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**S & M Engineering, LLC  
DBA  
S & M Engineering Services**

**STATEMENT OF QUALIFICATIONS**

**March 14, 2020**



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# 1.0 INTRODUCTION

## 1.1 Ownership/Shareholders

S & M Engineering Services is a minority-owned consulting engineering business. It is owned by Mr. Subijoy Dutta, a registered Professional Engineer (P.E.), who won the 1991 National Award for Individual Excellence in Environmental Restoration from the U.S. Air Force. In August 2009, S & M Engineering had its 25th anniversary marked by two decades of growth and success. Some nationally known professionals and engineers, such as Dr. William E. Roper, P.E., Mr. Dennis Haag, and Dr. Matthew Perry are retained by the company as outside consultants.

S & M Engineering has established active partnership agreements with –

- OMO Energy & Technology, Inc. (Mr. Carnelious Jones, CEO) <http://www.omoenergytech.com> in Greenbelt, Maryland.
- Pure Water Corporation (Mr. William Danshin, President) <http://watercorp.com> in Nanaimo, British Columbia, and
- Pinnacle Equipments Pvt. Ltd., (Mr. P G Banerjee), Jyotiba Nagar, Pune, India (<http://www.sme.in/pinnacleequipments/>).

S & M Engineering, LLC is a newly added entity of S&M doing business as (DBA) S & M Engineering Services in Crofton, Maryland. The shareholders include the sole proprietorship of Subijoy Dutta and his assignees as advised and recommended by S & M's Financial Advisor, Donald G. Henry, NTPI-Fellow (<http://www.dhenryea.com>).

S & M Engineering also established a subsidiary and **Registered office in Kolkata, S & M Engineering Services, 352/3, M.B. Road, Birati, Kolkata** (Trade License ID – 9770). The project activities there is run by Mr. Sucharit Dutta, a full time Project Manager/Coordinator of S & M Engineering Services, Birati, Kolkata, India. Mr. Tushar Kanti Guha provides routine advice to the S & M activities at the India office as a Senior Advisor/Business Manager.

S & M Engineering also established a center in **New Delhi, India** for business development and project coordination. Mr. Suresh Soman, a 30+ years experienced Mechanical Engineer is the project manager in New Delhi, India. Mr. Soman provides onsite technical expertise and coordination with the client organizations including the State of Delhi, UP, Haryana, Uttarakhand, and Punjab. Mr. Suresh Soman can be reached at [ambady123@gmail.com](mailto:ambady123@gmail.com)



Dr. Kamal Taori, ex IAS, provides expert advice on various rural development projects in India. Dr. Taori is from the Uttar Pradesh cadre and holds a doctorate in Rural Entrepreneurship. He has worked as Collector, Commissioner and Union Secretary in many departments besides leading the Council for Advancement of People's Action and Rural Technology (CAPART) and Chief Executive Officer, Khadi & Village Industries Commission (KVIC), nodal agencies for catalyzing and coordinating the partnership between voluntary organizations and the Government for sustainable development of rural areas as well as village industries.



S & M Engineering is presently working in a collaborative effort with also William Danshin, President, Purewater Corporation, Vancouver, BC, Canada, and Mark Garvin, CEO, Union ProCon Pvt. Ltd, Nagpur, Maharashtra, India

## 1.2 Summary Technical Expertise

S & M Engineering (SMES) provides technical expertise in all phases of environmental management, beginning from preliminary investigation to final cleanup in compliance with the locally applicable regulation. From studies, planning, remedial design to treatment, installation, and construction management is undertaken by our engineering consulting services. Within each project phase S & M has developed the ability to adapt and use the most cost-effective and site-specific techniques available.

S & M Engineering Services is headquartered in Crofton, Maryland, USA. We are a small business organization and meet all the requirements of the SBE program of the US Small Business Administration (SBA). Our organization have access to top level professionals and field staff, mostly on project basis including:

- Engineers
  - Civil & Environmental
  - Geological
  - Chemical
  - Mechanical
  - Electrical & Computer Science
- Ecologists
- Soil Scientists
- Geologists
- Data Base Specialists

- Programmer Analyst
- Environmental Specialists
- Hydrogeologists
- Geospatial Data Analyst

S & M Engineering's staff and associates has experience in environmental and ecological studies, including, permitting, design, and construction management. We were involved in waste management including municipal, hazardous, and medical wastes for a few sites in Philippines, Indonesia, and India. We also undertook Municipal Solid Waste Landfill siting and design. We have conducted many water use studies, estimating future needs including potential area growth projection, dating back to the early 1970s. The total staff strength of S & M varies project wise since most people are on consultant basis.

