date for contentions would effectively deprive the public of the required opportunity for review.

Moran letter at 1. Significantly, as far as the Tribe is aware, no paper copies of the materials have been made available for review on the Pine Ridge Reservation, or anywhere in Custer or Fall River Counties. A significant proportion of the public in this part of the country has no regular access to computer technology or high speed internet service. The sole alternative, copying several thousand pages of printed material exacts a financial burden few persons in this area could meet. For these reasons, there has been little or no meaningful public access to the materials for a large number of those who could be affected by the project if permitted. Given the volume of materials, the technical nature of the material, and the lack of physical access to that material, the Tribe respectfully requests an extension of time. This extension will allow the NRC to provide us with physical copies of the materials in a location readily available to the affected public and the Tribal membership. Only in this way will the Tribe be able to undertake a comprehensive review of the application in light of the preliminary concerns our expert raised during his attempt to review the application.

Second, as the NRC is aware, the Tribe has been granted access to documents from the license application materials which the NRC staff has designated as SUNSI. A resolution on the contours of a protective order has not been achieved, however, and the Tribe has not yet obtained access to these documents. While the Tribe is aware that the NRC's Notice of Opportunity for Hearing in this matter, published in the Federal Register, provides a 25-day period for the filing of what it terms "SUNSI contentions" after the grant of access to this information, this timeline will not be adequate, given the necessary detailed review of this information. As the matter stands, the 25-day period will extend beyond the date specified in the Notice of Opportunity for Hearing for submission of contentions (March 8, 2010). Given the extensive and careful review necessary to adhere to the strict pleading requirements of NRC regulations, comity and respect for the

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Request for Extension of Time to Request a Hearing

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efficient use of the Tribe's scarce resources dictates that the filing of all contentions be coordinated, rather than piecemealed as would occur without the extension requested herein. In fact, the extra burden of preparing and coordinating two separate tribal government reviews of any potential contentions would prejudice the Tribe by causing the unnecessary expenditure of extremely limited Tribal government resources.

Third, and related, is the need for coordination and approval within the Tribal government of any contentions that may be filed in this matter. The current date set for the filing of contentions provides inadequate time for the Tribe to conduct the necessary internal review. The issues raised by the proposed project involve sensitive matters to the Tribe, especially where the proposal may impact cultural issues and properties, human health, environmental, and water quality protection. These are matters the Tribe considers with the utmost care, and the time provided simply does not allow for the careful and meaningful review needed.

Fourth, as indicated by the recent notices of appearance, the Tribe has retained new counsel in this matter as of February 21, 2010. The attorneys require additional time to become familiar with the extensive license application materials, and to advise the Tribe as to the filing of contentions, should the Tribe decide to do so. Absent an extension as requested herein, the Tribe suffers prejudice in effectively limiting its ability to obtain complete legal counsel and advice.

For the reasons cited above, the Oglala Sioux Tribe respectfully requests that the NRC grant a 90-day extension of time for all persons, including the Tribe, to request a hearing in this matter, to include SUNSI-related contentions. This relatively short extension will afford the Tribe and the public the meaningful opportunity to review the voluminous application materials, assuming physical copies will also have been distributed in Custer, Fall River and Shannon (Pine Ridge Indian Reservation) Counties, SD.

We note that the NRC, as an agency of the United States, owes a trust responsibility to the Tribe and its members. We submit that this trust responsibility can be recognized and honored by the NRC's prompt grant of this reasonable extension request.

We would appreciate your response by March 1, 2010, so in the event this extension request is not granted, the Tribe will have time to take the matter up with the Commission and/or a federal court as appropriate. Your reply by email or telephone will be fine.

Please contact me with any questions or comments.

Sincerely,

GRACE DUGAN
Gonzalez Law Firm
Attorney for Oglala Sioux Tribe

2-23-2010

Robert E. Moran, Ph.D.
Michael-Moran Assoc., LLC
Water Quality/Hydrogeology/Geochemistry
Golden, Colorado, U.S.A.
remwater@gmail.com

To: Grace Dugan
Gonzalez Law Firm
522 7th Street, Suite 202
Rapid City, SD 57701

Subject: Need for 90-Day Extension, Dewey-Burdock License Application
Expert Review

Dear Ms. Dugan,

I am a hydrogeologist / geochemist with more than 38 years of applied experience related to natural resource development, including consulting related to uranium mining, processing, and environmental impacts. In addition, I have been contracted to supply comments to Powertech (USA) Inc.'s Dewey-Burdock In Situ Recovery NRC License Application for the express purpose of aiding the Oglala Sioux Tribe, and others, in the drafting of contentions to be submitted to the NRC. My CV is attached.

