



Project Summary

EADS Liquid Effluents Data System 1982 Annual Report

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This report is the first data summary of wastewater sampling and analysis results compiled in EPA's Liquid Effluents Data System (LEDS). LEDS is a component of a group of related computerized data bases — the Environmental Assessment Data Systems (EADS) — that describe multimedia discharges from energy systems and industrial processes. EADS was designed to aid researchers in environmental assessment, source characterization, and control technology development. This report summarizes data compiled from the implementation of LEDS in 1980 through 1982. It lists the sources reported in LEDS, feed materials used, chemical analysis data on hazardous and priority pollutants, and the number of samples for each source.

This Project Summary was developed by EPA's Industrial Environmental Research Laboratory, Research Triangle Park, NC, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Introduction

The Liquid Effluents Data System (LEDS) is a computerized information system that contains results of sampling and analysis of wastewater discharges from energy systems and industrial processes. LEDS is one of four waste stream data bases that make up the Environmental Assessment Data Systems (EADS). LEDS became operational in June 1980. This annual report describes LEDS and its growth, contents, and future within EADS.

EADS is a comprehensive system of computerized data bases that describe energy systems, industrial processes,

control technologies, and process discharges. Moreover, EADS is a protocol for data analysis and evaluation that allows users to make consistent and meaningful interpretations of the data collected and reported. The EADS protocol may be applied to any type of sampling and analysis activity in which discrete samples are collected.

EADS consists of four operational data bases for multimedia product, process, or waste streams sampled and analyzed, that are supported by a variety of reference data bases and data evaluation programs. The four sampling and analysis data bases now in operation are the Fine Particle Emissions Information System (FPEIS), the Gaseous Emissions Data System (GEDS), LEDS, and the Solid Discharge Data System (SDDS).

Each data base contains extensive information on the source of the discharges, on applied control technologies, on fuels or feedstocks, and on the composition of each discharge. EADS applies to most sources, including industrial processes, energy systems, and wastewater treatment plants. The structure of EADS and the types of data contained in it are discussed in the full report.

The vast and growing volume of sampling and analysis data produced by EPA, its contractors, and other agencies required a mechanism to consolidate such data. These organizations have produced and still are producing a broad range of data from a variety of industrial and energy sources, and sampling and analysis methods and protocols are constantly evolving. EADS was created to provide a comprehensive and diverse repository for multimedia environmental sampling and analysis data to consolidate the data in a central location where they can be readily available to the user.

community. To meet this provision, EADS was designed to accommodate a variety of multimedia data from assorted sampling and analysis programs.

One requirement of an environmental data base was that a consistent format be used to facilitate accurate, reliable data assessments. More specifically, it was essential that data be reported in similar units and be compiled with consistency in engineering conditions, technical bases, etc. To meet this need, EADS was developed to provide a standardized and uniform protocol for reporting sampling and analysis data.

A critical need existed for current information and standardized data analysis procedures. Thus, EADS was created to supply current sampling and analysis data for evaluation and to provide standard methods for retrieving and analyzing the data. LEADS, for example, has been useful to EPA's Office of Research and Development in developing the Wastewater Treatability Manual. EADS is updated and expanded constantly, and a Program Library aids users in data evaluation through the utilization of standard reports and analysis software.

Finally, and possibly most important, EADS was created to document the quality of the data reported. EPA is committed to producing environmental data of high quality and to providing a cost-effective way to document results of sampling and analysis programs so that data quality may be determined. EADS is an integral component of IERL—RTP's approved Quality Assurance (QA) Program Plan and contains QA parameters to help the user interpret the data. The broad applicability and comprehensiveness of EADS make it particularly suitable for a QA documentation role.

Data from EADS have been used to model process engineering emissions, to design and evaluate control technology, and for many other applications. Because of the sensitive nature of some stationary source emissions data, EADS provides a special feature that protects confidential or proprietary source data. With this feature, EPA does not know the identity of the source. This feature enables the EADS to obtain, store, and use multimedia emissions data that would otherwise be unavailable. Confidentiality, already used extensively, has been a great aid in obtaining data which probably would not have been available otherwise.

EADS is user-oriented. A LEADS User Guide documents instructions for data encoding and submittal, along with methods for data retrieval. LEADS data may be retrieved either by direct computer

access to the data base and its user program or by written or verbal request to EADS technical support staff. Use of the LEADS data and analysis software is described in the LEADS User Guide. The documentation is revised easily, and supplements are issued as needed.

A key component of the design effort for the EADS data bases is flexibility. User needs will change, and EADS can adapt to these changes to remain a useful information resource. EADS has undergone several improvements since it became operational in 1980, and will undergo additional changes as needed. EADS is still the only sampling, analysis, and engineering data system available that is completely integrated across media boundaries.

