United States
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Agency

Office of
Research and
Development

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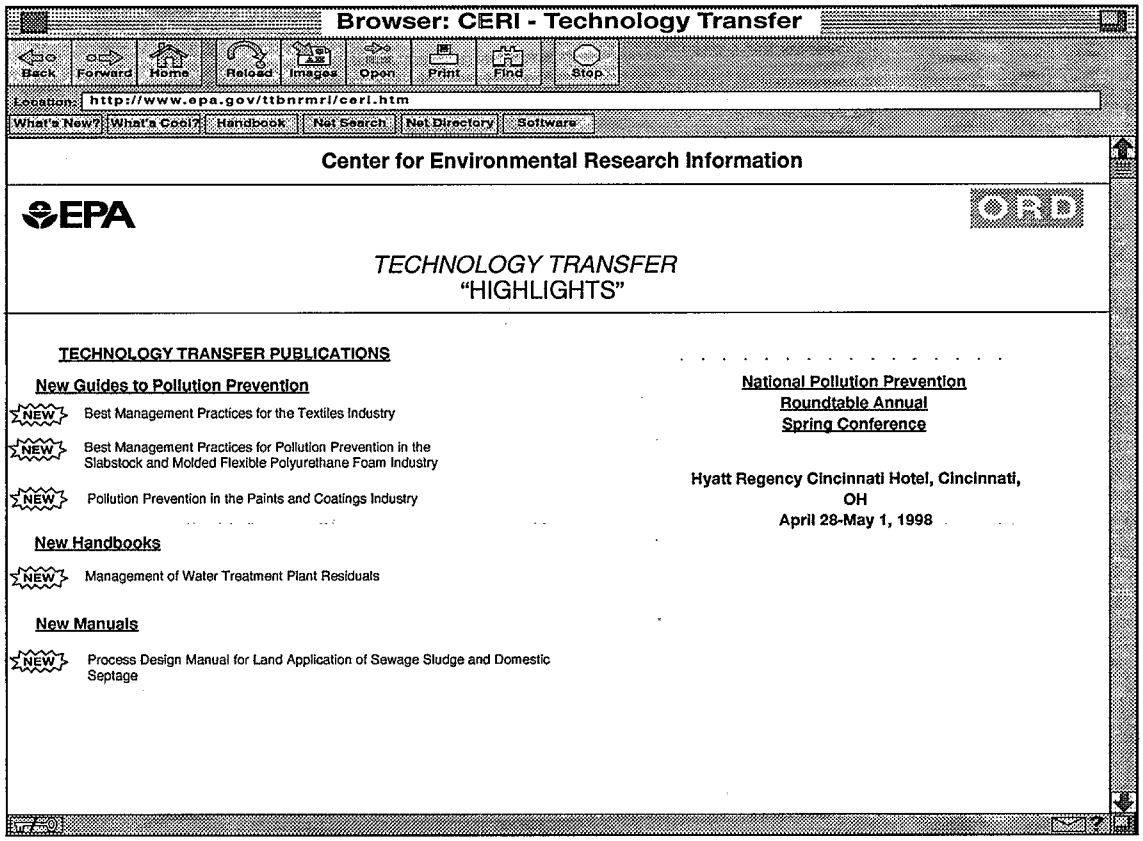
EPA Technology Transfer HIGHLIGHTS

CERI Introduces the "Technology Transfer Highlights" Homepage



The Center for Environmental Research Information (CERI) is introducing its new *Technology Transfer Highlights* homepage. This World Wide Web (WWW) page is located at the following URL (Uniform Resource Locator):

http://www.epa.gov/ttbnrmrl/ceri.htm

This new homepage can also be accessed directly from the homepage of EPA's Office of Research and Development located at **http://www.epa.gov/ORD/**. Our homepage is fashioned after CERI's "*Technology Transfer* HIGHLIGHTS" newsletter that notifies our customers of new technology transfer products using a traditional hardcopy format. This homepage provides our customers with a dynamic mechanism for learning of new technology transfer products and allows for on-line ordering of our publications and registering for our meetings. In addition, some of our newer products can be downloaded directly to a personal computer for viewing and printing.

The homepage is extremely user-friendly because of its straight forward design and ease of use. Technology transfer products are organized by several features including, subject and product type. In addition, the homepage allows our customers to search a database of titles and abstracts to identify products that can meet a specific need.

