

PD-ABI-666
10N 88518

**PURE TECH ENGINEERING PVT.LTD.
TAMIL NADU, INDIA**

October 4 to 21,1993

US - ASIA ENVIRONMENTAL PARTNERSHIP



WORLD ENVIRONMENT CENTER

DISCLAIMER

This project was sponsored by the U.S. Agency for International Development through WEC's Cooperative Agreement in support of the US - Asia Environmental Partnership (US-AEP). The opinions expressed herein are the professional opinions of the author and do not represent the official position of the Government of the United States of America or the World Environment Center.

TABLE OF CONTENTS

I.	EXECUTIVE SUMMARY	1
II.	INTRODUCTION	2
III.	DISCUSSIONS AND FINDINGS	4
	A. INTRODUCTION	4
	B. HAZARDOUS WASTE INCINERATION	4
	C. ADVANCED WASTEWATER TREATMENT	6
IV.	RECOMMENDATIONS AND CONCLUSIONS	7

APPENDICES

- A. FIGURES AND PHOTOGRAPHS
- B. ITINERARY
- C. PERSONS AND ORGANIZATIONS VISITED
- D. BUSINESS CARDS OF PERSONS VISITED
- E. DOCUMENTS RECEIVED

I. EXECUTIVE SUMMARY

The United States Asia-Environmental Partnership (US-AEP), through a Cooperative Agreement with the World Environment Center (WEC), provided funding for Mr. B. Ravi of Pure Tech Engineering to travel from India to the U.S. under WEC's Environmental Business Exchange (EBE) Program. Mr. Ravi's trip had two purposes. His foremost goal was to identify a source for the purchase of a hazardous waste incinerator facility for the disposal of waste generated by various industries in the Madras region. His secondary purpose was to identify an advanced wastewater equipment manufacturer with which to collaborate in India.

Madras is known for its refinery, petrochemical, and fertilizer plants. Over the years, these industries have accumulated enormous amounts of hazardous waste, both in solid form and in the form of sludges produced in the manufacturing process or resulting from effluent wastewater treatment. Some industries use pits to store their wastes, and this results in a significant release of pollutants to the environment.

With the current enforcement of strict rules by the Government of India (GOI), the industries are now looking for other means of hazardous waste disposal. When a survey was conducted in the industrial areas, most of the industries expressed an interest in contracting with Cynoclean to dispose of their wastes using a proven technology for environmentally safe disposal.

In order to obtain information on hazardous waste incineration technology, Mr. Ravi met with IT Corp. For information on wastewater treatment, he met with Komline Sanderson, Ecology & Environment, Inc., Smith and Loveless, Inc., and Science Applications International Corp. Mr. Ravi traveled in the U.S. from October 2 to 25, 1993. The trip itinerary is included in Appendix B.

Based on this trip, Mr. Ravi determined that IT Corp, employing its Hybrid Thermal Treatment System (HTTS), has the capabilities necessary to meet hazardous waste incineration needs in South India. Cynoclean entered into an agreement with IT Corp on October 13, 1993 for the design, purchase, and construction of a plant in Tamil Nadu, India.

Mr. Ravi also found that Smith and Loveless, Inc. would be an appropriate source of advanced wastewater treatment equipment and entered into an agreement to represent this firm in southern India. Smith and Loveless, Inc. will provide package treatment plants and design solutions for India's wastewater treatment problems.

II. INTRODUCTION

This report describes the activities, findings, and conclusions and recommendations by Mr. B. Ravi during a mission to the United States, October 2 to 25, 1993. Mr. Ravi's participation in this mission was facilitated through the United States-Asia Environmental Partnership (US-AEP) Cooperative Agreement with World Environment Center (WEC) under the Environmental Business Exchange (EBE) program.

Mr. Ravi is the Managing Director of Pure Tech Engineering Pvt.Ltd., a consulting firm that started in 1985 executes projects for small-and medium-scale industrial and domestic effluent wastewater treatment plants. The organization has grown in all respects and has the capabilities to do large turnkey projects. After a thorough market analysis, Mr. Ravi decided to promote Cynoclean Company Pvt. Ltd., a sister affiliate of Pure Tech Engineering, for hazardous waste disposal facilities in Tamil Nadu, India.

Madras is known for its refinery, petrochemical, and fertilizer plants. Over the last few years, these industries have been land disposing their hazardous wastes; vast quantities have accumulated and are impacting the environment. Cynoclean is interested in helping to provide a permanent solution for this problem. Cynoclean has approached the Industrial Credit and Investment Corporation of India (ICICI) for financial assistance to set up an incineration plant. ICICI recommended that Mr. Ravi be sent to the U.S. on a fact-finding mission to determine the best and latest technology and to identify a U.S. firm to supply the plant. Through WEC's EBE program, Mr. Ravi visited IT Corp and ThermAll, Inc., to discuss with their engineers the design and purchasing of a plant suitable to India's environmental conditions.