## 2.0 SPECIFIC AREA OF EXPERTISE

S & M Engineering Services has four senior level Registered Professional Engineers and two ecologists. These professionals look after many different aspects of engineering, geology, and hydrogeology as the project leaders. A list of several project Leaders and their respective Projects and expertise is below:

<b>Project Leader</b>	<b>Expertise</b>
Mr. Subijoy Dutta, P.E.	Municipal solid waste management
	Environmental studies & water use studies
	Hazardous waste collection & disposal
	Construction management /fugitive dust control
Mr. William Danshin	Wastewater treatment plant
	Sewer system/lagoon design
Mr. Subijoy Dutta, P.E. & P.G. Banerjee	Industrial wastewater treatment (removal of heavy metals and organics)
	Wastewater treatment system
	Air quality monitoring
	Remedial wetland systems

	Air emission control system design
	Ecological studies
	Waste management
	Municipal solid waste disposal – landfill design/construction
	Hazardous waste treatment/disposal – subtitle C landfill design
Mr. Dennis Haag & Dr. Amy Townsend	Socio-economic studies
	Biodiversity survey
	Environmental impact studies
	Ozone depletion study
Dr. William E. Roper, P.E.	Remote sensing
	Watershed analysis
	Disaster management
	Water quality analysis

### 3.0 SERVICES OFFERED

The following are a partial list of services offered by S&M Engineering:

1. Consulting engineering services in:
  - a. Environmental engineering
  - b. Geological engineering
  - c. Mechanical engineering
  - d. Electrical engineering
  - e. Chemical engineering
  - f. Water and wastewater engineering
2. Groundwater and hydrology study
3. Waste water treatment facility design, modification, & construction
4. Municipal, and Industrial waste management including site assessment and remediation
5. Remedial design of hazardous waste site cleanup
6. Air quality assessment and water and soil analysis
7. Environmental seminar/training
8. Abandoned mine land reclamation

9. Preparation and submittal of state & federal forms
10. Expert witness testimony
11. Water quality monitoring and reporting
12. Petroleum storage tank residue recycling Ecological studies/marine biology studies
13. Water use studies
14. Aquifer productivity study

## 4.0 PROJECT EXPERIENCE SUMMARIES

A brief summary of expertise provided by the associates and consultants of S & M Engineering Services is presented below. Detailed information pertaining to specific needs may be readily obtained by request. To obtain the **confidential fee schedule** of S & M Engineering, please submit your request containing your name, organization, and address of physical location to [snmengineering1@gmail.com](mailto:snmengineering1@gmail.com).

Year	Project Name/Description	Project Cost	Remarks
2019	Restoration of several Oil storage sites in US	\$480,000.00	In partnership with OMO Energy Technologies.
2019	Professional Services towards analysis and registration of a few biotech products.	\$25,000.00	In active partnership with Nuvia Technologies, Inc. of Ontario, Canada.
2018	Technical support on an Innovative Water Treatment System Design and Installation	\$439,000.00	Municipal water supply project involving groundwater treatment using an innovative water treatment system – building the test module to run at 400 gpm
2016	Municipal Solid Waste Management of Gangtok and Four other Towns, Sikkim, India	\$370,000.00	Pilot project covering 3 Municipal Wards in Gangtok, Sikkim, India. This pilot Project is still pending, no contracts awarded. The estimated gross revenue for the whole city with 17 Wards is about \$3 Million/year The GMC (Gangtok Municipal Corporation) will provide their available infrastructure/facilities.



<b>Year</b>	<b>Project Name/Description</b>	<b>Project Cost</b>	<b>Remarks</b>
2015	Environmental Training and Research Institute – Training and Research Development	\$250,000.00	A 2-acre land and building, worth \$250,000 has been provided to us by the Rishikesh Institute of Yoga in India to begin the Environmental Training and Research Institute. We are developing the curriculum and Research topics.
2015	INDIA – Kolkata Study and evaluate Renewable Energy with a low Carbon footprint for a growing Frozen Food Distributor, Sappers Info-tech Company in Kolkata, India.	\$125,000	Initiated in 2015-2016 We had a meeting with them in the 3 <sup>rd</sup> week of September, 2015 and again met with them during January 29-30 <sup>th</sup> , 2016 in Kolkata, India.
2014	Philippines –Marikina (Manila) City, Iloilo, and Roxas City	\$75,000	2014-2016 Provided Keynote speech by Subijoy Dutta at the International River Summit. Follow up site visits. Project work impacted by Hurricane.
2013	China – Wuhan City Yangtze River Water Quality Monitoring	\$25,000	2013-2014 Yangtze River Water Quality Monitoring from Wuhan City to 3-Gorges Dam
2012	India – New Delhi Yamuna River WQ monitoring and cleanup options	\$10,000	2012 Yamuna River WQ monitoring and cleanup options/proposals
2011	India – Shillong Meghalaya Government contract for supplying uniforms	\$8,500	2011 Meghalaya Government contract for supplying uniforms and dresses in partnership with a local Company in Shillong, India.