After reviewing a large portion of the approximately 6000 pages of relevant documents [Technical Report is 3103 pg.; Environmental Report is 2615 pg.; Supplement is 66 pg.], I find it is not possible to provide a meaningful expert review and technical comment on the adequacy of the documents within the time provided because they are quite disorganized, often with little consistency between the various documents, and frequently presenting information and interpretations in a technically inadequate manner. More importantly, the reports fail to provide the most important information necessary to commenting intelligently on these matters. Further details are presented below.

As such, in my professional judgment, in order for a qualified expert to have a meaningful opportunity to fully review, assess, and provide technical comment on the submitted Application, a minimum of an additional 90 days past the current contention submission deadline of March 8, 2010 is required. Failure to provide such an extension of the submittal date for contentions would effectively deprive the public of the required opportunity for review.

With respect to details as to the difficulty in review caused by the manner in which the application materials have been prepared, Tables 2.7-27, 28 and 29 of TR (pg. 2-198-199) serve as representative examples of the poorly-written, confusing nature of these documents. Because their titles are so inadequate, [i.e., Table 2.7-27: Quarterly Sampled Groundwater Quality Well Data; Table 2.7-

29: Additional Well Data] the reader has no way of knowing what sampling dates are represented. The total depths and screened intervals for many of the wells listed in Table 2.7-27 are not known. Hence, how can the reader reasonably interpret their usefulness?

Frequently the text will refer to a specific table or figure, but when the reader goes to that table or figure, it is not the one referred to. A typical example can be found on pg. 2-199 of the TR, where the text refers to Table 2.7-29, when in fact it is discussing Table 2.7-30. Such mistakes are common in these Application documents and are quite confusing to the reader.

No coordinated, statistically-sound data set for **all** Baseline Water Quality (both surface and ground water) is presented in these documents—as is required in NURGEG--1569. For example, on pg. 2-14 and 2-15 of the Technical Report (TR), Sect. 2.2.3.2.2., Powertech states: “At the project site, baseline groundwater sampling was conducted in general (sic) accordance with NRC Regulatory Guide 4.14 (NRC, 1980). ... A summary of the results and methods for the groundwater quality monitoring program, as well as the historical TVA data, is presented in Section 2.7.” However, when the reader goes to Section 2.7, there are no tables that actually summarize, statistically, complete baseline field and lab water quality data for the complete data sets—both historic and recent. Instead, for ground waters, Powertech presents statistics for field data from individual wells or selected aquifers, but fails to statistically-summarize the laboratory data and leaves out the historic TVA data. Powertech then states (TR, pg. 2-203): “Complete groundwater quality data results are available in Appendix 2.7-G.” However, on pg. 2-205 (Sect. 2.7.3.2.2.2, Results for Laboratory Parameters) Powertech then states: “Summary statistics for baseline monitoring program laboratory samples are contained in Appendices 2.7-H and 2.7-I. Appendix 2.7-H **gives statistics for all groundwater constituents detected at or above PQL by constituent.**” Thus, it appears that Powertech has not included “qualified values,” that is data reported as “less than” some concentration. By deleting the “less than” values, Powertech has severely biased the data set, rendering it useless as a reliable source for evaluating baseline conditions.

Furthermore, Powertech states (TR, pg. 2-217-218) that they have arbitrarily selected some analyses from the voluminous, historic TVA data, but the reviewer is never allowed to see a statistical summary of the total original data set. Portions of the relevant data are scattered throughout the Appendices of the various documents, and disingenuously organized to leave out all baseline data that had concentrations reported below the detection limits (i.e. “less than” values). Obviously, this approach biases the data. Powertech must statistically summarize all historic water quality data and all recently collected data in separate tables, including all “less than values.” Both historic and recent baseline data should be segregated by water-bearing unit.