So, when you need environmental information and technology transfer products, visit CERI's new "*Technology Transfer Highlights*" homepage and obtain the latest news and our up-to-date product listing. And, let us know what you think about our products by using the built-in e-mail to us.

The Center for Environmental Research Information
The Bridge Between Research and Implementation

The following technology transfer products were developed by the Center for Environmental Research Information (CERI) over the past year. These products are available and can be obtained from CERI using the form on page 11 or visiting our home page at: http://www.epa.gov/ttbnrmrl/ceri.htm.

Technical Capsule Report

Aqueous Mercury Treatment *(EPA/625/R-97/004)*

Mercury can contaminate wastewater and the environment through several sources. One of the major consumptive users of mercury is the chlor-alkali industry through the production of various electrolytic cells. Other users of mercury include the electrical and electronics industry, explosives manufacturing, the photographic industry, chemical and petro-chemical industry and paint production. Mercury may also be present in a wastewater due to its occurrence as an incidental contaminant at trace levels in an industrial raw material. This report describes established technologies and innovative strategies for treating aqueous mercury. The information provided encompasses full-, pilot- and bench-scale treatment results as presented in the technical literature. This report also evaluates alternative technologies based upon: (1) governing physical and chemical principles; (2) key treatment parameters and (3) pretreatment requirements, performance, design considerations and economics, where applicable. This information can be useful for evaluating mercury treatment alternatives for industrial wastewater, groundwater and soil washing extract.

Each of the mercury treatment technologies described in this report achieves different effluent mercury concentrations. The effectiveness of treatment provided by each type of technology depends upon the chemical nature and initial concentration of mercury, as well as, the presence of other constituents in the wastewater that may interfere with the treatment process. However, other factors, such as residuals management and cost, weigh heavily in selecting the appropriate treatment approach. Some of the technologies featured in the report include: precipitation, coagulation/co-precipitation, activated carbon adsorption, iox exchange, chemical reduction, membrane separation, biological treatment and membrane extraction.

Handbooks

Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air - First Edition *(EPA/625/R-96/010a)*

This handbook represents the First Edition of the Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air. It is intended to assist those persons responsible for sampling and analysis of ambient inorganic pollutants. These methods have been prepared to provide regional, state, and local environmental regulatory agencies, industry, and other users with step-by-step and analysis procedures for the determination of selected inorganic pollutants in ambient air.

This Compendium contains a set of 17 methods (in 5 categories) presented in a standardized format, with a variety of applicable sampling methods and various analytical techniques for specific classes of inorganic pollutants, as appropriate to their ambient levels and potential interferences. Consequently, this treatment allows flexibility in selecting alternatives to complement the user's background and laboratory capability.

(The Second Edition to the Compendium of Methods for the Determination of Toxic Organic Compounds is currently in the final review phase. This additional Compendium will provide sampling and anlytical procedures for the determination of toxic organic pollutants in compliance with Title III of the Clean Air Act Amendments.)

Handbook for Continuous Emission Monitoring Systems for Non-Criteria Pollutants *(EPA/625/R-97/001)*

In 1979, a Technology Transfer Handbook was prepared on the topic of continuous emission monitoring (CEM) systems designed to provide detailed information necessary for developing continuous monitoring programs of criteria pollutants (such as sulfur dioxide-SO_2, and oxides of nitrogen-NO_x) at stationary sources. This document was subsequently updated in 1991 and 1993. Due to the successes of these criteria pollutant CEM programs, requirements for continuous emission monitoring have been and are being extended to cover a wider range of non-criteria pollutant categories such as volatile organic compounds (VOCs) and hazardous air pollutants (HAPs).

This Handbook provides a description of the methods used to continuously monitor non-criteria pollutants emitted from stationary sources. The Handbook contains a view of current regulatory programs, the state-of-the-art sampling system design, analytical techniques, and the use of computer systems for data acquisition and predictive monitoring. The Handbook is intended for those in industry or in government who are charged with implementing a continuous emission monitoring (CEM) program for this wider range of air pollutants.

Summary Reports

Treatment Technology Performance and Cost Data for Remediation of Wood Preserving Sites *(EPA/625/R-97/005)*

Wood preserving has been a viable industry in North America for over 100 years. During this time, wood preserving facilities have employed a variety of compounds to treat lumber for commercial and residential use, including pentachlorophenol (PCP), creosote, and inorganics, such as, copper chromated arsenic (CCA). Past operations and waste management practices have resulted in soil and groundwater contamination at many of the wood preserving sites in the United States. Current database estimates have identified over 700 wood preserving sites. The U.S. Environmental Protection Agency (EPA) has responded to the need for credible performance and cost information aimed at facilitating the clean-up of wood preserver sites through the conduct of treatability studies, demonstration projects, seminars and technical documents.