<b>Year</b>	<b>Project Name/Description</b>	<b>Project Cost</b>	<b>Remarks</b>
2010	India and Philippines Site visit and providing advice on river cleanup and restoration of sites.	\$55,000	2010 Iloilo City, Philippines – Site visit and providing advice on river cleanup and restoration of sites. Shillong, India – Government Contract in partnership with a local company.
2009	A comprehensive study of - existing sewage and drainage system, drinking water resources and future planning, and Municipal solid waste management for Gokul, UP, India.	\$ 25,000.00	Project work began during Summer 2009. The study report was completed in December 2010. Total project cost includes matching costs for additional items(hydrogeology), travel and other expenses on top of the base cost.
2008	Landfill Site evaluation for the Dhapa Landfill with Techknow Environmental & Sustainable Solutions Pvt. Ltd.	\$ 5,000.00	Project work began in October 2008. Total project cost includes matching costs for additional professional time for research, travel and other expenses on top of the base cost.
2007	Definitional Mission on Cooperative Project with Comisión Federal de Electricidad (CFE) to provide help on Recovery of Contaminated Soils, PCB Treatment Technologies, Sulfur Hexafluoride (SF6) emission reduction, and Flyash Disposal.	\$ 50,000.00	Project work underway, began in October 2007. Total project cost includes matching costs for additional professional time for research, travel and other expenses on top of the base cost of \$25,000.
2005	ASEAN Clean Land 2005 project to help 23 Cities within the Association of South East Asian Nations with waste Management and Cleanups.	\$ 200,000.00	Project work underway, began in March 2005

<b>Year</b>	<b>Project Name/Description</b>	<b>Project Cost</b>	<b>Remarks</b>
2004	Low-Cost Wastewater Treatment Plant at JNTU, Hyderabad.	\$ 50,000.00	Completed Construction on August 31, 2004
2002	Development of a Scheme for a Pilot Municipal Solid Waste Management Plan for the Silchar Municipality, India.		2002-2003 Performed by S& M Engineering (India)
2002	Project Proposal preparation	\$ 5,200.00	
2002	Total Project Cost for Pilot System	\$ 30,000.00	
2002	Watershed Analysis using remote sensing & Satellite Imagery for the Yamuna River Remediation Project, India.	\$ 15,000.00	2002-2003 Performed en-gratis for the Yamuna Foundation for Blue Water.
2000	Seminar at MIT (Massachusetts Institute of Technology) on Engineered Barrier Systems.	\$ 5,000.00	2000 – presented by Subijoy Dutta covering Landfill cover systems, Slurry walls, and other Engineered barrier systems with special emphasis on site selection, design, construction, and monitoring aspects.
1998	PM (Particulate Matter) Emissions Control and alternatives to Surface and Underground Shaft mining of Coal.	\$ 245,000.00	1998-present : working with Coilwell, Inc. of Oklahoma in developing a hydraulic mining system by using a high pressure water-jet cutting system.
1997	Plasma Energy Pyrolysis System for destruction of Medical Waste.	\$ 55,000.00	1997-98 – Conducted a feasibility study and made presentation of the technology (currently used in US)
1997	Medical Waste Management Seminar.	\$ 2,500.00	1997 - Presented a seminar on medical waste management in Oklahoma

