United States
Environmental Protection
Agency

Industrial Environmental Research
Laboratory
Research Triangle Park NC 27711

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Report Abstracts

Industrial Environmental Research Laboratory RTP

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
INDUSTRIAL ENVIRONMENTAL RESEARCH LABORATORY
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October 1980

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TECHNICAL REPORT DATA
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1. REPORT NO. EPA-600/2-80-042b	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Source Assessment: Residential Combustion of Wood		5. REPORT DATE March 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) D. G. DeAngelis, D. S. Ruffin, and R. B. Reznik		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Monsanto Research Corporation 1515 Nicholas Road Dayton, Ohio 45418		10. PROGRAM ELEMENT NO. 1AB015
		11. CONTRACT/GRANT NO. 68-02-1874, Task 23
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Task Final; 11/76 - 2/80
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is John O. Milliken, Mail Drop 63, 919/541-2745.

16. ABSTRACT The report gives results of an estimate of the potential environmental impact of the residential combustion of wood. About 16.6 million metric tons of wood was burned in the residential section in 1976. About 30% of this was burned for primary heating in about 912,000 residential units. Geographic distribution of wood-fired heaters is related to the natural forest regions in the U.S. By 1985, over 10 million homes will be using some wood fuel. Emissions from wood-fired residential heaters include particulates, SOx, NOx, CO, hydrocarbons (HC), and polycyclic organic material (POM). The impact of these emissions has been assessed by source severity, involving estimating maximum ground level concentrations of pollutants and comparing these concentrations to a National Ambient Air Quality Standard for criteria pollutants or to a reduced threshold limit value for non-criteria pollutants. A comparative analysis of source severities for residential wood combustion with other stationary sources indicates that residential wood combustion is a major source of POM. Particulate, HC, and CO emissions from all residential wood-fired sources were estimated to contribute 1.0, 1.5, and 3.8%, respectively, of the total national emission burden for those species in 1976.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Sulfur Oxides	Pollution Control	13B	07B
Combustion	Nitrogen Oxides	Stationary Sources	21B	
Wood	Carbon Monoxide	Residential Heaters	11L	
Residential Buildings	Hydrocarbons	Source Assessment	13M	07C
Heating Equipment	Polycyclic Compounds	Particulate	13A	
Assessments		Polycyclic Organic Material	14B	
Dust			11G	

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1. REPORT NO. EPA-600/2-80-075d	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Assessment of Atmospheric Emissions from Petroleum Refining: Volume 4. Appendices C, D, and E		5. REPORT DATE April 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) L. P. Provost and R. G. Wetherold (C); G. E. Harris and M. W. Hooper (D); and W. R. Phillips (E)		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Radian Corporation P.O. Box 9948 Austin, Texas 78766		10. PROGRAM ELEMENT NO. 1AB604
		11. CONTRACT/GRANT NO. 68-02-2147, Exhibit B
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Final; 3/76-6/79
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is Bruce A. Tichenor, Mail Drop 62, 919/541-2547.

16. ABSTRACT The report gives results of a 3-year program to assess the environmental impact of petroleum refining atmospheric emissions. This volume contains Appendices C, D, and E. Appendix C presents the quality assurance program and a statistical analysis of the emissions data. It describes quality control procedures for screening, sampling, analyzing, species identification, and data validation. It discusses the accuracy and precision of the various data types. Appendix D describes the procedures used to develop a detailed environmental assessment of refineries. Refinery emission rate data were used to predict ambient pollutant levels near a model refinery. The environmental effects and the potential hazard to the public are discussed. Appendix E is a detailed review and evaluation of pollution control technology. The state-of-the-art of fugitive and process emission controls in refineries is reviewed. Available controls are described. Control technologies used in related industries are examined for potential applicability in the refining industry.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Pollution Control	13B
Petroleum Refining	Stationary Sources	13H
Assessments		14B
Quality Assurance		14D
Quality Control		
Statistical Analysis		12A

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1. REPORT NO. EPA-600/7-79-158a	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Chemically Active Fluid Bed for SOx Control; Volume I. Process Evaluation Studies		5. REPORT DATE December 1979
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) D. L. Keairns, W. G. Vaux, N. H. Ulerich, E. J. Vidt, and R. A. Newby		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Westinghouse Research and Development Center 1310 Beulah Road Pittsburgh, Pennsylvania 15235		10. PROGRAM ELEMENT NO. EHB536
		11. CONTRACT/GRANT NO. 68-02-2142
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Final; 7/75-10/79
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is Samuel L. Rakes, Mail Drop 61, 919/541-2825.

16. ABSTRACT The report describes selected process evaluation studies supporting the development of an atmospheric-pressure, fluidized-bed, chemically active gasification process, using a regenerative limestone sulfur sorbent to produce low- to intermediate-Btu fuel gas. Limestone sorbent selection and attrition, alternative medtal oxide sorbents, particulate control, fuel supply, and an updated process assessment are investigated. Limestone sorbent selection results are presented for the EPA-sponsored CAFB demonstration plant. Sorbent attrition and economics are the main criteria as most limestone are not limited by sulfur removal. Trace element, regeneration, and disposal characteristics should be considered. Feasibility tests of air oxidation for disposal of gasifier solids for once-through operation show up to 70% conversion of the CaS. Methods for improving performance are identified. A procedure was developed to measure the attrition tendency of the sorbent selected. Brownwood limestone has intermediate attrition resistance showing 5.4% mass loss by attrition for this test, compared with three reference stones ranging from 0.5 to 9.1%. Sixteen alternative metal oxide sulfur sorbents that could reduce the environmental impact of solids disposal and may improve process economics were screened. CaO/CaO3, ZnO, and FeO are sorbents identified for further study.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Pollution Control	13B
Sulfur Oxides	Stationary Sources	07B
Fluidized Bed Processing	Chemically Active Fluid Bed	13H,07A
Coal Gasification		
Calcium Carbonates	Particulate	
Dust	Metal Oxides	11G
Aerosols		07D

