

**United States of America
Federal Energy Regulatory Commission**

**Notice Requesting Applications for Panel Member List for Hydropower
Licensing Study Dispute Resolution**

Docket No. AD04-4-000

The following information is submitted to USFERC in response to their request for qualified applicants to serve as panel members for disputes associated with hydropower licensing.

Item #1: Areas of Technical Expertise:

Geology: (i.e., including sub-areas of geomorphology, erosion and general)

I am a licensed Professional Geologist in several states including Wyoming, Pennsylvania, Kentucky and Illinois. I have a Bachelor of Science degree in Geological Sciences from Rutgers University in New Brunswick, New Jersey, a Professional Degree in Geological Engineering and a Master of Engineering degree in Earth Systems Engineering from the Colorado School of Mines in Golden, Colorado. I am certified and registered as a Professional Hydrogeologist by the American Institute of Hydrology.

I have worked in consulting engineering industry for over seventeen years. My first geologic project was a Superfund site called American Thermostat in South Cairo, New York in 1987. I was the field operations leader. I was responsible for administering and coordinating an investigation of groundwater contamination that resulting from the improper disposal of trichloroethylene and tetrachloroethylene. The investigation consisted of delineation of contaminant migration in the groundwater systems including both soil and hard rock formations. As part of this investigation, unconsolidated and bedrock wells were installed to depths of 400 feet. Geophysical surveys (e.g. resistivity, gamma, spontaneous potential and caliper) were conducted to identify various rock formations and fracture zones through which groundwater and contaminants could migrate. Packer testing was also performed to estimate the volume of flow and sample groundwater from individual fractures.

Subsequent to completing this project, I worked on other numerous projects including modeling of groundwater flow regimes in shallow unconsolidated and deep bedrock formations. I have worked as a technical professional, project manager and department manager at several firms. I have attached a copy of my resume for your review.

Academically, my graduate studies have include analyzing and interpreting soil and rock slope stability (i.e., associated with erosion), soil and rock strengths, groundwater flow in soil and fractured rock systems, tunnel design and construction, and groundwater movement under man-made structures such as dams. I have studied surface water hydrology, groundwater hydrology, groundwater modeling and finite element analysis. I have studied geomorphology and glaciology and applied my knowledge to delineating landforms through aerial photograph, satellite imagery and field survey interpretation. My undergraduate studies have also included historical geology, mineralogy, petrology, sedimentology, stratigraphy, field geology (i.e., mapping), marine geology, paleontology, and paleoecology.

In addition, I have also studied U. S. environmental law, international environmental law and exploration and mine law (i.e., both U.S. and International). Through these studies, I have acquired an understanding of how our legal system works, sources of environmental law, the major USEPA enforcement programs, state and local match programs, and various regulations and statutes for the National Environmental Protection Act (NEPA), the Clean Air Act (CAA), the Clean Water Act (CWA), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Resource Conservation Recovery Act (RCRA), as well as, several others.

Socio-Economics:

My work as a professional requires that I evaluate the cost of each project and its potential impact on the people in the community who are most likely to be affected by the project. In particular, it is necessary to identify the advantages and disadvantages that may result from the implementation of a specific project. Several types of economic analyses are performed including cost-benefit, present and future worth analyses and alternative evaluations. Some or all of these analyses and evaluations might be included in a feasibility study. My undergraduate and graduate studies that support my understanding of socio-economics have included courses in sociology, psychology, economics, law, anthropology, biology and archeology.

Engineering: (i.e., including sub-areas of civil, hydraulic and general engineering)

As mentioned in the previous paragraphs, I have both undergraduate and graduate degrees in engineering (e.g., geological and earth systems engineering) from the

Colorado School of Mines in Golden, Colorado. I am also licensed as a Professional Engineer in civil engineering in Colorado, Pennsylvania and New Jersey. I am certified and registered as a Diplomate Environmental Engineer by the American Academy of Environmental Engineers. My graduate studies have included advanced soil mechanics, foundation engineering, microtunneling, tunneling, hazardous waste engineering and geotechnics. I have also taken a graduate course in dispute resolution board procedures and protocols. My undergraduate studies included statics, dynamics, mechanics of material, fluid mechanics, thermodynamics, hydrology and rock mechanics.