Description of the LEADS Data Base

The LEADS data base contains industrial or energy process source emissions test data and related source and control system design and operating data. It describes liquid effluents at the point where the liquid sample is collected from the discharge stream. This is accomplished through a flexible data base structure and in the definitions of the principal data types that are reported. Data types are defined as data elements, each describing a particular piece of information (e.g., a source characteristic, discharge stream characteristic, control device or treatment process, source operation, test informa-

tion, analyses of the fuels and feedstocks, sampling activity information, chemical analyses, radionuclide analysis, or bioassay result). The data elements collectively describe the entire source test activity. LEADS may contain more than 500 discrete data elements for each site test activity reported. The extent (or completeness) of the data contained in the data base depends on the objectives of the site test plan.

Major categories of data at each level of the data base are given in Figure 1. The data are grouped into four general categories: general source description and related information; design conditions and parameters of the effluent stream and of the control device or treatment/storage/recovery process; test operating information, including analysis of any fuels and feedstock; and sampling activities information, including chemical, physical, radionuclide, and biological analysis results.

Data Summary

The LEADS data base is similar in size to GEDS in terms of numbers of samples (about 450), although LEADS contains twice the number of test series. The rate of growth of LEADS will increase significantly as emphasis at the Federal and state levels shifts from air pollution to toxic and hazardous waste problems. Toxic and hazardous waste sampling typically involves either liquid or solid media. Source categories in LEADS are summarized in Table 1.

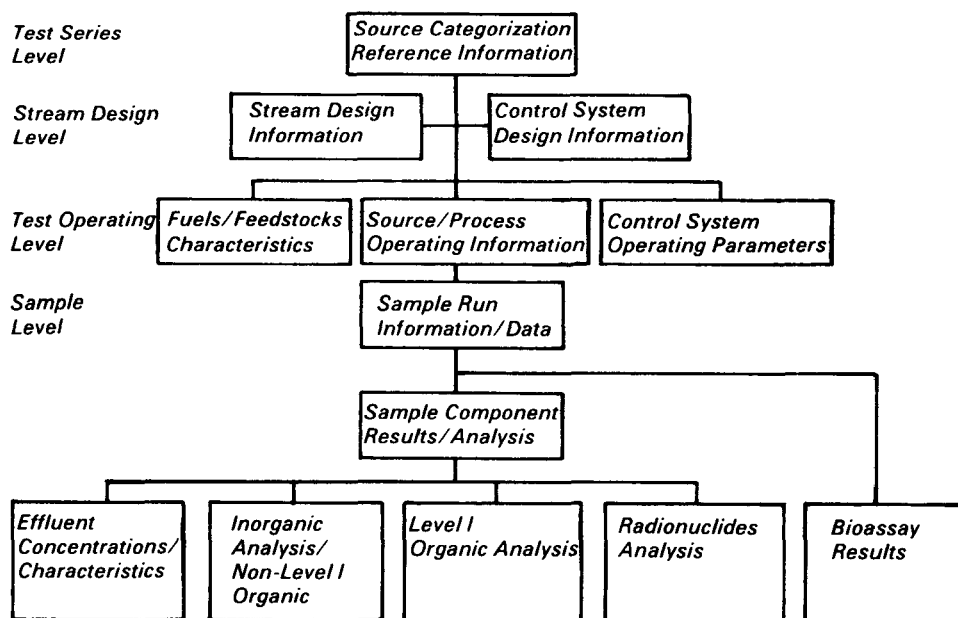


Figure 1. LEADS structure.

