NUREG/CR-6147
Vol. 6

Characterization of Class A Low-Level Radioactive Waste 1986–1990

Appendices G–J

Prepared by
J-C Dehmel, D. Loomis, J. Mauro/SC&A
M. Kaplan/ERG

S. Cohen & Associates, Inc.

Eastern Research Group, Inc.

Prepared for
U.S. Nuclear Regulatory Commission

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Prepared by
J-C Dehmel, D. Loomis, J. Mauro, S. Cohen & Associates, Inc.
M. Kaplan, Eastern Research Group, Inc.

S. Cohen & Associates, Inc.
1355 Beverly Road, Suite 250
McLean, VA 22101

Subcontractor:
Eastern Research Group, Inc.
110 Hartwell Avenue
Lexington, MA 02173

Prepared for
Division of Regulatory Applications
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, DC 20555–0001
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FOREWORD

This report characterizes Class A Low Level waste shipped for disposal from 1986 through 1990. It was developed as part of a Nuclear Regulatory Commission (NRC) sponsored study to develop a technical information base useful to persons and organizations involved in the management and disposal of Low-Level radioactive waste and in the regulation of these activities.

This NUREG report is not a substitute for NRC regulations, and compliance is not required. The approaches and/or methods described in this NUREG are provided for information only. Publication of this report does not necessarily constitute NRC approval or agreement with the information contained herein.

Donald A. Cool

Donald A. Cool, Chief
Radiation Protection and Health
Effects Branch
Division of Regulatory Applications
Office of Nuclear Regulatory Research

ABSTRACT

Under contract to the U.S. Nuclear Regulatory Commission, Office of Nuclear Regulatory Research, the firms of S. Cohen & Associates, Inc. (SC&A) and Eastern Research Group (ERG) have compiled a report that describes the physical, chemical, and radiological properties of Class-A low-level radioactive waste. The report also presents information characterizing various methods and facilities used to treat and dispose non-radioactive waste.

The characterization of Class-A low-level waste is based primarily on information contained in the Manifest Information Management System (MIMS), an electronic database compiled by the National Low-Level Waste Management Program. The Program is managed by EG&G Idaho, Inc. for the Department of Energy. Supplementary sources of information include reports and studies conducted under the auspices of the Nuclear Regulatory Commission, Department of Energy, regional low-level waste Compacts and unaffiliated States, and trade organizations. The database characterizes low-level waste shipped for disposal from 1986 to 1990.

A database management program was developed for use in accessing, sorting, analyzing, and displaying the electronic data provided by EG&G. The program was used to present and aggregate data characterizing the radiological, physical, and chemical properties of the waste from descriptions contained in shipping manifests. The data thus retrieved are summarized in tables, histograms, and cumulative distribution curves presenting radionuclide concentration distributions in Class-A waste as a function of waste streams, by category of waste generators, and regions of the United States.

The report also provides information characterizing methods and facilities used to treat and dispose non-radioactive waste, including industrial, municipal, and hazardous waste regulated under Subparts C and D of the Resource Conservation and Recovery Act (RCRA). The information includes a list of disposal options, the geographical locations of the processing and disposal facilities, and a description of the characteristics of such processing and disposal facilities.

Volume 1 contains the Executive Summary, Volume 2 presents the Class-A waste database, Volume 3 presents the information characterizing non-radioactive waste management practices and facilities, and Volumes 4 through 7 contain Appendices A through P with supporting information.

VOLUME 6 APPENDICES

Appendices G through J present additional information for the Executive Summary (Vol. 1) and Main Report (Vol. 2 and 3).

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PREFACE

Section 10 of the Low-Level Radioactive Waste Plicy Amendments Act (LLRWPAA) of 1985 directed the Commission to develop criteria and procedures to act upon petitions "to exempt specific radioactive waste streams from regulations ... due to the presence of radionuclides ... in sufficiently low concentrations or quantities as to be below regulatory concern." The Commission responded to this statutory provision by issuing a policy statement on August 29, 1986 (51 FR 30839) that contained criteria for evaluating such petitions. On December 2, 1986 (51 FR 43367), the commission published an advance notice of proposed rulemaking (ANPR) entitled "Radioactive Waste Below Regulatory Concern: Generic Rulemaking" (RIN 3150-AC35). In July 1990, the Commission issued a second policy statement addressing the below regulatory concern issue, "General Statement of Policy on Below Regulatory Concern," July 3, 1990 (55 FR 27522).

In July 1988, the NRC's Office of Nuclear Regulatory Research contracted S. Cohen & Associates (SC&A) to develop technical information concerning Class A low-level radioactive waste which could be used to support NRC technical evaluations of petitions for exempt waste streams. In May 1990, the contract was modified to include the development of information which could be used in establishing a basis for a generic NRC rule governing the disposal of radioactive waste determined to be Below Regulatory Concern (BRC).

In October 1992, the congress enacted the energy Policy Act of 1992. Section 2901 of the Act revoked the Commission's 1986 and 1990 BRC Policy Statements, and in August 1993, the Commission formally withdrew the two BRC Policy Statements. The Commission also terminated the rulemaking action that was initiated to implement the 1986 BRC Policy and withdrew the December 2, 1986 ANPR.

Although it effectively revoked the 1986 BRC Policy Statement, Section 2901 of the energy Policy Act did not either (1) explicitly remove the Commission's obligation under Section 10 of the Low-Level Radioactive Waste Policy Amendments Act of 1985 to develop criteria and procedures for evaluating exemption requests for specific radioactive waste streams on an expedited basis, or (2) revoke the Commission's authority under the Atomic Energy Act to exempt classes of materials from licensing.

By early 1993, SC&A had already accumulated a substantial amount of information concerning Class A low-level waste. Since the information contained in this report should be useful to the NRC staff and others involved in the regulation or disposal of low-level radioactive waste, the NRC, in July 1993, authorized SC&A to compile and present this information in a NUREG/CR report.

ACKNOWLEDGEMENTS

S. Cohen & Associates, Inc. would like to take this opportunity to acknowledge the efforts and participation of the Nuclear Regulatory Commission staff, namely Messrs. Robert Meck, James Malaro, Paul Kovach, and Steve Klementowicz.

In addition, we would like to thank Mr. Ronald Fuchs and Ms. Miriam Muneta of EG&G Idaho, Inc. for their assistance in generating the low-level waste database for this project.

APPENDIX G

Location of Major Waste Generators, Population Distributions, and Listing of Major Waste Brokers and Processors

APPENDIX G-1

Geographical Locations of Major Waste Generators

Table G-1-1 Northwest Compact - Location of Major Waste Generators

Information not available - Can be purchased through U.S. Ecology given that needs are justified, database dump specifications are defined, and that a confidentiality agreement is reached with the NRC. USE contact: Mr. Steve Marshall 1-800-999-7160

WASHINGTON - Utility

Washington Power Supply System
Washington Nuclear 2 NPS
Benton County
Richland, WA

WASHINGTON - Fuel Fabrication/Cycle

Advanced Nuclear Fuels
Benton County
Richland, WA

OREGON - Utility

Portland General Electric Co.
Trojan NPS
Columbia County
Prescott, OR

Source: Nuclear Information Digest, 1991 Edition, NUREG-1350, Vol. 3, Nuclear Regulatory Commission, March 1991.

Table G-1-2 Rocky Mountain Compact - Location of Major Waste Generators

Information not available - Can be purchased through U.S. Ecology given that needs are justified, database dump specifications are defined, and that a confidentiality agreement is reached with the NRC. USE contact: Mr. Steve Marshall 1-800-999-7160

COLORADO - Utility

Fort St. Vrain NPS
Weld County
Platteville, CO

Source: Nuclear Information Digest, 1991 Edition, NUREG-1350, Vol. 3, Nuclear Regulatory Commission, March 1991.

Table G-1-3 Central Compact - Location of Major Waste Generators

Information not available - It was indicated that the information would not be provided; we could however, conduct our own survey.
Contact: Mr. Hall Bohlinger
(504) 925-4518

ARKANSAS - Utility

Entergy Operations, Inc
Arkansas Nuclear NPS - Units 1/2
Pope County
Russellville, AR

KANSAS - Utility

Wolf Creek Nuclear Operating Co.
Wolf Creek NPS
Coffey County
Burlington, KS

LOUISIANA - Utility

Entergy Operations, Inc
Waterford 3 NPS
St. Charles County
Taft, LA

Gulf State Utilities Co.
River bend NPS
West Feliciana County
St. Francisville, LA

NEBRASKA - Utility

Nebraska Public Power Utility Dist.
Cooper NPS
Nemaha County
Brownville, NE

Omaha Public Power Dist.
Fort Calhoun NPS
Washington County
Fort Calhoun, NB

Table G-1-3 Central Compact - Location of Major Waste Generators, Cont'd

OKLAHOMA - Fuel Fabrication/Cycle

Sequoyah Fuels Corp.
Oklahoma County
Oklahoma City, OK

Source: Nuclear Information Digest, 1991 Edition, NUREG-1350, Vol. 3, Nuclear Regulatory Commission, March 1991.

Table G-1-4 Midwest Compact - Location of Major Waste Generators

INDIANA - Academic

Indiana University
Monroe County
Bloomington, IN

Indiana University - School of Medicine
Lake County
Gary, IN

Indiana/Purdue University
Marion County
Indiana, IN

Purdue University
Tippecanoe County
West Lafayette, IN

University of Notre Dame
St. Joseph County
Notre Dame, IN

INDIANA - Medical

V.A. Medical Center
Marion County
Indianapolis, IN

INDIANA - Industrial

Boehringer Mannheim Diagnostics, Inc
Marion County
Indianapolis, IN

Bristol Meyers
Vanderburgh
Evansville, IN

Eli Lilly and Co.
Marion County
Indianapolis, IN

Pfizer, Inc.
Vigo County
Terre Haute, IN

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

Pitman-Roche
Vigo County
Terre Haute, IN

IOWA - Academic

Cornell College
Linn County
Mt Vernon, IA

Iowa State University
Story County
Ames, IA

Luther College
Winneshiek County
Decorah, IA

Maharishi International University
Jefferson County
Fairfield, IA

University of Iowa
Johnson County
Iowa City, IA

University of Osteo Med./ Health Science
Polk County
Des Moines, IA

University of Northern Iowa
Black County
Cedar falls, IA

IOWA - Utility

Iowa Electric Light & Power Co.
Duane Arnold
Linn County
Palo, IA

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

IOWA - Industrial

Pioneer Hi-Bred International, Inc.
Polk County
Johnston, IA

Fansteel/Wellman Dynamics
Union County
Creston, IA

Ft. Dodge Labs
Webster County
Ft. Dodge, IA

Kemin Industries, Inc.
Polk County
Des Moines, IA

MICHIGAN - Academic

Alma College
Gratiot County
Alma, MI

Michigan State University
Ingham County
East Lansing, MI

The University of Michigan
Washtenaw County
Ann Arbor, MI

Wayne State University
Wayne County
Detroit, MI

MICHIGAN - Medical

Children's Hospital
Wayne County
Detroit, MI

Henry Ford Hospital
Wayne County
Detroit, MI

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

Hutzel Hospital
Wayne County
Detroit, MI

Sinai Hospital of Detroit
Wayne County
Detroit, MI

V.A. Medical Center
Wayne County
Allen Park, MI

V.A. Medical Center
Washtenaw County
Ann Arbor, MI

William Beaumont hospital
Macomb County
Royal Oak, MI

MICHIGAN - Government

Michigan Dept. of Public Health
Ingham County
Lansing, MI

U.S. Dept. of Commerce - NOAA/GLERL
Washtenaw County
Ann Arbor, MI

MICHIGAN - Utility

Indiana/Michigan Power Co.
Donald C. Cook NPS - Units 1/2
Berrien County
Bridgman, MI

Consumers Power Company
Big Rock Point NPS
Charlevoix County
Charlevoix, MI

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

Consumers Power Company
Palisades NPS
Van Buren County
Covert, MI

Detroit Edison Co.
Fermi 2 NPS
Monroe County
Newport, MI

MICHIGAN - Industrial

Ameritech Services, Inc.
Wayne County
Detroit, MI

BioQuant, Inc.
Washtenaw County
Ann Arbor, MI

Dow Chemical Comp.
Midland County
Midland, MI

International Research and Development Corp.
Kalamazoo County
Mattawan, MI

KMS Fusion
Washtenaw County
Ann Arbor, MI

Leeco Diagnostics, Inc.
Oakland County
Southfield, MI

Michigan Cancer Foundation
Wayne County
Detroit, MI

Parke-Davis/Warner-Lambert
Washtenaw County
Ann Arbor, MI

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

Prob-Tek Comp.
Ingham County
Lansing, MI

Stroh Brewery Comp.
Wayne County
Detroit, MI

SBX Corp.
Muskegon County
Muskegon, MI

UpJohn Comp.
Kalamazoo County
Kalamazoo, MI

MINNESOTA - Academic

Bemidji State University
Beltrami County
Bemidji, MN

College of St. Thomas
Ramsey County
St. Paul, MN

University of Minnesota
Hennepin County
Minneapolis, MN

MINNESOTA - Medical

Hennepin County Medical Center
Hennepin County
Minneapolis, MN

Metropolitan Mt. Sinai Medical Center
Hennepin County
Minneapolis, MN

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

MINNESOTA - Utility

Northern States Power Co.
Monticello NPS
Wright County
Monticello, MN

Northern States Power Co.
Prairie Island NPS - Units 1/2
Goohue County
Red Wing, MN

MINNESOTA - Industrial

Biomedical Research Inst.
Ramsey County
St. Paul, MN

Endotronics, Inc.
Anoka County
Coon Rapids, MN

Environmental Research Laboratory
Saint Louis County
Duluth, MN

Hitchcock Ind. Inc.
Hennepin County
Minneapolis, MN

Honweywell, Inc. - Defense systems
Hennepin County
Minnetonka, MN

Honweywell, Inc. - Returned Goods
Hennepin County
Plymouth, MN

INCSTAR Corp.
Washington County
Stillwater, MN

Life Core Biomedical, Inc.
Hennepin County
Minneapolis, MN

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

3M Company
Ramsey County
St. Paul, MN

Plant Science Research Center
Hennepin County
Minnetonka, MN

Research and Diagnostics Systems, Inc.
Hennepin County
Minneapolis, MN

MISSOURI - Academic

Kirksville College of Osteopathic Med.
Adair County
Kirksville, MO

Northeast Missouri State University
Adair County
Kirksville, MO

St. Louis University Medial Center
St. Louis County
St. Louis, MO

University of Missouri
Boone County
Columbia, MO

University of Missouri
Jackson County
Kansas City, MO

University of Missouri
Phelps County
Rolla, MO

University of Missouri
St. Louis County
St. Louis, MO

Washington University
St. Louis County
St. Louis, MO

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

MISSOURI - Medical

V.A. Medical Center
St. Louis County
St. Louis, MO

MISSOURI - Government

U.S. Dept. of Interior - Fish and Wild Life
Boone County
Columbia, MO

MISSOURI - Utility

Union Electric Co.
Callaway
Callaway County
Fulton, MO

MISSOURI - Fuel Fabrication/Cycle

Combustion Engineering
Jefferson County
Hematite, MO

MISSOURI - Industrial

American Radiolabeled Chemicals, Inc.
St. Louis County
St. Louis, MO

American Red Cross
St. Louis County
St. Louis, MO

Analytical Bio-Chemistry Laboratories, Inc.
Boone County
Columbia, MO

AT&T Technologies
Jackson County
Lee's Summit, MO

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

Mallinckrodt, Inc.
St. Louis County
St. Louis, MO

Marion Laboratories, Inc
Jackson County
Kansas City, MO

McDonnell Douglas
St. Louis County
St. Louis, MO

Metatrace, Inc.
Jefferson County
Earth City, MO

Mosanto Comp.
St. Louis County
St. Louis, MO

Sigma Chemical Comp.
St. Louis County
St. Louis, MO

R.M. Webster & Assoc., Inc.
St. Charles County
St. Peters, MO

OHIO - Academic

Bowling Green State University
Wood County
Bowling Green, OH

Case Western University
Cuyahoga County
Cleveland, OH

Cleveland State University
Cuyahoga County
Cleveland, OH

Cleveland V.A. Medical Center
Cuyahoga County
Cleveland, OH

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

Kent State University
Summit County
Kent, OH

Medical College of Ohio
Lucas County
Toledo, OH

Miami University
Butler County
Oxford, OH

Northeastern Ohio - Universities College of Medicine
Portage County
Rootstown, OH

Ohio State University
Franklin County
Columbus, OH

Ohio State University
Athens County
Athens, OH

The University of Akron
Summit County
Akron, OH

Wright State University
Montgomery County
Dayton, OH

OHIO - Medical

Children's Hospital and Research Foundation
Franklin County
Columbus, OH

Cleveland Clinic Foundation
Cuyahoga County
Cleveland, OH

Metro Health Medical Center
Cuyahoga County
Cleveland, OH

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

Riverside Methodist Hospital
Franklin County
Columbus, OH

University Hospital of Cleveland
Cuyahoga County
Cleveland, OH

University of Cincinnati Medical Center
Hamilton County
Cincinnati, OH

OHIO - Government

NASA
Cuyahoga County
Cleveland, OH

U.S. Environmental Protection Agency
Hamilton County
Cincinnati, OH

OHIO - Utility

The Cleveland Electric Illuminating Co.
Perry NPS
Lake County
North Perry, OH

Toledo Edison Co.
Davis-Besse NPS
Ottawa County
Oak Harbor, OH

OHIO - Industrial

Advanced Medical Systems
Cuyahoga County
Cleveland, OH

Battelle Columbus - Operations
Franklin County
Columbus, OH

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

Becton Dickinson Polymer Research
Montgomery County
Dayton, OH

General Electric - Lighting Business Group
Cuyahoga County
Cleveland, OH

General Electric - Lighting Business Group
Portage County
Ravenna, OH

General Electric - Lighting Business Group
Cuyahoga County
Euclid, OH

General Electric - Aircraft Engines
Hamilton County
Cincinnati, OH

GE/Reuter-Stokes
Summit County
Twinsburg, OH

The Goodyear Tire and Rubber Company
Summit County
Akron, OH

Hipple Cancer Research Center
Montgomery County
Dayton, OH

Merrell Dow Pharmaceuticals
Hamilton County
Cincinnati, OH

The Ohmart Corp.
Hamilton County
Cincinnati, OH

Proctor and Gamble - Miami Valley Lab.
Butler County
Ross, OH

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

Ricerca, Inc.
Lake County
Painesville, OH

SmithKline Bioscience Laboratories
Cuyahoga County
Beachwood, OH

U.S. Biochemical Corp.
Cuyahoga County
Cleveland, OH

Victoreen, Inc.
Cuyahoga County
Solon, OH

WISCONSIN - Academic

University of Wisconsin - Madison
Dane County
Madison, WI

University of Wisconsin - Milwaukee
Milwaukee County
Milwaukee, WI

University of Wisconsin - Oshkosh
Winnebago County
Oshkosh, WI

WISCONSIN - Medical

Memorial Medical Center
Ashland County
Ashland, WI

V.A. Medical Center
Milwaukee County
Milwaukee, WI

WISCONSIN - Government

U.S. Dept. of Interior - Fish and Wild Life
La Crosse County
La Crosse, WI

Table G-1-4 Midwest Compact - Location of Major Waste Generators, Cont'd

WISCONSIN - Utility

Dairyland Power Cooperative
La Crosse NPS
La Crosse County
La Crosse, WI

Wisconsin Electric Power Co.
Point Beach NPS - Units 1/2
Manitowoc County
Two Rivers, WI

Wisconsin Public Service Corp.
Kewaunee NPS
Kewaunee County
Carlton, WI

WISCONSIN - Industrial

Agracetus
Dane County
Middleton, WI

Hazelton Laboratories
Dane County
Madison, WI

Miller Brewing Comp.
Milwaukee County
Milwaukee, WI

Molecular Biology Resources, Inc.
Milwaukee County
Milwaukee, WI

S.C. Johnson & Johnson, Inc.
Racine County
Sturtevant, WI

Sources: Midwest Interstate Low-Level Radioactive Waste Commission, Governor's Certification in Response to Public Law 99-240, December 28, 1989.
Nuclear Information Digest, 1991 Edition, NUREG-1350, Vol. 3, Nuclear Regulatory Commission, March 1991.

Table G-1-5 Central Midwest Compact - Location of Major Waste Generators

ILLINOIS - Academic

Northwestern University
Cook County
Chicago, IL

Southern Illinois University
School of Medicine
Sagamon County
Springfield, IL

University of Chicago
Radiation Protection Service
Cook County
Chicago, IL

University of Health Sciences
The Chicago Medical School
Cook County
Chicago, IL

University of Illinois
College of Medicine at Rockford
Winnebago County
Rockford, IL

Intensity of Illinois at Chicago
Cook County
Chicago, IL

ILLINOIS - Medical

Children's Memorial Hospital
Cook County
Chicago, IL

Christ Hospital and Medical Center
Cook County
Oak Lawn, IL

Cook County Hospital
Cook County
Chicago, IL

Table G-1-5 Central Midwest Compact Location of Major Waste Generators, Cont'd

Illinois State Psychiatric Institute
Cook County
Chicago, IL

Loyola University Medical Center
Cook County
Maywood, IL

Michael Reese Hospital and Medical Center
Cook County
Chicago, IL

Northwestern Memorial Hospital
Cook County
Chicago, IL

Rush-Presbyterian
St. Luke's Medical Center
Cook County
Chicago, IL

SmithKline-Beechman Clinical Laboratory
Cook County
Schaumburg, IL

ILLINOIS - Governmental

Illinois Department of Nuclear Safety
Sagamon County
Springfield, IL

Metropolitan Water Reclamation District
of Greater Chicago
Cook County
Chicago, IL

ILLINOIS - Utility

Commonwealth Edison Company
Braidwood NPS
Grundy County
Braceville, IL

Table G-1-5 Central Midwest Compact - Location of Major Waste Generators, Cont'd

Commonwealth Edison Company
Byron NPS
Ogle County
Byron, IL

Commonwealth Edison Company
Dresden NPS
Grundy County
Morris, IL

Commonwealth Edison Company
LaSalle NPS
LaSalle County
Marseilles, IL

Commonwealth Edison Company
Quad Cities NPS
Rock Island County
Cordova, IL

Commonwealth Edison Company
Zion NPS
Lake County
Zion, IL

Illinois Power Company
Clinton NPS
DeWitt County
Clinton, IL

ILLINOIS - Fuel Fabrication/Cycle

Allied-Signal, Inc
Massac County
Metropolis, IL

G.E. Nuclear Energy
Grundy County
Morris, IL

Table G-1-5 Central Midwest Compact - Location of Major Waste Generators, Cont'd

ILLINOIS - Industrial

Abbott Laboratories
Lake County
Abbott Park, IL

Amersham Corporation
Cook County
Arlington Heights, IL

Baxter Healthcare Corporation
Lake County
Mundelein, IL

C.P. Clare Corporation
Cook County
Chicago, IL

DuPont Critical Care
Lake County
Waukegan, IL

EPL Bio-Analytical Services, Inc.
Macon County
Decatur, IL

Honeywell, Inc.
Cook County
Arlington Heights, IL

Honeywell, Inc.
Will County
Joliet, IL

Illinois Bell telephone
Cook County
Chicago, IL

Interstate Nuclear Services, Inc.
Grundy County
Morris, IL

Table G-1-5 Central Midwest Compact - Location of Major Waste Generators, Cont'd

Keystone Steel and Wire Company
Peoria County
Peoria, IL

Kraft General Foods, Inc.
Cook County
Glenview, IL

LCN Closers
Bureau County
Princeton, IL

Medi-Physics, Inc.
Cook County
Arlington Heights, IL

Nuclin Diagnostics, Inc.
Cook County
Northbrook, IL

Nutrasweet Company
Cook County
Mount Prospect, IL

Olin Corporation
Williamson County
Marion, IL

Packard Instruments Company
DuPage County
Downers Grove, IL

Pitman-Moore, Inc.
Cook County
Morton Grove, IL

Radiation Management Corporation
Cook County
Schaumberg, IL

Reliance Electric
Cook County
Franklin Park, IL

Table G-1-5 Central Midwest Compact - Location of Major Waste Generators, Cont'd

Rosemount/Kay-Ray/Sensall, Inc.
Cook County
Mount Prospect, IL

Siemens Gammasonics, Inc.
Cook County
Hoffman Estates, IL

KENTUCKY - Academic

University of Kentucky
Fayette County
Lexington, KY

KENTUCKY - Medical

University of Louisville
Health Science Center
Jefferson County
Louisville, KY

KENTUCKY - Industrial

United Catalysts, Inc.
Jefferson County
Louisville, KY

PTRL-East, Inc.
Madison County
Richmond, KY

Sources: 1989 Annual Survey Report, Illinois Department of Nuclear Safety, October 1990.
State of Illinois, Governor's Office, Governor's Certification Package in Response to Public Law 99-240, December 29, 1989.

Table G-1-6 Southeast Compact - Location of Major Waste Generators

ALABAMA - Academic

University of Alabama - Birmingham
Jefferson County
Birmingham, AL

ALABAMA - Utility

Alabama Power Co.
J.M. Farley NPS - Units 1/2
Houston County
Dothan, AL

Tennessee Valley Authority
Browns Ferry NPS - Units 1/2/3
Morgan County
Decatur, AL

ALABAMA - Industrial

Wyle Laboratories
Madison County
Huntsville, AL

FLORIDA - Academic

Florida State University
Leon County
Tallahassee, FL

University of Florida
Alachua County
Gainesville, FL

FLORIDA - Medical

VA Medical Center
Dade County
Miami, FL

James Haley Veterans Hospital
Hillsborough County
Tampa, FL

Table G-1-6 Southeast Compact - Location of Major Waste Generators, Cont,d

FLORIDA - Utility

Florida Power and Light Co.
St. Lucie NPS - Units 1/2
St. Lucie County
Hutchinson Island, FL

Florida Power and Light Co.
Turkey Point NPS -Units 3/4
Palm Beach
Juno Beach, FL

Florida Power Corp.
Crystal River 3 NPS
Citrus County
Crystal River, FL

FLORIDA - Industrial

Ciba-Geigy Corp.
Indian River County
Vero Beach, FL

GEORGIA - Utility

Georgia Power Co.
E.I. Hatch NPS - Units 1/2
Appling County
Baxley, GA

Georgia Power Co.
A.W. Vogtle NPS - Units 1/2
Burke County
Waynesboro, GA

GEORGIA - Industrial

Interstate Nuclear Services
Macon County
Macon, GA

Table G-1-6 Southeast Compact - Location of Major Waste Generators, Cont,d

MISSISSIPPI - Utility

Entergy Operations, Inc.
Grand Gulf NPS
Claiborne County
Port Gibson, MS

MISSISSIPPI - Industrial

Interstate Nuclear Services
Warren County
Vicksburg, MS

NORTH CAROLINA - Academic

Duke University - Medical Center
Durham County
Durham, NC

University of North Carolina - Chapel Hill
Durham County
Chapel Hill, NC

East Carolina University
Pitt County
Greenville, NC

North Carolina State University
Wake County
Raleigh, NC

NORTH CAROLINA - Utility

Carolina Power & Light Co.
Brunswick NPS - Units 1/2
Brunswick County
Southport, NC

Carolina Power & Light Co.
Shearon Harris NPS
Wake County
New Hill, NC

Table G-1-6 Southeast Compact - Location of Major Waste Generators, Cont,d

Duke Power Co.
McGuire NPS - Units 1/2
Mecklenburg County
Cornelius, NC

NORTH CAROLINA - Industrial

Ciba-Geigy Corp.
Guilford County
Greensboro, NC

Compuchem Labs, Inc.
Durham County
Durham, NC

ICI Americas, Inc.
Wayne County
Goldsboro, NC

Glaxo, Inc.
Durham County
Research Triangle Park, NC

Organon Technika Corp.
Durham County
Durham, NC

SOUTH CAROLINA - Medical

Baptist Hospital
Forsyth County
Winston-Salem, NC

SOUTH CAROLINA - Government

Charelston Naval Shipyards
Charleston County
Charleston, SC

SOUTH CAROLINA - Utility

Carolina Power & Light Co.
H.B. Robinson 2 NPS
Darlington County
Hartsville, SC

Table G-1-6 Southeast Compact - Location of Major Waste Generators, Cont,d

Duke Power Co.
Catawba NPS - Units 1/2
York County
Clover, SC

Duke Power Co.
Oconee NPS - Units 1/2/3
Oconee County
Seneca, SC

South Carolina Electric & Gas Co.
V.C. Summer NPS
Fairfield County
Parr, SC

SOUTH CAROLINA - Industrial

Chem-Nuclear Services, Inc.
Richland County
Columbia, SC

Interstate Nuclear Services
Richland County
Columbia, SC

TENNESSEE - Academic

Vanderbilt University
Davidson County
Nashville, TN

University of Tennessee - Memphis
Shelby County
Memphis, TN

TENNESSEE - Medical

St. Jude Children's Hospital
Shelby County
Memphis, TN

Table G-1-6 Southeast Compact - Location of Major Waste Generators, Cont,d

TENNESSEE - Utility

Tennessee valley Authority
Sequoyah NPS - Units 1/2
Hamilton County
Soddy Daisy, TN

TENNESSEE - Industrial

Aerojet Ordinance Tennessee
Washington County
Jonesborough, TN

Florida Steel Corp.
Madison County
Jackson, TN

Frank W. Hake
Shelby County
Memphis, TN

Manufacturing Science Corp.
Anderson County
Oak Ridge, TN

Quadrex Recycle Center
Anderson County
Oak Ridge, TN

SEG, Inc.
Anderson County
Oak Ridge, TN

W.R. Grace & Company
Hamilton County
Chattanooga, TN

VIRGINIA - Academic

Virginia Commonwealth University
Henrico County
Richmond, VA

Table G-1-6 Southeast Compact - Location of Major Waste Generators, Cont,d

VIRGINIA - Government

Norfolk Naval Shipyards
Norfolk County
Norfolk, VA

VIRGINIA - Utility

Virginia Power Co.
North Anna NPS - Units 1/2
Louisia County
Mineral, VA

Virginia Power Co.
Surry NPS - Units 1/2
Surry County
Gravel Neck, VA

VIRGINIA - Industrial

Newport News Shipbuilding
Newport News County
Newport News, VA

SOUTHEAST COMPACT - Fuel Fabrication/Cycle

General Electric
New Hanover
Wilmington, NC

Westinghouse
Richland County
Columbia, SC

Westinghouse
Spartansburg County
Spartansburg, SC

Nuclear Fuel Services
Unicoi County
Erwin, TN

Babcock & Wilcox - Commercial and Naval Fuels
Campbell County
Lynchburgh, VA

Table G-1-6 Southeast Compact - Location of Major Waste Generators, Cont,d

United Nuclear Corp.
Polk County
Mulberry, FL

Source: Nuclear Information Digest, 1991 Edition, NUREG-1350, Vol. 3, Nuclear Regulatory Commission, March 1991. Correspondence from Mr. Sean Howard, Southeast Compact Commission to Mr. Jean-Claude Dehmel, S. Cohen & Associates, Inc., August 9, 1991 (Generators producing 100 ft^3 or more of waste per year).

Table G-1-7 Northeast Compact - Location of Major Waste Generators

NEW JERSEY - Academic

Princeton University
Mercer County
Princeton, NJ

Rutgers University
Middlesex County
Piscataway, NJ

University of Medicine and Dentistry
Essex County
Newark, NJ

University of Medicine and Dentistry/Osteopathic
Camden County
Camdem, NJ

Trenton State College
Mercer County
Trenton, NJ

NEW JERSEY - Medical

Bayonne Hospital
Hudson County
Bayonne, NJ

Columbus Hospital
Essex County
Newark, NJ

Cooper Hospital
Camdem County
Camdem, NJ

Corriell Institute for Medical Research
Camdem County
Camdem, NJ

Dover general Hospital
Morris County
Dover, NJ

Table G-1-7 Northeast Compact - Location of Major Waste Generators, Cont'd

Bergen Pines County Hospital
Bergen County
Paramus, NJ

Englewood Hospital
Bergen County
Englewood, NJ

Freehold Area Hospital
Monmouth
Freehold, NJ

Helene Fuld Medical Center
Mercer County
Trenton, NJ

Hopewell Radiology Group
Mercer County
Jamesburg, NJ

Hunterdon Medical Center
Hunterdon County
Flemington, NJ

Irvington General Hospital
Essex County
Irvington, NJ

John F. Kennedy Medical Center
Middlesex County
Edison, NJ

Kennedy Memorial Hospital
Bergen County
Saddlebrook, NJ

Medical Center of Ocean County
Ocean County
Point Pleasant, NJ

Monmouth Medical Center
Monmouth County
Long Branch, NJ

Table G-1-7 Northeast Compact - Location of Major Waste Generators, Cont'd

Newark Beth Israel Medical Center
Essex County
Newark, NJ

Newcomb Medical Center
Cumberland County
Vineland, NJ

Old Bridge Regional Hospital
Middlesex County
Old Bridge, NJ

Our Lady of Lourdes Medical Center
Camdem County
Camdem, NJ

Perth Amboy General Hospital
Middlesex County
Perth Amboy, NJ

Princeton Medical Center
Mercer County
Princeton, NJ

Rahway Hospital
Union County
Rahway, NJ

Somerset Medical Center
Somerset County
Somerville, NJ

South Amboy Memorial Hospital
Middlesex County
South Amboy

St. Barnabas Medical Center
Essex County
Livingston, NJ

St. Francis Medical Center
Mercer County
Trenton, NJ

Table G-1-7 Northeast Compact - Location of Major Waste Generators, Cont'd

St. Joseph's Hospital and Medical Center
Passaic County
Paterson, NJ

St. Mary's Hospital
Passaic County
Passaic, NJ

St. Peter's medical Center
Middlesex County
New Brunswick, NJ

The General Hospital Center at Passaic
Passaic County
Passaic, NJ

Wayne General Hospital
Passaic County
Wayne, NJ

NEW JERSEY - Government

Princeton Plasma Physics Lab.
Middlesex County
Princeton, NJ

U.S. Army - Fort Dix
Burlington County
Fort Dix, NJ

U.S. Army Electronics Research and Development
Fort Monmouth
Monmouth County
Fort Monmouth, NJ

NEW JERSEY - Utility

GPU Nuclear
Oyster Creek NPS
Ocean County
Forked River, NJ

Table G-1-7 Northeast Compact - Location of Major Waste Generators, Cont'd

PSE&G
Hope Creek NPS
Salem County
Hancocks Bridge, NJ

PSE&G
Salem NPS
Salem County
Hancocks Bridge, NJ

NEW JERSEY - Industrial

Allied Signal, Inc.
Morris County
Morristown, NJ

American Cyanamid
Monmouth
Princeton, NJ

AT&T Bell Laboratories
Union County
Murray Hill, NJ

Berlex Laboratories, Inc.
Morris County
Cedar Knolls, NJ

Ciba-Geigy Corp.
Union County
Summit, NJ

Cistron Biotechnology, Inc.
Morris County
Pine Brook, NJ

Colgate Palmolive Research Center
Middlesex County
Piscataway, NJ

E.R. Squibb & Son, Inc.
Middlesex County
New Brunswick

Table G-1-7 Northeast Compact - Location of Major Waste Generators, Cont'd

EMR Photoelectric
Mercer County
Princeton, NJ

Enichem Americas, Inc.
Middlesex
Monmouth Junction, NJ

Exxon Research Center
Hunterdon County
Annadale, NJ

General Foods Corporation
Middlesex County
Cranbury, NJ

Hoechst-Roussell Pharmaceutical
Somerset county
Somerville, NJ

Hoffman-Laroche, Inc.
Essex County
Nutley, NJ

Immunibiology Research Center
Hunterdon County
Annadale, NJ

Interferon Sciences, Inc
Middlesex County
New Brunswick, NJ

Johnson & Johnson Baby Products
Somerset County
Skillman, NJ

Medi-Physics, Inc.
Middlesex County
Sth Plainfield, NJ

Merck & Co, Inc.
Union County
Rahway, NJ

Table G-1-7 Northeast Compact - Location of Major Waste Generators, Cont'd

Mobile Research and Development Center
Gloucester County
Paulsboro, NJ

New Jersey Steel Corporation
Middlesex County
Sayreville, NJ

Ortho Diagnostic Systems
Somerset County
Raritan, NJ

Princeton Gamma Tech
Mercer County
Princeton, NJ

Sandoz Pharmaceuticals
Morris County
East Hanover, NJ

Schering Corporation
Essex County
Bloomfield, NJ

Teledyne Isotopes
Bergen County
Westwood, NJ

The Liposome Company, Inc.
Middlesex County
Princeton, NJ

Unigene Laboratories, Inc.
Essex County
Fairfield, NJ

Uniliver Research, Inc.
Bergen County
Edgewater, NJ

Weyth-Ayerst
Middlesex County
Monmouth Junction, NJ

Table G-1-7 Northeast Compact - Location of Major Waste Generators, Cont'd

CONNECTICUT - Academic

Connecticut College
New London County
New London, CT

Trinity College
Hartford County
Hartford, CT

University of Connecticut
Tolland County
Mansfield, CT

Wesleyan University
Middlesex County
Middletown, CT

Yale University
New Haven County
New Haven, CT

CONNECTICUT - Medical

Hartford Hospital
Hartford County
Hartford, CT

Norwalk Hospital
Fairfield County
Norwalk, CT

St. Francis Hospital & Medical Center
Hartford County
Hartford, CT

University of Connecticut Health Center
Hartford County
Farmington, CT

VA Medical Center
Hartford County
Newington, CT

Table G-1-7 Northeast Compact - Location of Major Waste Generators, Cont'd

VA Medical Hospital
New haven County
West Haven, CT

CONNECTICUT - Government

Connecticut Agricultural Experiment Station
New Haven County
New Haven, CT

U.S. Coast Guard Academy
New London County
New London, CT

U.S. Navy
New London County
New London, CT

CONNECTICUT - Utility

Connecticut Yankee Atomic Power Co.
Yankee-Rowe NPS
Middlesex County
Haddam, CT

Northeast Utilities
Millstone NPS - Units 1/2/3
New London County
Waterford, CT

CONNECTICUT - Fuel Fabrication/Cycle

Combustion Engineering - Nuclear Products
Hartford County
Windsor, CT

United Nuclear Corp. - Naval Products
New London County
Uncasville, CT

CONNECTICUT - Industrial

Aetna Casualty and Surety
Hartford County
Hartford, CT

Table G-1-7 Northeast Compact - Location of Major Waste Generators, Cont'd

Aircraft Components
New Haven County
Branford, CT

Boehringer Ingelheim Pharmaceuticals
Fairfield County
Ridgefield, CT

Bristol Meyers Co.
New Haven County
Wallingford, CT

Canberra Industries
New haven County
Meriden, CT

Ciba-Geigy
Hartford County
Farmington, CT

Clairol
Fairfield County
Stamford, CT

Combustion Engineering - Nuclear Services
Hartford County
Windsor, CT

Cyto Roche
New London County
Norwich

Fisher Technology
Hartford County
Windsor, CT

General Dynamics Electric Boat Div.
New London, County
Groton, CT

International Biotechnologies
New haven County
New Haven, CT

Table G-1-7 Northeast Compact - Location of Major Waste Generators, Cont'd

Miles, Inc.
New Haven County
West Haven, CT

Perkin-Elmer Corp.
Fairfield County
Wilton, CT

Pfizer
New London County
Groton, CT

Schlumberger-Doll Research
Fairfield County
Ridgefield, CT

Uniroyal Chemical Co.
New Haven County
Middlebury, CT

United Technologies - Pratt & Whitney Div.
Hartford County
Hartford, CT

United Technologies - Sikorsky Div.
Fairfield County
Stratford, CT

Sources: New Jersey Low-Level Radioactive Waste Disposal Plan, Final Report, Task 2 Appendices, New Jersey Low-Level Radioactive Waste Disposal Facility Siting Board, May 3rd, 1990.
The 1989 Update of the Connecticut Low-Level Radioactive Waste Management Plan, Connecticut Hazardous Waste Management Service, March 1990.

Table G-1-8 Appalachian Compact - Location of Major Waste Generators

PENNSYLVANIA - Academic

Allegheny College
Crawford County, PA

Bryn Mawr College
Montgomery County, PA

Community College of Allegheny County
Allegheny County, PA

Carnegie Mellon Institute (2 sites)
Allegheny County, PA

Dickenson College
Crawford County, PA

Drexel University
Philadelphia County, PA

Duquesne University
Allegheny County, PA

Haverford College
Montgomery County, PA

Hahnemann University
Philadelphia County, PA

Lafayette College
Northampton County, PA

Lehigh University
Northampton County, PA

Lincoln University
Chester County, PA

Pennsylvania State University
Center County, PA

Pennsylvania College of Podiatric Medicine
Philadelphia County, PA

Table G-1-8 Appalachian Compact - Location of Major Waste Generators, Cont'd

Philadelphia College of Pharmacy and Science
Philadelphia County, PA

Presbyterian Medical Center
Philadelphia County, PA

St. Joseph University
Philadelphia County, PA

Swarthmore College
Delaware County, PA

Temple University
Montgomery County, PA

Temple University (2 sites)
Philadelphia County, PA

Thomas Jefferson University
Philadelphia County, PA

The Medical College of Pennsylvania
Philadelphia County, PA

University Science Center
Philadelphia County, PA

University of Pennsylvania
Philadelphia County, PA

University of Pittsburgh
Allegheny County, PA

University of Scranton
Lackawanna County, PA

Villanova University
Delaware County, PA

PENNSYLVANIA - Medical

Albert Einstein Medical Center
Philadelphia County, PA

Table G-1-8 Appalachian Compact - Location of Major Waste Generators, Cont,d

Allegheny General Hospital
Allegheny County, PA

Eastern Pennsylvania Psychiatric Institute
Philadelphia County, PA

Fox Chase Cancer Center
Philadelphia County, PA

Geisinger Medical Center
Montour County, PA

Graduate Hospital
Philadelphia County, PA

Lankenau Hospital
Philadelphia County, PA

Milton S. Hershey Medical Center
Dauphin County, PA

Montefiore Hospital
Allegheny County, PA

Pennsylvania Hospital
Philadelphia County, PA

Shady Side Hospital
Allegheny County, PA

St. Christofer's Hospital for Children
Philadelphia County, PA

St. Luke Hospital
Lehigh County, PA

The Reading Hospital
Berks County, PA

V.A. Medical Center
Allegheny County, PA

V.A. Medical Center
Philadelphia County, PA

Table G-1-8 Appalachian Compact - Location of Major Waste Generators, Cont,d

Wills Eye Hospital
Philadelphia County, PA

PENNSYLVANIA - Government

U.S. Army
Franklin County, PA

U.S Dept. of Agriculture
Montgomery County, PA

U.S. Nuclear Regulatory Commission
Montgomery County
King of Prussia, PA

PENNSYLVANIA - Utility

Duquesne Light Co.
Beaver Valley NPS - Units 1/2
Beaver County
Shippingport, PA

GPU Nuclear Corp.
Three Mile Island NPS - Units 1/2
Dauphin County
Londonderry, PA

Pennsylvania Power & Light Co.
Susquehanna NPS - Units 1/2
Luzerne County
Berwick, PA

Philadelphia Electric Co.
Limerick NPS - Units 1/2
Montgomery County
Pottstown, PA

Philadelphia Electric Co.
Peach Bottom NPS - Units 1/2/3
York County
Peach Bottom, PA

Table G-1-8 Appalachian Compact - Location of Major Waste Generators, Cont'd

PENNSYLVANIA - Industrial

Air Products and Chemicals
Lehigh County, PA

Affrex, Ltd
Allegheny County, PA

ALARON Corp.
Lawrence County, PA

Applied Health Physics, Inc.
Allegheny County, PA

Bachem Bioscience, Inc.
Philadephia County, PA

Babcock & Wilcox (2 sites)
Armstrong County, PA

Bethlehem Stell - Homer Research Lab.
Northampton County, PA

Bets Laboratories
Bucks County, PA

Centocor, Inc
Chester County
Malvern, PA

Cephalon, Inc.
Chester County, PA

Connaught Laboratories, Inc.
Monroe County, PA

Damon Clinical Laboratories
Bucks County, PA

Dupont Elmwood Court II
Delaware County, PA

Dupont Glenolden Laboratory
Delaware County, PA

Table G-1-8 Appalachian Compact - Location of Major Waste Generators, Cont'd

Ecogen, Inc.
Bucks County, PA

General electric Co. - Aerospace Div.
Philadelphia County, PA

GTE Products Corp.
Bradford County, PA

Hewlett-Packard Comp.
Chester County, PA

ICN Micromedic Systems, Inc.
Montgomery County, PA

Interstate Nuclear Services Corp.
Montgomery County, PA

Johnson Mathey, Inc.
Chester County
West Chester, PA

II-VI Incorporated
Butler County, PA

Med-Check Laboratories, Inc.
Allegheny County, PA

Merck Pharmaceuticals Manufacturing Div.
Montgomery County, PA

McNeil Pharmaceutical
Montgomery County, PA

Mine Safety Appliances
Butler County, PA

Pennsylvania Endocrine Laboratory
Philadelphia County, PA

PermaGrain Products, Inc.
Clearfield County, PA

Pharmakon research International
Lackawanna County, PA

Table G-1-8 Appalachian Compact - Location of Major Waste Generators, Cont'd

Physicians Clinical Services
Chester County, PA

Radiation Management Consultants
Philadelphia County, PA

Rohm and Hass Research Labs
Montgomery County, PA

Rorer Group - Ft. Washington
Montgomery County, PA

Rorer Group - King of Prussia
Montgomery County, PA

Roy F. Weston
Chester County
West Chester, PA

Safety Light Corp.
Columbia County, PA

SmithKline Beckman
Chester County, PA

SmithKline and French Laboratories
Chester County, PA

Sterling Drug Inc.
Chester County
Malvern, PA

Stroud Water Research Center
Chester County, PA

Westinghouse electric Company (3 sites)
Allegheny County, PA

Wyeth-Ayerst Research
Delaware County, PA

Zynaxis Cell Science, Inc.
Chester County, PA

Table G-1-8 Appalachian Compact - Location of Major Waste Generators, Cont'd

MARYLAND - Academic

University - Baltimore
Baltimore County
Baltimore, MD

University of Maryland
Prince Georges County, MD

MARYLAND - Medical

Central Laboratories of Associated MD Pathologists
Baltimore County, MD

Francis Scott Key Medical Center
Baltimore County
Baltimore, MD

John Hopkins - Asthma Center
Baltimore County
Baltimore, MD

John Hopkins - Medical Institution
Baltimore County
Baltimore, MD

O'Neill Laboratories
Baltimore County
Baltimore, MD

MARYLAND - Government

Food and Drug Administration
Montgomery County, MD

Food and Drug Administration (2 sites)
Prince Georges County, MD

NASA
Prince Georges County, MD

National Institute of Standards & Technology
Montgomery County, MD

Table G-1-8 Appalachian Compact - Location of Major Waste Generators, Cont'd

National Institute of Health (5 sites)
Montgomery County, MD

Naval Surface Warfare Center
Montgomery County, MD

University of Health Sciences
Uniformed Services
Montgomery County, MD

U.S. Army - Fort Detrick
Frederick County, MD

U.S. Army - Aberdeen Proving Ground
Harford County, MD

U.S. Department of Agriculture
Prince Georges County, MD

U.S. Department of the Interior
Prince Georges County, MD

Smithsonian Institute - Edgewater
Anne Arundel County, MD

Smithsonian Institute - Suitland
Prince Georges County, MD

MARYLAND - Utility

Baltimore Gas & Electric Co.
Calvert Cliffs NSP - Units 1/2
Calvert County
Lusby, MD

MARYLAND - Industrial

Agrisearch Incorporated (2 sites)
Frederick County, MD

Becton Dickinson Advanced Diagnostics (3 sites)
Baltimore County, MD

Table G-1-8 Appalachian Compact - Location of Major Waste Generators, Cont'd

Becton Dickinson Advanced Diagnostics
Baltimore County
Baltimore, MD

Bethlehem Steel
Baltimore County, MD

BIOQUAL
Montgomery County, MD

Biotronic Systems Care
Montgomery County, MD

Chesapeake Biological Labs
Clavert County, MD

Crops Genetics International
Anne Arundel County, MD

Horn Point Environmental Labs
Dorchester County, MD

Nova Pharmaceuticals Corp.
Baltimore County
Baltimore, MD

Pharmacia ENI Diagnostics, Inc.
Howard County, MD

Program Resources, Inc.
Frederick County, Inc.

RSO, Inc.
Prince Georges County
Laurel, MD

Westinghouse Electric Corp.
Anne Arundel County, MD

DELAWARE - Academic

University of Delaware
New Castle County, DE

Table G-1-8 Appalachian Compact - Location of Major Waste Generators, Cont'd

University of Delaware - Lewes
Sussex County, DE

DELAWARE - Industrial

E.I. Dupont de Nemours & Co. - Newark
New Castle County, DE

E.I. Dupont de Nemours & Co. - Wilmington
New Castle County, DE

Edge Moor Plant
New Castle County, DE

Hercules Inc.
New Castle County, DE

ICI Americas, Inc.
New Castle County, DE

WEST VIRGINIA - Academic

Marshall University
Cabell County, WV

West Virginia University
Monongalia County, WV

WEST VIRGINIA - Government

Dept. of Health and Human Services
Monongalia County, WV

U.S. Department of Agriculture
Raleigh County, WV

WEST VIRGINIA - Industrial

Allegany Ballistics Laboratory
Mineral County, WV

Table G-1-8 Appalachian Compact - Location of Major Waste Generators, Cont'd

Bethlehem Steel
Kanawha County, WV

Source: Annual Low-Level Radioactive Waste Program Report to the General Assembly - 1989, Pennsylvania Department of Environmental Resources, Bureau of Radiation Protection

Table G-1-9 Southwest Compact - Location of Major Waste Generators

Information not available - Information and data were purchased from U.S. Ecology in support of siting activities. Information cannot be released because of confidentiality agreement with USE. Contact: Mr. Russel Huck, Jr. (916) 445-0498

CALIFORNIA - Utility

Pacific Gas & Electric Co.
Diablo Canyon NPS - Units 1/2
San Luis Obispo County
Avila Beach, CA

Southern California Edison Co.
San Onofre NPS - Units 1/2/3
Santa Ana County
San Clemente, CA

Sacramento Municipal Utility Dist.
Rancho Seco NPS
Sacramento County
Clay Station, CA

CALIFORNIA - Fuel Fabrication/Cycle

General Atomics
San Diego County
San Diego, CA

ARIZONA - Utility

Arizona Public Service Co.
Palo Verde NPS - Units 1/2/3
Maricopa County
Wintersburg, AZ

Table G-1-9 Southwest Compact - Location of Major Waste Generators, Cont'd

NORTH DAKOTA - Academic

North Dakota State University
Cass County
Fargo, ND

University of North Dakota
Grand Forks County
Grand Forks, ND

NORTH DAKOTA - Medical

Quain and Ramstad Clinic
Burleigh County
Bismarck, ND

NORTH DAKOTA - Industrial

Immunotherapeutics, Inc.
Cass County
Fargo, ND

Sources: State of North Dakota, Governor's Office, Governor's Certification Package in Response to Public Law 99-240, December 12, 1989.
Nuclear Information Digest, 1991 Edition, NUREG-1350, Vol. 3, Nuclear Regulatory Commission, March 1991.

Table G-1-10 District of Columbia - Location of Major Waste Generators

DISTRICT OF COLUMBIA - Academic

University of the District of Columbia
Washington, DC, NW

American University
Washington, DC, NW

Catholic University
Washington, DC, NW

Carnegie Institute
Upton Street Branch
Washington, DC, NW

Carnegie Institute
Broad Rd Branch
Washington, DC, NW

DISTRICT OF COLUMBIA - Medical

Children's Hospital
Washington, DC, NW

D.C. General Hospital
Washington, DC, SE

George Washington Hospital
Washington, DC, NW

Georgetown University Hospital
Washington, DC, NW

Howard University Hospital
Washington, DC, NW

Washington Hospital Center
Washington, DC, NW

Table G-1-10 District of Columbia - Location of Major Waste Generators, Cont'd

DISTRICT OF COLUMBIA - Government

Food and Drug Administration
Washington, DC, SW

Veteran Administration Hospital
Washington, DC, NW

Walter Reed Army Hospital
Washington, DC, NW

Naval Research Center
Washington, DC, SW

Source: District of Columbia, Mayor's Office, Governor's Certification Package in Response to Public Law 99-240, December 29, 1989.

Table G-1-11 Maine - Location of Major Waste Generators

MAINE - Medical

Maine Medical Center
Cumberland County
Portland, ME

Foundation for Blood Research
Cumberland County
Scarborough, ME

Eastern Maine Medical Center
Penobscot County
Bangor, ME

MAINE - Academic

Bowdoin College
Cumberland County
Brunswick, ME

University of Maine
Penobscot County
Orono, ME

Colby College
Kennebec County
Waterville, ME

Bates College
Androscoggin County
Lewiston, ME

MAINE - Government

Portsmouth Naval Shipyard
York County
Kittery, ME

MAINE - Utility

Maine Yankee Atomic Power Company
Lincoln County
Wiscasset, ME

Table G-1-11 Maine - Location of Major Waste Generators, Cont'd

MAINE - Industrial

Bigelow Laboratory
Lincoln County
Boothbay Harbor, ME

FMC BioProducts
Knox County
Rockland, ME

Mount Desert Island
Biological Laboratory
Hancock County
Salsbury Cove, ME

Ventrex Laboratories, Inc.
Cumberland, County
Portland, ME

Source: Survey of Existing Low-Level radioactive Waste Storage Facilities Within the State of Maine, Report to the Maine Low-Level Radioactive Waste Disposal Authority, Augusta, Maine, November 2, 1989.

Table G-1-12 Massachusetts - Location of Major Waste Generators

Information not available - Not willing to supply information.
Contact: Ms. Carol Amick
(617) 727-6018

MASSACHUSETTS - Utility

Boston Edison Co.
Pilgrim NPS
Plymouth County
Plymouth, MA

Yankee Atomic Electric Co.
Yankee Rowe NPS
Berkshire County
Rowe, MA

Sources: Nuclear Information Digest, 1991 Edition, NUREG-1350, Vol. 3, Nuclear Regulatory Commission, March 1991.

Table G-1-13 New Hampshire - Location of Major Waste Generators

NEW HAMPSHIRE - Academic

University of New Hampshire
Strafford County
Durham, NH

Dartmouth College
Coos County
Colebrook, NH

NEW HAMPSHIRE - Industrial

Kollsman Instruments
Hillsborough County
Merrimak, NH

NEW HAMPSHIRE - Utility

Public Service Company of New Hampshire
Seabrook NPS
Rockingham County
Seabrook, NH

Source: Correspondence, State of New Hampshire, Governor's Office to the Nuclear Regulatory Commission, Office of Nuclear Materials Safety and Safeguards, December 29, 1989.

Table G-1-14 New York - Location of Major Waste Generators

NEW YORK - Academic

Albert Einstein College of Medicine
New York County
New York, NY

Columbia University
New York County
New York, NY

Cornell University
Tompkins County
Ithaca, NY

CUNY - City College
New York County
New York, NY

Elmhurst Hospital Center
Queens County
Elmhurst, NY

New York Medical College
Westchester County
Valhalla, NY

New York University - A.J. Lanza hall
Orange County
Tuxedo, NY

SUNY - Buffalo
Erie County
Buffalo, NY

SUNY - Stony Brook
Suffolk County
Stony Brook, NY

Syracuse University
Onondaga County
Syracuse, NY

The Rockefeller University
New York County
New York, NY

Table G-1-14 New York - Location of Major Waste Generators, Cont'd

University of Rochester
Monroe County
Rochester, NY

NEW YORK - Medical

Albany Medical Center
Albany County
Albany, NY

Beth Israel Medical Center
New York County
New York, NY

Brunswick Hospital
Suffolk County
Amityville, NY

Columbia Presbyterian Medical Center
New York County
New York, NY

Hospital for Special Surgery
New York County
New York, NY

Kingsbrook Jewish Medical Center
Kings County
Brooklyn, NY

Lincoln Medical & Mental Health Center
New York County
New York, NY

Long-Island Jewish Medical Center
Nassau County
New Hyde Park, NY

Maimonides Medical Center
Kings County
Brooklyn, NY

Memorial Sloan-Kettering Cancer Center
New York County
New York, NY

Table G-1-14 New York - Location of Major Waste Generators, Cont'd

Montefiore Medical Center
New York County
New York, NY

Mt. Sinai Medical Center
New York County
New York, NY

New York Hospital - Cornell
New York County
New York, NY

New York University Medical Center
New York County
New York, NY

SUNY - Health Science Center
Kings County
Brooklyn, NY

SUNY - Health Science Center
Onondaga County
Syracuse, NY

The Brookdale Hospital Medical Center
Kings County
Brooklyn, NY

The Brooklyn Hospital - Caledonian
Kings County
Brooklyn, NY

The Methodist Hospital
Kings County
Brooklyn, NY

V.A. Medical Center - Brooklyn
Kings County
Brooklyn, NY

V.A. Medical Center - Bronx
Bronx County
Bronx, NY

Table G-1-14 New York - Location of Major Waste Generators, Cont'd

V.A. Medical Center - New York
New York County
New York, NY

The Genesee Hospital
Monroe County
Rochester, NY

Winthrop University Hospital
Nassau County
Mineola, NY

NEW YORK - Government

NYS-DOH Wadsworth Center
Albany County
Albany, NY

U.S. Environmental Protection Agency
New York County
New York, NY

NEW YORK - Utility

Consolidated Edison Co.
Indian Point 2 NPS
Westchester County
Buchanan, NY

Long Island Lighting Company
Shoreham NPS
Suffolk County
Wading River, NY

Niagara Mohawk Power Corp.
Nine Mile Point NPS - Units 1/2
Oswego County
Lycoming, NY

New York Power Authority
Indian Point 3 NPS
Westchester County
Buchanan, NY

Table G-1-14 New York - Location of Major Waste Generators, Cont'd

New York Power Authority
J.A. Fitzpatrick NPS
Oswego County
Lycoming, NY

Rochester Gas & Electric Corp.
R.E. Ginna NPS
Wayne County
Ontario, NY

NEW YORK - Industrial

ADL, Inc.
Queens County
Woodside, NY

American Health Foundation
Westchester County
Valhalla, NY

Becton Dickinson
Rockland County
Orangeburg, NY

Bender Hygienic Laboratory
Albany County
Albany, NY

Bristol-Meyers Squibb Company
Onondaga County
Syracuse, NY

Centralized Laboratory Services, Inc.
Queens County
Long Island, NY

Ciba-Geigy Corp.
Columbia County
Hudson, NY

Ciba-Geigy Corp.
Westchester County
Ardsley, NY

Table G-1-14 New York - Location of Major Waste Generators, Cont'd

Cintichem, Inc.
Orange County
Tuxedo, NY

Cold Spring Harbor Laboratory
Suffolk County
Cold Spring Harbor, NY

Eastman Kodak Company
Monroe County
Rochester, NY

Fisons Pharmaceuticals
Monroe County
Rochester, NY

Imaging Sensing Technology Corp.
Chemung County
Horseheads, NY

Interscience Diagnostic Laboratory
New York County
New York, NY

Lifecodes Corporation
Westchester County
Valhalla, NY

Manhattan Clinical Laboratory
New York County
New York, NY

Modern Medical Laboratory, Inc.
Kings County
Brooklyn, NY

National Health Laboratories
New York County
New York, NY

New York Blood Center, Inc.
New York County
New York, NY

Table G-1-14 New York - Location of Major Waste Generators, Cont'd

Norwich Eaton Pharmaceuticals, Inc.
Chenango County
Norwich, NY

NRD, Inc.
Erie County
Grand Island, NY

NYNEX
New York County
New York, NY

Pall Corporation
Nassau County
Glen Cove, NY

Public Health Research Institute
New York County
New York, NY

Protein Databases, Inc.
Suffolk County
Huntington Station, NY

Roswell Park Cancer Institute
Erie County
Buffalo, NY

Quentin Medical Laboratory, Inc.
Kings County
Brooklyn, NY

Sherman-Abrams Laboratory, Inc.
Kings County
Brooklyn, NY

Smith Kline Beecham Clinical Laboratories
Nassau County
Syosset, NY

Sterling Research Group
Rensselaer County
Rensselaer, NY

Table G-1-14 New York -- Location of Major Waste Generators, Cont'd

TII Corporation
Suffolk County
Copiague, NY

Universal Diagnostic Laboratories, Inc.
Kings County
Brooklyn, NY

W. Alton Jones Cell Science Center, Inc.
Essex County
Lake Placid, NY

Source: New York State Low-Level Radioactive Waste Status Report for 1989, New York State Energy Research and Development Authority, June 1990.

Table G-1-15 Rhode Island - Location of Major Waste Generators

RHODE ISLAND - Academic

Brown University
Providence County
Providence, RI

University of Rhode Island
Washington County
Narragansett Bay, RI

University of Rhode Island
Washington County
Kingstown, RI

RHODE ISLAND - Medical

Roger Williams General Hospital
Providence County
Providence, RI

Memorial Hospital
Providence County
Pawtucket, RI

Miriam Hospital
Providence County
Providence, RI

Rhode Island Hospital
Providence County
Providence, RI

St. Joseph Hospital
Providence County
North Providence, RI

RHODE ISLAND - Government

U.S. Environmental Protection Agency
Environmental Research laboratory
Washington County
Narragansett, RI

Table G-1-15 Rhode Island - Location of Major Waste Generators, Cont'd

Rhode Island Atomic Energy Commission
Nuclear Science Center
Washington County
Narragansett, RI

Source: State of Rhode Island, Governor's Office, Governor's Certification Package in Response to Public Law 99-240, December 22, 1989.

Table G-1-16 Texas - Location of Major Waste Generators

TEXAS - Academic

Texas A&M University
Brazos County
College Station, TX

University of Texas - Balcones Research Center
Travis County
Austin, TX

TEXAS - Medical

University of Texas - Medical Branch
Gavelston County
Galvelston, TX

University of Texas - Health Science Center
Dallas County
Dallas, TX

University of Texas - Health Science Center
Bexar County
San Antonio, TX

TEXAS - Utility

Texas Utilities Electric Company
Commanche Peak NPS
Somervell County
Glen Rose, TX

Houston Lighting & Power Co
South Texas Project
Matagorda County
Palacios, TX

TEXAS - Industrial

NSSI, Inc.
Harris County
Houston, TX

Source: Texas Low-Level Radioactive Waste Disposal Authority, correspondence and telecommunications, January 9, 1990 and August 5, 1991, respectively.

Table G-1-17 Vermont - Location of Major Waste Generators

VERMONT - Academic

Middlebury College
Addison County
Middlebury, VT

University of Vermont
Chittenden County
Burlington, VT

VERMONT - Medical

Veterans Administration Medical and
Regional Offices Center
Windsor County
White River Junction, VT

VERMONT - Utility

Vermont Yankee Nuclear Power Co.
Vermont Yankee NPS
Windham County
Vernon, VT

VERMONT - Government

Vermont Occupational and radiological Health
Washington County
Montpelier, VT

VERMONT - Industrial

IBM Corporation
Chittenden County
Essex Junction, VT

Simpson Paper Company
Essex County
Gilman, VT

The Helen W. Toolan Institute
Bennington County
Bennington, VT

Source: Vermont Low-Level Radioactive Waste Authority correspondence dated January 21, 1991.

APPENDIX G-2

Population Distributions by Compact and Unaffiliated States

Table G-2-1 Northwest Compact - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Compact		150,117		12,916,329
Alaska			550,043	
Hawaii			1,108,229	
Idaho			1,006,749	
Montana			819,445	
Oregon		37,557	2,842,321	
Columbia	37,557			
Utah			1,722,850	
Washington		112,560	4,866,692	
Benton	112,560			

Source: Bureau of Census - 1990 Population Data, U.S. Department Commerce.

Table G-2-2 Rocky Mountain Compact - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Compact		1,439,818		6,464,884
Colorado		599,431	3,294,394	
Denver	467,610			
Weld	131,821			
Nevada		741,459	1,201,833	
Clark	741,459			
New Mexico		98,928	1,515,069	
Santa Fe	98,928			
Wyoming			453,588	

Source: Bureau of Census - 1990 Population Data, U.S. Department Commerce.

Table G-2-3 Central Compact - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Compact		733,837		13,707,574
Arkansas		45,883	2,350,725	
Pope	45,883			
Kansas		8,404	2,477,574	
Coffey	8,404			
Louisiana (Parish)		55,352	4,155,305	
St. Charles	42,437			
West Feliciana	12,915			
Nebraska		24,587	1,578,385	
Nemaha	7,980			
Washington	16,607			
Oklahoma		599,611	3,145,585	
Oklahoma	599,611			

Source: Bureau of Census - 1990 Population Data, U.S. Department Commerce.

Table G-2-4 Midwest Compact - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Compact		20,246,322		42,433,068
Indiania		2,030,546	5,544,159	
Lake	475,594			
Marion	797,159			
Monroe	108,978			
Tippecanoe	130,598			
Vanderburgh	165,058			
Vigo	106,107			
St. Joseph	247,052			
Iowa		880,325	2,776,755	
Black Hawk	123,798			
Johnson	96,119			
Jefferson	16,310			
Linn	168,767			
Polk	327,140			
Story	74,252			
Union	12,750			
Webster	40,342			
Winneshiek	20,847			
Michigan		5,361,061	9,295,297	
Berrien	161,378			
Charlevoix	21,468			
Ingham	281,912			
Gratiot	38,982			
Kalamazoo	223,411			
Macomb	717,400			
Midland	75,651			
Monroe	133,600			
Muskegon	158,983			
Oakland	1,083,592			
Van Buren	70,060			
Washtenaw	282,937			
Wayne	2,111,687			

Table G-2-4 Midwest Compact - Population Distribution, Cont'd

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Minnesota		2,249,730	4,335,285	
Anoka	243,641			
Beltrami	34,384			
Googhue	40,690			
Hennepin	1,032,431			
Ramsey	485,765			
St. Louis	198,213			
Washington	145,896			
Wright	68,710			
Missouri		2,216,061	4,720,388	
Adair	24,577			
Boone	112,379			
Callaway	32,809			
Jackson	633,232			
Jefferson	171,380			
Phelps	35,248			
St. Charles	212,907			
St. Louis	993,529			
Ohio		5,653,375	10,847,115	
Athens	59,549			
Butler	291,479			
Cuyahoga	1,412,140			
Franklin	961,437			
Hamilton	866,228			
Lucas	462,361			
Lake	215,499			
Montgomery	573,809			
Ottawa	40,029			
Portage	142,585			
Summit	514,990			
Wood	113,269			

Table G-2-4 Midwest Compact - Population Distribution, Cont'd

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Wisconsin		1,855,224	4,914,069	
Ashland	16,307			
Dane	367,085			
Kewaunee	18,878			
La Crosse	97,904			
Manitowoc	80,421			
Milwaukee	959,275			
Racine	175,034			
Winnebago	140,320			

Source: Bureau of Census - 1990 Population Data, U.S. Department Commerce.

Table G-2-5 Central Midwest Compact - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Compact		8,898,126		15,116,898
Kentucky		947,811	3,685,296	
Fayette	225,366			
Jefferson	664,937			
Madison	57,508			
Illinois		7,950,315	11,430,602	
Bureau	35,588			
De Witt	16,516			
Du Page	781,666			
Cook	5,105,067			
Grundy	32,337			
Lake	516,418			
La Salle	106,913			
Macon	117,206			
Massac	14,752			
Ogle	45,957			
Peoria	182,827			
Rock Island	148,723			
Sangamon	178,386			
Will	357,313			
Williamson	57,733			
Winnebago	252,913			

Source: Bureau of Census - 1990 Population Data, U.S. Department Commerce.

Table G-2-6 Southeast Compact - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Compact		11,876,914		44,902,906
Alabama		1,071,811	4,040,587	
Houston	81,331			
Jefferson	651,525			
Madison	238,912			
Morgan	100,043			
Florida		4,748,031	12,937,926	
Alachua	181,596			
Citrus	93,515			
Dade	1,937,094			
Hillsborough	834,054			
Indian river	90,208			
Leon	192,493			
Palm Beach	863,518			
Polk	405,382			
St. Lucie	150,171			
Georgia		36,323	6,422,680	
Appling	15,744			
Burke	20,579			
Mississippi		59,250	2,573,216	
Claiborne	11,370			
Warren	47,880			
South Carolina		1,100,589	3,486,703	
Barnwell	20,293			
Charleston	295,039			
Darlington	61,851			
Fairfield	22,295			
Oconee	57,094			
Richland	285,720			
Spartanburg	226,800			
York	131,497			

Table G-2-6 Southeast Compact - Population Distribution, Cont'd

County for Compact/State	Each County	All Counties	Entire State	Compact Region
North Carolina		2,212,740	6,628,637	
Brunswick	50,985			
Cabarrus	98,935			
Durham	181,835			
Forsyth	265,878			
Guilford	347,420			
Mecklenburg	511,433			
New Hanover	120,284			
Pitt	107,924			
Wake	423,380			
Wayne	104,666			
Tennessee		1,924,973	4,877,185	
Anderson	68,250			
Davidson	510,784			
Hamilton	285,536			
Madison	77,982			
Roane	47,227			
Shelby	826,330			
Unicoi	16,549			
Washington	92,315			
Virginia		723,197	3,935,972	
Campbell	47,572			
Henrico	217,881			
Louisia	20,325			
Newport News	170,045			
Norfolk	261,229			
Surry	6,145			

Source: Bureau of Census - 1990 Population Data, U.S. Department Commerce.

Table G-2-7 Northeast Compact - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Compact		9,697,928		11,017,304
New Jersey		7,412,549	7,730,188	
Atlantic	224,327			
Bergen	825,380			
Burlington	395,066			
Camden	502,824			
Cumberland	138,053			
Essex	778,206			
Gloucester	230,082			
Hudson	553,099			
Hunterdon	107,776			
Mercer	325,824			
Middlesex	671,780			
Monmouth	553,124			
Morris	421,353			
Ocean	433,203			
Passaic	453,060			
Salem	65,294			
Somerset	240,279			
Union	493,819			
Connecticut		2,285,379	3,287,116	
Hartford	851,783			
Middlesex	143,196			
New Haven	804,219			
New London	254,957			
Tolland	128,699			
Windham	102,525			

Source: Bureau of Census - 1990 Population Data, U.S. Department Commerce.

Table G-2-8 Appalachian Compact - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Compact		12,575,851		18,386,742
Delaware		666,168	666,168	
Kent	110,993			
New Castle	441,946			
Sussex	113,229			
Maryland		3,206,944	4,045,454	
Anne Arundel	427,239			
Baltimore	692,134			
Calvert	51,372			
Dorchester	30,236			
Frederick	150,208			
Harford	182,132			
Howard	187,328			
Montgomery	757,027			
Prince George's	729,268			
West Virginia		483,471	1,793,477	
Cabell	96,827			
Kanawha	207,619			
Mineral	26,697			
Monongalia	75,509			
Raleigh	76,819			
Pennsylvania		8,219,268	11,881,643	
Allegheny	1,336,449			
Armstrong	73,478			
Beaver	186,093			
Berks	336,523			
Bucks	541,174			
Butler	152,013			
Bradford	60,967			
Centre	123,786			
Chester	376,396			
Clearfield	78,097			
Columbia	63,202			
Crawford	86,169			

Table G-2-8 Appalachian Compact - Population Distribution, Cont'd

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Pennsylvania cont'd				
Dauphin	237,813			
Delaware	547,651			
Franklin	121,082			
Lackawanna	219,039			
Lawrence	96,246			
Lehigh	291,130			
Luzerne	328,149			
Montgomery	678,111			
Monroe	95,709			
Montour	17,735			
Northampton	247,105			
Philadelphia	1,585,577			
York	339,574			

Source: Bureau of Census - 1990 Population Data, U.S. Department Commerce.

Table G-2-9 Southwest Compact - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Compact				27727847
Arizona			2716598	
Maricopa	1509227			
North Dakota			652717	
Burleigh	54811			
Cass	88247			
Grand Forks	66100			
South Dakota			690768	
California			23667764	
Alameda	1105379			
Orange	1932921			
San Luis Obispo	155435			
Sacramento	783381			
San Diego	1861846			

Source: Bureau of Census - 1980 Population Data Adjusted to 1986 U.S. Department Commerce.

Table G-2-10 District of Columbia - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
District	---	---	638432	---

Source: Bureau of Census - 1980 Population Data Adjusted to 1986 U.S. Department Commerce.

Table G-2-11 Maine - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Maine			1125043	
Androscoggin	99509			
Cumberland	215789			
Hancock	41781			
Kennebec	109889			
Knox	32941			
Lincoln	25691			
Penobscot	137015			
York	139739	802354		

Source: Bureau of Census - 1980 Population Data Adjusted to 1986
U.S. Department Commerce.

Table G-2-12 Massachusetts - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Massachusetts			5737093	
Plymouth	405437			
Berkshire	145110			

Source: Bureau of Census - 1980 Population Data Adjusted to 1986
U.S. Department Commerce.

Table G-2-13 New Hampshire - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
New Hampshire			920610	
Coos	35147			
Hillsborough	276608			
Rockingham	190345			
Strafford	85408	587508		

Source: Bureau of Census - 1980 Population Data Adjusted to 1986
U.S. Department Commerce.

Table G-2-14 New York - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
New York			17558165	
Albany	285909			
Bronx	1168972			
Chemung	97656			
Chenango	49344			
Columbia	59487			
Erie	1015472			
Essex	36176			
Kings	2231028			
Monroe	702238			
Nassau	1321582			
New York	1428285			
Monroe	702238			
Onondaga	463920			
Orange	259603			
Oswego	113901			
Queens	1891325			
Rensselaer	151966			
Rockland	259530			
Tompkins	87085			
Suffolk	1284231			
Wayne	84581			
Westchester	866599	14561128		

Source: Bureau of Census - 1980 Population Data Adjusted to 1986 U.S. Department Commerce.

Table G-2-15 Rhode Island - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Rhode Island			947154	
Providence	571349			
Washington	93317	664660		

Source: Bureau of Census - 1980 Population Data Adjusted to 1986 U.S. Department Commerce.

Table G-2-16 Texas - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Texas			14225512	
Brazos	93588			
Bexar	988971			
Dallas	1556419			
Harris	2409547			
Galveston	195738			
Matagorda	37828			
Somervell	4154	5286245		

Source: Bureau of Census - 1980 Population Data Adjusted to 1986
U.S. Department Commerce.

Table G-2-17 Vermont - Population Distribution

County for Compact/State	Each County	All Counties	Entire State	Compact Region
Vermont			511456	
Addison	29406			
Bennington	33345			
Chittenden	115534			
Essex	6313			
Washington	52393			
Windsor	51030			
Windham	36933	324954		

Source: Bureau of Census - 1980 Population Data Adjusted to 1986
U.S. Department Commerce.

Appendix G-3

Major Waste Brokers and Processors

Major Waste Brokers and Processors

Organization/County/City/State

ADCO Services, Inc.
Cook County
Tinley Park, IL

Allied Ecology Services, Inc.
Alameda County
Pleasanton, CA

ALARON Corp.
Lawrence County
Wampum, PA

Applied Health Physics, Inc.
Allegheny County
Bethel Park, PA

AWC, Inc.
Clark County
Las Vegas, NE

Bartlett Services, Inc.
Plymouth County
Plymouth, MA

Bionomics, Inc.
Santa Fe County
Santa Fe, NM

Bionomics, Inc.
Roane County
Harriman, TN

Chem-Nuclear Systems, Inc.
Richland County
Columbia, SC

Chem-Nuclear Systems, Inc.
Will County
Channahon, IL

DSSI, Inc.
Roane County
Kingston, TN

Major Waste Brokers and Processors, Cont'd

Ecology and Environment, Inc.
Erie County
Lancaster, NY

Ecology Services, Inc.
Prince Georges
Laurel, MD

Decon International
Allegheny County
Bethel Park, PA

Intersol
Hills Borough County
Tampa, FL

NDL Organization, Inc.
Westchester County
Peekskill, NY

NSSI/Recovery Services, Inc.
Harris County
Houston, TX

Pacific Nuclear Services
Benton County
Richland, WA

Pacific West Environmental
San Diego County
Vista, CA

Quadrex HPS, Inc.
Alachua County
Gainesville, FL

Quadrex Recycle Center
Anderson County
Oak Ridge, TN

Radiac Research
Kings County
Brooklyn, NY

Major Waste Brokers and Processors, Cont'd

RAMP Industries
Denver County
Denver, CO

RSO, Inc.
Prince Georges County
Laurel MD

SEG, Inc.
Roane County
Oak Ridge, TN

Teledyne Isotopes
Bergen County
Westwood, NJ

Thomas Gray and Associates
Stanislaus County
Turlock, CA

Thomas Gray and Associates
Orange County
Orange, CA

U.S. Ecology, Inc.
Jefferson County
Louisville, KY

APPENDIX H

Fuel Fabrication Facilities
Shipment Level Analyses for Selected Radionuclides and States
(Aggregate Practices from 1986 to 1990)

Exhibit H-1 Connecticut Fuel Fabrication Facilities
Radionuclide Distributions - Shipment Level[a]

Waste Class: A-Unstable and A-Stable
Number of shipping records: 26
Number of shipping containers: no data
Total waste volume: 731.5 m^3
Total waste mass: 748,300 Kg
Average waste form density: 1.02 g/cm^3

Nuclide	Concentration Ranges - Ci/m^3 - 1st	50th	99th	Percentile[b] - pCi/g - 1st	50th	99th
Th-228	1.59E-05	2.27E-05	3.86E-05	1.56E+01	2.22E+01	3.78E+01
Th-230	6.50E-05	9.07E-05	1.54E-04	6.35E+01	8.87E+01	1.51E+02
Th-232	8.15E-05	1.13E-04	1.93E-04	7.97E+01	1.11E+02	1.89E+02
Th-nat*	1.58E-03	1.58E-03	1.58E-03	1.55E+03	1.55E+03	1.55E+03
U-235	1.07E-05	4.79E-04	4.47E-03	1.04E+01	4.68E+02	4.37E+03
U-238	1.11E-05	4.00E-05	8.17E-04	1.08E+01	3.91E+01	7.99E+02
U-nat*	2.11E-02	2.11E-02	2.11E-02	2.06E+04	2.06E+04	2.06E+04

(a) Based on direct shipment data to all three disposal sites from 1986 to 1990.
(b) The concentration of nuclides tagged with an asterisk are based on a single value. In such instances, the percentile distribution does not apply.

Exhibit H-1 (Continued)

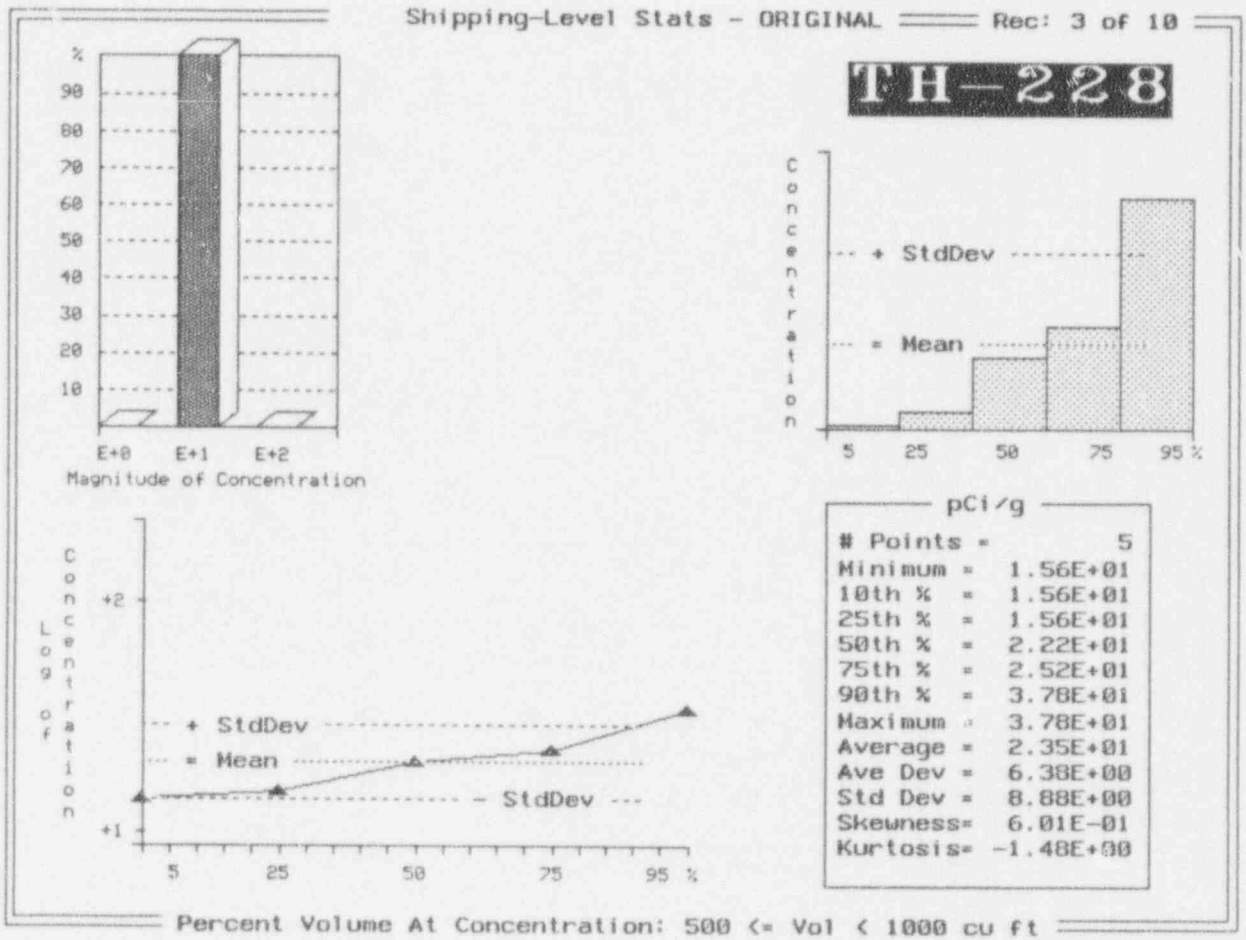


Exhibit H-1 (Continued)

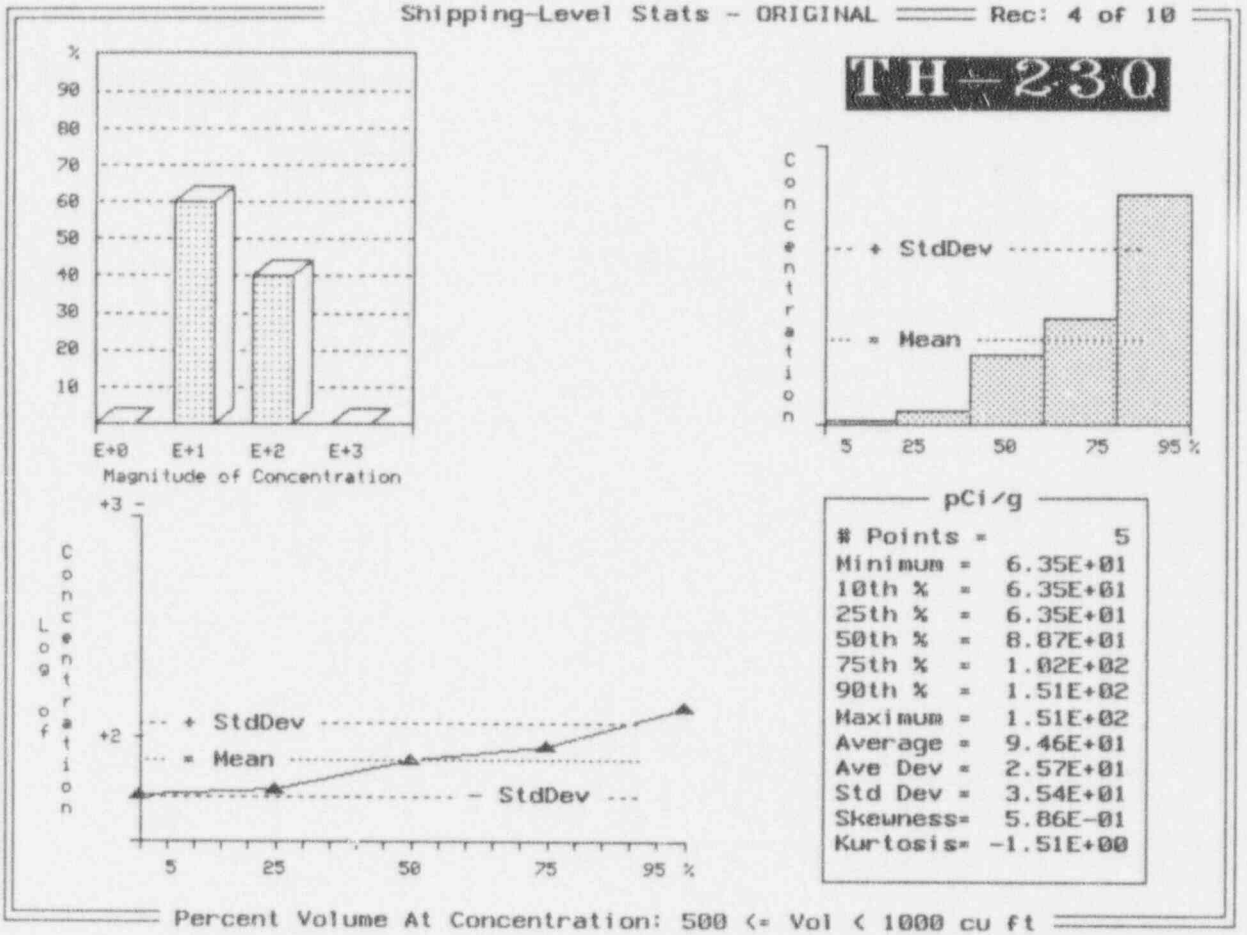


Exhibit H-1 (Continued)

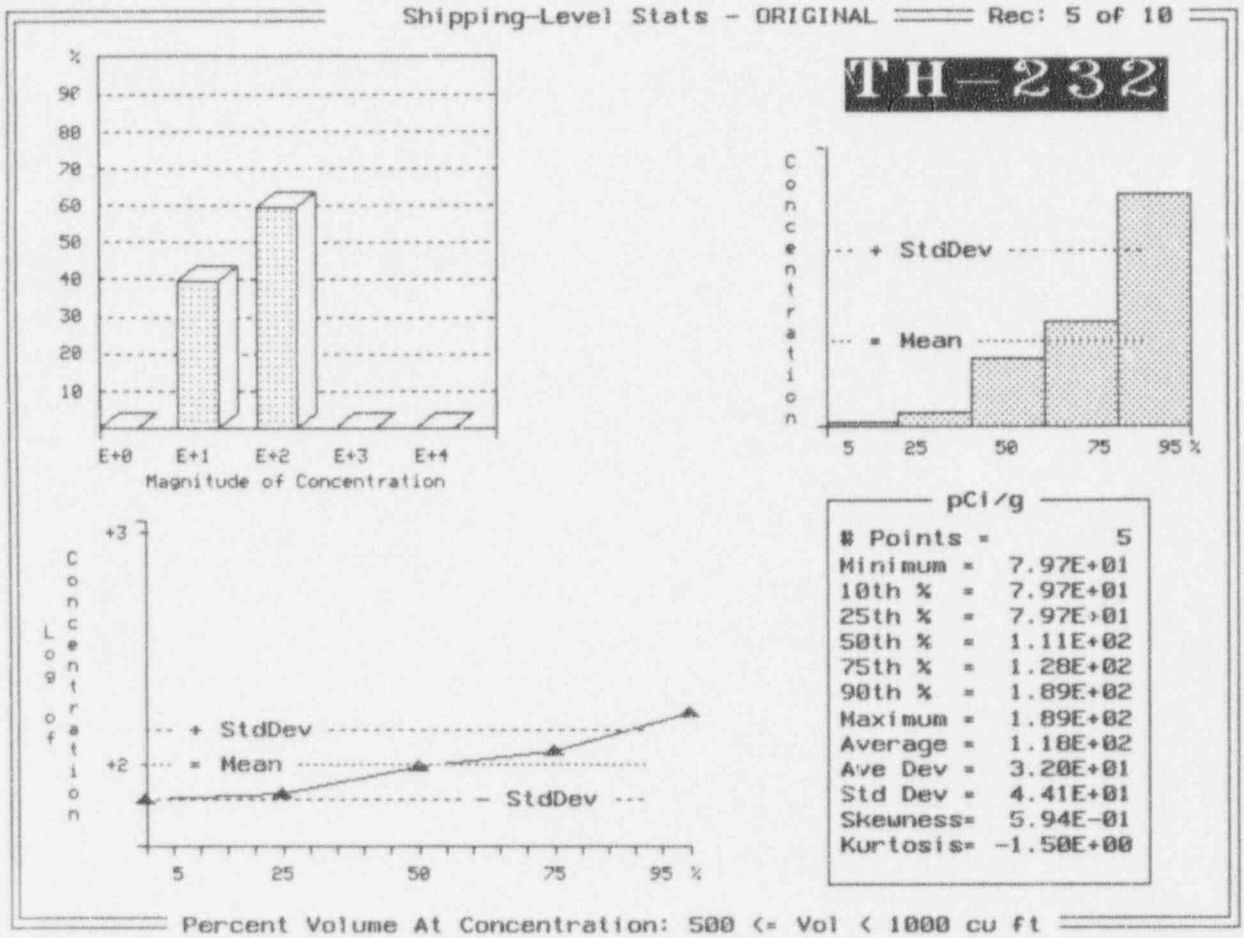


Exhibit H-1 (Continued)

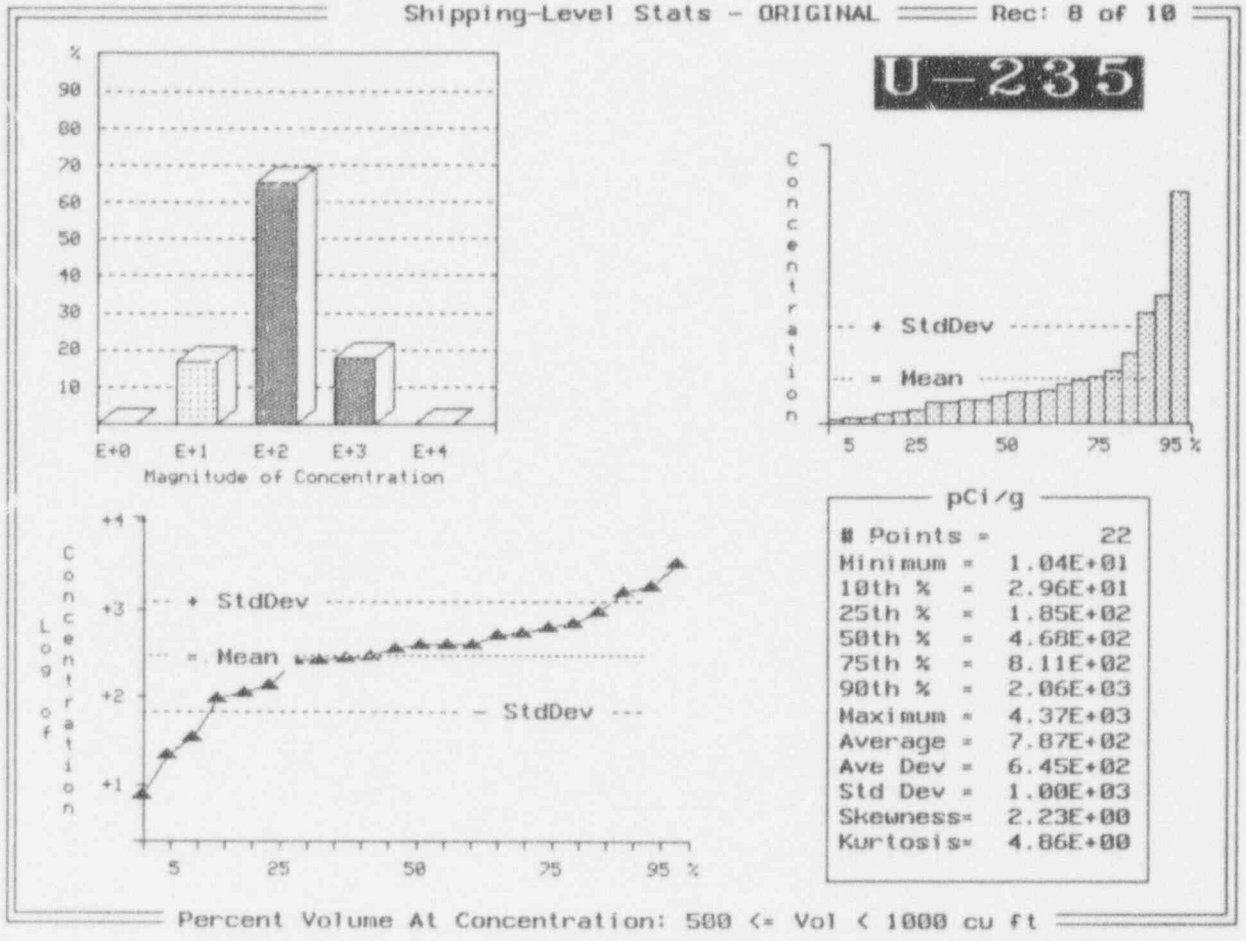


Exhibit H-1 (Continued)

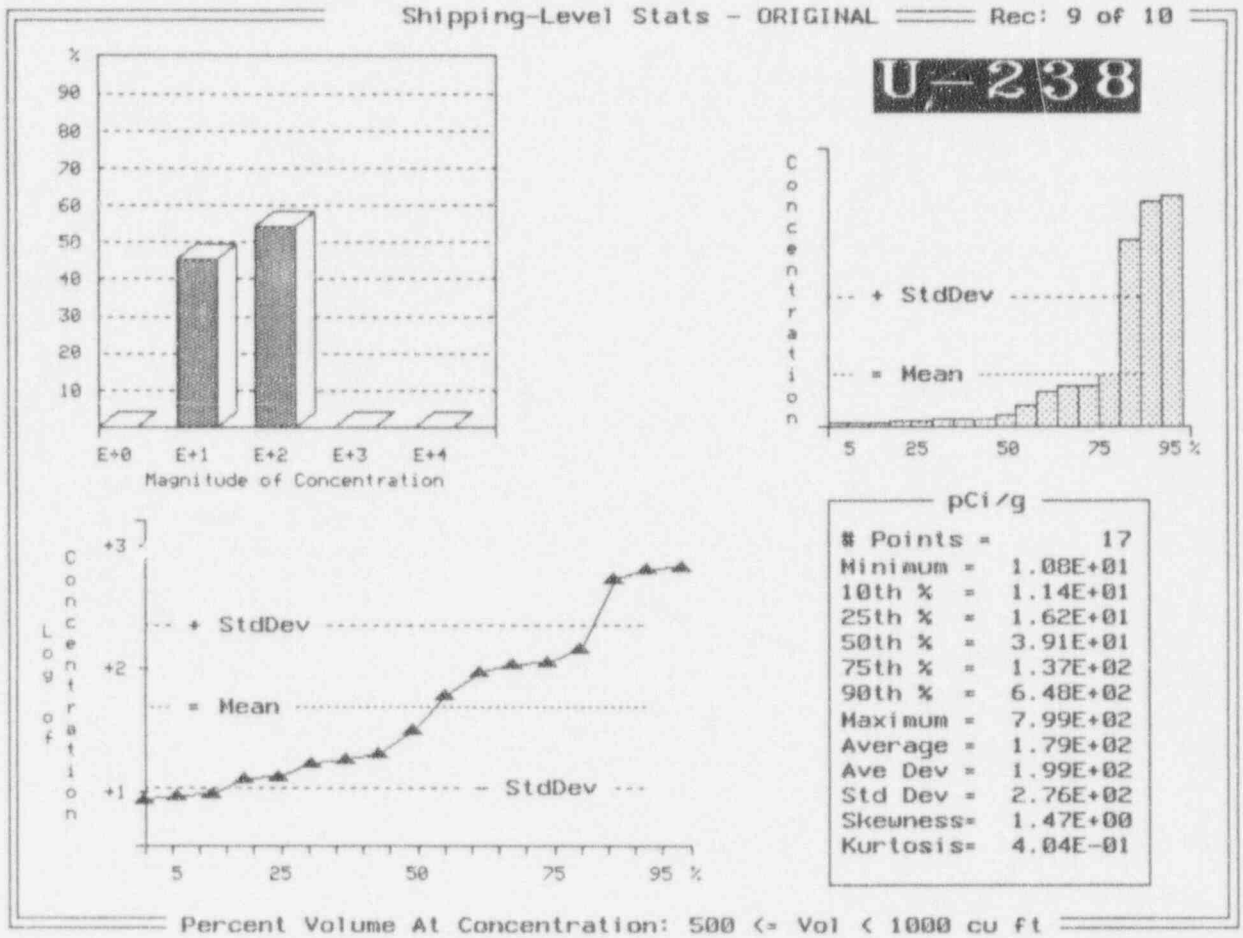
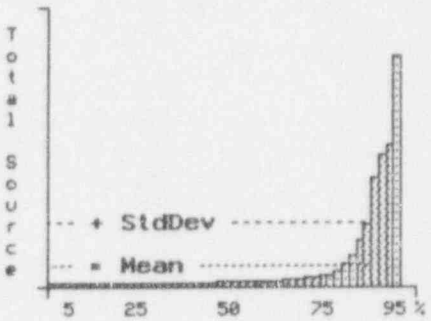


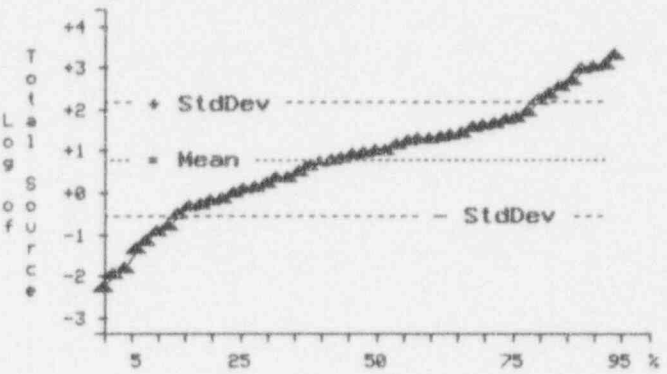
Exhibit H-1 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: Connecticut

Total source material [kg]: 3.43E+04





kg

# Points =	142
1st % =	1.00E-02
10th % =	1.50E-01
25th % =	1.76E+00
50th % =	1.63E+01
75th % =	8.03E+01
90th % =	8.07E+02
99th % =	2.96E+03
Average =	2.41E+02
Ave Dev =	3.62E+02
Std Dev =	6.24E+02
Skewness=	3.25E+00
Kurtosis=	1.05E+01

Total Source Material

Exhibit H-1 (Continued)

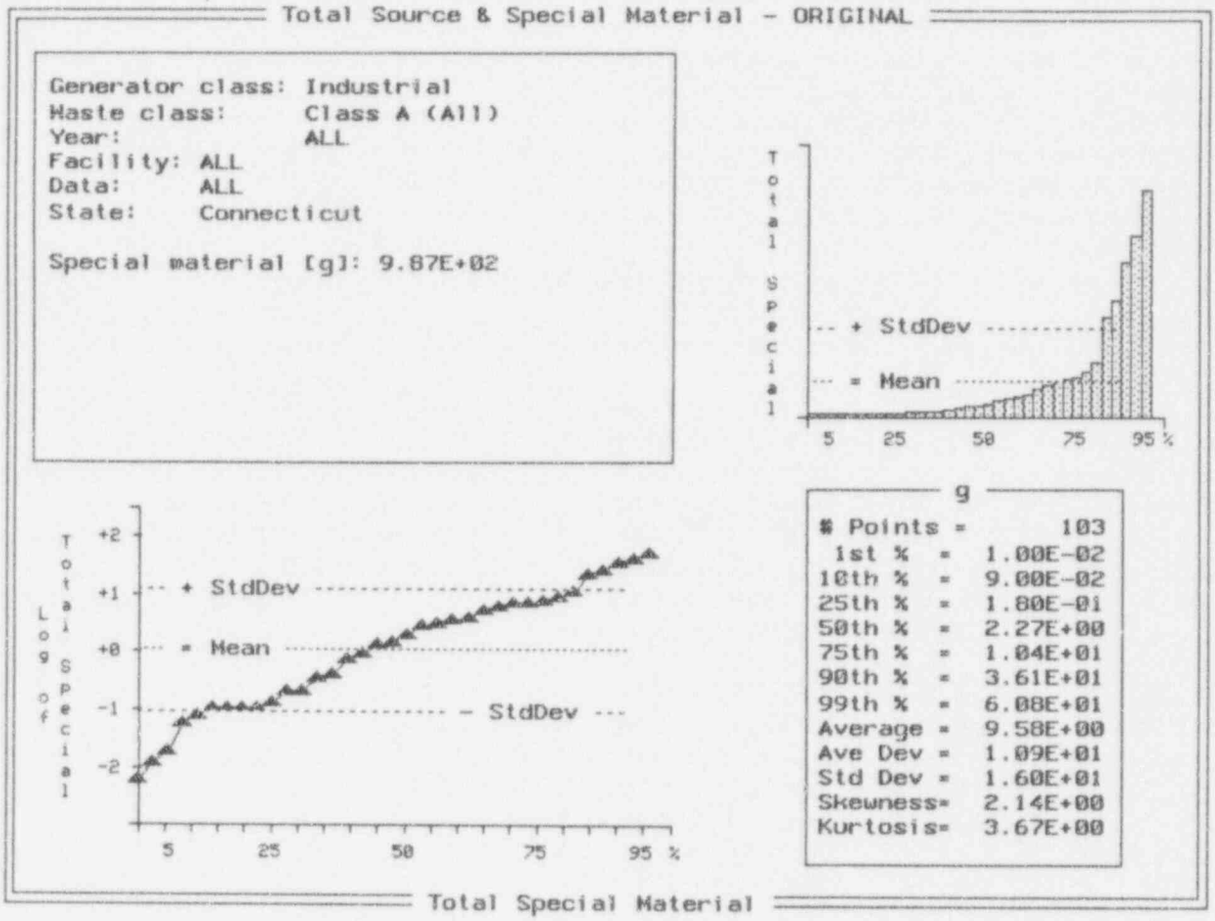


Exhibit H-2 Pennsylvania Fuel Fabrication Facilities
Radionuclide Distributions - Shipment Level[a]

Waste Class: A-Unstable and A-Stable
Number of shipping records: 146
Number of shipping containers: 204
Total waste volume: 2,061 m^3
Total waste mass: 2,108,000 Kg
Average waste form density: 1.02 g/cm^3

Nuclide	Concentration Ranges - Ci/m^3 - 1st	50th	99th	Percentile[b] - pCi/g - 1st	50th	99th
Am-241	3.65E-08	3.40E-06	4.24E-05	3.56E-02	3.33E+00	9.22E+01
Am-243	9.80E-07	1.25E-06	1.51E-06	9.58E-01	1.22E+00	1.48E+00
Cm-242	4.88E-08	1.24E-06	2.34E-06	4.77E-02	1.21E+00	5.09E+00
Cm-244	9.76E-08	1.96E-07	2.94E-07	9.54E-02	1.91E-01	2.87E-01
Dep-U*#	3.61E-03	3.61E-03	3.61E-03	3.53E+03	3.53E+03	3.53E+03
Np-237	1.46E-07	1.88E-07	2.29E-07	1.43E-01	1.83E-01	2.24E-01
Pu-238	2.62E-07	4.71E-06	1.29E-05	1.68E-01	4.60E+00	1.26E+01
Pu-239	2.62E-07	4.71E-06	4.71E-06	1.68E-01	4.60E+00	4.60E+00
Pu-240	3.65E-08	5.18E-06	3.97E-05	3.56E-02	5.06E+00	8.61E+01
Pu-241	3.65E-08	4.76E-05	3.70E-02	3.56E-02	5.64E+01	3.62E+04
Pu-242	3.65E-08	1.38E-07	8.29E-07	3.56E-02	1.82E-01	8.11E-01
Th-232	4.28E-05	5.94E-04	2.02E-03	4.18E+01	5.81E+02	1.97E+03
Th-nat	5.06E-05	2.14E-04	3.77E-04	4.95E+01	2.09E+02	3.68E+02
TRU#	1.12E-05	3.69E-05	1.08E-04	1.10E+01	3.61E+01	1.06E+02
U-234	1.74E-05	6.60E-04	1.82E-02	1.70E+01	6.45E+02	1.78E+04
U-235	1.07E-06	3.99E-05	8.48E-04	1.05E+00	3.90E+01	8.28E+02
U-236	3.02E-06	1.94E-05	1.65E-04	4.41E-01	1.92E+01	1.61E+02
U-238	4.68E-06	1.75E-04	7.04E-04	4.58E+00	1.71E+02	6.88E+02
U-nat	2.47E-05	2.47E-05	2.94E-03	2.42E+01	2.42E+01	2.88E+03

(a) Based on direct shipment data to all three disposal sites from 1986 to 1990.
(b) The concentration of nuclides tagged with an asterisk are based on a single value. In such instances, the percentile distribution does not apply. Nuclides identified with the pound symbol (#) signify depleted uranium, and transuranics (TRU), respectively.

Exhibit H-2 (Continued)

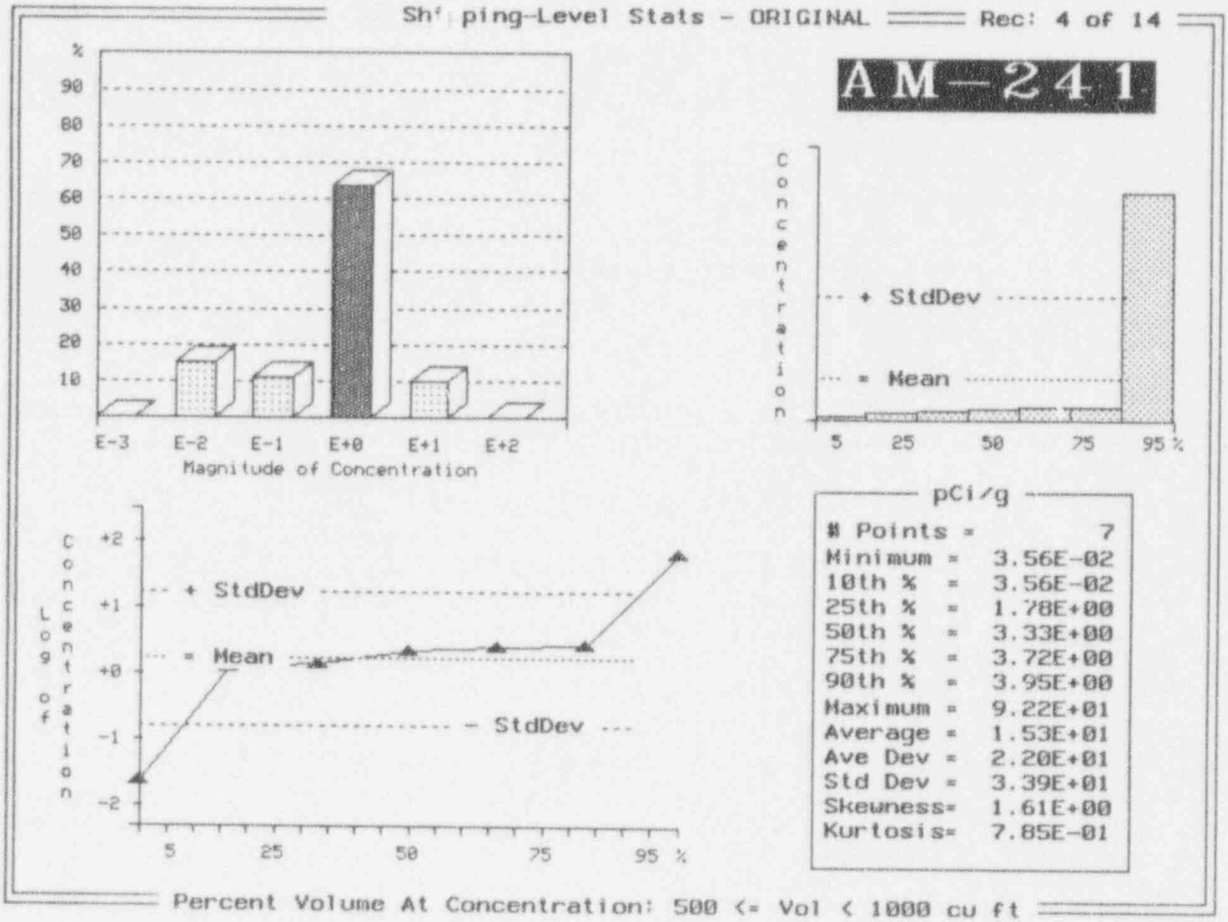


Exhibit H-2 (Continued)

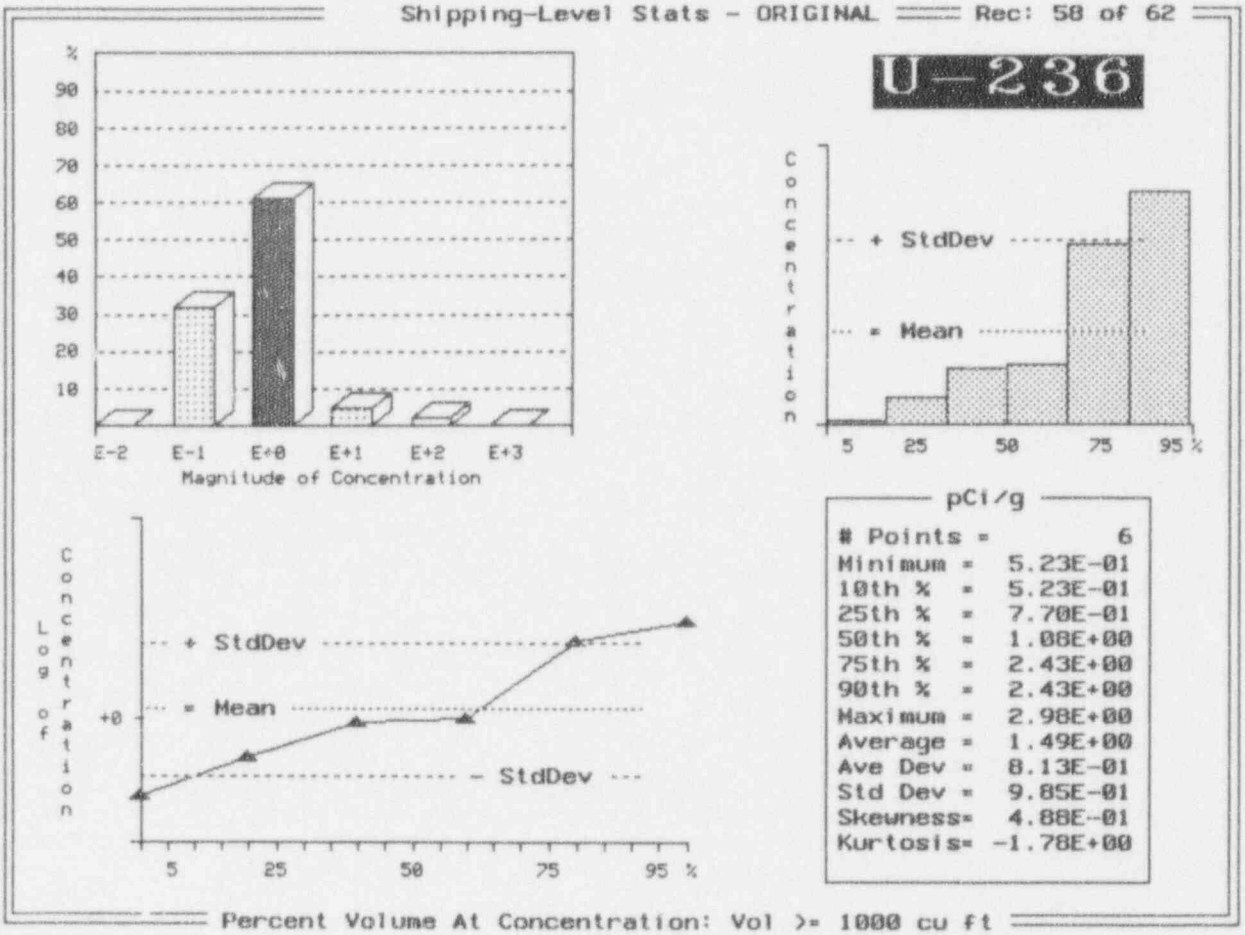


Exhibit H-2 (Continued)

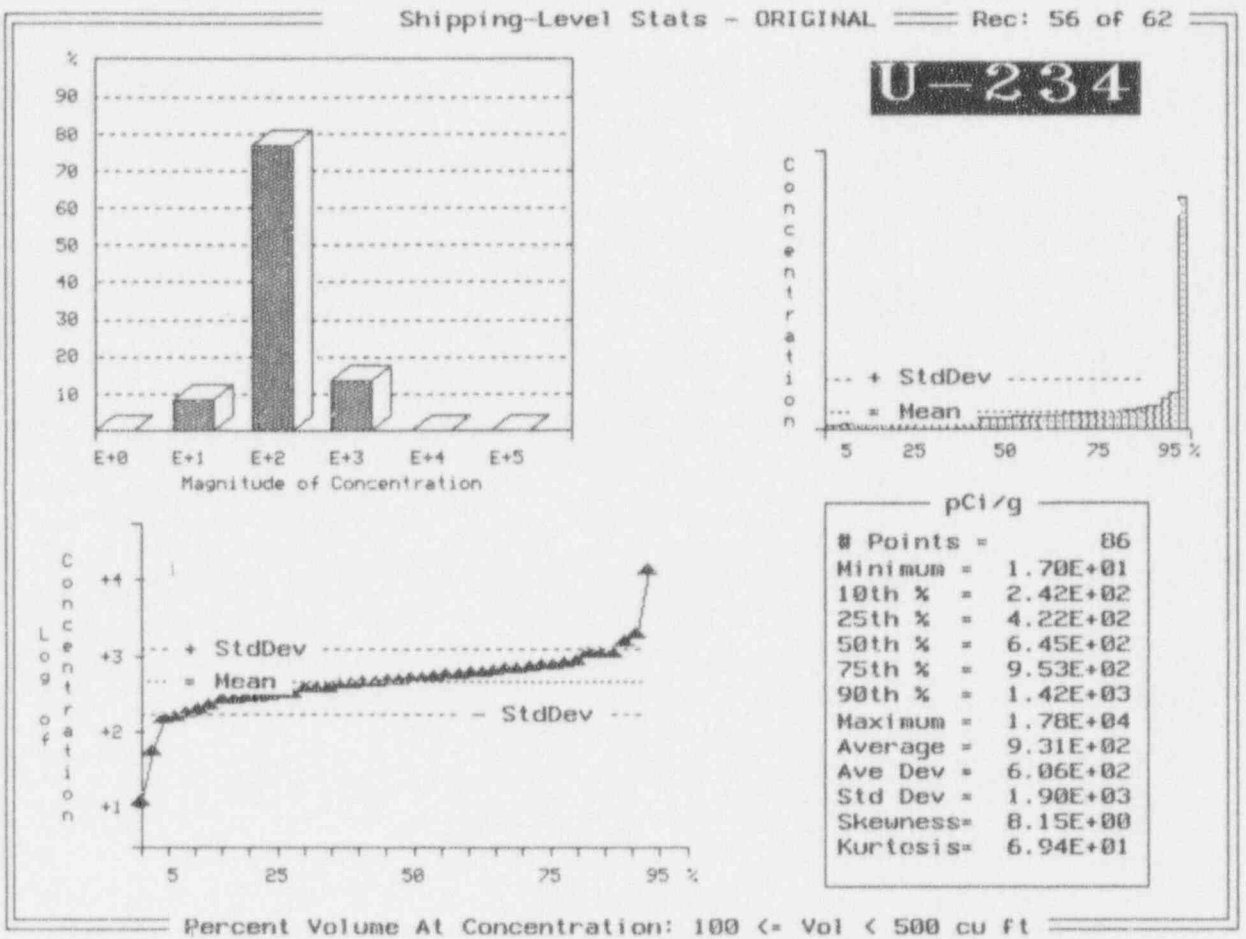


Exhibit H-2 (Continued)

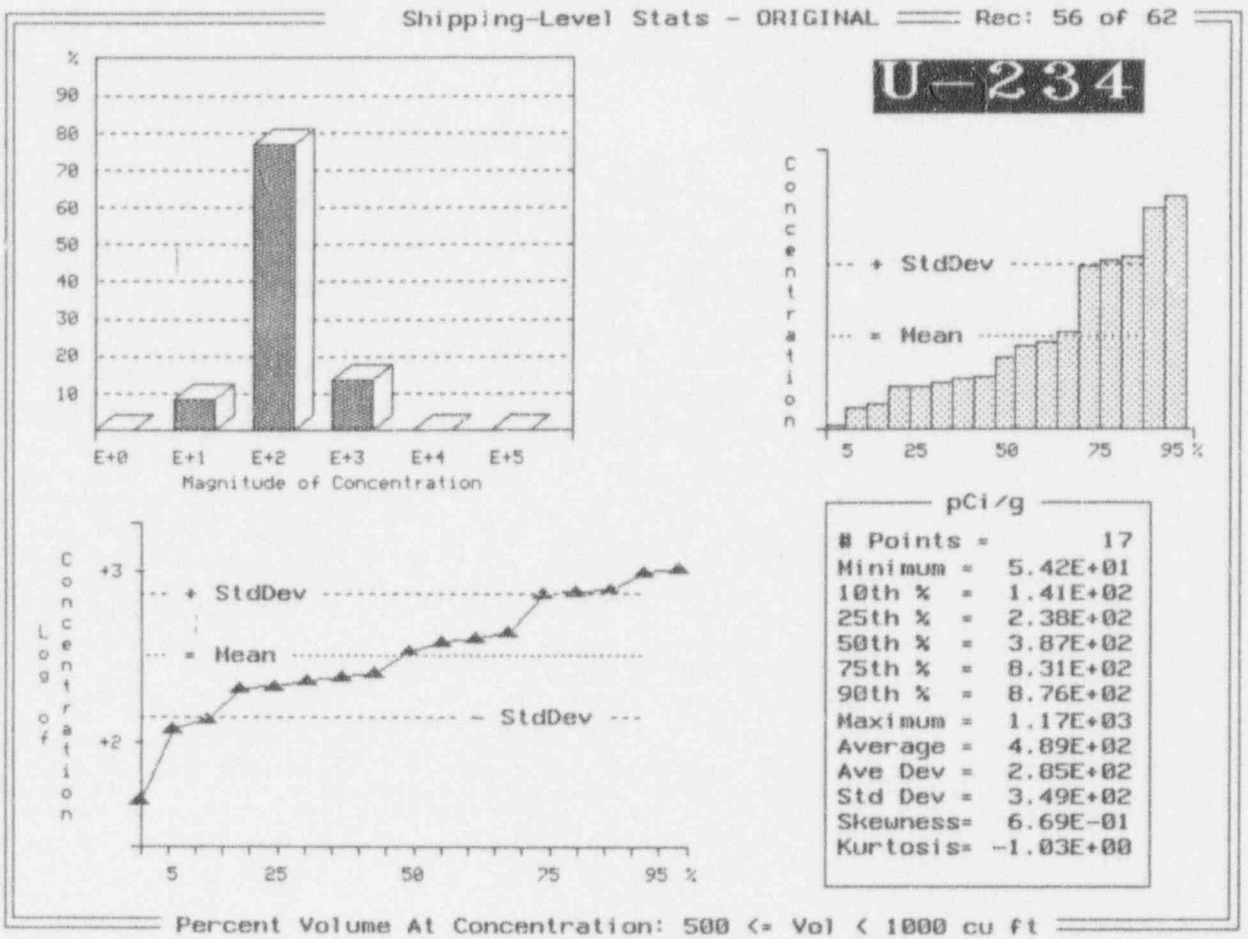


Exhibit H-2 (Continued)

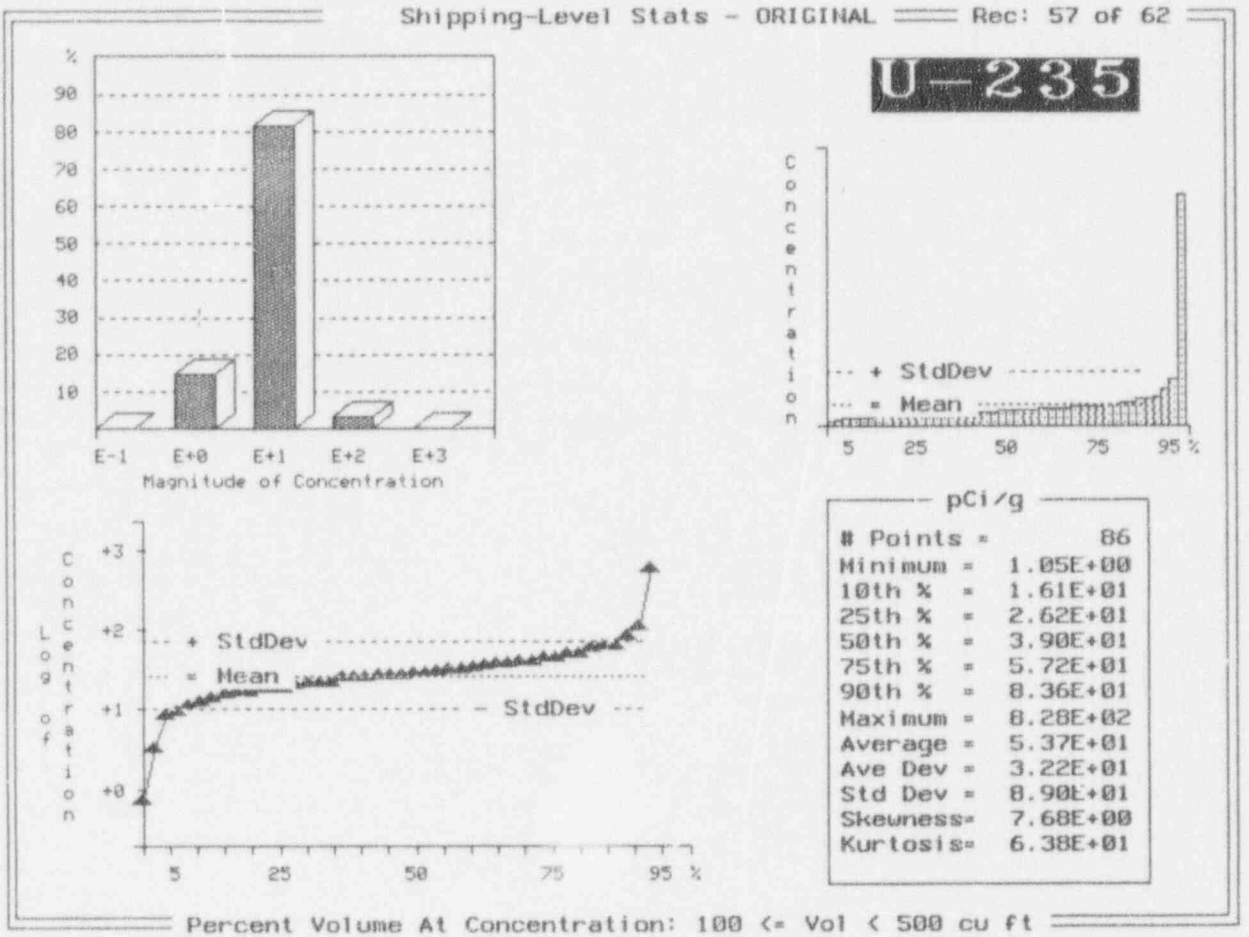


Exhibit H-2 (Continued)

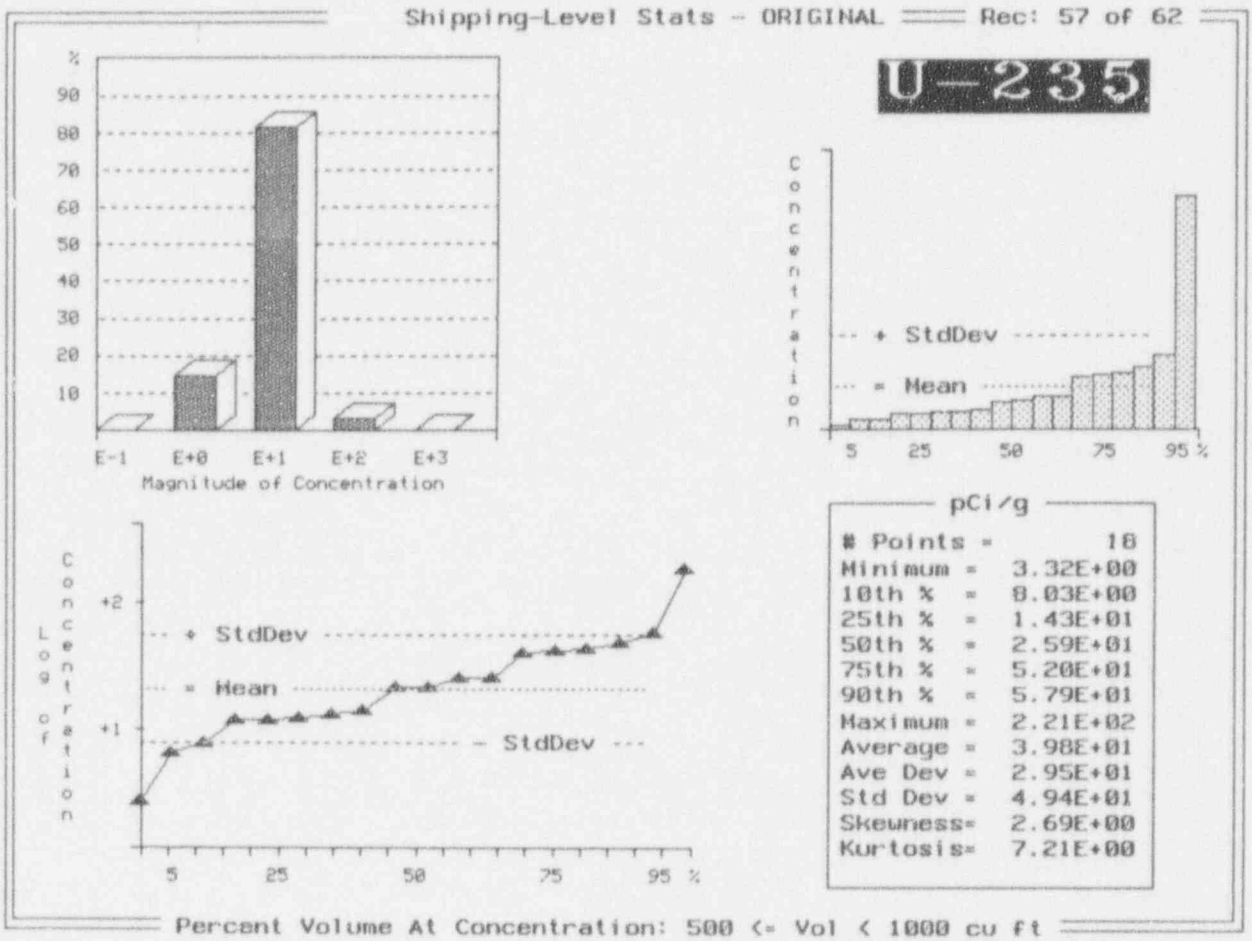


Exhibit H-2 (Continued)

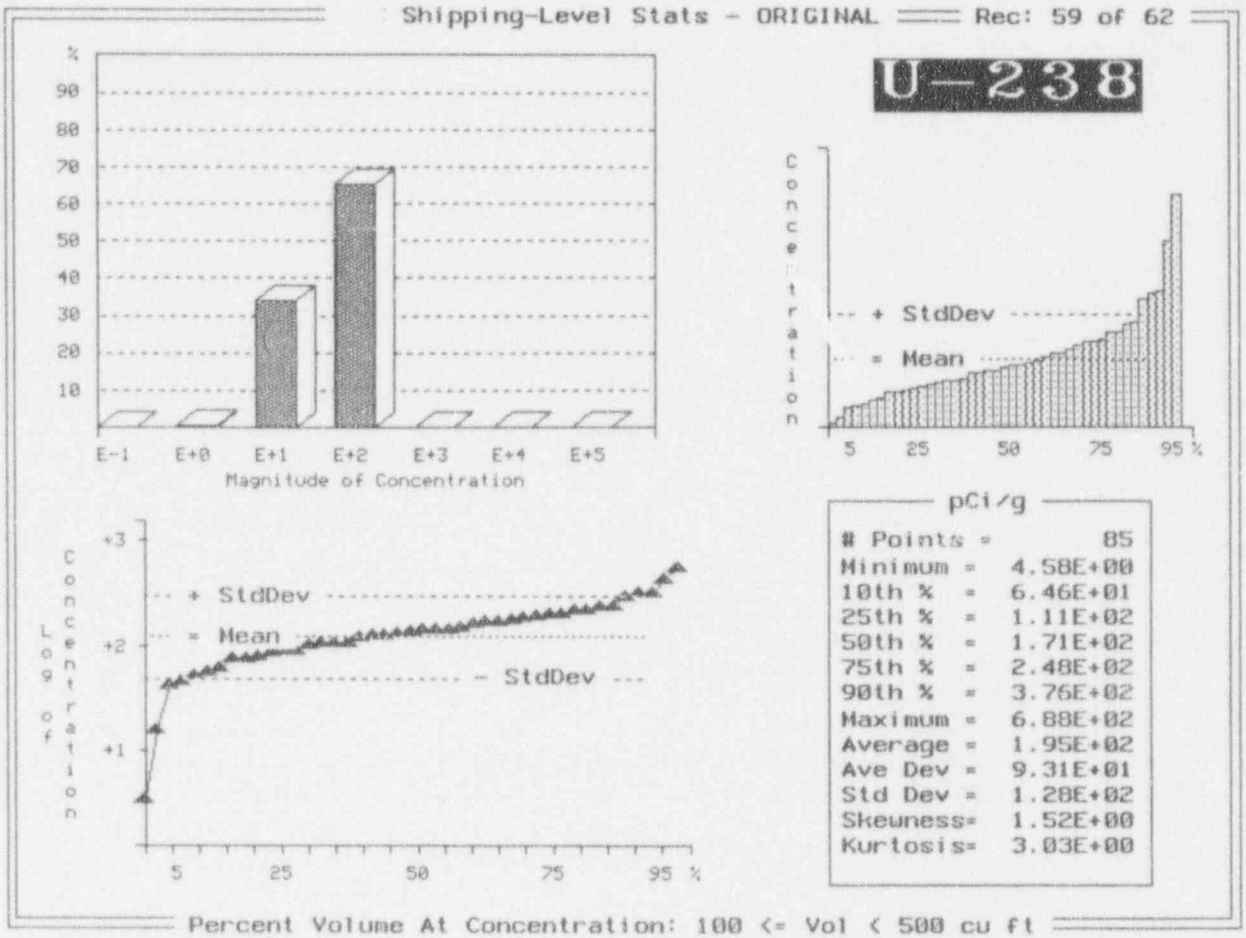


Exhibit H-2 (Continued)

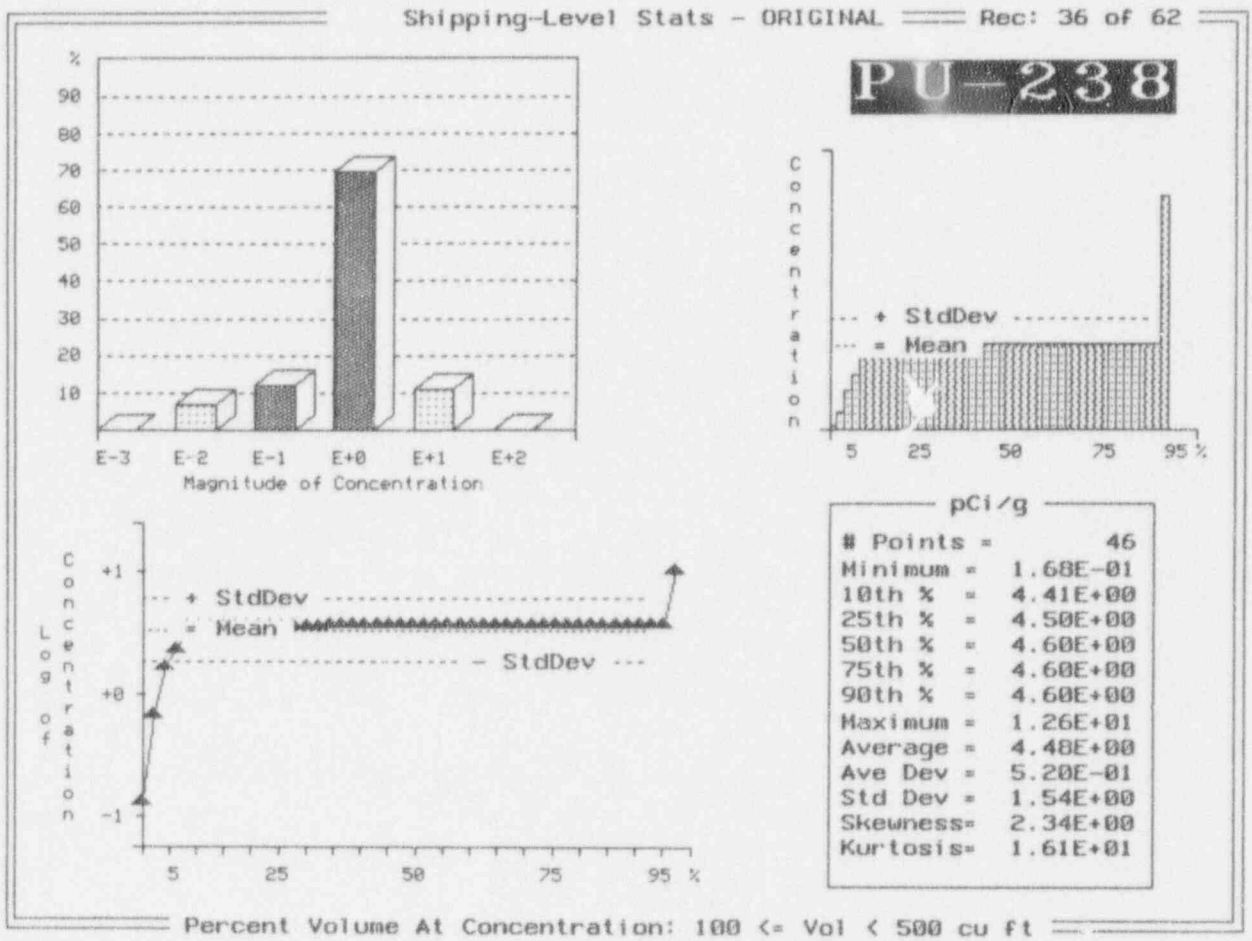


Exhibit H-2 (Continued)

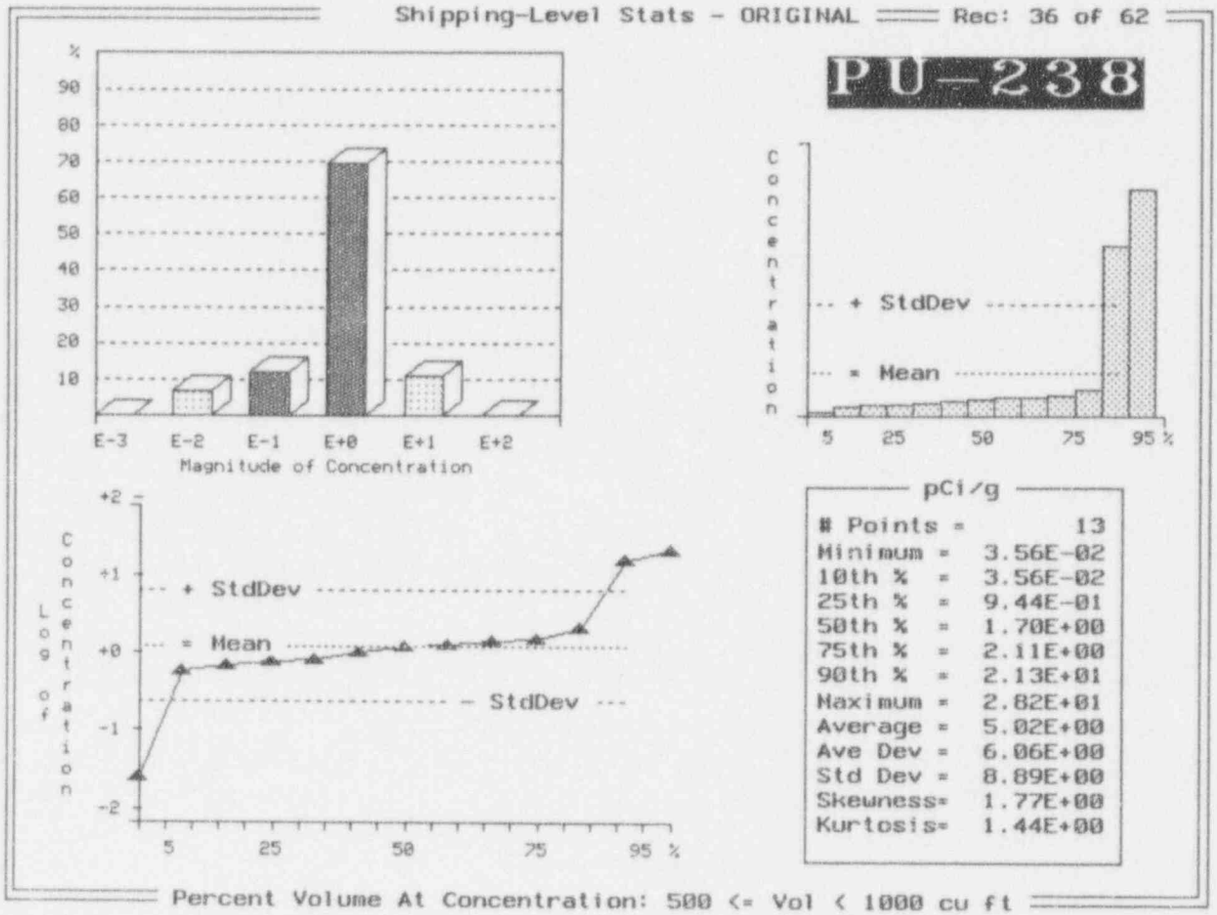


Exhibit H-2 (Continued)

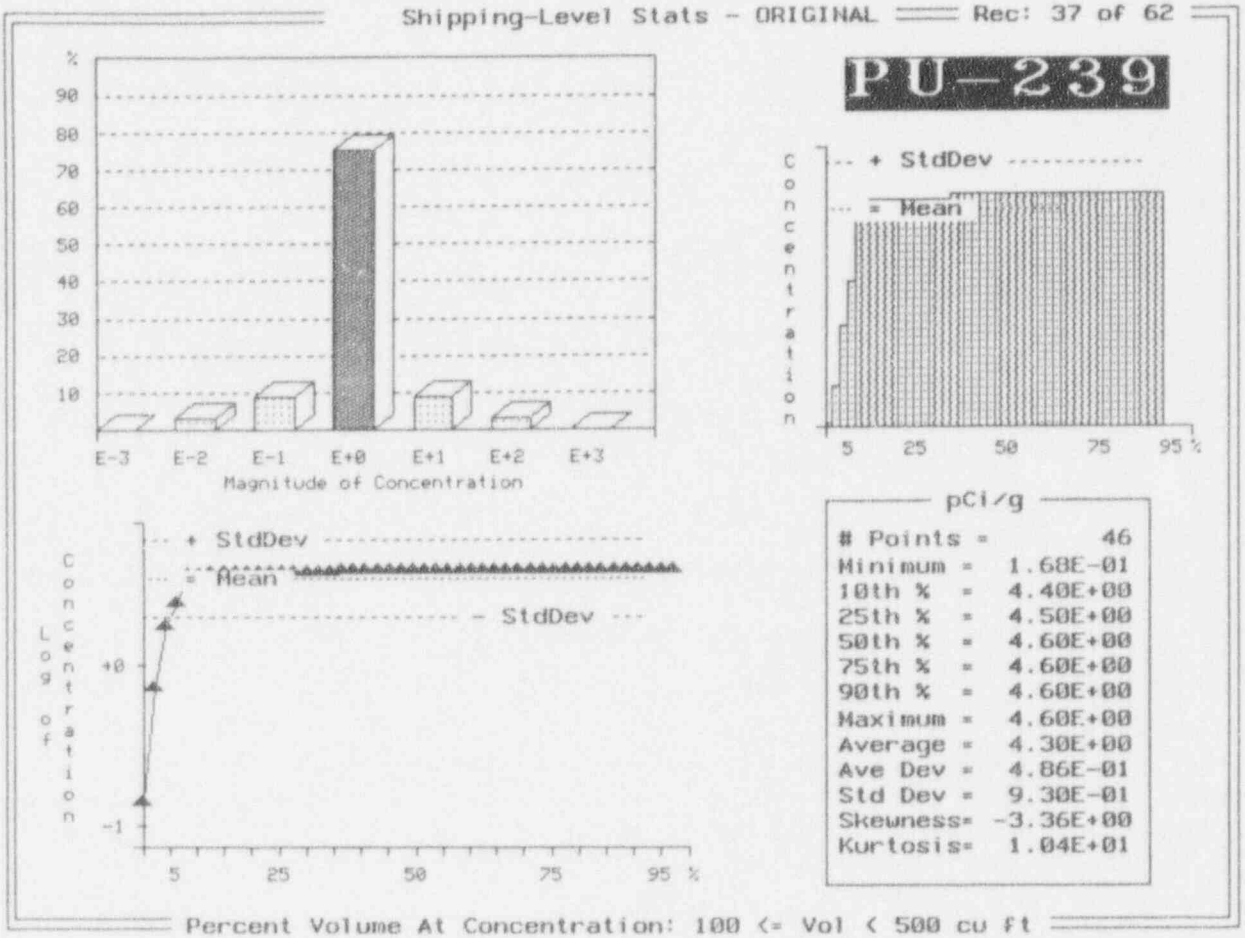


Exhibit H-2 (Continued)

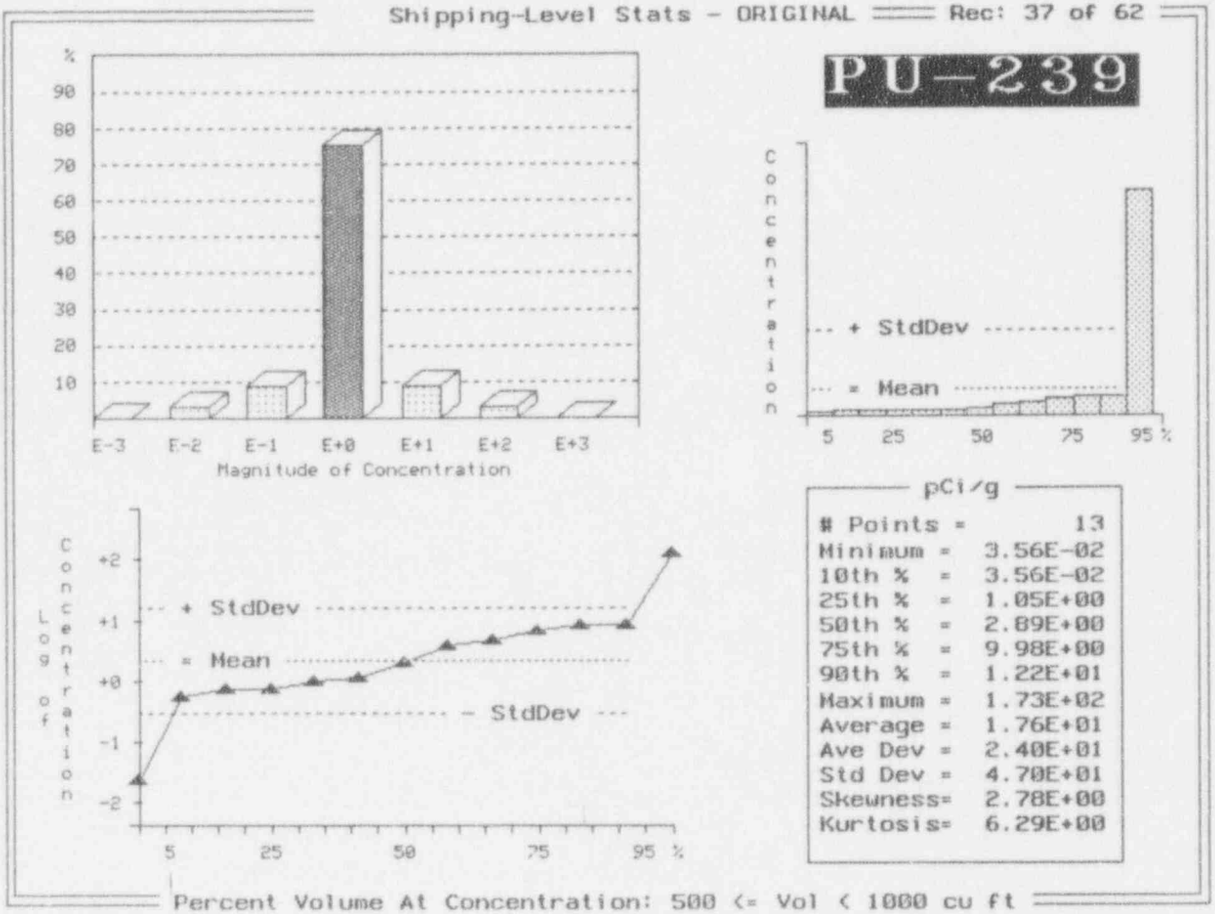
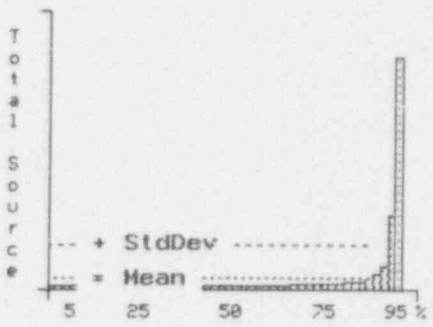


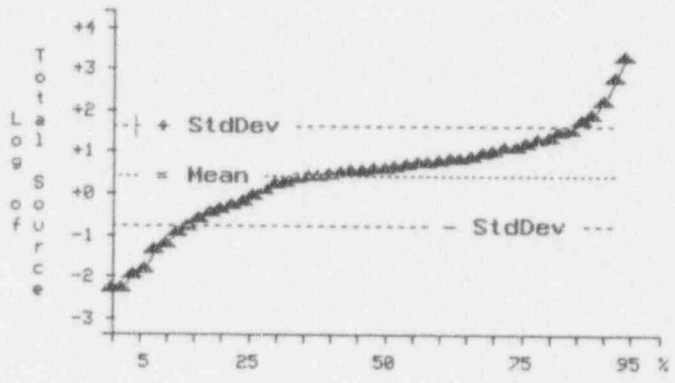
Exhibit H-2 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: Pennsylvania

Total source material [kg]: 1.76E+04





kg

# Points	=	373
1st %	=	1.00E-02
10th %	=	8.00E-02
25th %	=	1.05E+00
50th %	=	6.14E+00
75th %	=	1.75E+01
90th %	=	5.74E+01
99th %	=	9.10E+02
Average	=	4.72E+01
Ave Dev	=	6.85E+01
Std Dev	=	2.22E+02
Skewness	=	9.41E+00
Kurtosis	=	1.03E+02

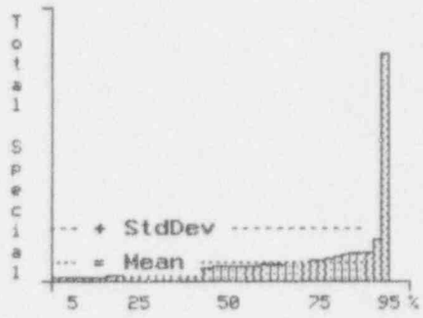
Total Source Material

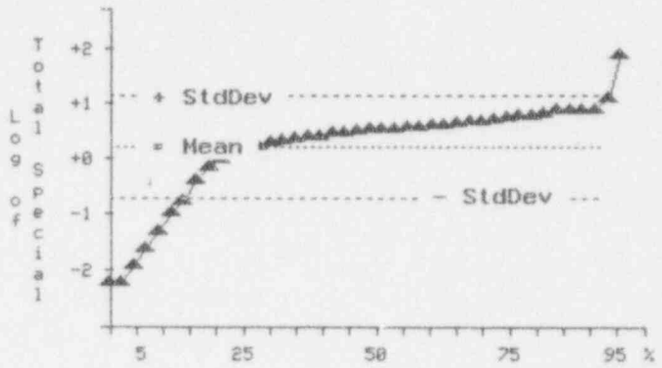
Exhibit H-2 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: Pennsylvania

Special material [g]: 9.39E+02





g

# Points =	162
1st % =	1.00E-02
10th % =	7.00E-02
25th % =	2.13E+00
50th % =	5.00E+00
75th % =	7.63E+00
90th % =	1.16E+01
99th % =	1.48E+01
Average =	5.80E+00
Ave Dev =	3.83E+00
Std Dev =	9.15E+00
Skewness=	9.31E+00
Kurtosis=	1.04E+02

Total Special Material

Exhibit H-3 Virginia Fuel Fabrication Facilities
Radionuclide Distributions - Shipment Level[a]

Waste Class: A-Unstable and A-Stable
Number of shipping records: 125
Number of shipping containers: no data
Total waste volume: 1,989 m^3
Total waste mass: 2,035,000 Kg
Average waste form density: 1.02 g/cm^3

Nuclide	Concentration Ranges - Ci/m^3 - 1st	50th	99th	Percentile[b] - pCi/g - 1st	50th	99th
Am-241	7.86E-05	8.66E-05	9.46E-05	7.68E+01	8.47E+01	9.25E+01
Cm-242*	6.42E-06	6.42E-06	6.42E-06	6.28E+00	6.28E+00	6.28E+00
Dep-U*#	6.40E-04	6.40E-04	6.40E-04	6.25E+02	6.25E+02	6.25E+02
Pu-238	2.43E-05	2.85E-05	3.26E-05	2.38E+01	2.78E+01	3.19E+01
Pu-239	2.16E-04	2.24E-04	2.32E-04	2.11E+02	2.19E+02	2.27E+02
Pu-240	8.59E-05	1.28E-04	1.69E-04	8.40E+01	1.25E+02	1.66E+02
Pu-241	3.92E-05	6.10E-04	1.13E-02	3.84E+01	5.96E+02	1.11E+04
Pu-242	2.66E-06	3.13E-06	3.59E-06	2.60E+00	3.06E+00	3.51E+00
Th-232	3.98E-08	1.76E-03	6.87E-03	3.89E-02	1.72E+03	6.71E+03
TRU#	5.04E-06	1.57E-04	1.67E-03	4.93E+00	1.53E+02	1.64E+03
U-234	2.43E-06	2.44E-03	8.84E-03	2.37E+00	2.39E+03	8.64E+03
U-235	3.81E-07	6.89E-05	4.16E-04	3.72E-01	6.73E+01	4.07E+02
U-236	0.00E+00	1.70E-06	2.47E-04	0.00E+00	1.66E+00	2.42E+02
U-237	5.89E-07	5.28E-05	1.05E-04	5.75E-01	5.16E+01	1.03E+02
U-238	4.40E-07	1.71E-06	7.74E-04	4.30E-01	1.67E+00	7.57E+02

(a) Based on direct shipment data to all three disposal sites from 1986 to 1990.
(b) The concentration of nuclides tagged with an asterisk are based on a single value. In such instances, the percentile distribution does not apply. Nuclides identified with the pound symbol (#) signify depleted uranium, and transuranics (TRU), respectively.

Exhibit H-3 (Continued)

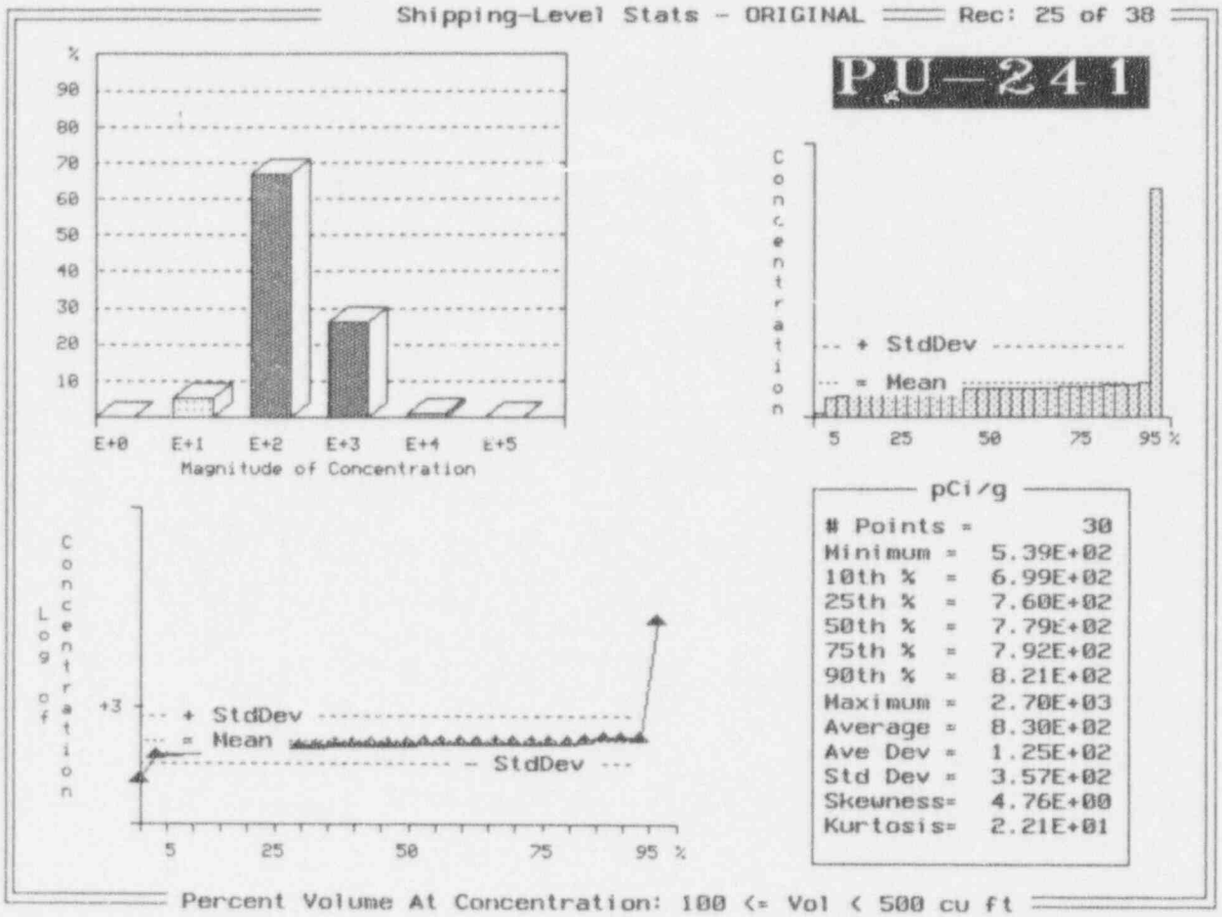


Exhibit H-3 (Continued)

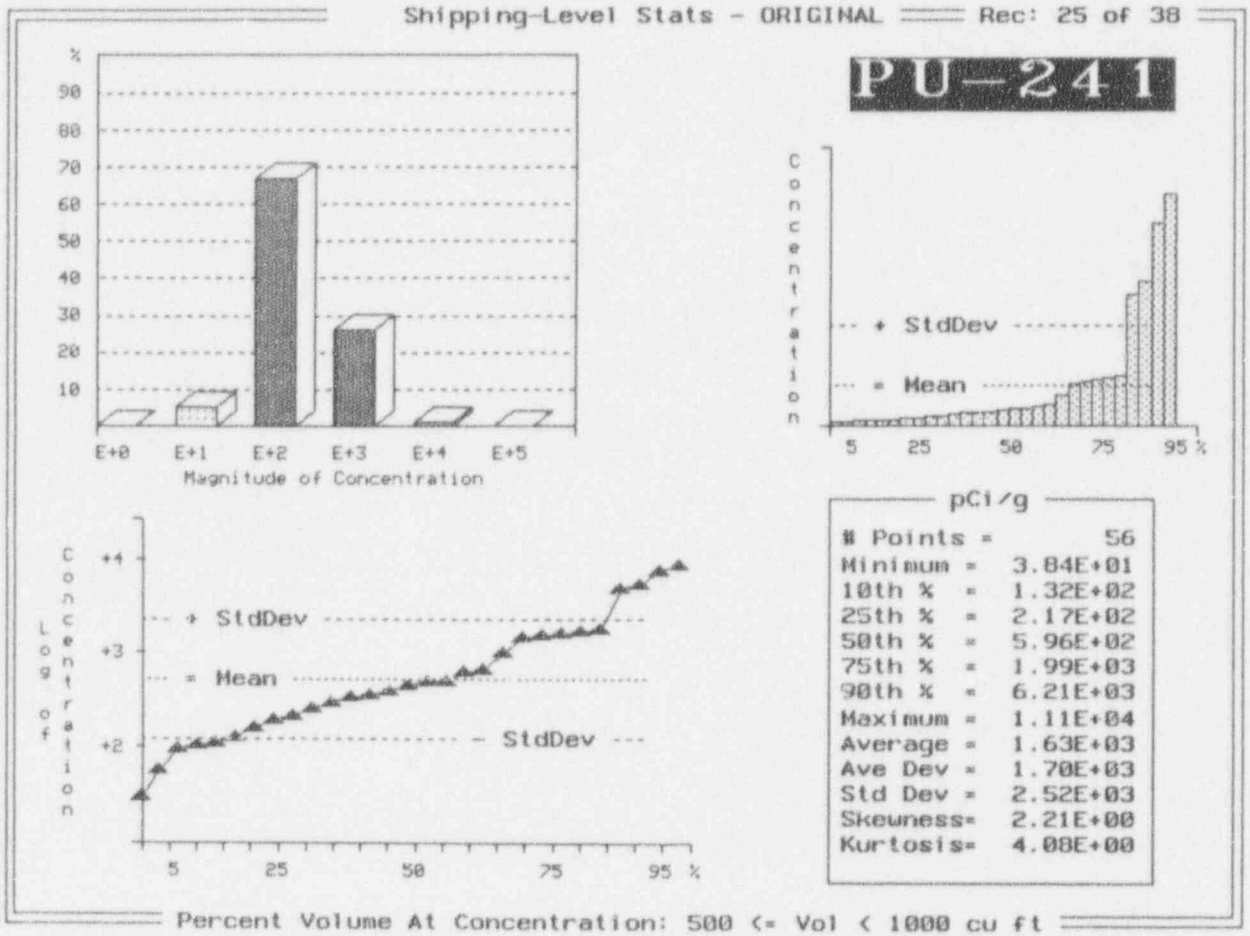


Exhibit H-3 (Continued)

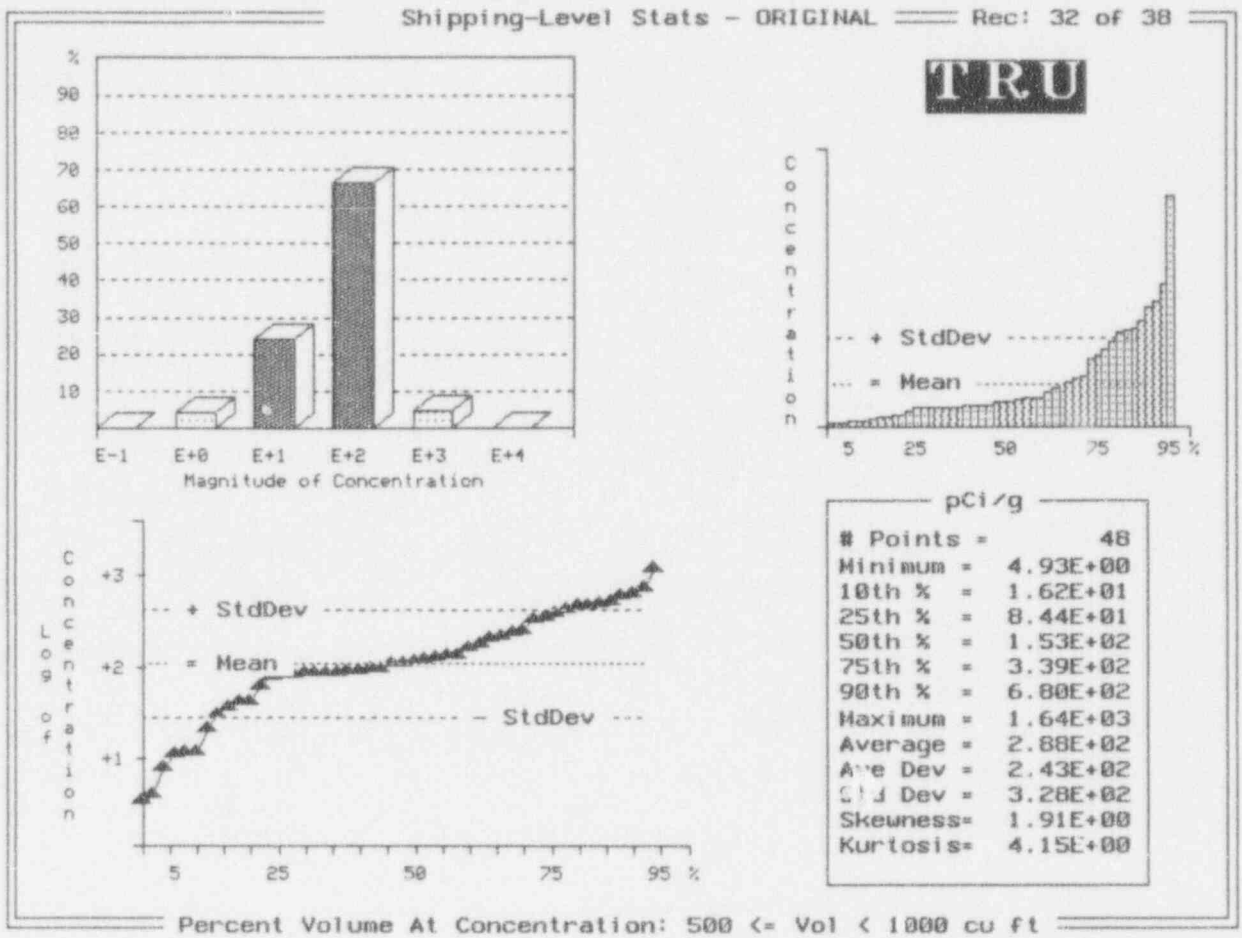


Exhibit H-3 (Continued)

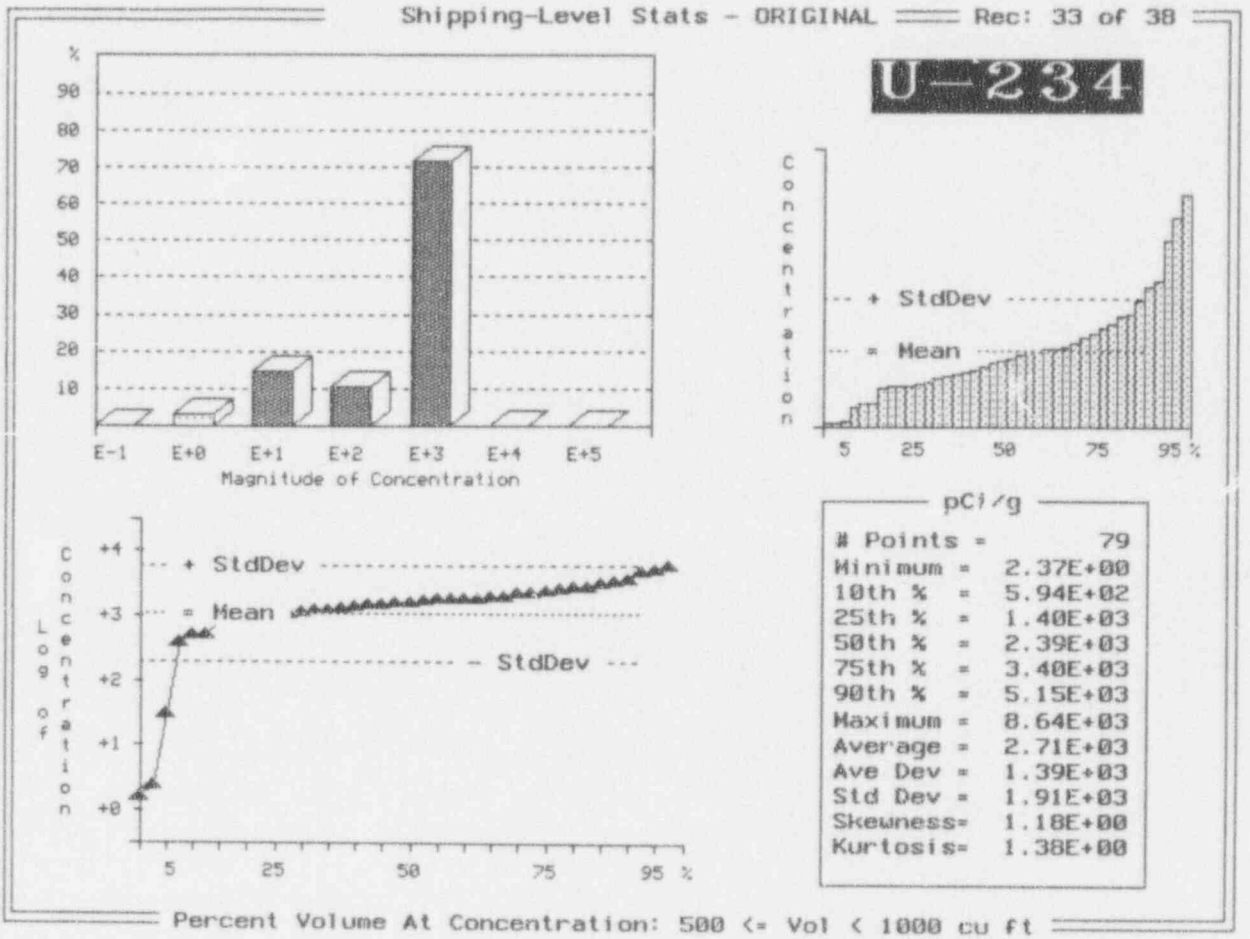


Exhibit H-3 (Continued)

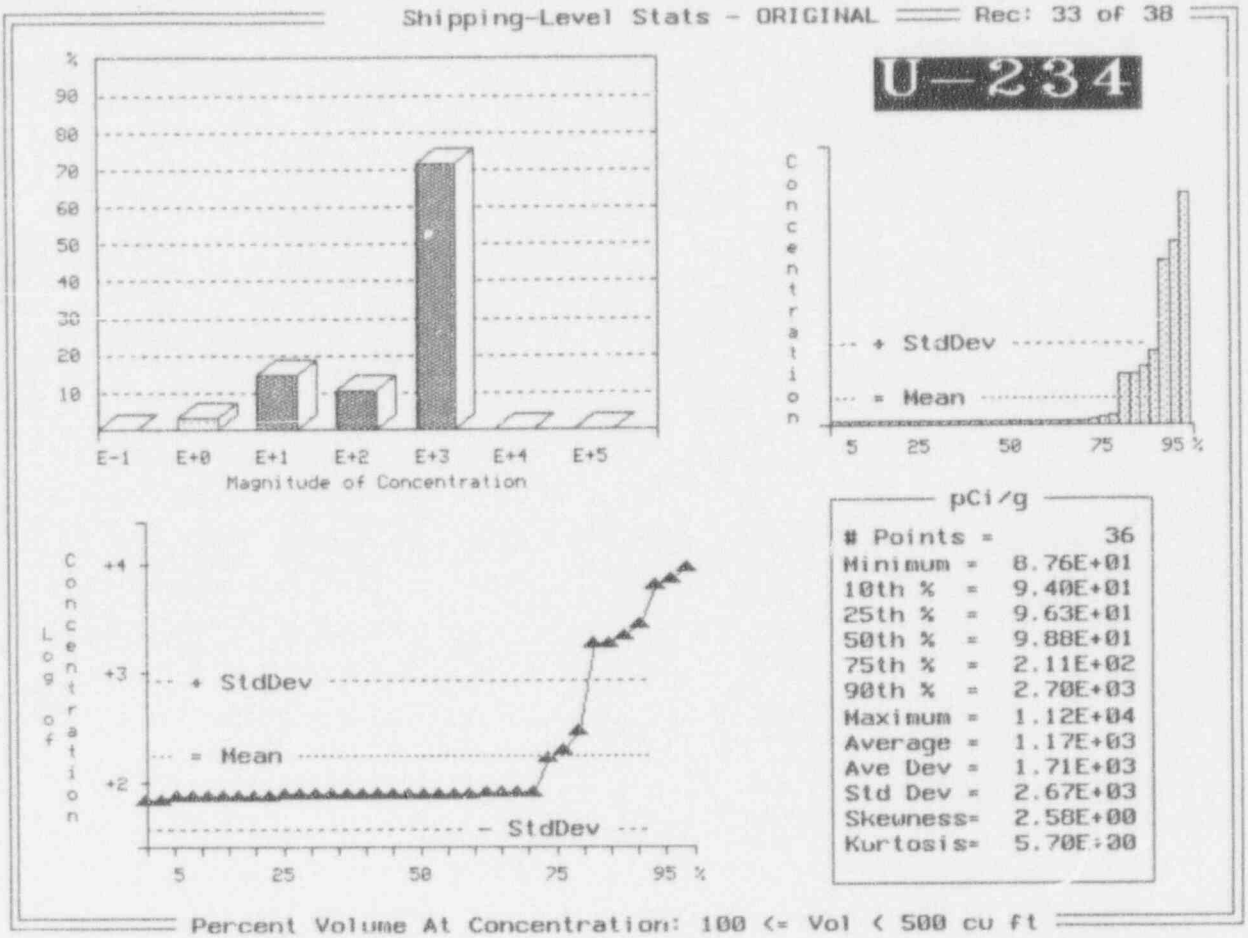


Exhibit H-3 (Continued)

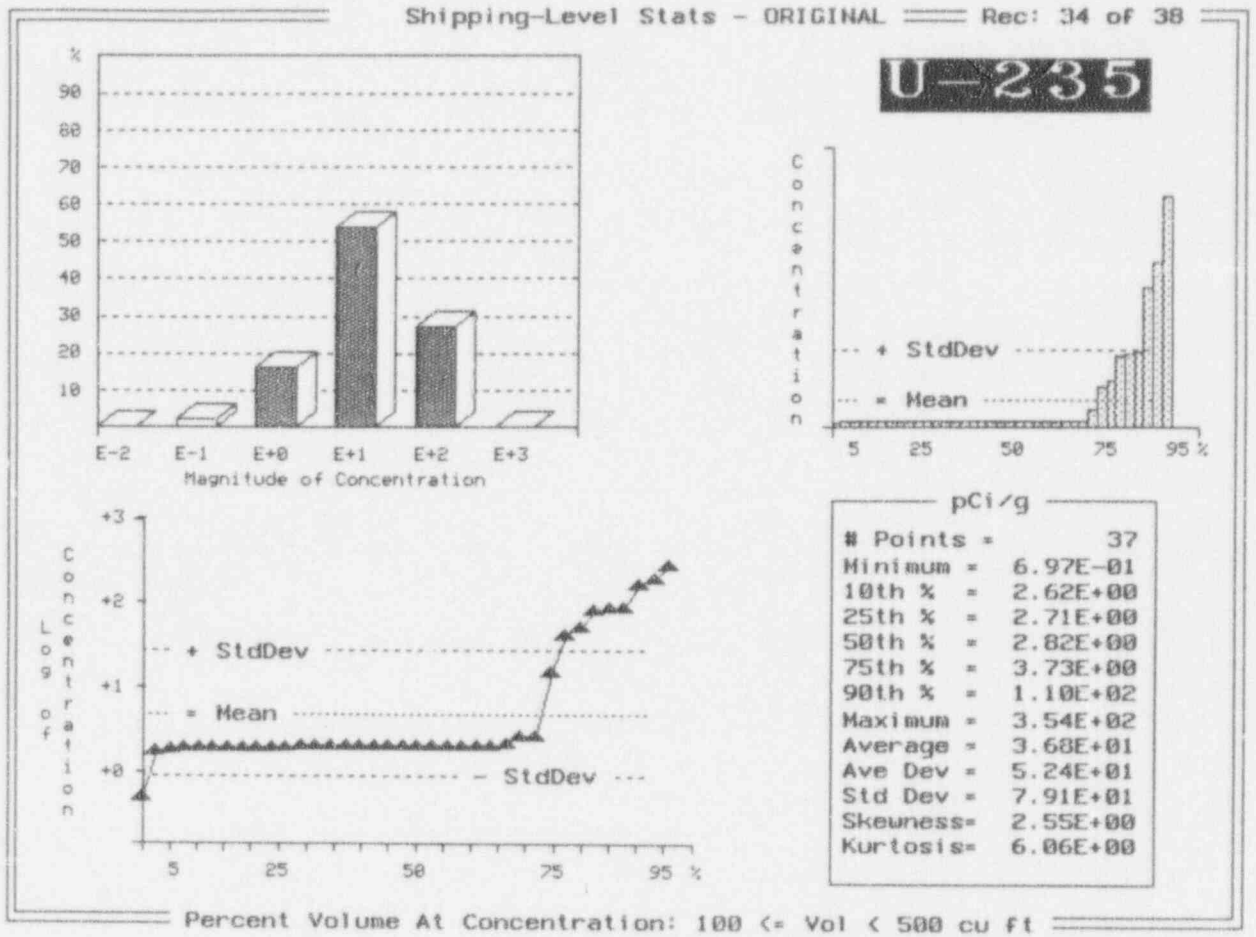


Exhibit H-3 (Continued)

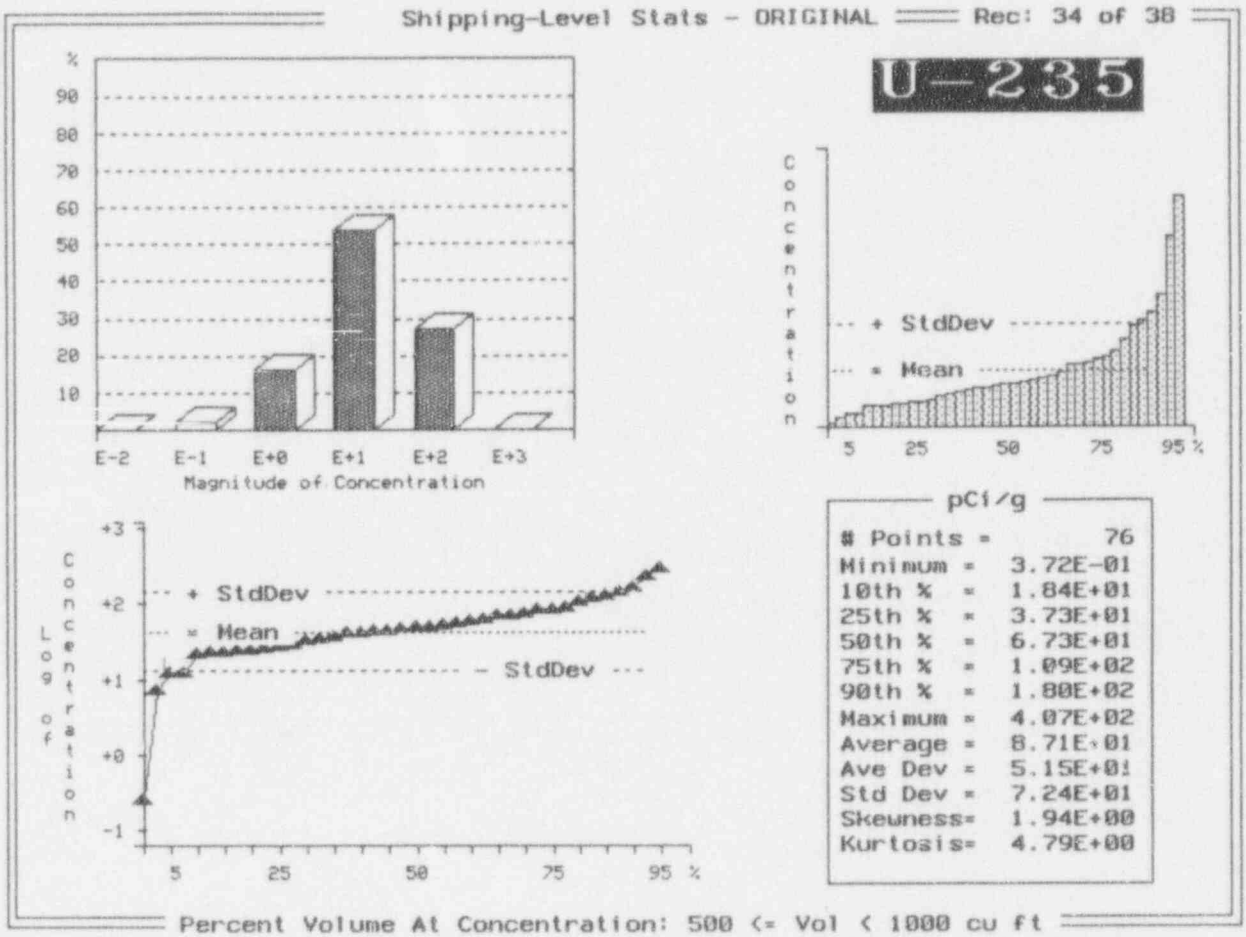


Exhibit H-3 (Continued)

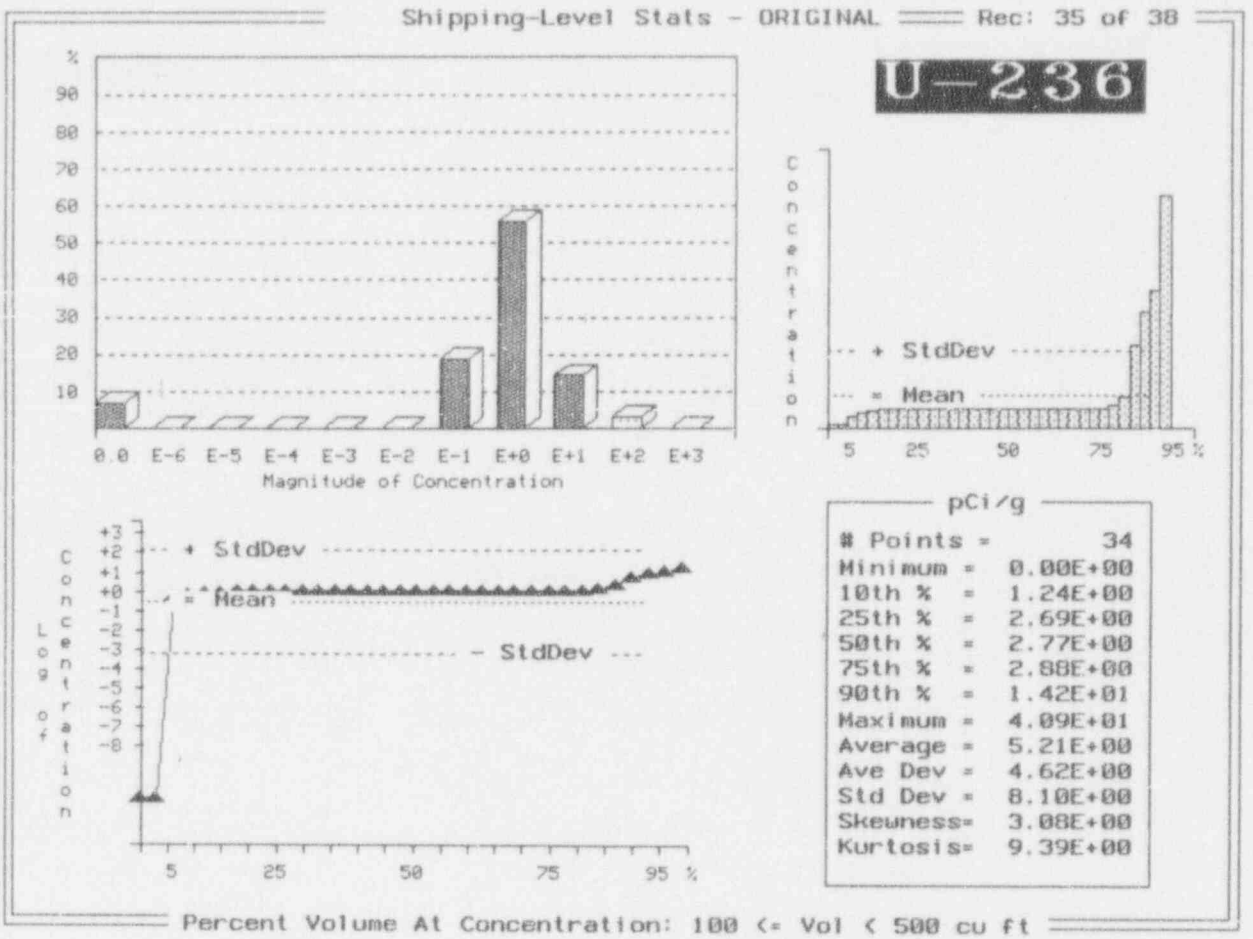


Exhibit H-3 (Continued)

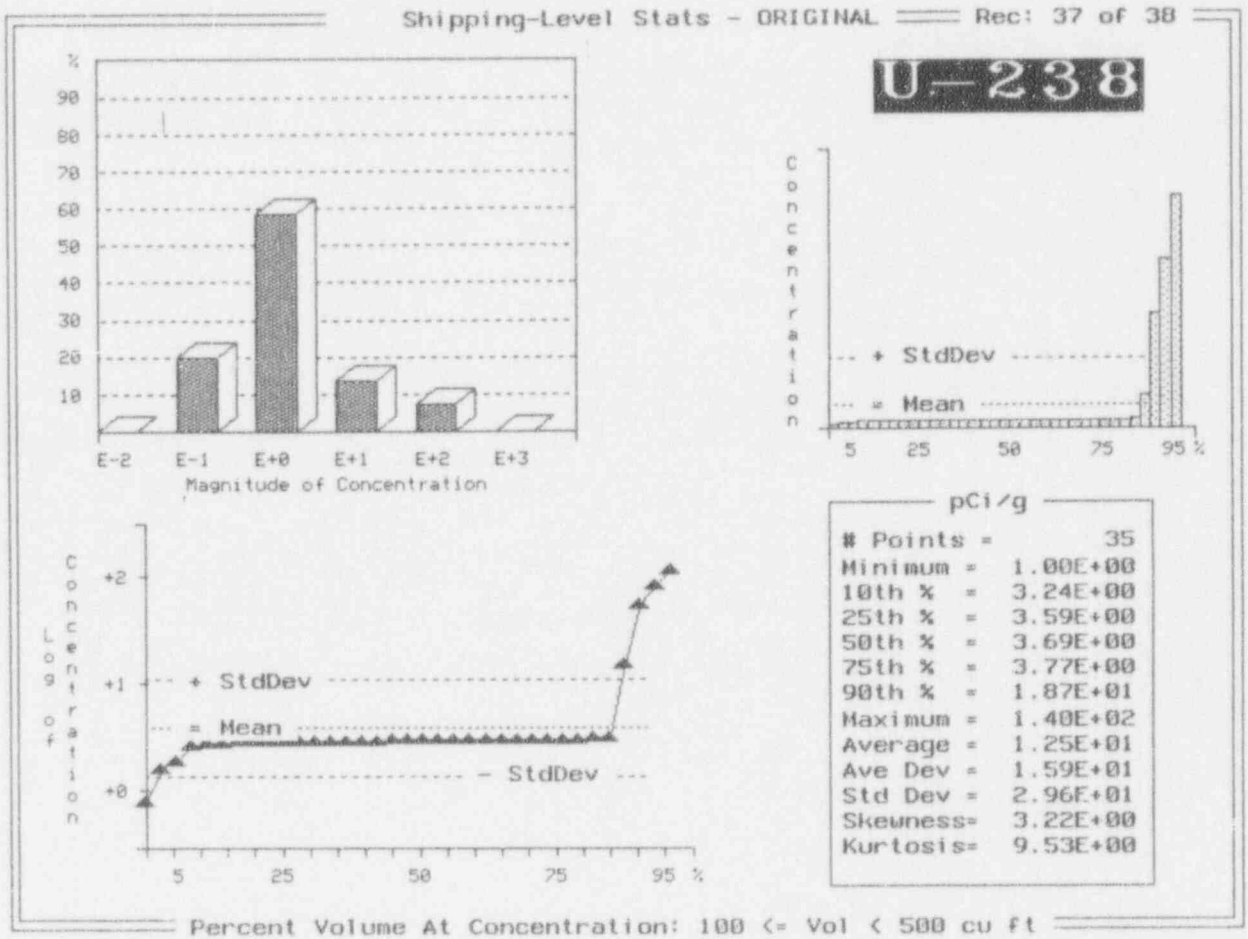


Exhibit H-3 (Continued)

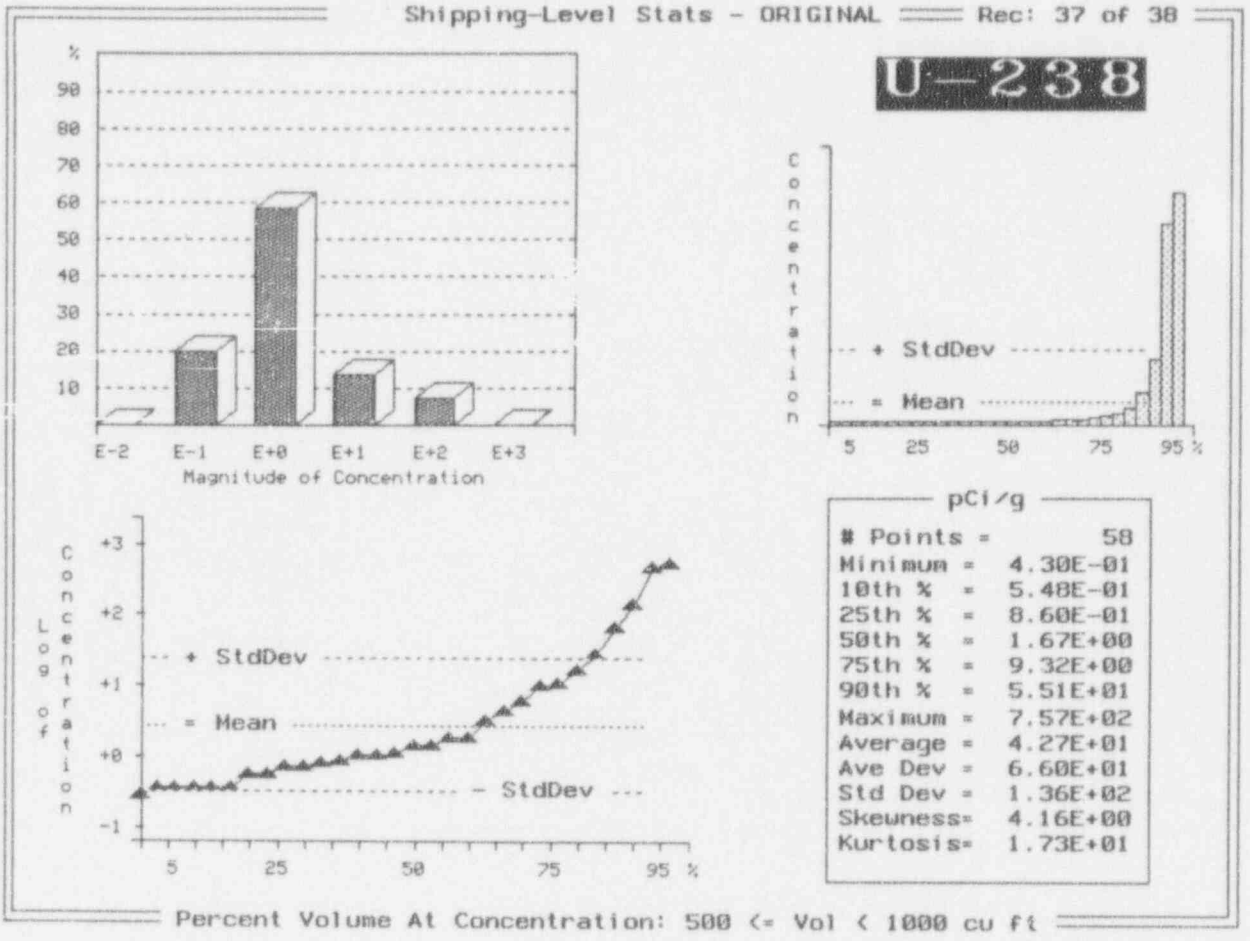


Exhibit H-3 (Continued)

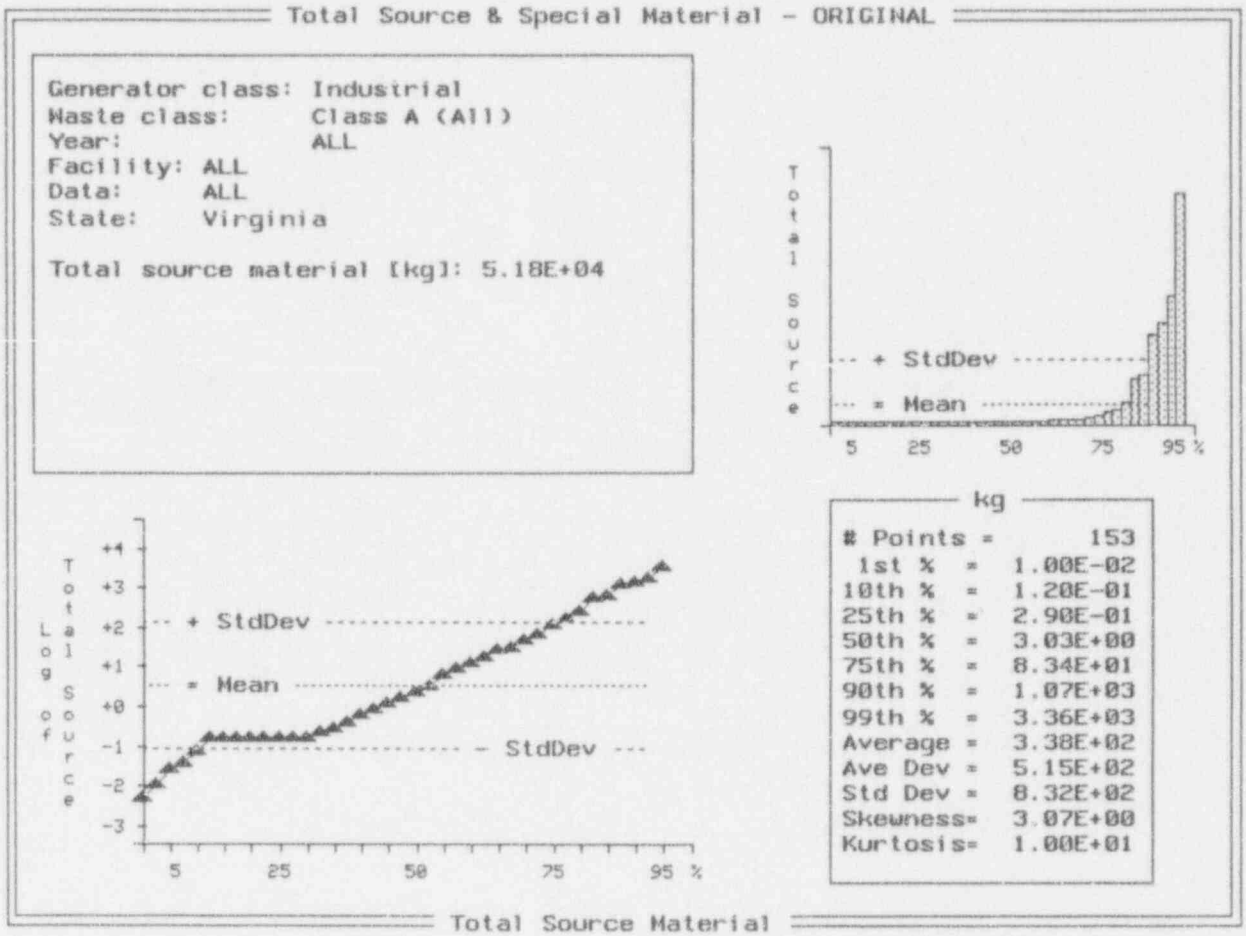
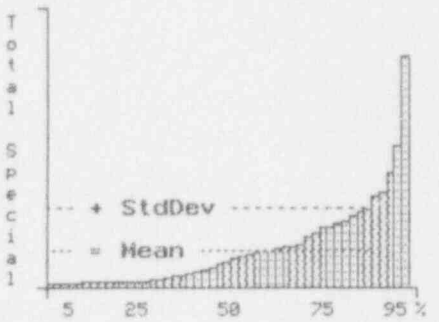


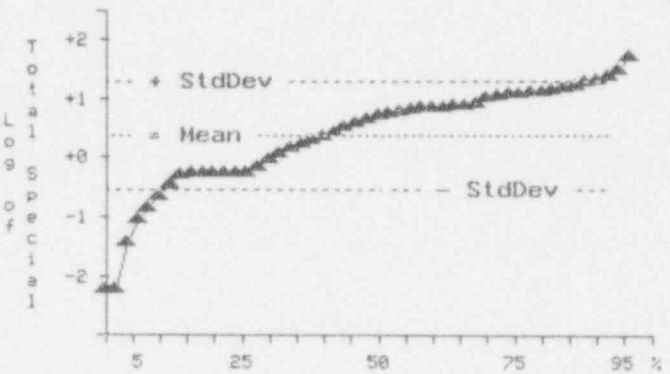
Exhibit H-3 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: Virginia

Special material [g]: 2.41E+03





g

# Points =	240
1st % =	1.00E-02
10th % =	3.20E-01
25th % =	8.40E-01
50th % =	6.66E+00
75th % =	1.57E+01
90th % =	2.31E+01
99th % =	6.65E+01
Average =	1.00E+01
Ave Dev =	8.66E+00
Std Dev =	1.21E+01
Skewness=	2.24E+00
Kurtosis=	7.05E+00

Total Special Material

Exhibit H-4 North Carolina Fuel Fabrication Facilities
Radionuclide Distributions - Shipment Level (a)

Waste Class: A-Unstable and A-Stable
Number of shipping records: 64
Number of shipping containers: no data
Total waste volume: 1,445 m^3
Total waste mass: 1,478,000 Kg
Average waste form density: 1.02 g/cm^3

Nuclide	Concentration Ranges - Ci/m^3 - 1st	50th	99th	Percentile - pCi/g - 1st	50th	99th
Th-232	5.19E-04	5.19E-04	2.08E-03	5.08E+02	5.08E+02	2.03E+03
U-234	4.91E-04	1.51E-03	5.49E-03	4.80E+02	1.48E+03	5.37E+03
U-235	6.40E-04	6.40E-04	6.40E-04	3.11E+01	9.61E+01	3.61E+02
U-236	6.88E-06	2.18E-05	7.92E-05	6.73E+00	2.13E+01	7.74E+01
U-238	1.46E-04	5.44E-04	2.85E-03	1.43E+02	5.32E+02	2.78E+03

(a) Based on direct shipment data to all three disposal sites from 1986 to 1990.