While in the U.S, Pure Tech was also interested in finding a collaborator to provide advanced wastewater treatment equipment to India. For this purpose, Mr. Ravi visited numerous firms and discussed appropriate technology with engineers and top manufacturing executives. In particular, a client in Bombay needs slow speed floating aerators, including 33 50hp and 24 20hp units. This equipment is to be supplied under a single contract.

III. DISCUSSIONS AND FINDINGS

A. INTRODUCTION

The purpose of Mr. Ravi's mission to the U.S. was to meet with IT Corp to discuss their hazardous waste incineration capabilities. Mr. Ravi also evaluated the market for advanced wastewater treatment.

B. HAZARDOUS WASTE INCINERATION

To investigate hazardous waste incineration technology and find a potential supplier of a system suitable to the needs and environment of the Madras, India, region, Mr. Ravi visited IT Corp, as well as ThermAll, Inc. He found that these companies have different kinds of capabilities. IT Corp is highly regarded for its installation of five major incineration plants employing the Hybrid Thermal Treatment System (HTTS) using counter current, rotary kiln incineration technology.

The Table below shows how HTTS units compare to the best available technology.

TABLE I. HTTS - BAT COMPARISON

<u>Best Available Technology Criteria (BAT)</u>	<u>HTTS Unit Achievement</u>
Handle wide range of applications and waste types	Five HTTS units have been designed, constructed, and successfully operated in full scale applications involving a wide variety of waste types
Provide economical incineration for a wide range of applications	Proven to be economically competitive, as evidenced by IT dominance in market position

ThermAll, Inc. specializes in installation of small-scale incinerators for the disposal of hospital and pharmaceutical wastes. Backed by Komline Sanderson, ThermAll, Inc. has 45 years of experience in heavy duty process equipment technology. ThermAll, Inc. brings a wide range of incineration systems. They have designed and fabricated incineration systems for pharmaceutical, chemical, and medical facilities.

Mr. Ravi found that IT Corp has in-depth expertise in incineration technology; most of its engineers and scientists are specialists in this field, and hence, they are generally able to solve any problem brought to them. IT Corp has a laboratory that is well equipped to perform pilot plant studies prior to any major scale installation of incineration projects. From process design to construction and further operation and maintenance by their sister company, IT Davy, the follow-up of project management appears to be very effective. IT Corp is a full service environmental management/consulting firm with the capability to address a wide variety of situations involving hazardous chemical and nuclear materials. The company provides a comprehensive range of engineering services to industrial clients and governmental agencies, including: risk assessment; thermal technology; permitting; nuclear/mixed waste; analytical services; environmental biotechnology; engineering; remediation and decontamination; groundwater; air pollution control process technology; development of waste minimization and pollution prevention.

The thermal technology adopted by IT Corp is the Hybrid Thermal Treatment Systems (HTTS). These systems are designed and procured by the Pollution Control Engineering Division of IT Corp. They are constructed and operated by the Construction and Remediation Services Division.

Of the various incineration technologies applied to hazardous waste, rotary kilns with secondary combustion chambers are considered the most common and versatile. The HTTS configuration is an innovative and patented version of these proven and demonstrated technologies. The units include reduced gas flow through the utilization of counter current controlled air operation, high turbulent mixing in the secondary combustion chambers to ensure high waste destruction efficiency, controlled ash quality by means of adjusting the treatment zones inside the kiln, and a crystallization process that eliminates aqueous purge from a wet gas cleaning system, even when incinerating highly halogenated wastes. All these features have demonstrated their effectiveness in full scale-operation systems.

IT Corp has transportable, adaptable, and proven technology, which is capable of meeting all applicable U.S. regulatory criteria. IT Corp units have proven thermal capacity from 40 to 150 mm btu/hr, solids feed rates as high as 50 tons/hr, and they accept solids, liquids and sludges. IT Corp's patented technology is available for domestic and international procurement.

According to the Engineering News Record Report [McGraw Hill. *Construction Weekly, July 12, 1993*] on top design firms in hazardous waste, IT Corp leads the twenty U.S firms. IT Corp has a good track record year after year and has satisfied many clients with their successful installations. Last year IT Corp worked on more than 35,000 environmental projects developing new creative technology solutions implementing a broad range of available technologies. Their client list consisted of hundreds of governmental organizations and commercial companies representing a wide variety of industries including Chemical, Petro-chemical, heavy manufacturing, and pharmaceutical business industries.

C. ADVANCED WASTEWATER TREATMENT

In order to determine the best appropriate technology for advanced wastewater treatment in the Madras, India region, Mr. Ravi visited Komline Sanderson, Ecology and Environment, Inc., Smith & Loveless, Inc., and Science Applications International Corporation. He discussed wastewater treatment technology and products with the engineers and manufacturing executives of these firms.

Each firm has advantages in specific fields, and each manufacturer has a different manufacturing product profile. Ecology and Environment and Science Applications International Corporation are large environmental consulting firms that have vast capabilities in performing Environmental Impact Assessments (EIAs), as well as other remedial measures for reclaiming polluted sites. They are not manufacturers, but under contract, they supply equipment design details to manufacturing facilities.

IV. CONCLUSIONS AND RECOMMENDATIONS

Mr. Ravi's trip to the U.S. resulted in the following conclusions and recommendations.