Table 1. Summary of Source Categories in LEDES

Print-001

Environmental Assessment Data Systems
Source Category Summary

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Data Base: LEDES

Where Clause Follows:
WH C355 LT 01/01/83

Source Category	Source Type	Product or Device	Process Type	SIC	Number of Test Series	Number of Samples
Chemical Manufac	Gum & Wood	Oils	Extraction/Fraction	2861	5	15
Chemical Manufac	Pharmaceuticals	Not Specified	Not Specified	2834	9	18
Chemical Manufac	Surface Coating	Paints	Latex Paint MFG	2816	11	33
Chemical Manufac	Surface Coating	Paints	Latex/Oil Mix Paints	2816	1	3
Chemical Manufac	Surface Coating	Paints	Oil Paint MFG	2816	2	6
Chemical Manufac	Synthetic Rubber	Misc Products	Polymerization Proc	2822	5	10
Coal Mining	Bituminous & Lignite	Bituminous	Phys-Mech Cleaning	1211	3	6
Coal Mining	Misc Coals	Not Specified	Mining	1200	7	19
Combust-Energy	Commercial-Inst	Incinerators	Multiple Chamber	4953	1	8
Combust-Energy	Industrial	Gasification	Entrained Bed	4960	1	6
Combust-Energy	Utility	Boiler	Cyclone	4911	5	17
Combust-Energy	Utility	Boiler	Horiz Opposed Wall	4911	1	3
Combust-Energy	Utility	Boiler	Single Wall	4911	5	13
Combust-Energy	Utility	Boiler	Stoker	4911	2	2
Combust-Energy	Utility	Boiler	Tangential	4911	6	10
Consumer Services	Laundries	Automobiles	Rollover	7542	2	7
Consumer Services	Laundries	Automobiles	Tunnel	7542	1	4
Consumer Services	Laundries	Automobiles	Wand	7542	2	7
Consumer Services	Laundries	Other	Commercial	7210	6	24
Consumer Services	Laundries	Other	Industrial	7210	8	28
Fabricated MTL Prod	Metal Products	Appliances	Surface Coating	3449	7	14
Leather Products	Tanning/Finishing	Cured Leather Goods	Not Specified	3111	7	14
Metal Mining	Ore Mine & Dressing	Bauxite	Mine	1051	1	2
Metal Mining	Ore Mine & Dressing	Copper	Mine/Mill	1021	2	7
Metal Mining	Ore Mine & Dressing	Ferroalloy	Mine/Mill	1061	3	8
Metal Mining	Ore Mine & Dressing	Iron	Mine	1011	1	2
Metal Mining	Ore Mine & Dressing	Iron	Mine/Mill	1011	1	2
Metal Mining	Ore Mine & Dressing	Lead	Mine/Mill	1031	1	4
Metal Mining	Ore Mine & Dressing	Lead/Zinc	Mine/Mill	1031	3	8
Metal Mining	Ore Mine & Dressing	Silver	Mine/Mill	1042	1	4
Metal Mining	Ore Mine & Dressing	Titanium	Mine/Mill	1099	1	3
Metal Mining	Ore Mine & Dressing	Uranium	Mill	1094	1	2
Metal Mining	Ore Mine & Dressing	Uranium	Mine	1094	2	4
Metals	Primary Ferrous	Coke	Coke Oven	3312	1	2
Metals	Primary Ferrous	Iron	Foundry/Casting	3320	6	16
Metals	Primary Ferrous	Iron	Sintering	3320	3	6
Metals	Primary Ferrous	Steel	Alkaline Cleaning	3312	3	6
Metals	Primary Ferrous	Steel	Basic Oxygen Furnace	3312	6	12
Metals	Primary Ferrous	Steel	Coating	3312	4	8
Metals	Primary Ferrous	Steel	Cold Rolling	3312	3	6
Metals	Primary Ferrous	Steel	Electric Arc Furnace	3312	4	8
Metals	Primary Ferrous	Steel	Hot Coating	3312	3	6
Metals	Primary Ferrous	Steel	Hot Forming	3312	2	4
Metals	Primary Ferrous	Steel	Open Hearth	3312	3	6
Metals	Primary Ferrous	Steel	Pipe & Tube Prod	3312	1	2
Metals	Primary Ferrous	Steel	Scarfig	3312	3	8
Metals	Primary Ferrous	Steel	Vacuum Degassing	3312	2	4
Metals	Primary Nonferrous	Aluminum	Foundry/Casting	3334	3	6
Metals	Primary Nonferrous	Copper	Foundry/Casting	3331	1	2
Textiles & Products	Dyeing & Finishing	Blended Fabric	Finishing	2264	12	24
Textiles & Products	Dyeing & Finishing	Polyester Fabric	Finishing	2262	2	4
Textiles & Products	Dyeing & Finishing	Wool	Finishing	2269	1	2

LEDS data are characterized by variety in the source categories, in the control device/treatment systems, and in the compounds analyzed. The data base contains information on conventional wastewater pollutants and nonconventional inorganic and organic compounds. About half of the test series have been conducted on effluent streams from the metals source category, primarily in ore mining and dressing, and primary ferrous sources. The rest of the test series are in the chemical manufacturing, combustion, consumer products, and incineration source categories. The source categories, control systems, feed materials, and numbers of samples in LEDS are summarized in the full report.

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Gary L. Johnson is the EPA Project Officer (see below).
The complete report, entitled "EADS Liquid Effluents Data System 1982 Annual Report," (Order No. PB 84-194 091; Cost: \$8.50, subject to change) will be available only from:*

*National Technical Information Service
5285 Port Royal Road
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