Exhibit H-4 (Continued)

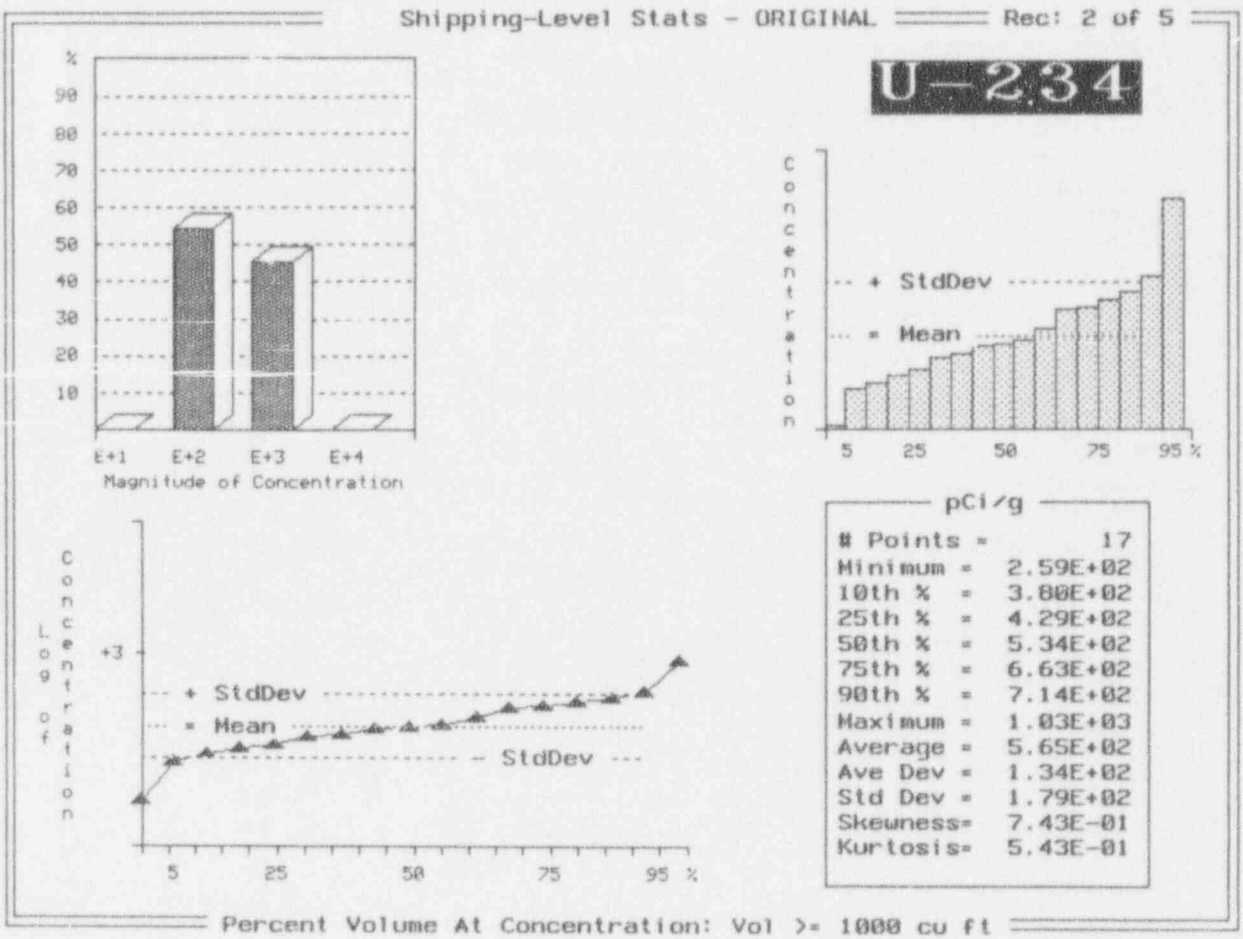


Exhibit H-4 (Continued)

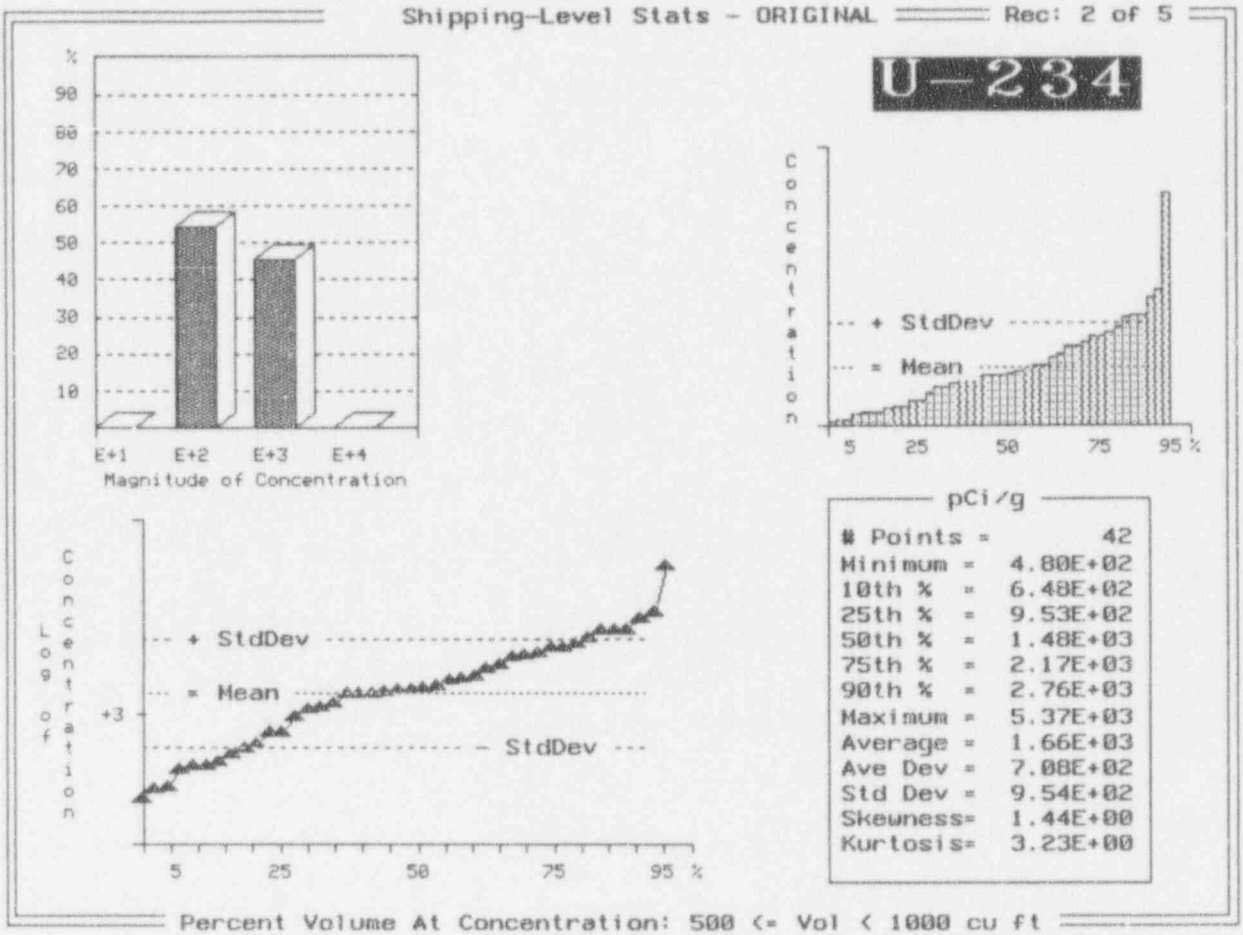


Exhibit H-4 (Continued)

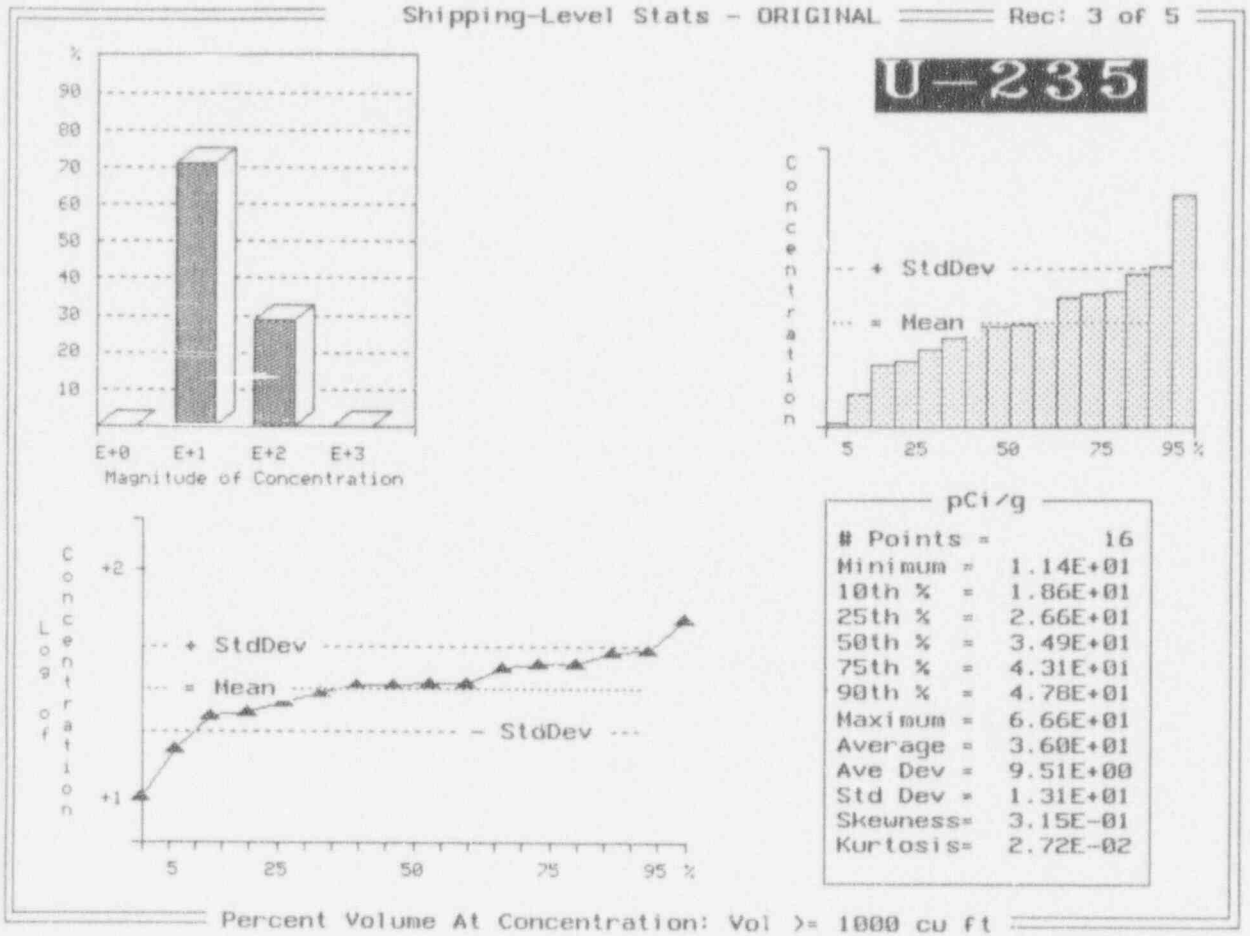


Exhibit H-4 (Continued)

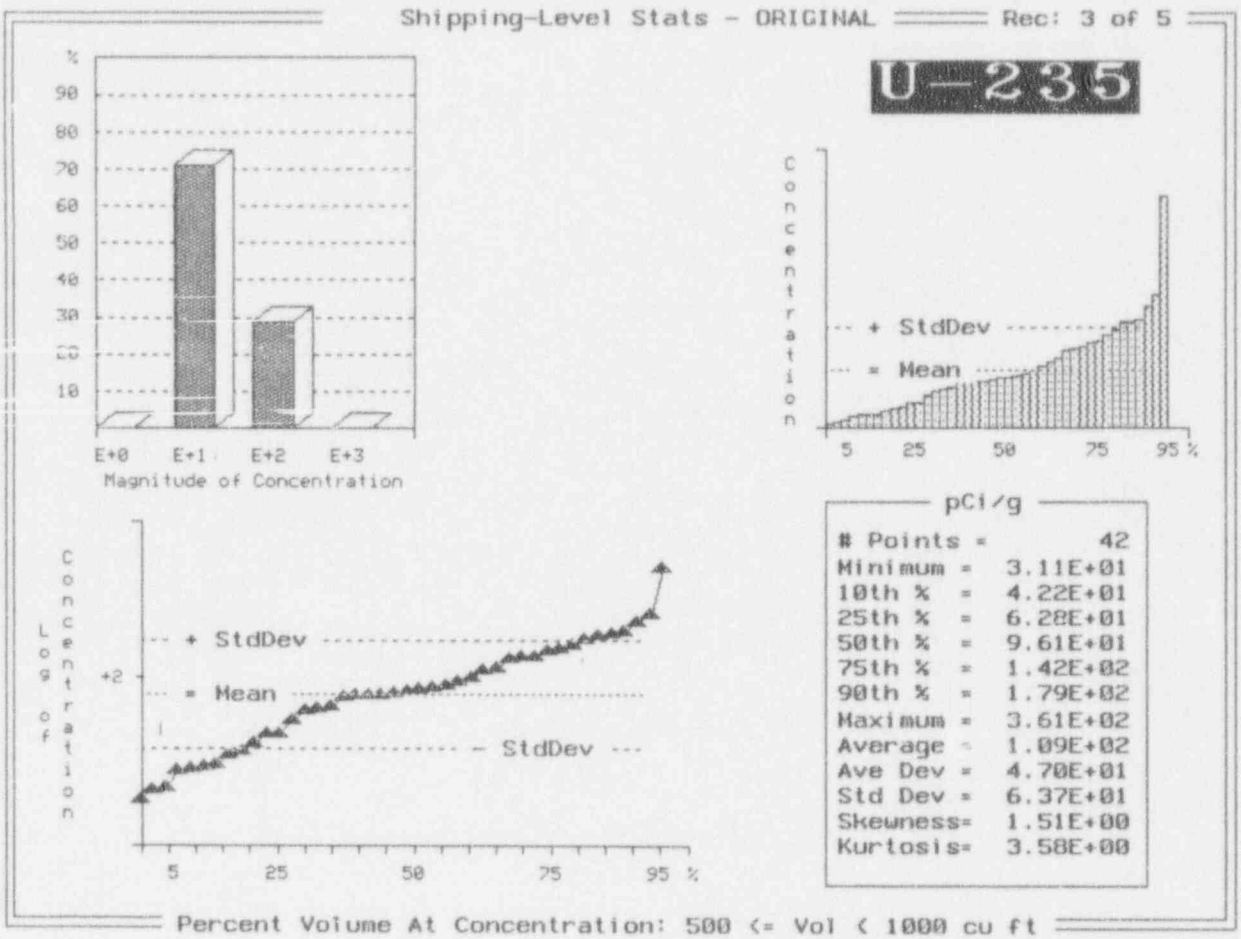


Exhibit H-4 (Continued)

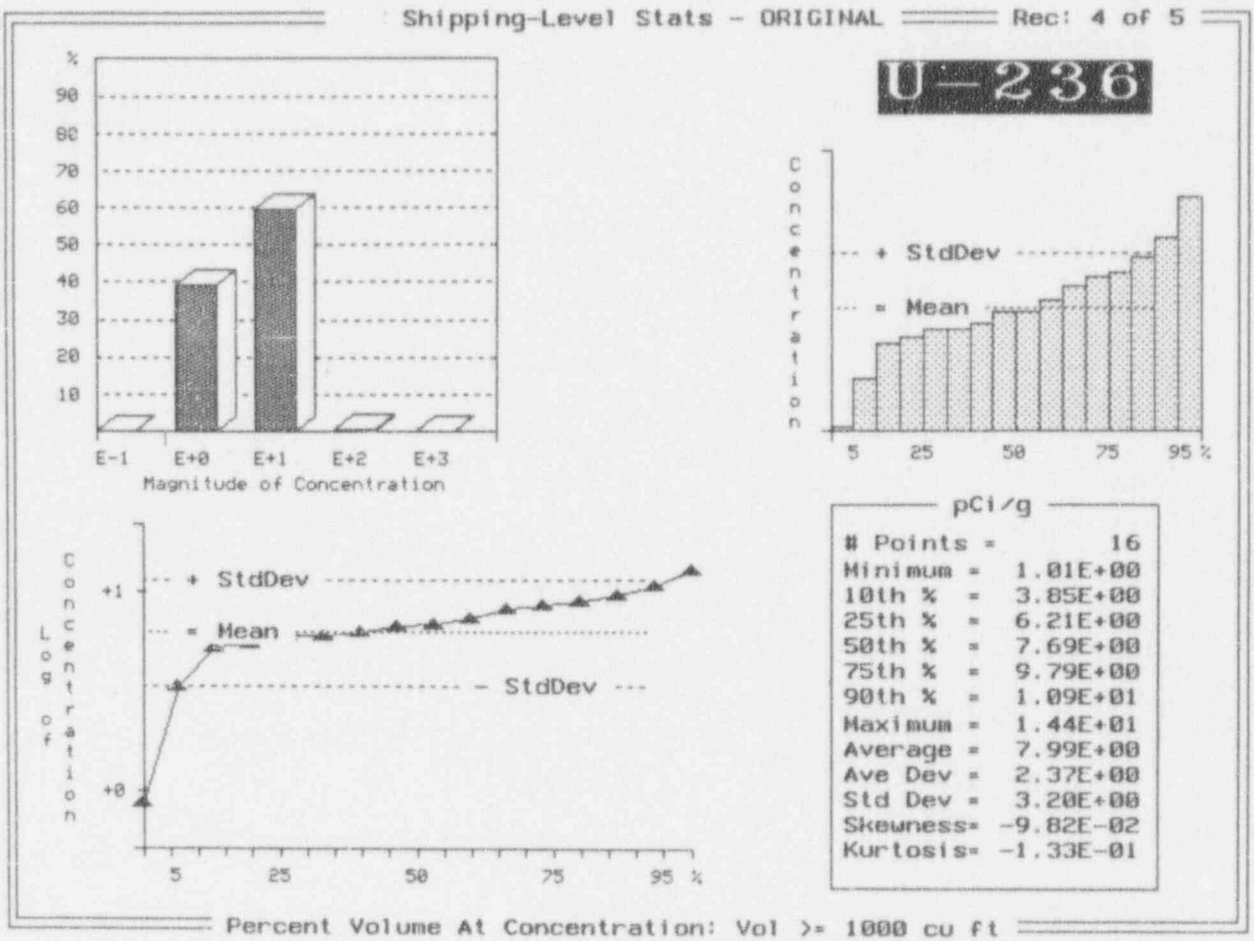


Exhibit H-4 (Continued)

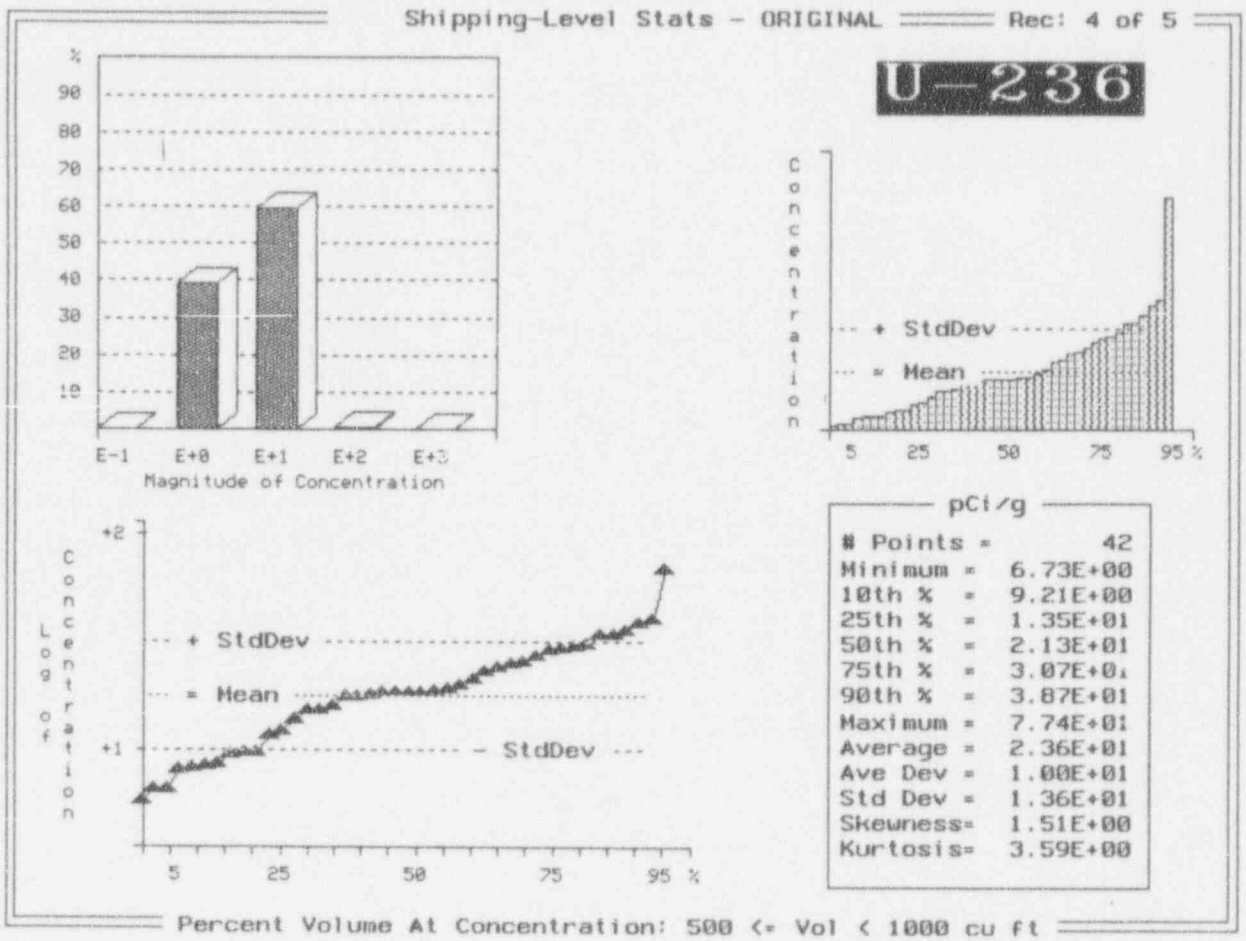


Exhibit H-4 (Continued)

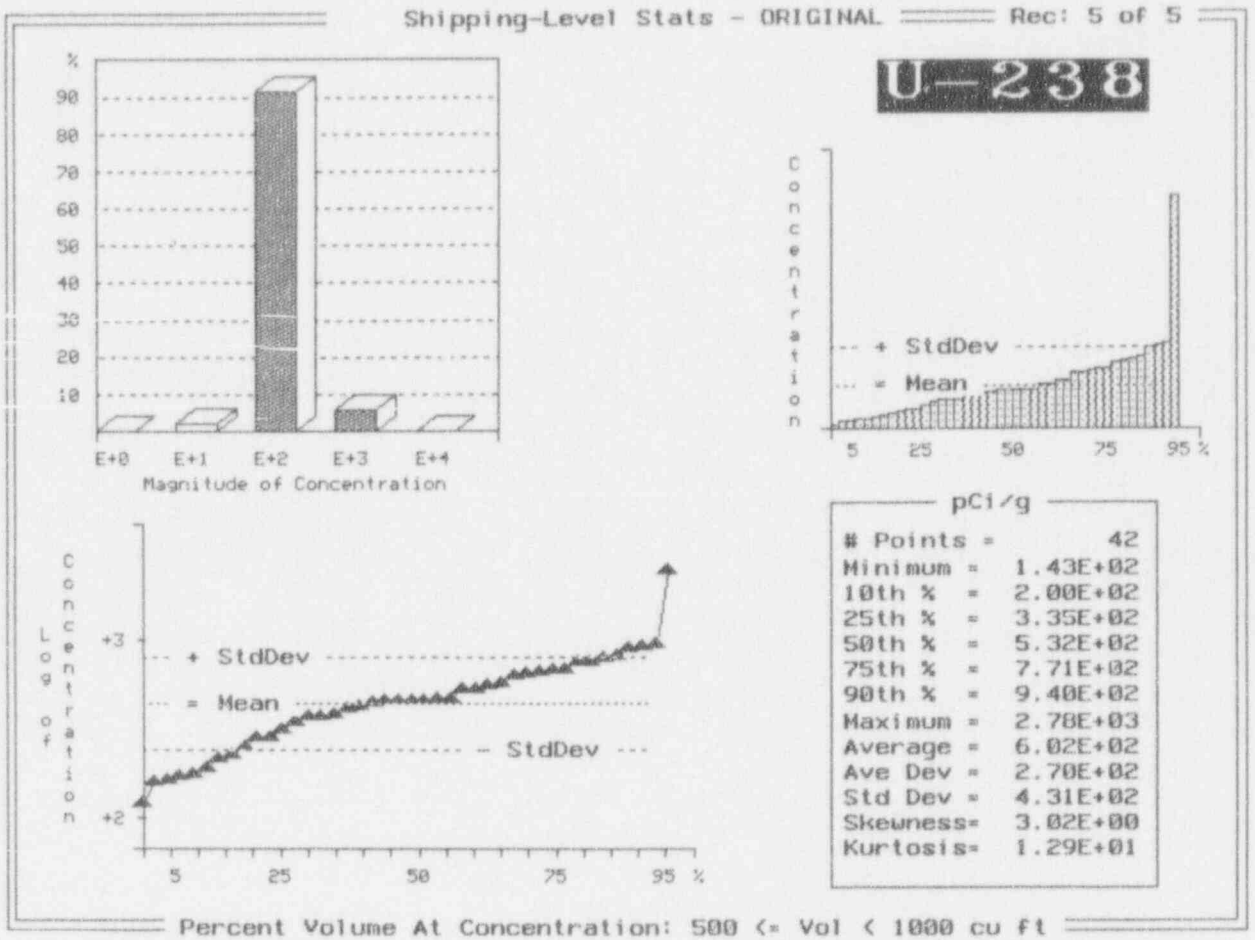


Exhibit H-4 (Continued)

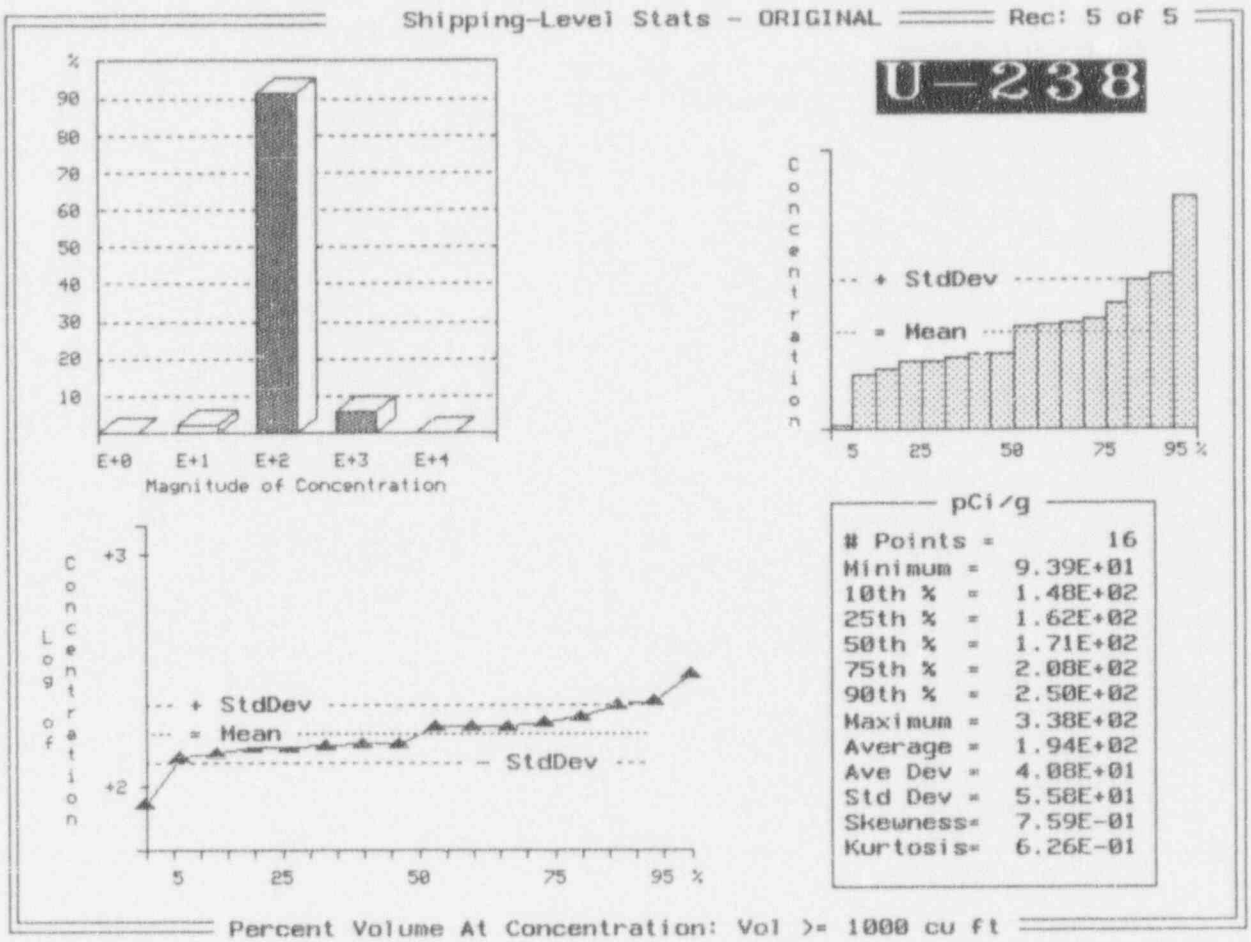
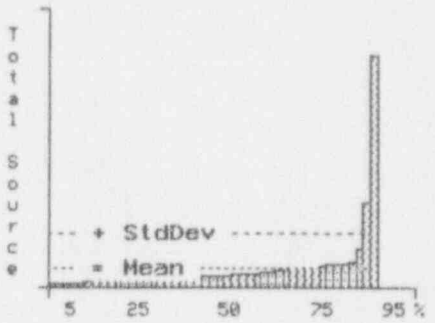


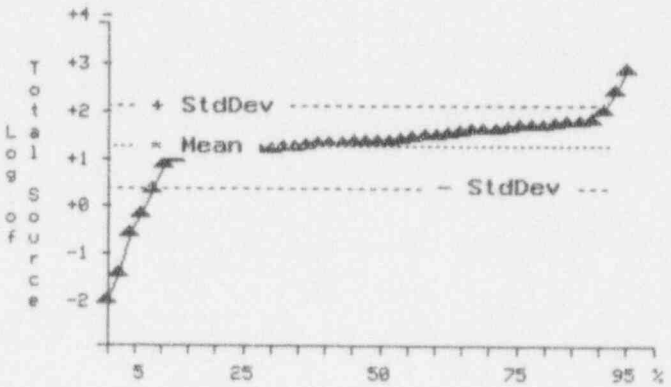
Exhibit H-4 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: North Carolina

Total source material [kg]: 6.17E+03





kg

# Points =	89
Minimum =	2.00E-02
10th % =	4.17E+00
25th % =	2.42E+01
50th % =	3.80E+01
75th % =	7.10E+01
90th % =	9.59E+01
Maximum =	1.15E+03
Average =	6.93E+01
Ave Dev =	5.58E+01
Std Dev =	1.38E+02
Skewness=	6.07E+00
Kurtosis=	4.16E+01

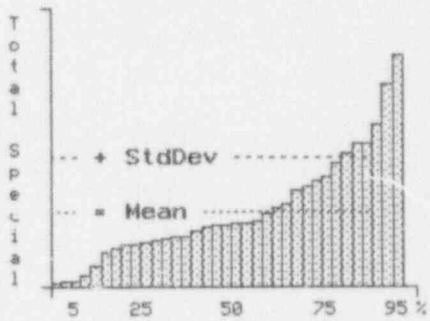
Total Source Material

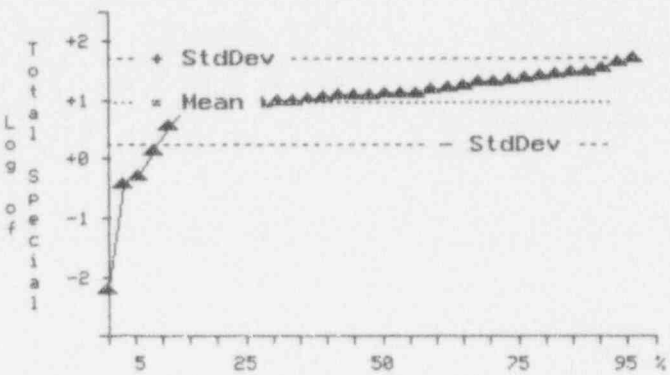
Exhibit H-4 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: North Carolina

Special material [g]: 1.52E+03





g

# Points =	68
Minimum =	1.00E-02
10th % =	2.11E+00
25th % =	1.23E+01
50th % =	1.84E+01
75th % =	3.08E+01
90th % =	4.41E+01
Maximum =	7.24E+01
Average =	2.23E+01
Ave Dev =	1.23E+01
Std Dev =	1.58E+01
Skewness=	9.38E-01
Kurtosis=	5.83E-01

Total Special Material

Exhibit H-5 South Carolina Fuel Fabrication Facilities
Radionuclide Distributions - Shipment Level (a)

Waste Class: A-Unstable and A-Stable
Number of shipping records: 432
Number of shipping containers: no data
Total waste volume: 4,952 m^3
Total waste mass: 5,066,000 Kg
Average waste form density: 1.02 g/cm^3

Nuclide	Concentration Ranges - Percentile - Ci/m^3 - 1st	50th	99th	- pCi/g - 1st	50th	99th
Th-232	5.19E-04	5.19E-04	1.04E-03	5.08E+02	5.08E+02	1.02E+03
U-234	7.36E-07	1.47E-06	1.28E-03	7.19E-01	1.44E+00	1.25E+03
U-235	5.42E-05	1.62E-04	3.17E-03	5.30E+01	1.58E+02	3.10E+03
U-236	7.36E-07	1.43E-06	2.70E-05	7.19E-01	1.39E+00	2.64E+01
U-238	3.14E-04	4.52E-02	8.58E-02	3.07E+02	4.42E+04	8.39E+04

(a) Based on direct shipment data to all three disposal sites from 1986 to 1990.

Exhibit H-5 (Continued)

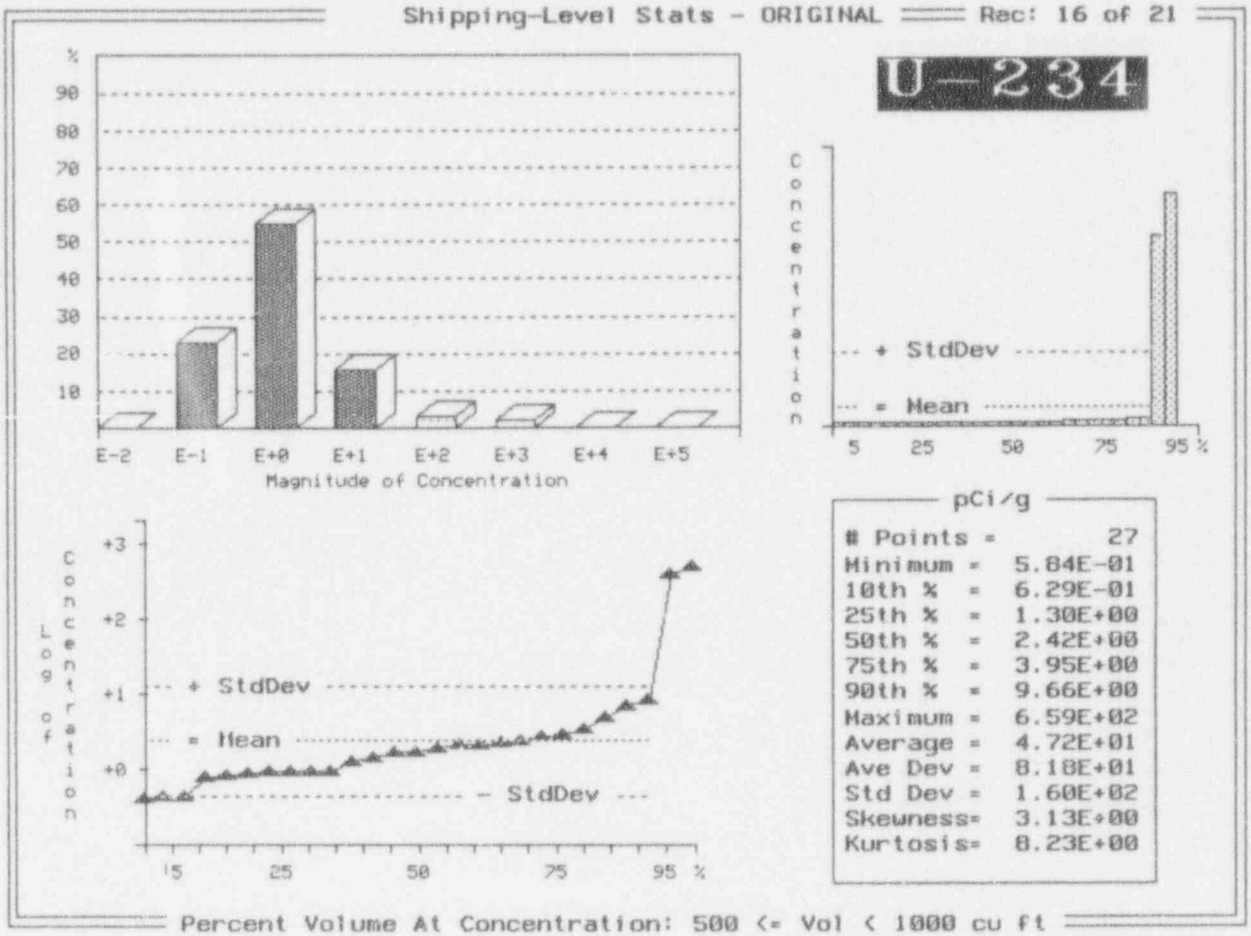


Exhibit H-5 (Continued)

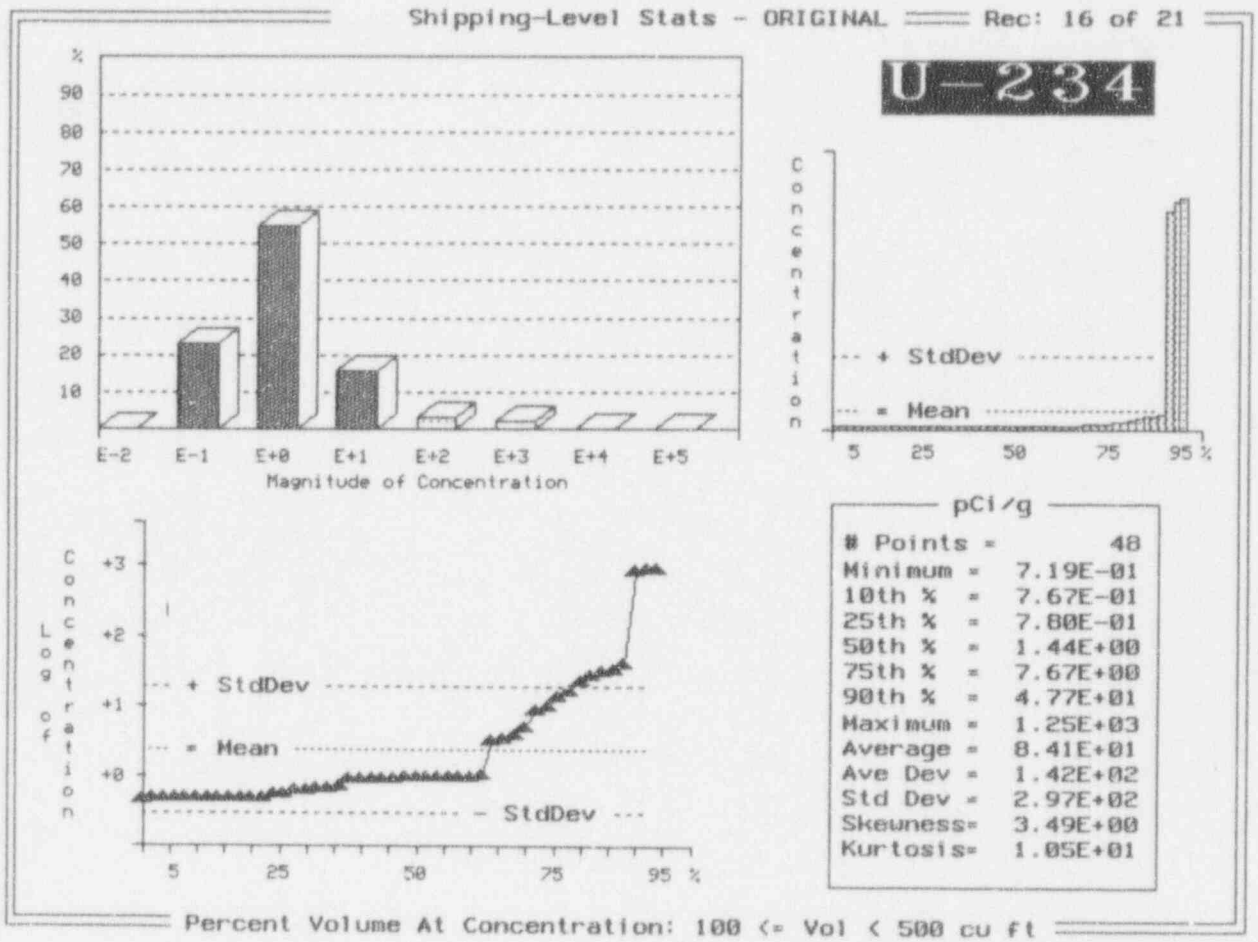


Exhibit H-5 (Continued)

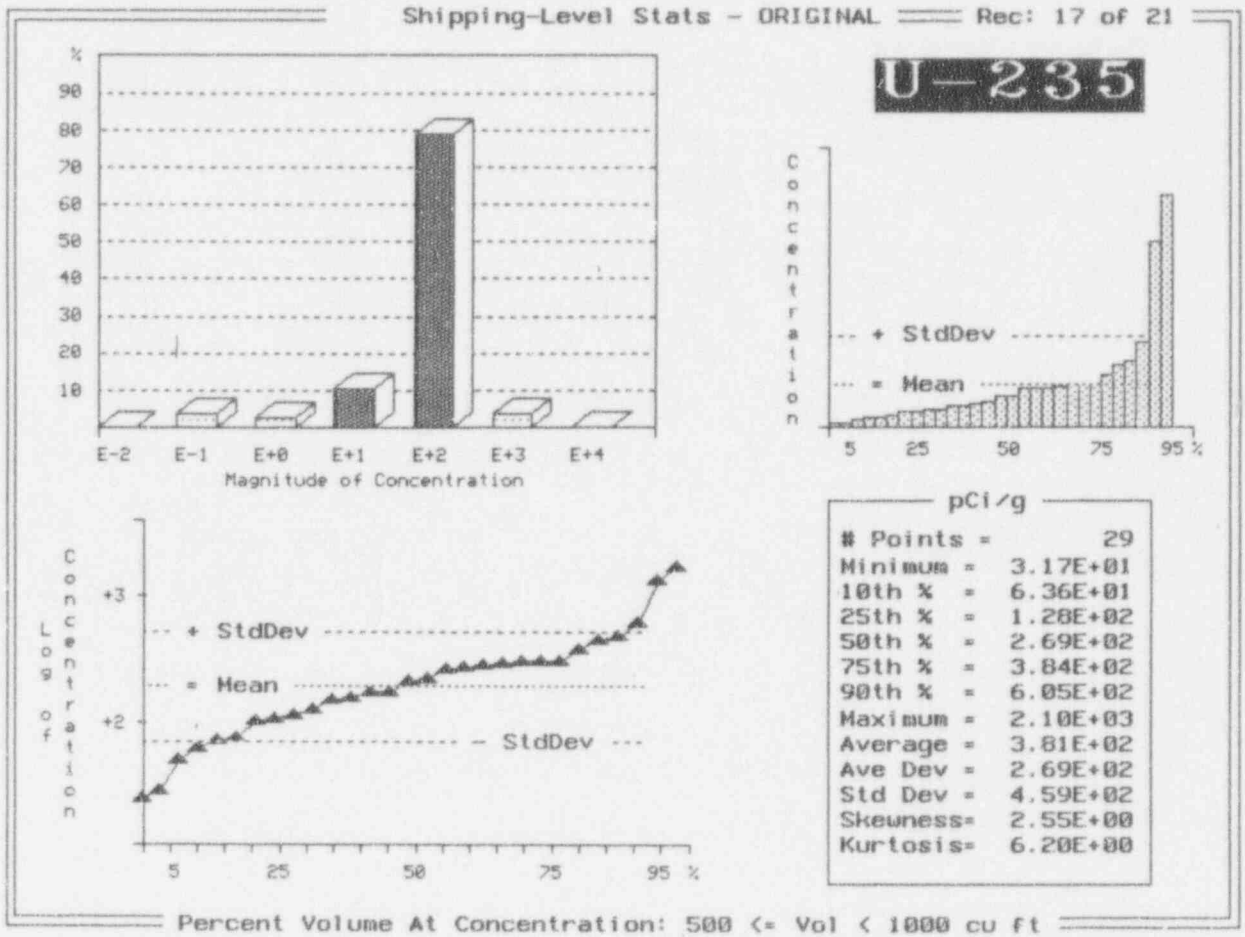


Exhibit H-5 (Continued)

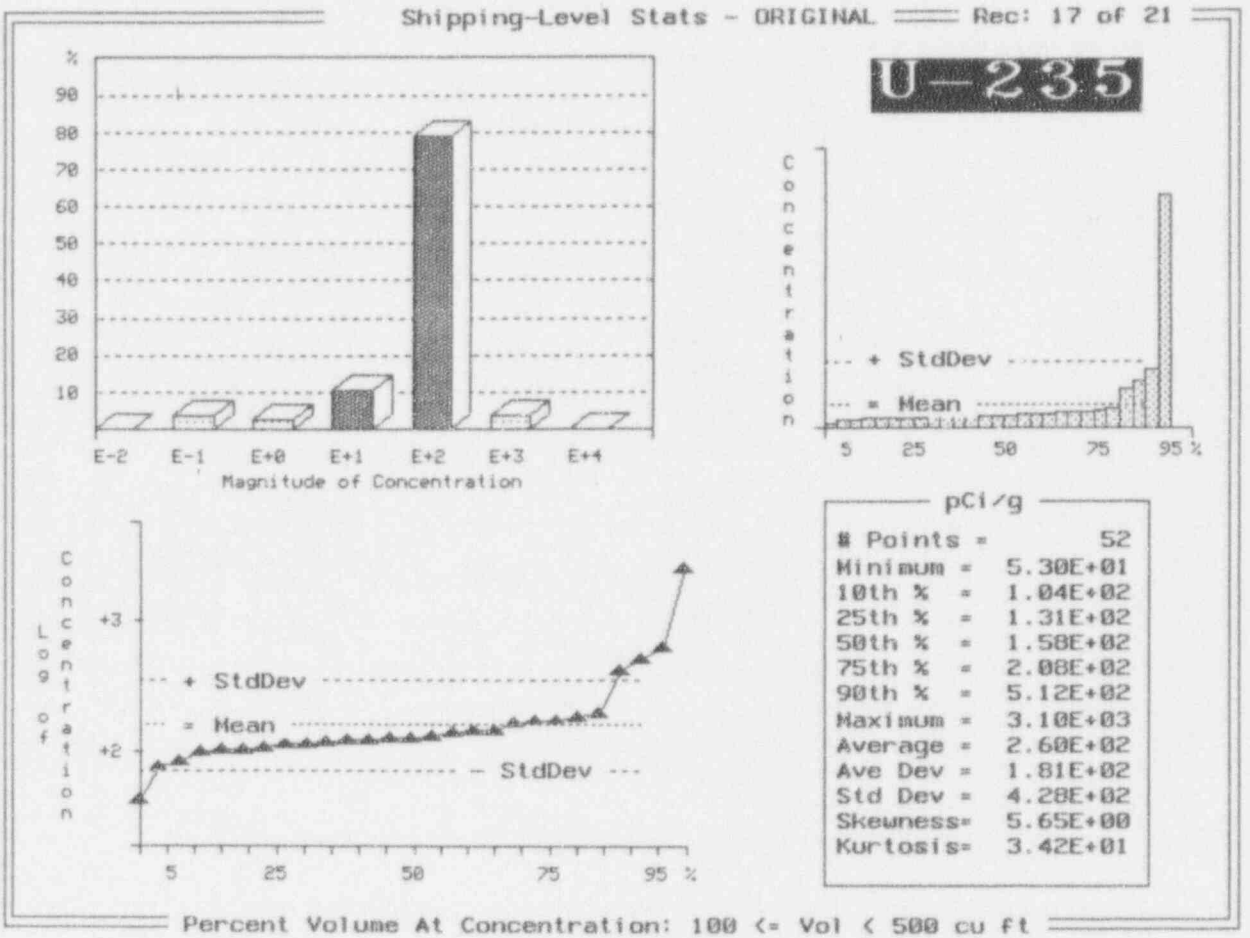


Exhibit H-5 (Continued)

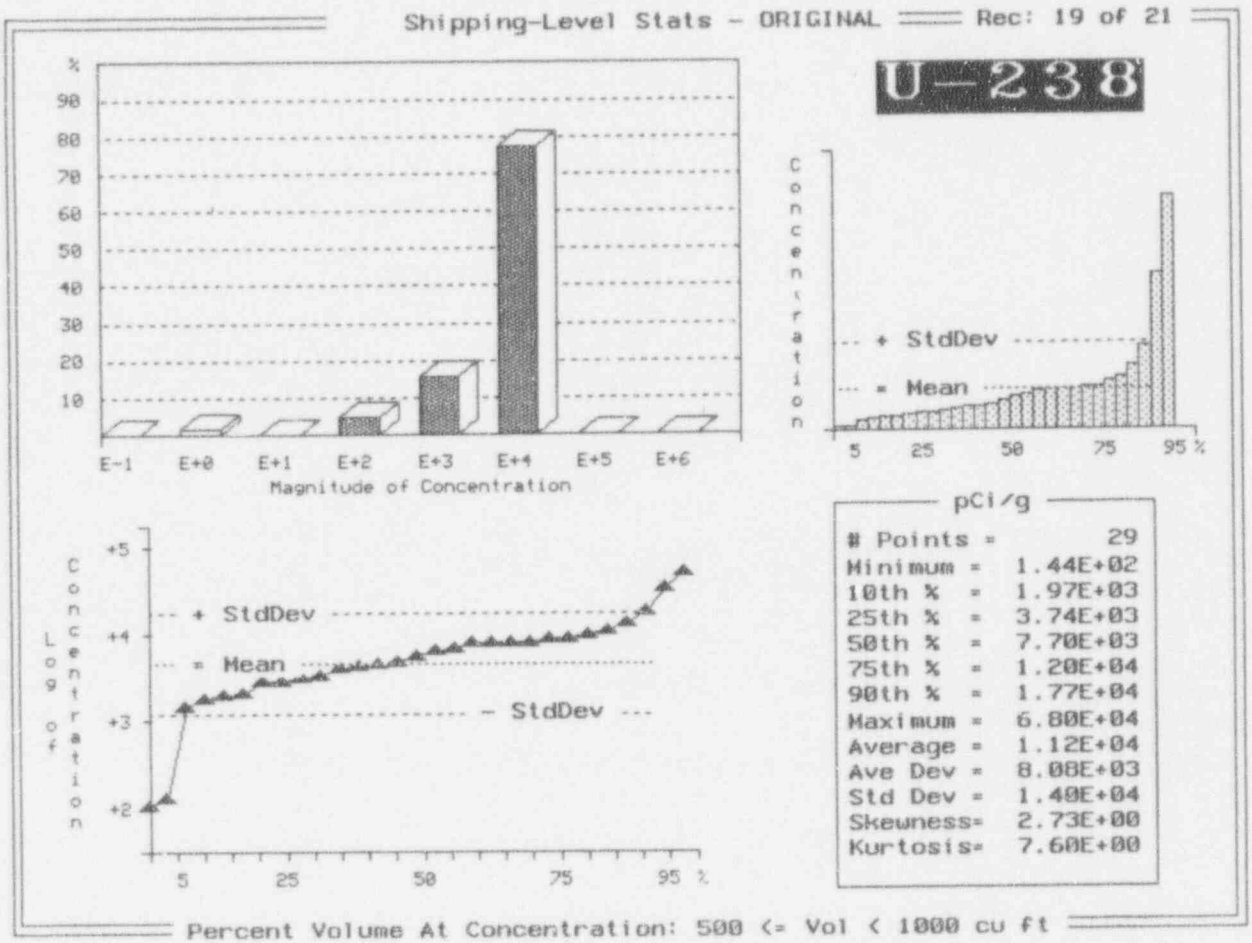


Exhibit H-5 (Continued)

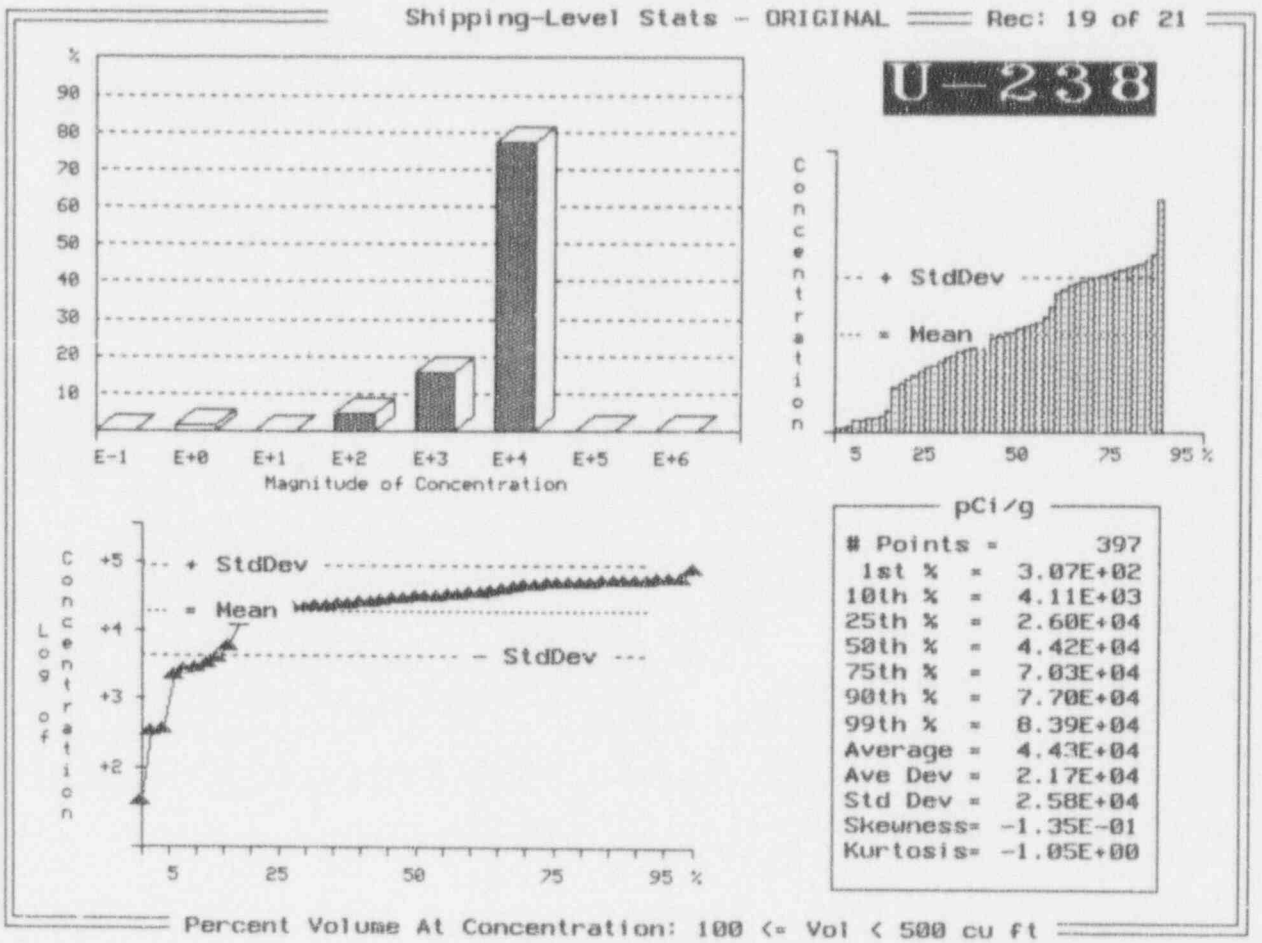


Exhibit H-5 (Continued)

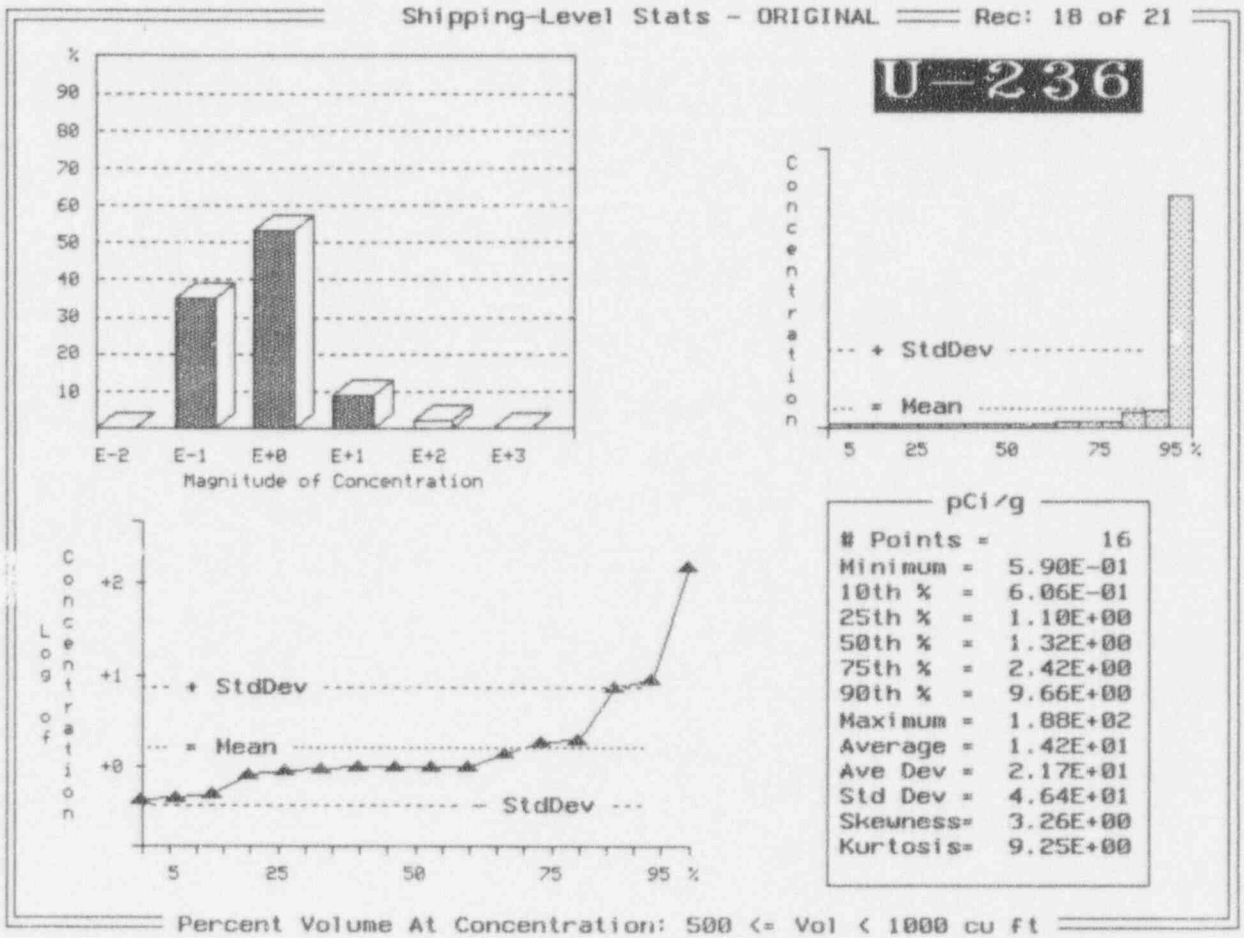


Exhibit H-5 (Continued)

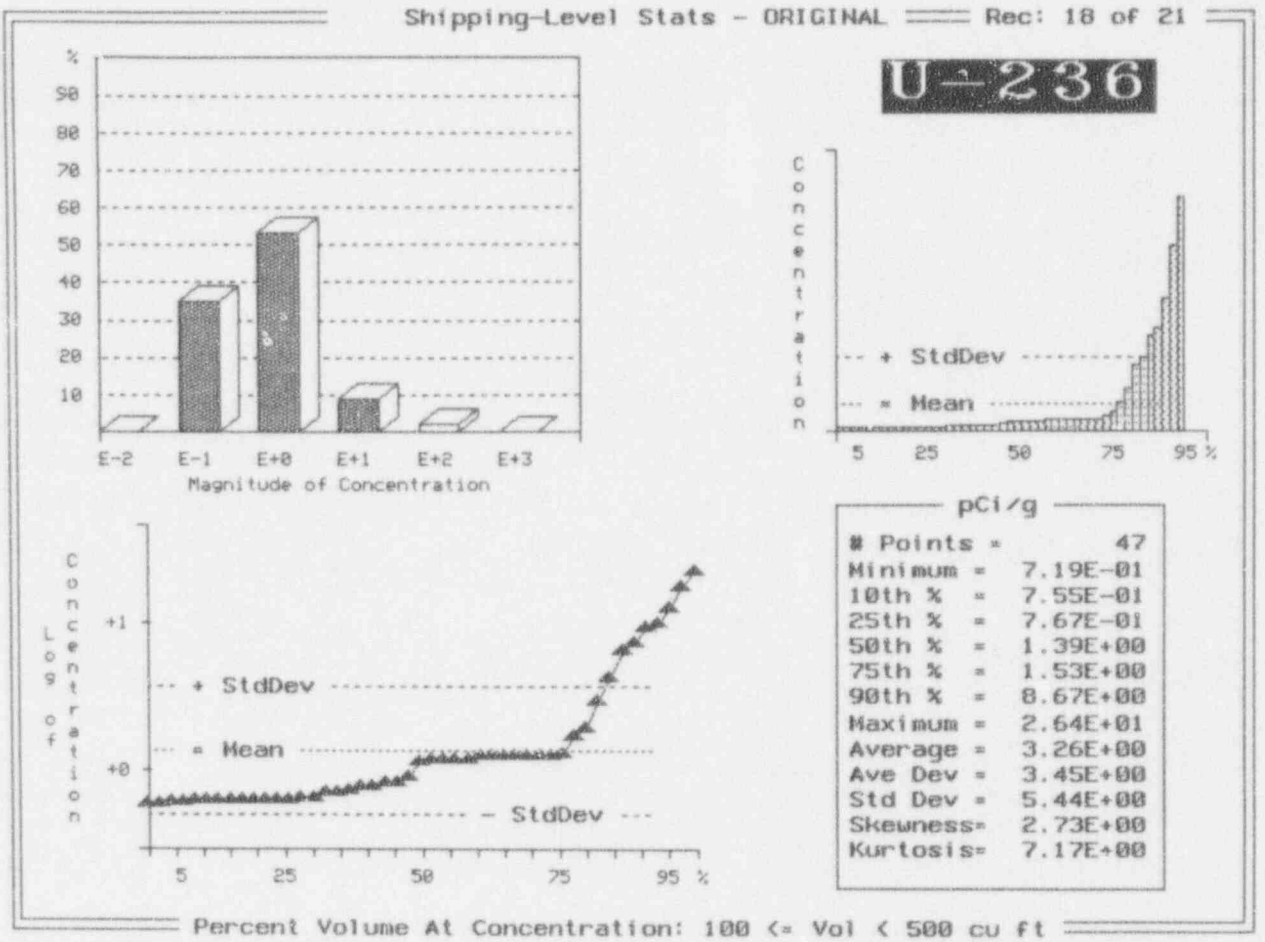
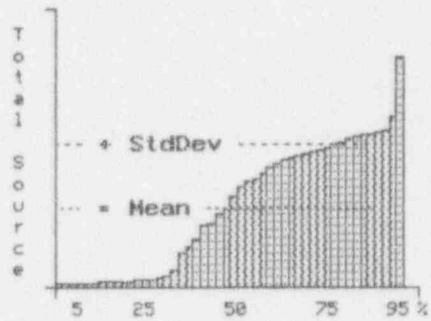


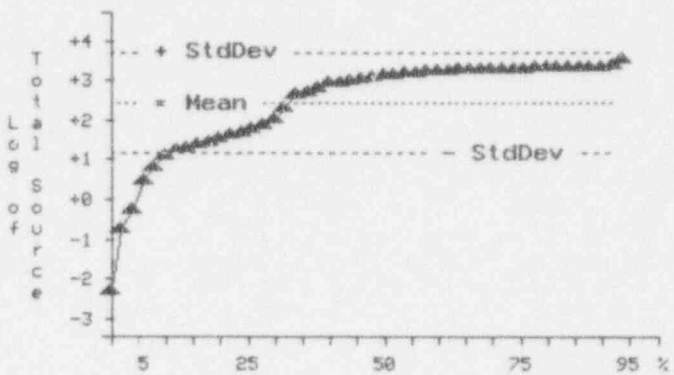
Exhibit H-5 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: South Carolina

Total source material [kg]: 1.36E+06





kg

# Points =	650
1st % =	9.00E-02
10th % =	2.13E+01
25th % =	8.80E+01
50th % =	2.21E+03
75th % =	3.75E+03
90th % =	4.25E+03
99th % =	4.61E+03
Average =	2.10E+03
Ave Dev =	1.61E+03
Std Dev =	1.74E+03
Skewness=	-1.46E-03
Kurtosis=	-1.61E+00

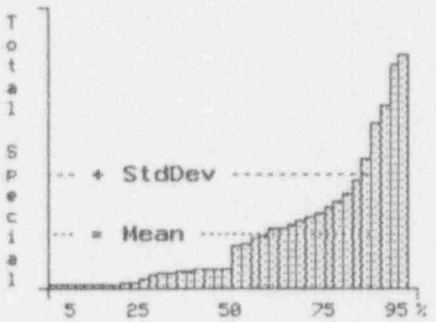
Total Source Material

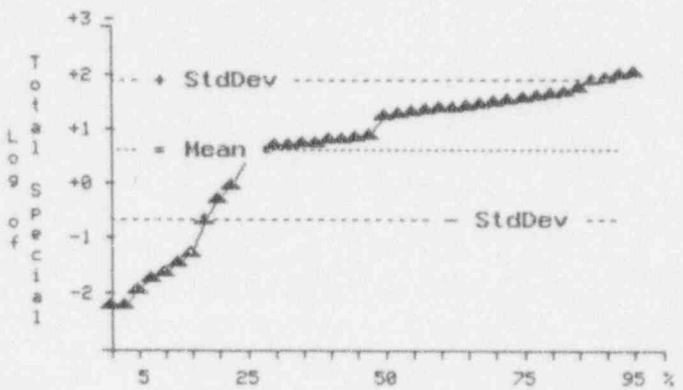
Exhibit H-5 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: South Carolina

Special material [g]: 4.93E+03





g

# Points =	152
1st % =	1.00E-02
10th % =	3.00E-02
25th % =	1.78E+00
50th % =	1.11E+01
75th % =	4.76E+01
90th % =	8.65E+01
99th % =	1.51E+02
Average =	3.24E+01
Ave Dev =	2.93E+01
Std Dev =	3.81E+01
Skewness=	1.46E+00
Kurtosis=	1.57E+00

Total Special Material

Exhibit H-6 Illinois Fuel Fabrication Facilities
Radionuclide Distributions - Shipment Level[a]

Waste Class: A-Unstable and A-Stable
Number of shipping records: 119
Number of shipping containers: 630
Total waste volume: 1,677 m^3
Total waste mass: 1,716,000 Kg
Average waste form density: 1.02 g/cm^3

Nuclide	Concentration Ranges - Ci/m^3 - 1st	50th	99th	Percentile - pCi/g - 1st	50th	99th
Th-232	4.76E-06	1.60E-03	2.44E-03	4.60E+00	1.56E+03	2.38E+03
U-238	8.06E-04	9.38E-03	2.14E-02	7.88E+02	7.81E+03	2.10E+04
U-nat	2.45E-04	4.02E-04	4.40E-04	3.08E+02	3.93E+02	4.30E+02

(a) Based on direct shipment data to all three disposal sites from 1986 to 1990.

Exhibit H-6 (Continued)

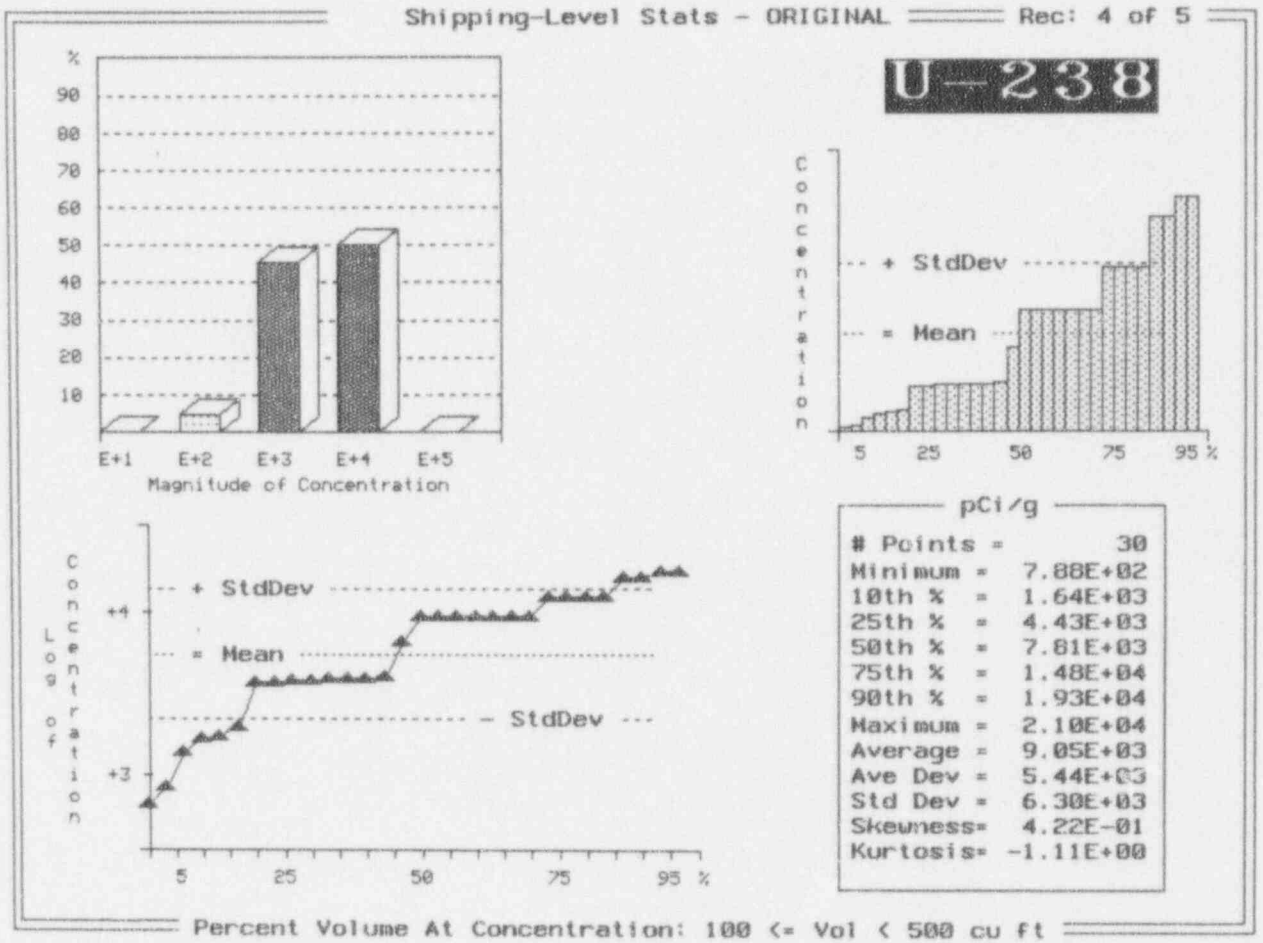


Exhibit H-6 (Continued)

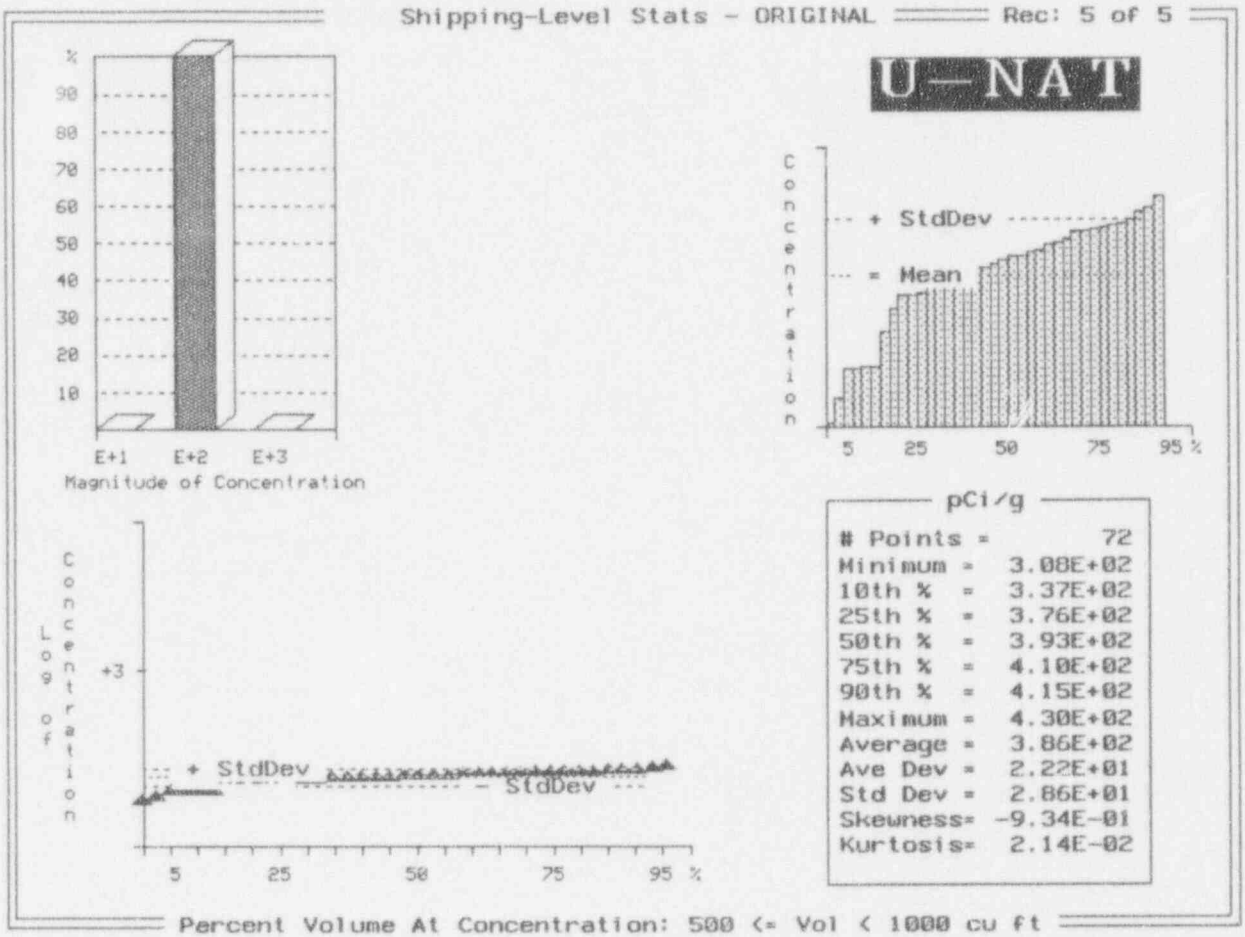


Exhibit H-6 (Continued)

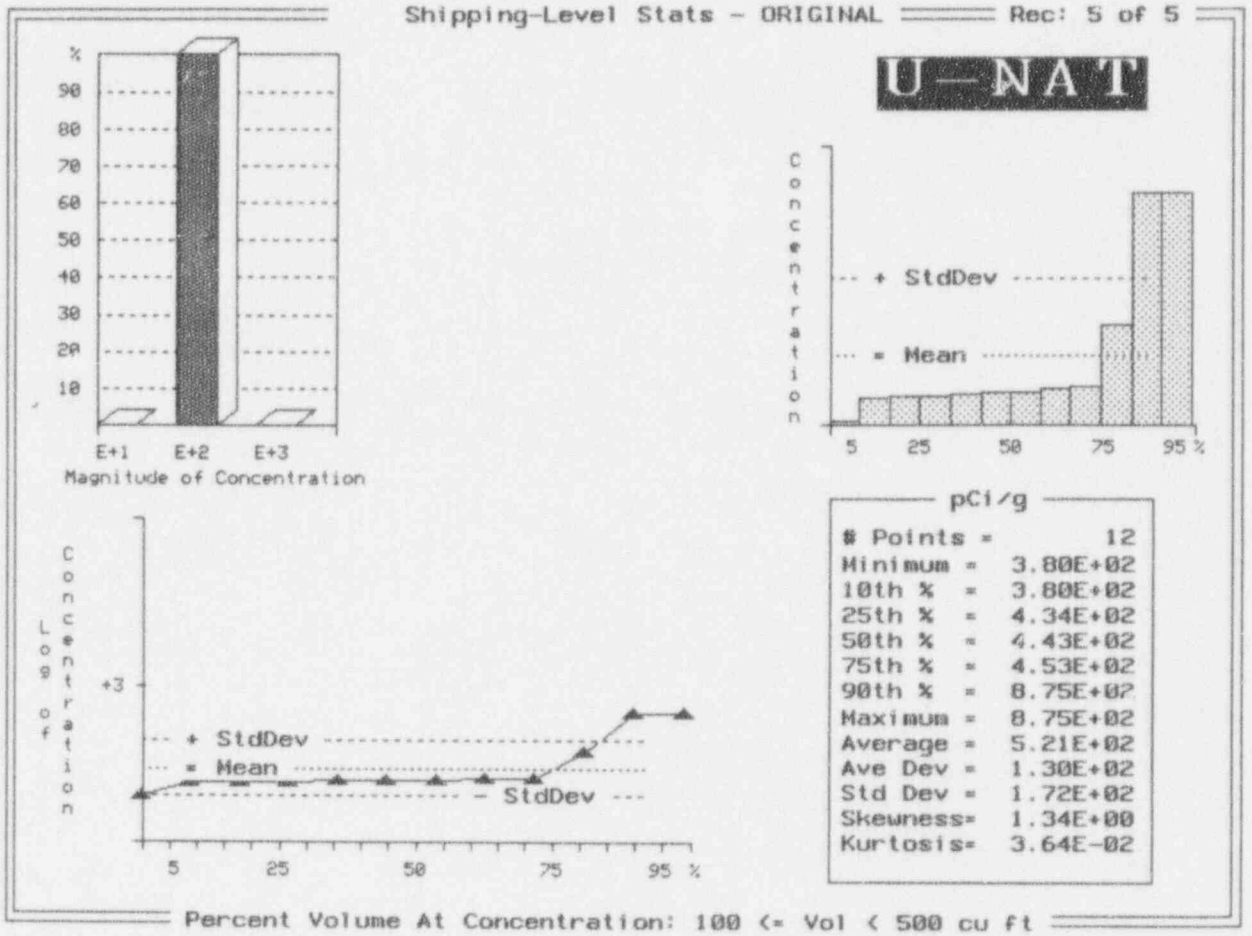
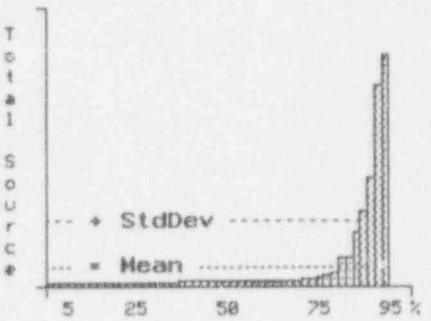


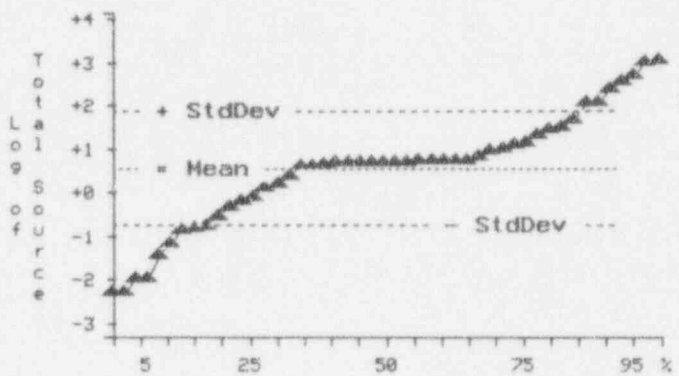
Exhibit H-6 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: Illinois

Total source material [kg]: 2.74E+04





kg

# Points =	317
1st % =	1.00E-02
10th % =	8.00E-02
25th % =	1.23E+00
50th % =	9.27E+00
75th % =	2.11E+01
90th % =	2.11E+02
99th % =	1.22E+03
Average =	8.65E+01
Ave Dev =	1.30E+02
Std Dev =	2.53E+02
Skewness=	4.31E+00
Kurtosis=	2.09E+01

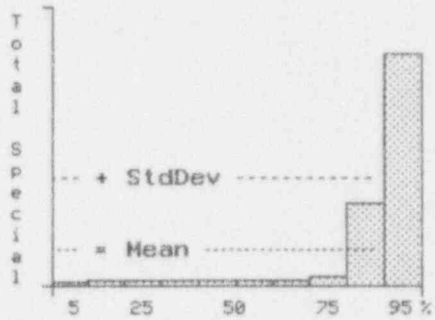
Total Source Material

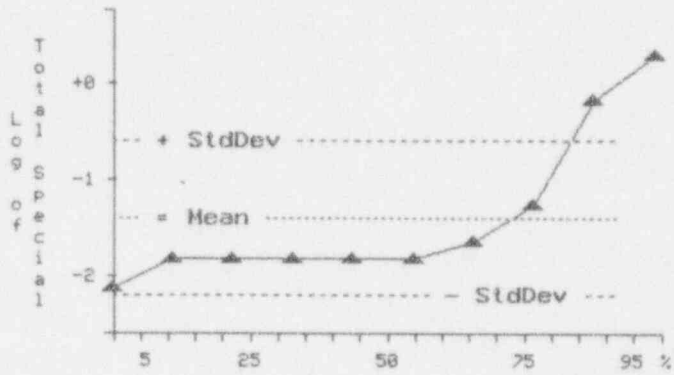
Exhibit H-6 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: Illinois

Special material [g]: 3.51E+00





g

# Points =	10
Minimum =	1.00E-02
10th % =	1.00E-02
25th % =	2.00E-02
50th % =	2.00E-02
75th % =	7.00E-02
90th % =	8.50E-01
Maximum =	2.45E+00
Average =	3.51E-01
Ave Dev =	5.20E-01
Std Dev =	7.82E-01
Skewness=	1.90E+00
Kurtosis=	2.24E+00

Total Special Material

Exhibit H-7 Oklahoma Fuel Fabrication Facilities
Radionuclide Distributions - Shipment Level[a]

Waste Class: A-Unstable and A-Stable
Number of shipping records: 461
Number of shipping containers: 1,663
Total waste volume: 5,762 m^3
Total waste mass: 5,894,000 Kg
Average waste form density: 1.02 g/cm^3

	Concentration Ranges - Percentile[b] - Ci/m^3 -			- pCi/g -		
Nuclide	1st	50th	99th	1st	50th	99th
Am-241	6.98E-07	4.71E-06	2.62E-05	6.82E-01	4.60E+00	2.56E+01
Dep-U*#	3.14E-05	3.14E-05	3.14E-05	1.16E+02	1.16E+02	1.16E+02
Pu-238	3.25E-07	4.71E-06	5.89E-05	3.17E-01	4.60E+00	5.76E+01
Pu-239	6.98E-07	4.71E-06	4.94E-05	6.82E-01	4.60E+00	4.83E+01
Pu-240	6.98E-07	4.71E-06	1.21E-04	6.82E-01	4.60E+00	1.18E+02
Pu-241	6.98E-07	4.71E-06	8.62E-04	6.82E-01	4.60E+00	8.42E+02
Pu-242	1.62E-07	4.71E-06	4.71E-06	1.59E-01	4.60E+00	4.60E+00
Th-228*	5.12E-08	5.12E-08	5.12E-08	5.32E-02	5.32E-02	5.32E-02
Th-232	5.23E-06	4.64E-04	2.18E-02	5.11E+00	4.54E+02	2.13E+04
Th-nat	5.06E-06	2.24E-05	2.64E-04	4.94E+00	2.19E+01	2.58E+02
U-232	5.12E-08	5.12E-08	5.81E-08	5.32E-02	5.32E-02	5.68E-02
U-234	8.12E-07	5.27E-04	3.51E-03	7.94E-01	5.15E+02	3.43E+03
U-235	8.56E-07	2.28E-05	2.10E-04	8.37E-01	2.23E+01	2.05E+02
U-236	6.10E-07	4.71E-06	4.11E-05	5.97E-01	4.60E+00	4.02E+01
U-238	1.11E-05	2.20E-04	2.12E-02	1.09E+01	2.15E+02	2.00E+04
U-239*	7.32E-06	7.32E-06	7.32E-06	7.15E+00	7.15E+00	7.15E+00
U-nat	4.40E-03	1.80E-02	3.01E-02	5.92E+03	2.32E+04	4.08E+04

(a) Based on direct shipment data to all three disposal sites from 1986 to 1990.
(b) The concentration of nuclides tagged with an asterisk are based on a single value. In such instances, the percentile distribution does not apply. Nuclides identified with the pound symbol (#) signify depleted uranium.

Exhibit H-7 (Continued)

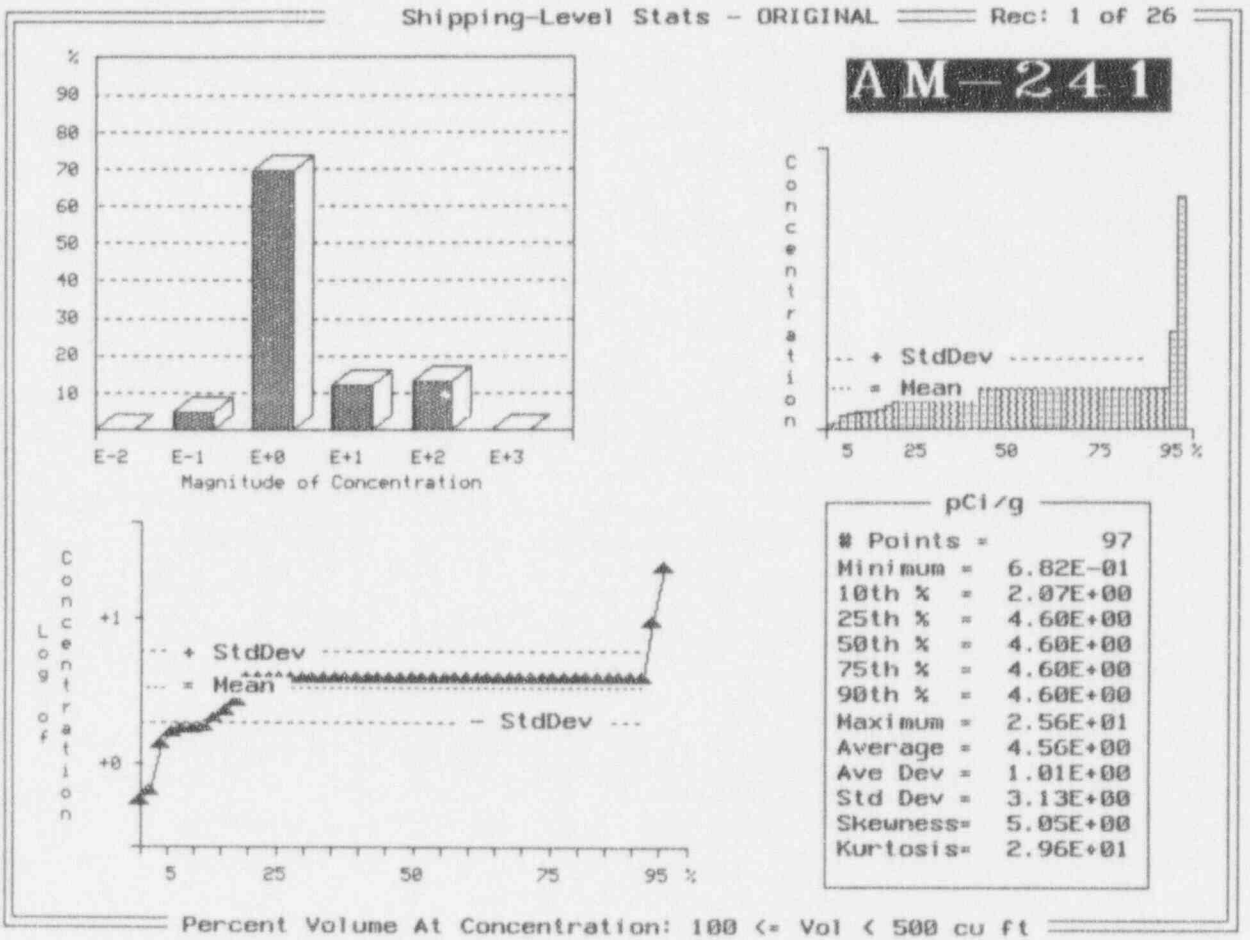


Exhibit H-7 (Continued)

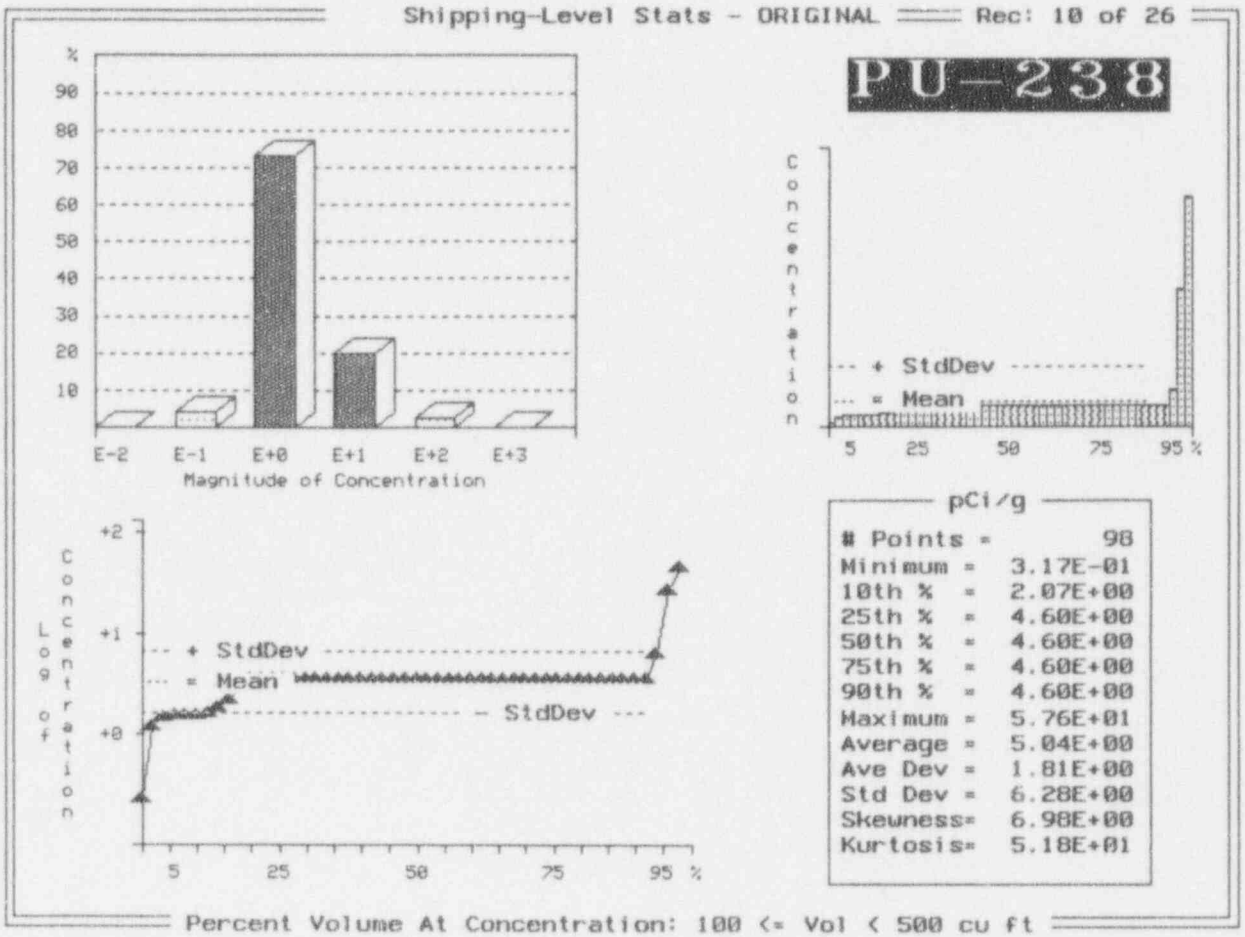


Exhibit H-7 (Continued)

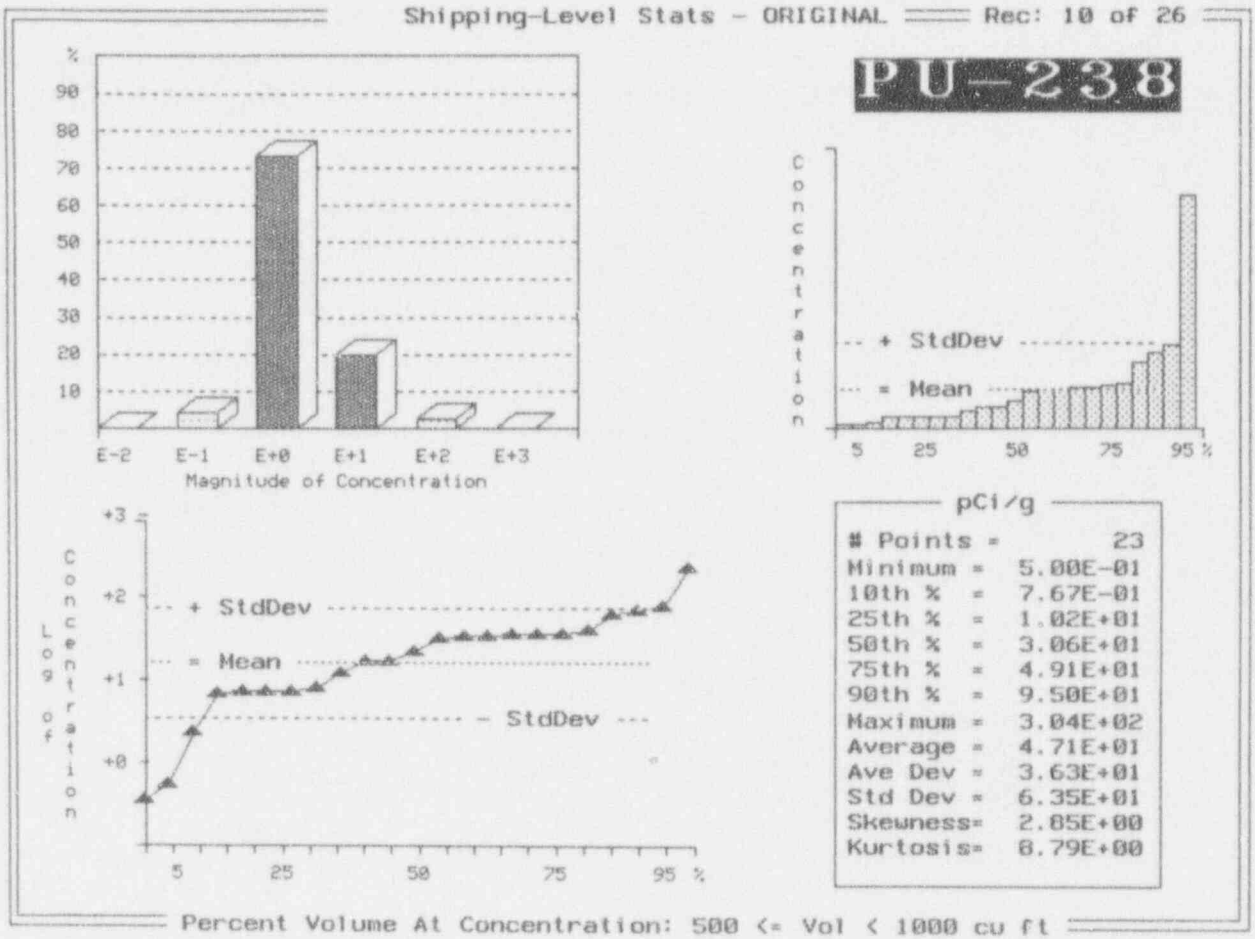


Exhibit H-7 (Continued)

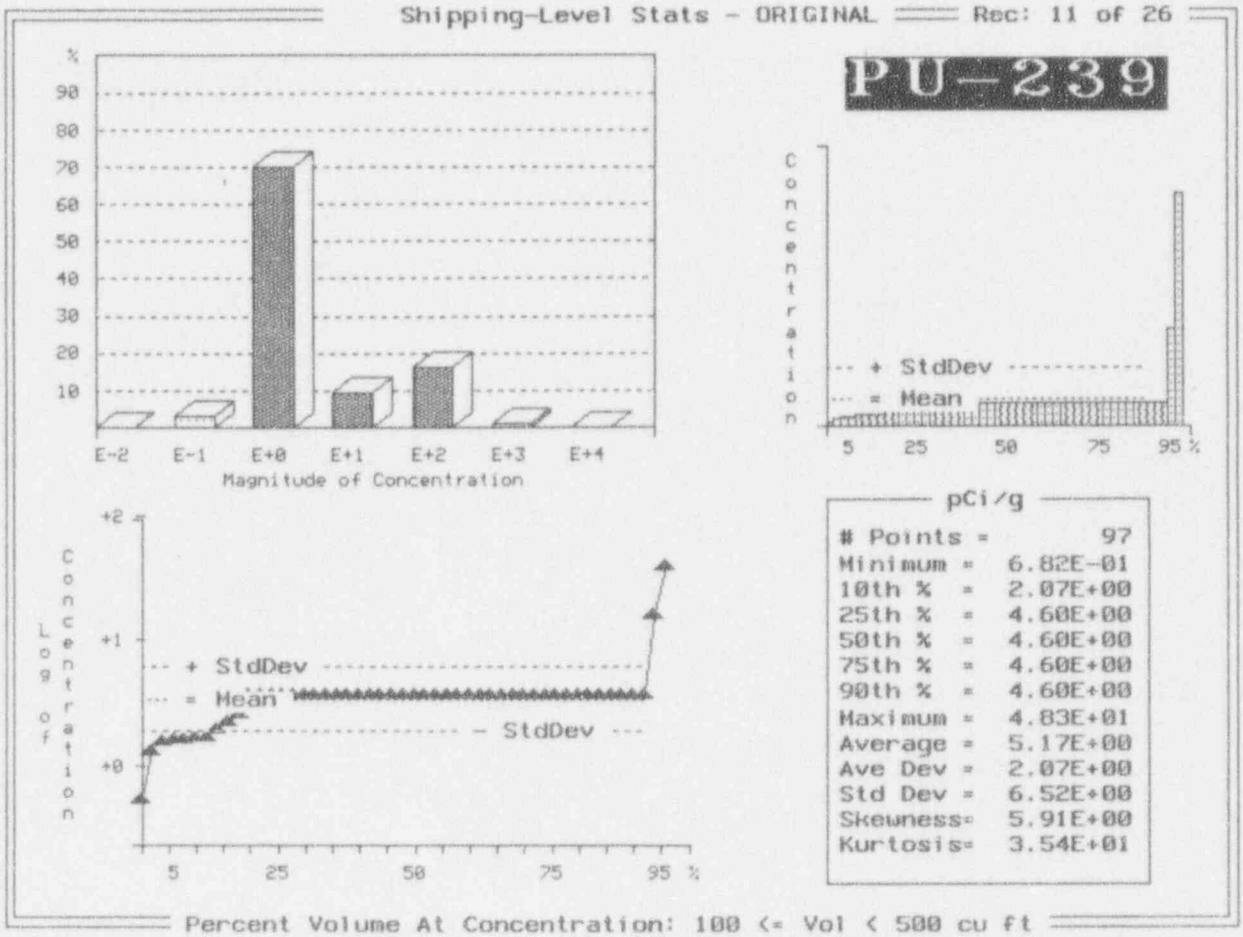


Exhibit H-7 (Continued)

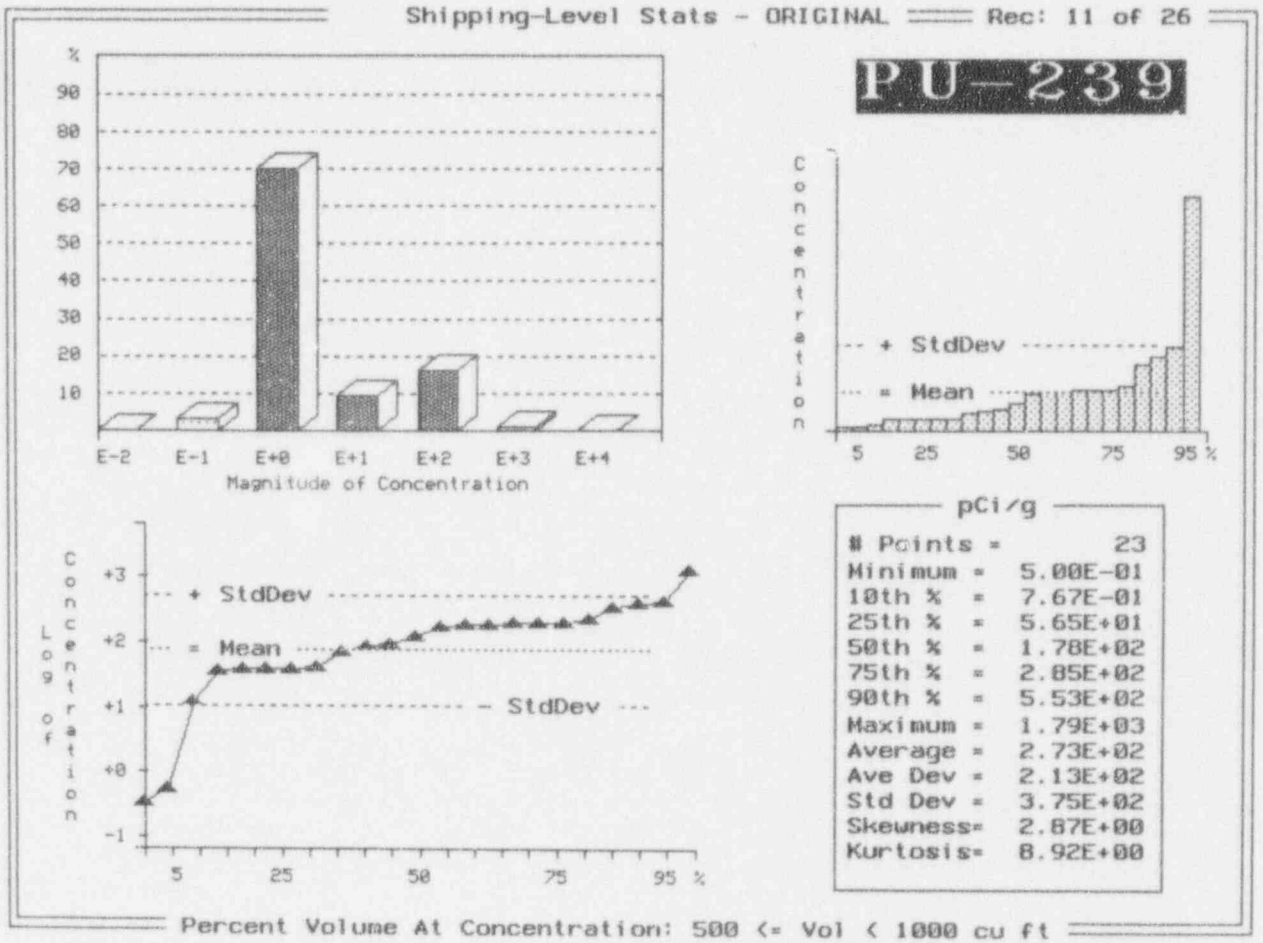


Exhibit H-7 (Continued)

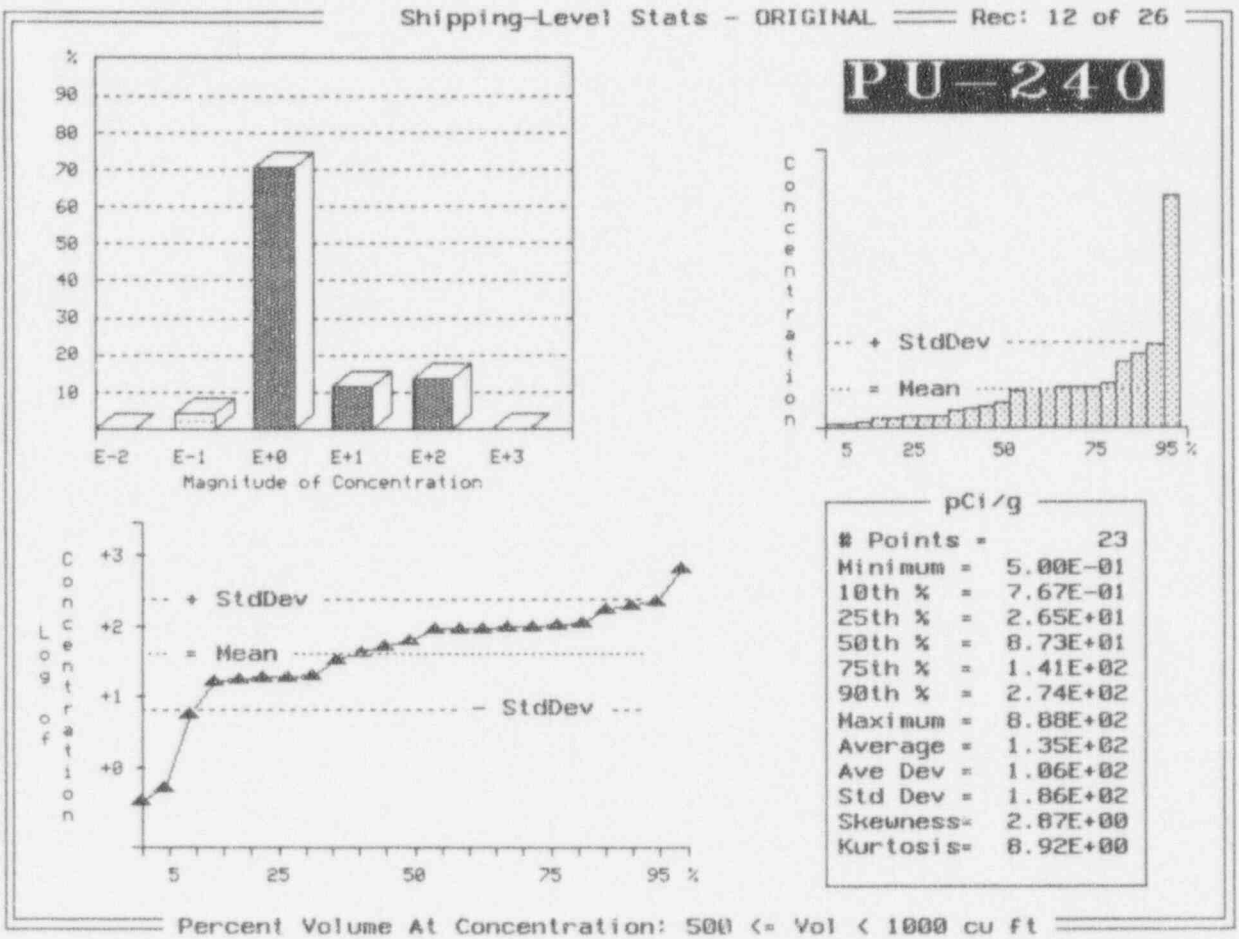


Exhibit H-7 (Continued)

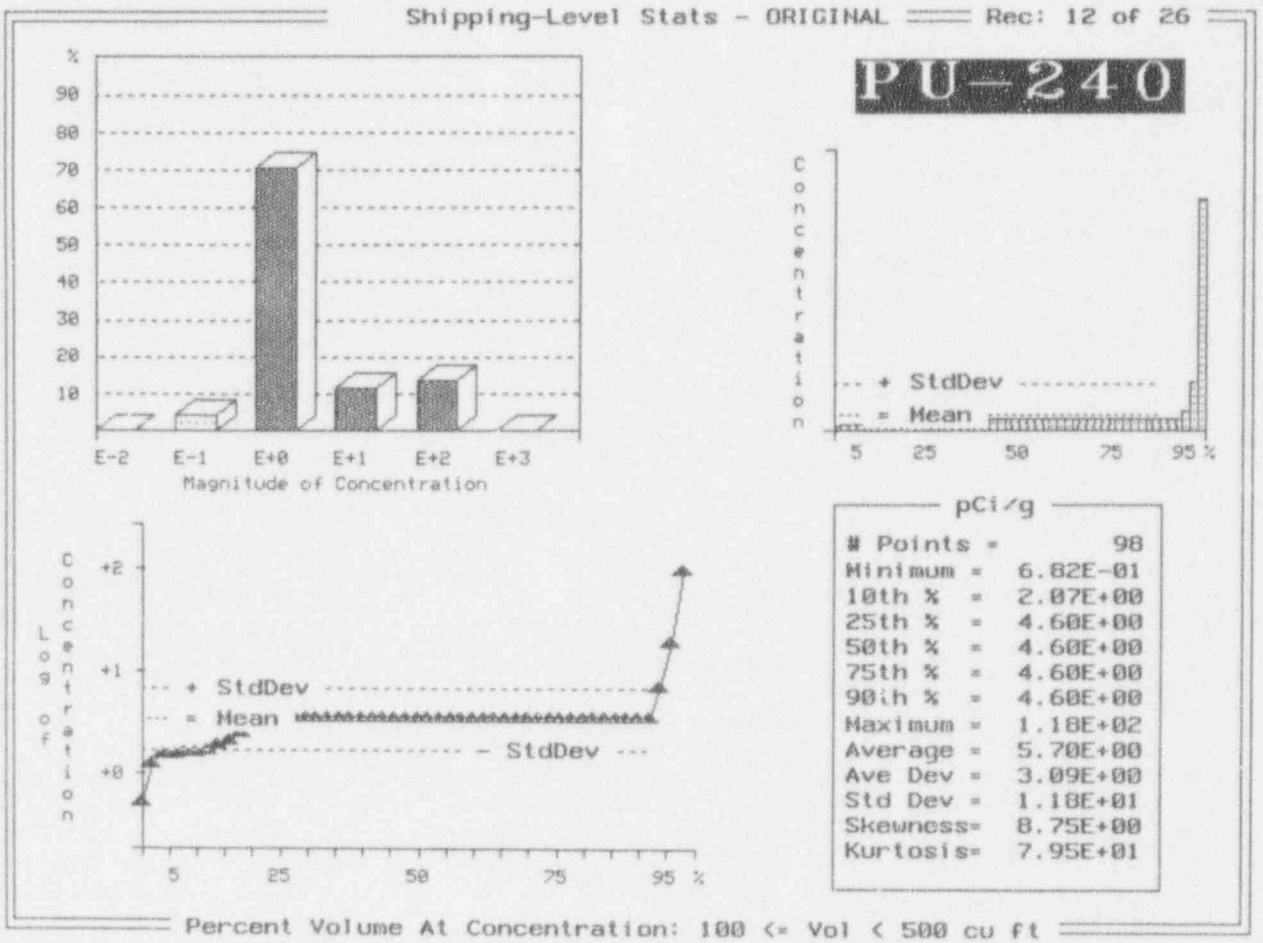


Exhibit H-7 (Continued)

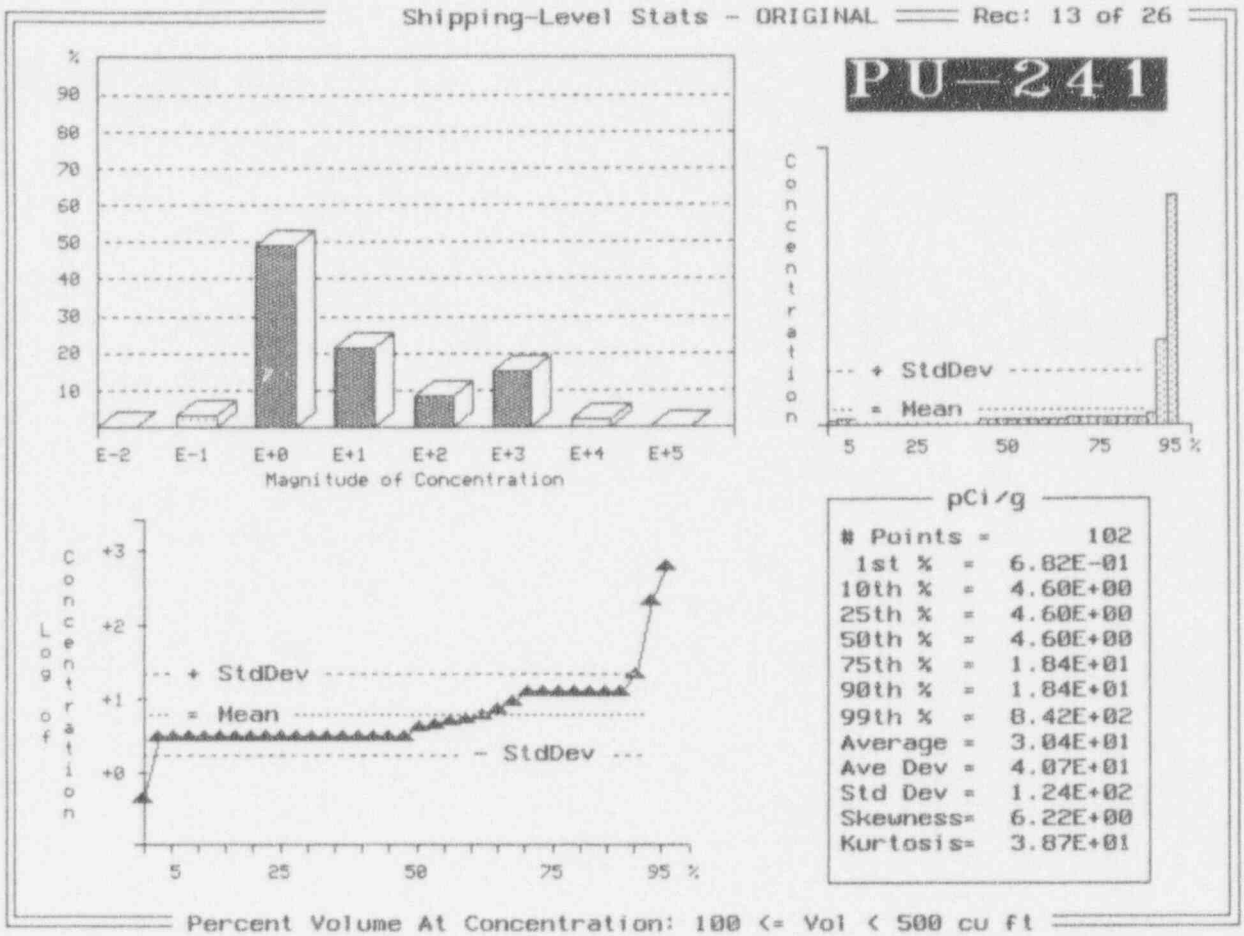


Exhibit H-7 (Continued)

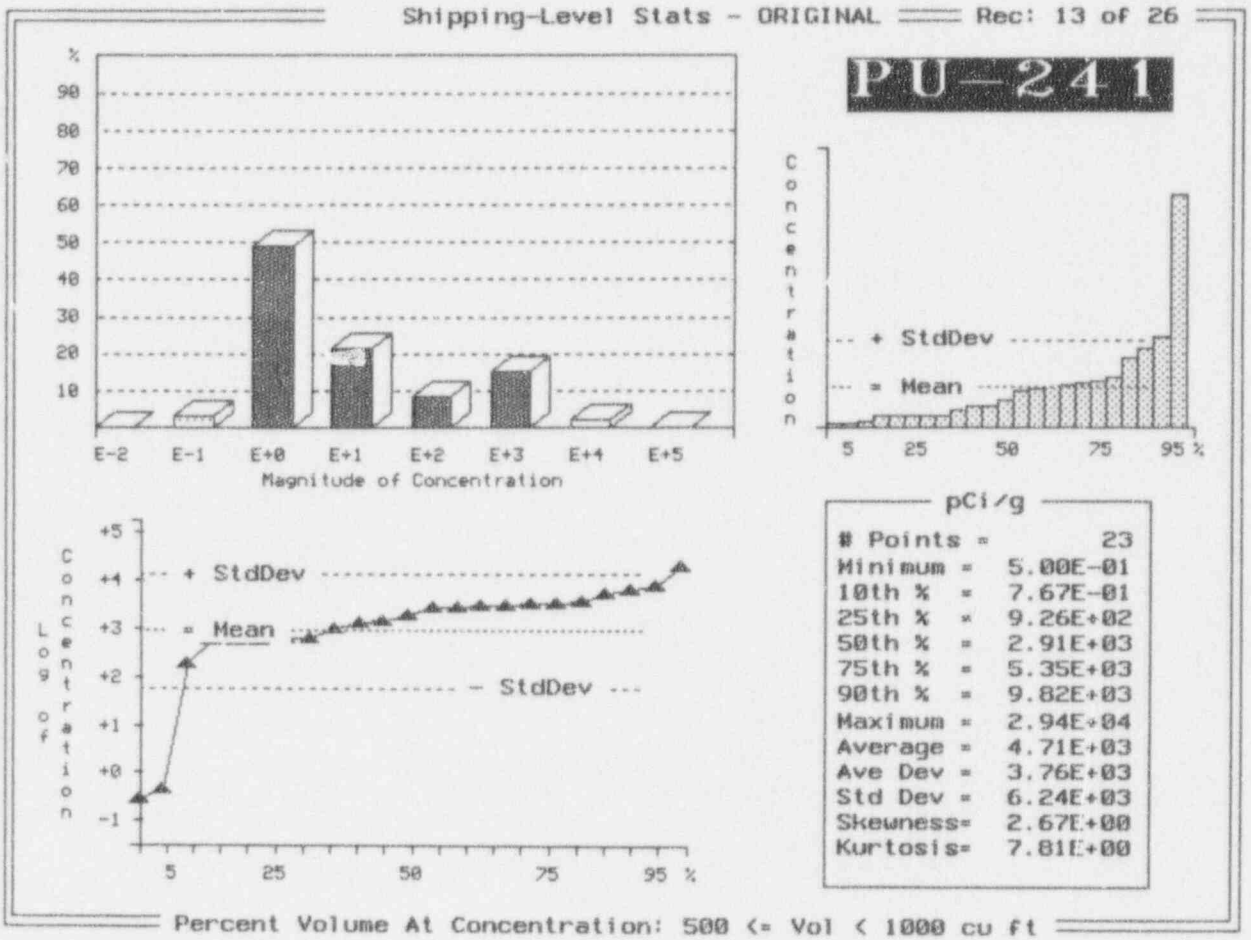


Exhibit H-7 (Continued)

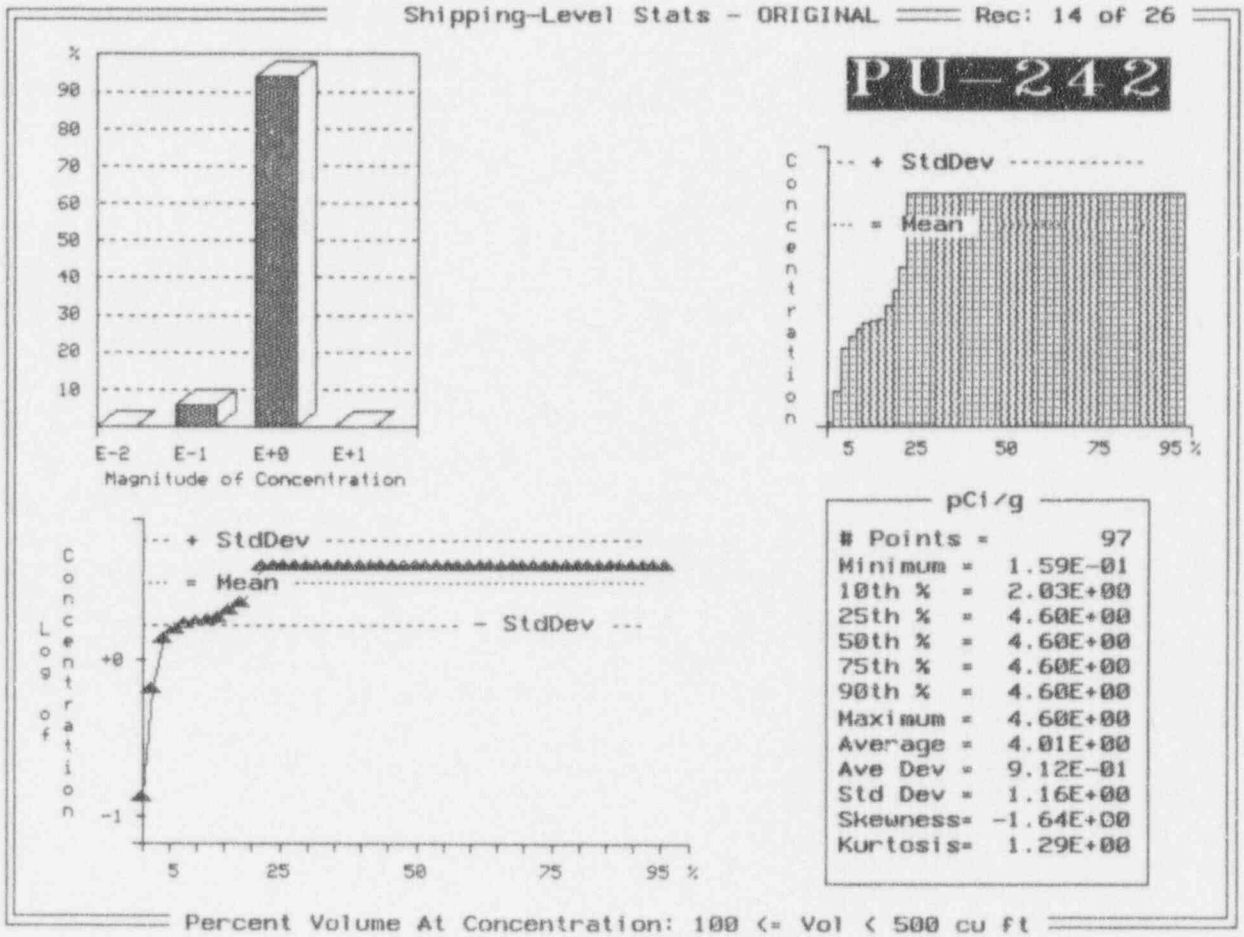


Exhibit H-7 (Continued)

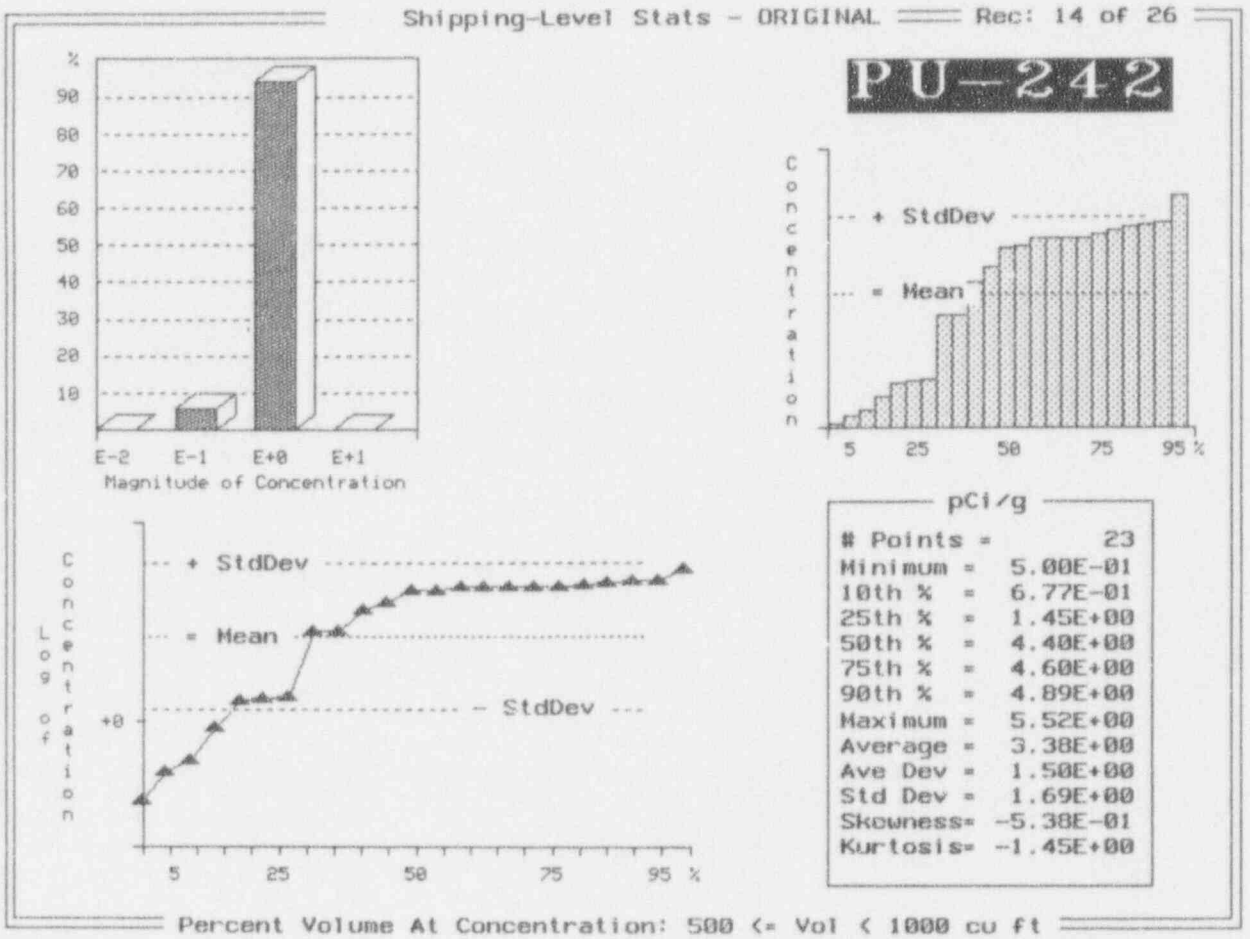
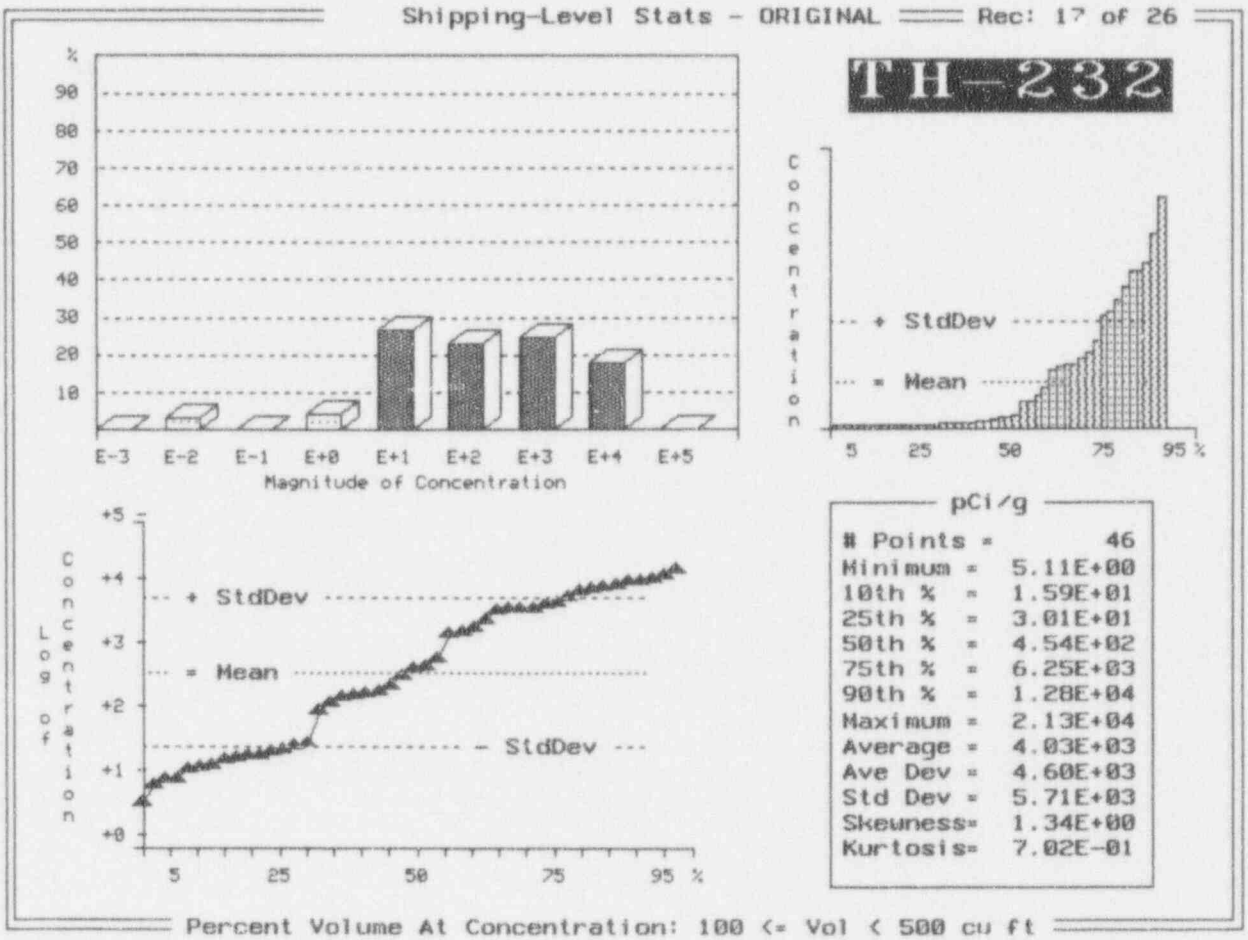


Exhibit H-7 (Continued)



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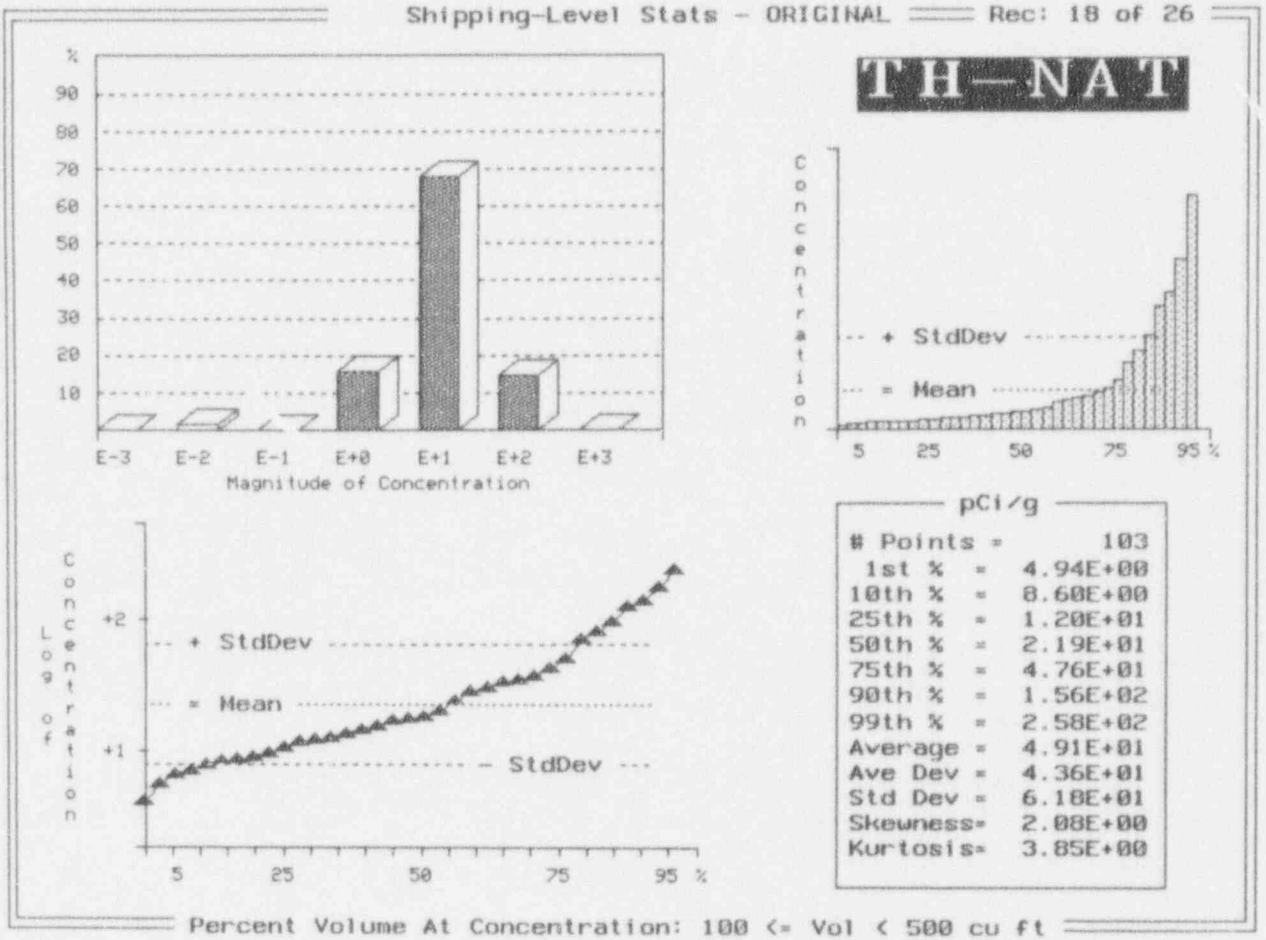

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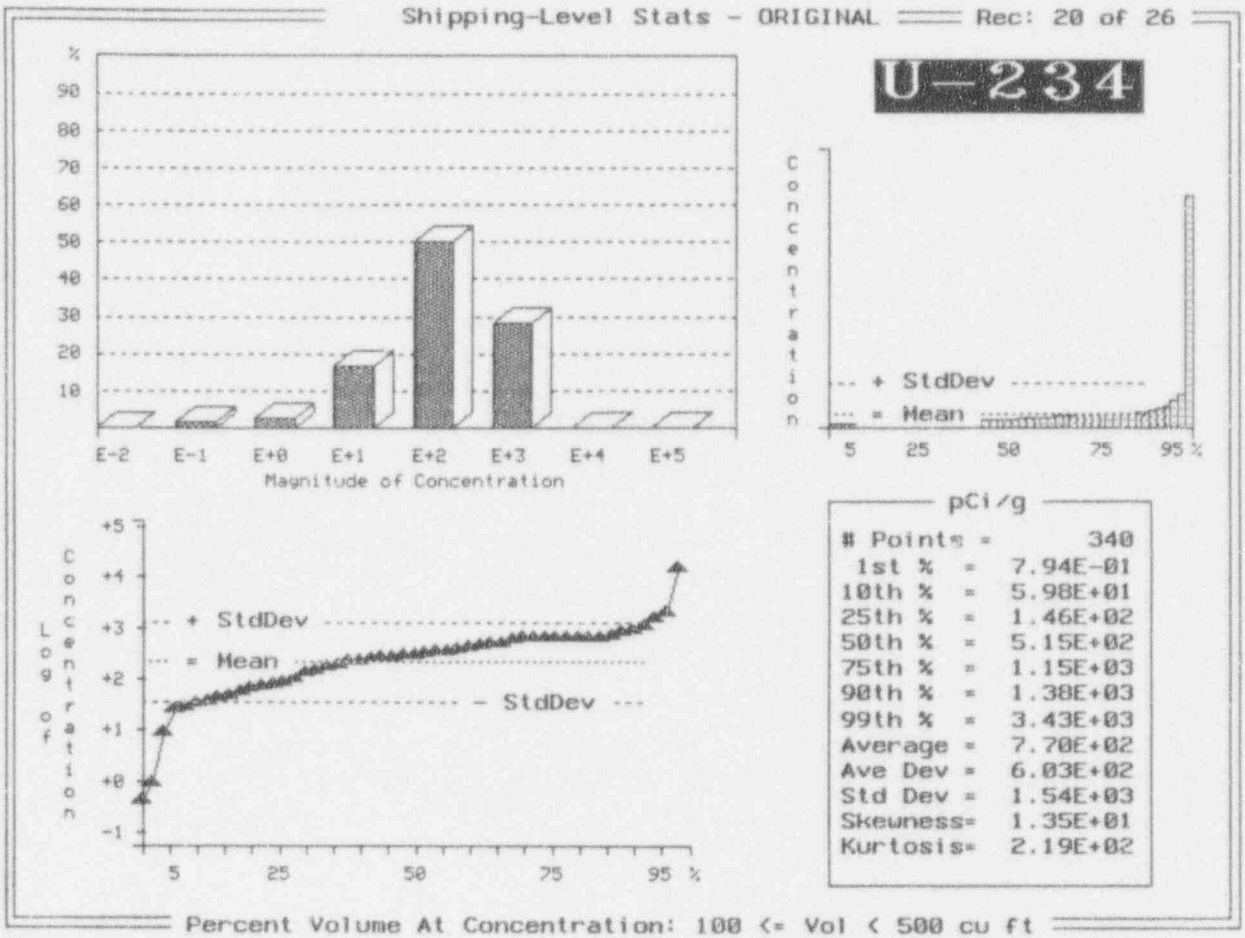


Exhibit H-7 (Continued)

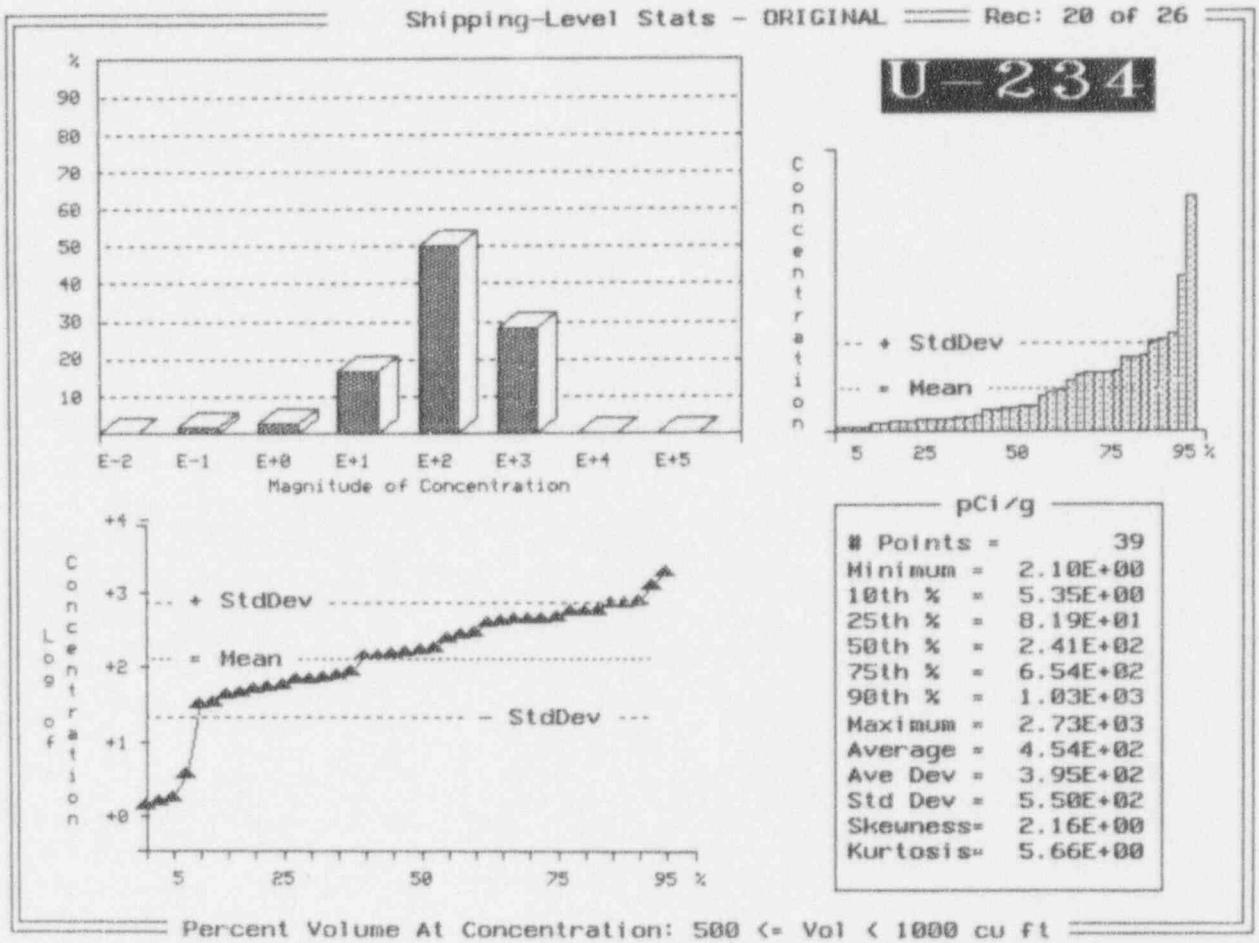


Exhibit H-7 (Continued)

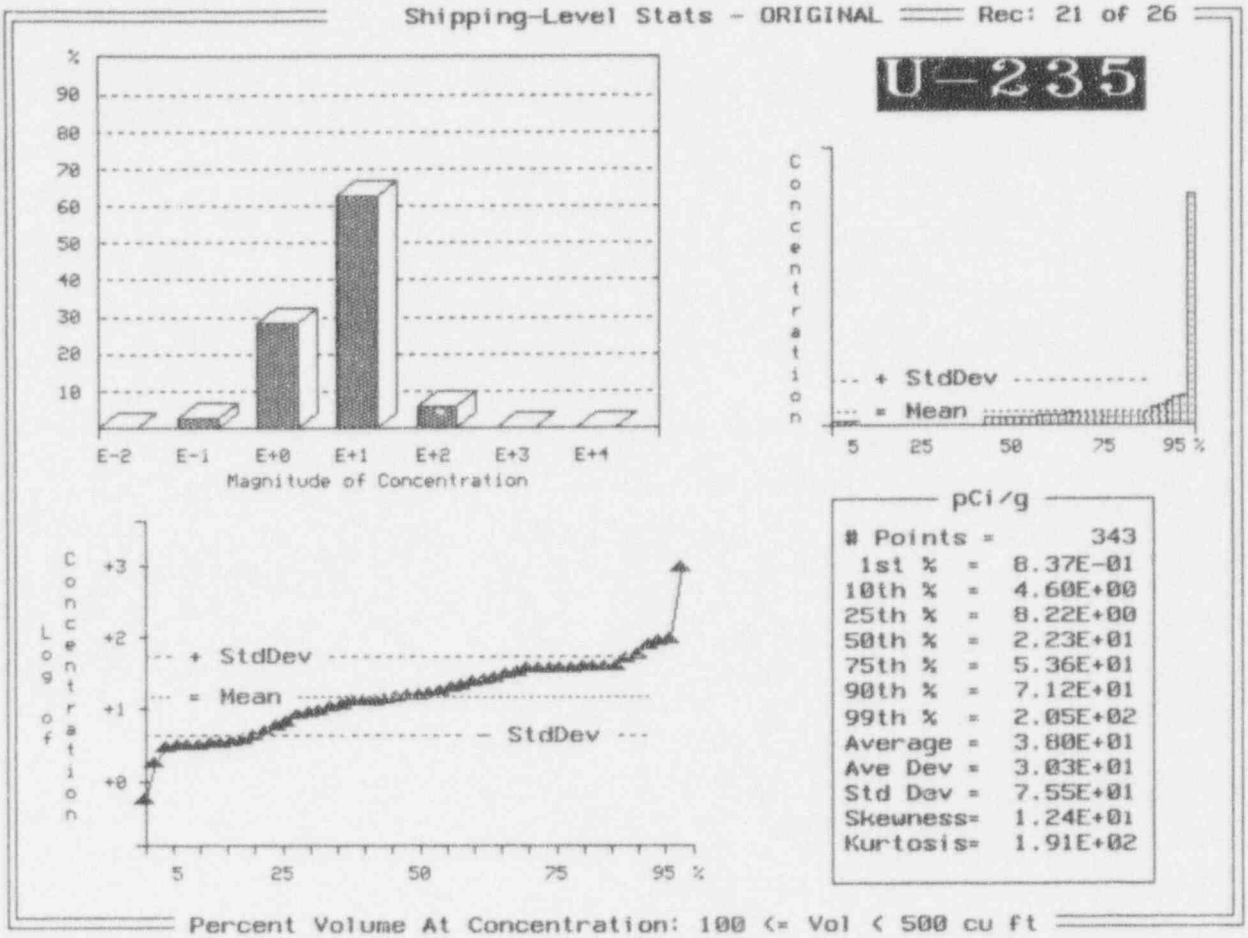


Exhibit H-7 (Continued)

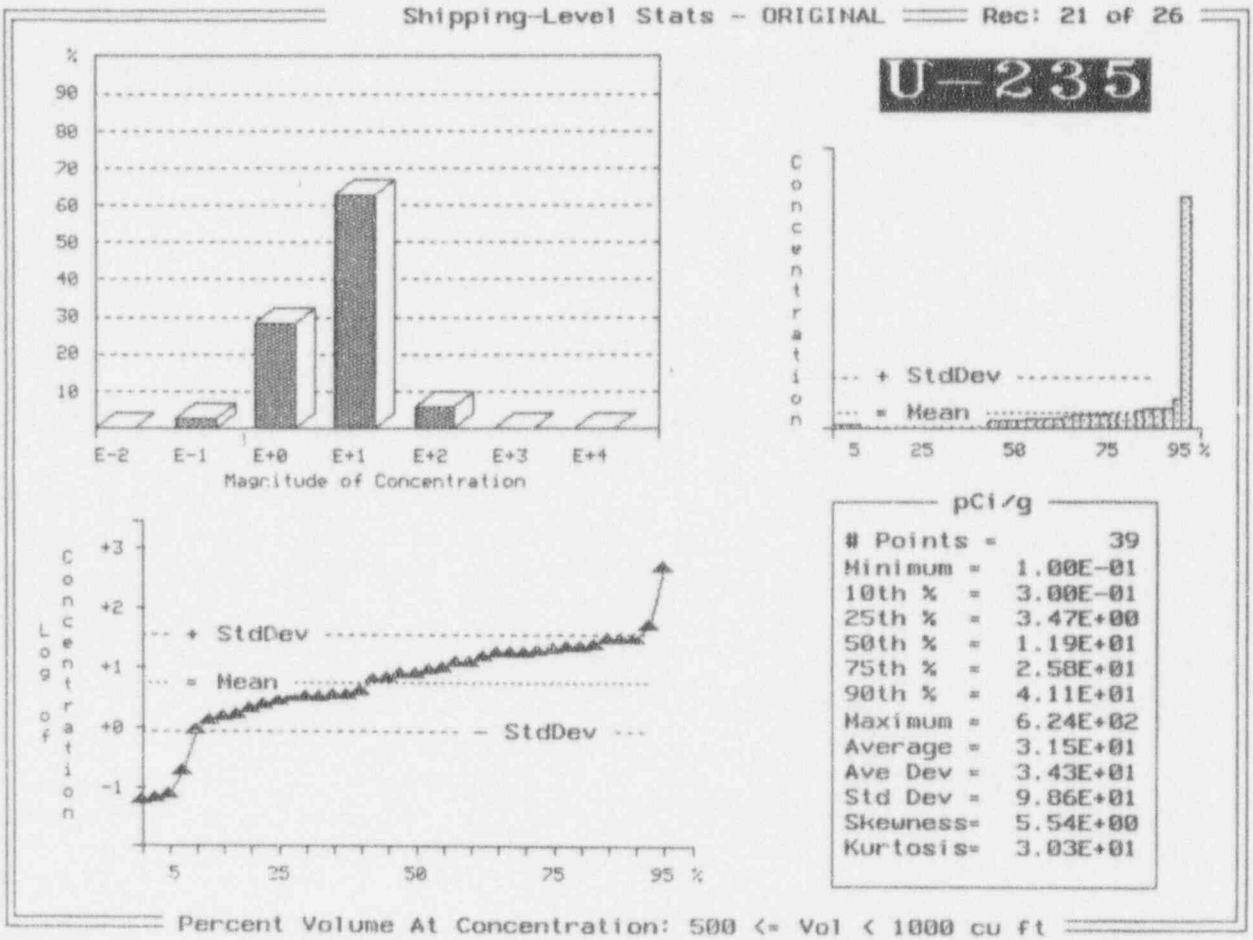
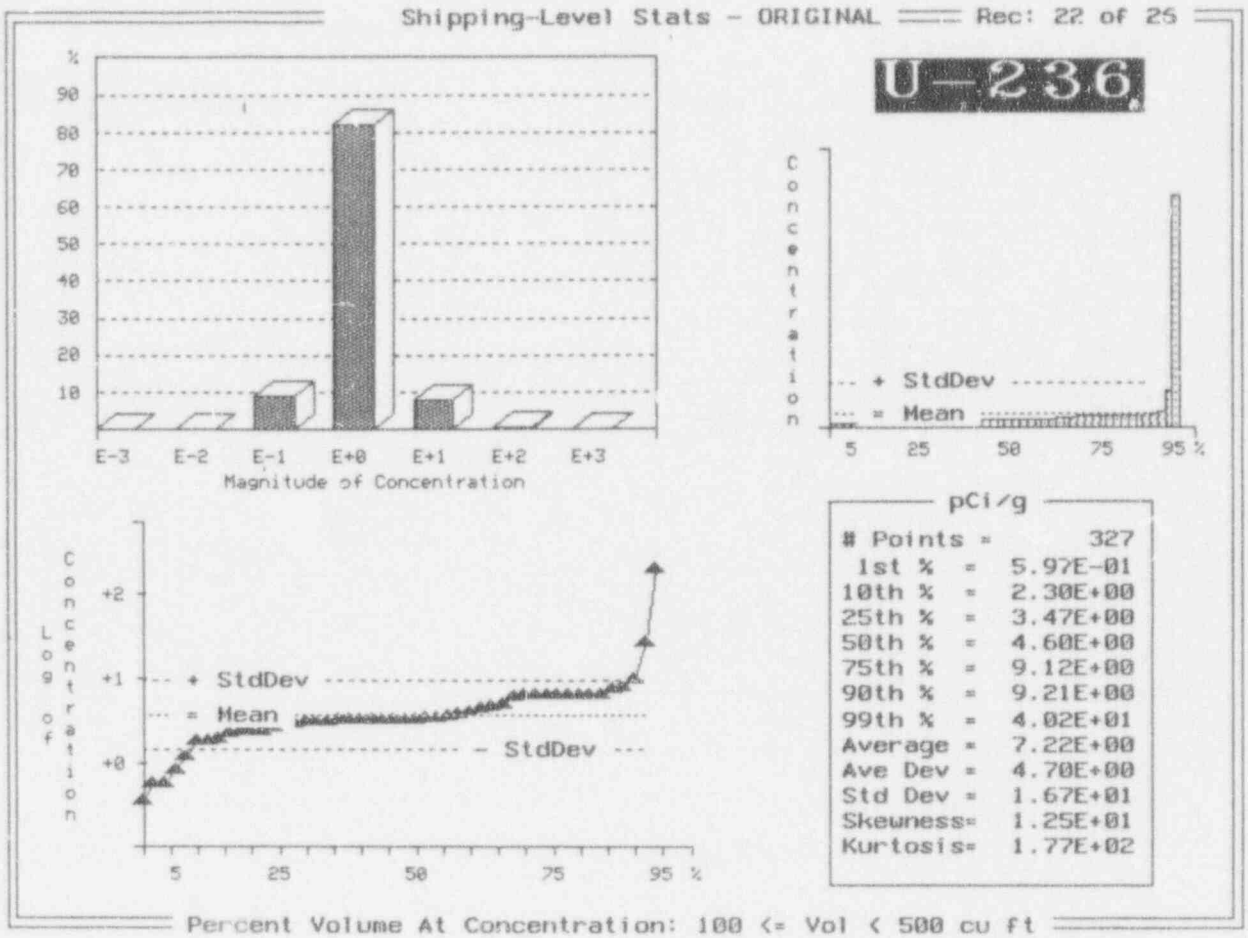


Exhibit H-7 (Continued)



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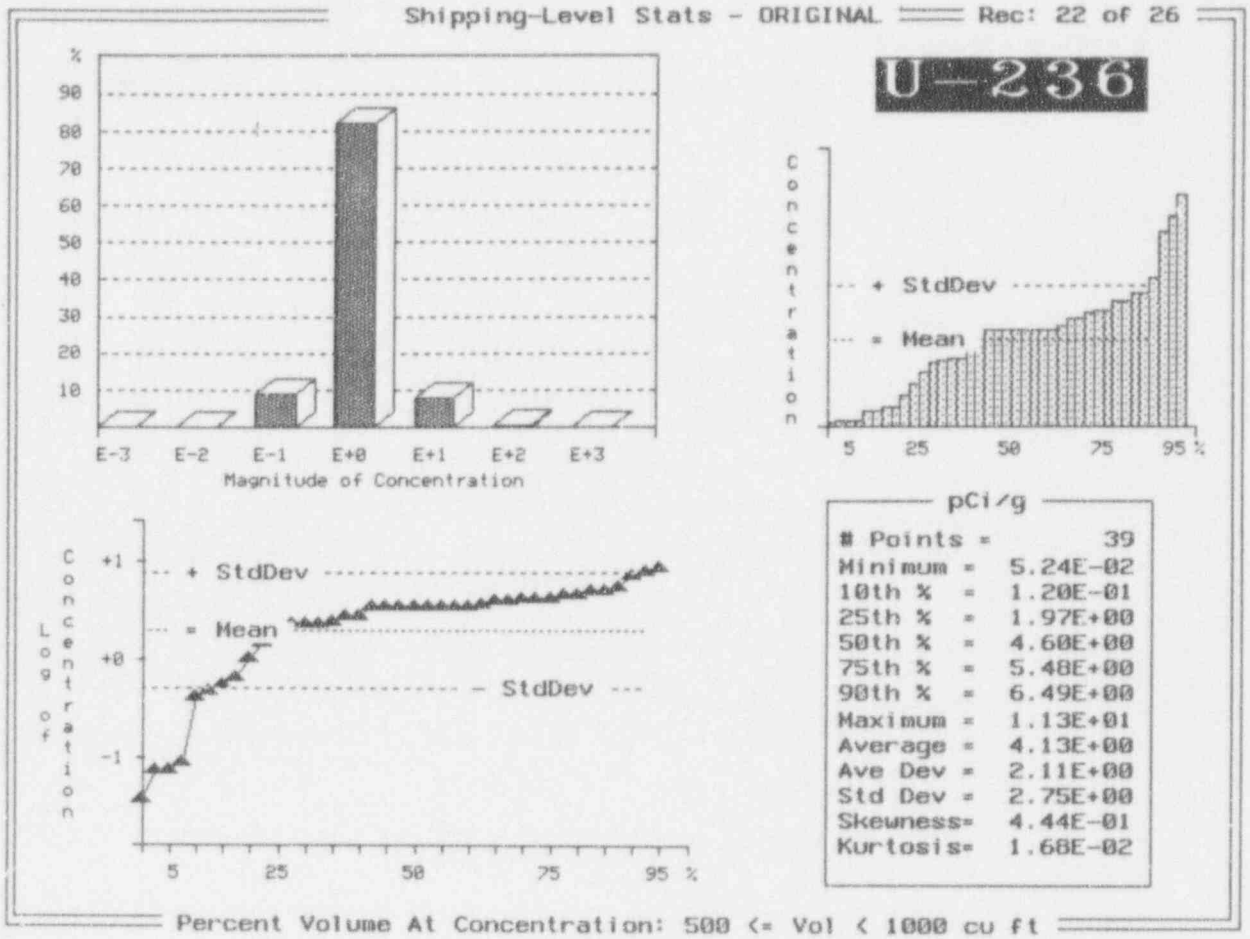


Exhibit H-7 (Continued)

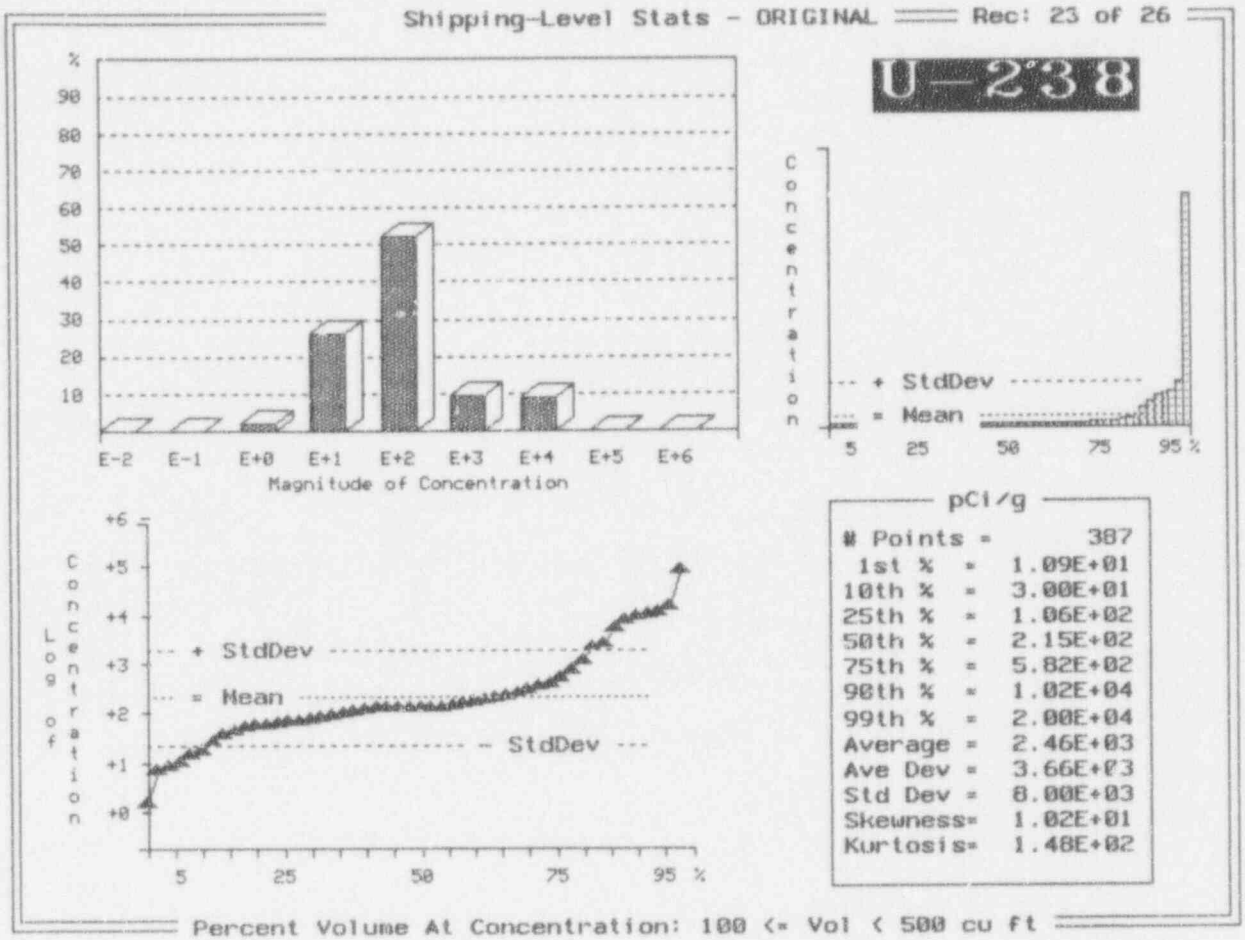


Exhibit H-7 (Continued)

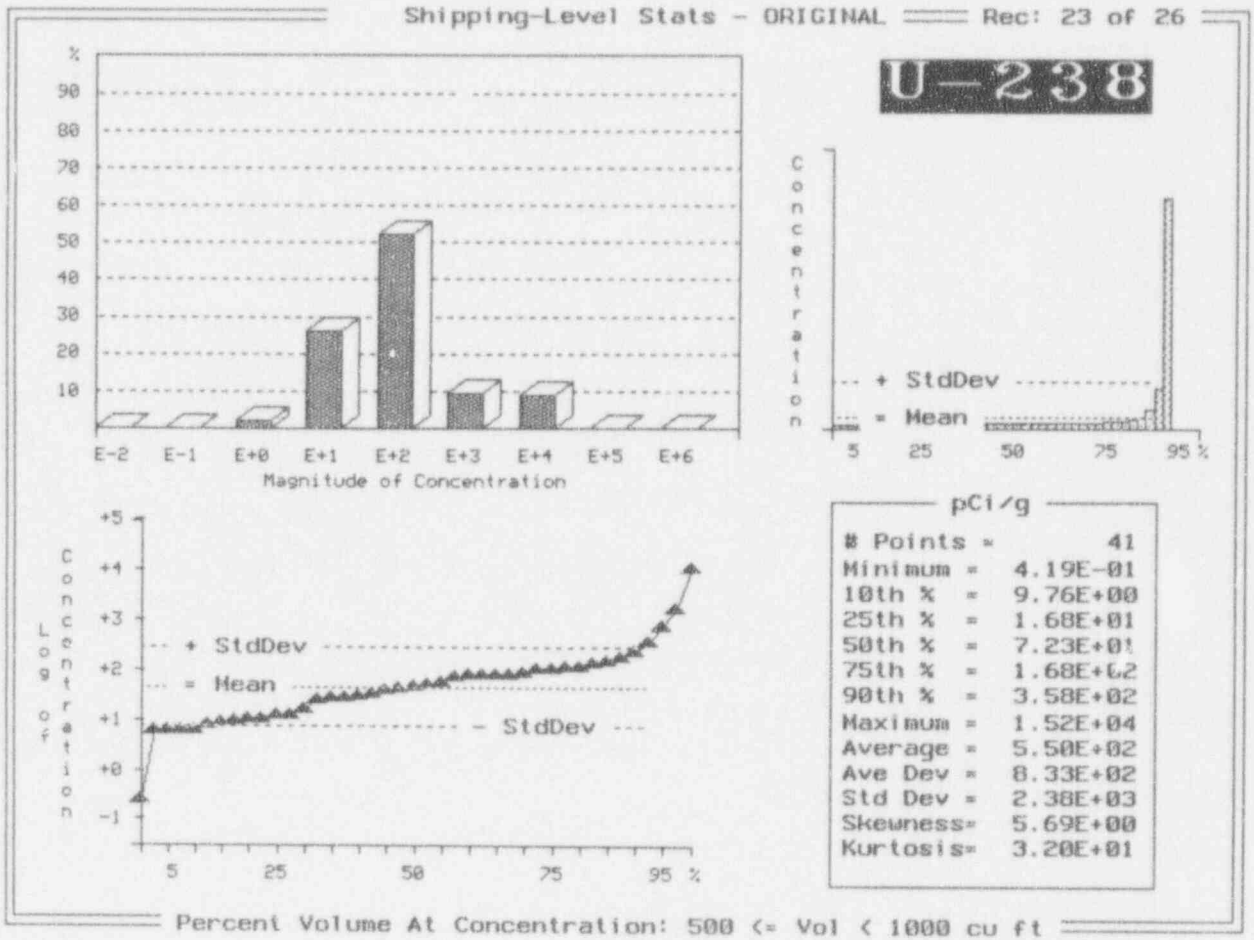
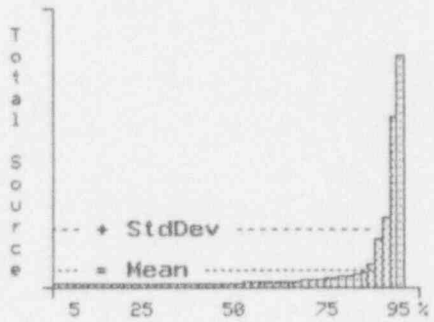


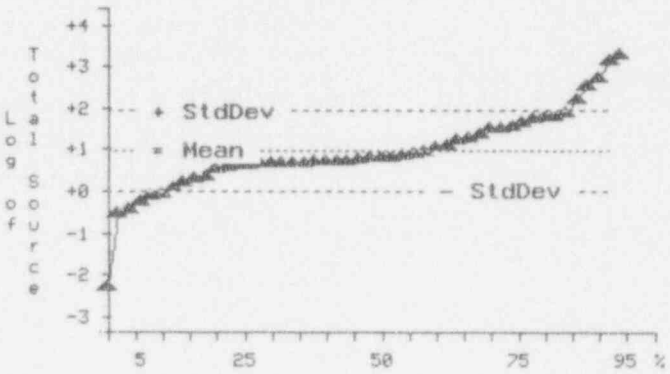
Exhibit H-7 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: Oklahoma

Total source material [kg]: 4.80E+04





kg

# Points =	466
1st % =	5.30E-01
10th % =	1.49E+00
25th % =	6.64E+00
50th % =	1.04E+01
75th % =	5.40E+01
90th % =	1.26E+02
99th % =	2.04E+03
Average =	1.03E+02
Ave Dev =	1.46E+02
Std Dev =	3.36E+02
Skewness=	5.23E+00
Kurtosis=	2.98E+01

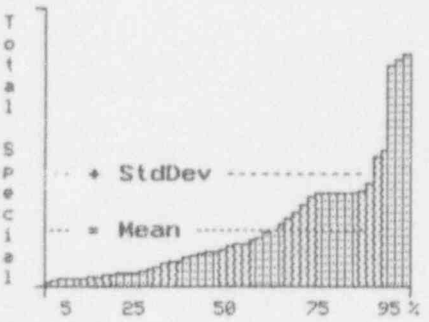
Total Source Material

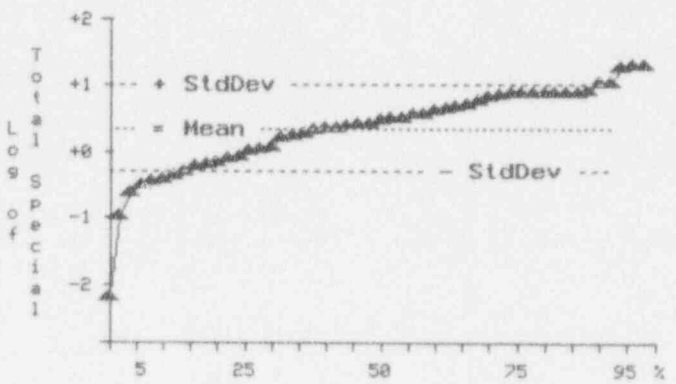
Exhibit H-7 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: Oklahoma

Special material [g]: 2.47E+03





g

# Points	=	393
1st %	=	3.00E-02
10th %	=	5.40E-01
25th %	=	1.26E+00
50th %	=	4.13E+00
75th %	=	1.07E+01
90th %	=	1.21E+01
99th %	=	2.72E+01
Average	=	6.28E+00
Ave Dev	=	4.87E+00
Std Dev	=	6.37E+00
Skewness	=	1.66E+00
Kurtosis	=	2.83E+00

Total Special Material

Exhibit H-8 Missouri Fuel Fabrication Facilities
Radionuclide Distributions - Shipment Level[a]

Waste Class: A-Unstable and A-Stable
Number of shipping records: 42
Number of shipping containers: 81
Total waste volume: 673.4 m^3
Total waste mass: 688,900 Kg
Average waste form density: 1.02 g/cm^3

Nuclide	Concentration Ranges - Percentile[b] - Ci/m^3 - 1st	50th	99th	- pCi/g - 1st	50th	99th
Th-232*	2.43E-03	2.43E-03	2.43E-03	3.15E+03	3.15E+03	3.15E+03
Th-nat*	1.19E-04	1.19E-04	1.19E-04	9.91E+01	9.91E+01	9.91E+01
U-235	2.48E-06	2.42E-04	4.06E-03	2.42E+00	2.36E+02	3.97E+03
U-238	1.93E-05	2.03E-04	3.61E-03	1.88E+01	1.98E+02	3.53E+03
U-nat	4.80E-05	1.37E-04	2.27E-04	4.69E+01	1.18E+02	1.88E+02

(a) Based on direct shipment data to all three disposal sites from 1986 to 1990.
(b) The concentration of nuclides tagged with an asterisk are based on a single value. In such instances, the percentile distribution does not apply.