Conclusion 1: HTTS technology is a proven means of treating hazardous waste through incineration.

HTTS technology has been applied to the complete spectrum of hazardous and toxic wastes. HTTS technology has demonstrated successful incineration of the following type of feeds in full compliance with all applicable U.S. regulatory criteria, explosive contaminated soils, high heat-of-combustion organic liquids and tars, organic sludges, PCB-contaminated sludges and liquids, hydrocarbon saturated soils, trash, debris and drums.

The effectiveness of a hazardous waste incineration technology is reflected by its ability to safely and economically handle a wide range of applications and waste types while controlling the quality of combustion gas emissions, and ash and water discharges so as to comply with regulatory criteria. The HTTS unit has achieved all of these criteria. It has been concluded that a hazardous waste incinerator facility employing HTTS technology should be built near Madras.

Conclusion 2: IT Corp has the capabilities necessary to meet hazardous waste incineration needs in the South of India.

Mr. Ravi found that IT Corp has the capability to supply, construct, operate, and maintain incinerators on a contract basis. Cynoclean entered into an agreement with IT Corp on October 13, 1993 for the design, purchase, and construction of a plant in Tamil Nadu, India.

Conclusion 3: Pure Tech will represent Smith & Loveless, Inc. in India.

Pure Tech has entered into an agreement with Smith & Loveless, Inc., a company which has been manufacturing equipment for the environmental industry since 1945. Pure Tech will represent Smith & Loveless, Inc. in India, providing package treatment plants and complete design solutions for all wastewater treatment problems in the southern part of India, focusing on the cities of Madras, Hyderabad, and Bangalore.

Recommendation 1: US-AEP sponsorship of projects similar to this one would be very beneficial to India's environmental industry.

In September 1992, Mr. Ravi visited some firms in the United States for the purposes described; however, the response was very poor. With the sponsorship of US-AEP, and WEC, as well as the support of Sanders International, Pure Tech received a very good response. Most of the companies extended their full cooperation regarding entering the Indian market. Due to the high profile generated by the U.S.-AEP sponsorship, it is recommended that the WEC and U.S.-AEP program continue to support similar projects in India.

Recommendation 2: US-AEP should sponsor a follow-up trip for Pure Tech engineers to become familiar with HTTS technology.

A follow-up trip should be sponsored to introduce engineers from Pure Tech to Sikes incinerator operated by IT Corp in December, 1993. This would enable Pure Tech to do a thorough cost benefit analysis which would provide necessary input to finalizing plans for the installation of technology.

APPENDIX A
FIGURES AND PHOTOGRAPHS

APPENDIX A (continued)