2-23-2010

To further confuse the baseline issues, Powertech's Supplement to the Application (August 2009) states on pg. 3-3: "A minimum of eight baseline water quality wells will be installed in the ore zone in the planned well field area." Thus the massive amounts of water quality data (historic and recent) presented in both the TR and ER (Environmental Report) will not actually be used to determine baseline. More importantly, it is unclear whether Powertech has baseline (pre-operational) ground water quality data that describes the **non-ore zone regions of the relevant aquifers**.

Overall, the presentation of the information and technical data is in such a state that a comprehensive review of the materials for use in the preparation of any contentions will require a minimum of 90 days additional time beyond the current deadline.

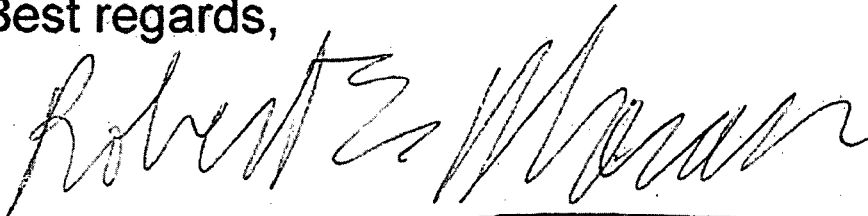
Thank you for considering these comments. I can be contacted at the following coordinates if you have further questions:

Work: 303.526.1405;

Cell: 303.358.8720—functions only when away from home/office;

remwater@gmail.com

Best regards,

A handwritten signature in black ink, appearing to read "Robert E. Moran", written over a horizontal line.

Robert E. Moran

Robert E. Moran, Ph.D.

Michael Moran Associates, L.L.C.
Water Quality/Hydrogeology/Geochemistry
Golden, Colorado, U.S.A.
Phone: (303) 526-1405
Fax: (303) 526-2678
remwater@gmail.com

EDUCATION

University of Texas, Austin: Ph.D., Geological Sciences, 1974
San Francisco State College: B.A., Zoology, 1966

PROFESSIONAL HISTORY

Michael-Moran Associates, LLC, Partner, 2003 to present
Moran and Associates, President, 1983 to 1992; 1996 to 2003
Woodward-Clyde Consultants, Senior Consulting Geochemist, 1992 to 1996
Gibbs and Hill, Inc., Senior Hydrogeologist, 1981 to 1983
Envirollogic Systems, Inc., Senior Hydrogeologist/Geochemist, 1980 to 1981
Tetra Tech Intl./ Sultanate of Oman, Senior Hydrogeologist, 1979 to 1980
Science Applications, Inc., Geochemist/Hydrologist, 1978 to 1979
U.S. Geological Survey, Water Resources Division, Hydrologist/Geochemist, 1972 to 1978
Texas Bureau of Economic Geology, Research Scientist Assistant, 1970 to 1971

REPRESENTATIVE EXPERIENCE

Dr. Moran has more than thirty-seven years of domestic and international experience in conducting and managing water quality, geochemical and hydrogeologic work for private investors, industrial clients, tribal and citizens groups, non-governmental organizations, law firms, and governmental agencies at all levels. His experience includes the following representative project assignments:

- Comisión de Gestión Integral de Aguas de Bolivia (Commission for the Integrated Management of Bolivian Waters) and Federación Regional Única de los Trabajadores Campesinos del Altiplano Sud (Regional Farmers Federation of the Southern Altiplano), Bolivia. Review of present mining activities and documents related to the San Cristobal Mine. Activities funded by the Municipality of Colcha K (Potosí, Bolivia), the Centro de Estudios de la Universidad de San Simón, Cochabamba, and Global Green Grants Fund.
- Shute, Mihaly & Weinberger / San Diego State University Research Foundation. Review of hydrogeologic / environmental impacts associated with quarry construction near a university wildlife refuge.
- Sarah Vogel Law Firm, North Dakota. Litigation support and evaluation of environmental impacts resulting from a release of oilfield waters onto livestock lands and waters.