Exhibit H-8 (Continued)

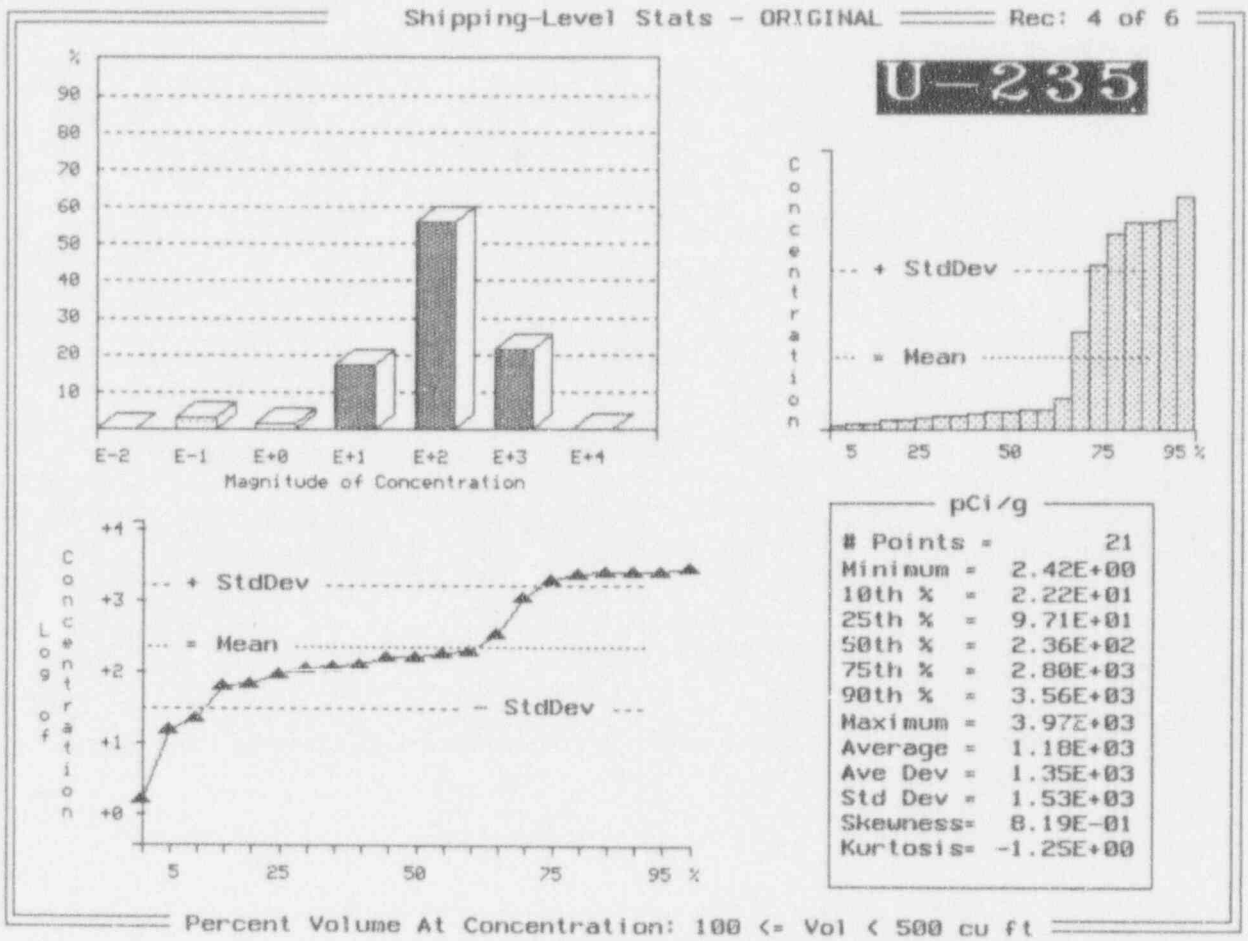


Exhibit H-8 (Continued)

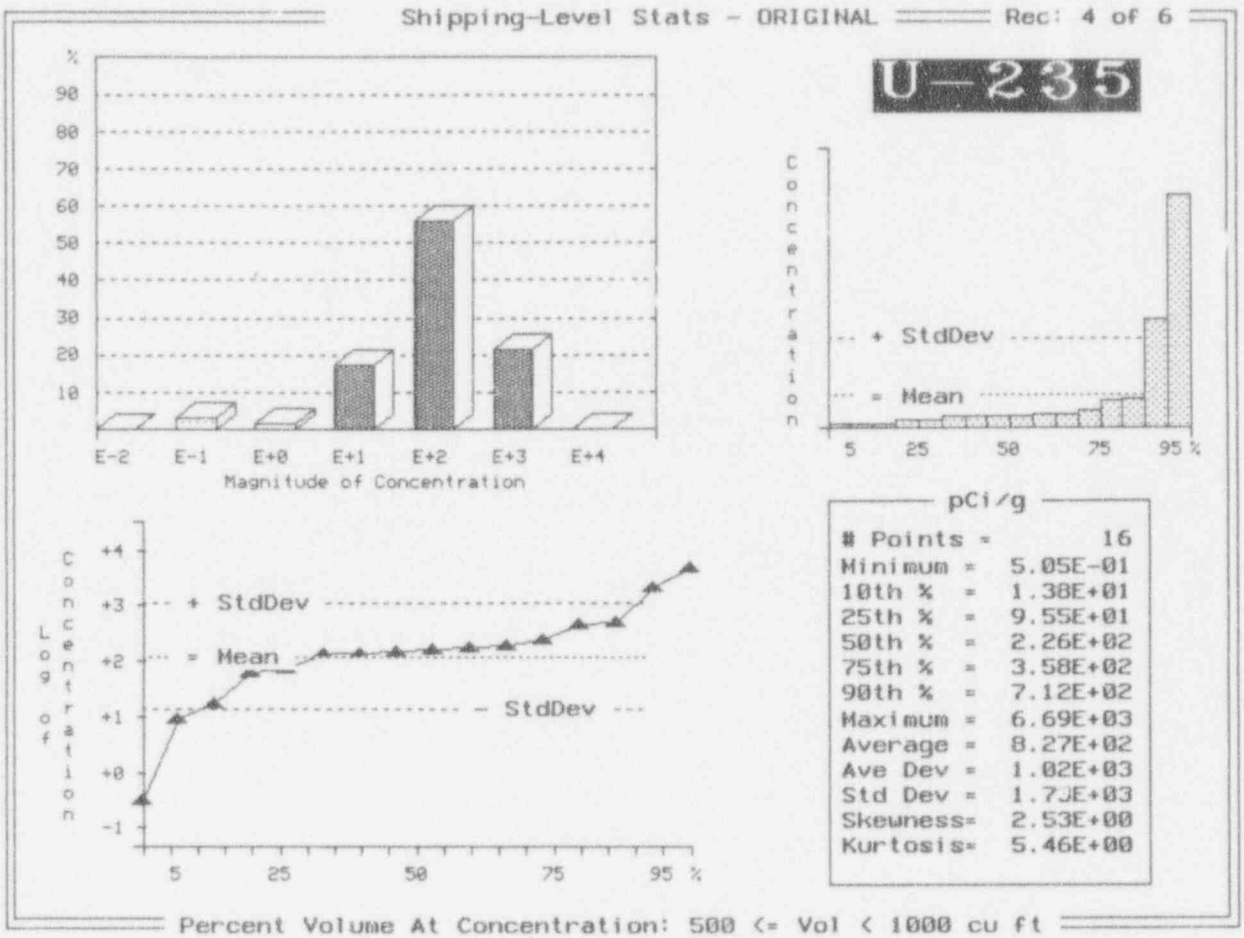


Exhibit H-8 (Continued)

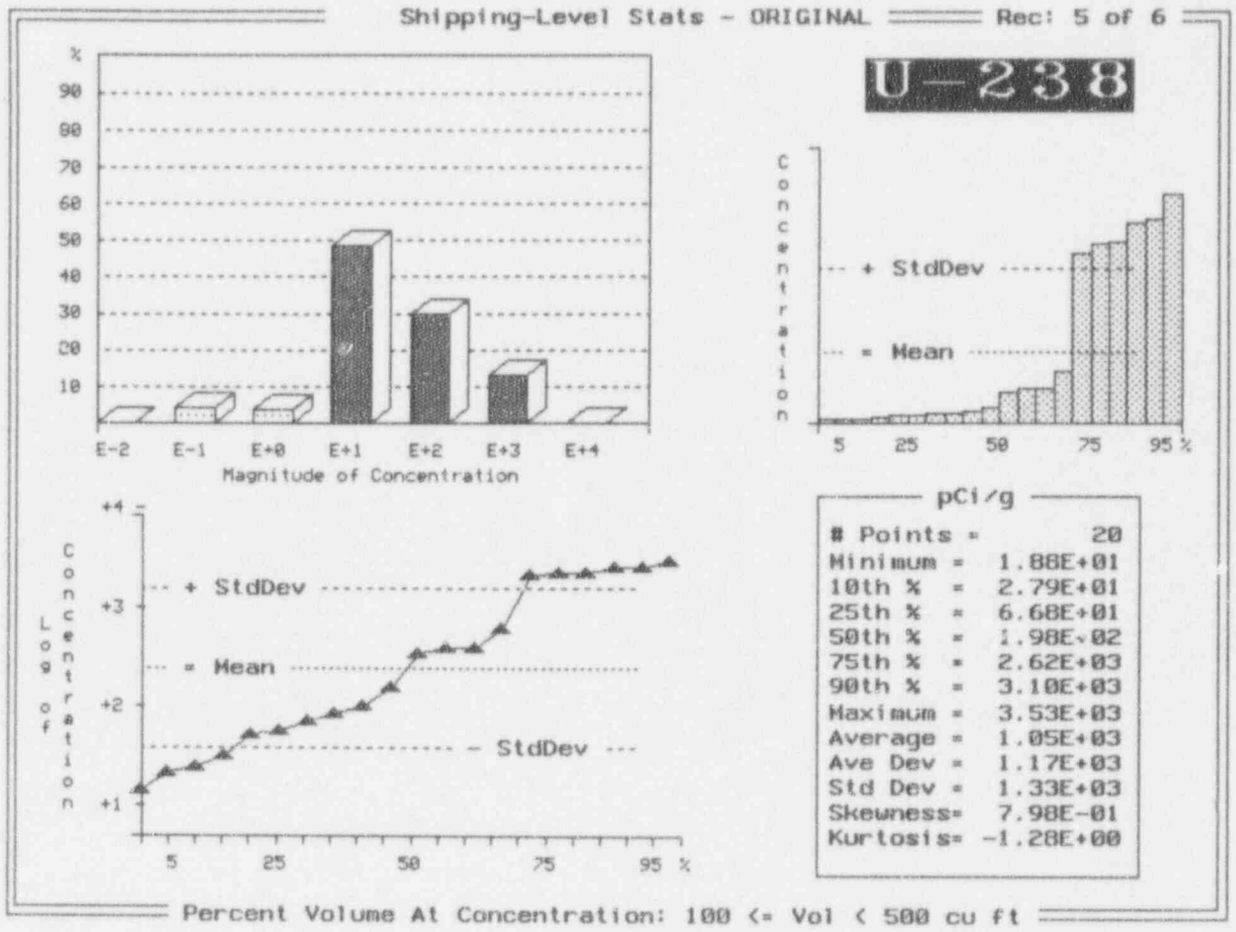


Exhibit H-8 (Continued)

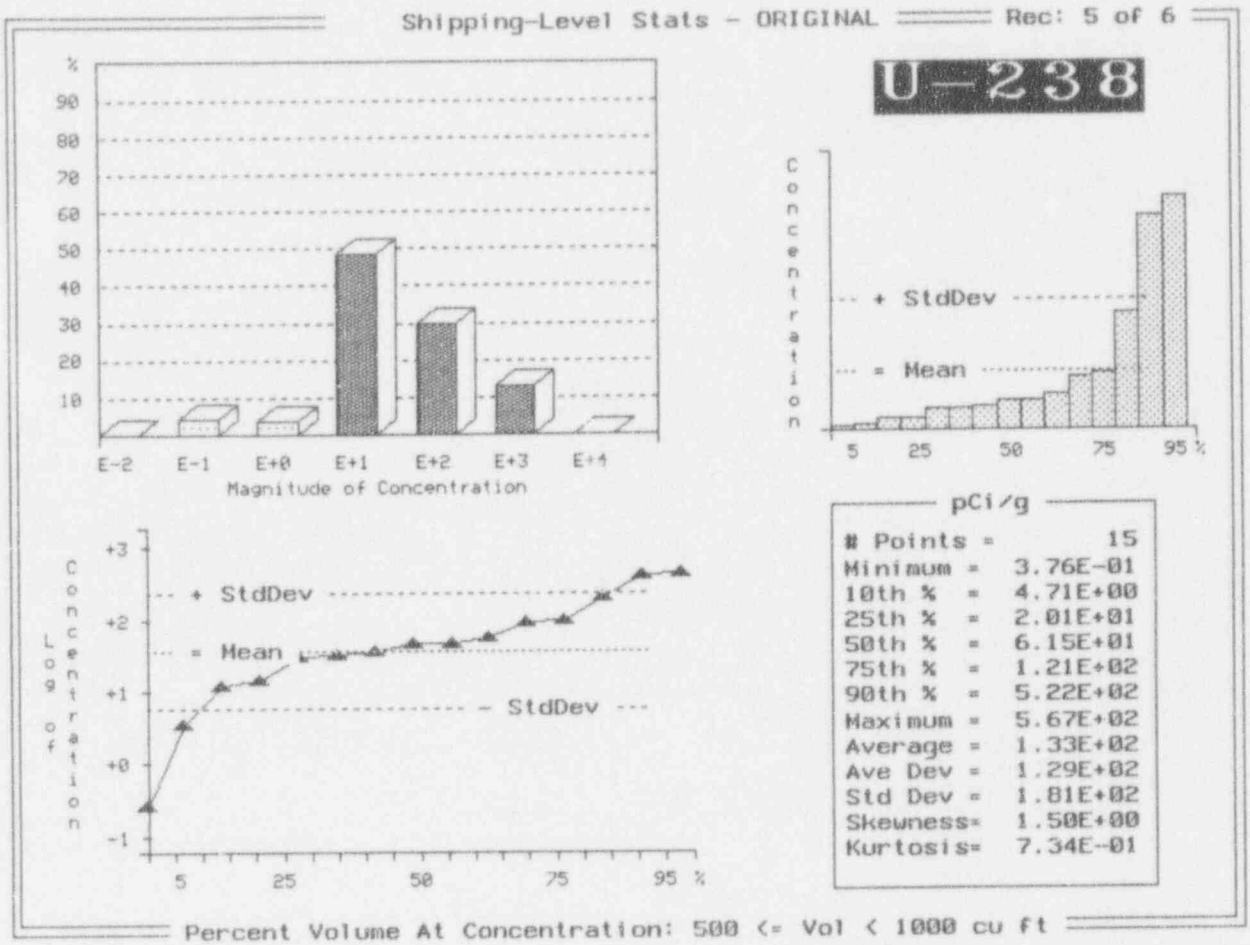


Exhibit H-8 (Continued)

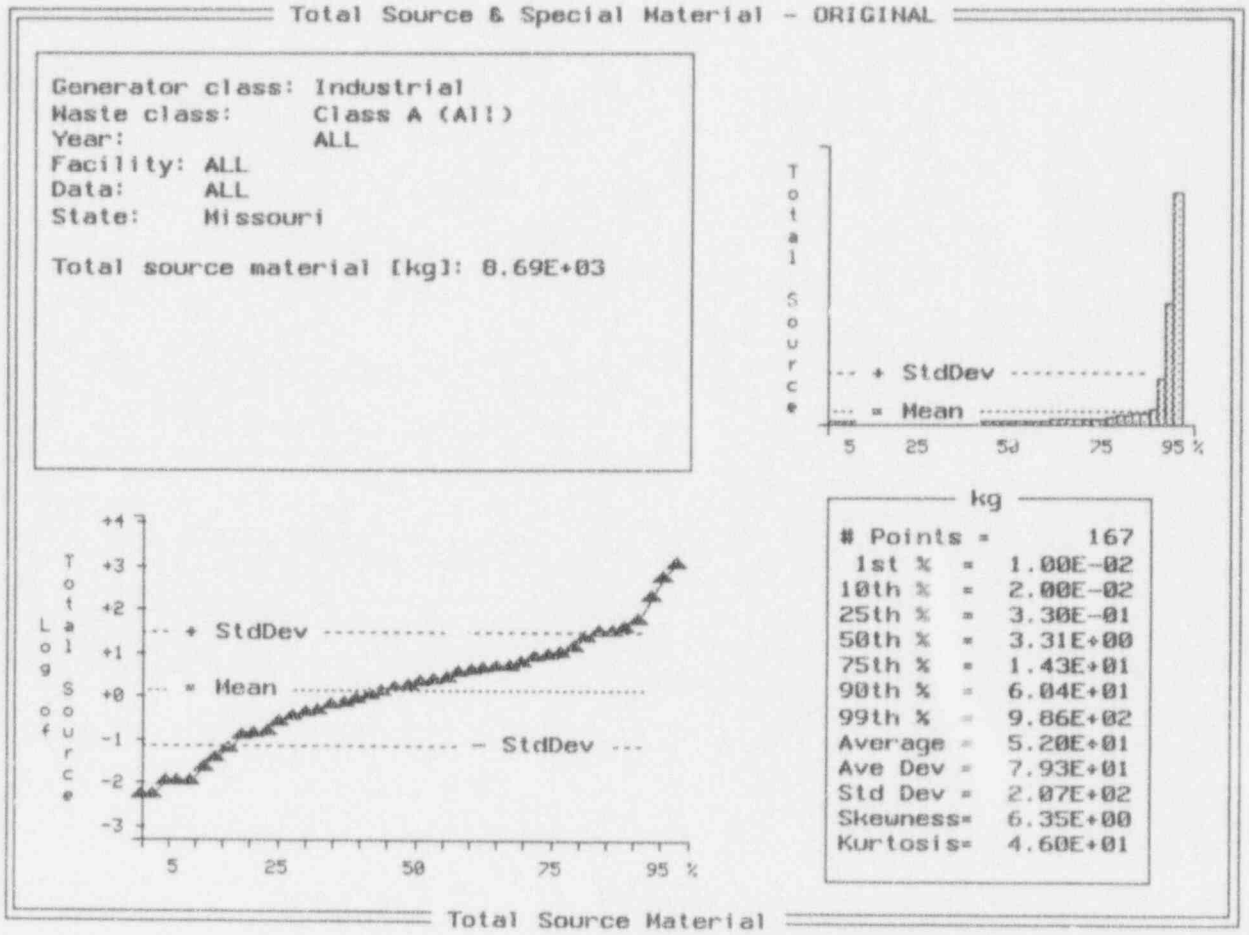
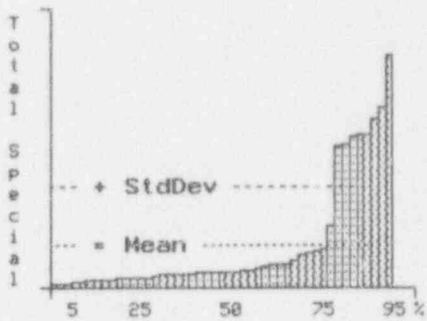


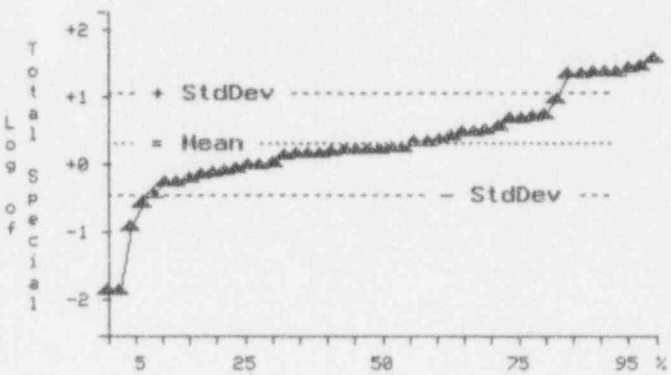
Exhibit H-8 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: Missouri

Special material [g]: 4.01E+02





g

# Points =	47
Minimum =	2.00E-02
10th % =	5.20E-01
25th % =	1.19E+00
50th % =	2.41E+00
75th % =	6.66E+00
90th % =	3.31E+01
Maximum =	5.12E+01
Average =	8.53E+00
Ave Dev =	9.63E+00
Std Dev =	1.32E+01
Skewness=	1.76E+00
Kurtosis=	1.69E+00

Total Special Material

Exhibit H-9 Tennessee Fuel Fabrication Facilities
Radionuclide Distributions - Shipment Level[a]

Waste Class: A-Unstable and A-Stable
Number of shipping records: 578
Number of shipping containers: 210
Total waste volume: 7,538 m^3
Total waste mass: 7,712,000 Kg
Average waste form density: 1.02 g/cm^3

	Concentration Ranges - Percentile[b] - Ci/m^3 -			- pCi/g -		
Nuclide	1st	50th	99th	1st	50th	99th
Am-241	3.14E-07	1.38E-05	3.95E-05	3.07E-01	1.35E+01	3.86E+01
Pu-238	3.14E-07	2.14E-06	7.05E-06	3.07E-01	2.09E+00	6.89E+00
Pu-239	1.11E-06	2.59E-05	7.51E-05	1.08E+00	2.53E+01	7.34E+01
Pu-240	3.14E-07	8.75E-06	2.54E-05	3.07E-01	8.55E+00	2.48E+01
Pu-241	2.22E-06	8.54E-05	2.47E-04	2.17E+00	8.35E+01	2.42E+02
Th-232	3.23E-01	4.22E-01	7.40E-01	3.15E+05	4.13E+05	7.23E+05
U-232*	7.34E-02	7.34E-02	7.34E-02	7.17E+04	7.17E+04	7.17E+04
U-235	3.88E-07	1.76E-04	5.06E-02	3.79E-01	1.72E+02	4.95E+04
U-238	8.62E-04	7.63E-02	2.39E-01	8.43E+02	7.46E+04	2.34E+05
Dep-3#	1.44E-04	1.16E-01	6.15E-01	1.41E+02	1.14E+05	6.01E+05
Dep-38#	5.24E-02	2.51E-01	8.68E-01	5.12E+04	2.46E+05	8.49E+05
U-dep*#	2.83E-03	2.83E-03	2.83E-03	2.39E+03	2.39E+03	2.39E+03
U-nat*	2.81E-03	2.81E-03	2.81E-03	2.57E+03	2.57E+03	2.57E+03

(a) Based on direct shipment data to all three disposal sites from 1986 to 1990.
(b) The concentration of nuclides tagged with an asterisk are based on a single value. In such instances, the percentile distribution does not apply. Nuclides identified with the pound symbol (#) signify depleted uranium.

Exhibit H-9 (Continued)

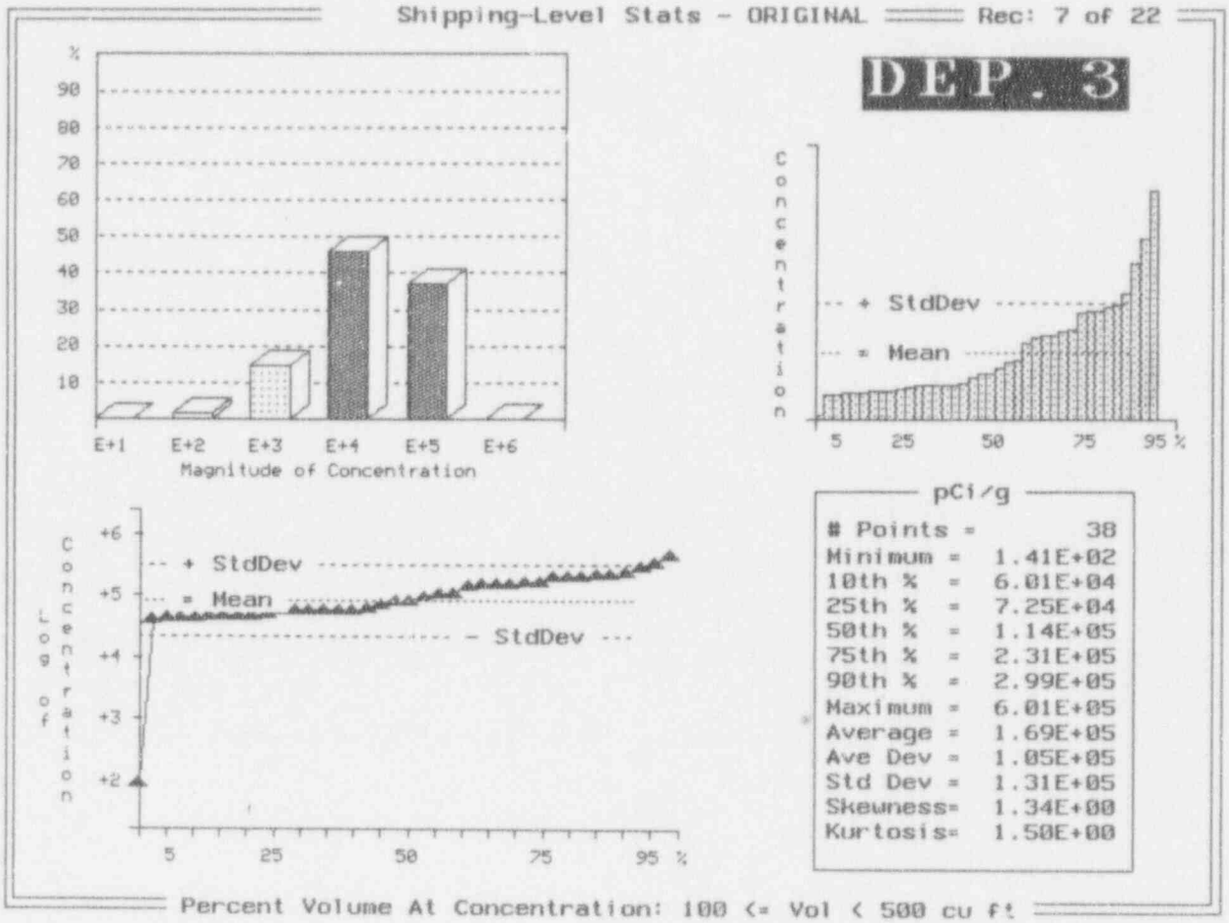


Exhibit H-9 (Continued)

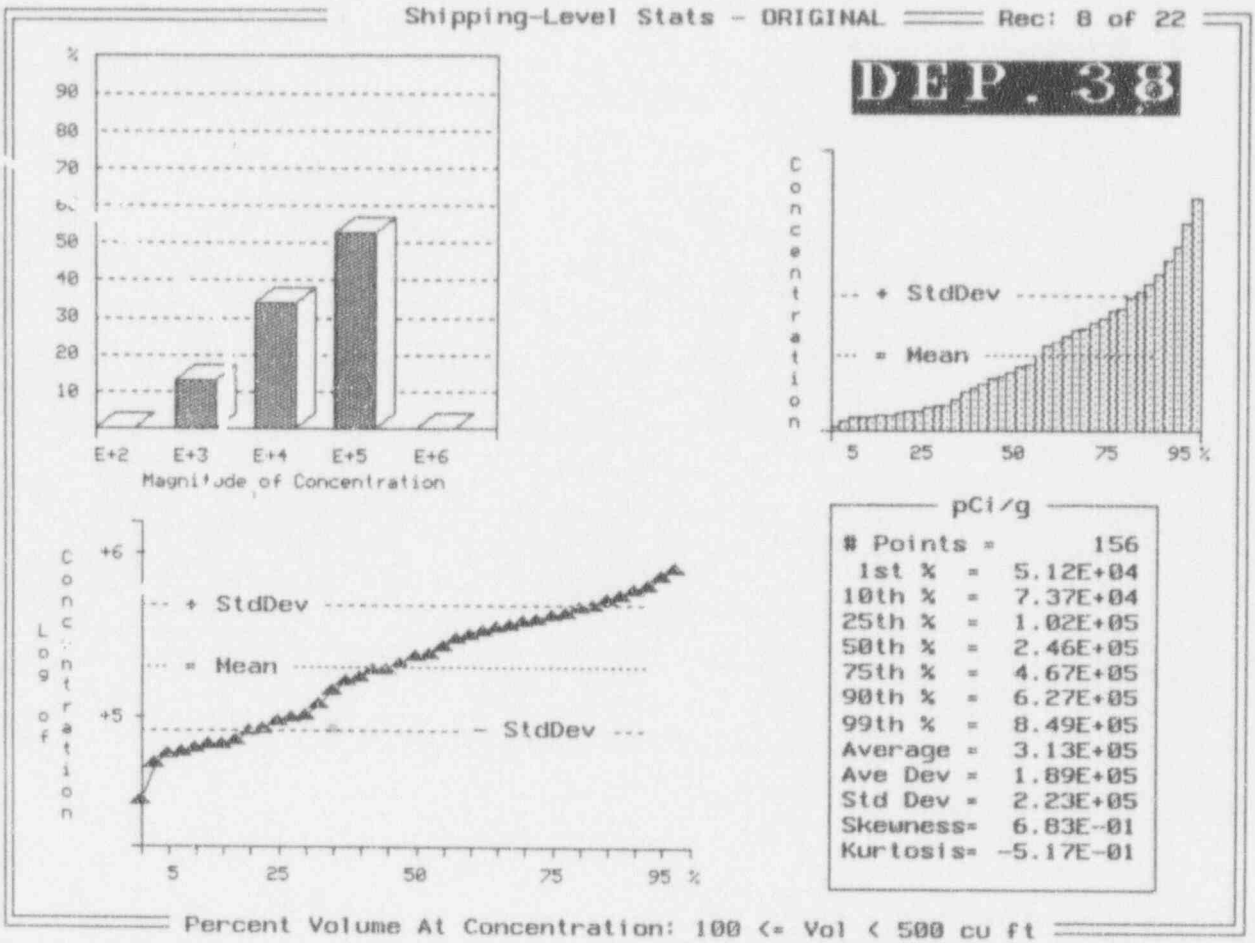


Exhibit H-9 (Continued)

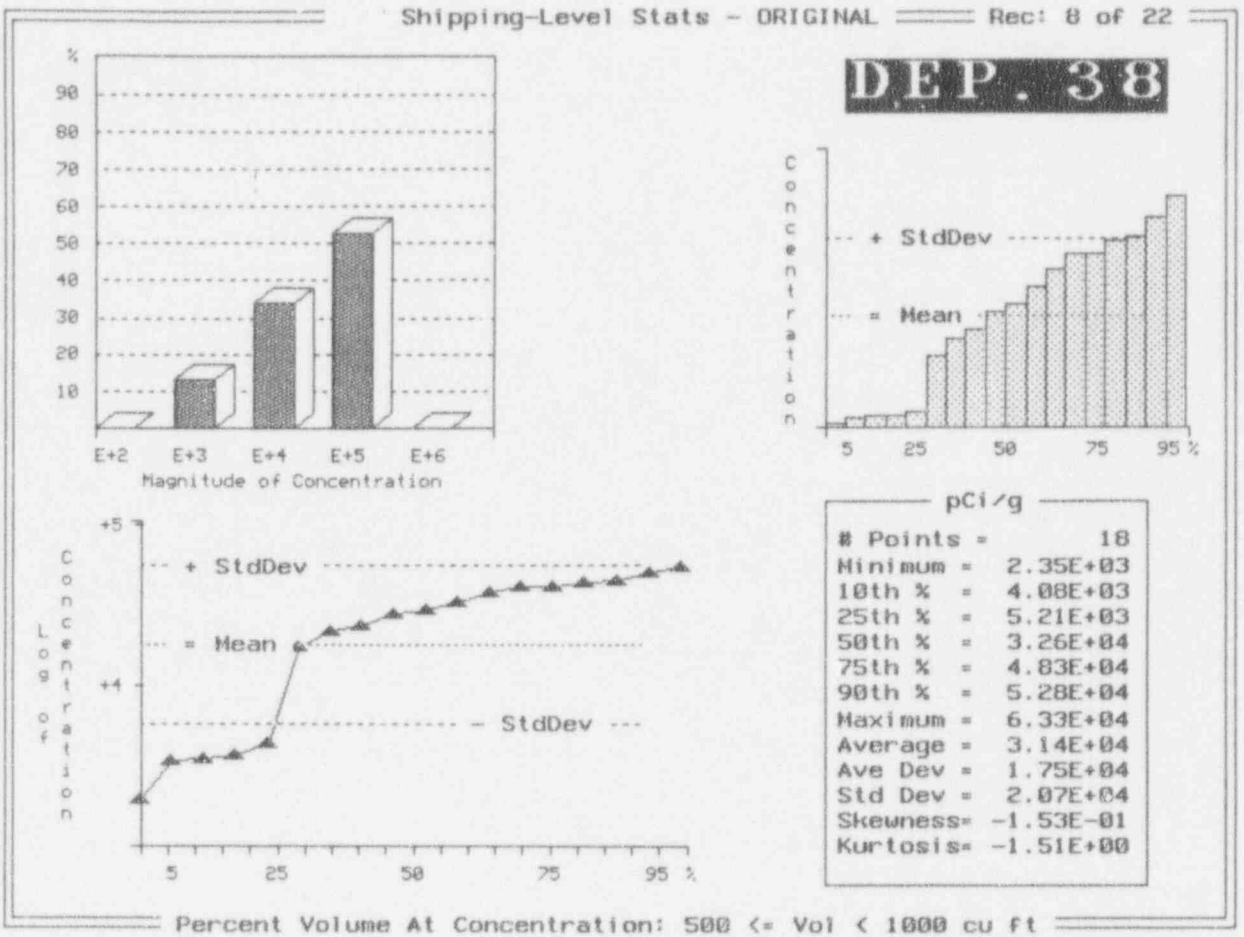


Exhibit H-9 (Continued)

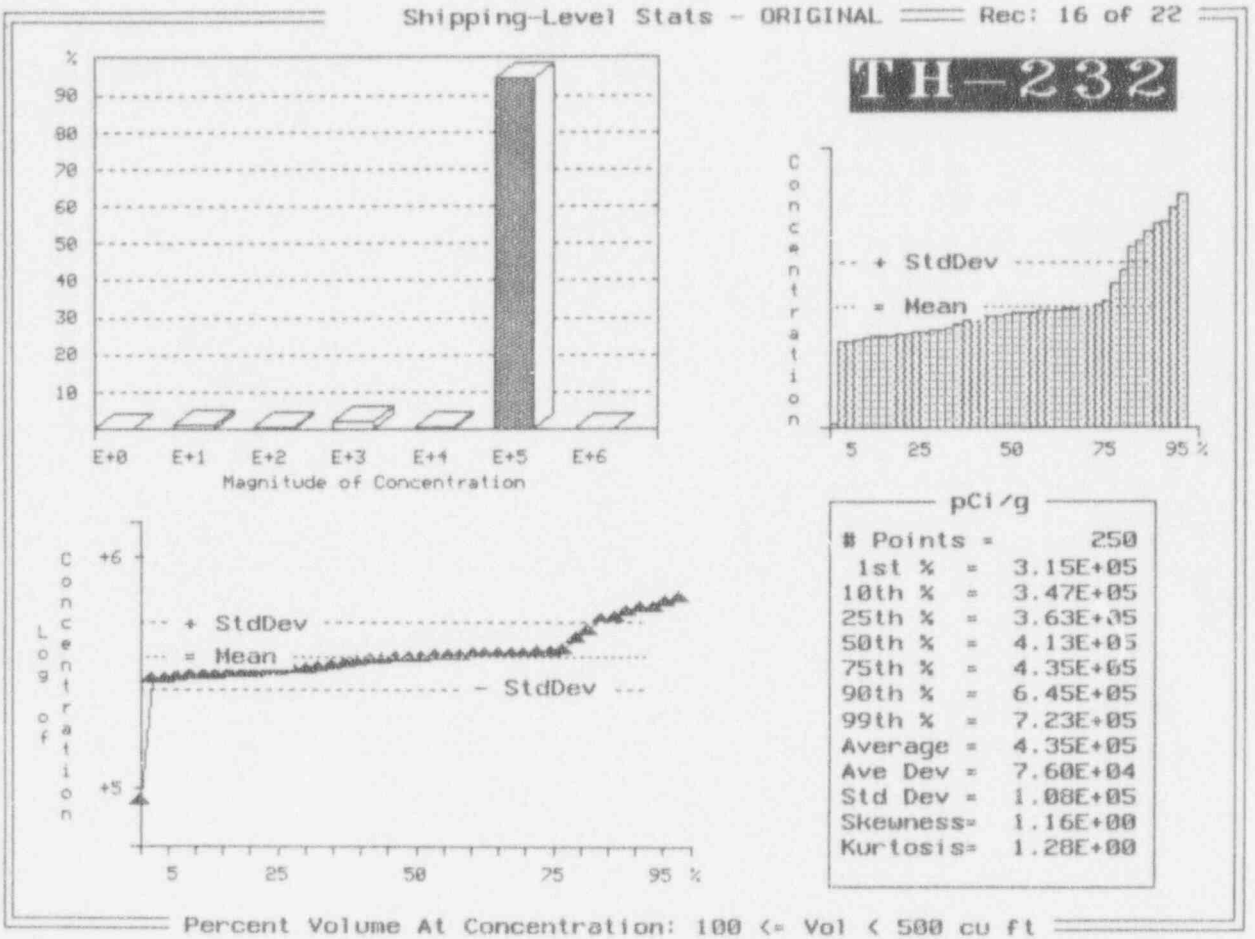


Exhibit H-9 (Continued)

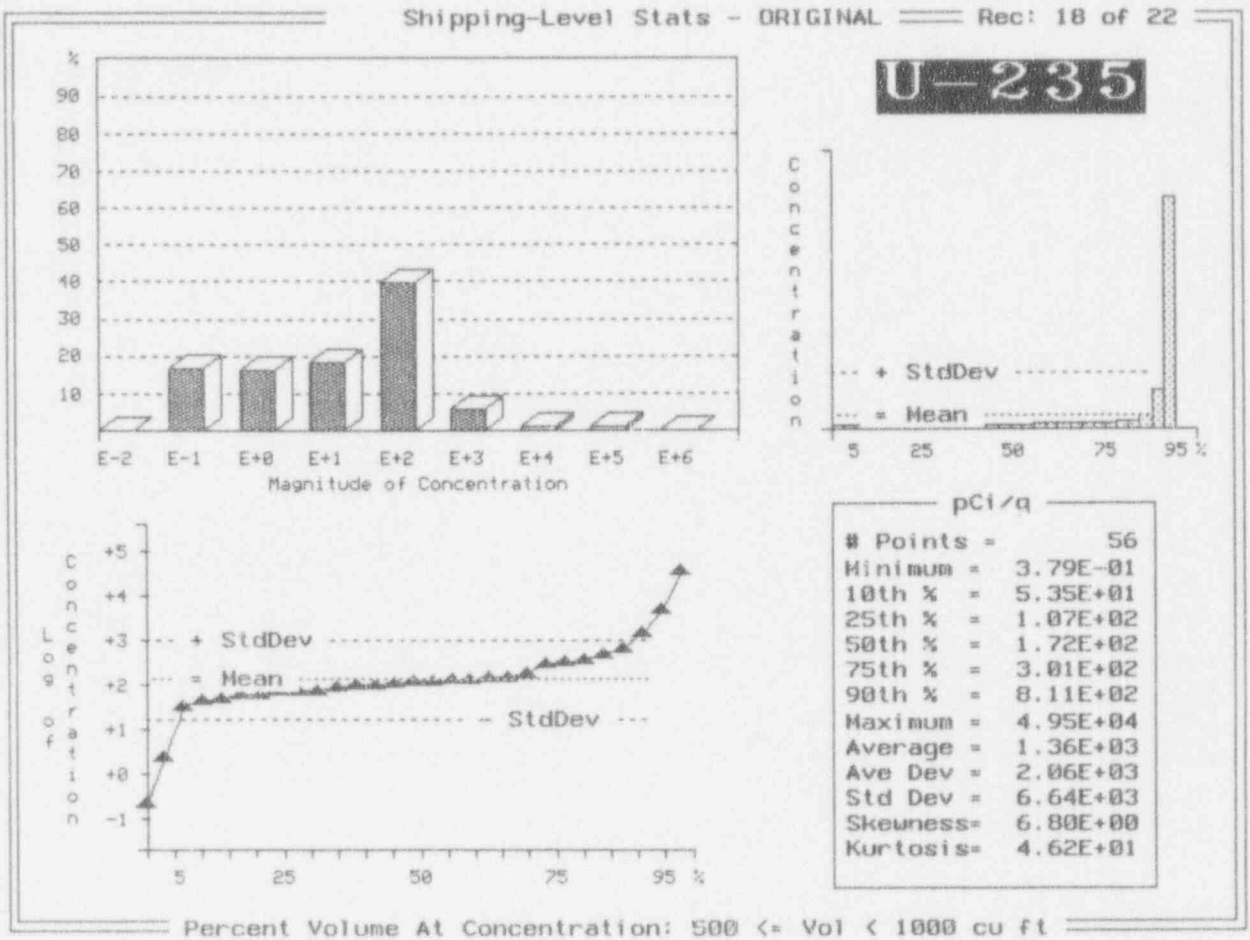


Exhibit H-9 (Continued)

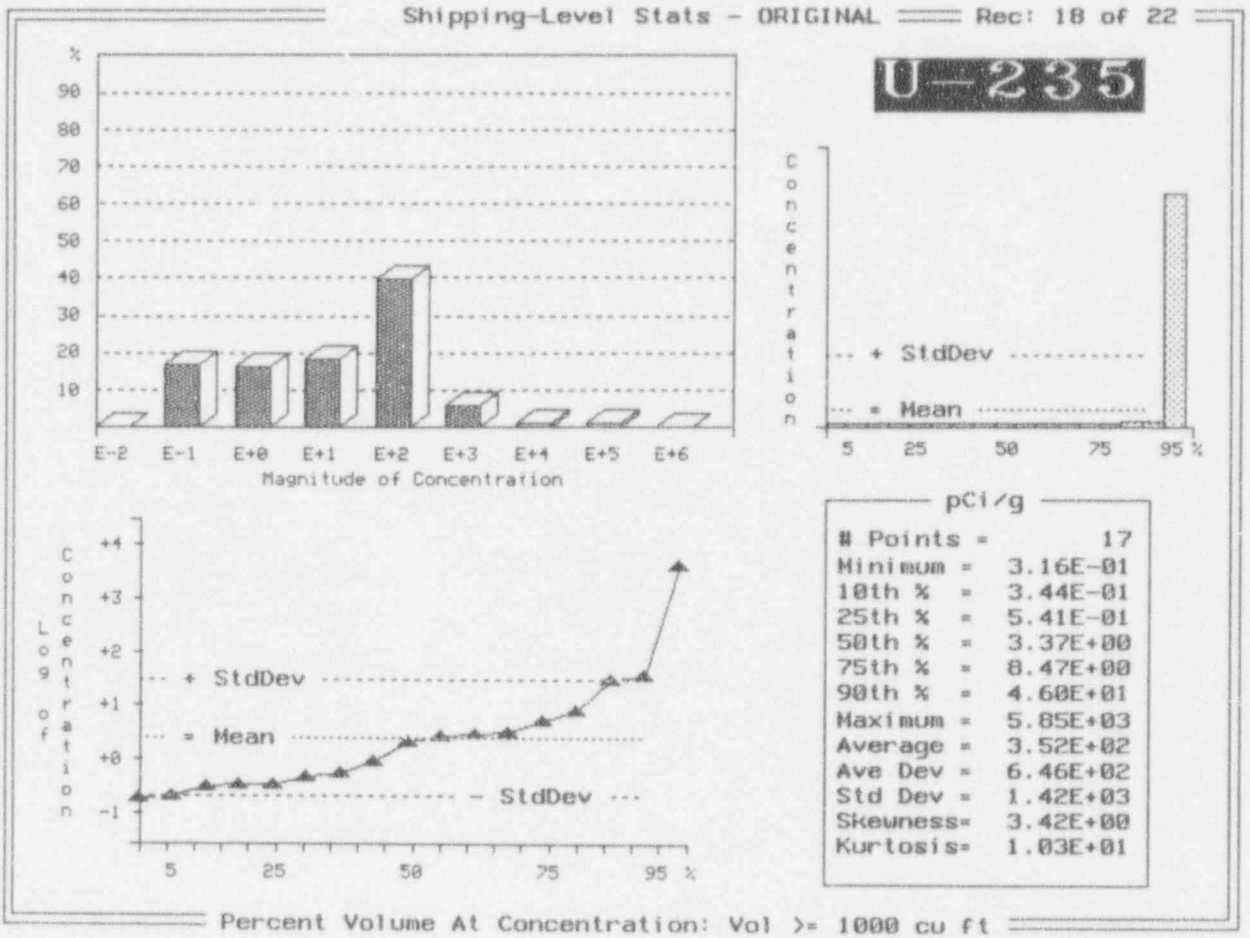


Exhibit H-9 (Continued)

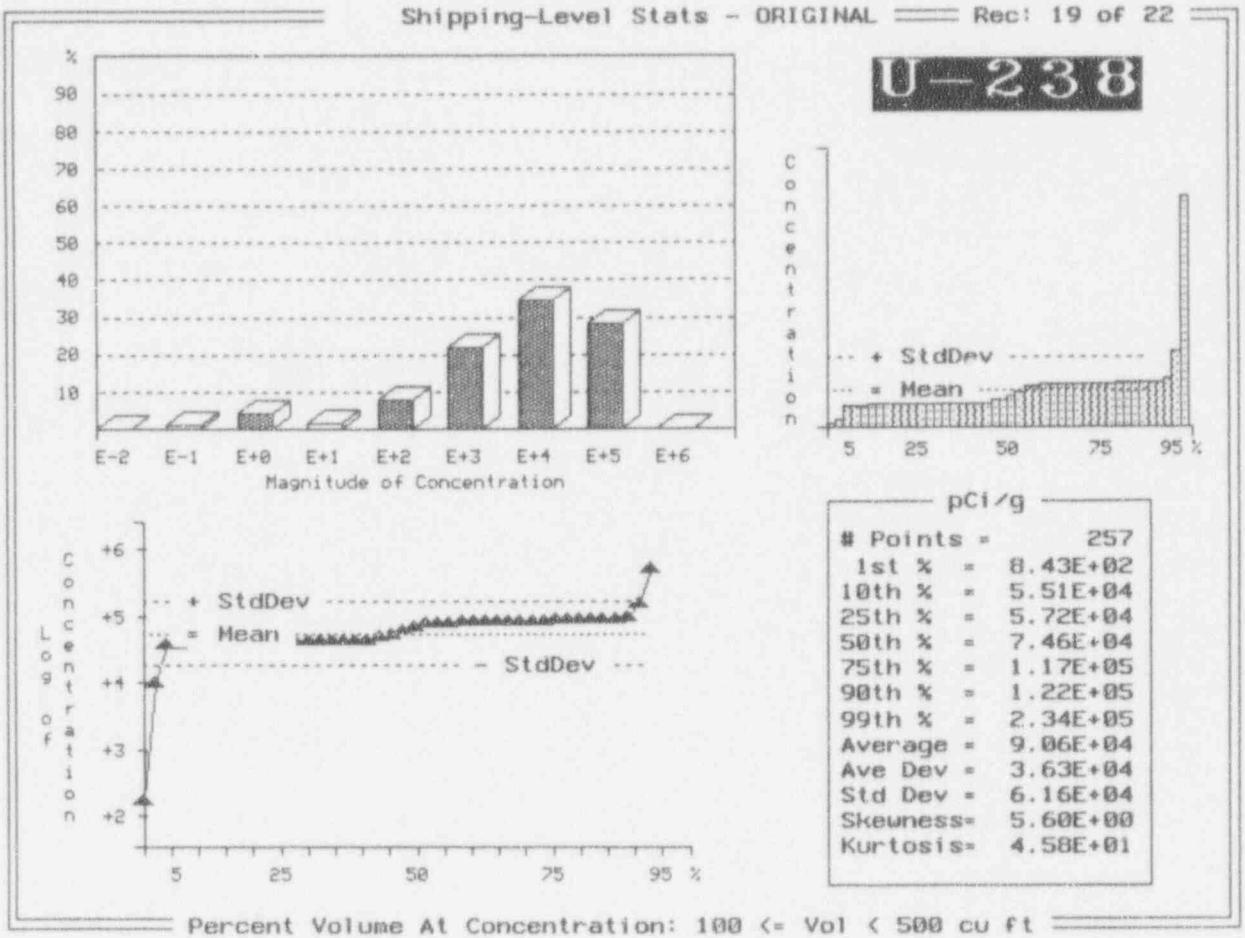


Exhibit H-9 (Continued)

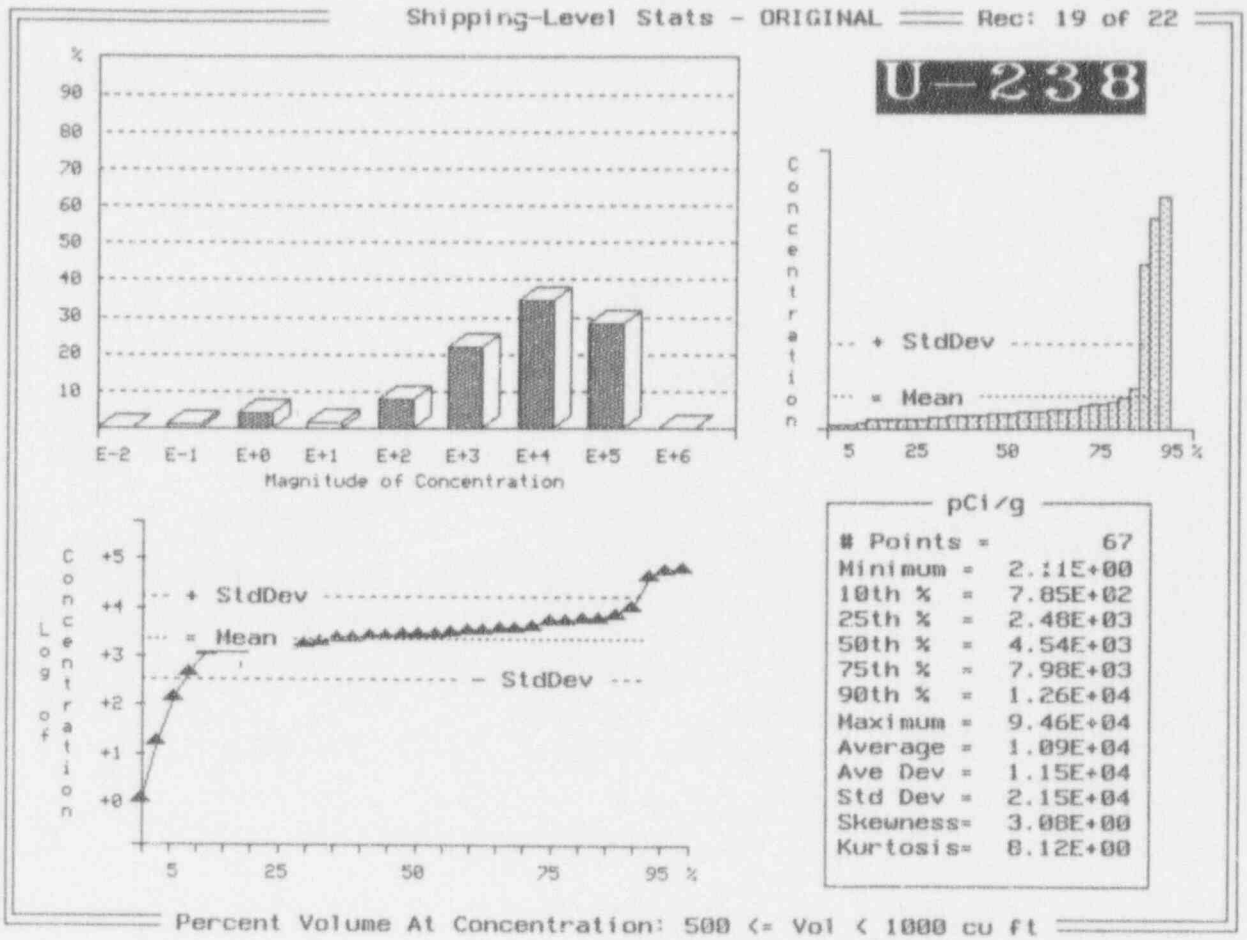
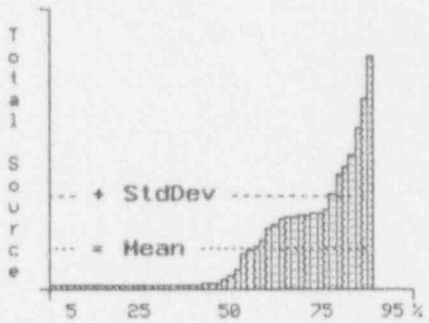


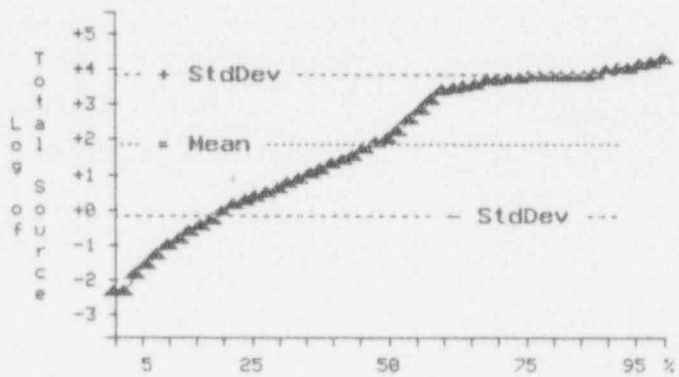
Exhibit H-9 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: Tennessee

Total source material [kg]: 5.84E+06





kg

# Points =	1192
1st % =	1.00E-02
10th % =	1.90E-01
25th % =	4.24E+00
50th % =	1.94E+02
75th % =	9.73E+03
90th % =	1.55E+04
99th % =	2.76E+04
Average =	4.90E+03
Ave Dev =	5.64E+03
Std Dev =	6.89E+03
Skewness=	1.48E+00
Kurtosis=	1.71E+00

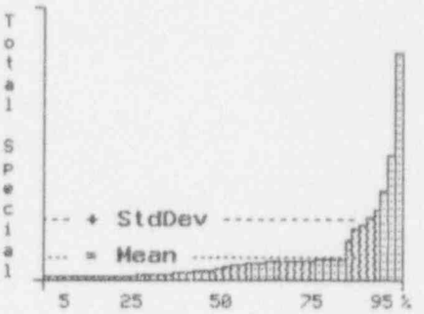
Total Source Material

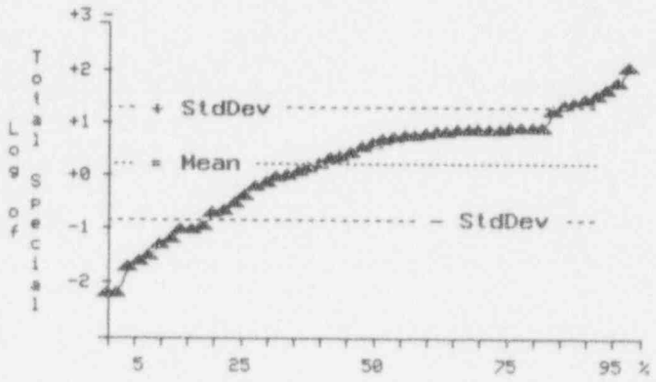
Exhibit H-9 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: Tennessee

Special material [g]: 4.18E+03





g

# Points =	344
1st % =	1.00E-02
10th % =	7.00E-02
25th % =	4.90E-01
50th % =	5.84E+00
75th % =	1.10E+01
90th % =	3.56E+01
99th % =	1.03E+02
Average =	1.22E+01
Ave Dev =	1.25E+01
Std Dev =	2.12E+01
Skewness=	3.38E+00
Kurtosis=	1.39E+01

Total Special Material

Exhibit H-10 Washington Fuel Fabrication Facilities
Radionuclide Distributions - Shipment Level[a]

Waste Class: A-Unstable and A-Stable
Number of shipping records: 43
Number of shipping containers: 97
Total waste volume: 916.3 m^3
Total waste mass: 937,400 Kg
Average waste form density: 1.02 g/cm^3

Nuclide	Concentration Ranges - Percentile[b] - Ci/m^3 - 1st	50th	99th	- pCi/g - 1st	50th	99th
Am-241	6.73E-07	1.03E-05	1.99E-05	6.47E-01	2.42E-01	4.77E+01
Cm-242*	1.35E-06	1.35E-06	1.35E-06	1.29E+00	1.29E+00	1.29E+00
Cm-244*	5.47E-06	5.47E-06	5.47E-06	1.31E+01	1.31E+01	1.31E+01
Pu-238	4.71E-06	6.91E-06	9.11E-06	2.19E+01	2.35E+01	2.50E+01
Pu-239	2.77E-07	1.38E-04	6.66E-04	2.71E-01	3.66E+02	1.78E+03
Pu-240	4.71E-06	6.23E-06	7.75E-06	1.47E+01	1.66E+01	1.86E+01
Pu-242*	6.73E-07	6.73E-07	6.73E-07	6.47E-01	6.47E-01	6.47E-01
Th-232	2.35E-06	3.53E-06	4.71E-06	6.29E+00	8.65E+00	1.10E+01
Th-234*	9.88E-07	9.88E-07	9.88E-07	8.54E-01	8.54E-01	8.54E-01
Th-nat*	2.01E-05	2.01E-05	2.01E-05	1.96E+01	1.96E+01	1.96E+01
U-235	2.58E-08	1.27E-06	6.65E-05	2.52E-02	1.56E+00	6.50E+01
U-238	9.21E-08	9.11E-05	6.71E-02	9.00E-02	8.91E+01	6.56E+04
U-dep#	6.05E-06	3.09E-03	6.16E-03	5.82E+00	1.09E+04	2.19E+04
U-nat	6.73E-07	3.27E-02	1.60E-01	6.47E-01	3.21E+04	1.56E+05

(a) Based on direct shipment data to all three disposal sites from 1986 to 1990.
(b) The concentration of nuclides tagged with an asterisk are based on a single value. In such instances, the percentile distribution does not apply. Nuclides identified with the pound symbol (#) signify depleted uranium.

Exhibit H-10 (Continued)

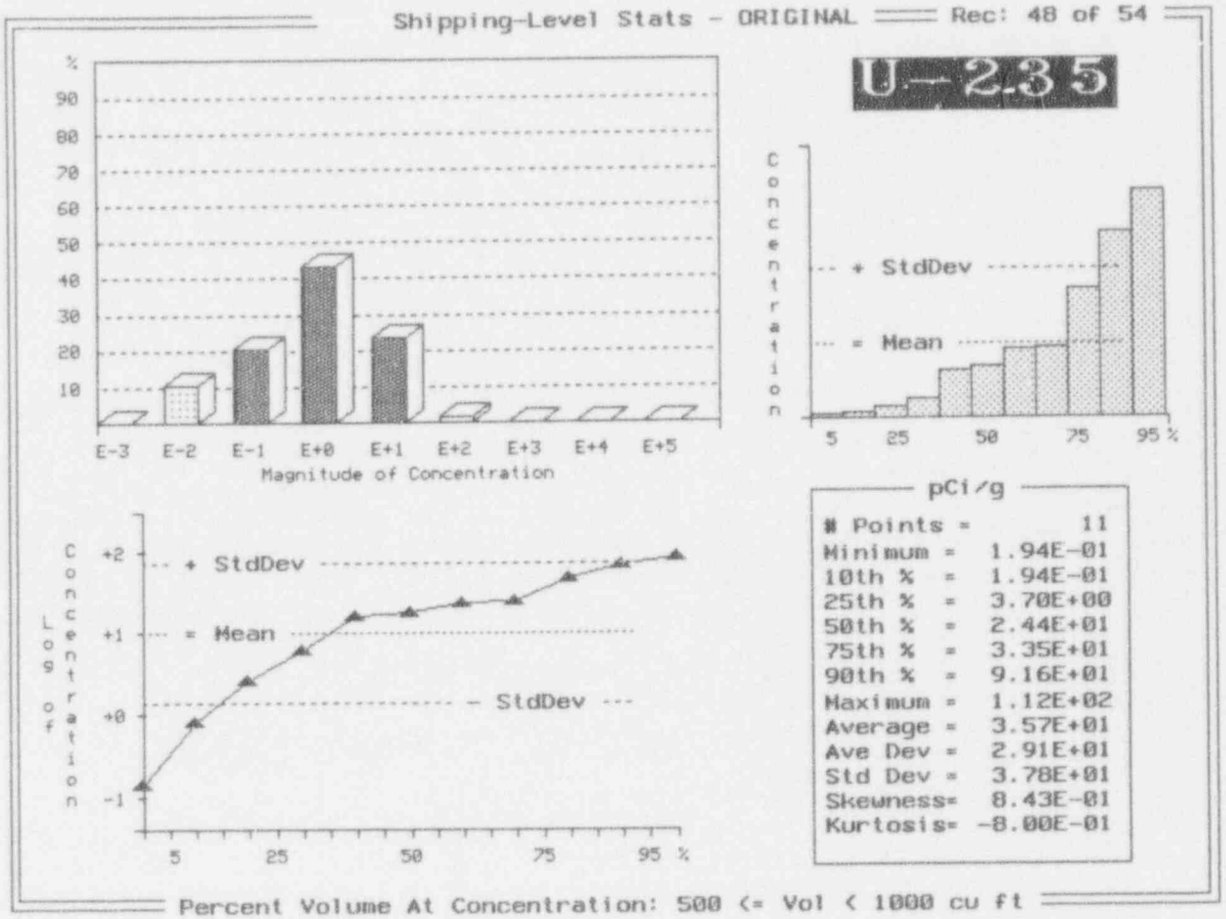


Exhibit H-10 (Continued)

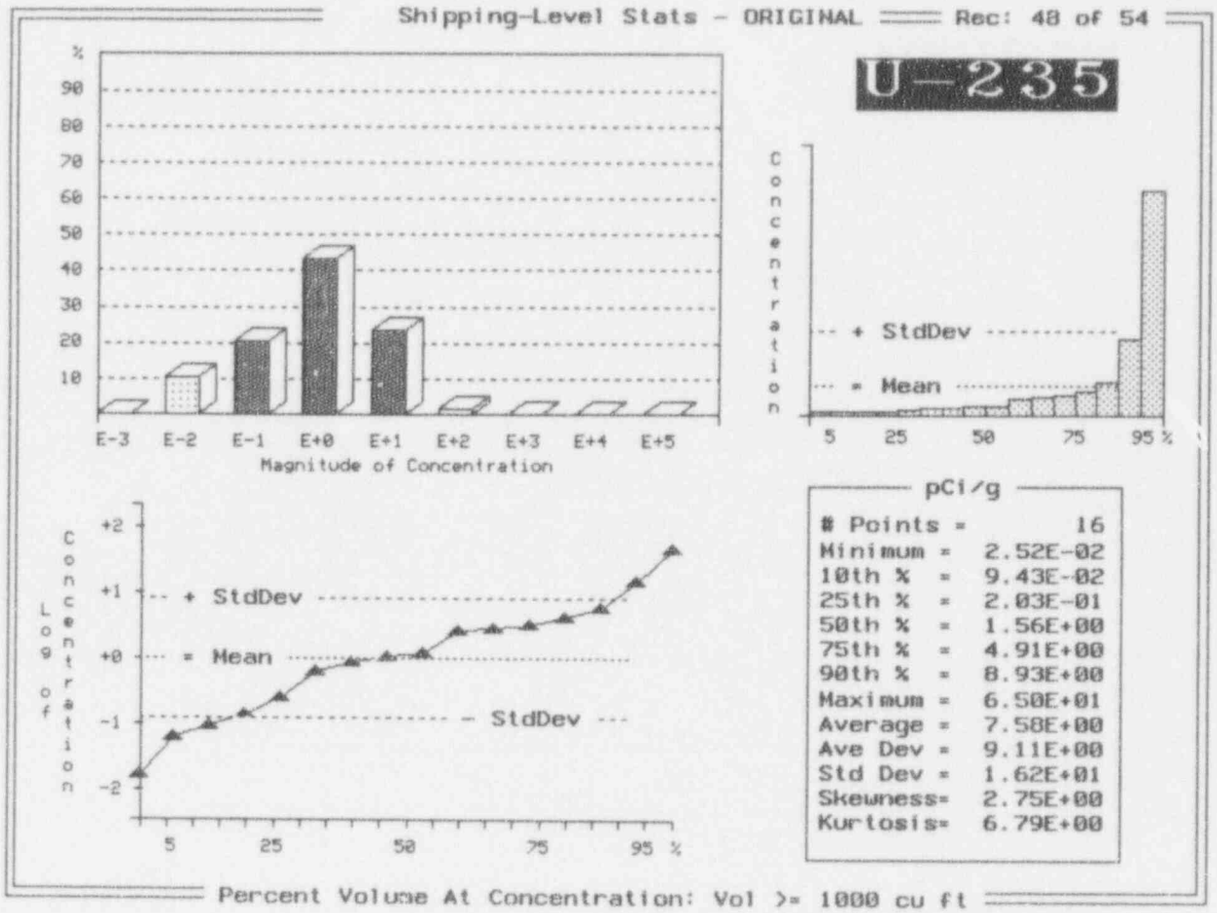


Exhibit H-10 (Continued)

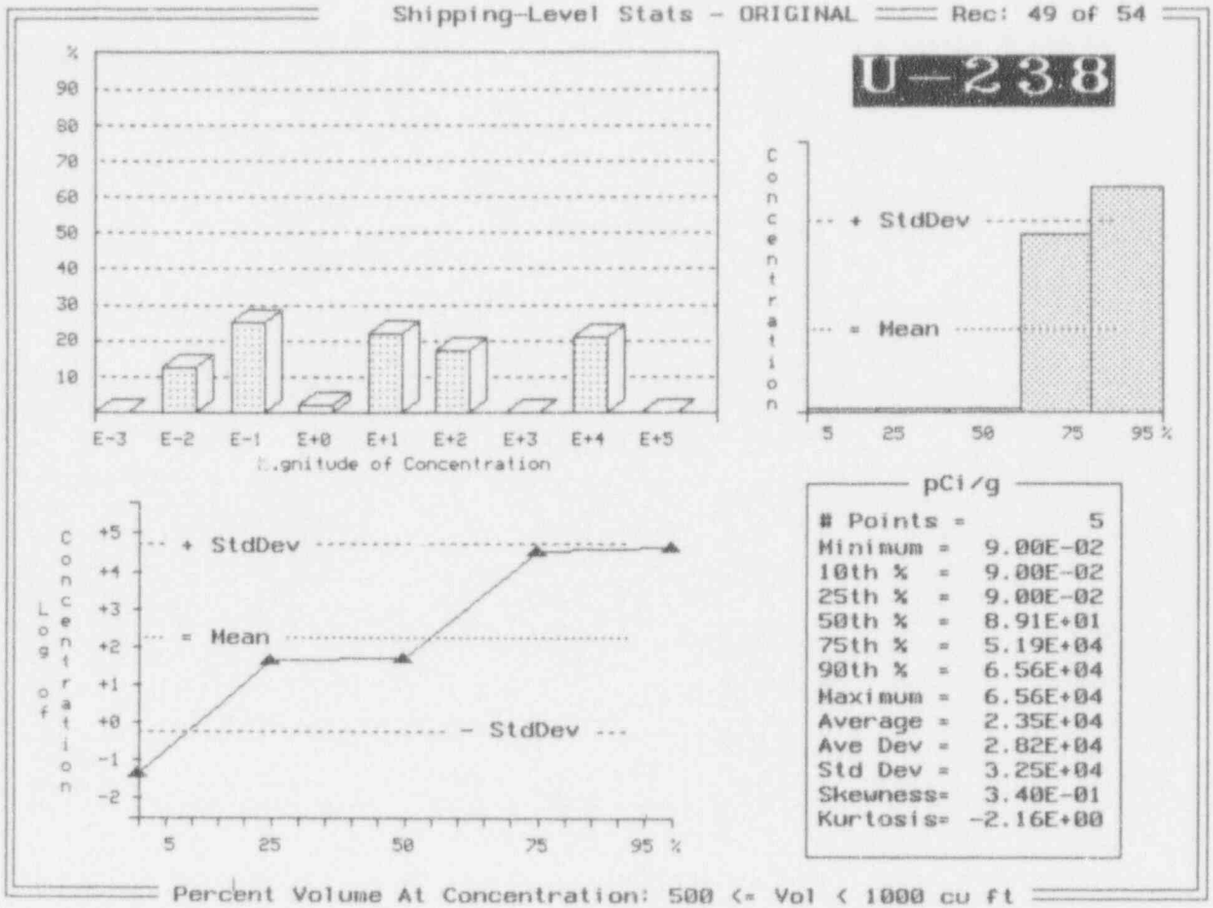
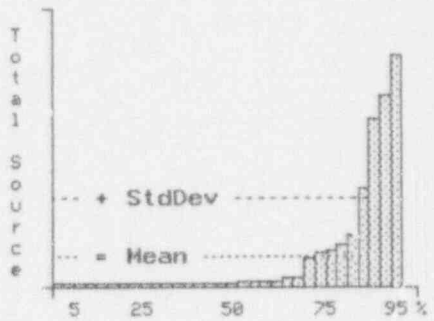


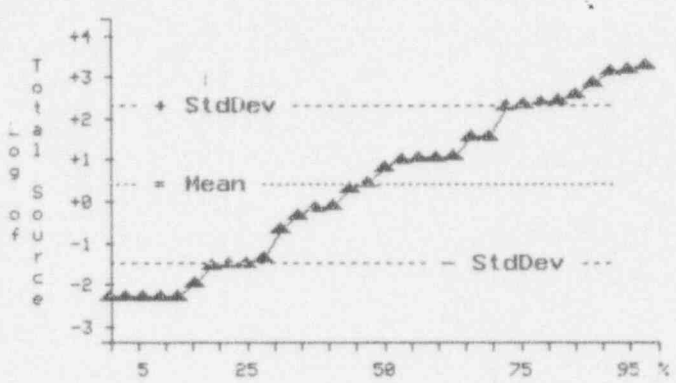
Exhibit H-10 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: Washington

Total source material [kg]: 1.04E+04





kg

# Points =	32
Minimum =	1.00E-02
10th % =	1.00E-02
25th % =	6.00E-02
50th % =	4.97E+00
75th % =	2.90E+02
90th % =	1.14E+03
Maximum =	2.73E+03
Average =	3.25E+02
Ave Dev =	4.56E+02
Std Dev =	7.04E+02
Skewness=	2.30E+00
Kurtosis=	4.13E+00

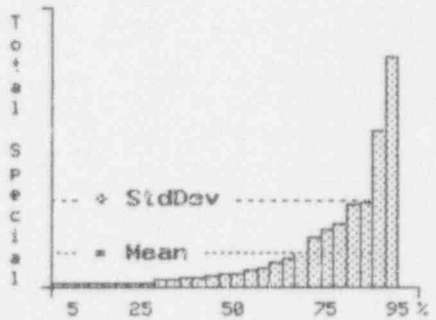
Total Source Material

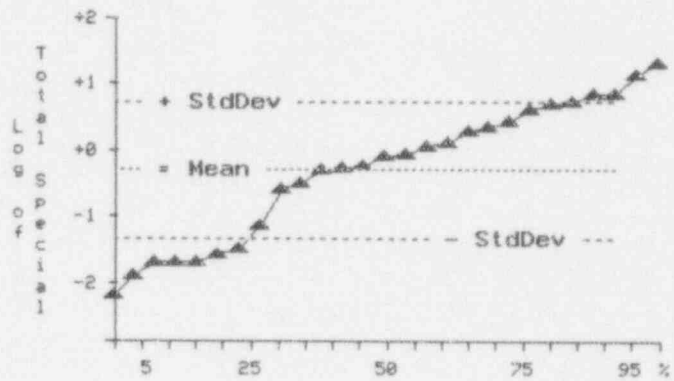
Exhibit H-10 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: Washington

Special material [g]: 1.07E+02





g

# Points =	27
Minimum =	1.00E-02
10th % =	3.00E-02
25th % =	5.00E-02
50th % =	1.18E+00
75th % =	3.91E+00
90th % =	9.84E+00
Maximum =	2.84E+01
Average =	3.96E+00
Ave Dev =	4.43E+00
Std Dev =	6.59E+00
Skewness=	2.32E+00
Kurtosis=	5.15E+00

Total Special Material

Exhibit H-11 California Fuel Fabrication Facilities
Radionuclide Distributions - Shipment Level[a]

Waste Class: A-Unstable and A-Stable
Number of shipping records: 71
Number of shipping containers: 744
Total waste volume: 958.6 m^3
Total waste mass: 980,600 Kg
Average waste form density: 1.02 g/cm^3

	Concentration Ranges - Percentile[b] - Ci/m^3 -			- pCi/g -		
Nuclide	1st	50th	99th	1st	50th	99th
Am-241	4.90E-08	2.93E-05	1.41E-04	4.79E-02	2.86E+01	1.38E+02
Np-237*	3.63E-06	3.63E-06	3.63E-06	1.01E+01	1.01E+01	1.01E+01
Pu-236*	4.74E-07	4.74E-07	4.74E-07	5.33E-01	5.33E-01	5.33E-01
Pu-238*	1.13E-04	1.13E-04	1.13E-04	1.11E+02	1.11E+02	1.11E+02
Pu-239	4.74E-08	4.88E-06	9.71E-06	5.33E-02	4.77E+00	9.49E+00
Pu-242*	9.48E-08	9.48E-08	9.48E-08	1.07E-01	1.07E-01	1.07E-01
Th-228	1.20E-07	1.67E-06	3.71E-04	1.17E-01	1.63E+00	1.00E+03
Th-230	7.74E-07	1.10E-06	1.43E-06	7.57E-01	1.57E+00	2.39E+00
Th-232	3.33E-05	5.06E-04	2.35E-03	3.25E+01	4.95E+02	2.30E+03
Th-nat	3.21E-07	2.92E-05	4.22E-02	6.68E-01	3.28E+01	5.58E+04
U-233*	4.06E-03	4.06E-03	4.06E-03	5.83E+03	5.83E+03	5.83E+03
U-234	4.90E-08	5.65E-03	2.23E-02	4.79E-02	1.01E+04	4.37E+04
U-235	4.46E-06	1.10E-04	9.58E-04	9.43E+00	1.24E+02	1.19E+03
U-238	1.79E-07	6.66E-04	3.93E-01	2.52E-01	7.85E+02	3.85E+05
U-Dep*#	7.77E-03	7.77E-03	7.77E-03	1.49E+04	1.49E+04	1.49E+04
Dep-3#	3.17E-04	4.13E-04	4.99E-04	3.09E+02	4.03E+02	4.88E+02
U-nat	3.43E-08	9.57E-03	8.33E-02	5.69E-02	9.35E+03	8.14E+04

(a) Based on direct shipment data to all three disposal sites from 1986 to 1990.
(b) The concentration of nuclides tagged with an asterisk are based on a single value. In such instances, the percentile distribution does not apply. Nuclides identified with the pound symbol (#) signify depleted uranium.

Exhibit H-11 (Continued)

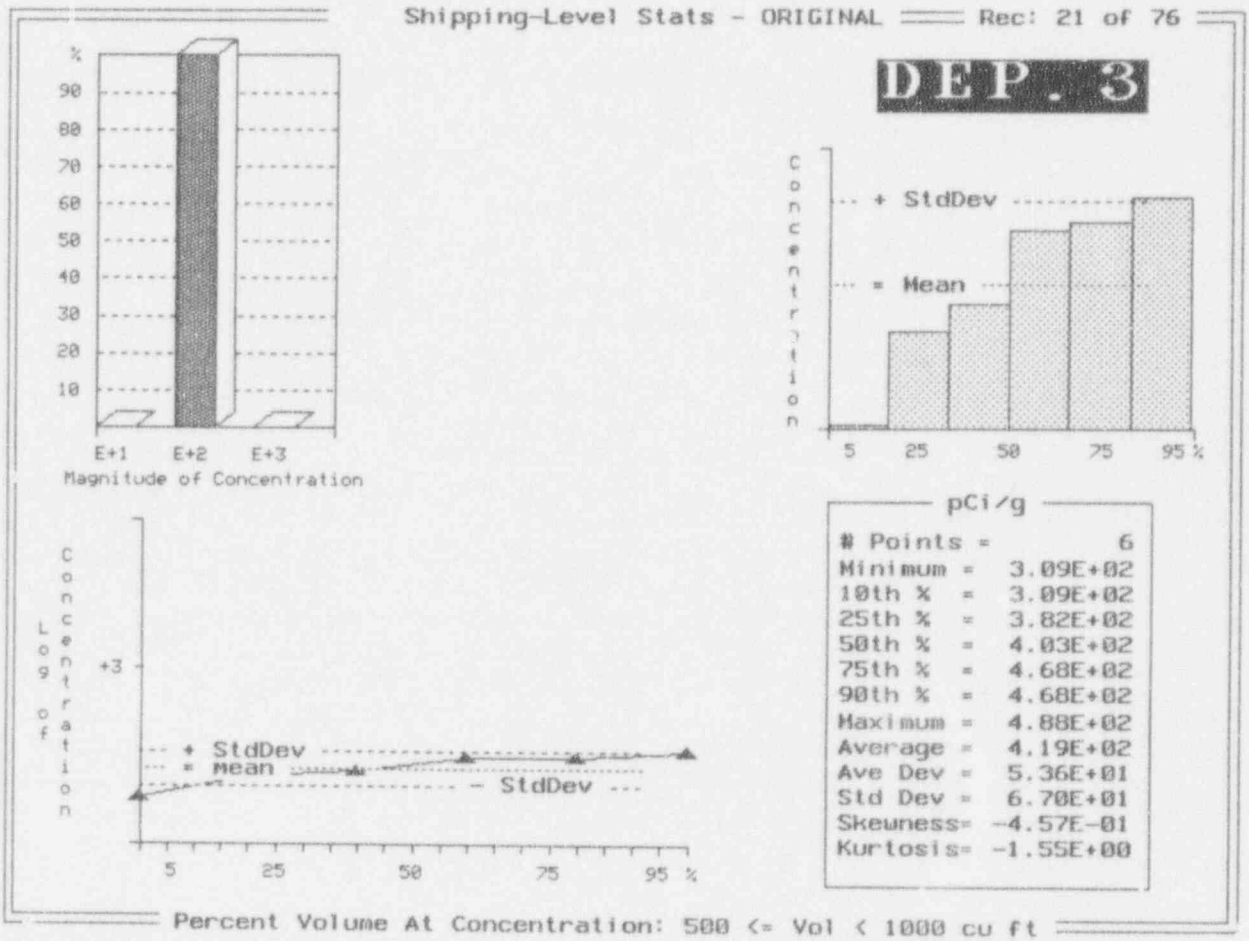


Exhibit H-11 (Continued)

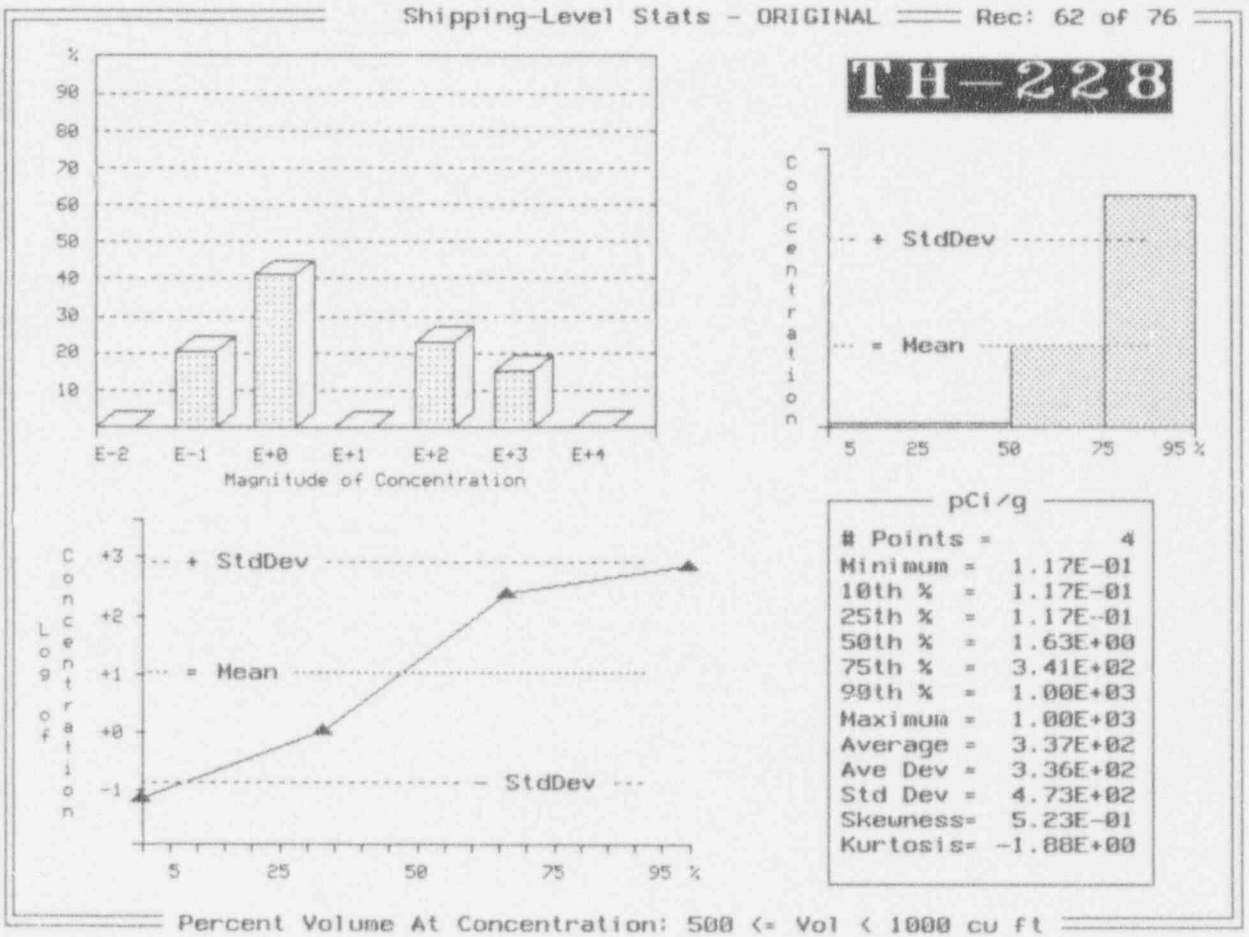


Exhibit H-11 (Continued)

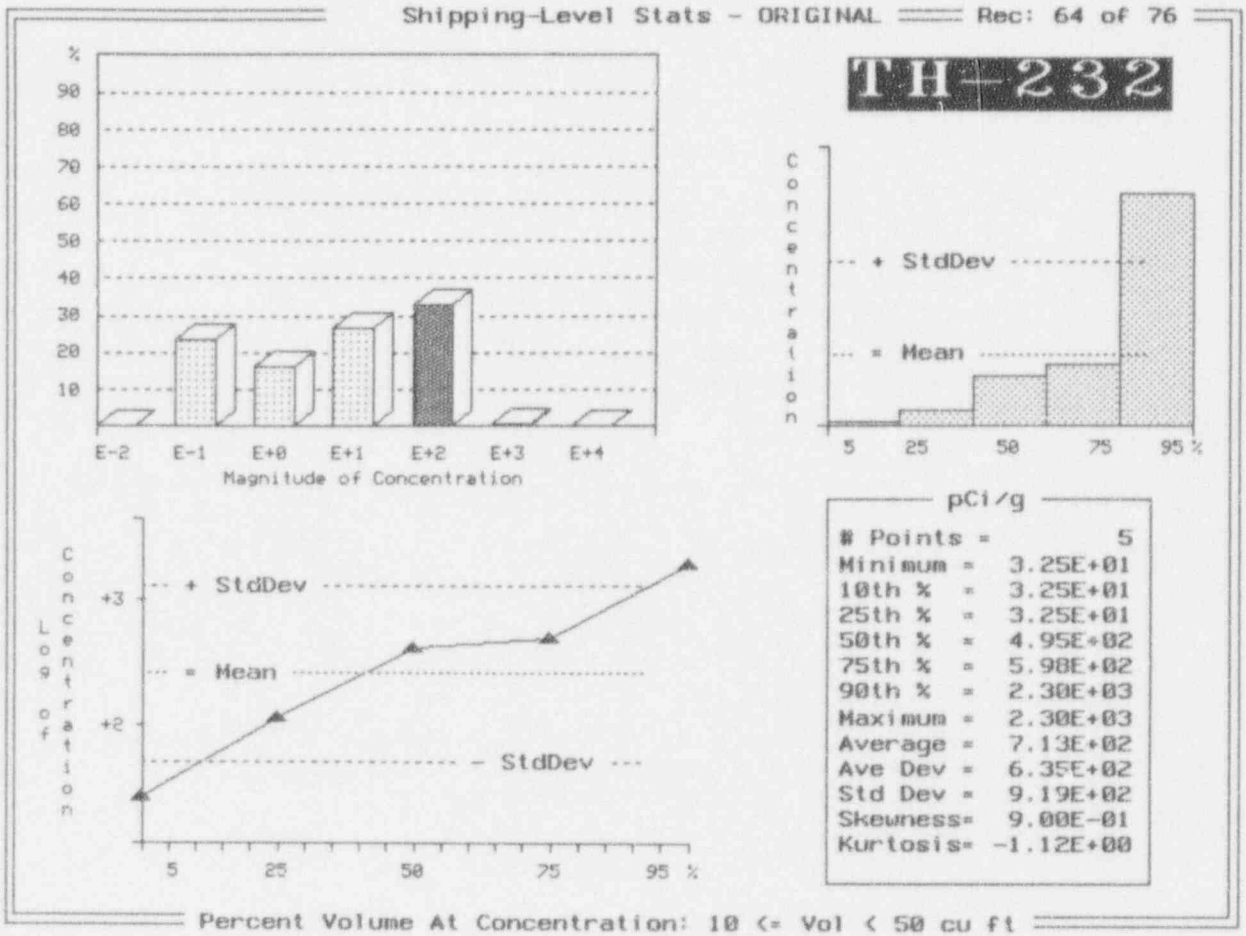


Exhibit H-11 (Continued)

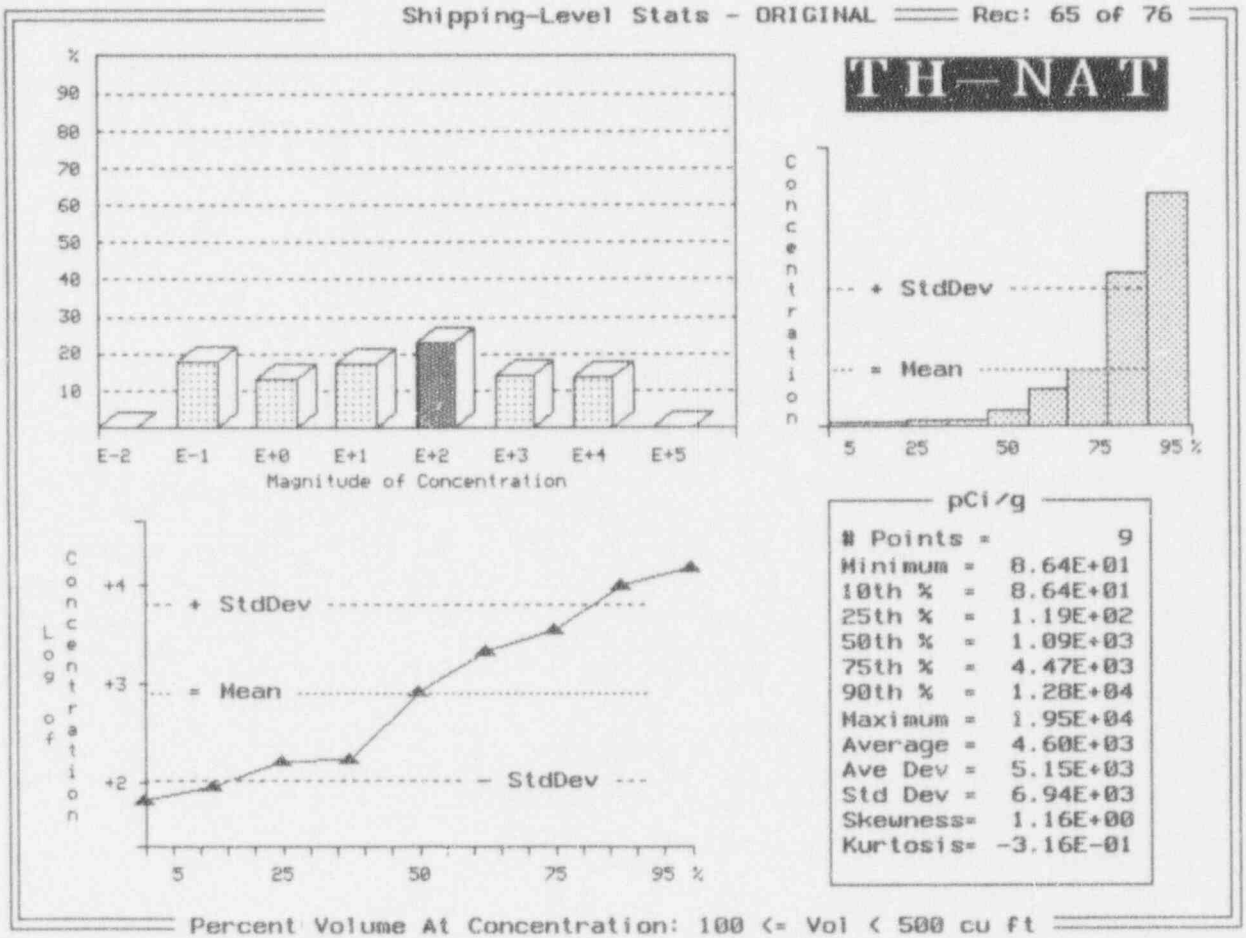


Exhibit H-11 (Continued)

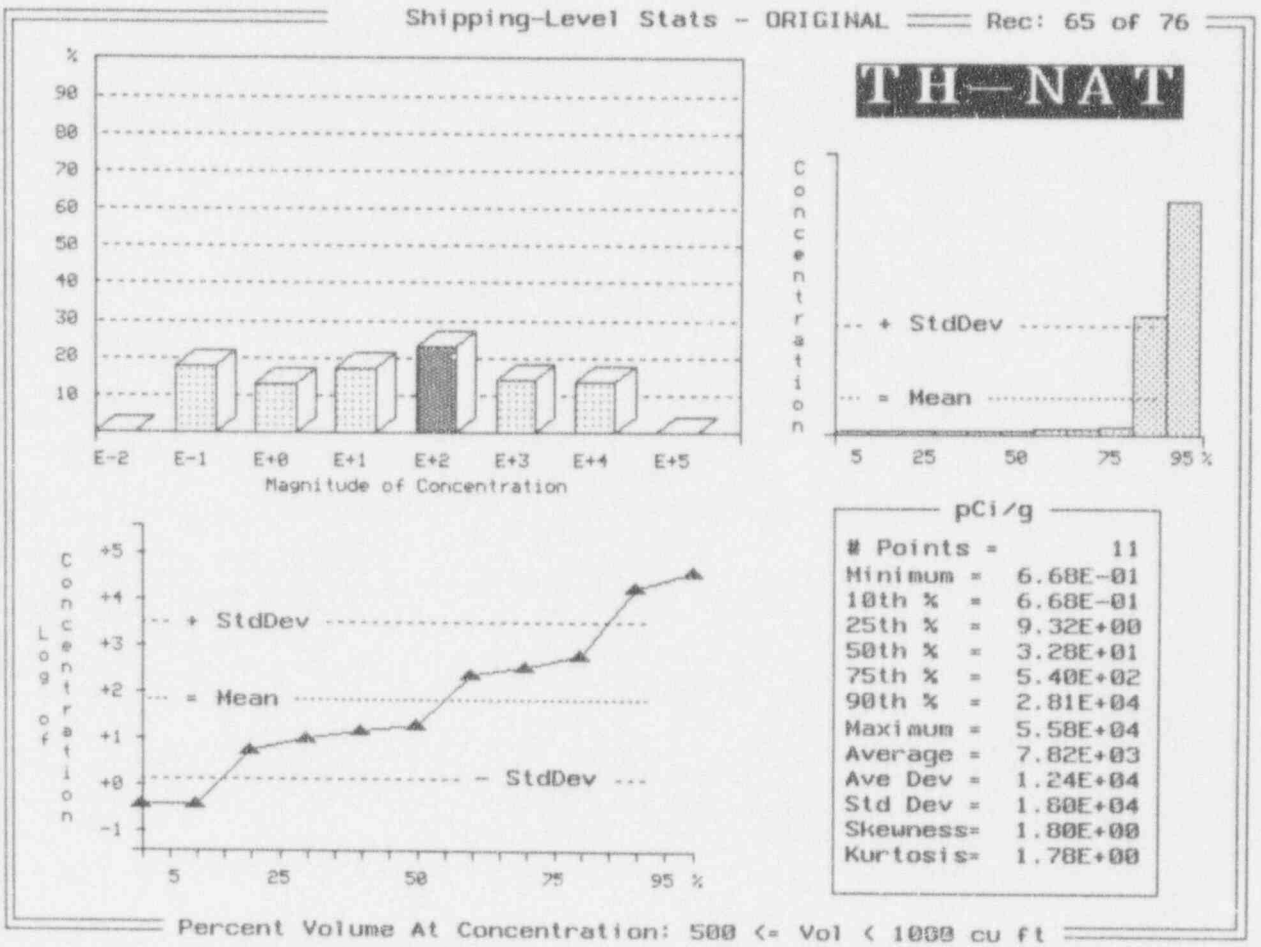


Exhibit H-11 (Continued)

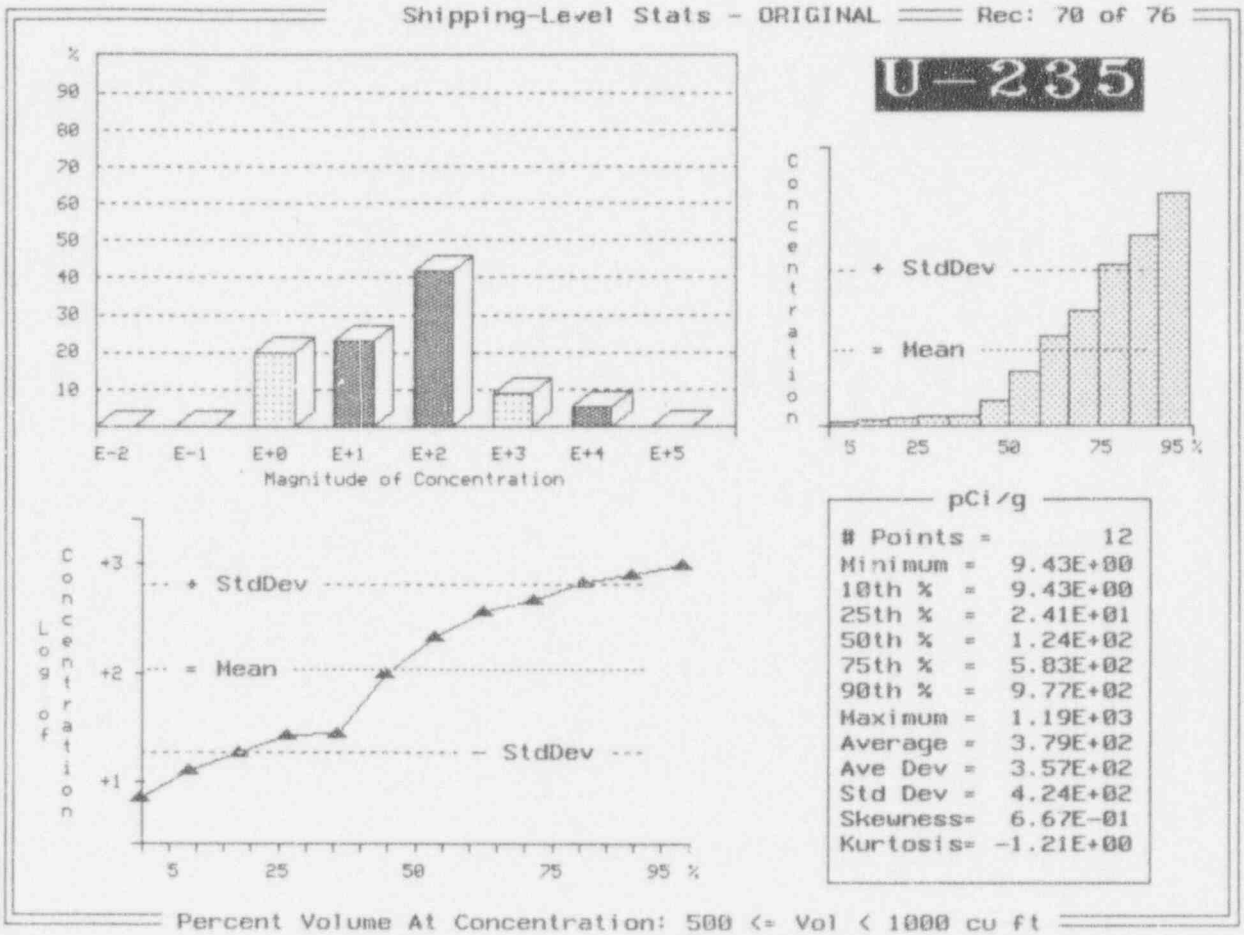


Exhibit H-11 (Continued)

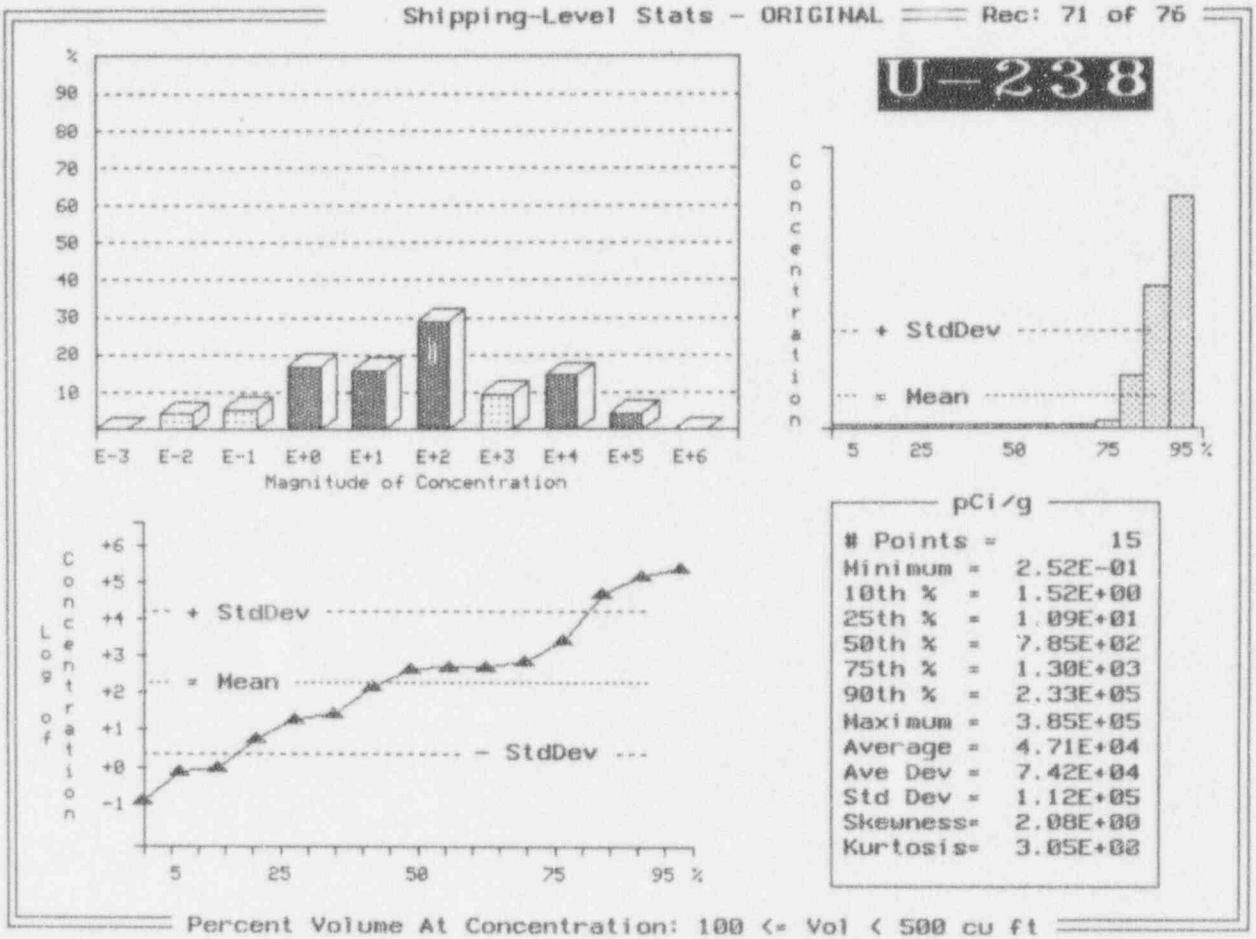


Exhibit H-11 (Continued)

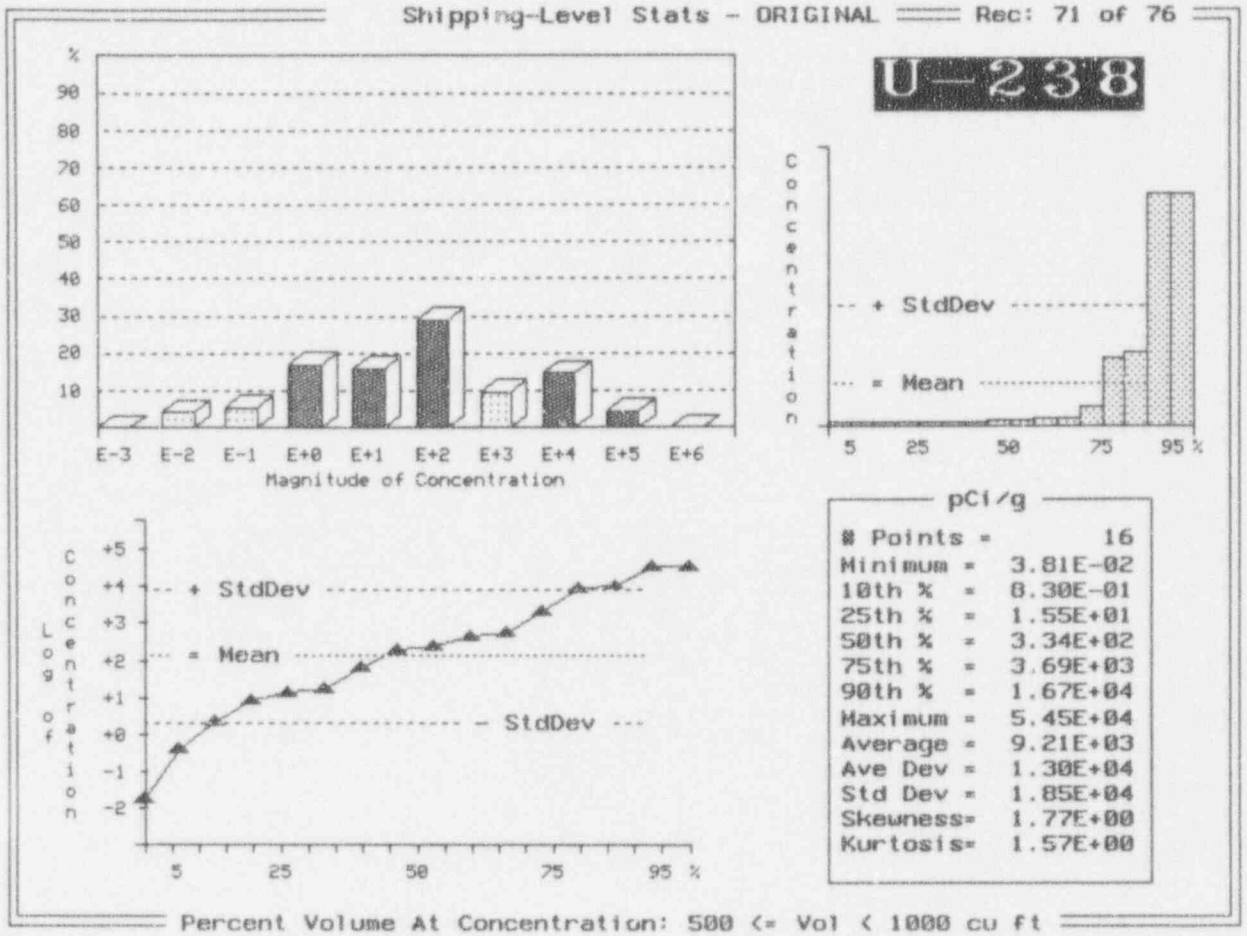
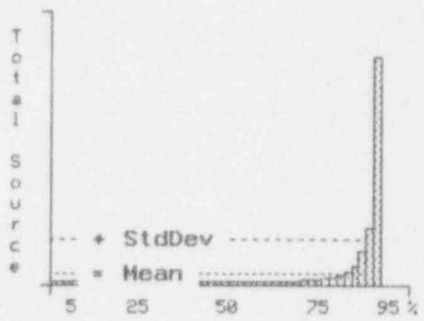


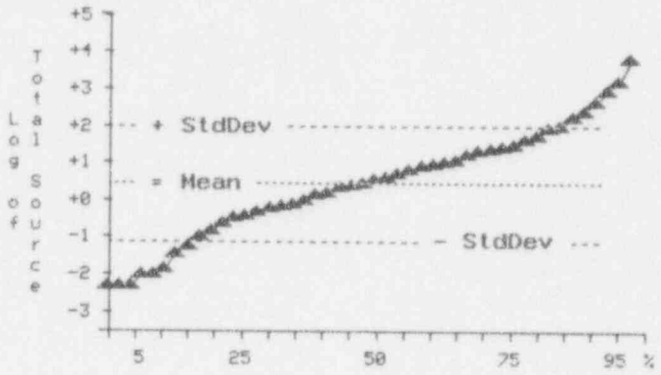
Exhibit H-11 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: California

Total source material [kg]: 8.28E+04





kg

# Points =	403
1st % =	1.00E-02
10th % =	2.00E-02
25th % =	6.80E-01
50th % =	5.81E+00
75th % =	4.55E+01
90th % =	3.50E+02
99th % =	3.22E+03
Average =	2.05E+02
Ave Dev =	3.24E+02
Std Dev =	8.88E+02
Skewness=	9.02E+00
Kurtosis=	1.00E+02

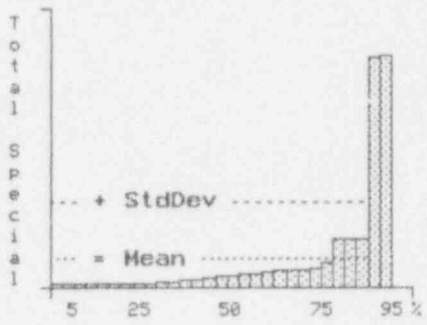
Total Source Material

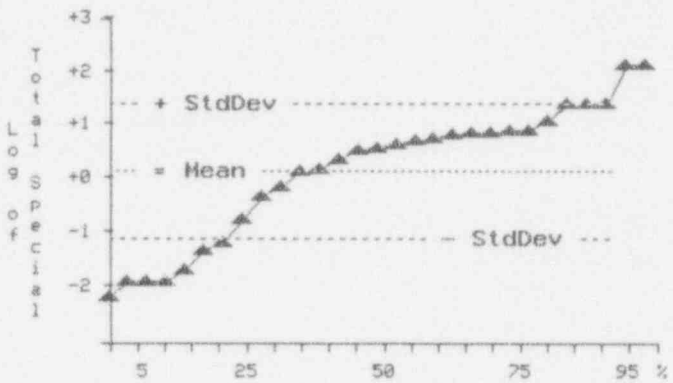
Exhibit H-11 (Continued)

Total Source & Special Material - ORIGINAL

Generator class: Industrial
Waste class: Class A (All)
Year: ALL
Facility: ALL
Data: ALL
State: California

Special material [g]: 8.23E+02





g

# Points =	56
Minimum =	1.00E-02
10th % =	2.00E-02
25th % =	2.10E-01
50th % =	5.46E+00
75th % =	1.04E+01
90th % =	3.44E+01
Maximum =	1.75E+02
Average =	1.47E+01
Ave Dev =	1.72E+01
Std Dev =	3.35E+01
Skewness=	3.93E+00
Kurtosis=	1.56E+01

Total Special Material

APPENDIX I

Utility Waste Forms and Radionuclide Concentrations
(Container Level Analyses for Selected Waste Forms)
(Beatty and Richland: 1988 to 1990)

Exhibit I-1 Dry Solid Waste Radionuclide Distributions
Container Level Analysis for 1989 Non-Brokered
Utility Waste and All Regions and States[a]

Waste Class: A-Unstable and A-Stable
Solidification/Absorption media: Oil-Dri, Envirostone, Floor-Dry, and other unspecified agents.
Number of shipping records: 44
Number of shipping containers: 1,062
Total waste volume: 505.5 m^3
Total waste mass: 436,400 Kg
Average waste form density: 0.86 g/cm^3

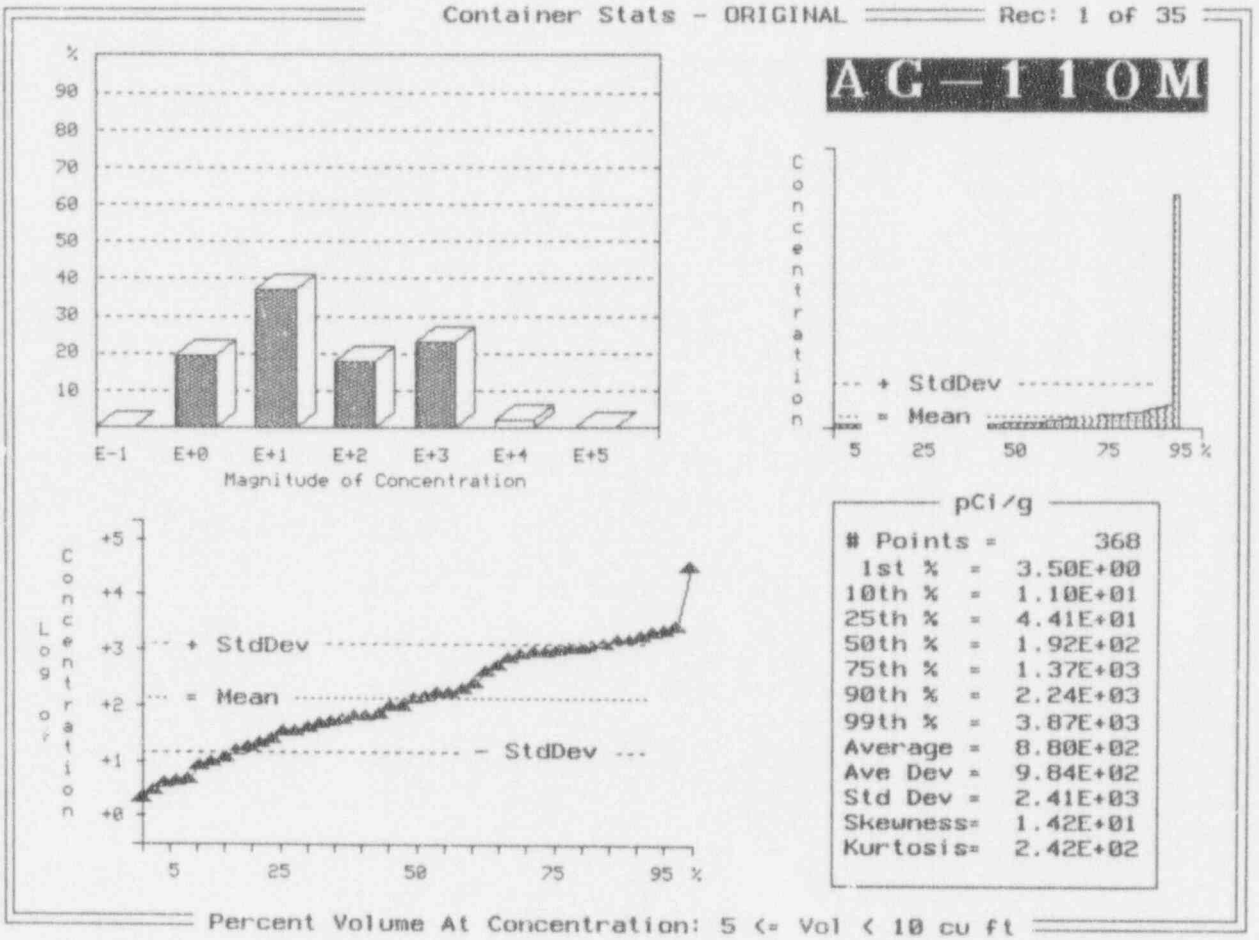
	Concentration Ranges - Percentile[b] - Ci/m^3 -			- pCi/g -		
Nuclide	1st	50th	99th	1st	50th	99th
Ag-110m	4.71E-06	1.08E-04	2.48E-03	3.50E+00	1.92E+02	3.87E+03
Am-241	4.71E-06	4.71E-06	3.30E-05	5.62E+00	8.22E+00	7.45E+01
C-14	4.71E-06	4.71E-06	4.34E-03	2.01E+00	8.41E+00	4.97E+03
Ce-144	4.71E-06	4.71E-06	1.47E-02	3.39E+00	8.01E+00	2.50E+04
Cm-242	4.71E-06	4.71E-06	4.24E-05	6.88E+00	8.64E+00	6.61E+01
Cm-244	4.71E-06	4.71E-06	9.42E-06	5.62E+00	7.29E+00	1.60E+01
Co-57	4.71E-06	4.71E-06	7.63E-03	5.33E+00	6.76E+00	1.19E+04
Co-58	4.71E-06	4.71E-06	2.34E+00	5.31E+00	6.95E+00	3.97E+06
Co-60	4.71E-06	1.38E-03	2.67E-01	2.84E+00	1.41E+03	2.99E+05
Cr-51	8.48E-05	4.13E-03	2.41E-01	1.67E+02	6.51E+03	3.88E+05
Cs-134	4.71E-06	8.48E-05	1.98E-02	2.84E+00	1.49E+02	3.02E+04
Cs-137	4.71E-06	1.98E-04	2.31E-02	2.84E+00	3.44E+02	3.11E+04
Eu-155	4.71E-06	1.88E-05	3.20E-04	8.60E+00	3.29E+01	7.24E+02
Fe-55	4.71E-06	4.20E-03	7.12E-01	2.84E+00	4.38E+03	6.99E+05
Fe-59	9.42E-06	4.66E-04	2.67E-02	1.85E+01	7.27E+02	4.29E+04
H-3	4.71E-06	5.18E-05	1.17E-02	7.39E+00	8.29E+01	1.80E+04
I-129	4.71E-06	4.71E-06	4.71E-06	1.92E+00	6.12E+00	1.18E+01
Mn-54	4.71E-06	4.19E-04	7.72E-02	3.50E+00	6.90E+02	1.25E+05
Nb-95	1.41E-05	6.31E-04	4.62E-02	2.99E+01	1.06E+03	7.43E+04
Ni-63	4.71E-06	9.09E-04	6.12E-02	2.67E+00	8.61E+02	1.00E+05
Pm-147	6.12E-05	1.65E-04	2.68E-03	1.12E+02	2.86E+02	6.05E+03

Exhibit I-1 Dry Solid Waste Radionuclide Distributions Container Level Analysis for 1989 Non-Brokered Utility Waste and All Regions and States[a], Cont'd

Nuclide	Concentration Ranges - Ci/m^3 - 1st	50th	99th	Percentile[b] - pCi/g - 1st	50th	99th
Pu-238	4.71E-06	4.71E-06	5.18E-05	5.62E+00	8.25E+00	8.81E+01
Pu-239	4.71E-06	9.42E-06	1.55E-04	5.62E+00	1.38E+01	3.51E+02
Pu-240	4.71E-06	4.71E-06	4.24E-05	6.88E+00	8.54E+00	9.58E+01
Pu-241	4.71E-06	4.71E-06	3.86E-03	3.26E+00	7.57E+00	6.31E+03
Ru-106	4.71E-06	1.41E-05	2.35E-04	8.60E+00	2.47E+01	5.32E+02
Sb-125	4.71E-06	1.88E-05	1.27E-02	2.75E+00	3.39E+01	2.09E+04
Sr-90	4.71E-06	4.71E-06	3.42E-03	3.39E+00	7.70E+00	6.10E+03
Tc-99	4.71E-06	4.71E-06	1.88E-05	1.95E+00	5.95E+00	2.80E+01
Te-125m	4.71E-06	4.71E-06	2.07E-04	2.75E+00	7.60E+00	3.30E+02
U-234	4.71E-06	4.71E-06	4.71E-06	6.88E+00	8.47E+00	1.10E+01
U-235	4.71E-06	4.71E-06	4.71E-06	6.88E+00	8.47E+00	1.10E+01
U-238	4.71E-06	4.71E-06	4.71E-06	6.88E+00	8.47E+00	1.10E+01
Zn-65	1.32E-04	3.39E-03	3.87E-02	2.22E+02	5.45E+03	6.04E+04
Zr-95	7.64E-07	5.38E-05	6.19E-02	1.63E+00	1.21E+02	9.10E+04

(a) Based on LLW data for Beatty and Richland only.
(b) Includes only radionuclides with 30 or more data points characterizing concentration ranges.

Exhibit I-1 (Continued)



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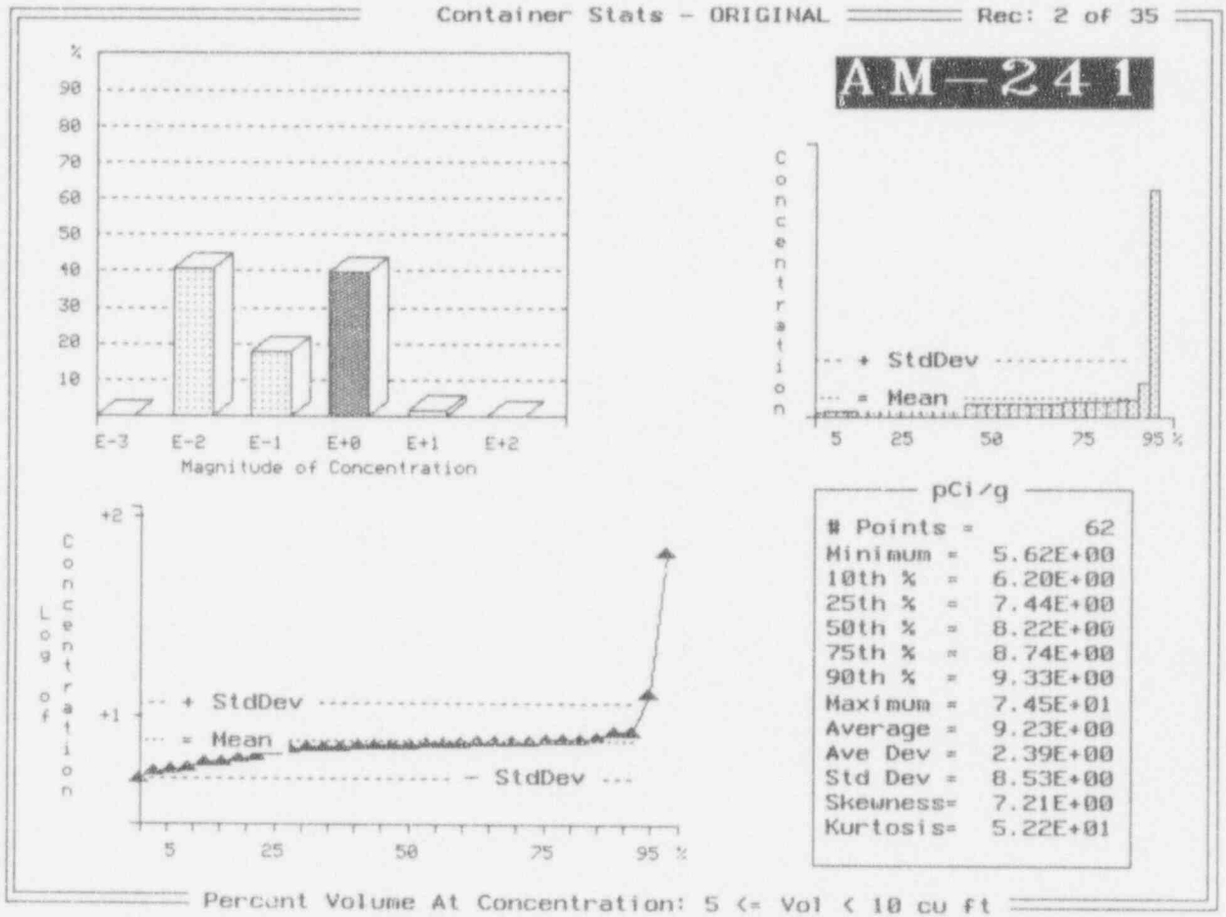
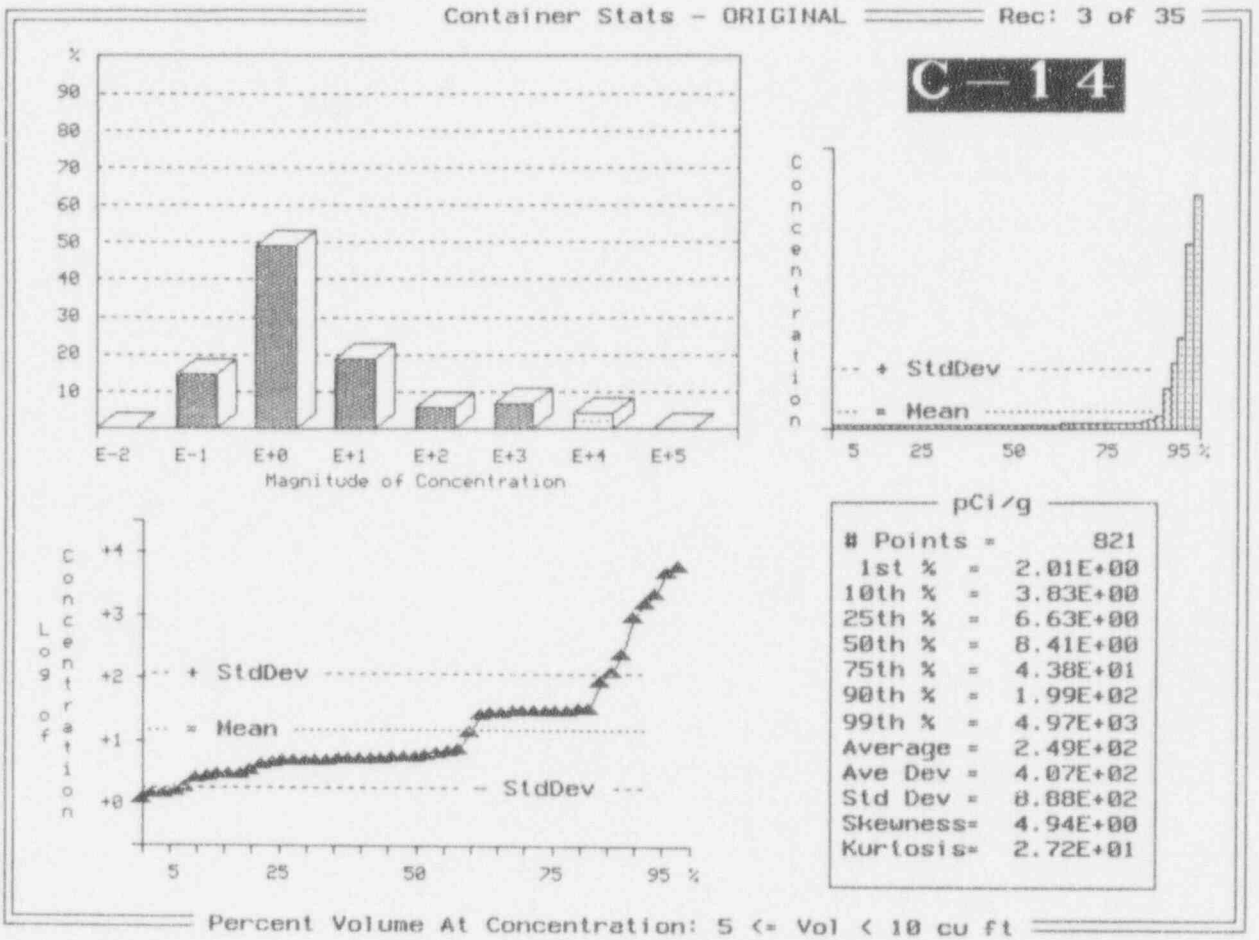


Exhibit I-1 (Continued)



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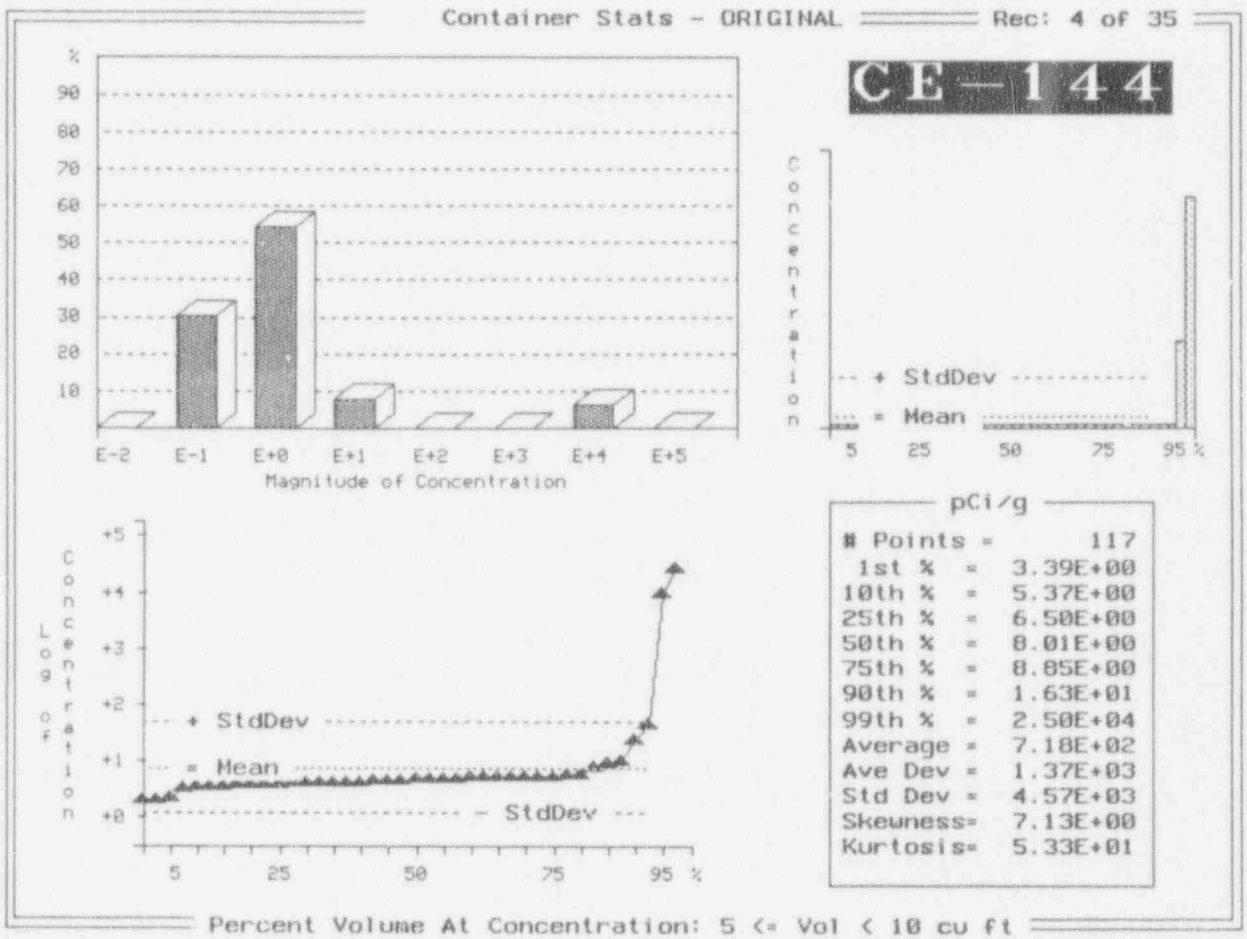

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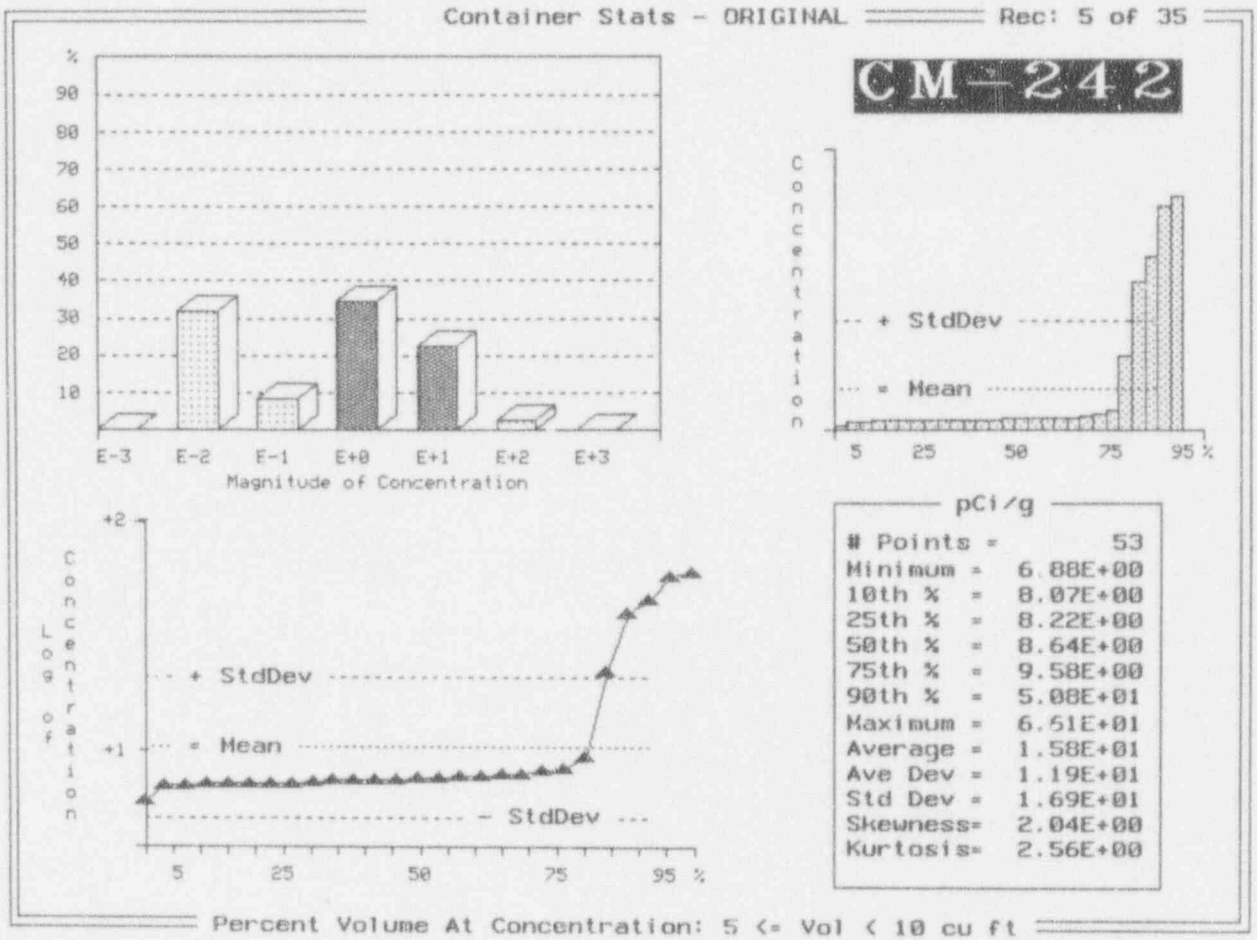

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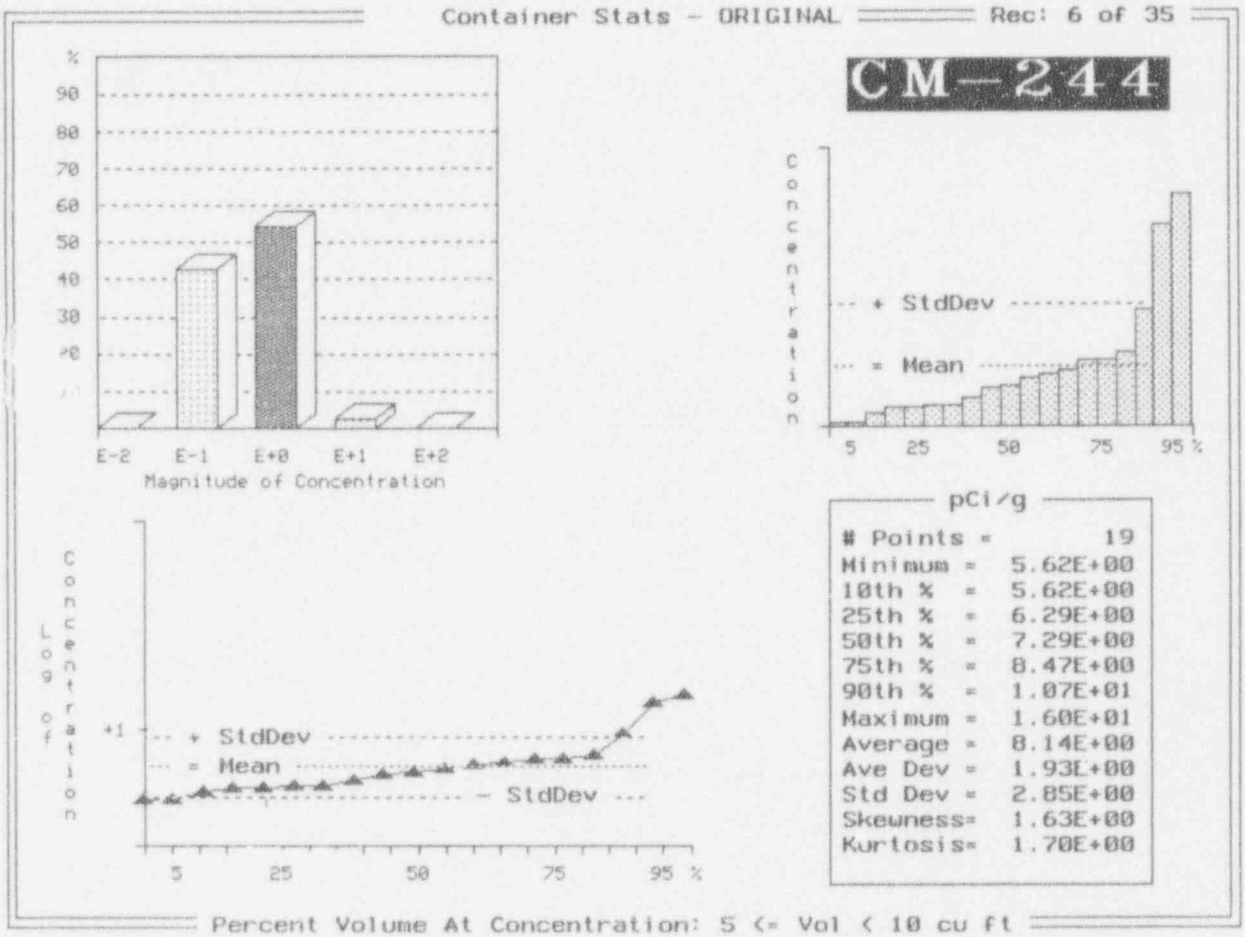

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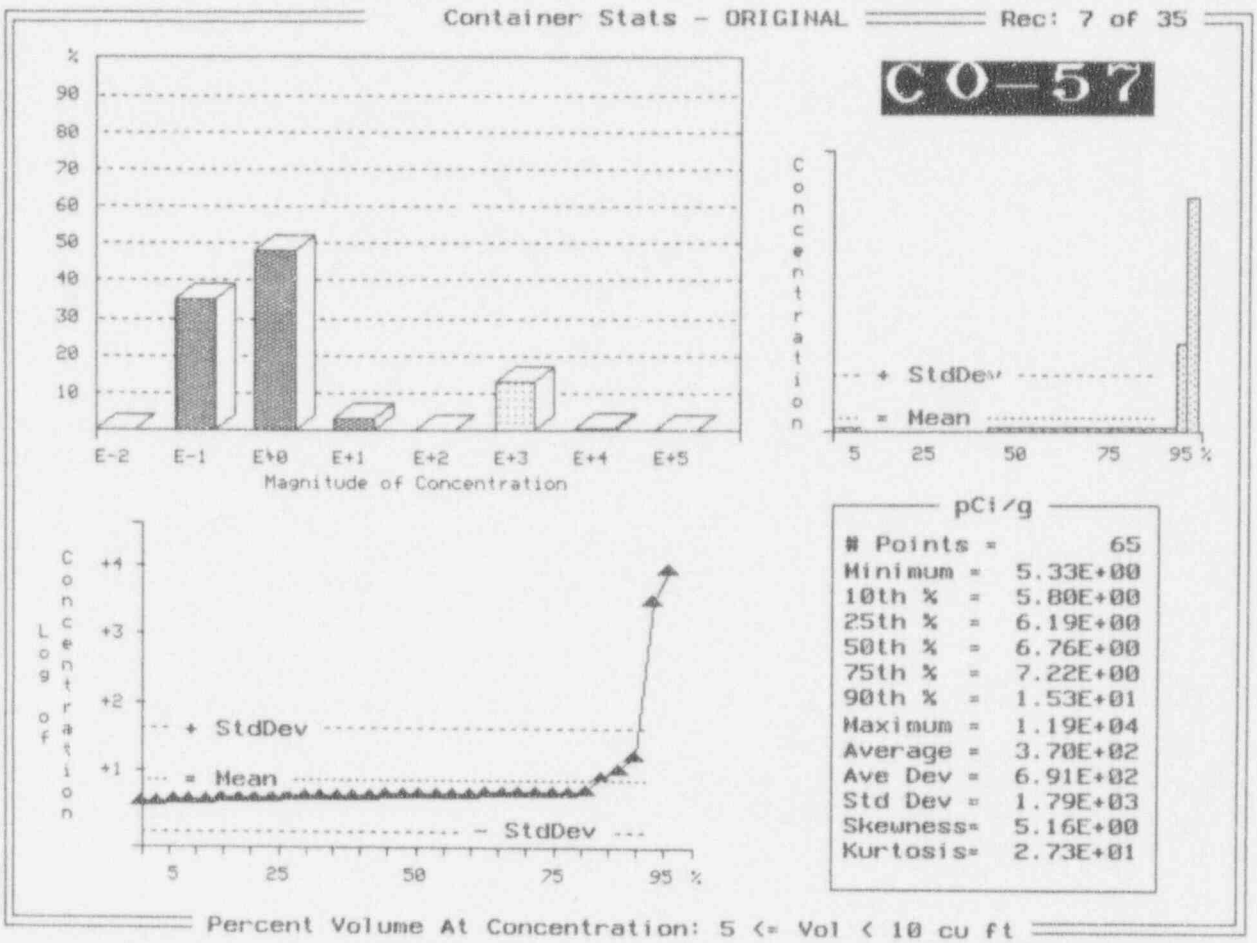
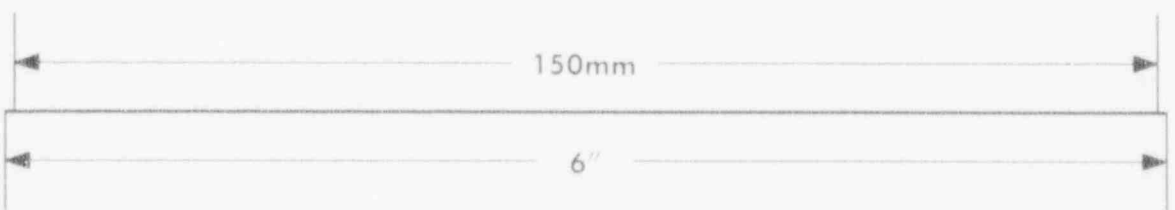


2

IMAGE EVALUATION TEST TARGET (MT-3)



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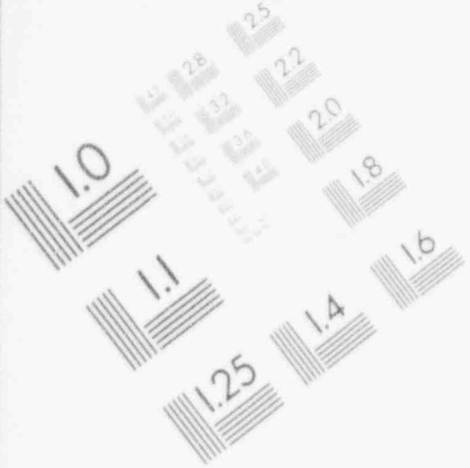
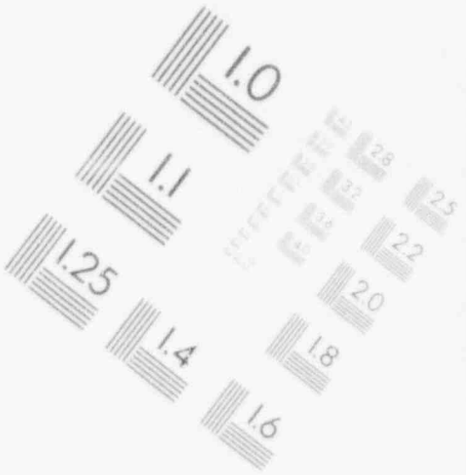
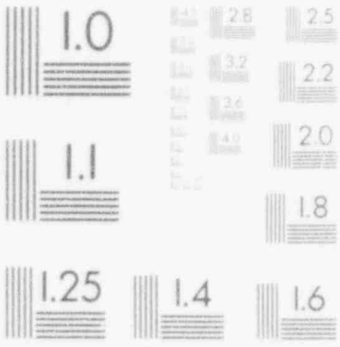
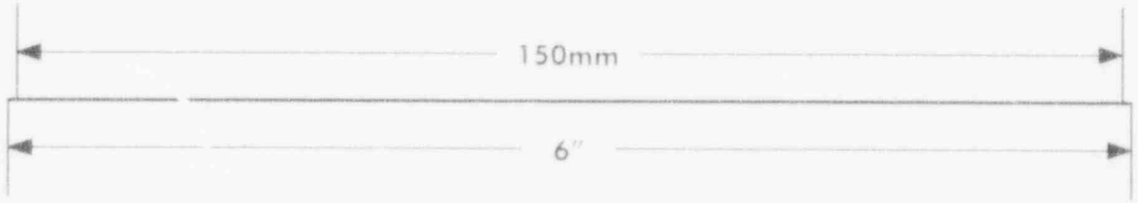
2

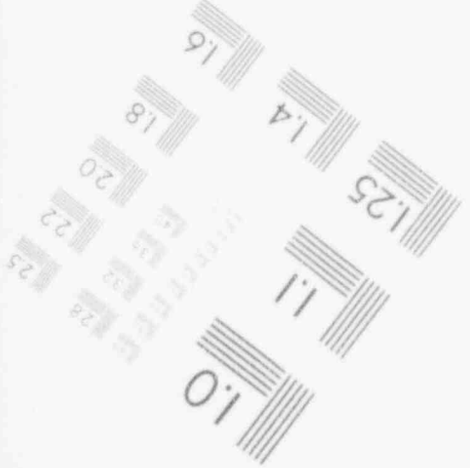
IMAGE EVALUATION TEST TARGET (MT-3)











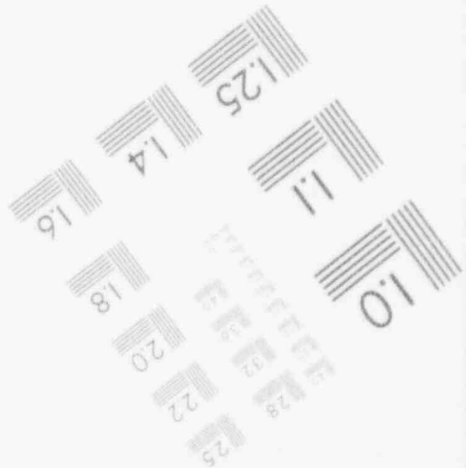


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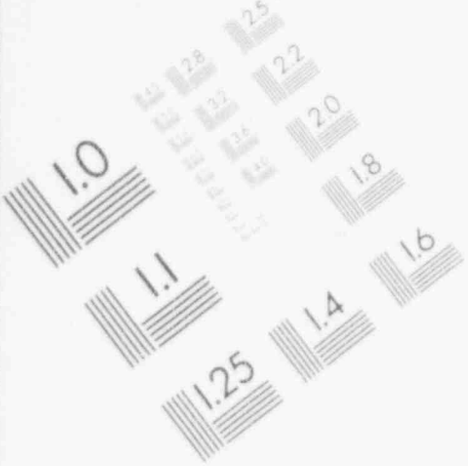
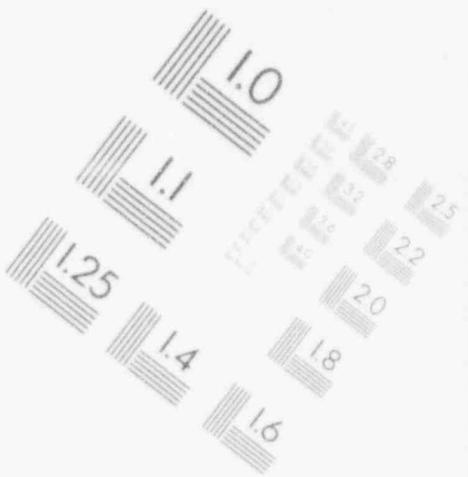
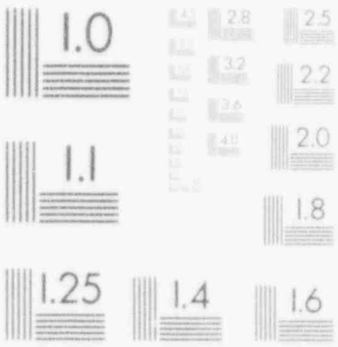
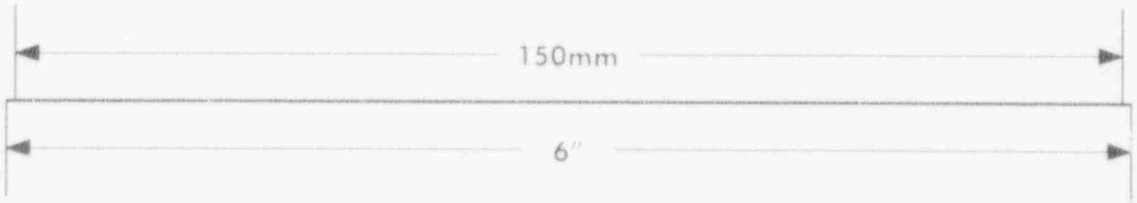
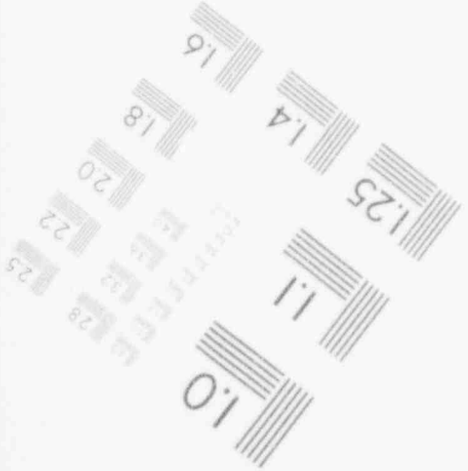
IMAGE EVALUATION TEST TARGET (MT-3)











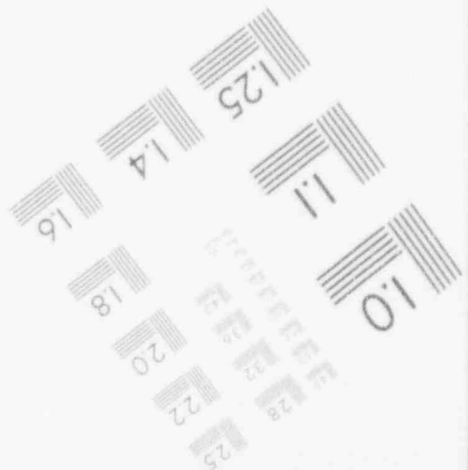


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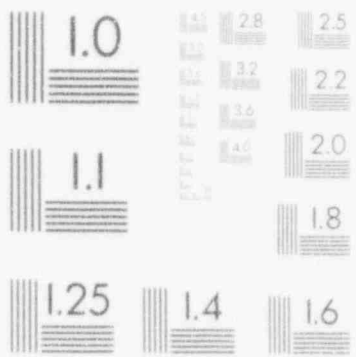
IMAGE EVALUATION TEST TARGET (MT-3)



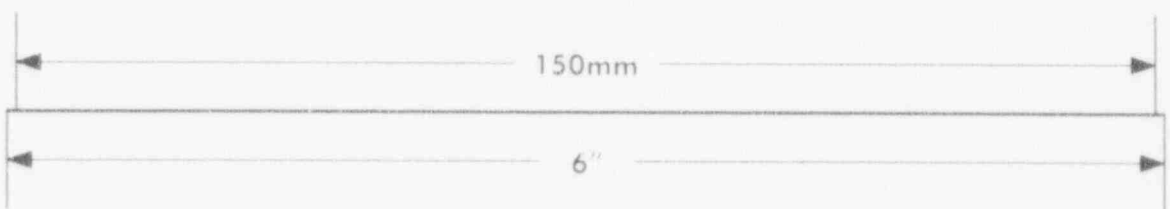


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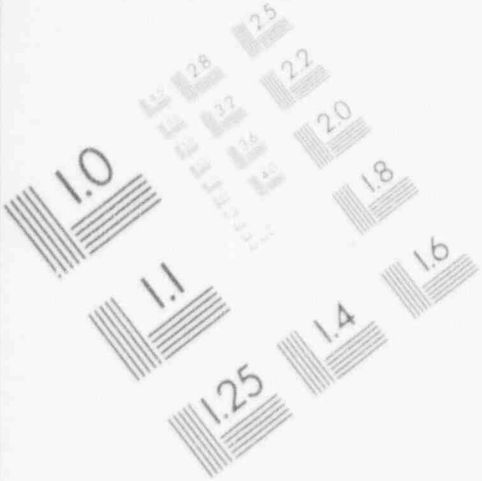
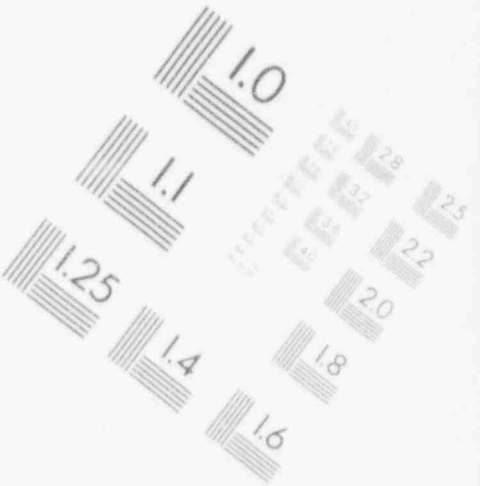
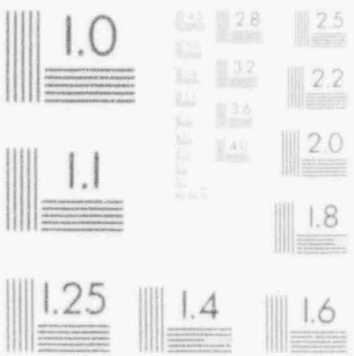
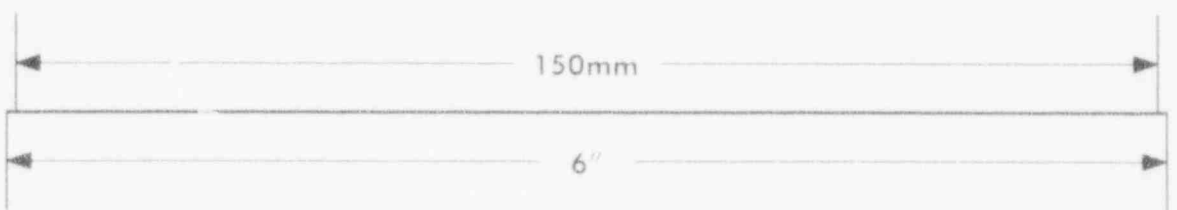
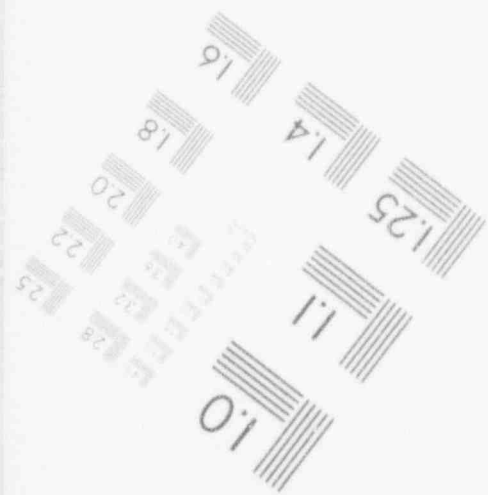
IMAGE EVALUATION TEST TARGET (MT-3)











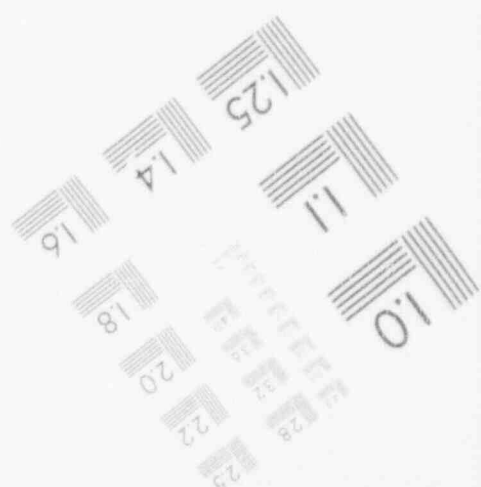


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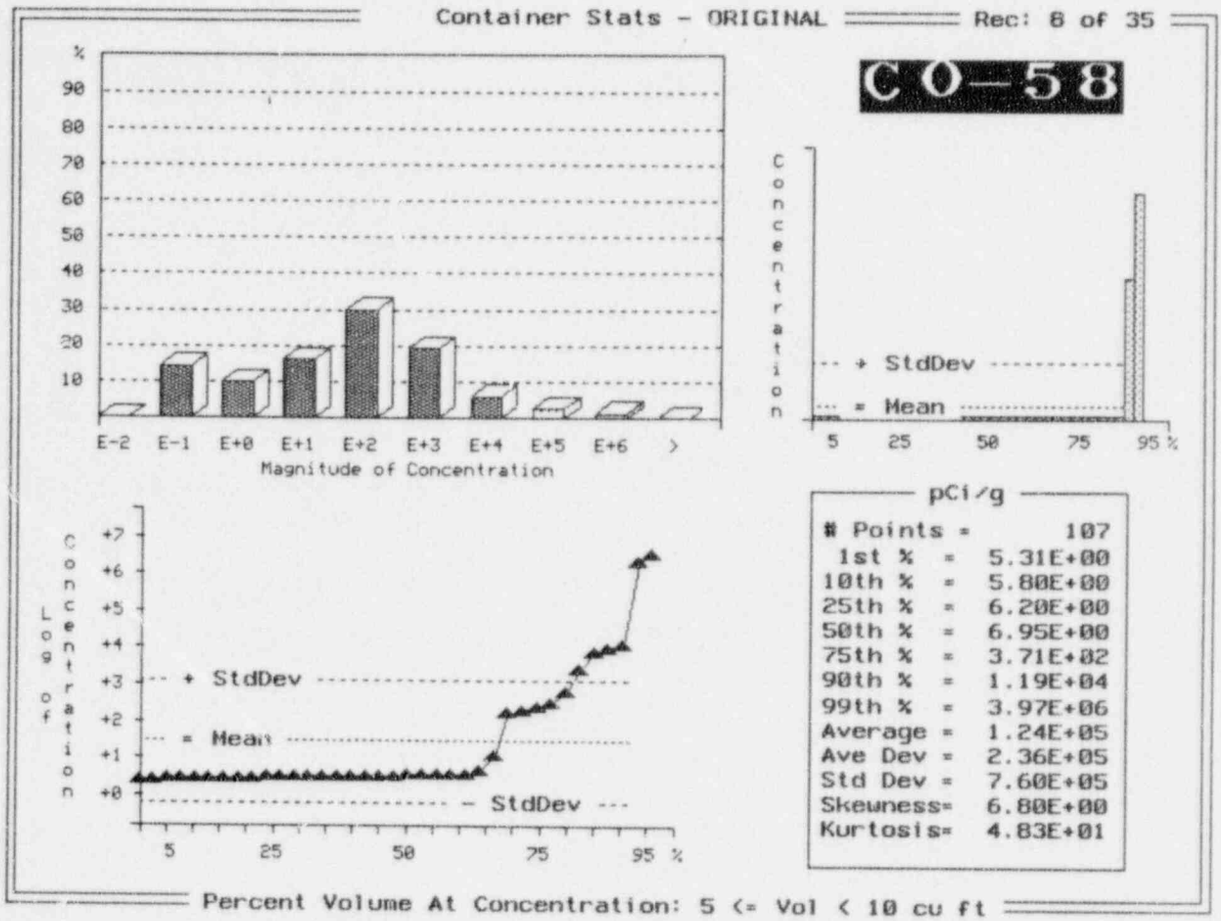
Exhibit I-1 (Continued)



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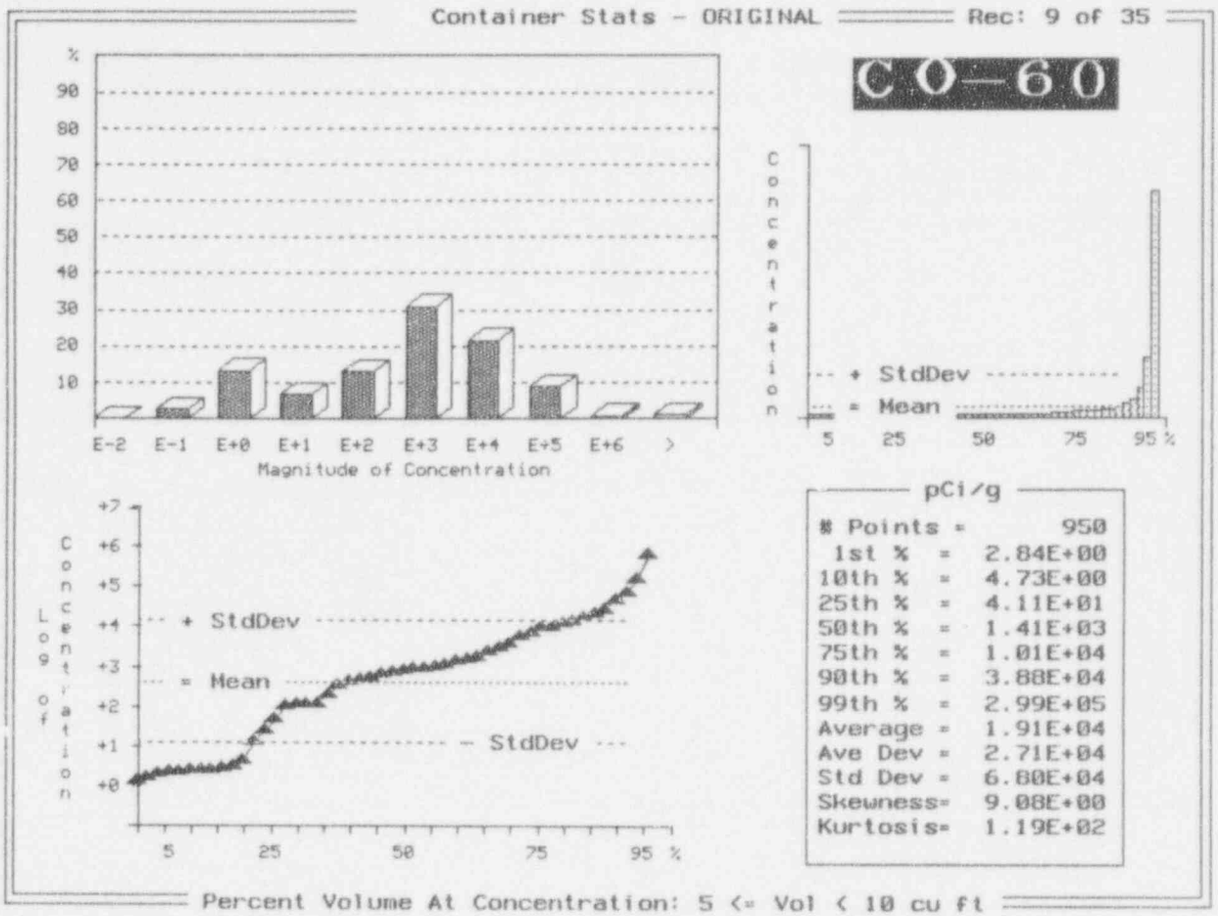

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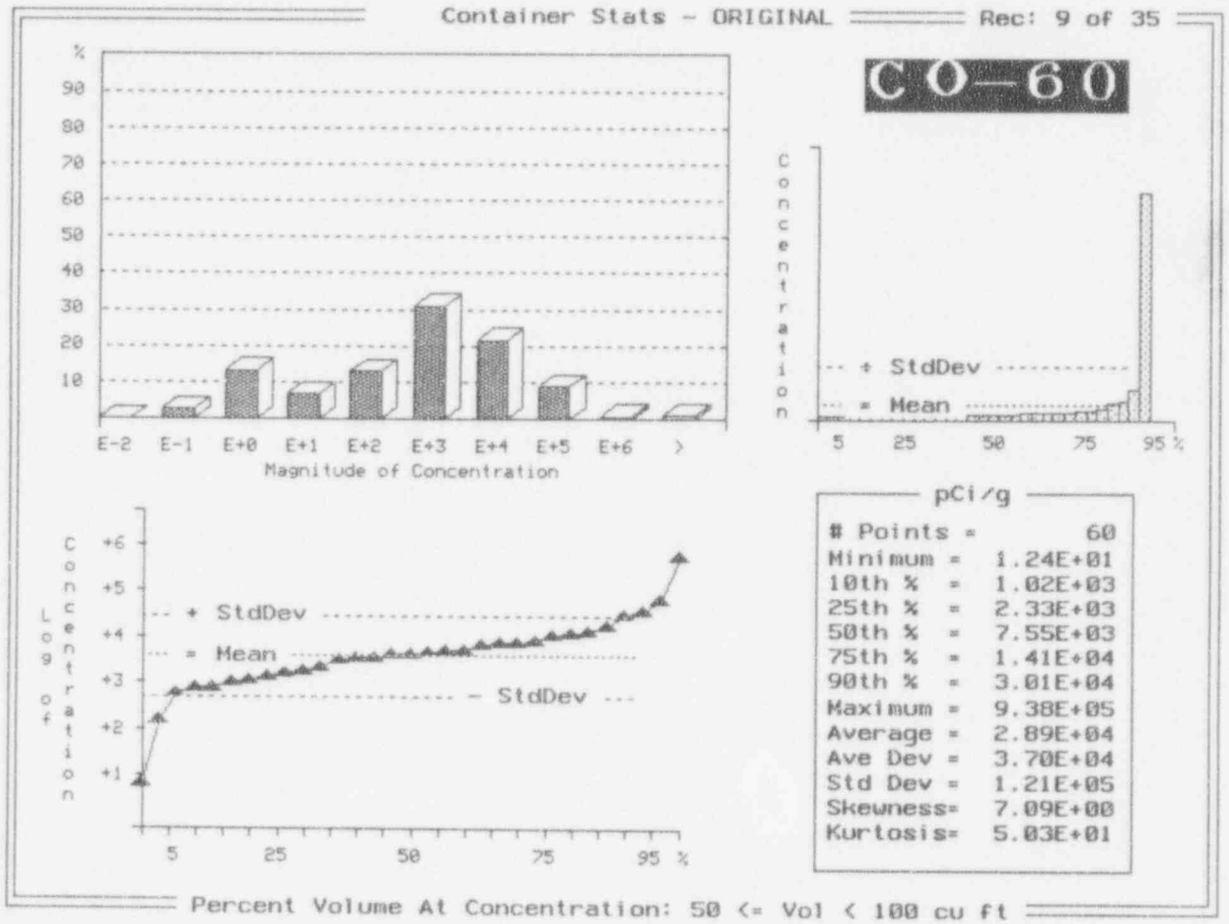

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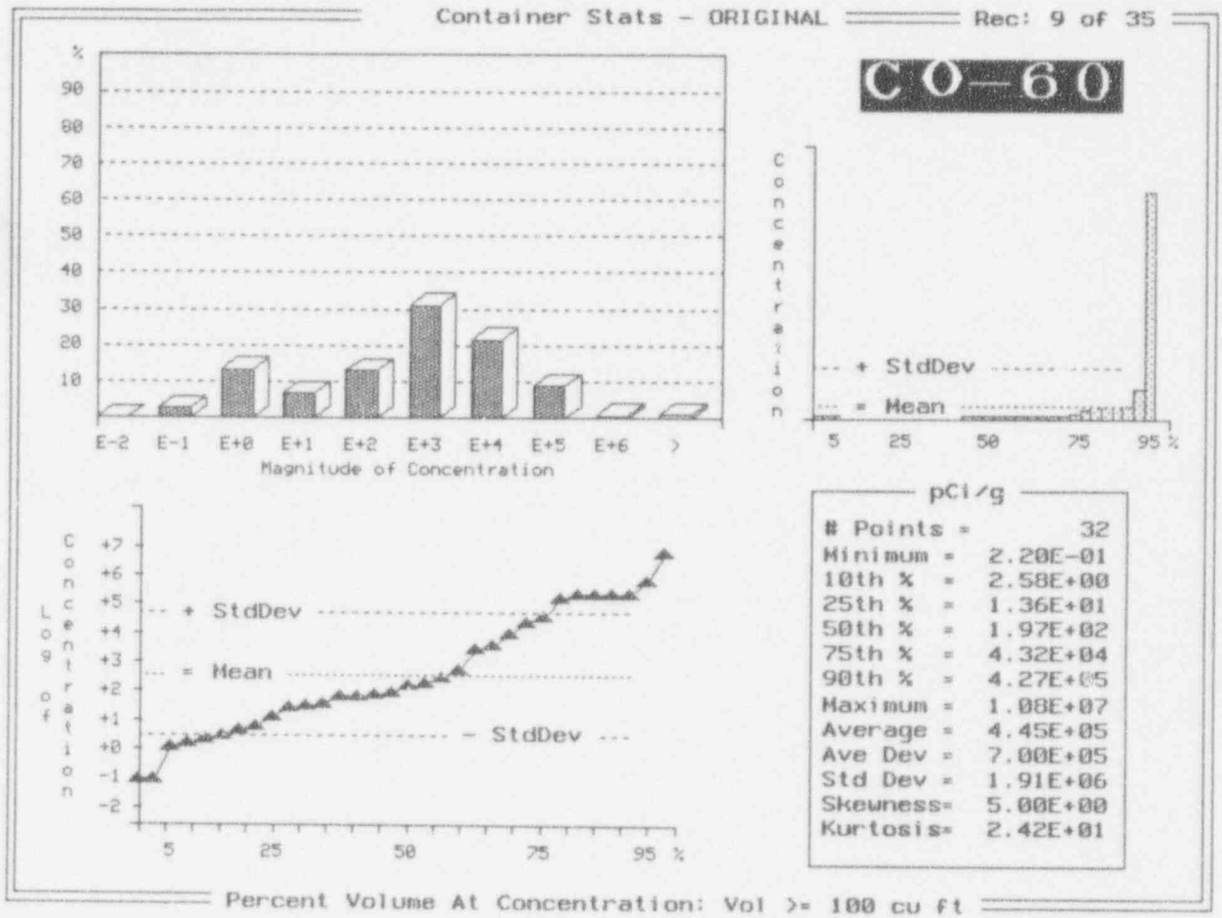

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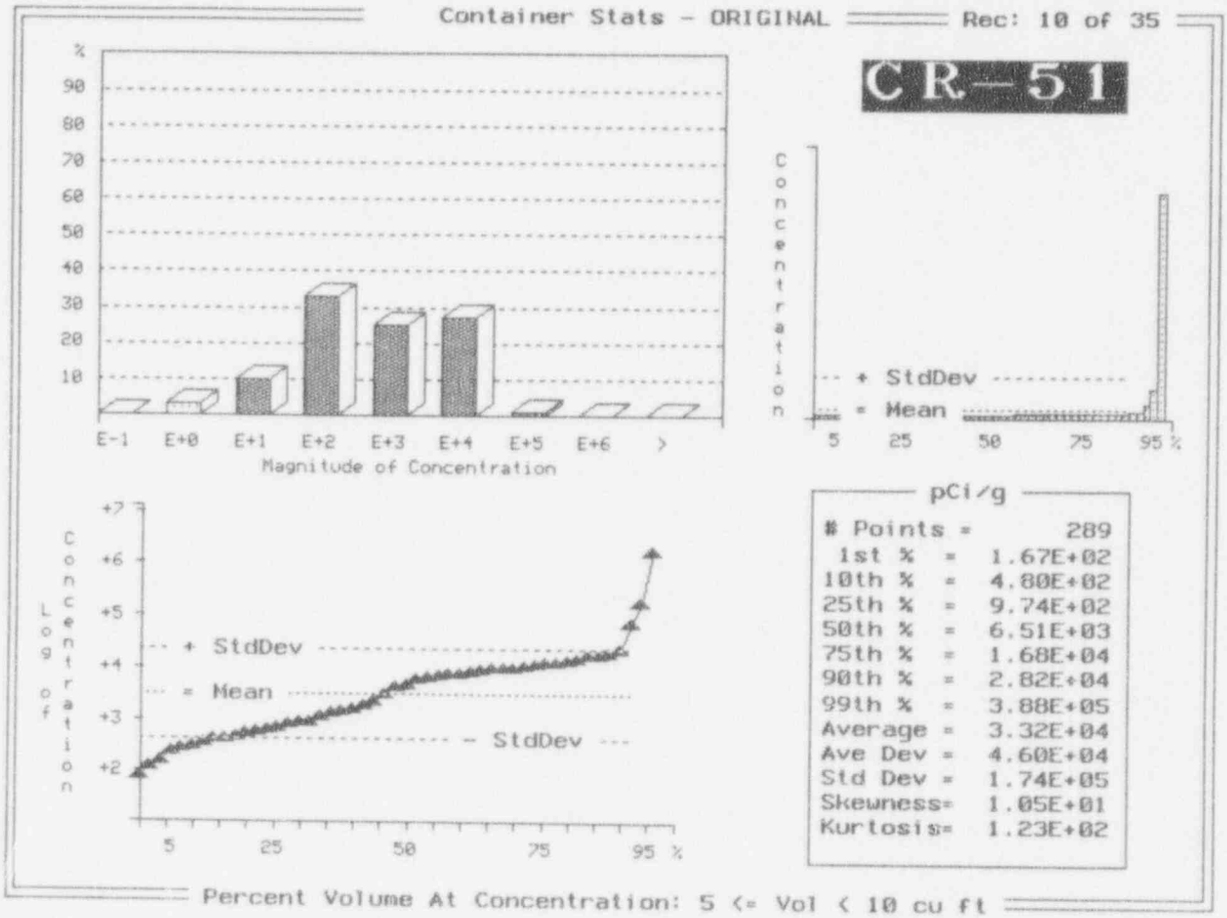

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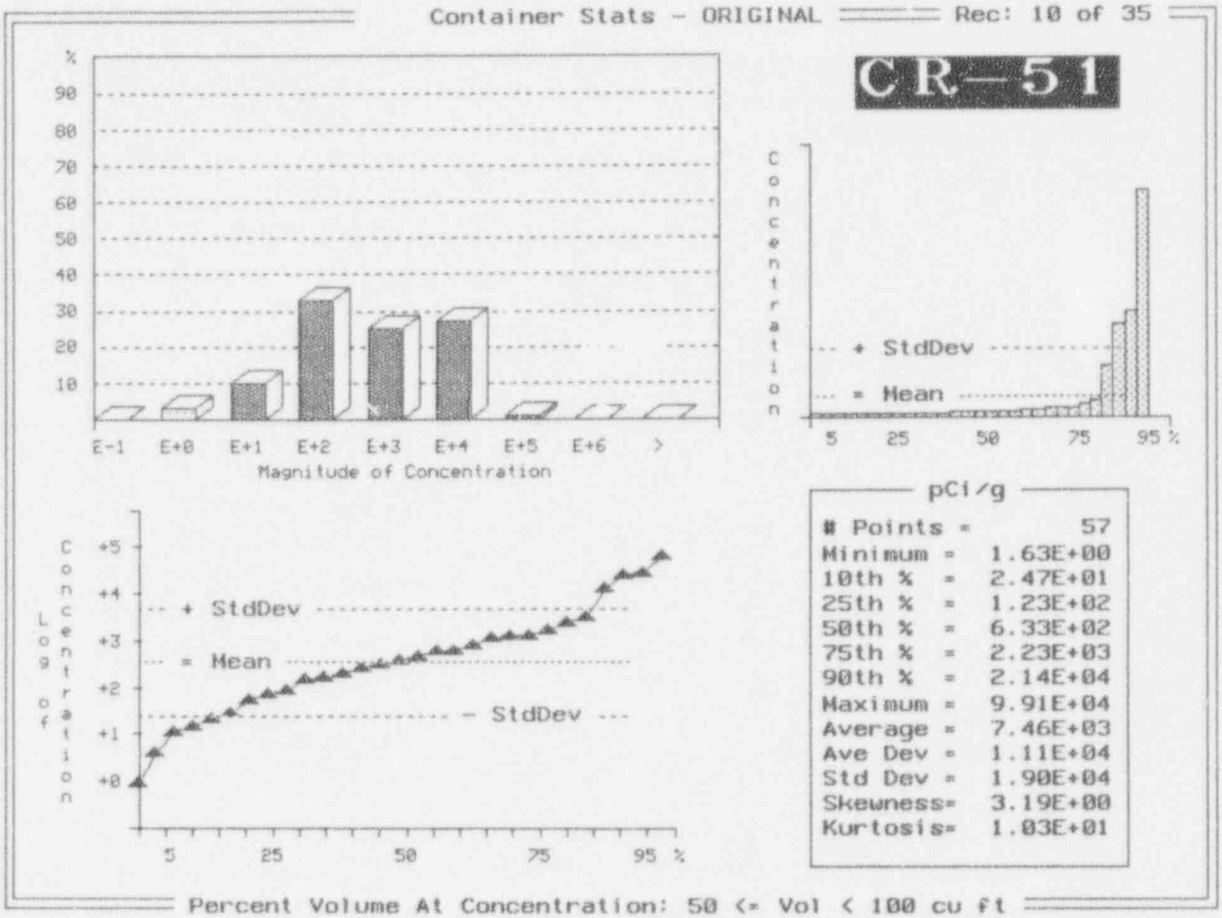

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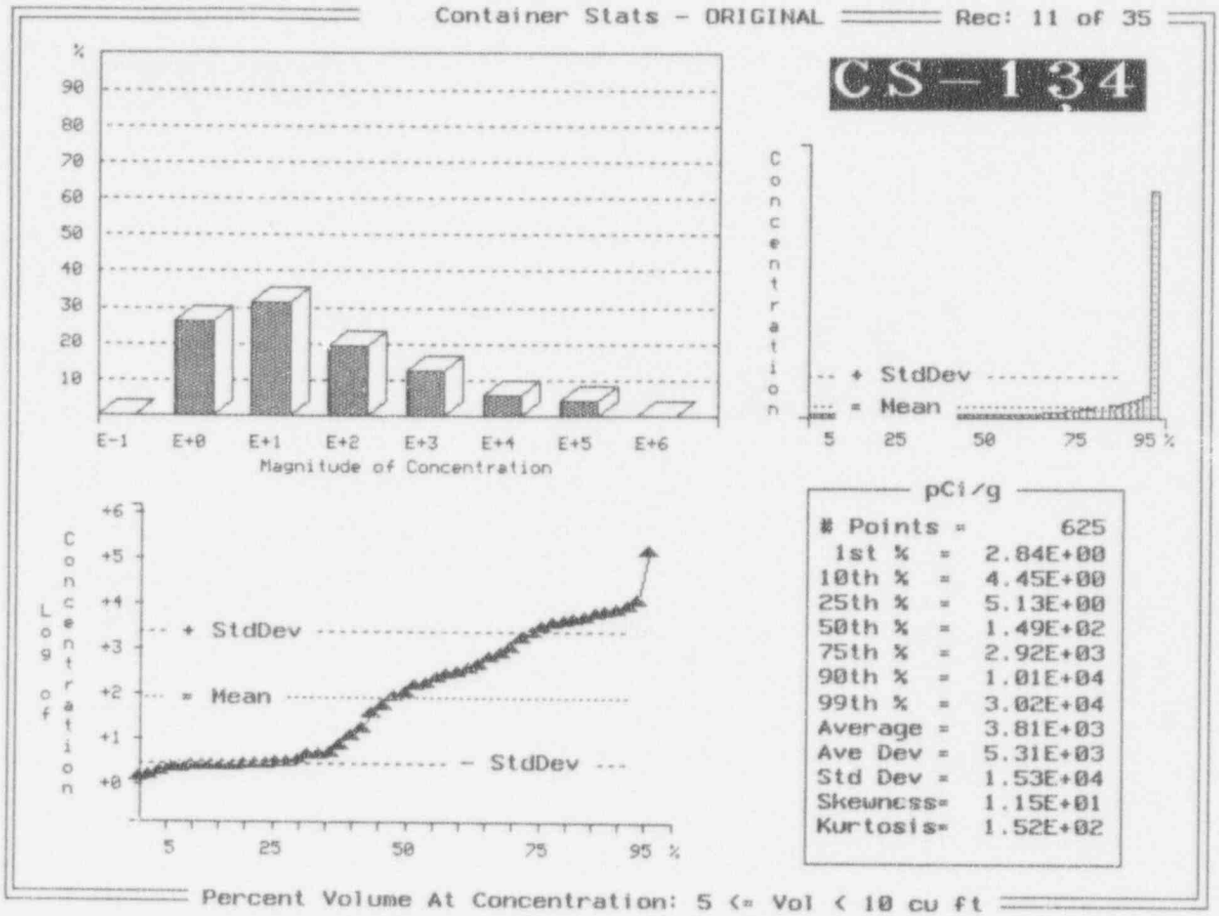

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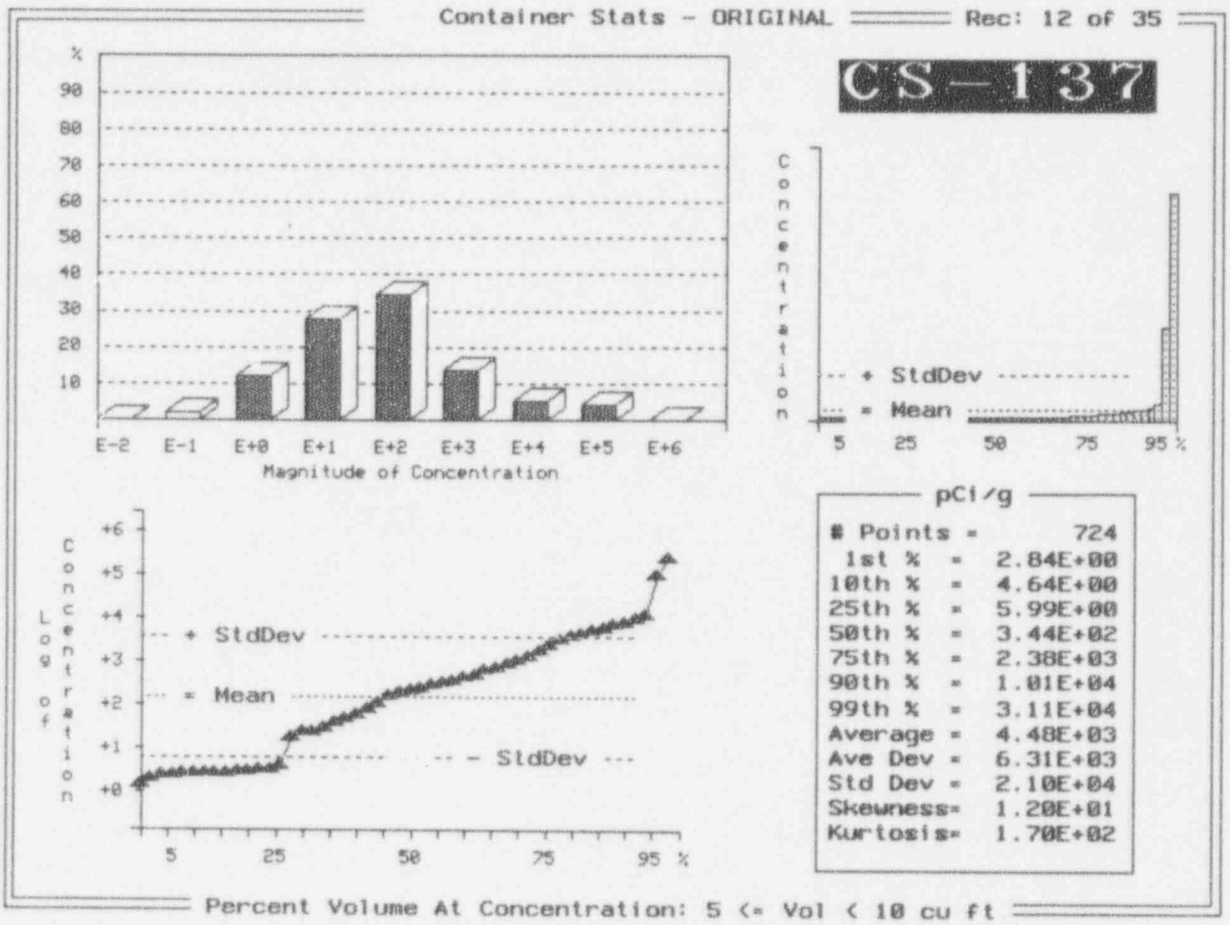

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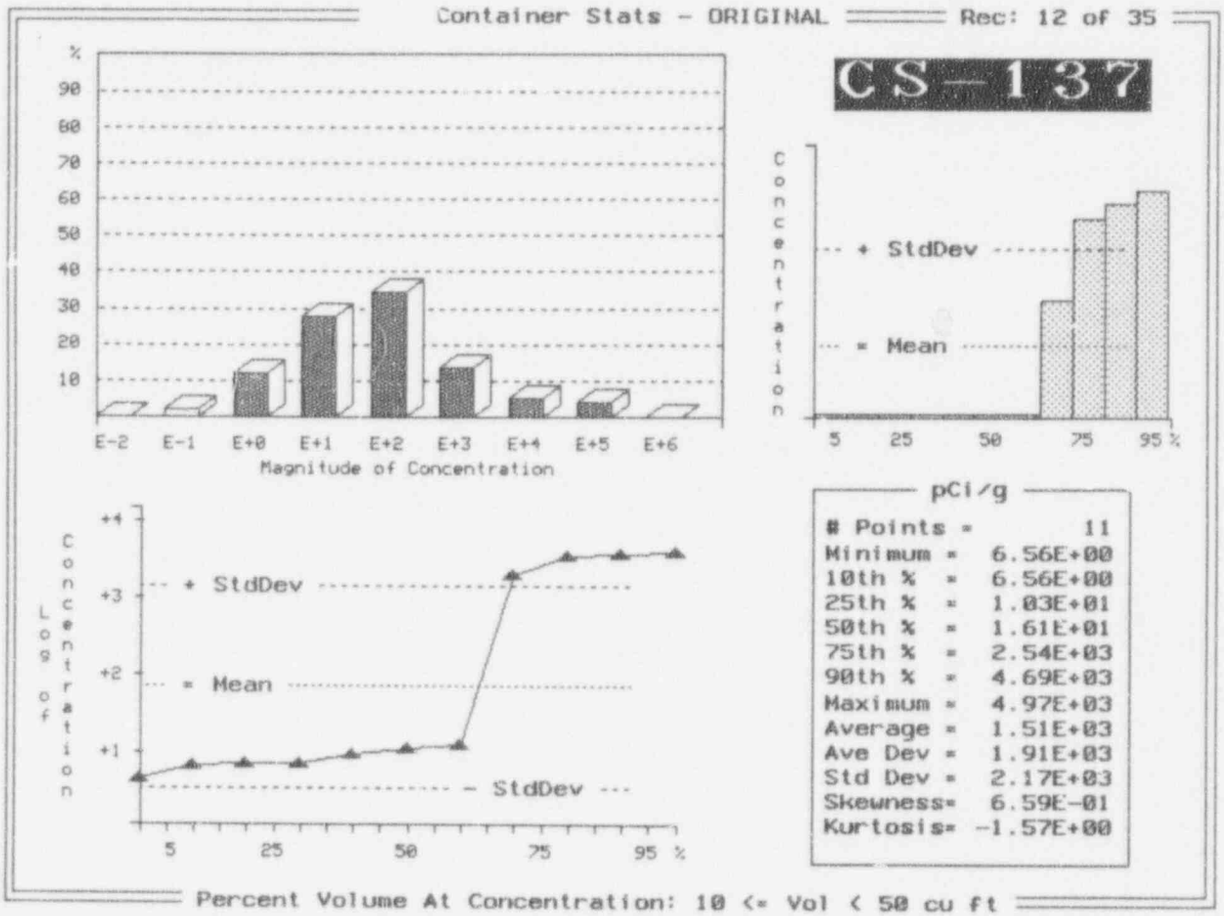

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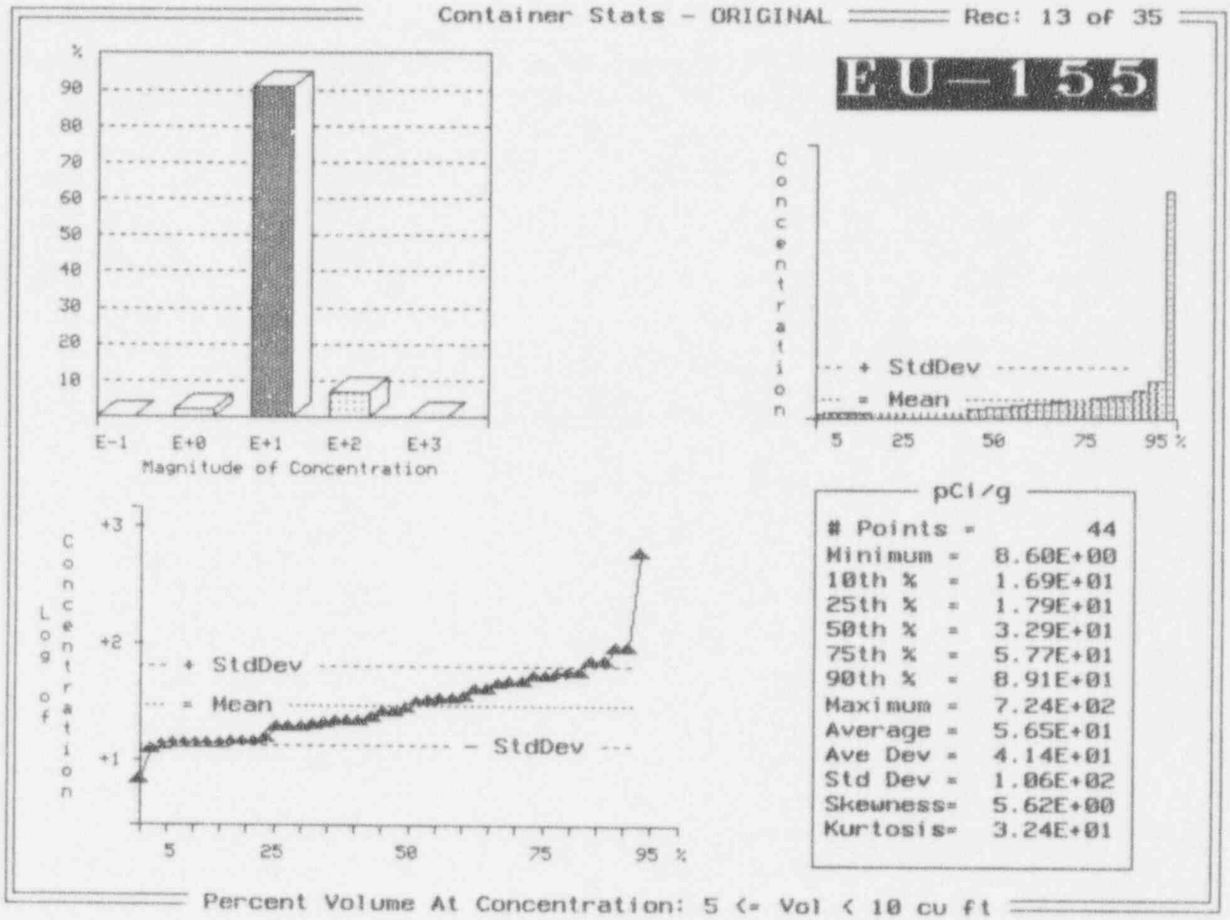