A. FIGURES AND PHOTOGRAPHS

IT CORPORATION WORLD BIGGEST MOBILE INCINERATION PLANT
LOCATED AT CROSBY, TEXAS



A COMPUTER CONTROLLED FACILITY AT IT CORPORATION
INCINERATION PLANT AT CROSBY, TEXAS

BEST AVAILABLE COPY

A-1

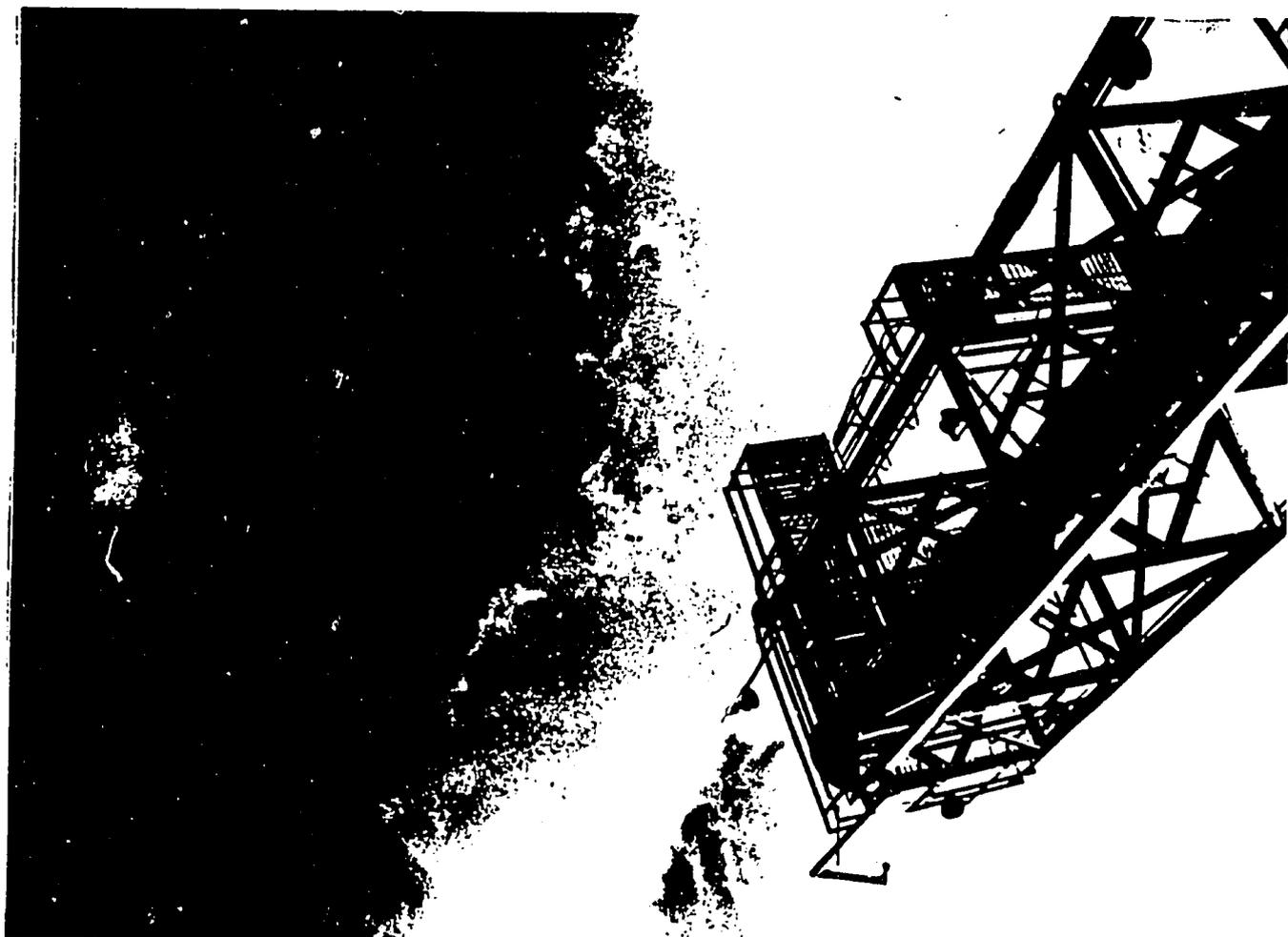


IT CORPORATION - SITE TO BE CLEANED HAZARDOUS
WASTE CONTAMINATED SOIL AT CROSBY, TEXAS