<b>Year</b>	<b>Project Name/Description</b>	<b>Project Cost</b>	<b>Remarks</b>
1996	Air Emission Control and Removal of Nitroglycerine (NG) from Air Stream and Heavy Metals from Wastewater at the Navy Facility in Indian Head, Maryland.	\$ 200,000.00	1996-97 performed jointly with Tetrahedron, Inc.
1995	Environmental Technologies for Ecological Restoration Seminar/Training.	\$ 120,000.00	1995 – Conducted the seminar in Bowie, Maryland to address the needs of developing countries. Participants included scientists and engineers from India, Philippines, Thailand, and Bangladesh.
1994	Yamuna river remediation project by use of constructed wetlands, New Delhi, India.	\$ 120,000.00	1994-present – Submitted preliminary designs to Delhi Jal Board for approval and funding. Expended S & M funds over \$45,000 so far.
1993	Boilers and Industrial Furnaces (BIF) emission Standards, Taiwan, Mexico.	\$ 150,000.00	1993-1995 – provided standards and demonstrated technologies to meet the standards.
1993	Site Specific Leach Test – Patented Method for Soil Cleanup Level.	\$ 60,000.00	1993-1997 – developed method and filed patent in US
1993	Environmental Assessment and Preliminary Designs and permitting of the Seventh Day Adventist Church in Maryland.	\$ 180,000.00	1993-1995 – Completed preliminary plans
1992	Water testing and Monitoring Yamuna River upstream (Yamuna Nagar) to Agra, UP (1992 to 2011).	\$ 1,800,000.00	Average \$100,000 per year for 18 years
1991	Sunderban Tiger Survey, India.	\$ 25,000.00	1991-93 – Assisted in Tiger Survey – project lead : Amy Townsend

<b>Year</b>	<b>Project Name/Description</b>	<b>Project Cost</b>	<b>Remarks</b>
1991	Water Use Study for Haskell County Water Co., Stigler, OK.	\$ 10,000.00	1991 - Small community help project
1990	Environmental Evaluation, Frontier State Bank, Oklahoma City.	\$ 2,500.00	1990 – Assessment of a small manufacturing facility
1988	Hydrogeologic study, Oakwood E. Addition, Midwest City, Oklahoma.	\$ 25,000.00	1988 – Assisted a small community for expense reimbursement only.
1987	Water Use study, Atoka County RWD #4, Atoka, OK.	\$ 35,000.00	1987 – Expert Testimony in a case involving oilfield pollution of a drinking water reservoir.
1987	Hydrogeologic Expert Testimony, Alfalfa County Rural Water District.	\$ 60,000.00	1987 - Expert Testimony in a case involving oilfield pollution of a drinking water reservoir.
1987	Abandoned Mine Land Reclamation Design Project, Haskell County, Oklahoma.	\$ 250,000.00	1987-1989 – Eastern Oklahoma surface coal mine reclamation
1987	Hydrogeological Investigation in Ponca City, Oklahoma.	\$ 55,000.00	1987-88 – Conducted an independent investigation for the State of Oklahoma for the most controversial groundwater pollution case in Southwest US at that time.

S & M Engineering team consists of experts in engineering and environmental science. The engineers offer their expertise in a number of fields, including civil, geotechnical, geological, petroleum, and environmental areas. The social science and environmental aspects of S & M assure that projects are both culturally appropriate and environmentally sound. Most of S & M's team has advanced degrees. Many have won awards and honors, and some have contributed to their fields by writing articles and books. Through active participation in a variety of professional organizations, they keep themselves up with the leading edge technological developments in their fields.

#### 4.1 Success Stories

S & M Engineering team consists of experts in engineering and environmental science.

The engineers offer their expertise in a number of fields, including civil, geotechnical, geological, petroleum, and environmental areas. The social science and environmental aspects of S & M assure that projects are both culturally appropriate and environmentally sound. Most of S & M's team has advanced degrees. Many have won awards and honors, and some have contributed to their fields by writing articles and books. Through active participation in a variety of professional organizations, they keep themselves up with the leading edge technological developments in their fields.

S & M conducted the Clean Land Project in 2005-2006 with active participation of eleven Team Members / Expert Panel as listed below.. This project was conducted by a well-balanced team of professionals from various Industries, Academia, and Governments.

