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09 March 1984
Ref. No. 1148

Wild Record File
D1004

Wild Record No. 1011
Docket No.

PDR
LPDR

U. S. Nuclear Regulatory Commission
7915 Eastern Avenue
Silver Spring, MD 20910

Distribution:

J. T. Greeves

Attention: Mr. John T. Greeves

(Return to WM, 623-SS)

Subject: Contract No. NRC-02-84-002
"Technical Assistance for In Situ Testing"

Ladies and Gentlemen:

As per a telephone conversation between Mr. John T. Greeves of the Nuclear Regulatory Commission (NRC) and the undersigned of Engineers International, Inc. (EI), a couple weeks back, we have formed separate teams to work on various waste repository media. The suggested teams are as follows:

	<u>BWIP</u>	<u>NTS</u>	<u>Salt</u>
Lead Project Engineer	V. Rajaram	M.M. Singh	R.A. Cummings
Senior Geologist	G. Buma	C.H. Baker	R.L. Jennings
Senior Mining Engineer	S.K. Mukherjee	S. Bhattacharya	M.F. Dunn
Consultants	M.A. Mahtab	R.D. Hart	M. Christianson
	A. Brown	Z.T. Bieniawski	F.S. Kendorski
		D.B. Stephens	A. Brown
Quality Assurance	L. Ackermann	L. Ackermann	D.J. Aucutt
Support Staff	S.E. Sharp	J.P. Schubert	P.L. Wilkey

The overall management of the project, as indicated to you in our letter dated 17 February 1984, will be Dr. Madan M. Singh. He will be assisted, as required, by Mr. Robert A. Cummings and Dr. V. Rajaram.

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Silver Spring, MD 20910
09 March 1984
Page Two

I believe that you have resumes of all the persons on the above list except Mr. Grant Buma, who is a Principal Hydrogeologist on EI's staff; this is included here. However, a few of the resumes were submitted in connection with Contract No. NRC-02-82-030, "Technical Assistance for Design Reviews," and not in the proposal for this contract; these are attached herewith for completeness.

We hope you will find this satisfactory. Should you have any comments on the above teams, please let me know. In the meantime, we are awaiting the receipt of the Task Orders on the subject contract and will initiate work on them when received.

Sincerely,

ENGINEERS INTERNATIONAL, INC.



Madan M. Singh
President

MMS/bt

Enclosures

cc: Mr. John Buckley



GRANT BUMA
Principal Geohydrologist

Grant Buma is a geohydrologist with 16 years of experience in all aspects of ground water testing, monitoring and modeling of impacts. He has successfully completed several projects in the United States and Australia, which have included design and installation of test wells, ground water sampling, tracer studies, permit procurement and compliance, and developing and implementing computer codes for modeling ground water impacts. He has developed innovative well drilling and completion techniques, and instrumentation for measurement of ground water thermodynamic data. He has managed large field projects in which ground water testing and evaluation was completed to establish the baseline ground water quantity and quality.

1984-Present: Engineers International, Inc., Westmont, IL.
Manages projects related to high level and low level radioactive waste disposal, cleanup of hazardous waste sites, and ground water impacts of coal, uranium, and metal mining.

1982-1984: Consulting Geohydrologist, Salt Lake City, UT.
Provided geohydrological services to several companies on the impacts of mining on ground water quality, aquifer restoration, and design and implementation of ground water testing and monitoring programs. Work included testifying at public hearings and serving as expert witness. Typical projects included:

- Design review for construction and installation of injection, production, and monitor wells for the US Bureau of Mines.
- Field inspection and design review of several well fields and 2 deep disposal wells in South Texas, including collection and evaluation of field data from aquifer tests for Niagara Mohawk Power Company.

1980-1982: Vice President, Minatome Corporation, Denver, CO.
Managed ground water and surface water testing and evaluation programs for uranium resource development in the western United States. Work involved liaison with government agencies for procurement of permits. Typical projects included:

- Design, installation, and operation of well fields in South Texas and Australia for aquifer testing
- Specification and procurement of equipment and instrumentation
- Collection and evaluation of field data.

1976-1980: Manager, Rocky Mountain Geochemical Corporation, Salt Lake City, UT.

GRANT BUMA (continued)

Established the ground water baseline and evaluated impacts from in situ leaching of uranium, gold, and potash operations in the western United States. Typical projects included:

- Evaluation of certain aquifers in eastern North Dakota and western Minnesota. Work included development of techniques and instrumentation as well as collection and evaluation of field data.
- Design and construction supervision of wellfields for aquifer testing and production including collection and evaluation of field data on several projects in the western U.S.