BEST AVAILABLE COPY

A-2

13

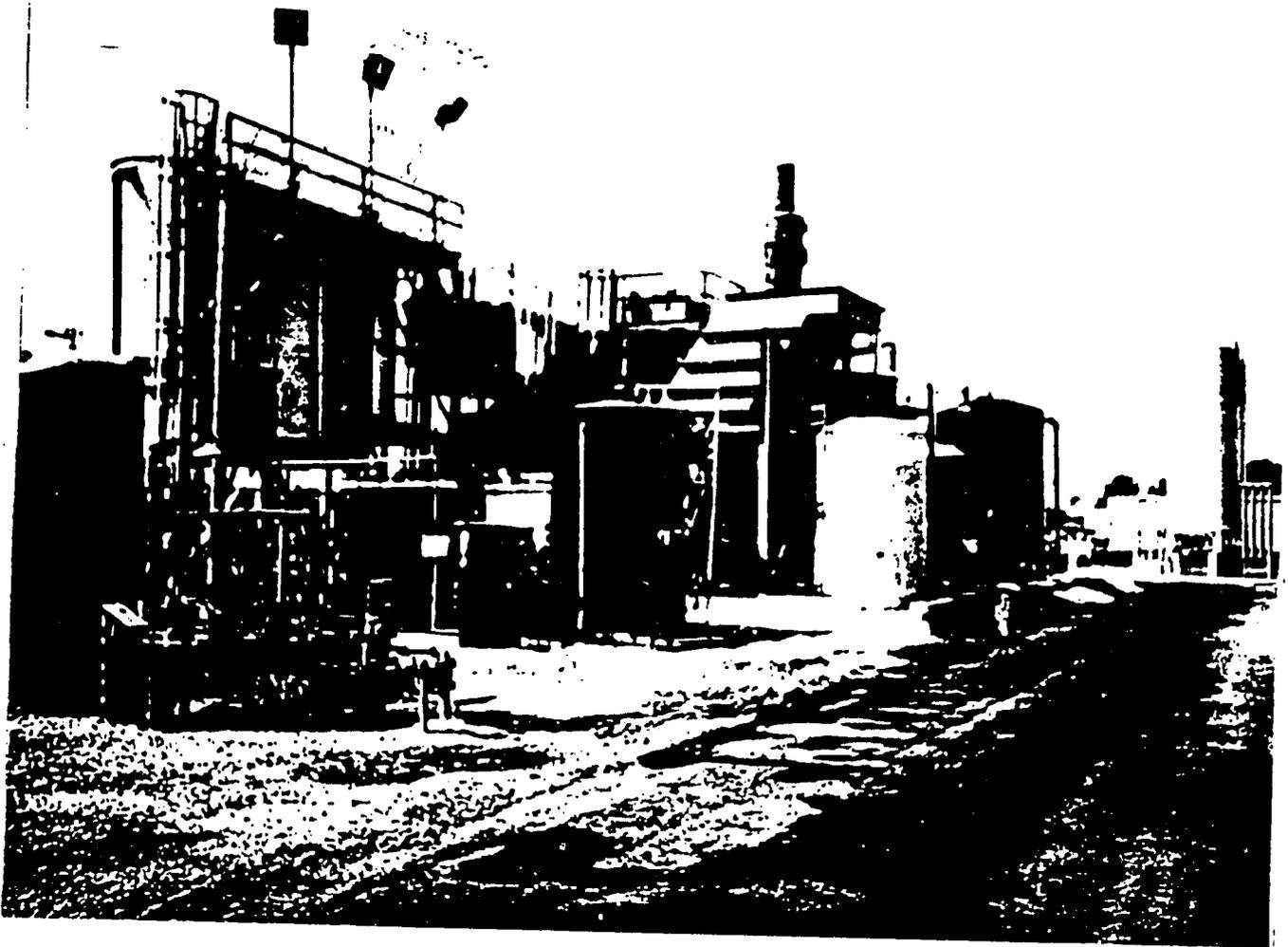


IT CORPORATION ONE OF THE STACK OF
INCINERATION PLANT AT CROSBY, TEXAS

A-3

BEST AVAILABLE COPY

14

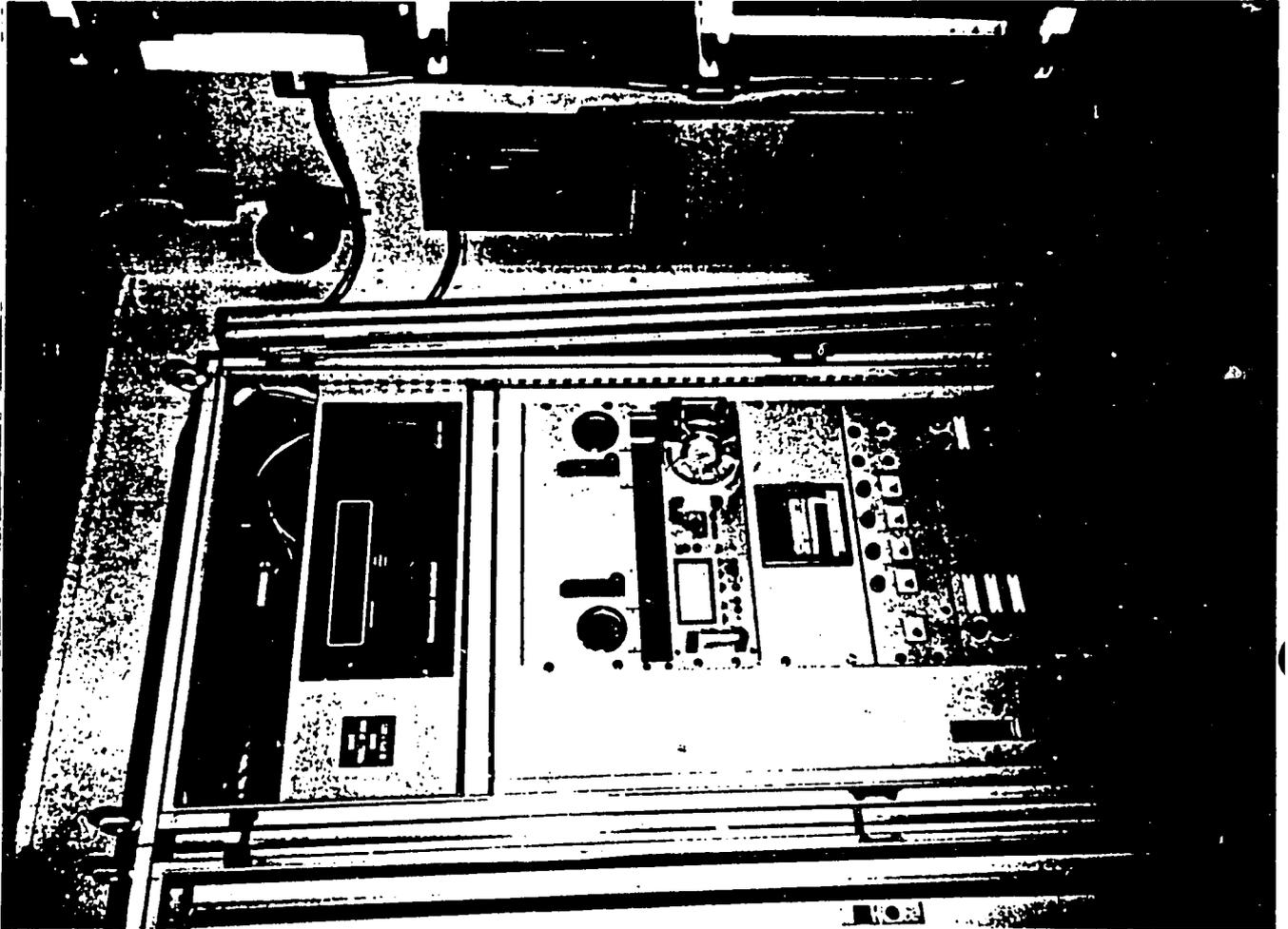


IT CORPORATION INCINERATION PLANT - MONITORING
PROVISION CONNECTED WITH EPA AT CROSBY, TEXAS.