1. Mr. Subijoy Dutta, P.E, (Tech. Director, S & M Engineering Services, MD) Team Lead,
2. Dr. William Roper, P.E. (Professor, George Mason University, VA), Associate Team Leader,
3. Dr. Phillip A. Singerman (Executive Director, Maryland TEDCO), Moderator/Facilitator,
4. Mr. David Nemazie [Univ. of MD, Center for Environmental Science (UMCES), MD],
5. Dr. P. Somasundaran (Professor and Director, I/UCR Center ASNS, Columbia University, NY)
6. Dr. Darrell Cornell (Project Manager, MERCO, Inc., Denver, CO)
7. Dr. Waqi Alam (President, Tetrahedron, Inc., Baltimore, MD)
8. Mr. Gary Huffman (Chief Technical Officer and Member, EnviroProducts International, LLC, CO)
9. Ms. Carol A. Collins (Chief Technology Architect, Spiralcat Innovations, Inc., MD)
10. Dr. Matthew Perry (Senior Scientist, Patuxent Wildlife Research Center, MD)
11. Ms. Bonnie Robinson (Geologist, Yamuna Foundation for Blue Water, Inc., MD)

The project partnerships have been an advocate of public/private partnerships to build capacity for waste minimization and recycling. The Clean Land project was undertaken in partnership with the City of **Balikpapan, Indonesia and Iloilo City, Philippines**. This project helped the city of Balikpapan, Indonesia in developing a conceptual municipal solid waste (MSW) management and disposal system that safeguards public health. The Balikpapan City partner rearranged its MSW disposal system to reduce the threat of a landslide as identified during a visit by Mr. Dutta in March 2006. With an active partnership with the communities in Iloilo City, Philippines, this project helped in developing the tools needed for proper management of hazardous and solid waste. Due to the active effort of the SNM team **3 pilot household hazardous waste collection centers got started in Iloilo City, Philippines**. The medical waste management plan developed by the SNM team got initiated by waste segregation at two Hospitals in Iloilo City. The stakeholder focus group formed to implement the full plan

got started to work on developing an effective plan for the Hospital and Nursing home/Clinic consortium in Iloilo city, Philippines.

In 2004-2005 Mr. Dutta formed a team between the State of Maryland, Delta Business Services, Chicago, and the Jawaharlal Nehru Technological University (JNTU) in **Kukatpally, Andhra Pradesh, India** to conduct a demonstration project involving an innovative wastewater treatment system. This project **demonstrated a low-cost treatment alternative for wastewater** by completing the system construction, adjustments, and monitoring **within \$82,800**. The cost included some additional items such as fencing and high-end polishing for removal of pathogens for agricultural reuse. For a similar performance and capacity of 10,000 gallons/day in Andhra Pradesh, India, a **standard wastewater treatment system would cost at least five times** the above cost. Thus the proposed project has **successfully demonstrated a cost saving of more than 80% over conventional system** by use of the innovative deep pond system. This project had also demonstrated reduction of greenhouse gas (methane) emission which would have been otherwise emitted from a standard/conventional treatment plant. This project has **contributed towards reduction of greenhouse gases, thus reducing the threat to climate change** due to increased global temperature by proper management of the waste.

## **5.0 SUMMARY BACKGROUND OF KEY PROFESSIONALS**

Types of expertise range greatly within S & M Engineering as identified by the following spectrum of socio-economic, cultural, engineering, environmental, mining, and waste management projects conducted by the following key professionals.

**Mr. Subijoy Dutta**, a registered Professional Engineer (P.E), provides overall direction to all technical projects of S & M Engineering. He has extensive experience in Remedial investigations, Feasibility studies (RI/FS), Remedial Design, and Remedial Actions (RD/RA) pertaining to the CERCLA regulations. He is the author of the book “*Environmental Treatment Technologies for Hazardous and Medical Wastes - Remedial Scope and Efficacy*” published by Tata McGraw Hill in March 2002. He has also co-authored a book titled “Sustainable Mining Practices – A Global Perspective” published by Taylor & Francis in July 2005. **Summary of the books are furnished under Appendix I at the end.**



Mr. Dutta was the project leader for The Clean Land Project of SNM with active participation of eleven Team Members / Expert Panel in 2005-2006. This project was conducted by a well-balanced team of professionals from various Industries, Academia, and Governments. The project partnerships have been an advocate of public/private partnerships to build capacity for waste minimization and recycling. The Clean Land project was undertaken in partnership with the City of Balikpapan,



Indonesia and Iloilo City, Philippines. This project helped the city of **Balikpapan, Indonesia** in developing a conceptual municipal solid waste (MSW) management and disposal system that safeguards public health. The Balikpapan City partner rearranged its MSW disposal system to reduce the threat of a landslide as identified during a visit by Mr. Dutta in March 2006. With an active partnership with the communities in **Iloilo City, Philippines**, this project helped in developing the tools needed for proper management of hazardous and solid waste. Due to the active effort of the SNM team **3 pilot household hazardous waste collection centers got started in Iloilo City, Philippines**. The medical waste management plan developed by the SNM team got initiated by waste segregation at two Hospitals in Iloilo City. The stakeholder focus group formed to implement the full plan got started to work on developing an effective plan for the Hospital and Nursing home/Clinic consortium in Iloilo city, Philippines.