- IKV Pax Christi (Netherlands), Tolima, Colombia. Technical review of proposed La Colosa gold project (Anglo Gold Ashanti); interaction with regulators, civil society and company; prepare recommendations & report.
- Thompson Divide Coalition, Western Colorado. Technical assistance to a consortium of environmental groups in designing and conducting a baseline water sampling program in anticipation of gas drilling activities.
- Global Green Grants / Nature's Own, Papua New Guinea. Prepare technical / policy papers on marine disposal of mining wastes.
- SAVIA, School of Ecological Thought / Comision Pastoral Paz y Ecologia, Guatemala. Presentations on ecological aspects of resource legislation to Guatemalan government ministries, high-level officials, and educational institutions. Conduct water quality training classes; assist with development of laboratory capabilities.
- Astrella & Rice, Colorado, U.S.A. Technical assistance in preparing litigation arguments for citizen lawsuit involving alleged drinking water contamination by oil and gas activities.
- Office of the Prime Minister, Iraqi Kurdistan. Development of information infrastructure and management training for numerous ministries in Northern Iraq; done in partnership with faculty of American University, Washington, D.C. Headed an audit team for the Regional Statistics Organization.
- Southwest Research and Information Center / Buryat Regional Organization on Baikal / Mongolia Nature Protection Coalition; Buryatia, Siberia, Russia and northern Mongolia. Technical information exchanges with local NGOs, government officials and mining company staffs.
- Rulison Citizens Group / Public Counsel of the Rockies. Colorado. Development of technical arguments and potential litigation support intended to define environmental issues related to gas development near the Rulison underground nuclear test site. Hearing testimony.
- The Nature Conservancy, Trout Unlimited, Alaska Conservation Foundation, Trustees for Alaska and Renewable Resources Coalition, Alaska. Presentations to public interest groups and development of technical issues and papers relating to construction of the Pebble copper-molybdenum-gold mine, proposed for operation above the largest sockeye salmon fishery in the world.
- Wild Salmon Center, Alaska. Technical evaluation of hydrogeological, and chemical issues that may impact fisheries near the proposed Pebble Mine.
- Miller, Axline & Sawyer / Meyers, Nave, Riback, Silver & Wilson / City of Grass Valley, California. Technical and litigation support in a suit alleging contamination by Newmont Mining Corporation; deposition testimony.
- Latin American Water Tribunal. San Salvador, El Salvador. Prepare presentations and conduct workshops on water and water quality. Funding: Heinrich Boll Foundation.

- Alburnus Maior, Rosia Montana, Romania. Evaluation of EIA and preparation of summary report on a proposed gold mine in Transylvania. Funded by the Staples Trust, U.K. and the Open Society Foundation, Romania.
- Asociacion de Desarrollo Social Santa Marta (ADES), El Salvador. Evaluate EIA and related documents; technical presentation at national forum; prepare review report. Funded by DIAKONIA, Swedish Ecumenical Action.
- Alburnus Maior, Romania. Review documents and prepare comments related to development of proposed Rosia Montana Mine for a Romanian NGO.
- La Lumiere, Senegal and WACAM, Ghana. Conducted water quality training sessions for NGO and government staffs, as related to mining and other development activities. Funded by Oxfam America.
- ESRI (Environmental Systems Research Institute). Provide technical assistance to several Iraqi Ministries to define information management needs, deploy map-based systems (GIS), and establish a Middle East-based Center of Excellence to support these ministries.
- Colectivo Madre Selva, Guatemala. Evaluation of Marlin Mine site, review of EIA and preparation of report; attendance at national and indigenous mining forums; conducted water quality training; review of CAO / IFC documents. Funded partly by Misereor, Catholic Bishops' Development Organization, Germany.
- International Union for Conservation of Nature and Natural Resources (IUCN, Switzerland). Review of the Mining and Metals Supplement of the Global Reporting Initiative (GRI).
- World Bank, Extractive Industry Review. Member of Advisory Group assisting WB in evaluating extractive industry practices.
- Nishnawbe Aski and other Ontario First Nation bands---Ontario, Canada. Review of environmental documents relating to Montcalm Mine, a proposed copper-nickel facility. Activities paid for by Falconbridge Limited.
- Kazakh Institute of Physics and Technology / ISTC---Almaty, Kazakhstan. Technical oversight of environmental program, evaluating migration of radionuclides at the Semipalatinsk Nuclear Test site.
- Greenpeace Argentina / Mineral Policy Center---Esquel, Argentina. Review of EIA (water, environ. issues) and conditions at proposed mine in Patagonia.
- Oxfam America / Sahel Development Foundation ---Syama Mine, Southern Mali. Review of environmental conditions and documents related to an IFC-funded gold mine (2003); conduct technical workshops and policy meetings with Mali government and press (2004).
- Kivalina Relocation Planning Committee---Alaska. Litigation support to Center on Race, Poverty & the Environment regarding water quality issues, Red Dog Mine. Deposition testimony.
- Asociacion de Organismos No Gubernamentales---Santa Rosa de Copan, Honduras. Independent review of water / environmental issues at San Andres