This Summary Report presents information pertaining to applicable treatment and control alternatives for the remediation of soil and water at wood preserving sites. It provides background information on the wood preserving industry; common wood preserving contaminants including PCP, polycyclic aromatic hydrocarbons (PAHs), dioxins/furans and inorganics; environmental concerns associated with these contaminants and over ten technologies which have been used for remediating contaminated media at wood preserver sites. Sources of additional information in the form of documents and databases are also provided. Appendices include a listing of known wood preserving sites along with addtional soil and water treatment studies.

Guides to Pollution Prevention

ISO 14000 Resource Directory *(EPA/625/R-97/003)*

This document, developed through cooperation between EPA's Office of Research and Development and the Office of Prevention, Pesticides and Toxic Substances, is a listing of government and nonprofit organization initiatives and projects related to the International Organization for Standardization (ISO) 14000 Environmental Management Systems (EMS) Standards. The goal of the document is to inform readers of the ISO 14000 standards and activities related to ISO 14000

Included in this directory are overviews of ISO, the ISO 14000 standards, the structure of the ISO Technical Committee 207 (TC-207) which has the responsibility for developing standards under the ISO 14000 designation, the U.S. Technical Advisory Group to ISO TC-207, and U.S. EPA's involvement with ISO 14000 standards. The directory presents information on initiatives relating to ISO 14000 standards currently being pursued by U.S. EPA, other federal departments and agencies, state governments, nonprofit organizations, and foreign governments and organizations.

The directory also provides a listing of resources that can be used to obtain additional information relating to ISO 14000 standards. It is envisioned that the directory will be updated periodically and available in a downloadable format on the *Technology Transfer Highlights* homepage. Also, plans are to have the directory in an INTERNET interactive format in the future.

EPA Standards Network Fact Sheet ISO 14000: International Environmental Management Standards *(EPA/625/F-97/004)*

This fact sheet provides an overview of the International Organization for Standardization (ISO) 14000 Enviornmental Management Standards. It also explains the structure of ISO and discusses the current status of the ISO 14000 standards. This fact sheet identifies members of the U.S. Technical Advisory Group to the ISO Technical Committee 207. In addition, ISO 14000 standards information resources are identified.

Meetings/Conferences

National Pollution Prevention Roundtable Annual Spring Conference

The National Pollution Prevention (P2) Roundtable (NPPR) will hold its' annual Spring Conference in Cincinnati, OH, at the Hyatt Regency Cincinnati Hotel on April 28-May 1, 1998. This conference will focus on the latest P2 policy, regulatory, technical and industrial assistance initiatives. Plenary sessions will feature lawmakers and other high ranking government officials who will talk about the next steps needed for pollution prevention to become a centerpiece of federal, state and local environmental policies. There will be further discussion on reauthorizing the Pollution Prevention Act of 1990 in order to strengthen the national commitment to P2. Other legislative issues will be featured such as Chemical Use Reporting and P2 Planning, and there will be a special update on the Roundtable's Materials Accounting Project and pilot program.

Sessions on electronic networking, international community linkages, cleaner production, global climate change, energy efficiency, sustainable development, household/landscaping P2 and technologies will be featured.

The NPPR is the largest membership association devoted solely to promoting pollution prevention. Approximately 600 participants attended the annual Spring meeting in Denver, CO, in April of this year.

A committee comprised of representatives from USEPA, Ohio EPA, Indiana's Department of Environmental Management, the Kentucky Pollution Prevention Center, the City of Cincinnati and the Institute of Advanced Manufacturing Sciences (IAMS) are assisting in the organization and planning of activities, including local site visits and evening social activities.

Registration information will be available from the Technology Transfer Highlights homepage at http://www.epa.gov/ttbnrmrl/ceri.htm. So take advantage of this opportunity to network with experts in the P2 field from across the nation and around the world!

American Water Works Association (AWWA) Annual Conference

The EPA Offices of Research and Development (ORD) and Groundwater and Drinking Water (OGWDW) cooperated for the twelfth year in putting together a display/exhibit at the AWWA Annual Conference and Exposition, held June 15-19, 1997, in Atlanta, GA. Approximately 14,000 state and utility personnel along with consultants, manufacturers and academicians routinely attend this conference; and many visit the exhibit.