In 2004-2005 Mr. Dutta formed a team between the State of Maryland, Delta Business Services, Chicago, and the Jawaharlal Nehru Technological University (JNTU) in Kukatpally, Andhra Pradesh, India to conduct a demonstration project involving an innovative wastewater treatment system. This project demonstrated a low-cost treatment alternative for wastewater by completing the system construction, adjustments, and monitoring within \$82,800. The cost included some additional items such as fencing and high-end polishing for removal of pathogens for agricultural reuse. For a similar performance and capacity of 10,000 gallons/day in Andhra Pradesh, India, a standard wastewater treatment system would cost a minimum of about Rs. 20,790,000 (Indian Rupees, INR) or \$450,000 (US Dollars). Thus the proposed project has successfully demonstrated a cost saving of more than 80% over conventional system by use of the innovative deep pond system. This project had also demonstrated reduction of greenhouse gas (methane) emission which would have been otherwise emitted from a standard/conventional treatment plant.

He has been the Remedial Project Manager (RPM) for several superfund and RCRA sites. He has designed and supervised construction of several landfill cover systems. He was instrumental in the cleanup of three radioactive waste disposal sites at Tinker Air Force Base in Oklahoma. He played a key role beginning from the initial investigation, conducting dosimetric survey, to final cleanup of these three radioactive waste disposal sites. He has also designed the ground water treatment plant for TCE and Cr<sup>6+</sup> removal for a superfund site in Oklahoma. He



initiated the Yamuna river remediation effort in New Delhi, India, by use of constructed wetlands. Hydrogeological investigation of the Ponca City pollution problem, and watershed analysis for investigating the severe erosion problem in Midwest City, Oklahoma, are a few examples of his community projects. He has given various environmental seminars and has over 20 publications.

**Mr. Tushar Kanti Guha** a science graduate from Shillong, Meghalaya has over 35 year's comprehensive Techno-commercial experience in project execution and marketing, sales and contract operations, out of which 22 years in the Senior Management Positions in the reputed engineering industries for the core sectors of the economy like steel, coal, power, paper, aluminum, cement, and fertilizers. He has interacted with the local communities in Salt Lake, Kolkata concerning waste management, recycling, reuse and composting of residential and local business-generated waste.



**Dr. Mathew Perry** provides a strong support to SNM as an outside consultant. He has extensive project design and management experience in Wetland protection and restoration. He has been a leader in research and development of various biological restoration systems at the Patuxent Wildlife Research Center in Laurel, Maryland. He has also worked on various studies involving ducks. One of his association and partnership with S&M Engineering involved the constructed wetland system at the visitor center of the Patuxent Wildlife Center.



**Dr. Amy Townsend** researches and writes on cultural and environmental sustainability, intellectual property rights, and management of commons and protected areas. The impacts of coastal and marine tourism, and developments on human populations and the environment including the global environmental change are also her major areas of focus. She has contributed to two United Nations reports, and studied land-based sources of marine pollution in the wider Caribbean. She has also participated in the committee for the National Institute on the Environment's work on the environmental effects of stratospheric ozone depletion, and investigated methods for environmentally sound and culturally appropriate community and building design. Ms. Townsend has numerous publications.

**Dr. William E. Roper's** professional experience includes senior management positions in the U.S. Department of Transportation, U.S. Environmental Protection Agency, and the Army. He also served on the faculty of the University of Wisconsin, Michigan State University, and North Carolina State University. Dr. Roper was recently appointed to the new National Academies Committee on the Protection of Critical Transportation Infrastructure and selected to chair the sub-committee on Technology Research, Development and Deployment. He has also been active with the Water Science and Technology Board, the Infrastructure and Constructed Environment Board, and the Transportation Research Board of the National Academy of Engineering, as well as the Society of American Military Engineers. He was a member of the National Oil Spill Research Committee, the National Aquatic Nuisance Species Task Force, Construction Industry Strategic Development Council, National Civil Engineering Research Council, and U.S. Co-Chairman of the Geospatial Data Management Task Committee under the U.S.-Japan Natural Resources Agreement. He has authored more than 100 technical papers and delivered numerous presentations to national and international audiences. He is also President and Founder of Roper and Associates, a Virginia Corporation created to provide engineering and environmental consulting services to the global community.