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1. REPORT NO. EPA-600/7-79-202	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Pollutants from Synthetic Fuels Production: Environmental Evaluation of Coal Gasification Screening Tests		5. REPORT DATE August 1979
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) D. G. Nichols, J. G. Cleland, D. A. Green, F. O. Mixon, T. J. Hughes, and A. W. Kolber		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Research Triangle Institute P.O. Box 12194 Research Triangle Park, North Carolina 27709		10. PROGRAM ELEMENT NO. EHE623A
		11. CONTRACT/GRANT NO. Grant No. R804979
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Task Final; 8/78 - 7/79
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is N. Dean Smith, Mail Drop 61, 919/541-2708. Grant-related reports include EPA-600/7-78-171, EPA-600/7-79-200, and EPA-600/7-79-201.

16. ABSTRACT The report gives results of an environmental evaluation of 38 screening test runs using a laboratory-scale, fixed-bed coal gasifier to study pollutants generated during the gasification of various coals. Pollutants were identified and quantitative analyses performed for tars, aqueous condensates, volatile organics, primary gases, and reactor residues. Tar partition fractions were also generated and studied for each coal providing distributions of insolubles, organic acids and bases, polar and nonpolar neutrals, and polynuclear aromatic hydrocarbons. Showing the greatest potential for adverse health effects are: oxygen-containing species and PNAs in the tars and aqueous condensates; carbon monoxide, benzene, and hydrogen sulfide in the primary gas streams; and certain trace elements in the reactor residues. Bioassays of various coal gasification effluents showed the crude tars and selected tar fractions to have a potentially mutagenic character.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Pollution Control	13B
Coal Gasification	Stationary Sources	13H
Tars	Synthetic Fuels	07C
Condensates		07D
Organic Compounds		
Gases		
Residues		14B

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1. REPORT NO. EPA-600/7-80-003	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Abundance of Trace and Minor Elements in Organic and Mineral Fractions of Coal		5. REPORT DATE January 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) J. K. Kuhn, F. L. Fiene, R. A. Cahill, H. J. Gluskoter, and N. F. Shimp		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Illinois State Geological Survey University of Illinois Urbana, Illinois 61801		10. PROGRAM ELEMENT NO. EHE623A
		11. CONTRACT/GRANT NO. 68-02-2130
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Final; 11/75-5/79
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is N. Dean Smith, Mail Drop 61, 919/541-2708.

16. ABSTRACT The report gives results of subjecting 27 U.S. coals to float/sink, acid, and ion-exchange treatments. From these treatments, coal fractions were obtained and analyzed to determine the organic and mineral associations of 45 elements. Of the elements studied, B, Be, Br, Ge, and Sb were consistently classified organic; sulfide-forming elements (Zn, As, Cd, and Fe) were classified inorganic; and others (e.g., Al, Ca, Ga, Ni, P, Si, and Ti) were intermediate or variable in their association. Three general observations were made: (1) the total concentration of an element in coal is not indicative of its concentration in the organic phase; (2) because concentrations vary widely, an accurate appraisal of trace and minor element associations requires that each coal be evaluated separately; and (3) the highest concentrations of trace and minor elements in coal occur in the mineral matter. Despite evidence that many elements exhibit some degree of organic association, most of the trace and minor elements in these coals were in a mineral form. Thus many elements could be significantly reduced by physical cleaning. The degree of reduction depends on the mineral, its size, and its distribution.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Pollution Control	13B
Coal	Stationary Sources	08G
Analyzing	Characterization	14B
Organic Compounds	Coal Cleaning	07C
Minerals		
Coal Preparation		08I

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1. REPORT NO. EPA-600/7-80-015d	2. NTIS PB 80-222052	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Experimental/Engineering Support for EPA's FBC Program: Final Report Volume 4. Engineering Studies		5. REPORT DATE January 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) J. R. Hamm, D. F. Ciliberti, R. W. Wolfe, R. A. Newby, and D. L. Keairns		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Westinghouse Research and Development Center 1310 Beulah Road Pittsburgh, Pennsylvania 15235		10. PROGRAM ELEMENT NO. INE825
		11. CONTRACT/GRANT NO. 68-02-2132
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Final; 12/75 - 12/78
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is D. Bruce Henschel, Mail Drop 61, 919/541-2825. EPA-600/7-78-163 also relates to this work.

16. ABSTRACT The report gives results of engineering studies addressing several aspects of fluidized-bed combustion (FBC) system design and performance, as applied to coal. It reviews an evaluation of the impact of SO2 emission requirements on FBC system performance and cost. Stringent SO2 emission requirements can be satisfied economically if design and operating parameters are properly selected. An alternative SO2 control concept for pressurized FBC (PFBC), pressurized scrubbing of the products of combustion with water, is evaluated. The concept is not economically competitive because of reduced plant efficiency and the need for recuperative heating. A potential reduction in solid waste is realized with the concept, but the SO2 control efficiency may be limited. An evaluation of PFBC, examining the technical and economic trade-offs between the level of particulate control achieved and the frequency of gas-turbine blade replacement, is described. The evaluation incorporates models of PFBC particulate carry-over, particulate control device efficiency, and turbine erosion. Also, an indirect air-cooled PFBC concept is compared with other PFBC concepts. The indirect air-cooled concept provides significant particulate control advantages over the adiabatic combustor PFBC concept, resulting in about 4% lower plant efficiency and 1% higher cost of electricity.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Dust	Pollution Control	13B	11G
Combustion	Gas Turbines	Stationary Sources	21B	13G
Fluidized Bed Processing		Particulate	13H, 07A	
Coal			21D	
Sulfur Oxides			07B	
Scrubbers			13I	

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1. REPORT NO. EPA-600/7-80-018	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE A Theoretical Analysis of Nitric Oxide Production in a Methane/Air Turbulent Diffusion Flame		5. REPORT DATE January 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Frank E. Marble (California Institute of Technology) and James E. Broadwell		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS TRW Defense and Space Systems Group One Space Park Redondo Beach, California 90278		10. PROGRAM ELEMENT NO. INE829
		11. CONTRACT/GRANT NO. 68-02-2613
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		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is W.S. Lanier, Mail Drop 65, 919/541-2432.