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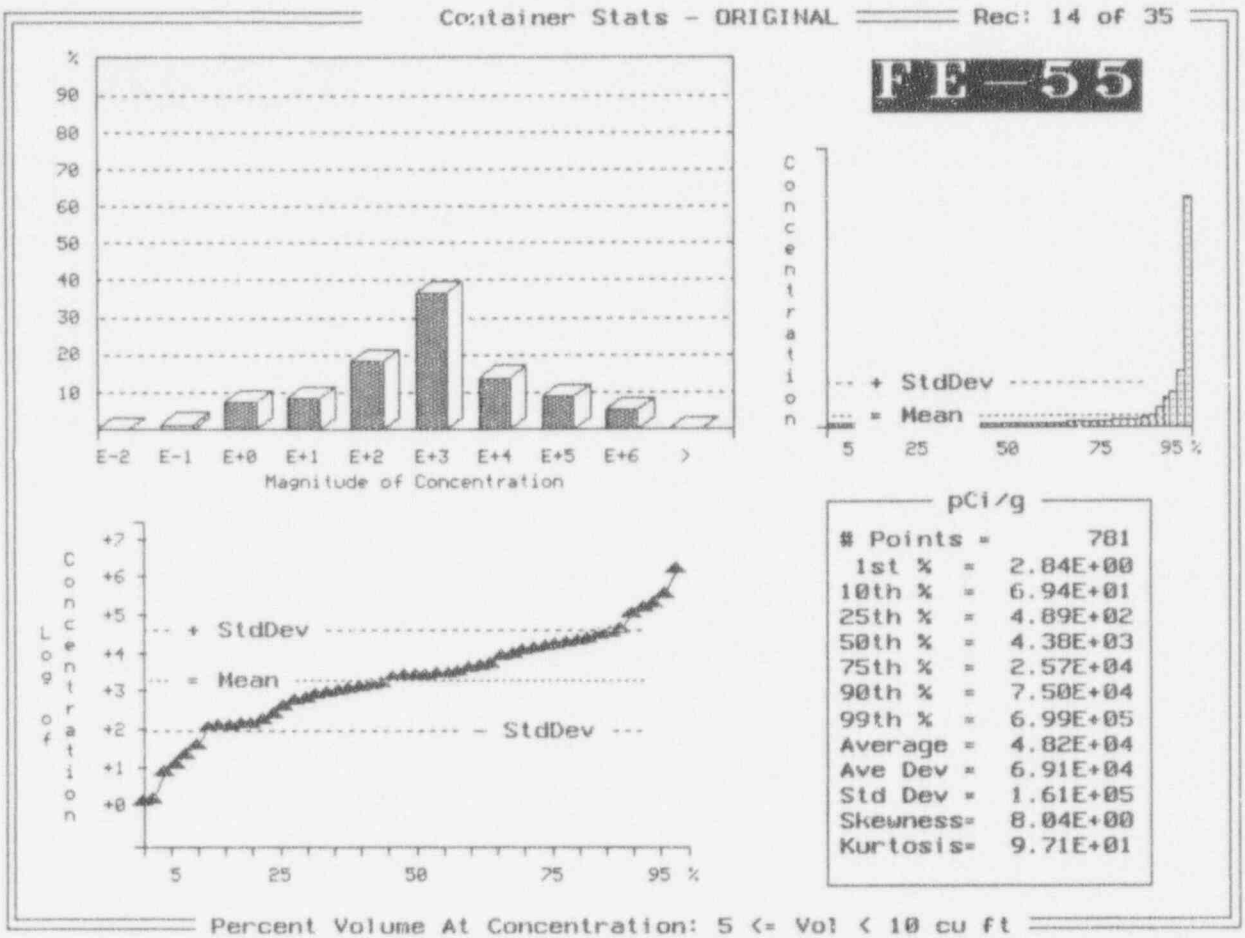

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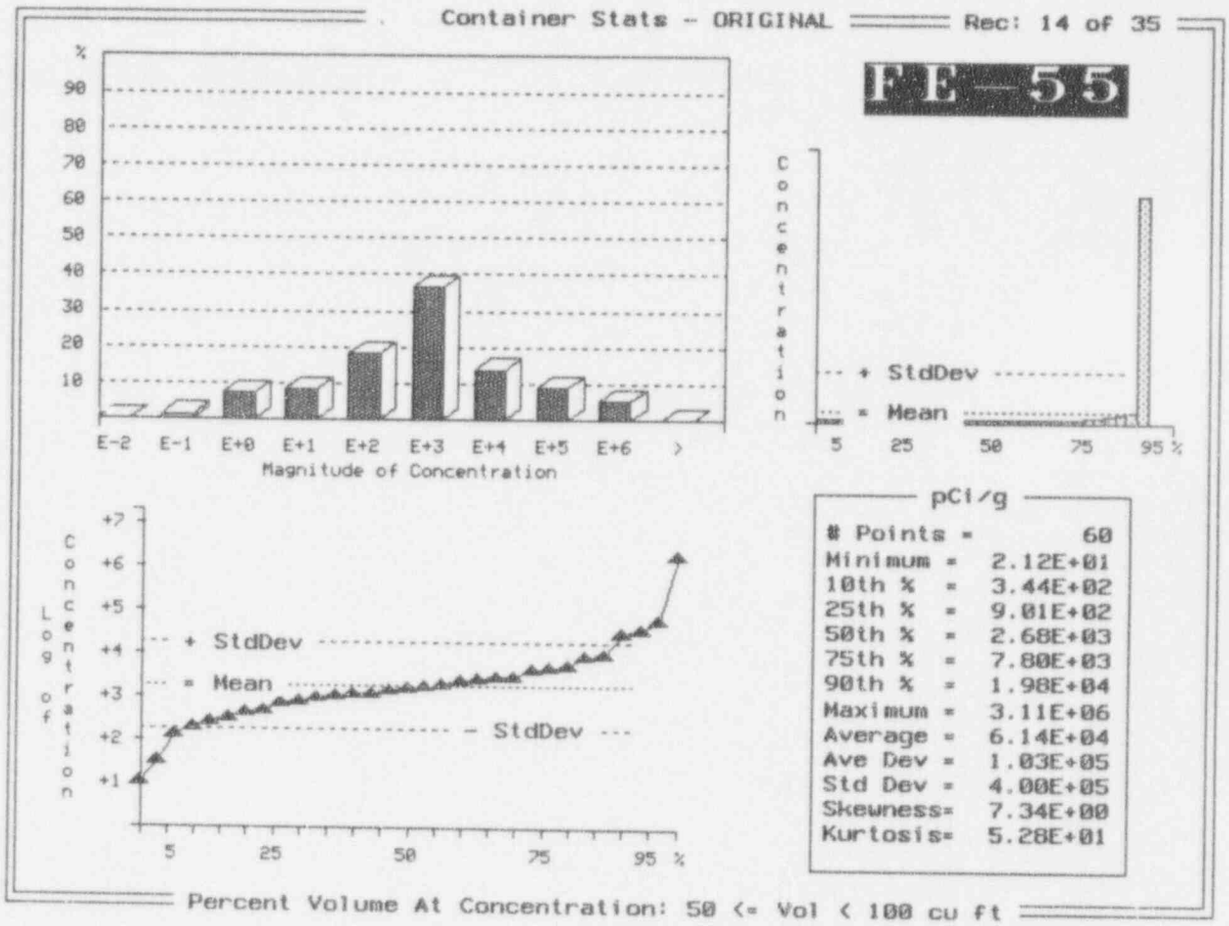

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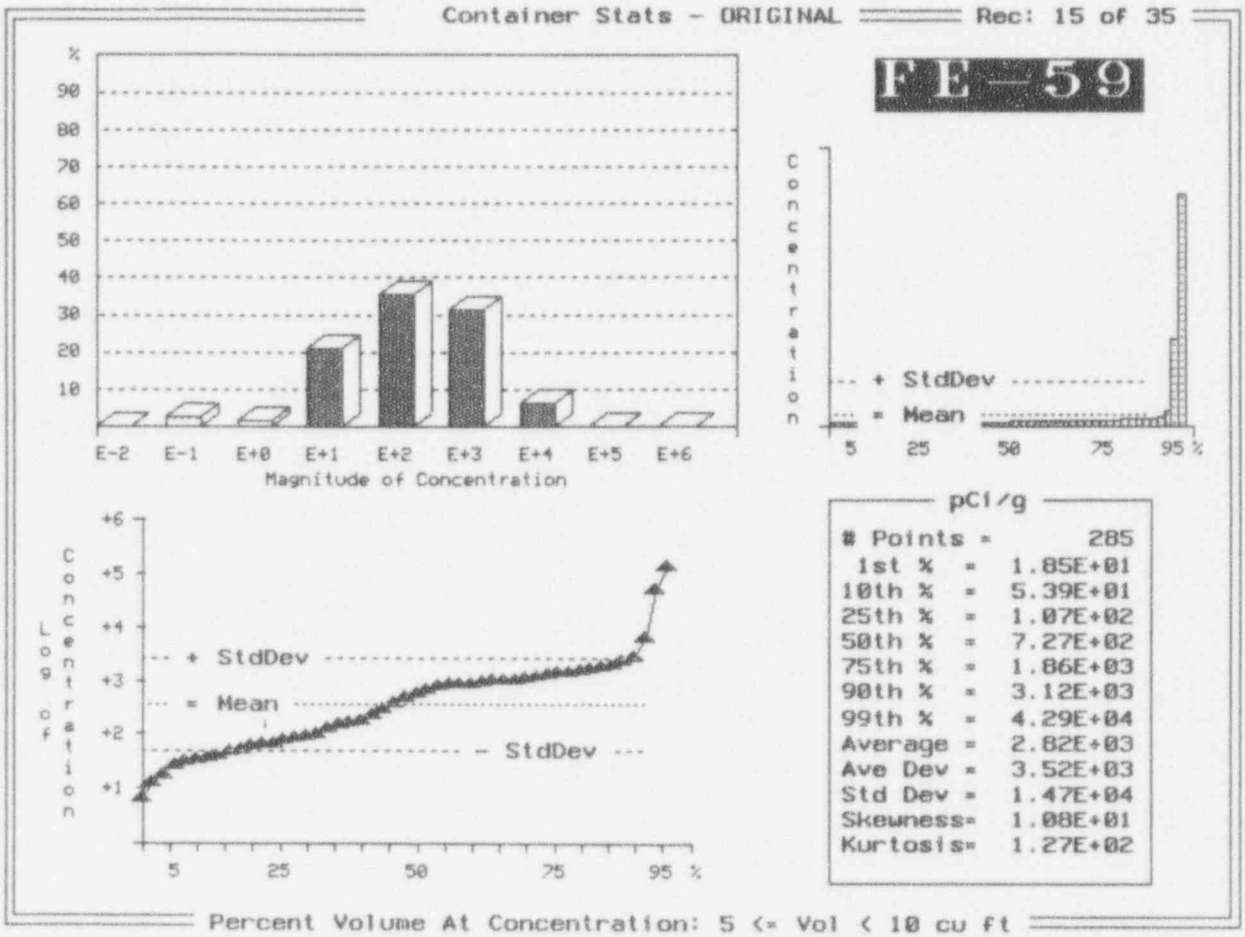

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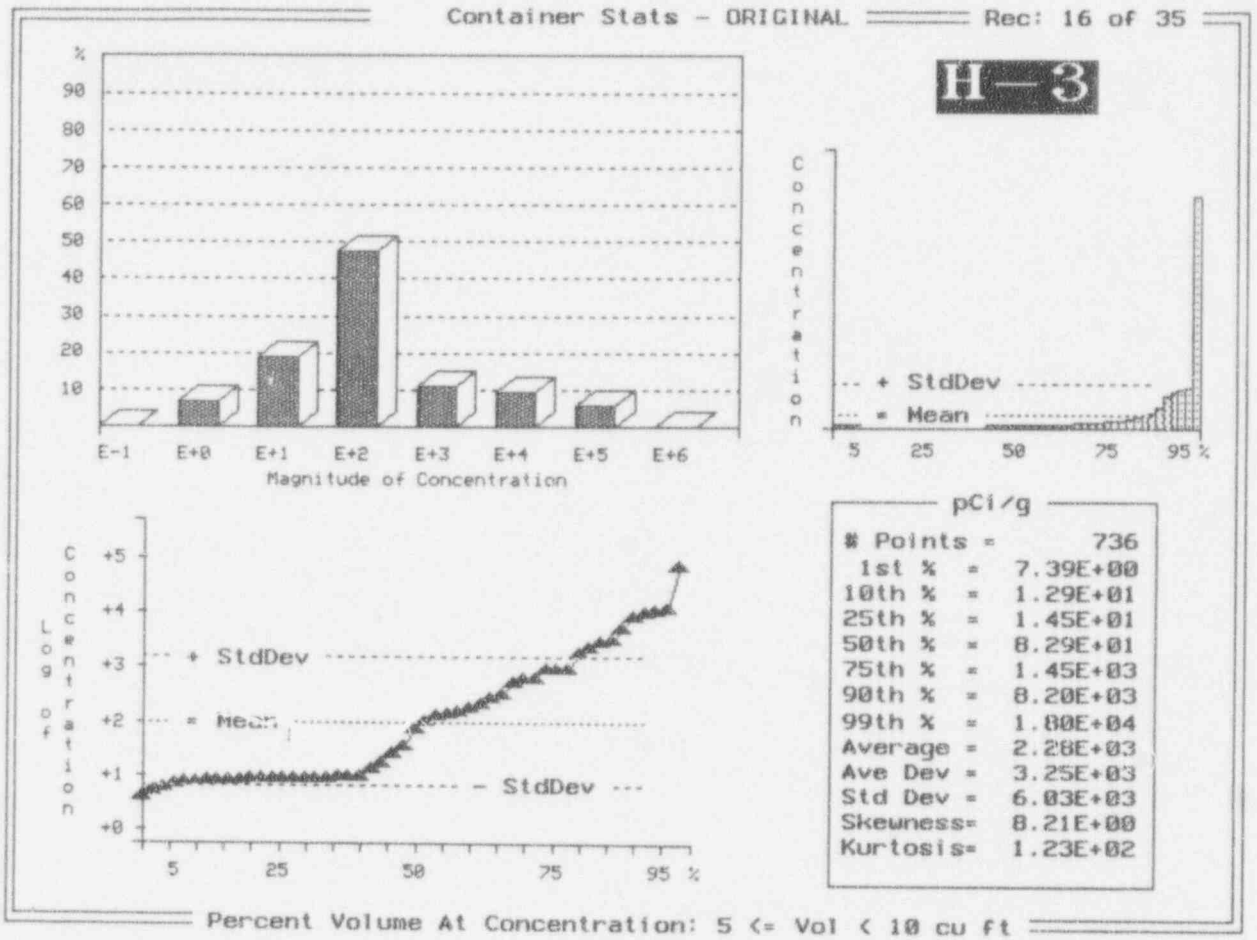

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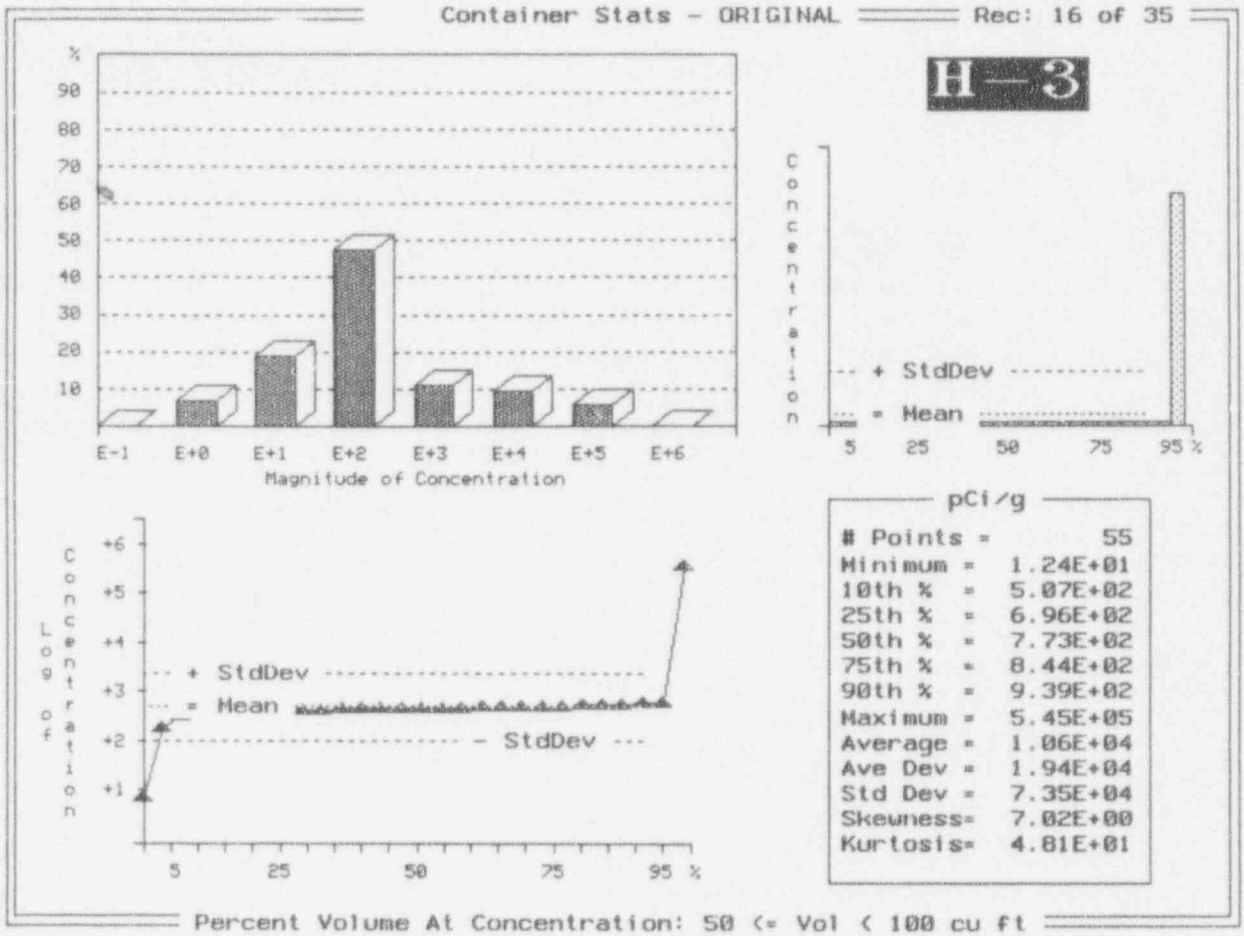

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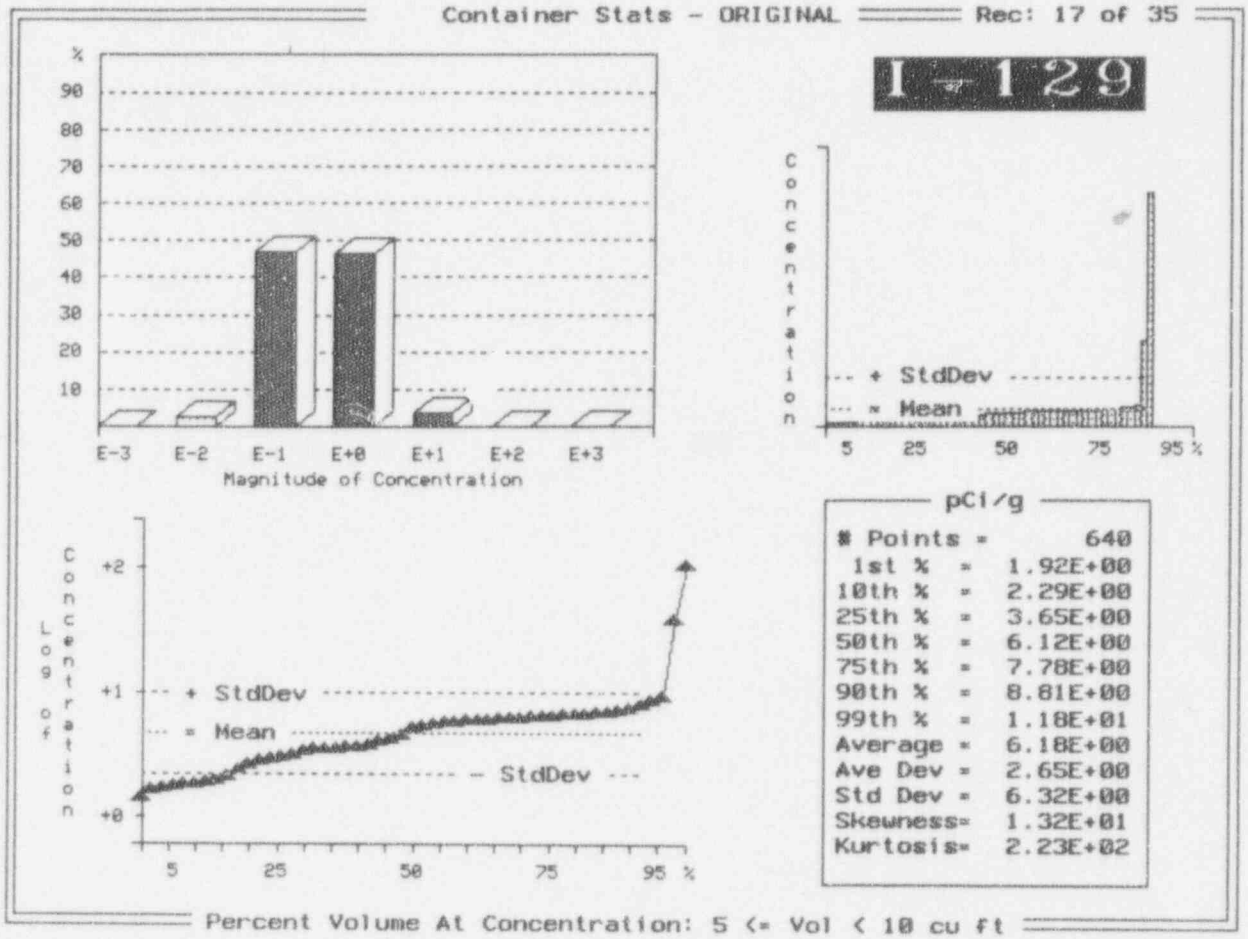

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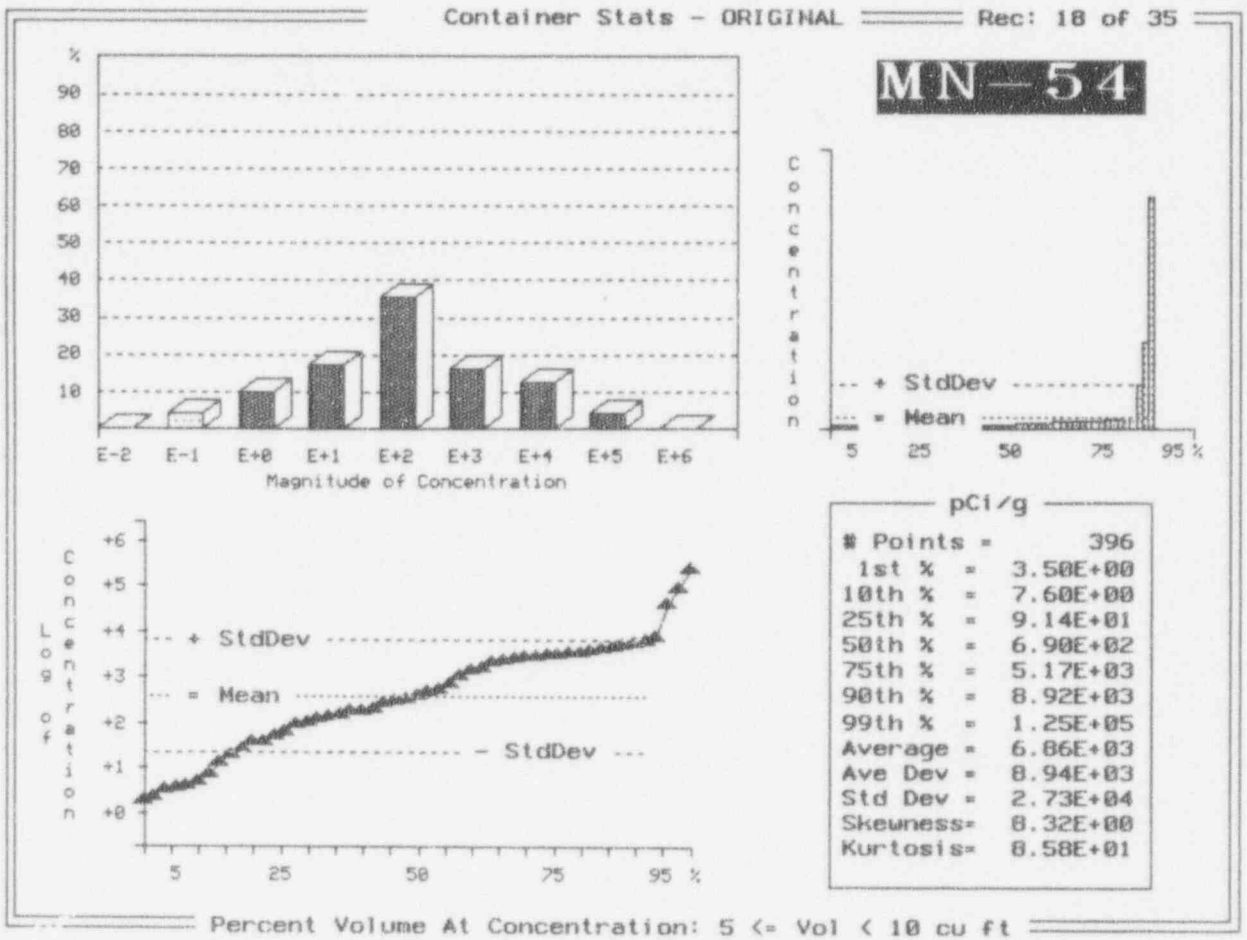

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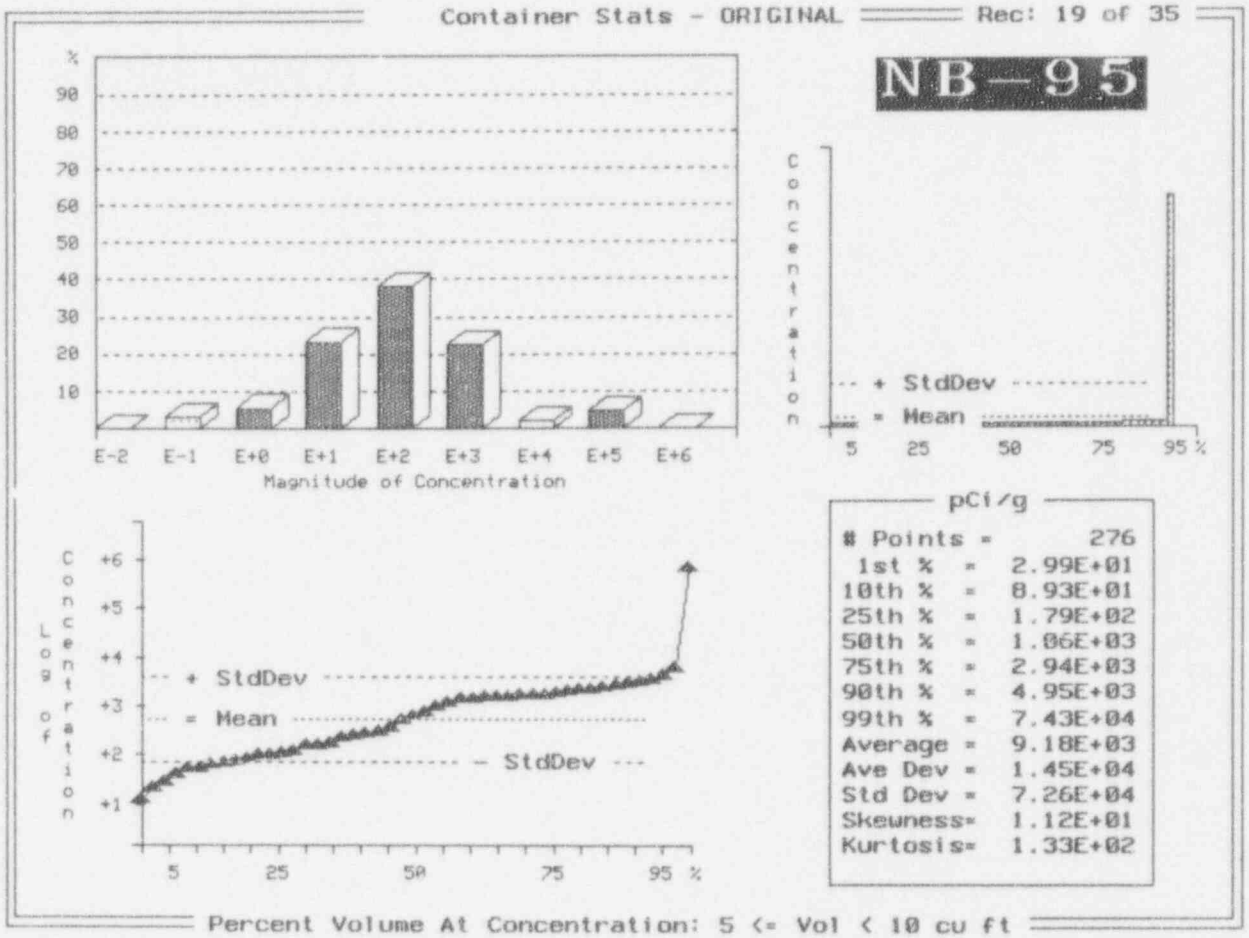

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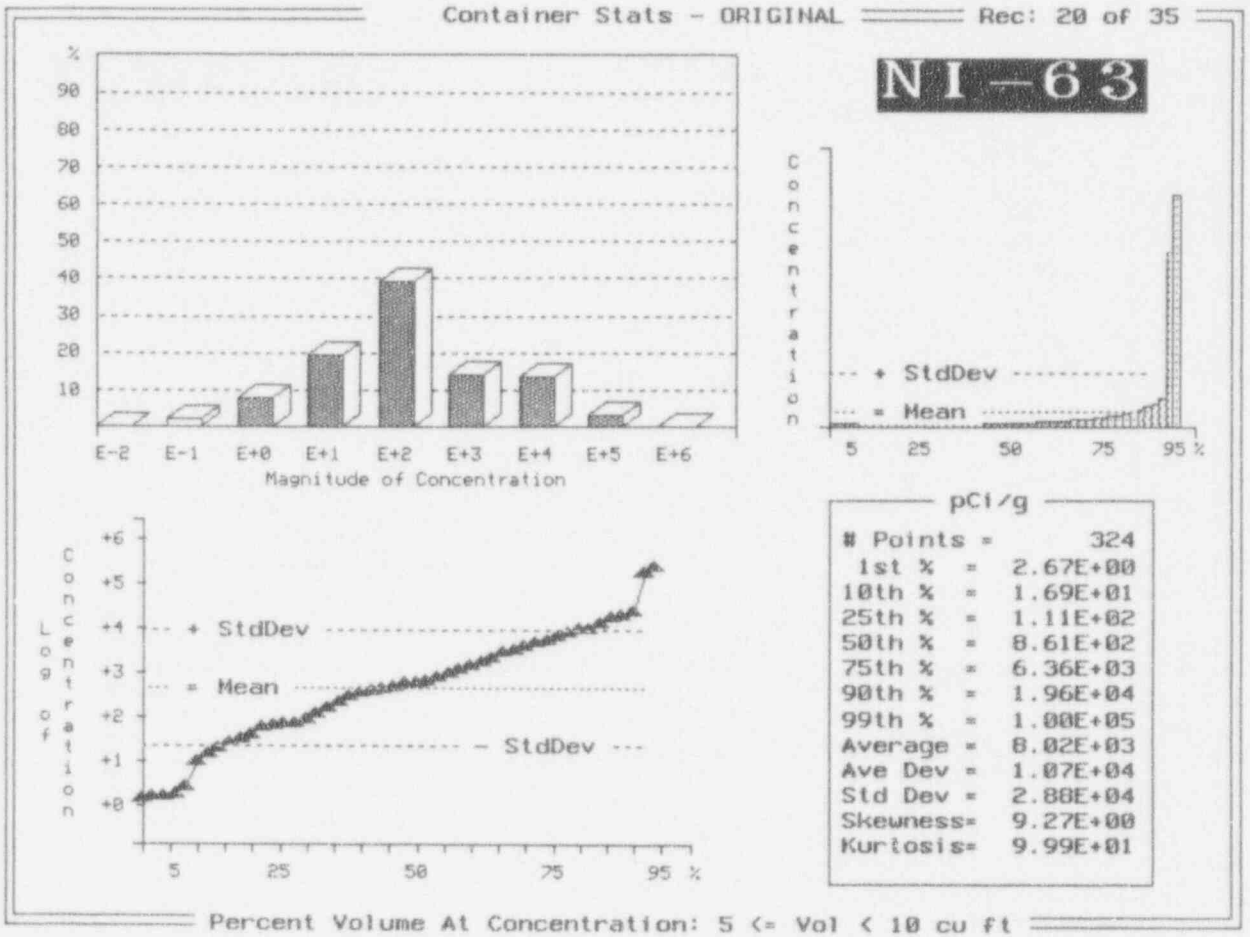

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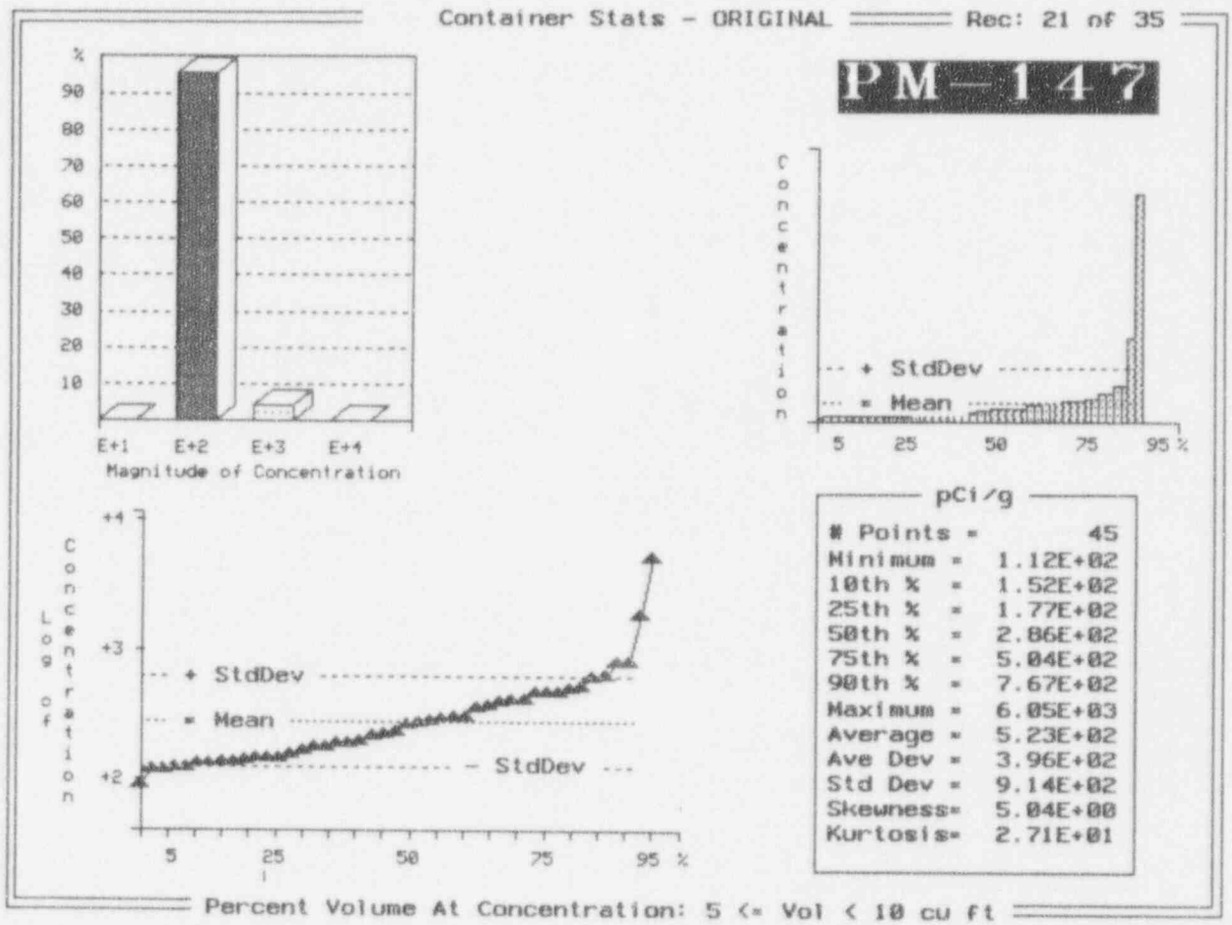

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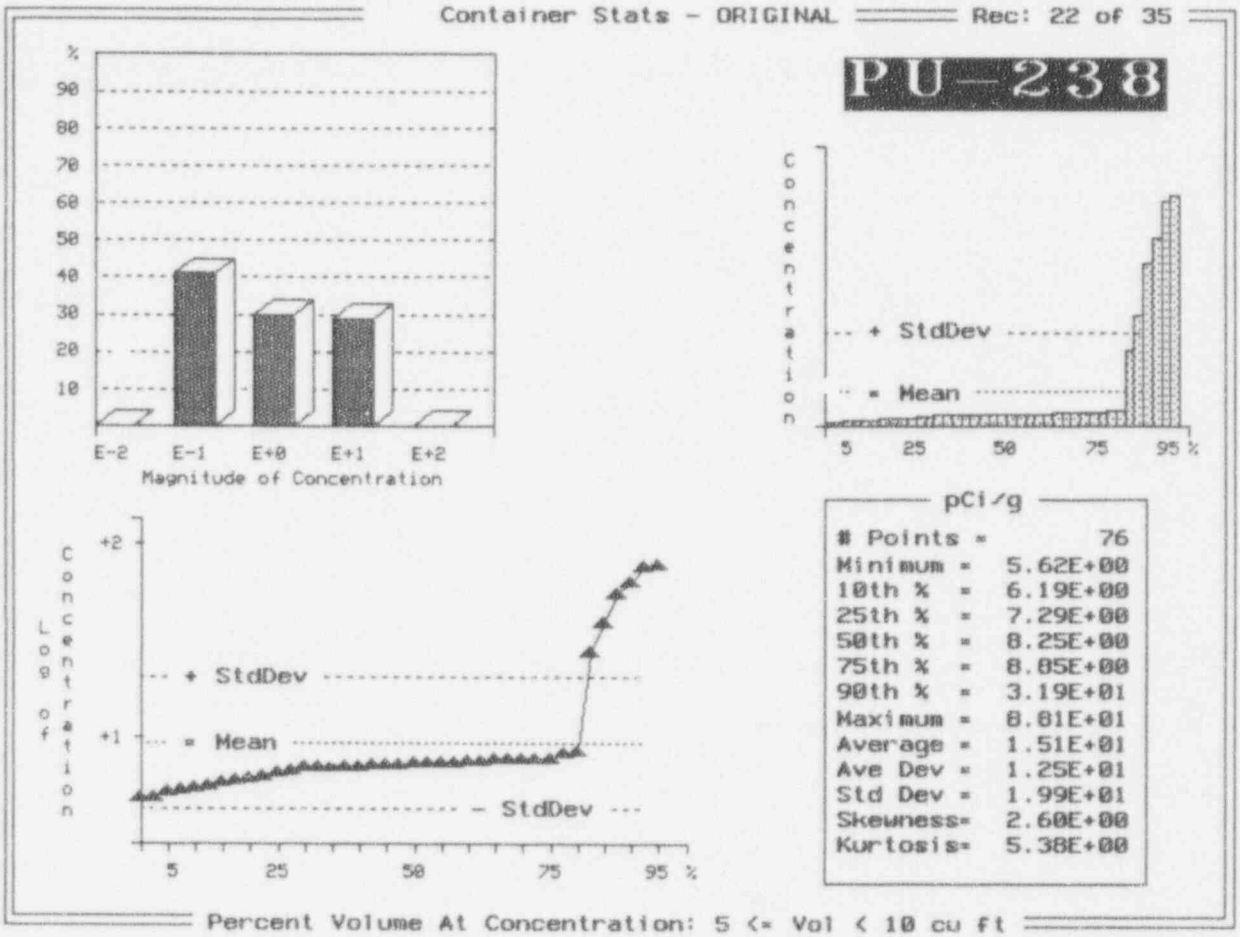

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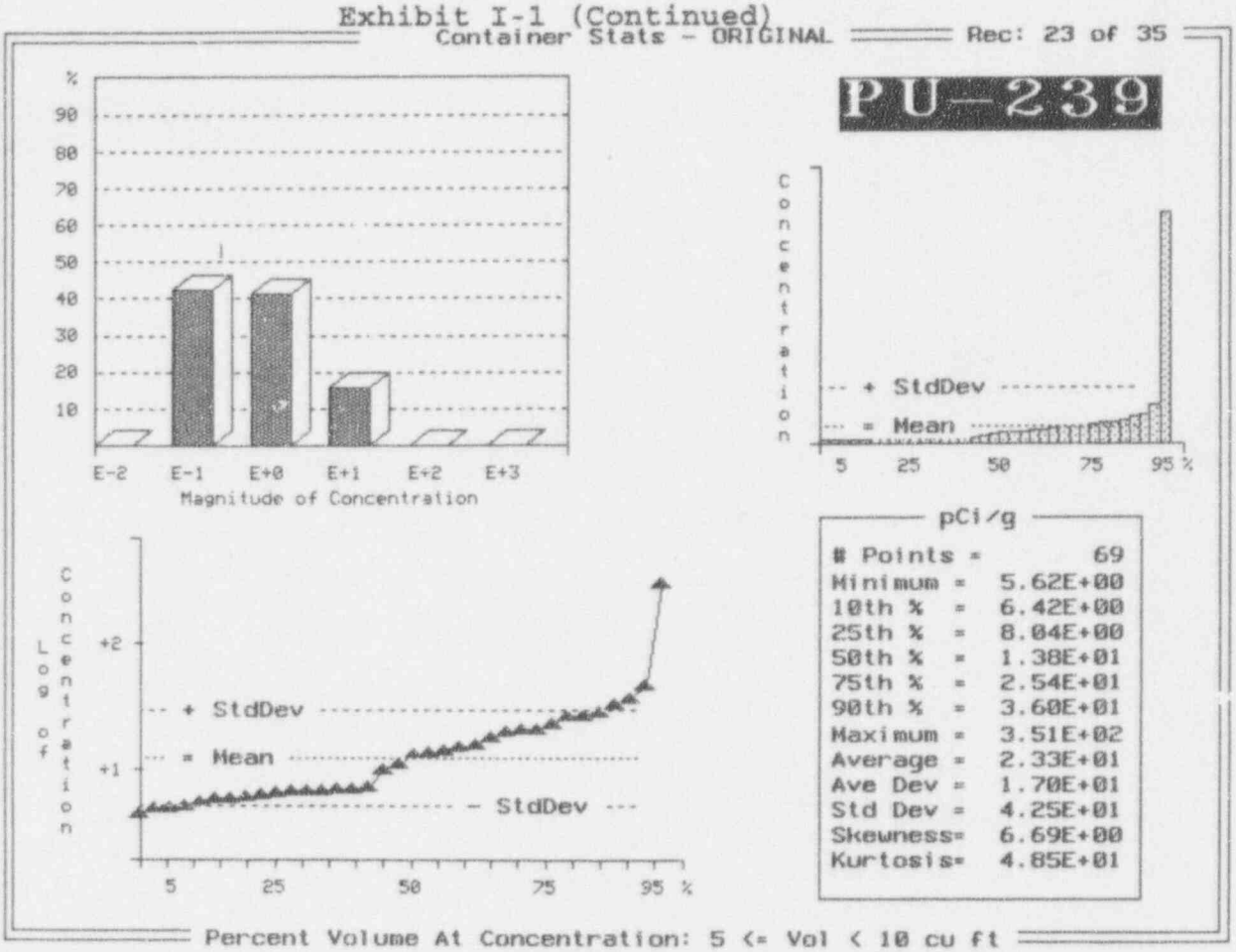

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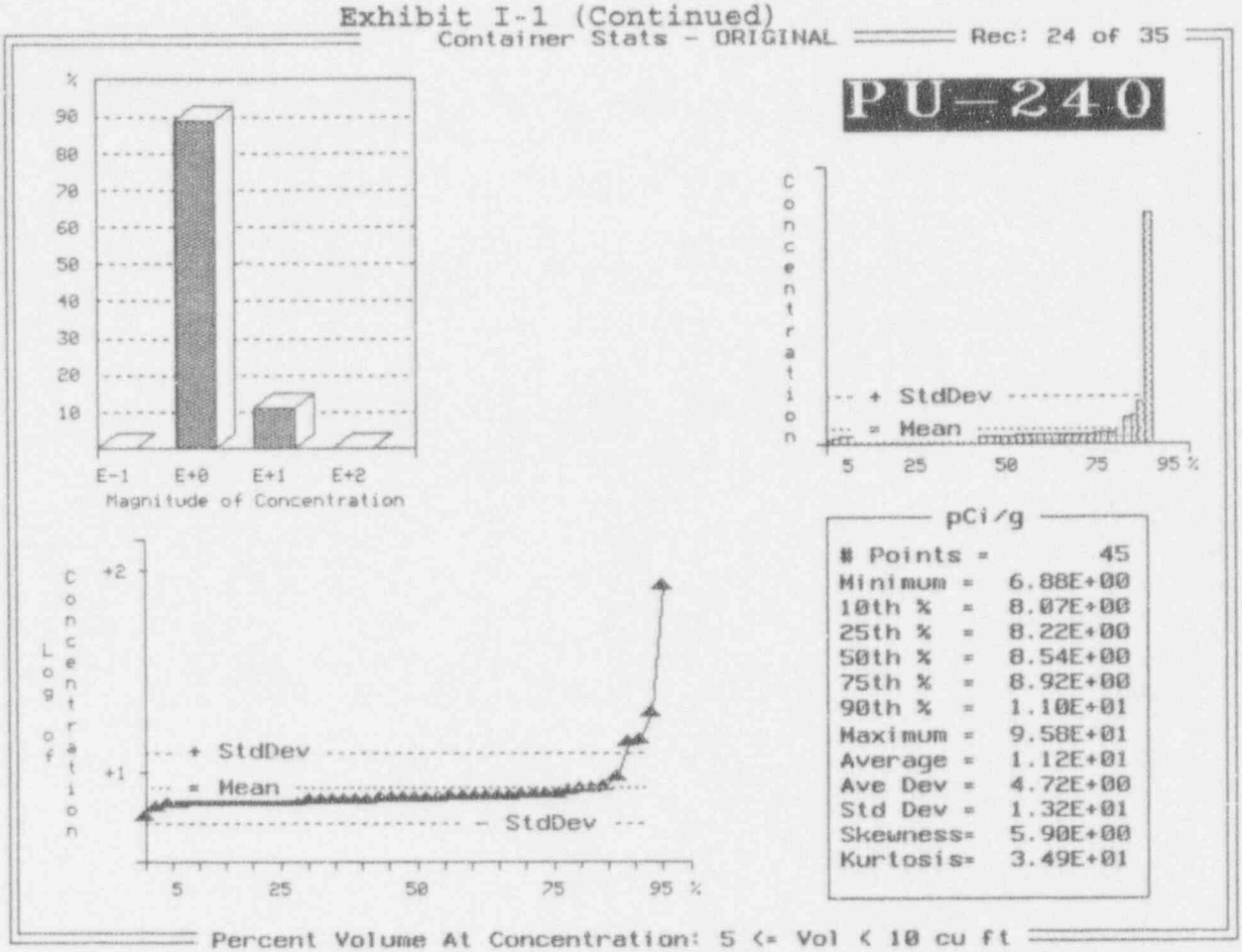
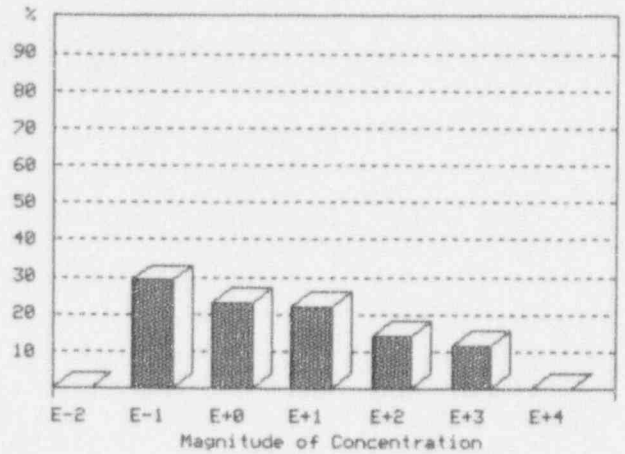
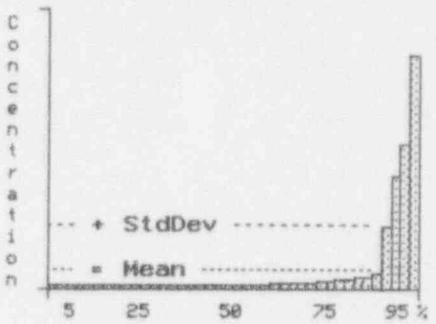


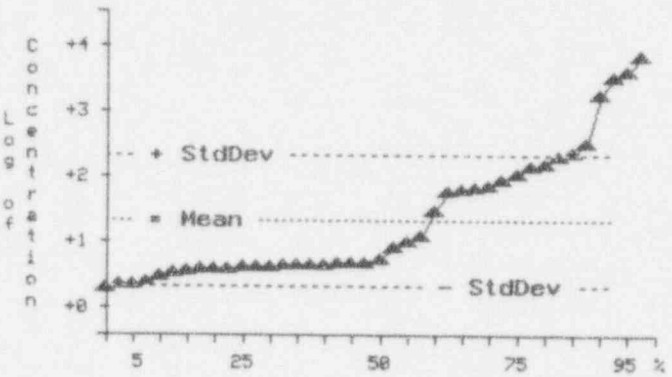
Exhibit I-1 (Continued)

Container Stats - ORIGINAL Rec: 25 of 35



PU-241





pCi/g

# Points =	157
1st % =	3.26E+00
10th % =	4.24E+00
25th % =	6.15E+00
50th % =	7.57E+00
75th % =	1.38E+02
90th % =	4.55E+02
99th % =	6.31E+03
Average =	4.98E+02
Ave Dev =	7.81E+02
Std Dev =	1.50E+03
Skewness=	3.62E+00
Kurtosis=	1.31E+01

Percent Volume At Concentration: 5 <= Vol < 10 cu ft

Exhibit I-1 (Continued)

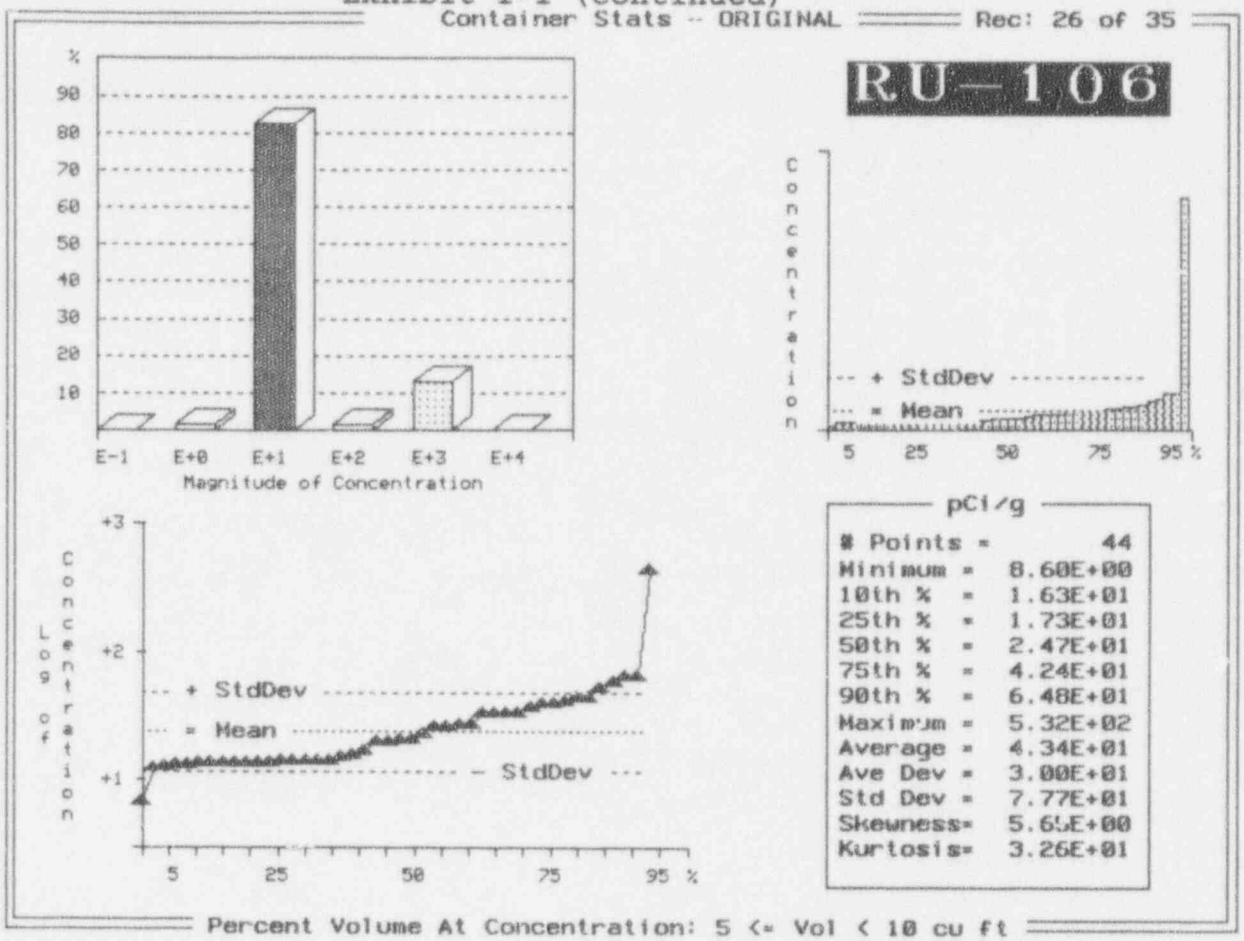


Exhibit I-1 (Continued)

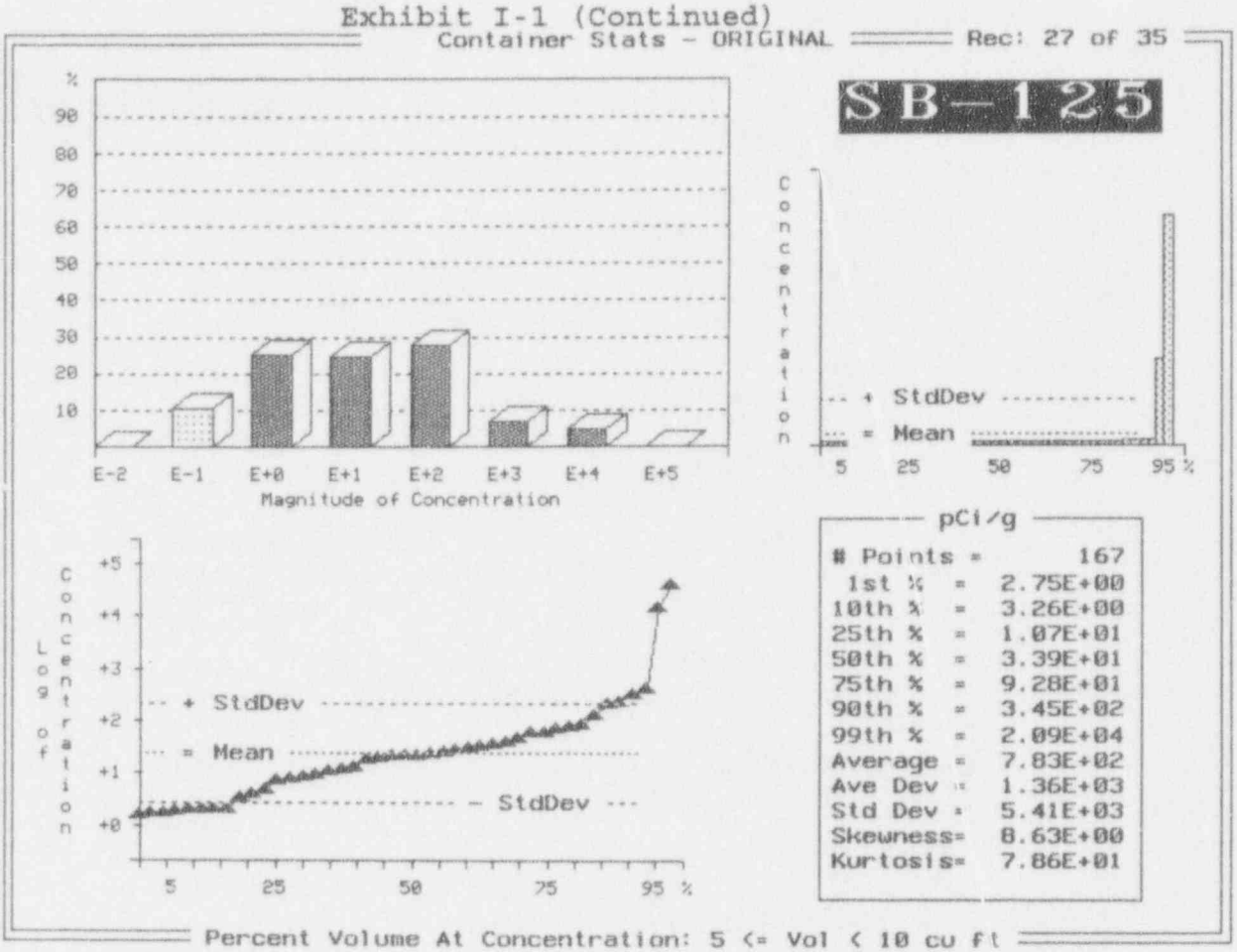


Exhibit I-1 (Continued)

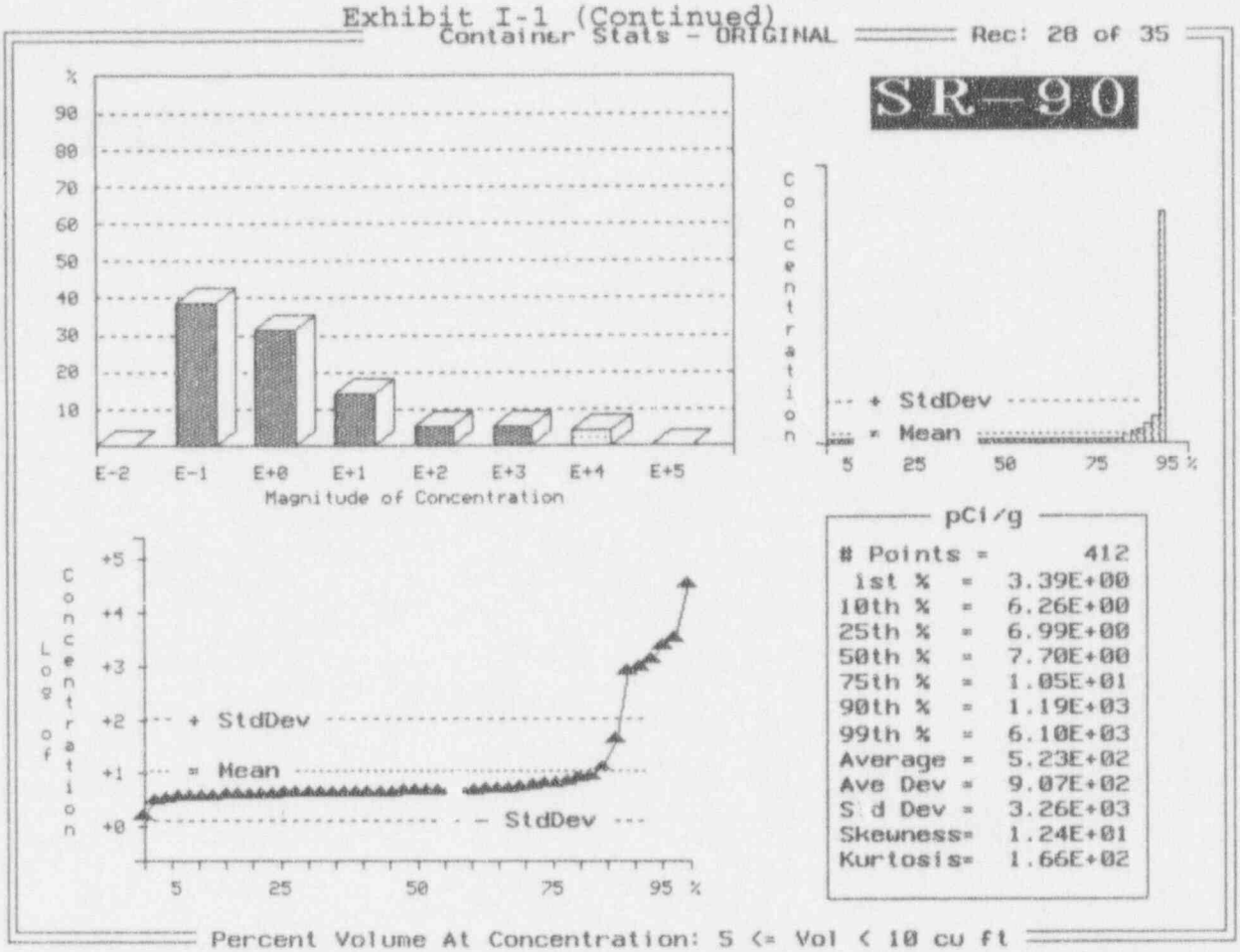


Exhibit I-1 (Continued)

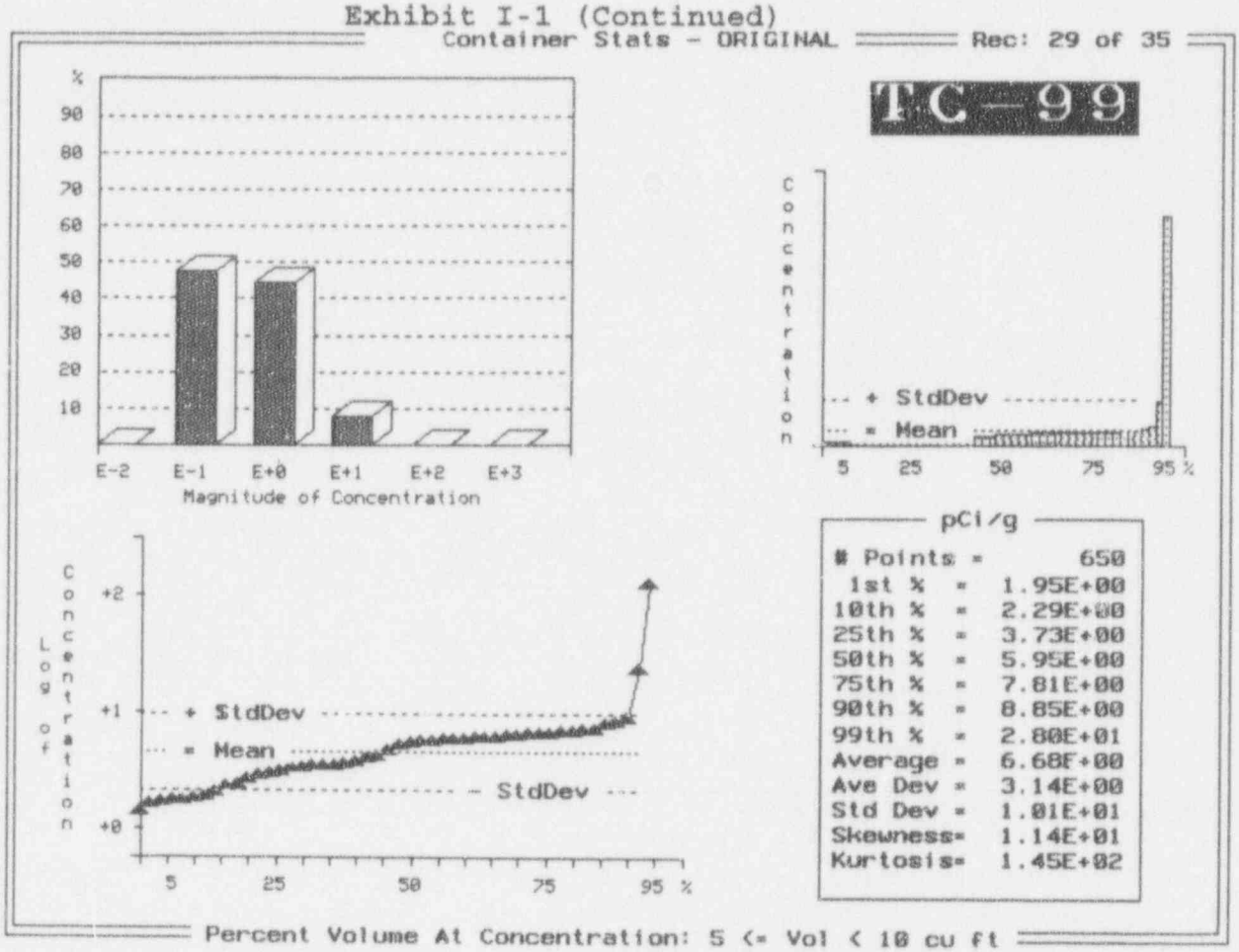


Exhibit I-1 (Continued)

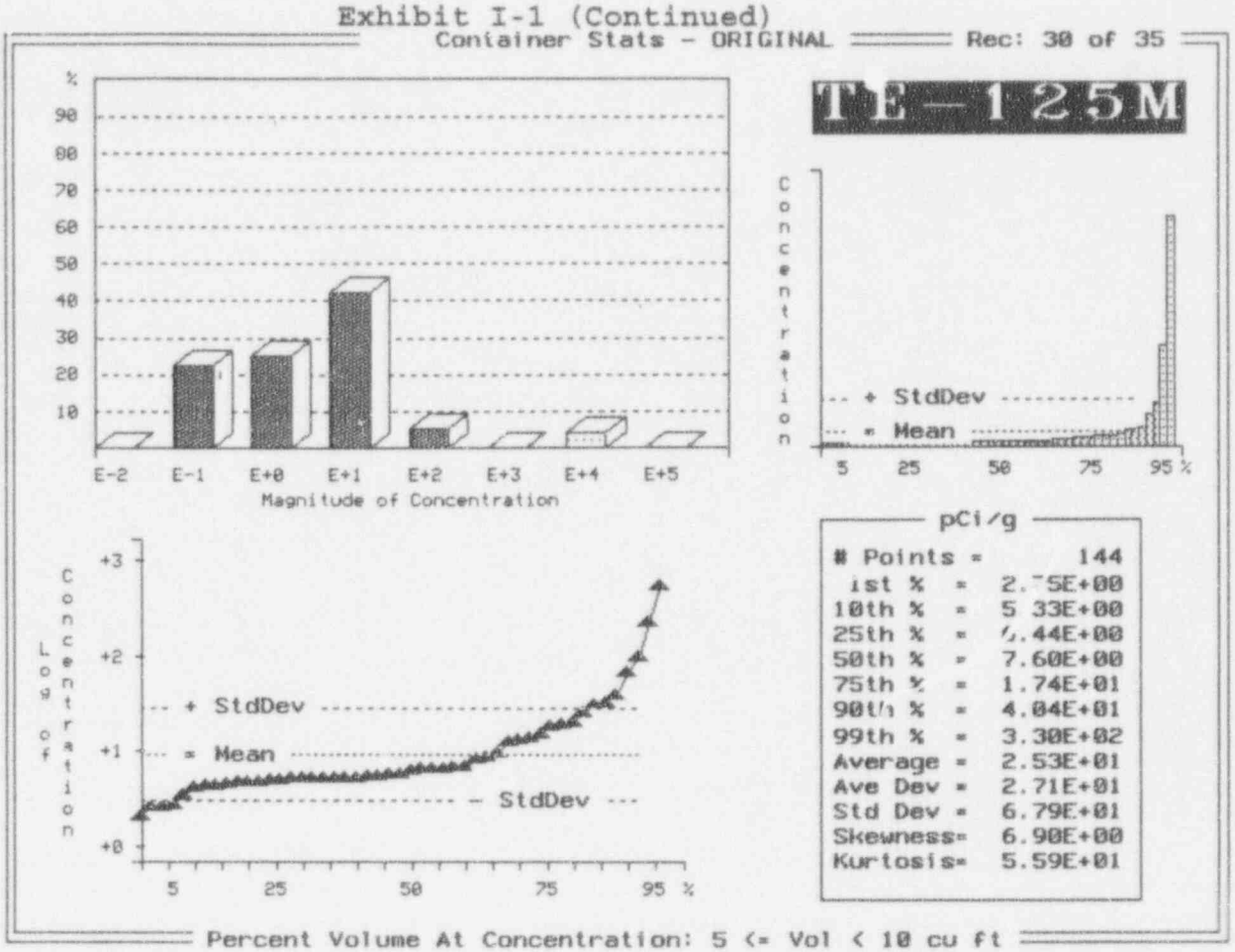


Exhibit I-1 (Continued)

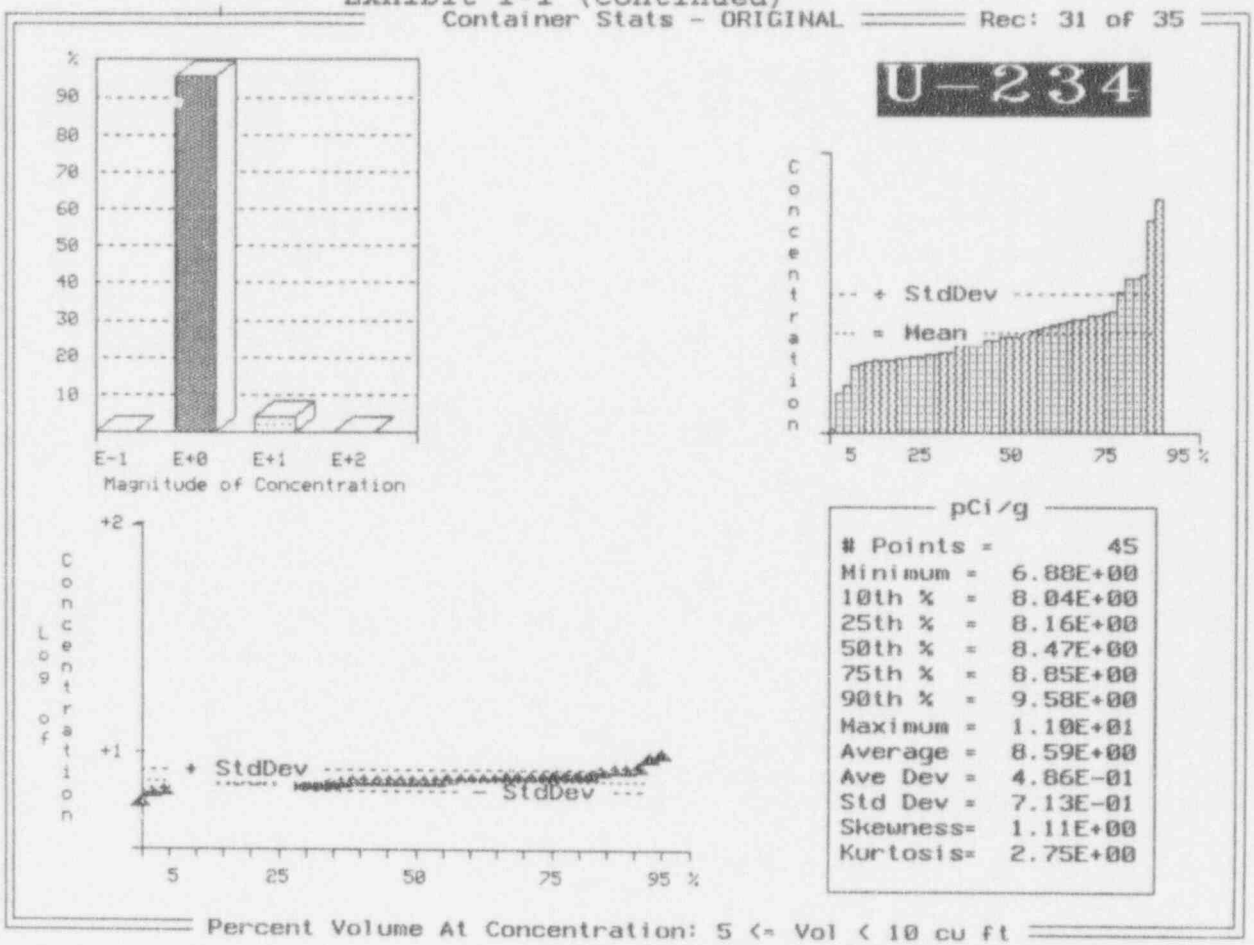
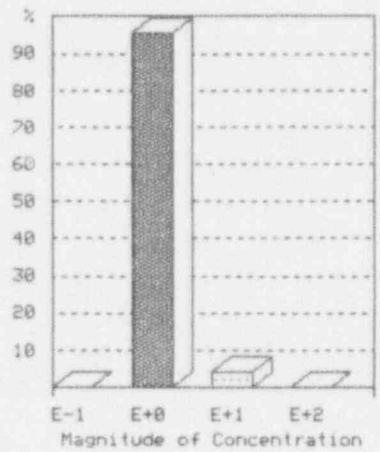
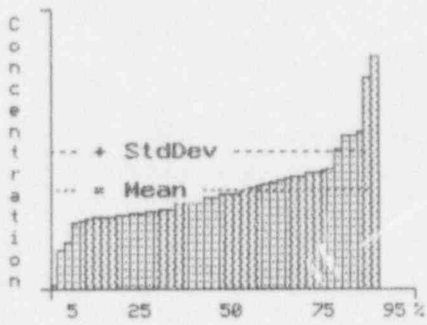


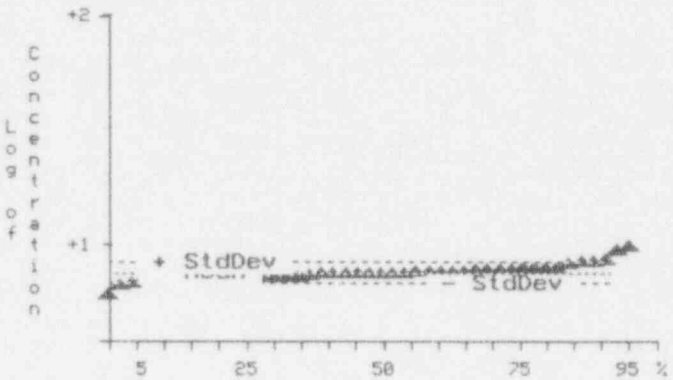
Exhibit I-1 (Continued)

Container Stats - ORIGINAL Rec: 32 of 35



U-235





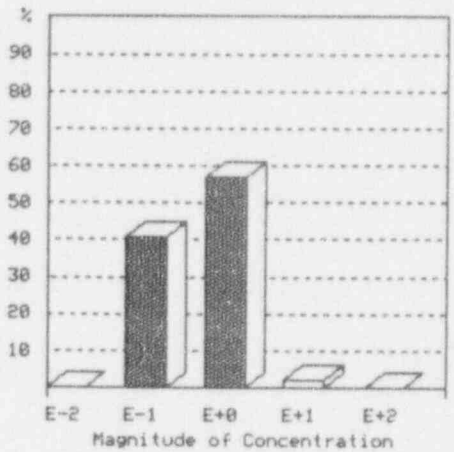
pCi/g

# Points =	45
Minimum =	6.88E+00
10th % =	8.04E+00
25th % =	8.16E+00
50th % =	8.47E+00
75th % =	8.85E+00
90th % =	9.58E+00
Maximum =	1.10E+01
Average =	8.59E+00
Ave Dev =	4.86E-01
Std Dev =	7.13E-01
Skewness=	1.11E+00
Kurtosis=	2.75E+00

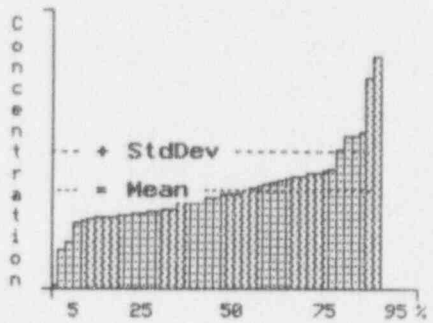
Percent Volume At Concentration: 5 <= Vol < 10 cu ft

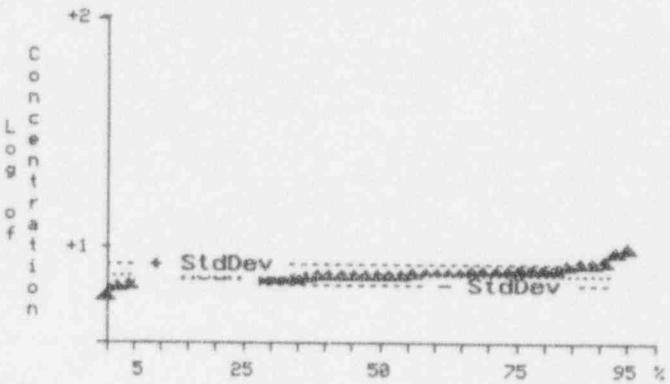
Exhibit I-1 (Continued)

Container Stats - ORIGINAL — Rec: 33 of 35



U-238





pCi/g

# Points =	45
Minimum =	6.88E+00
10th % =	8.04E+00
25th % =	8.16E+00
50th % =	8.47E+00
75th % =	8.85E+00
90th % =	9.58E+00
Maximum =	1.10E+01
Average =	8.59E+00
Avg Dev =	4.86E-01
Std Dev =	7.13E-01
Skewness=	1.11E+00
Kurtosis=	2.75E+00

Percent Volume At Concentration: 5 <= Vol < 10 cu ft

Exhibit I-1 (Continued)

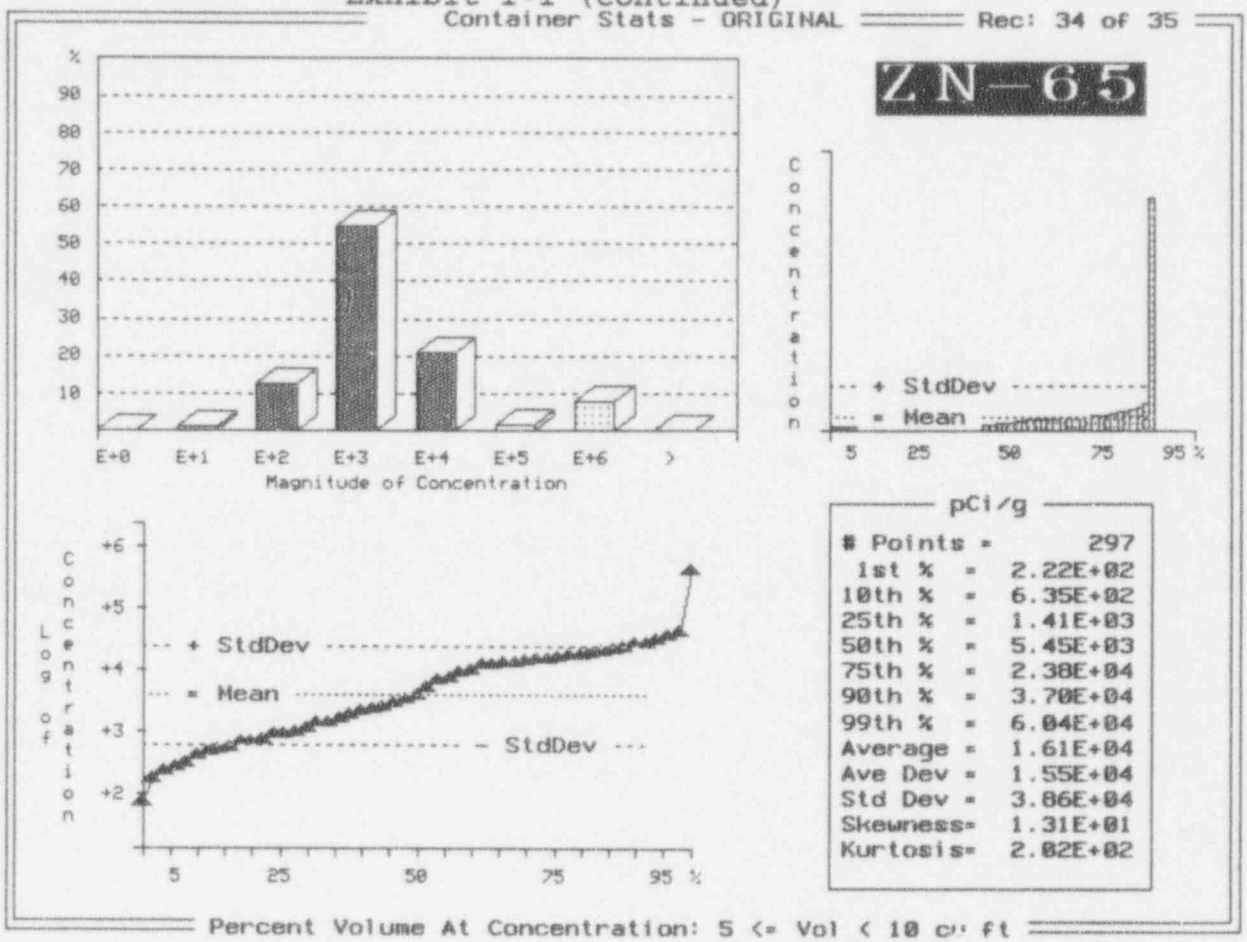
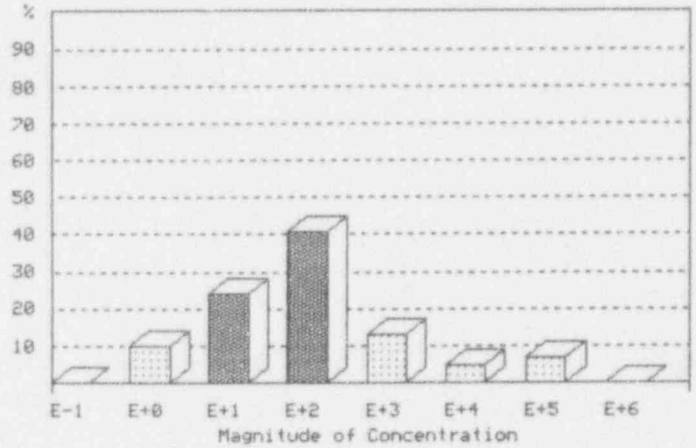
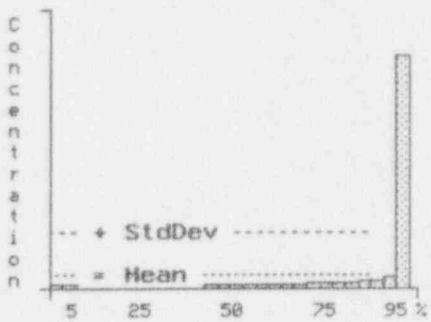


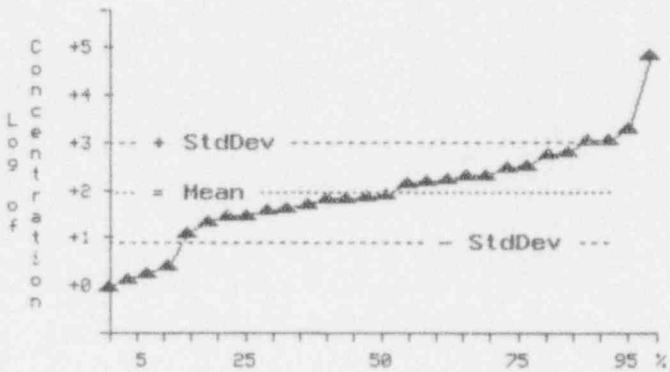
Exhibit I-1 (Continued)

Container Stats - ORIGINAL — Rec: 35 of 35



ZR-95





pCi/g

# Points =	28
Minimum =	1.63E+00
10th % =	3.06E+00
25th % =	4.54E+01
50th % =	1.21E+02
75th % =	4.54E+02
90th % =	1.58E+03
Maximum =	9.10E+04
Average =	3.65E+03
Ave Dev =	6.24E+03
Std Dev =	1.71E+04
Skewness=	4.73E+00
Kurtosis=	2.11E+01

Percent Volume At Concentration: 50 <= Vol < 100 cu ft

Exhibit I-2 Solidified Liquids Radionuclide Distributions
Container Level Analysis for 1989 Non-Brokered
Utility Waste and All Regions and States[a]

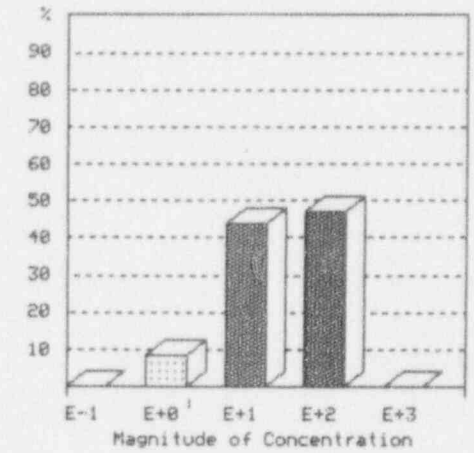
Waste Class: A-Unstable and A-Stable
Solidification/Absorption media: Cement and Envirostone.
Number of shipping records: 12
Number of shipping containers: 20
Total waste volume: 91.4 m^3
Total waste mass: 153,600 Kg
Average waste form density: 1.68 g/cm^3

	Concentration Ranges - Percentile[b] - Ci/m^3 -			- pCi/g -		
Nuclide	1st	50th	99th	1st	50th	99th
C-14	1.43E-05	1.70E-04	5.96E-04	8.35E+00	9.21E+01	7.51E+02
Co-58	1.17E-02	2.26E-02	5.42E-01	6.50E+03	1.15E+04	3.16E+05
Co-60	1.94E-03	2.26E-02	4.02E-01	1.14E+03	1.15E+04	4.81E+05
Cr-51	3.24E-03	6.51E-03	9.92E-02	1.94E+03	3.44E+03	1.19E+05
Cs-134	2.24E-03	6.35E-03	8.95E-02	1.31E+03	3.52E+03	5.23E+04
Cs-137	3.00E-03	1.10E-02	1.18E-01	1.75E+03	6.10E+03	6.91E+04
Fe-55	2.64E-03	3.20E-02	2.39E-01	1.54E+03	1.61E+04	2.86E+05
H-3	1.97E-04	7.29E-04	3.89E-01	1.15E+02	4.04E+02	2.15E+05
I-129	4.23E-07	5.94E-07	6.79E-07	4.79E-01	4.90E-01	5.06E-01
Mn-54	4.50E-04	4.86E-03	3.98E-02	2.63E+02	2.59E+03	4.76E+04
Ni-63	1.63E-03	1.82E-02	6.43E-02	9.50E+02	9.54E+03	3.76E+04
Sb-125	9.67E-04	1.01E-03	2.42E-03	5.36E+02	5.68E+02	1.31E+03
Tc-99	1.99E-07	5.08E-07	5.36E-06	1.02E-01	2.81E-01	3.13E+00

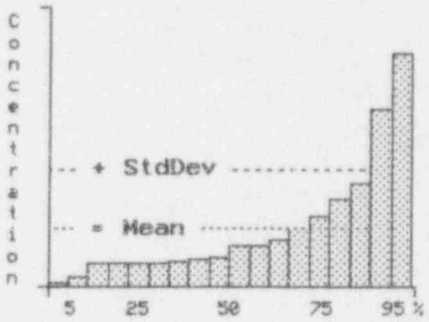
(a) Based on LLW data for Beatty and Richland only.
(b) Includes only radionuclides with 3 or more data points characterizing concentration ranges.

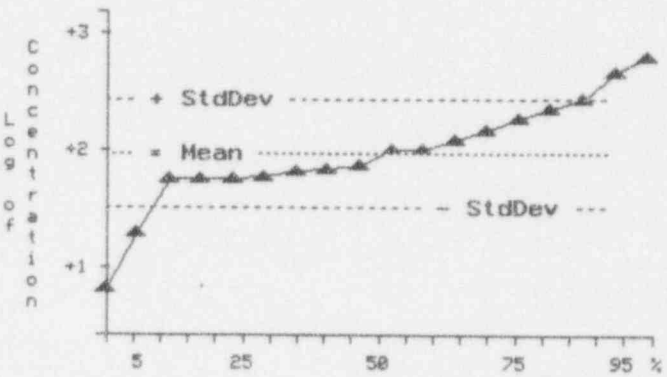
Exhibit I-2 (Continued)

Container Stats - ORIGINAL Rec: 1 of 12



C—14





pCi/g

# Points =	18
Minimum =	8.35E+00
10th % =	2.43E+01
25th % =	7.07E+01
50th % =	9.21E+01
75th % =	2.25E+02
90th % =	3.30E+02
Maximum =	7.51E+02
Average =	1.84E+02
Ave Dev =	1.37E+02
Std Dev =	1.95E+02
Skewness=	1.68E+00
Kurtosis=	1.93E+00

Percent Volume At Concentration: Vol >= 100 cu ft

Exhibit I-2 (Continued)

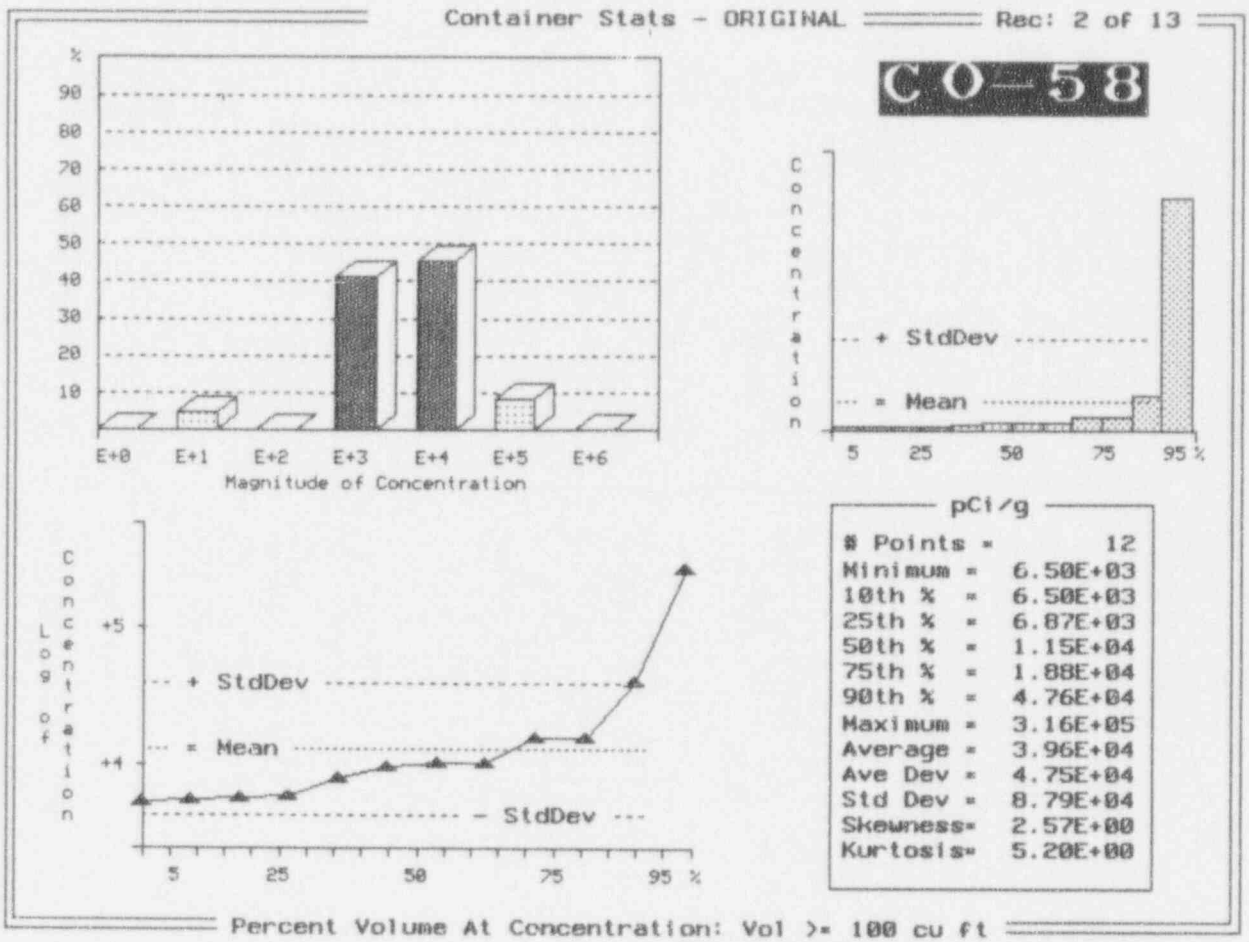


Exhibit I-2 (Continued)

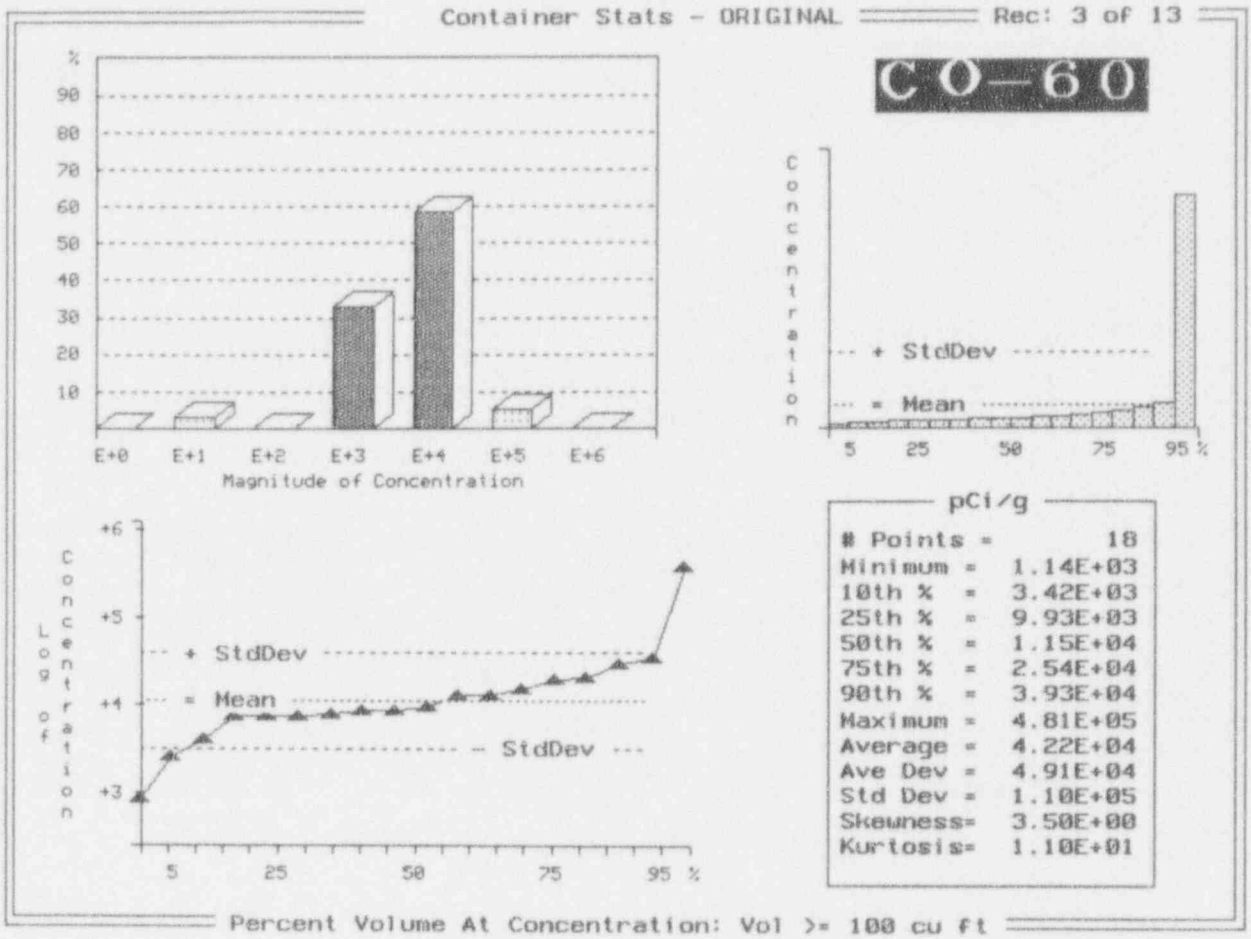


Exhibit I-2 (Continued)

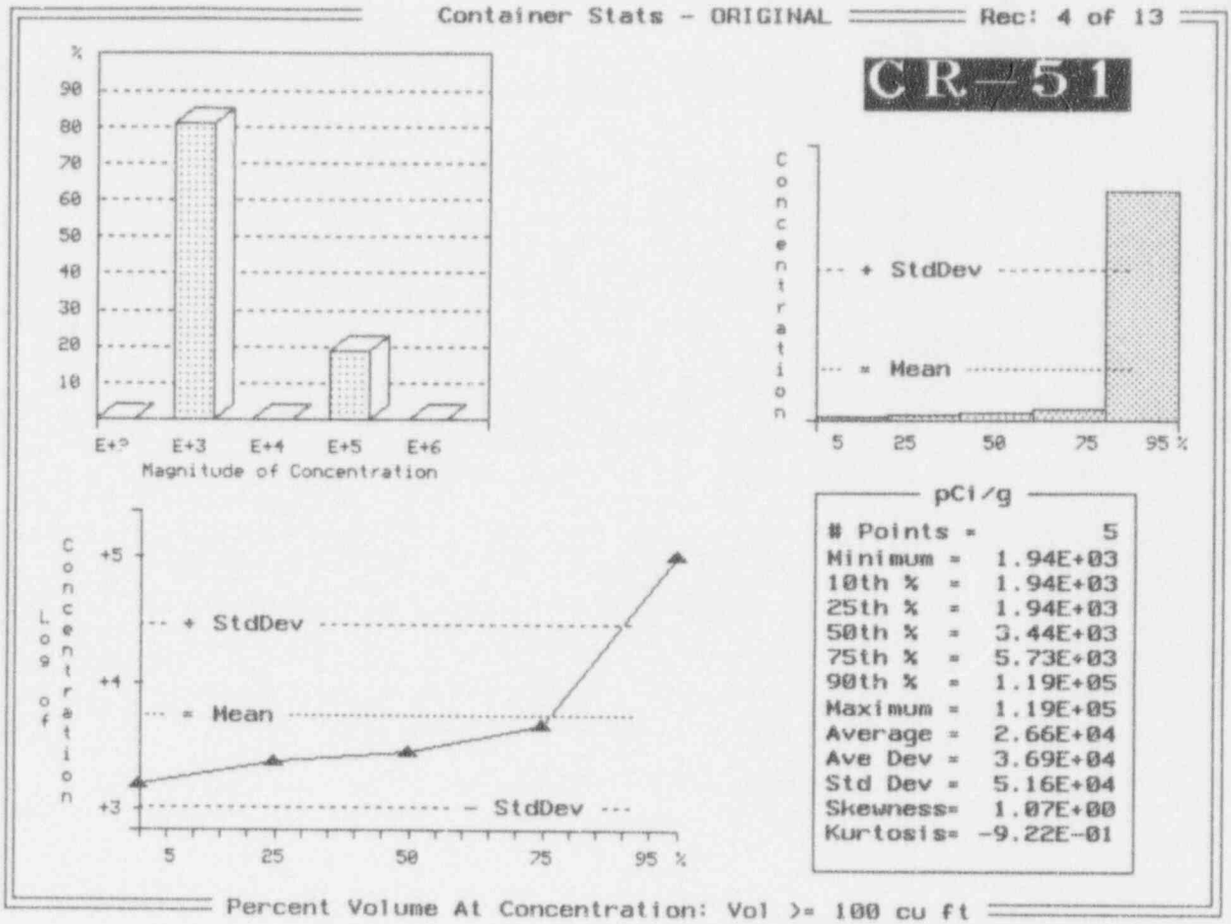


Exhibit I-2 (Continued)

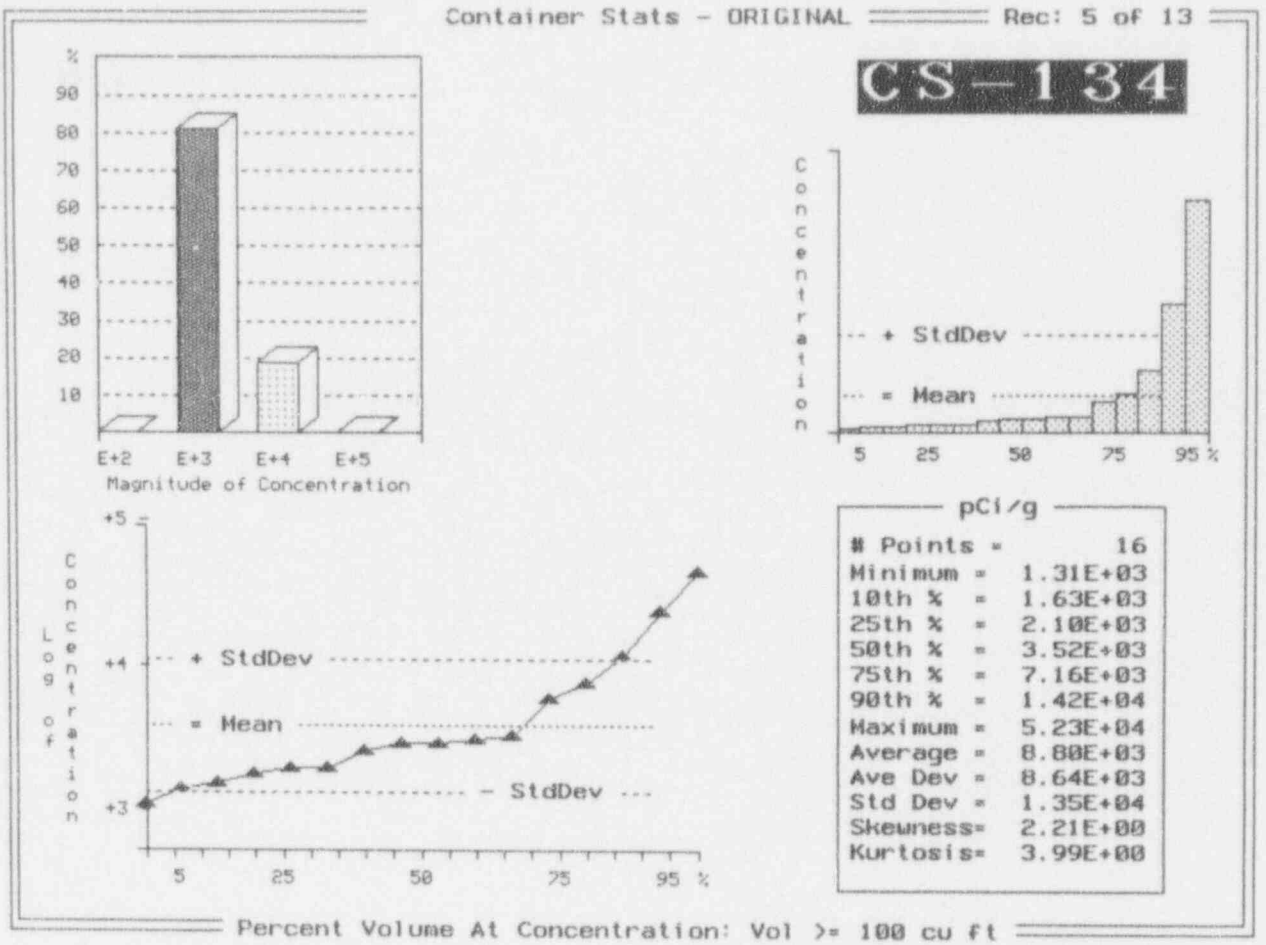


Exhibit I-2 (Continued)

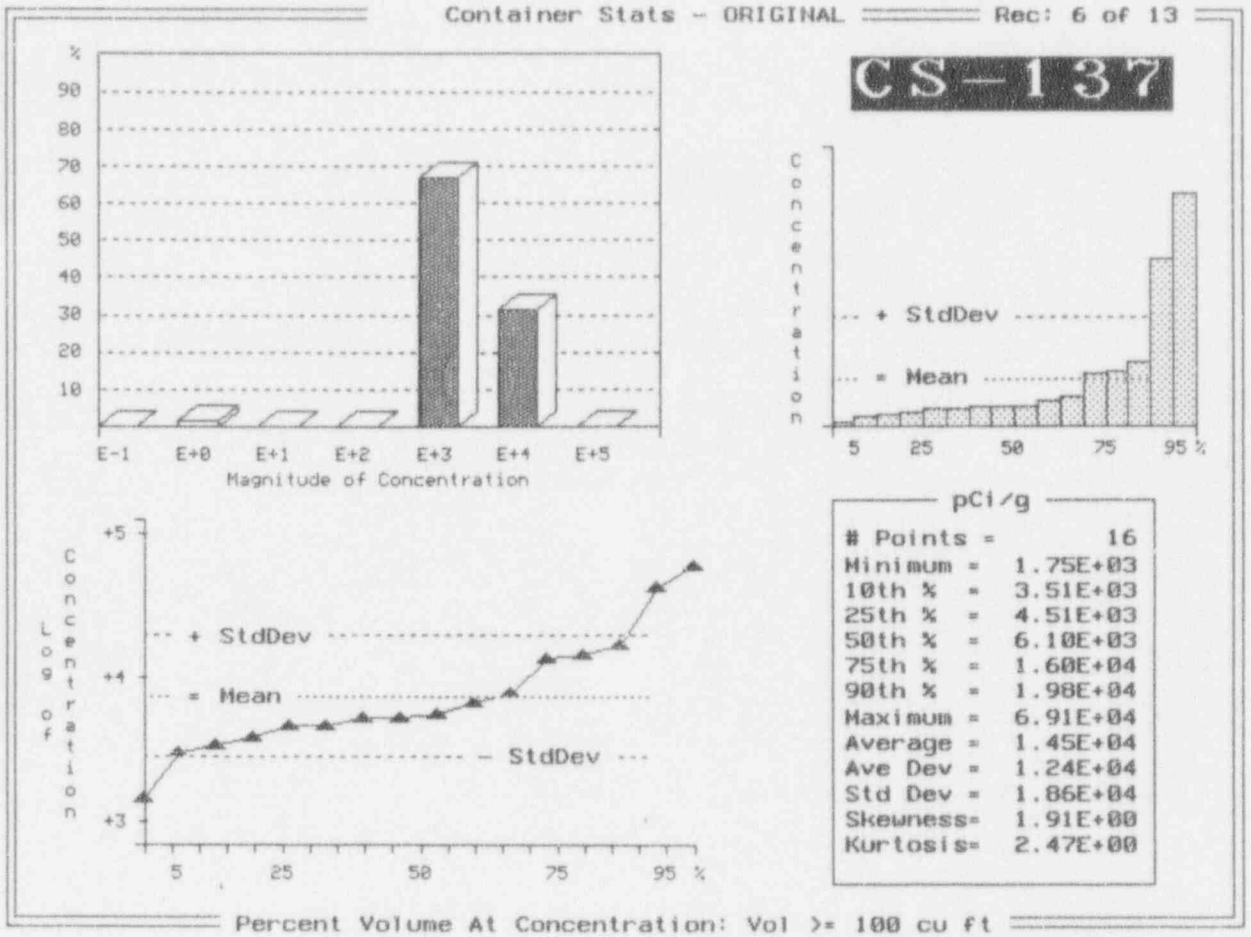


Exhibit I-2 (Continued)

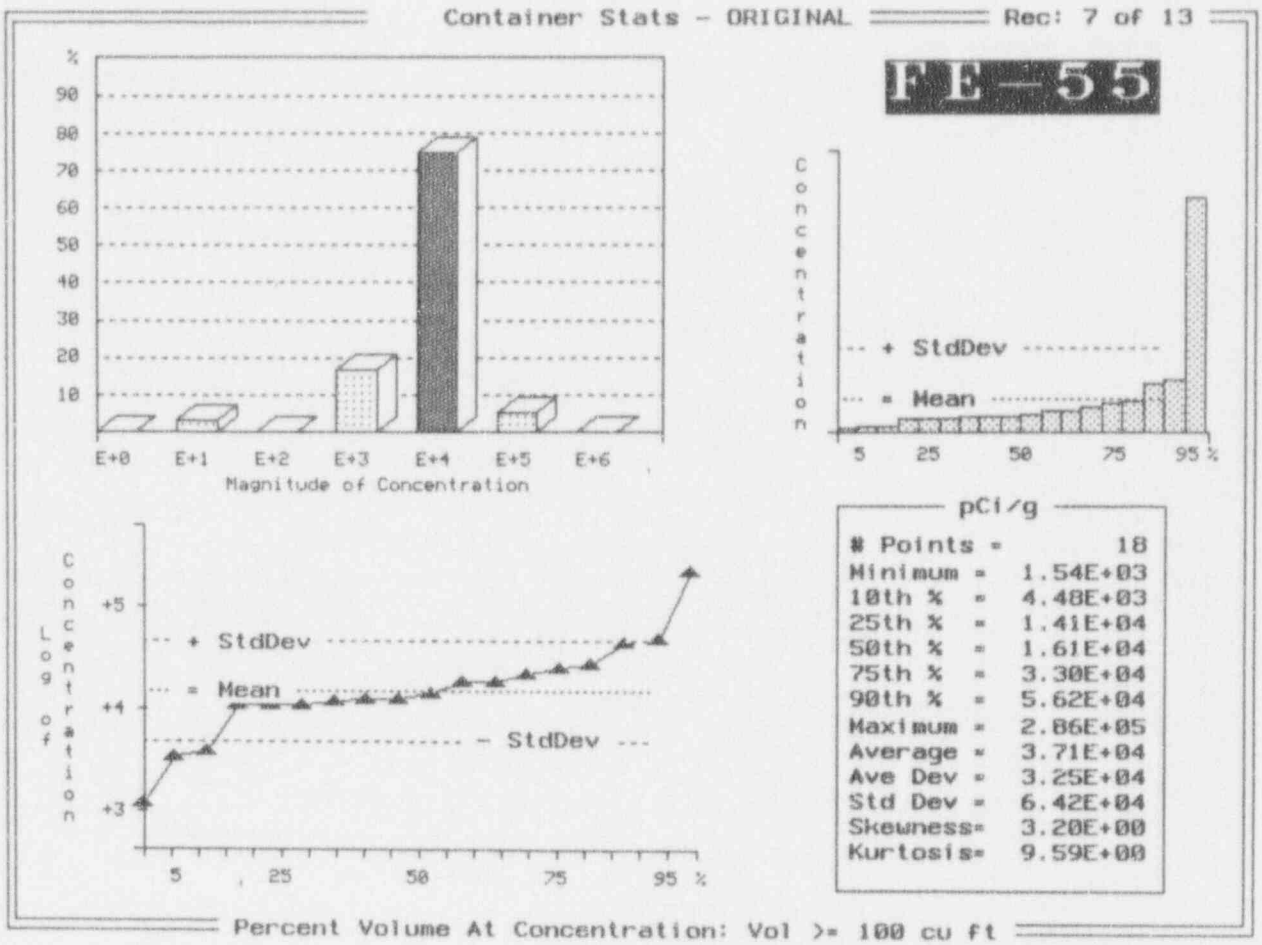


Exhibit I-2 (Continued)

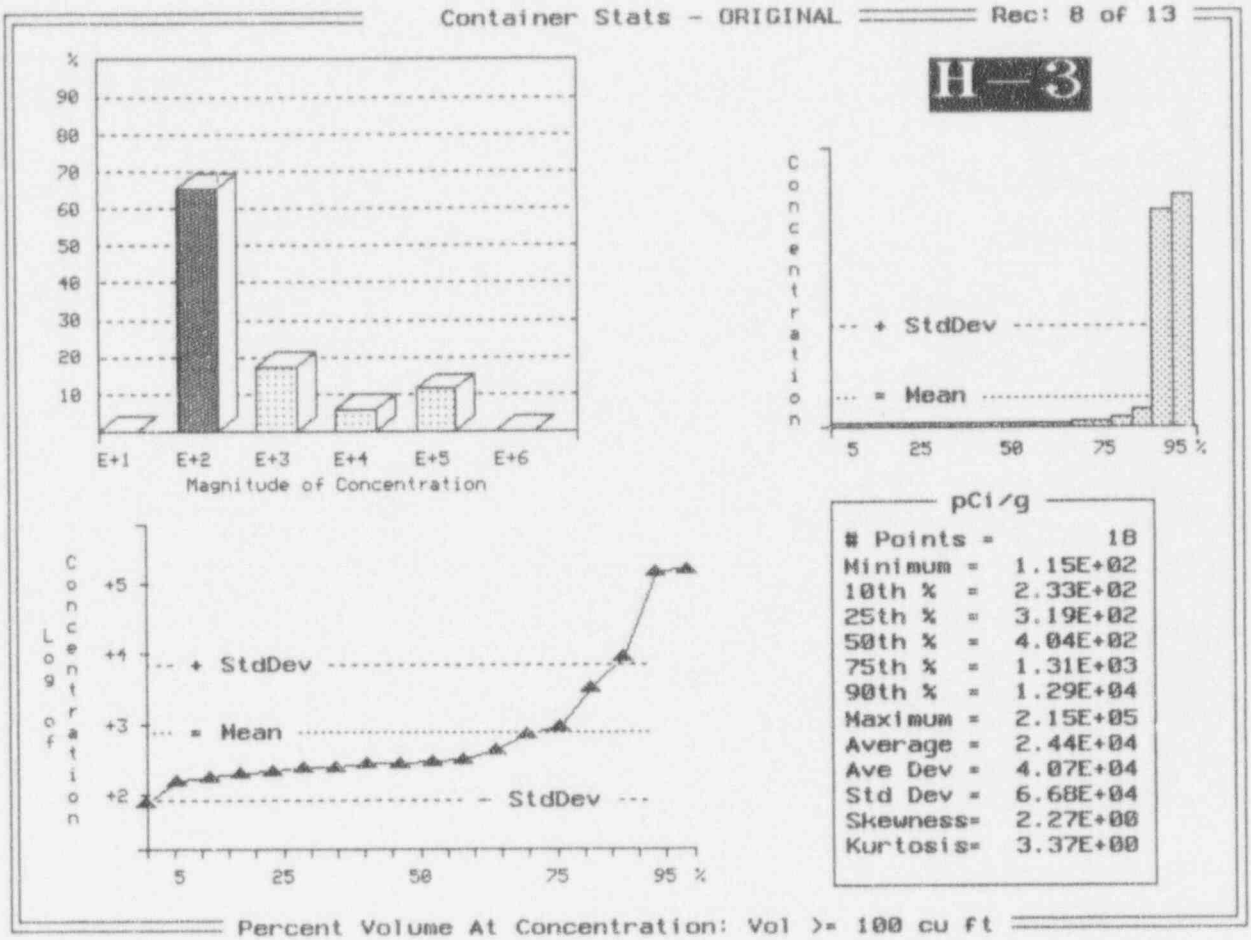


Exhibit I-2 (Continued)

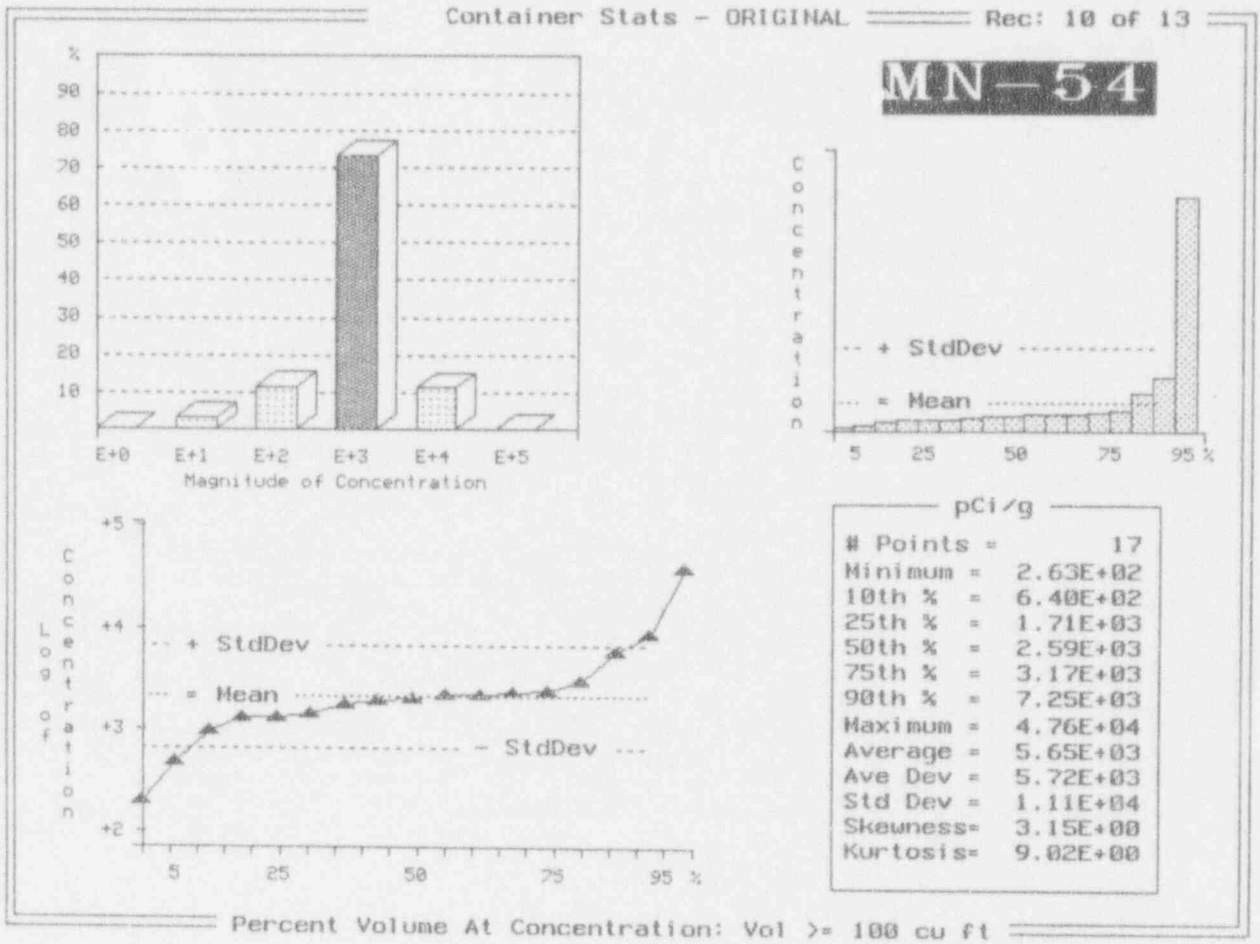


Exhibit I-2 (Continued)

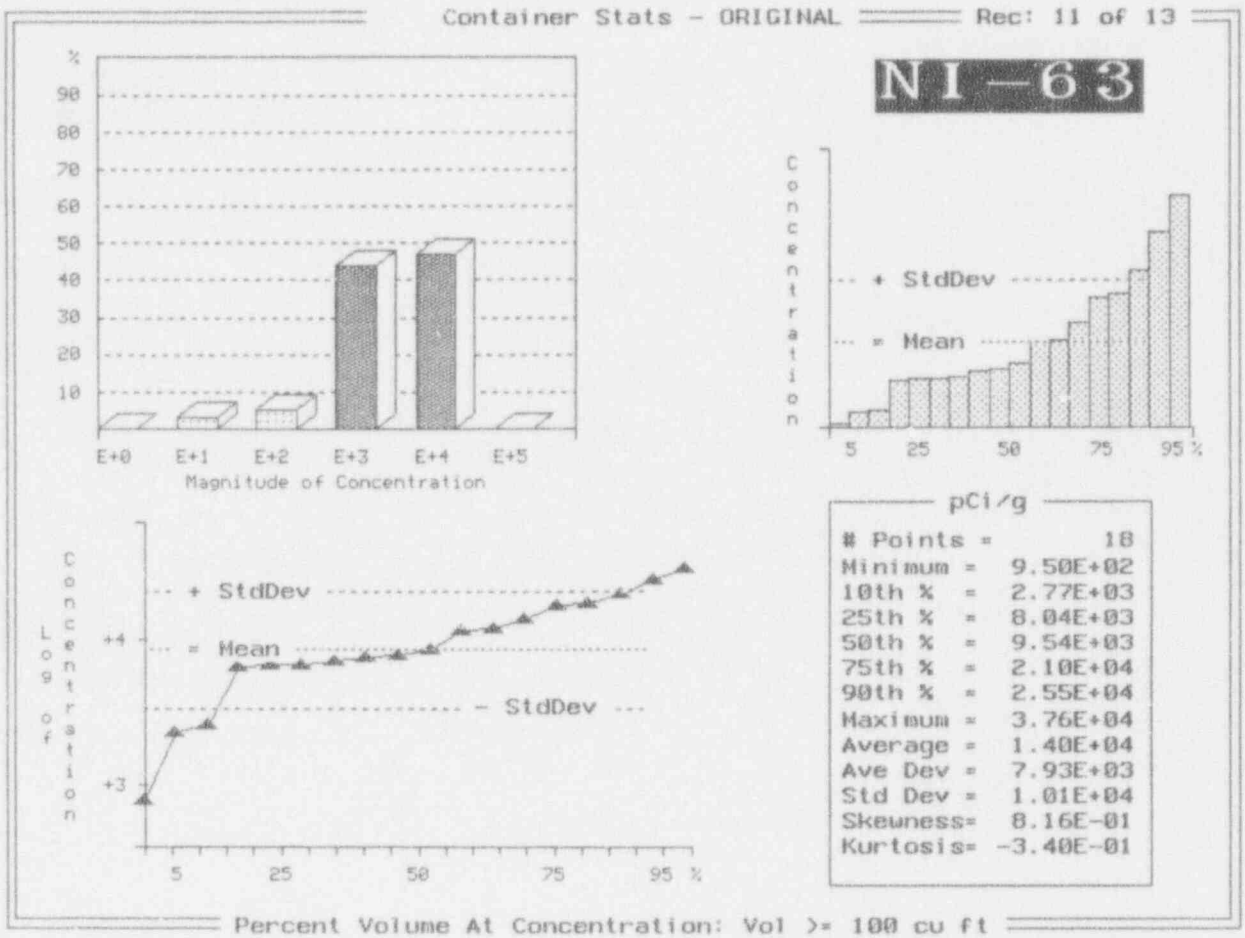


Exhibit I-2 (Continued)

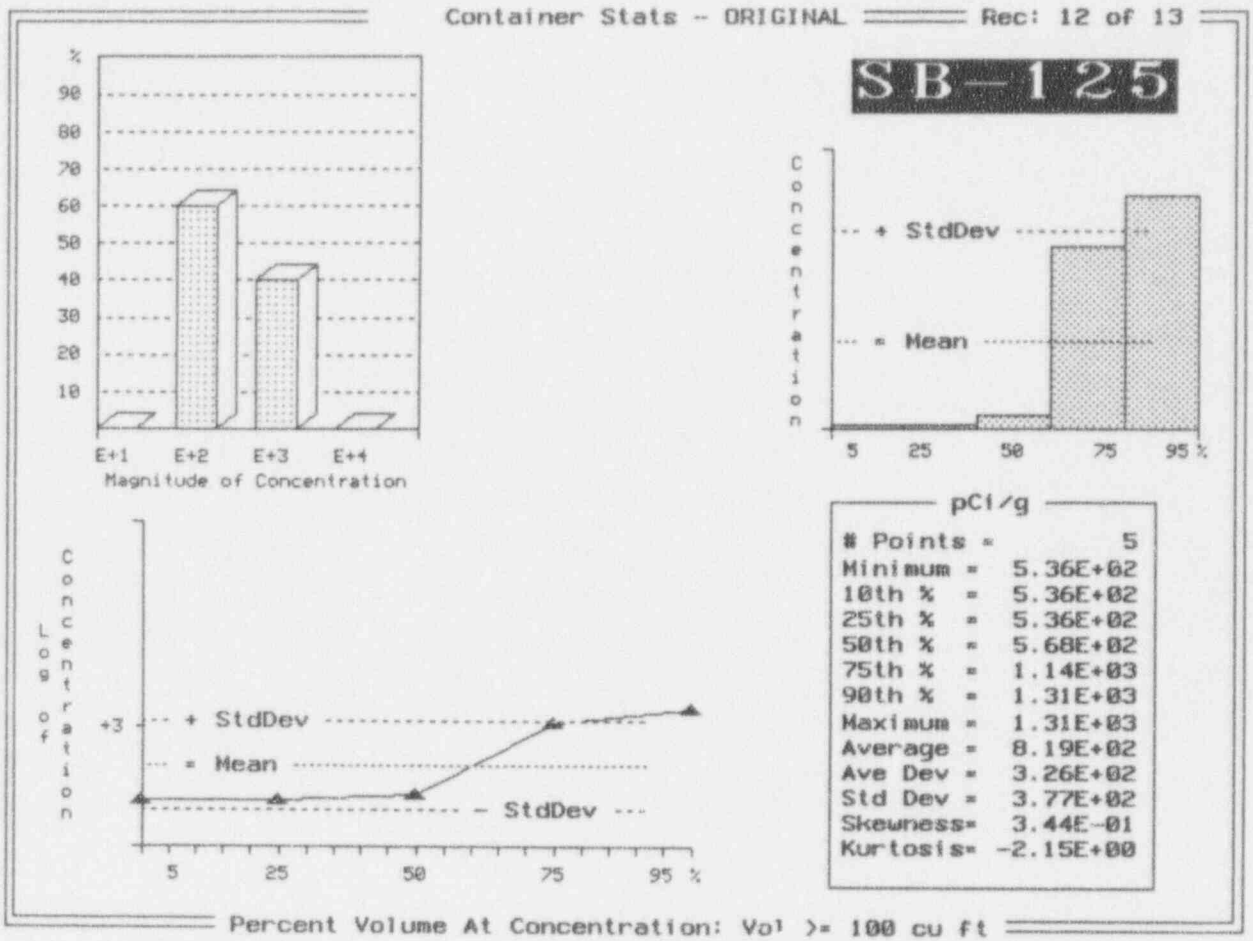


Exhibit I-2 (Continued)

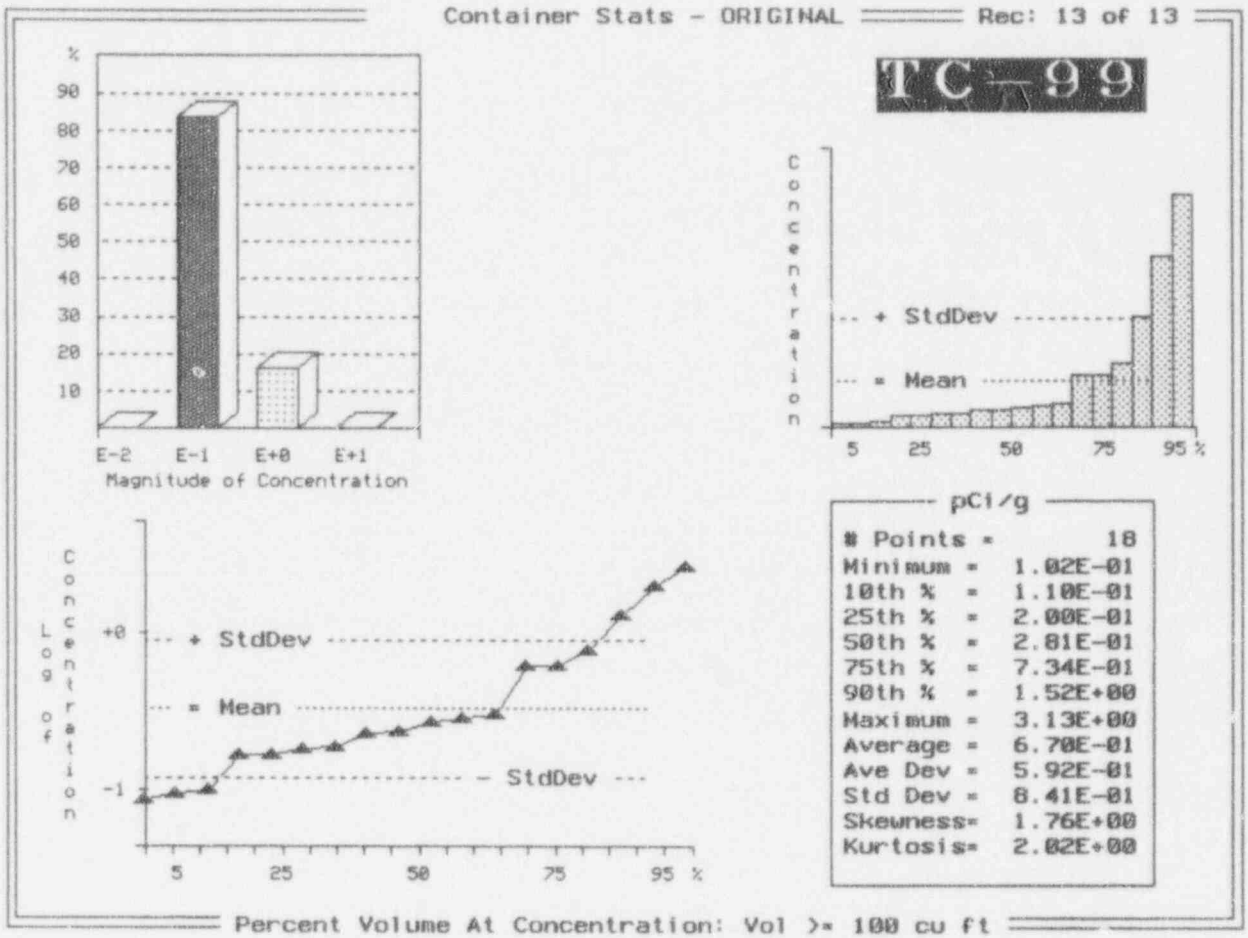


Exhibit I-3 Dewatered Resins Radionuclide Distributions
Container Level Analysis for 1989 Non-Brokered Utility Waste and All Regions and States[a]

Waste Class: A-Unstable and A-Stable
Solidification/Absorption media: Oil-Dri
Number of shipping records: 123
Number of shipping containers: 278
Total waste volume: 783.2 m^3
Total waste mass: 635,000 Kg
Average waste form density: 0.81 g/cm^3

	Concentration Ranges - Percentile[b] - Ci/m^3 -			- pCi/g -		
Nuclide	1st	50th	99th	1st	50th	99th
Ag-110m	3.77E-06	5.26E-03	4.63E-01	4.47E+00	6.65E+03	5.28E+05
C-14	1.77E-07	5.17E-04	3.69E-02	2.14E-01	6.98E+02	5.37E+04
Ce-144	4.78E-05	7.46E-04	6.72E-02	6.46E+01	1.11E+03	7.06E+04
Cm-242	1.75E-07	1.06E-06	8.33E-06	2.27E-01	1.39E+00	9.95E+00
Co-58	2.08E-07	1.27E-02	1.15E+00	2.14E-01	1.66E+04	1.36E+06
Co-60	2.08E-07	4.36E-02	7.12E+00	2.14E-01	4.93E+04	8.41E+06
Cr-51	3.38E-05	1.22E-02	1.48E+01	4.10E+01	1.52E+04	1.69E+07
Cs-134	2.08E-07	9.94E-04	2.83E-01	2.14E-01	1.16E+03	3.35E+05
Cs-137	2.08E-07	6.91E-03	2.54E-01	2.14E-01	9.13E+03	3.00E+05
Fe-55	2.08E-07	1.92E-02	3.43E+00	2.82E-01	2.15E+04	3.91E+06
Fe-59	3.97E-06	4.02E-03	5.62E-01	4.66E+00	5.55E+03	6.56E+05
H-3	1.77E-07	4.33E-04	1.55E-01	2.14E-01	6.05E+02	1.84E+05
I-129	1.68E-07	1.27E-06	2.91E-04	1.93E-01	1.56E+00	4.58E+02
I-131	2.12E-07	5.49E-04	1.85E-02	2.45E-01	7.59E+02	2.46E+04
Mn-54	2.08E-07	6.21E-02	2.24E+00	2.69E-01	6.83E+04	2.61E+06
Nb-95	4.44E-06	2.04E-03	3.15E+00	5.64E+00	2.36E+03	3.59E+06
Ni-63	2.08E-07	7.86E-03	9.49E-02	2.82E-01	1.03E+04	1.22E+05
Pu-238	2.08E-07	5.16E-06	2.24E-05	2.14E-01	6.03E+00	3.25E+01
Pu-239	1.94E-07	2.83E-06	2.70E-04	2.10E-01	3.80E+00	3.91E+02
Pu-241	1.77E-07	1.27E-04	3.18E-03	2.39E-01	1.71E+02	4.60E+03
Sb-124	1.90E-06	1.03E-03	1.61E-01	2.42E+00	1.48E+03	1.88E+05

Exhibit I-3 Dewatered Resins Radionuclide Distributions
Container Level Analysis for 1989 Non-Brokered
Utility Waste and All Regions and States[a]
Cont'd

Nuclide	Concentration Ranges - Percentile[b] - Ci/m^3 - 1st	50th	99th	- pCi/g - 1st	50th	99th
Sb-125	8.30E-07	1.26E-03	3.24E-01	1.10E+00	1.47E+03	5.10E+05
Sr-90	2.08E-07	1.18E-04	6.94E-02	2.62E-01	1.60E+02	1.03E+05
Tc-99	1.68E-07	2.83E-06	1.16E-03	1.93E-01	3.75E+00	1.73E+03
Zn-65	3.74E-05	6.11E-02	2.34E+01	5.04E+01	7.07E+04	2.66E+07

(a) Based on LLW data for Beatty and Richland only.
(b) Due to paucity of data, listing includes radionuclides with 3 or more data points characterizing concentration ranges.

Exhibit I-3 (Continued)

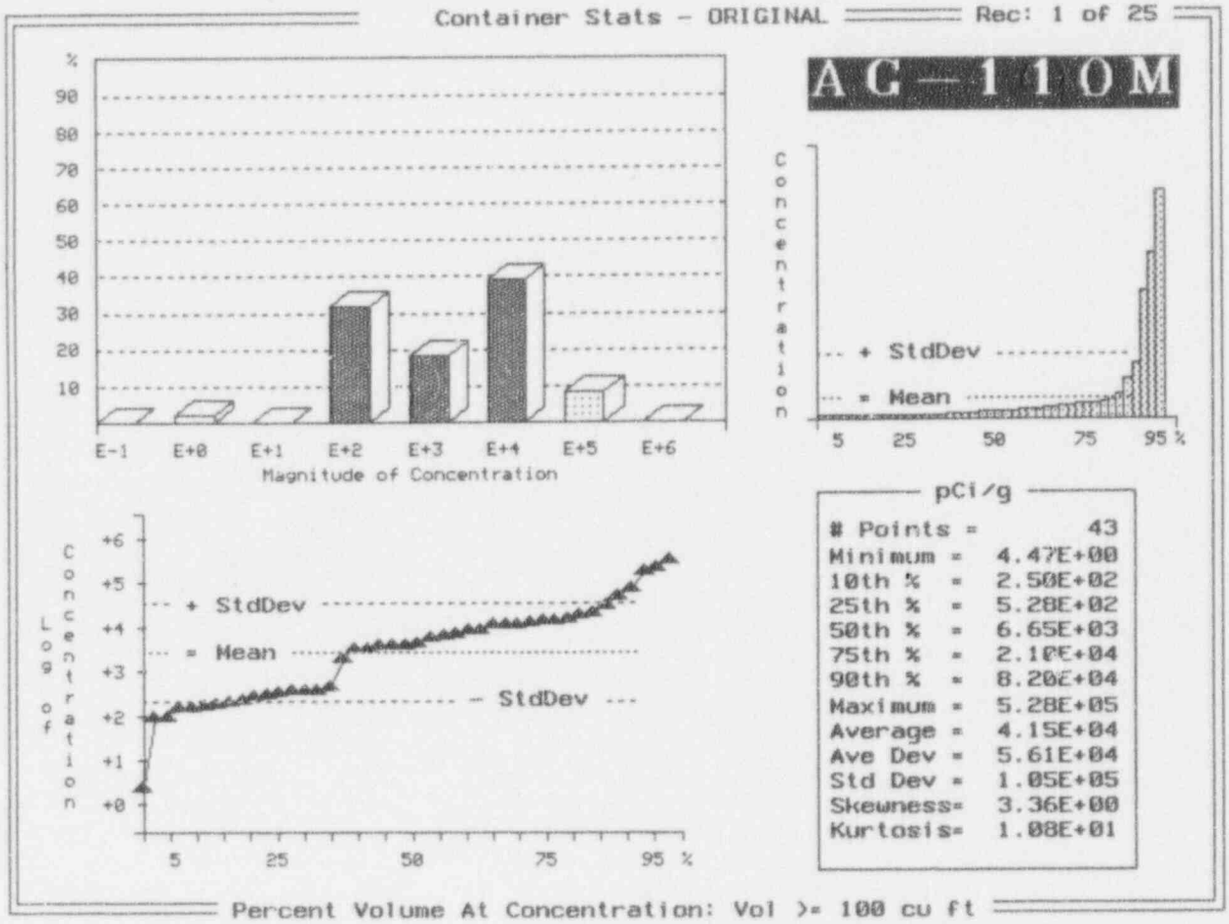
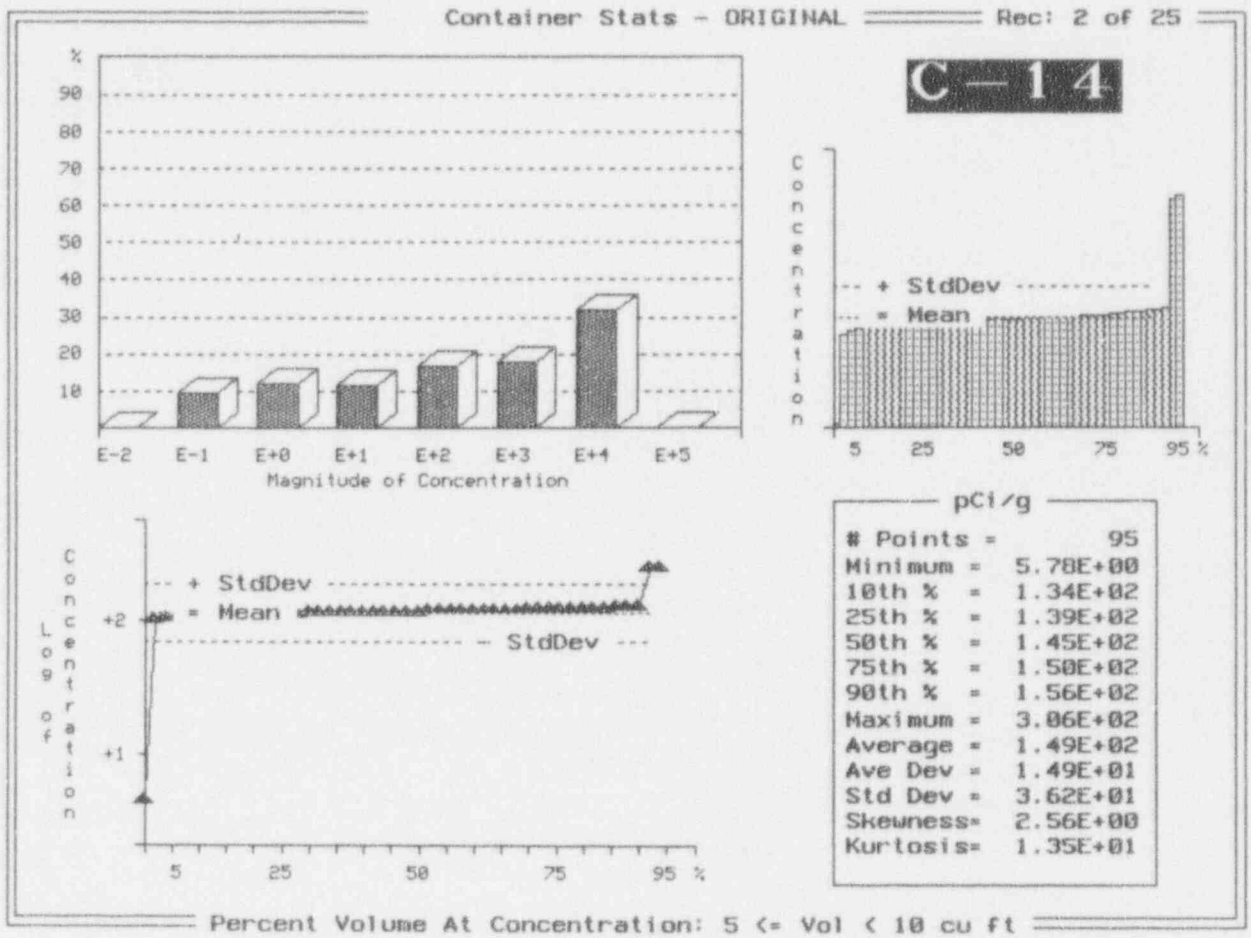


Exhibit I-3 (Continued)



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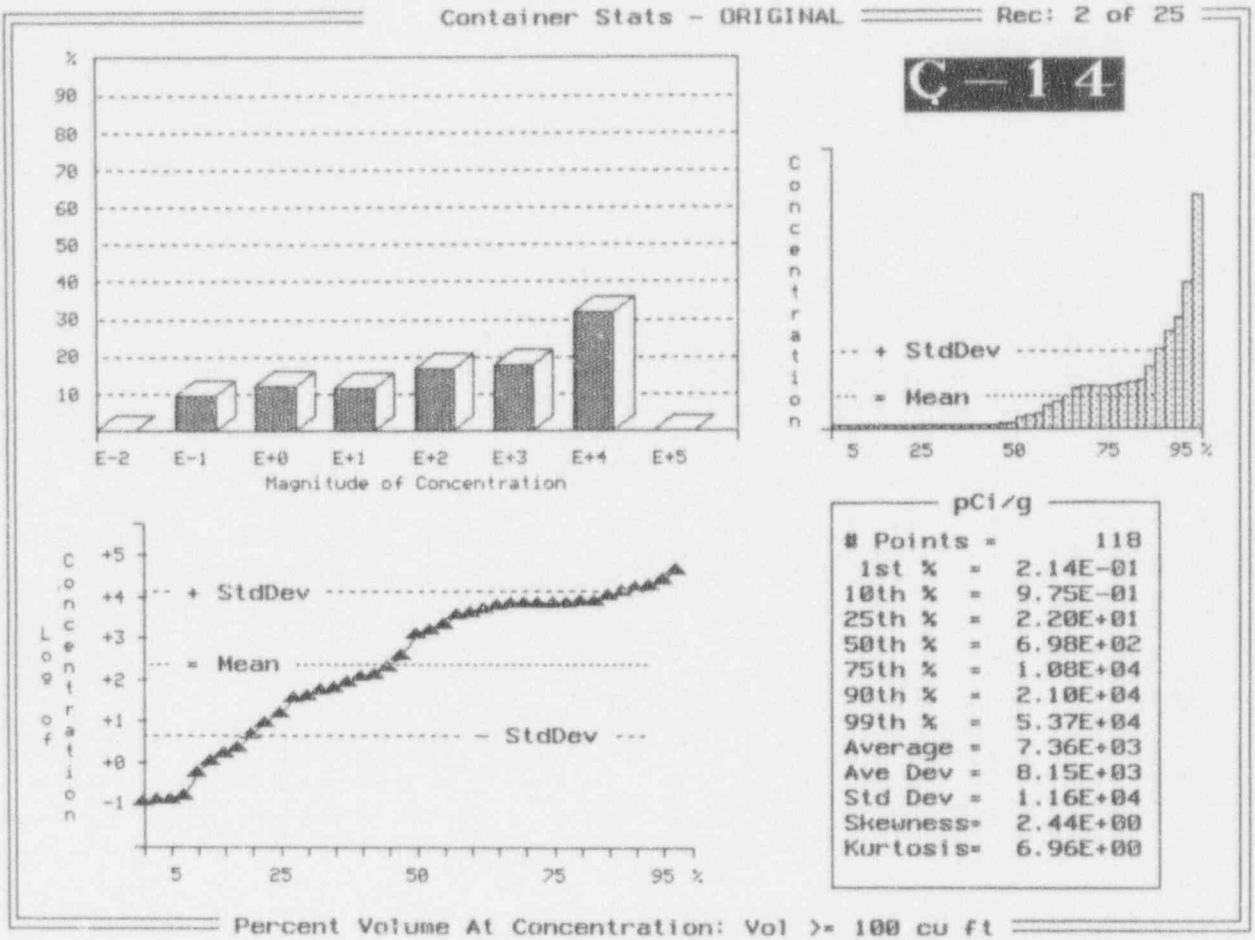

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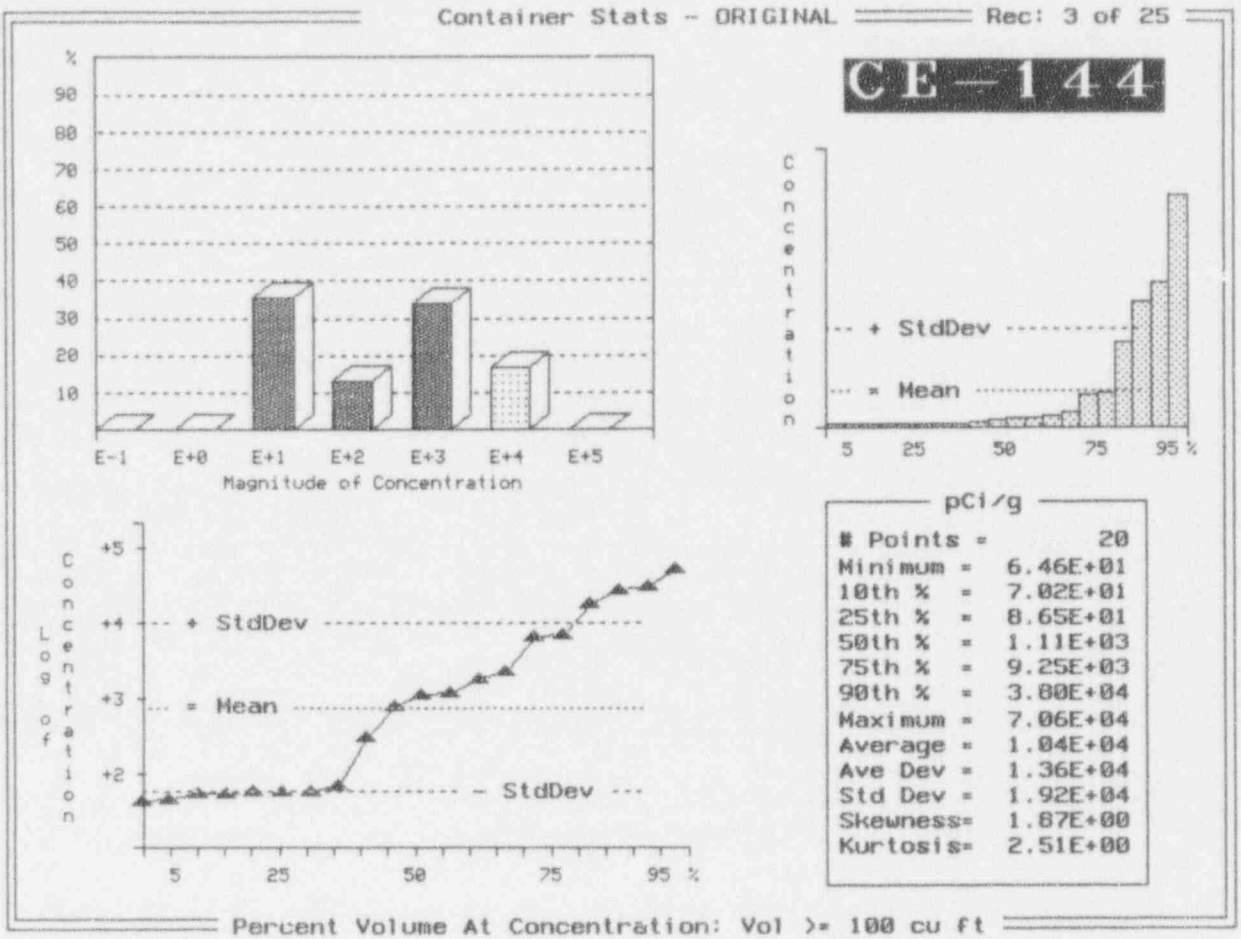


Exhibit I-3 (Continued)

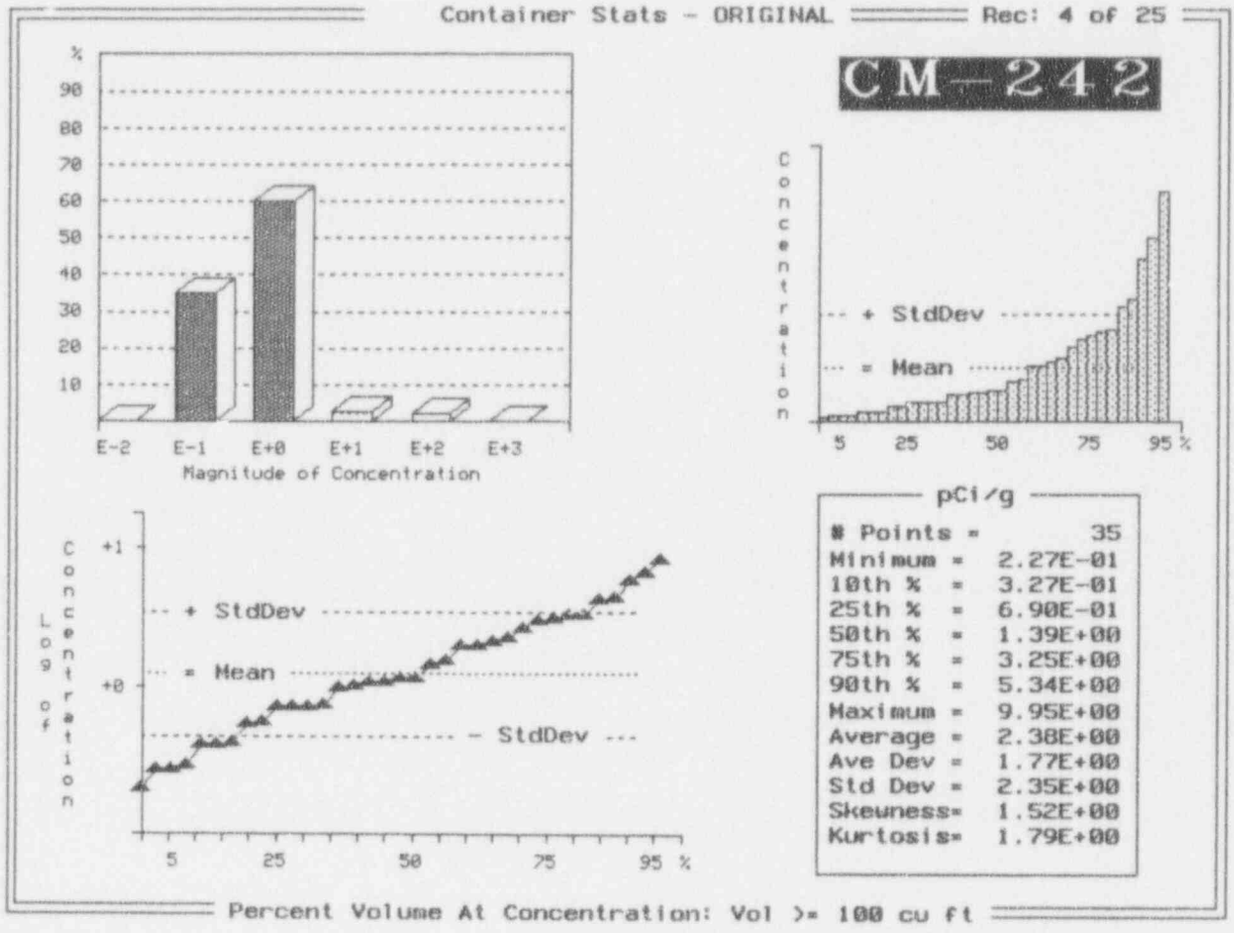


Exhibit I-3 (Continued)

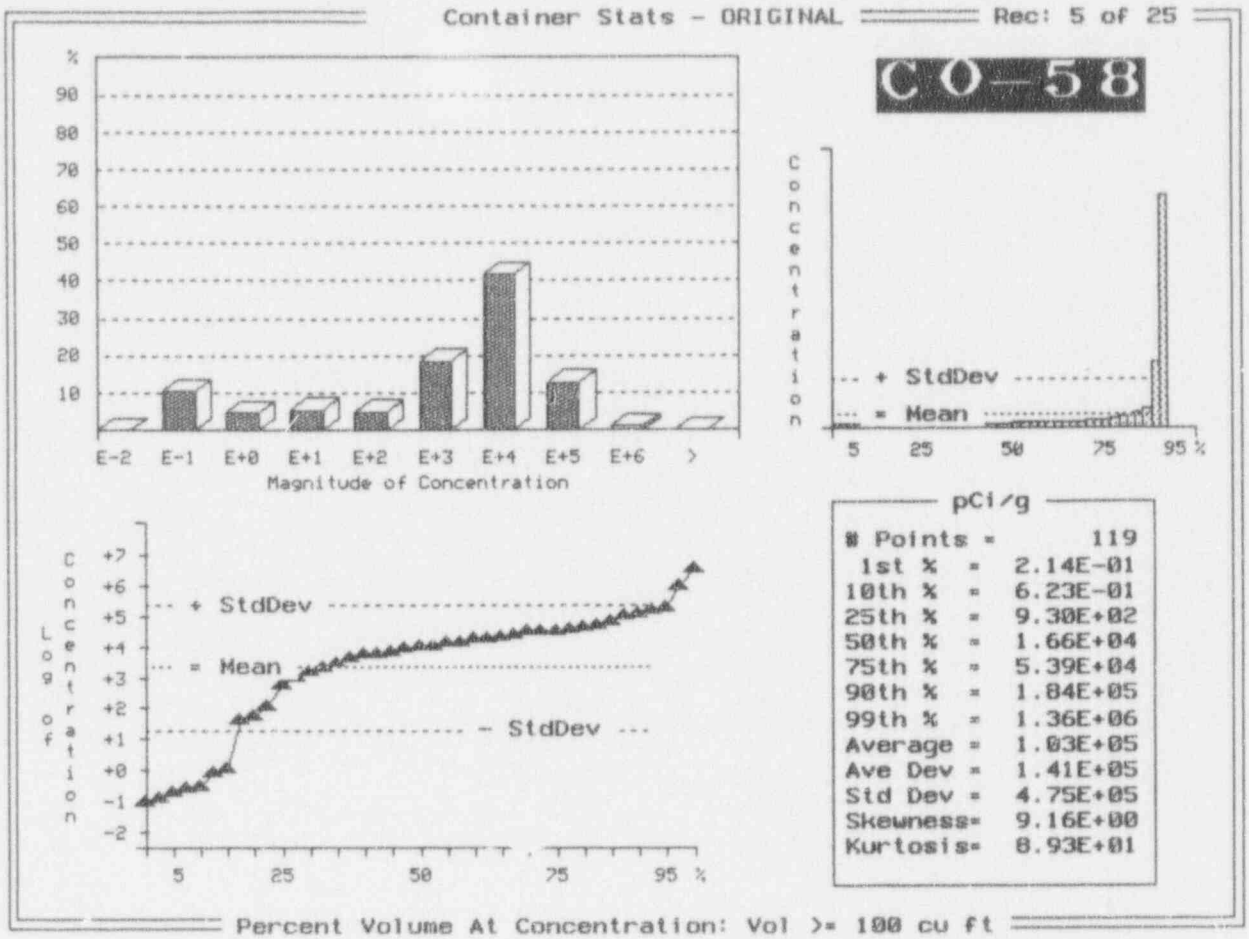
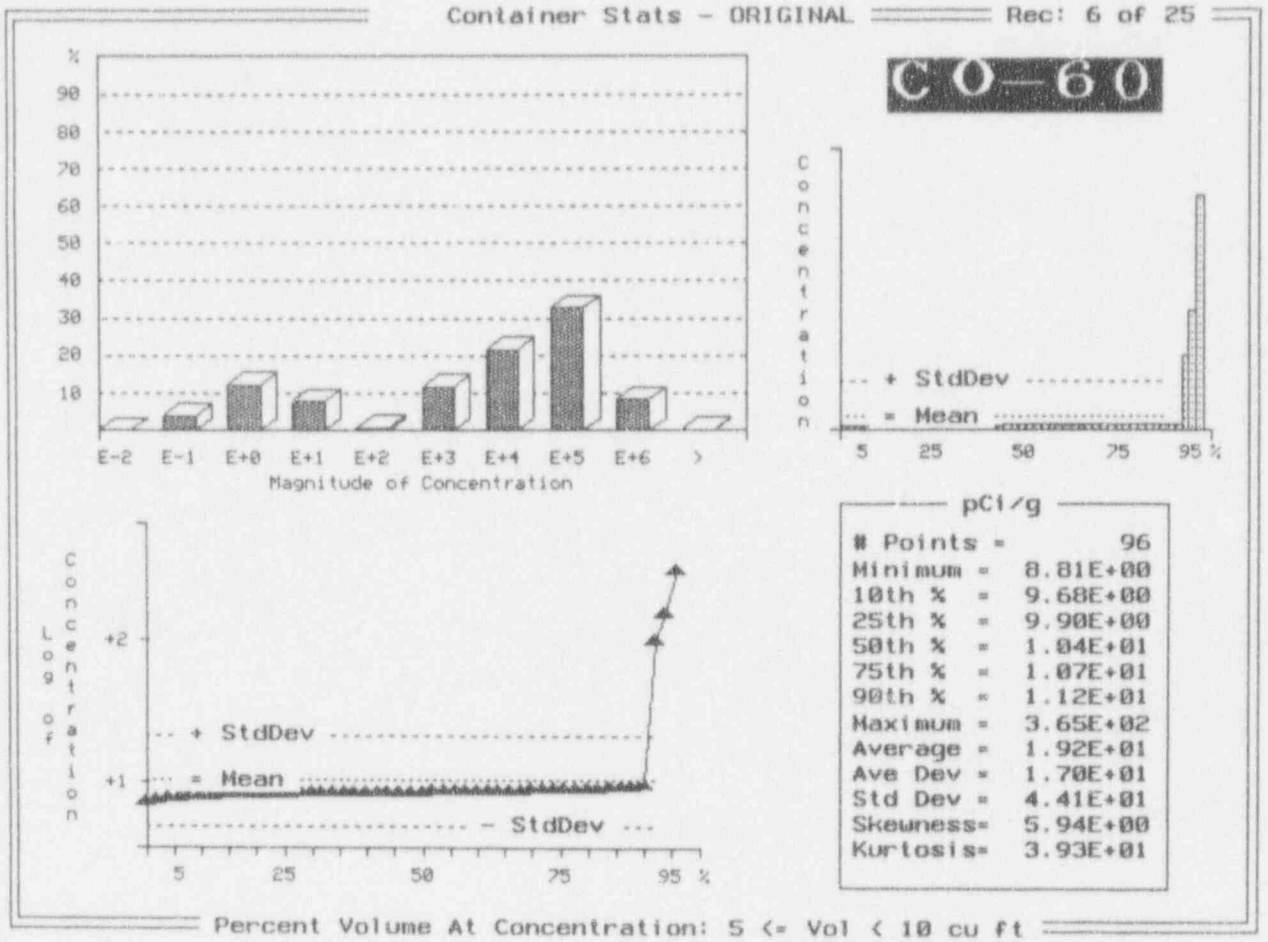


Exhibit I-3 (Continued)



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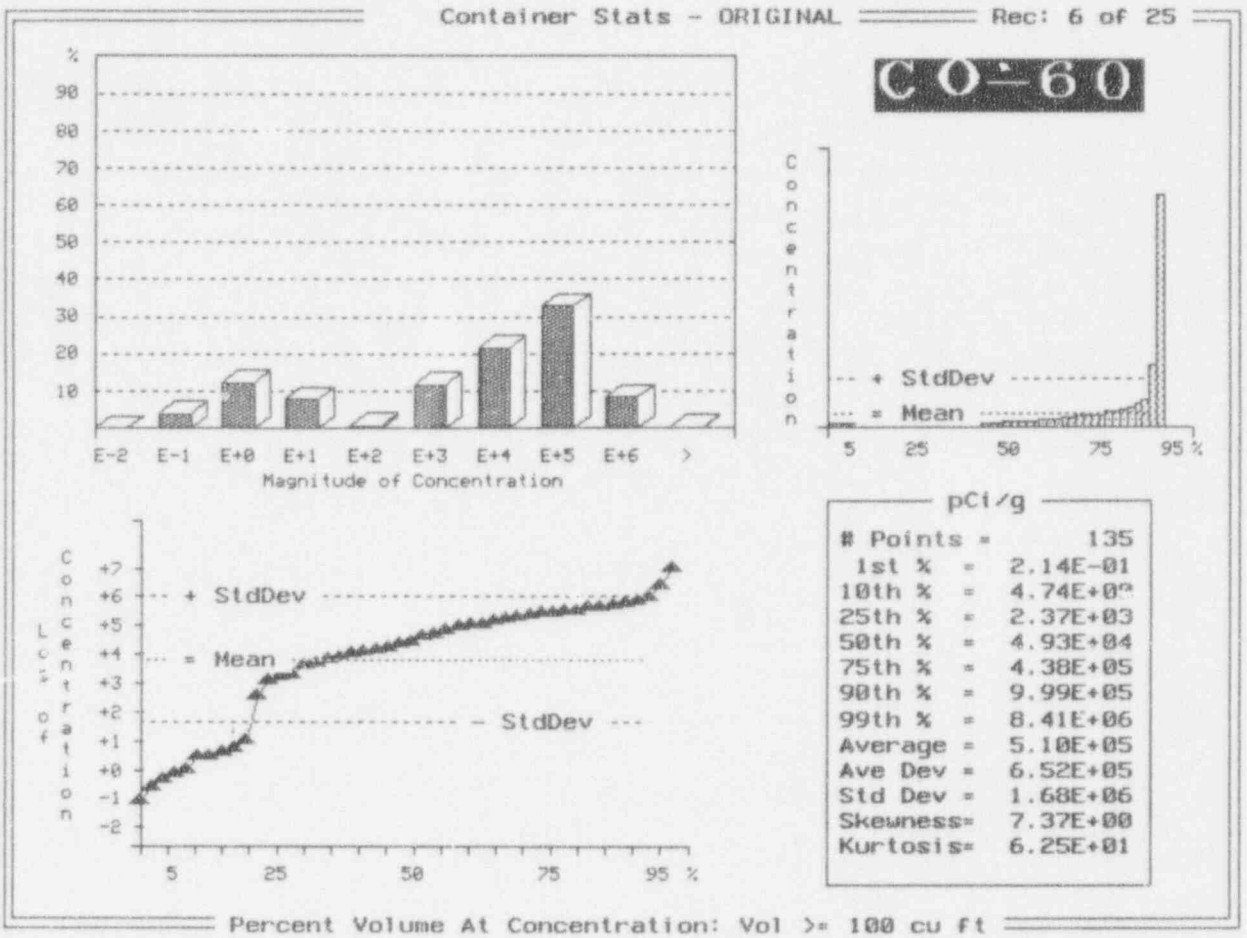

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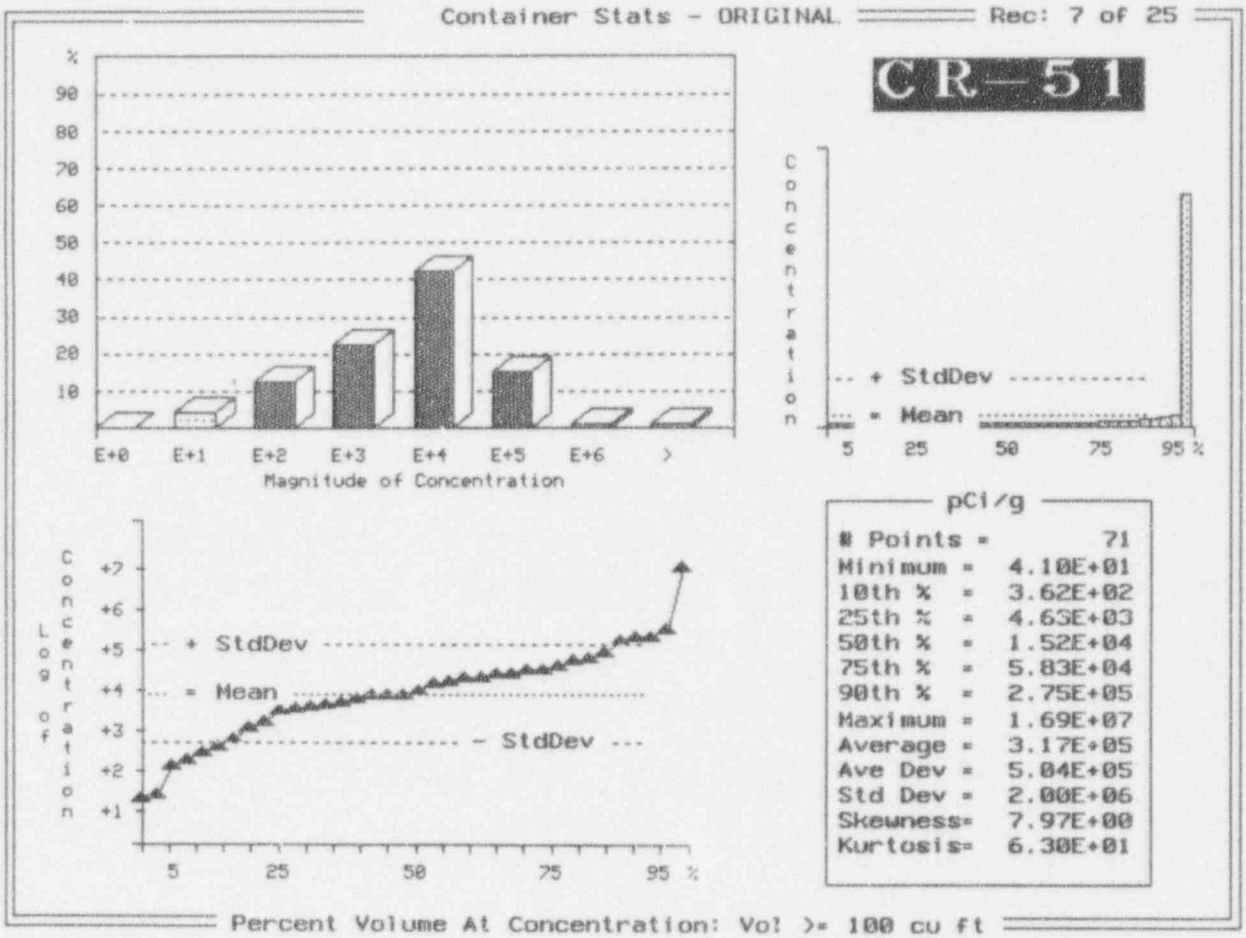

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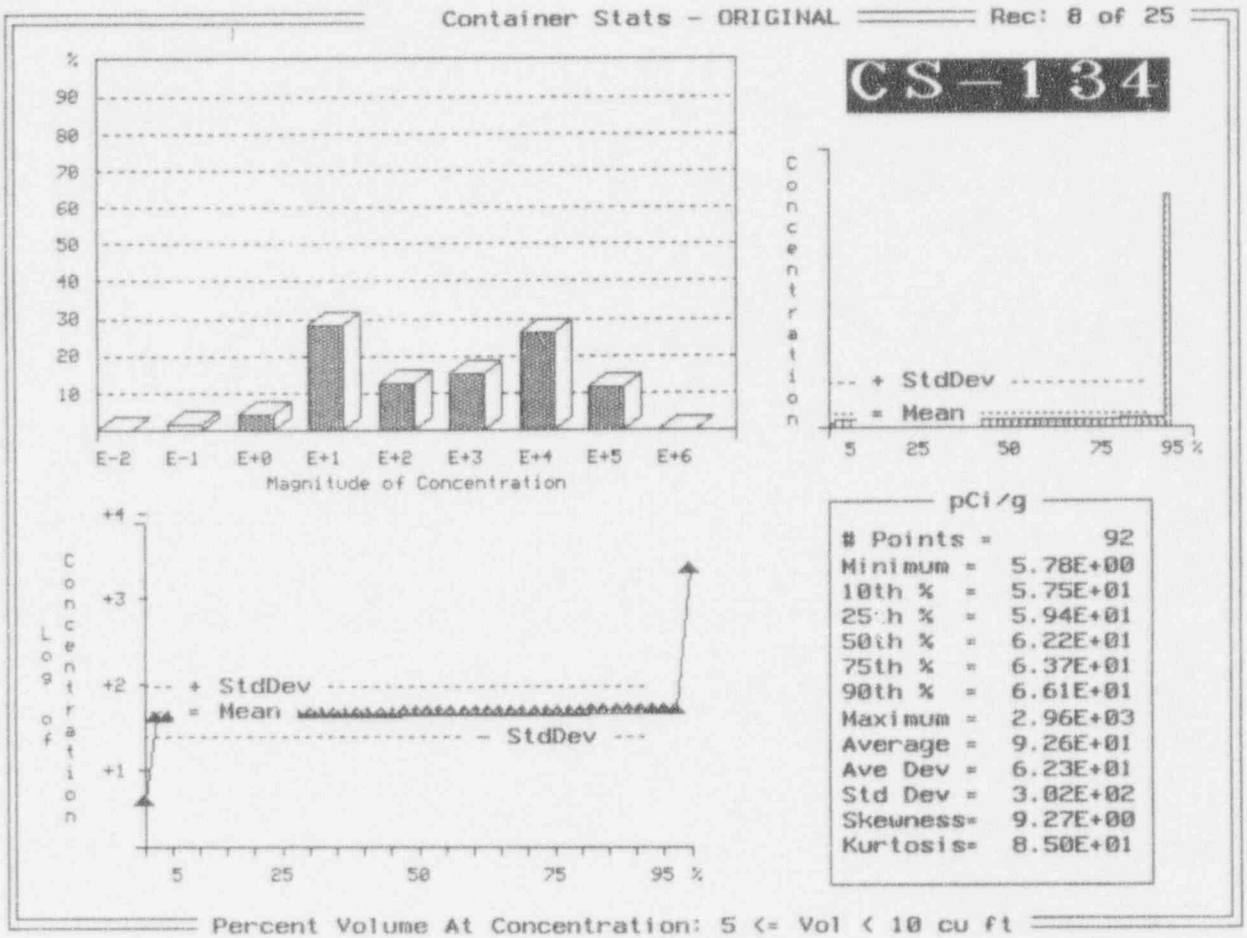

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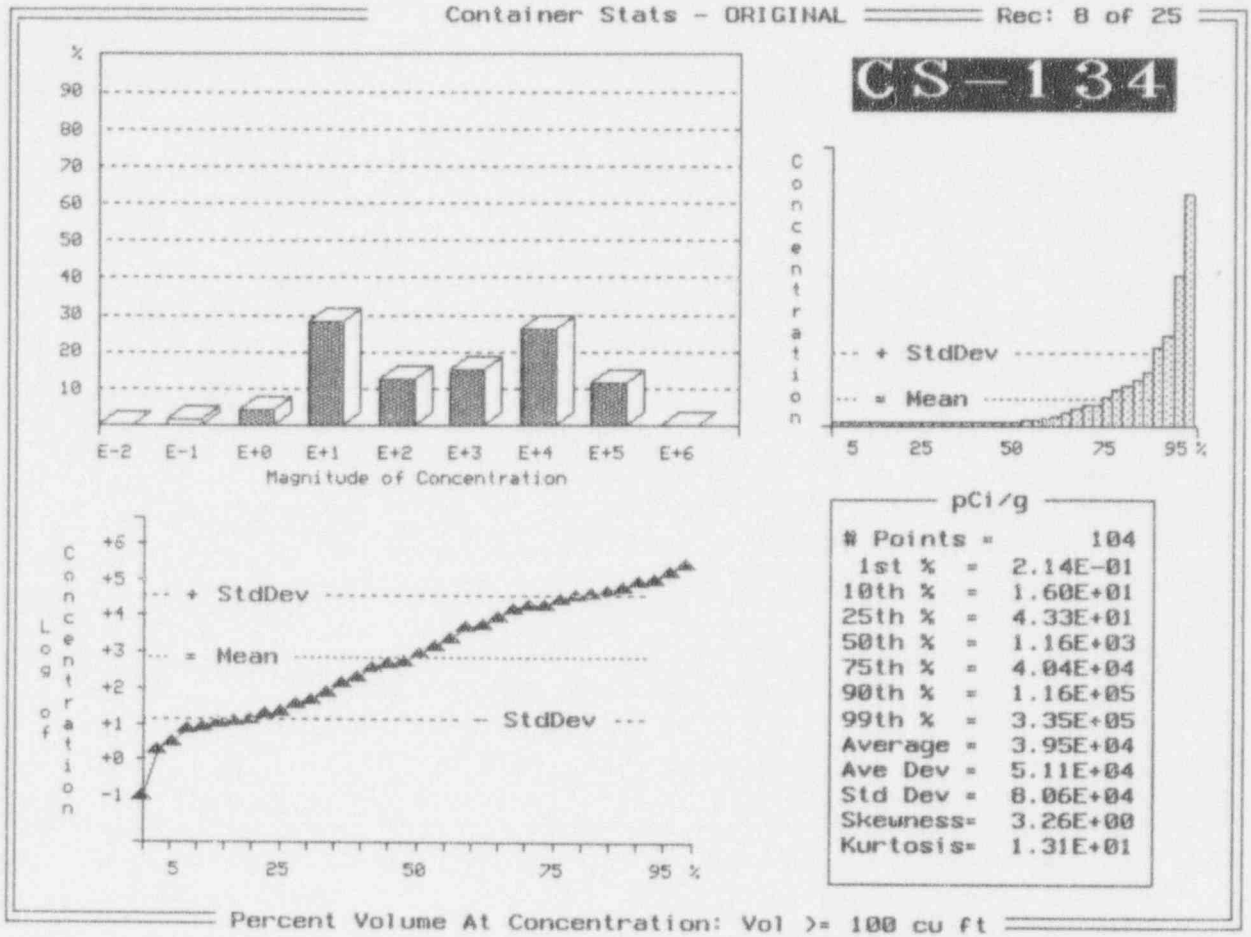

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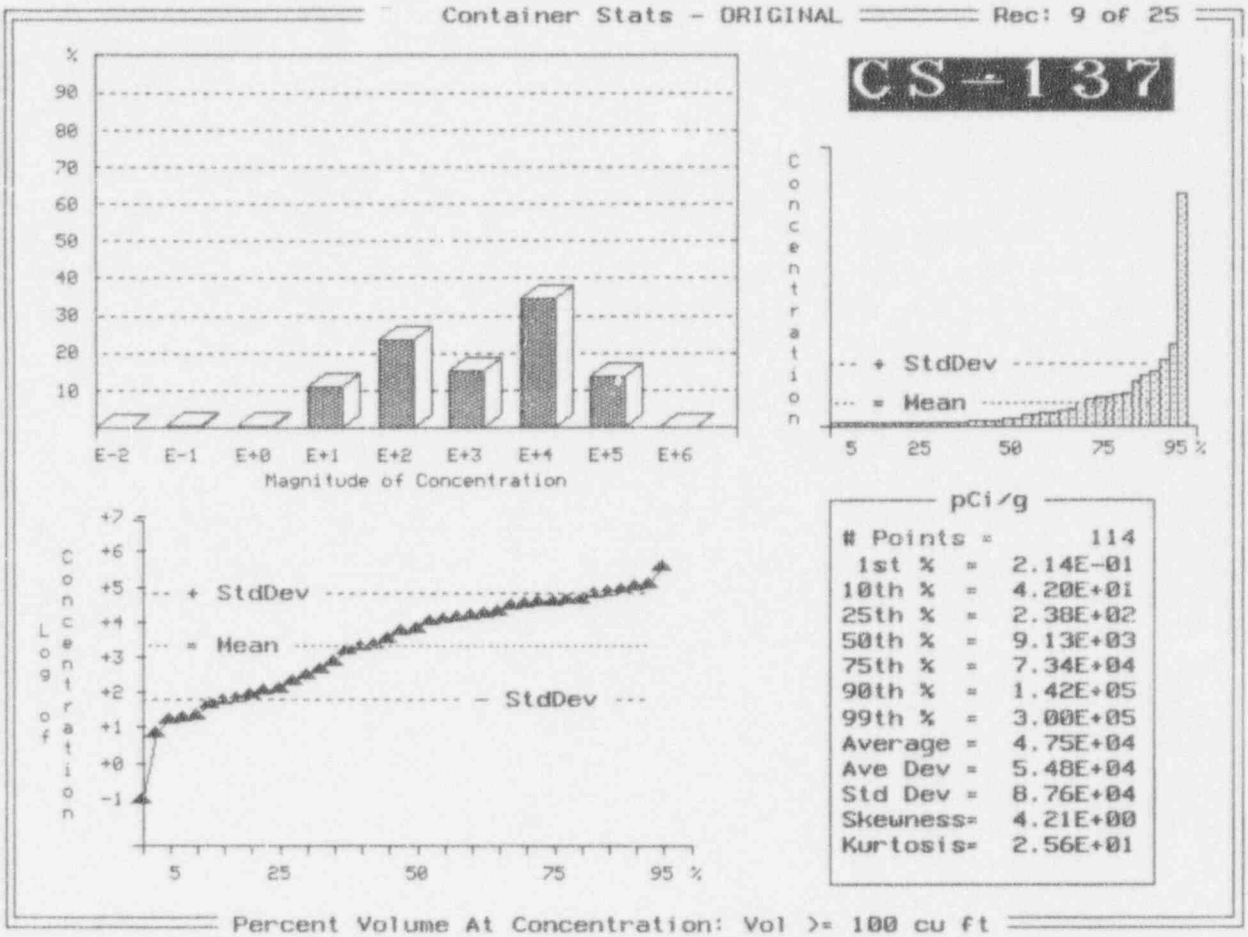

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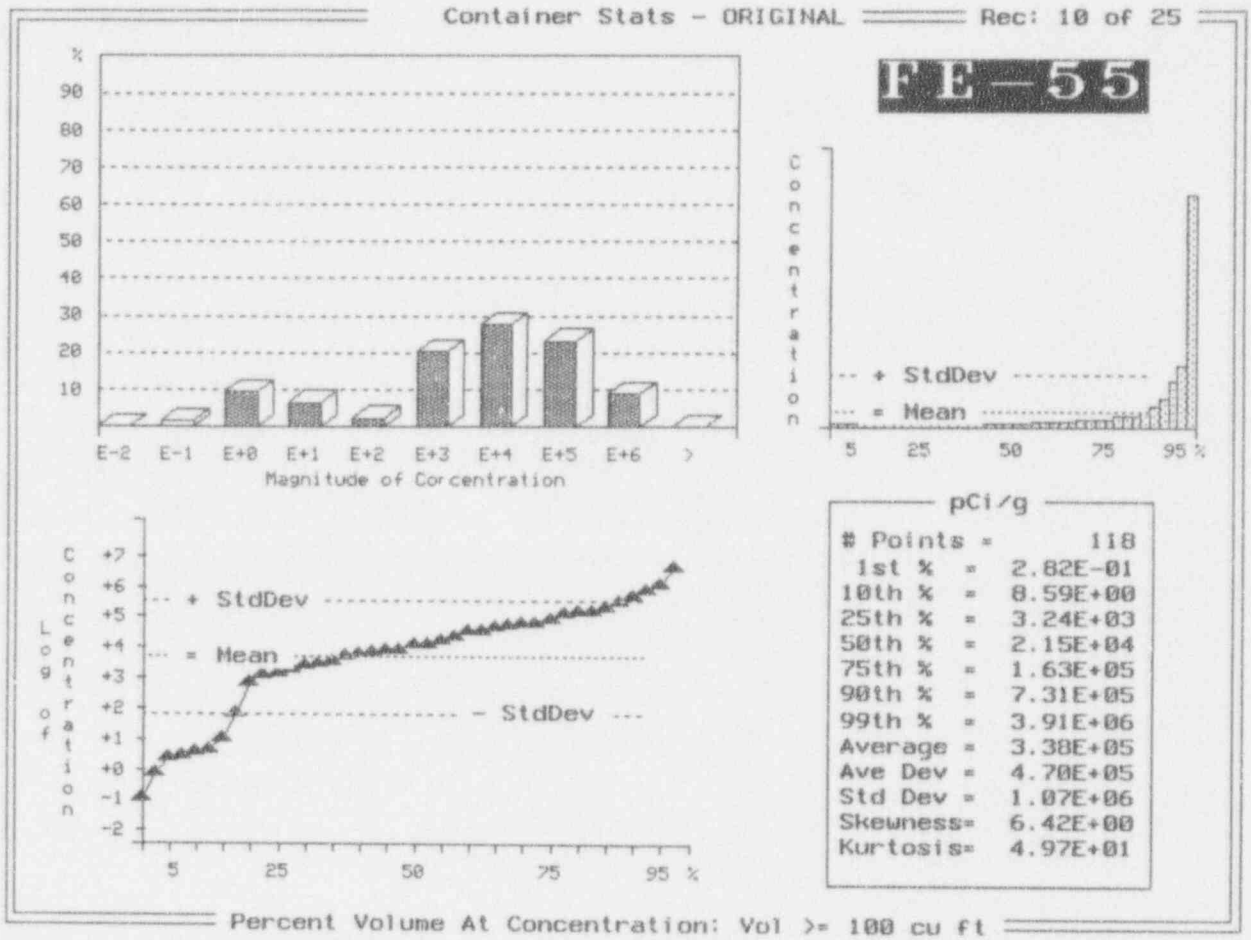

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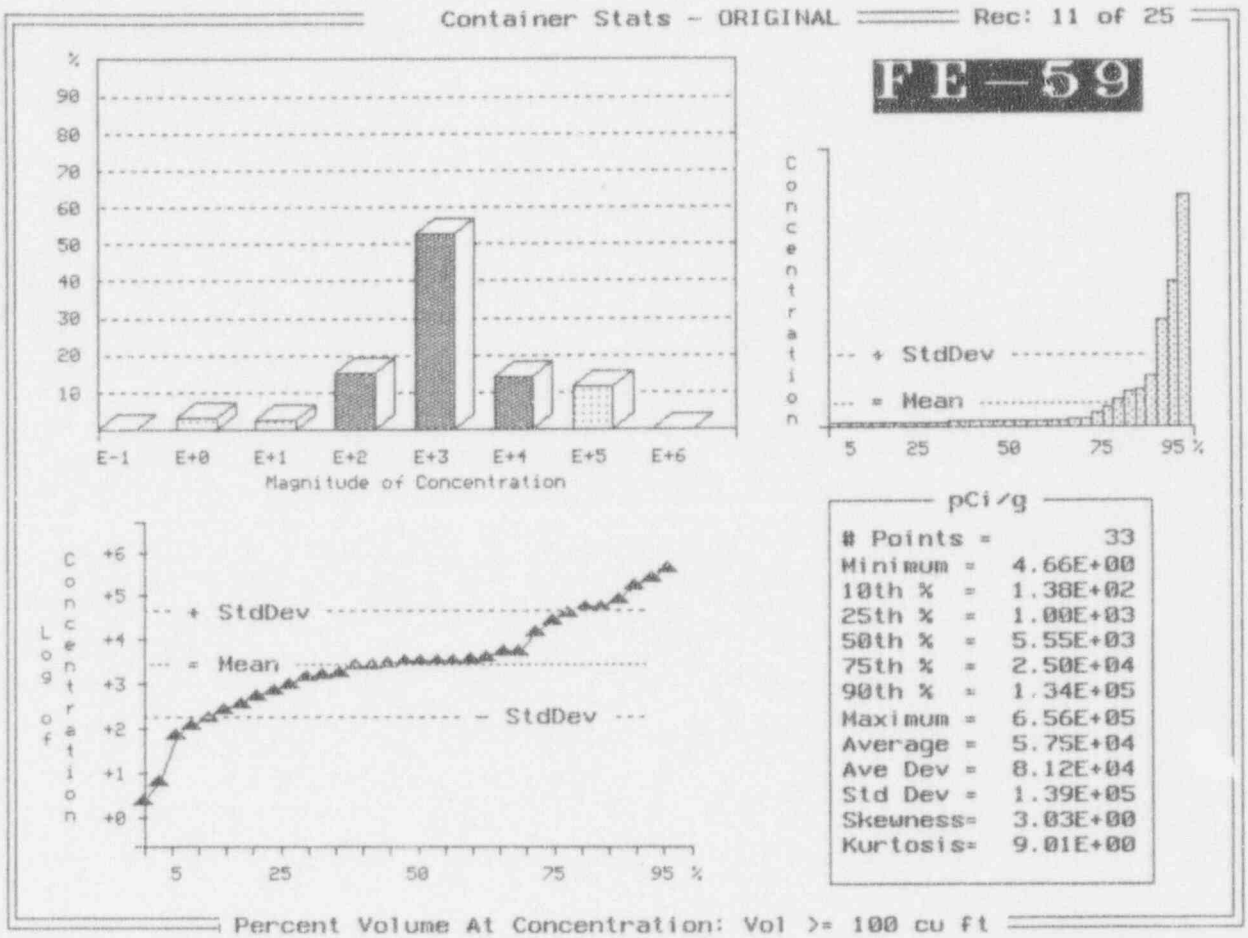