Dr. Roper was director of the U.S. Army Topographic Engineering Center (TEC), Alexandria, VA. In that capacity he was responsible for the overall leadership and management of TEC's R&D programs for the Army, Department of Defense agencies, other Federal agencies and reimbursable customers. This major Army program involved nearly 1000 people and an annual budget at the \$140 million level. Dr. Roper has also served as the director of the Army Corps of Engineers World-Wide Civil Works Research and Development Program which involved research program development and execution at seven major laboratories and five research centers located throughout the United States. Dr. Roper is a member of the Federal Senior Executive Service, the New York Academy of Sciences and a registered professional engineer in Wisconsin. He is a graduate of the Federal Executive Development Program, Federal Executive Institute, The Harvard Senior Managers in Government Program, Army Command and General Staff College, Air Force War College, and is a distinguished military graduate of the University of Wisconsin. He has also held Adjunct Professor Appointments with the engineering graduate schools of Catholic University of America, George Washington University and Johns Hopkins University. He has managed a number of international joint research programs including initiatives with the People's Republic of China, the former U.S.S.R., Canada and Japan. Technical areas of cooperation range from large-scale estuary sediment movement field studies and water resource development, to earthquake engineering, cold region construction methods, and geospatial data management systems.

S & M's team provides a wealth of knowledge and experience in projects involving engineering,

cultural, and environmental issues. A detail qualification and expertise of the key S & M engineering professionals can be furnished upon request.

**Dr. Hilary Inyang** is one of the top ten geotechnical engineers in US and author of the book “*Geoenvironmental Engineering*”, which was just released by the Pennwell Publishing Company. This new book (retail price US \$150.00) has been used as a text book in many environmental engineering curriculum in US and overseas since 2000. Dr. Inyang is now the Vice president, Engineering at Botswana International University of Science and Technology.

## 6.0 APPENDIX I

### BOOK 1

#### **Environmental Treatment Technologies for Hazardous and Medical Wastes: Remedial Scope and Efficacy**

ISBN No. 0-07-043586-3, Tata McGraw Hill Publishing Co. Mar. 2002

#### **Description**

Many well-intentioned land development projects are conceived, planned, and carried to completion in an inadequate environmental context. The unintended consequences of such projects often include contamination and degradation of streams, forests, soils, and entire natural systems. Dealing with the challenges of maintaining a decent balance between man's needs and a sustainable environment has become the province of specialized professionals and technicians trained and equipped to address the complexities of environmental contamination.

*Environmental Treatment Technologies for Hazardous and Medical Wastes* provides a systematic framework for analyzing the full range of outcomes that may result from many of the components of urban development and for remediating their adverse effects. The book also provides details on various waste treatment technologies for hazardous and medical wastes.

It includes:

- Containment Technology
- Bioremediation
- Soil Washing
- Incineration
- Thermal Treatment
- Vapor Extraction
- Other Physical/Chemical Treatments

The book also includes a description of the technology, flow diagram and other technology specific information. With this coverage the book would be useful for the environmental scientists and engineers, scientists at the Pollution Control Boards, NGO's, hospitals and medical organizations and students of environmental engineering and sciences.

Red Band:

Foreword by Prof. Dorn C. McGrath, Jr., AICP, Director of Institute for Urban Environmental Research, The George Washington University



*Flap I:*

*Contents include:*

1. Introduction
2. Synopsis of Hazardous and Medical Waste Identification and Characterization
3. General Site Cleanup Process
4. Environmental Treatment Technologies for Hazardous
5. Containment Technologies
6. Soil Washing
7. Thermal Treatment
8. Vapor Extraction
9. Bioremediation
10. Incineration Treatment
11. Other Physical/Chemical Treatments
12. Remediation Case Studies
13. Monitoring and Control Technologies
14. Alternative Treatment Technology Options for Medical Wastes

*Flap II:*

*Author's Profile and Photograph*

Mr. Subijoy Dutta is a registered professional engineer (P.E.) in Maryland, USA. He has authored this book in March 2002, published by Tata McGraw Hill Company. Mr. Dutta has over 18 years of experience in Remedial Investigations, Feasibility Studies (RI/FS), Remedial Design, and Remedial Actions (RD/RA) pertaining to the RCRA and CERCLA regulations. He also provides expertise in the treatment, storage and disposal aspects of medical waste. He has designed modified cover systems for Landfills and have supervised installation of Landfill covers for several hazardous waste sites. Currently he is on a detail to the Center for Urban Environmental Research (CUER) at the George Washington University in Washington, DC. Mr. Dutta has more than 30 publications in major technical journals. He also has two equipment patents pending. He has received the 1991 **National Award for Individual Excellence** in Environmental Restoration from the U.S. Air Force chief of Staff General Merrill A. McPeak in Washington D.C. on April 20, 1992. He has received the **Unsung Hero Award in 1997 from the EPA Administrator, Carol Browner** for his voluntary work towards the cleanup of the highly polluted Yamuna River in New Delhi, India.