16. ABSTRACT

The report gives results of a theoretical analysis of nitric oxide production in a methane/air turbulent diffusion flame. In the coherent flame model used, the chemical reactions take place in laminar flame elements which are lengthened by the turbulent fluid motion and shortened when adjacent flame segments consume intervening reactant. The rates with which methane and air are consumed and nitric oxide generated in the strained laminar flame are computed numerically in an independent calculation. The model predicts nitric oxide levels of approximately 80 ppm at the end of the flame generated by a 30.5 cm (1 ft) diameter jet of methane issuing at 3050 cm/sec (100 ft/sec). This level varies directly with the fuel jet diameter and inversely with the jet velocity. A possibly important nitric oxide production mechanism, neglected in the analysis, can be treated in a proposed extension to the model.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Diffusion Flames	Pollution Control	13B	
Combustion	Mathematical Models	Stationary Sources	21B	12A
Nitrogen Oxide (NO)	Methane	NOx Control	07B	07C
Turbulence		Coherent Structures	20D	
Coherence		Methane/Air Flames		
Shear Flow				

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1. REPORT NO. EPA-600/7-80-029c	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE EPA Utility FGD Survey: April - June 1980		5. REPORT DATE July 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) M. Smith, M. Melia, N. Gregory		8. PERFORMING ORGANIZATION REPORT NO. PN 3570-1-Z
9. PERFORMING ORGANIZATION NAME AND ADDRESS PEDCo Environmental, Inc. 11499 Chester Road Cincinnati, Ohio 45246		10. PROGRAM ELEMENT NO. INE828
		11. CONTRACT/GRANT NO. 68-01-4147, Task 143
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Quarterly; 4-6/80
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES
IERL-RTP project officer is Norman Kaplan, Mail Drop 61, 919/541-2556. The report supplements EPA-600/7-80-029a.

16. ABSTRACT

This report is the second of three supplements updating the October-December 1979 report (EPA-600/7-80-029a) and should be used in conjunction with it. The report, which is generated by a computerized data base system, presents a survey of operational and planned domestic utility flue gas desulfurization (FGD) systems, operational domestic particle scrubbers, and Japanese coal-fired utility boiler FGD installations. It summarizes information contributed by the utility industry, process suppliers, regulatory agencies, and consulting engineering firms. Domestic FGD systems are tabulated alphabetically by development status (operational, under construction, or in planning stages), utility company, process supplier, process, and waste disposal practice. It presents data on boiler design, FGD system design, fuel characteristics, and actual performance. It includes unit by unit dependability parameters and discusses problems and solutions associated with the boilers and FGD systems. Process flow diagrams and FGD system economic data are appended.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Pollution Control	13B
Flue Gases	Stationary Sources	21B
Desulfurization	Utility Boilers	07A, 07D
Electric Utilities		
Waste Disposal		15E
Boilers		13A
Maintenance		

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1. REPORT NO. EPA-600/7-80-039	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Chemical and Biological Characterization of Leachates from Coal Solid Wastes		5. REPORT DATE March 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) R.A. Griffin, R.M. Schuller, J.J. Suloway, N.F. Shimp, and W.F. Childers		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Illinois State Geological Survey Natural Resources Building Urbana, Illinois 61801		10. PROGRAM ELEMENT NO. EHE623A
		11. CONTRACT/GRANT NO. 68-02-2130
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Final; 9/76-6/79
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is N. Dean Smith, Mail Drop 61, 919/541-2708.

16. ABSTRACT The report gives results of the chemical and mineralogical characterization of coal solid wastes. The wastes included three Lurgi gasification ashes, mineral residues from the SRC-I and H-Coal liquefaction processes, two chars, two coal-cleaning residues, and a fly-ash-and-water-quenched bottom ash (slag) from a coal-fired power plant. Leachates generated from the solid wastes at eight pH levels and under two different gas atmospheres were analyzed for more than 40 chemical constituents. Thermodynamic speciation of inorganic ions and complexes in solution were modeled. The modeling demonstrated that similar mineral phases controlled the aqueous solubility of the major ionic species for all wastes. Adsorption and co-precipitation of trace metals with iron, manganese, and aluminum oxides and hydroxides were thought to be the likely controls on trace metal concentrations in the leachates. A high degree of attenuation of the leachate constituents by soils was observed. Soil properties controlled the degree of attenuation to a greater extent than did the chemical concentrations of the leachates. Results of acute 96-hour static bioassays using fathead minnows identified mortality as being caused by the combined effect of pH and total ionic strength of the leachate.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Bioassay	Pollution Control	13B	06A
Wastes	Ashes	Stationary Sources		
Coal	Coal Gasification	Biological Properties	21D	13H
Combustion	Coal Preparation	Chars	21B	
Chemical Properties	Fly Ash	Coal Cleaning	07D	
Minerals	Slags		08G	11B
	Leaching			07A

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1. REPORT NO. EPA-600/7-80-044	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE POM Source and Ambient Concentration Data: Review and Analysis		5. REPORT DATE March 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) J.B. White and R.R. Vanderslice		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Research Triangle Institute P.O. Box 12194 Research Triangle Park, North Carolina 27709		10. PROGRAM ELEMENT NO. INE623
		11. CONTRACT/GRANT NO. 68-02-2612, Task 86
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Task Final; 9/78 - 1/80
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is John O. Milliken, Mail Drop 63, 919/541-2745.