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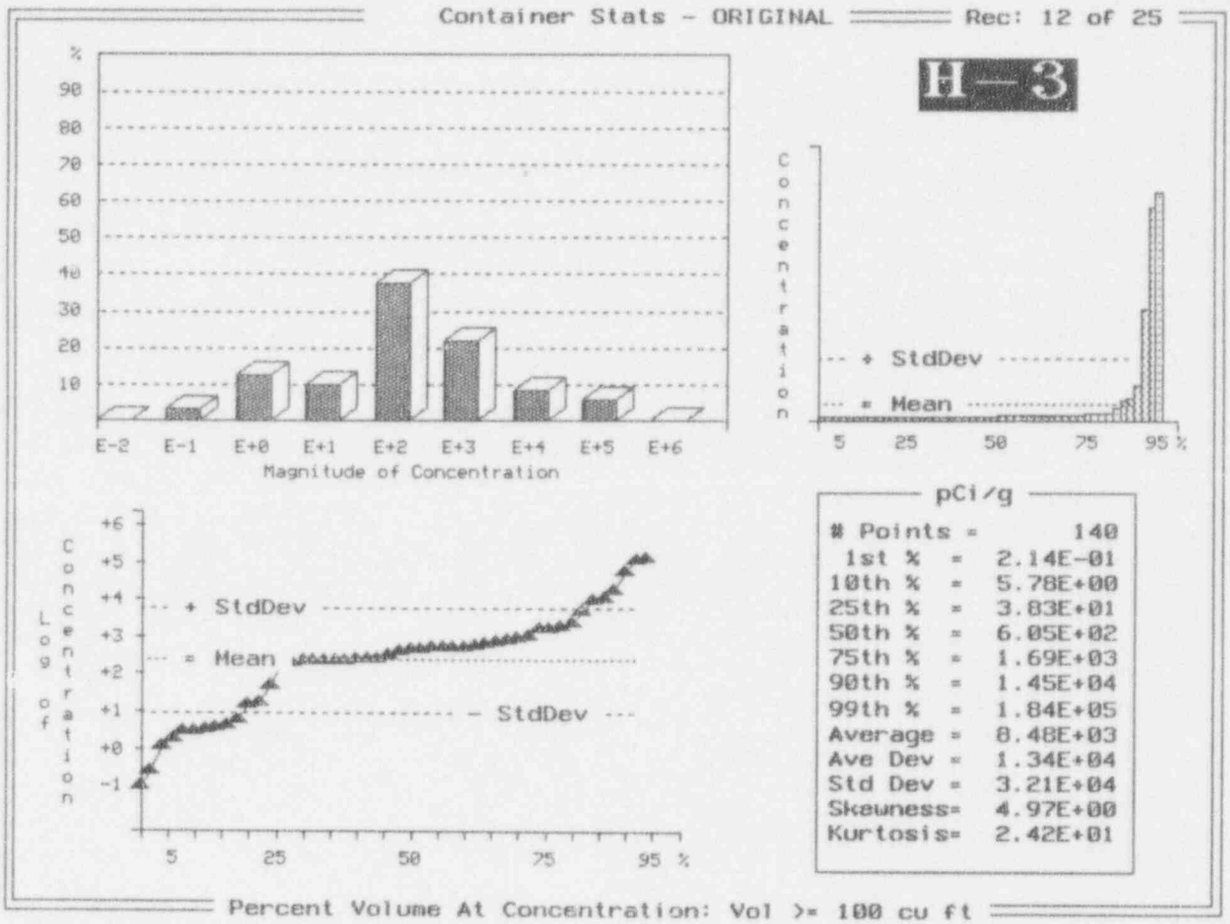

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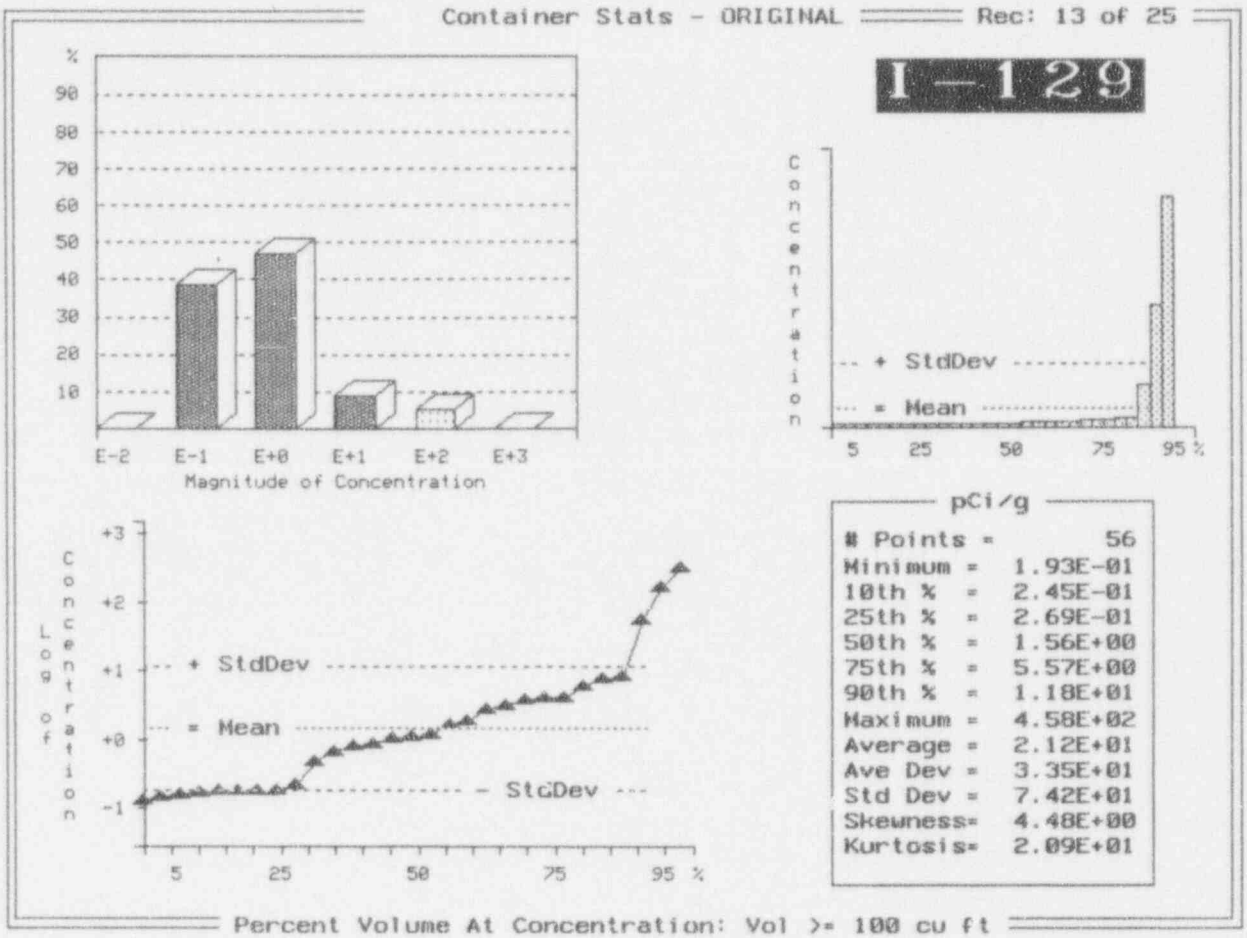

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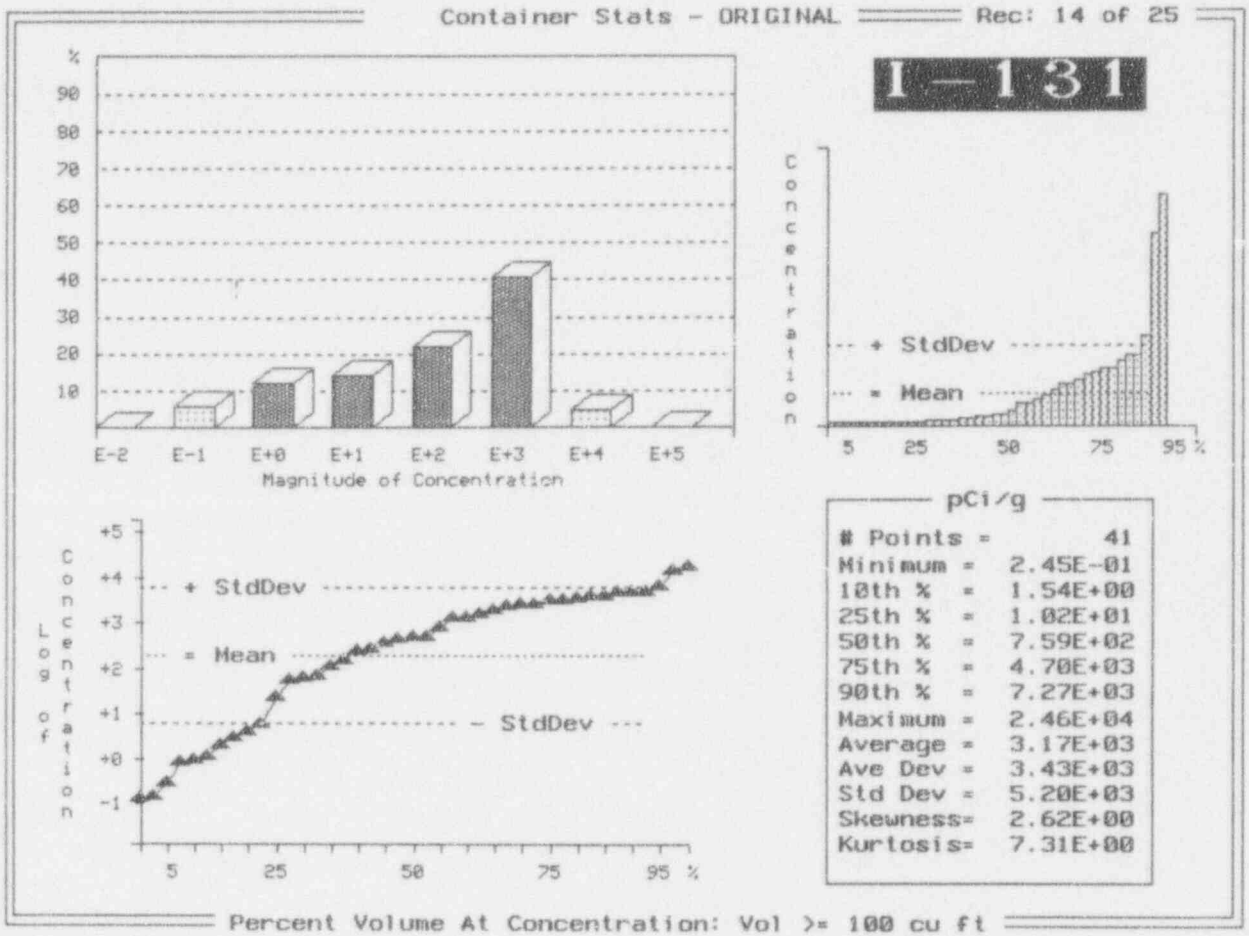

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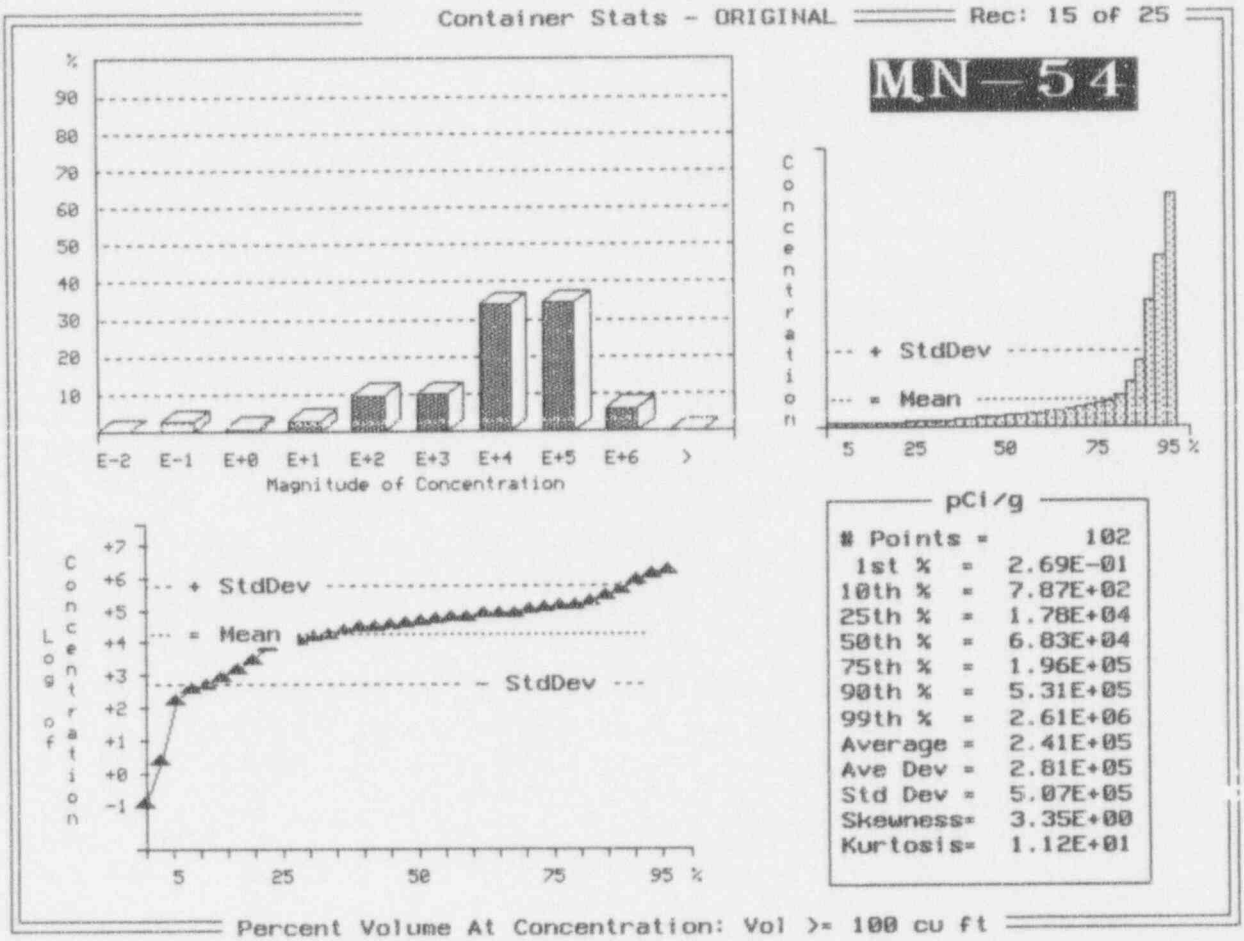

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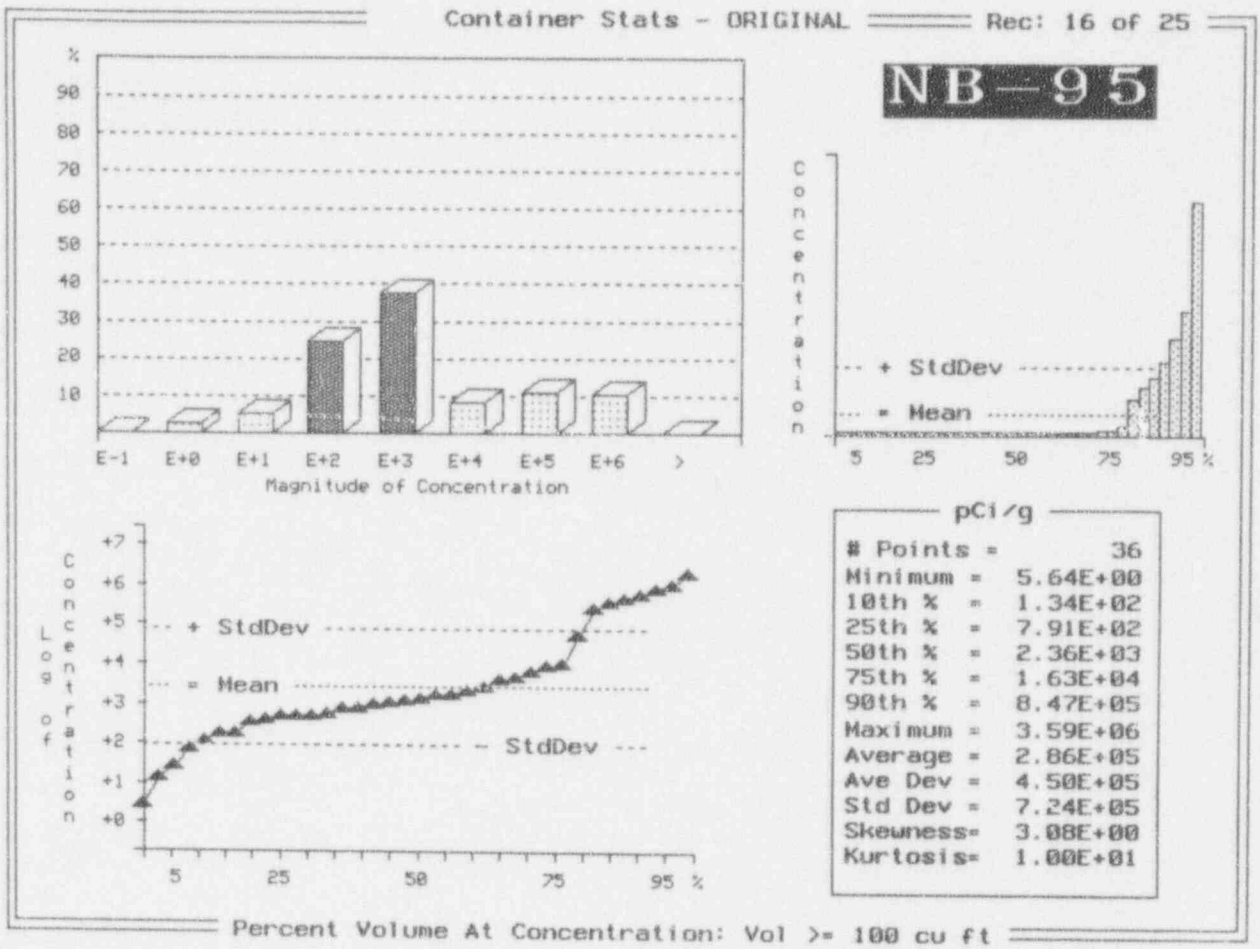

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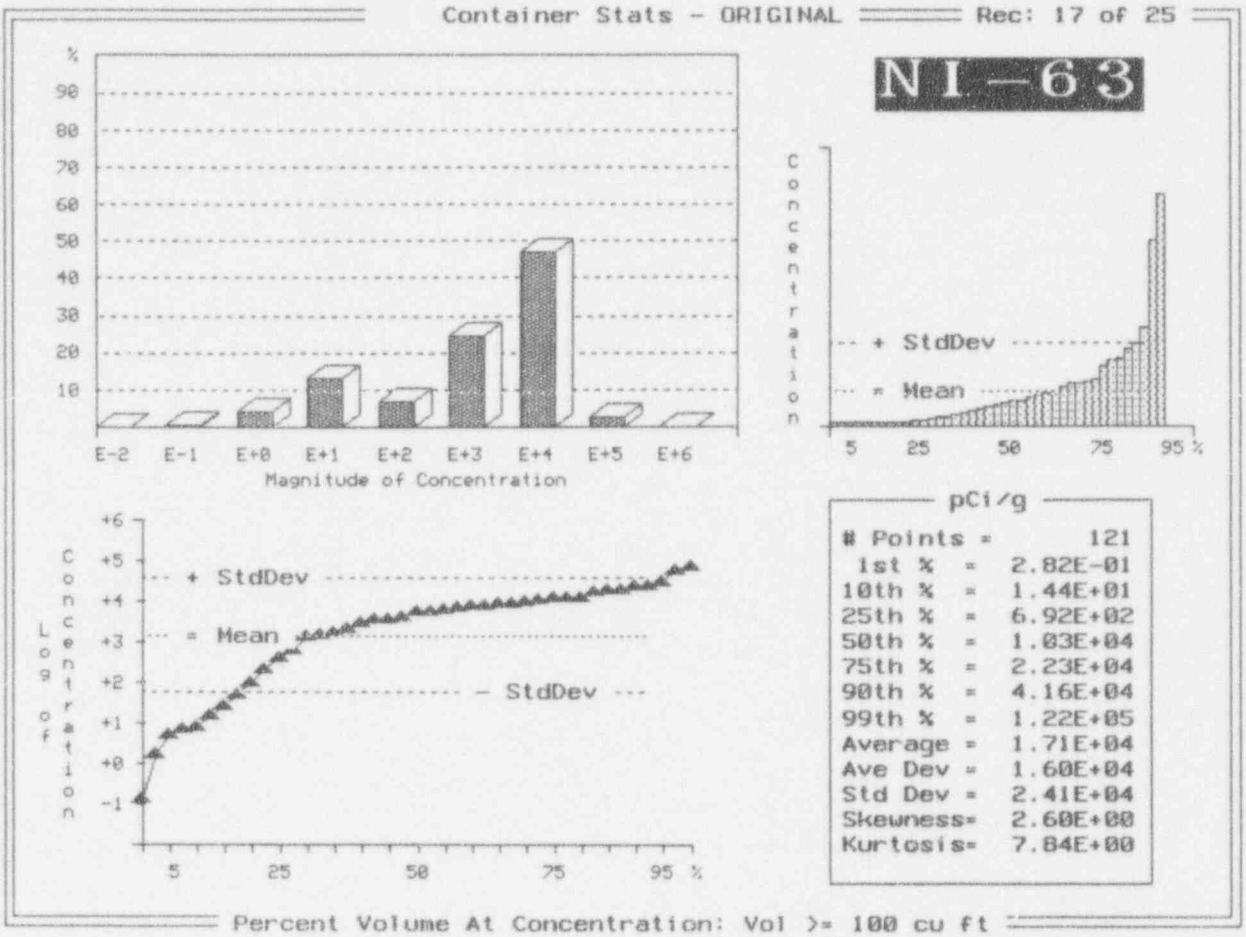

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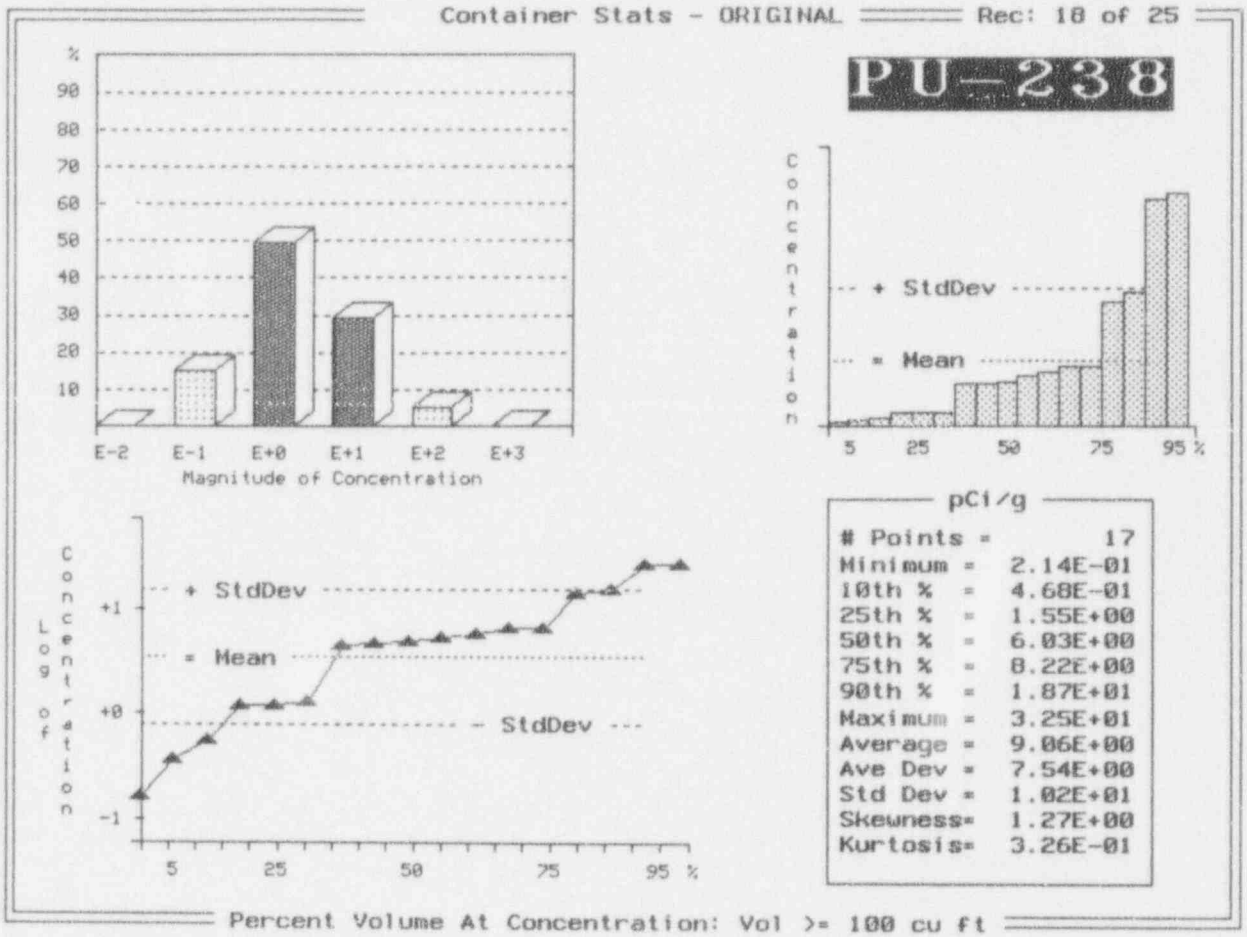

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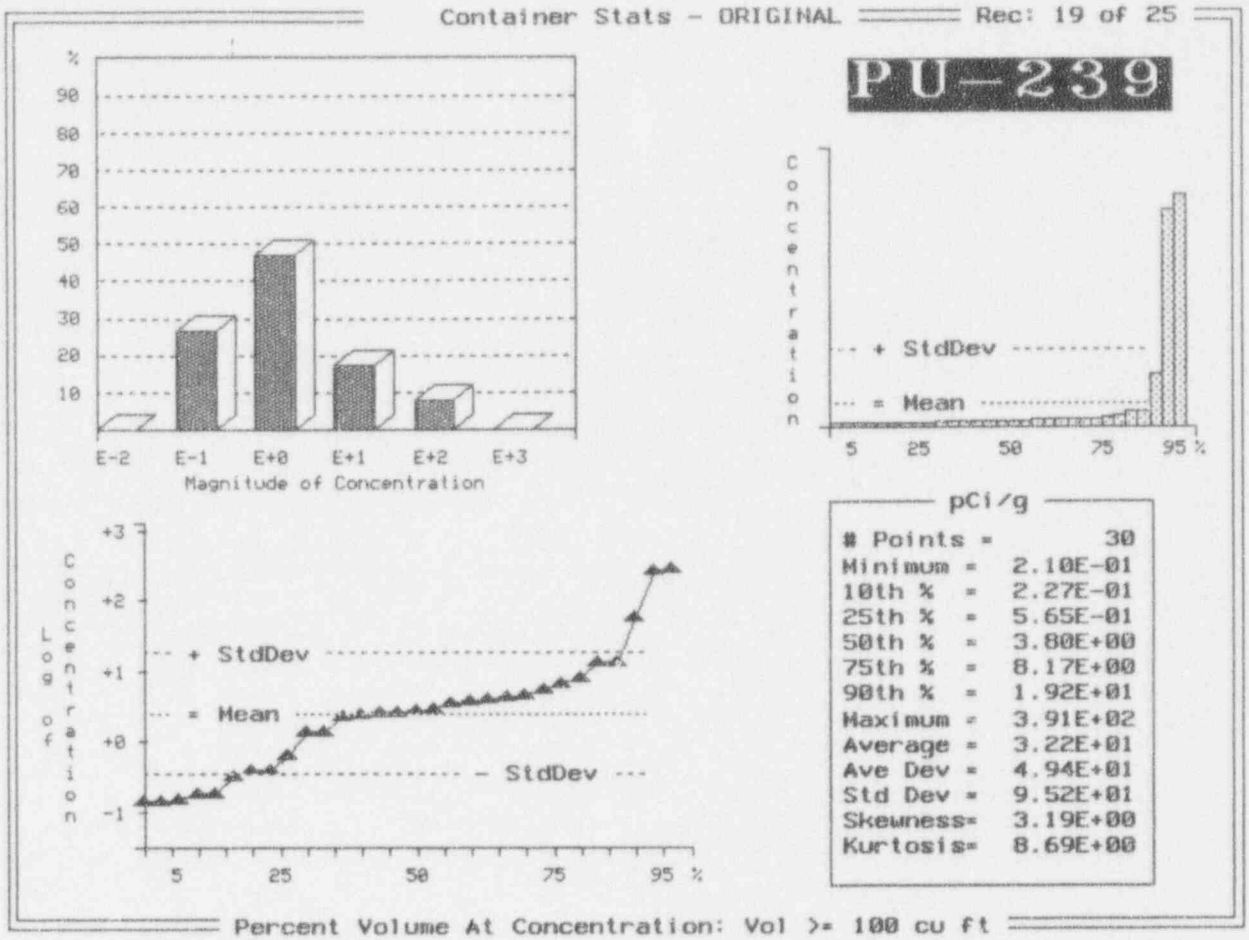

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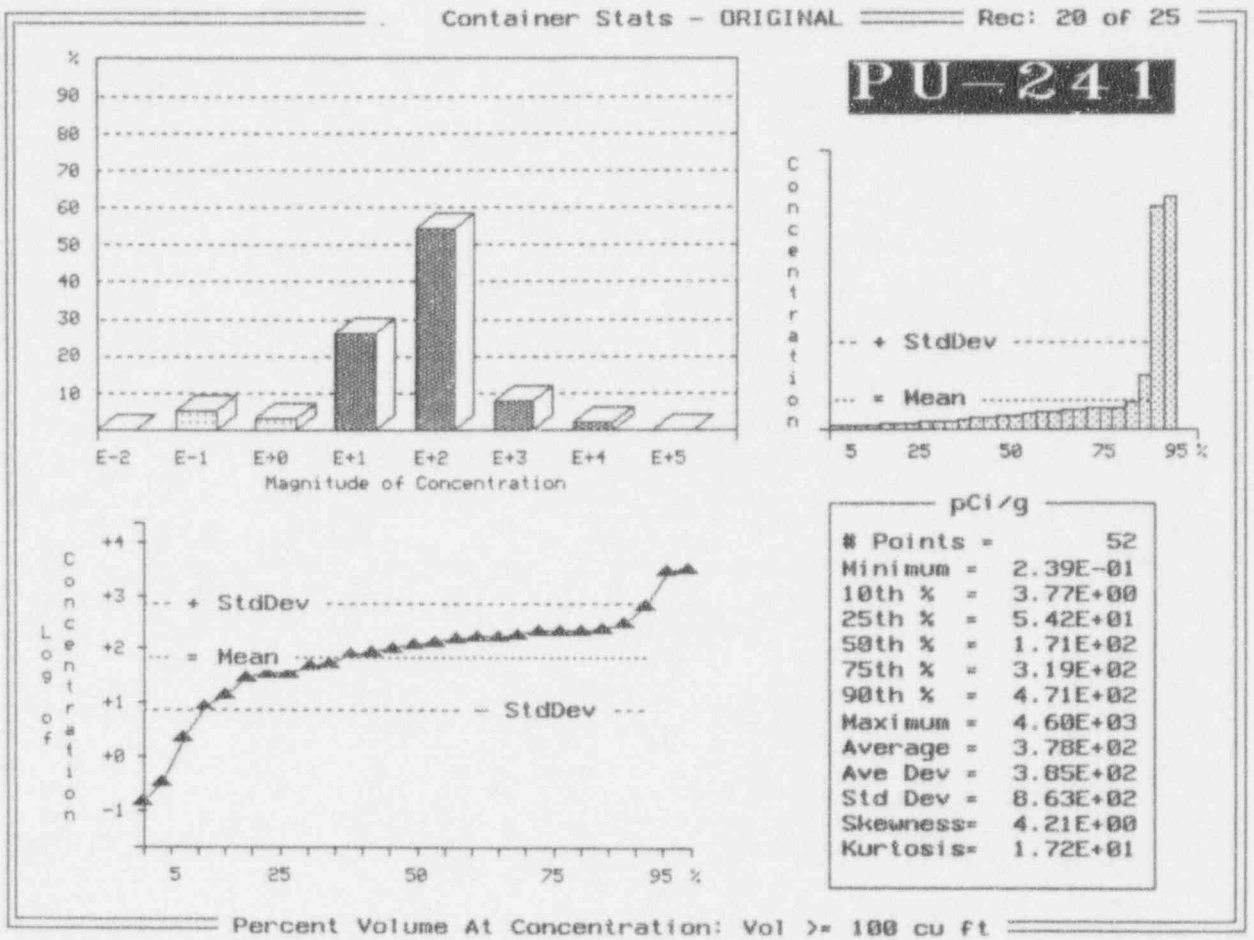

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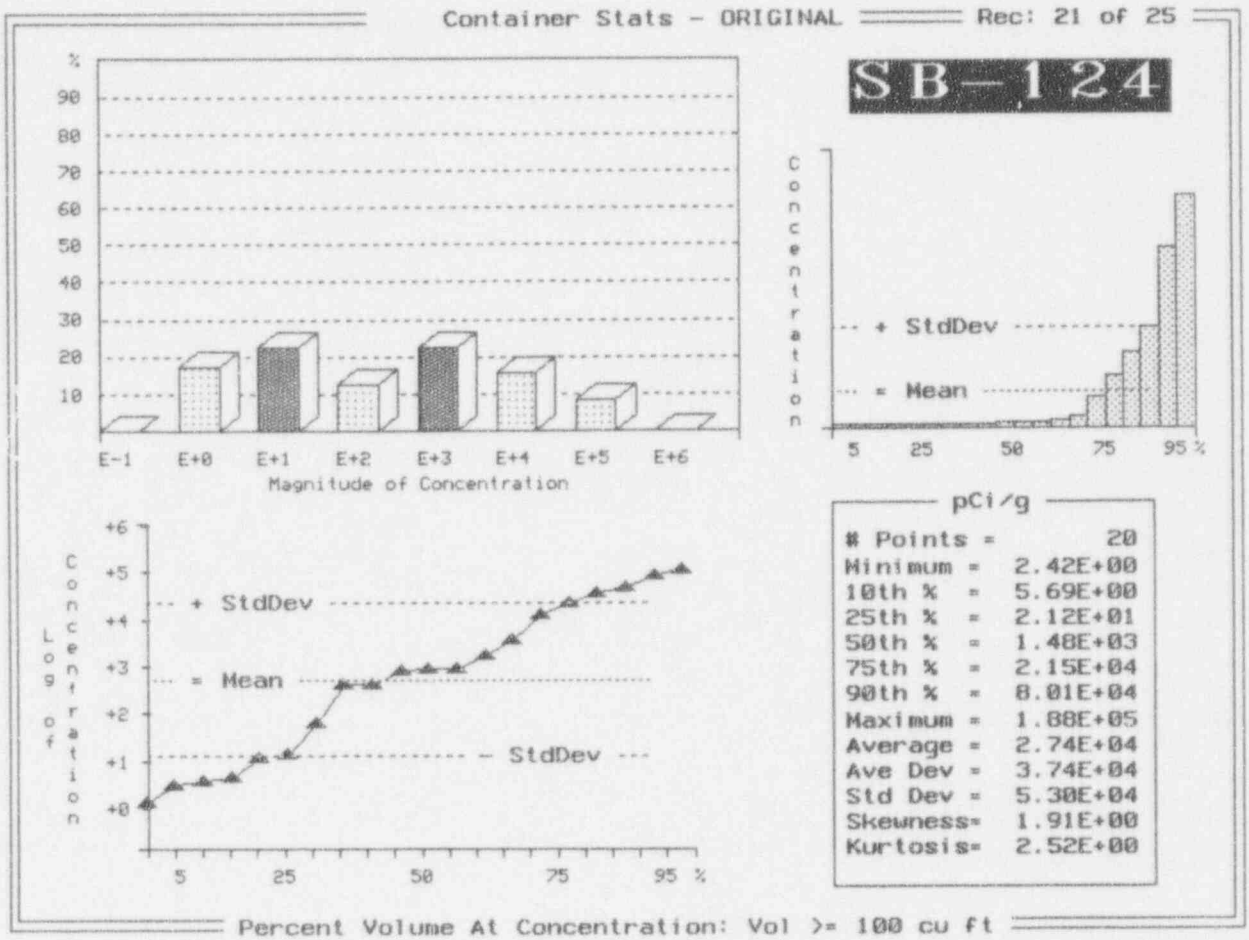

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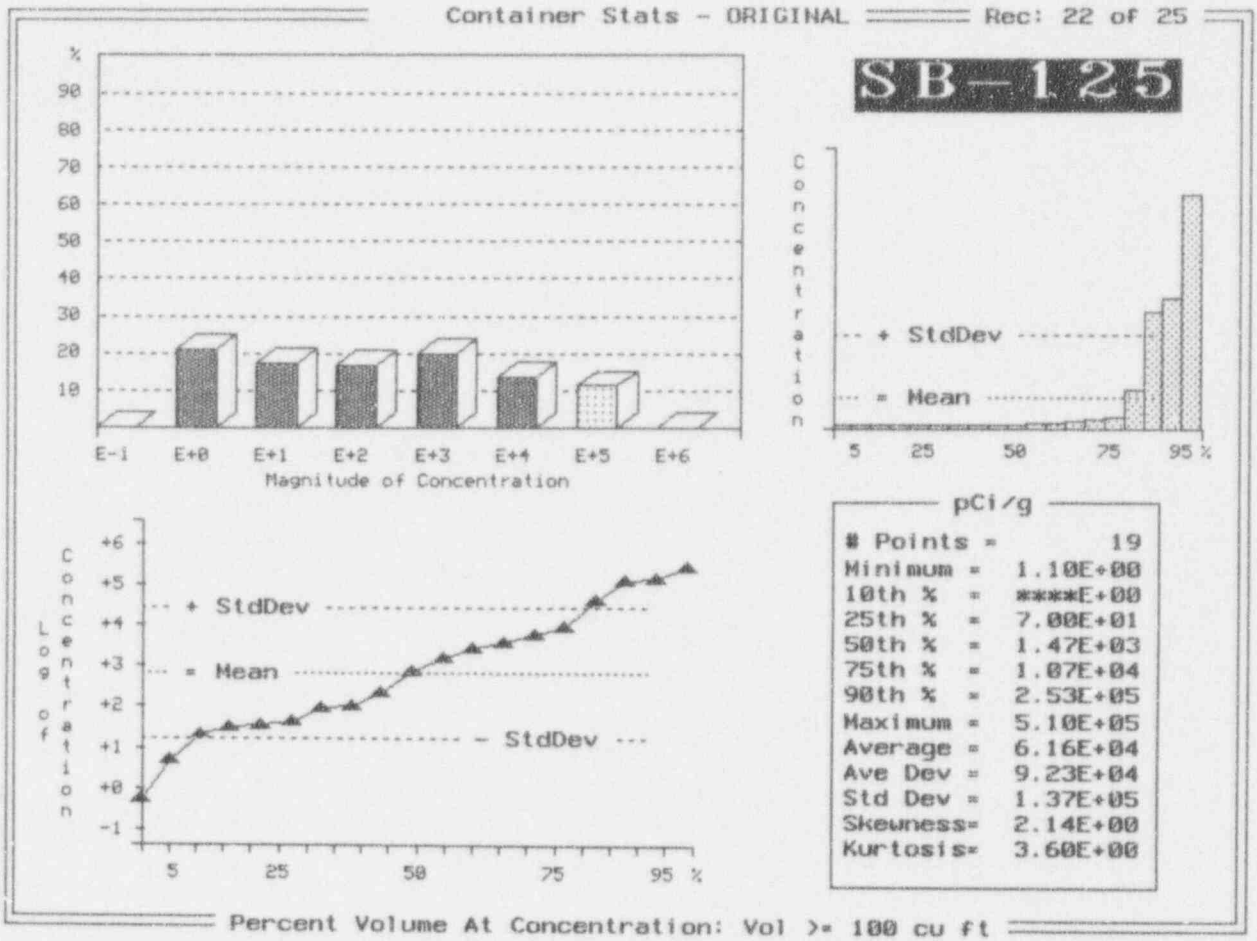

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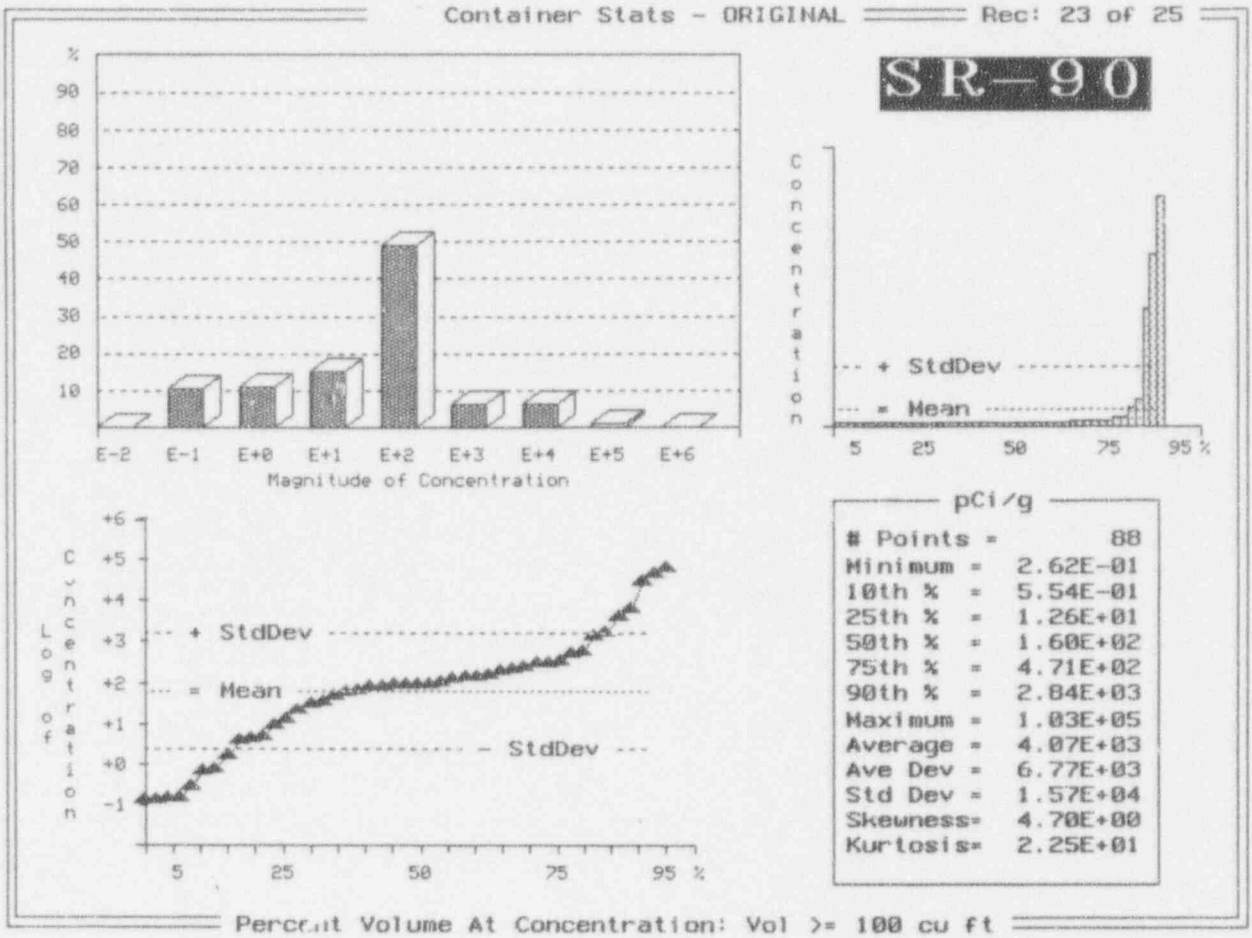

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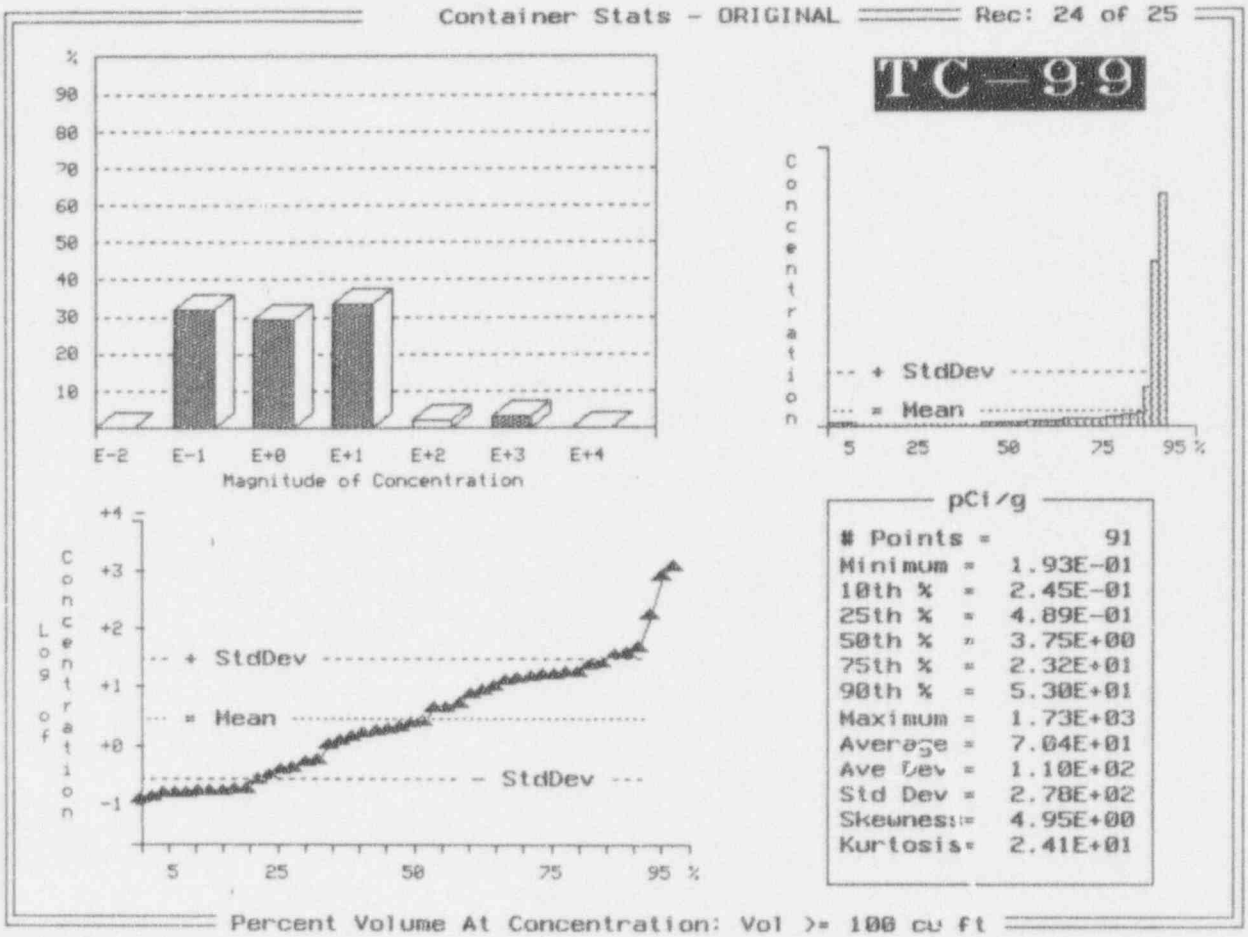

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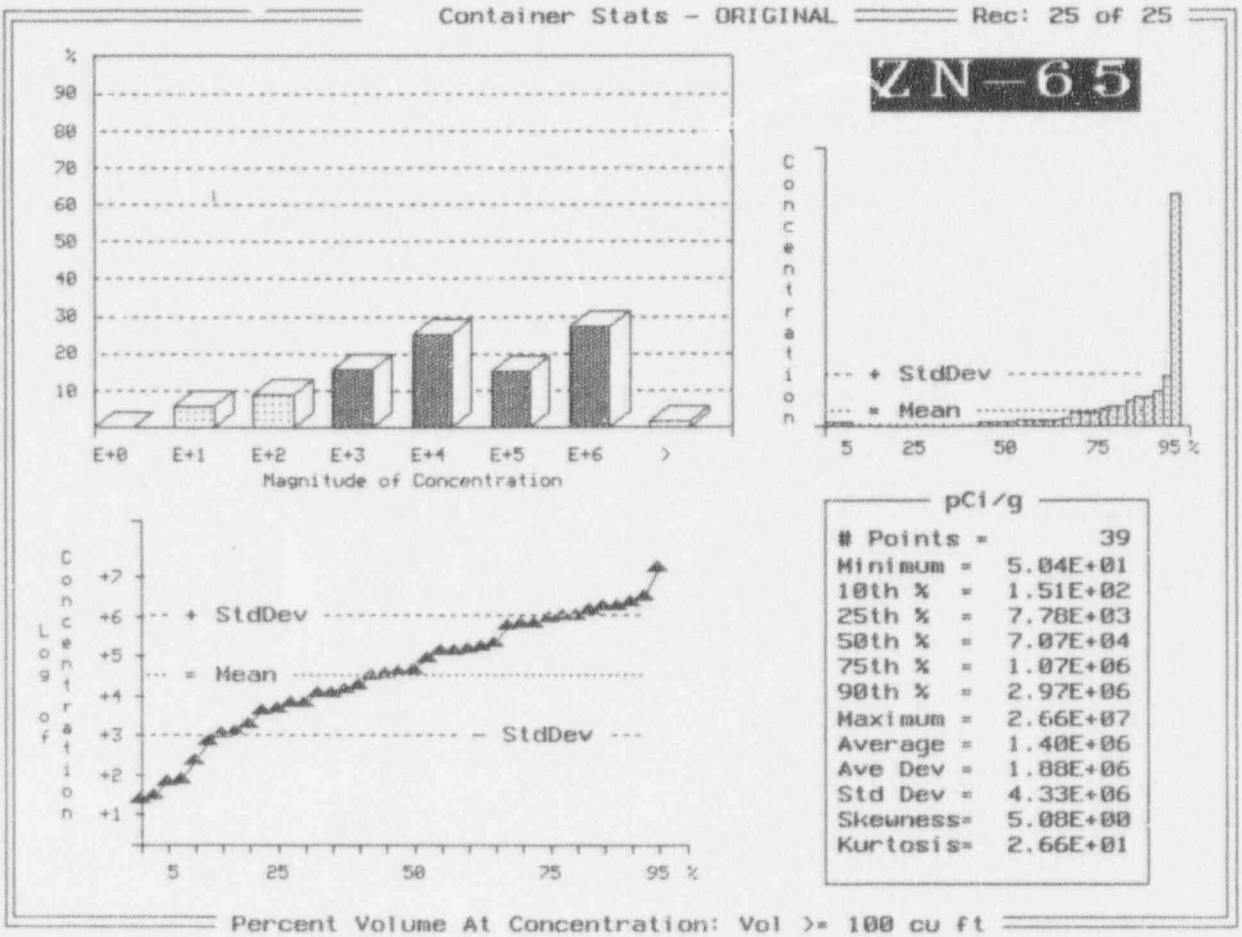


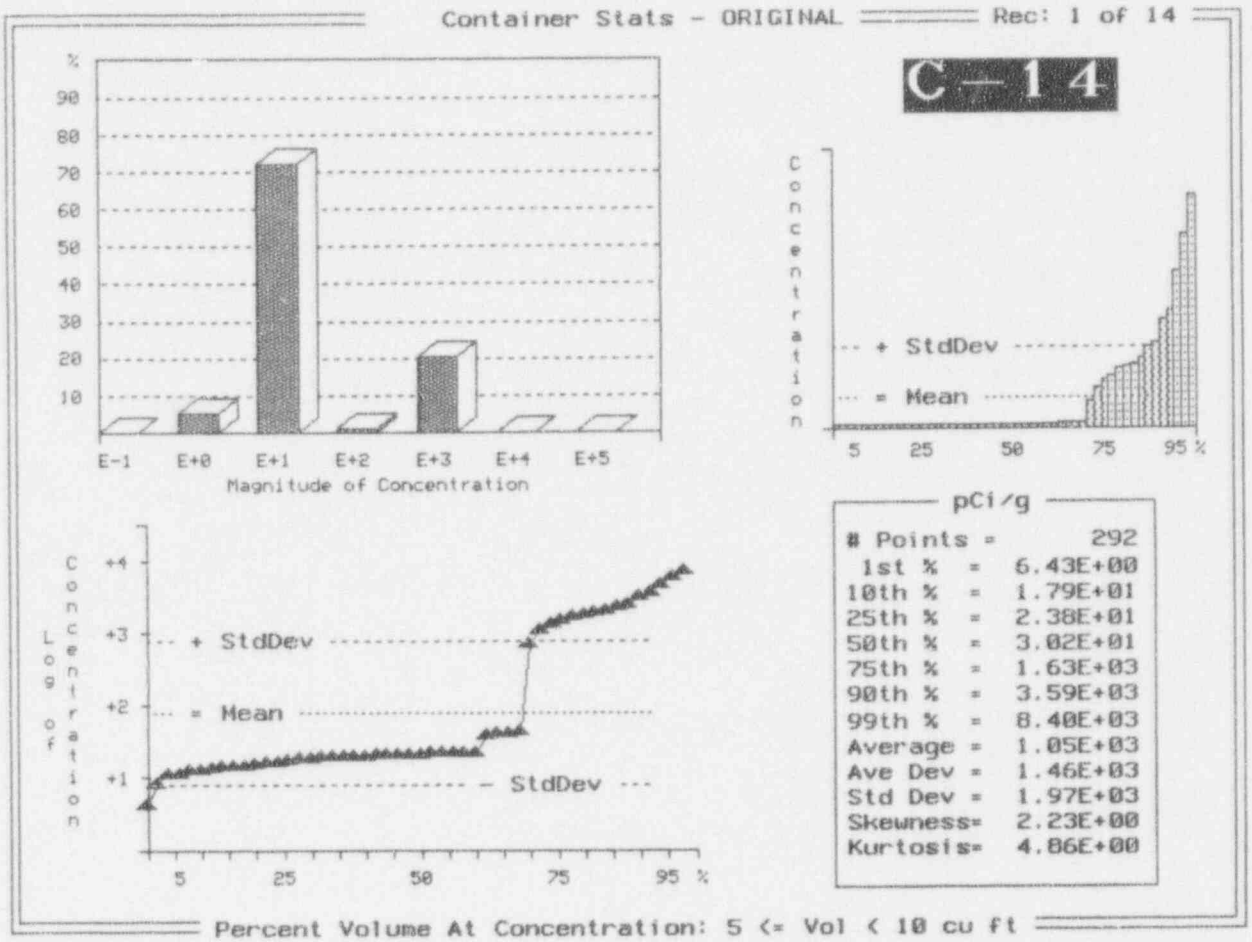
Exhibit I-4 Solidified Resins Radionuclide Distributions
Container Level Analysis for 1989 Non-Brokered
Utility Waste and All Regions and States[a]

Waste Class: A-Unstable and A-Stable
Solidification/Absorption media: Bitumen, cement, and others.
Number of shipping records: 18
Number of shipping containers: 356
Total waste volume: 92.6 m^3
Total waste mass: 135,500 Kg
Average waste form density: 1.46 g/cm^3

	Concentration Ranges - Ci/m^3 -			Percentile[b] - pCi/g -		
Nuclide	1st	50th	99th	1st	50th	99th
C-14	9.42E-06	4.71E-05	1.06E-02	6.43E+00	3.02E+01	8.40E+03
Co-58	2.40E-04	1.29E-03	1.26E-02	1.60E+02	8.10E+02	9.32E+03
Co-60	6.95E-03	3.51E-02	3.44E-01	4.84E+03	2.33E+04	3.61E+05
Cr-51	5.51E-04	1.70E-03	1.20E-02	3.94E+02	1.13E+03	7.01E+03
Cs-137	1.25E-03	4.94E-03	1.39E-02	8.08E+02	3.23E+03	8.69E+03
Cs-134	1.37E-04	1.89E-04	2.31E-04	8.93E+01	1.23E+02	1.70E+02
Fe-55	9.75E-04	4.76E-03	1.65E+00	7.52E+02	3.72E+03	1.73E+06
Fe-59	2.47E-02	5.05E-02	1.21E-01	1.70E+04	9.46E+04	4.46E+05
H-3	4.19E-04	2.02E-03	7.11E-03	2.80E+02	1.31E+03	4.41E+03
I-129	4.71E-06	4.71E-06	4.71E-06	2.75E+00	3.02E+02	3.31E+00
Mn-54	1.65E-03	7.96E-03	4.49E-01	1.04E+03	5.08E+03	4.71E+05
Ni-63	1.37E-04	8.00E-04	5.46E-03	9.00E+01	5.24E+02	4.32E+03
Pu-239	4.71E-06	4.71E-06	4.71E-06	2.47E+00	2.94E+00	3.10E+00
Sr-90	4.71E-06	2.35E-05	1.70E-04	3.15E+00	1.51E+01	1.03E+02
Tc-99	4.71E-06	4.71E-06	1.41E-05	2.55E+00	3.10E+00	8.99E+00
Zn-65	2.07E-04	8.00E-04	1.70E-03	1.34E+02	5.13E+02	1.04E+03

(a) Based on LLW data for Beatty and Richland only.
(b) Includes only radionuclides with 30 or more data points characterizing concentration ranges.

Exhibit I-4 (Continued)



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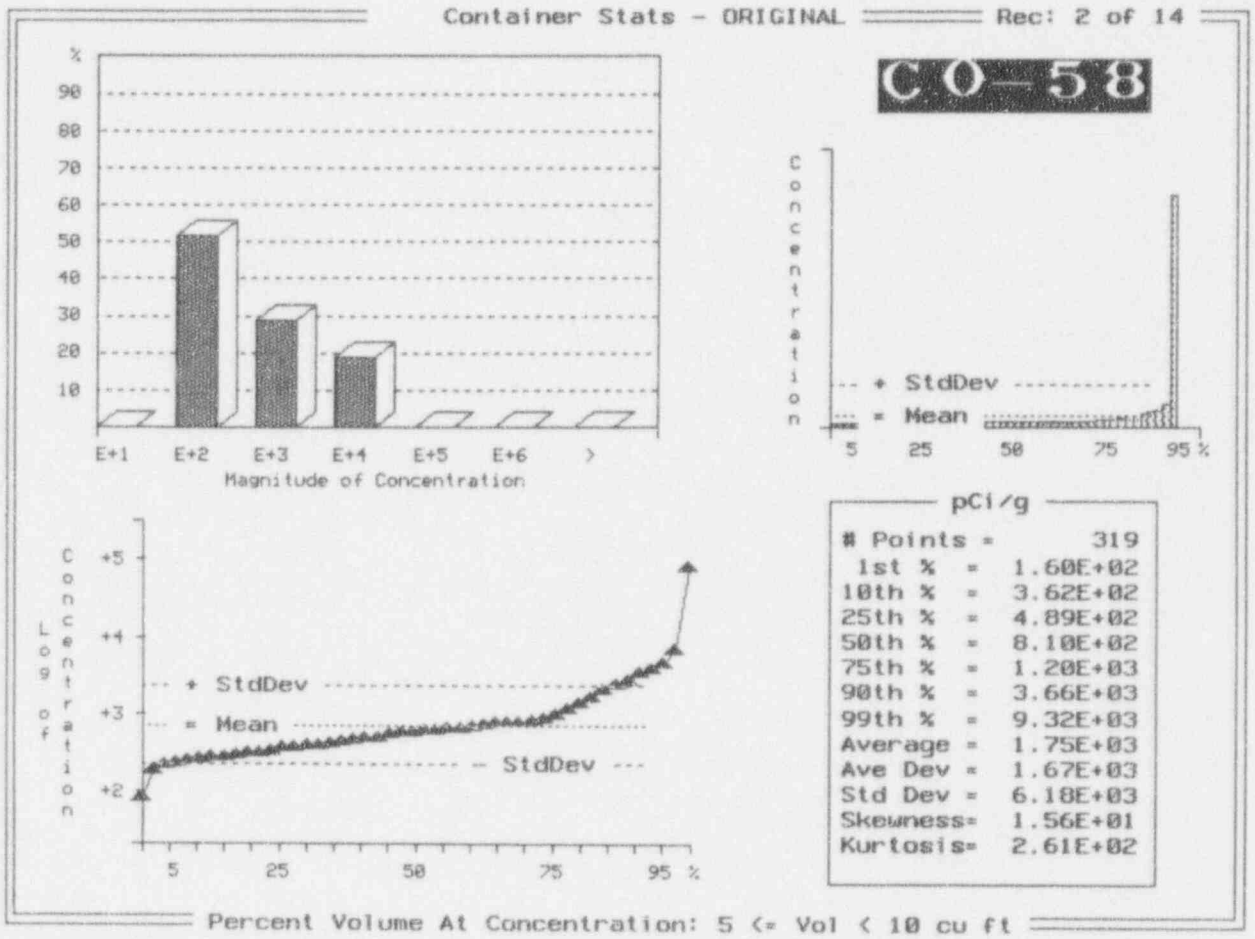

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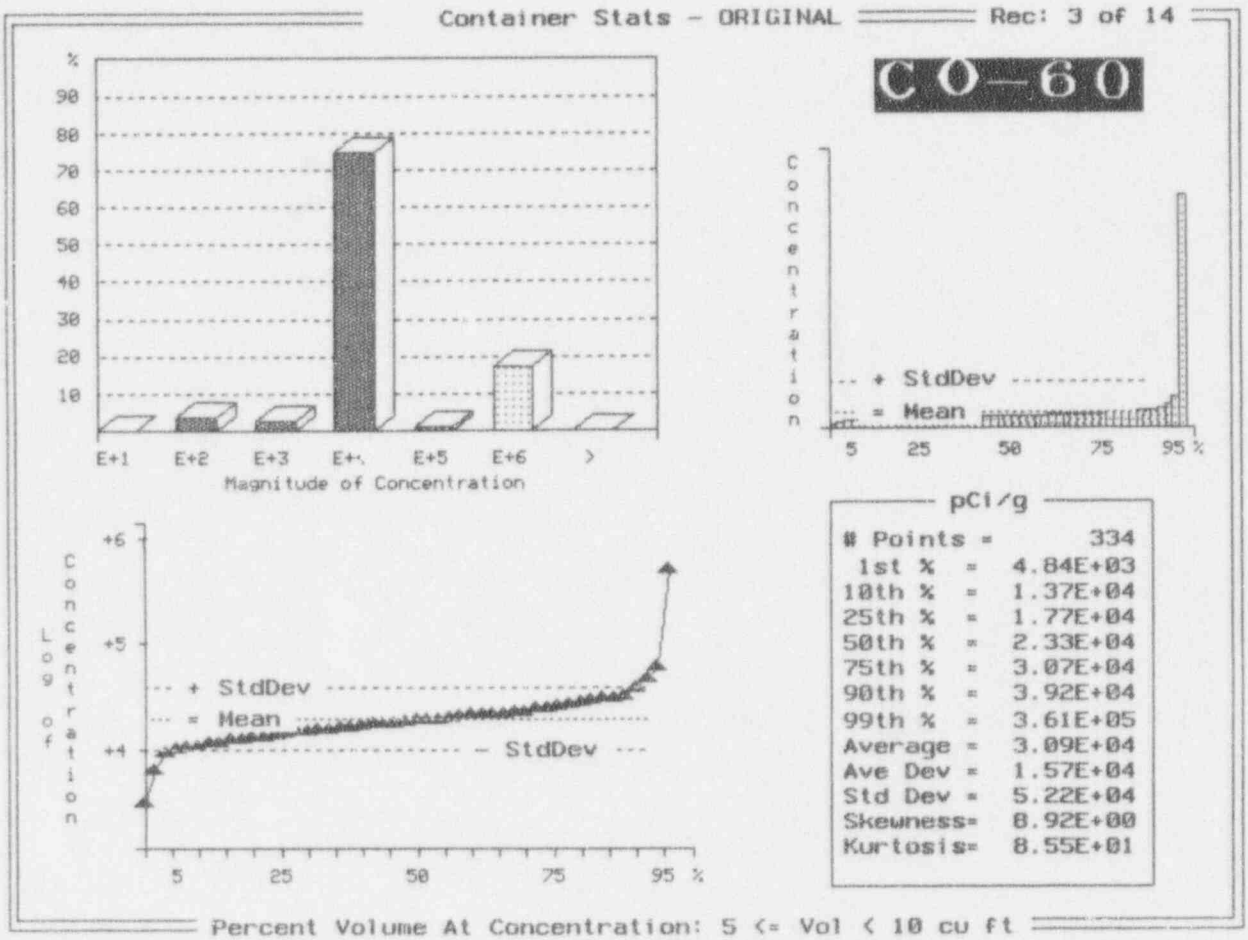

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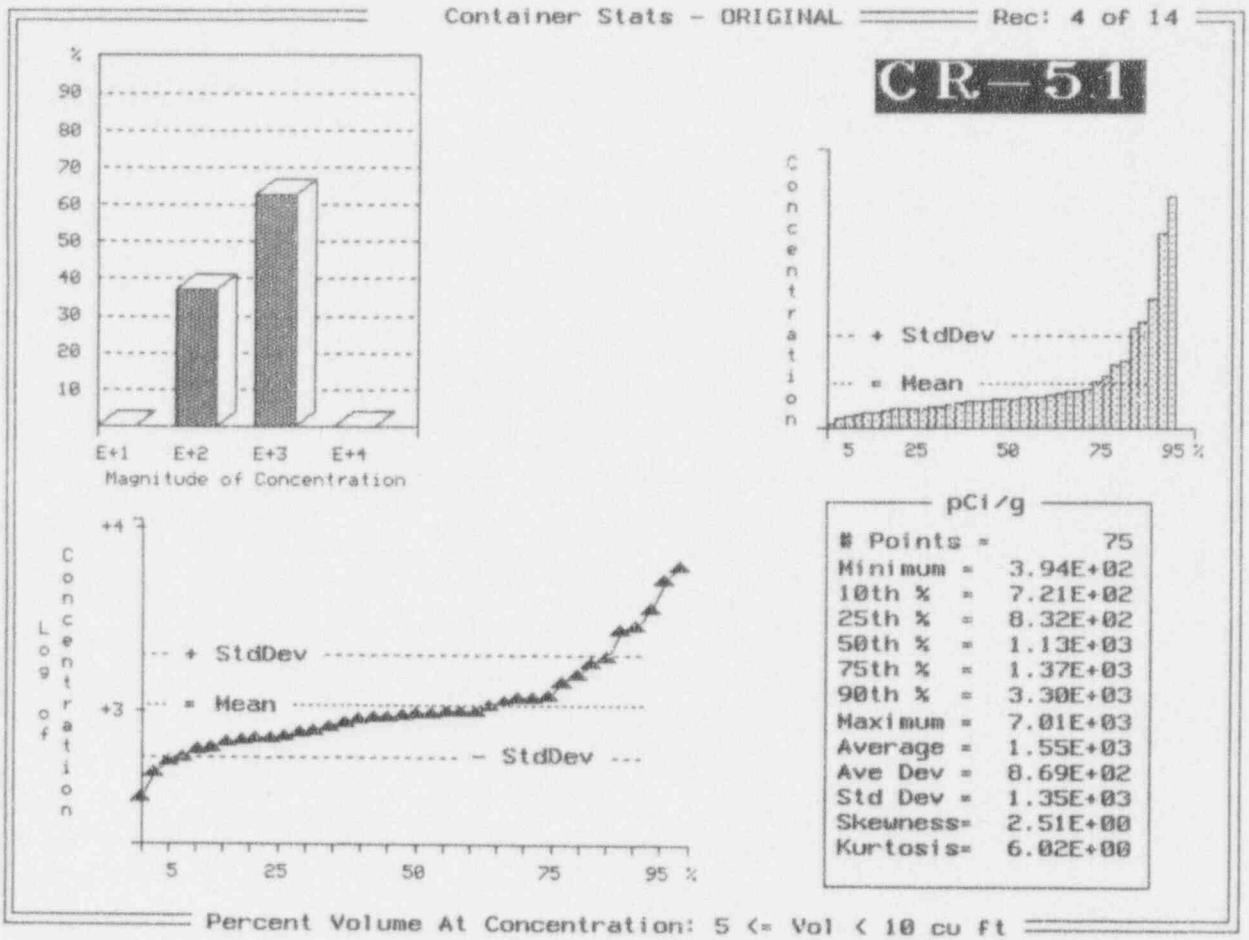

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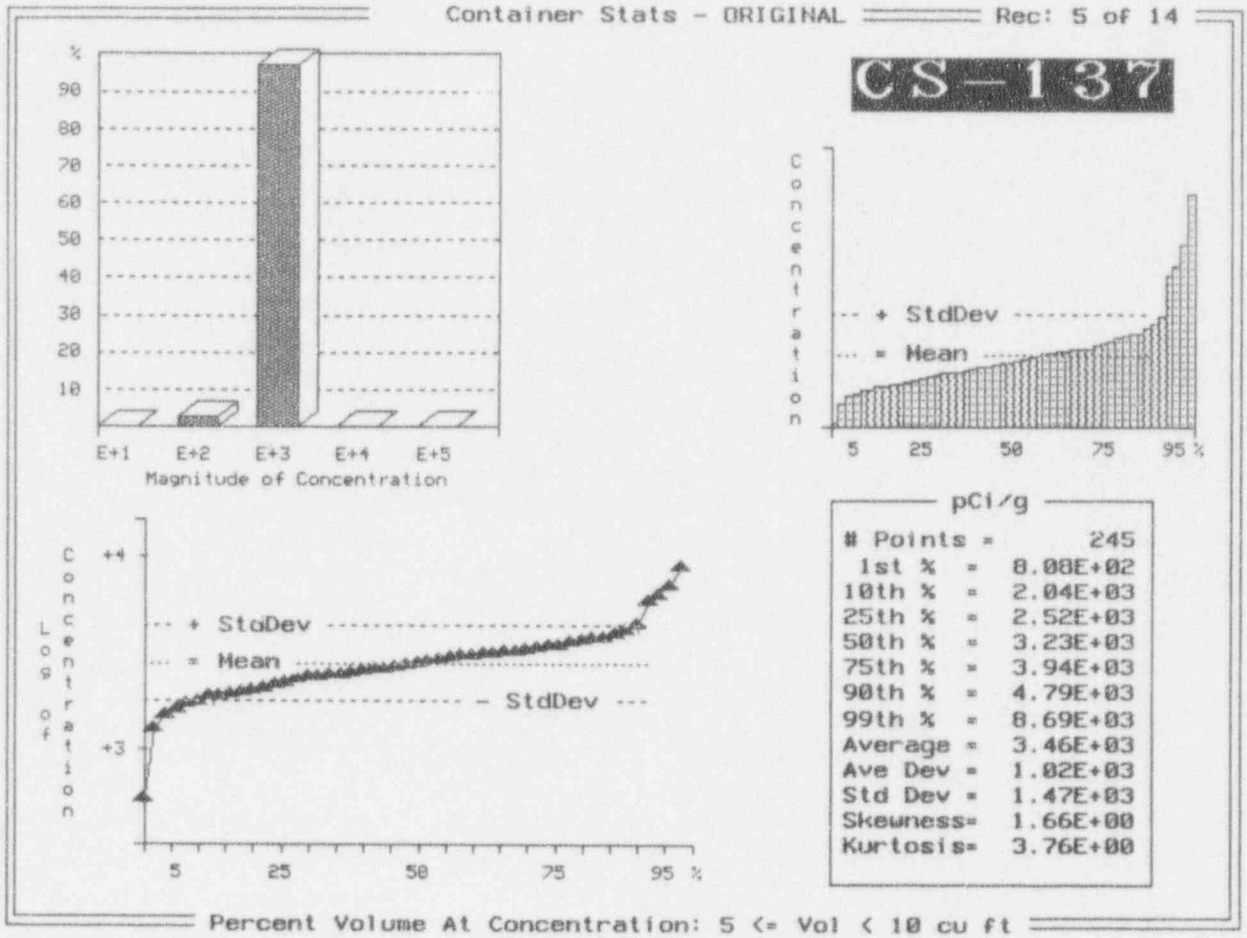

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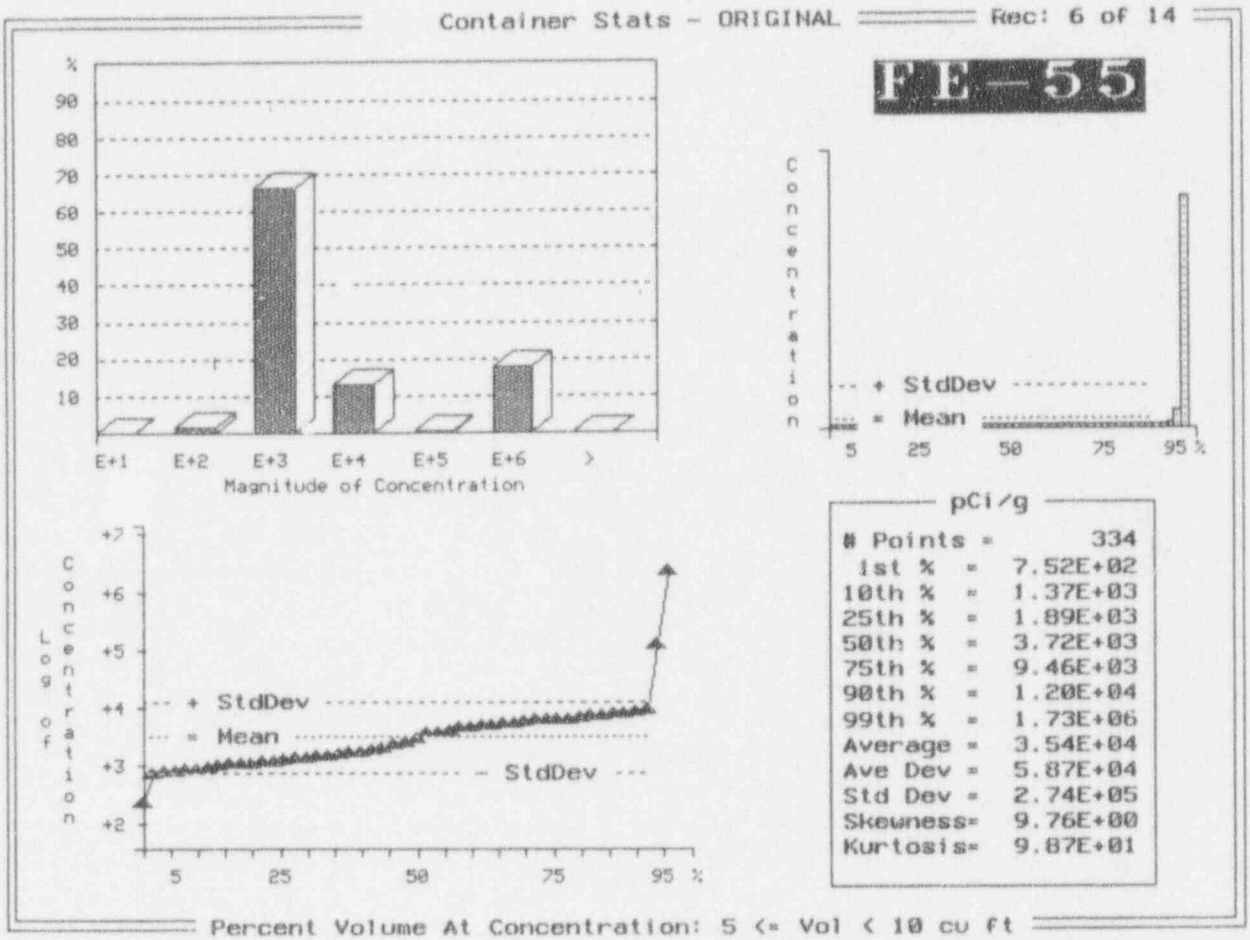

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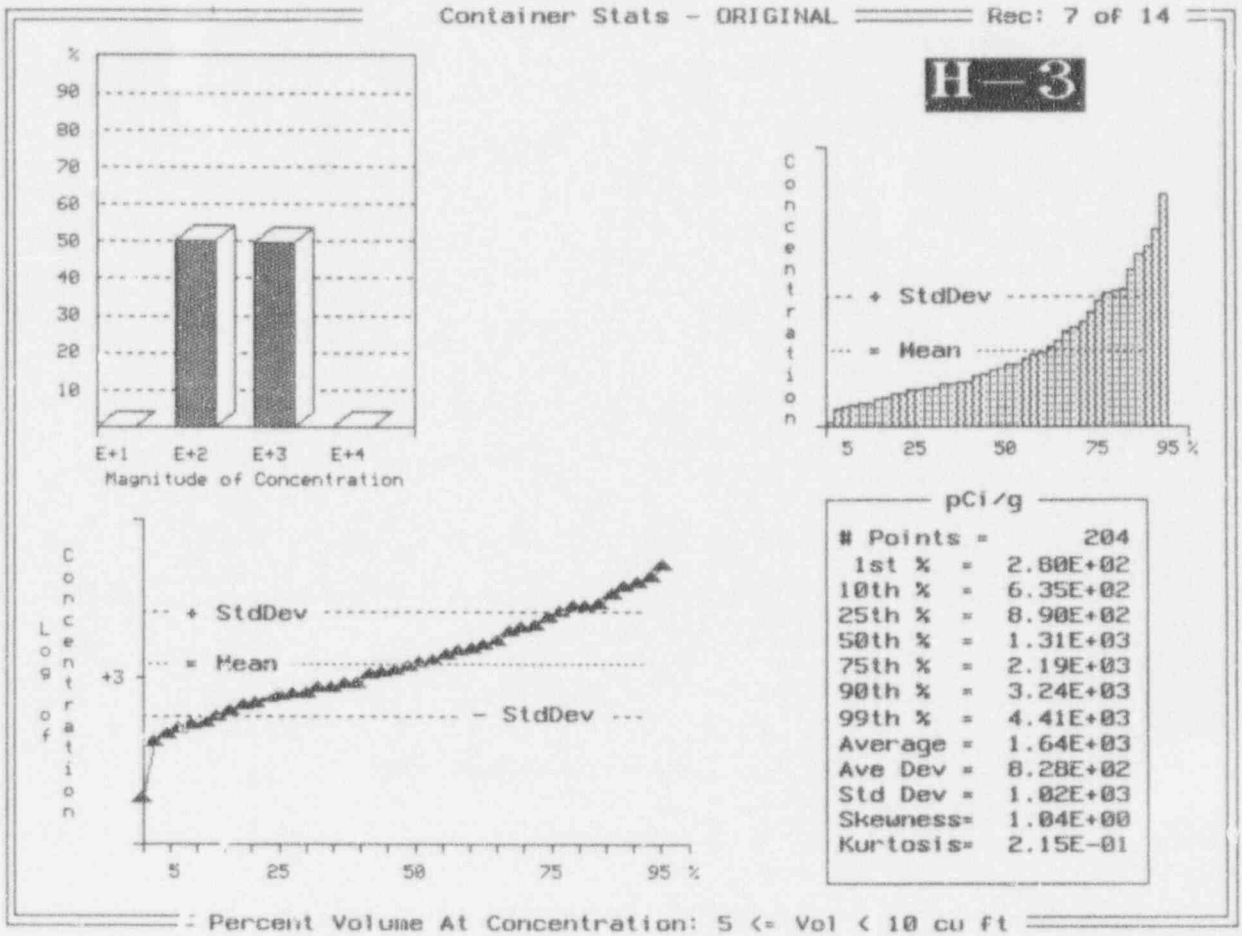

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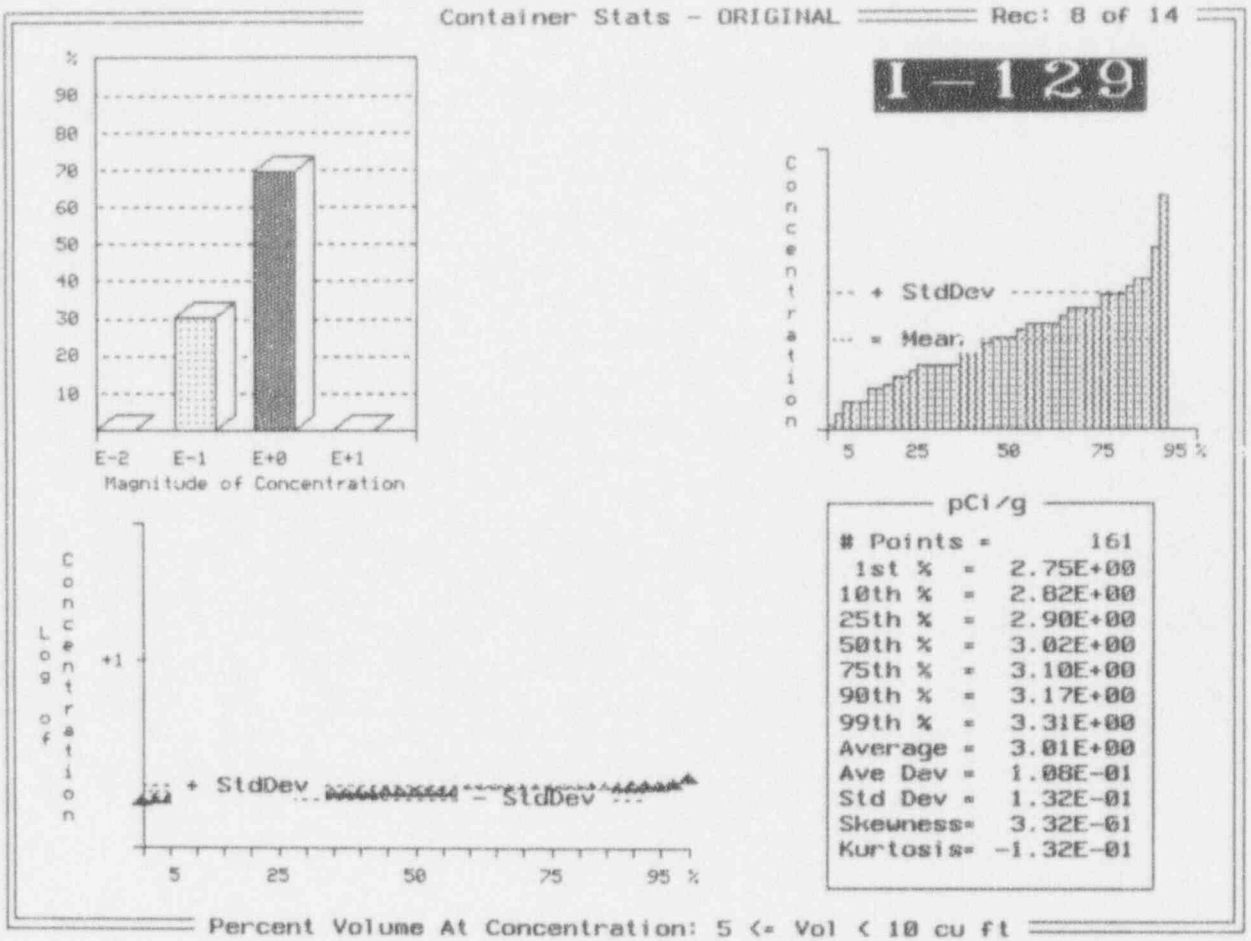

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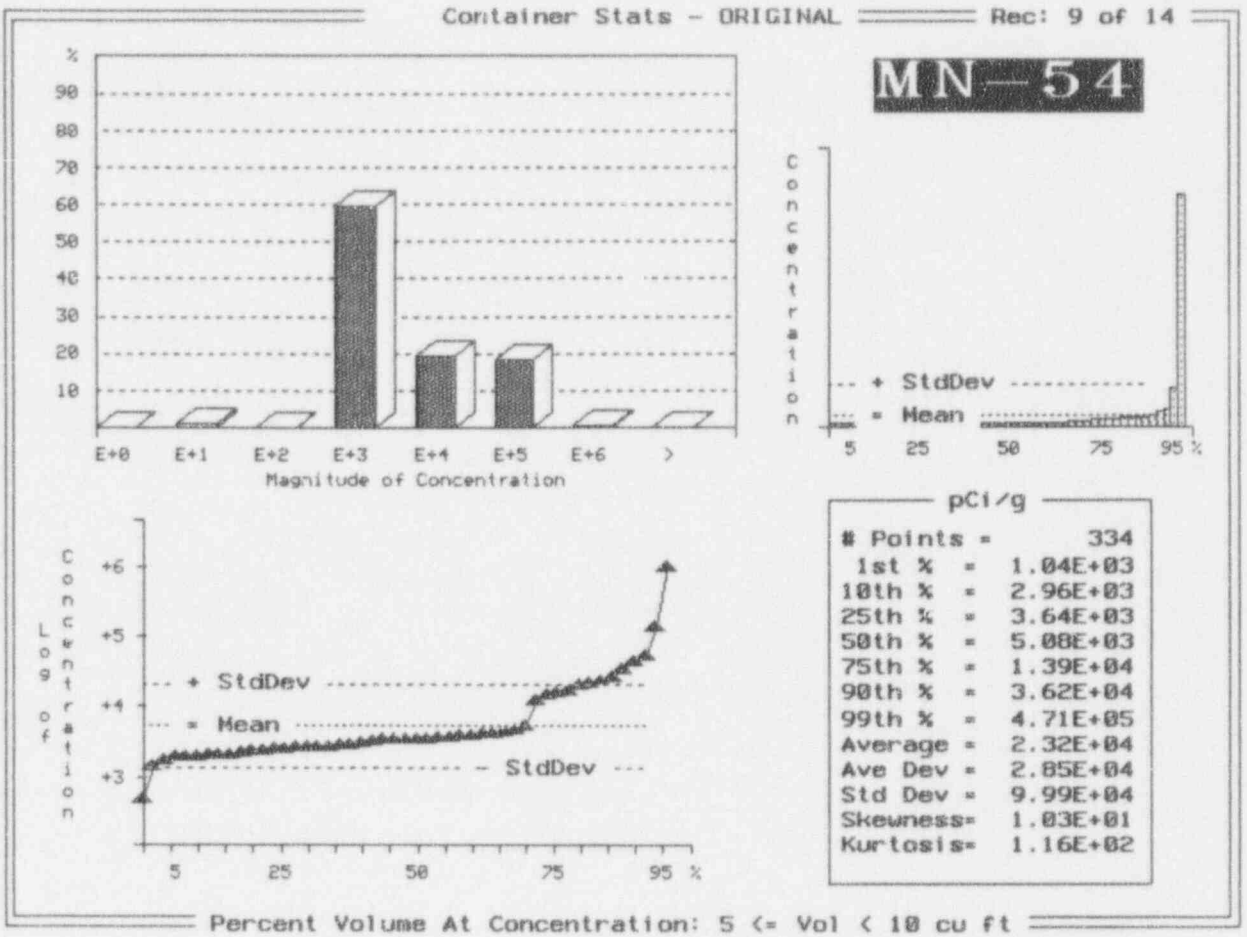

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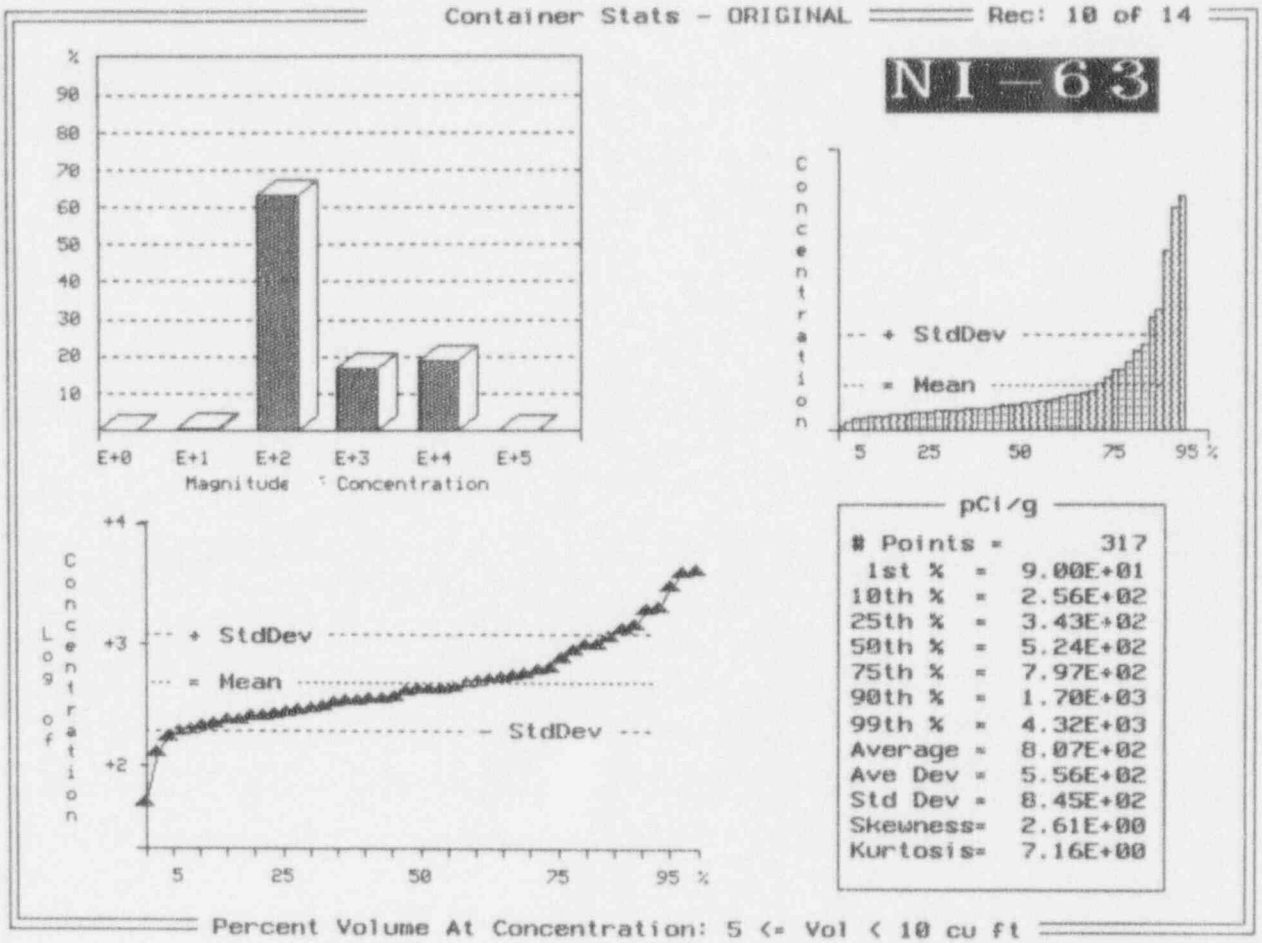

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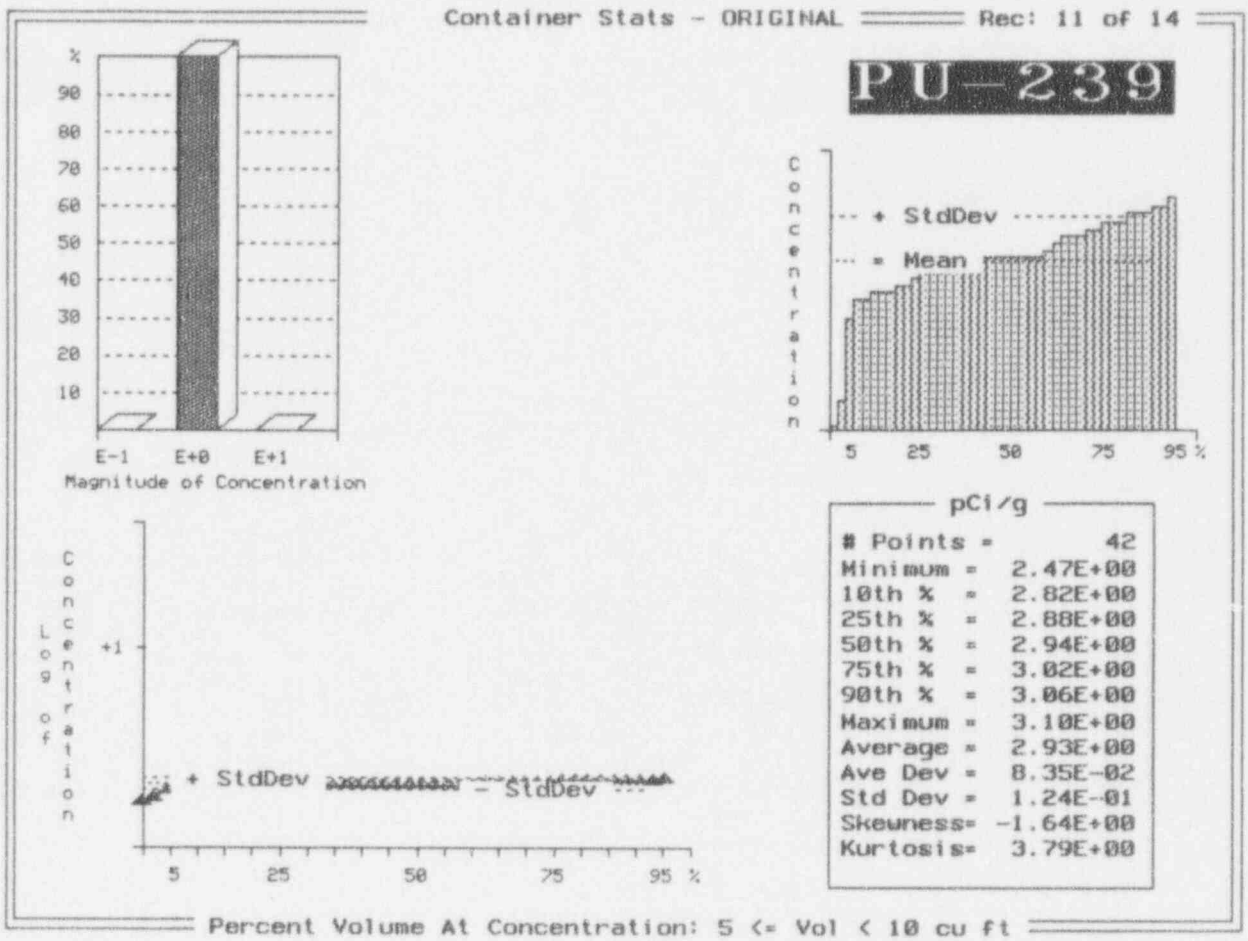

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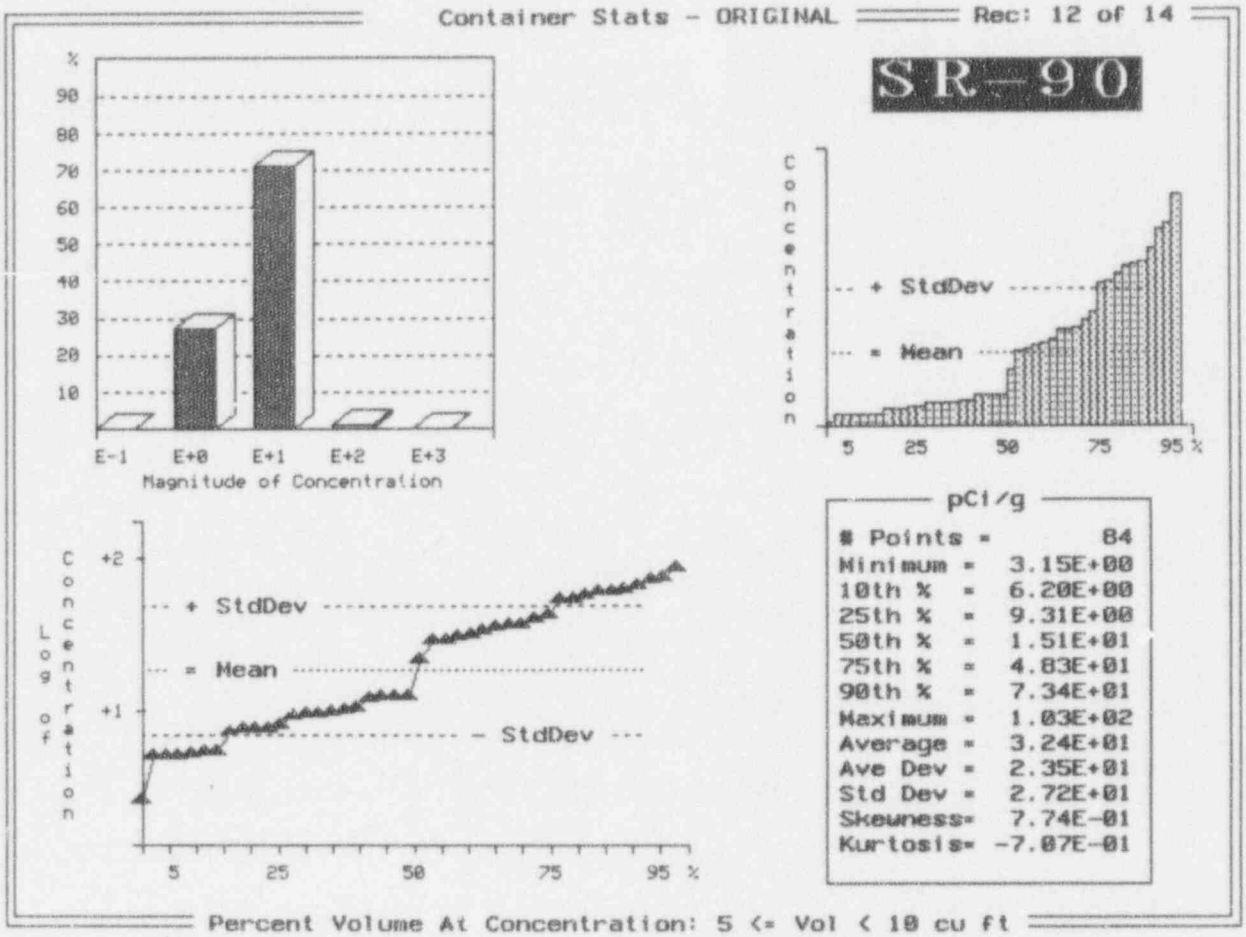

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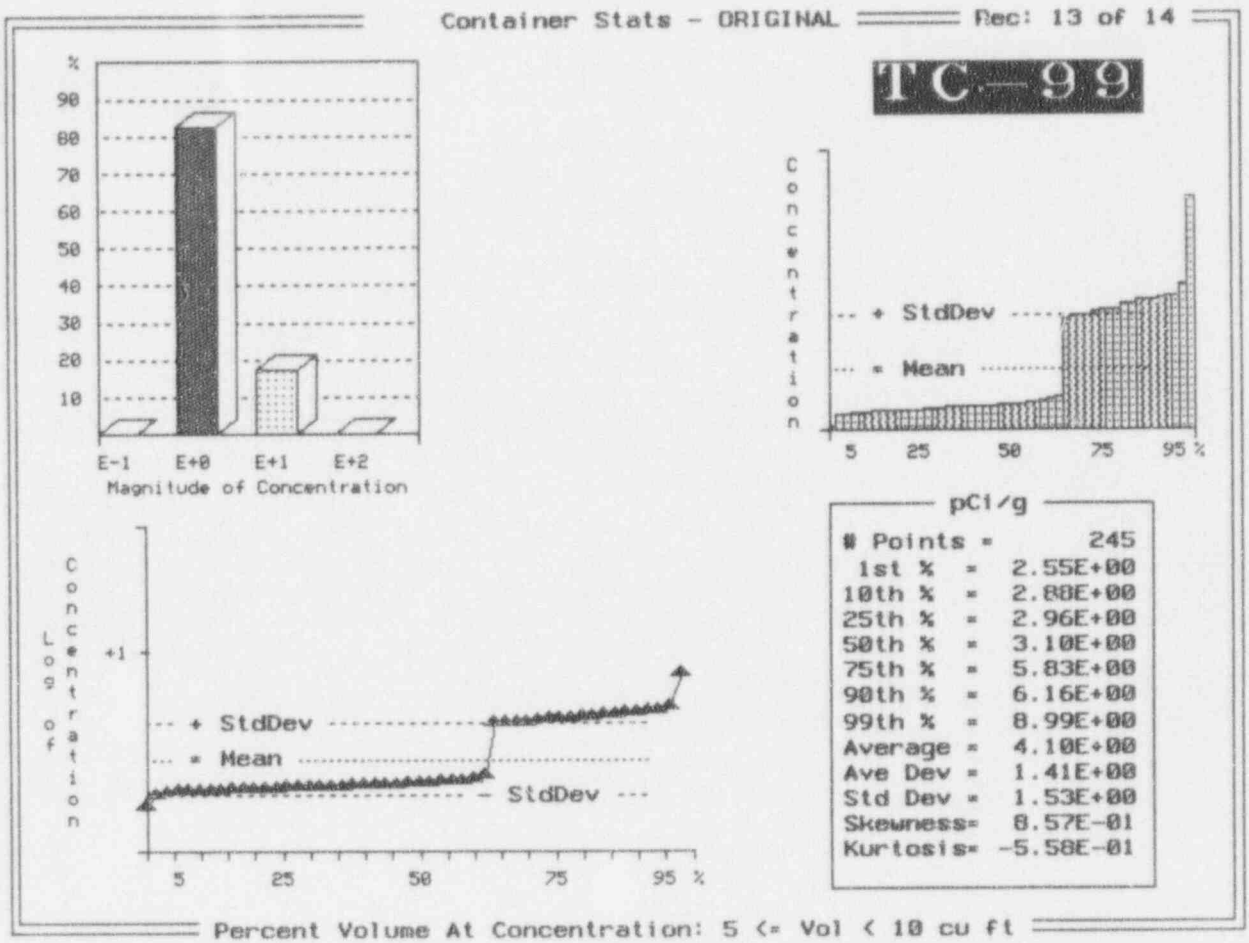

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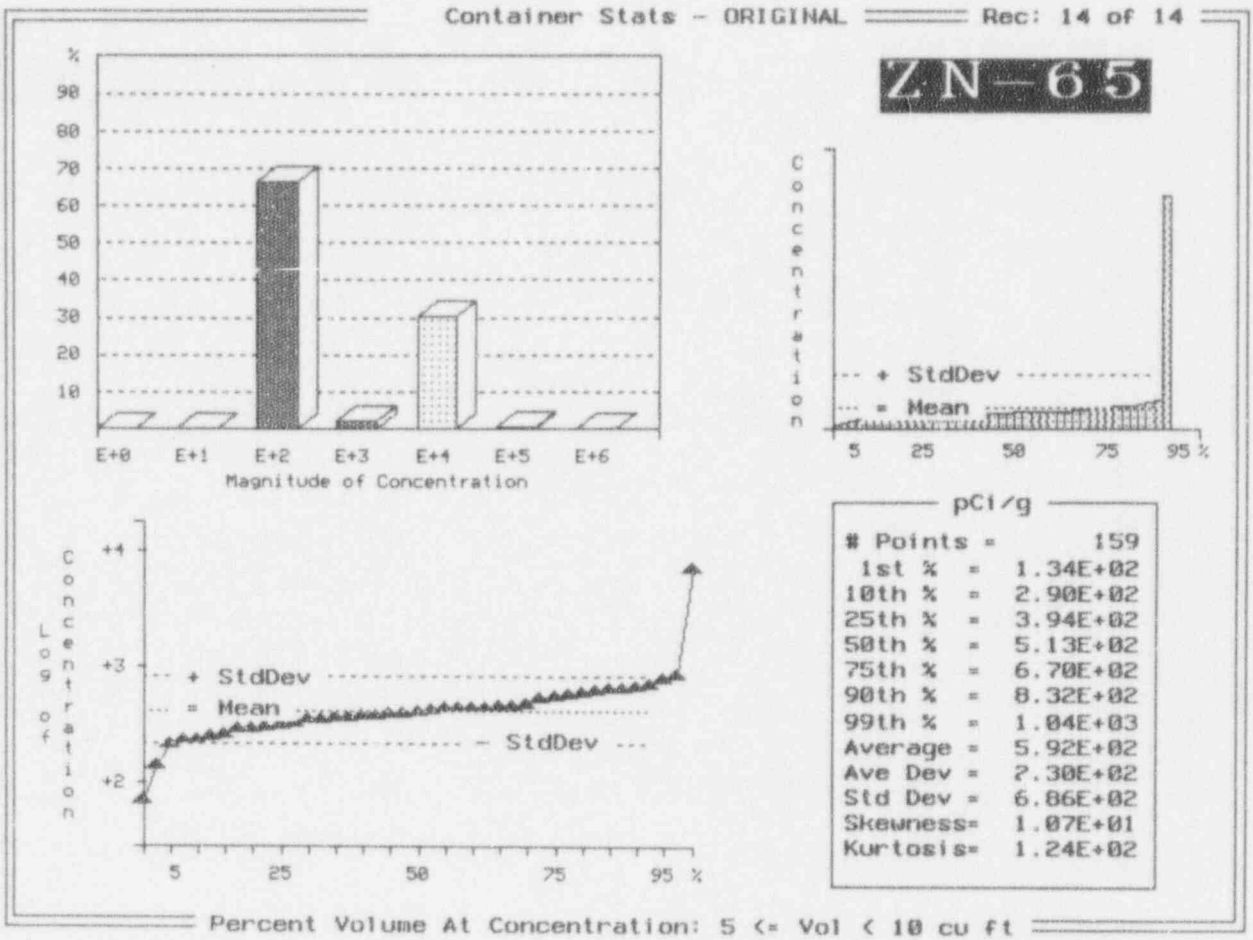


Exhibit I-5 Evaporator Bottoms Radionuclide Distributions
Container Level Analysis for 1989 Non-Brokered
Utility Waste and All Regions and States[a]

Waste Class: A-Unstable and A-Stable
Solidification/Absorption media: Bitumen, Cement, & Envirostone.
Number of shipping records: 125
Number of shipping containers: 1,105
Total waste volume: 711.3 m^3
Total waste mass: 1,085,000 Kg
Average waste form density: 1.53 g/cm^3

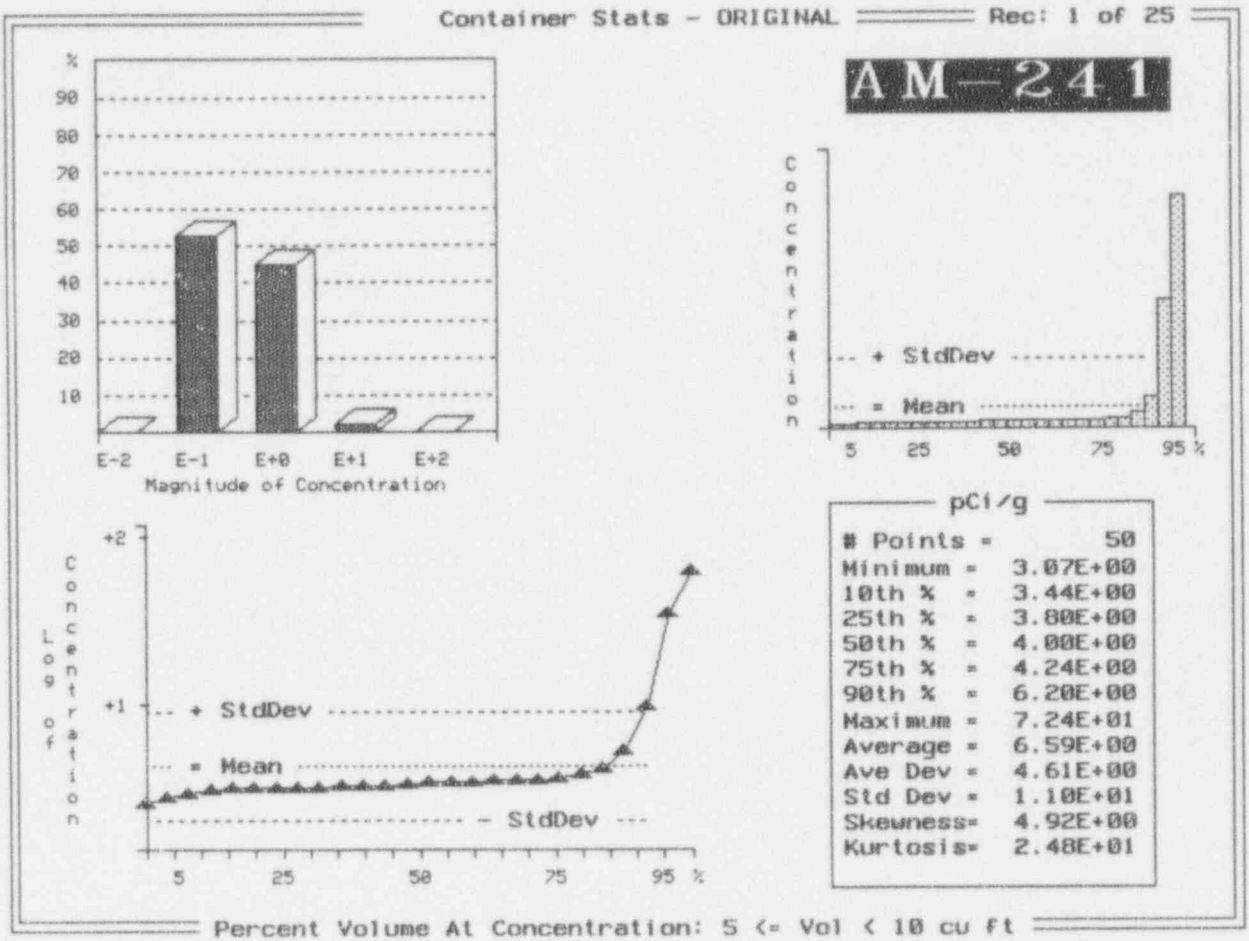
Nuclide	Concentration Ranges - Percentile[b] - Ci/m^3 - 1st	50th	99th	- pCi/g - 1st	50th	99th
Am-241	4.71E-06	4.71E-06	6.12E-05	3.07E+00	4.00E+00	7.24E+01
C-14	4.24E-05	1.70E-04	1.89E-02	2.74E+01	1.04E+02	1.23E+04
Cm-242	4.71E-06	4.71E-05	2.07E-04	3.07E+00	4.13E+01	2.36E+02
Cm-244	4.71E-06	1.41E-05	1.13E-04	3.83E+00	1.26E+01	9.04E+01
Co-57	9.42E-06	5.41E-04	4.06E-01	6.14E+00	5.32E+02	3.09E+05
Co-58	2.69E-03	3.15E-02	1.65E-01	2.49E+03	1.94E+04	1.40E+05
Co-60	6.50E-03	1.15E-00	3.10E+00	7.18E+03	7.05E+05	2.04E+06
Cr-51	5.74E-03	2.23E-01	6.33E-01	4.19E+03	1.38E+05	4.09E+05
Cs-134	2.73E-04	7.11E-03	2.65E-01	3.70E+02	6.29E+03	3.10E+05
Cs-137	5.18E-04	1.21E-03	6.87E-02	3.21E+02	7.48E+02	6.80E+04
Fe-55	5.58E-01	2.91E+00	7.40E+00	4.14E+05	1.81E+06	4.80E+06
Fe-59	9.42E-05	1.89E-02	5.13E-02	7.73E+01	1.18E+04	3.30E+04
H-3	2.50E-04	8.99E-04	1.06E-01	1.57E+02	5.56E+02	1.06E+05
I-129	4.71E-06	4.71E-06	2.31E-04	2.76E+00	2.96E+00	2.20E+02
Mn-54	9.32E-04	3.69E-01	9.66E-01	8.90E+02	2.28E+05	6.22E+05
Ni-63	1.72E-03	1.26E-02	1.50E-01	1.60E+03	7.85E+03	1.40E+05
Pu-238	4.71E-06	4.71E-06	9.42E-05	3.07E+00	4.08E+00	8.47E+01
Pu-239	4.71E-06	4.71E-06	5.65E-05	3.07E+00	4.00E+00	6.20E+01
Pu-241	4.71E-06	2.26E-04	3.75E-03	3.07E+00	1.81E+02	4.33E+03
Pu-242	4.71E-06	9.42E-06	5.65E-05	3.07E+00	7.66E+00	4.52E+01
Sb-124	1.68E-05	2.25E-03	2.99E-02	1.10E+01	1.47E+03	1.94E+04

Exhibit I-5 Evaporator Bottoms Radionuclide Distributions Container Level Analysis for 1989 Non-Brokered Utility Waste and All Regions and States[a], Cont'd

Nuclide	Concentration Ranges - Percentile[b] - Ci/m^3 - 1st	50th	99th	- pCi/g - 1st	50th	99th
Sb-125	9.42E-05	3.80E-03	8.72E-02	6.14E+01	3.19E+03	1.01E+05
Sr-90	9.42E-06	2.73E-04	2.30E-03	1.28E+01	2.18E+02	1.84E+03
Tc-99	4.71E-06	4.71E-06	3.09E-03	2.76E+00	2.96E+00	2.94E+03
Zn-65	1.27E-02	3.23E-02	9.75E-02	8.34E+03	2.01E+04	6.50E+04

(a) Based on LLW data for Beatty and Richland only.
(b) Includes only radionuclides with 30 or more data points characterizing concentration ranges.

Exhibit I-5 (Continued)



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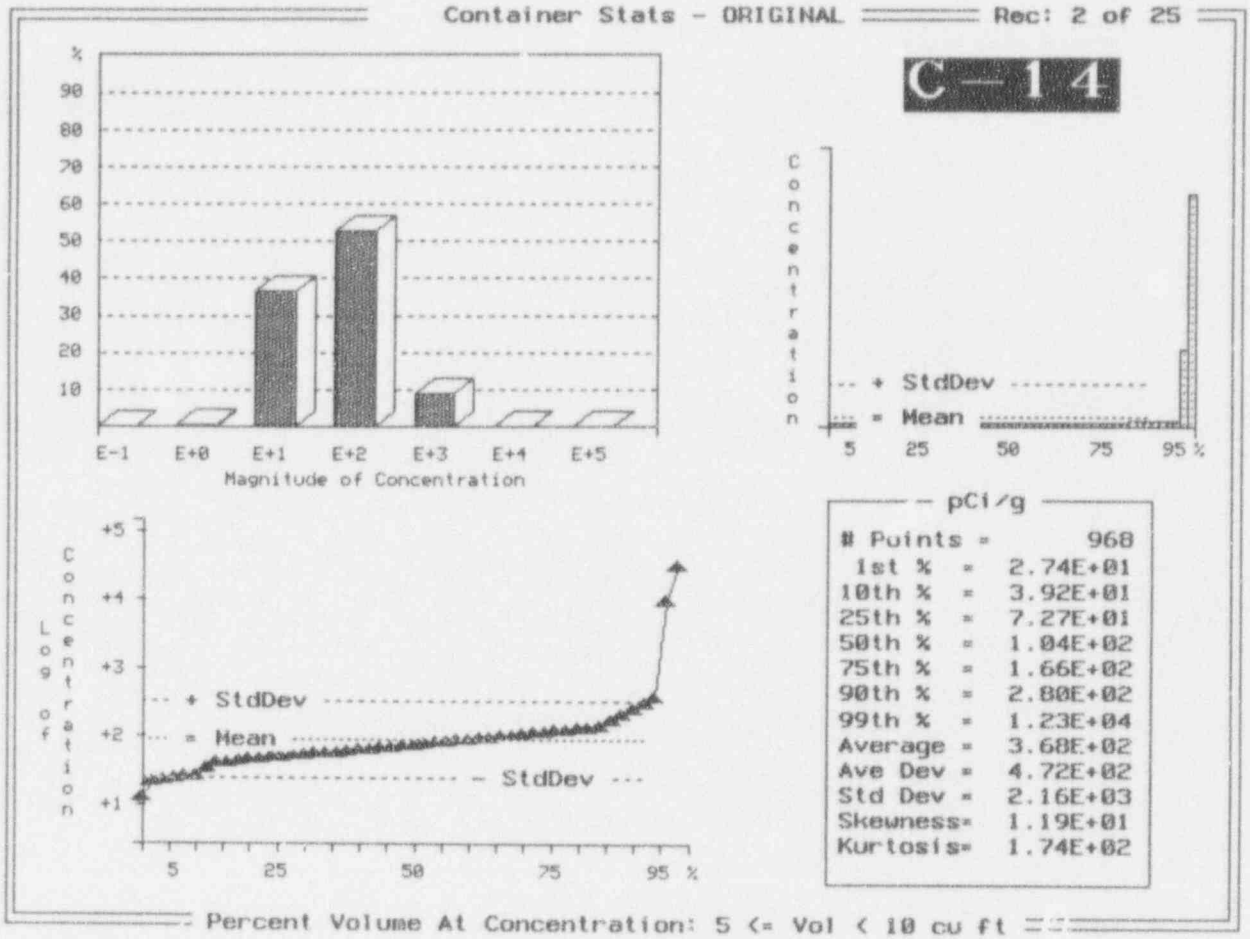

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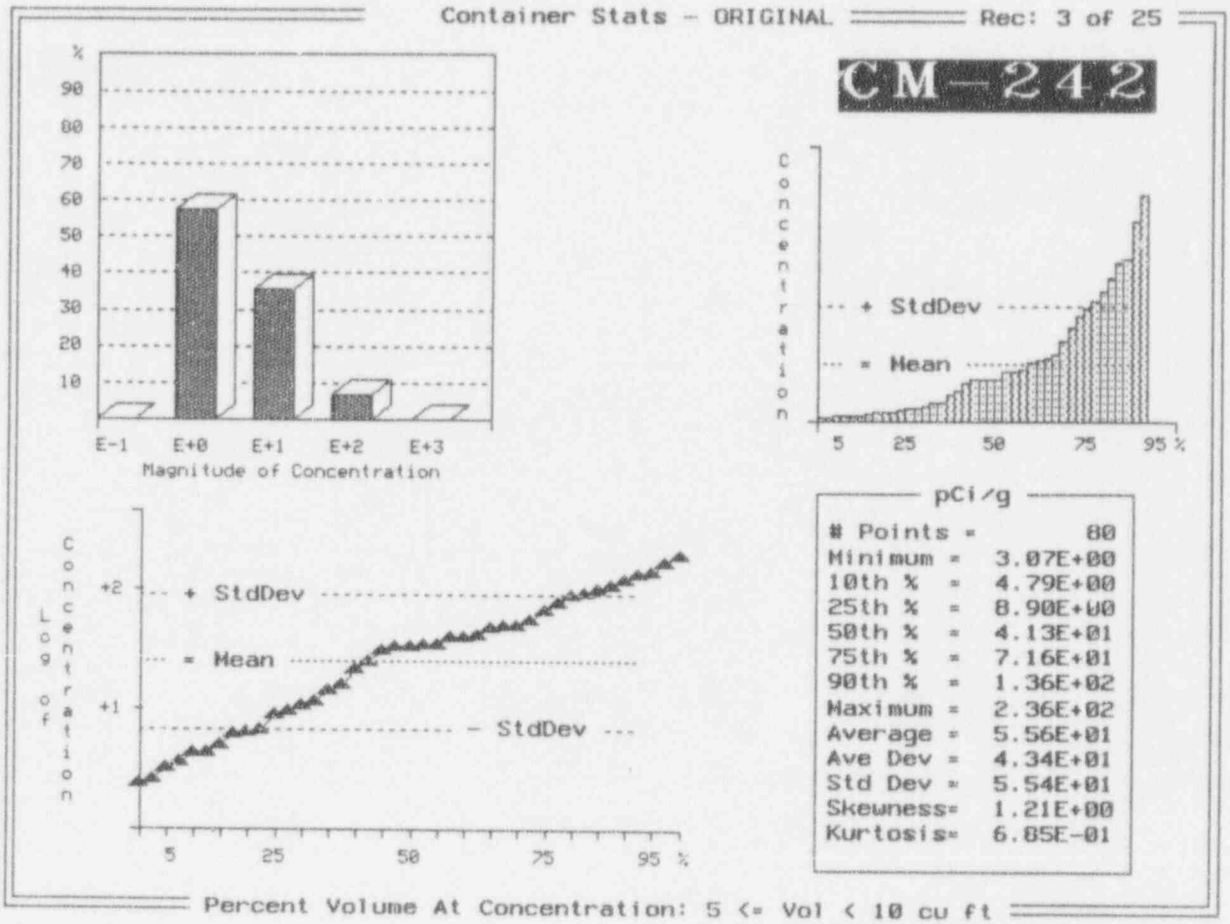
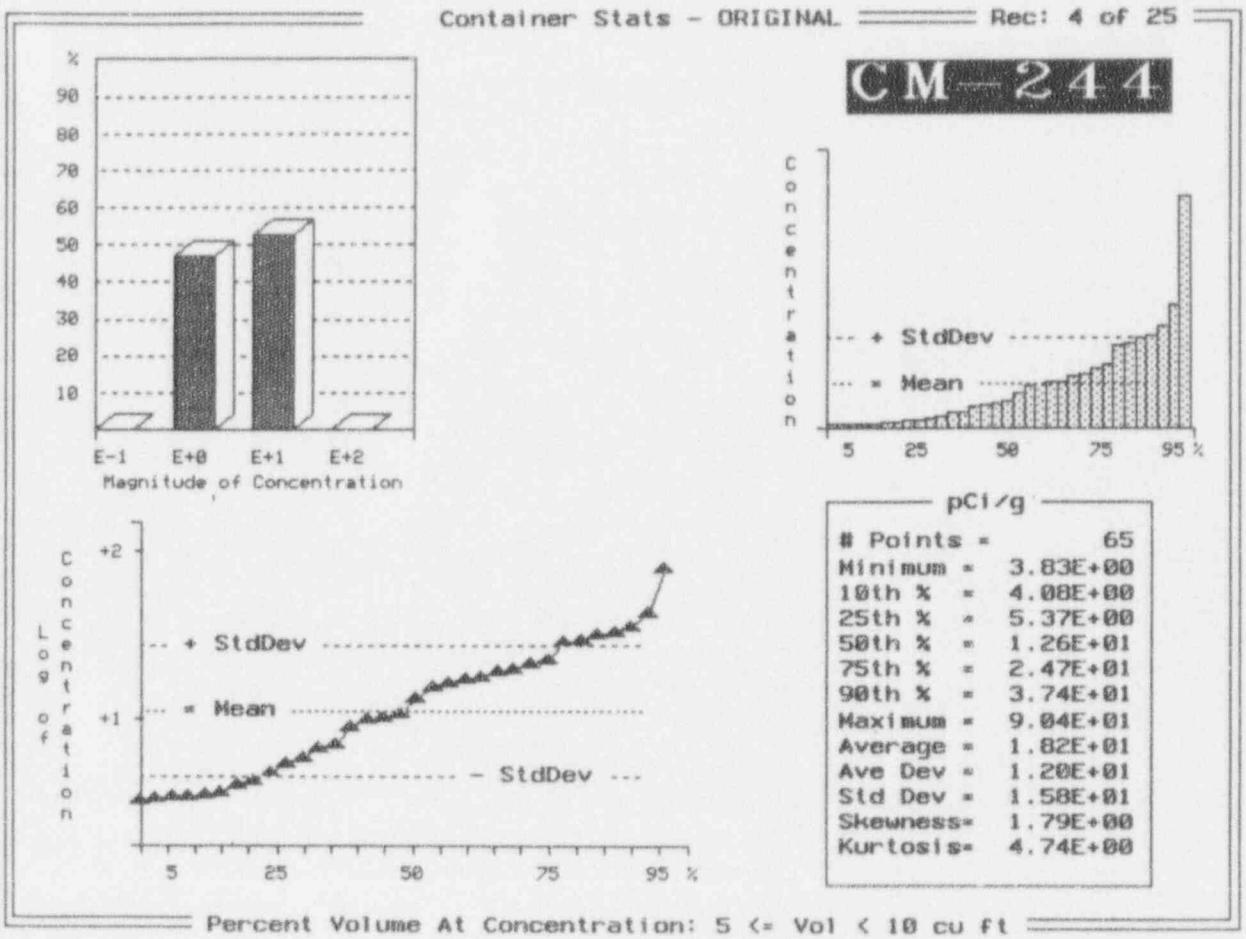


Exhibit I-5 (Continued)



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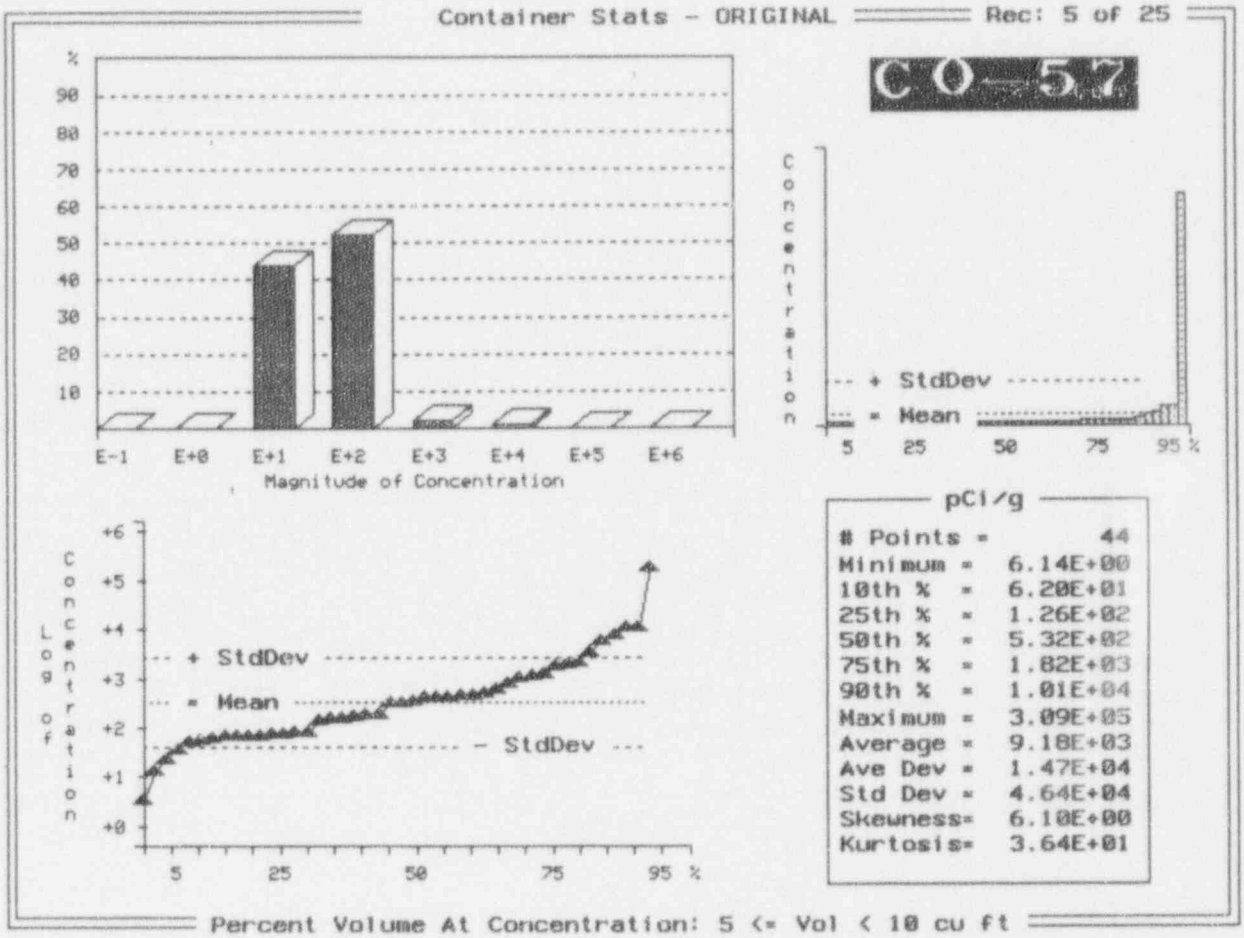

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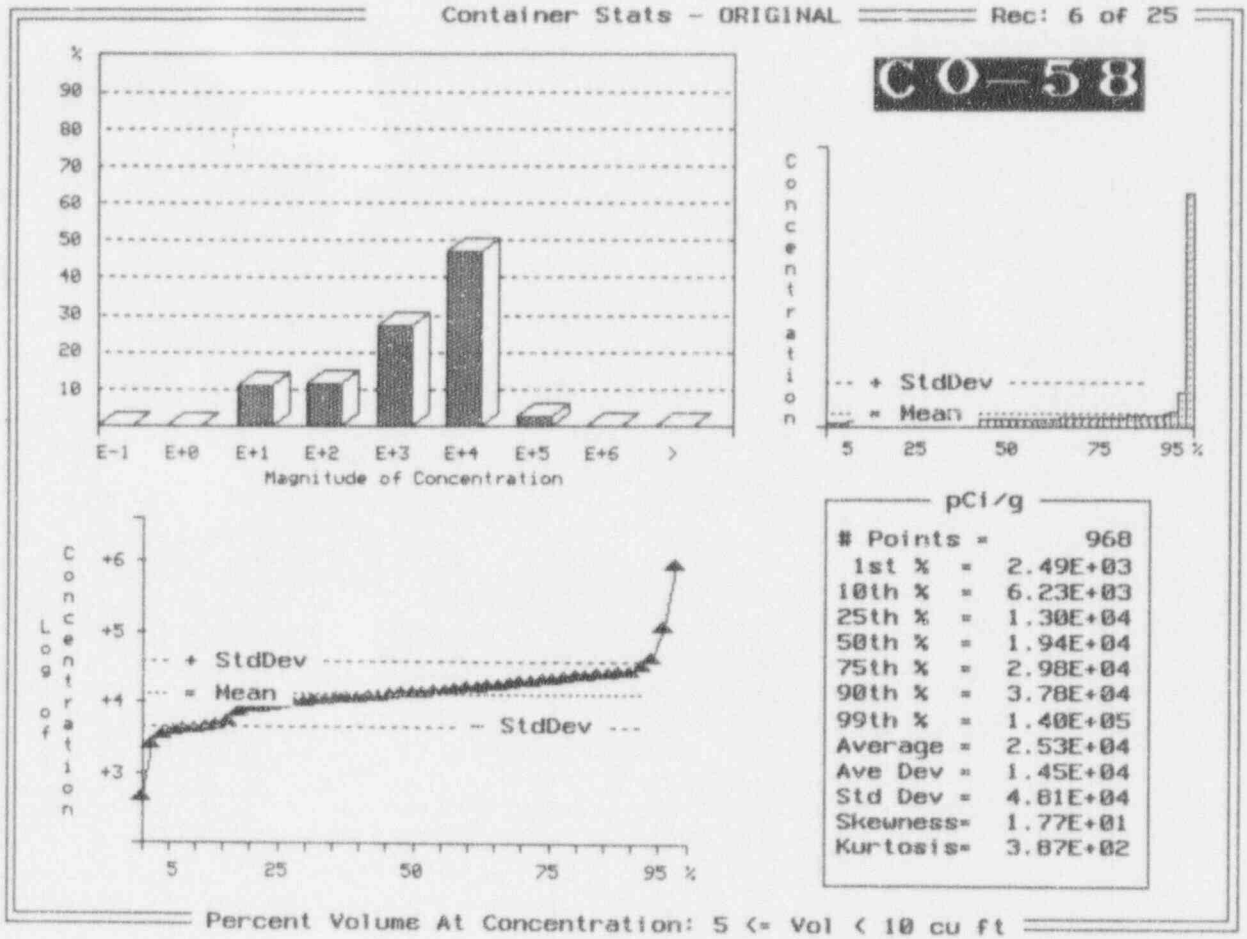

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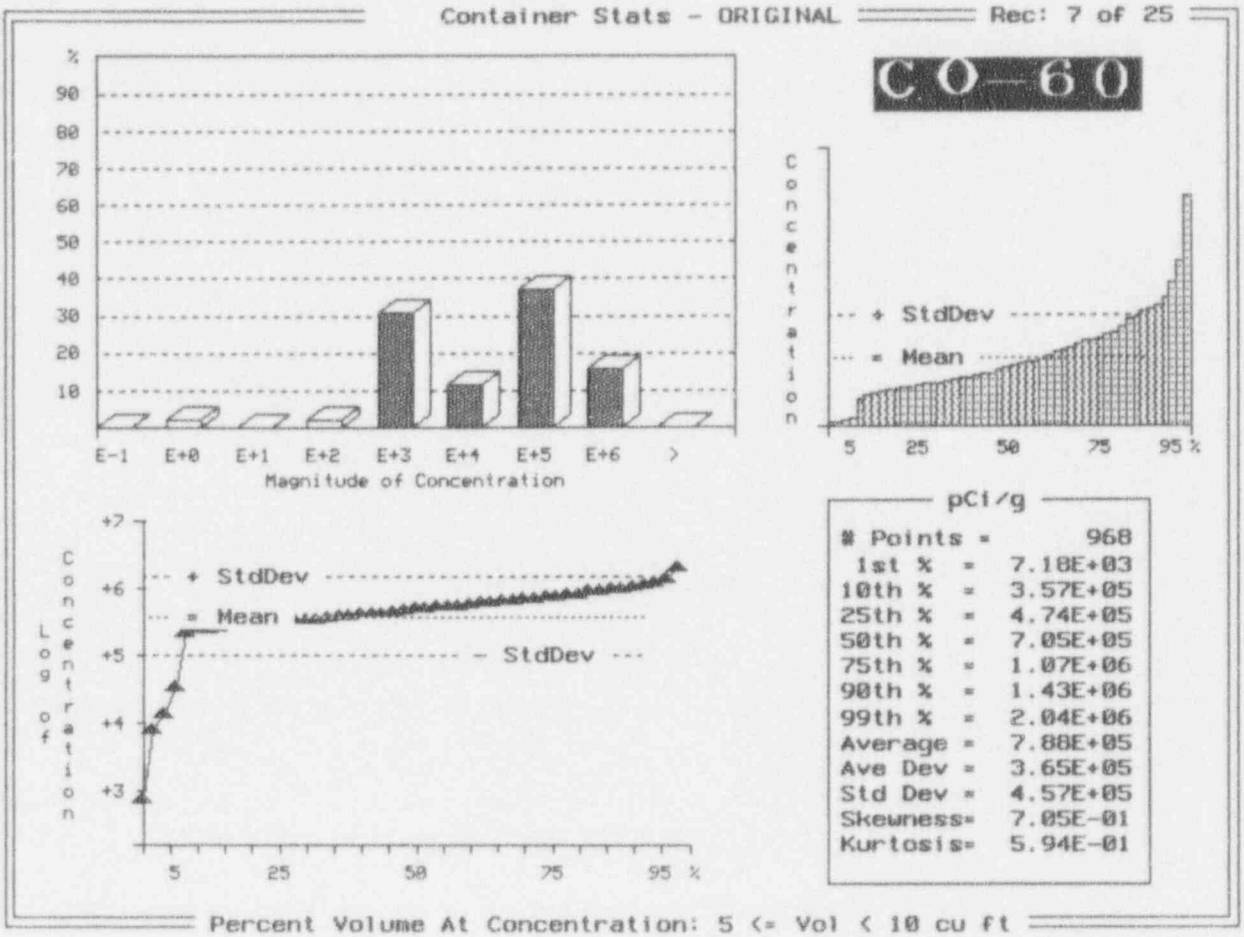

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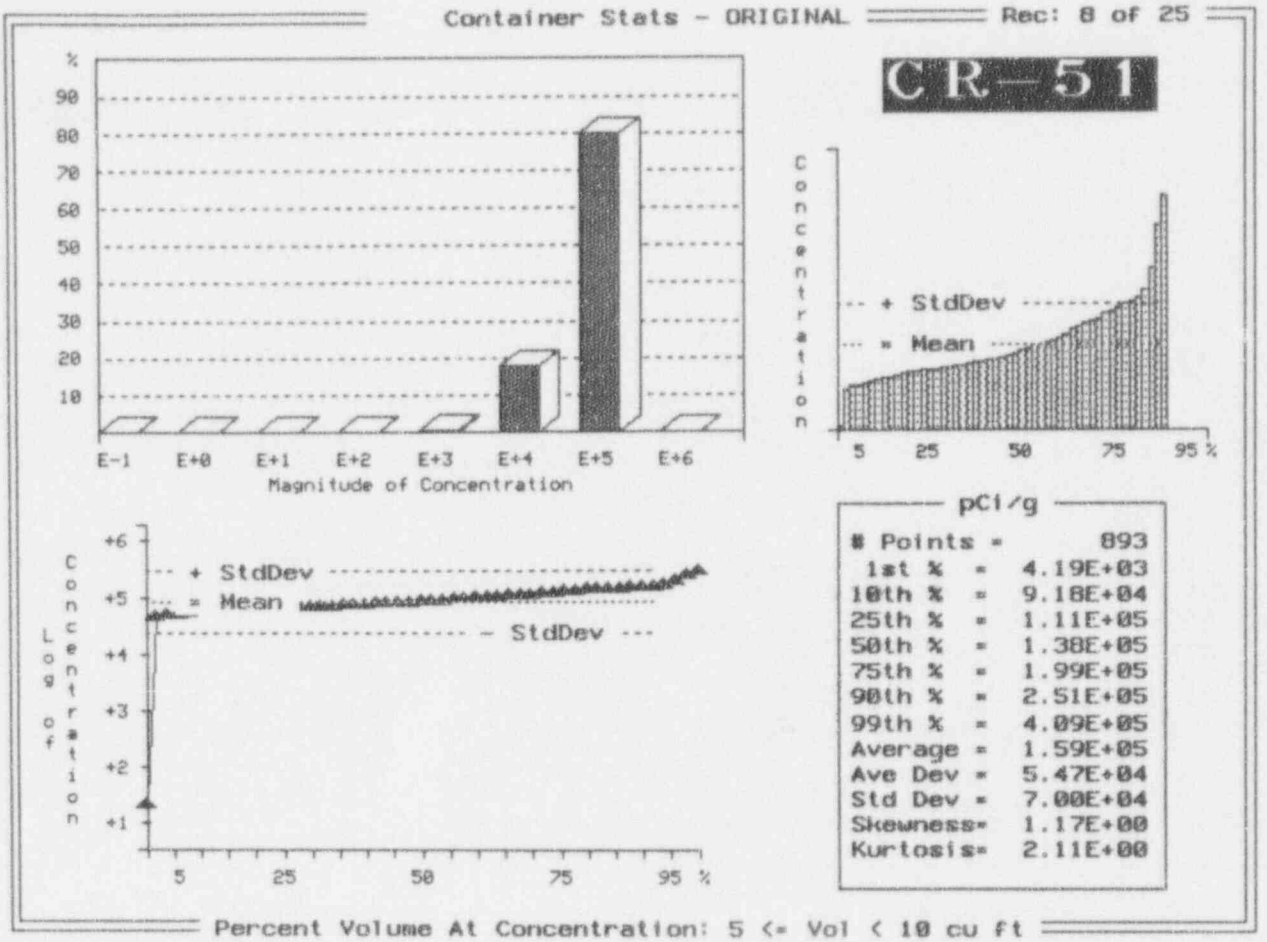

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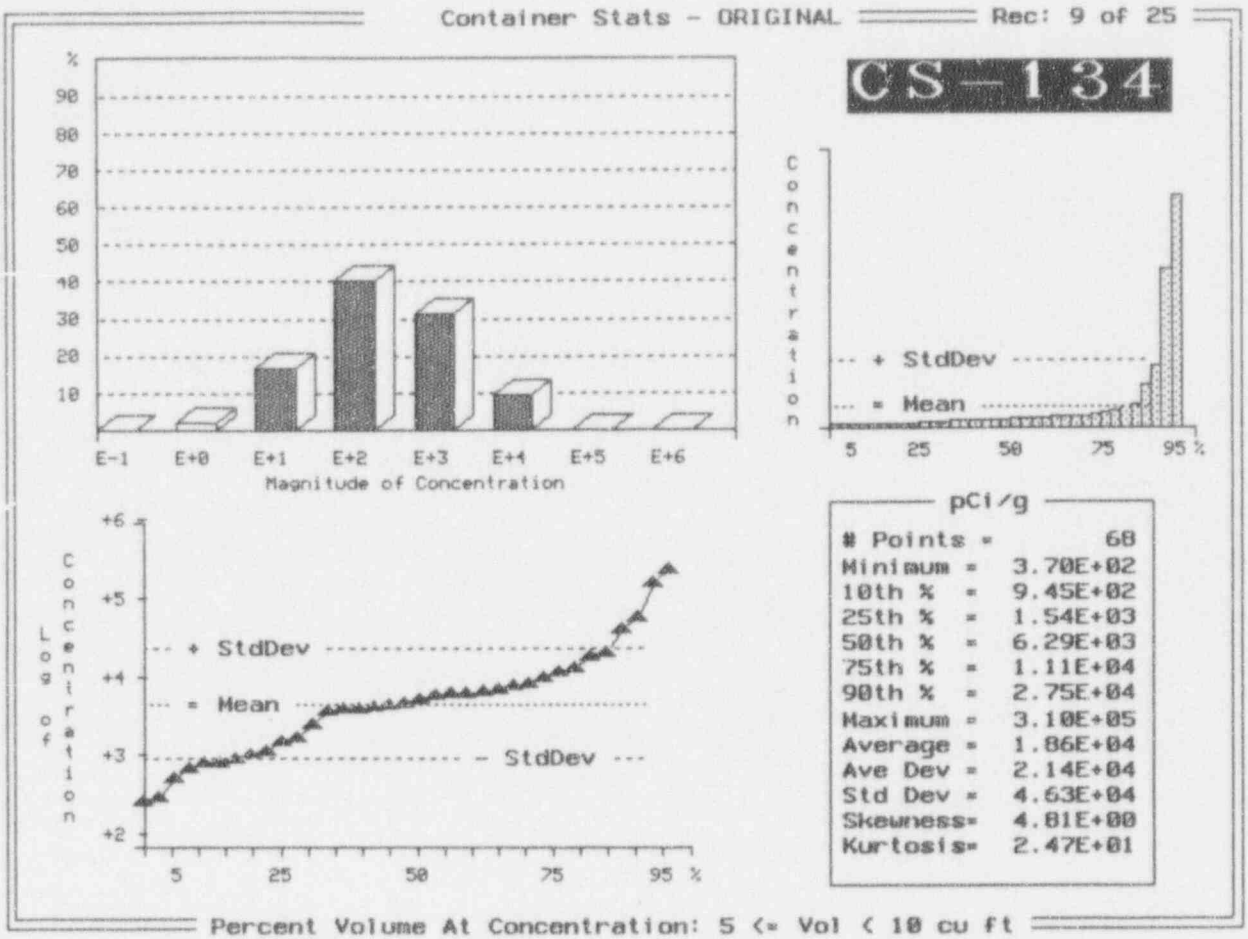

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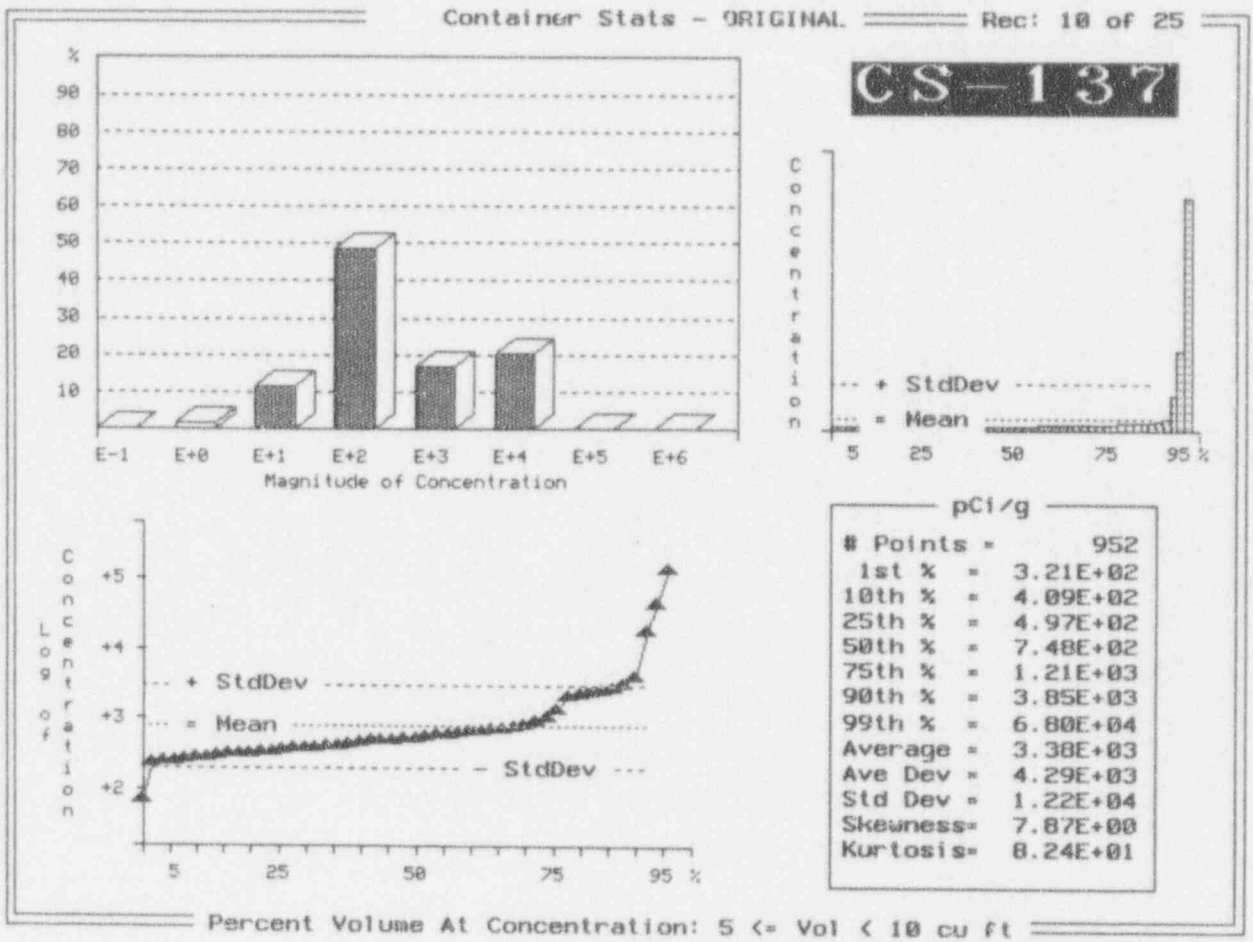

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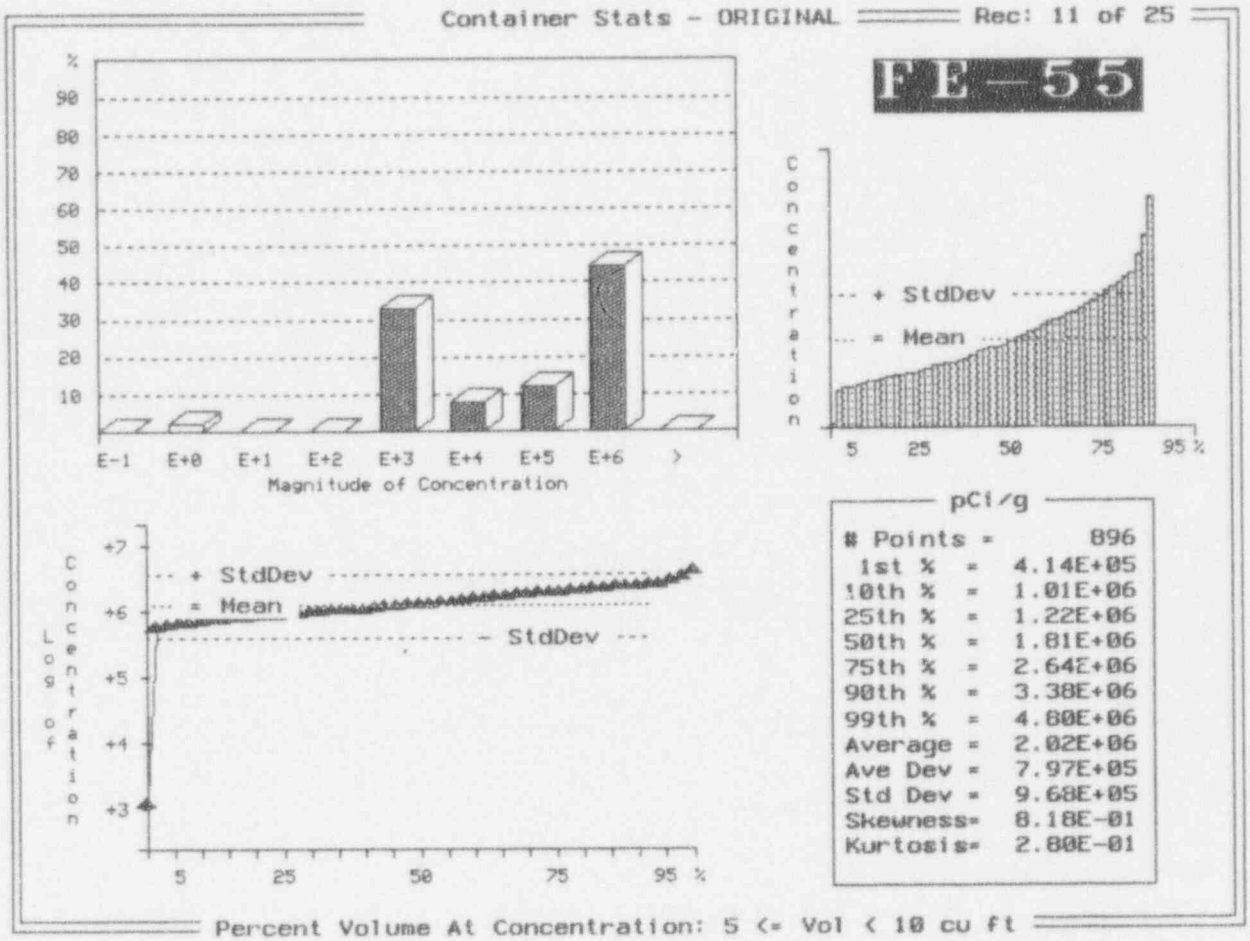

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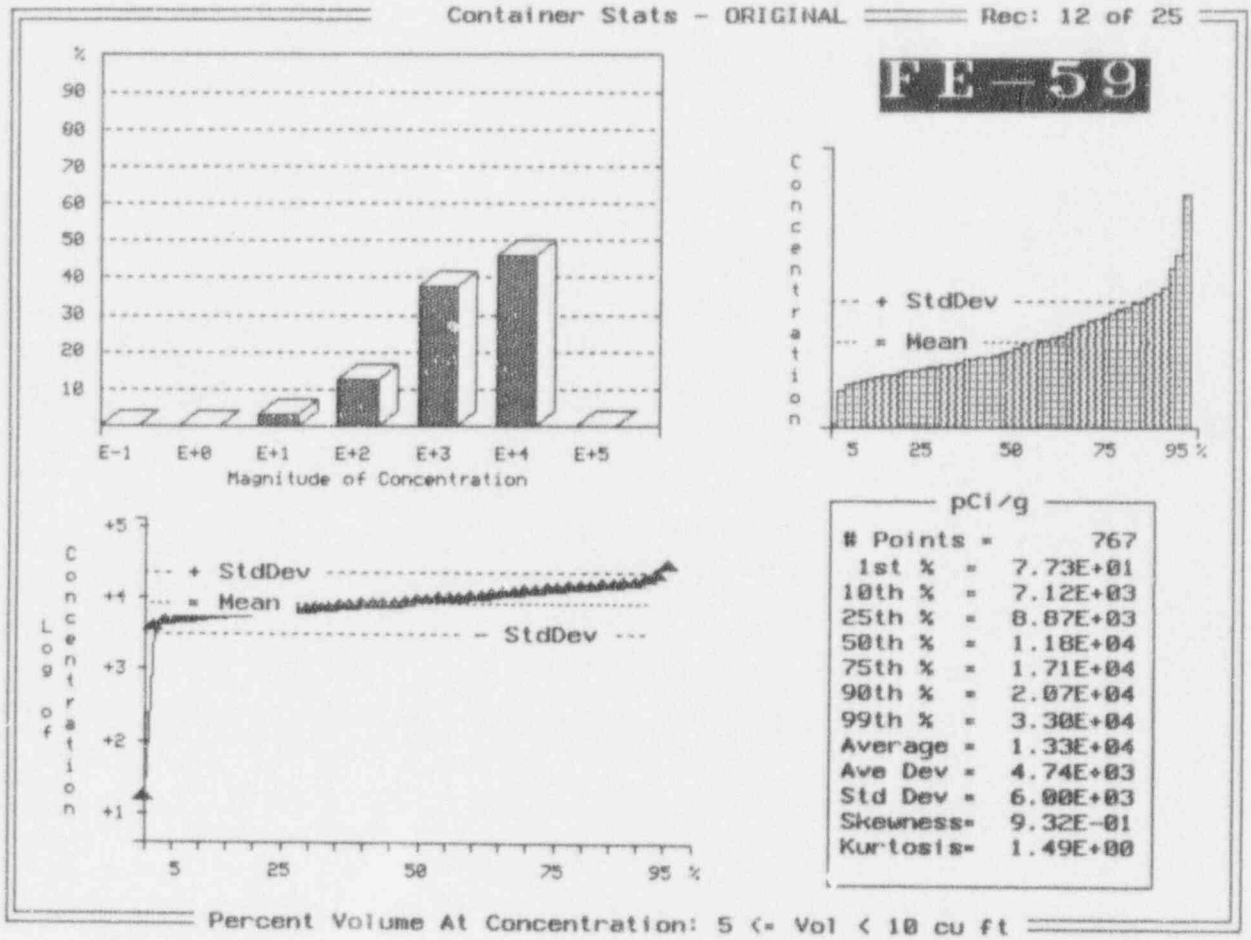

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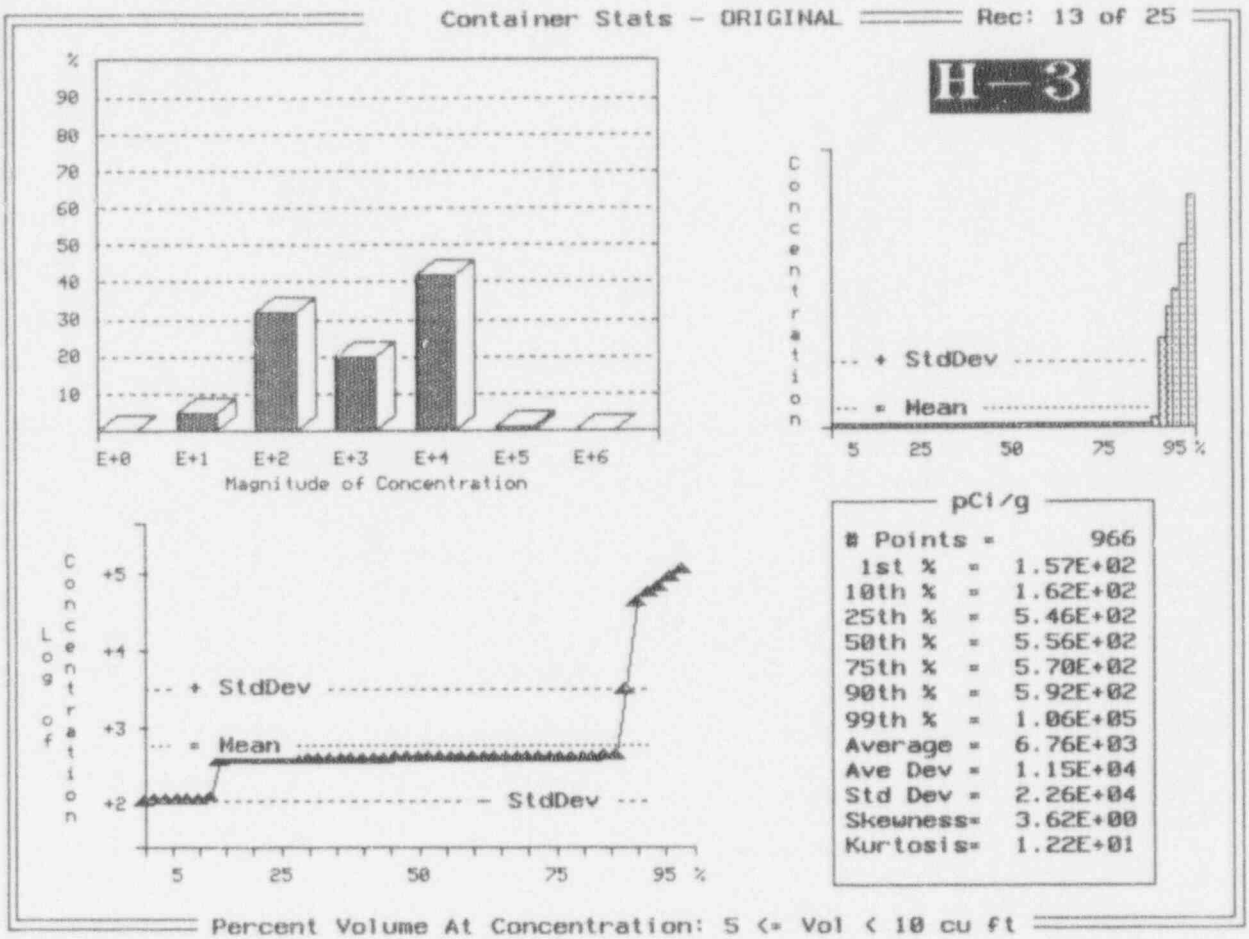

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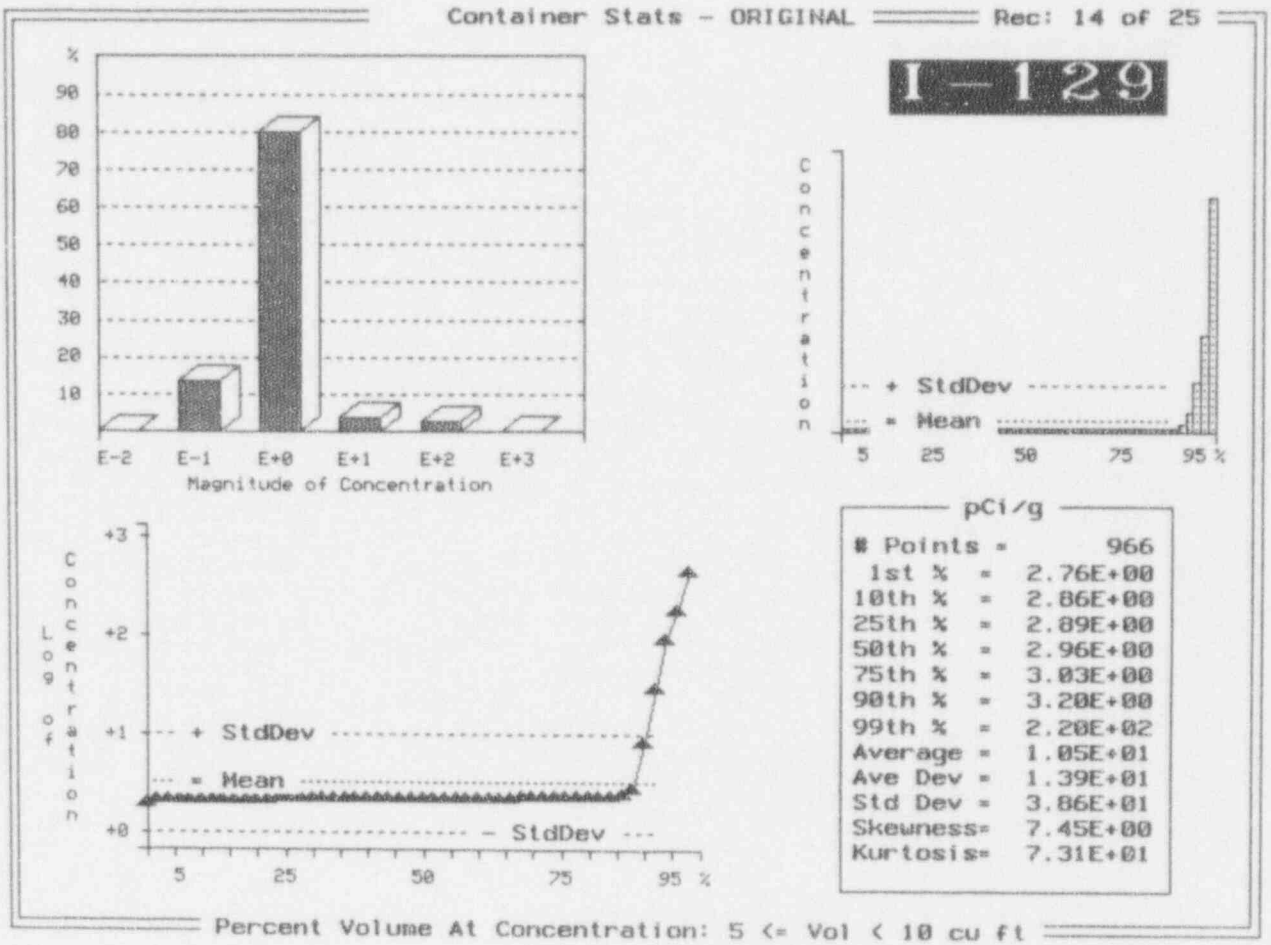

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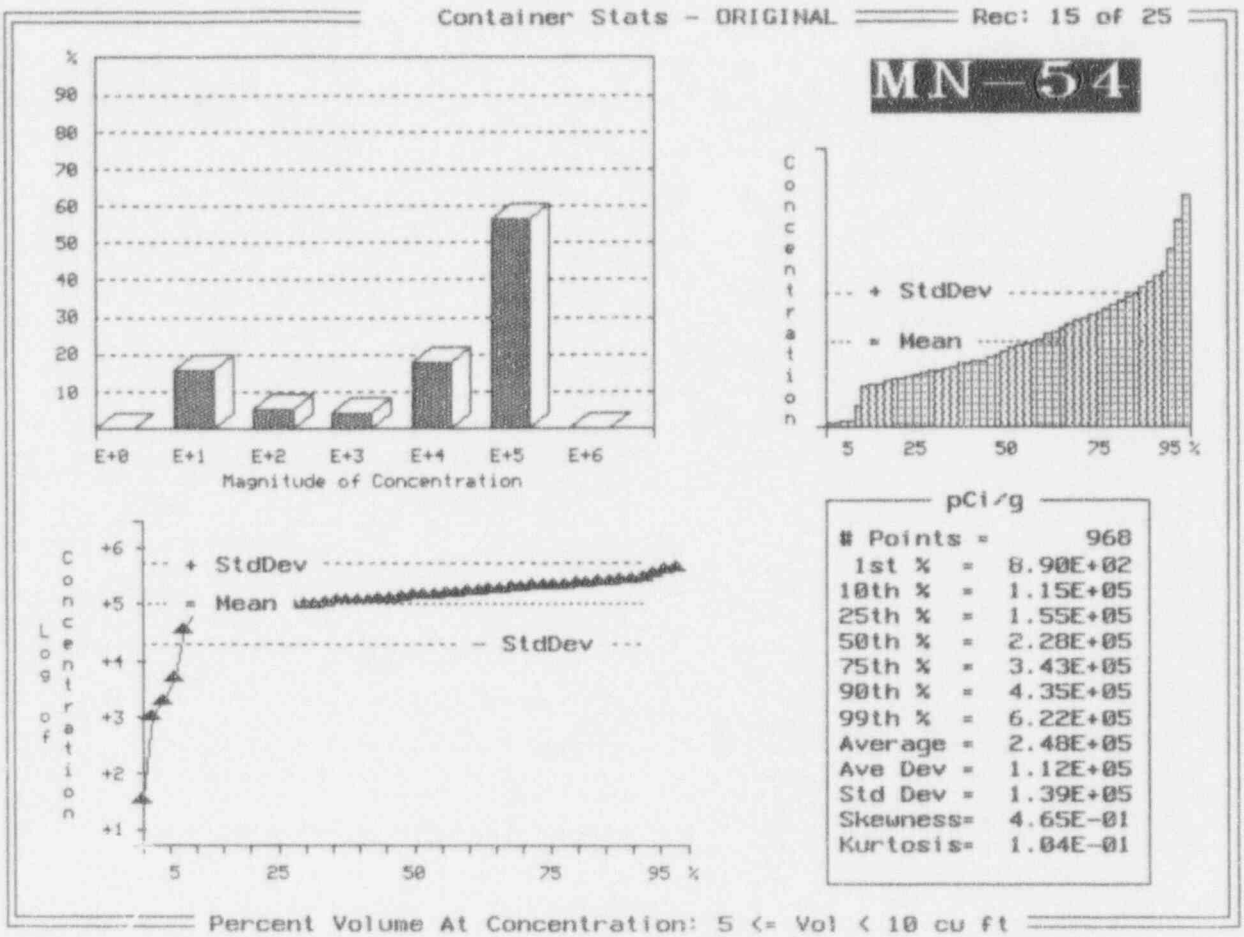

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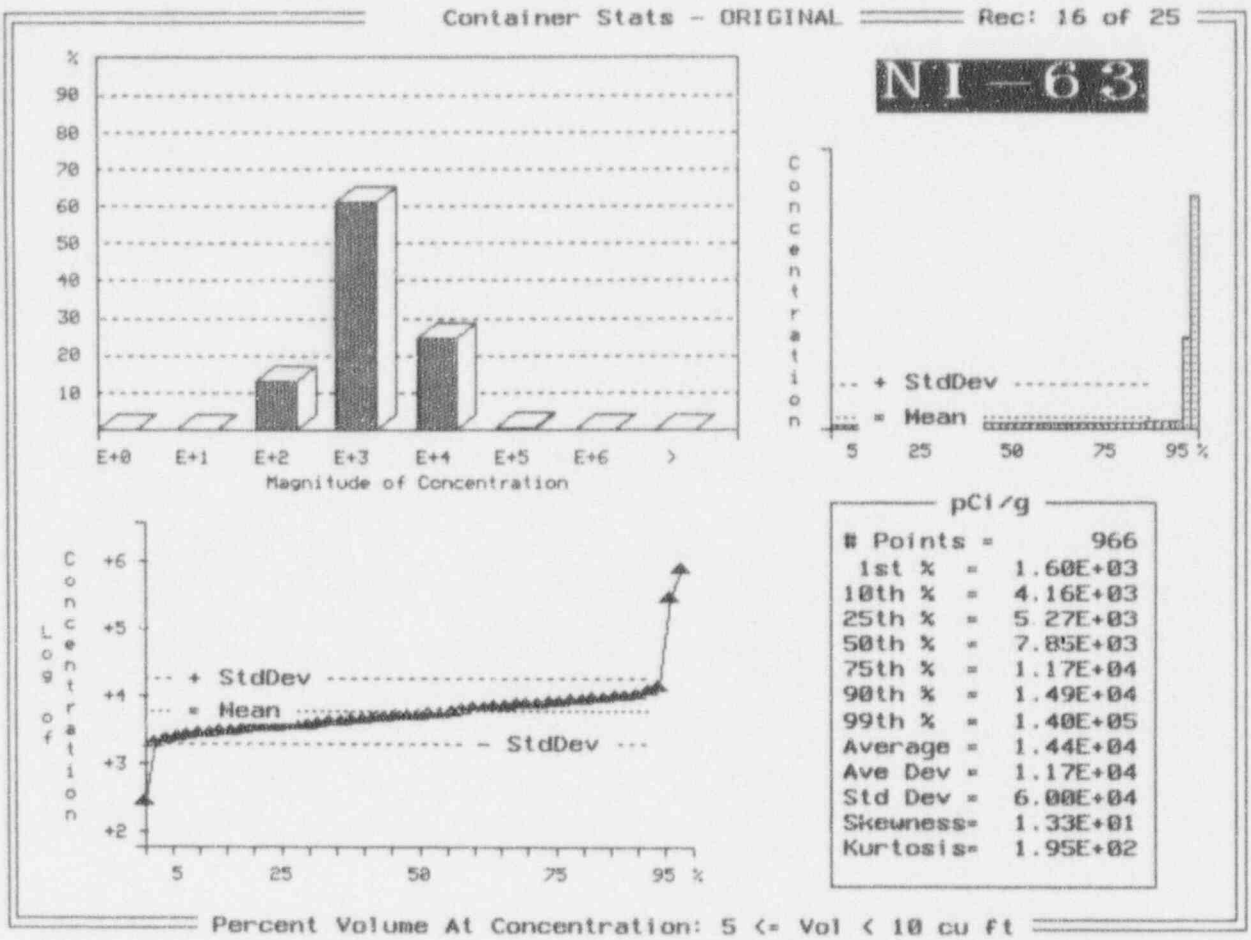

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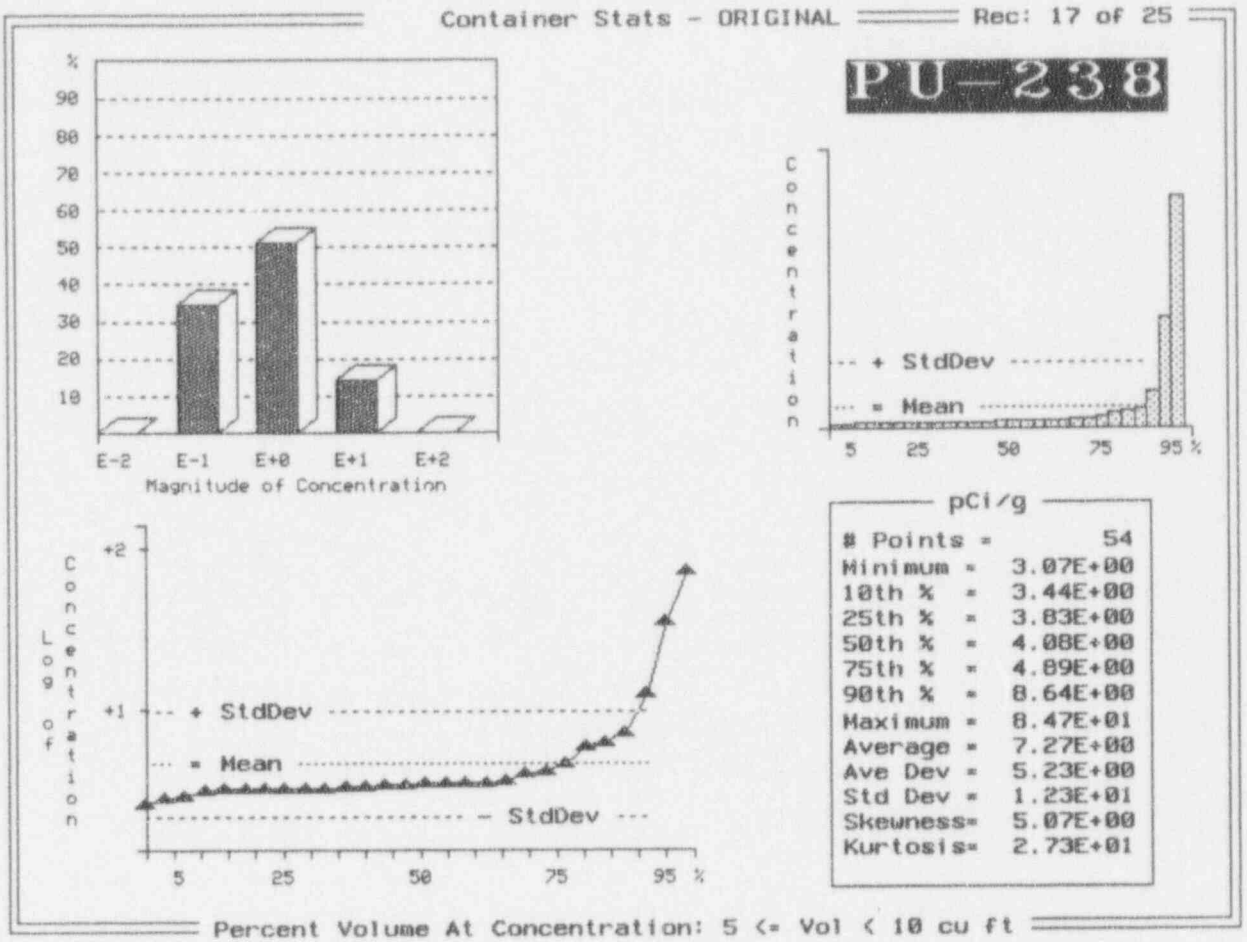

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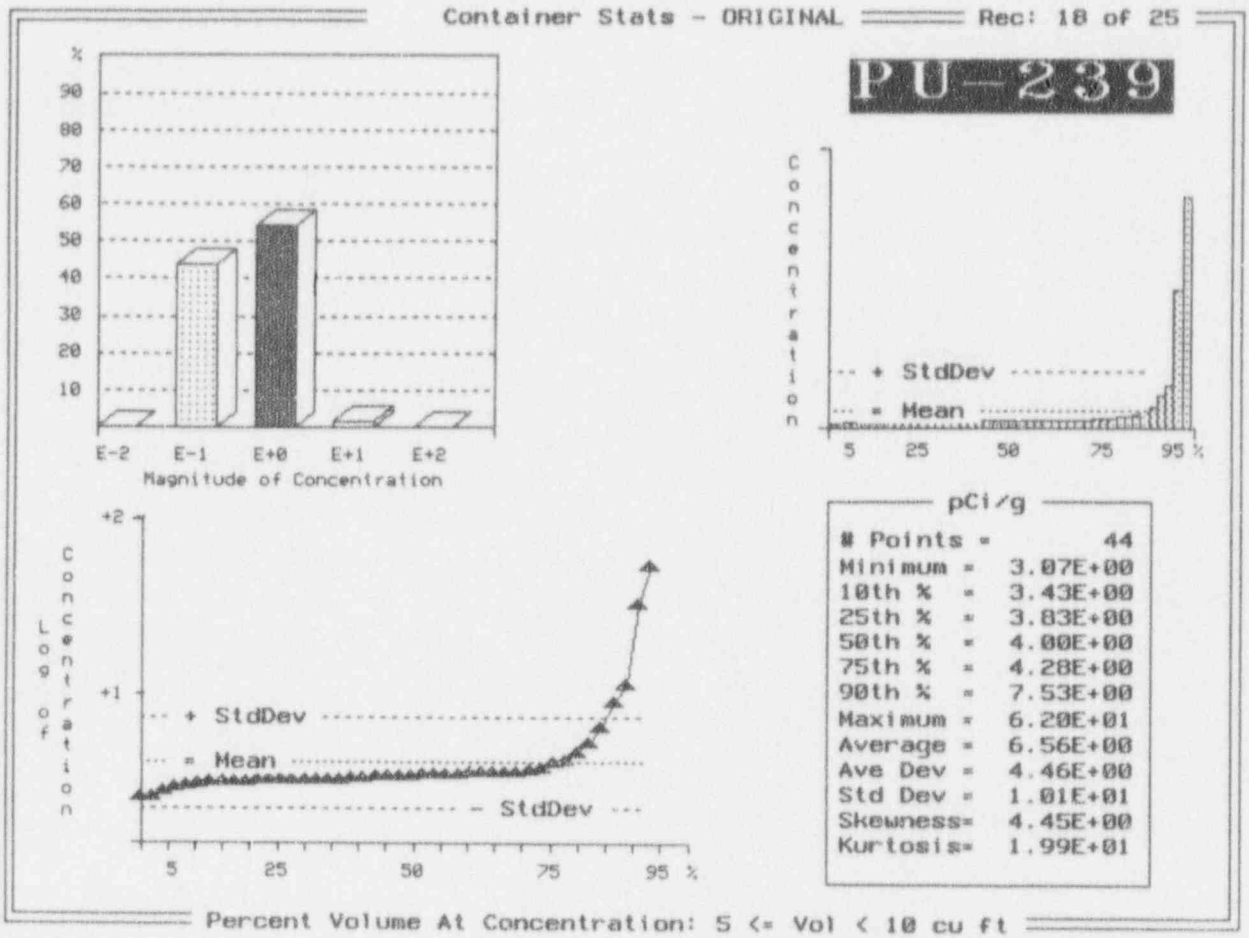

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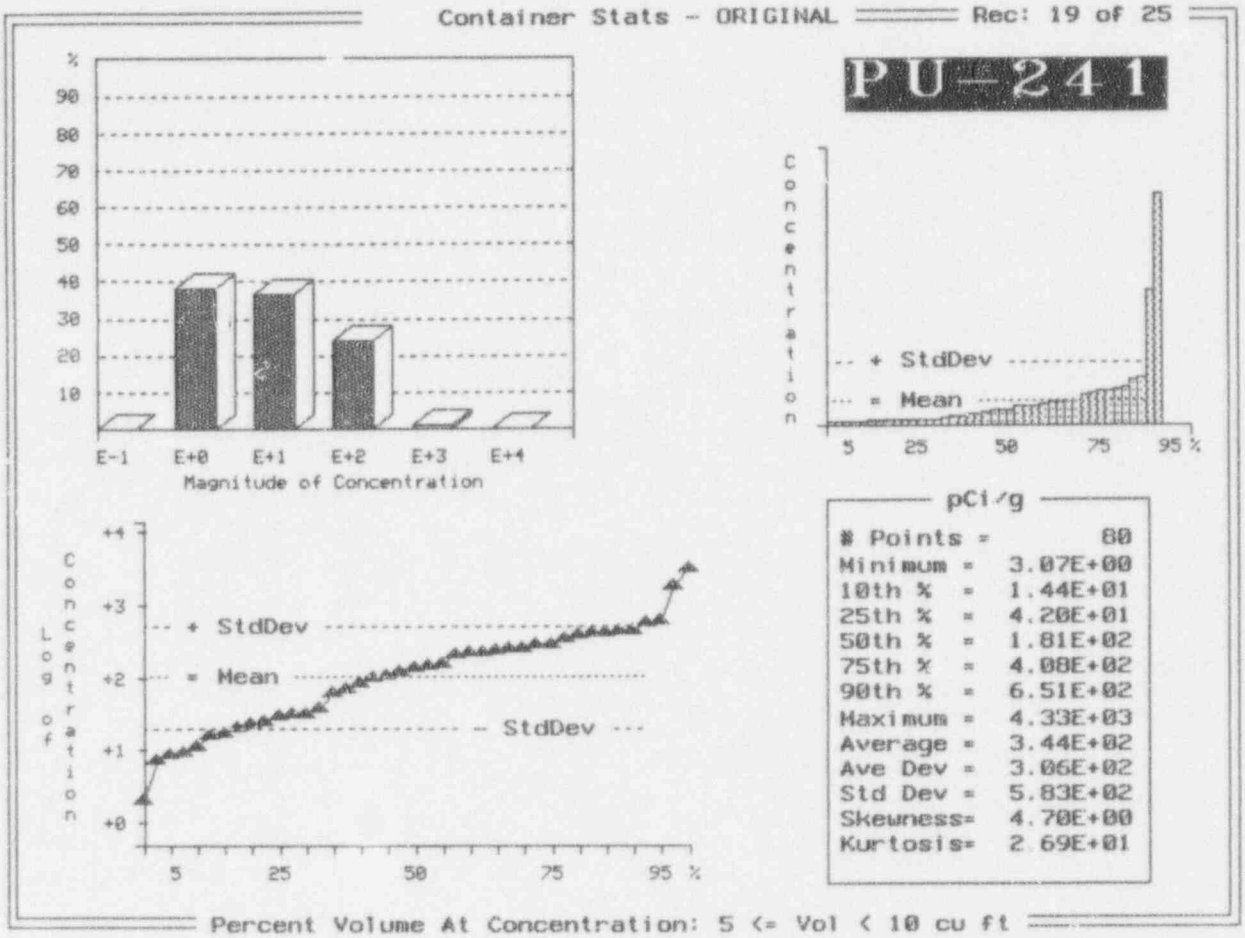

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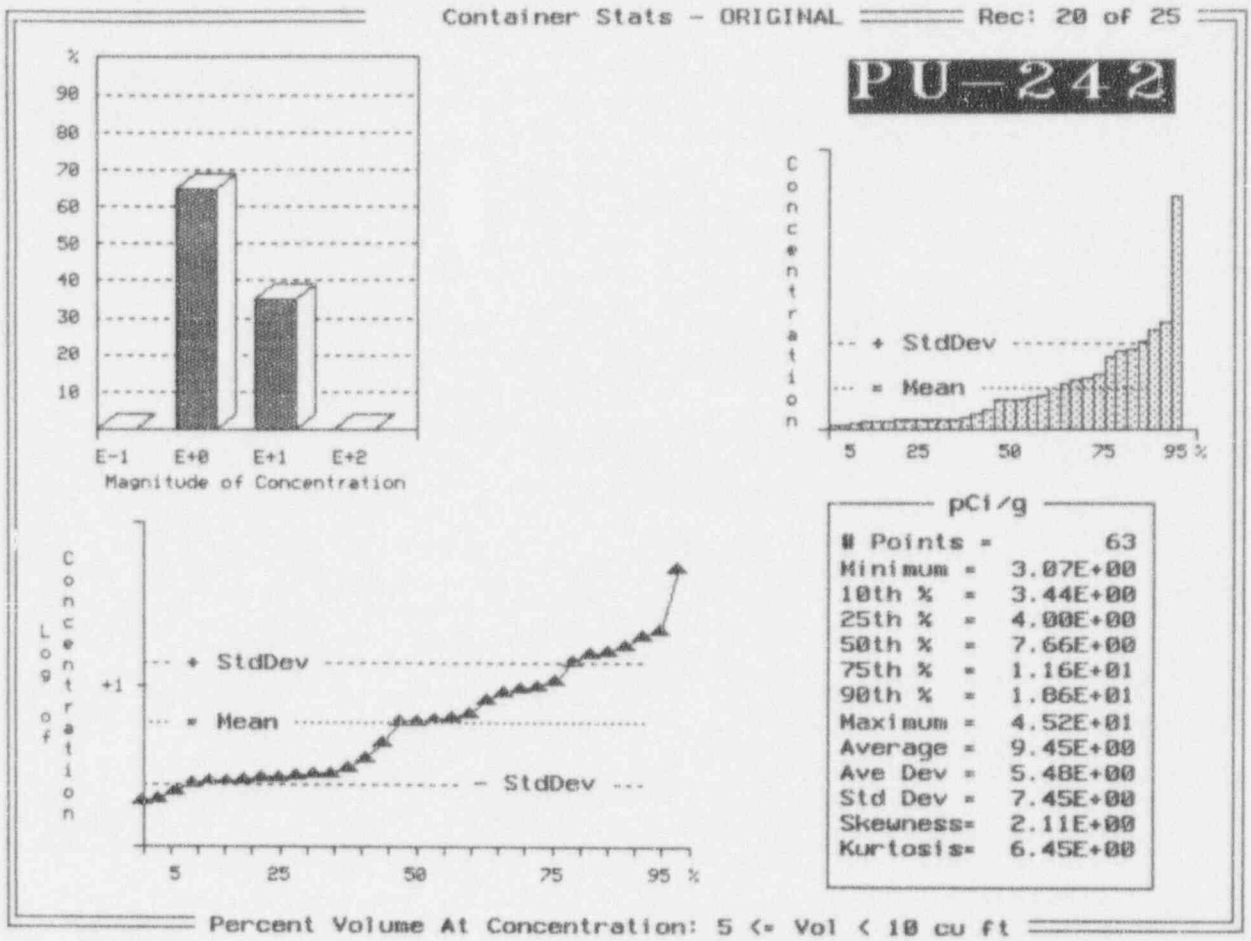