1973-1976: Manager, Wyoming Mineral Corporation, Denver, CO.

Managed several Research and Development programs related to in situ leaching of uranium in Texas and Wyoming. Developed and evaluated computer codes for analyzing the impacts of uranium mining on the ground water quality of the area. Responsible for property evaluation and development. Typical projects included:

- Design, installation and operation of experimental and production well fields. Design of 2 deep disposal wells including pretreatment facilities. Collection and evaluation of field data. Installation and startup of 3 commercial in situ leaching operations at:
 - Bruni, Texas
 - Lamprecht, Texas
 - Irigary Ranch, Wyoming.

1970-1973: Associate Scientist, Kennecott Copper Corporation, Salt Lake City, UT.

Participated in several projects involving ground water and surface water monitoring programs for the exploration and development of metal mines.

EDUCATION

MS (Earth and Planetary Science; Geohydrology specialty) - Massachusetts Institute of Technology, Cambridge, MA, 1970.

BS (Geological Engineering) - University of Utah, Salt Lake City, UT, 1968.

PROFESSIONAL SOCIETIES

American Institute of Mining, Metallurgical and Petroleum Engineers
American Association of Petroleum Geologists
National Water Well Association
Geochemical Society

ROBERTA L. JENNINGS
Senior Hydrogeologist

EXPERIENCE

1983-Present: Engineers International, Inc., Westmont, IL.
Participates in business development and technical management of projects involving solid and hazardous waste management, nuclear waste, and mining. Projects have included pollution assessment and remedial action planning, hydrogeologic exploration and reporting, surface and groundwater characterization and modeling. Has participated responsible in hydrogeologic assessment of nuclear repositories in domal and bedded salt, utilizing regional hydrogeologic data interpretation of geophysical logging, regional structural systems, and tectonic data.

1982-1983: Privately retained as consulting expert and expert witness in three-party litigation involving a permitted, but undeveloped hazardous waste facility, having determined hydrogeologic unsuitability. The project involved a geologically complex, fracture-controlled groundwater system, involving the interaction of a perched aquifer, a water-table aquifer, and a confined artesian aquifer.

1978-1982: Andrews Engineering, Inc., Springfield, IL.
Project management in all phases of solid and hazardous waste management, including hydrogeologic characterization and engineering design. Projects included pollution assessment and surface and groundwater modeling for environments ranging from complex glacial and alluvial environments to deep bedrock sequences, as well as fracture and subsidence assessment in undermined areas. Prepared numerous solid and hazardous waste landfill permits and mine permits. The work involved thorough knowledge of numerous state and federal regulations, and mine regulations, many of which were in a continual state of change. Projects involved successful testimony at adverse public hearings where hydrogeology was normally the major issue. Was successful in determining the source and responsible part in remedial action activities for polluted groundwater systems.

1975-1978: Involved in private research project analyzing structural systems around the Humor and Nectaris basins of the lunar nearside. Tutored chemistry and geology to private students.

1973-1975 Brown University, Department of Geological Sciences, Providence, RI.
Research Assistant. Participated in planetary research, preparing maps based upon data from various remote sensing techniques. Involved in photo-geologic problems and major basin structural analyses. Participated in stratigraphic analyses utilizing photography and data returned from various Apollo missions.

ROBERTA L. JENNINGS (Continued)

EDUCATION

MS (Geological Sciences) - Brown University, Providence, RI, 1975

BS (Geological Sciences) - University of Illinois, Chicago Circle,
Chicago, IL 1973.

REGISTRATION

Certified Professional Geological Scientist - AIPG No. 6440

Certified Professional Geologist - Indiana, No. 257

PROFESSIONAL SOCIETIES

American Institute of Professional Geologists
Association of Engineering Geologists

SANDIP K. MUKHERJEE
Senior Mining Engineer

EXPERIENCE

1980-Present: Engineers International, Inc., Westmont, IL.
Senior Mining Engineer: Participates in a wide variety of projects related to open pit and underground mining. Project Engineer on U.S. Bureau of Mines project on Design Guidelines for Improved Water Spray Systems which involved an industry wide survey on water spray installations in underground coal and non-coal mines and interviews with MSHA, USBM and mine operating personnel. Mr. Mukherjee has also been Project Engineer on U. S. Bureau of Mine contract on cost-effectiveness analysis of various methods to increase airflow underground. This project involved conducting ventilation surveys, computer modeling of the ventilation networks and cost analysis of applicable methods to increase airflow to the active sections. Mr. Mukherjee has been involved in underground multiple seam coal mining methods and in the economic analysis of multiple seam mining versus single seam mining. He is currently Project Engineer on U. S. Bureau of Mines project on Investigations Into The Use of Air Sprays and Unique Foam Application Methods for dust control on longwall faces. Mr. Mukherjee is especially qualified in computer simulation and Operations Research techniques, mining systems analysis, equipment analysis, mine feasibility studies and technological forecasting.