16. ABSTRACT The report gives results of an analysis of source and ambient concentration data for polycyclic organic matter (POM). Based on the literature reviewed, POM data were summarized and the sampling and analytical techniques were critiqued and evaluated against state-of-the-art technology. The objective was to determine the scientific and engineering credibility of a previously established POM data base by an evaluation of the sampling and analytical techniques employed. (POM is an unregulated class of pollutants which is a potential candidate for regulatory action as outlined in Section 122a of the Clean Air Act Amendments of 1977.) It was concluded that sampling techniques contain uncertainties that limit the udesfulness of these data in an environmental assessment of POM. The uncertainties include the possibility of the incomplete capture of POM during emission sampling, the chemical degradation of the collected sample during both emission source and embient sampling, and the unproven reliability of benzo(a)pyrene as an indicator of total POM from emission sources or in ambient media. The uncertainties may be compounded by losses during analysis. Also, since it is not feasible to quantify all the POM which may be present in an environmental sample, the number of POMs reported will reflect the scope of the analytical strategy and the limitations of the analytical technique employed.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Pollution Control	13B
Pyrenes	Stationary Sources	07C
Polycyclic Compounds	Polycyclic Organic Matter	14B
Organic Compounds	Benzo(a)pyrene	
Sampling		
Analyzing		
Assessments		

18. DISTRIBUTION STATEMENT Release to Public	19. SECURITY CLASS *(This Report)* Unclassified	21. NO. OF PAGES 147
	20. SECURITY CLASS *(This page)* Unclassified	22. PRICE

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TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-600/7-80-080	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE A Case Study in the Use of Ambient Data for Source Assessment		5. REPORT DATE April 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Edward T. Brookman and John E. Yocum		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS TRC--The Research Corporation of New England 125 Silas Deane Highway Wethersfield, Connecticut 06109		10. PROGRAM ELEMENT NO. INE623
		11. CONTRACT/GRANT NO. 68-02-2615, Task 18
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Task Final; 5-8/79
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is John O. Milliken, Mail Drop 63, 919/541-2745.

16. ABSTRACT The report is a case history for an environmental management study to determine what pollution sources are the principal determinants of environmental quality in Allegheny County, PA. The study was conducted for the Allegheny County Health Department, Bureau of Air Pollution Control, in Pittsburgh, PA. Results were used as part of Allegheny County's contribution to the State Implementation Plan for achieving air quality standards for total suspended particulate matter (TSP). Techniques used in this ambient-correlation study include: (1) analysis of present air quality and trends; (2) log-normal distributions; (3) relative frequency of TSP levels; (4) monthly variations in TSP levels; (5) weekday/weekend analysis; (6) wet-day/dry-day analysis; (7) analysis of pollution roses; (8) wind frequency analysis; (9) isopleth maps; (10) contribution of steel plant emissions by modeling; and (11) particulate identification analysis. The report describes the integrated application of these techniques to determine the background traditional and nontraditional components of the ambient TSP levels. Study results include estimates of the relative source strengths of the particulates, the relative impacts of the sources, and the level of confidence of these results.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Pollution Control	13B
Assessments	Stationary Sources	14B
Dust	Source Assessment	11G
Aerosols	Particulate	07D
	Ambient Data	

18. DISTRIBUTION STATEMENT Release to Public	19. SECURITY CLASS *(This Report)* Unclassified	21. NO. OF PAGES 33
	20. SECURITY CLASS *(This page)* Unclassified	22. PRICE

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TECHNICAL REPORT DATA
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1. REPORT NO. EPA-600/7-80-084	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Exposure to Pollutants from Domestic Combustion Sources: A Preliminary Assessment		5. REPORT DATE April 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Edward T. Brookman and Amnon Birenzvige		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS TRC - Environmental Consultants, Inc. 125 Silas Deane Highway Wethersfield, Connecticut 06109		10. PROGRAM ELEMENT NO. INE623
		11. CONTRACT/GRANT NO. 68-02-3115, Task 112
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Task Final; 8/79-2/80
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is John O. Milliken, Mail Drop 63, 919/541-2745.

16. ABSTRACT The report gives results of a preliminary assessment of exposure to pollutants from domestic combustion sources, some of which emit airborne particulate matter (PM), CO, and polycyclic organic matter (POM) near human receptors. Transient ambient concentrations of these pollutants at the receptor (and the corresponding time-averaged exposures) have been determined for the following domestic combustion sources: lawn mowing, chain sawing, charcoal cooking, indoor gas cooking, and indoor side-stream smoke. An experimental test program utilizing personal monitoring equipment was conducted to acquire data for the lawn mower, chain saw, and charcoal grill sources. Literature data were used to assess the indoor sources of gas cooking and side-stream smoke. Transient ambient concentrations of total suspended particulate (TSP) matter encountered were as high as 35 times the 24 hour secondary ambient air quality standard of 150 micrograms/cu m for TSP. However, large quantities of noncombustion-related PM on the filters (e.g., grass particles, sawdust), concurrent lower values of ambient CO relative to ambient air quality CO standards, and the absence of detectable POM indicate that these sources probably do not result in exposures to combustion-generated pollutants that are relatively significant.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Charcoal	Pollution Control	13B	
Combustion	Stoves	Stationary Sources	21B	13A
Assessments	Cooking Devices	Domestic Combustion	14B	06H
Measurement	Smoke	Lawn Mowers		
Grasses	Dust	Chain Saws	06C	11G
Saws	Polycyclic Compounds	Side-stream Smoke	13I	07C
Gasoline	Organic Compounds	Particulate	21D	