Professionally, I have worked on the design of various engineering systems and structures including water treatment systems, water supply systems, storm water and sewer systems, foundations, tunnels, roads and buildings. My resume is attached with more detailed information.

Currently, I am in the process of completing a doctoral degree in earth systems engineer at the Colorado School of Mines. My thesis topic consists of developing better method and procedures for estimating groundwater inflows into tunnels.

Item #2: Knowledge of the effects of construction and operation of hydroelectric projects.

I think it is important to understand how the construction and operation of a hydroelectric project may impact local communities and the environment. Specifically, the construction of a hydroelectric project such as a dam may impact local wildlife in the river and along the banks of a river that may warrant some efforts to mitigate these impacts. In addition, communities located along the banks of a river or near the river may be affected in so far as potable water supplies may need to be modified. Communities may have to be relocated in areas where dams are proposed. Also, a complete analysis of how the re-shaping of the topography of the land may need to be evaluated for slope stability. The operation of the hydroelectric project may also warrant some consideration, for example, excessive noise pollution can greatly impact wildlife in an area.

Item #3: Working knowledge of laws relevant to expertise.

As mentioned previously, in the practice of my profession, I have had to incorporate my understanding of legal issues in all engineering design. Particularly, in areas related to the Clean Water Act and Coastal Management Act when I was designing a wastewater treatment facility. I have also taken graduate courses in U. S. environmental law, international environmental law and

exploration and mining law. Therefore, I have had to learn various statutes and regulations that might effect the construction or design of an engineering project.

Item #4: Ability to promote constructive communication about a disputed study.

I think that the presentation of information present in previous paragraphs exemplifies my abilities to communicate effectively. My studies in dispute resolutions have given me a strong foundation for working with other professionals and understanding the mechanisms of the process and the potential needs of all stakeholders.

Mark J. Vanarelli, PE, PG, PHG, DEE
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Denver, CO 80401
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Professional Experience

1999-Present **COVAN Engineering LLC, Denver, Colorado**

Principal Engineer (Independent Practice, Part-time)

Managed all engineering work for civil, hydrogeologic and geotechnical projects. Prepared and reviewed soil and foundation reports. Designed foundations for residential houses. Prepared pavement designs for commercial developments. Inspected building foundations. Managed a renovation for a jail in Costilla County that included re-design of structural supports, electrical and mechanical layouts, fire protection, and security. Prepared contract documents and specifications for all components of the jail renovation. Conducted groundwater studies. Performed environmental site assessments. Prepare proposals for various business opportunities. Responsible for the overall profit and loss of engineering projects. Held meetings with clients and interfaced with government officials and attorneys. Coordinate all business development and marketing efforts. Clients include land developers, geotechnical laboratories, local/state agencies and private companies/citizens.

1998 - 1999 **Baltec Associates, Inc., Armonk, New York**

Manager of Engineering Services

Provided overall management and technical guidance for the design of wastewater/remediation systems at petroleum bulk fuel distribution terminals and commercial fuel service stations in New York, Massachusetts, and Rhode Island. Reviewed designs of aboveground storage tank systems. Responsibilities include providing senior technical review of all engineering projects and managing technical professionals in the performance of all engineering projects. Supervised and coordinated soil vapor extraction tests and air sparging tests.

1997-1998 **Port Authority of New York and New Jersey, New York City, New York**

Consultant

Managed large-scale petroleum hydrocarbon investigations and remediation programs for bulk fuel farms at Newark International Airport and John F. Kennedy International Airport. Responsibilities included developing remediation programs (i.e., injection/pumping well systems, soil vapor extraction systems and air sparging systems) utilizing groundwater models such as MOVER, BIOSLURP, MODFLOW, BIOF&T and SURFER. Coordinated work effort to develop contract document and engineering drawings for Newark Monorail System.