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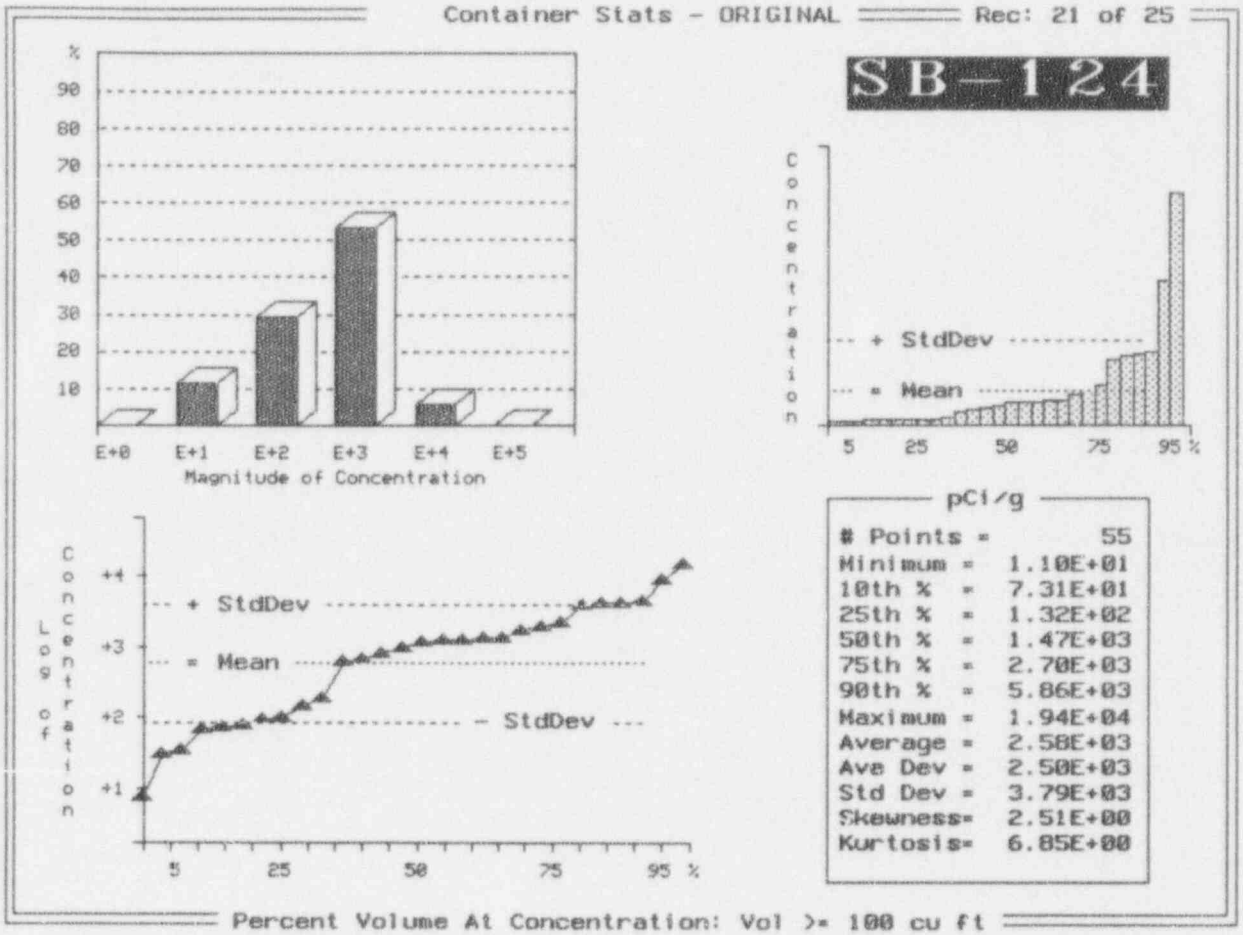

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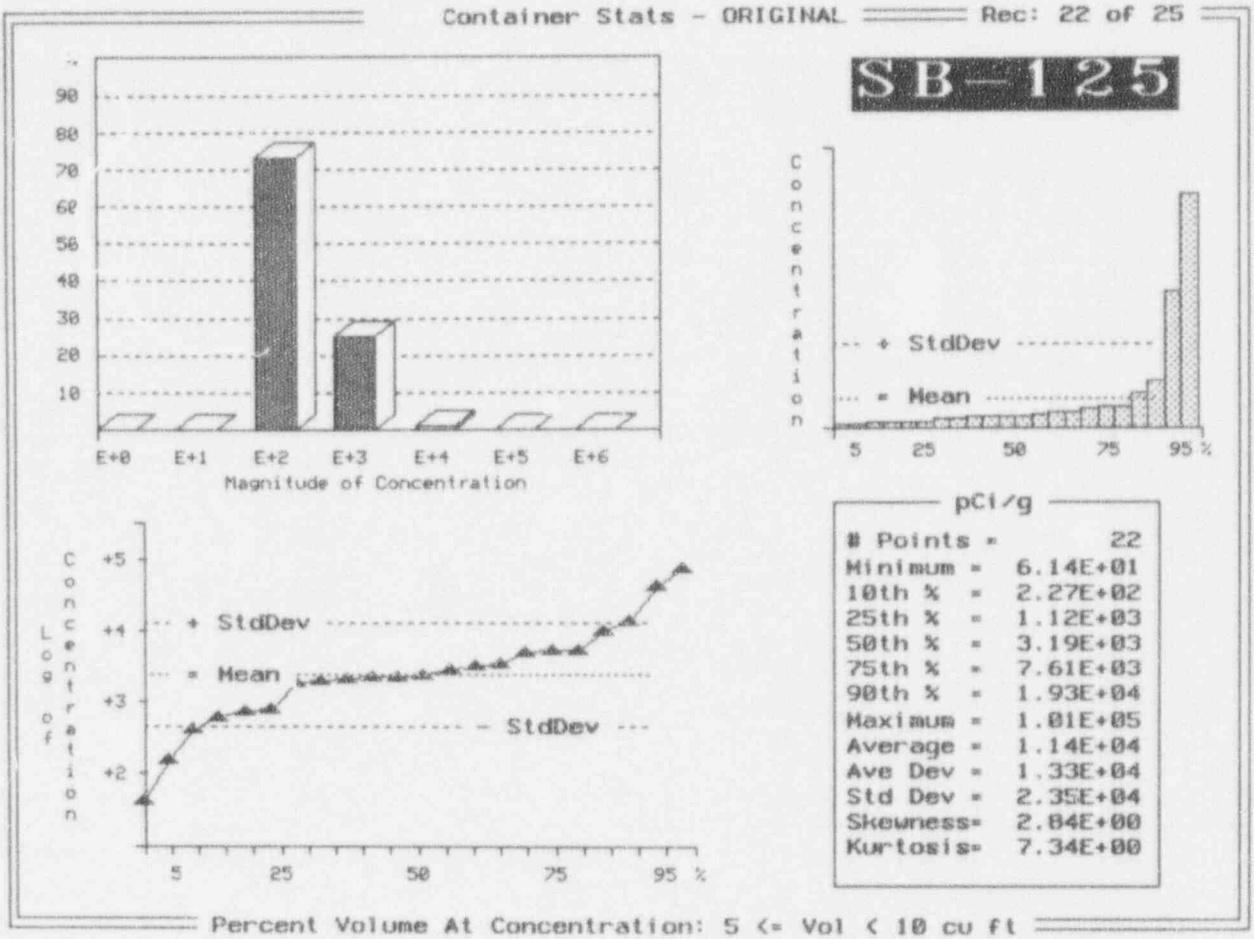

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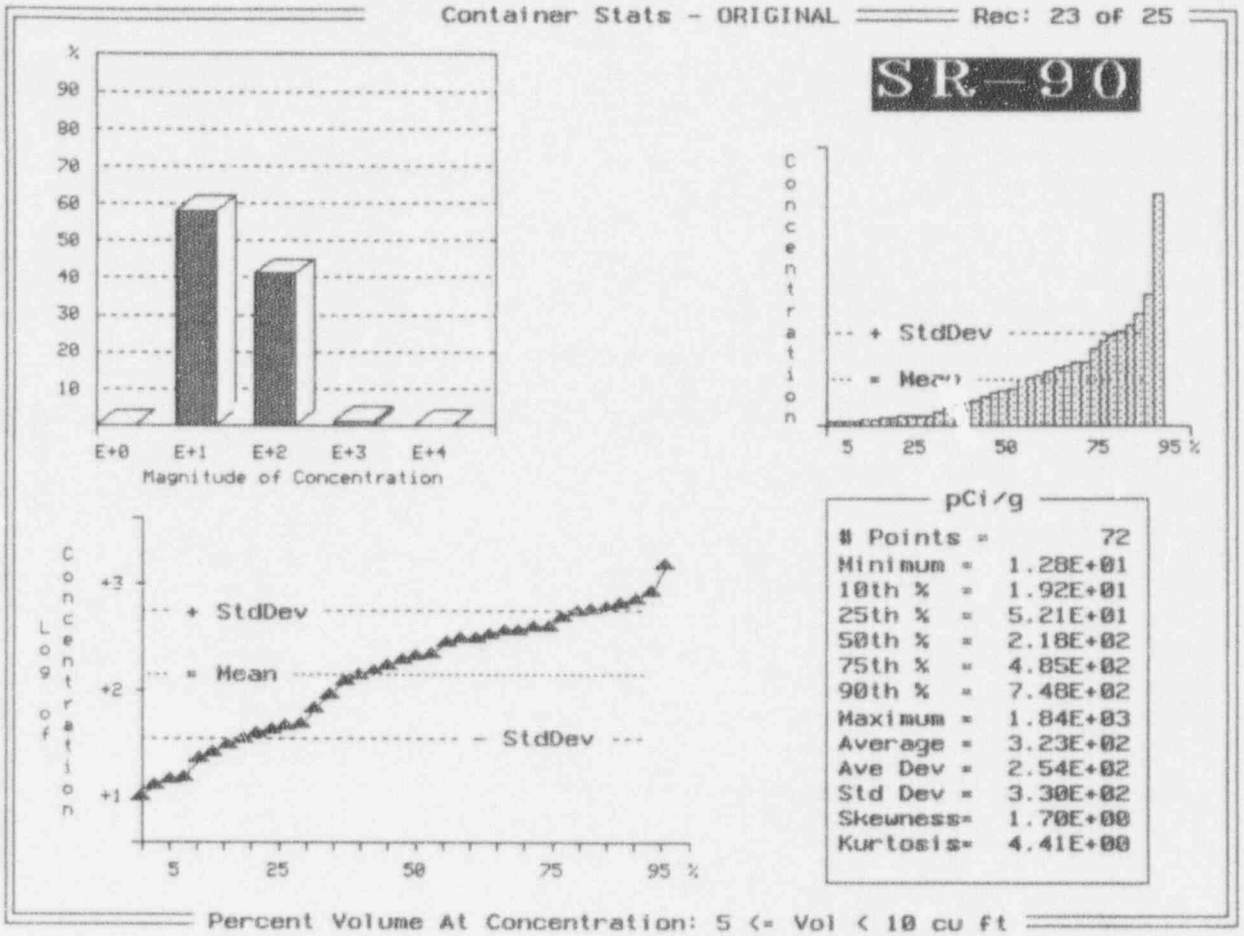

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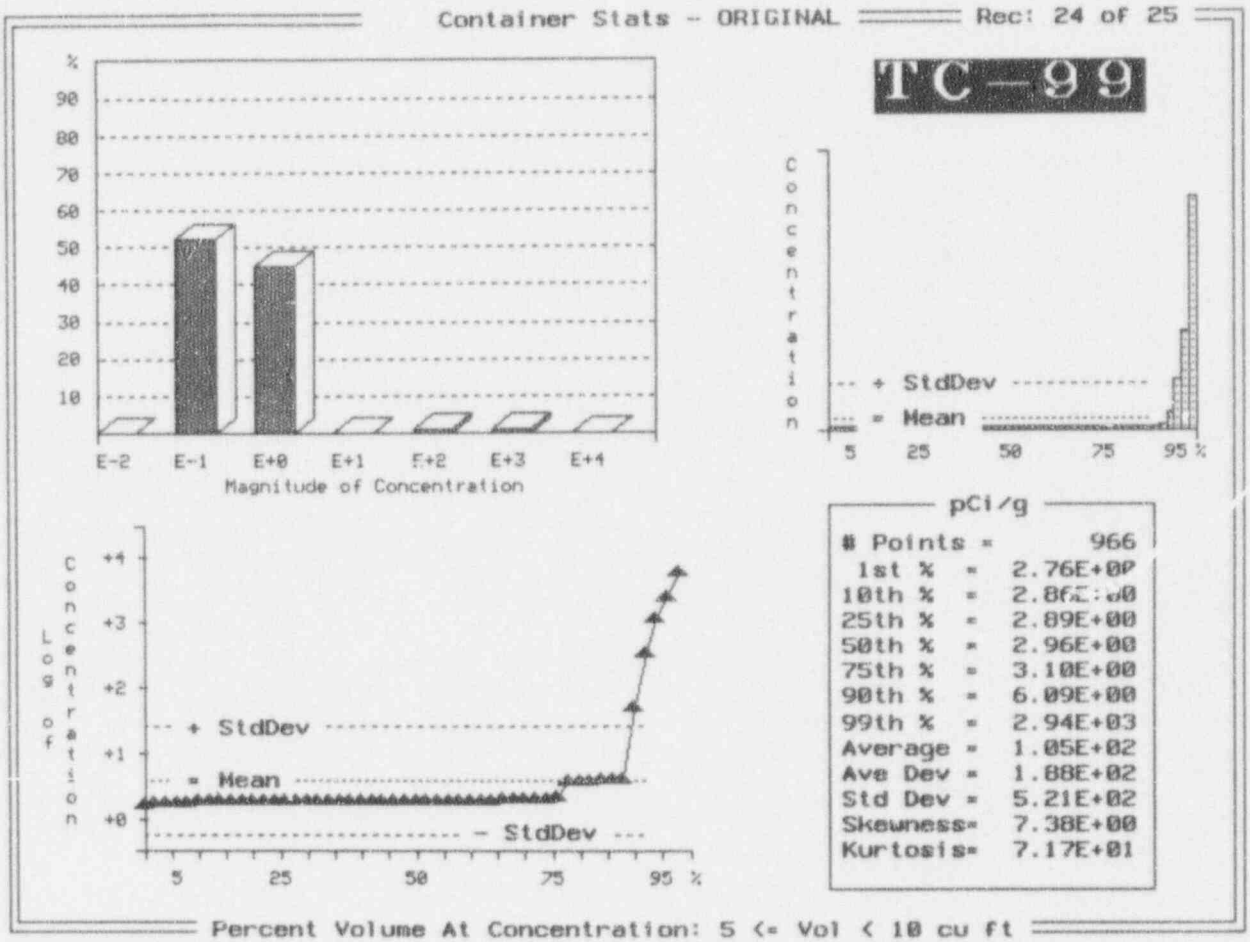

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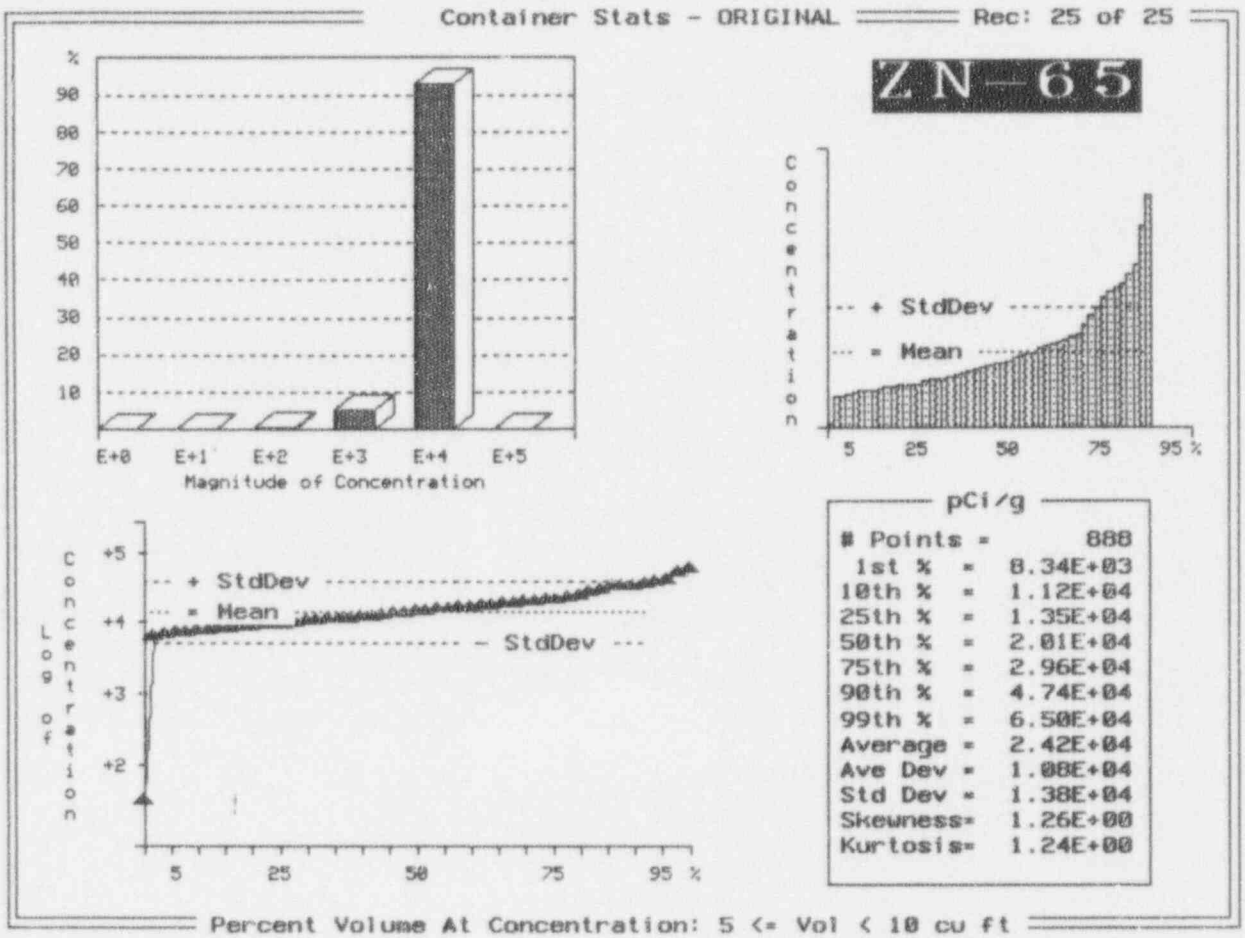


Exhibit I-6 Compacted Dry Active Waste
Radionuclide Distributions
Container Level Analysis for 1989 Non-Brokered
Utility Waste and All Regions and States[a]

Waste Class: A-Unstable and A-Stable
Solidification/Absorption media: Speedi-Dry and Oil-Dri.
Number of shipping records: 78
Number of shipping containers: 3,740
Total waste volume: 1,123 m^3
Total waste mass: 899,500 Kg
Average waste form density: 0.80 g/cm^3

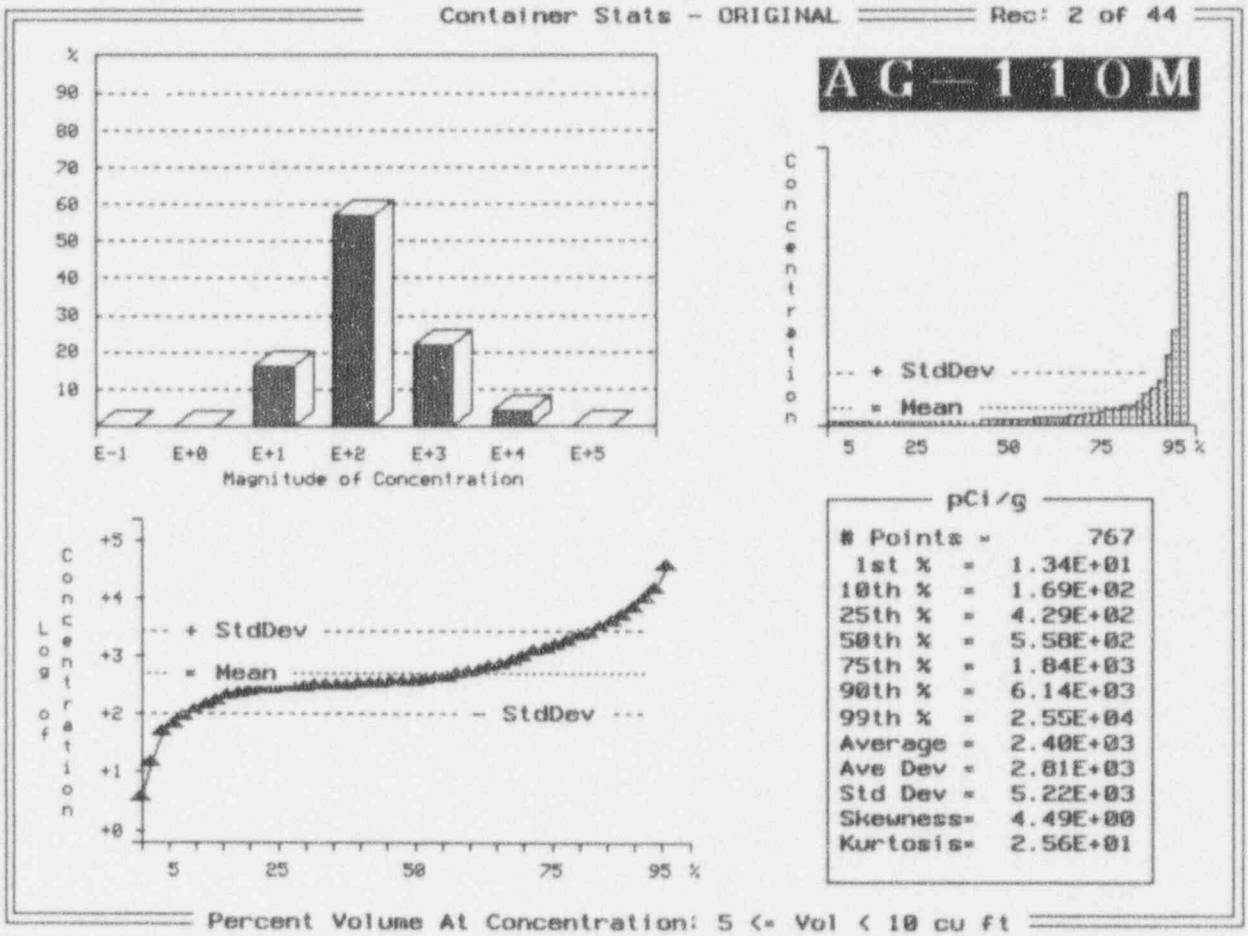
	Concentration Ranges - Percentile[b] - Ci/m^3 -			- pCi/g -		
Nuclide	1st	50th	99th	1st	50th	99th
Ag-110	9.89E-05	1.77E-03	3.79E-01	8.19E+01	1.47E+03	3.43E+05
Ag-110m	9.42E-06	3.58E-04	1.88E-02	1.34E+01	5.58E+02	2.55E+04
Am-241	4.71E-06	4.71E-06	2.35E-05	2.64E+00	5.31E+00	2.40E+01
Ba-140	4.24E-05	1.79E-04	4.90E-03	4.50E+01	2.10E+02	5.44E+03
C-14	4.71E-06	4.71E-06	1.89E-02	3.58E+00	6.48E+00	1.98E+04
Ce-141	9.42E-06	3.30E-05	4.01E-03	1.01E+02	4.00E+01	5.96E+03
Ce-144	3.30E-05	2.68E-04	2.53E-02	4.66E+01	4.26E+02	2.99E+04
Cm-242	4.71E-06	4.71E-06	2.92E-04	2.75E+00	5.51E+00	3.10E+02
Cm-243	4.71E-06	4.71E-06	4.71E-06	2.64E+00	5.24E+00	8.47E+00
Co-57	4.71E-06	3.77E-05	6.88E-03	3.97E+00	3.81E+01	6.22E+03
Co-58	1.88E-05	1.07E-03	8.80E-02	3.22E+01	1.16E+03	9.99E+04
Co-60	3.30E-05	2.18E-03	1.96E-01	4.41E+01	2.27E+03	2.16E+05
Cr-51	2.35E-05	1.25E-03	2.30E-01	2.42E+01	1.55E+03	3.16E+05
Cs-134	7.06E-05	1.17E-03	9.13E-02	7.28E+01	1.21E+03	1.14E+05
Cs-137	6.59E-05	4.13E-03	3.32E-01	8.78E+01	4.16E+03	4.07E+05
Fe-55	1.22E-04	7.35E-03	9.77E-01	1.37E+02	8.09E+03	1.10E+06
Fe-59	1.41E-05	1.04E-04	3.22E-02	2.10E+01	1.55E+02	4.79E+04
H-3	4.71E-06	2.44E-03	2.00E-02	5.22E+00	3.00E+03	1.87E+04
I-129	4.71E-06	4.71E-06	5.65E-05	3.04E+00	5.37E+00	4.86E+01
I-131	1.41E-05	6.59E-05	2.59E-02	1.35E+01	7.96E+01	3.47E+04
I-133	9.42E-06	2.17E-04	4.31E-03	1.04E+01	2.74E+02	4.74E+03

Exhibit I-6 Compacted Dry Active Waste
Radionuclide Distributions
Container Level Analysis for 1989 Non-Brokered Utility Waste and All Regions and States[a], Cont'd

Nuclide	Concentration Ranges - Percentile[b] - Ci/m^3 - 1st	50th	99th	- pCi/g - 1st	50th	99th
La-140	4.71E-05	1.88E-04	1.67E-03	5.06E+01	2.23E+02	1.93E+03
Mn-54	3.30E-05	6.73E-04	9.34E-02	3.45E+01	8.03E+02	1.11E+05
Mo-99	1.60E-04	3.25E-04	4.86E-03	1.58E+02	3.85E+02	5.35E+03
Nb-95	9.42E-06	3.06E-04	8.05E-02	1.20E+01	3.28E+02	1.05E+05
Nb-97	4.71E-06	1.13E-04	1.92E-02	3.97E+00	1.05E+02	1.73E+04
Ni-63	6.12E-05	8.29E-04	9.90E-02	7.71E+01	8.68E+02	1.02E+05
Np-237	4.71E-06	4.71E-06	4.71E-06	2.45E+00	4.39E+00	5.35E+00
Pu-238	4.71E-06	4.71E-06	1.41E-05	2.64E+00	5.28E+00	1.20E+01
Pu-239	4.71E-06	4.71E-06	4.24E-05	2.64E+00	5.31E+00	4.55E+01
Pu-241	4.71E-06	2.35E-05	1.21E-02	4.33E+00	2.55E+01	1.78E+04
Pu-242	4.71E-06	4.71E-06	4.71E-06	2.53E+00	4.52E+00	7.11E+00
Rh-106	4.71E-05	2.40E-04	1.06E-02	5.87E+01	3.74E+02	1.38E+04
Ru-103	2.35E-05	3.67E-04	1.70E-02	2.98E+01	5.54E+02	2.17E+04
Sb-122	9.42E-06	8.01E-05	2.18E-03	9.60E+00	7.74E+01	1.71E+03
Sb-124	9.42E-06	5.27E-04	4.62E-01	7.94E+00	6.12E+02	6.18E+05
Sb-125	1.41E-05	2.31E-04	1.15E-02	1.67E+01	2.10E+02	1.17E+04
Sn-113	9.42E-06	1.60E-04	2.96E-02	7.08E+00	1.31E+02	2.68E+04
Sr-89	1.88E-05	2.73E-04	6.07E-03	1.85E+01	3.23E+02	6.48E+03
Sr-90	9.42E-06	1.13E-04	1.04E-02	9.58E+00	1.30E+02	1.15E+04
Tc-99	4.71E-06	4.71E-06	1.40E-02	3.10E+00	5.80E+00	1.75E+04
Zn-65	1.08E-04	6.69E-04	2.01E-02	8.63E+01	8.22E+02	2.56E+04
Zr-95	1.88E-05	4.61E-04	8.15E-02	2.12E+01	4.04E+02	9.03E+04
Zr-97	4.71E-06	1.13E-04	1.92E-02	3.97E+00	1.05E+02	1.73E+04

(a) Based on LLW data for Beatty and Richland Only.
(b) Includes only radionuclides with 30 or more data points characterizing concentration ranges.

Exhibit I-6 (Continued)



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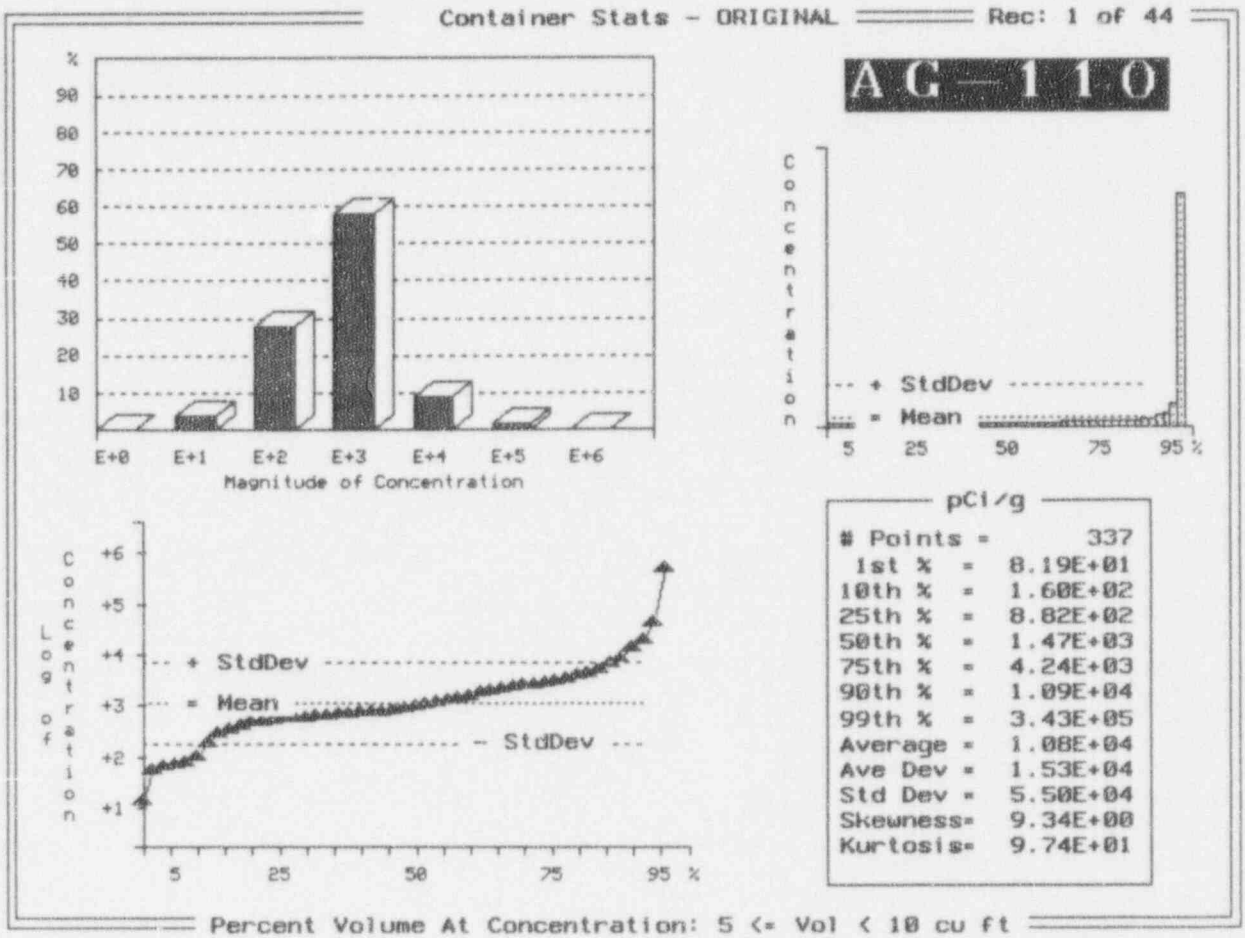

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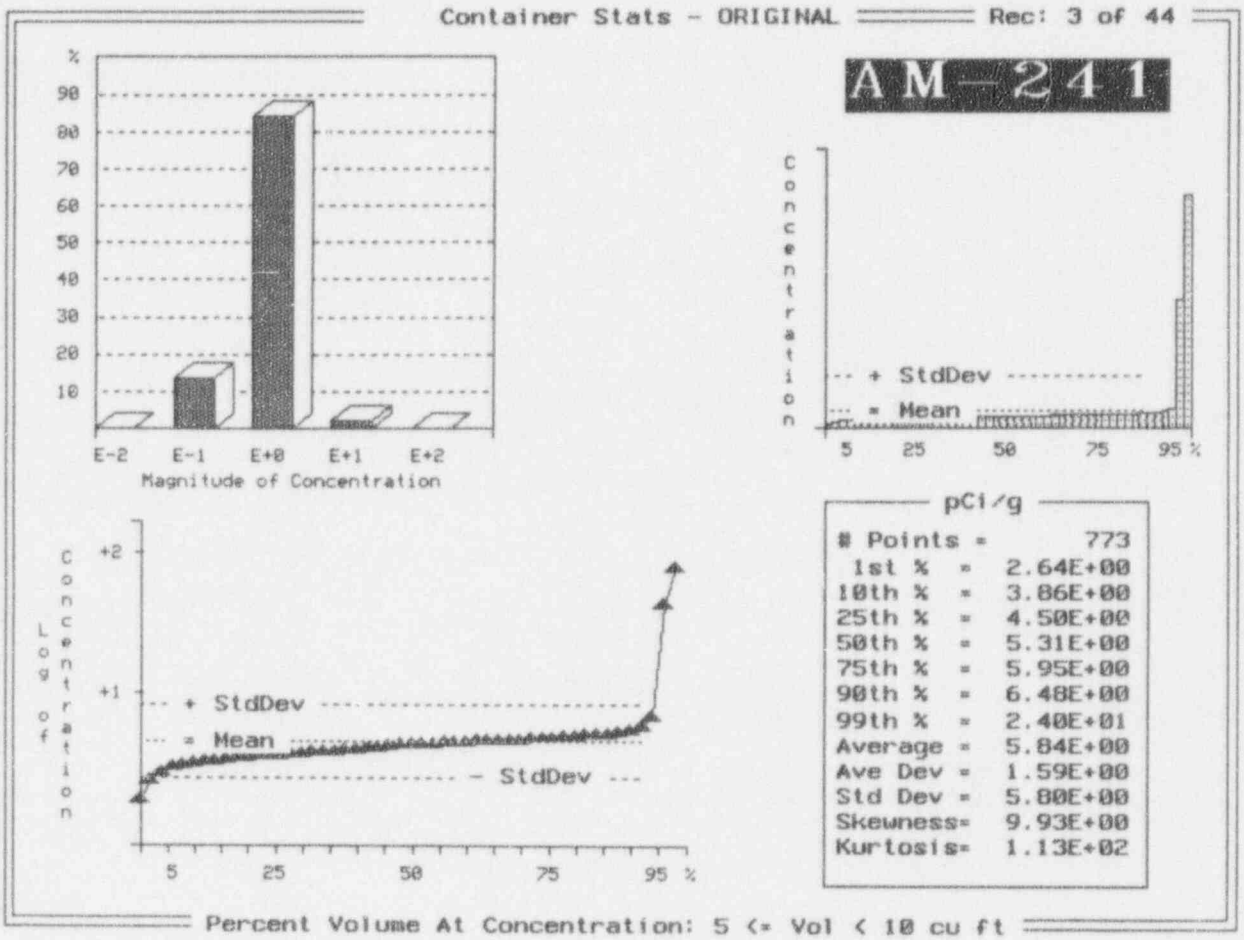

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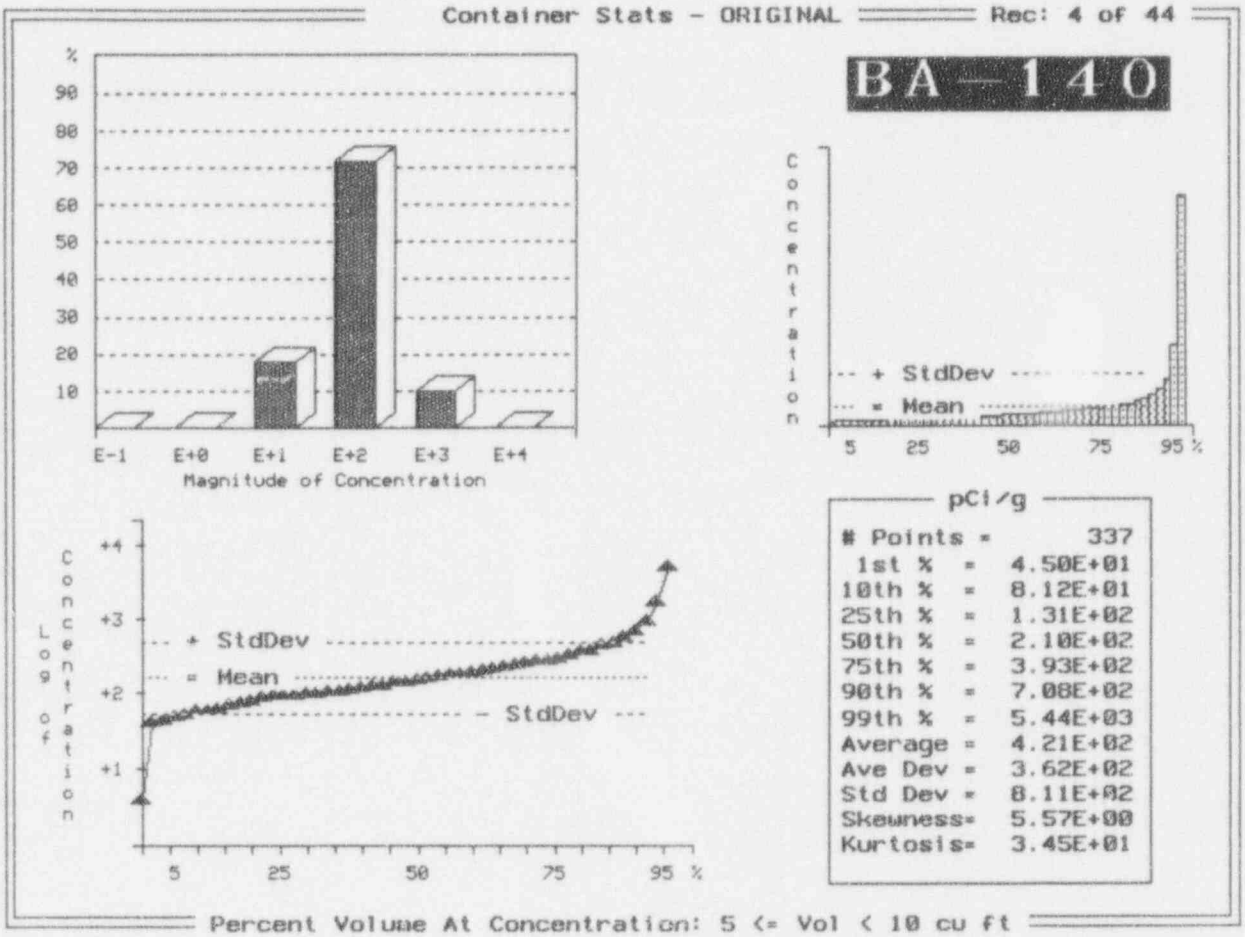

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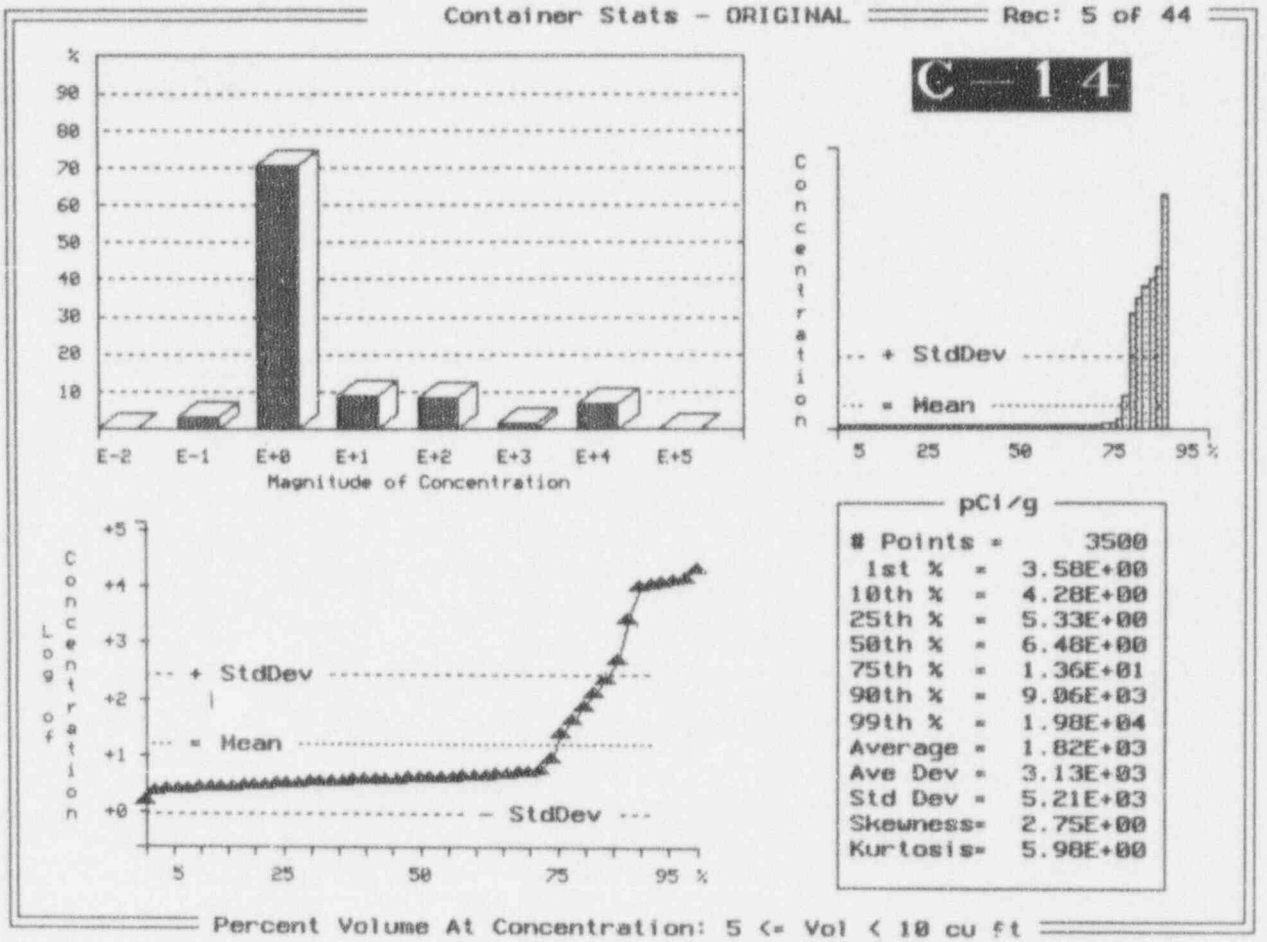

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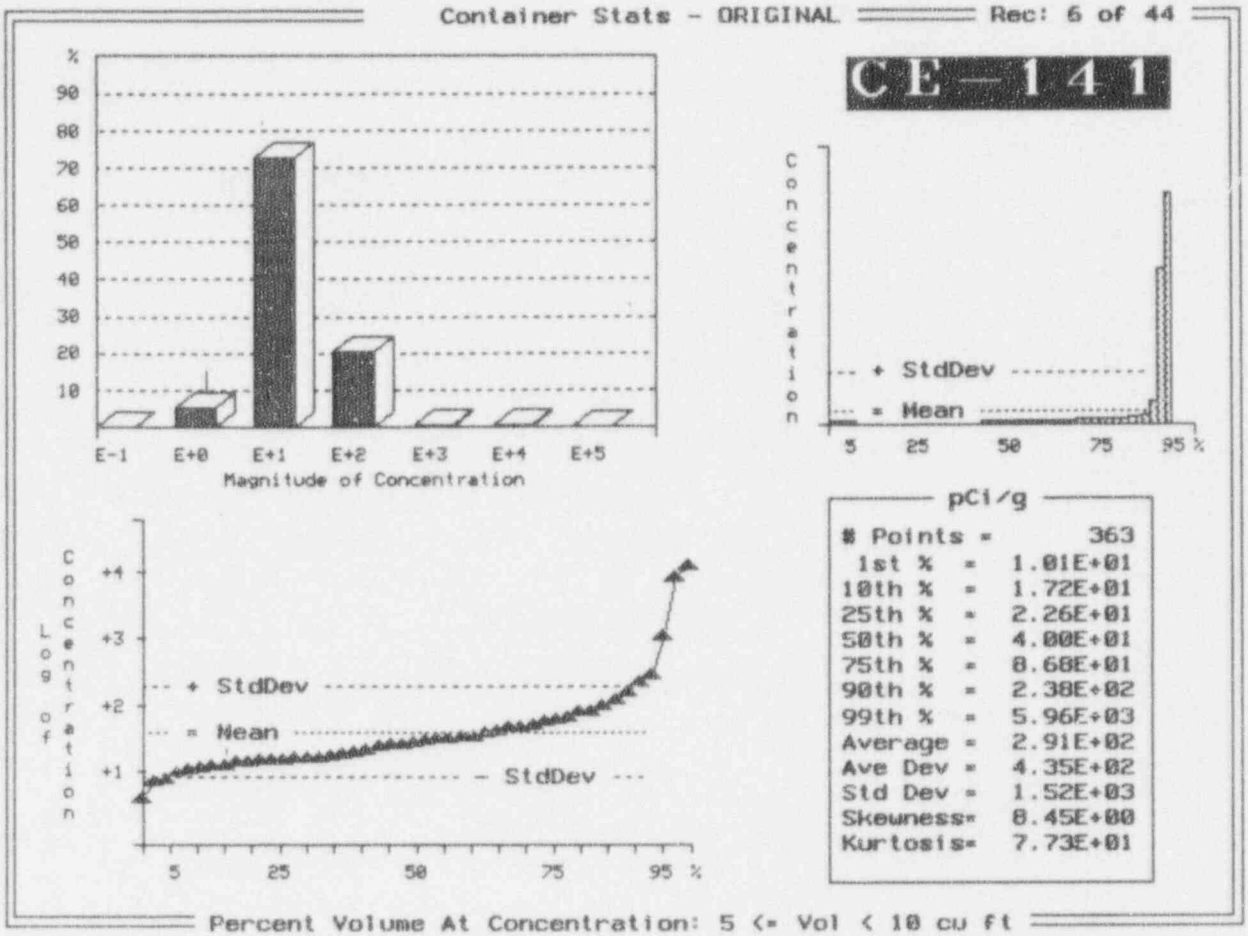

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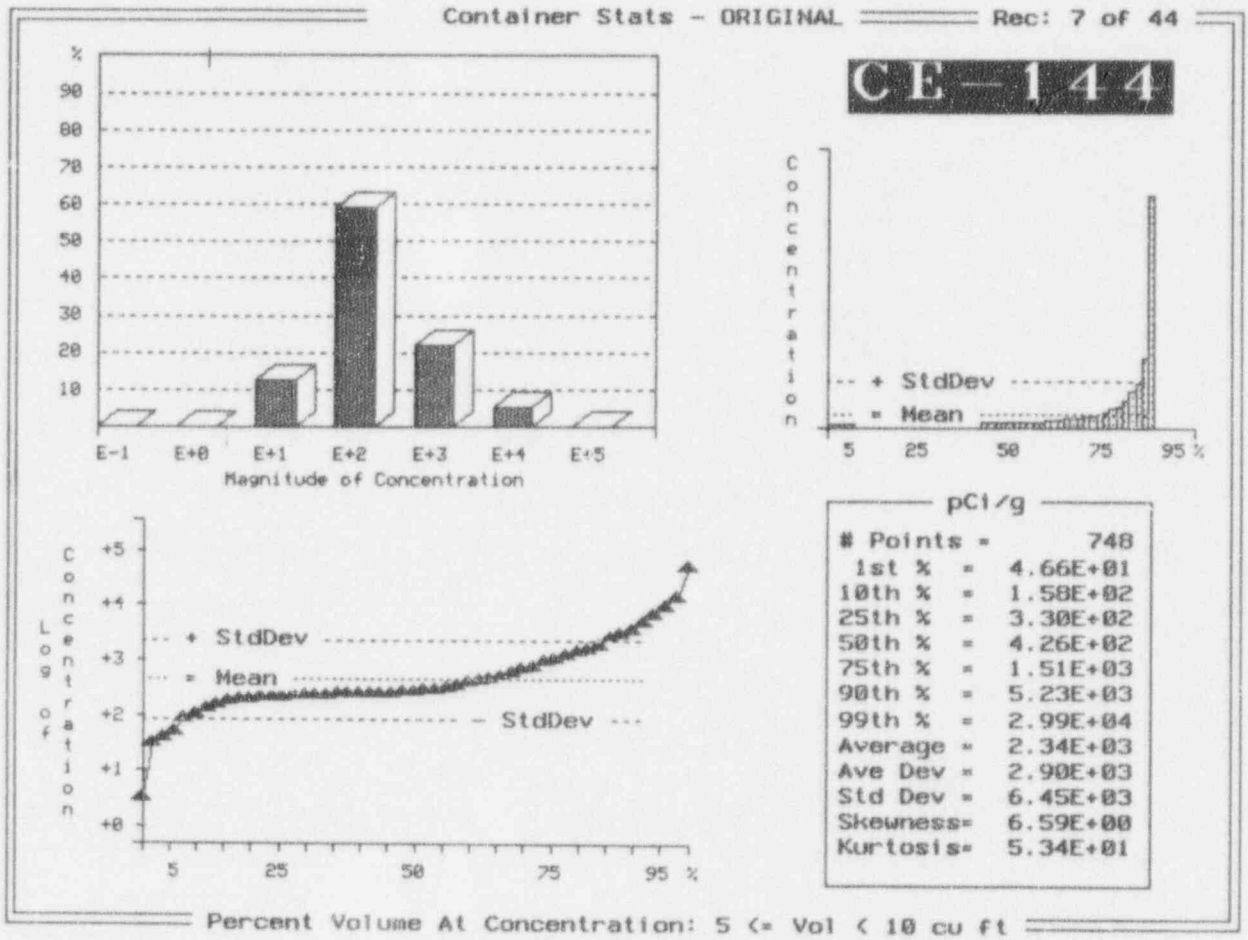

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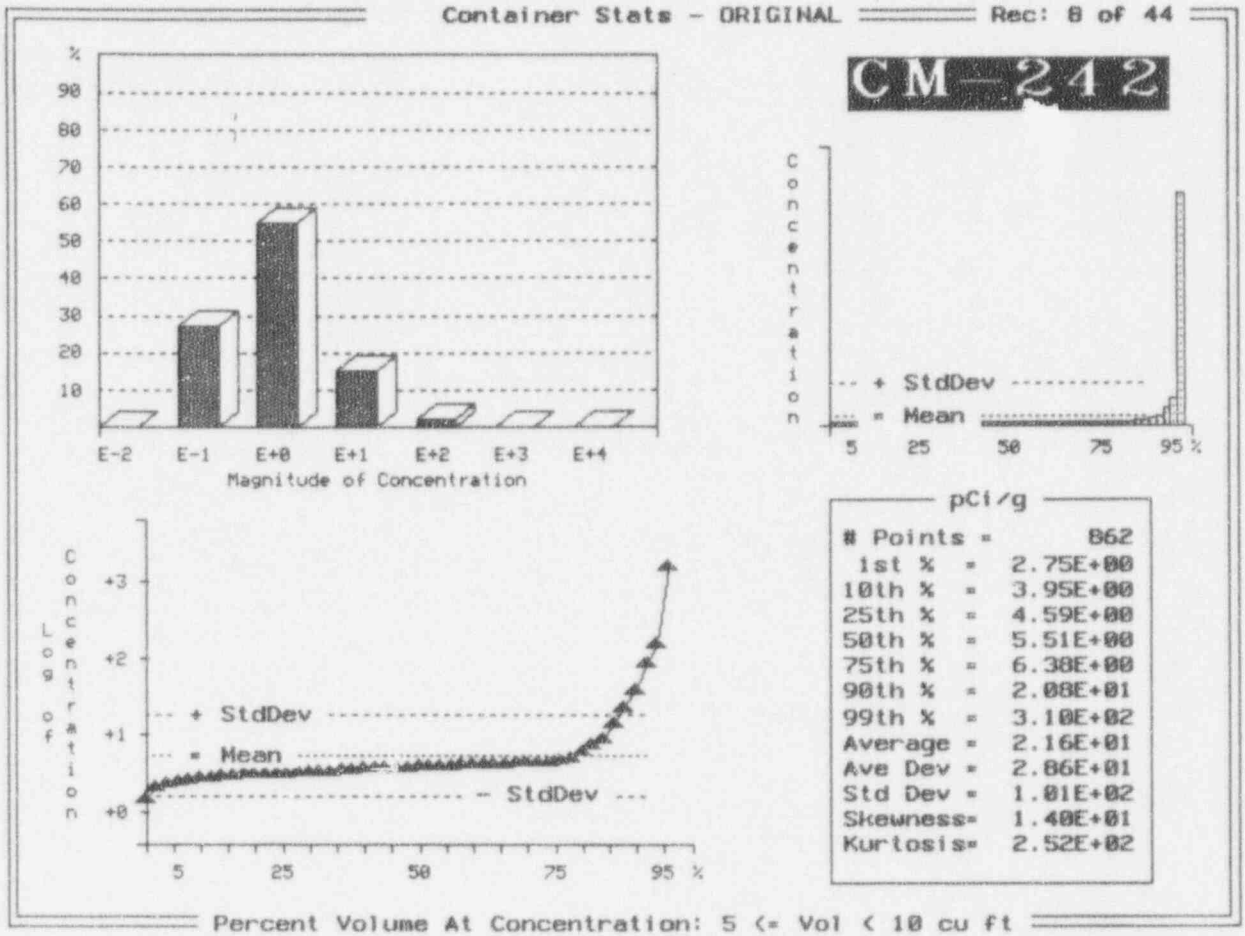

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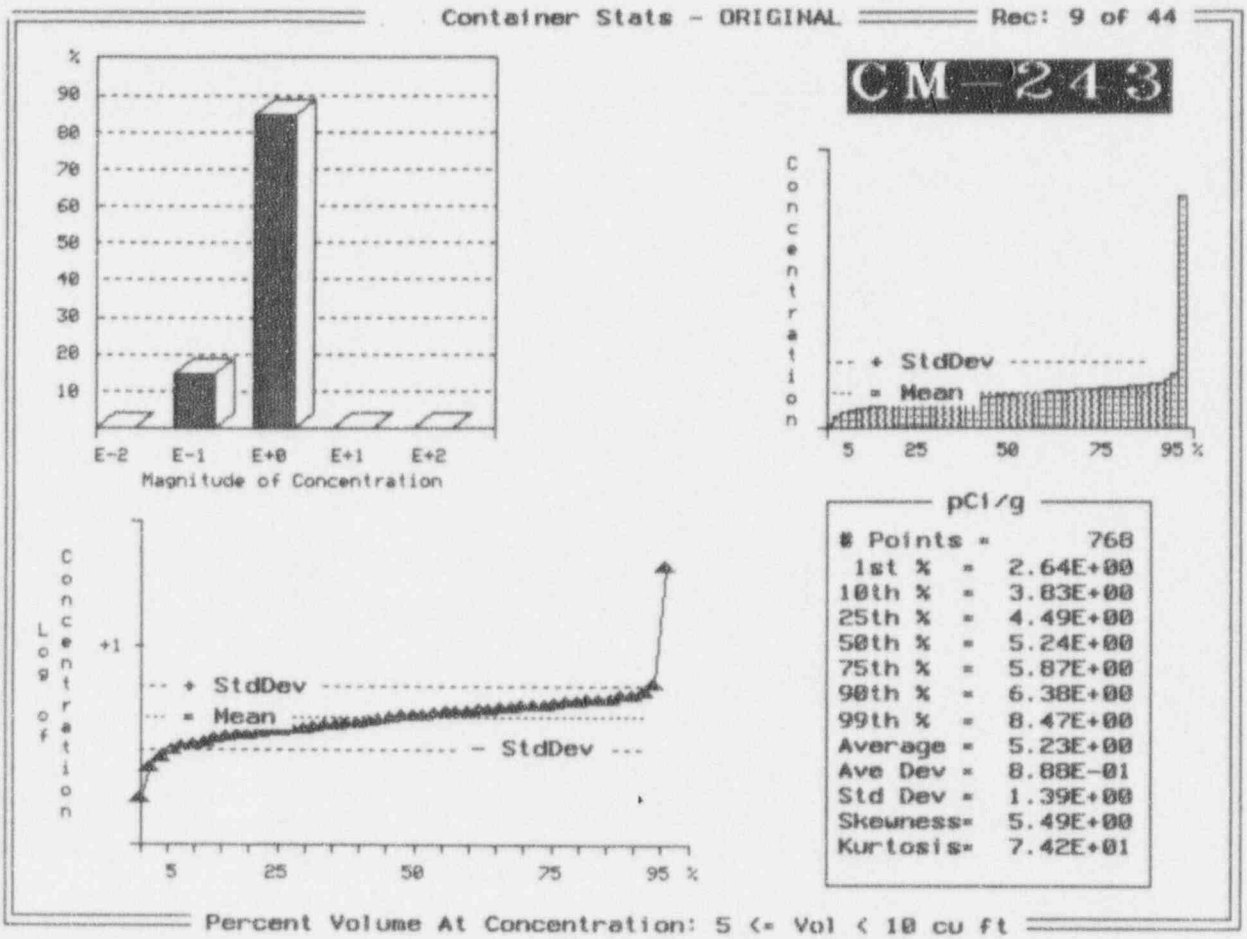

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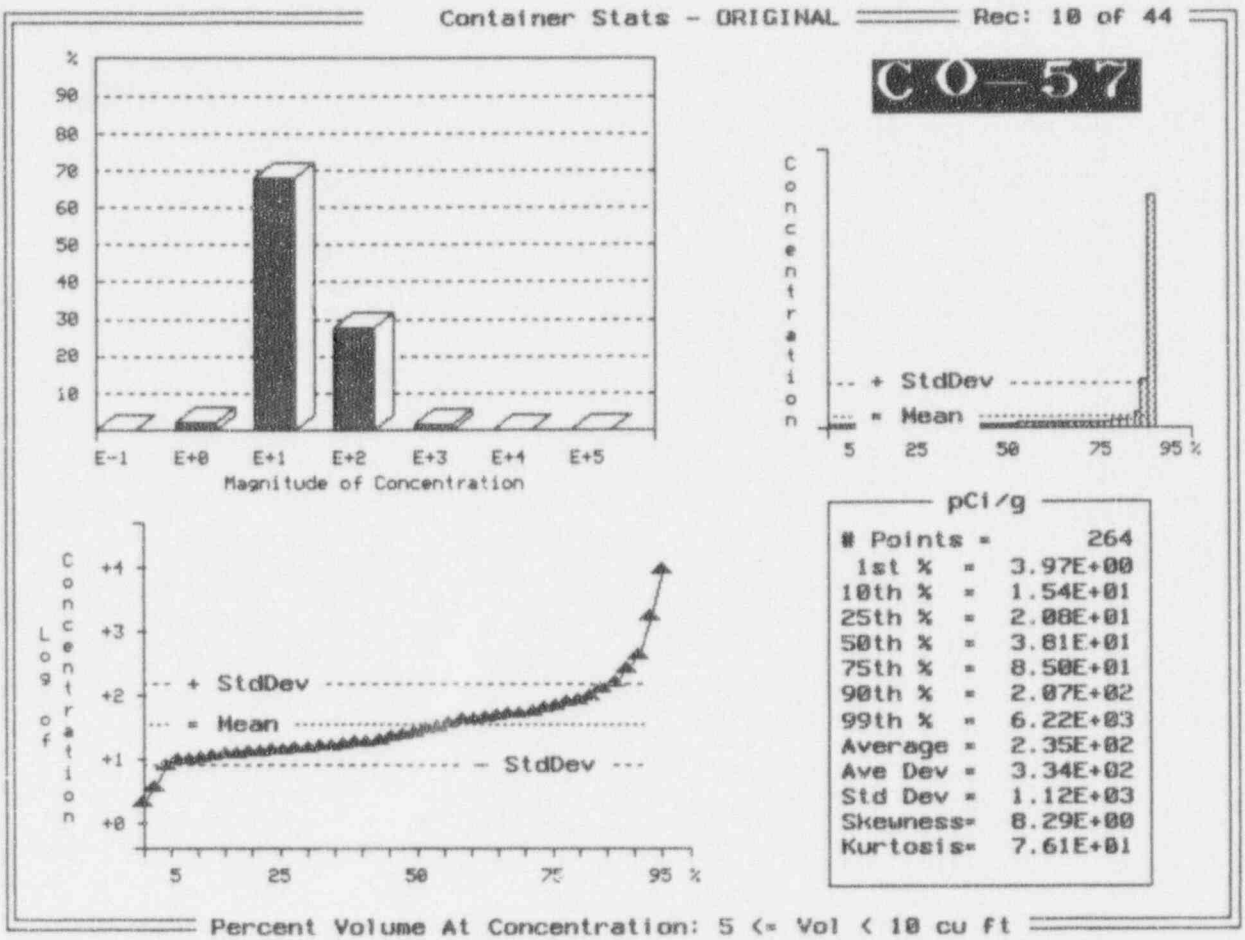

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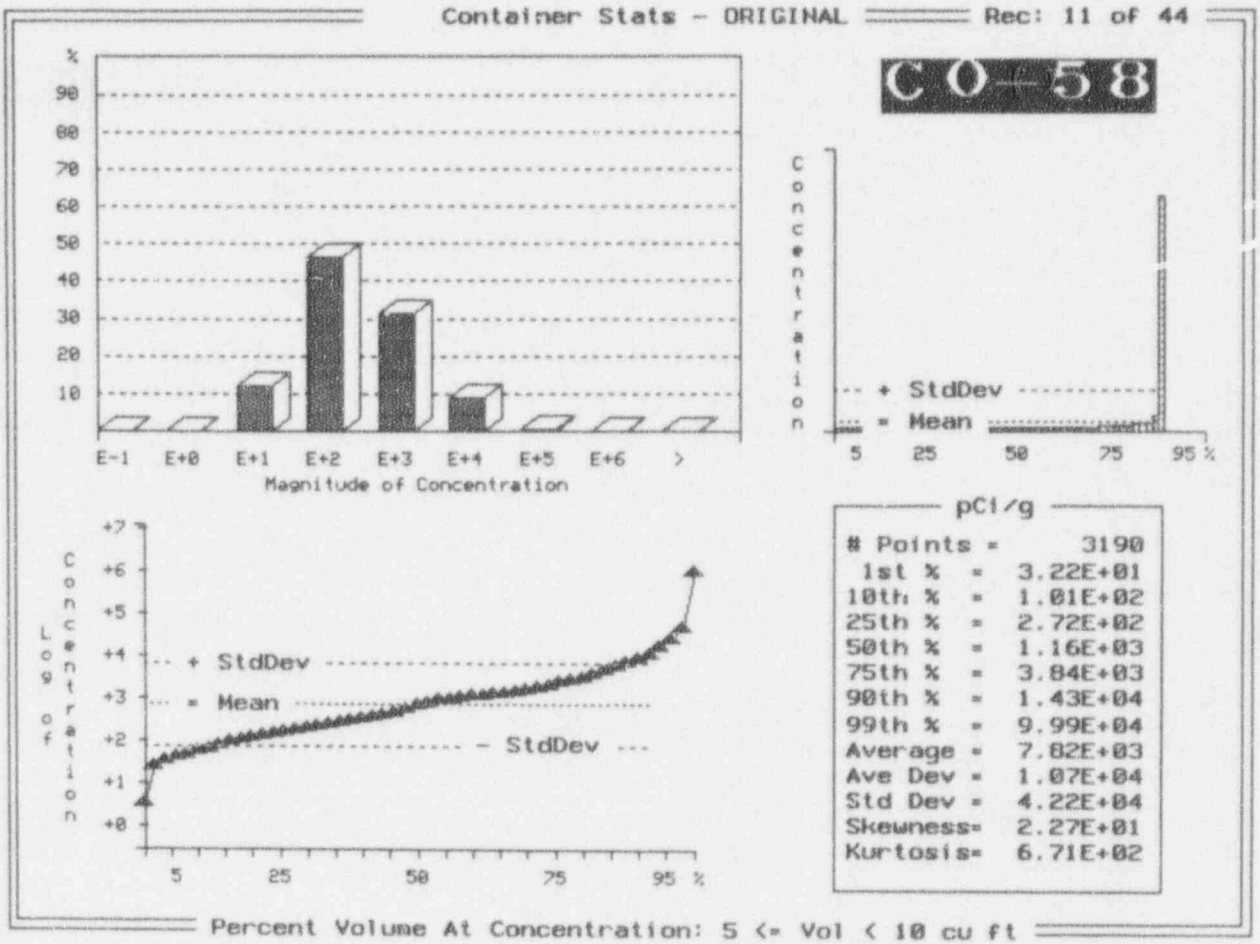

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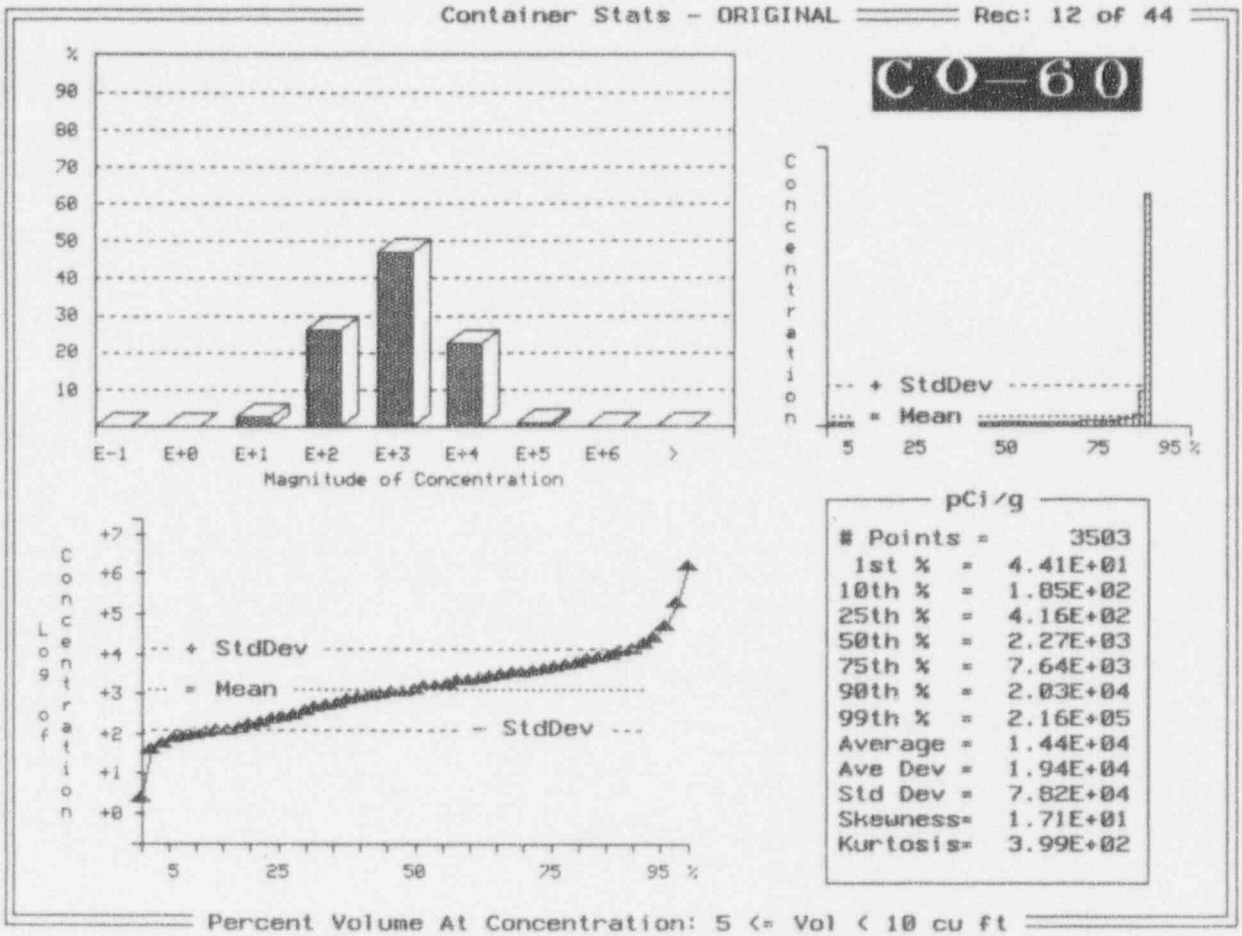

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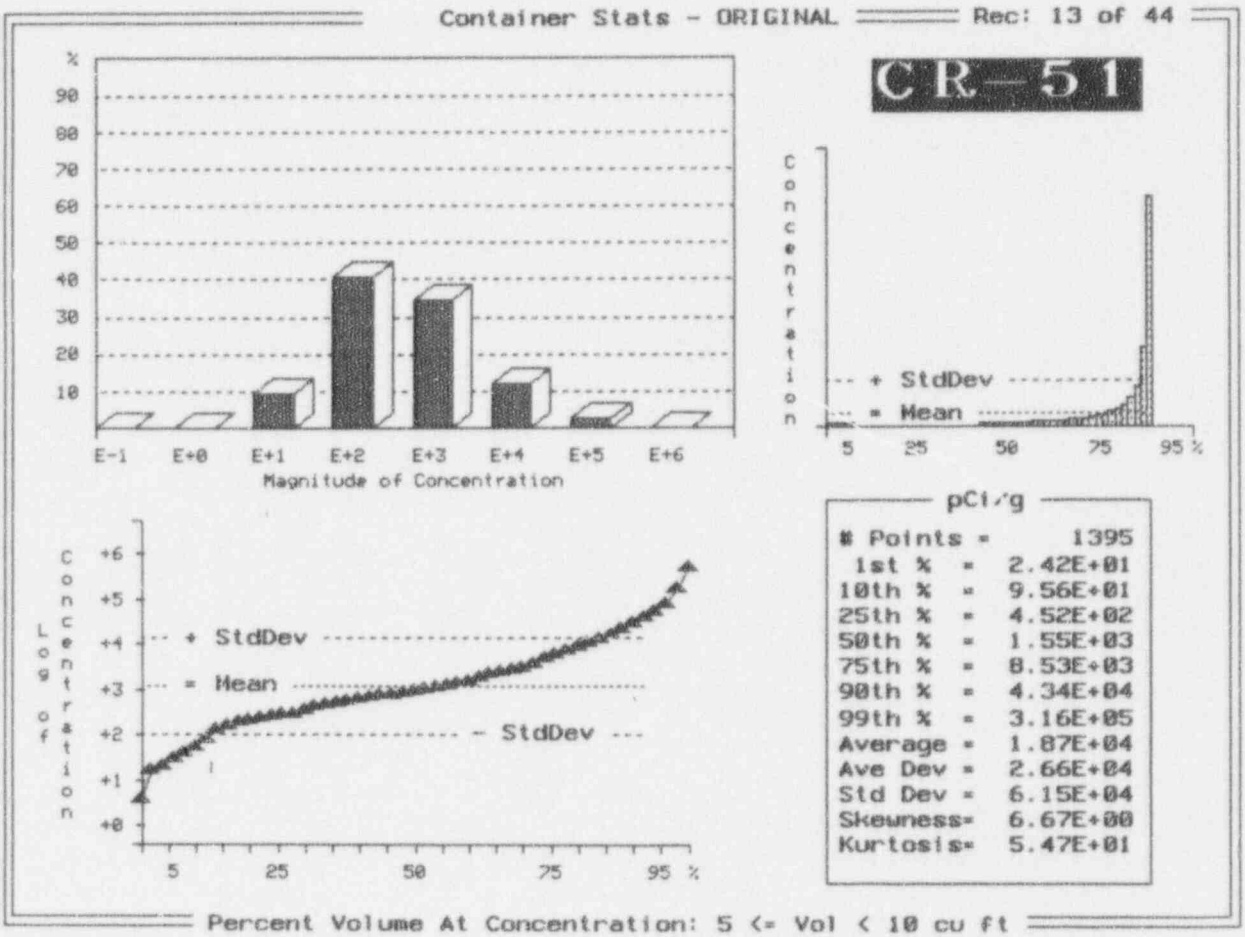

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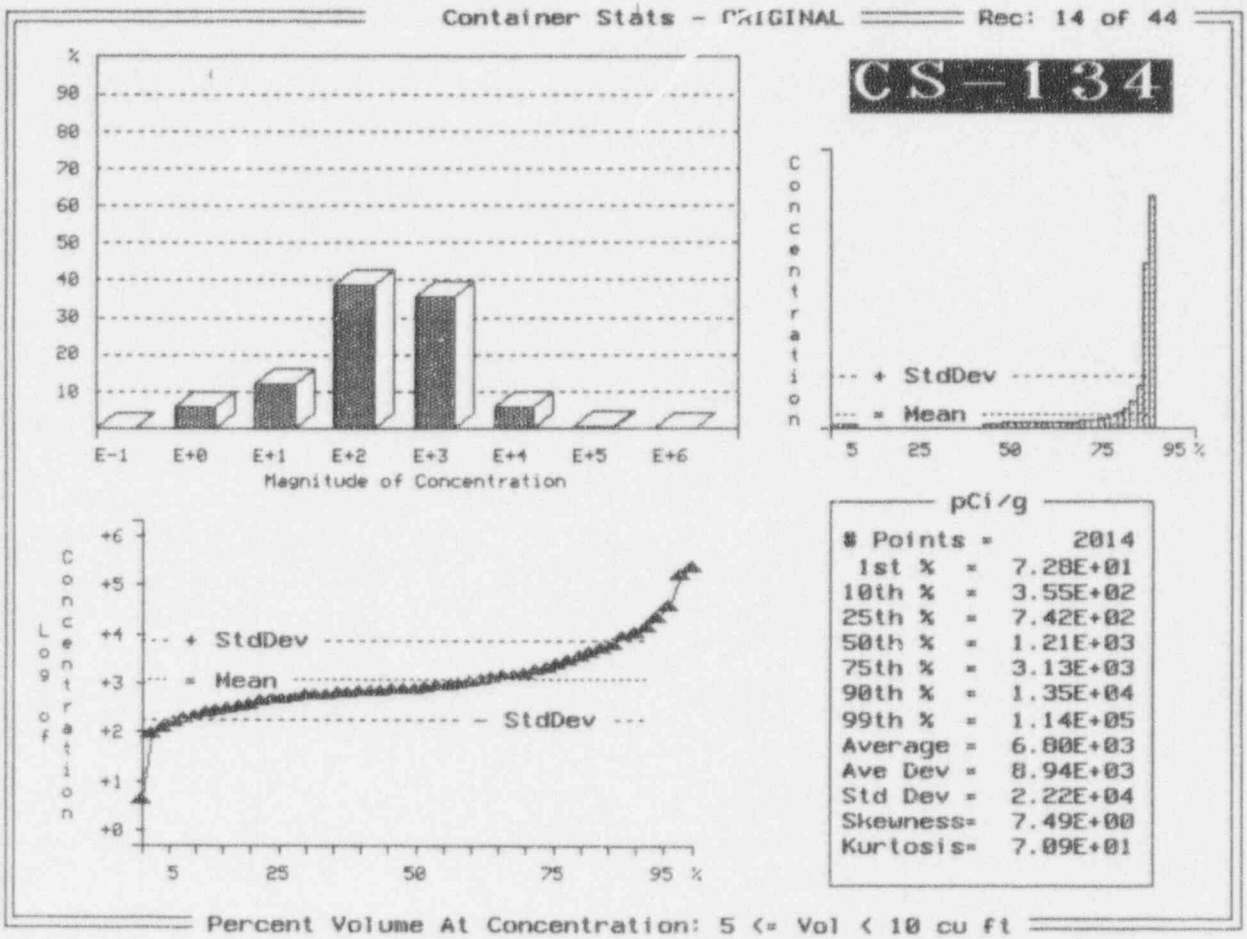

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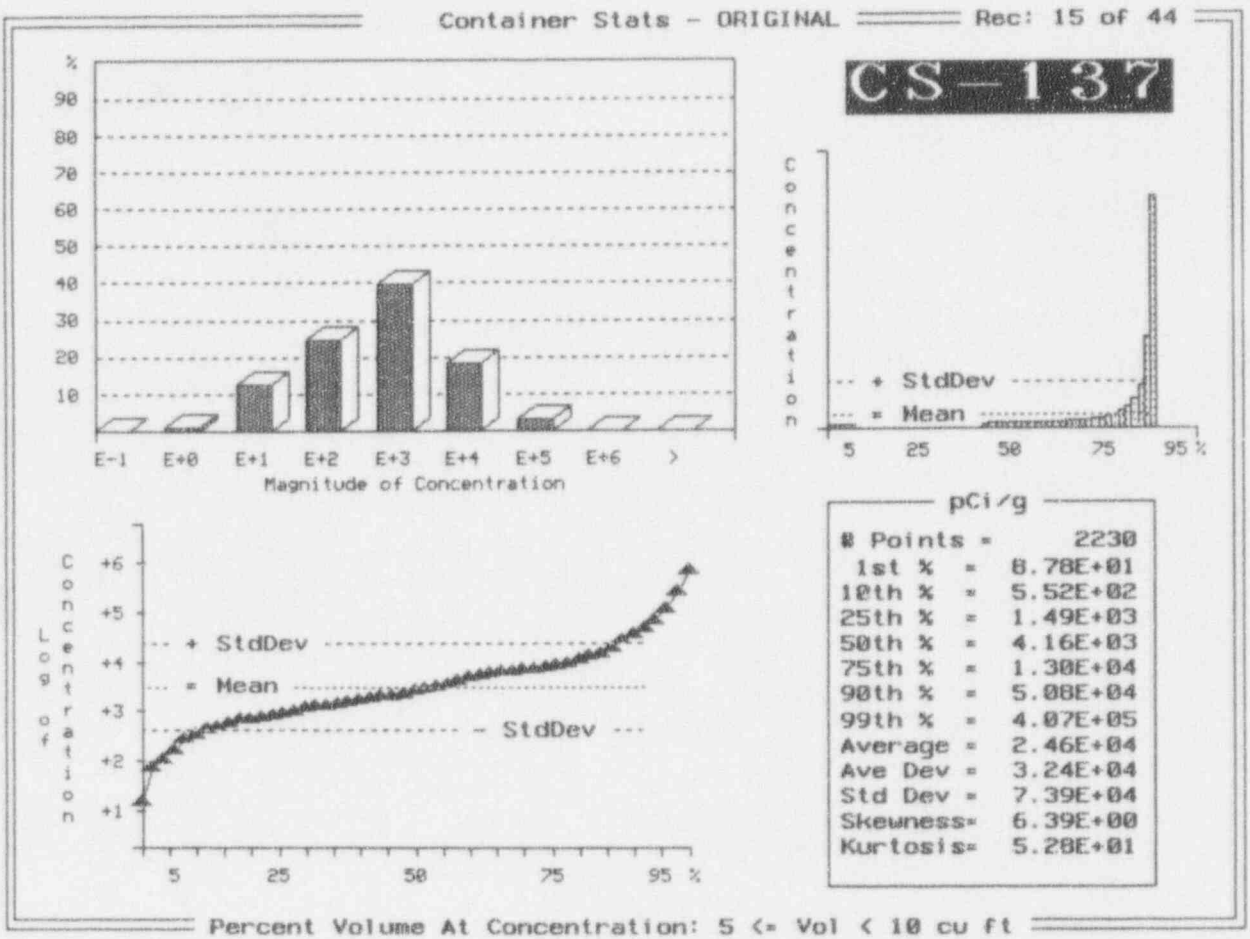

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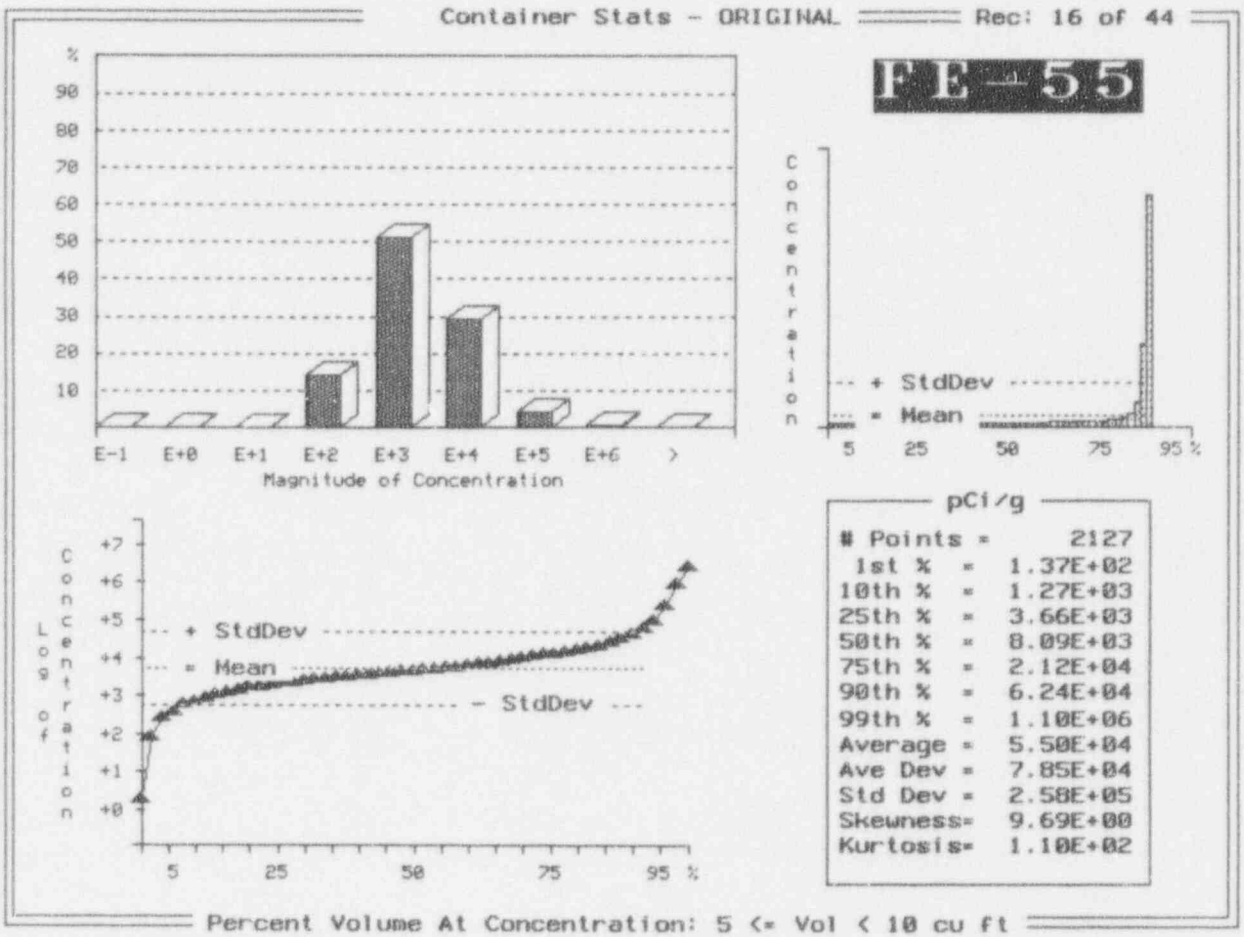

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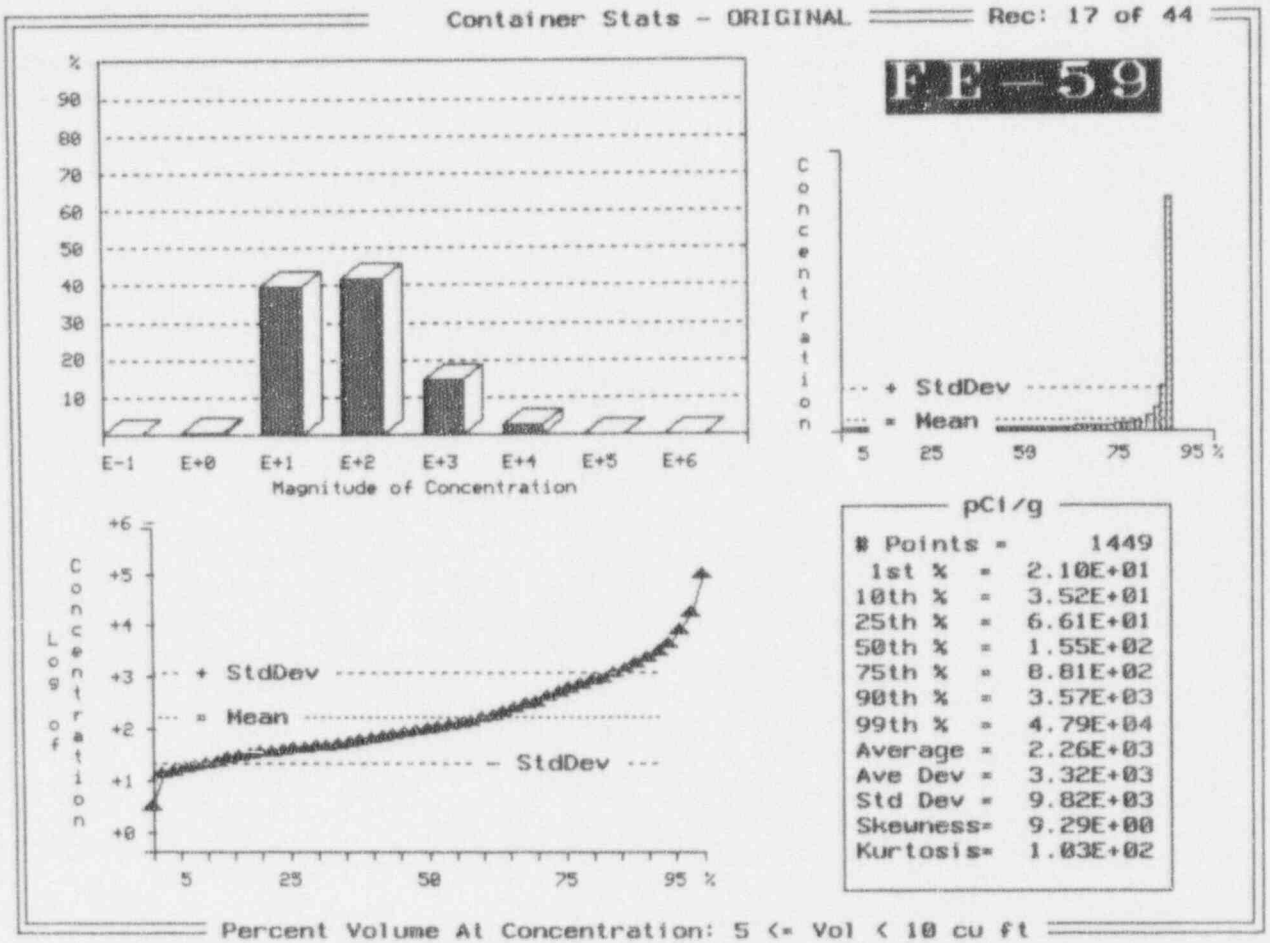

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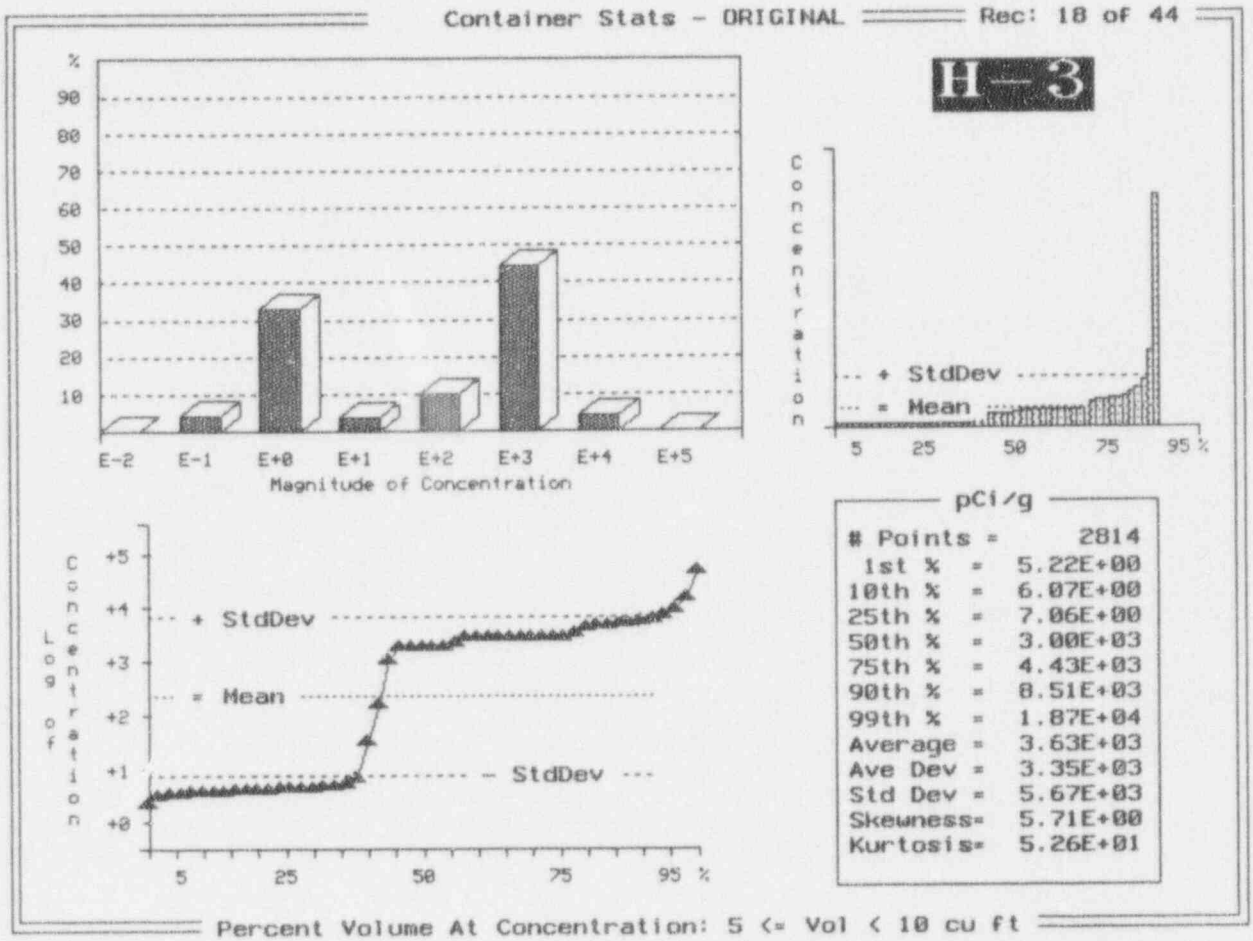

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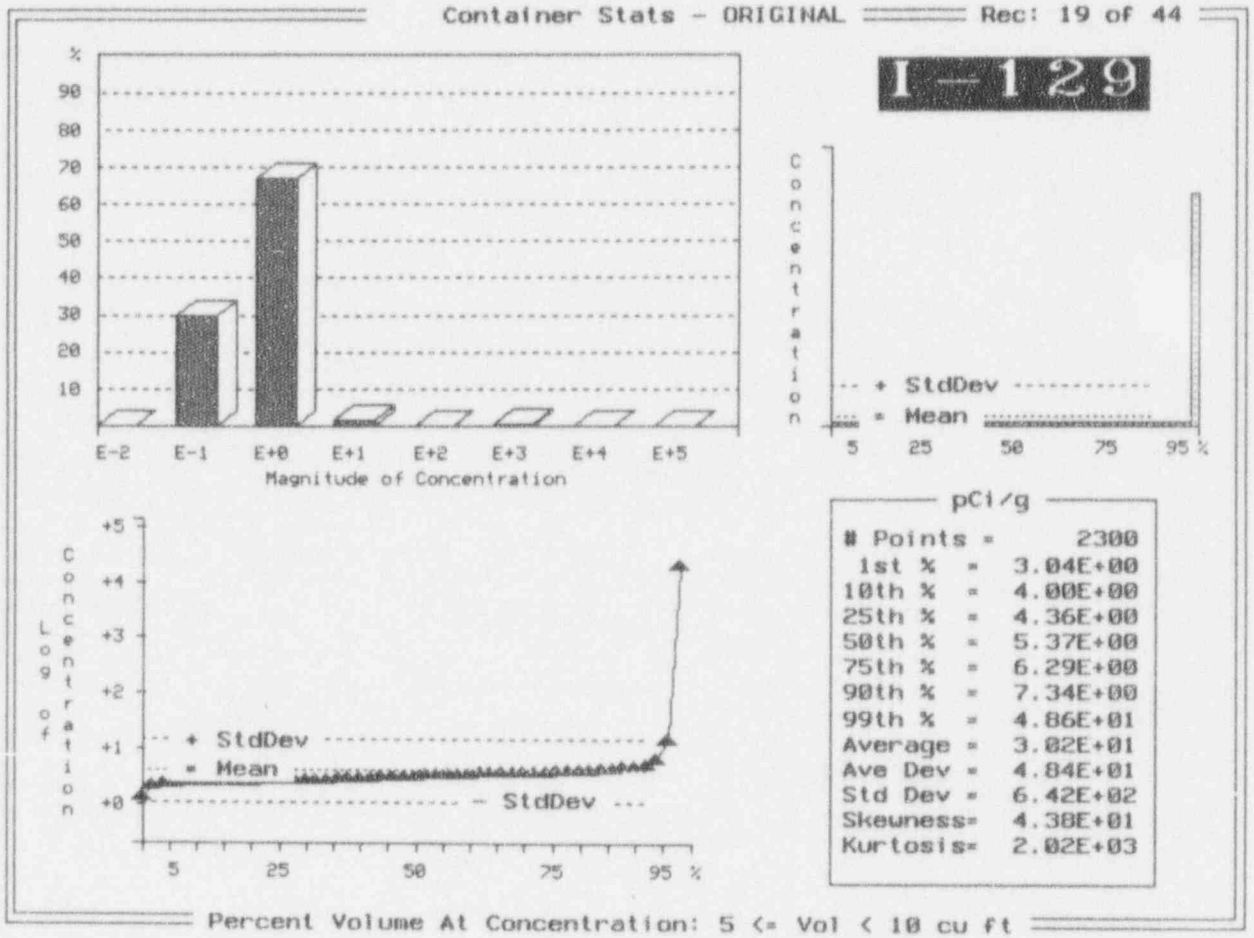

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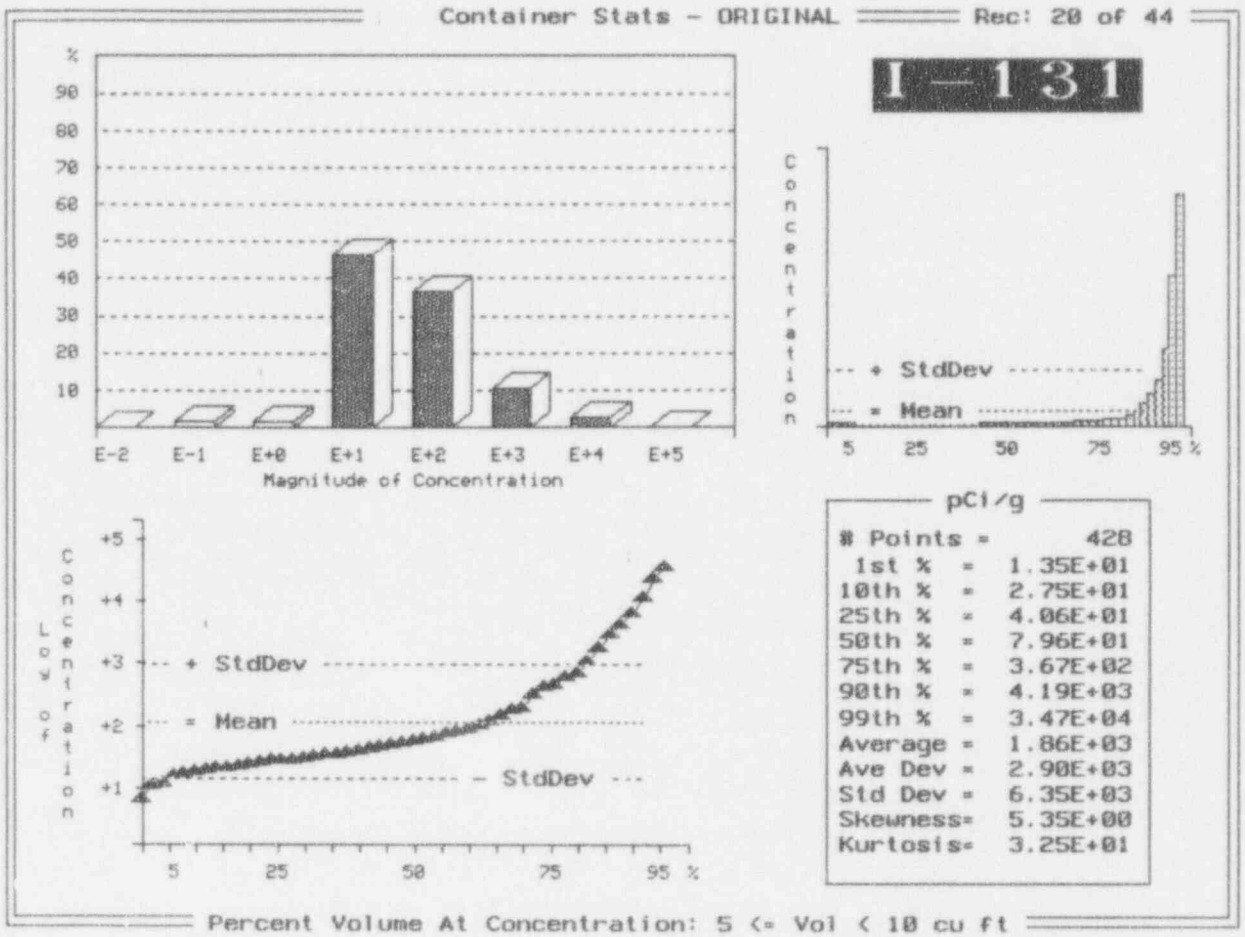

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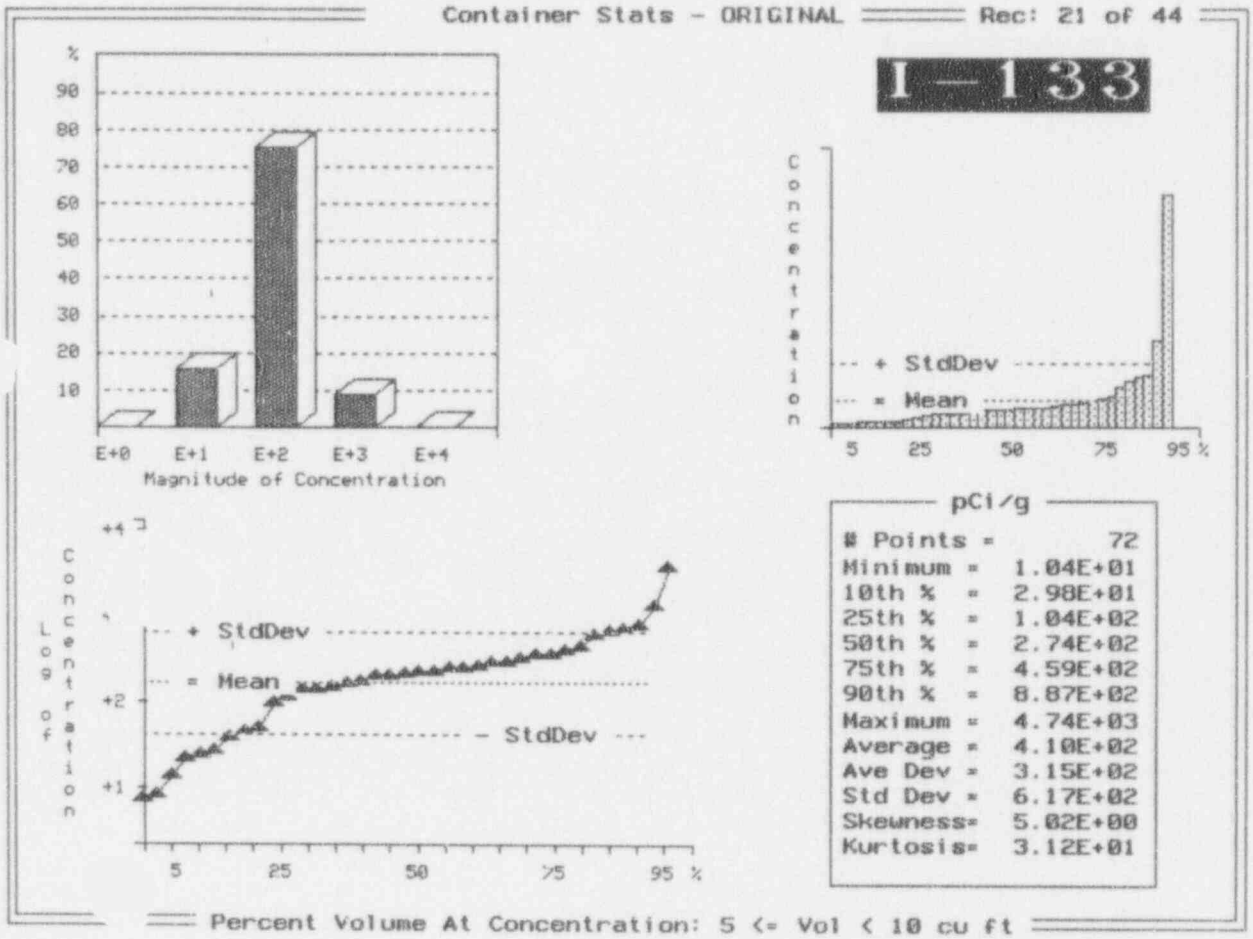

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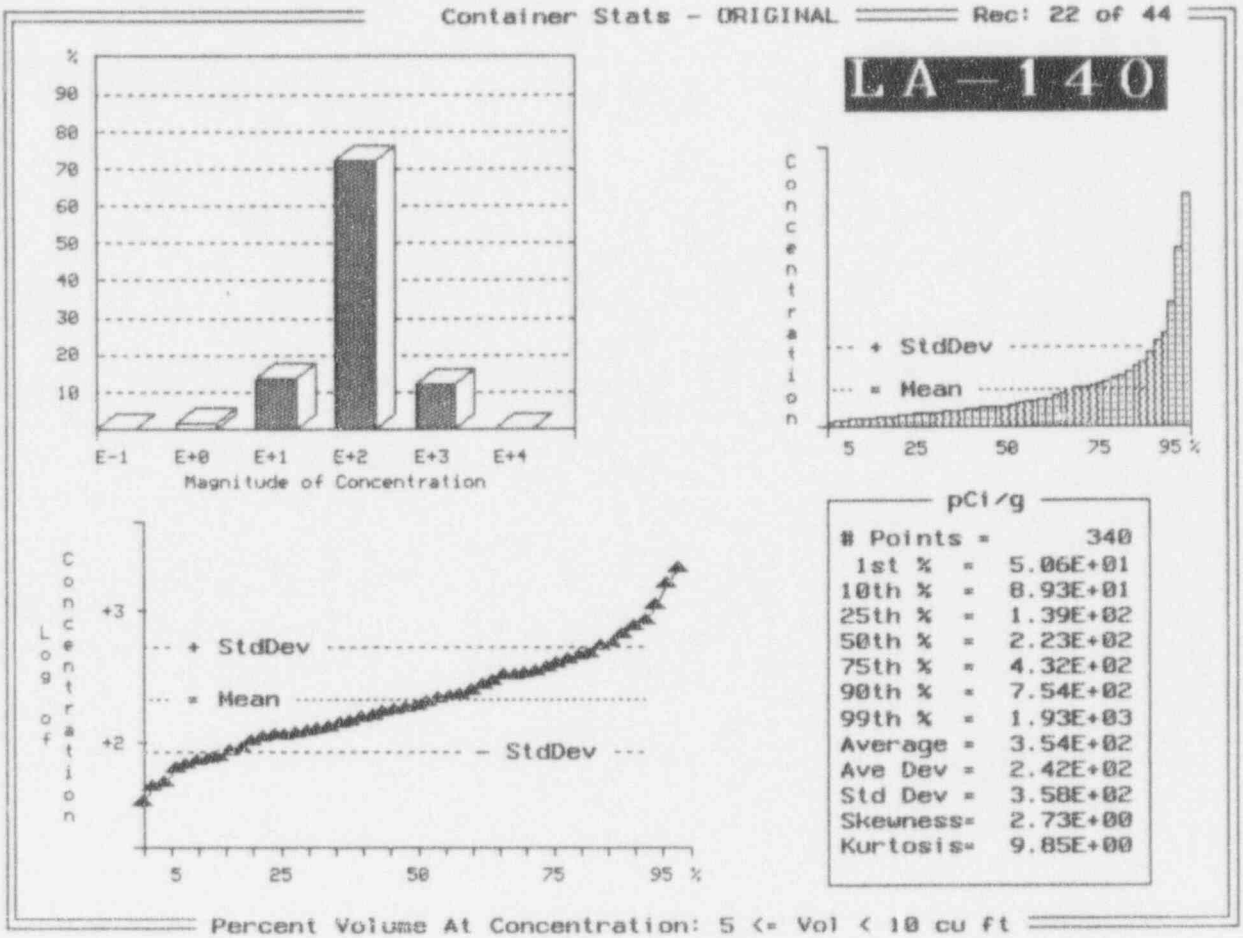

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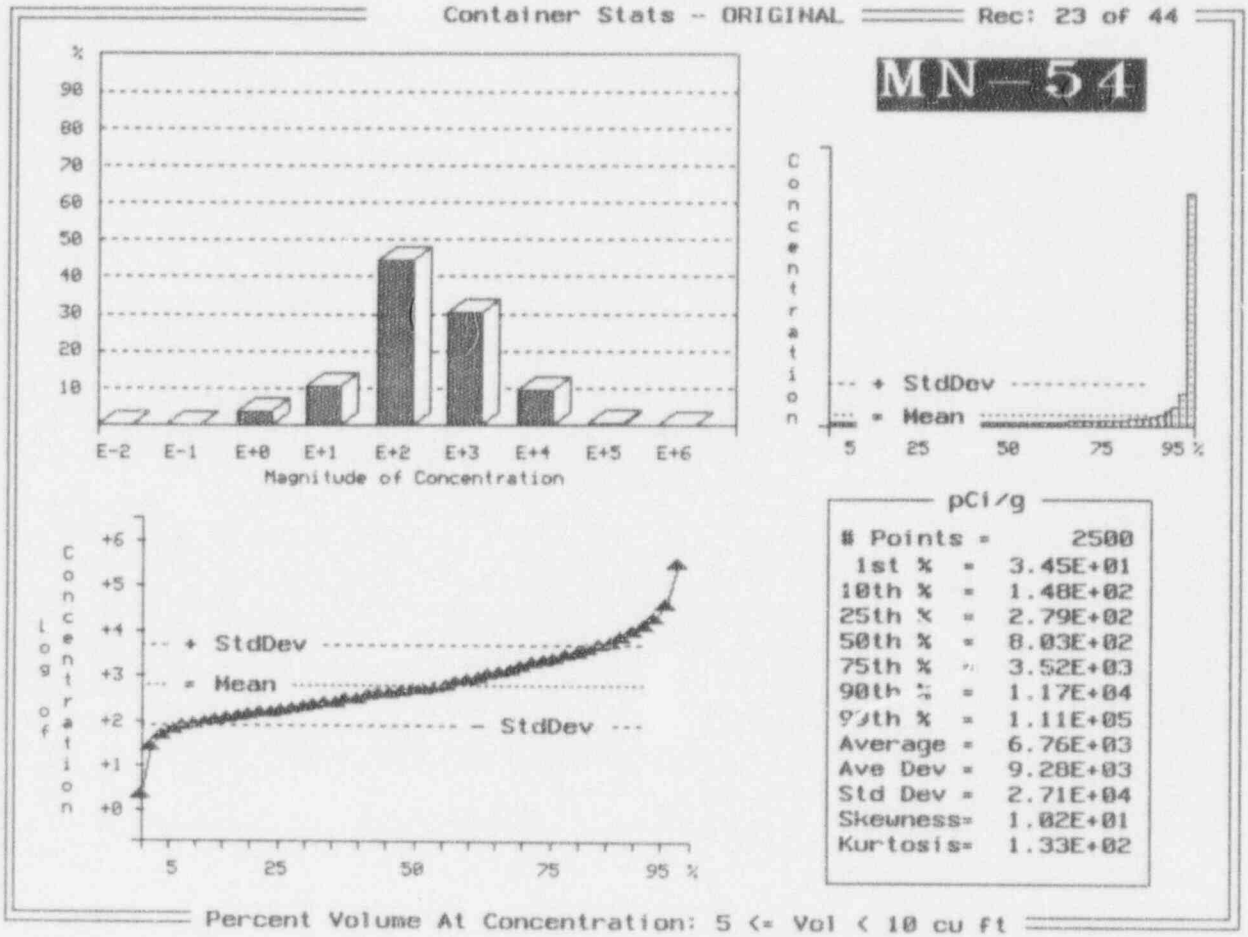

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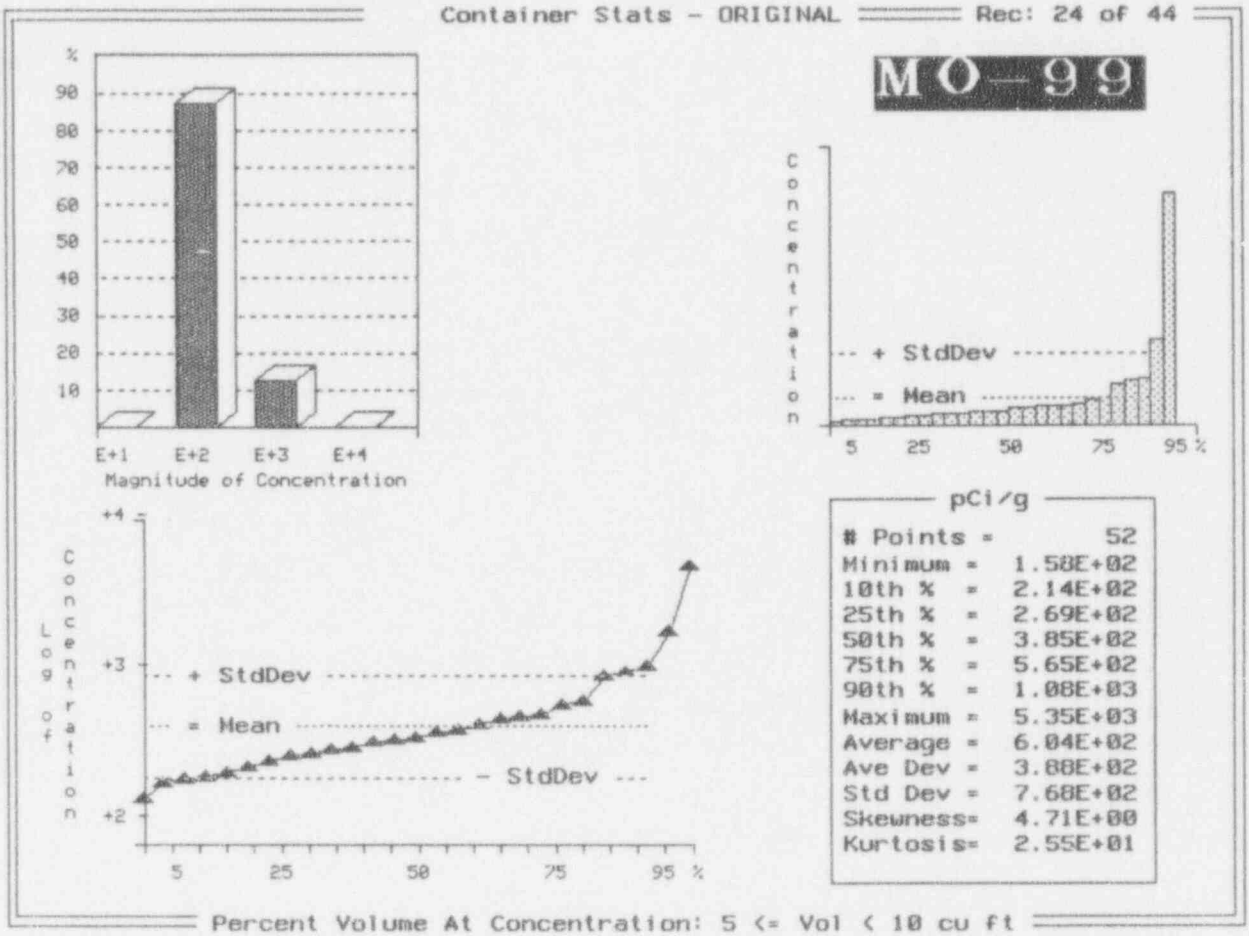

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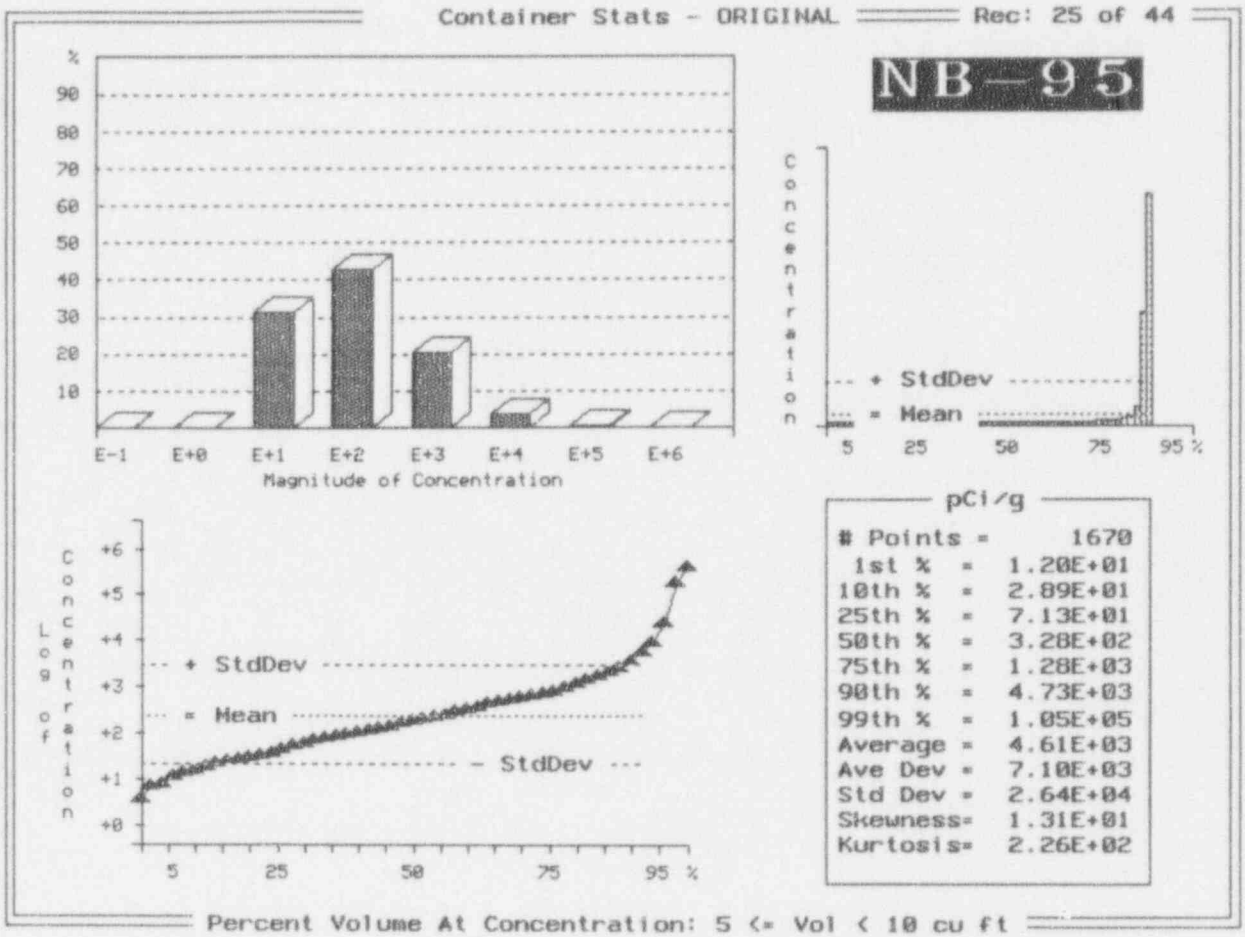

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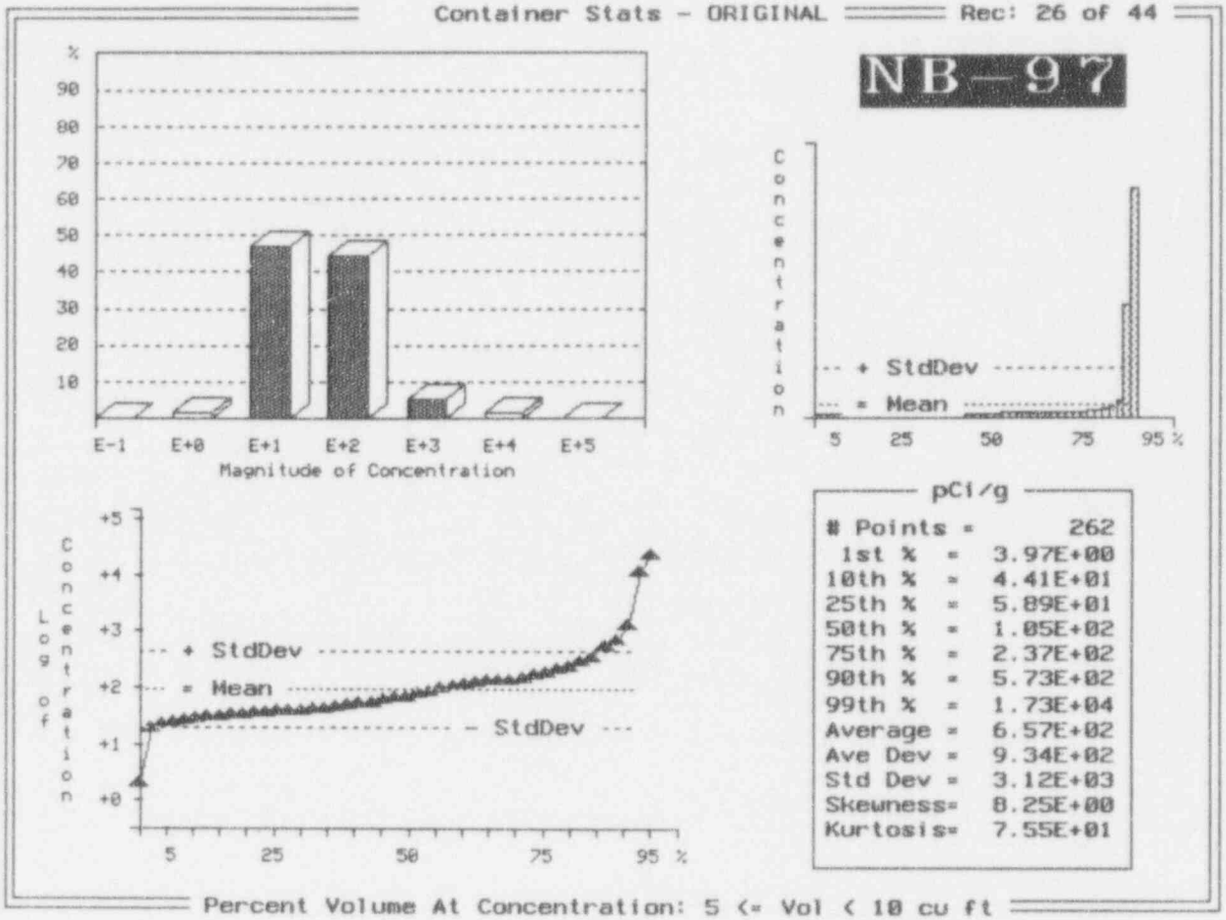

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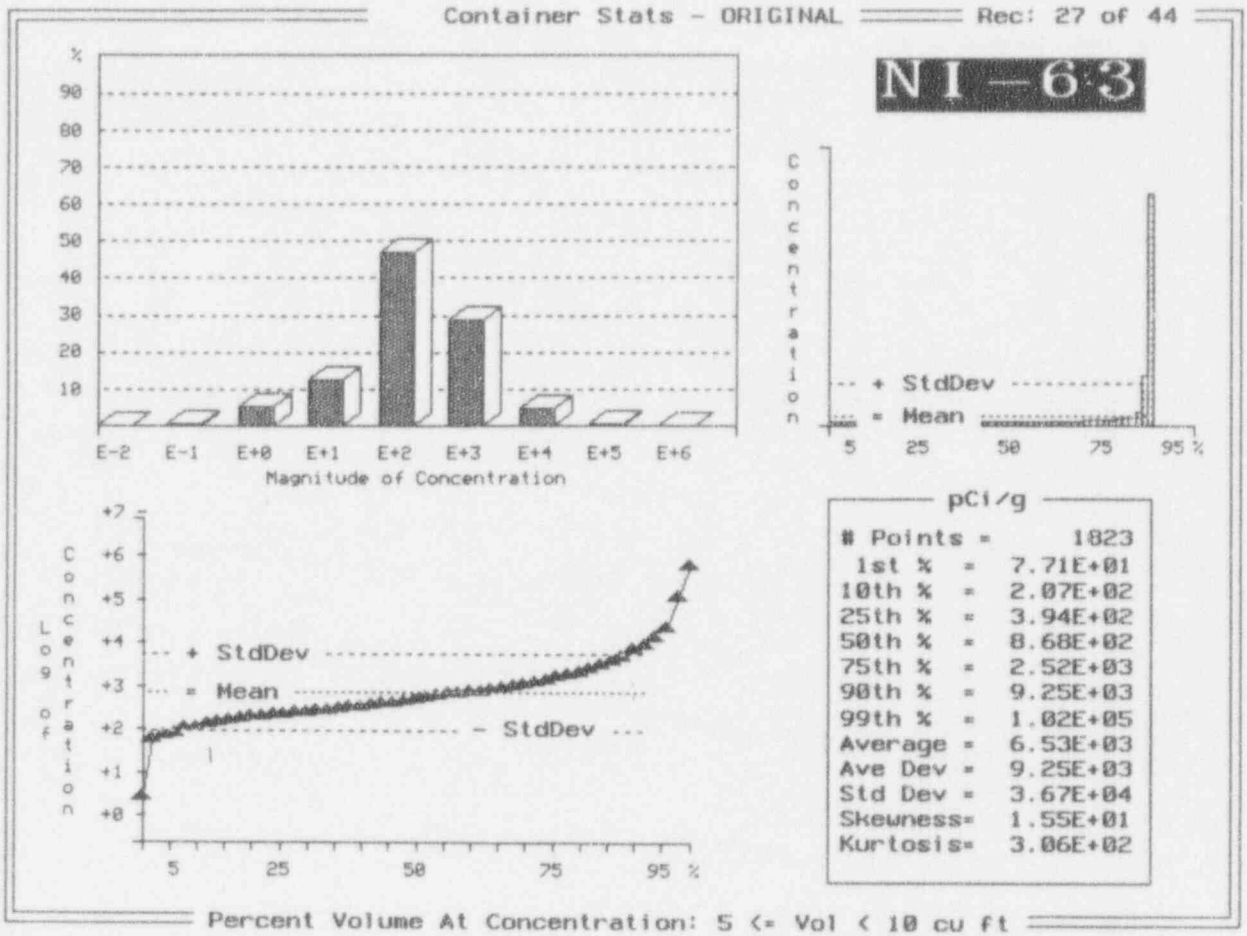

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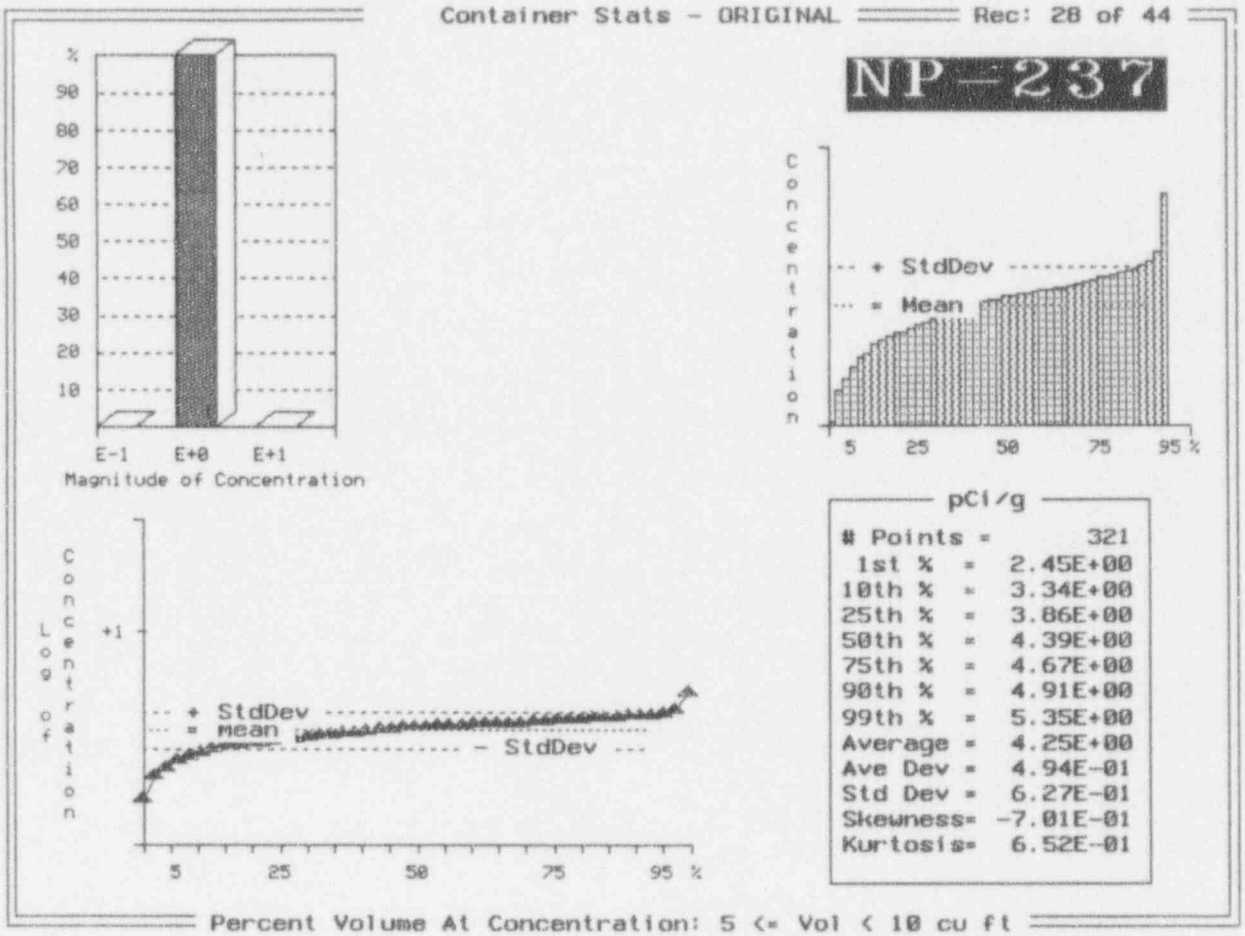

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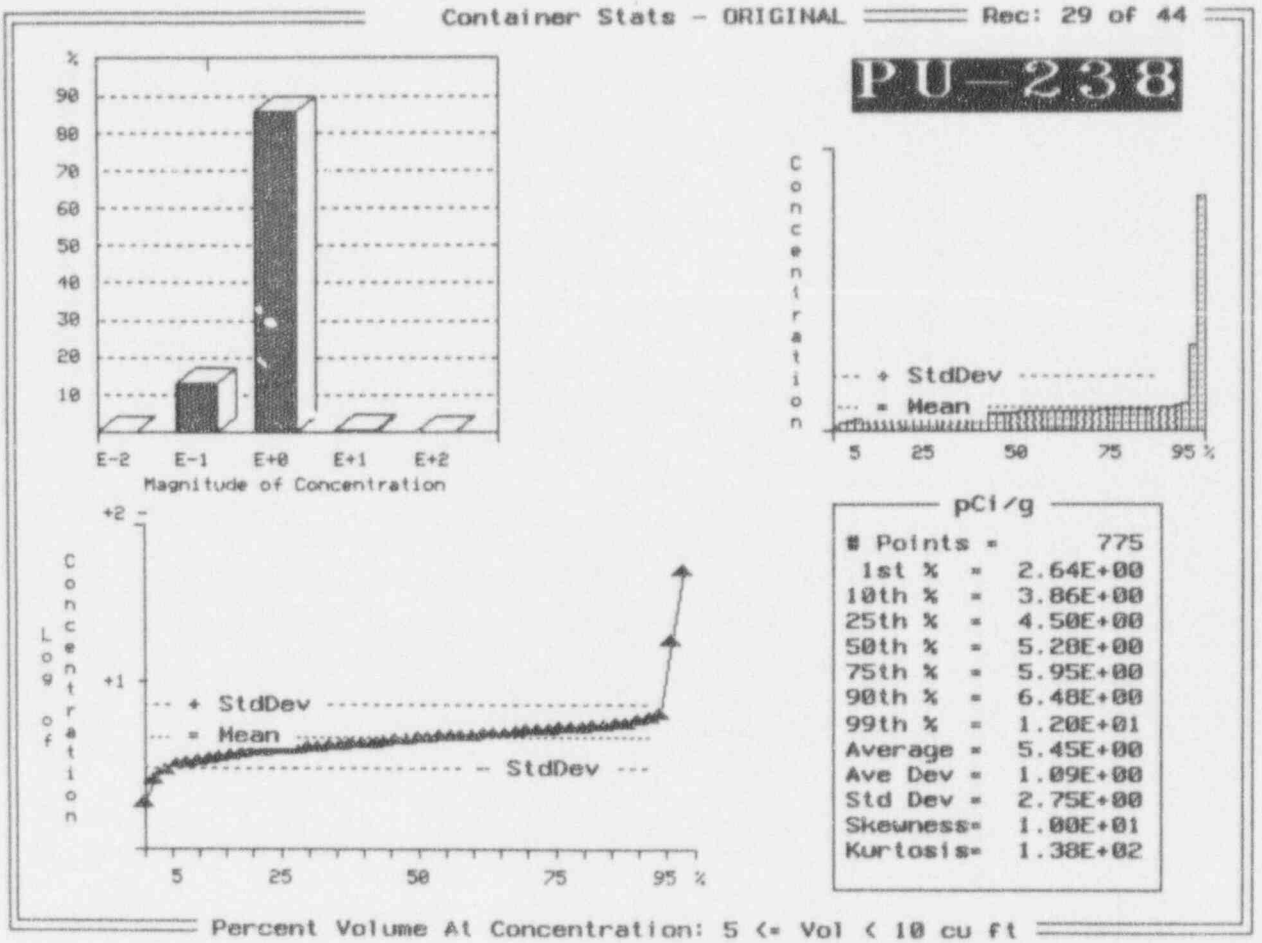

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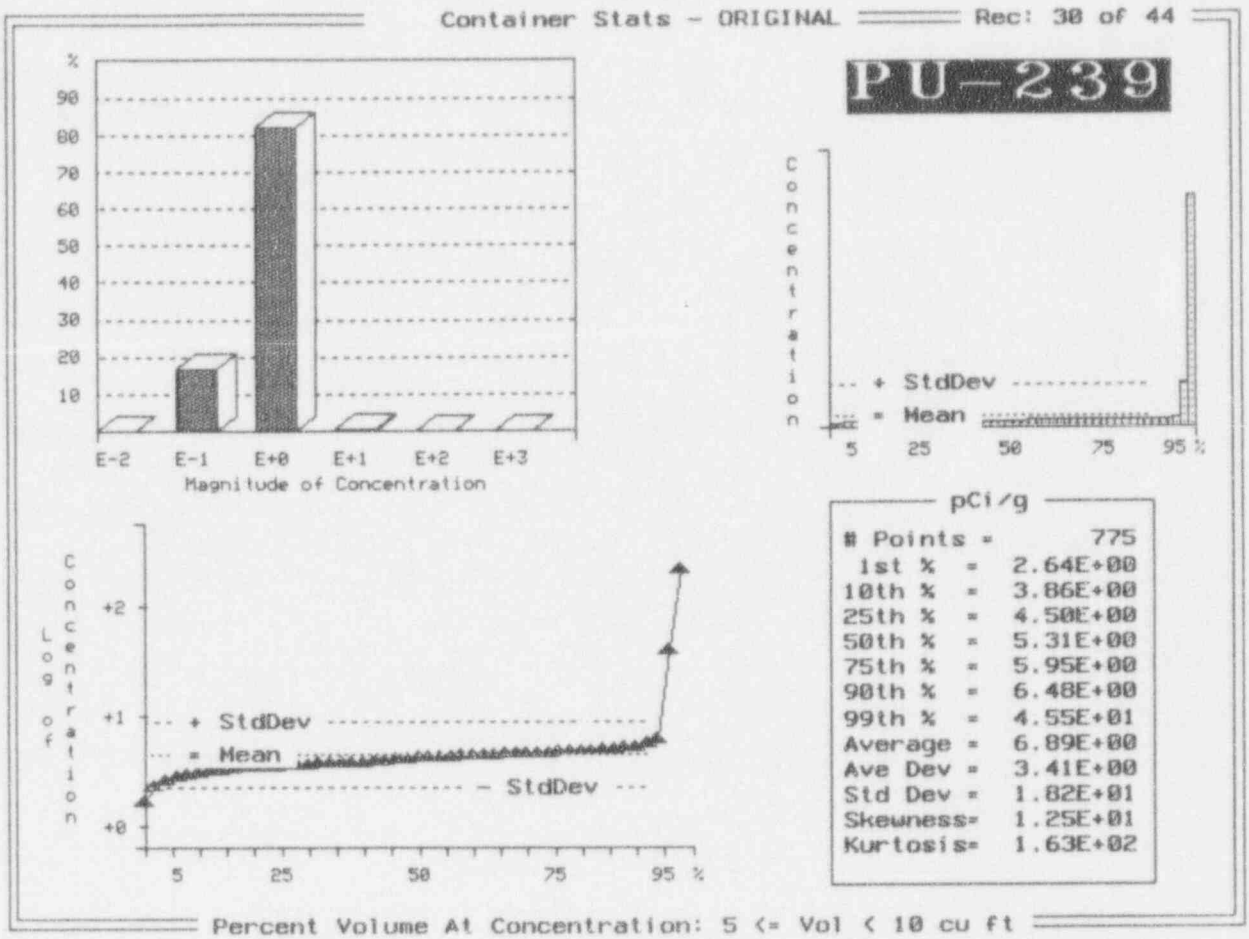

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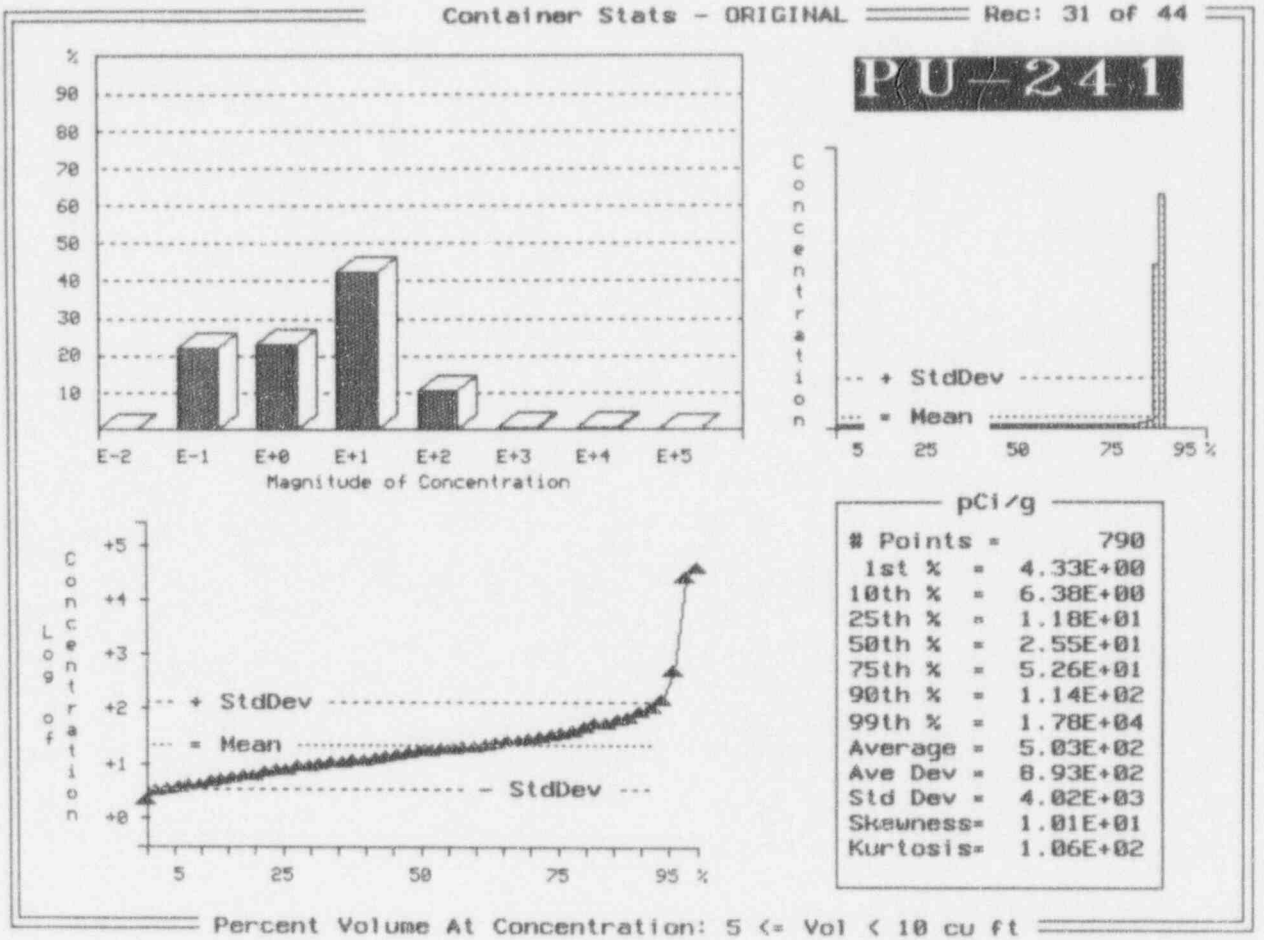

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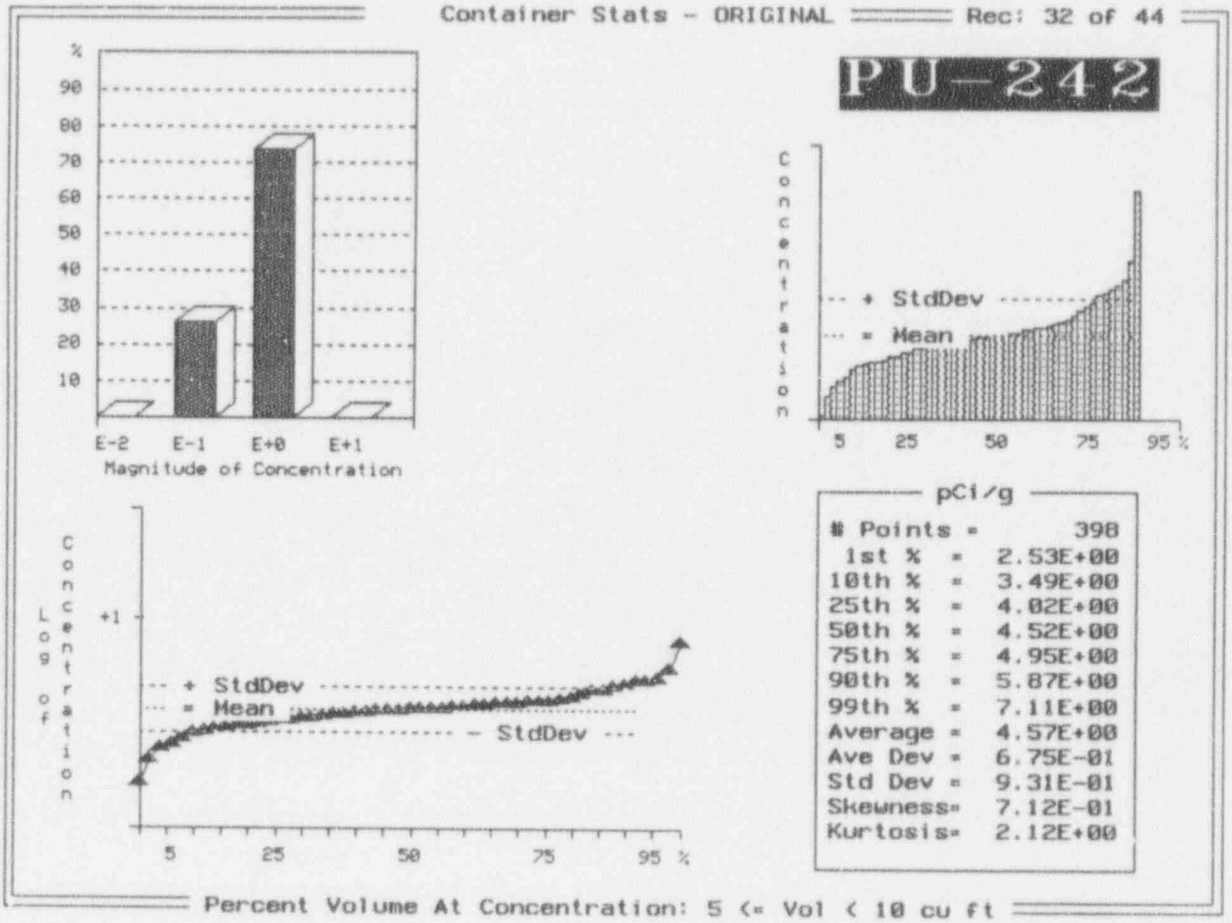

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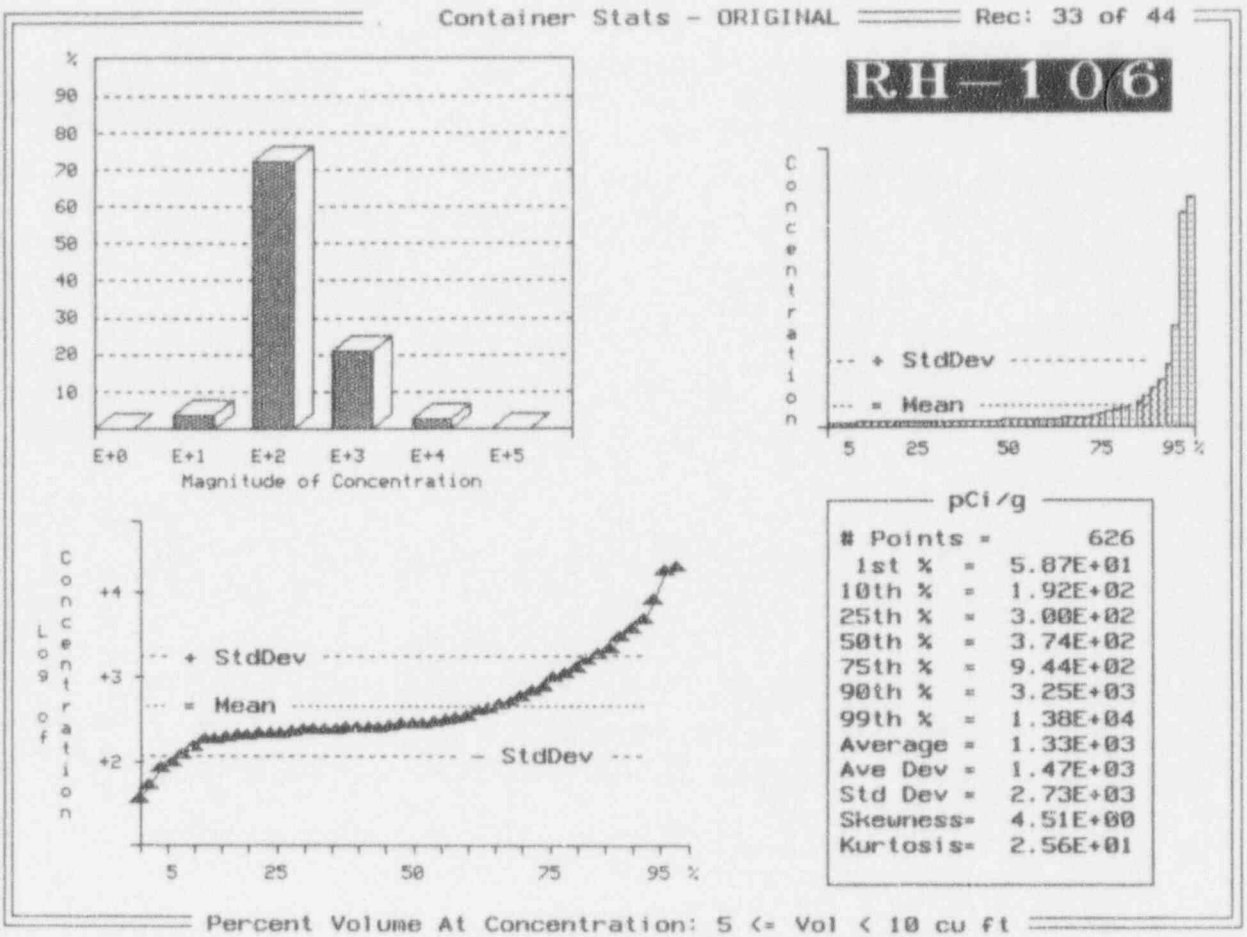

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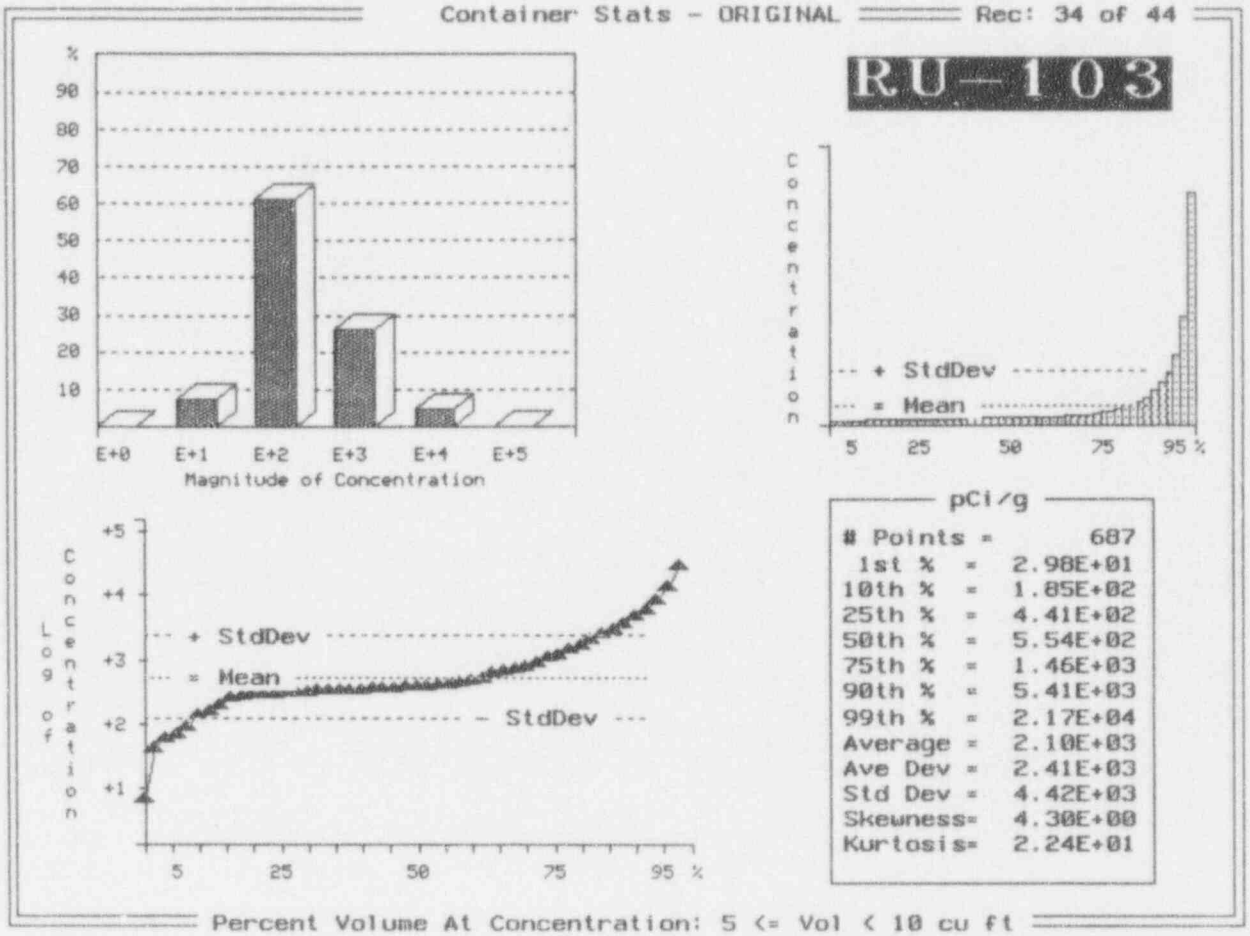

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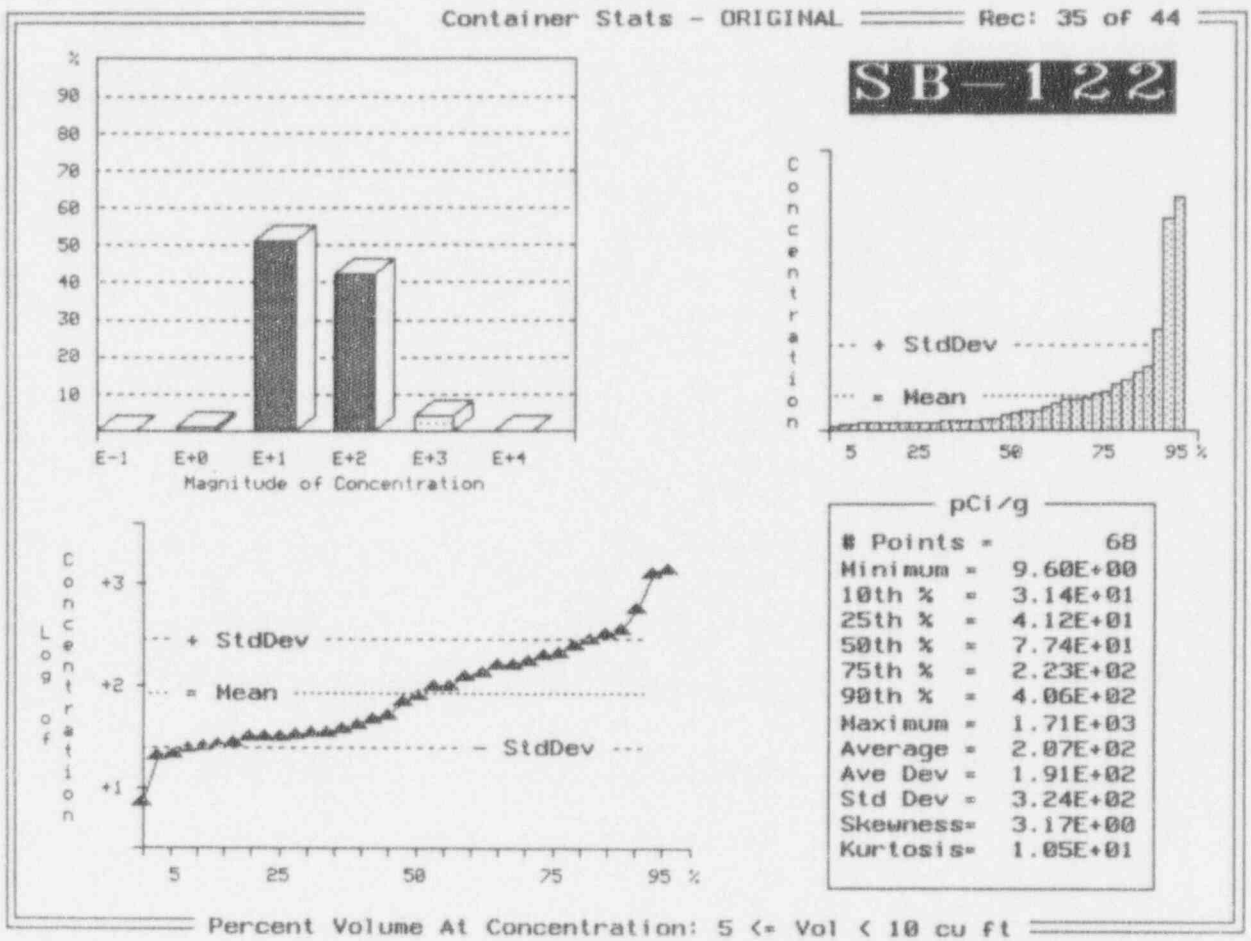

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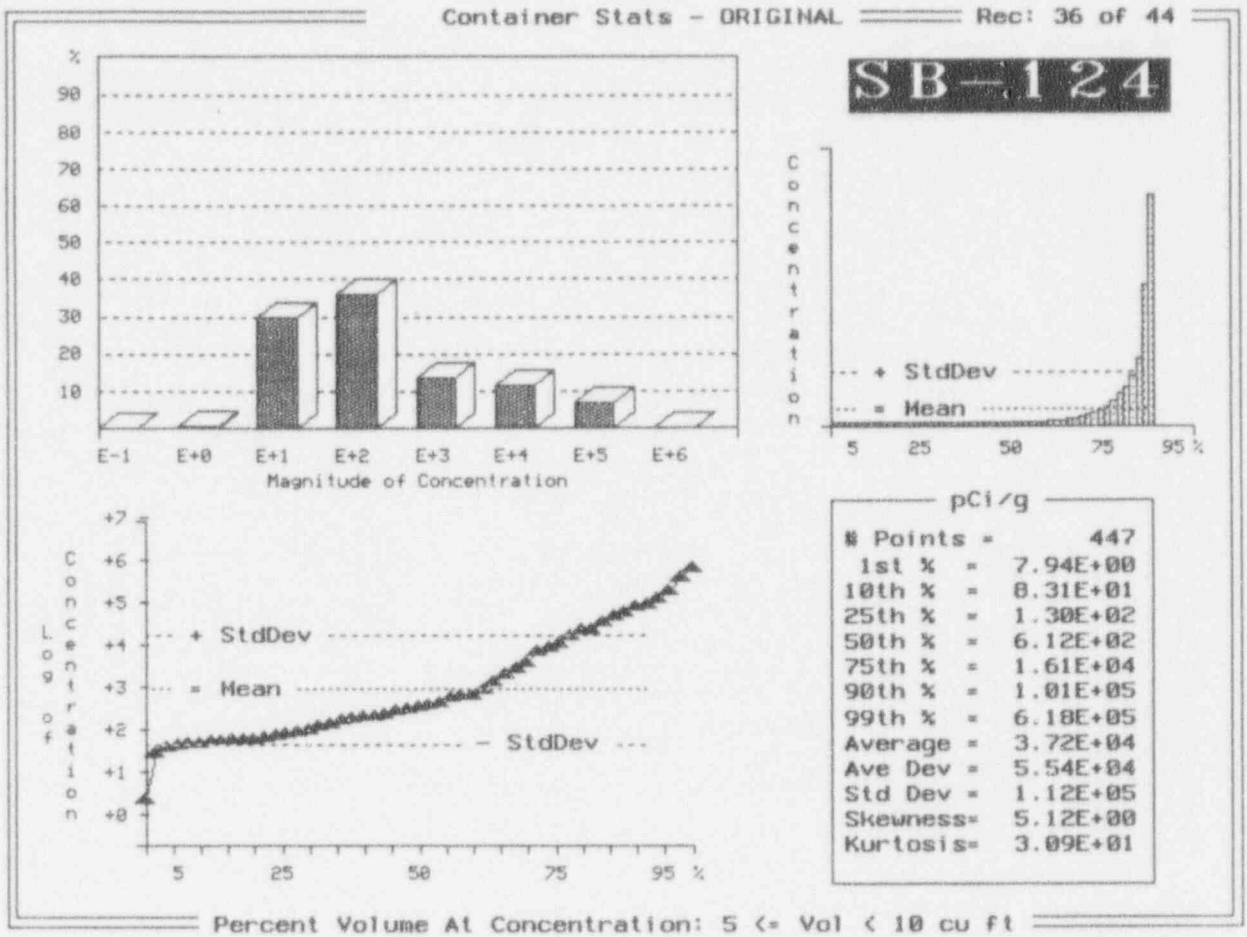

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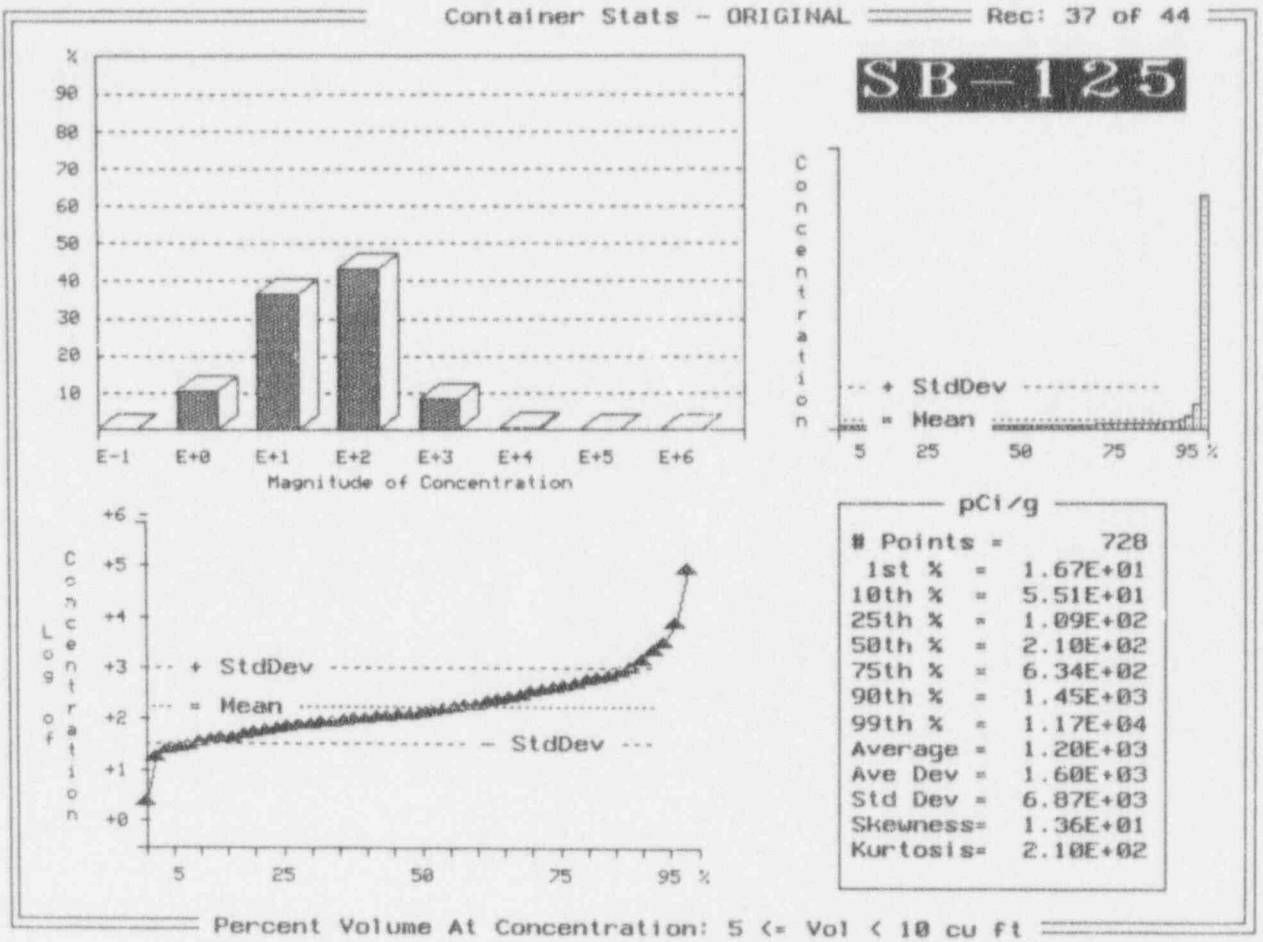

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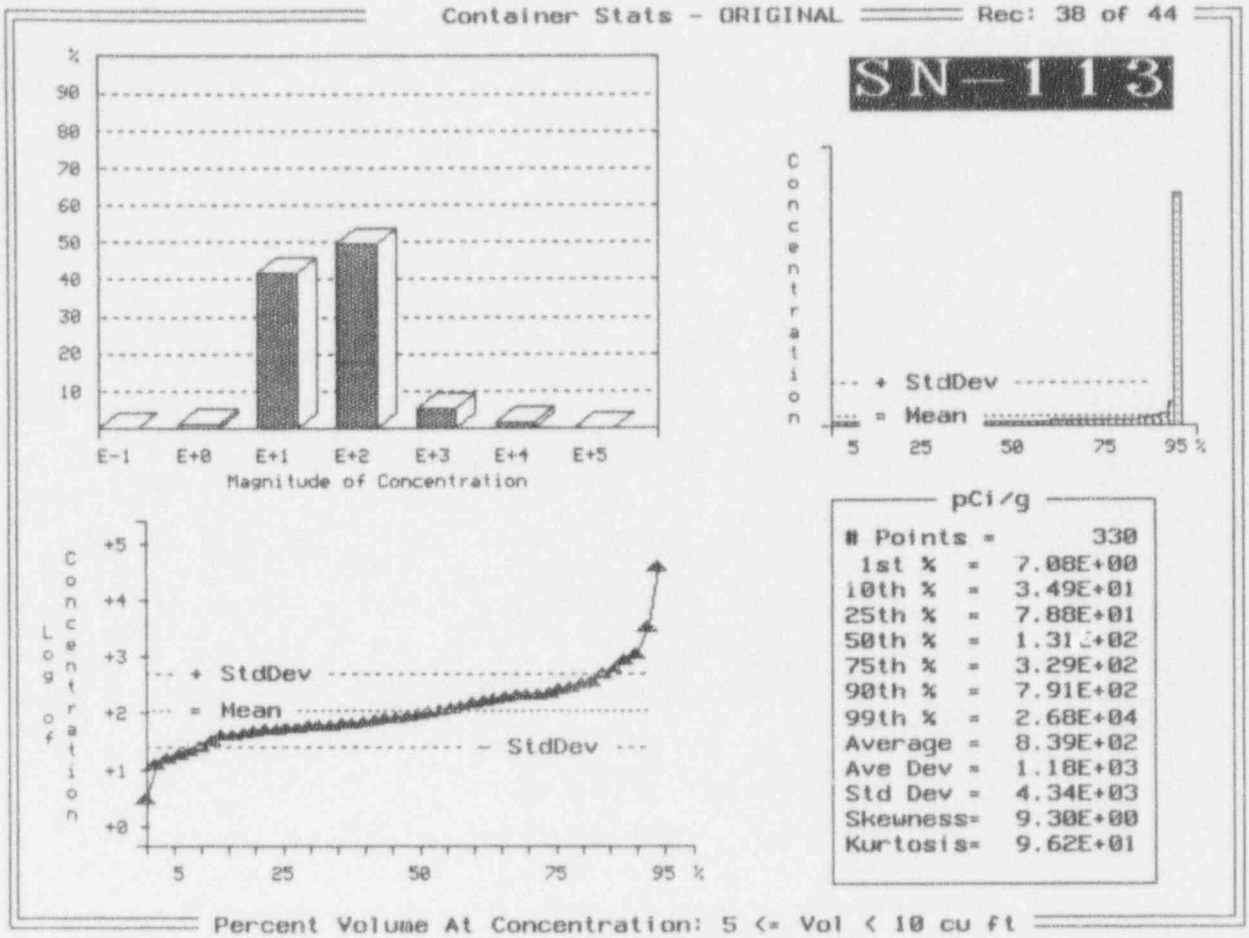

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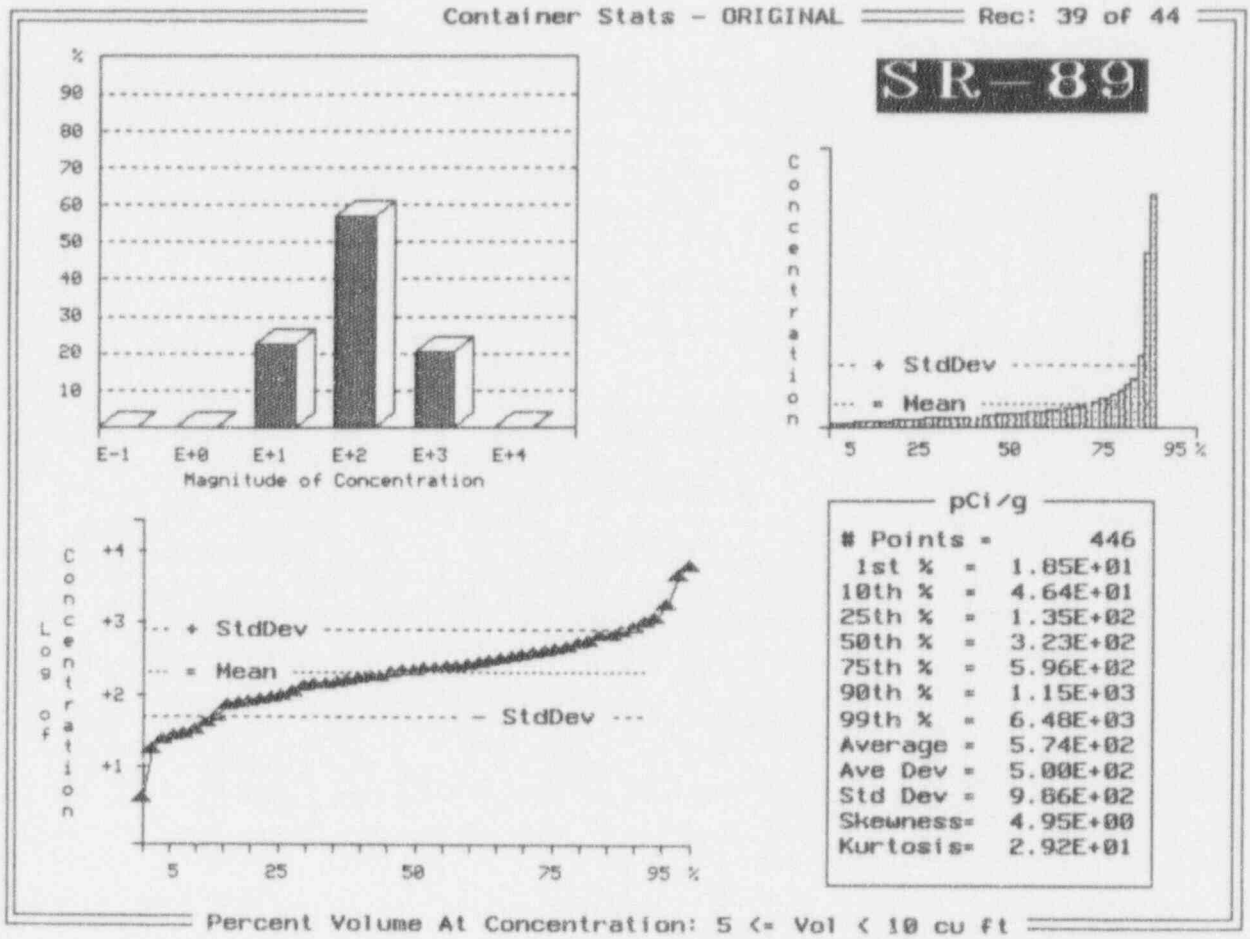

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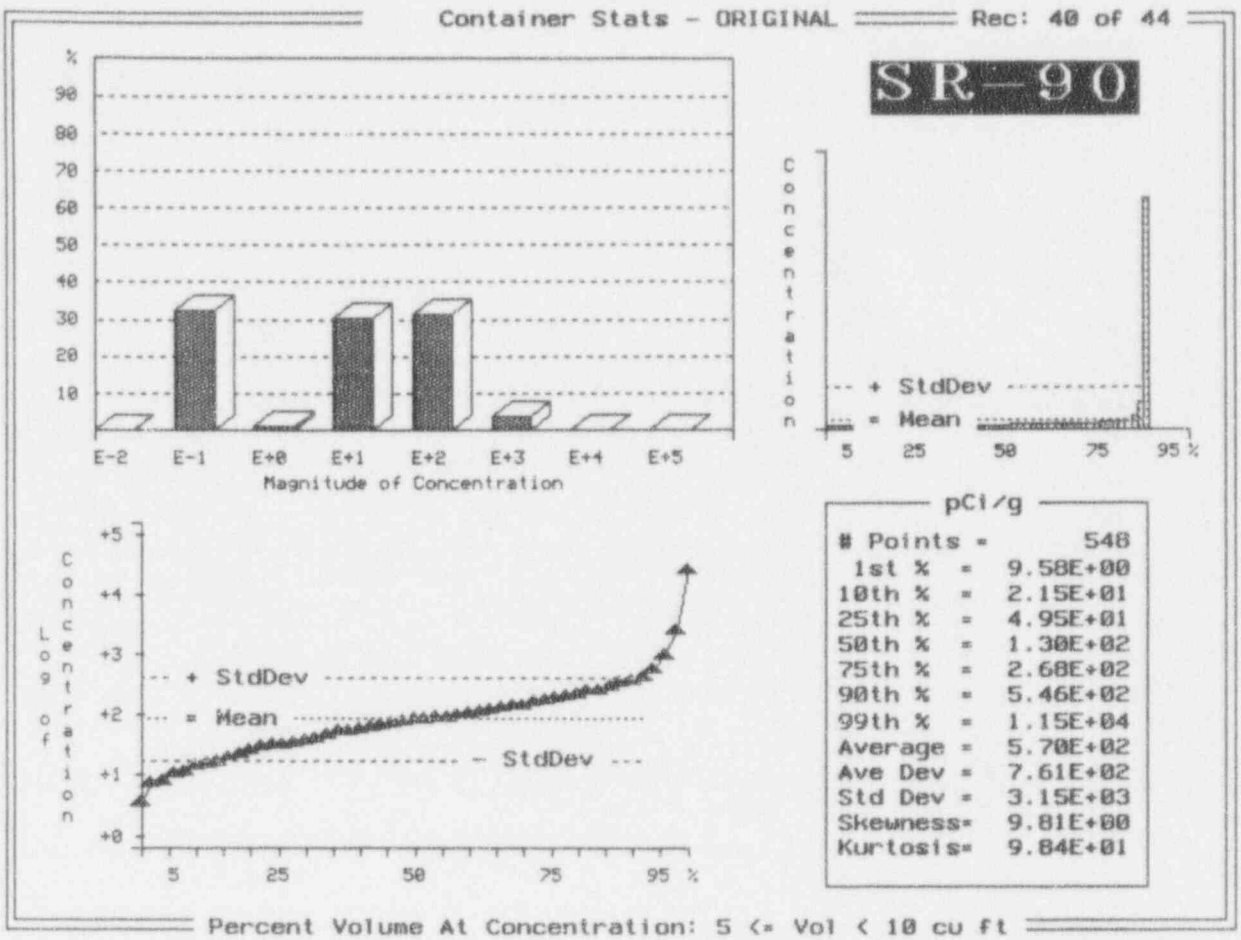

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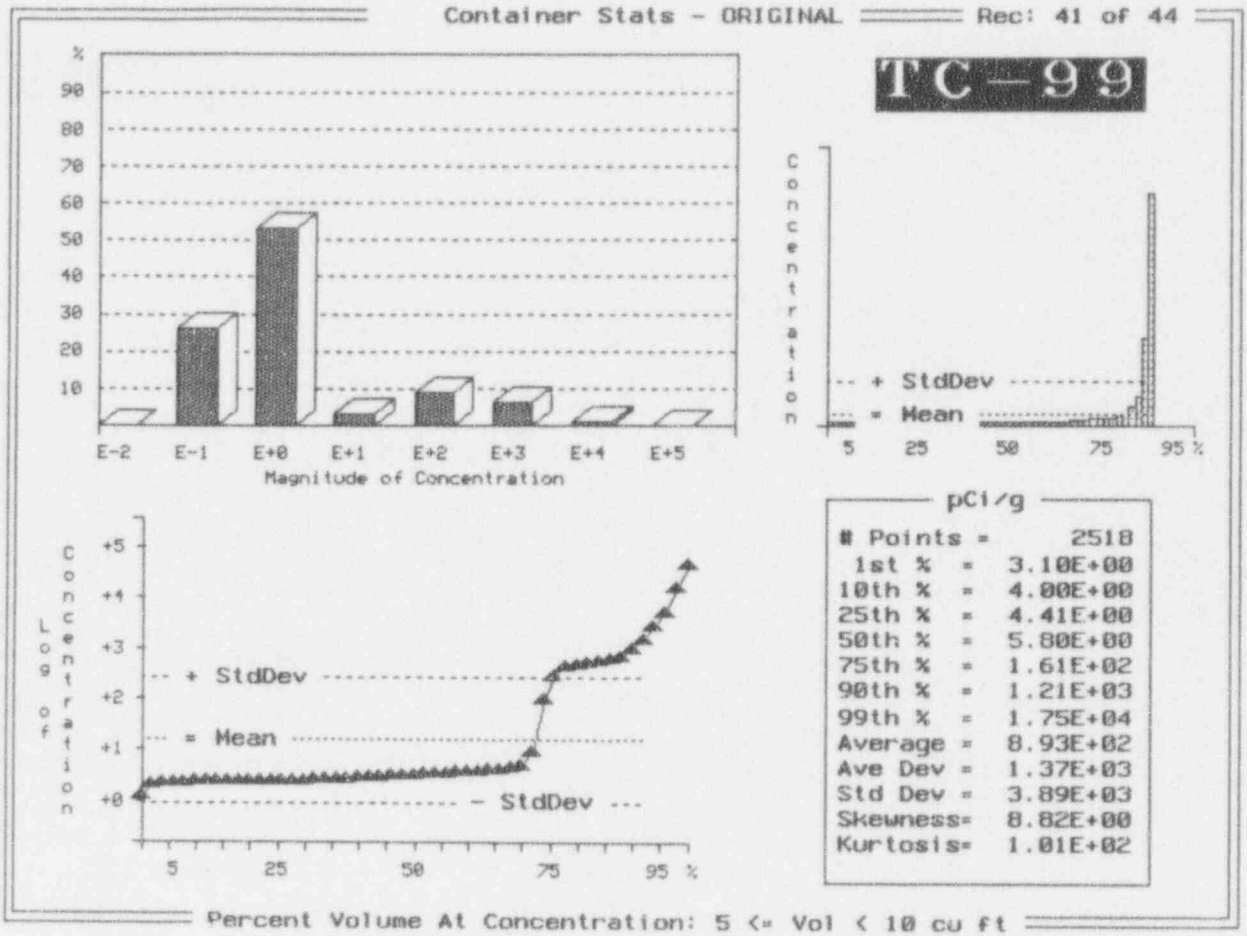

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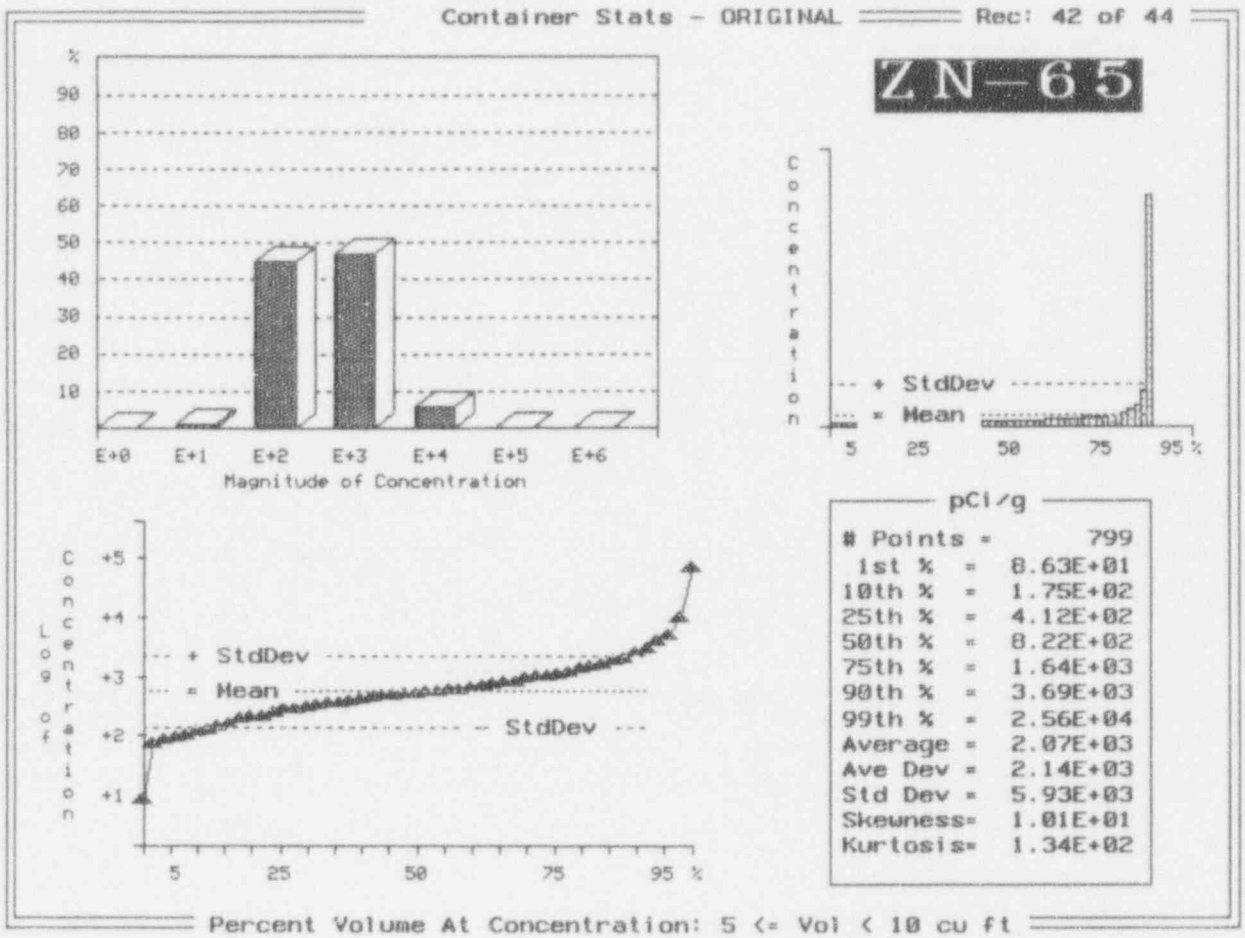

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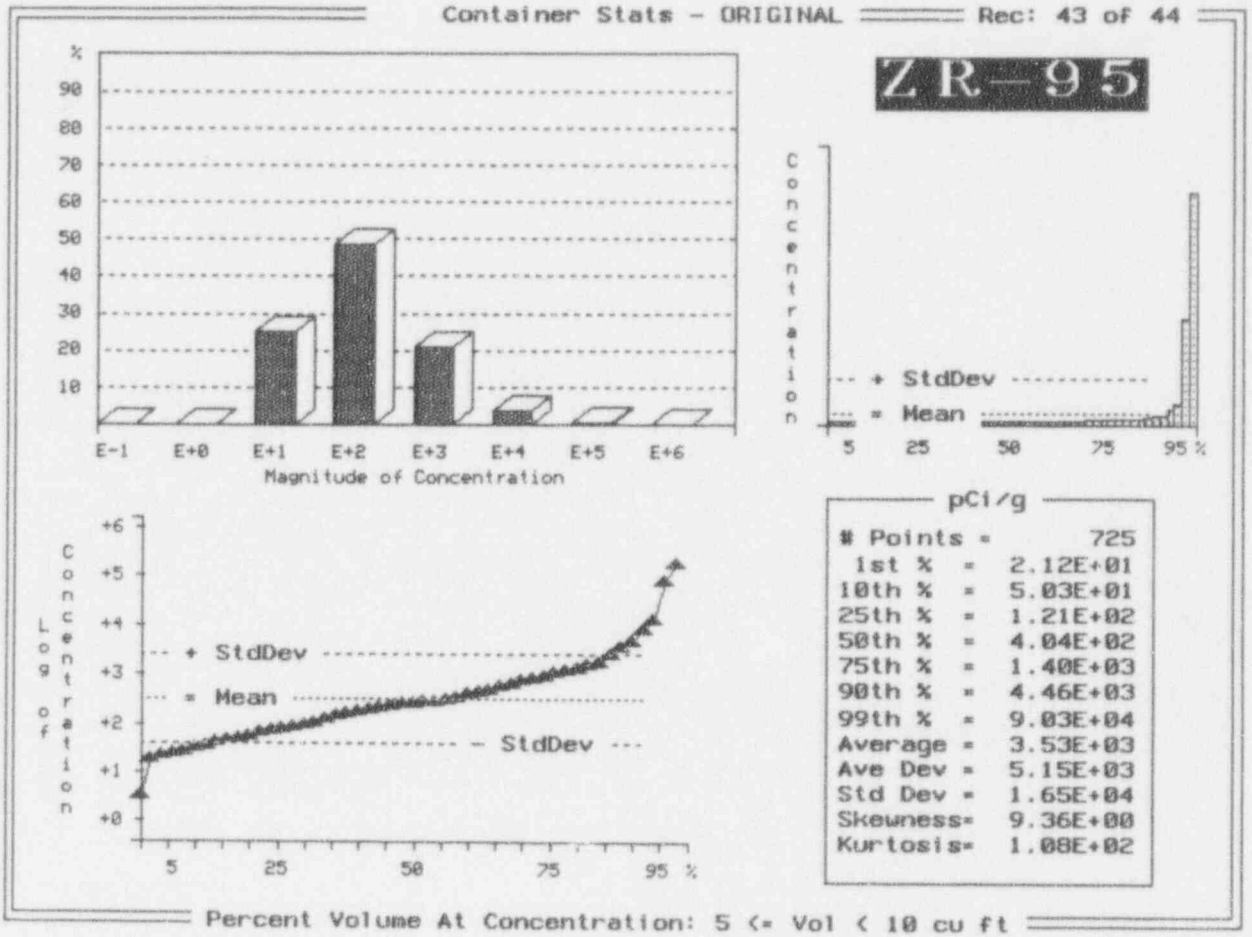

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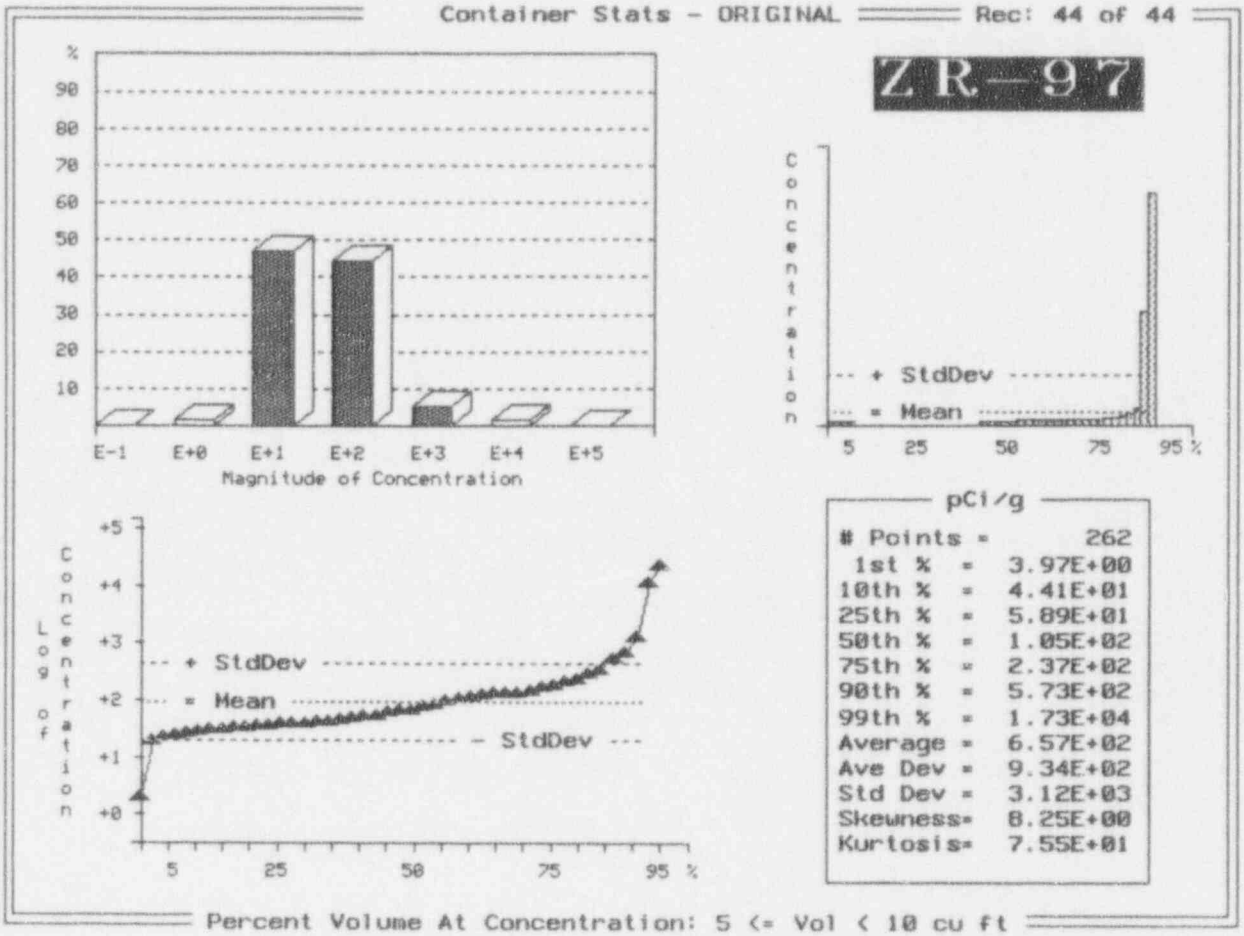


Exhibit I-7 Non-Compacted Dry Active Waste Radionuclide Distributions - Container Level Analysis for 1989 Non-Brokered Utility Waste and All Regions and States[a]

Waste Class: A-Unstable and A-Stable
Solidification/Absorption media: Cement and Oil-Dri
Number of shipping records: 59
Number of shipping containers: 976
Total waste volume: 654.1 m^3
Total waste mass: 390,000 Kg
Average waste form density: 0.59 g/cm^3

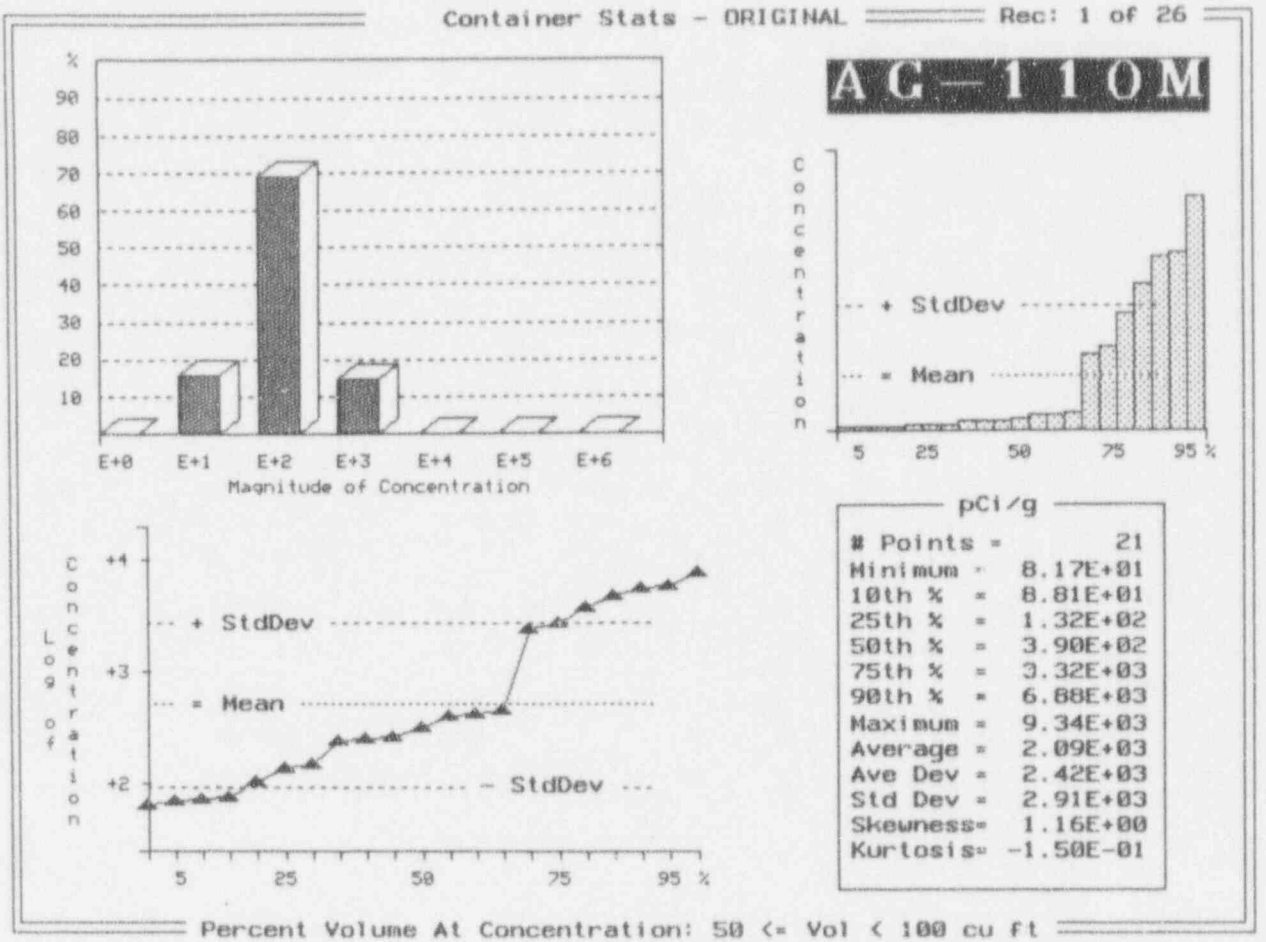
Nuclide	Concentration Ranges - Ci/m^3 - 1st	50th	99th	Percentile[b] - pCi/g - 1st	50th	99th
Ag-110m	4.04E-05	2.17E-04	5.08E-03	8.17E+01	3.90E+02	9.34E+03
C-14	4.71E-06	9.42E-06	1.89E-02	2.38E+00	2.42E+01	4.44E+04
Ce-144	6.58E-07	3.22E-05	5.40E-03	8.81E-01	7.22E+01	1.92E+04
Cm-242	3.21E-07	3.21E-07	5.14E-06	4.05E-01	5.95E-01	8.86E+00
Co-58	4.71E-06	2.83E-04	2.22E-01	5.87E+00	8.16E+02	5.47E+05
Co-60	4.05E-04	2.59E-03	4.80E-01	3.49E+02	2.56E+03	1.72E+06
Cr-51	4.71E-06	9.42E-05	2.76E-03	4.94E+00	2.88E+02	8.20E+03
Cs-134	2.35E-05	2.35E-04	1.55E-01	2.50E+01	1.92E+02	4.60E+05
Cs-137	1.32E-04	9.42E-04	5.70E-02	9.19E+01	1.43E+03	1.47E+05
Fe-55	1.41E-04	3.53E-03	5.60E-01	1.33E+02	1.83E+03	2.01E+06
Fe-59	3.94E-06	3.48E-05	8.75E-03	1.38E+01	7.54E+01	3.11E+04
H-3	4.71E-06	1.49E-03	4.10E-02	2.78E+00	4.34E+03	9.25E+04
I-129	4.71E-06	4.71E-06	1.41E-05	2.46E+00	5.51E+00	3.15E+01
I-131	4.71E-06	1.65E-04	2.89E-03	4.94E+00	1.14E+02	2.95E+03
Mn-54	4.71E-06	6.03E-04	2.34E-01	7.49E+00	1.41E+03	7.24E+05
Nb-95	3.61E-06	2.24E-04	8.87E-03	1.26E+01	5.06E+02	3.15E+04
Ni-63	1.41E-05	3.30E-04	8.25E-01	1.48E+01	2.39E+02	2.56E+06
Pu-241	9.42E-06	7.06E-05	1.13E-03	8.54E+00	5.60E+01	1.15E+03
Ru-103	4.60E-06	5.22E-05	1.10E-02	1.61E+01	1.17E+02	3.91E+04
Ru-106	4.71E-06	4.71E-05	6.22E-04	4.94E+00	3.80E+01	6.36E+02
Sb-124	4.24E-05	3.81E-04	8.11E-02	1.28E+02	8.88E+02	2.88E+05

Exhibit I-7 Non-Compacted Dry Active Waste Radionuclide Distributions - Container Level Analysis for 1989 Non-Brokered Utility Waste and All Regions and States[a], Cont'd

Nuclide	Concentration Ranges - Percentile[b] - Ci/m^3 - 1st	50th	99th	- pCi/g - 1st	50th	99th
Sb-125	4.71E-06	5.65E-05	6.87E-04	2.85E+00	3.93E+01	1.36E+03
Sr-90	9.42E-06	1.22E-04	1.80E-02	1.26E+01	2.89E+02	2.20E+04
Tc-99	4.71E-06	4.71E-06	4.24E-05	2.38E+00	5.87E+00	1.57E+02
Zn-65	1.46E-04	1.46E-03	2.91E-02	1.49E+02	1.07E+03	2.98E+04
Zr-95	4.71E-06	2.35E-05	2.43E-02	4.00E+00	1.76E+01	9.88E+04

(a) Based on LLW data for Beatty and Richland only.
(b) Includes only radionuclides with 30 or more data points characterizing concentration ranges.