1979: Foster-Miller Associates, Inc., Waltham, MA.
Project Engineer - Mining: Mr. Mukherjee carried out several studies in the fields of coal mining equipment and safety, including dust control in room and pillar and longwall operations; evaluation and technical guideline formulation for the use of the newly developed oxygen - generating self-rescuers; guidelines for rescue chambers and mine ventilation.

1976-1978: The Pennsylvania State University, State College, PA.
Graduate Research and Teaching Assistant, Department of Mineral Engineering: Mr. Mukherjee was involved in the evaluation of operational constraints in continuous and conventional mining systems, performance prediction of steam-powered shuttle car and an auger with face drills system. He developed a computer simulation model for underground longwall coal mining operations which can be used for equipment selection and predicting the productivity and economics of longwall operations. He served as teaching assistant on an undergraduate course in Mine Production Engineering and a short course on computer simulation models for underground mining.

Summer 1974: Hindustan Zinc, Ltd., India,
Engineering Trainee: Carried out a study of shrinkage and sublevel stopping methods, ore reserves estimation, operation and maintenance of tower mounted Koepe cage and skip winding system, Alimak Raise Climber, Cavo loader, and Simba Junior ring drilling machine.

SANDIP K. MUKHERJEE (continued)

Summer 1973: Coal India, Ltd., India.

Engineering Trainee: Carried out studies of operations on a longwall face, including shearer, props, and sand-stowing of the gob.

EDUCATION

MS (Mining Engineering) - The Pennsylvania State University,
State College, PA, 1978.

B. Tech. (Mining Engineering) - Institute of Technology,
Banaras Hindu University, India, 1975.

Certification for Mine Safety Training by MSHA for Surface and Under-
ground, Coal, Metal, and Nonmetal Mining (1982).

PROFESSIONAL SOCIETIES

Society of Mining Engineers of AIME.
Mining, Geological and Metallurgical Institute of India.
Operations Research Society of America

PUBLICATIONS

Author of several technical papers and reports on coal mining
management, operational simulation, and operational constraints.

STEPHEN E. SHARP
Engineering Geologist

EXPERIENCE

1979-Present: Engineers International, Inc., Westmont, IL.
Engineering Geologist: Mr. Sharp carried out geological and geotechnical instrumentation work in support of design verification during construction of a large-diameter tunnel and shaft for a pumped-storage power plant, with responsibility for coordinating and reviewing the activities of several geologists. He has also planned and supervised the drilling of core holes up to 1500 ft deep, for in situ stress measurement by hydraulic fracturing techniques for the Nuclear Regulatory Commission (NRC). He has also participated in nuclear waste repository design reviews in an NRC-sponsored study of underground water intrusion.

Mr. Sharp has successfully completed several long-term field geotechnical assignments in Colorado, Georgia, and West Virginia, in which he had to operate without supervision. He has participated in several field projects, including: site investigations for tunnel design projects in the southeastern and western United States, a geotechnical investigation for retreat longwall mining, the development of improved blasting practices for highwall stability, and a study of the effect of atmospheric conditions on the deterioration of coal mine roof shale.

He has extensive experience in the testing of geologic and soil materials and construction materials. His duties in projects have included in situ and laboratory testing of rock, mapping of rock mass conditions, core logging, sampling, detailed joint surveys, and statistical analyses of field data. He has performed a study of multiple seam coal reserves in the United States, and participated in a research project which involves applying rock mass classification schemes to block caving drift support design.

Summer 1978: Purdue University, Lafayette, IN.
Student: Gained experience in field mapping techniques and problems in a varied geologic environment in the Rocky Mountains of Montana.

EDUCATION

BS (Engineering Geology) Purdue University, Lafayette, IN, 1978

CERTIFICATION

Certification for Mine Safety Training by MSHA for Surface and Underground, Coal, Metal, and Nonmetal Mining, 1980

PROFESSIONAL SOCIETIES

Society of Mining Engineers of AIME