1994-1996 **Louis Berger and Associates, Inc., East Orange, New Jersey**

Project Manager

Managed and directed staff professionals in geotechnical engineering projects. Responsibilities included review and preparation of final reports, proposals, cost estimates and schedules. Coordinated geotechnical investigations for highway construction projects. Managed six drill rigs with personnel. Collected rock cores and classified samples utilizing RQD methods. Performed vane shear tests. Projects included highway construction investigations, industrial and military closures and commercial property transfers.

1992-1994 **Handex of New Jersey, Inc., Morganville, New Jersey**

Engineer

Provided technical support to the senior engineering and hydrogeology staff in selecting, designing, installing, and maintaining equipment and systems used in the remediation of soil and groundwater (e.g. pump and treat systems, bioreactors, and vapor extraction systems). Responsibilities included supervising the closure of underground storage tank systems and delineation of liquid-phase and soluble phase petroleum hydrocarbon contamination and modeling aquifer systems using AQUESOLV.

1989-1991 Clayton Environmental Consultants, Inc., Edison, New Jersey

Hydrogeologist

Prepared proposals and final reports for environmental site assessments, soil and groundwater investigations/remediation programs. Responsibilities included supervising soil remediation programs including landfarming and bioremediation, hollow stem drilling and monitoring well installation and preparing discharge investigative corrective action reports (DICARs) and ECRA submissions.

1987-1989 EBASCO Services, Inc. Lyndhurst, New Jersey

Geological Engineer

Prepared work and field operation plans on several Superfund (CERCLA) projects. Responsibilities included preparing bid specifications for monitoring well installations, geophysical logging and packer testing. Performed packer testing on fractured rock systems. Estimated hydraulic flow rates of rock systems. Coordinated groundwater, surface water, soil and sediment sampling programs. Classified soil samples utilizing Unification Classification System and a Modified Burmeister system. Supervised air rotary, hollow stem, and roller bit drilling. Interpreted geophysical logging such as caliper, gamma, resistivity and spontaneous potential. Conducted downhole television camera surveys, pump tests and slug tests. Analyzed pump and slug test data to determine hydraulic conductivity of soil formations.

Professional Registrations/Certifications

- Diplomate Environmental Engineer – American Academy of Environmental Engineers
- Registered Professional Engineer (i.e. Civil) – Colorado, Pennsylvania, and New Jersey
- Registered Professional Geologist – Pennsylvania, Kentucky, Illinois and Wyoming
- Registered Professional Hydrogeologist - American Institute of Hydrology (since 1995)
- Licensed UST Subsurface Evaluator - State of New Jersey

- Licensed in UST Closure - State of New Jersey
- OSHA 8-hour HAZWOPER Supervisor Training Certification
- OSHA 40-hour Hazardous Waste Operation and Emergency Response Certification

Professional Affiliations

National Society of Professional Engineers – Member since 1990
American Society of Civil Engineers – Member since 1997
American Consulting Engineers Council of Colorado– Member since 2000
Society of American Military Engineers – Member since 2001
Colorado Association of Geotechnical Engineers – Member since 2001
American Underground-Construction Association-2002

Education

B.S., Rutgers University, New Brunswick, New Jersey, 1983
Geol.E., Colorado School of Mines, Golden, Colorado, 1987
M.E., Colorado School of Mines, Golden, Colorado (GPA = 3.5), 2002
ABD (Ph.D.), Colorado School of Mines, Golden, Colorado

Computer Skills

Microsoft Word, MS Excel, MS Project 2000, MS PowerPoint, WordPerfect, Lotus 1-2-3, SURFER, MOVER, BIOSLURP, BIO F&T, MODFLOW2000, MT3D, GWVista, GMS, AQUESOLV, GEOSTAT, STERONET, CRSP, STABR, SLOPE1, GOLDNAIL, Rocscience (Phase 2), MathCad and UTEXAS3.