BEST AVAILABLE COPY

A-4

15



IT CORPORATION INCINERATION PLANT
WATER TREATMENT PLANT AT CROSBY, TEXAS

BEST AVAILABLE COPY

A-5

16

APPENDIX B
ITINERARY

BEST AVAILABLE COPY

ITINERARY

<u>Companies</u>	<u>Dates</u>
1. ITC - Knoxville, TN	10/4/93
2. IT - Davy, TX	10/5/93
3. WEC & SANDERS INTERNATIONAL - Washington, DC	10/6/93
4. THERMALL, INC. - NJ	10/7/93
5. KOMLINE SANDERSON - NJ	10/8/93
6. ECOLOGY AND ENVIRONMENT, INC. - BUFFALO, NY	10/11/93
7. ITC - New Orleans, LA	10/12/93
8. ITC - Knoxville, TN	10/13/93
9. SMITH & LOVELESS, Inc. - Kansas City, MO	10/4/93 & 10/15/93
10. WEC & SANDERS INTERNATIONAL - Washington, DC	10/18/93- 10/20/93
11. SAIC - Washington, DC	10/21/93

APPENDIX C
PERSONS AND ORGANIZATIONS VISITED

PERSONS AND ORGANIZATIONS VISITED

<u>Organization</u>	<u>Contact Person</u>
1. IT Corporation 312 Directors Drive Knoxville, TN 37923	Mr. Prakash Acharya, P.E., CHMM Staff Consultant Pollution Control Engineering Division
2. IT Corporation 312 Directors Drive Knoxville, TN 37923	Mr. Alan Baker Business Development Manager Pollution Control Engineering Division
3. IT Corporation 312 Directors Drive Knoxville, TN 37923	Mr. Johnnie E. Silas Senior Instrumentation and Controls Designer Pollution Control Engineering Division
4. IT Corporation 312 Directors Drive Knoxville, TN 37923	Mr. Stuart E. Shealy, P.E. Treatability Programs Manager Technology Development Laboratory
5. IT Corporation 312 Directors Drive Knoxville, TN 37923	Mr. Steven G. Decicco Process Engineering & Services Manager Pollution Control Engineering Division
6. IT Corporation 312 Directors Drive Knoxville, TN 37923	Mr. Charles Pfrommer, Jr., P.E. Thermal Systems Manager Pollution Control Engineering Division
7. IT Corporation William Penn Plaza Monroeville, PA 15146-2792	Mr. Michael Gust Director, Thermal Operations
8. IT Davy 275 Highway 90, East P.O. Box 1649 Crosby, TX 77532	Mr. Michael Gust Project Director
9. IT Davy 275 Highway 90, East P.O. Box 1649 Crosby, TX 77532	Mr. Alberman Laboratory Manager

PERSONS AND ORGANIZATIONS VISITED

<u>Organizations</u>	<u>Contact Person</u>
10. IT Davy 275 Highway 90, East P.O. Box 1649 Crosby, TX 77532	Mr. Phil Putman Operations Manager
11. World Environment Center 1600 Wilson Boulevard Suite 500 Arlington, VA 22209	Ms. Swarupa Ganguli Deputy Project Manager
12. World Environment Center 1600 Wilson Boulevard Suite 500 Arlington, VA 22209	Ms. Sarah Gober Asia Programs
13. Sanders International, Inc. 1616 P Street, N.W. Suite 410 Washington, DC 20036	Mr. Jeffrey D. Hallett Senior Consultant TEST Project Manager
14. Sanders International, Inc. 1616 P Street, N.W. Suite 410 Washington, DC 20036	Ms. Emily Harwit Associate
15. ThermAll, Inc. P.O. Box 1776 Peapack, NJ 07977	Mr. James H. Milo
16. ThermAll, Inc. P.O. Box 1776 Peapack, NJ 07977	Mr. William W. Musgrave Manager of Projects
17. Komline Sanderson Holland Avenue Peapack, NJ 07977	Mr. Donald R. Miller Applications Specialist

PERSONS AND ORGANIZATIONS VISITED

<u>Organizations</u>	<u>Contact Person</u>
18. Ecology & Environment, Inc. Rosslyn Center 1700 N. Moore Street Arlington, VA 22209	Mr. Hendry Labalme
19. Ecology & Environment, Inc. Rosslyn Center 1700 N. Moore Street Arlington, VA 22209	Mr. Marc G. Schneckenberger Buffalo Corporate Center
20. Ecology & Environment, Inc. Rosslyn Center 1700 N. Moore Street Arlington, VA 22209	Mr. Robert R. Santa Maria DOE Programs Director
21. Ecology & Environment, Inc. Buffalo Corporate Center 368 Pleasantview Drive Lancaster, NY 14086	Mr. Michael A. Shelly, Ph.D.
22. Ecology & Environment, Inc. Buffalo Corporate Center 368 Pleasantview Drive Lancaster, NY 14086	Mr. Gerhard J. Neumaier
23. Ecology & Environment, Inc. 1203 Governor's Square Tallahassee, FL	Mr. Dhroov M. Shivjiani, P.E.
24. Smith & Loveless, Inc. 14040 Santa Fe Trail Drive Lenexa, KS 66215-1284	Mr. Stuart B. Marshall Executive Vice President
25. Science Applications International Corporation 11251 Roger Bacon Drive Reston, VA 22090	Mr. Dash Sayala, Ph.D. Senior Scientist/Program Manager