Exhibit I-7 (Continued)



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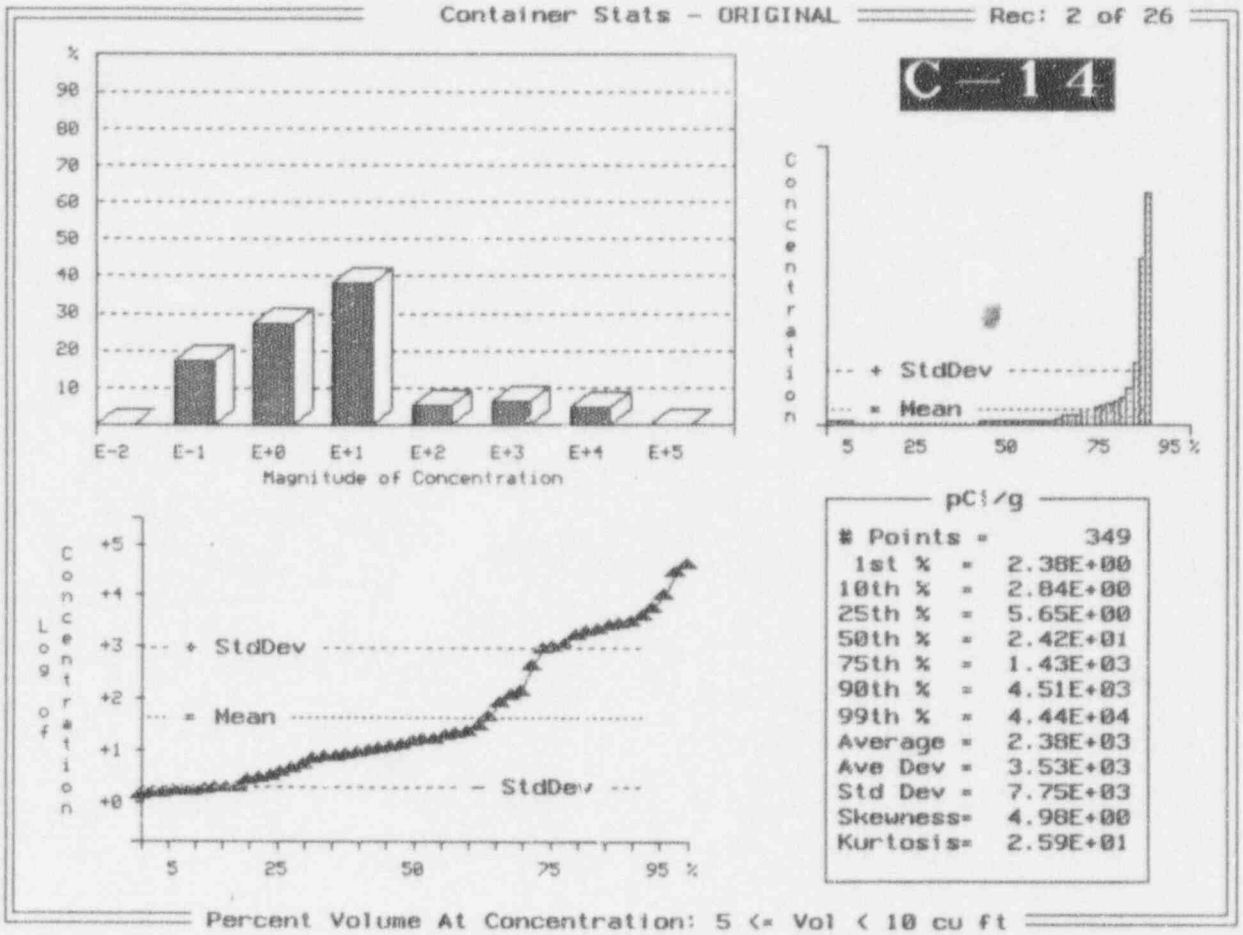

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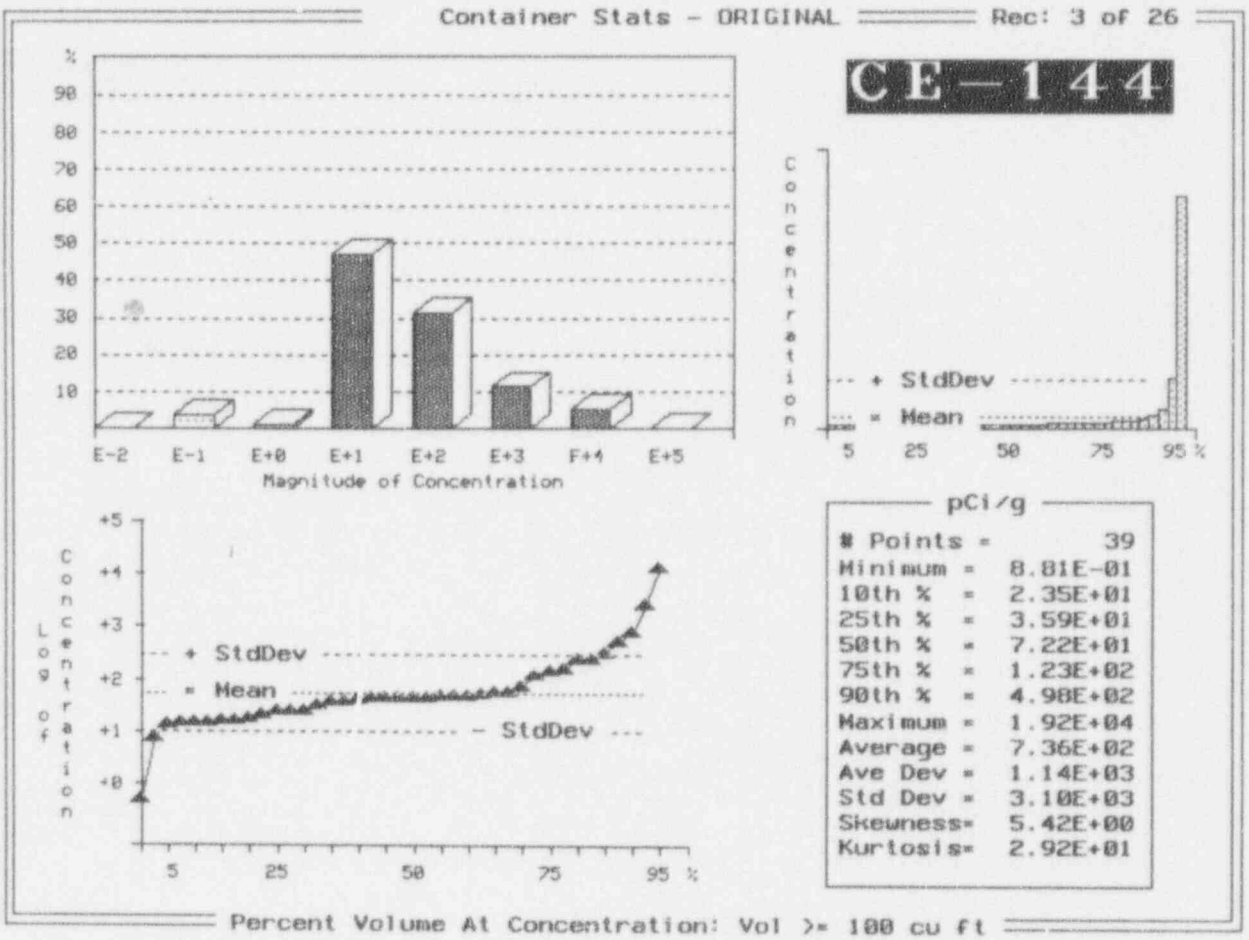

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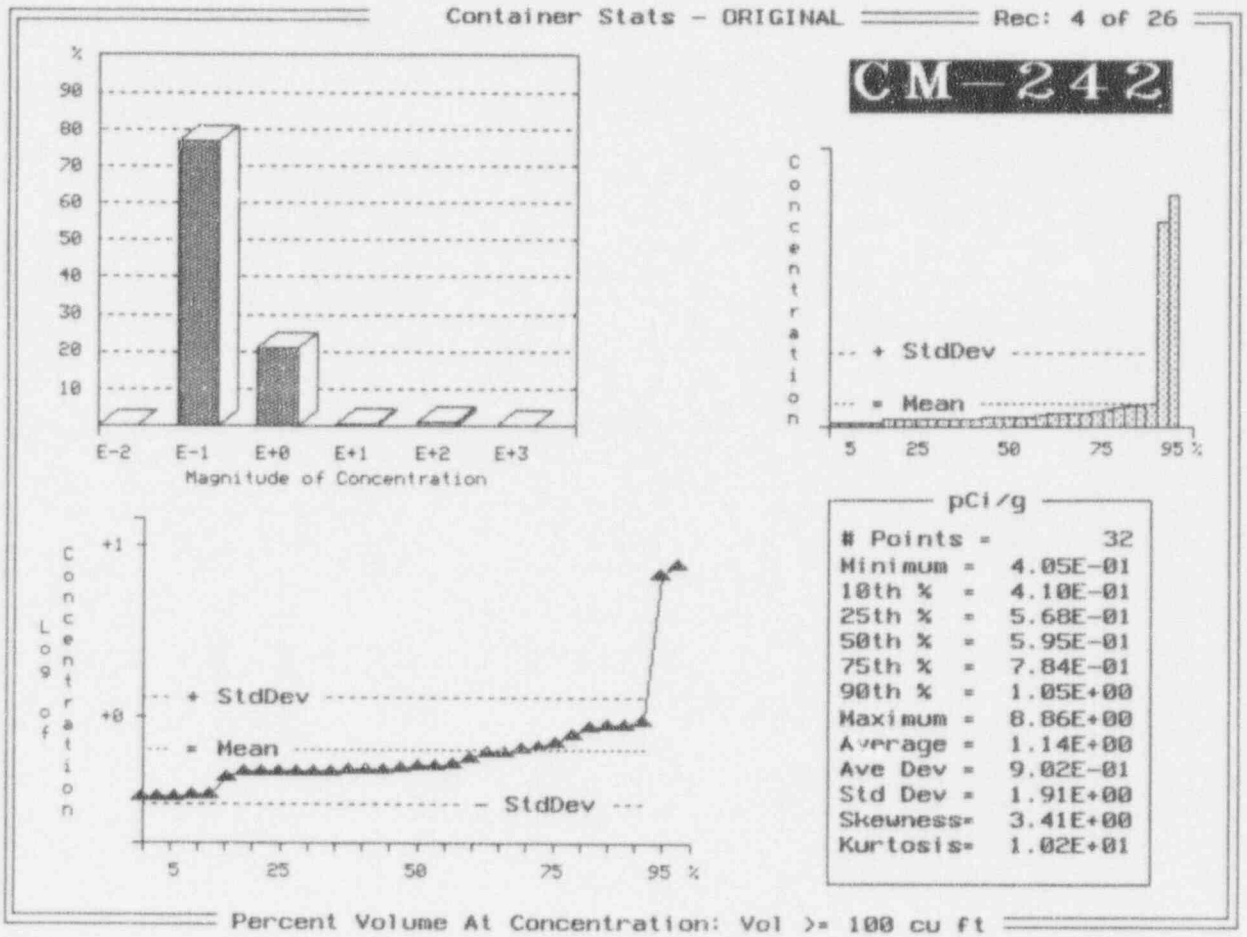

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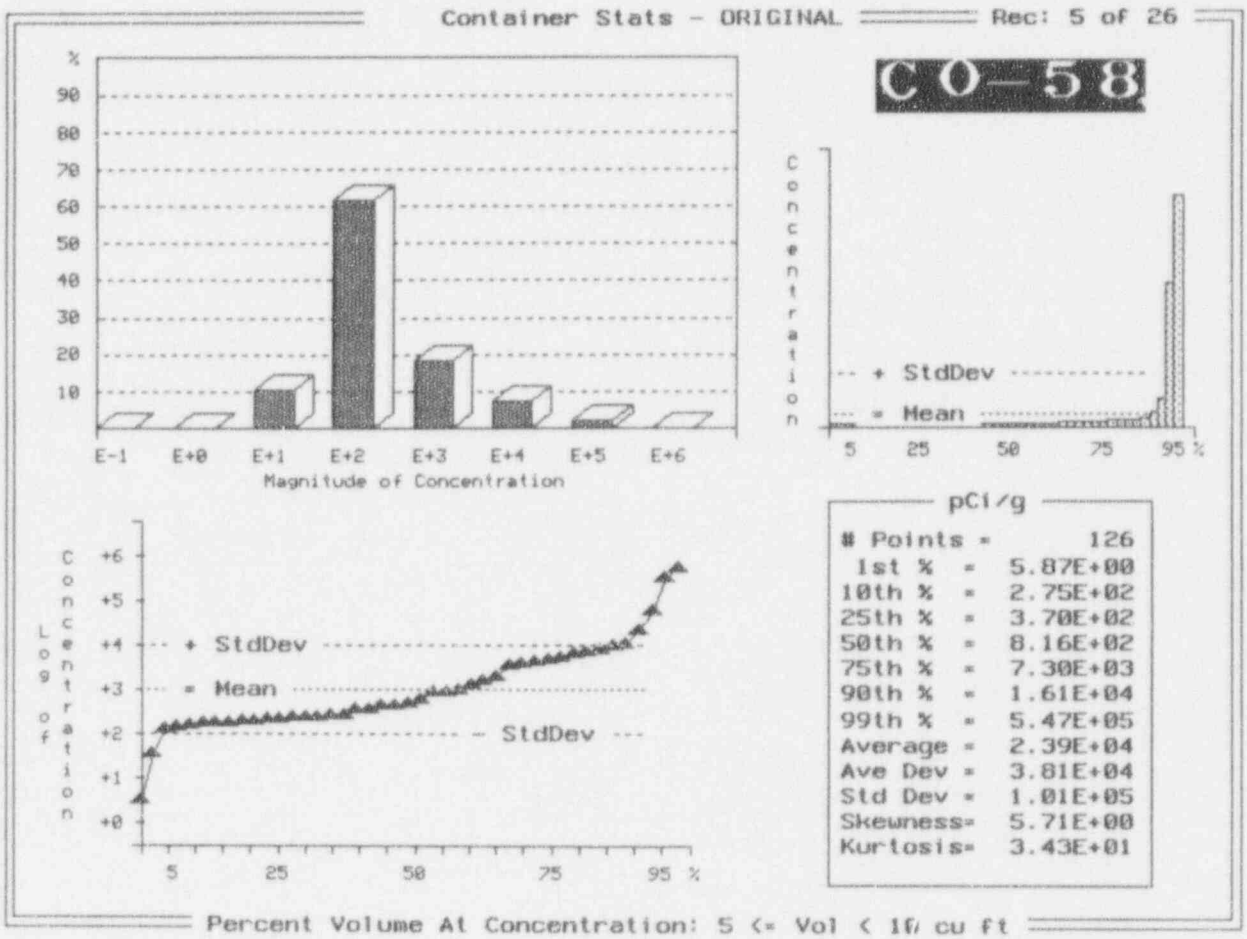

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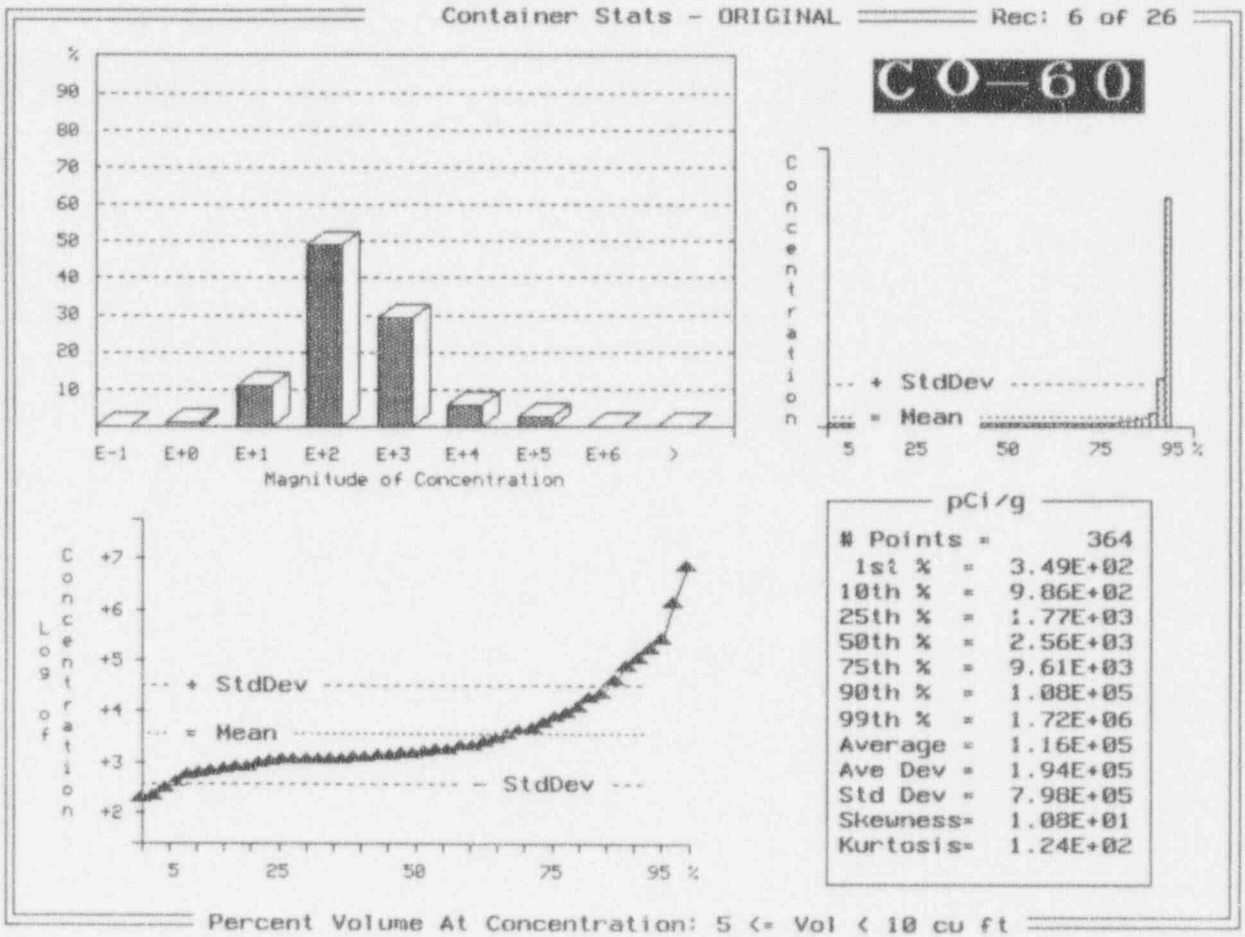

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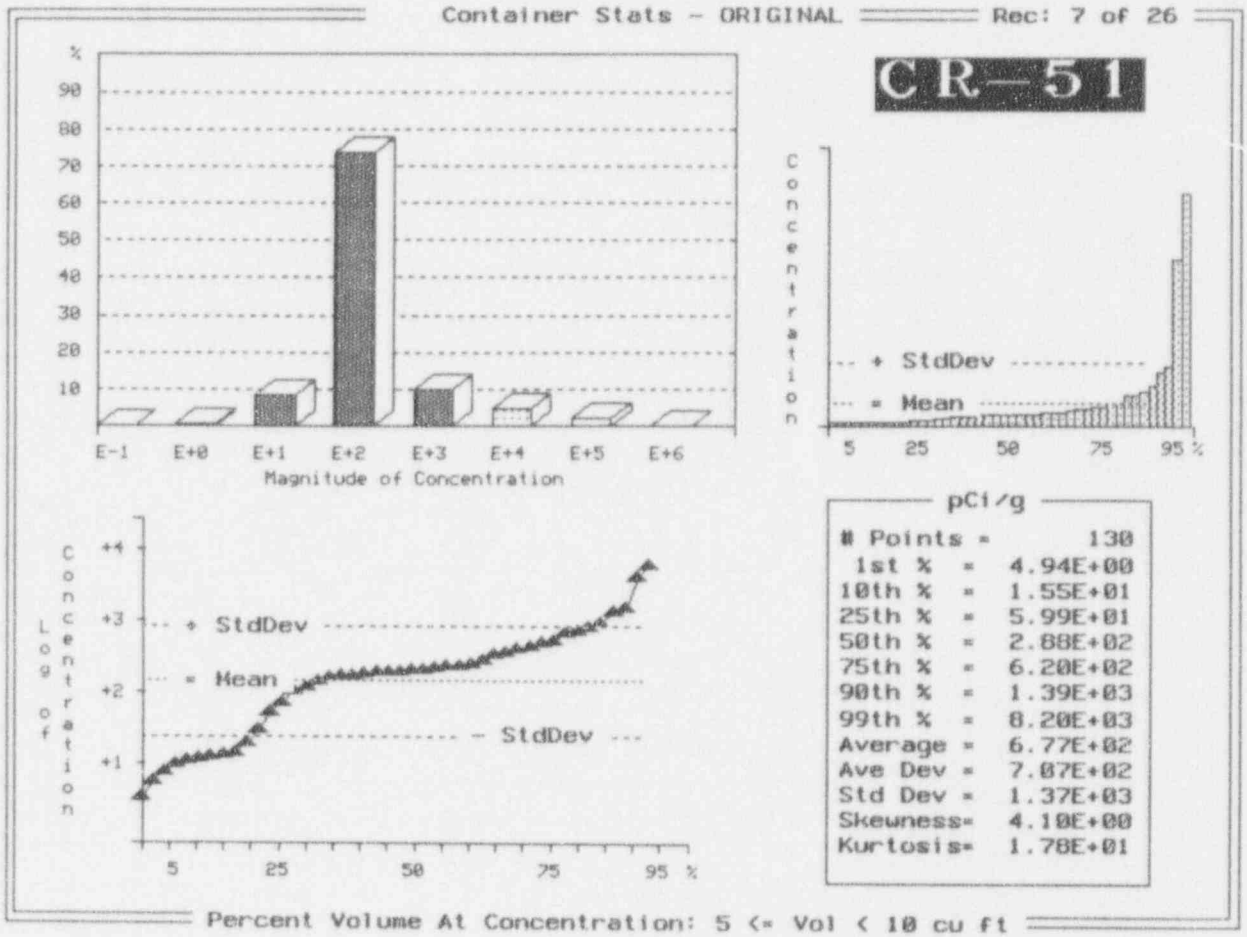

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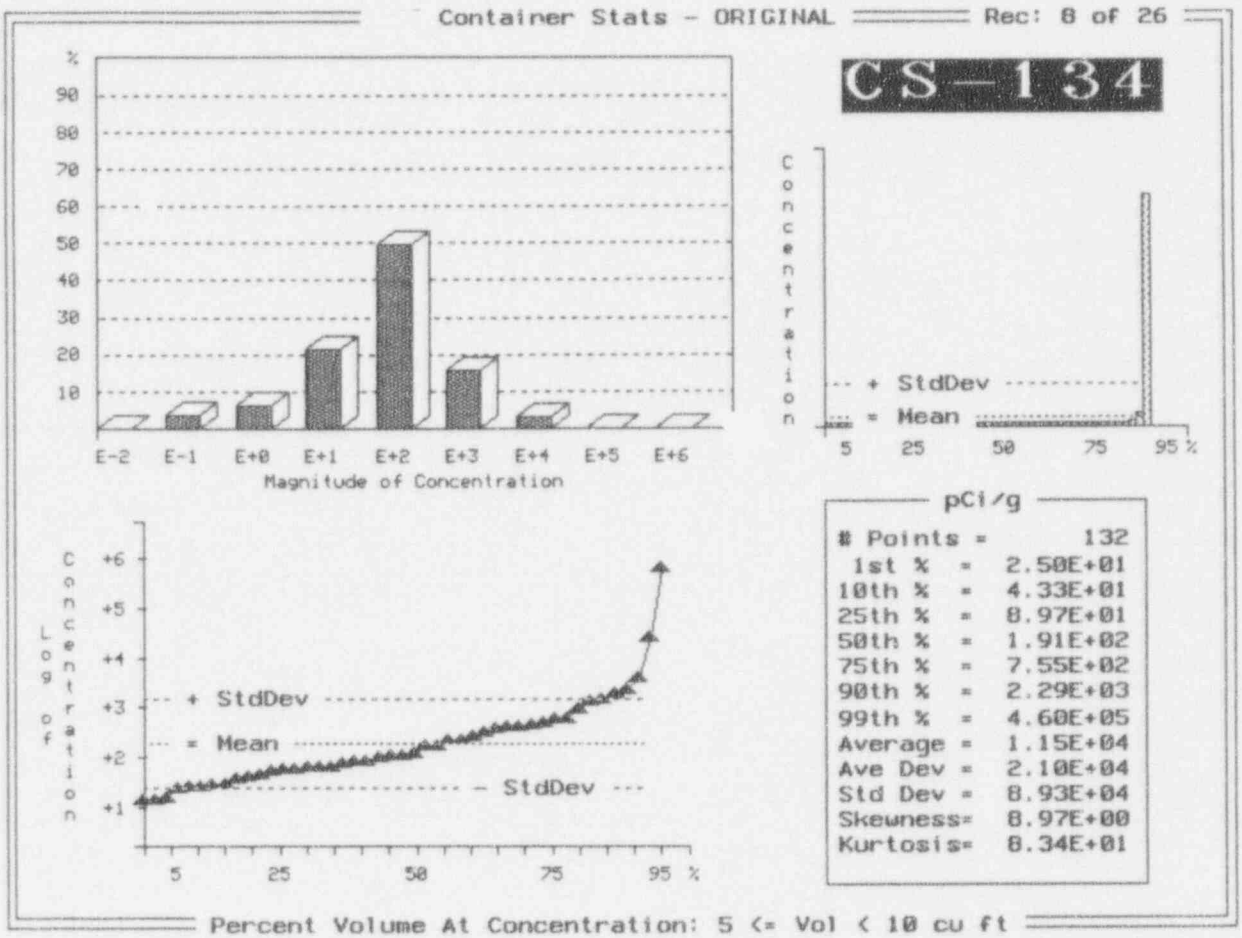

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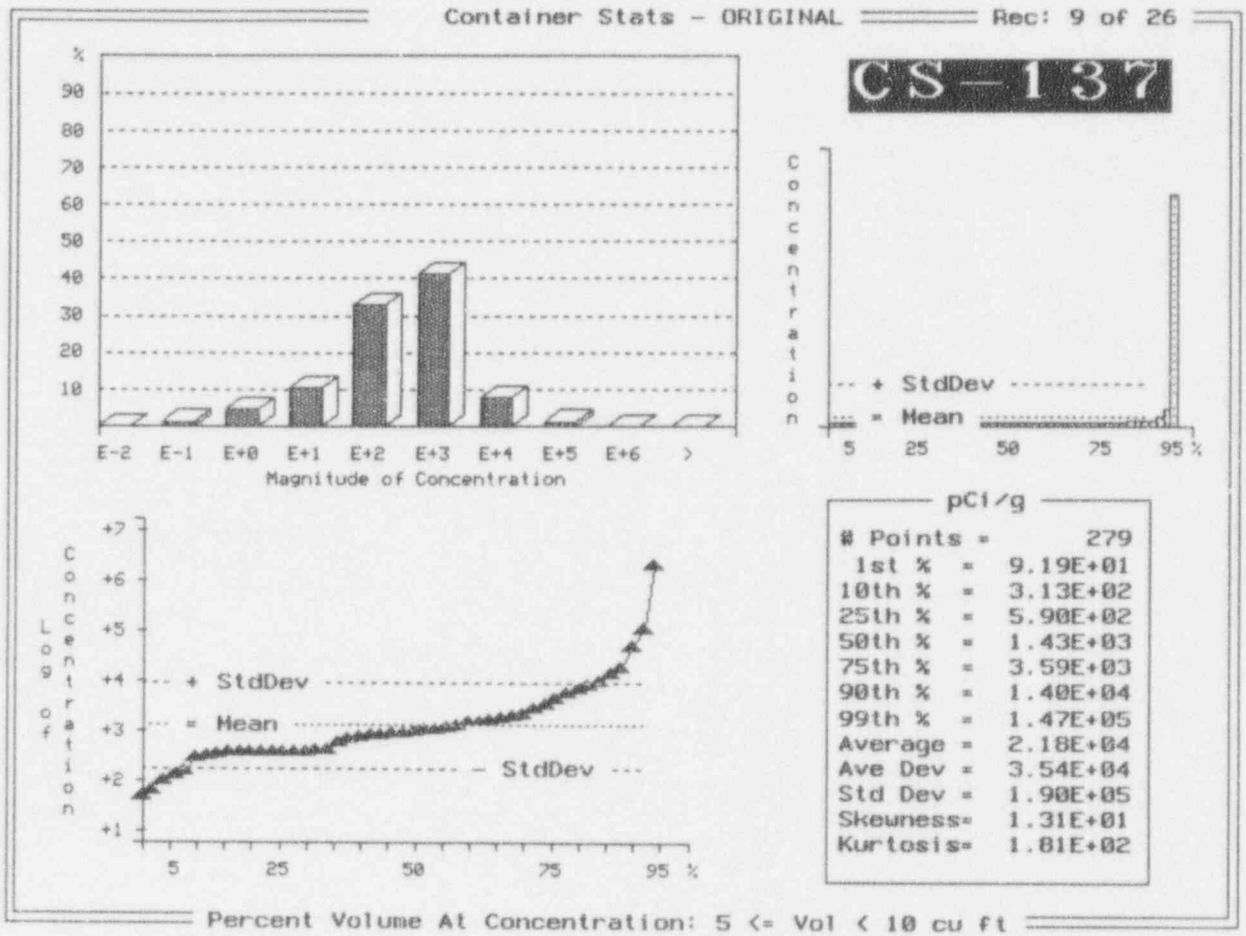

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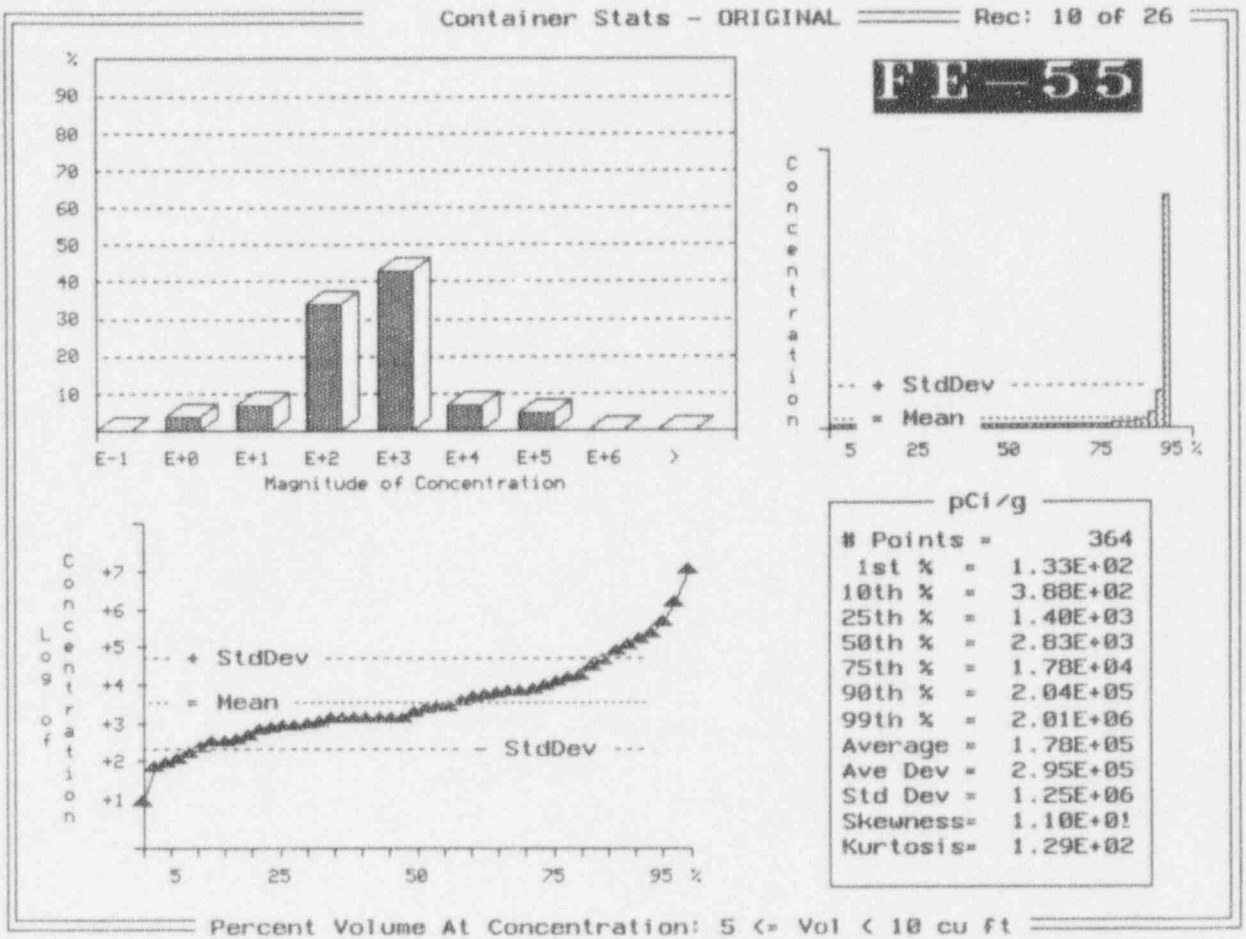

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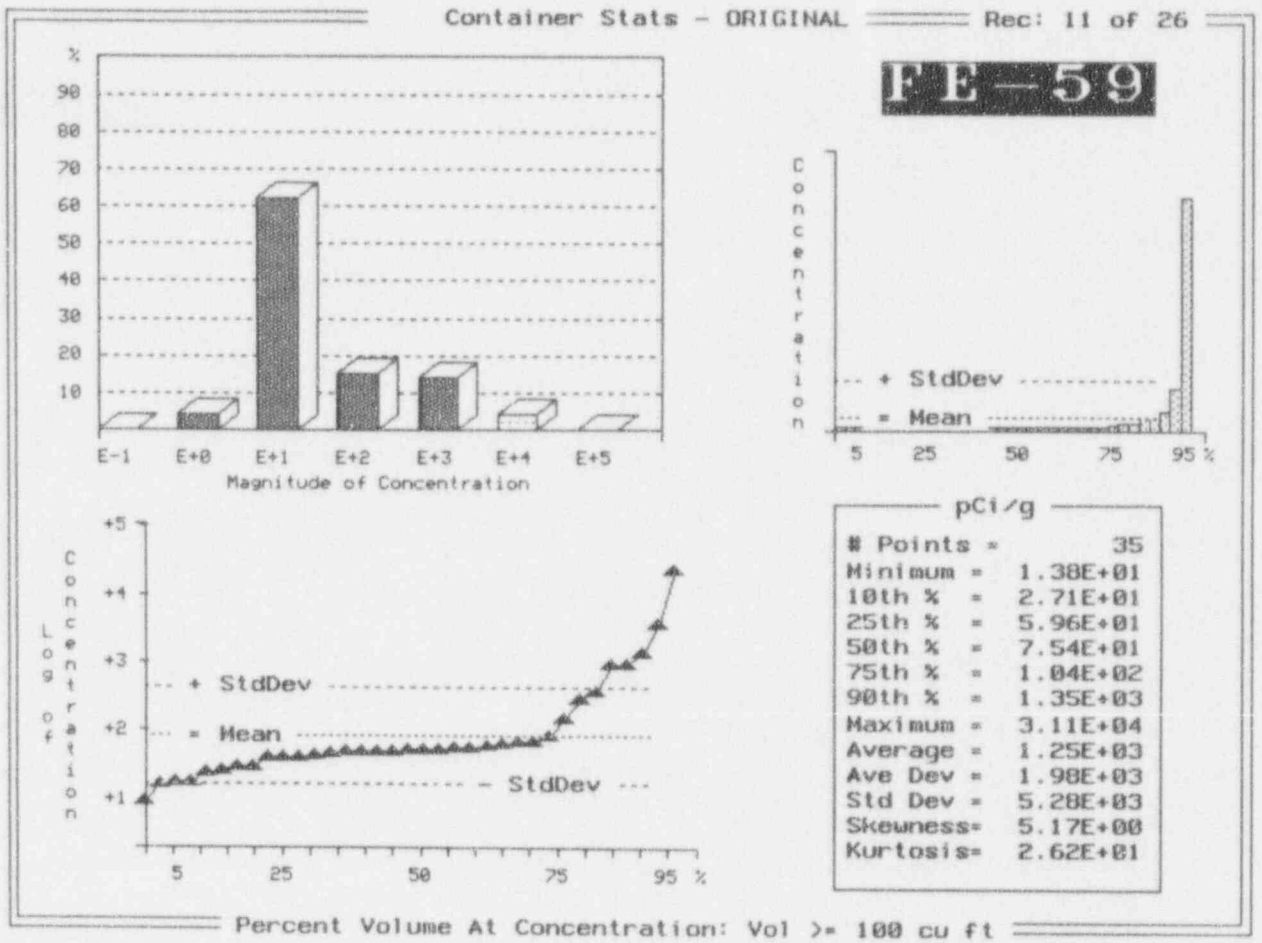

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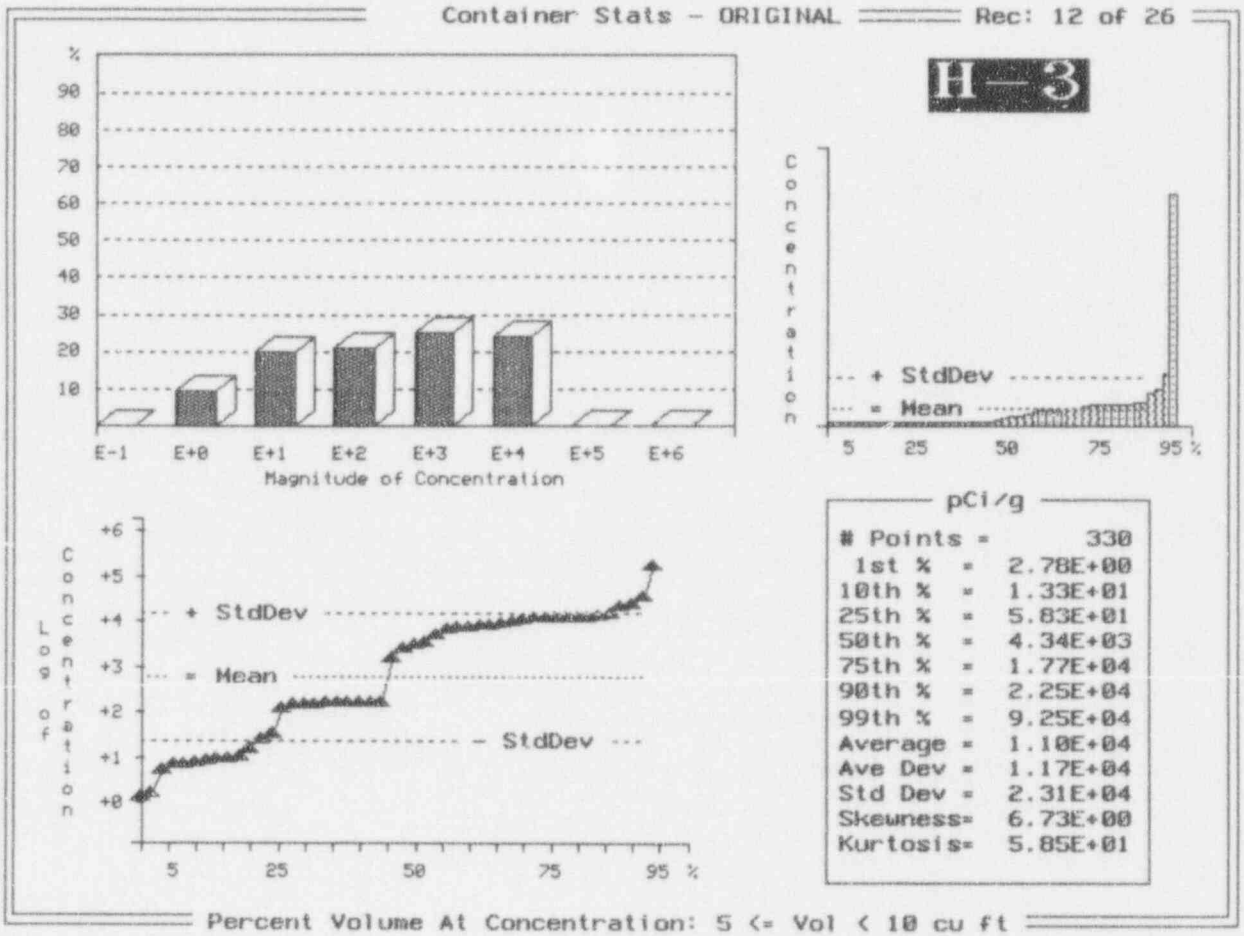

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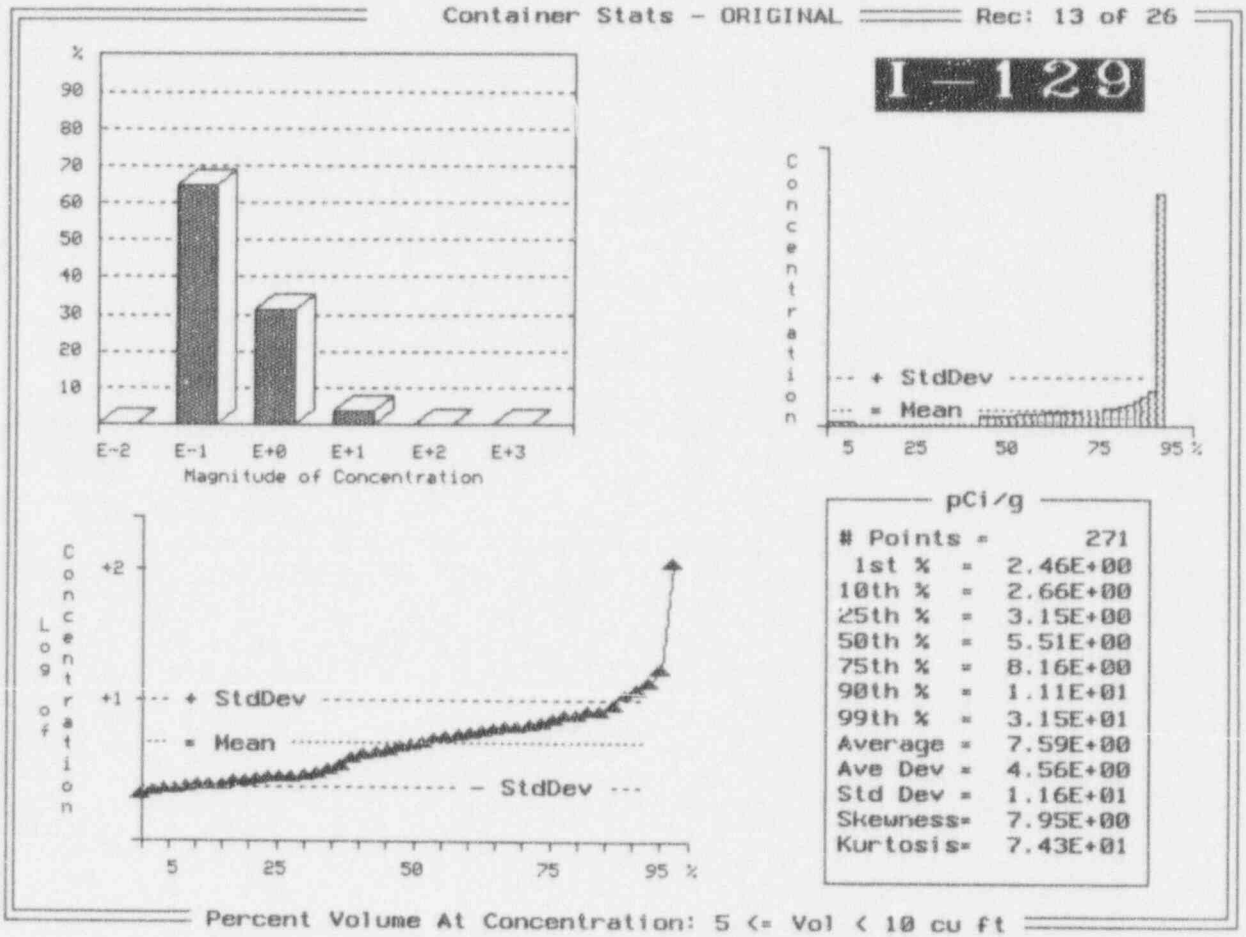

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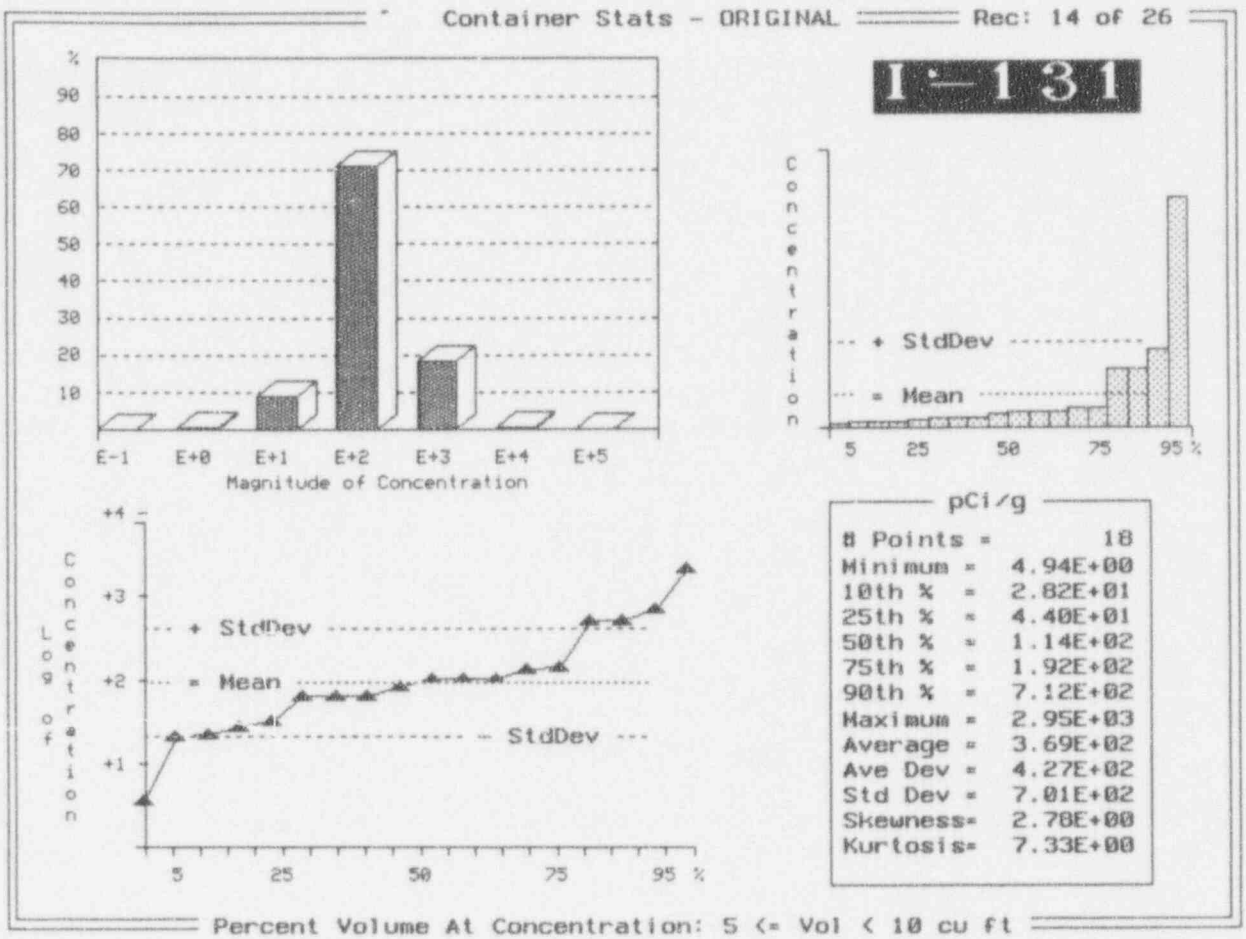

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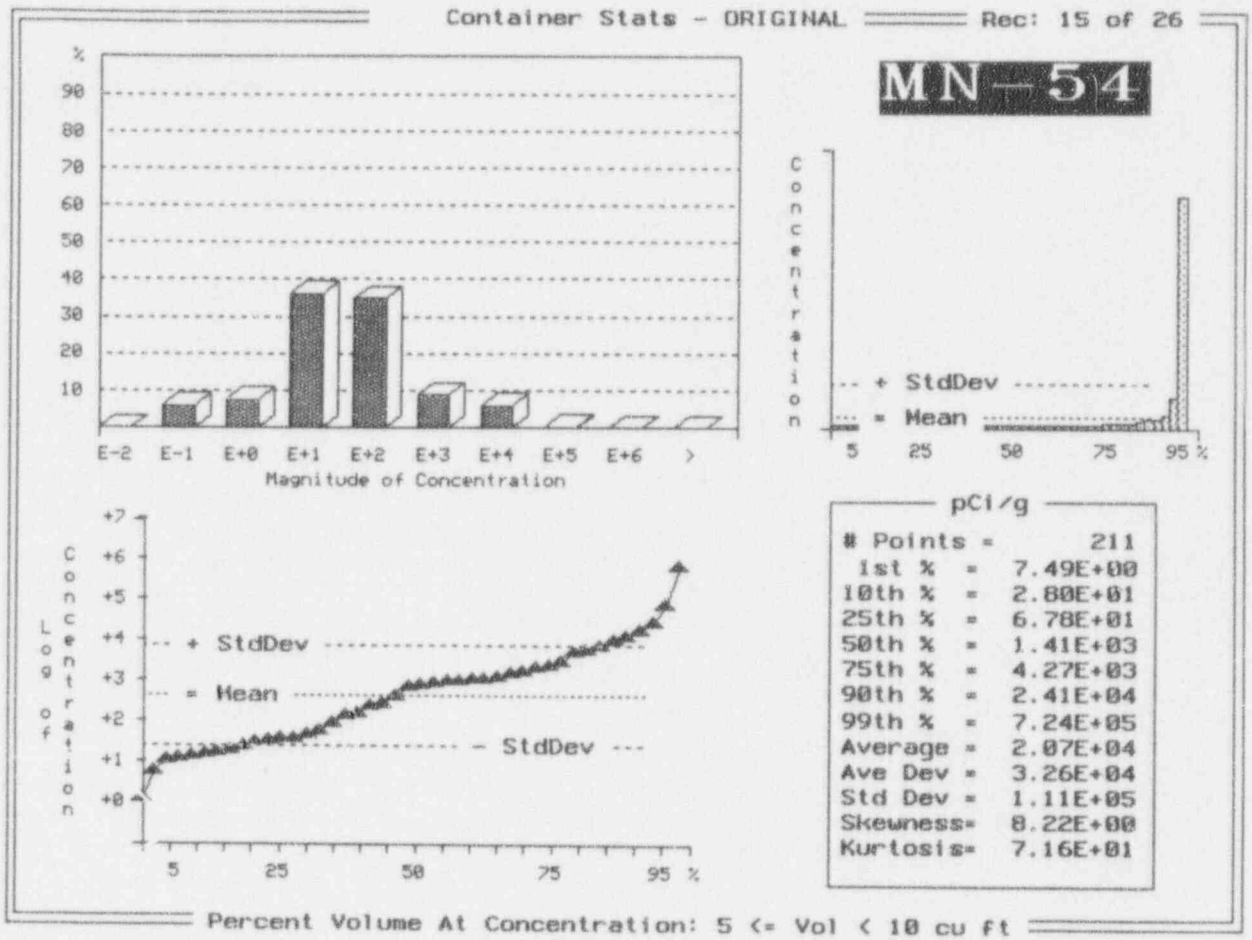

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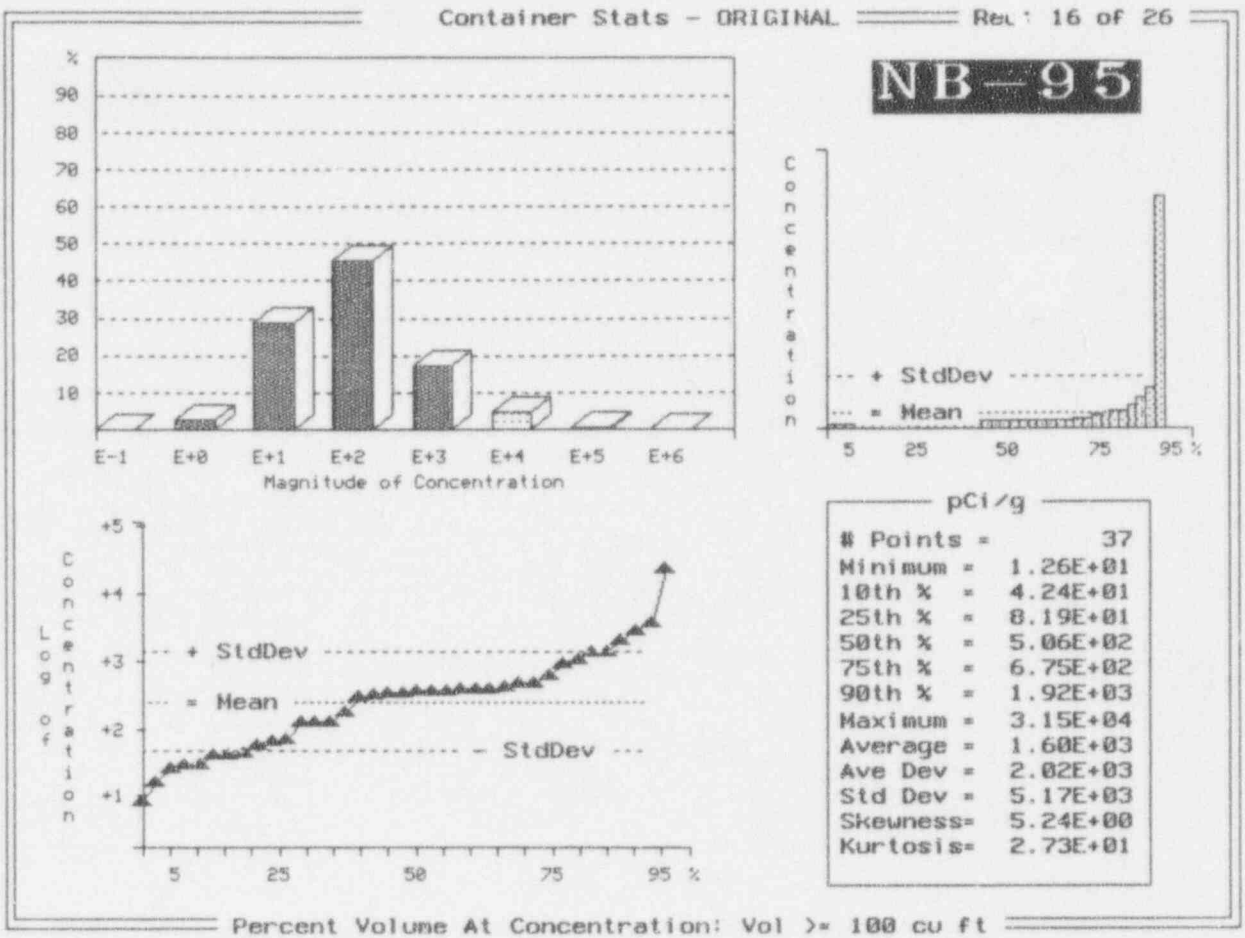

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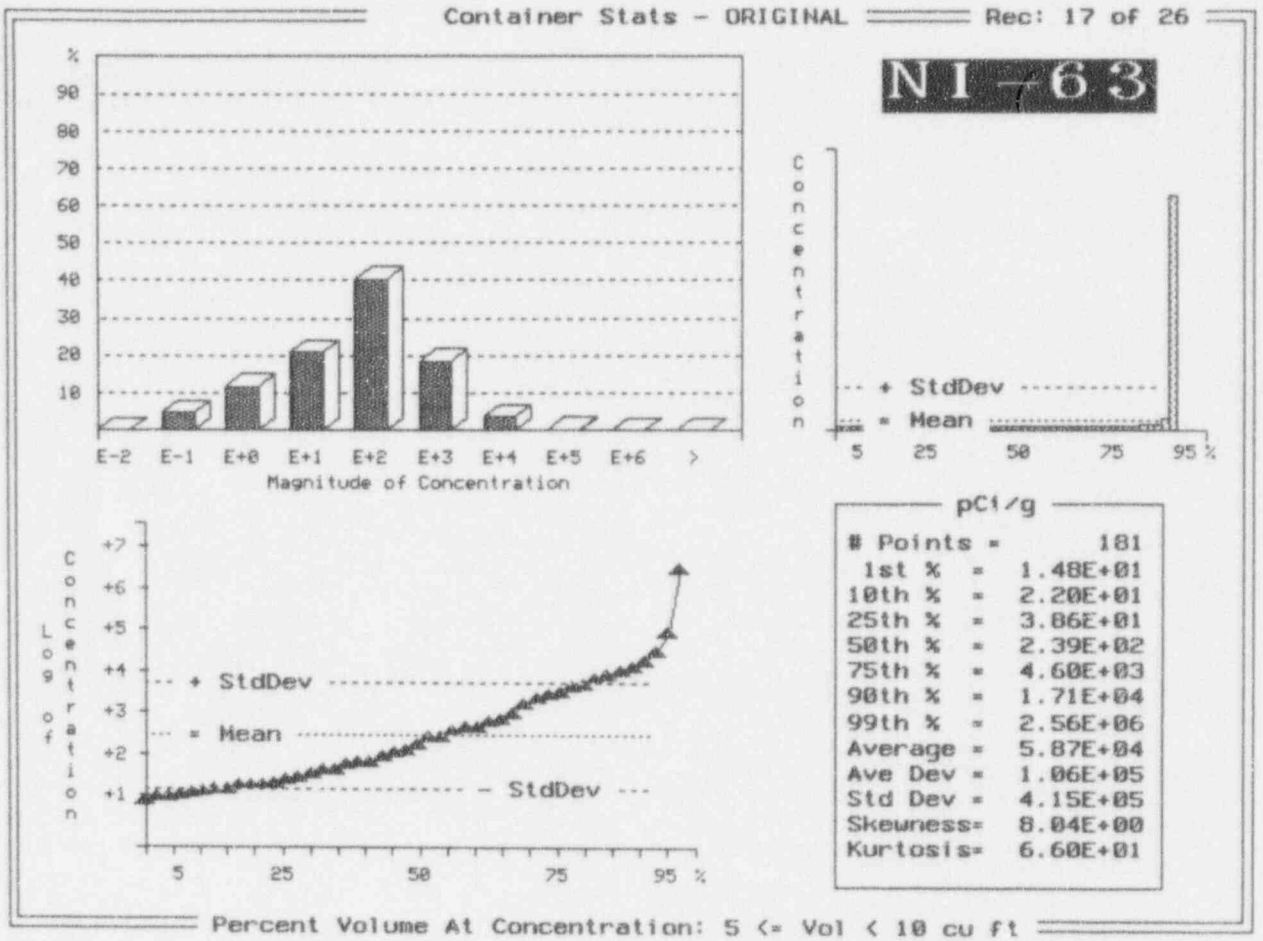

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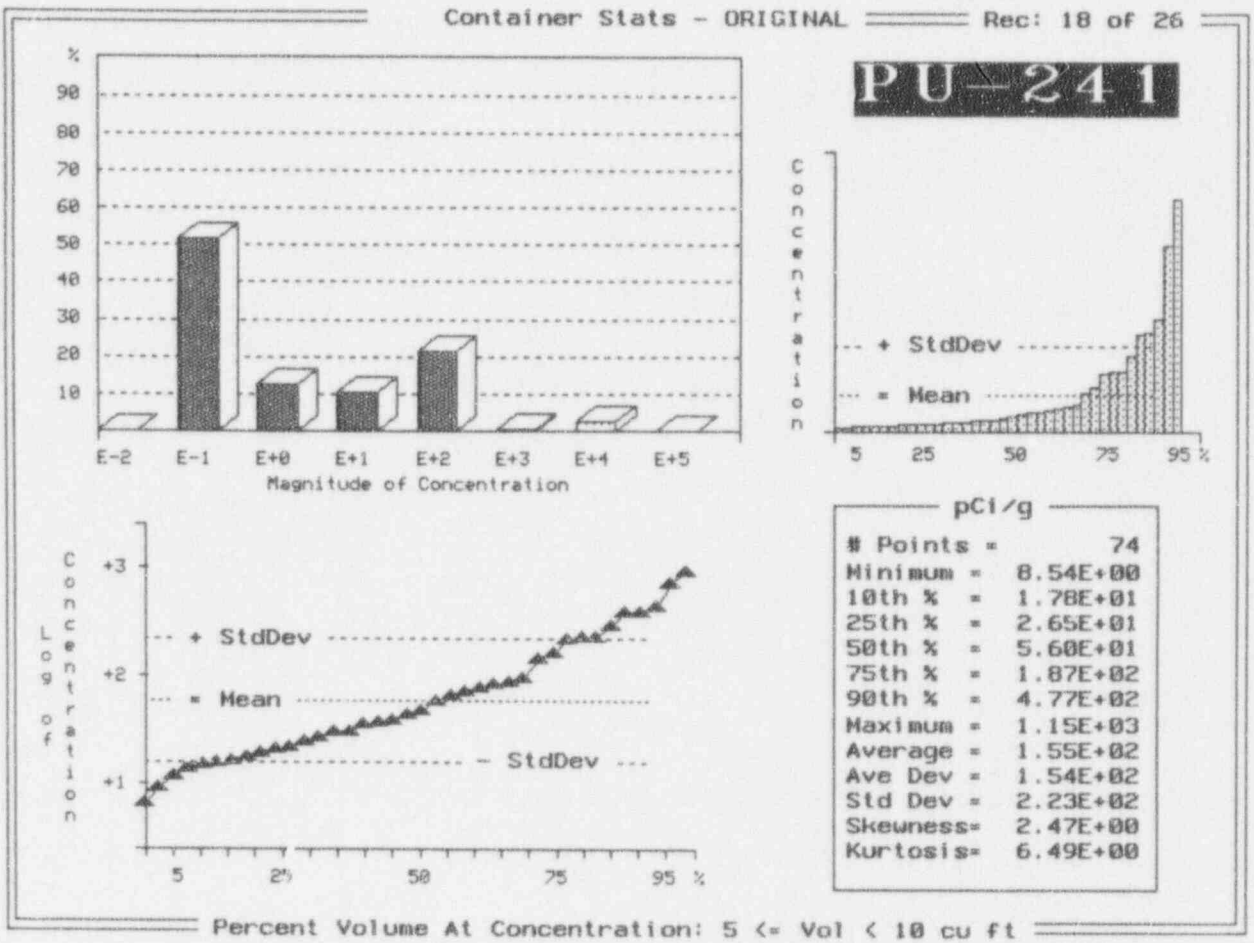
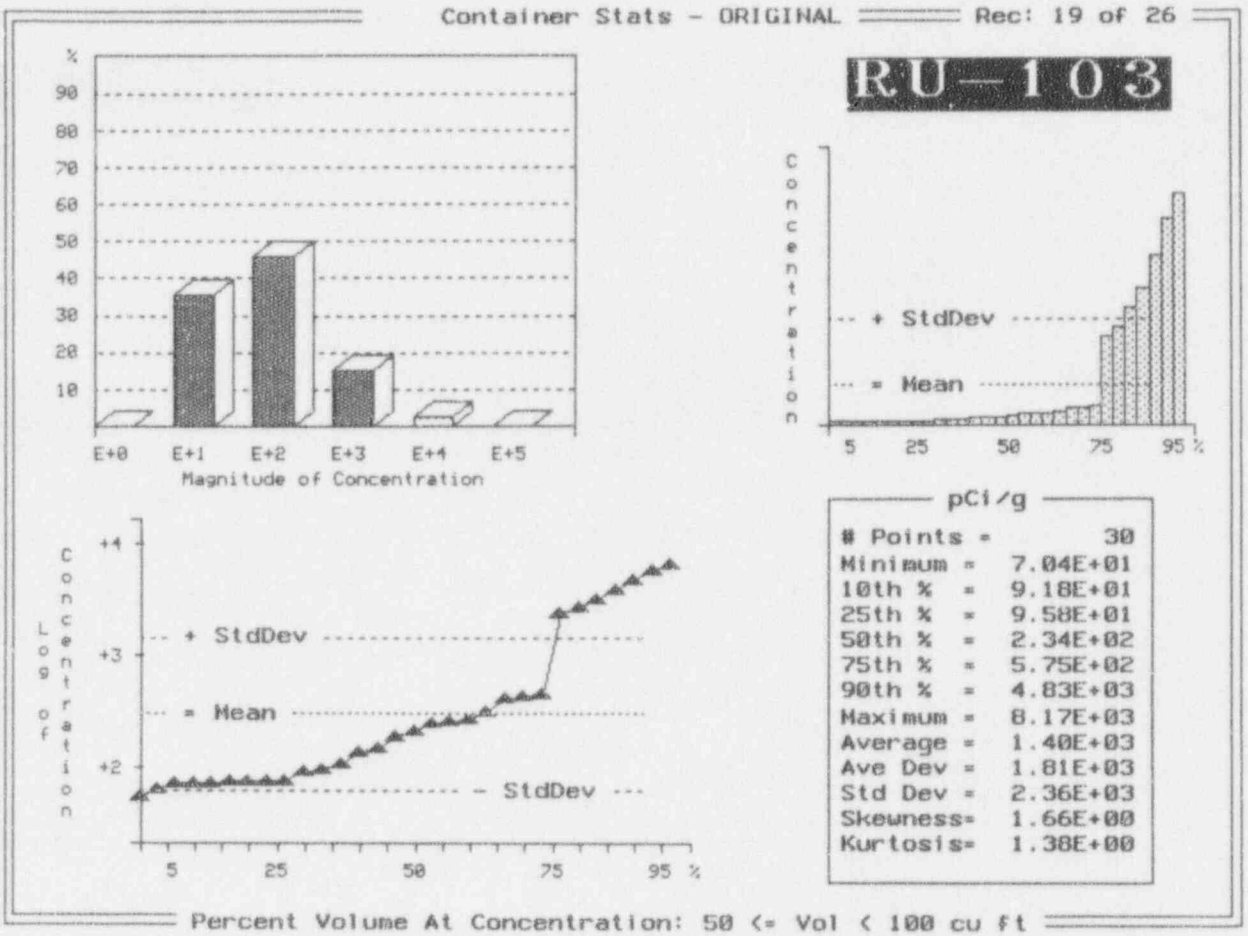


Exhibit I-7 (Continued)



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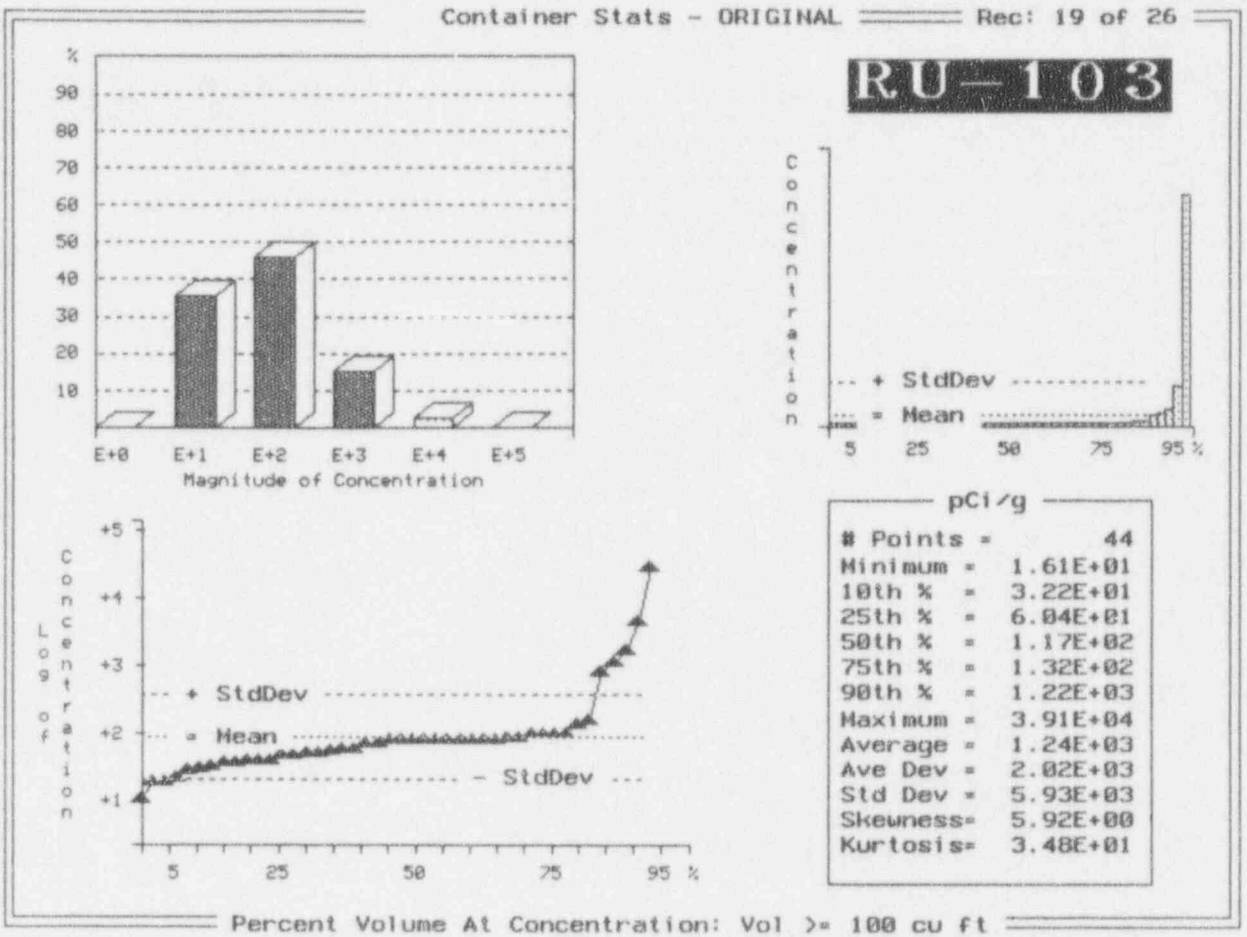

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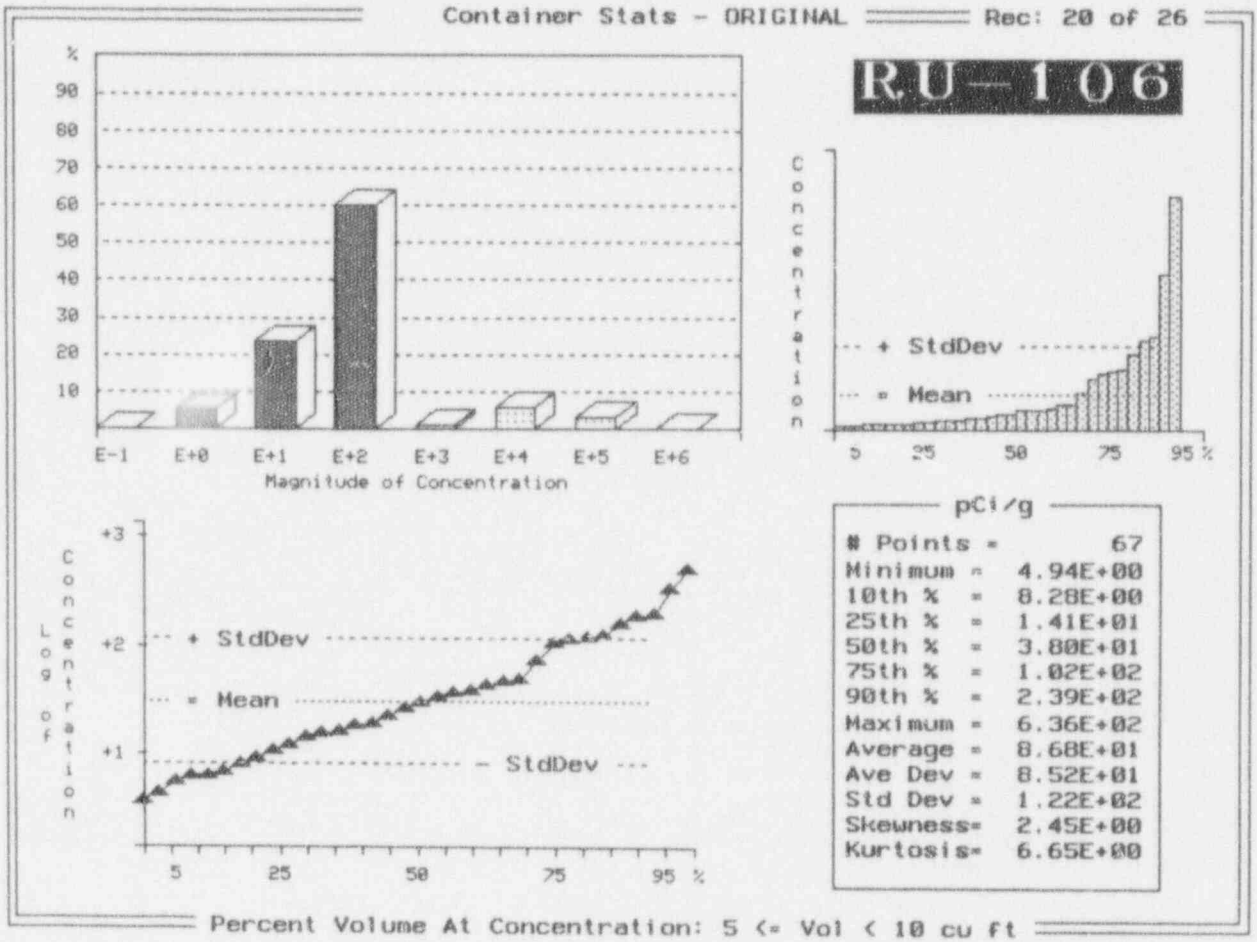

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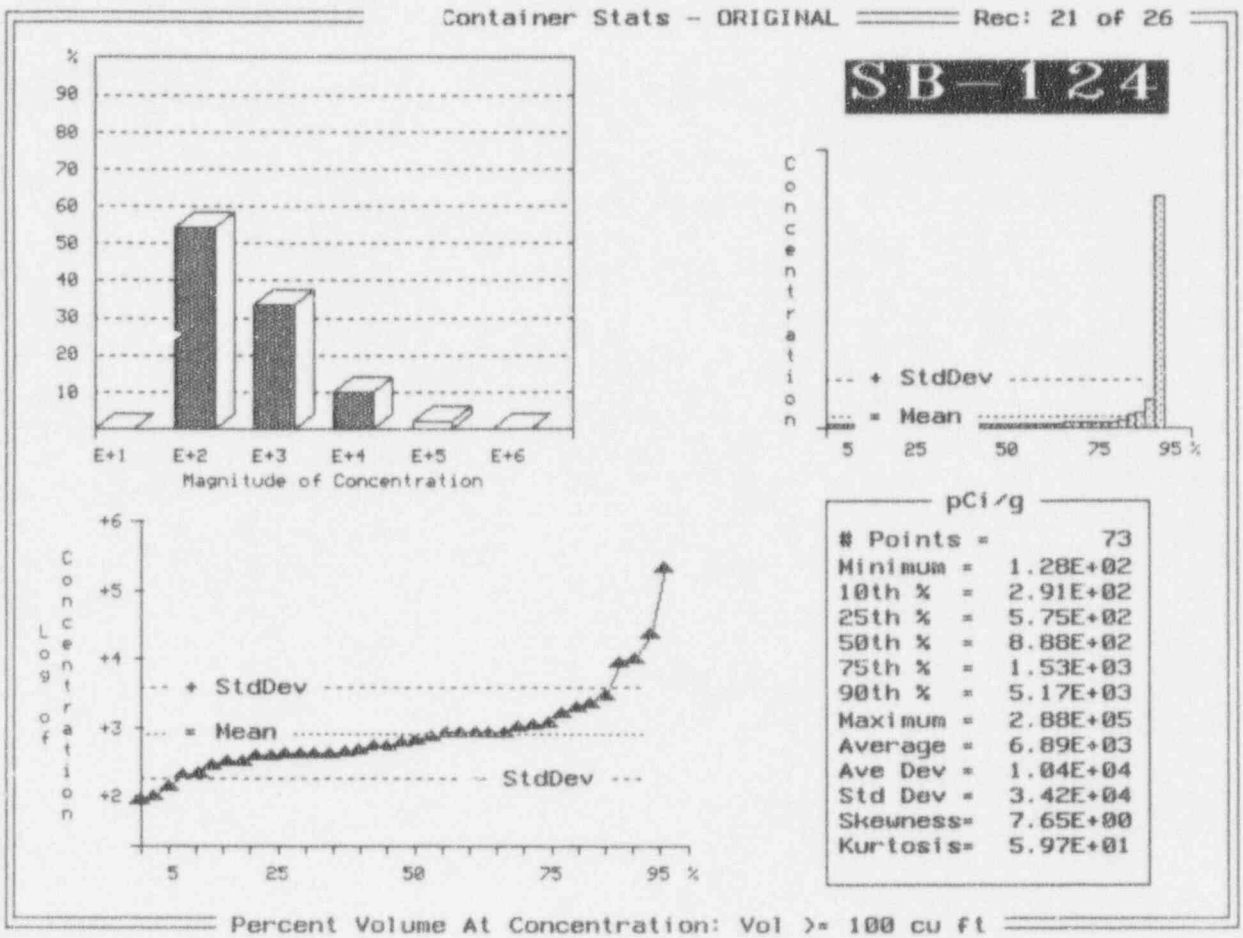

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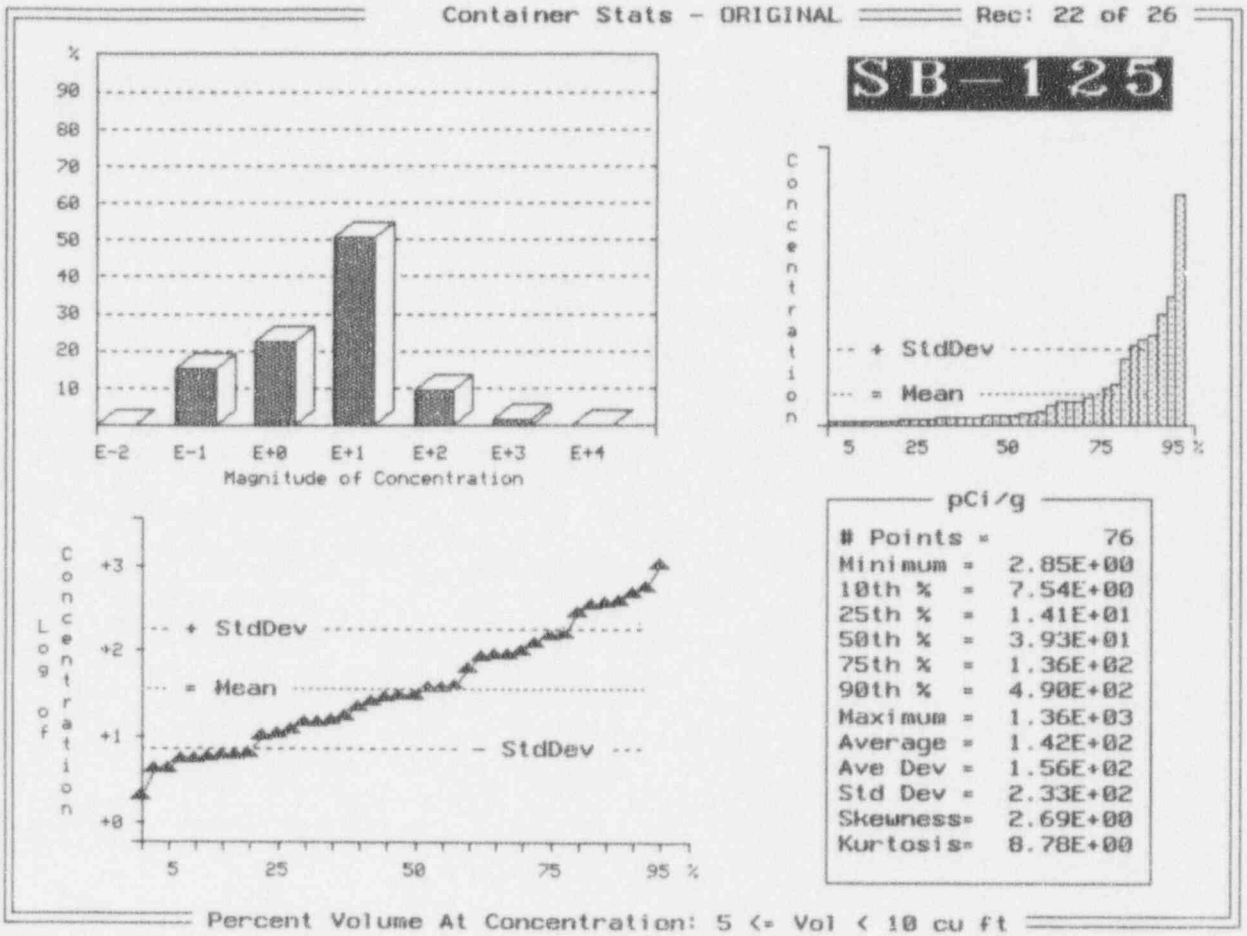

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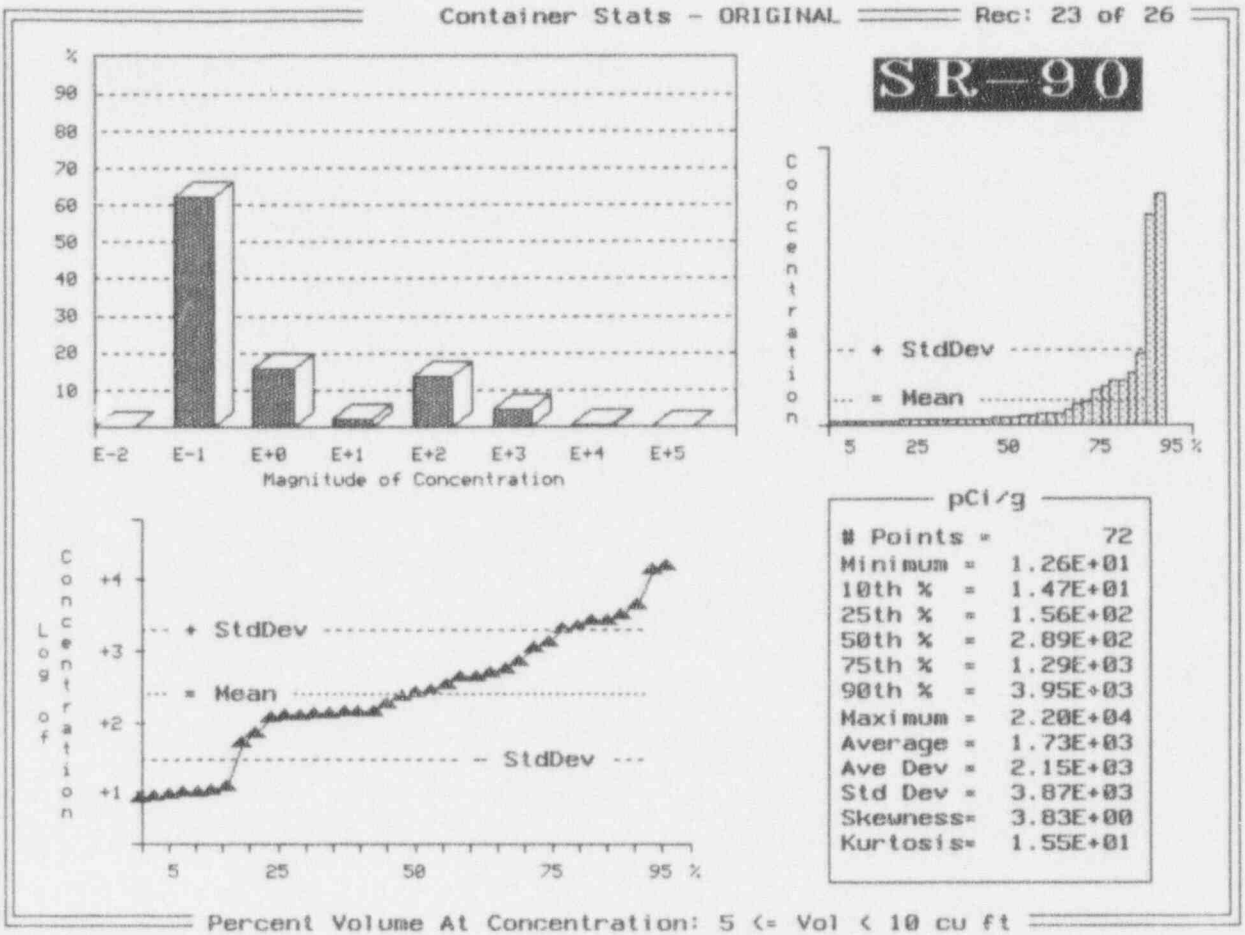

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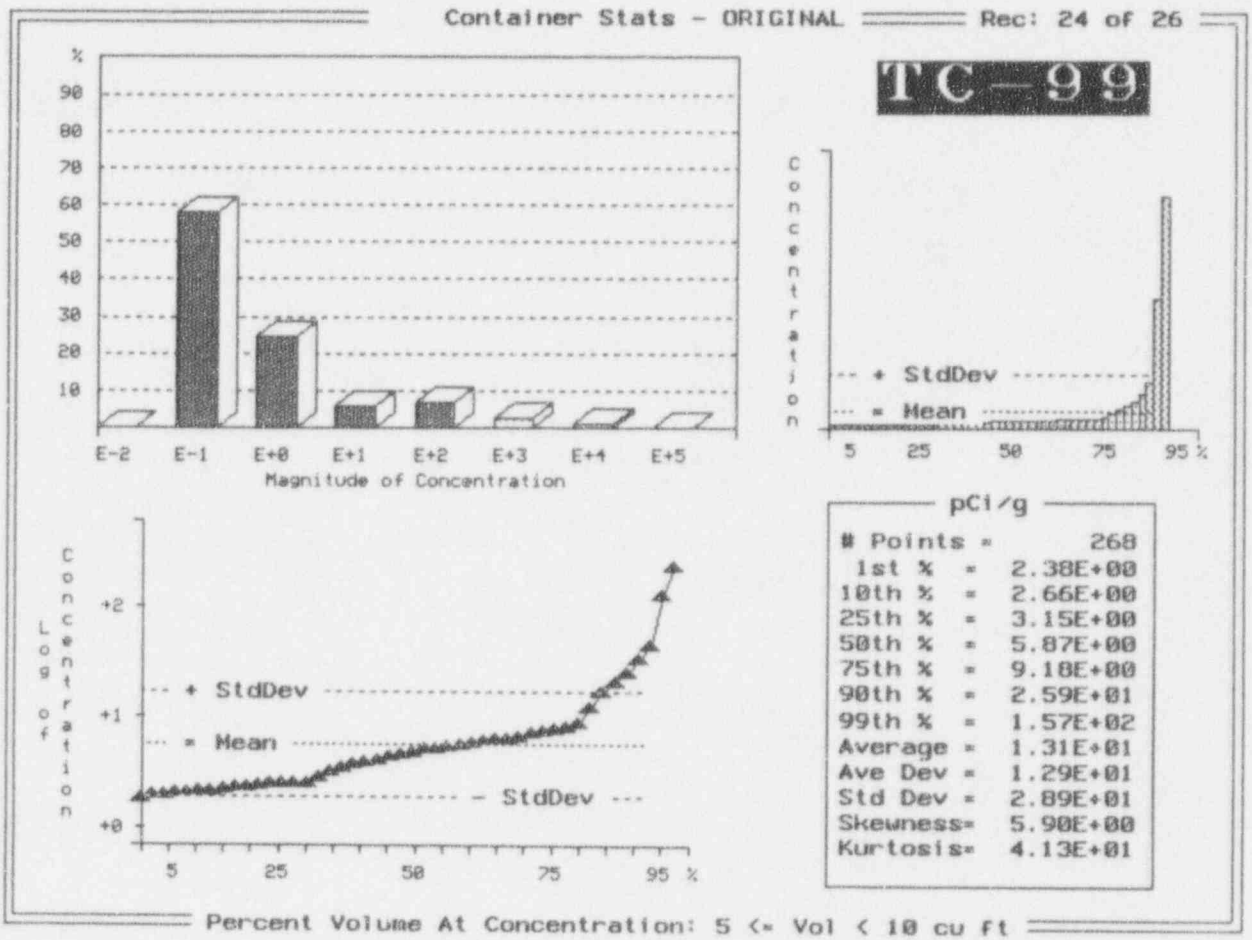

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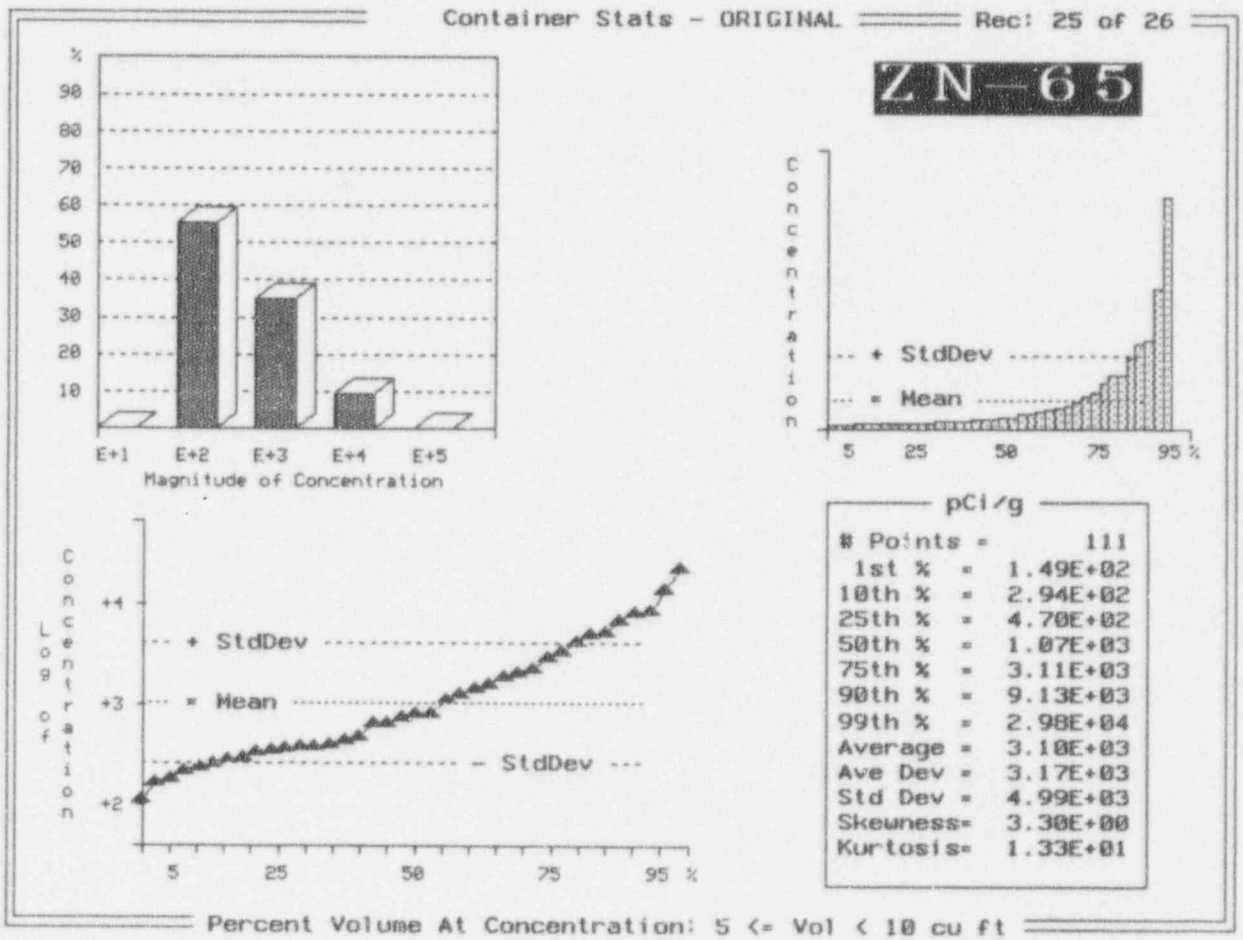


Exhibit I-7 (Continued)

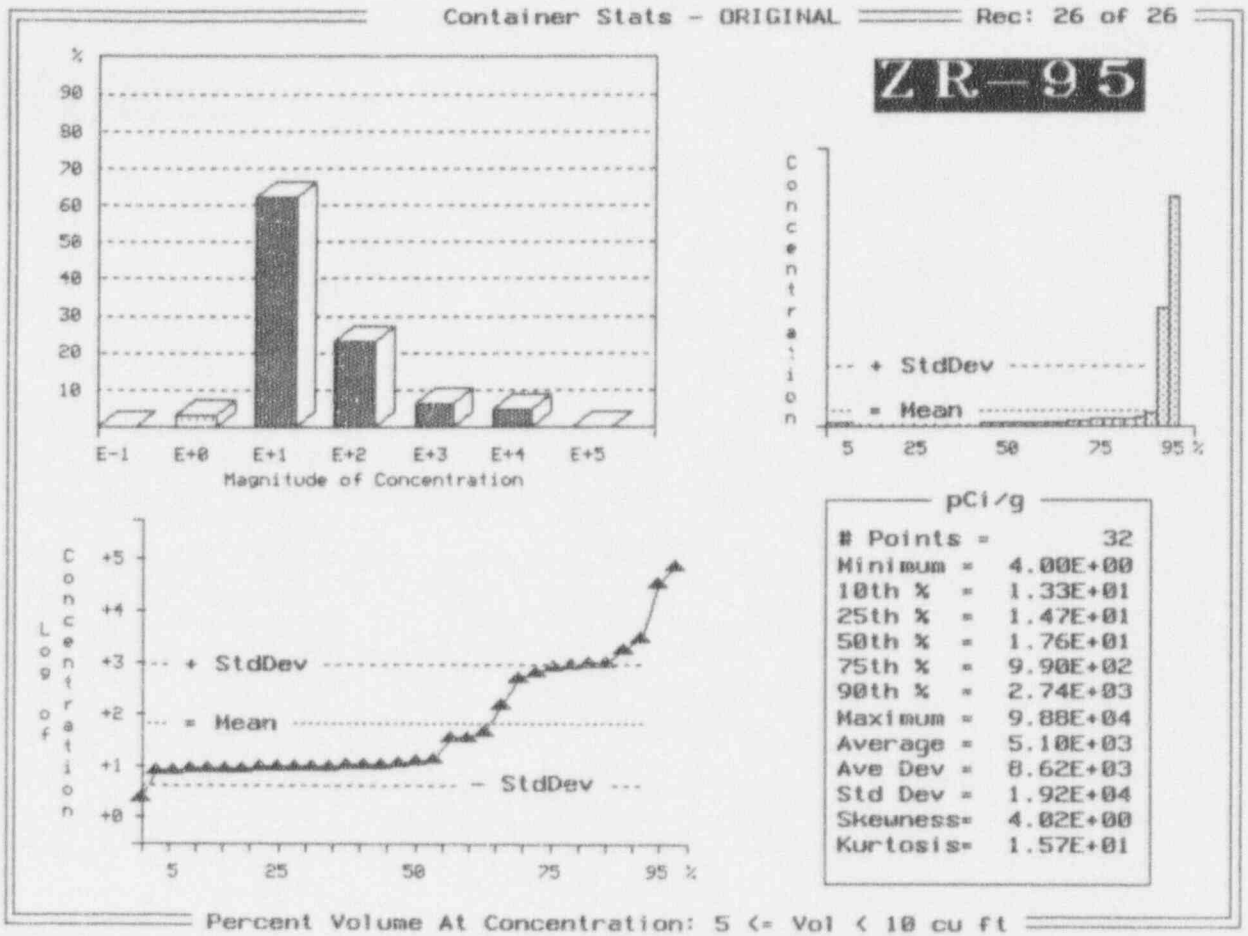


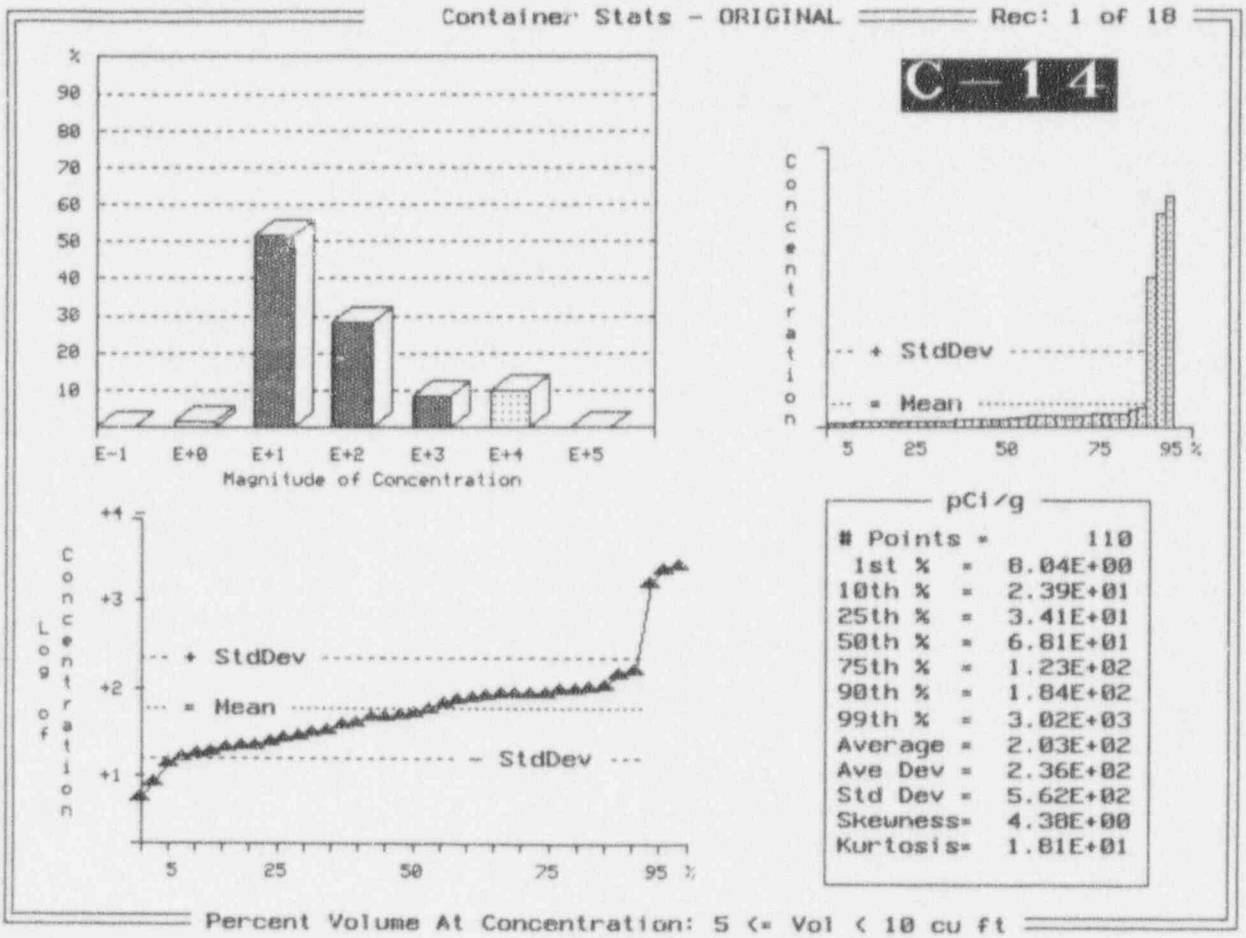
Exhibit I-8 Non-Cartridge Filter Media
Radionuclide Distributions
Container Level Analysis for 1989 Non-Brokered Utility Waste and All Regions and States[a]

Waste Class: A-Unstable and A-Stable
Solidification/Absorption media: Bitumen, Grout, and Cement.
Number of shipping records: 38
Number of shipping containers: 158
Total waste volume: 152.6 m^3
Total waste mass: 174,500 Kg
Average waste form density: 1.14 g/cm^3

	Concentration Ranges - Percentile[b] - Ci/m^3 -			- pCi/g -		
Nuclide	1st	50th	99th	1st	50th	99th
C-14	9.42E-06	8.00E-05	3.81E-03	8.04E+00	6.81E+01	3.02E+03
Co-58	1.27E-03	1.32E-02	1.12E-02	1.01E+03	1.04E+04	1.07E+05
Co-60	1.99E-02	1.42E-01	7.44E-01	1.61E+04	1.05E+05	7.51E+05
Cr-51	2.80E-02	3.57E-01	5.80E+01	1.78E+04	2.50E+05	7.56E+07
Cs-134	2.34E-03	1.46E-02	4.57E-02	1.59E+03	1.00E+04	3.05E+04
Cs-137	1.99E-03	2.63E-02	5.77E-02	1.36E+03	2.20E+04	6.26E+04
Fe-55	2.72E-03	7.06E-01	3.93E+00	2.20E+03	5.84E+05	3.47E+06
Fe-59	7.60E-03	6.62E-02	1.79E+00	5.17E+03	6.01E+04	2.33E+06
H-3	3.66E-04	5.19E-03	1.57E-01	2.49E+02	3.58E+03	1.75E+05
I-129	2.54E-07	7.62E-07	2.54E-06	1.57E-01	5.20E-01	1.67E+00
Mn-54	2.34E-02	1.84E-01	1.55E+00	1.90E+04	1.47E+05	1.33E+06
Nb-95	4.10E-03	5.08E-03	1.36E+00	2.79E+03	3.39E+03	1.48E+06
Ni-63	2.36E-02	7.31E-02	2.25E+00	1.60E+04	6.11E+04	1.50E+06
Sb-124	5.66E-05	7.23E-05	3.13E-04	6.37E+01	7.60E+01	2.95E+02
Sb-125	7.23E-06	7.23E-06	3.74E-05	7.60E+00	8.13E+00	3.52E+01
Sr-90	1.21E-04	6.53E-04	3.16E-03	8.26E+01	6.61E+02	2.08E+03
Tc-99	3.05E-06	2.08E-05	7.79E-05	2.07E+00	1.77E+01	5.12E+01
Zn-65	2.82E-02	6.86E-02	1.47E-01	1.92E+04	4.58E+04	1.57E+05

(a) Based on LLW data for Beatty an Richland only.
(b) Due to paucity of data, listing includes radionuclides with 3 or more data points characterizing concentration ranges.

Exhibit I-8 (Continued)



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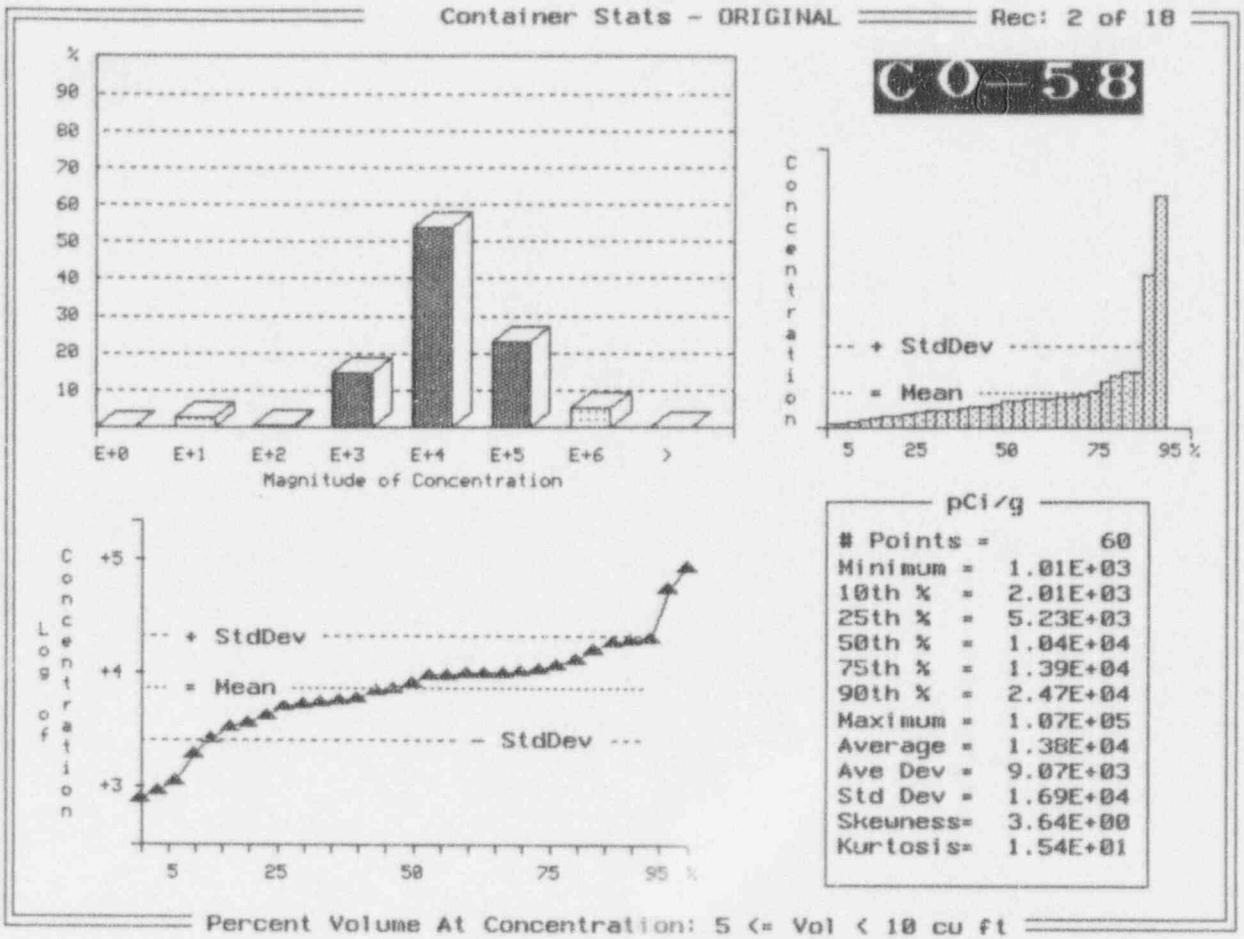

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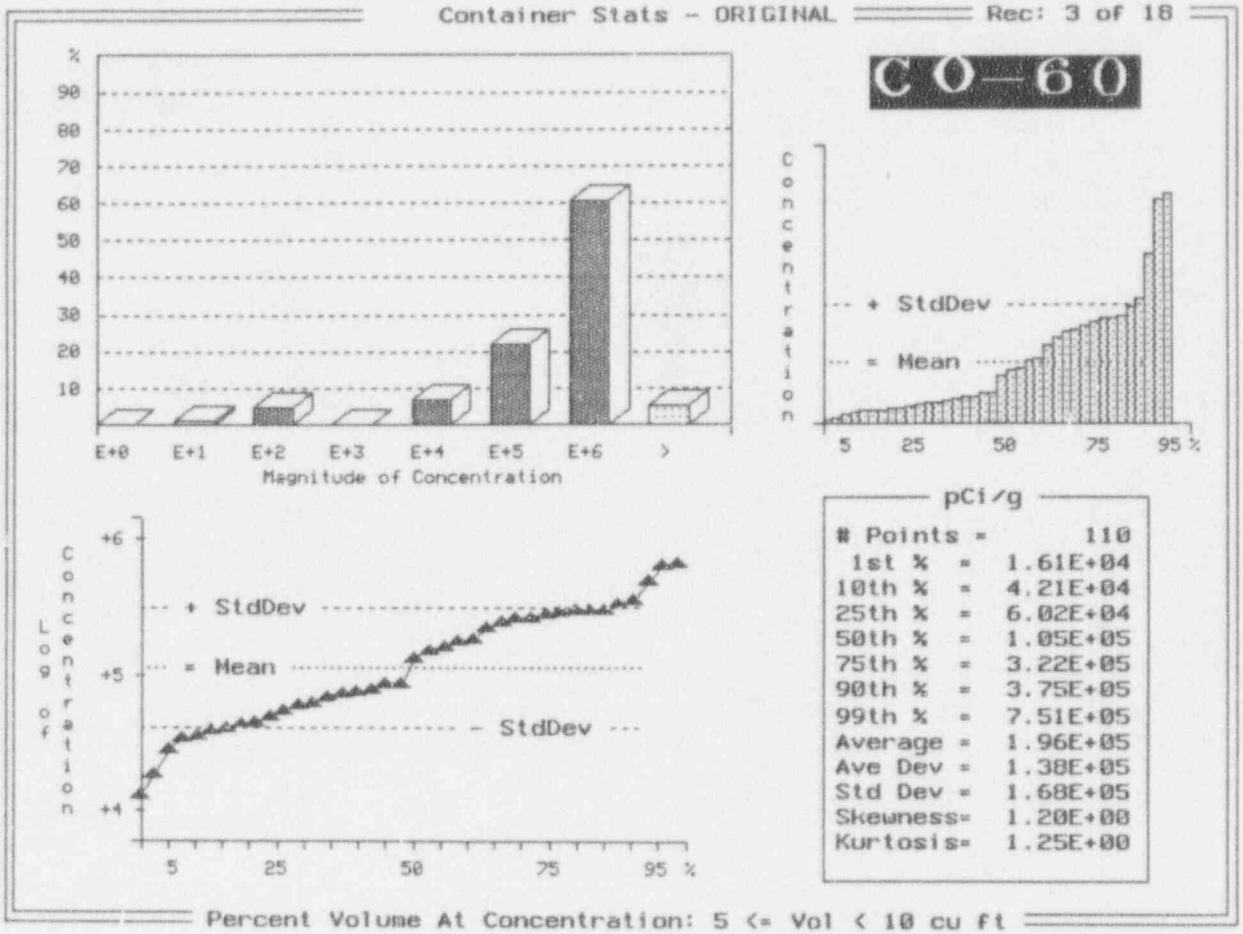

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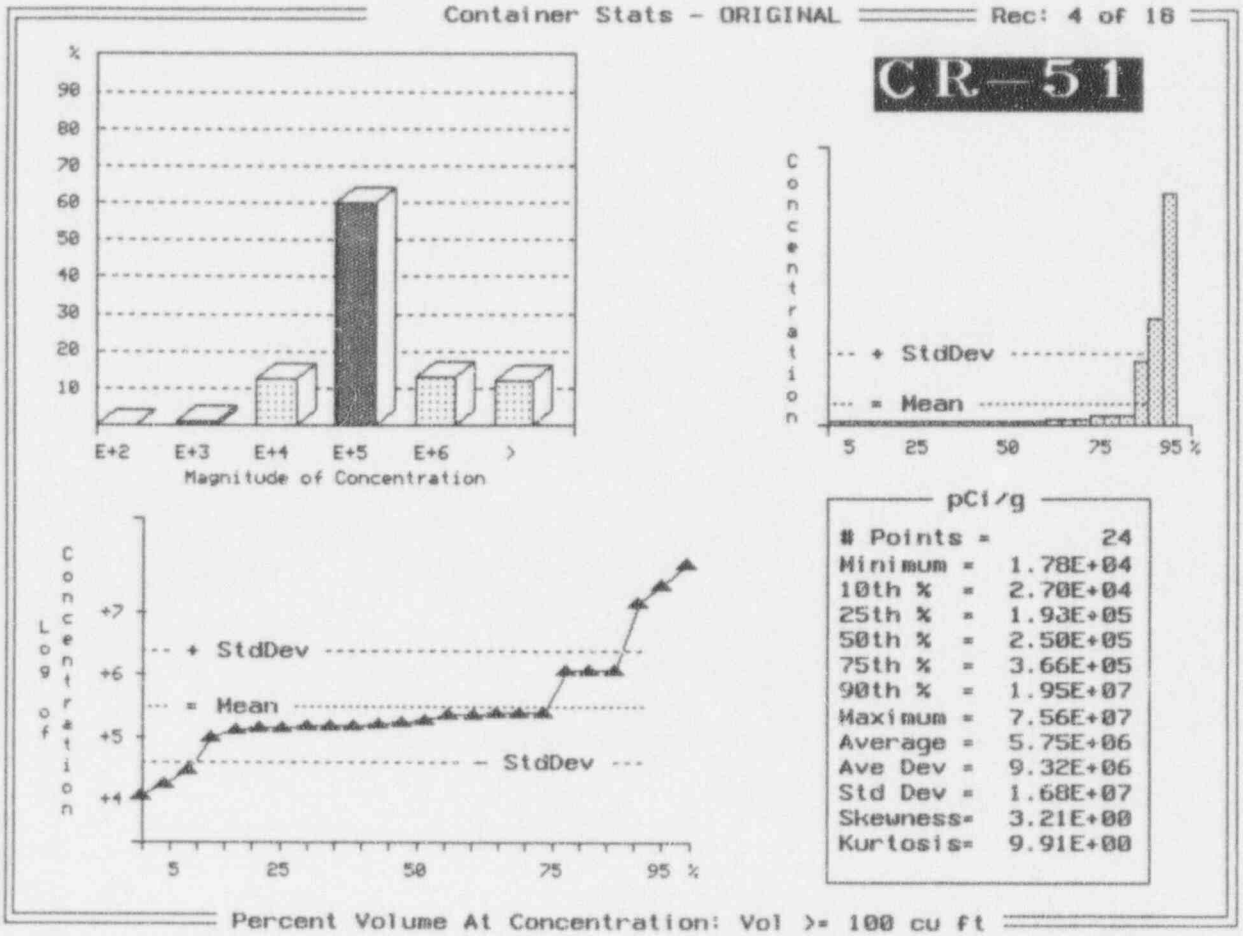

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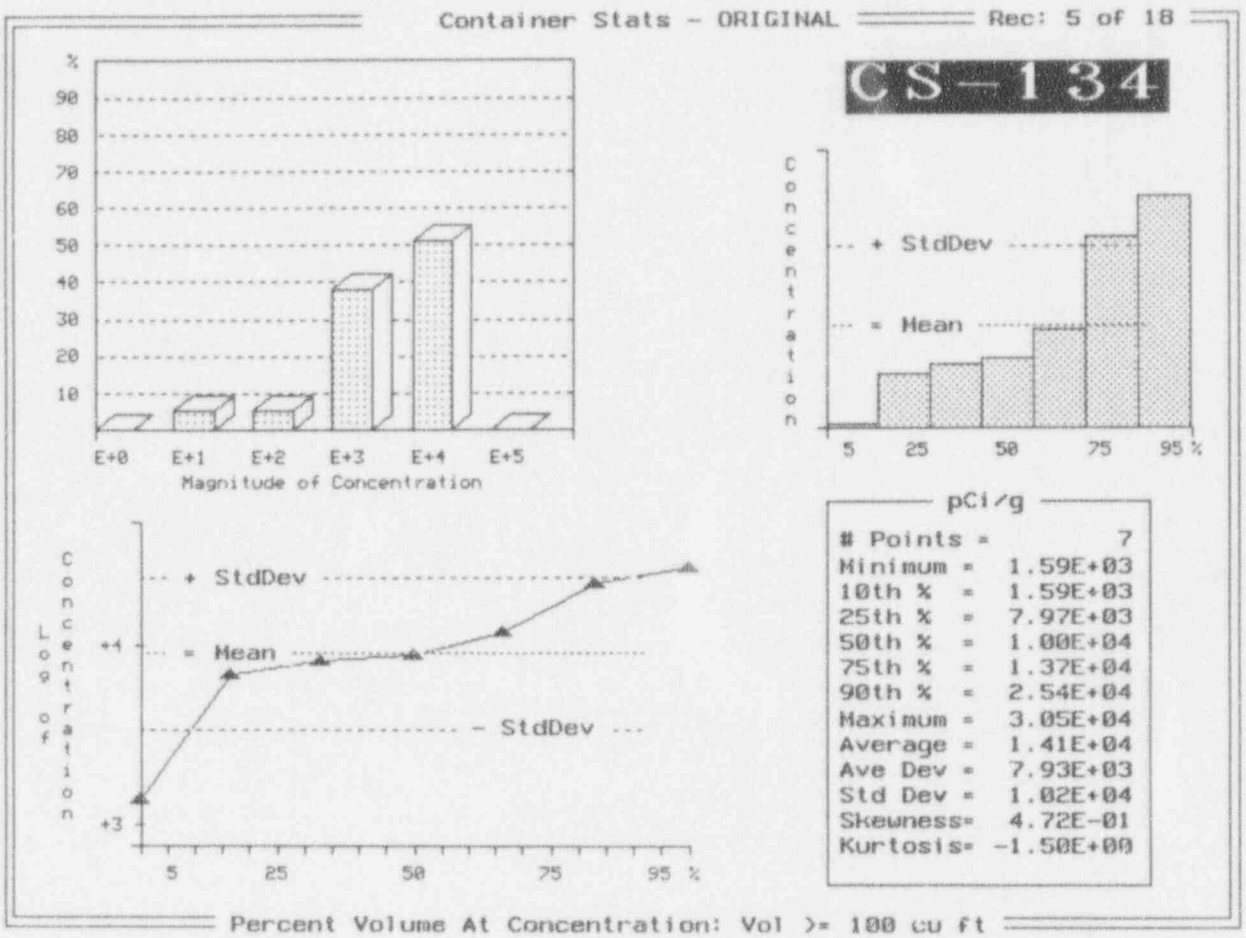

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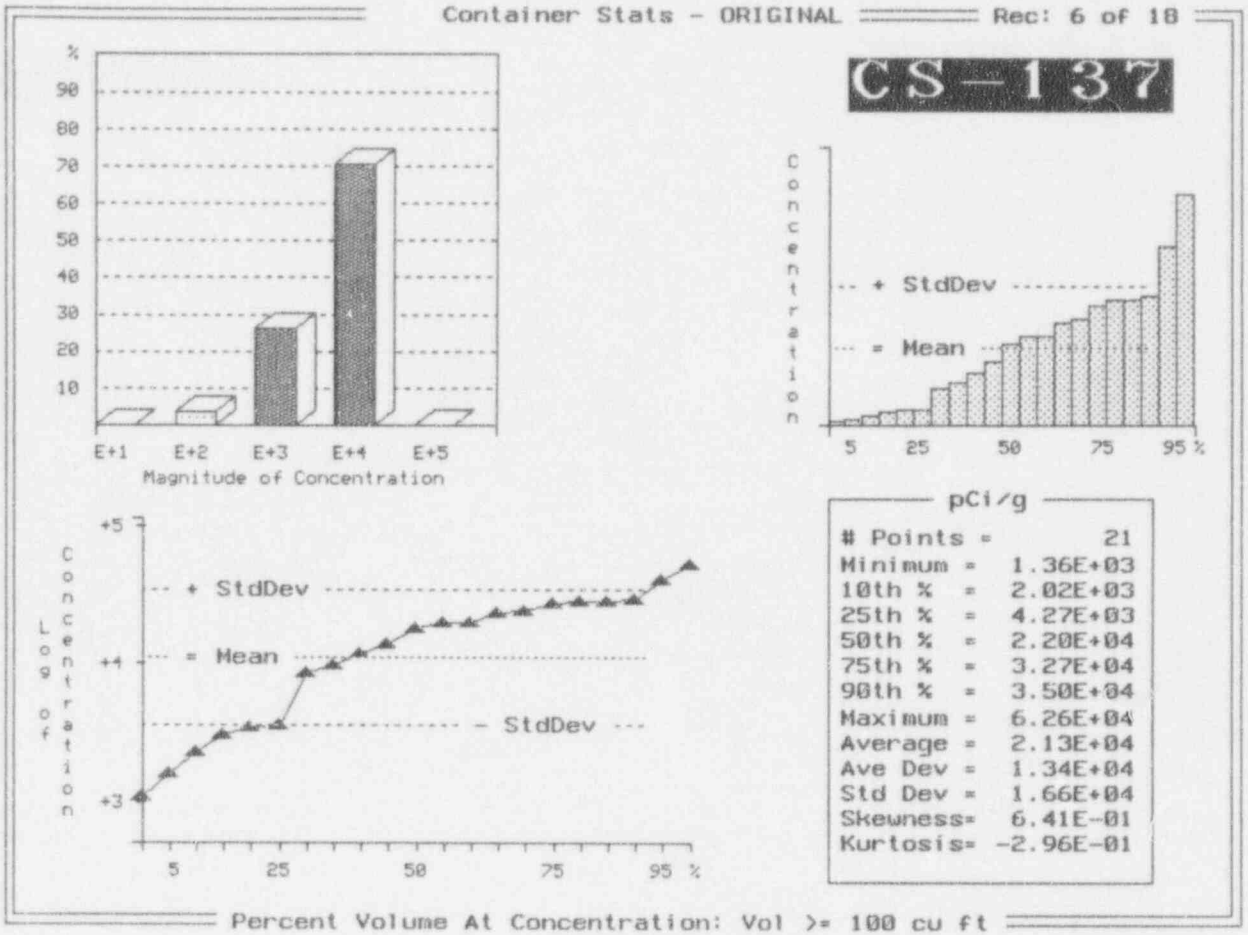

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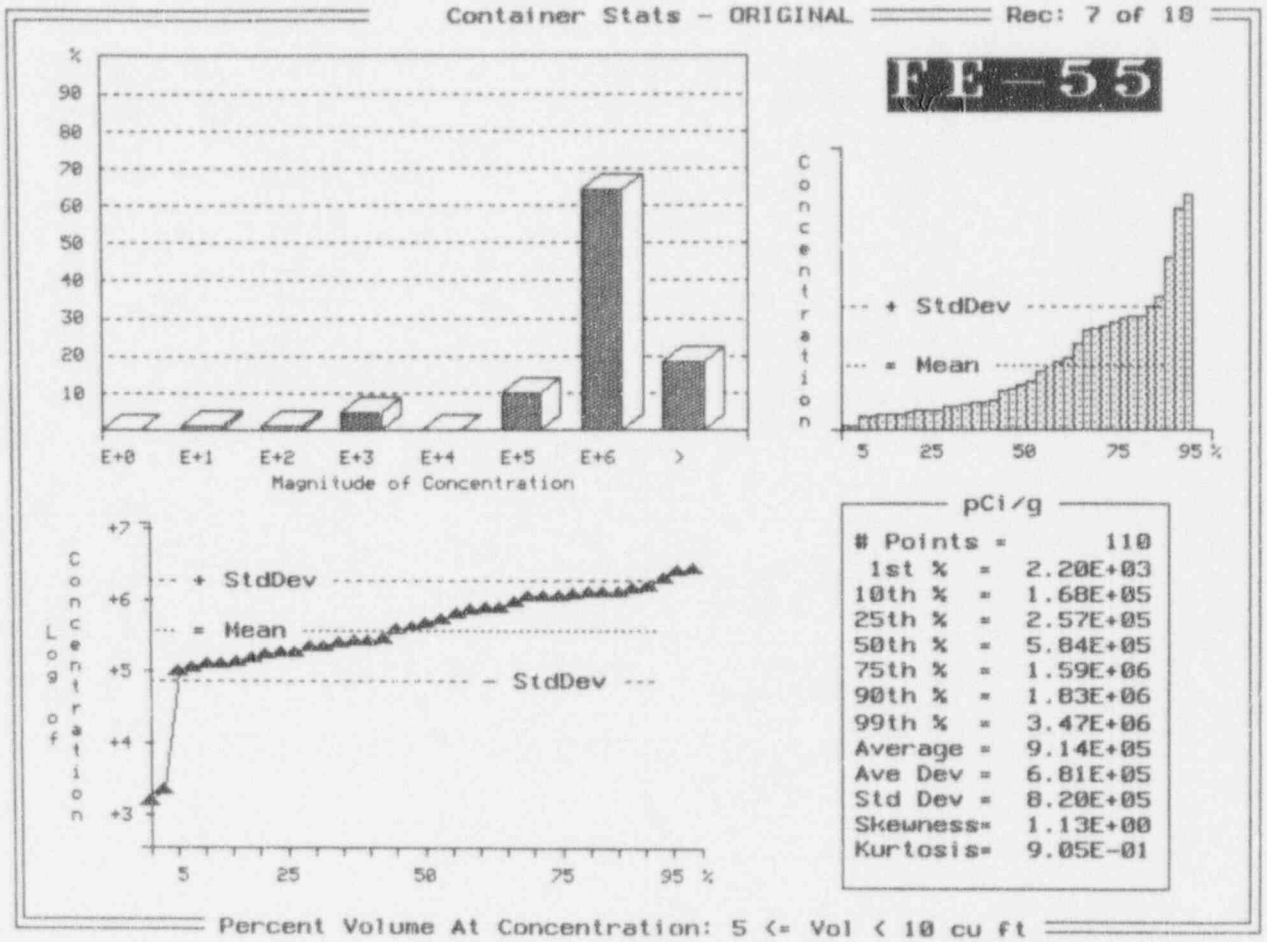

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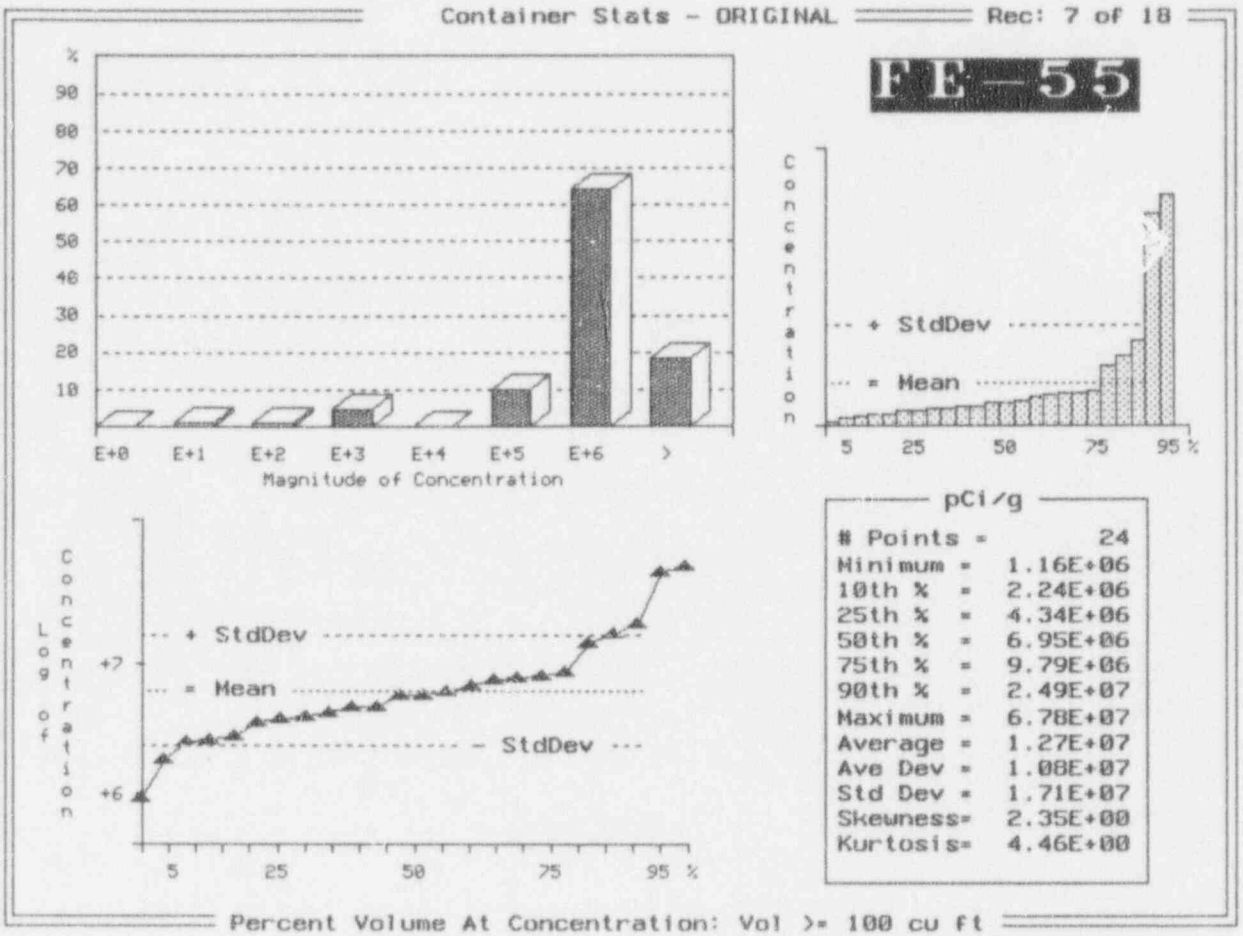

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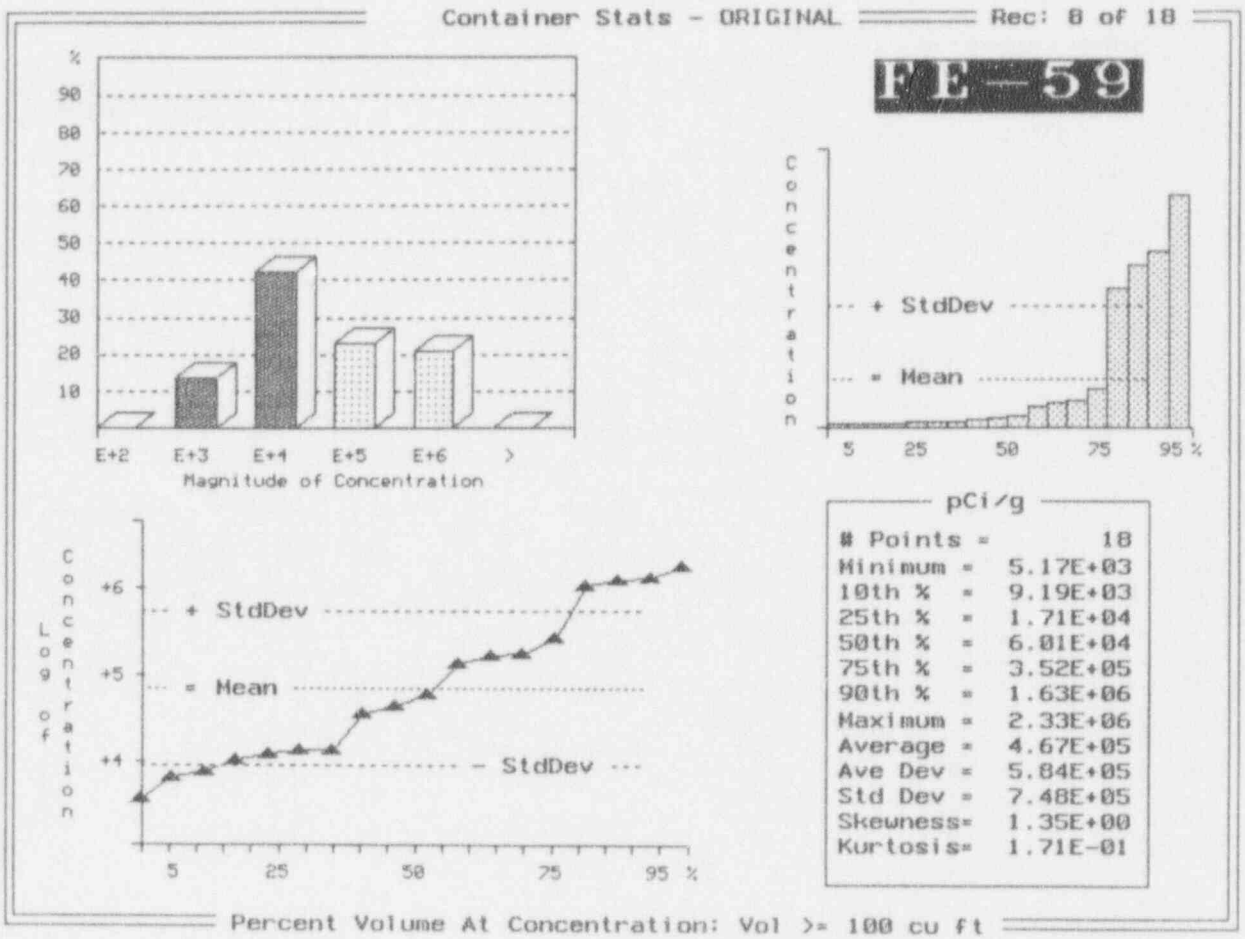

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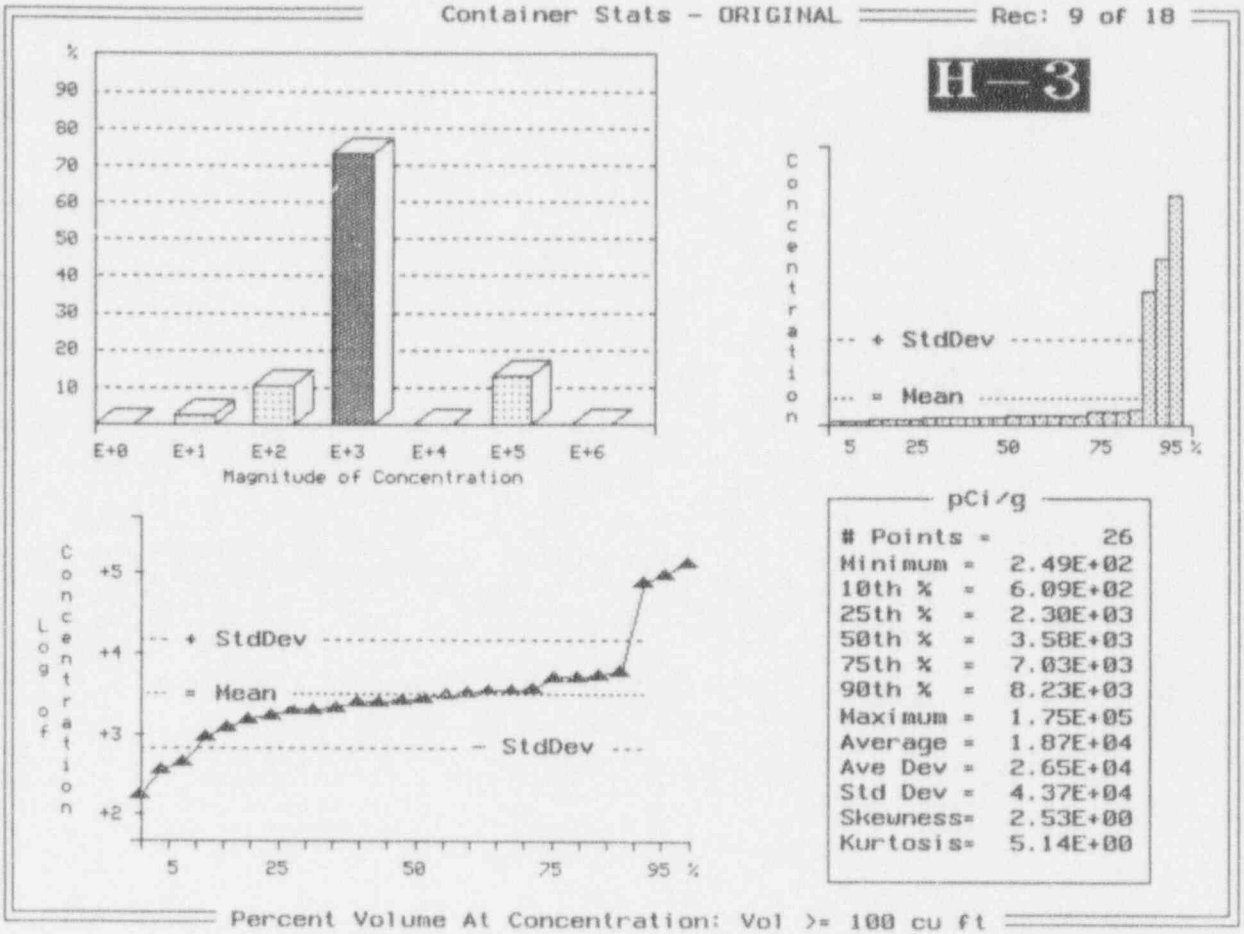

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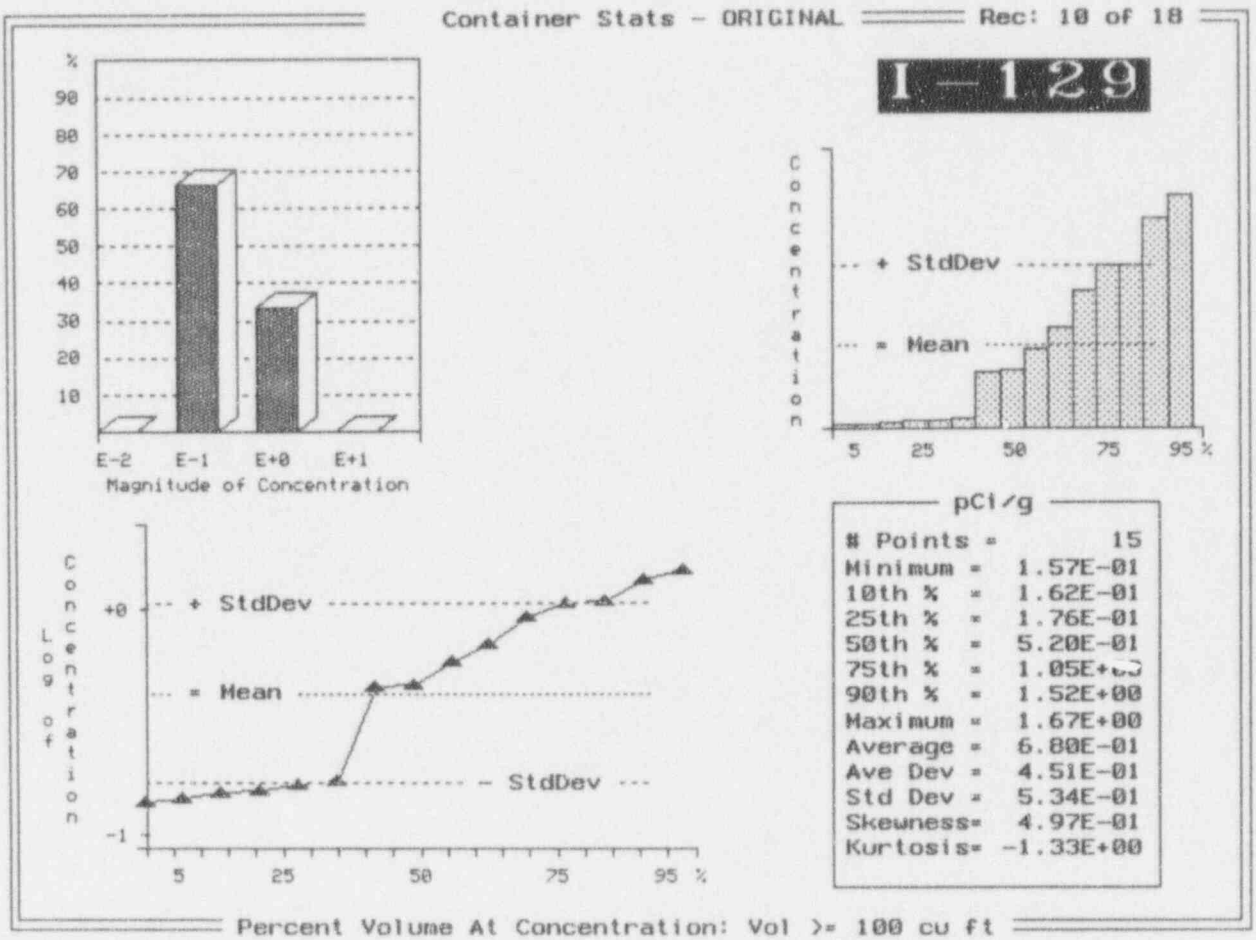

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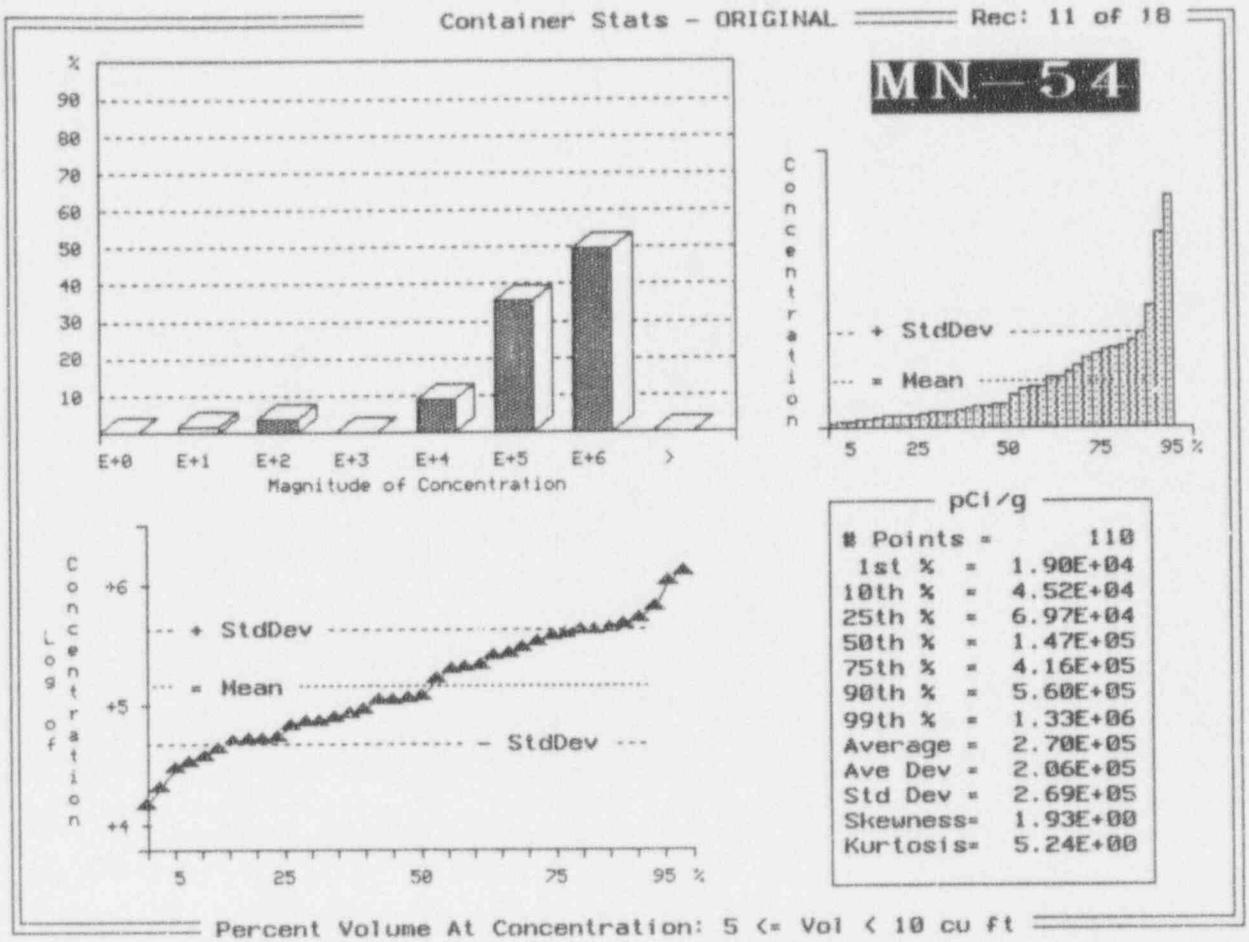

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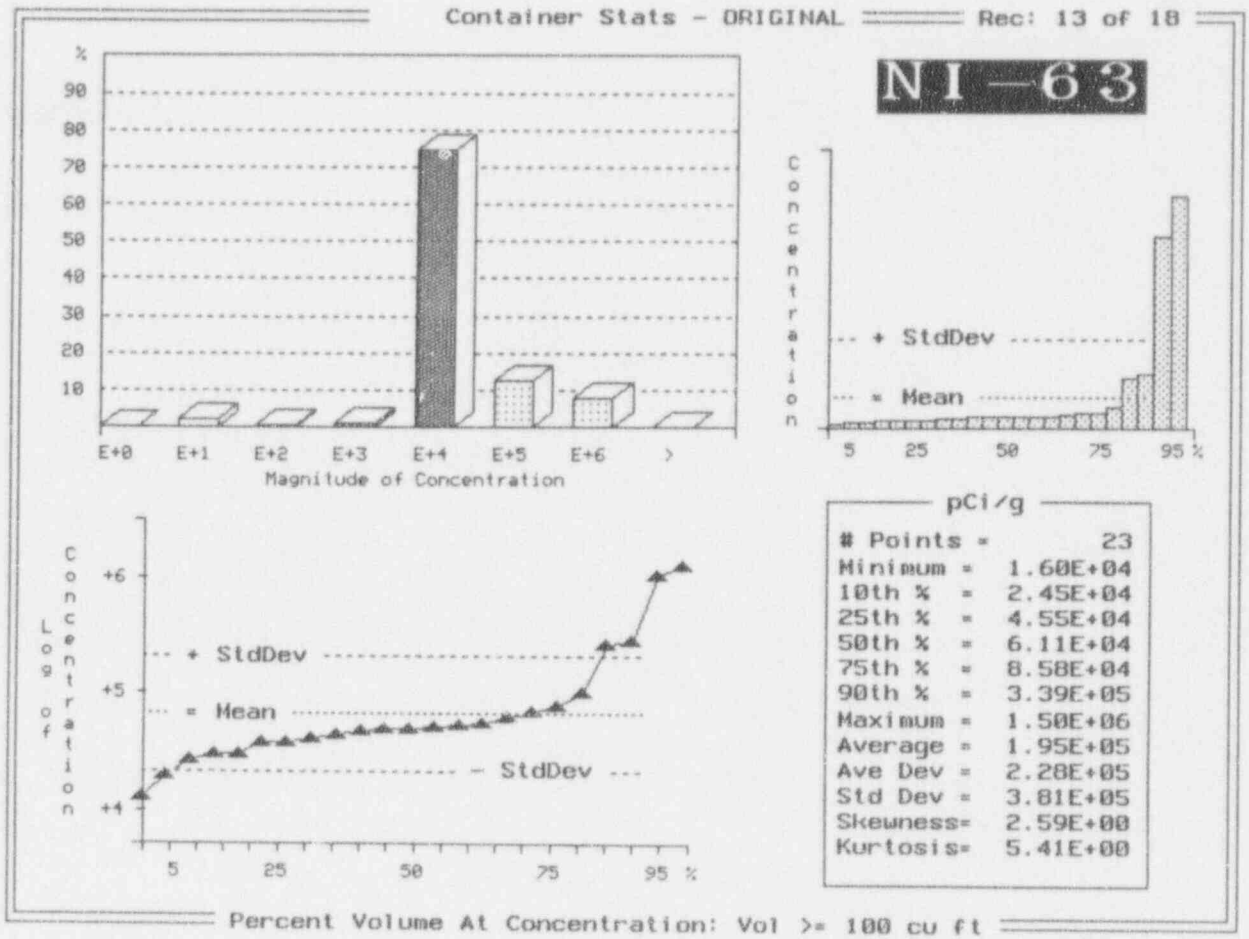

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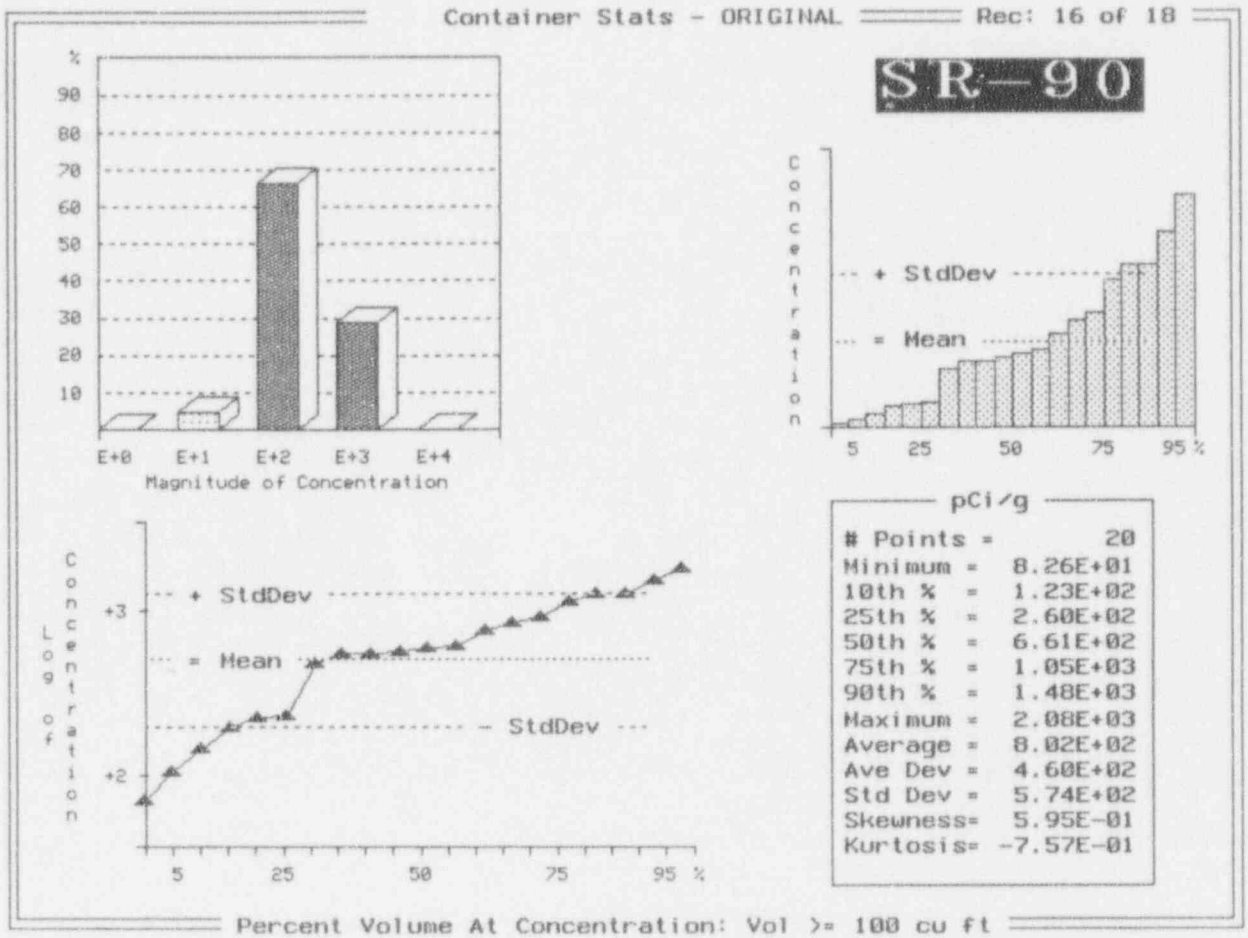

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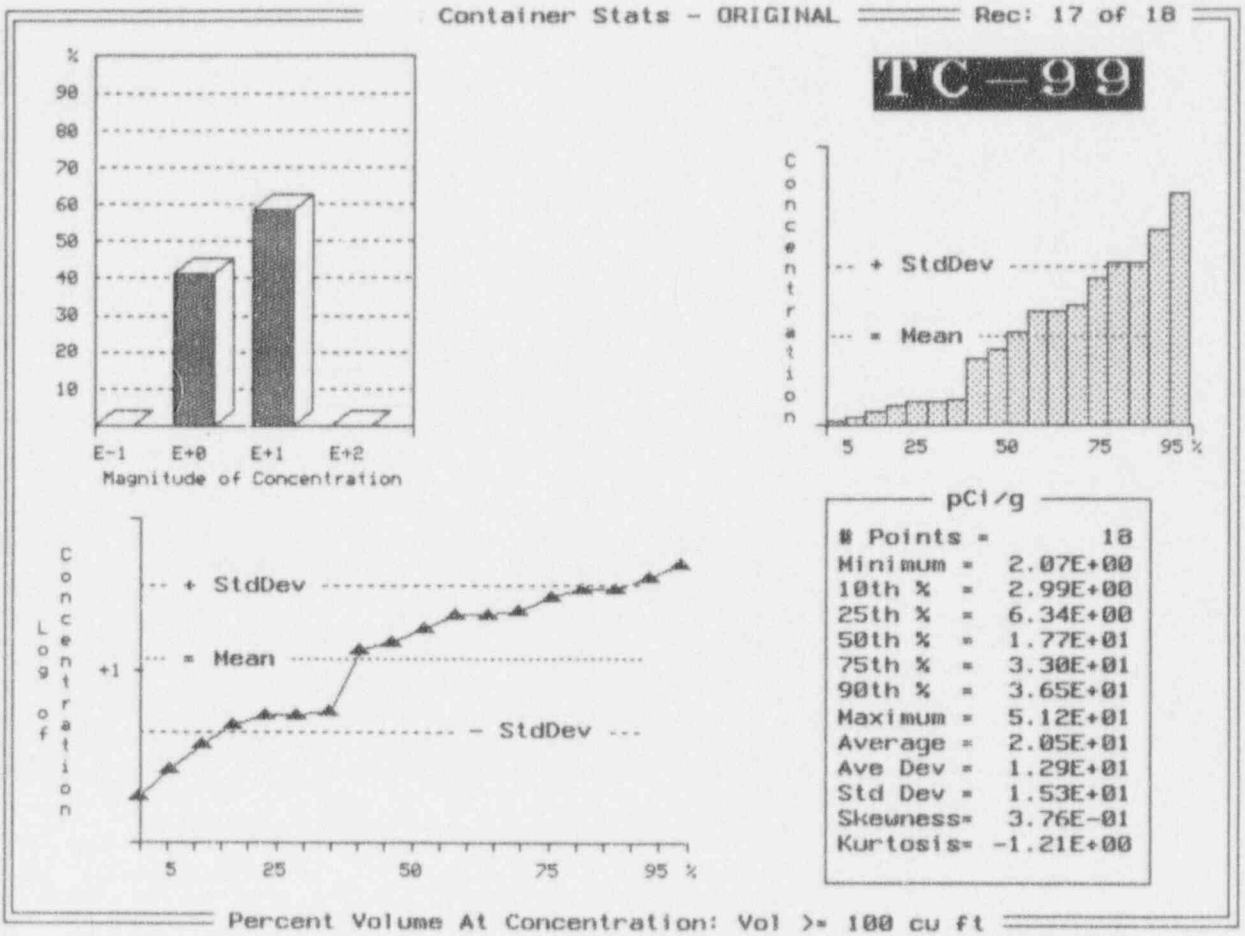

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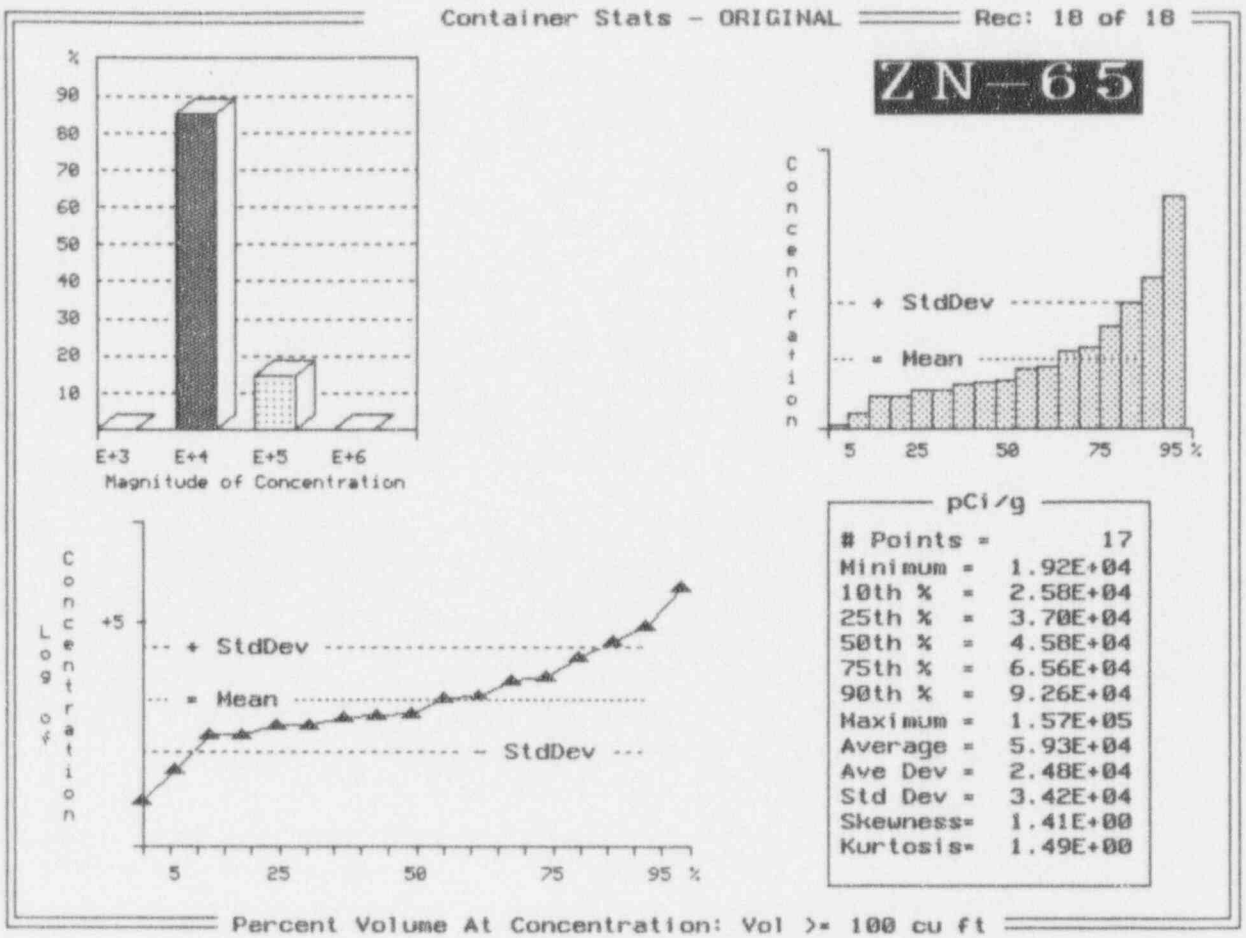


Exhibit I-9 Solidified Oils Radionuclide Distributions
Container Level Analysis for 1989 Non-Brokered Utility Waste and All Regions and States[a]

Waste Class: A-Unstable and A-Stable
Solidification/Absorption media: Petroset, Cement, Aquaset, and Envirostone.
Number of shipping records: 21
Number of shipping containers: 799
Total waste volume: 216.6 m^3
Total waste mass: 260,600 Kg
Average waste form density: 1.20 g/cm^3

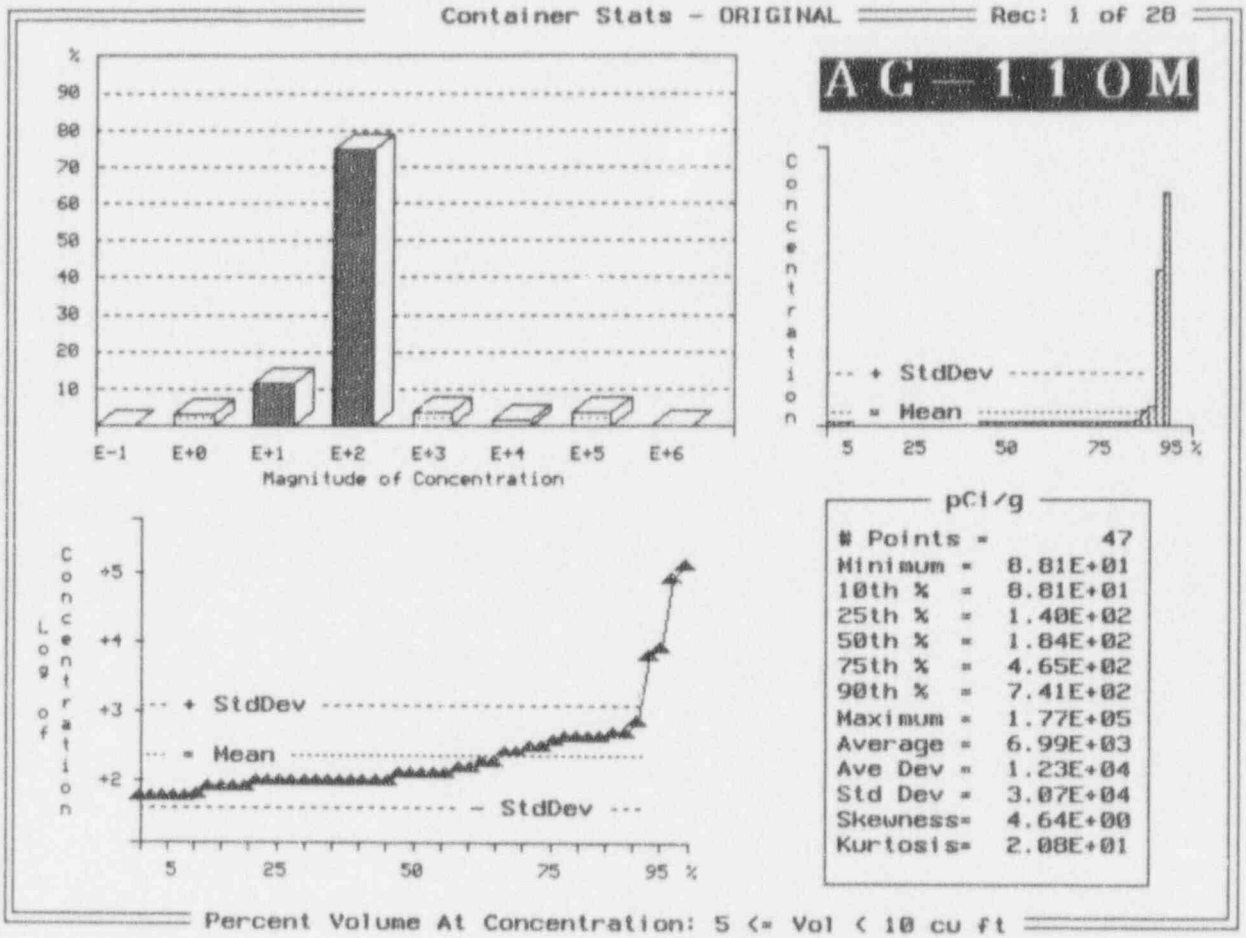
	Concentration Ranges - Percentile[b] - Ci/m^3 -			- pCi/g -		
Nuclide	1st	50th	99th	1st	50th	99th
Ag-110m	1.13E-04	2.17E-04	2.46E-01	8.81E+01	1.84E+02	1.77E+05
Am-241	4.71E-06	4.71E-06	3.73E-03	3.16E+00	4.24E+00	2.68E+03
Am-243	4.71E-06	4.71E-06	4.71E-06	4.08E+00	4.24E+00	4.64E+00
C-14	4.71E-06	4.71E-06	4.80E-04	3.63E+00	4.18E+00	7.94E+01
Ce-144	4.71E-06	4.71E-06	4.71E-06	4.08E+00	4.24E+00	4.64E+00
Cm-242	4.71E-06	4.71E-06	9.28E-04	3.16E+00	4.24E+00	6.68E+02
Cm-243	4.71E-06	4.71E-06	4.71E-06	4.08E+00	4.24E+00	4.64E+00
Cm-244	4.71E-06	4.71E-06	6.22E-04	4.08E+00	4.28E+00	4.47E+02
Co-58	4.71E-06	1.41E-05	3.05E-03	4.00E+00	1.20E+01	2.19E+03
Co-60	4.71E-06	1.37E-04	3.45E-03	3.50E+00	1.26E+02	2.86E+03
Cs-134	4.71E-06	4.71E+06	1.62E-02	3.39E+00	4.24E+00	1.17E+04
Cs-137	4.71E-06	9.42E-06	1.27E-03	3.47E+00	9.41E+00	9.84E+02
Fe-55	4.71E-06	2.17E-04	1.92E-03	3.50E+00	1.98E+02	1.52E+03
H-3	4.71E-06	1.41E-05	1.65E-03	3.44E+00	1.39E+01	1.47E+03
I-129	4.71E-06	4.71E-06	3.30E-05	3.39E+00	4.17E+00	3.01E+01
Mn-54	4.71E-06	9.42E-06	1.88E-04	3.47E+00	9.41E+00	1.51E+02
Nd-144	4.71E-06	4.71E-06	4.71E-06	4.08E+00	4.24E+00	4.64E+00
Ni-63	4.71E-06	8.95E-05	2.68E-04	3.83E+00	8.77E+01	2.37E+02
Np-237	4.71E-06	4.71E-06	4.71E-06	3.16E+00	4.24E+00	4.94E+00
Pu-238	4.71E-06	4.71E-06	9.84E-04	3.16E+00	4.24E+00	7.08E+02
Pu-239	4.71E-06	4.71E-06	1.17E-03	3.16E+00	4.24E+00	8.40E+02

Exhibit I-9 Solidified Oils Radionuclide Distributions Container Level Analysis for 1989 Non-Brokered Utility Waste and All Regions and States[a], Cont'd

Nuclide	Concentration Ranges - Percentile[b] - Ci/m^3 - 1st	50th	99th	- pCi/g - 1st	50th	99th
Pu-240	4.71E-06	4.71E-06	4.71E-06	3.16E+00	4.24E+00	4.94E+00
Pu-241	4.71E-06	4.71E-06	3.47E-02	3.66E+00	4.41E+00	2.50E+04
Pu-242	4.71E-06	4.71E-06	4.71E-06	3.16E+00	4.24E+00	4.94E+00
Sr-89	4.71E-06	4.71E-06	9.42E-06	3.34E+00	3.93E+00	8.23E+00
Sr-90	4.71E-06	4.71E-06	2.59E-04	3.39E+00	4.08E+00	1.86E+02
Tc-99	4.71E-06	4.71E-06	1.41E-05	3.39E+00	4.16E+00	1.19E+01
U-234	4.71E-06	4.71E-06	4.71E-06	4.08E+00	4.24E+00	4.64E+00

(a) Based on LLW data for Beatty and Richland only.
(b) Includes only radionuclides with 30 or more data points characterizing concentration ranges.