mine; funded by Dan Church Aid (Danish government and NGOs) and Christian Aid (English NGO).

- Oxfam America / Friends of the Earth Int'l. / Global Green Grants---Quellaveco, Peru. Independent review of mining, water and environmental issues at request of Asociacion Civil "Labor", Lima.
- Oxfam America / Mineral Policy Center / Environmental Mining Council of B. C.: Tambogrande, Peru. Independent review of mining water and environmental issues. Includes numerous public presentations to citizens and governmental groups, including members of the Peruvian Congress.
- New Mexico Environment Department---New Mexico. Review of cost estimates for water treatment systems for closure plans / bonding calculations, Chino and Tyrone Mines.
- International Institute for Environment and Development---London, U.K. Consultant to MMSD project on sustainable development / mining issues.
- Technical Chamber of Greece---Thrace, Greece. Technical assistance to an advisory arm of the Greek government and citizens groups regarding gold mining / environmental issues.
- Malerah-Wahlabul Native Title Claimants / Friends of the Earth---Sydney, Australia. Review of water quality issues related to cyanide leach gold operations on aboriginal lands, and testimony at Land and Environment Court.
- Loeb Aron & Co.---London, U.K. Preparation of report evaluating the Baia Mare, Romania waste spill for an investment banking firm.
- Centro de Investigacion y Planificacion del Medio Ambiental (CIPMA) / World Resources Institute / International Development Research Centre---Chile. Evaluation of environmental costs associated with copper mining in Chile.
- Carl Duisberg Gesellschaft / Univ. of Witwatersrand / United Nations---South Africa. Teaching cyanide technology and environmental technology assessment issues.
- Dogrib Nation / Pape and Salter---Yellowknife, Canada. Geochemical consulting and testimony regarding the proposed Diavik diamond mine.
- Soros Foundation Kyrgyzstan---Bishkek, Kyrgyzstan. Water quality instruction to regulators and NGOs regarding mining, sampling, laboratory procedures, and general environmental issues. Review laboratory.
- General Chemical / Sierra Club---Piceance Basin, Colorado. Review of water quality, treatment, legal and policy issues regarding the proposed Yankee Gulch soda ash mine; hearing testimony.
- Sierra Club Legal Defense Fund / Okanogan Highlands Alliance---Crown Jewel Mine, Washington. Litigation support on water quality, geochemistry, treatment issues to groups opposing proposed gold operation; test case on federal mining law; deposition testimony.
- National Wildlife Federation---Carlota Mine, Arizona. Litigation support for challenge of EPA regarding water quality/ treatment issues at copper mine.