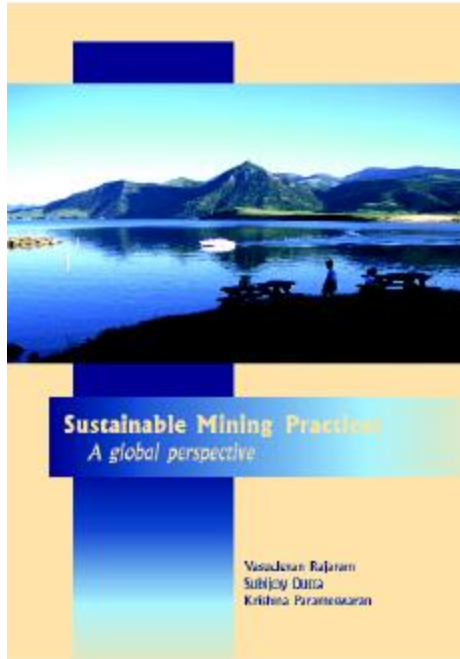


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## BOOK 2

### Sustainable Mining Practices: A global perspective



ISBN 90-5809-689-0, Printed in Great Britain, July 2005

This book considers developments in sustainable mining practices all over the world during the past twenty five years. It addresses issues such as managing mining waste, mine closure, the environmental impacts of mining, land use planning and energy use management. It provides detailed coverage of successful sustainable mining systems and technologies, as practiced in large-scale operations in the U.S., Europe and Australia, as well as practices being developed in developing countries, such as India for controlling small-scale mining operations. The concluding chapter of the book presents case histories of sustainable mining practices from the Americas, Asia (with emphasis on India), Australia, Africa (Tanzania and Zambia), and Europe. The primary audience for this book is Mine safety and environment personnel, Mine and Reclamation planners, practicing mining engineers, and environmental managers in mining companies. This book will also be of interest to consulting engineers and scientists, as well as college students, regulatory/governmental agencies and their permitting

and operations personnel. It contains a wealth of information on cleaner production and how to minimize the environmental impacts of mining.

#### About the authors:

Dr. Vasudevan Rajaram, P.E. is a licensed professional engineer, a certified professional geologist, and an attorney with over 30 years of experience in mining and environmental fields. He is currently working as a senior advisor and consultant with TechKnow Engineering LLC in Chicago, Illinois. His experience covers a wide range of projects in the United States, Canada and India.

Mr. Subijoy Dutta, P.E. is a registered professional engineer with over 15 years of experience in Environmental Management of Hazardous, solid and medical Wastes. He has also authored a book on *Environmental Treatment Technologies for Hazardous and Medical Wastes: Remedial Scope and Efficacy*, published by Tata McGraw Hill Publishing Co. in March, 2002 His expertise includes the treatment, storage and disposal aspects of solid, hazardous, and medical waste; disposal system design for mining waste, municipal solid waste, and hazardous waste. He has designed and completed installation of an unique wastewater treatment (Reuse) system in Hyderabad India in September 2004.

Dr. Krishna Parameswaran, P.E. is a licensed professional engineer in Pennsylvania. He is currently Director of Environmental Services – Operations and Compliance Assurance in Asarco's Environmental

Affairs Department. Dr Parameswaran's interests include sustainable development in relation to mining, recycling of metals, and energy use in metals production, life cycle energy use and life cycle assessments of products.

**Contents:**

- Cleaner production practices
- Blasting impacts and their control
- Minimizing surface water impacts, groundwater impacts and surface subsidence
- Use of environmental indicators in mining
- Emerging mining technologies minimizing environmental impacts
- Mineland reclamation and abandoned mineland reclamation
- Waste management issues: tailings management and risk evaluation of facilities
- Waste rock disposal: including acid mine drainage control
- Hazardous waste management: with emphasis on maintenance wastes
- Best Management Practices for Sustainable Mining,
- Small-scale mining: tailings pond management and hazardous waste management