18. DISTRIBUTION STATEMENT Release to Public	19. SECURITY CLASS *(This Report)* Unclassified	21. NO. OF PAGES 48
	20. SECURITY CLASS *(This page)* Unclassified	22. PRICE

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TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-600/7-80-094	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Evaluation of Two Concepts for Protection of Fish Larvae at Cooling Water Intakes		5. REPORT DATE May 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) *D. A. Tomljanovich, *J. H. Heuer, J. B. Brellenthin, J. T. Johnson, S. H. Magliente, *M. Smith, *P. Smith, *S. Vigander, and *R. Whittaker		8. PERFORMING ORGANIZATION REPORT NO. TVA EDT-102
9. PERFORMING ORGANIZATION NAME AND ADDRESS Tennessee Valley Authority Division of Energy Demonstrations and Technology Chattanooga, Tennessee 37401		10. PROGRAM ELEMENT NO. INE624A
		11. CONTRACT/GRANT NO. EPA Interagency Agreement D8-0721-BE
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Final; 5/75-3/80
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer: Theodore G. Brna, MD-61, 919/541-2683. TVA project director: H. B. Flora II. (*) Coauthors are with TVA, Office of Natural Resources, Norris, TN 37828.

16. ABSTRACT The report gives results of a laboratory evaluation of 'impinge-release' and 'fish-avoidance' concepts for protecting fish larvae at cooling water intakes. Impinge-release requires a vertical-traveling screen that limits impingement time to several minutes, the maximum time depending on the species to be protected. A stationary slotted screen in flowing water was used to evaluate the ability of fish to avoid entrapment. Both concepts showed high potential for protecting larvae as well as older life stages. Approach velocities = or < 30.5 cm/s did not affect survival. But at 61 cm/s, survival was usually significantly reduced, especially for impingements over 2 minutes. Fish in a water-holding tray of a screen panel had higher survival than fish exposed to air on emergence of the panel from water. Low pressure sprays for rinsing fish into and from the tray, followed by spilling the fish into a return trough, did not significantly reduce survival. The large range in swimming ability, size, and behavior among species gave large differences in their avoidance response. Adequate protection for small larvae may require 0.5-mm slots and through-screen (slot) velocity = or < 7.5 cm/s. Large larvae (> 10 mm) can avoid screens with 2-mm slots and a 7.5-cm/s slot velocity. Except for channel catfish, larvae avoidance of the slotted screen was higher during daylight.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Releasing	Pollution Control	13B
Fishes	Avoidance Responses	Stationary Sources	06C, 08A 05J
Larvae		Impinge-release	
Cooling Water		Fish-avoidance	13A
Water Intakes			13M
Impingement			14B

18. DISTRIBUTION STATEMENT Release to Public	19. SECURITY CLASS *(This Report)* Unclassified	21. NO. OF PAGES 112
	20. SECURITY CLASS *(This page)* Unclassified	22. PRICE

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TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-600/7-80-105	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Cost Benefits Associated with the Use of Physically Cleaned Coal		5. REPORT DATE May 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) G.A. Isaacs, R.A. Ressl, and P.W. Spaite (Consultant)		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS PEDCo Environmental, Inc. P.O. Box 20337 Dallas, Texas 75220		10. PROGRAM ELEMENT NO. EHE623A
		11. CONTRACT/GRANT NO. 68-02-2603, Task 31
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Task Final; 5/78-11/79
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is James D. Kilgroe, Mail Drop 61, 919/541-2851.

16. ABSTRACT The report identifies and quantifies several benefits associated with the use of physically cleaned coal in the operation of utility electric power plants. The benefits occur in: coal and ash handling, boiler operation, and gas handling and cleaning. Cleaning removes sulfur from the coal, thus reducing the emission of SO2 into the atmosphere. In most cases, however, the power plant must install supplemental control equipment to reduce emissions enough for compliance with environmental regulations. The cost of this supplemental equipment is less than the cost of a control system for use with uncleaned coal, but the cost decrement is usually insufficient to offset coal cleaning costs. Typically, however, the total of all benefits addressed in the report exceeds the cost of cleaning the coal. In a typical case, the cost of coal cleaning is $4.85 per ton of cleaned coal; whereas, total benefits associated with cleaning the coal are $7.20 per ton of cleaned coal. The report recommends additional projects aimed at quantifying coal cleaning benefits, and presents an annotated bibliography of related studies.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Utilities	Pollution Control	13B	
Coal	Coal Handling	Stationary Sources	21D, 08G	15E
Coal Preparation	Ashes	Physical Coal Cleaning	08I	21B
Desulfurization	Materials Handling		07A, 07D	13H
Cost Effectiveness	Gas Scrubbing		14A	
Electric Power Plants			10B	

18. DISTRIBUTION STATEMENT Release to Public	19. SECURITY CLASS (This Report) Unclassified	21. NO. OF PAGES 124
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TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-600/7-80-131	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Projection of 1985 Market Potential for FGD Byproduct Sulfur and Sulfuric Acid in the U.S.		5. REPORT DATE July 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) W.E.O'Brien, W.L.Anders, and J.D.Veitch		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS TVA, Office of Power Div. of Energy Demonstrations and Technology Muscle Shoals, Alabama 35660		10. PROGRAM ELEMENT NO. INE624A
		11. CONTRACT/GRANT NO. EPA Interagency Agreement D9-E721-BI
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Final; 1/79-4/80
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is Julian W. Jones, MD-61, 919/541-2489.