- Review of TMDL issues related to Pinto Creek for NWF and local citizens.
- International Rivers Network---Review of proposed dam project and associated mine water quality issues at the San Roque site, Philippines.
- Mineral Policy Center---Preparation of technical documents on the environmental behavior, analysis and toxicity of cyanides.
- Holnam Industries---Penrose, Colorado. Ground water quality/ geochemistry study for cement operation.
- World Resources Institute---mining water quality/ geochemistry assistance on Venezuelan forestry / mining environmental regulations, and on environmental economics of copper mining practices, Chile.
- U.S. EPA / American Geological Services---French Gulch, Colo. Geochemical / treatment /remediation support at an abandoned mine site; negotiated Superfund issues.
 - Stoel Rives---Richmond Hill Mine, So. Dakota. Review water quality treatment and geochemistry issues at a closed gold mine site with discharge violations.
 - Nacho Nyak Dun First Nation/ Pape and Salter---Yukon, Canada. Evaluation of proposed heap-leach gold mining facilities and practices for native group and barristers.
 - Molycorp/ Unocal---Questa, New Mexico. Review of water quality/ geochemical / aquatic biology issues at a molybdenum mine/ mill site.
- Homestake Mining< Lead, South Dakota, U.S.A. Review of water quality and geochemical problems and waste rock storage and tailings stability issues.
- U.S. Bureau of Land Management / Summo Minerals---Lisbon Valley, Utah. Review of water quality and geochemistry, and assistance in preparation of an EIS at a proposed copper mining and recovery site.
- Southern Peru Copper Corp. -Toquepala, Peru. Design and oversight of water quality, geochemistry, and remediation issues at an open-pit copper mine, mill, and waste facilities.
- Cortez Mining/ Placer Dome / U.S. Bureau of Land Management - Pipeline Project, Nevada. Review of water quality and geochemistry and preparation of EIS-related reports at this proposed open pit gold site.
- Kennecott Utah Copper. Interacted with the law firm of Bogle and Gates to assist an active metal mining company in defending against a CERCLA listing. Activities involved interpreting water quality/geochemical and other environmental data within the Hazardous Ranking System (HRS) context.

- Asarco - Leadville, Colorado. Oversight of water quality and geochemical activities at a historic metal mining and processing site where the client is involved in CERCLA negotiations. Interaction with State and EPA representatives and legal staff.
- Cambior Minerals - Metates Mine, Mexico. Water quality and geochemistry evaluation of a new gold property.
- Fraser Stryker and the Lindsey Chemical Co. - Nebraska. Technical support to legal staff involved in negotiations regarding a Superfund industrial processing site.
- W.R. Grace - Motorwheel Site, Michigan. Technical assistance to Grace legal staff involved in CERCLA negotiations at a hazardous waste site.
- Zortman Mining Co./U.S. Bureau of Land Management. Technical and management responsibilities for water resources and geochemistry tasks in preparation of revised EIS at a gold-cyanide leach site with existing acid drainage problems.
- Echo Bay Mining, Lamefoot Mine, Republic, Washington. Responsible for geochemistry and water quality aspects of a supplemental EIS at a new gold mine site. Development of monitoring, testing and remedial recommendations to the BLM.
- Angelina Farms, Louisiana. Technical support to legal staff of oil production companies accused of contaminating groundwaters with brines.
- Chino Mines, New Mexico. Technical evaluation of water quality and geochemical issues associated with leaching operations at an operating copper facility.
- Amax Gold/Haile Mining, South Carolina. Water quality consulting at a gold mining site with existing acid drainage problems.
- Shea and Gardner / Rockwell--Rocky Flats Plant, Colorado. Reviewed and evaluated geochemical studies; proposed future activities in preparation of potential litigation.
- Saunders, Snyder, Ross and Dickson/American Water Development, Inc. - San Luis Valley, Colorado. Coordinated water quality and geochemistry activities in support of water rights litigation. Oversaw water quality sampling, evaluated water quality and remote sensing data, assisted attorneys in technical strategy development and opponents' depositions; supplied deposition testimony.