As part of the exhibit, ORD and OGWDW displayed and made available to participants many publications that are pertinent to the Agency's Drinking Water Program. Almost 5,500 publications were requested by visitors to the booth. ORD documents distributed included:

- Guidelines for Water Reuse
- Control of Lead and Copper in Drinking Water
- Optimizing Water Treatment Plant Performance Using the Composite Correction Program Approach
- Ground Water and Wellhead Protection
- Drinking Water Treatment for Small Communities
- Preventing Water Borne Disease

Several ORD staff participated in the conference as follows:

Presentations:

- The Impact of Stagnation Time of Metals Leached from Distribution System Materials; Darren Lytle and Michael Schock
- USEPA Projects Assist Small Water Systems in Meeting the SDWA; James A. Goodrich, Benjamin W. Lykins, Jeffrey Q. Adams
- Predictions of Field-Scale Biotreatment with a Biomass Based Model; Nicholas R. Dugan
- Improved Corrosion Control Using Nanofiltration with Limited Post-treatment; Michael Schock (Coauthor)
- Kinetics of *Cryptosporidium parvum* Oocyst Inactivation with Ozone; James H. Owens and Eugene W. Rice (Coauthor)
- Modeling Chlorine Decay Using Ultraviolet Absorbance; Richard Miltner (Coauthor)
- Optimal Scheduling of Booster Disinfection; Lewis Rossman (Coauthor)
- Assessment of Ozone Disinfection Efficiency Using Fluorescent-Dyed Polystyrene Microspheres as Indicators for *Crytosporidium parvum*; Eugene W. Rice and James H. Owens (Coauthor)

Poster Sessions:

- Full-Scale Distribution System Storage Facility Tracer Studies; Logical Considerations; Lewis Rossman (Coauthor)
- Optimized Booster Disinfection for Distribution System Water Quality; Lewis Rossman (Coauthor)
- Water Quality Modeling of Distribution System Storage Facilities; Lewis Rossman (Coauthor)

National Conference on the Management and Treatment of Contaminated Sediments

The National Conference on the Management and Treatment of Contaminated Sediments was held in Cincinnati, OH on May 13-14, 1997. This technology transfer meeting was sponsored by the Center for Environmental Research Information (CERI). Over 230 professionals from various governmental agencies and the private sector attended the conference and heard presentations on the control and cleanup of contaminated sediments. The conference had two major purposes. One objective was to inform those involved with the problem of cleaning up contaminated sediments of currently available options for cleanup and of ongoing research on the development of new approaches and technologies. The second objective of the conference was to obtain feedback from the participants about needed research and future directions for the management and treatment of contaminated sediments.

There were 24 speakers from various organizations including the USEPA, the U.S. Army Corps of Engineers; Environment Canada, the National Research Council, private sector developers, engineering firms and academic researchers. In an adjoining exhibit hall, 23 vendor booths were open to the attendees for dissemination of information about technologies and discussion of case studies of sites that have been remediated.

Presentations on the first day of the conference were focused on currently available technologies and approaches. The topics presented were:

- EPA's National Sediment Quality Survey
- Roles of EPA and US Army Corps of Engineers
- Strategies and Technologies for Cleaning Up Contaminated Sediments (based on a report by the National Research Council)
- Solving Great Lakes Contaminated Sediment Problems
- A Perspective on Remediation and Natural Recovery
- Case Studies, including:
  - Natural Recovery
  - In-Situ Capping
  - Brownfields and Sediment Disposal at Indiana Harbor, East Chicago, IN
  - Environmental Dredging and Disposal
  - In-Situ Treatment
  - Ex-Situ Treatment Technologies - New York Harbor
  - The FIELDS System (Fully Integrated Environmental Location Decision Suport System)

The second day of the conference was devoted to ongoing research, additional systems to facilitate decision making and future research directions. Presentations were given on the following topics:

- Remediation Strategies and Demonstration of SEDTEC (A Directory of Contaminated Sediment Removal and Treatment Technologies) by Environment Canada
- Demonstration ADDAMS (Automated Dredging and Disposal Alternatives Modeling System)
- USEPA and USACOE Research Overviews
- Biological Research and Microbial Dechlorination of PCBs
- Phytoremediation
- Treatment of Metal Bearing Solids Using a Buffered Phosphate Stabilization System
- Treatment by Thermal Desorption
- Treatment by a Solvent Extraction Process
- Containment

A panel consisting of representatives from the federal government, academia and a representative from the Sierra Club discussed future research needs and responded to questions from the audience at the conclusion of the conference. Some of the issues raised were stability of caps in a turbulent environment, beneficial uses and the marketability of dredged sediments, the need for a framework to help evaluate treatment options and the effort of the International Joint Commission for the Great Lakes Region. A recommendation to EPA to address watershed management in order to reduce further contamination of sediments from point and nonpoint source discharges was made.