Mark J. Vanarelli, PE, PG, PHG, DEE

Graduate Studies

- Advanced Geotechnics - GEGN 672, CSM, Spring 2001 (3 sem. hours).
- Advanced Soil Mechanics – EGES 548, CSM, Fall 2001 (3 sem. hours).
- Advanced Engineering Geology – GEGN 571, CSM, Fall 2000 (3 sem. hours).
- Tunneling – MNGN 404, CSM, Spring 2003 (3 sem. hours)
- Rock Mechanics in Mining – MNGN 505, CSM, Fall 2002 (3 sem hours)
- Foundation Engineering – EGGN 464, CSM, Fall 2003 (3 sem hours)
- Microtunneling – MNGN 599, CSM, Fall 2002 (3 sem hours)
- Flow and Transport in Fractured Rock - GEGN 682, CSM, Fall 2001 (3 sem hours).
- Mathematical Modeling of Groundwater Systems - GEGN 583, CSM, Spring 2002
- Case Histories in Geological Engineering and Hydrogeology – GEGN 570, CSM, Fall 2001 (3 sem. hours).
- Hazardous Waste Site Remediation – ESGN 575, CSM, Spring 2002 (3 sem hours)
- Graduate Geology Seminar – GEOL 607, CSM, Spring 1987 (1 sem. hour).
- Geological Data Analysis – GEGN 532, CSM, Fall 2000 (3 sem. hours).
- Graduate Mining Seminar – MNGN625, CSM, 2002-2004 (3 sem hour)
- Introduction to Remote Sensing – GEOL 545, CSM, Fall 1985 (3 sem. hours)
- Exploration and Mine Law – MNGN598, CSM, Spring 2002 (3 sem. hours).
- International Environmental Law – ESGN602, CSM, Summer 2002 (3 sem. Hours)
- U.S. Environmental Law – ESGN 502, CSM, Fall 2002 (3 sem hours)
- Excavation Project Management – GOGN 506, CSM, Fall 2002 (2 sem hours)
- Patenting, Licensing and Inventing – EGGN 498, CSM, Field 2003 (3 sem. hours)
- International Industrial Psychology – LISS 513, CSM, Spring 2004 (3 sem. hours)
- Graduate Engineering Report (ME) – GEGN 700, CSM, Fall 2002 (3 sem hours)
- Graduate Research Credit (ME) – GEGN 704, CSM, Fall 2002 (3 sem hours)
- Graduate Research Credit (PhD) – MNGN 706, CSM, 2002-2004 (26 sem. hours)

Short Courses:

- Microtunneling – Short Course, Colorado School of Mines, 2003 (2.0 CEUs)
- Legislative Seminar, ACEC, 2002 (3.5 PDH)
- The Role of Failures and Failure Analysis in Engineering, PSI, 2001 (2.0 PDH)
- How to Prepare a Government Cost Proposal, Colorado Dept. of Transportation, 2001.
- How to Survive a Contract Audit, Colorado Dept. of Transportation, 2001.
- Entrepreneurial Training Workshop, SCORE, 2000.
- Site Investigation and Design in Limestone Terrains, Rutgers University, 1997 (0.6 CEUs).
- Planning and Engineering in Limestone Areas, Rutgers University, 1997 (0.6 CEUs).
- Technical and Regulatory Training in USTs, Rutgers University, 1995 (0.6 CEUs).
- 8-hour HAZWOPER Supervisor Training Course, New Jersey Institute of Technology, 1995 (0.8 CEUs).
- Professional Selling Skills, Learning International, 1993 (2-day course).
- UST Rules and Regulations course, NJDEP, 1992.
- Groundwater Management and Restoration Course, Executive Enterprises Inc.(EEI), 1990 (2-day course).
- 40-hour HAZWOPER Training Course, HAZCO, 1987 (4.0 CEUs).

Papers, Unpublished:

“South Fuel Farm Supplemental Investigation and Remediation Report”, Newark International Airport, Port Authority of New York and New Jersey, 1998.

“Comparison of Rock-fall Barrier Testing”, Graduate Engineering Report, Colorado School of Mines, Golden, Colorado, 2002.

References:

Mr. Richard San Pietro, Esq., Patent Attorney, Ph: 858-292-9468

Dr. Levent Ozdemir, PE, Professor of Mining, Ph: 303-273-3000

Dr. Vaughan Griffiths, PE, Professor of Engineering, Ph: 303-273-3000

Submission Contents

Application and resume of panel member on hydroelectric projects for Dispute Resolutions.

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