- Arnold and Porter/Keystone Ski Corporation - Keystone, Colorado. Designed water quality and geochemical sampling program for ski area expansion in a previously mined area. Evaluated data and proposed remediation activities.
- Advanced Sciences, Inc./EG&G - Rocky Flats Plant, Colorado. Evaluated existing water quality and geochemical sampling programs; prepared document on non-facility related sources of chemical constituents and background.
- City of Brighton - Brighton, Colorado. Evaluated existing surface and groundwater quality data and suggested remedial activities to deal with excessive manganese and dissolved organic concentrations. Provided testimony to City Council.
- Chadwick & Associates, Inc./Newmont Mining - Telluride, Red Mountain, Colorado. Provided diverse water quality and geochemical consulting relating to remediation of acid mine drainage problems.
- Intergraph Corp. - Reston, Virginia. Assisted in technical development and marketing of a new environmental data management/GIS product.
- U.S. Forest Service - Salmon, Idaho. Acted as a geochemical/water quality consultant at the Beartrack mine site, a proposed cyanide-leach gold project.
- Earth Satellite Corporation/Navajo Nation/Patton, Boggs, and Blow - Window Rock, Arizona. Conducted a preliminary reconnaissance of water resources on the joint-use area of the Navajo/Hopi reservations using satellite imagery.
- Mission-Viejo/Morrison and Forester - Denver Basin, Colorado. Acted as a geochemical consultant in a groundwater rights dispute.
- Bunker Hill Corporation/Dames and Moore - Kellogg, Idaho. Reviewed field and laboratory water quality procedures at a CERCLA metal-mining and processing facility. Audited proposed laboratory.
- Saunders, Snyder, Ross, and Dickson/Adolph Coors Company - Golden, Colorado. Water quality consultant; reviewed data from Central City/Blackhawk, CERCLA site, and determined potential impact to the Coors water treatment plant. Provided testimony at stream classification hearings, Colorado Water Quality Control Commission.

- Colorado Water Resources and Power Authority - San Luis Valley, Colorado. Conducted water quality/geochemical and Landsat evaluations of deep groundwater to aid in development decisions.
- Armstrong, Teasdale, Kramer, Vaughan, and Schlafly / Anschutz Corp.-- Fredricktown, Missouri. Supervised technical activities of a CERCLA / SARA-related lawsuit; acted as a technical liaison with attorneys and regulators; managed consultants; authored reports; deposition testimony.
- Holland and Hart/White and Jankowski/Weller, Friedrich, Ward and Andrew/Breckenridge Ski Corporation - Breckenridge, Colorado. Technical supervision of water quality-related issues in a private lawsuit against Breckenridge Ski Corporation. Managed sampling and data interpretation; interacted with attorneys on strategy and assisted at depositions; authored reports; expert witness.
- Dames and Moore/Hecla Mining Corporation - Leadville, Colorado. Acted as hydrogeological/geochemistry consultant to Hecla on a natural resources damage suit; interacted with attorneys at Davis, Graham and Stubbs.
- Dames and Moore/Davis, Graham and Stubbs - Eagle Mine, Colorado. Supervised water quality/hydrogeology activities in preparation of a legal defense of Gulf and Western Corporation versus the State of Colorado in a natural resources damage suit; supervised and participated in all sampling; QA activities and report preparation; interacted with attorneys and regulators; assisted at depositions; deposition testimony; testified before Colorado Water Quality Control Commission on appropriateness of proposed metals standards.
- Jacobs Engineering - Albuquerque, New Mexico. Prepared policy documents on water quality/geochemistry procedures associated with the Uranium Mill Tailings Remedial Actions Project (UMTRA).
- University of Wisconsin. Designed a proposed groundwater exploration program for Gambia, West Africa, in conjunction with Earth Satellite Corporation.
- Harza Engineering Company/University of Michigan - Senegal, Guinea, and Gambia, West Africa. Evaluated potential impacts of new dam construction within the Gambia River basin. Reviewed local hydrogeology, mining production and exploration data; interacted with local officials.
- Engineering-Science, Inc. Faisalabad, Pakistan. Assisted in design of a well field for a groundwater supply in the central Punjab where high salinity

and TDS were major problems; negotiated with local officials; prepared reports for Asian Development Bank.