A conference proceedings is planned. For more information about the conference, you may contact Joan Colson at 513/569-7501 or by email: colson.joan@epamail.epa.gov.

National Satellite Videoconference on Source Protection of Drinking Water Supplies

The Safe Drinking Water Act Amendments of 1996 place a strong emphasis on source water protection for the 240 million Americans served by public water systems. Preventing contamination is the key to keeping water supplies safe. Once a drinking water supply becomes contaminated, a community is faced with the difficult and costly task of installing additional and often very costly treatment facilities or locating an alternative source. Water supply protection isn't a new idea, the Safe Drinking Water Act Amendments of 1986 established the very successful Wellhead Protection Program, designed to protect ground water used as drinking water. The concepts involved in Wellhead Protection are now being expanded to include surface water sources.

Source Water Protection is a community-based approach to protecting sources of drinking water from contamination and involves; 1) Forming a team; 2) Identifying the land area to be protected (Delineation); 3) Identifying potential sources of contamination (Source Identification); 4) Planning for the future - emergenciies can happen (Contingency Planning); and 5) Managing those sources of contamination (Source Management). EPA's GOAL is to have 30,000 community-based protection efforts underway by the year 2005.

The live videoconference telecast was beamed on May 14, 1997 to approximately 200 sites with an audience of more than 4,000 including utility operators, engineers, regulatory officials, planners, representatives of watershed associations, and academicians. The 4-hour program was presented by CERI in cooperation with EPA's Office of Groundwater and Drinking Water (OGWDW), the National Rural Water Association (NRWA), the American Water Works Association (AWWA) and the Association of State Drinking Water Administrators (ASDWA). It was accessible at no charge to downlink locations nationwide.

This conference presented a national overview of historical and current source water protection efforts; a discussion of jurisdictional and other issues; a discussion of available financing and implementation assistance; and numerous case studies. Some case studies illustrated the benefits of source water protection plans and what is involved in putting them in-place; while others showed the consequences of not having in-place source water protection plans. The co-sponsoring organizations discussed activities they have ongoing in source water protection as well as, resources they can make available for problem solving. Participants were provided with practical tools for the protection of both ground water and surface water, drawing on the extensive experience of the sponsoring organizations in developing wellhead and watershed protection plans. Speakers highlighted the cost/resource savings that can be realized through prevention of source water contamination. In addition, issues faced by small systems were specifically addressed.

Speakers included Robert W. Barles, Chief, Prevention & Support Branch, OGWDW; E. Timothy Oppelt, Director, EPA's National Risk Management Research Laboratory (NRMRL); Preston Luitweiler, Philadelphia Suburban Water Company, and Chair of AWWA's Source Water Protection Technical Working Group; John Trax, NRWA; David Terry, State of Massachusetts, representing ASDWA; Robert Clark, Director; Water Supply and Water Resources Division, NRMRL; Lynda Laine, Northeast Rural Water Association; and Richard Cobb, Illinois EPA.

Audiences from across the US and Canada were given ample opportunity to telephone or fax into the studio questions for the expert speakers to answer. Materials were available to participants at the downlink sites including:

- Seminar Publication: Wellhead Protection: A Guide for Small Communities (EPA/625/R-93/002)
- Handbook: Ground Water and Wellhead Protection (EPA/625/R-94/001)

For further information on this video conference including the obtaining of a copy of the handout materials and/or conference videotape, please contact J.E. Smith, Jr., CERI (MS-G77), 26 W. M.L. King Drive, Cincinnati, OH 45268; E-mail: smith.james@epamail.epa.gov.