APPENDIX D
BUSINESS CARDS OF PERSONS CONTACTED

D. BUSINESS CARDS OF PERSONS CONTACTED



Prakash Acharya, P.E., CHMM

Self Consultant
Pollution Control Engineering Division

Regional Office
312 Directors Drive • Knoxville Tennessee 37923
615-690-3211 • FAX 615-690-3626



Alan Baker

Business Development Manager
Pollution Control Engineering Division

Regional Office
312 Directors Drive
Knoxville, Tennessee 37923
615-690-3211 • FAX 615-690-3626



Johnnie E. Silas

Senior Instrumentation and Controls Designer
Pollution Control Engineering Division

Regional Office
312 Directors Drive • Knoxville Tennessee 37923-4799
615-690-3211 • FAX 615-690-3626



Stuart E. Shealy, P.E.

Treatability Programs Manager
Technology Development Laboratory

Regional Office
304 Directors Drive
Knoxville, Tennessee 37923
615-690-3211 • FAX 615-694-9573



Steven G. DeCicco

Process Engineering & Services Manager
Pollution Control Engineering Division

Regional Office
312 Directors Drive • Knoxville Tennessee 37923-4799
615-690-3211 • FAX 615-690-3626



Charles Pfommer, Jr. P.E.

Thermal Systems Manager
Pollution Control Engineering Division

Regional Office
312 Directors Drive • Knoxville Tennessee 37923
615-690-3211 • FAX 615-690-3626

24



Michael Gust

Director Thermal Operations

Regional Office
William Penn Plaza • 2700 Mossdale Boulevard
Monroeville, Pennsylvania 15146-2792
412-373-7701 • FAX 412-373-7135



A Joint Venture

Michael Gust

Project Director

275 Highway 90 East
P.O. Box 1649
Crosby, Texas 77532

(713) 328-4799
Fax 328-4949



A Joint Venture

Al Berman

Laboratory Manager

275 Highway 90 East
P.O. Box 1649
Crosby, Texas 77532

(713) 328-4799
Fax 328-4949



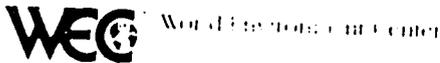
A Joint Venture

Phil Putman

Operations Manager

275 Highway 90 East
P.O. Box 1649
Crosby, Texas 77532

(713) 328-4799
FAX: 328-4949



SWARUPA GANGULI
DIRECTOR, PROJECT MANAGEMENT

WORLD ENVIRONMENT CENTER
1000 WILSON BLVD
SUITE 500
ARLINGTON, VA 22209

PHONE (703) 524-2805
FAX (703) 524-2808



Sarah Gober

~~XXXXXXXXXX~~
ASIA PROGRAMS

WORLD ENVIRONMENT CENTER
1000 WILSON BLVD
SUITE 500
ARLINGTON, VA 22209

PHONE (703) 524-2805
FAX (703) 524-2808

SANDERS INTERNATIONAL, INC.
Environmental Consultants

Jeffrey D. Hallett
Senior Consultant
TEST Project Manager

1616 P Street, N.W., Suite 410
Washington, D.C. 20036

202 939 3495
Tel. (202) 939-3486
Fax (202) 939-3487

SANDERS INTERNATIONAL, INC.
Environmental Consultants

Emily Harwit
Associate

1616 P Street, N.W., Suite 410
Washington, D.C. 20036

Tel. (202) 939-3495
Fax (202) 939-3487

P.O. Box 1776
Peapack, NJ 07977
908-234-1776
Fax 908-234-2941

James H. Milo

908
204/234-1776

ThermAll, inc.

Thermal Processing Systems

A Subsidiary of KOMLINE-SANDERSON

ThermAll, inc.

Thermal Processing Systems

William W. Musgrave
Manager of Projects

P.O. Box 1776 □ Peapack, New Jersey 07977

HENRY LABALME



ecology and environment, inc.

ROSSLYN CENTER, 1700 N. WOODRE STREET, ARLINGTON, VA 22209
TEL. (703) 522-6065, FAX: (703) 558-7950, TELEX 650-2676032MCI

International Specialists in the Environment

Holland Avenue
Peapack, NJ 07977
908-234-1000
Fax 908-234-9487

Donald R. Miller
Applications Specialist



**Komline-
Sanderson**

D-3

BEST AVAILABLE COPY

76

MARC G. SCHNECKENBERGER, P.E.



ecology and environment, inc.

BUFFALO CORPORATE CENTER
368 PLEASANTVIEW DRIVE, LANCASTER, NEW YORK 14086
TELEPHONE 716/684-8060

International Specialists in the Environment

ROBERT R. SANTA MARIA
DOI PROGRAMS DIRECTOR



ecology and environment, inc.