16. ABSTRACT The report projects the 1985 market potential for flue gas desulfurization (FGD) byproduct sulfur and sulfuric acid in the U.S. The projection is 165,000 tons of sulfur from 11 power plants and 554,000 tons of acid from 6 power plants, with a combined benefit to the affected industries of $20 million. FGD technology improvements and cost increases, particularly for fuel oil, enhanced the FGD sulfur market potential and decreased the FGD sulfuric acid potential, relative to previous projections. The 1979 revised New Source Performance Standards (NSPS), and the requirement (in many cases) for FGD waste treatment, improved the potential for both products. The revised NSPS, which preclude low-sulfur coal as an option, greatly increase the FGD market potential for plants coming on line after the mid-1980s. Fuel-oil cost escalation is important in reducing FGD sulfuric acid market potential, as are process modifications for chloride control. Limestone scrubbing with waste sludge ponding remains the economically predominant option. The limestone scrubbing advantage is decreased, however, when extensive waste treatment and landfill are required.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Marketing	Pollution Control	13B	05C
Flue Gases	Calcium Carbonates	Stationary Sources	21B	
Desulfurization	Scrubbers		07A,07D	13I
Sulfur	Sludge		07B	
Sulfuric Acid	Ponds			08H
Byproducts			14G	

18. DISTRIBUTION STATEMENT Release to Public	19. SECURITY CLASS *(This Report)* Unclassified	21. NO. OF PAGES 68
	20. SECURITY CLASS *(This page)* Unclassified	22. PRICE

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TECHNICAL REPORT DATA
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1. REPORT NO. EPA-600/8-80-025	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE A Manual for the Use of Electrostatic Precipitators to Collect Fly Ash Particles		5. REPORT DATE May 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Jack R. McDonald and Alan H. Dean		8. PERFORMING ORGANIZATION REPORT NO. SORI-EAS-80-066 (3540-7)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Southern Research Institute 2000 Ninth Avenue, South Birmingham, Alabama 35205		10. PROGRAM ELEMENT NO. EHE624
		11. CONTRACT/GRANT NO. 68-02-2114, Task 7
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Task Final; 12/78-2/80
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is Leslie E. Sparks, Mail Drop 61, 919/541-2925.

16. ABSTRACT The report incorporates the results of many studies into a manual oriented toward the collection of fly ash particles (produced by the combustion of pulverized coal) by electrostatic precipitation (ESP). It presents concepts, measurement techniques, factors influencing ESP performance, data, and data analysis from a practical standpoint. Extensive use of data from full-size ESPs should familiarize the user with what to expect in actual field operation. The manual covers fundamentals of ESP, mechanical and electrical components of ESPs, factors influencing ESP performance, measurement of important parameters, advantages and disadvantages of cold-side, hot-side, and flue-gas-conditioned ESPs, safety aspects, maintenance, troubleshooting, the use of a computer model for ESP, and features of a well-equipped ESP. Studies considered in this report include those, by various individuals and organizations, on comprehensive performance evaluations of full-scale ESPs, in situ and laboratory measurement of fly ash resistivity, rapping reentrainment, evaluations of the effects of flue gas conditioning agents on ESP performance, fundamental operation of hot-side ESPs, basic laboratory experiments, and development of a mathematical model of ESP. Information from these studies can be used by power plant personnel to select, size, maintain, and troubleshoot ESPs.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Pollution Control	13B
Electrostatic Precipitation	Stationary Sources	13H
Fly Ash	Operation	21B
Measurement	Troubleshooting	14B
Maintenance		15E
Mathematical Models		12A
Electrical Resistivity		20C

18. DISTRIBUTION STATEMENT Release to Public	19. SECURITY CLASS *(This Report)* Unclassified	21. NO. OF PAGES 782
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TECHNICAL REPORT DATA
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1. REPORT NO. EPA-600/8-80-031	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Environmental Assessment Data Systems User Guide: Project Profile System		5. REPORT DATE June 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) J. P. Reider, Editor		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Midwest Research Institute 425 Volker Boulevard Kansas City, Missouri 64110		10. PROGRAM ELEMENT NO. EHE624A
		11. CONTRACT/GRANT NO. 68-02-3177, Work Assignment No. 3
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Task Final; 8/79-4/80
		14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is Gary L. Johnson, Mail Drop 63, 919/541-2745.

16. ABSTRACT The report is a user guide to the Project Profile System (PPS), a computerized data base on projects of various types that pertain to specific industrial categories. PPS is one of five data bases which are components of the Environmental Assessment Data Systems (EADS), designed to aid researchers in environmental assessment, emissions characterization, and control technology development. PPS contains data from nine general projects: source monitoring; integrated assessment; transport, transportation, and fate; socioeconomics; sampling methods development; fuels; control technology; ecological effects; and health effects. Each project described in the PPS is identified by its sponsor, contractor, and other administrative information. The PPS contains an abstract of each project reported in text form and lists pertinent references. The specific data in the PPS depends largely on the type of project being reported; however, sufficient detail is available to report on a particular pollutant being sought or identified during the project. The PPS does not give results (e.g., pollutant concentrations, process data); it tells what the project involved. The guide gives detailed instructions for encoding PPS datasets, defines procedures for submitting and retrieving data, and contains standard nomenclature to facilitate data encoding. The guide also discusses procedures to access PPS.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Fuels	Pollution Control	13B	21D
Assessments	Ecology	Stationary Sources	14B	06F
Information Systems		Environmental Assessment	05B,09B	
Industries	Environmental Biology		05C	
Monitors		Project Profile System	14G	
Sampling		Socioeconomics		

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TECHNICAL REPORT DATA
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1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Industrial Environmental Research Brief: Greenhouse Production of Bedding and Foliage Plants with Industrial Waste Heat		5. REPORT DATE May 1980 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Isaac J. Crumbly		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Fort Valley State College P.O. Box 5800 Fort Valley, Georgia 31030		10. PROGRAM ELEMENT NO. EHE624 11. CONTRACT/GRANT NO. Grant R-804499
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Final; 8/76-8/79 14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is Theodore G. Brna, Mail Drop 61, 2683. Replaces cancelled report EPA-600/7-80-108.