The 90th Annual Meeting of the Air and Waste Management Association

Toronto, Canada hosted the 90th anniversary of the Air and Waste Management Association's International Conference, June 8-13, 1997. The theme for this year's meeting was Science and Technology: The International Language. In addition to the media excitement generated by the ribbon cutting ceremony hosted by Canadian's Minister of the Environment, Sergio Marchi, and the OPEC ministers tour of the exhibition, this year's event attracted representatives from over 35 countries outside of the U.S. and Canada. EPA participated by exhibiting and providing information on new environmental technologies available and demonstrating the latest in electronic information technologies including the new *Technology Transfer Highlights* homepage. EPA also participated in the International Environmental Technology Special Pavilion by showcasing the Environmental Technology Verification Program. This annual event features a three-day exhibition presented concurrently with a five-day technical conference including over 90 business meetings, 800 technical sessions, continuing education courses and public outreach programs. EPA is planning its involvement at the next annual meeting and exhibition in San Diego, CA in June 1998. Hope to see you there!

Technology Transfer Handbook: Management of Water Treatment Plant Residuals, receives the American Society of Civil Engineer's 1997 State-of-the-Art of Civil Engineering Award

This handbook was the result of a cooperative effort among the American Society of Civil Engineers, the American Water Works Association, and EPA. It was developed over a four-year period with the assistance of many individuals in the water supply and residuals management fields. It contains chapters on regulatory issues, characterization, processing, direct discharge to surface waters, discharge to wastewater treatment plants, landfilling, land application, brine waste disposal, radioactive waste disposal, economics, case studies, and waste minimization and reuse. The handbook provides the consensus opinion/judgment of the cooperating organizations as to what constitutes best practice. It first gives meaningful guidance to federal, state, and local regulatory personnel in reviewing drinking water treatment plant plans for residuals management, and it secondly helps the utility to select an environmentally sound way for managing its residuals. The handbook strives to provide enough information for the user to do a feasibility design of the selected process(es). Design examples, case studies, results of recent research in the field, and pollution prevention methods and technologies are included to the extent that information was available.

Copies of this handbook are generally only available from either the American Society of Civil Engineers, 345 E. 47th Street, New York, NY 10017 (refer to ASCE Manuals and Reports on Engineering Practice No. 88) or from the American Water Works Association (AWWA), 6666 W. Quincy Avenue, Denver, CO 80235.

ASCE/CSCE Residuals Management Workshop

The subject handbook was featured at a preconference workshop of the July 22-26, 1997, ASCE/CSCE "Environmental Engineering Annual Conference" in Edmonton, Alberta, Canada. Approximately 400 professionals attended this meeting of the American and Canadian Societies of Civil Engineers (ASCE/CSCE). They came from academia, consulting firms, utilities, and industry. Session topies included risk assessment, water treatment, wastewater treatment, residuals management, stormwater management, geographic information systems, and soils bioremediation.

The preconference workshop was held on July 22, 1997, had an attendace of 30 individuals, and addressed both water and wastewater treatment plant residuals. The basis for the water treatment plant residuals presentations was the newly completed *Technology Transfer Handbook: Management of Water Treatment Plant Residuals.* Topics covered included: residuals production, characteristics, thickening, stabilization, dewatering, and use or disposal.

WEF/AWWA Water Plant Residuals Workshop

The handbook was also featured at an August 3, 1997 workshop titled, "A Practical Approach to Evaluating (Water Treatment Plant) Residuals Management Alternatives," at the Water Environment Federation/American Water Works Association Joint Specialty Conference In Philadelphia, PA from August 3-6, 1997. Approximately 50 individuals attended this workshop which included the following topics: Regulatory Aspects, Reuse/Disposal Options, Residuals Processing, Planning Level Costs, and Special Wates Considerations: Recycling Backwash Streams/Radioactive/Brines.

For more information on the management of water treatment plant residuals, please contact J.E. Smith, Jr. at CERI (MS-G77), 26 W. M.L. King Drive, Cincinnati, OH 45268; E-mail: smith.james@epamail.epa.gov.

Two Major Decentralized Wastewater Systems Design Manuals to be Updated and Released in 1998

The Design Manual for Onsite Wastewater Treatment and Disposal Systems (EPA/625/1-80/012) has been one of the most popular USEPA manuals in history with distribution of over 60,000 copies since its release in 1980. However, new technological advances, new data generated in recent years, and the need to deal with issues of pollutant fate and potential impacts on humans and ecosystems required that a major upgrade be made for satisfaction of the new demands created by the recent USEPA report, Response to Congress on "Use of Decentralized Wastewater Treatment Systems".