BUFFALO CORPORATE CENTER
368 PLEASANTVIEW DRIVE, LANCASTER, NEW YORK 14086
TEL (716) 684-8060

International Specialists in the Environment

MICHAEL A. SHELLY, Ph.D.



ecology and environment, inc.

BUFFALO CORPORATE CENTER
368 PLEASANTVIEW DRIVE, LANCASTER, NEW YORK 14086
TEL (716) 684-8060, FAX (716) 684-0844, TELEX 650-2696050MCI

International Specialists in the Environment

GERHARD J. NEUMAIER
PRESIDENT



ecology and environment, inc.

BUFFALO CORPORATE CENTER
368 PLEASANTVIEW DRIVE, LANCASTER, NEW YORK 14086
TEL (716) 684-8060, FAX (716) 684-0844

International Specialists in the Environment

DHROOV M. SHIVJANI, P.E.



ecology and environment, inc.

1203 GOVERNOR'S SQUARE BOULEVARD, TALLAHASSEE, FL 32301
TEL (904) 877-1978

International Specialists in the Environment

Stuart B.
Marschall



Executive Vice President

14040 Santa Fe Trail Drive
Lenexa, KS 66215-1284
(913) 888-5201 Ext. 301
Fax: (913) 888-4230

Smith & Loveless, Inc.

Solutions to a World of Water Problems

Dash Sayala, Ph.D.
Senior Scientist/Program Manager

SAIC Science Applications
International Corporation
An Employee-Owned Company

11251 Roger Bacon Dr., P.O. Box 4875, MS R-1-3, Reston, VA 22090
Office: (703) 318-4644 FAX: (703) 709-1038

D-4

BEST AVAILABLE COPY

21

APPENDIX E
DOCUMENTS RECEIVED

APPENDIX E
DOCUMENTS RECEIVED

1. IT CORPORATION
 - i) Statement of Qualifications and Experience
 - ii) Thermal Treatment Technologies: Statement of Qualifications and Experience
 - iii) Annual Report - Contaminated Water Treatment: State of Qualifications
 - iv) ENR - Special Report

2. THERMALL, INC.
 - i) ThermAll Processing Systems: Experience List
 - ii) ThermAll, Inc. - Installation Systems

3. KOMLINE SANDERSON - Belt Filter Press

4. ECOLOGY & ENVIRONMENT, INC. - Experience List

5. SMITH & LOVELESS, INC. - All Product Details

APPENDIX F

RESUME

R E S U M E

Name : B. RAVI

Nationality : INDIAN

Date of Birth : 24.12.1960

Languages known : Telugu, Tamil, English

Education : Graduated in the year 1981
Post Graduation - 1985
Area of specialisation -
Environmental Chemistry.
Submitted Thesis for
Doctorate degree captioned,
"Innovative process for
Biological Waste Water
Treatment" where anaerobic and
aerobic systems are combined
in single unit which can treat
industrial and domestic
effluents more efficiently
than the conventional
activated sludge process.

CAREER PROFILE

Started my career in the year 1985 in Environmental Engineering Company in the year 1985. I was one of the partner and headed the technical department. During my one year tenure, many effluent treatment projects were successfully installed and commissioned.

One important project is revamping of M/s. New Horizon Sugar Mills Pvt. Ltd., Pondicherry. The sugar mill design involved converting the Anaerobic Lagoon into Anaerobic Contact Filter and extended aeration into activated sludge process.

BEST AVAILABLE COPY

In the year 1986, a consultancy firm was started on my own in the name and style of **PURE TECH ENGINEERING**.

The company offered consultancy services in the field of effluent treatment and prepared feasibility reports for various Industries. It has prepared around 600 reports to its credit. Gradually the company was converted to Private Limited Company.

PURE TECH ENGINEERING PVT. LTD has supplied effluent treatment plants on turnkey basis and has supplied mechanical equipments for effluent treatment plants.

The company has groomed the idea of Common Effluent Treatment Plants (C.E.T.P) for various Bleaching and Dyeing units. The company is expertised in C.E.T.P's right from preparing feasibility reports, tender document preparation and finally installation of the complete plant.

I have travelled widely in U.S, U.K and Europe and acquired vast knowledge in Pollution Control Engineering.

KEY EXPERIENCE

Process Design Engineering and Analytical, Estimation, Supervision and monitoring of Pollution Control Systems, Treatment Plants, sampling and analytical programmes for domestic sewage and Industrial Waste Water treatment and Pollution Control. Commissioning of waste water treatment works and upgradation of existing works. Formulating the most effective treatment scheme [on the basis of both Quality and Cost] by means of treatability studies.

Laboaratory analysis of industrial waste water and domestic sewage by classical and modern instrumental methods. Can successfully lead and motivate team of multi-disciplinary professionals towards success and company's growth.

Developed compact treatment systems to handle industrial waste water and sewage from housing complexes.

Many feasibility reports were prepared for Sago factories adopting anaerobic contact filter and extended aeration activated sludge process.

BEST AVAILABLE COPY

Yew

32