16. ABSTRACT The report gives results of an evaluation of potentially beneficial uses of industrial waste heat for production of bedding and foliage plants, using conventionally and warm-water heated greenhouses in Fort Valley, GA. Each greenhouse was a plastic covered, 30 x 72-ft quonset. The research greenhouse was heated and cooled with simulated warm condenser cooling water; the control greenhouse was conventionally heated and cooled during the 9-month test. During 1979, cultivars of 10 leading ornamental plants, 8 species of foliage plants, and tomatoes used as bedding plants were studied for growth rate, survivability, and susceptibility to disease in the humid greenhouses. No statistically significant difference in growth rate for 7 of 10 ornamental and 4 of 8 foliage plants was observed in the two greenhouses. Tomatoes, coleus, geraniums, Ardisia humilis, and Hypoestes sanguinolenta grown in the conventional greenhouse and the remaining cultivars in the research greenhouse had statistically significant higher growths. No significant difference in survivability among the foliage plants and 8 of 10 ornamentals was seen in either greenhouse. Browallia and coleus survived better in the conventional greenhouse. No diseases were evident in either greenhouse. Research greenhouse heating and cooling were satisfactory despite the oversized heat exchanger that was used.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Diseases	Pollution Control	13B	06E
Greenhouses	Growth	Stationary Sources	02C	
Industrial Wastes		Bedding Plants		
Heat Recovery		Disease Resistance	20M,13A	
Plants (Botany)			06C	
Vegetation				

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TECHNICAL REPORT DATA
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1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Proceedings: Fourth Symposium on Fugitive Emissions: Measurement and Control New Orleans, LA, May 1980		5. REPORT DATE 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Christine Wibberley (Compiler)		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS TRC--Environmental Consultants, Inc. 125 Silas Deane Highway Wethersfield, Connecticut 06109		10. PROGRAM ELEMENT NO. INE623 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Proceedings: 9/79-7/80 14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is D. Bruce Harris, MD-62, 919/541-2557. EPA-600/7-79-182 reports the third symposium.

16. ABSTRACT The proceedings document papers presentated at the Symposium, which provided a forum for the exchange of information between concerned representatives of industrial, research, and government organizations relative to recent developments in industrial and energy-related fugitive emissions measurement and control. It is part of IERL-RTP's continuing effort to develop methods for the measurement and control of air- and water-borne fugitive emissions. Several important factsemerged from the Symposium. Fugitive dust sources contribute substantially to both total suspended particulate (TSP) and inhalable particulate. Within a given industry, the contribution of fugitive emissions can be more than 50%, with the added problem that these particles may contain toxic or hazardous sunstances. Civil engineering fabrics are in common use for: ground stabilization, subsurface drainage, railroad construction and maintenance, sediment control, and erosion control. Using these fabrics for air pollution control is a recent development and the subject of recent and future field tests. Emissions from unpaved roads are reduced by covering the roads first with fabric, then with coarse aggregate. Emissions from unpaved parking lots, inactive piles, and construction sites could be similarly controlled.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Toxicity	Pollution Control	13B	06T
Processing	Industrial Fabrics	Stationary Sources	13H	11E
Leakage	Subsurface Drainage	Fugitive Emissions	14I	08H
Emission	Roadbeds	Particulate		
Measurement	Erosion	Ground Stabilization	14B	
Dust		Sediment Control	11G	
Erosion		Construction Sites		

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TECHNICAL REPORT DATA
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1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Evaluation of Solid Sorbents for Water Sampling		5. REPORT DATE 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) J.C. Harris, M.J. Cohen, Z.A. Grosser, and M.J. Hayes		8. PERFORMING ORGANIZATION REPORT NO. C-82480-42 (7/80)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Arthur D. Little, Inc. Acorn Park Cambridge, Massachusetts 02140		10. PROGRAM ELEMENT NO. C33B1B 11. CONTRACT/GRANT NO. 68-02-2150 (Task 108) and 68-02-3111
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Task Final; 9/78-9/81 14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP project officer is Larry D. Johnson, MD-62. 919/541-2557.

16. ABSTRACT The report describes a systematic evaluation of the applicability of macroreticular resins for general and compound-specific sampling of organics. The first portion is an extensive review of current pertinent literature concerned with the use of macroreticular resins for sampling and analysis of organic compounds in an aqueous matrix. The main body of the report describes and presents results of a laboratory investigation of selected solid adsorbents that appeared promising for sampling, based on the literature review. Results of screening a variety of sorbent-solute pairs indicate that a combination of two dissimilar resins is the most promising approach to a general purpose sorbent sampling system. In particular, a combination of XAD-2 and XE-347 resins offers the possibility of collection and recovery of both non-polar and polar organic species. This XAD-2/XE-347 system was, for the most part, found to be comparable with solvent extraction in regards to recovery; polar species such as phenols and pyrrole were recovered in higher yield from the cartridge.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Sorbents	Pollution Control	13B	11G
Water Analysis	Chromatography	Stationary Sources	14B	
Sampling		Macroreticular Resins		
Polymers			07D	
Reticles				
Organic Compounds			07C	

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TECHNICAL REPORT DATA
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1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Industrial Environmental Research Brief: A Preliminary Feasibility Study for an Offshore Hazardous Waste Incineration Facility		5. REPORT DATE
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) R.J. Johnson, F.E. Flynn, and P.J. Weller		8. PERFORMING ORGANIZATION REPORT NO.
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15. SUPPLEMENTARY NOTES IERL-RTP project officer is David C. Sanchez, MD-62, 919/541-2547. Provided as Problem-Oriented Report to EPA/OWWM.