Similarly, the Design Manual, Constructed Wetlands and Aquatic Plant Systems for Municipal Wastewater Treatment, released in 1988, filled a need at that time to attempt to fill a void in the literature regarding natural systems which employ plants to enhance performance of non-mechanical systems. In the case of this manual a body of literature has developed in the interim which fails to satisfy the needs of professionals in the field who are genuinely interested in the proper application of these systems to small community wastewater problem solutions. Therefore, this manual will attempt to address the mechanistic roles of these systems and how they can be used for treatment enhancement in a practical way, and describe the kinds of data which will be necessary to upgrade these systems to a level of true science for optimal application in the future.

Both manuals are under development at present by the staff of CERI, ORD's National Risk Management Research Laboratory and the Office of Wetlands, Oceans and Watersheds. The new onsite technology manual will be extensively peer reviewed through use of dozens of top technologists, regulators and researchers throughout the country. The wetlands manual will also rely heavily on peer review from environmental engineering researchers and professors who understand the treatment mechanisms extant in these complex systems.

Both manuals will be timely contributions to the decentralized wastewater systems field in light of the recent USEPA recognition of these technologies as permanent solutions to be evaluated on the same basis as traditional conventional sewerage and mechanical treatment systems which have been the standard of major urban systems for the last 75 years.

Brownfield Technical Guidance

CERI is developing a series of technical guidance documents to help communities, states and municipalities, and the private sector more effectively address brownfield sites. Abandoned, idle and under-used industrial sites called brownfields exist across the country. The USEPA's Brownfield Economic Redevelopment Initiative is desgned to empower states, communities and other stakeholders in economic redevelopment to work together to prevent, assess, safely cleanup and sustainably reuse brownfield sites.

Each guide in this series contains information on a different type of brownfield site (classified according to former industrial use). Three guides to facilitate characterization of contamination and cleanup options are being developed at this time. The site types, based on former use, are: automotive repair sites, iron and steel mill sites, and metal finishing sites. In addition, a supplementary guide in this series contains information on cost estimating tools and resources that are applicable to brownfield sites.

The guides are technical in nature and can be used in conjunction with other technical and policy guidance documents. These four documents are scheduled for completion in late 1997.

Process Capsule Reports for the Metal Finishing Industry

Two process capsule reports are being prepared that will serve as advisors and guides for metal finishing industry managers/operators, regulators (federal, state and local), consultants and other interested parties involved with the operation and management of hard chrome metal finishing shops/facilities. These capsule reports will emphasize compliance with the Maximum Achievable Control Technology (MACT) standards, as well as, other pollution control treatment practices that exemplify best management practices. Information supplied within these reports will: 1) demonstrate a real-world baseline of typical electroplating source emission prevention/control techniques; (2) enable decision-makers to determine if the MACT standard can be met under job shop working conditions; 3) demonstrate lower cost emission prevention/control techniques that emphasize pollution preveition; and 4) demonstrate methods of reducing trivalent, hexavalent and total chromium emissions into the environment.

Hard Chrome Mist Suppressants Capsule Report

This report will provide a summary of all existing and relevant information resulting from the Hard Chrome Pollution Prevention Demonstration Project(s) and other sources derived from plating facilities and industry contacts. The goal for limiting chromium emissions to levels specified in the MACT standards are: 1) 0.030 milligrams per dry standard cubic meter of air (mg/dscm) for small facilities with existing tanks and 2) 0.015 mg/dscm for small facilities with new tanks or large facilities with existing or new tanks. Some of the mist suppressants currently in use are: mesh pad mist eliminators, composite mesh pad mist eliminators, packed-bed scrubbers and polyballs. This capsule report will also emphasize other pollution prevention techniques.

Hard Chrome Control Technologies Capsule Report

This report will provide a general discussion of treatment and control techniques which are impacted by the recently promulgated MACT standards. Information provided in this report will include process descriptions, as well as, applications of the treatment technology on chrome plating emissions. Equipment specifications will be described along with O&M procedures. Special emphasis will be placed upon best management practices. Advantages and limitations will also be included with each technology.