- Holme Roberts and Owen - Canon City, Colorado. Reviewed and interpreted existing hydrogeology and water quality data at the Cotter uranium mill and tailings; proposed future activities; interpreted background concepts, prepared position papers for attorneys in negotiations with State of Colorado.
- Earth Satellite Corporation - Sultanate of Oman. Conducted an interpretive study of regional groundwater potential in Oman, with the staff of Earth Satellite Corporation. Activities included interpretation of existing geology and Landsat imagery combined with conventional low altitude flight and ground reconnaissance. Prepared reports for government of Oman.
- Anschutz Mining Corporation - Fredericktown, Missouri. Managed water resource-related activities for environmental baseline studies at a proposed cobalt/ nickel mine. Designed sampling programs, oversaw sampling, data interpretation, and report preparation.
- Kemmerer Coal Company - Frontier, Wyoming. Managed and conducted hydrogeologic and water quality studies at a proposed open-pit coal mine. Supervised well installation, aquifer testing, sampling, report preparation; interacted with state regulators.
- Anaconda Copper Company - Rico, Colorado. Conducted an investigation of hydrology, water chemistry, and aquatic biology at a complex ore mining district.
- Union Carbide Corporation - Uravan, Colorado. Managed and conducted a water quality monitoring program for a proposed uranium tailings disposal area and effluent evaporation basin. Assisted in design of geochemical testing program to evaluate potential leachate quality.
- Anschutz, Mining Corporation - Laredo, Texas. Managed and conducted an investigation of groundwater hydrology and soils geochemistry and associated hazardous wastes at a metal ore handling and reagent storage facility. Designed sampling protocol; prepared reports; negotiated with state regulators; interacted with attorneys at Baker, Botts.
- Snowmass Coal Company - Carbondale, Colorado. Managed and conducted hydrogeology investigation of an underground coal mine with steeply dipping seams.

- Marline Uranium Corporation/Union Carbide Corporation - Danville, Virginia. Managed water resources portion of a baseline investigation at a proposed hard-rock uranium mine site. Oversaw well installation monitoring programs and dewatering investigations.
- Southern Pacific Petroleum - Means, Kentucky. Conducted baseline hydrogeological/geochemical investigations at a proposed oil shale mine and retort facility.
- Central Arizona Association of Governments - Globe/Miami, Arizona. Conducted study to determine hydrogeologic/geochemical impact of long-term copper mining and processing facility. Designed monitoring programs; interacted with federal, state, local and tribal officials; prepared numerous reports.
- United Nuclear - Homestake Partners - Milan, New Mexico. Conducted hydrogeological/geochemical evaluation of an existing monitoring program for a uranium milling and waste-disposal facility.
- Sultanate of Oman/Tetra Tech International - Muscat, Oman. Member of Water Resources Council Staff, Sultanate of Oman, based in Muscat, Oman. The Water Resources Council was an interministerial body intended to coordinate all water-related activities within the Sultanate. Duties involved planning and design of surface and groundwater projects (both exploration and utilization) for the Omani government; development of water resources policy for the government; hydrogeological field work on both exploration and resource characterization projects - aquifer testing, borehole geophysics, water quality sampling, hydrogeologic mapping; review of work performed (or planned) by other consultants to the government, published reports on water resources of Oman.
- EG&G - Idaho National Engineering Laboratory, Idaho Falls, Idaho. Managed a hydrologic investigation of transuranic nuclide migration in groundwater. Contributed geochemical expertise to evaluation of waste isolation and transport modeling.
- Kerr-McGee Corporation - Grants, New Mexico. Conducted investigation into geochemistry of selenium associated with uranium mining/ milling.

While with the U.S. Geological Survey Water Resources Division, Dr. Moran was responsible for the design, management, and implementation of the following hydrogeological / geochemical studies:

- Metal-Mine Drainage - Colorado. Study of extent and magnitude of mining and mine drainage on the quality of Colorado streams.
- Selenium in Groundwater - Golden, Colorado. Hydrogeological/geochemical investigation of selenium and associated constituents at the margins of Rocky Flats nuclear plant.
- Geothermal Resources - Colorado. Reconnaissance investigation of potential geothermal resources throughout Colorado.
- Underground Coal Mine Water Quality - Colorado. Evaluation of existing and potential water quality problems from underground coal mines.
- In Situ Uranium Leaching - Grover, Colorado. Study of geochemical and hydrologic processes associated with in situ uranium mining and reinjection of waste products.
- Alluvial Metal Transport - Telluride, Colorado. Investigation of metal movement from tailings ponds into alluvium.
- Southwest Colorado Groundwater - Colorado. Study to determine availability and quality of groundwater in southwestern Colorado.
- Oil Shale Waters - Piceance Basin Colorado. Evaluation of disposal of saline groundwater discharged to the surface during oil shale development.
- Grace Coal Site - Axial Basin, Colorado. Hydrogeological /water quality study of proposed open-pit coal site.

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