16. ABSTRACT The report summarizes a feasibility study of using an existing offshore oil platform, being offered to the Government, as a site for incineration of hazardous wastes and related research. The platform, located in the Gulf of Mexico about 100 km south of Mobile, AL, has potential as an environmentally safe site for operational and research oriented incineration. The study indicates that an incinerator, capable of destroying a wide range of waste types at up to 3 metric tons/hour, can be installed on the platform along with the necessary support facilities. An environmental assessment of worst-case air and water quality impacts from waste incineration revealed insignificant air quality effects at the nearest land point and on the platform. Water quality effects will not be significant for most wastes. For highly toxic and persistent substances, an activated carbon scrubber water treatment system can be provided. Estimated capital costs were $6.6 million for offshore and shore base facilities, and waste transportation containers. Labor, offshore personnel subsistence, fuel, transportation, maintenance, depreciation, and land lease costs were estimated at $3.9 million/year, or approximately $298/metric ton of waste incinerated for 12 hour/day, 7 days/week operation. Continuous and intermittent operation of the incinerator were also considered.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Activated Carbon	Pollution Control	13B	
Offshore Structures	Scrubbers	Stationary Sources	13M	07A,13I
Incinerators		At-Sea Incineration		
Waste Disposal		Hazardous Wastes		
Toxicity			06T	
Hazardous Materials			11G	

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TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Industrial Environmental Research Brief: Facilities Evaluation of High Efficiency Boiler Destruction of PCB Waste		5. REPORT DATE 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) J.E. Cotter and R.J. Johnson		8. PERFORMING ORGANIZATION REPORT NO.
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15. SUPPLEMENTARY NOTES IERL-RTP project officer is David C. Sanchez, MD-62, 919/541-2547.

16. ABSTRACT The report gives results of an evaluation of destruction in two different high-efficiency boilers (as an alternative to landfill disposal) of waste (a rendering plant byproduct, yellow grease) found to be contaminated by PCBs from a transformer leak. (The PCB content--under 500 ppm--determines the disposal method under 40 CFR Part 761.) At the first boiler: (1) logistics and fuel handling requirements were found to be feasible to set up in a short time; (2) boiler size and residence time were determined to be likely to allow high destruction efficiency; (3) with 99.9% destruction of PCBs, downwind concentration was estimated to be less than OSHA limits for industrial exposure; and (4) fuel characteristics of the yellow grease were used to support the recommendation for 100% grease fired as fuel. At the second boiler: (1) the size and facilities were determined to satisfy all prerequisites for high efficiency boilers (40 CFR Part 761); (2) best operation was by blending the waste with the normal fuel oil supply; and (3) a 30% waste blend was found to be completely miscible and feasible with respect to logistical support. A verification test burn was recommended and outlined for either candidate site. Current EPA protocol and policy developments for PCB destruction were found to be appropriate for the preparation of a candidate facility test plan and an example public notice.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Pollution Control	13B
Tallow	Stationary Sources	06A
Chlorine Aromatic Compounds	Polychlorinated Biphenyls	07C
Biphenyl		
Boilers	Yellow Grease	13A
Waste Disposal	Rendering Plants	

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1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Source Assessment: Dry Bottom Utility Boilers Firing Pulverized Bituminous Coal		5. REPORT DATE 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) D. G. DeAngelis, R. B. Reznik, D. S. Ruffin, J. N. Rigano, W. R. McCurley, J. C. Ochsner, and T. W. Hughes		8. PERFORMING ORGANIZATION REPORT NO. MRC-DA-997
9. PERFORMING ORGANIZATION NAME AND ADDRESS Monsanto Research Corporation P.O. Box 8, Station B Dayton, Ohio 45407		10. PROGRAM ELEMENT NO. 1AB015; ROAP 21AXM-071 11. CONTRACT/GRANT NO. 68-02-1874, Task 9
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development Industrial Environmental Research Laboratory Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Task Final; 5/74-8/80 14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES IERL-RTP task officer is Michael C. Osborne, MD-62, 919/541-3996.

16. ABSTRACT The report describes and assesses the potential impact of air emissions, wastewater effluents, and solid wastes from dry-bottom utility boilers firing pulverized bituminous coal. Consuming about 320 million metric tons of the coal per year, this is the primary method of firing coal in utility boilers. Air emissions were characterized from literature data, supplemented by field sampling. Significant emissions from coal combustion were particulate matter, SOx, NOx, hydrocarbons, polycyclic organic materials, and a number of elements emitted as particles and vapors. The potential environmental impact of each emission species (after passing through state-of-the-art controls) was individually assessed using a calculated quantity known as ambient source severity (the ratio of the maximum ground level concentration--determined through dispersion equations--to an ambient environmental goal). No species were found to have an ambient source severity greater than 1.0; NOx (0.97) and SOx (0.93) had the highest severities. It was estimated that the human population around an average source in this category exposed to an ambient severity greater than 0.05 was about 300,000 persons for NOx and SOx. Pollutant concentrations were also determined in wastewater and solid waste streams. Effluent source severities and solid waste discharges were both found to be minor, with controls.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Pollution	Pollution Control	13B
Bituminous Coal	Stationary Sources	21D
Pulverized Fuels	Dry Bottom Boilers	
Combustion		21B
Boilers		13A
Utilities		

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