TECHNOLOGY TRANSFER PRODUCTS

MANUALS

Land Treatment of Municipal Wastewater (Oct. 1981) 625/1-81/013
Supplement for Land Treatment of Municipal Wastewater (Oct. 1984) 625/1-81/013a
Odor and Corrosion Control in Sanitary Sewerage Systems and Treatment Plants 625/1-85/018
Municipal Wastewater Disinfection (Oct. 1986) 625/1-86/021
Phosphorus Removal 625/1-87/001
Dewatering Municipal Wastewater Sludges (Sept. 1987) 625/1-87/014
Fine Pore Aeration Systems (Oct. 1989) 625/1-89/023
Alternative Collection Systems for Small Communities (Oct. 1991) 625/1-91/024
Guidelines for Water Reuse (Sept. 1992) 625/R-92/004
Wastewater Treatment/Disposal for Small Communities (Sept. 1992) 625/R-92/005
Control of CSO Discharges (Sept. 1993) 625/R-93/007
Nitrogen Control (Sept. 1993) 625/R-93/010
Alternative Methods for Delivery and Recover (Oct. 1994) 625/R-94/003
Recycling and Reuse of Materials Found on Superfund Sites (Oct. 1994) 625/R-94/004
Ground Water and Leachate Treatment Systems (Jan. 1995) 625/R-94/005
Process Design Manual for Land Application of Sewage Sludge and Domestic Septage 625/R-95/001
Process Design Manual: Surface Disposal of Sewage Sludge and Domestic Septage 625/R-95/002

TECHNICAL CAPSULE REPORTS

Radon-Resistant Construction Techniques for New Residential Construction: Technical Guidance 625/2-91/032
Approaches For Remediation Of Uncontrolled Wood Preserving Sites (Nov. 1990) 625/7-90/011
Treatment Of Metal Finishing Industry Wastewaters: Evaporation Process Capsule Report 625/R-96/008
Treatment Of Metal Finishing Industry Wastewaters: Reverse Osmosis Process Capsule Report 625/R-96/009
• Aqueous Mercury Treatment 625/R-97/004

SEMINAR PUBLICATIONS

Permitting Hazardous Waste Incinerators 625/4-87/017
Meeting Hazardous Waste Requirements for Metal Finishers 625/4-87/018
Transport and Fate of Contaminants in the Subsurface 625/4-89/019
Corrective Actions - Technologies and Applications 625/4-89/020
Solvent Waste Reduction Alternatives 625/4-89/021
Requirements for Hazardous Waste Landfill Design, Construction and Closure 625/4-89/022
Technologies for Upgrading Existing or Designing New Drinking Water Treatment Facilities 625/4-89/023
Risk Assessment, Management and Communication of Drinking Water Contamination 625/4-89/024
Design and Construction of RCRA/CERCLA Final Covers 625/4-91/025
Site Characterization for Subsurface Remediation 625/4-91/026
Nonpoint Source Watershed Workshop 625/4-91/027
Medical and Institutional Waste Incineration: Regulations, Management, Technology, Emissions, and Operation ... 625/4-91/030
Control of Biofilm Growth in Drinking Water Distribution Systems 625/R-92/001
Organic Air Emissions from Waste Management Facilities 625/R-92/003
The National Rural Clean Water Program Symposium 625/R-92/006
RCRA Corrective Action Stabilization Technologies 625/R-92/014
Control of Lead and Copper in Drinking Water 625/R-93/001
Wellhead Protection: A Guide for Small Communities 625/R-93/002
Operational Parameters for Hazardous Waste Combustion Devices 625/R-93/008
Design, Operation, and Closure of Municipal Solid Waste Landfills 625/R-94/008
National Conference on Urban Runoff Management 625/R-95/003

• Listed for first time

TECHNOLOGY TRANSFER PRODUCTS (continued)

National Conference on Environmental Problem Solving with Geographic Information Systems 625/R-95/004
Managing Environmental Problems at Inactive and Abandoned Metals Mine Sites 625/R-95/007
National Conference on Sanitary Sewer Overflows 625/R-96/007

BROCHURES

Environmental Pollution Control Alternatives: Drinking Water Treatment for Small Communities 625/5-90/025
Regional Environmental Monitoring and Assessment Program (R-EMAP) 625/R-93/012

HANDBOOKS

Retrofitting POTWs for Phosphorus Removal in the Chesapeake Bay Drainage Area (Sept. 1987) 625/6-87/017
Guide to Technical Resources for the Design of Land Disposal Facilities (Dec. 1988) 625/6-88/018
Guidance on Setting Permit Conditions and Reporting Trial Burn Results (Jan. 1989) 625/6-89/019
Retrofitting POTWs (July 1989) 625/6-89/020
Hazardous Waste Incineration Measurement Guidance (June 1989) 625/6-89/021
Stabilization/Solidification of CERCLA and RCRA Wastes (July 1989) 625/6-89/022
Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration (Jan. 1990) 625/6-89/023
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