Exhibit I-9 (Continued)



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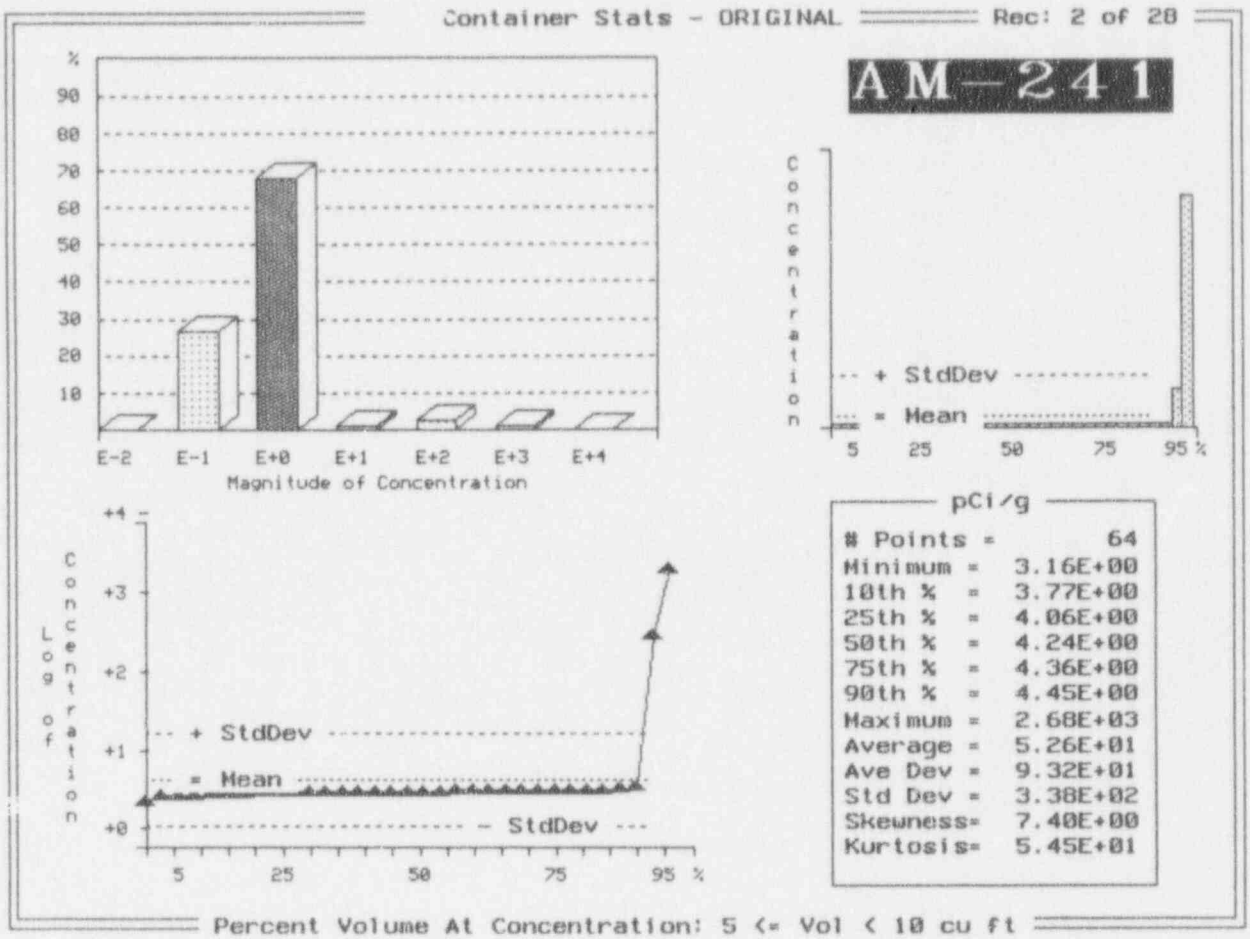
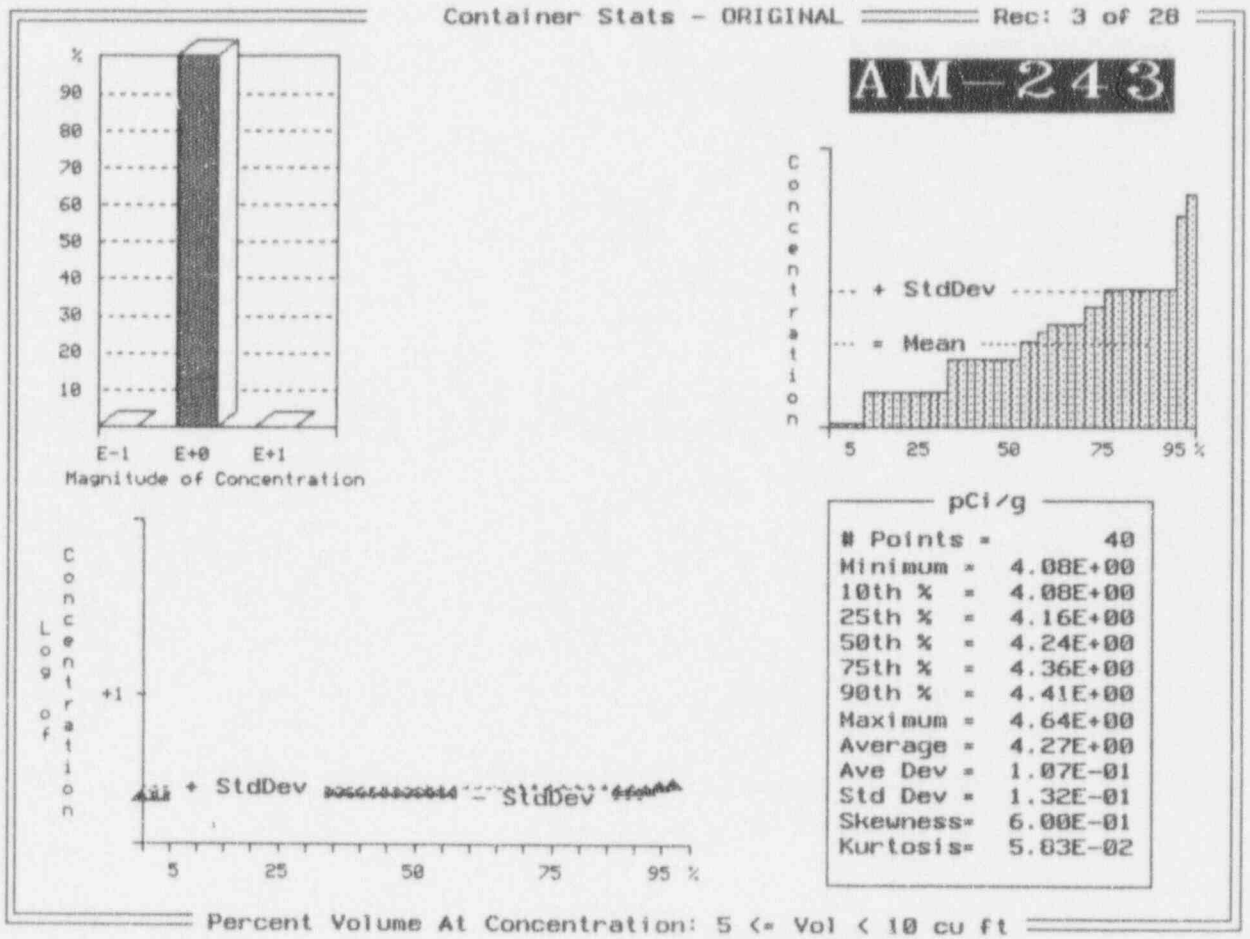


Exhibit I-9 (Continued)



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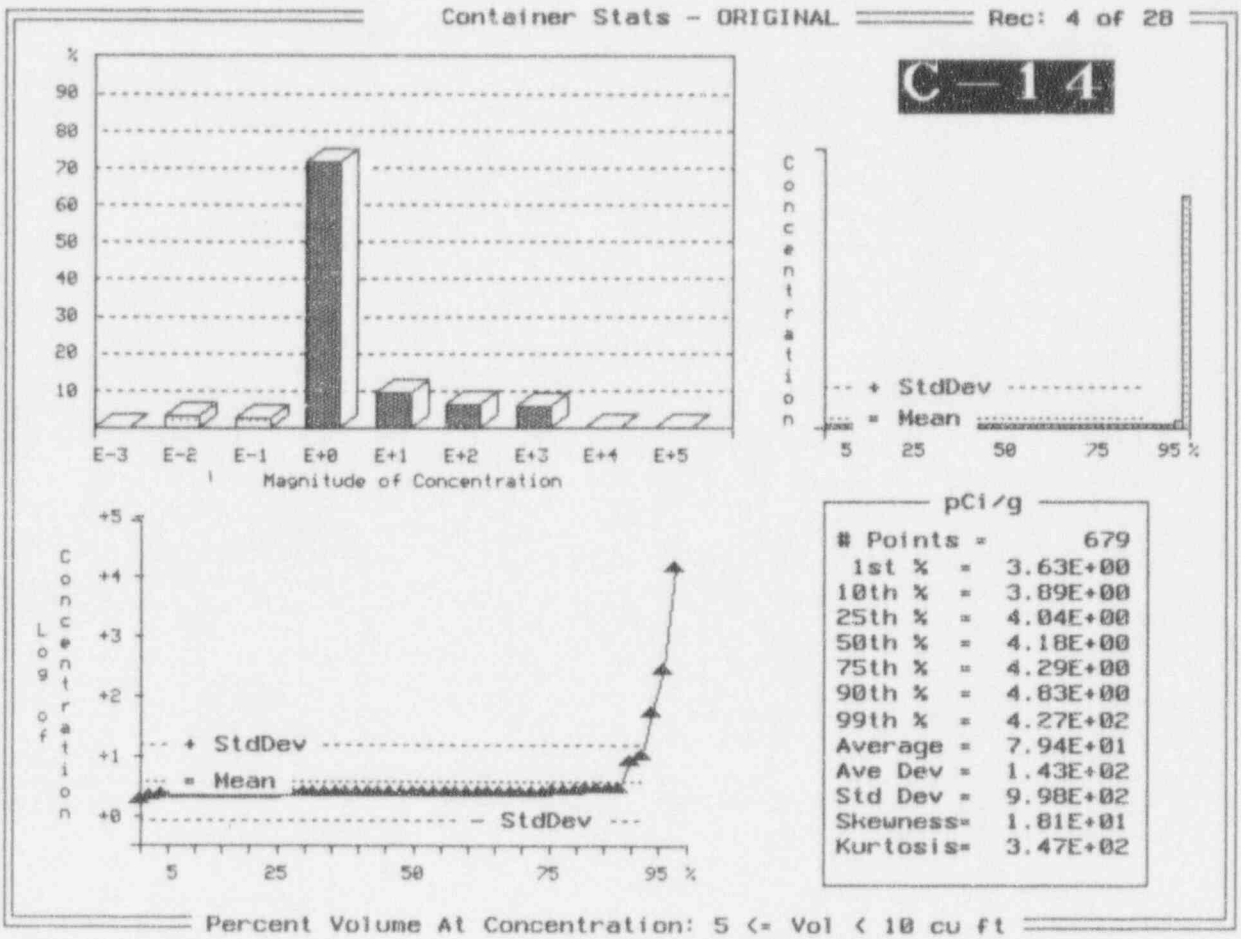

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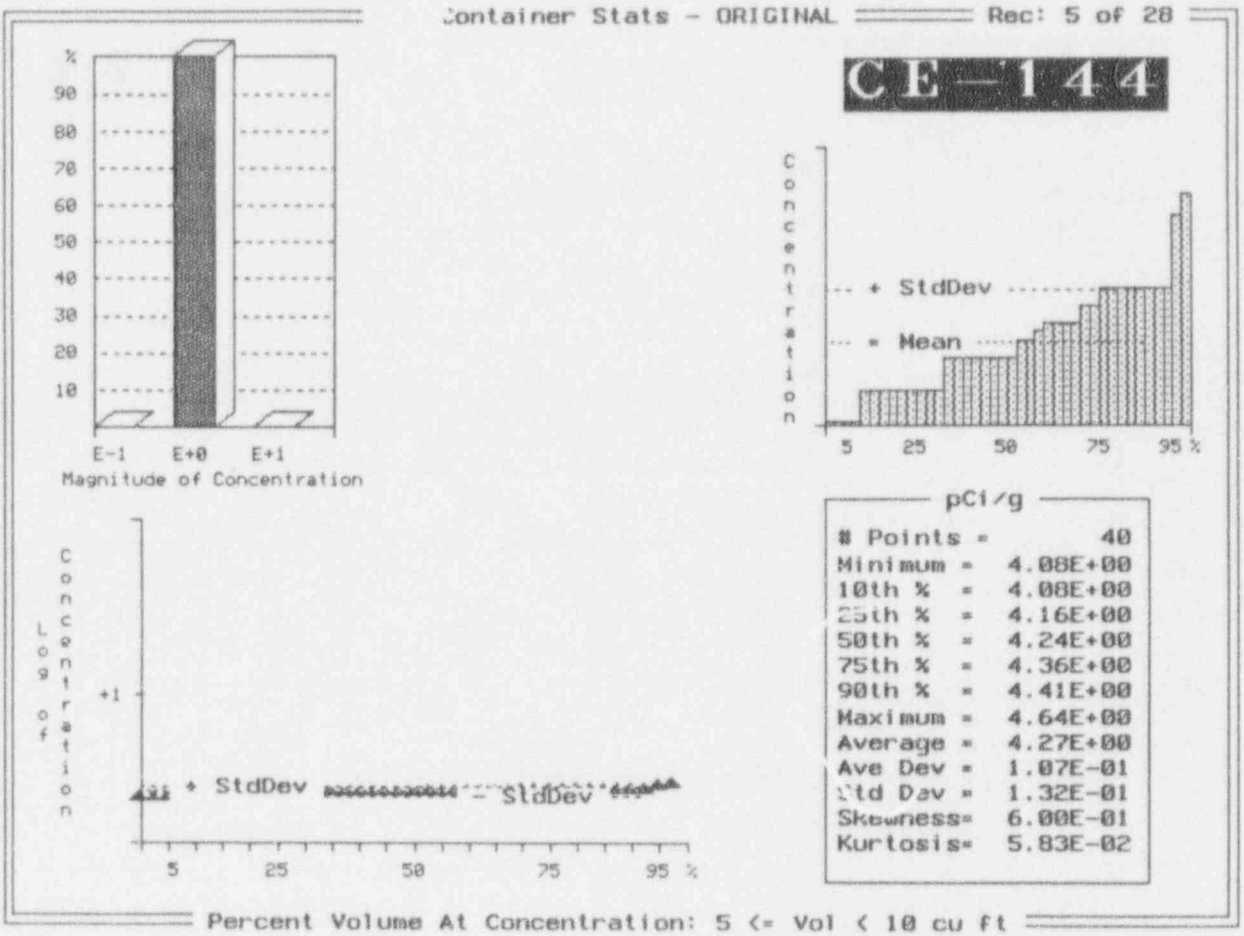

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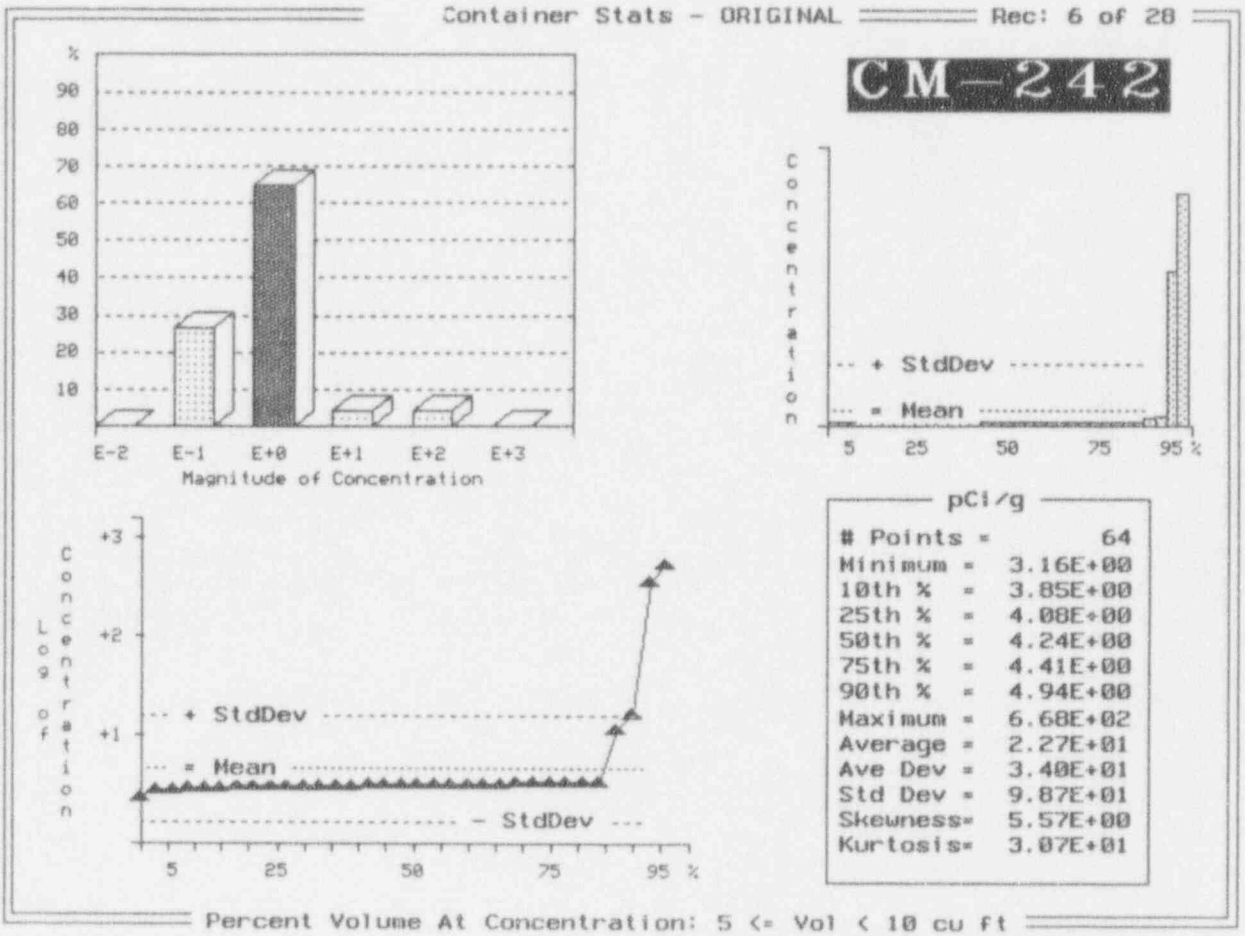

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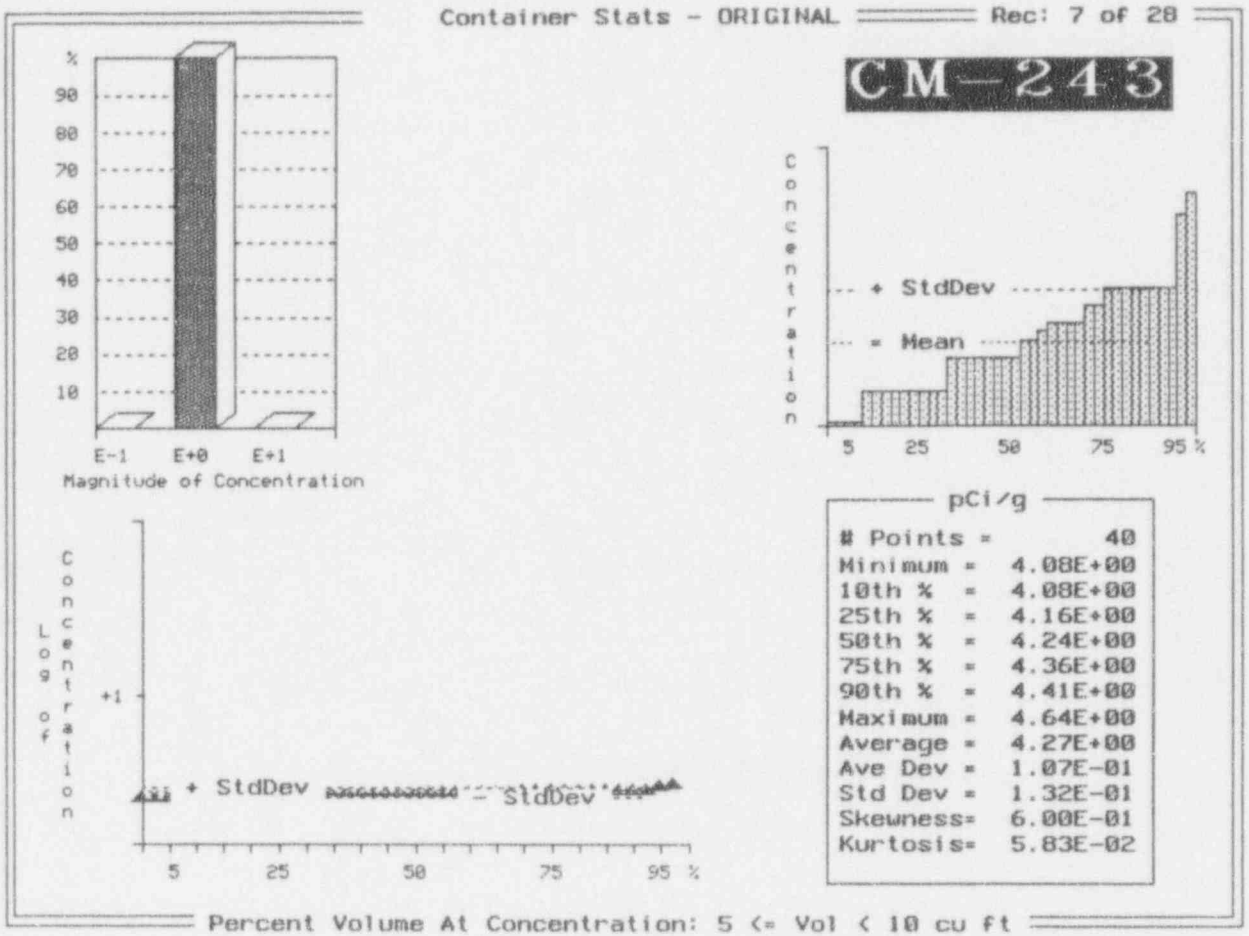

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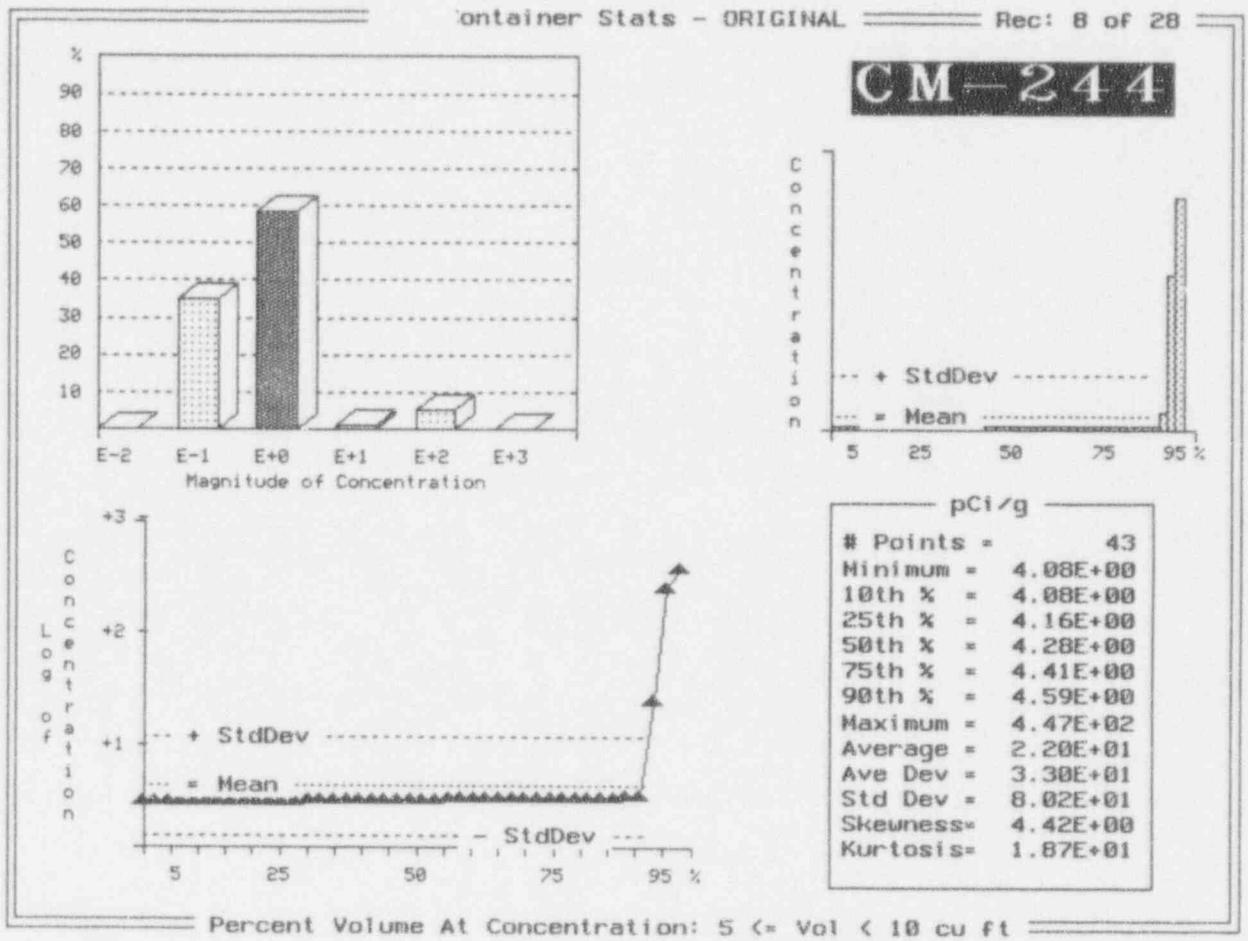

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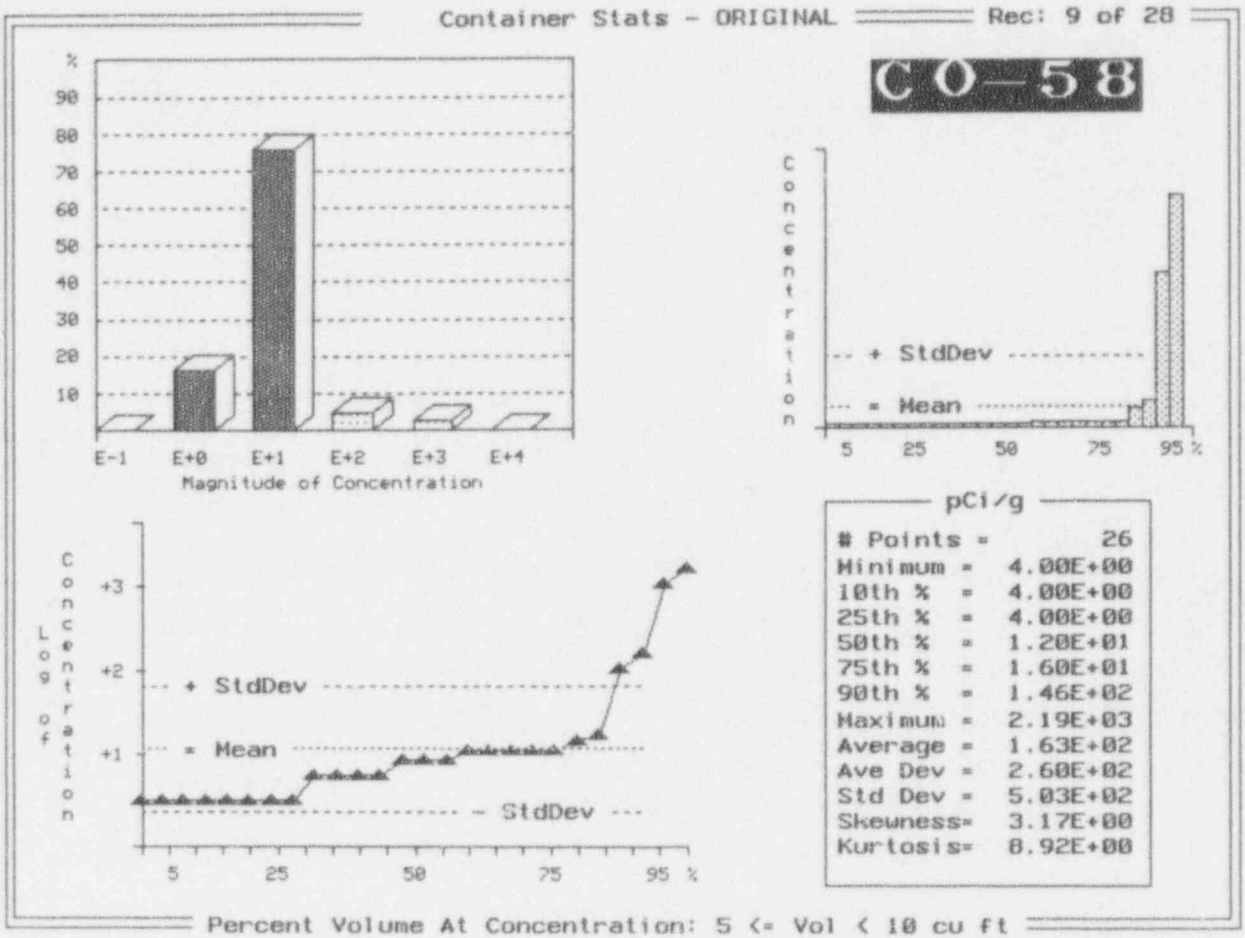

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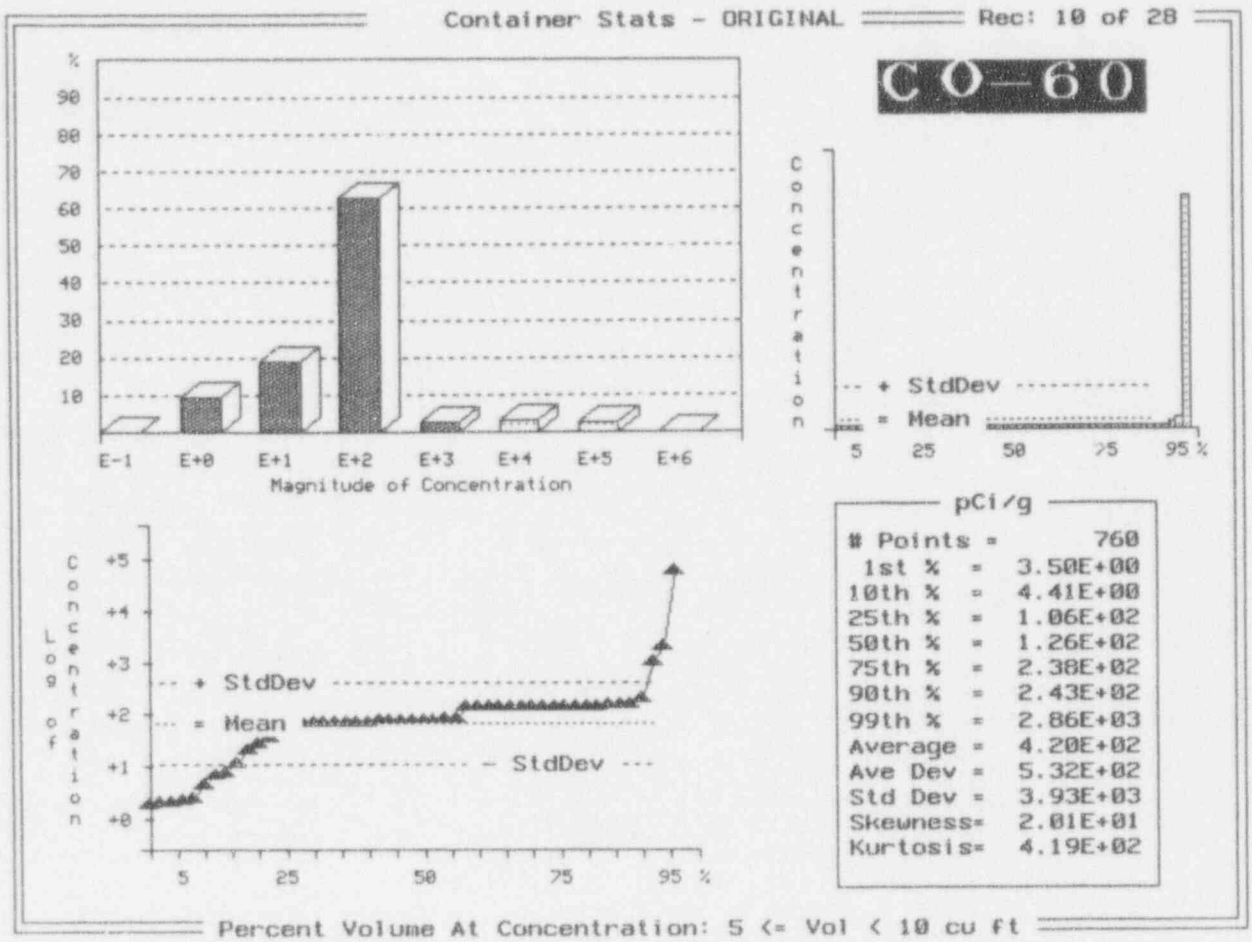

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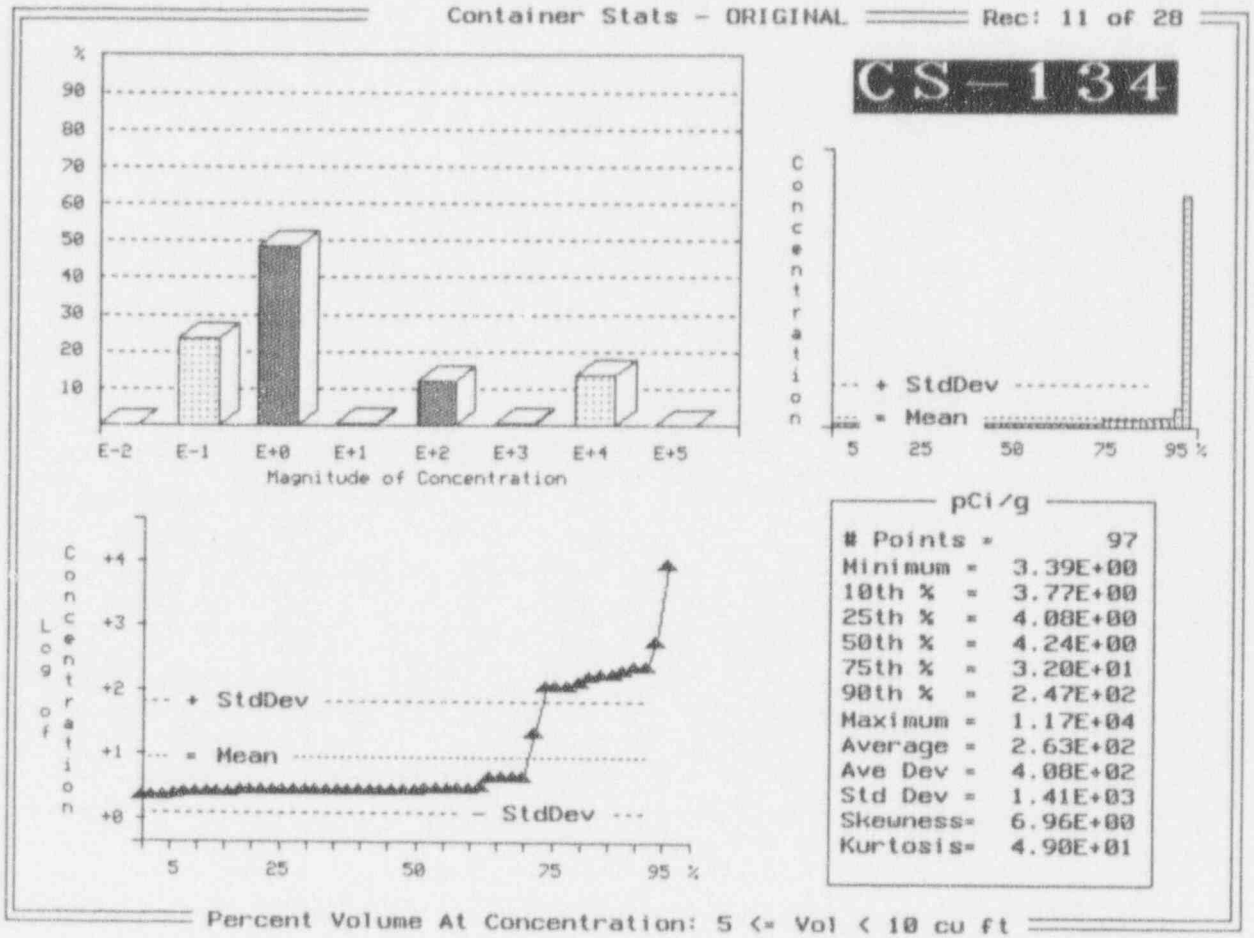

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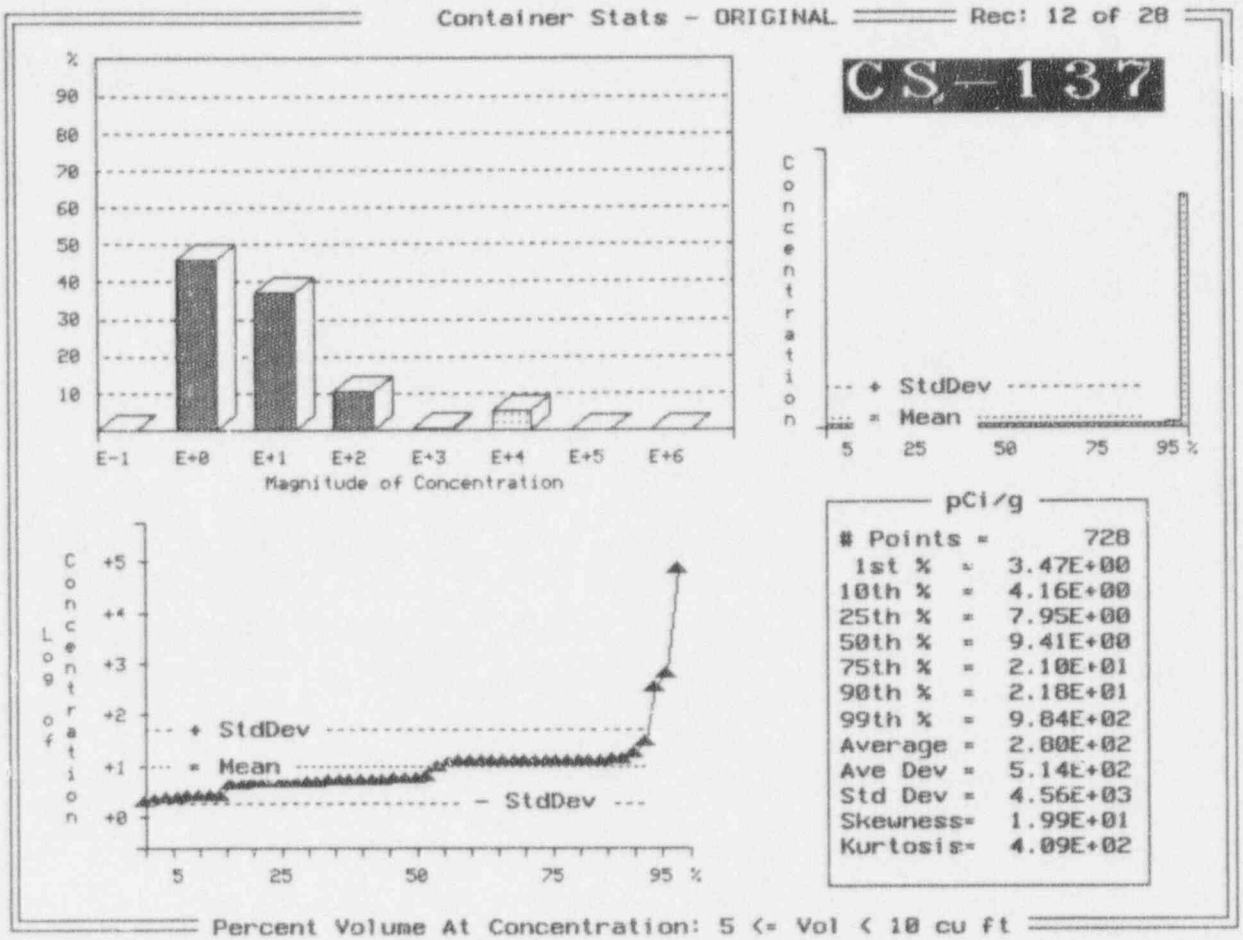

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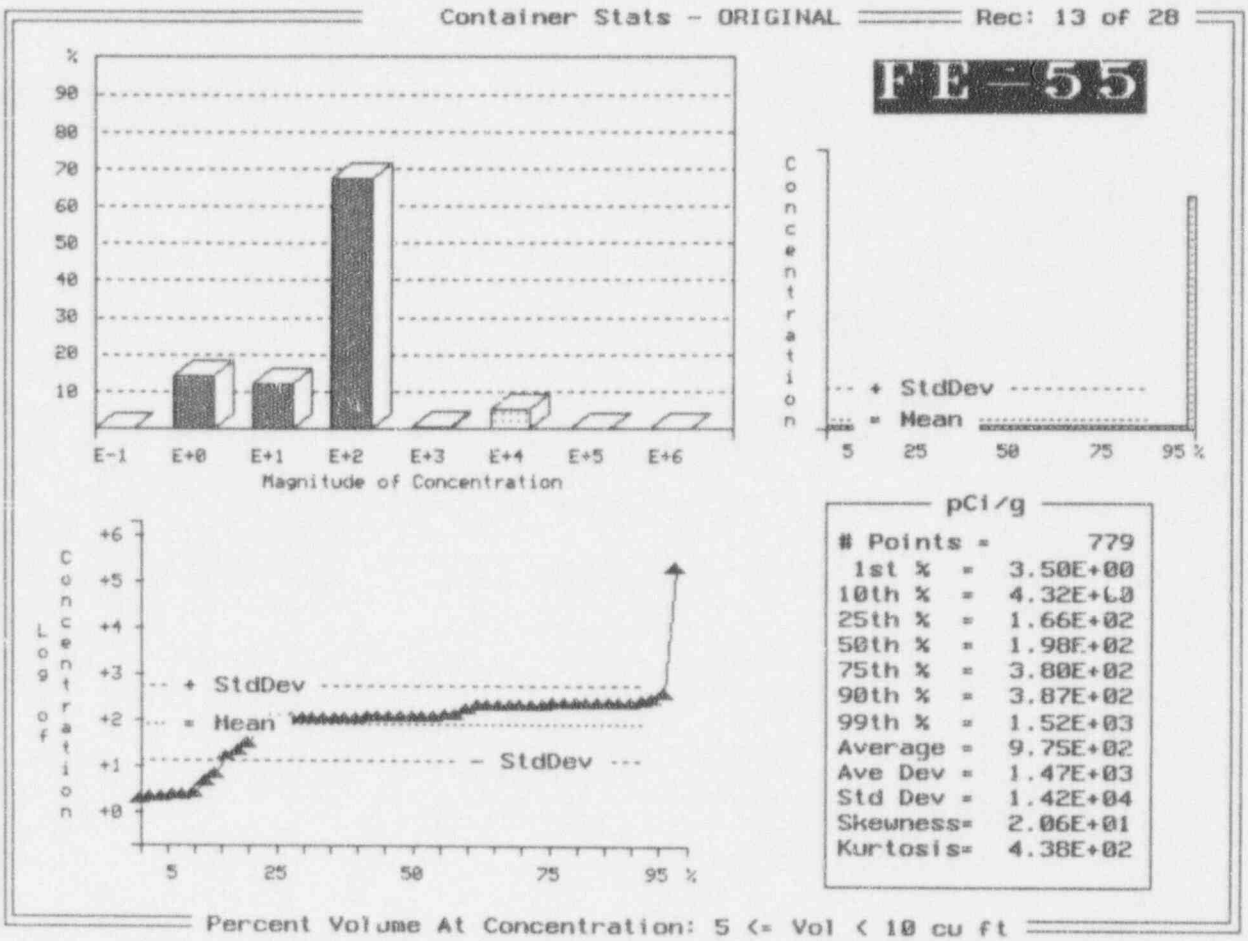

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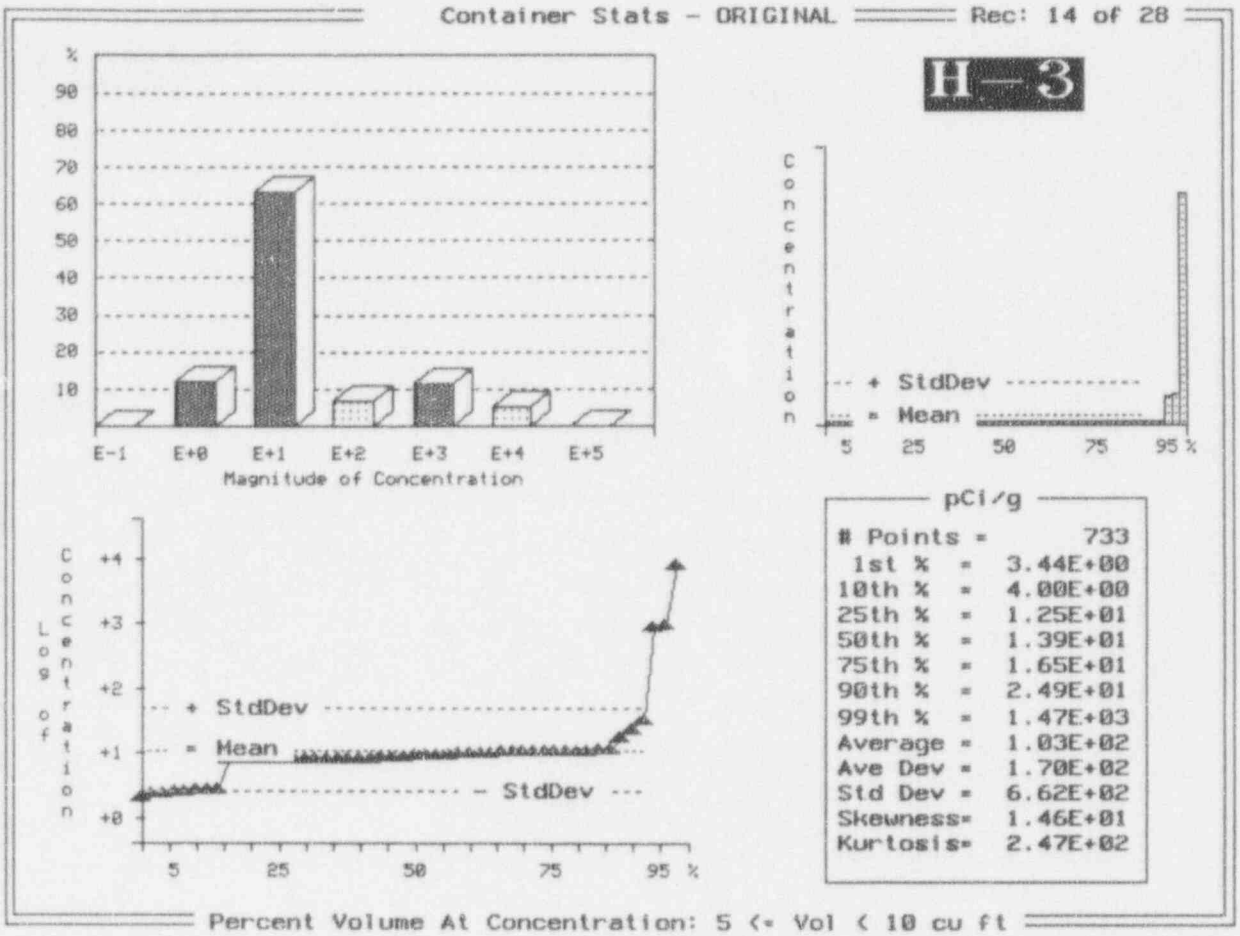

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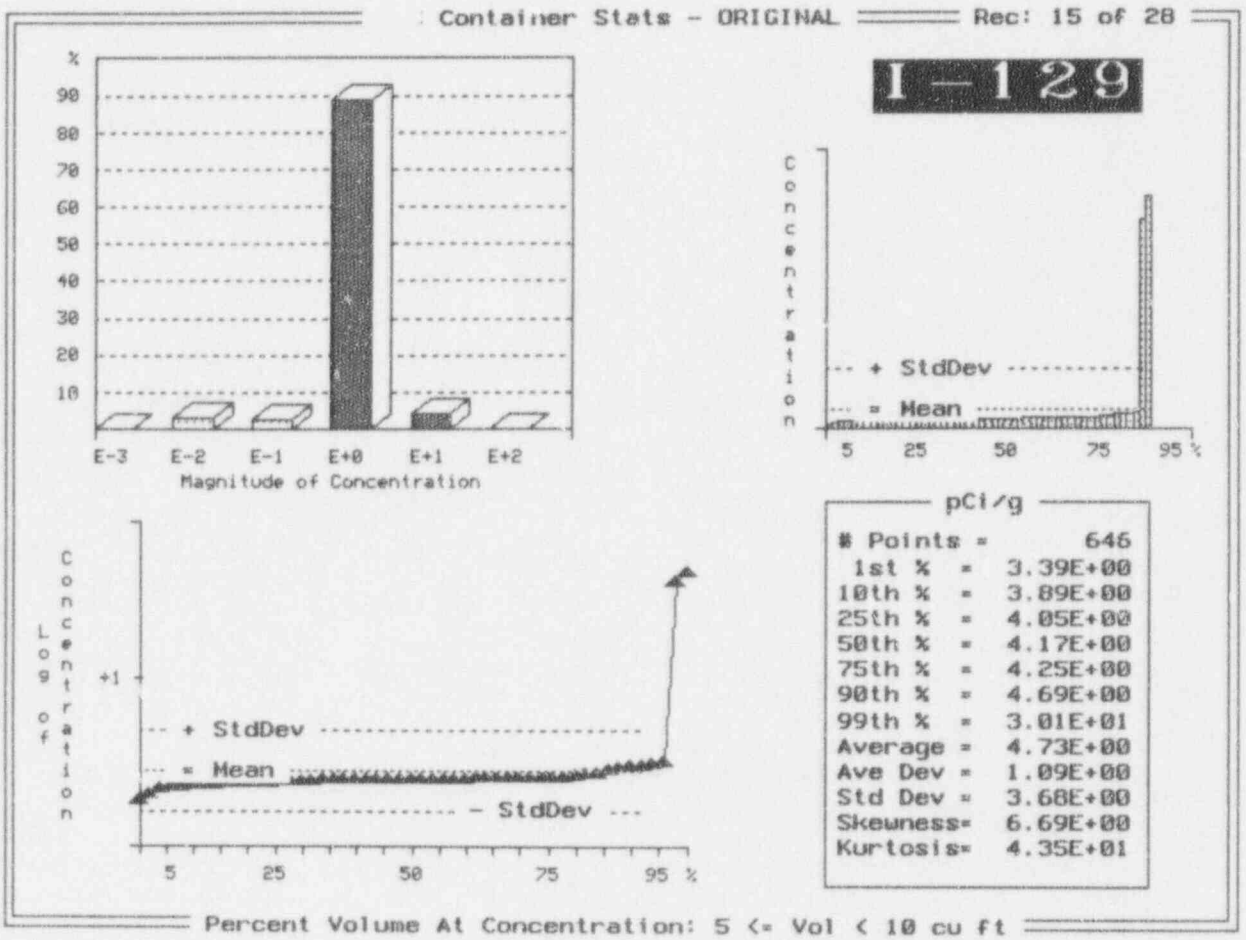

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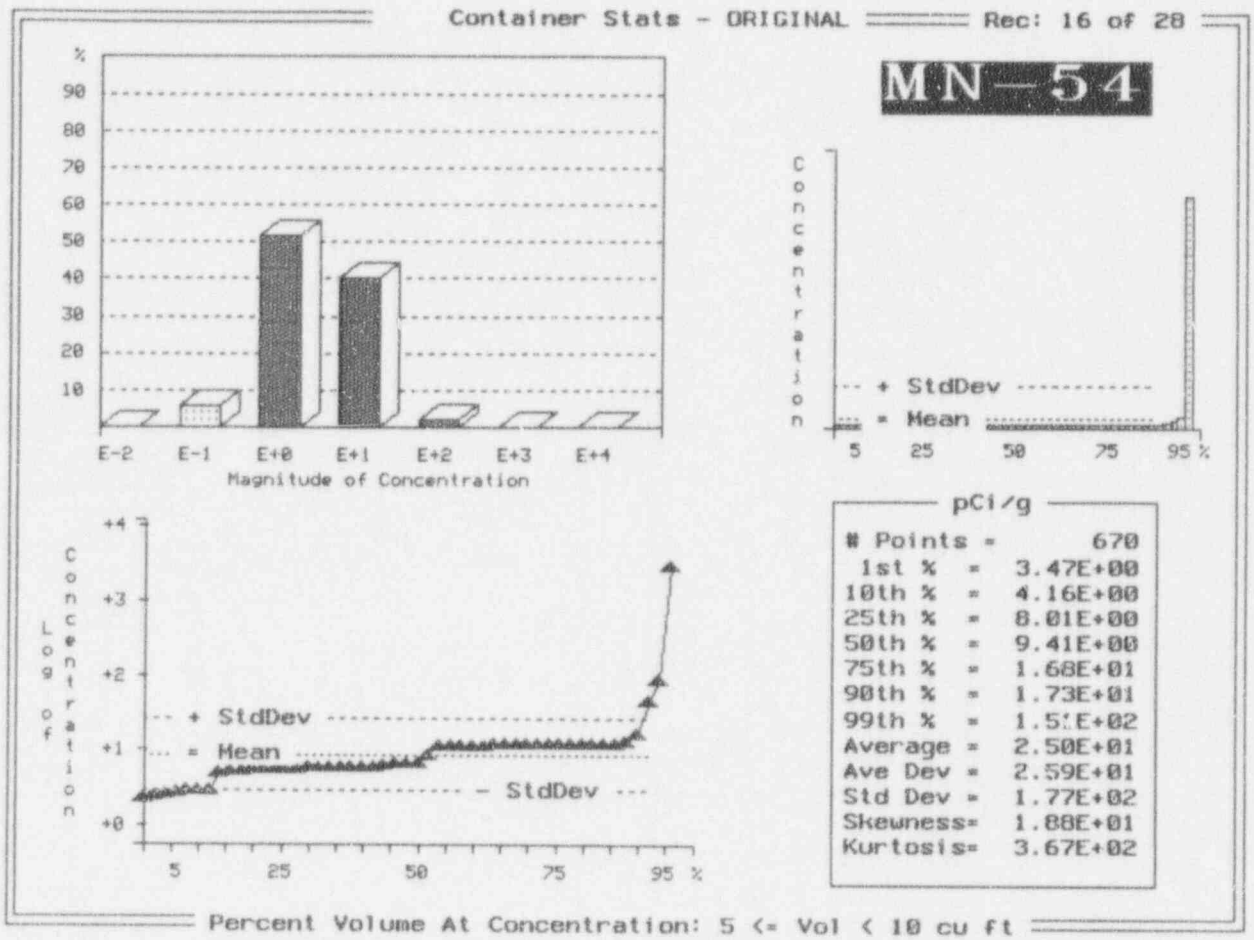

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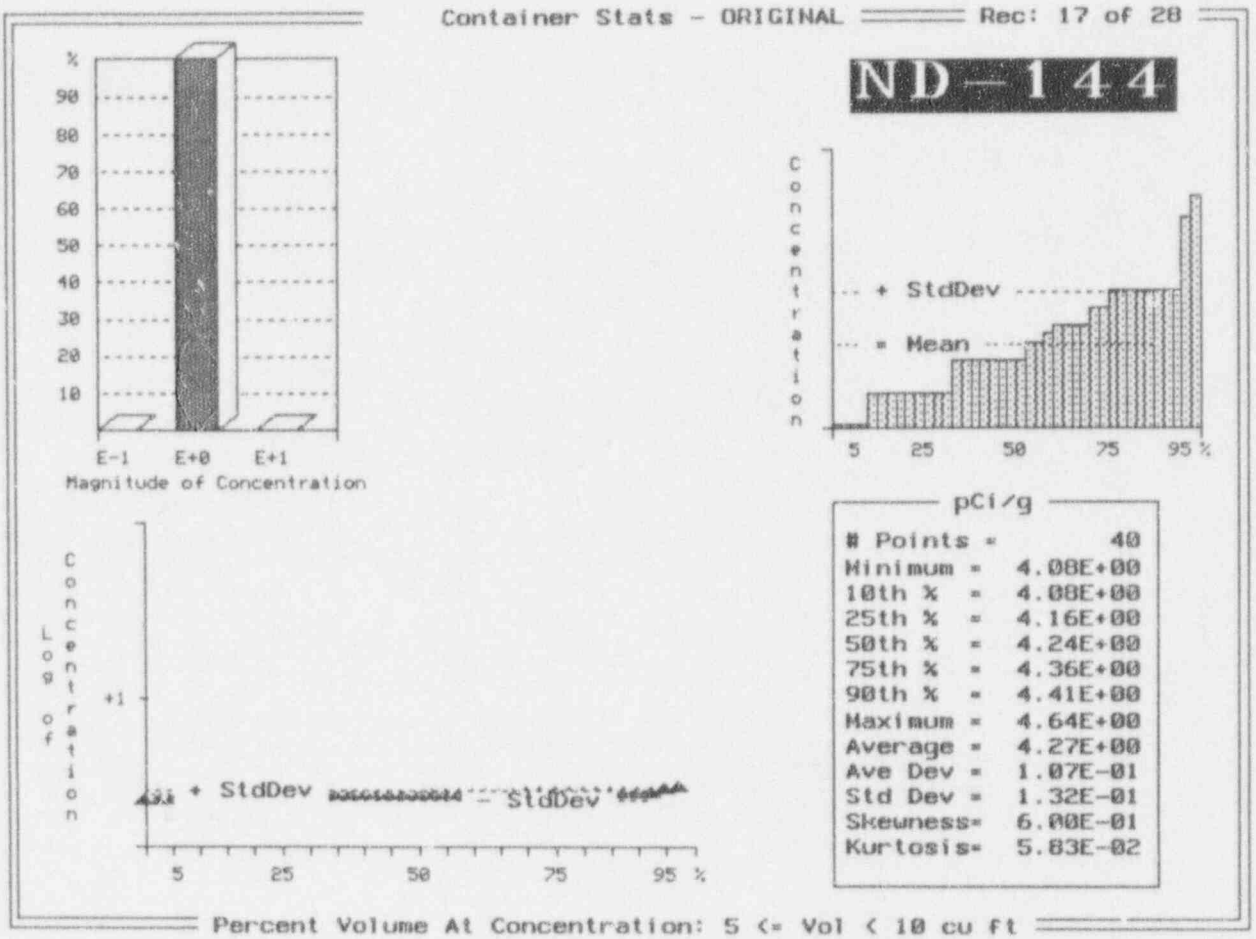

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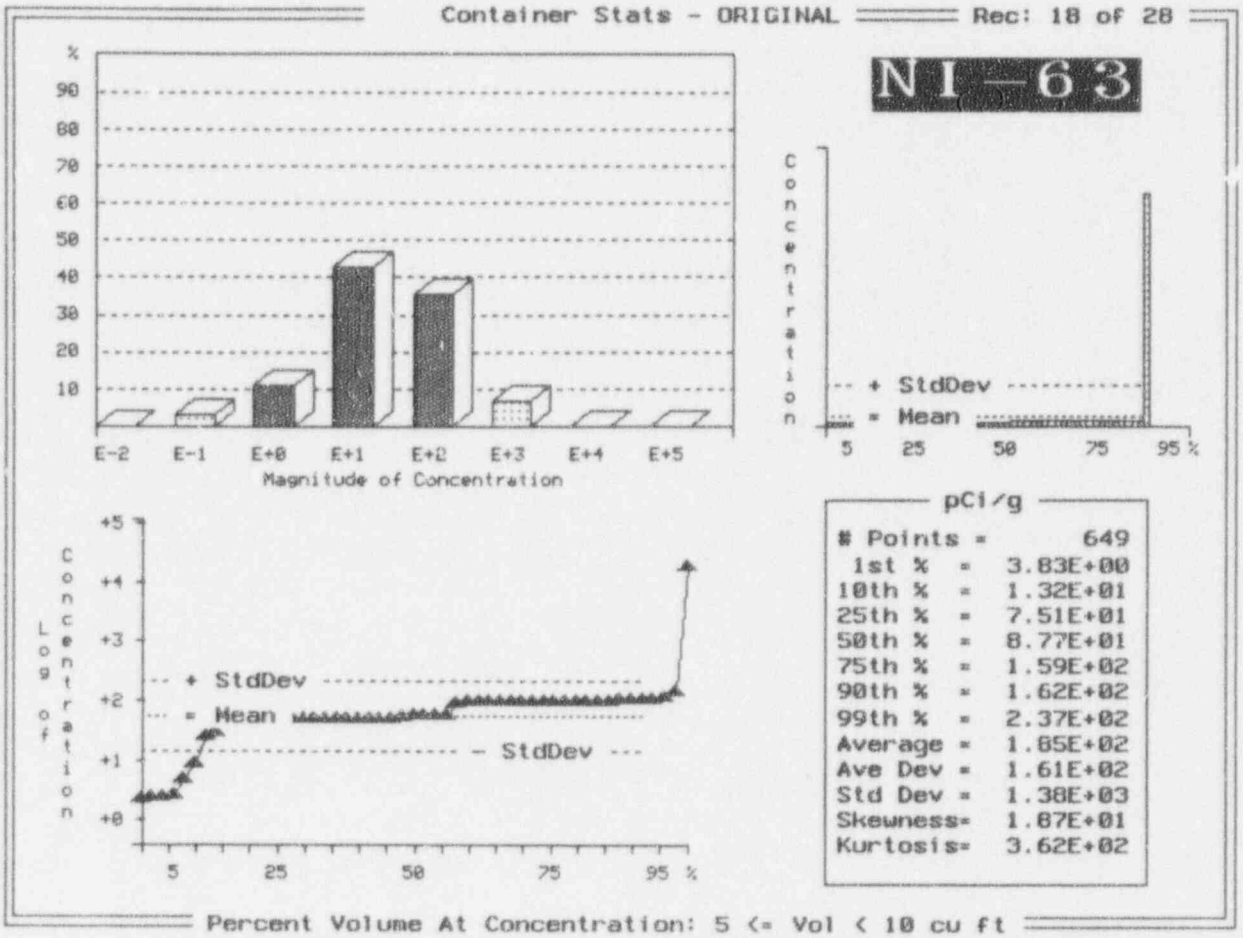

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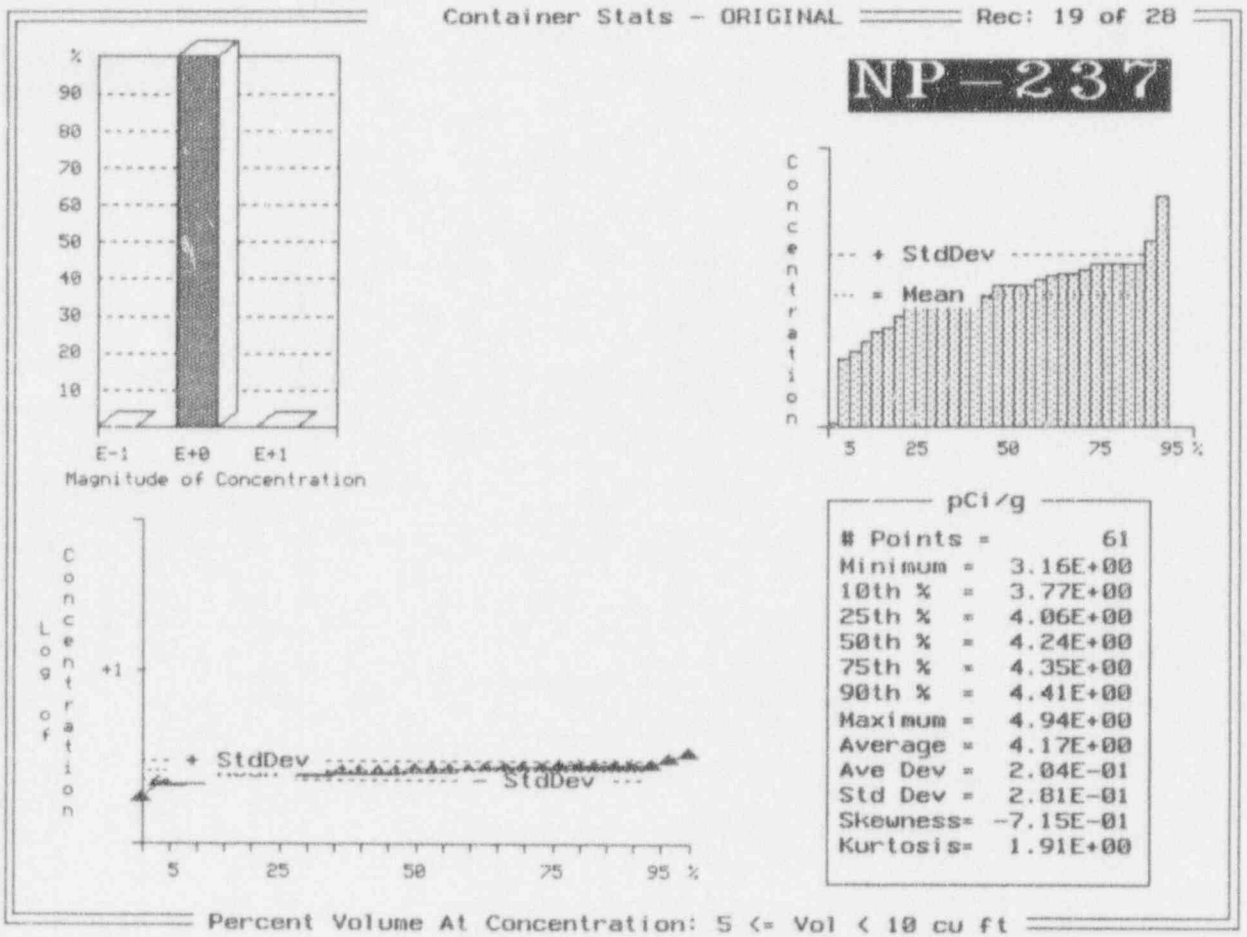

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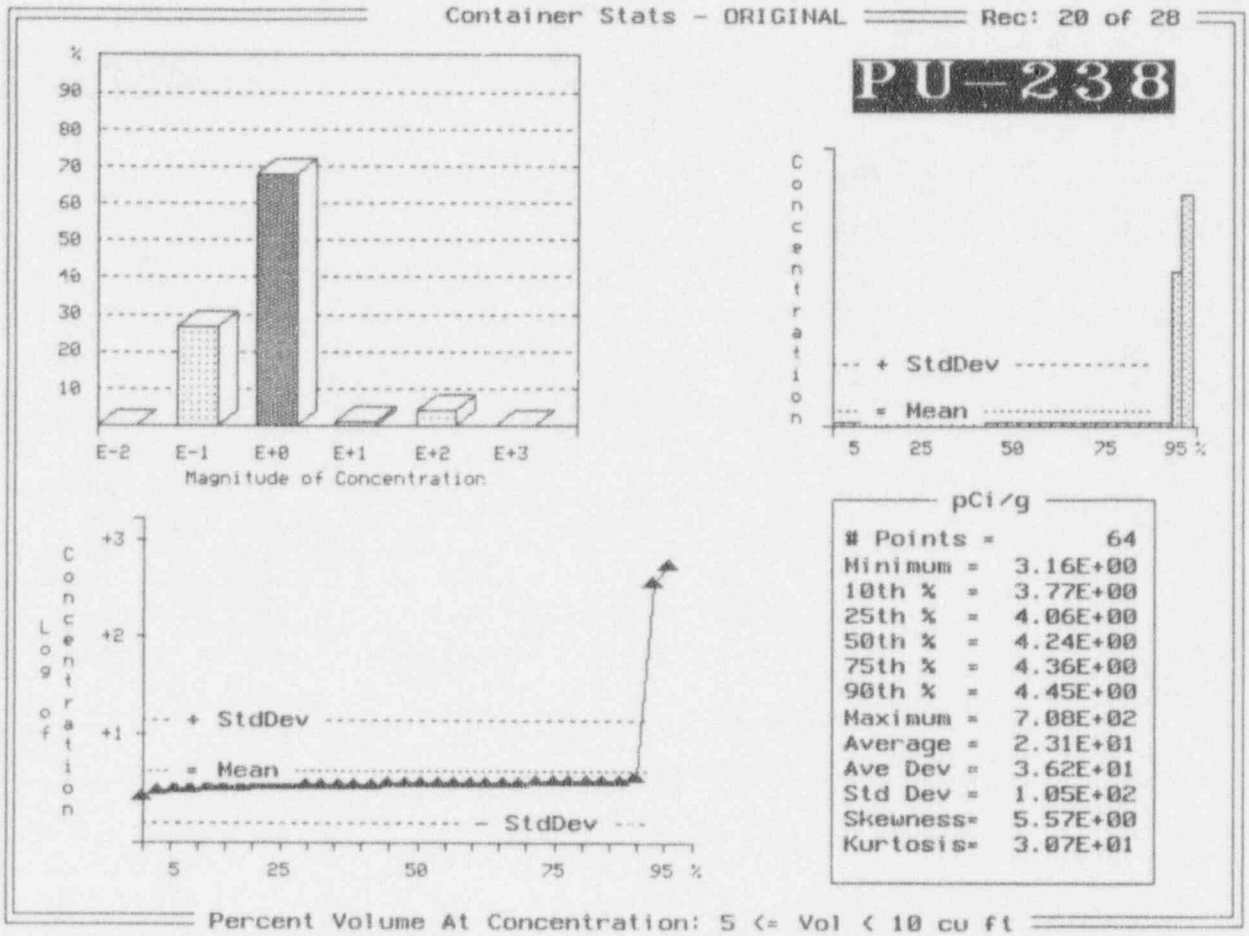

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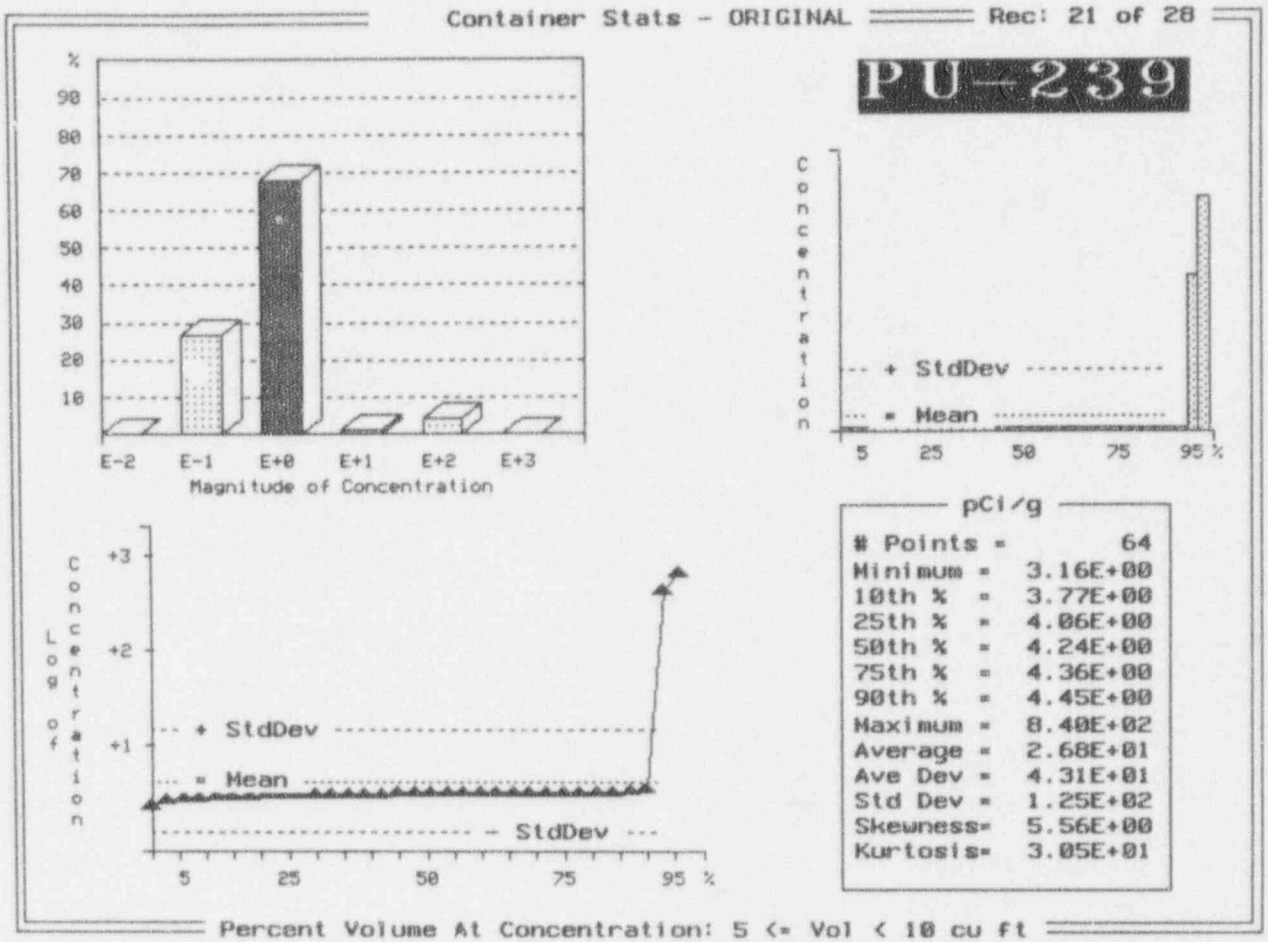

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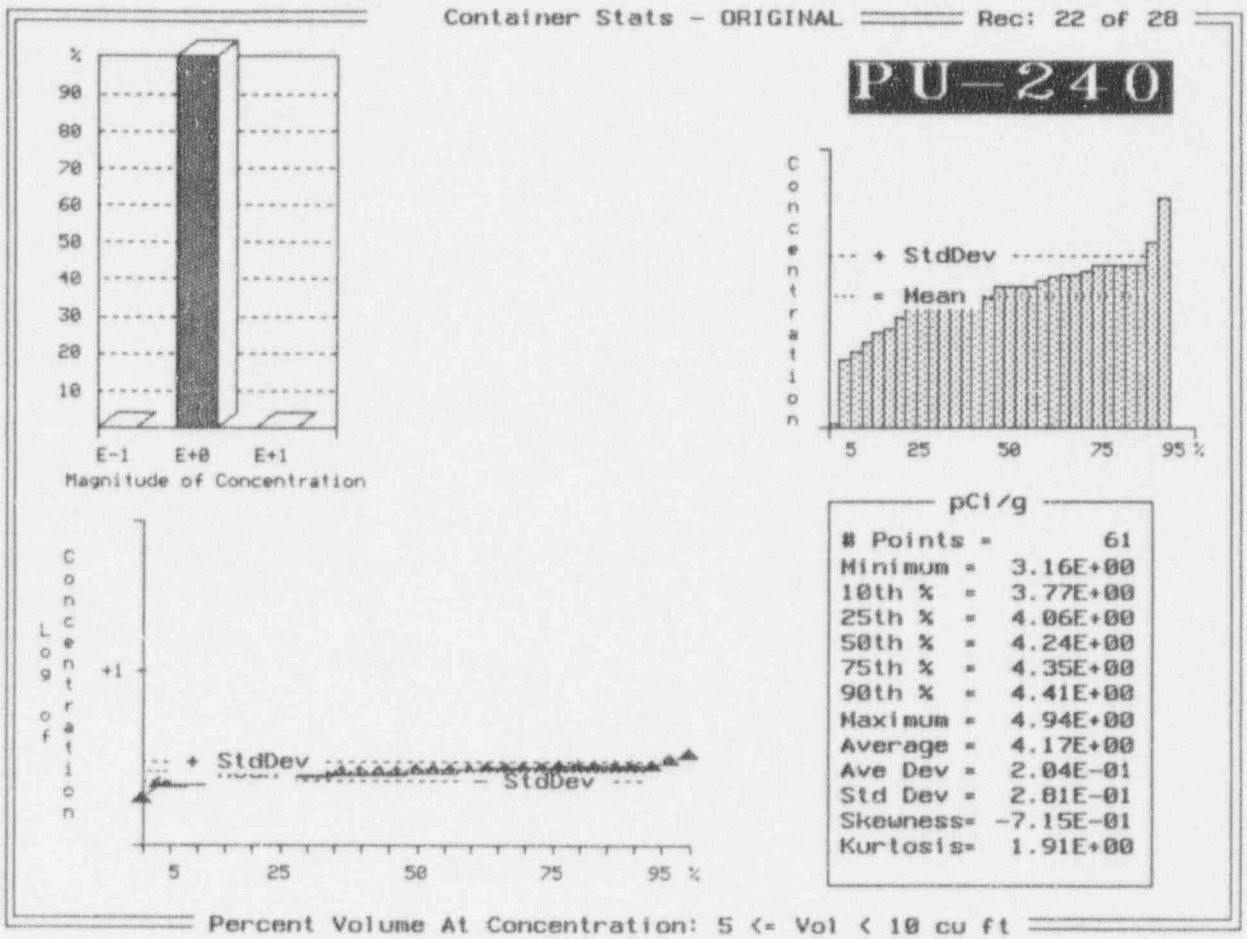

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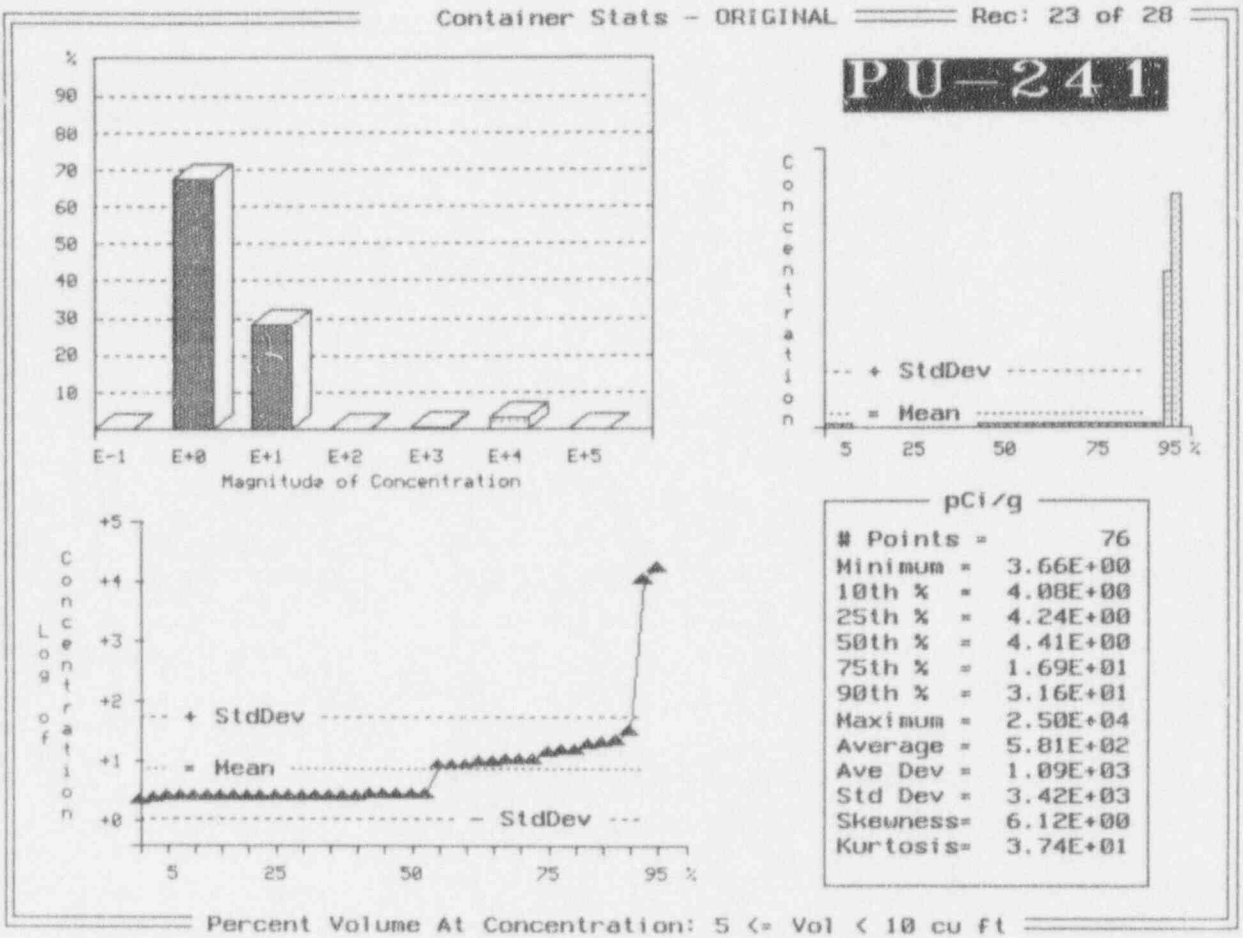

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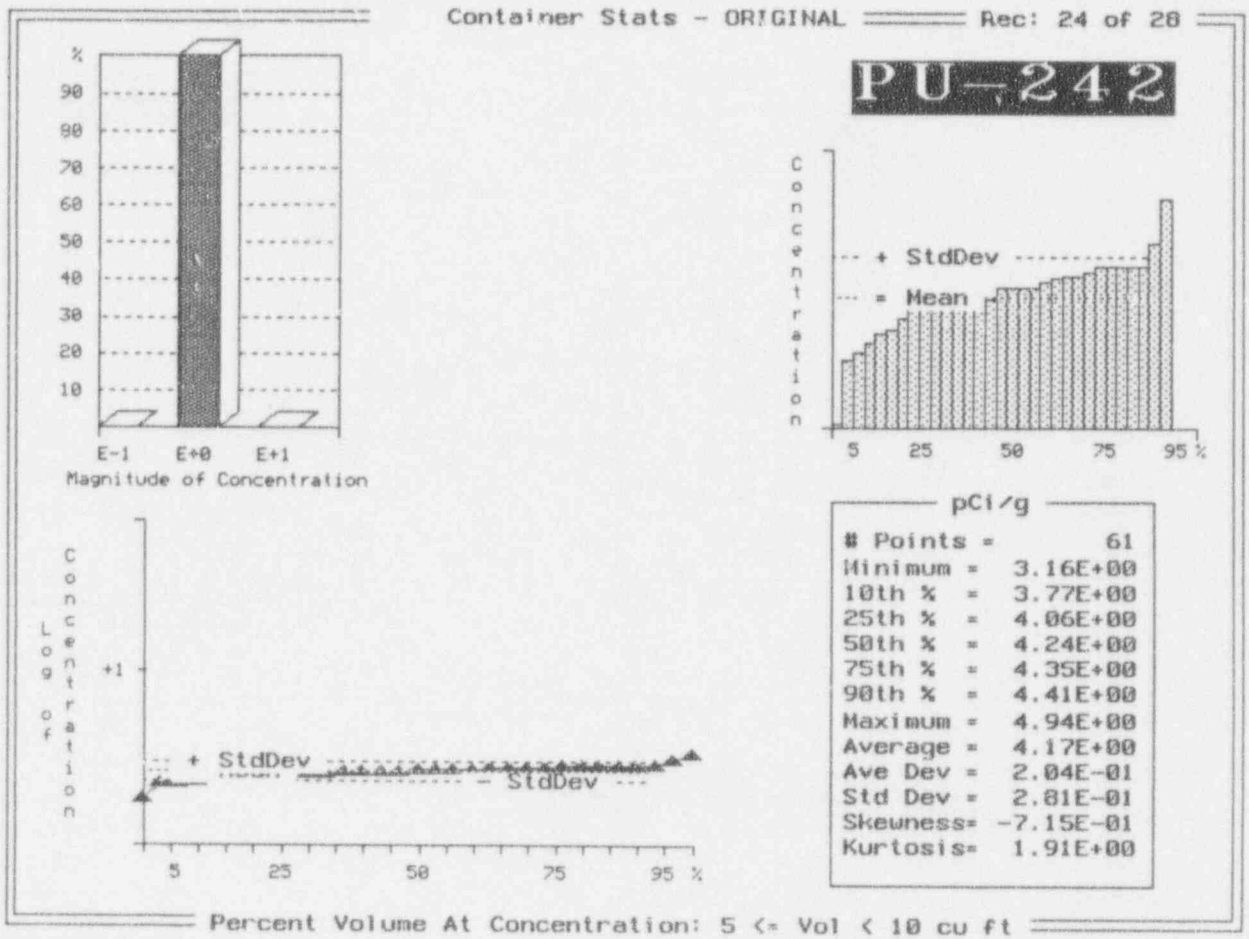

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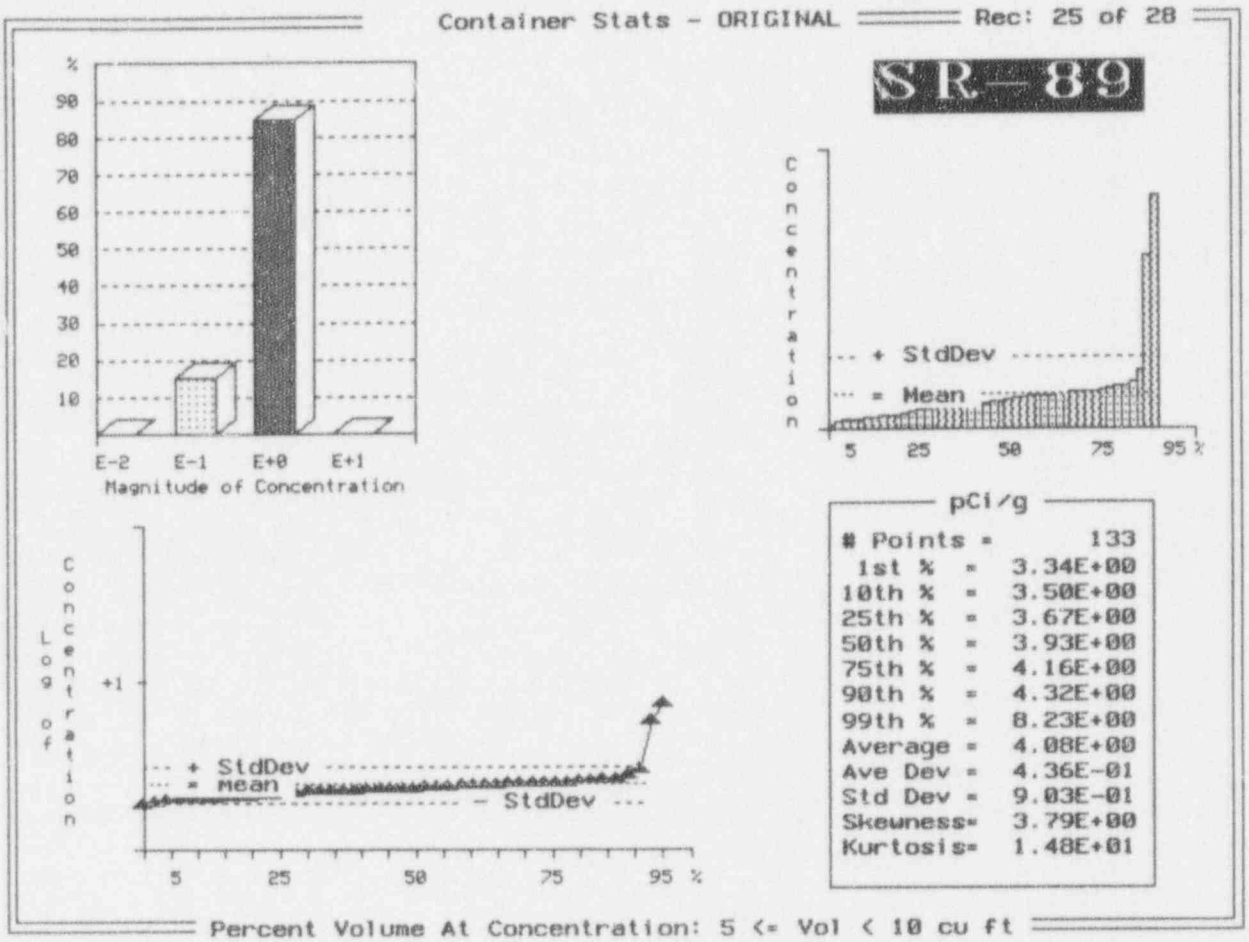

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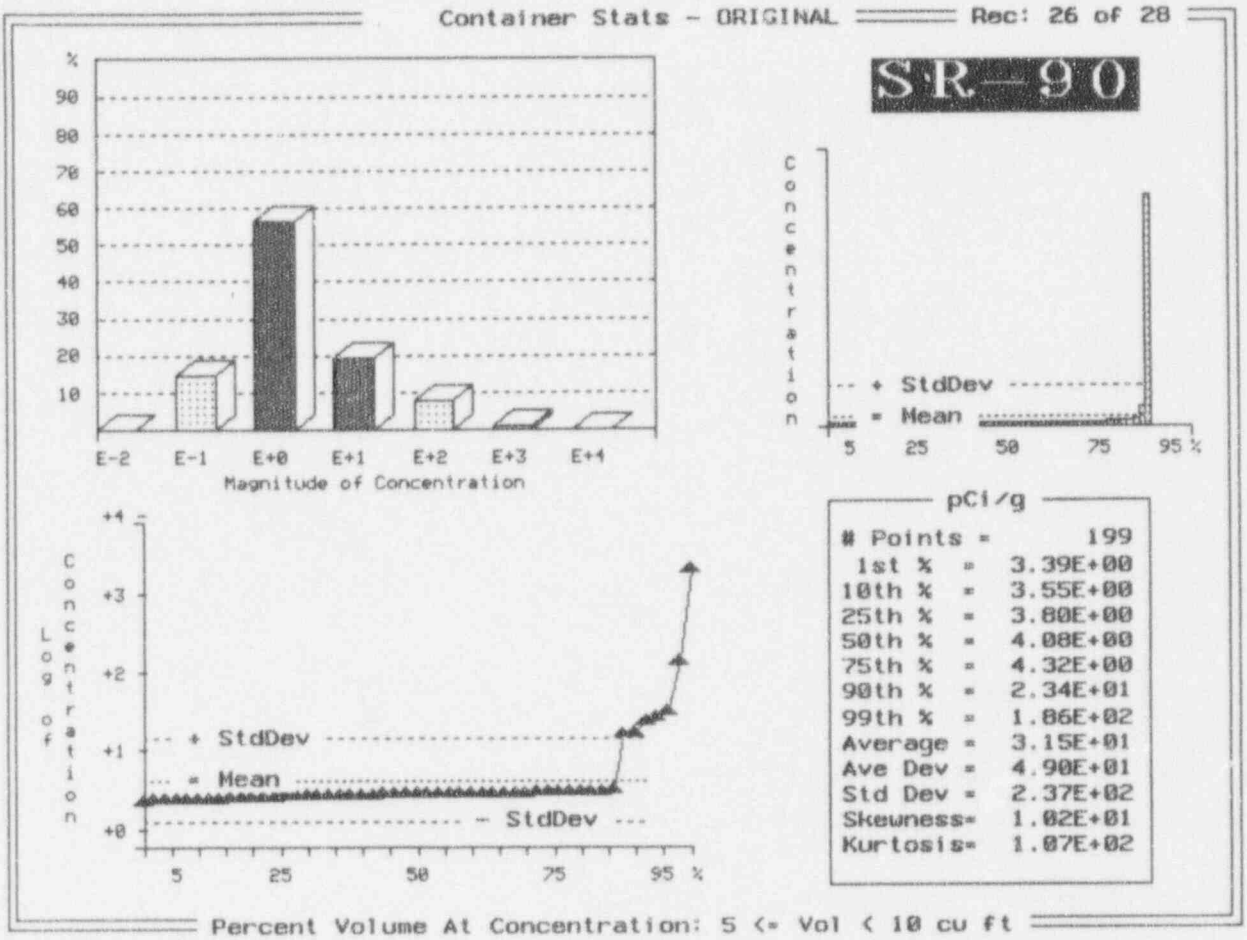

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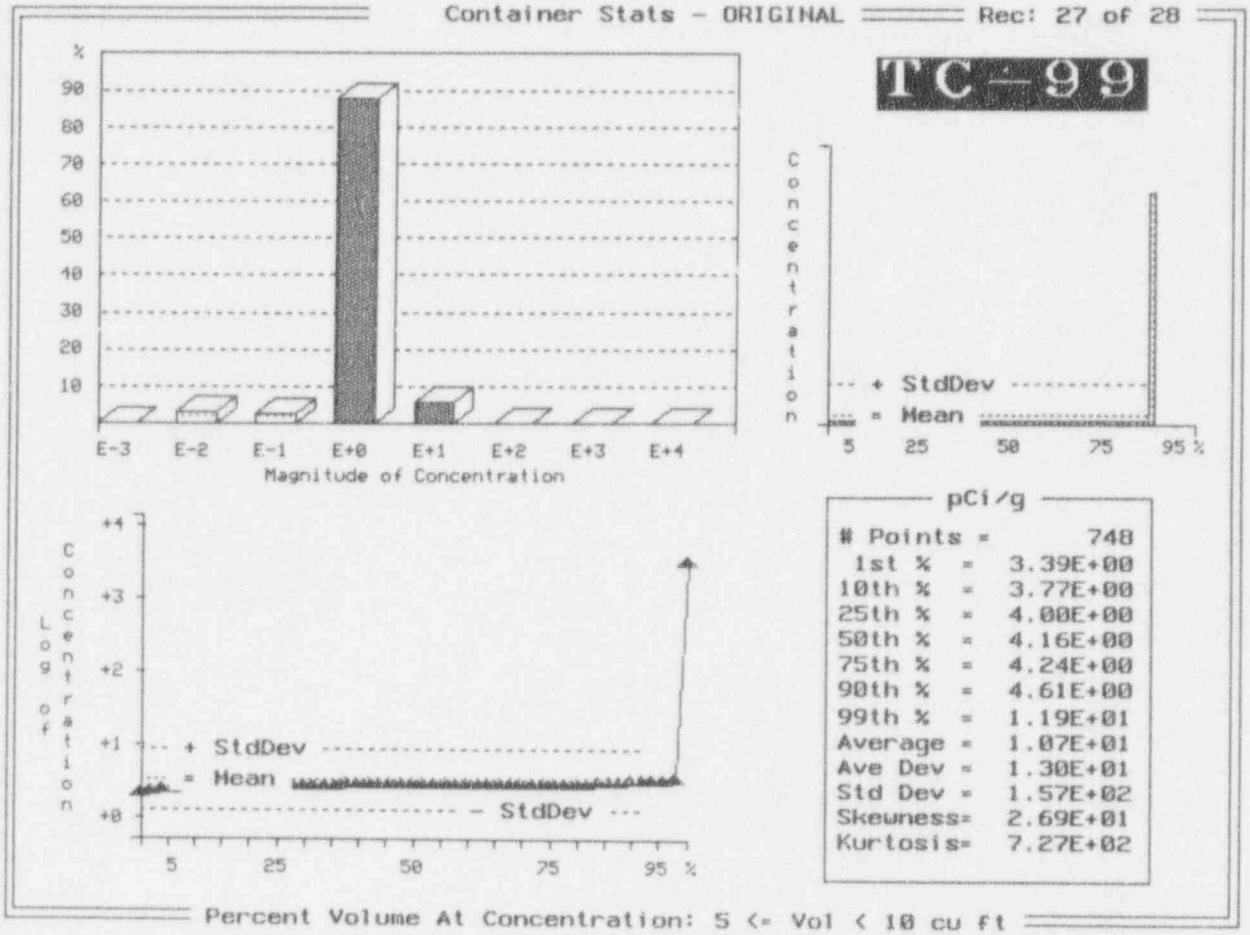

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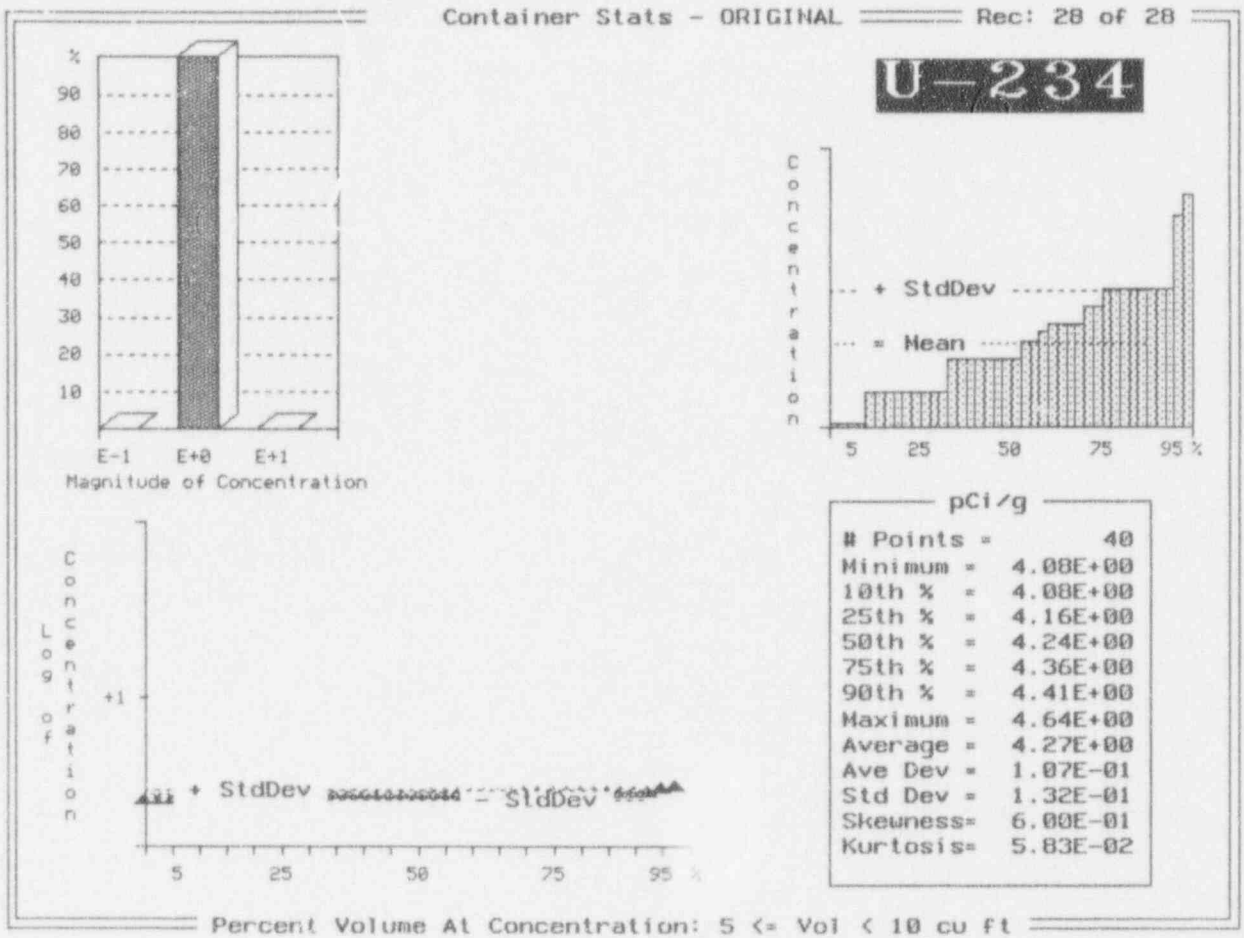


APPENDIX J

Utility Waste Radionuclide Concentrations
(Shipment Level Analyses - 1989 Barnwell and Richland)

Exhibit J-1 Radionuclide Distributions Shipment Level Analysis Barnwell 1989 Non-Brokered Utility Waste and All Regions and States[a]

Waste Class: A-Unstable and A-Stable
Number of shipping records: 649
Number of shipping containers: no data
Total waste volume: 6,611 m^3
Total waste mass: 6,281,000 Kg
Assumed waste density: 0.95 g/cm^3

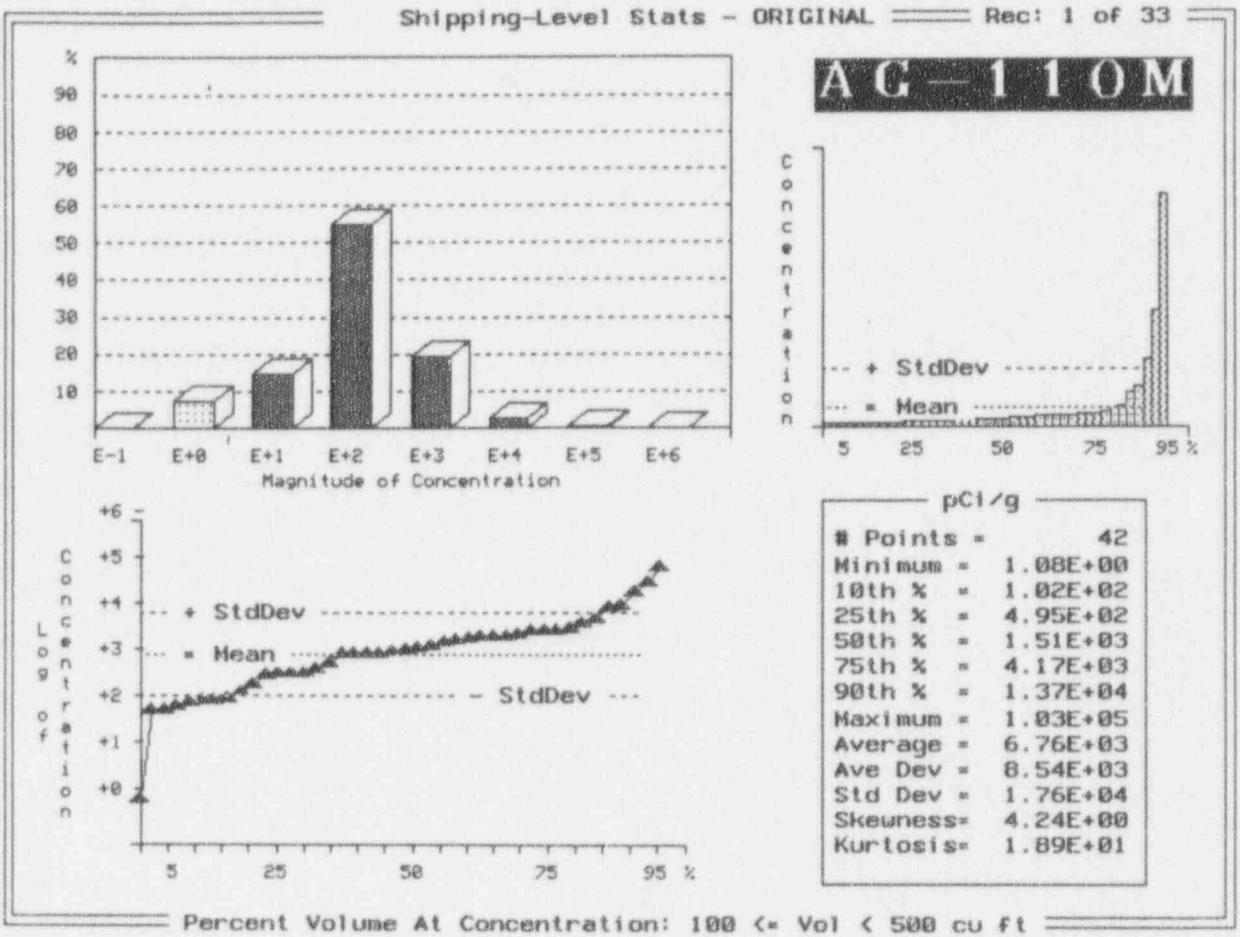
	Concentration Ranges - Percentile[b] - Ci/m^3 -			- pCi/g -		
Nuclide	1st	50th	99th	1st	50th	99th
Ag-110m	1.02E-06	1.44E-03	9.78E-02	1.08E+00	1.51E+03	1.03E+05
Am-241	8.72E-07	8.58E-06	2.41E-03	9.18E-01	9.03E+00	2.53E+03
Ba-140	2.10E-04	1.03E-02	2.84E-01	2.21E+02	1.08E+04	2.99E+05
C-14	1.75E-06	6.97E-04	2.18E-01	1.84E+00	7.34E+02	2.29E+05
Ce-141	4.91E-05	2.50E-03	2.59E-02	5.17E+01	2.63E+03	2.73E+04
Ce-144	8.72E-07	3.40E-04	6.23E-03	9.18E-01	3.58E+02	6.56E+04
Cm-242	8.72E-07	1.20E-05	1.49E-03	9.18E-01	1.26E+01	1.56E+03
Cm-244	8.72E-07	5.24E-06	1.73E-03	9.18E-01	5.52E+00	1.82E+03
Co-57	2.05E-06	5.92E-04	2.02E-02	2.15E+00	6.23E+02	2.13E+04
Co-58	1.68E-05	1.57E-02	1.11E+00	1.77E+01	1.66E+04	1.16E+06
Co-60	1.36E-04	6.82E-02	7.93E+00	1.43E+02	7.18E+04	8.34E+06
Cr-51	2.05E-05	2.48E-02	7.43E-01	2.16E+01	2.61E+04	7.85E+05
Cs-134	6.97E-05	2.66E-02	2.47E+00	7.34E+01	7.95E+04	2.60E+06
Cs-137	4.86E-05	3.22E-02	5.20E+00	5.11E+01	3.39E+04	5.47E+06
Fe-55	2.34E-04	4.35E-02	1.25E+01	2.47E+02	4.58E+04	1.31E+07
Fe-59	5.83E-06	3.67E-03	8.83E-01	6.14E+00	3.86E+03	9.29E+05
H-3	8.58E-06	1.47E-03	1.71E-01	9.03E+00	1.55E+03	1.80E+05
I-129	8.41E-07	8.10E-06	1.34E-03	8.85E-01	8.53E+00	1.41E+03
I-131	1.39E-05	1.29E-02	1.38E+00	1.47E+01	1.36E+04	1.45E+06
La-140	1.10E-04	3.13E-03	7.60E-02	1.16E+02	3.30E+03	8.00E+04
Mn-54	5.95E-05	2.25E-02	1.16E+00	6.27E+01	2.37E+04	1.22E+06

Exhibit J-1 Radionuclide Distributions Shipment Level Analysis Barnwell 1989 Non-Brokered Utility Waste and All Regions and States[a], Cont'd

Nuclide	Concentration Ranges - Ci/m^3 - 1st	50th	99th	Percentile[b] - pCi/g - 1st	50th	99th
Nb-95	2.79E-05	2.30E-03	7.20E-01	2.94E+01	2.42E+03	7.58E+05
Ni-63	2.56E-05	7.30E-03	2.80E+00	2.69E+01	7.68E+03	2.95E+06
Pu-238	8.72E-07	4.09E-06	3.70E-04	9.18E-01	4.31E+00	3.89E+02
Pu-239	8.72E-07	3.43E-06	4.49E-04	9.18E-01	3.61E+00	4.73E+02
Pu-241	1.94E-06	2.00E-04	6.05E-02	2.05E+00	2.11E+02	6.37E+04
Sb-124	8.18E-06	1.69E-03	5.48E-01	8.61E+00	1.78E+03	5.77E+05
Sb-125	3.74E-05	2.56E-03	8.29E+01	3.94E+01	2.69E+03	8.73E+07
Sr-89	0.00E+00	4.07E-03	2.74E-01	0.00E+00	4.28E+03	2.88E+05
Sr-90	8.72E-07	1.36E-04	1.46E-02	9.18E-01	1.43E+02	1.54E+04
Tc-99	8.41E-07	1.72E-05	6.25E-03	8.85E-01	1.81E+01	6.58E+03
Zn-65	6.10E-05	4.03E-02	5.47E+00	6.42E+01	4.24E+04	5.76E+06
Zr-95	1.74E-06	1.91E-03	9.82E-02	1.84E+00	2.01E+03	2.57E+04

(a) Based on Barnwell 1989 LLW data only.
(b) Includes only radionuclides with 30 or more data points characterizing concentration ranges.

Exhibit J-1 (Continued)



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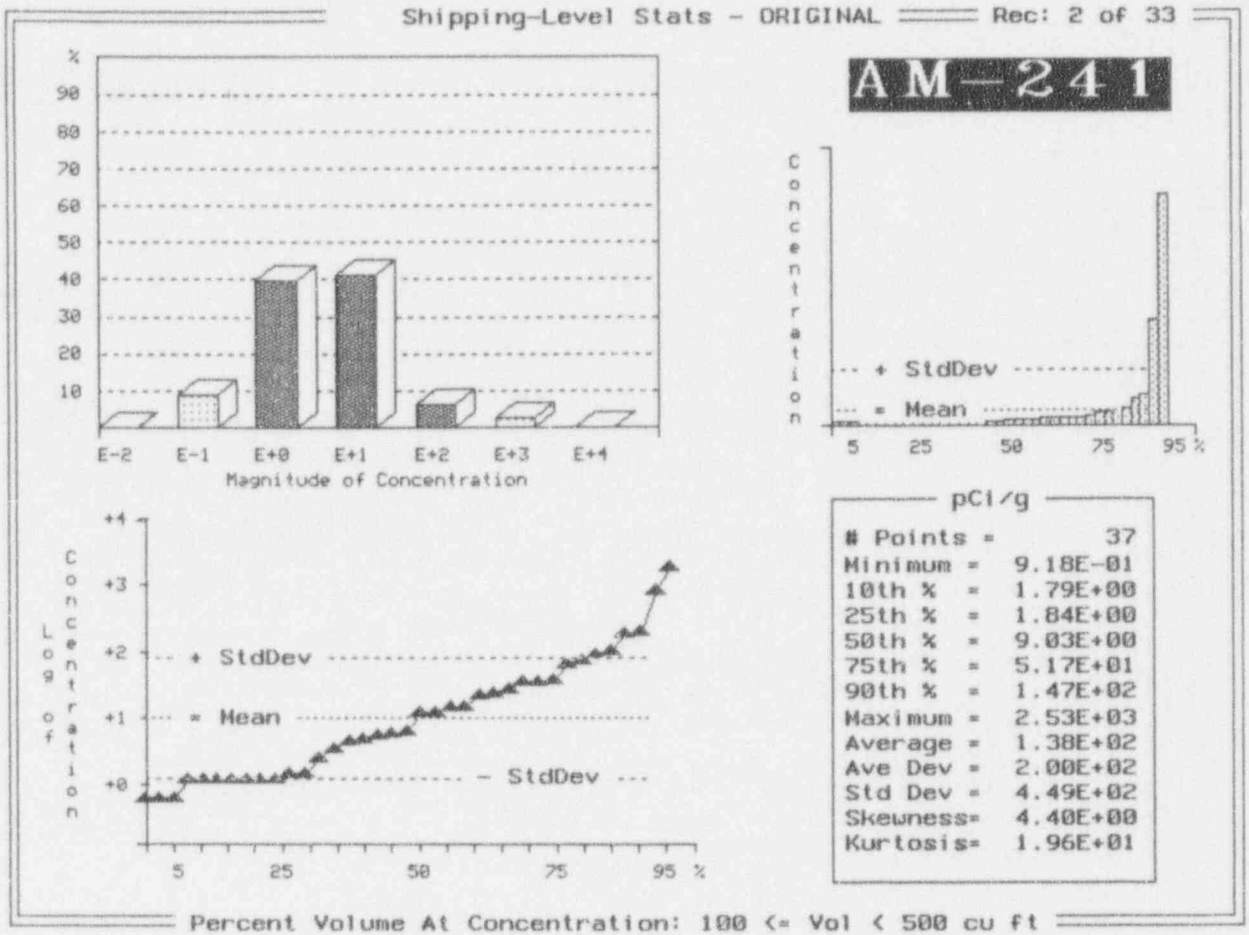

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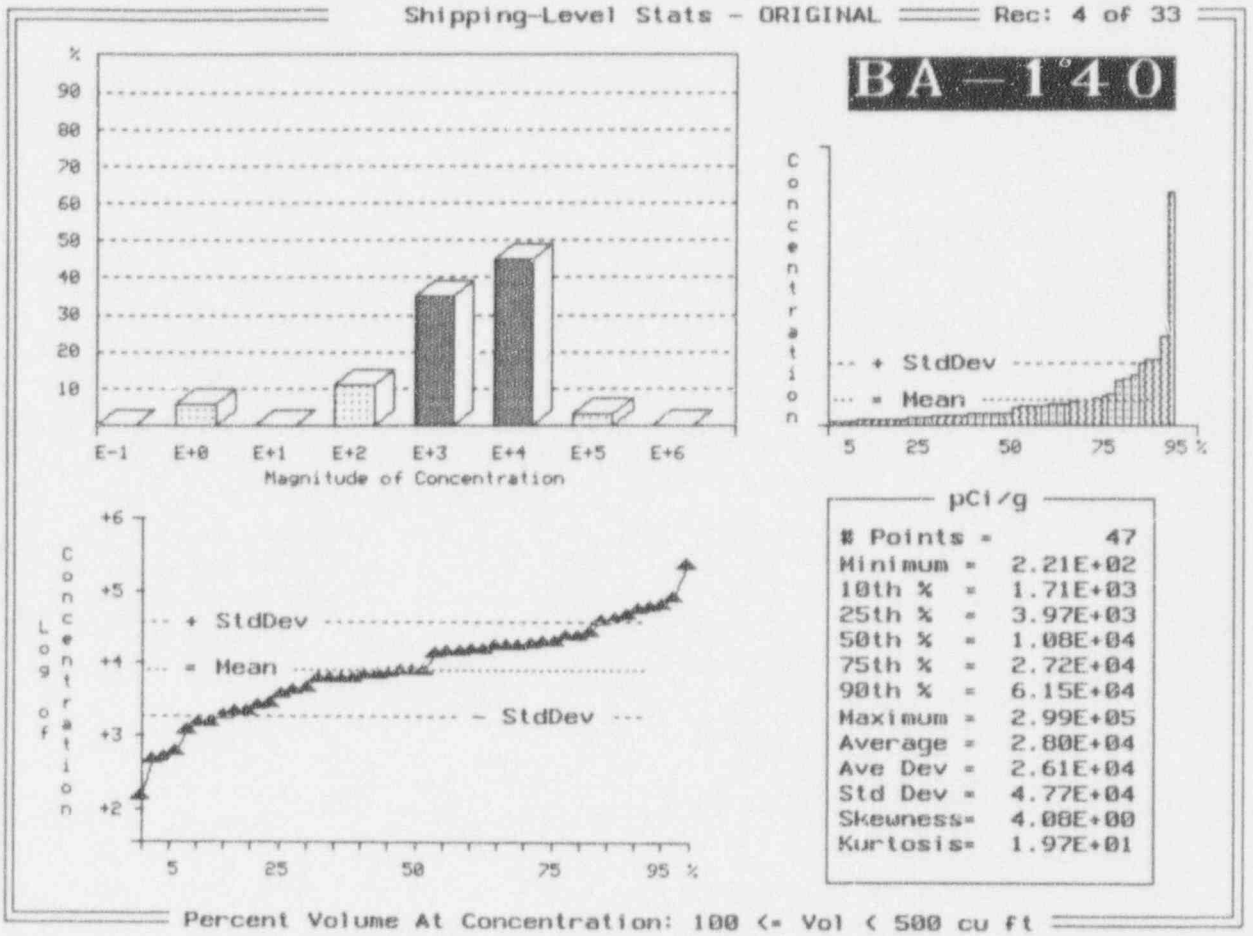

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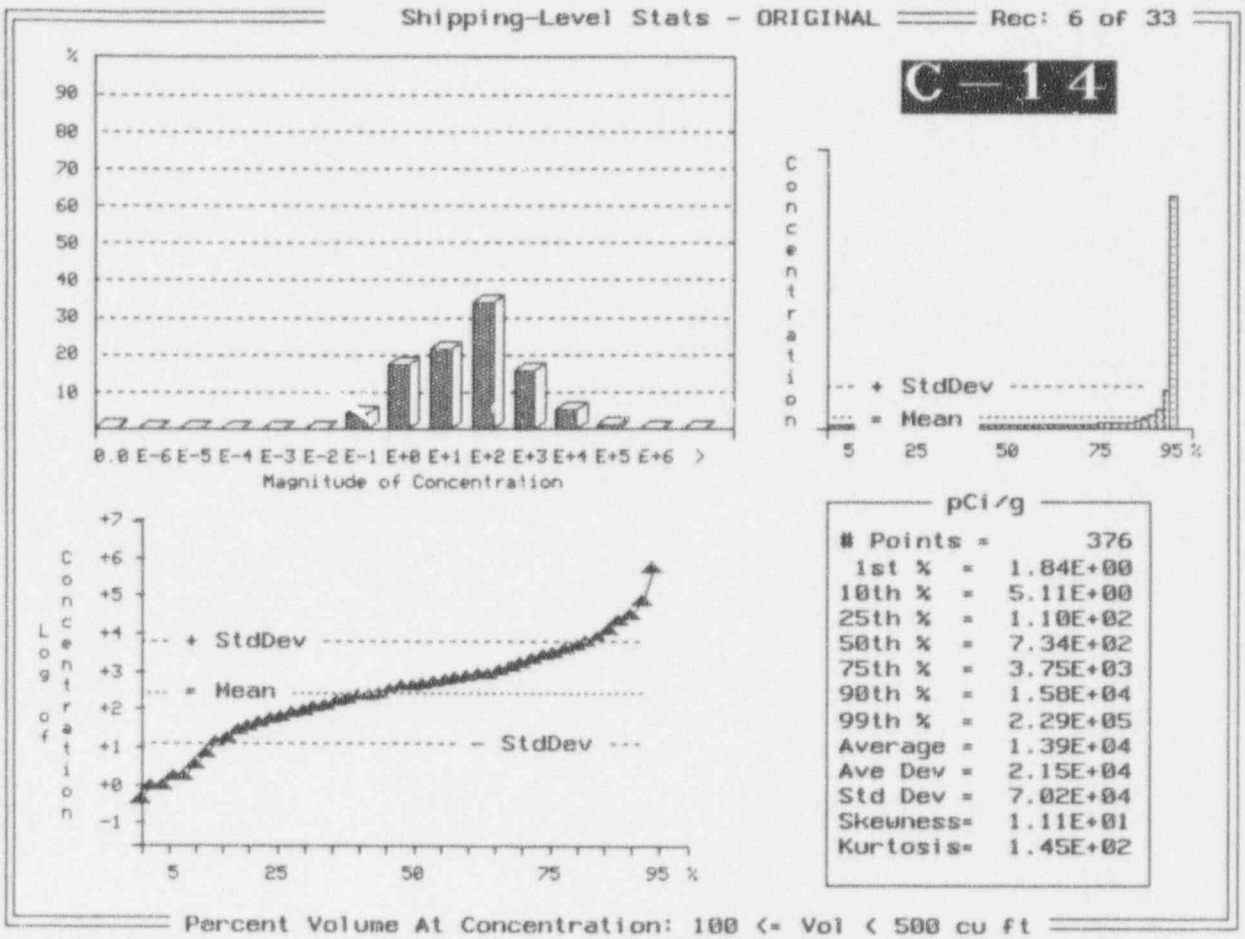

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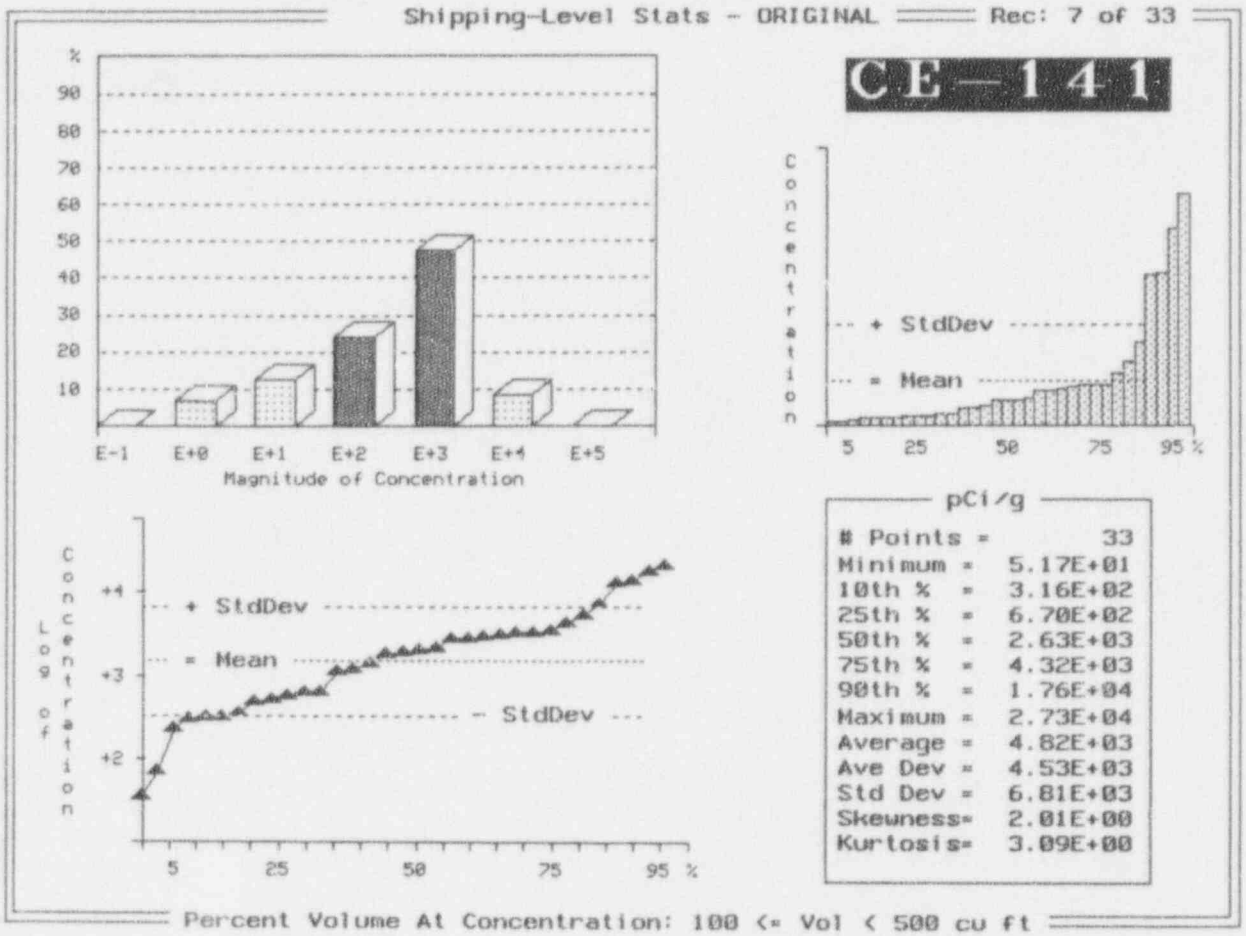

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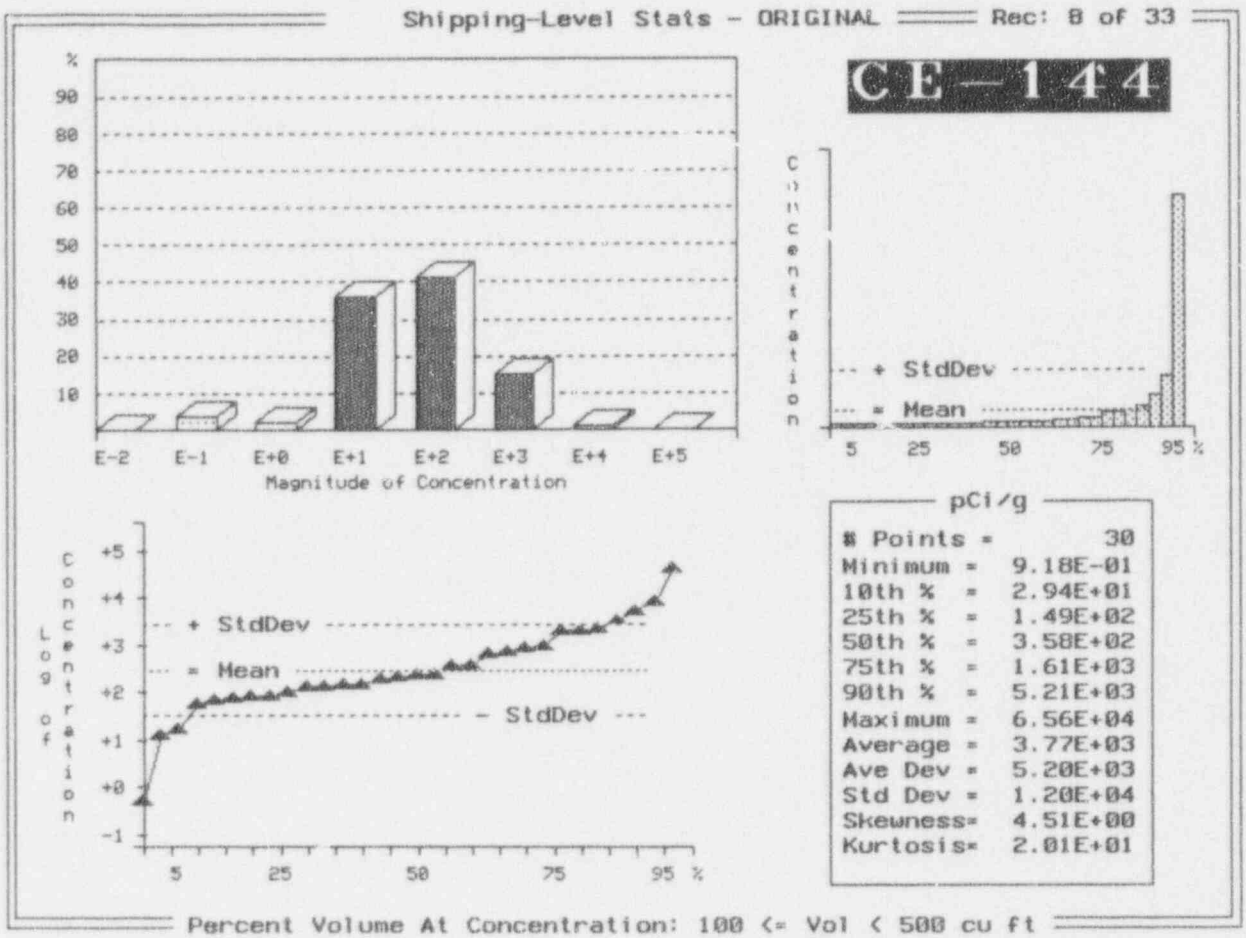

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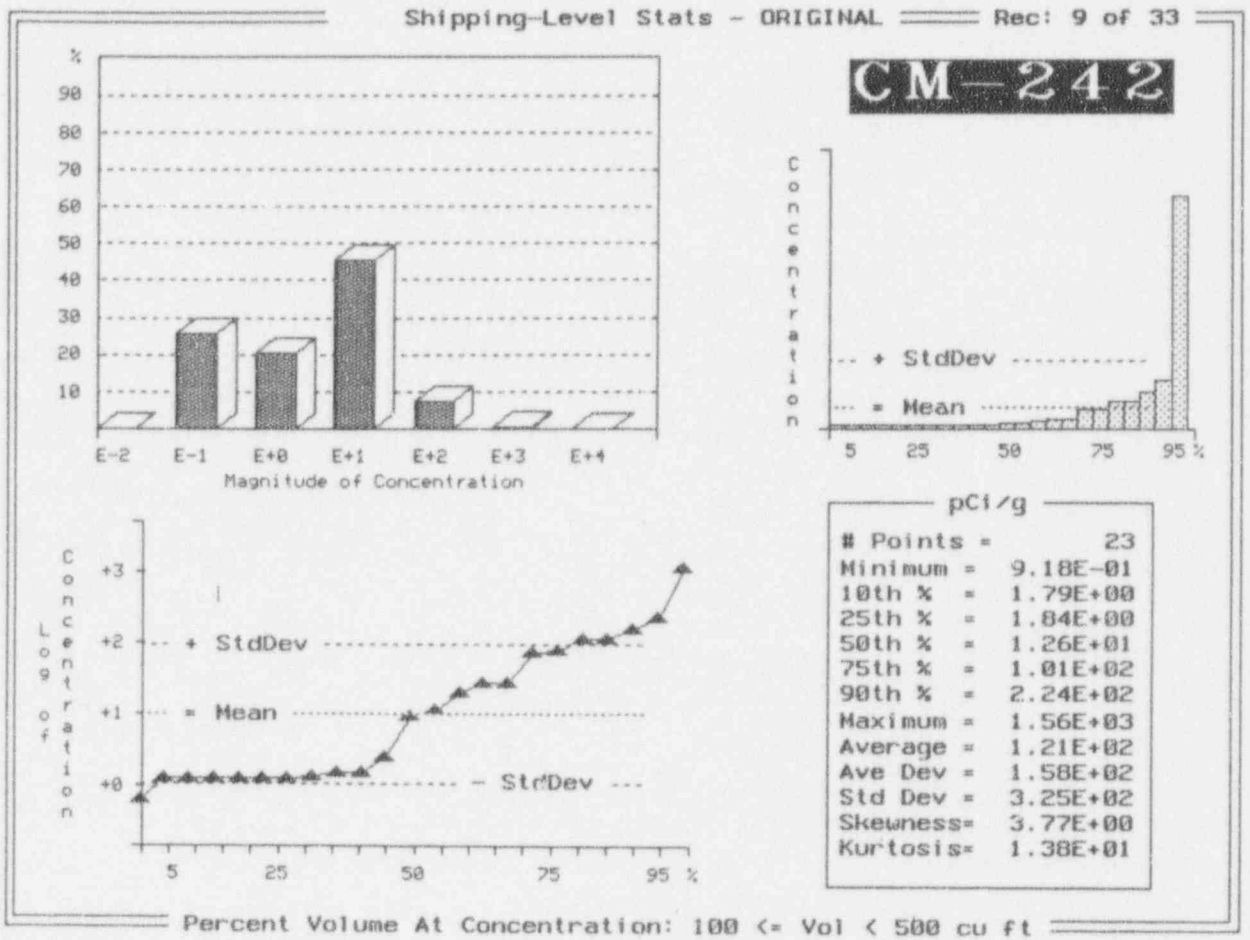

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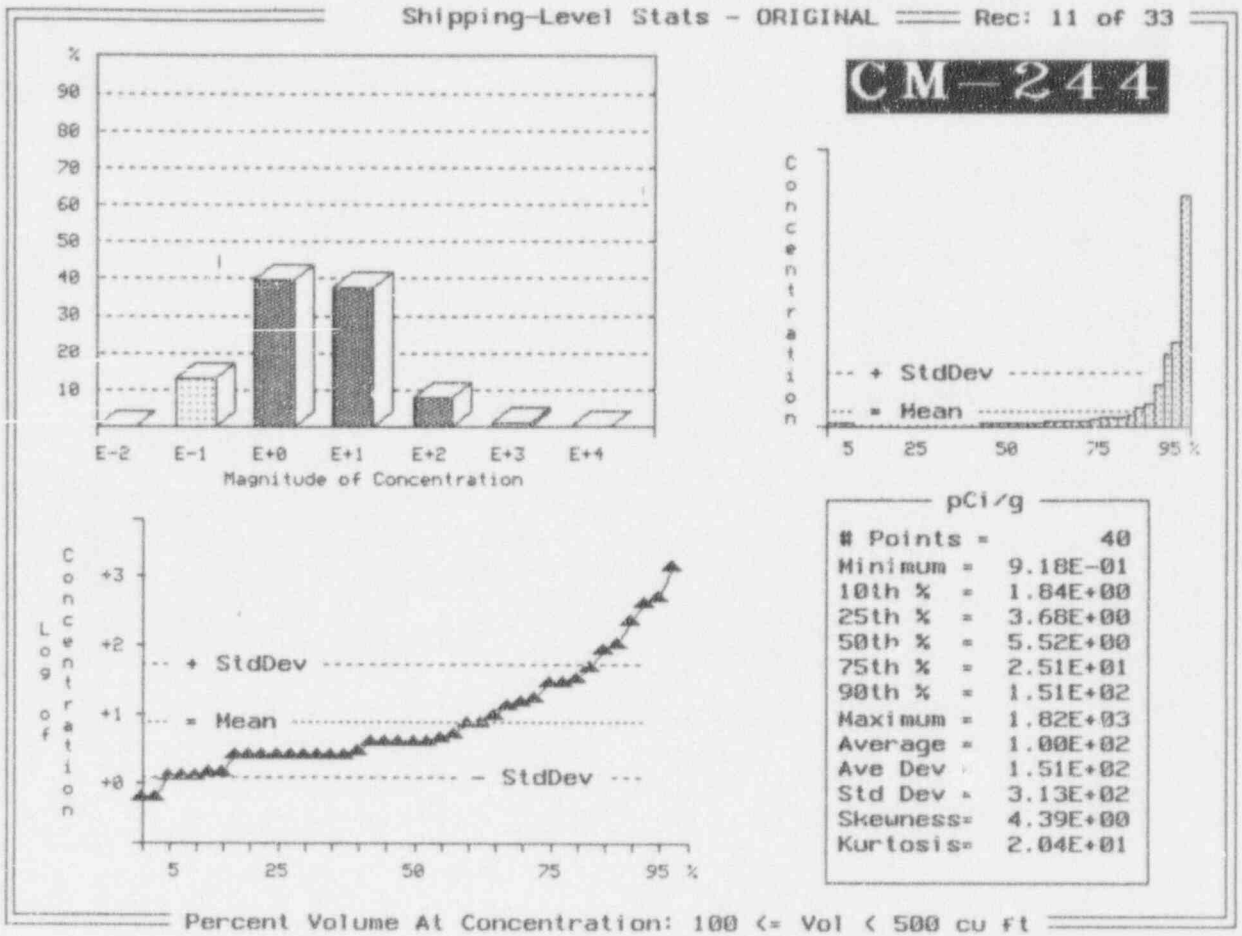

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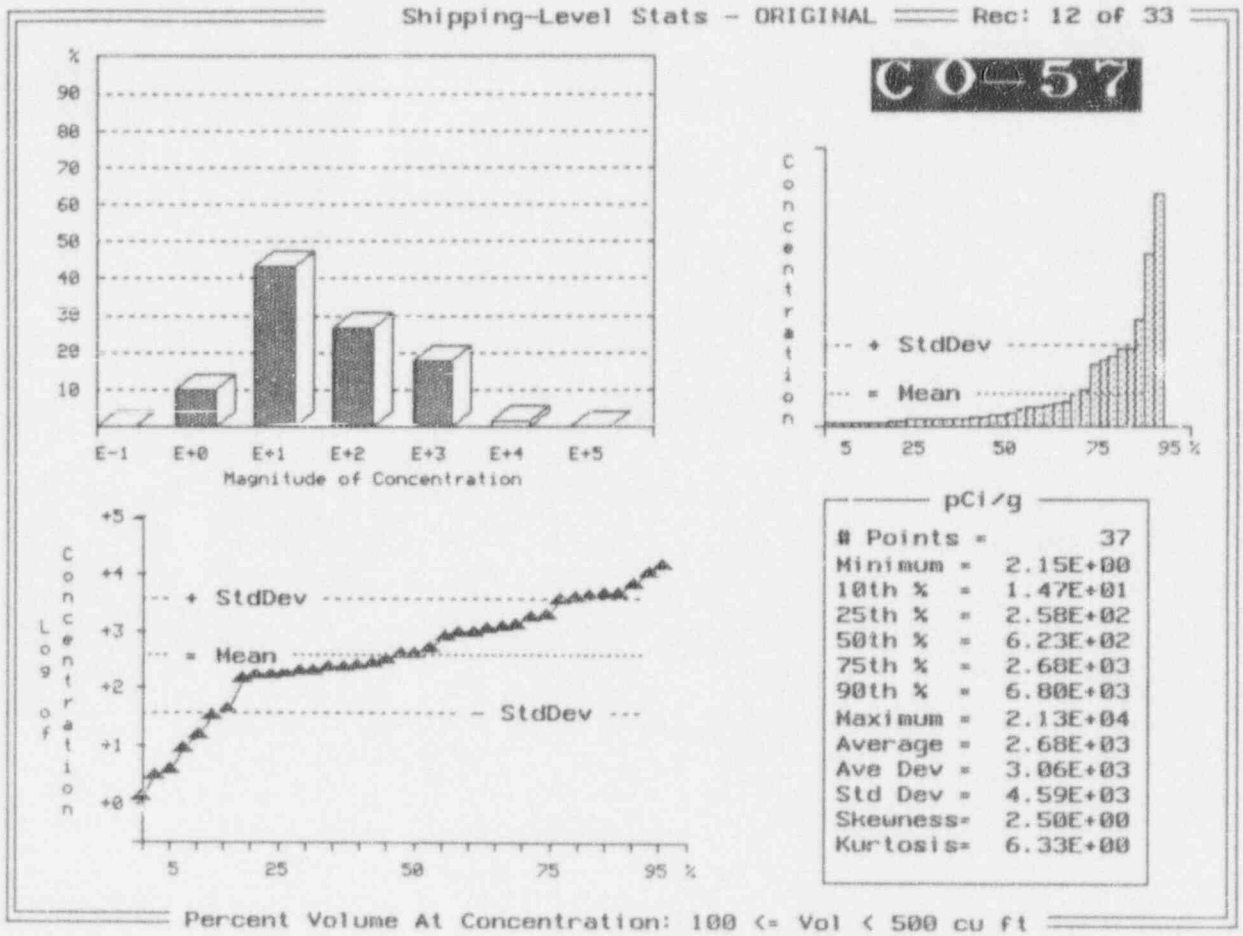

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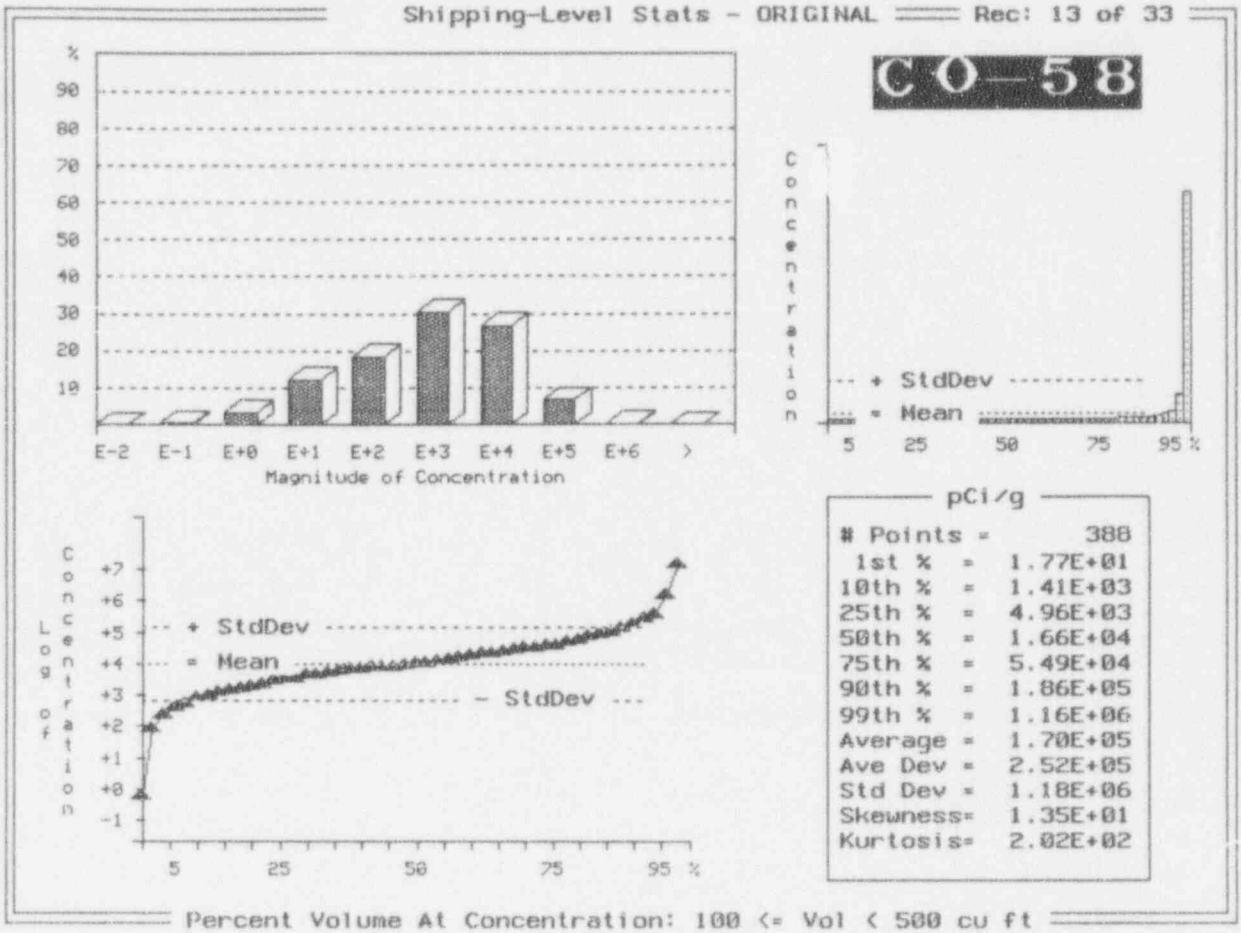

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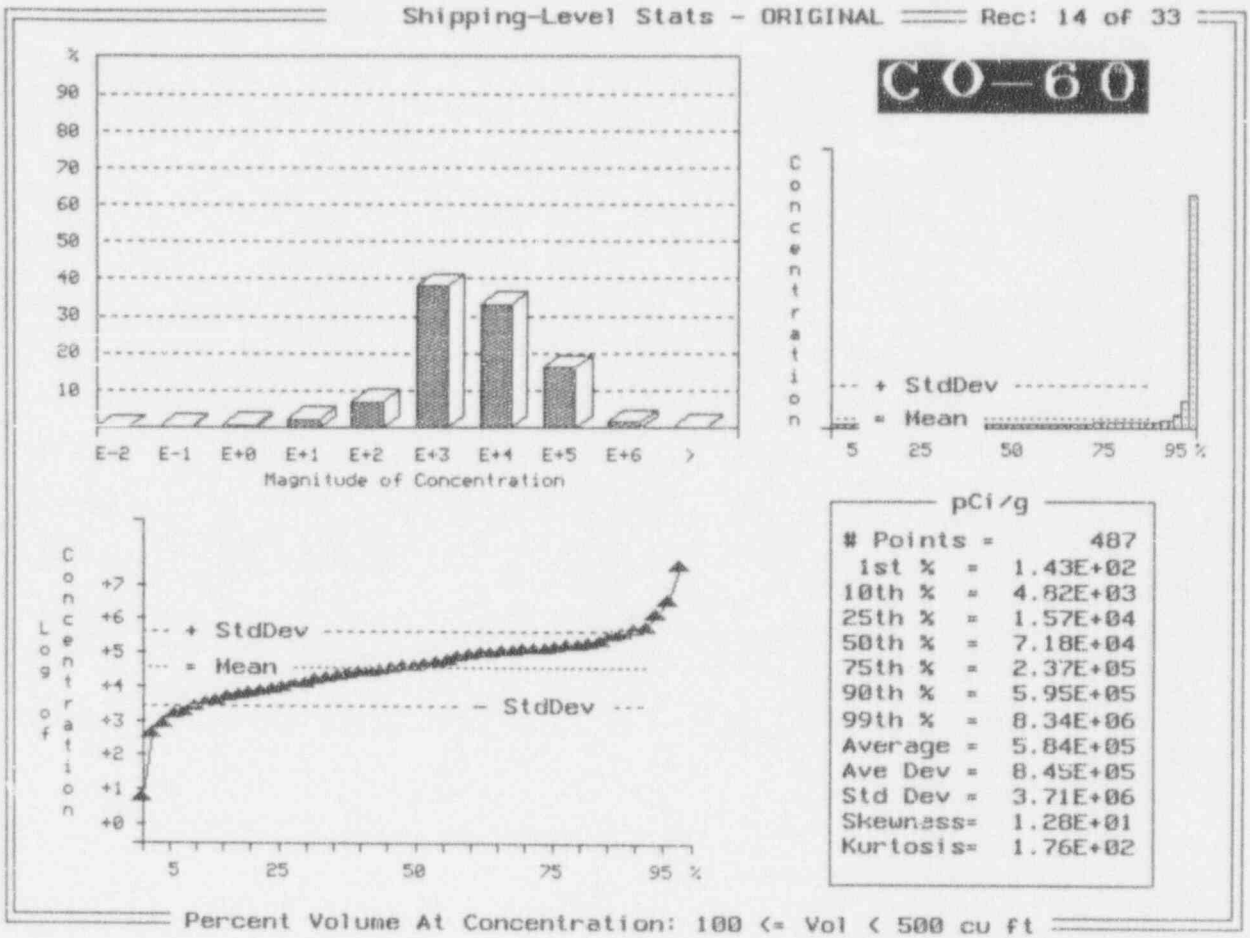

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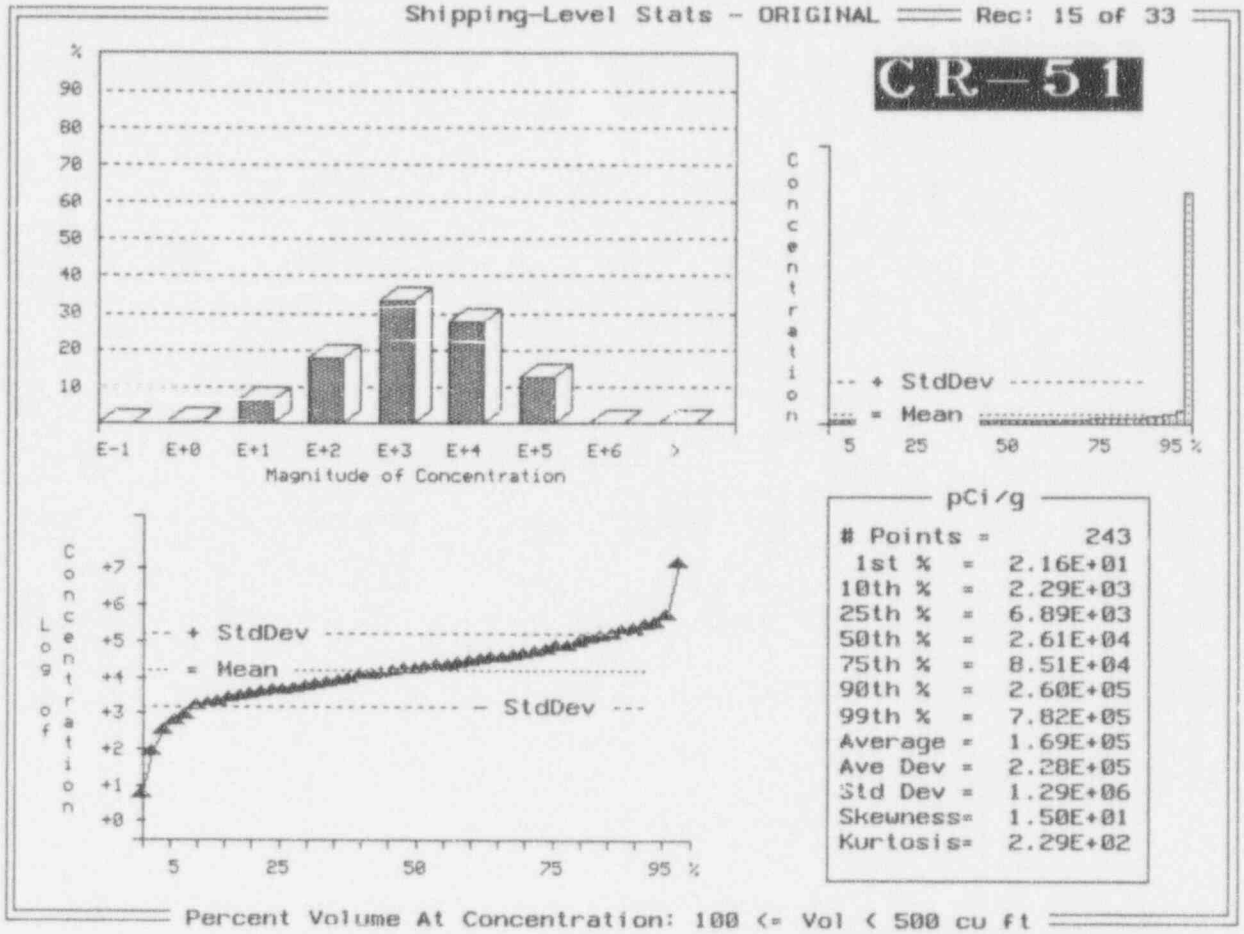

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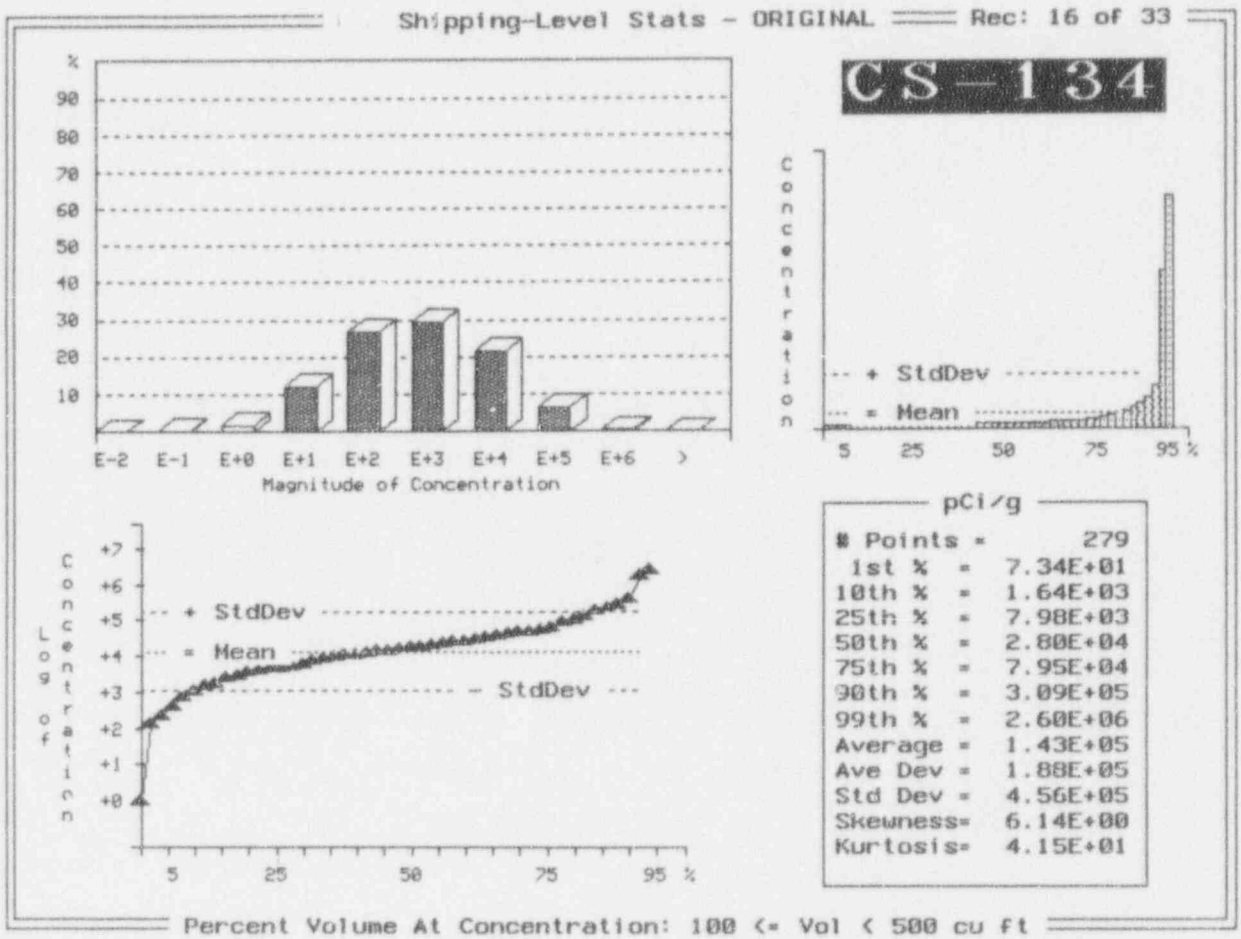

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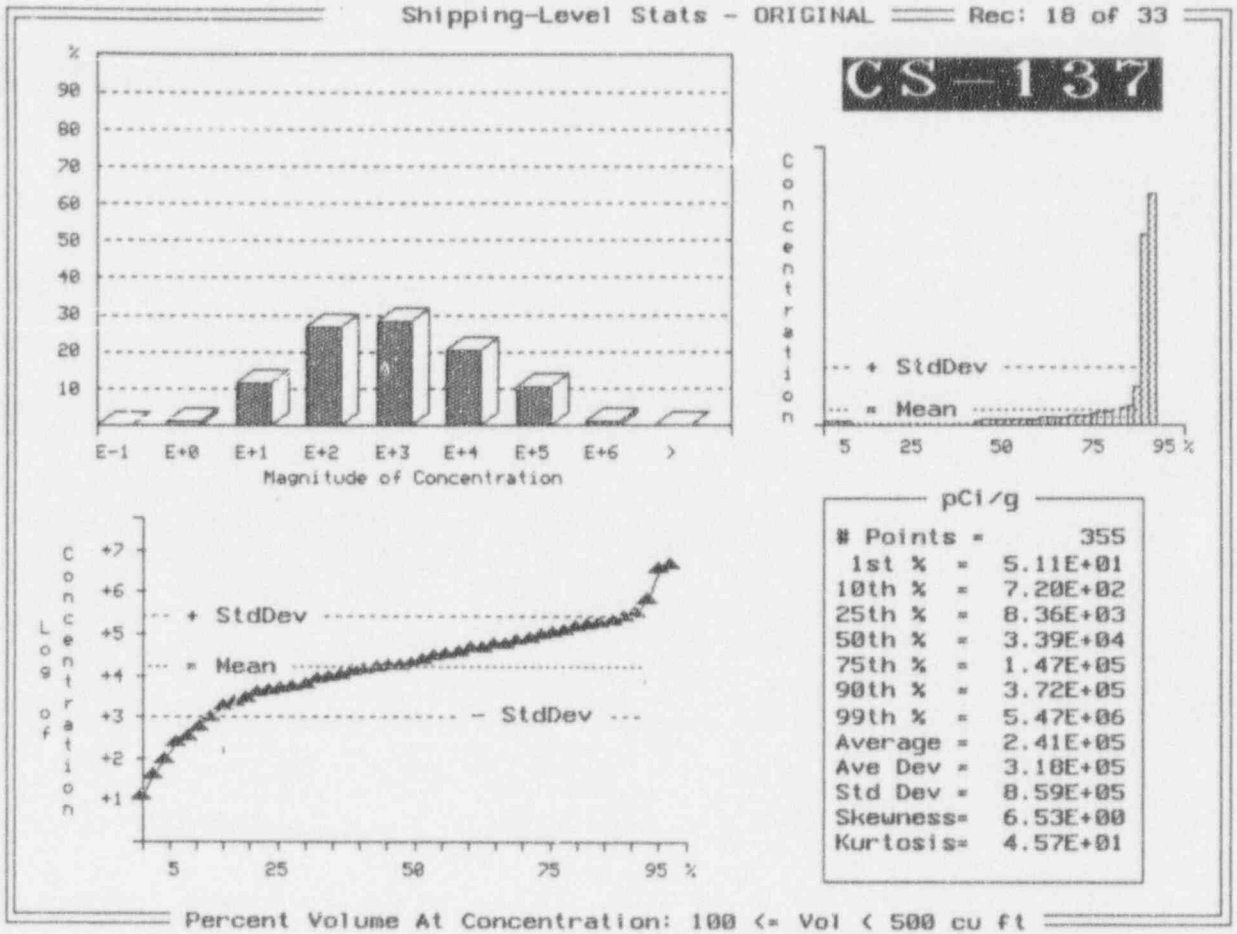

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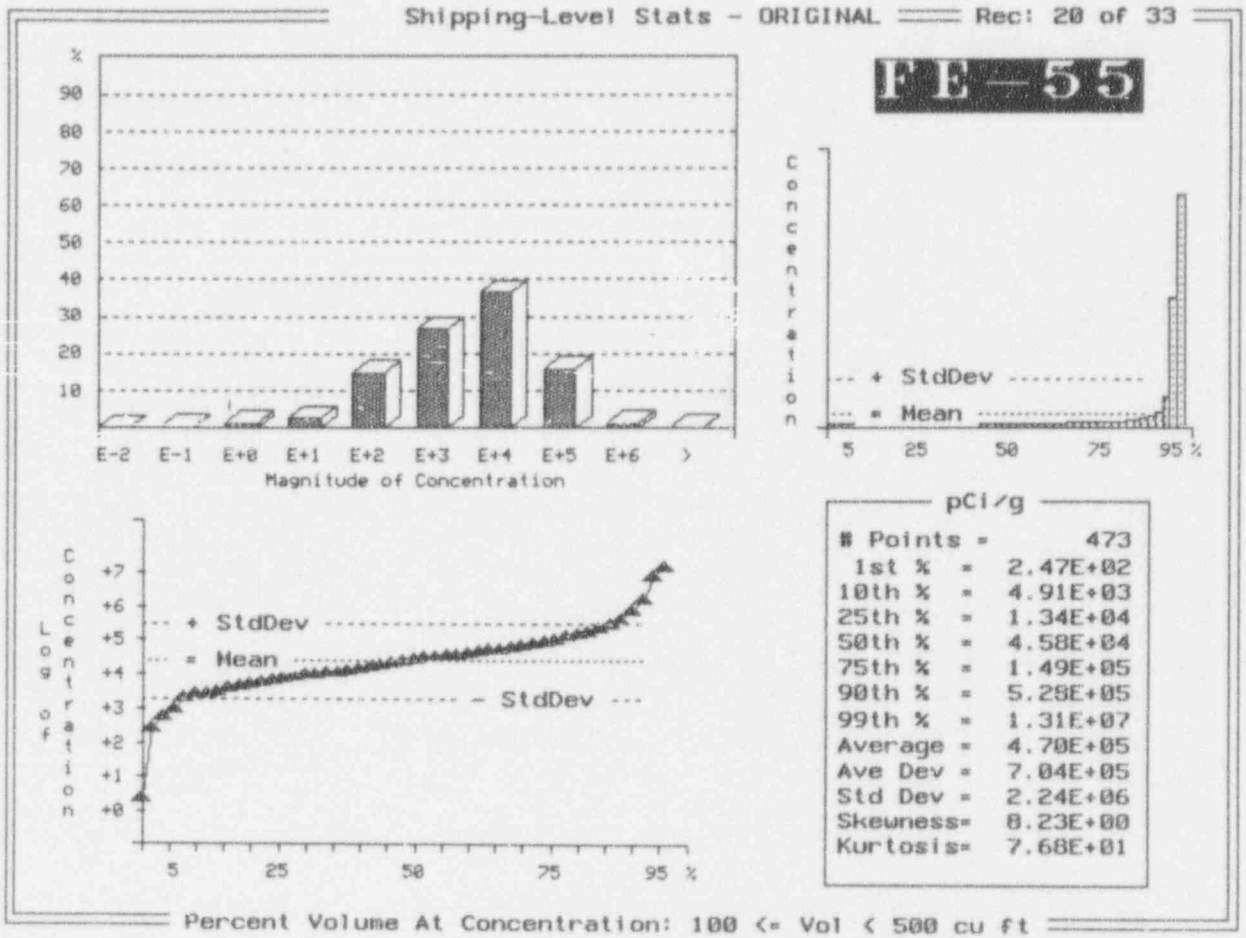

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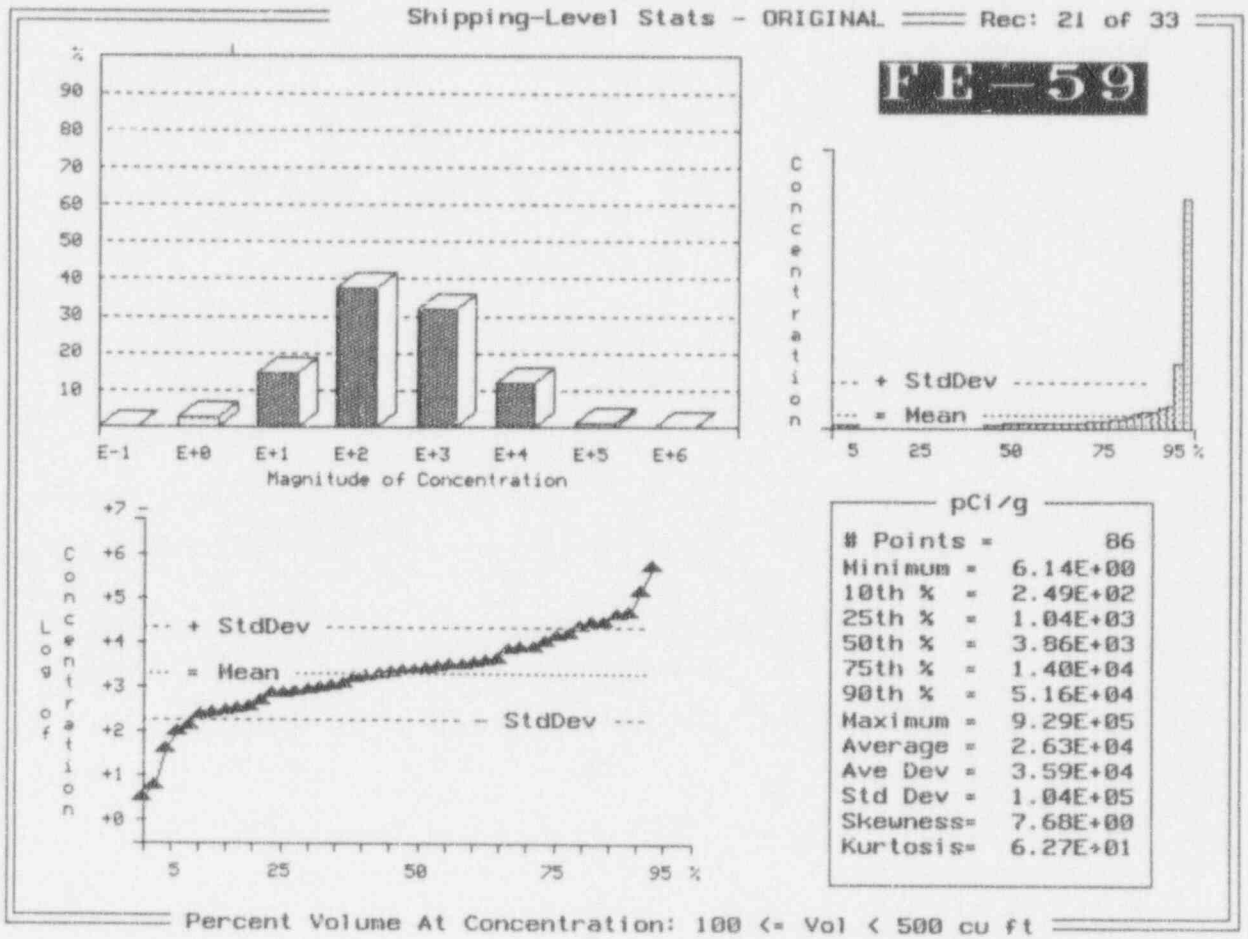

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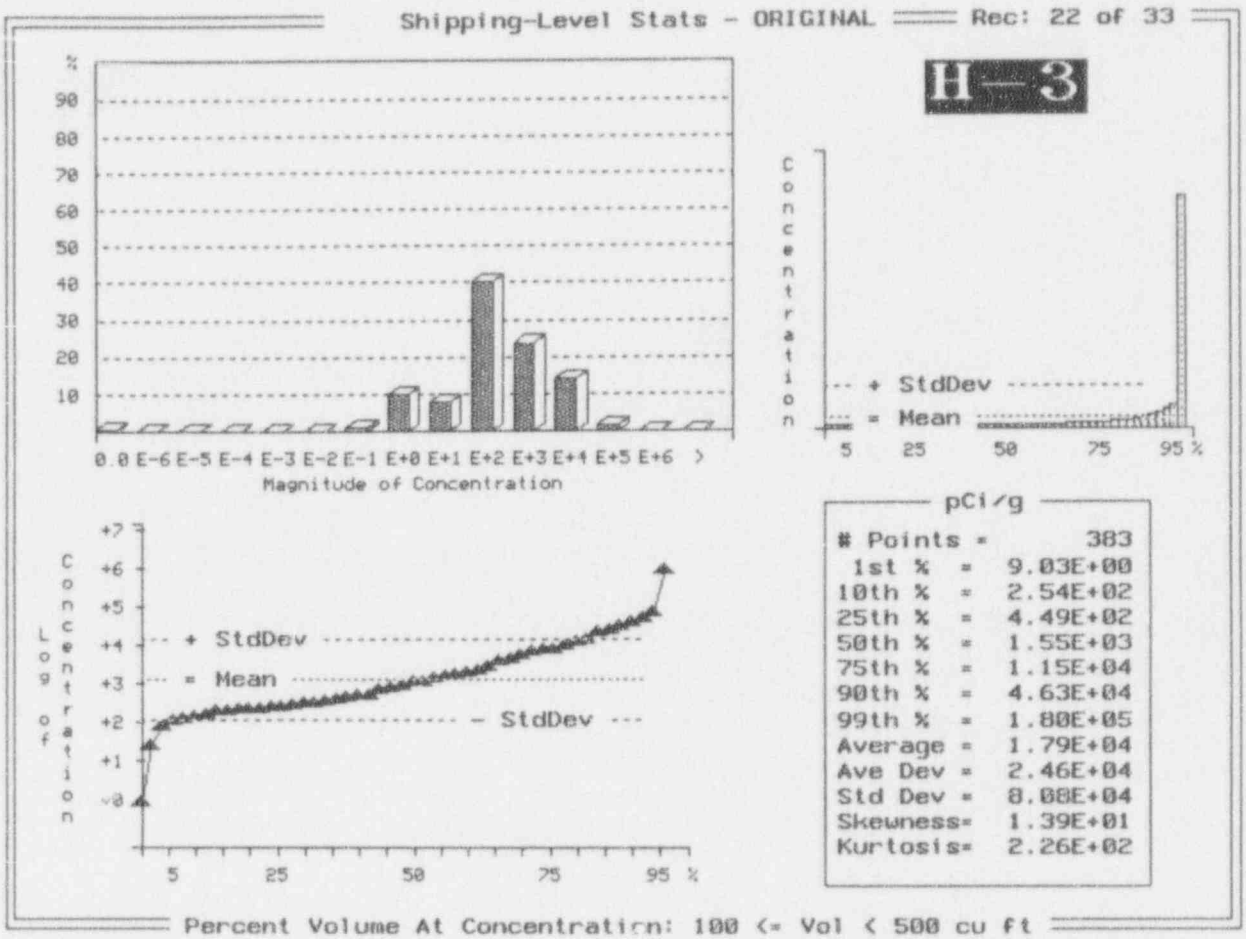

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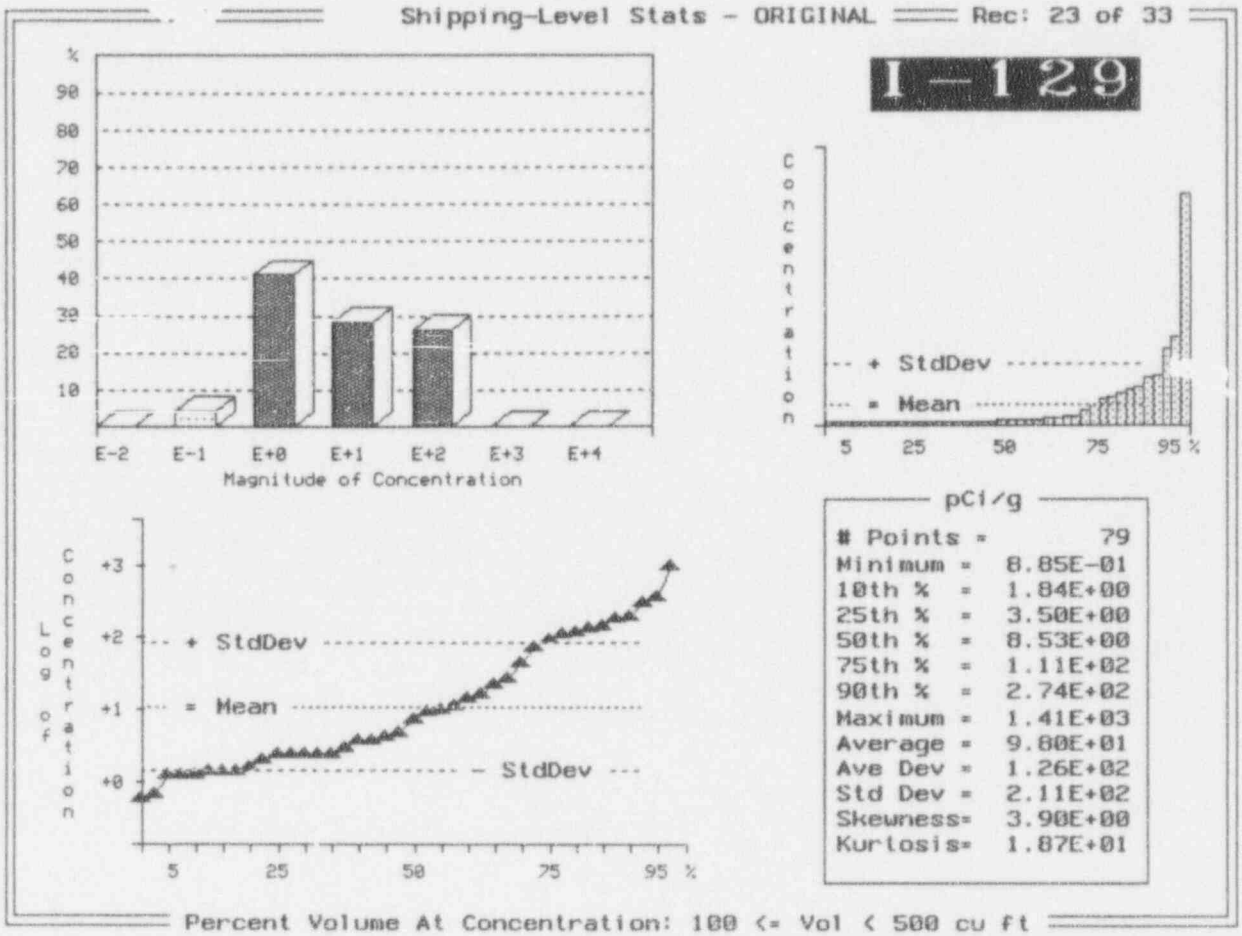

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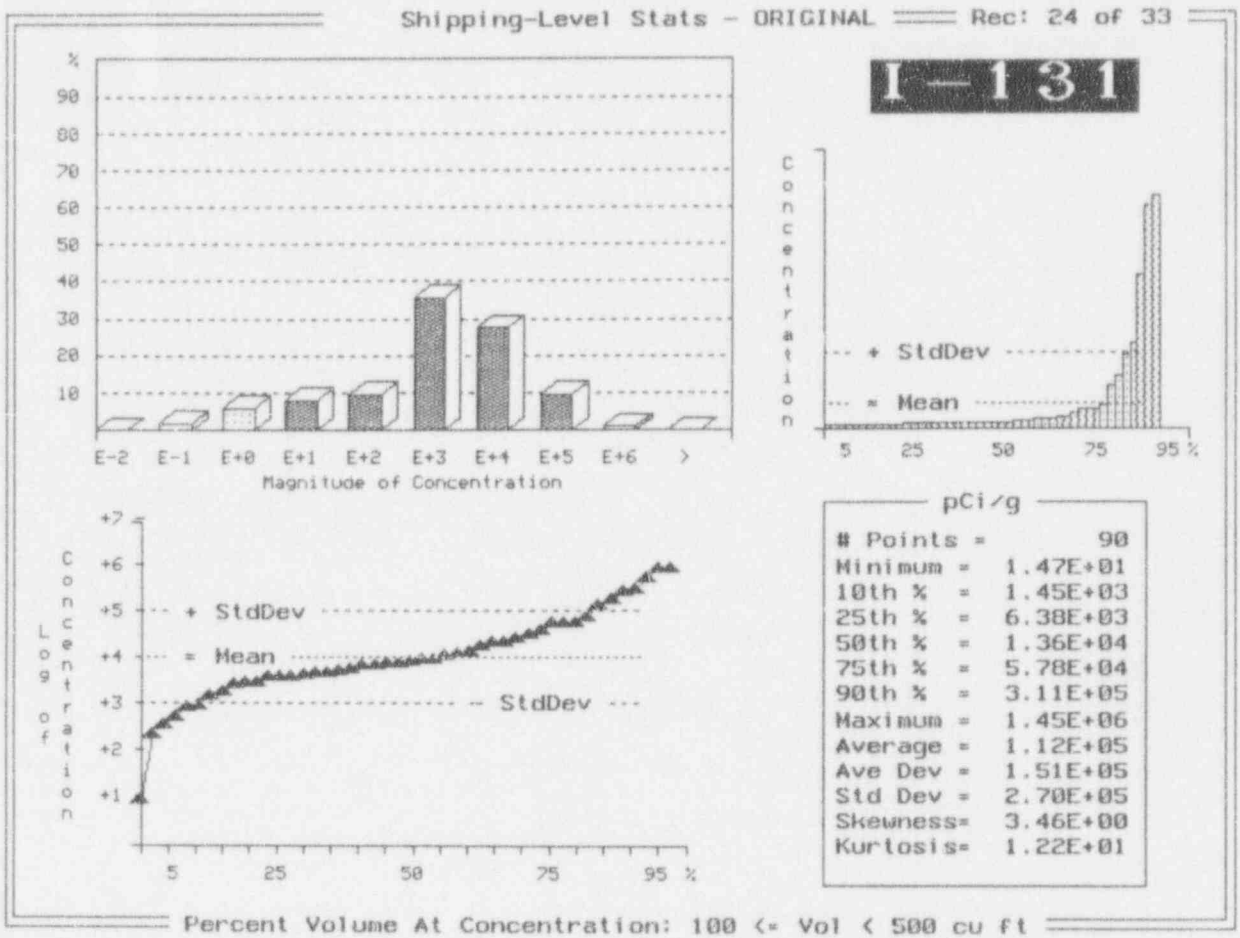

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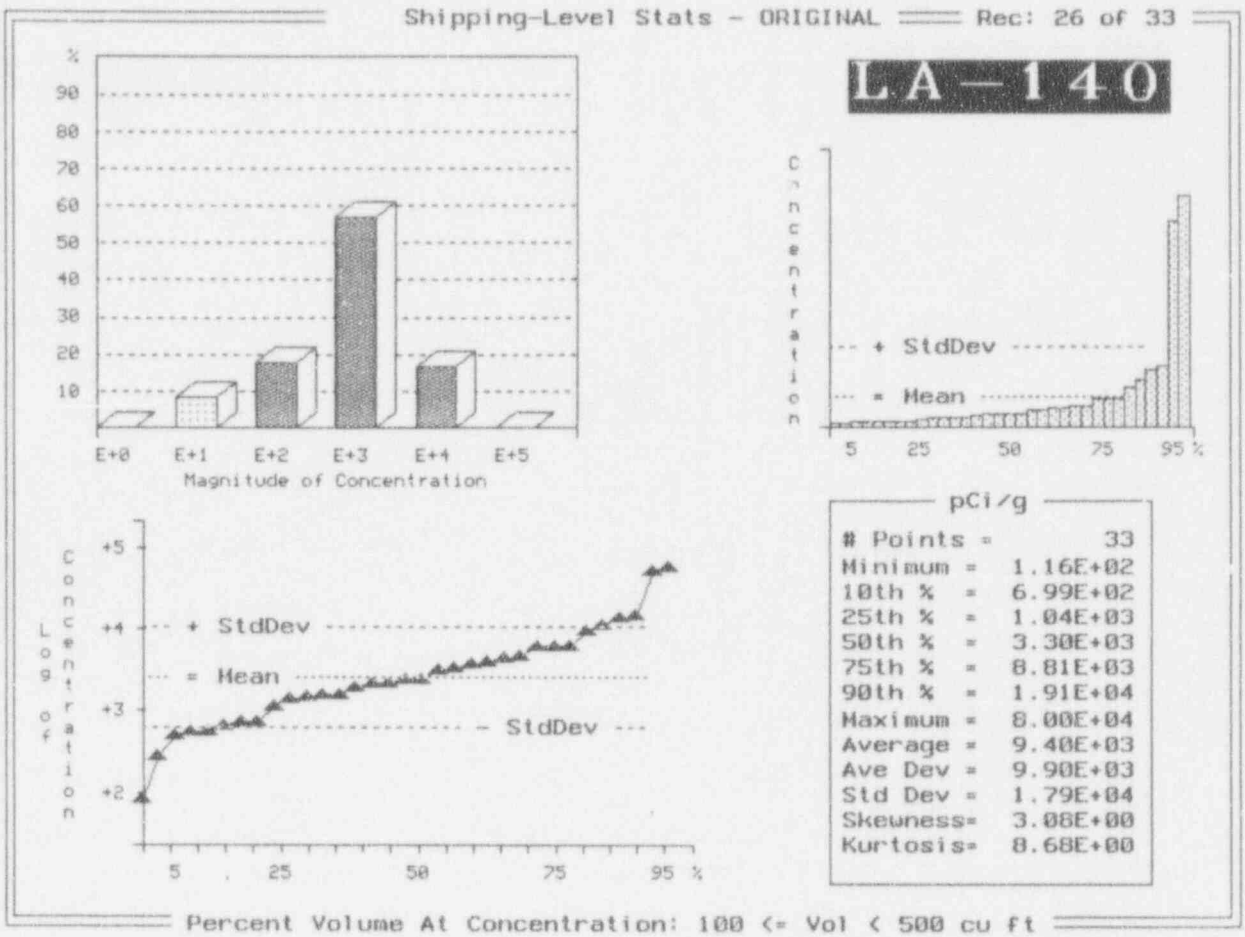

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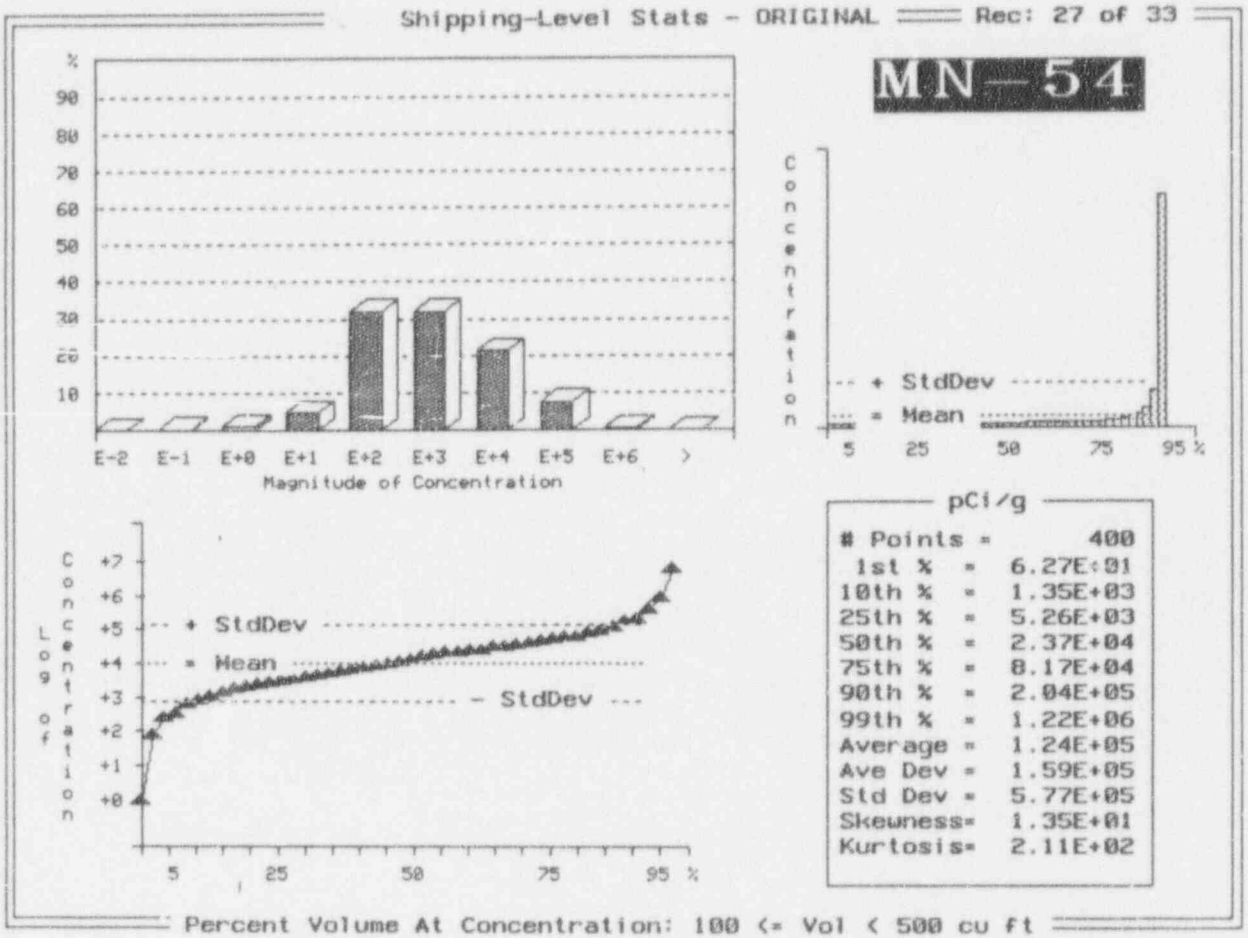

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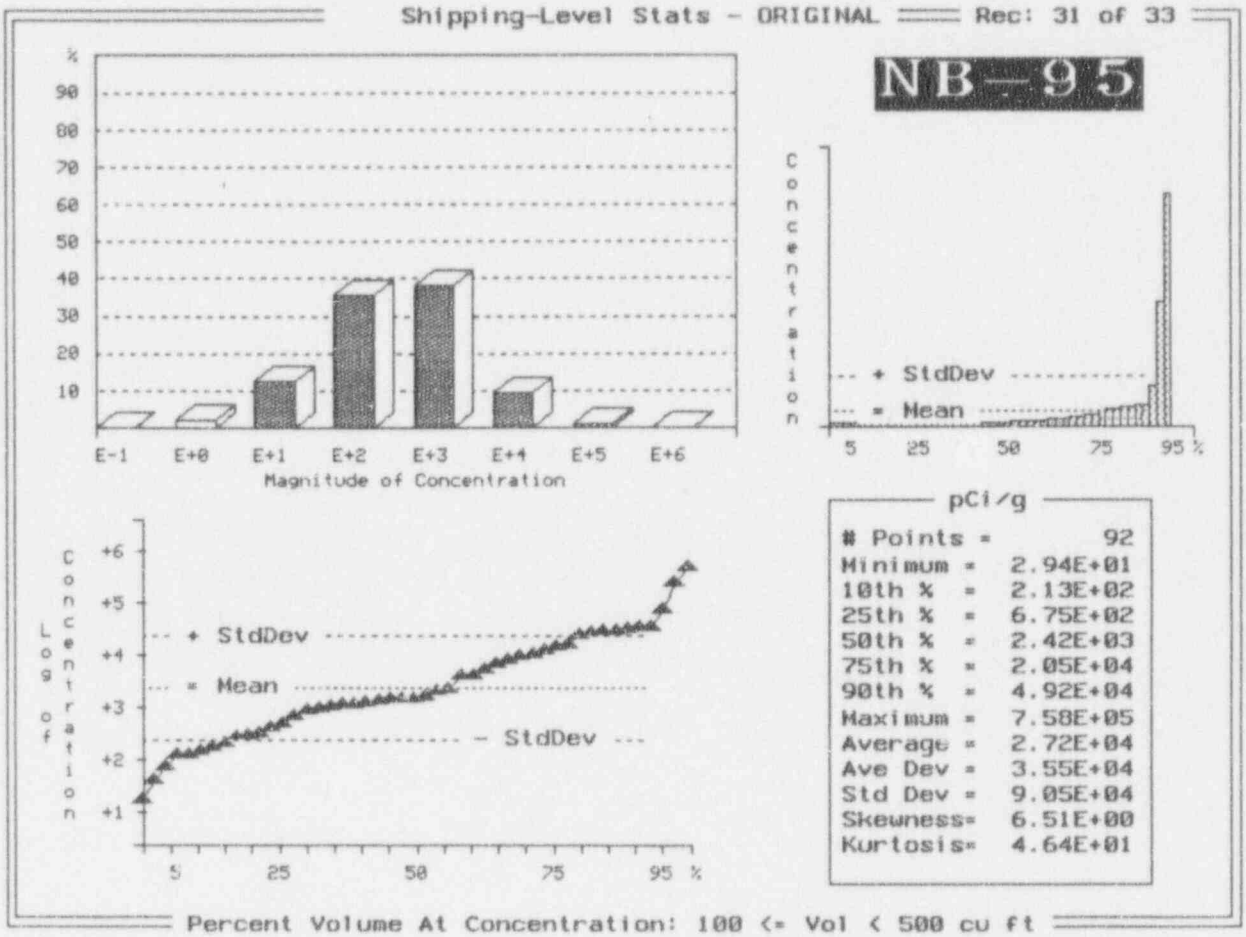

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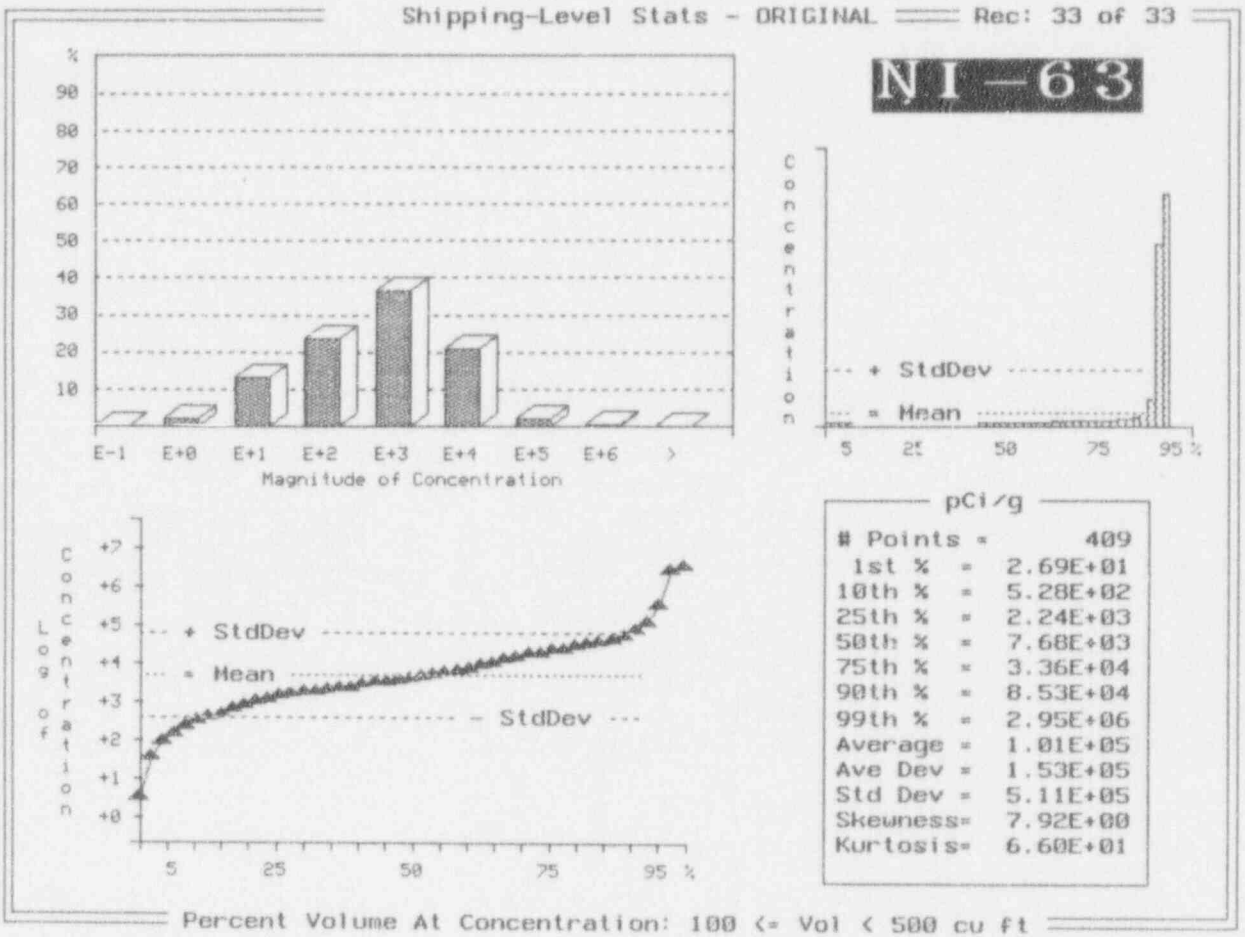

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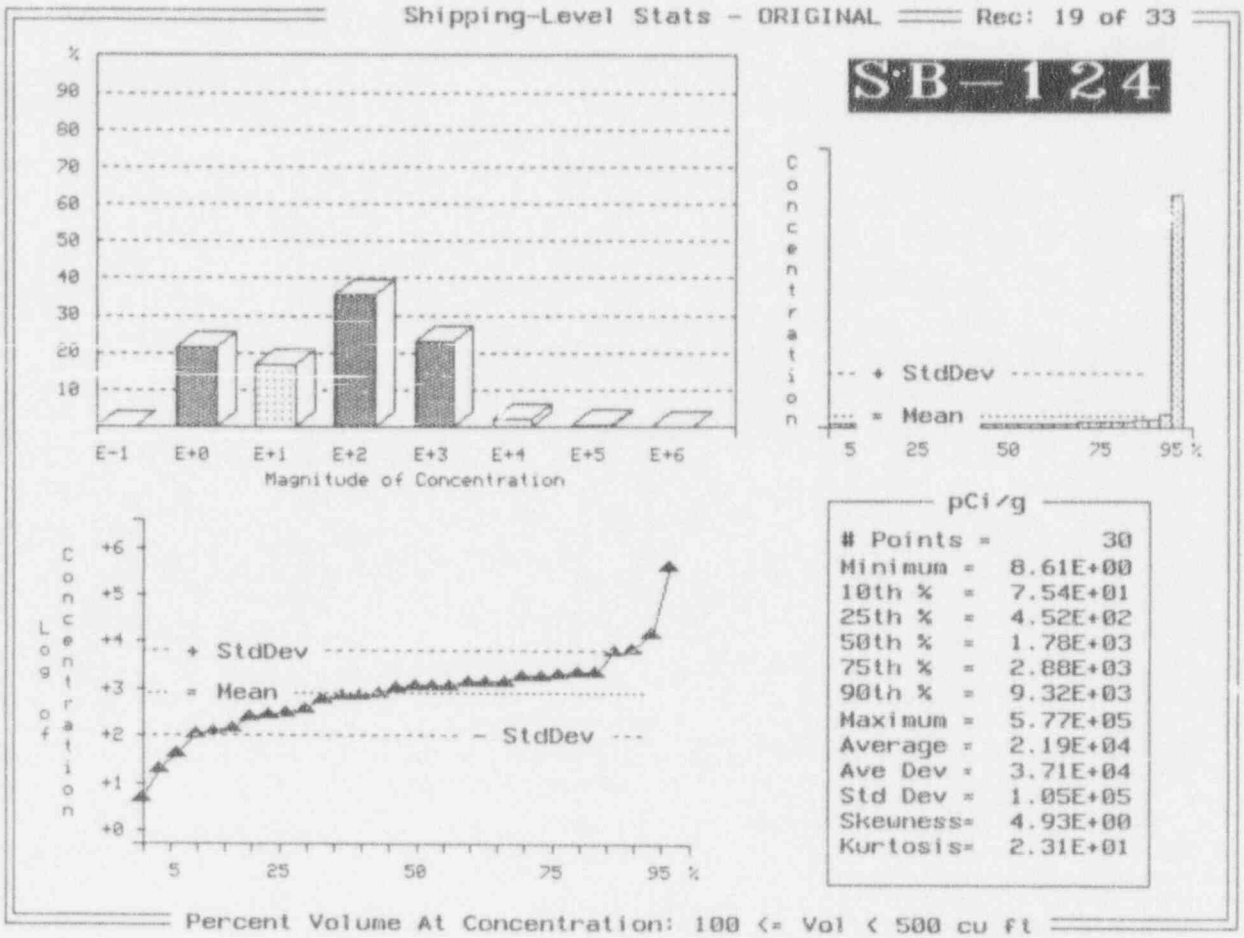

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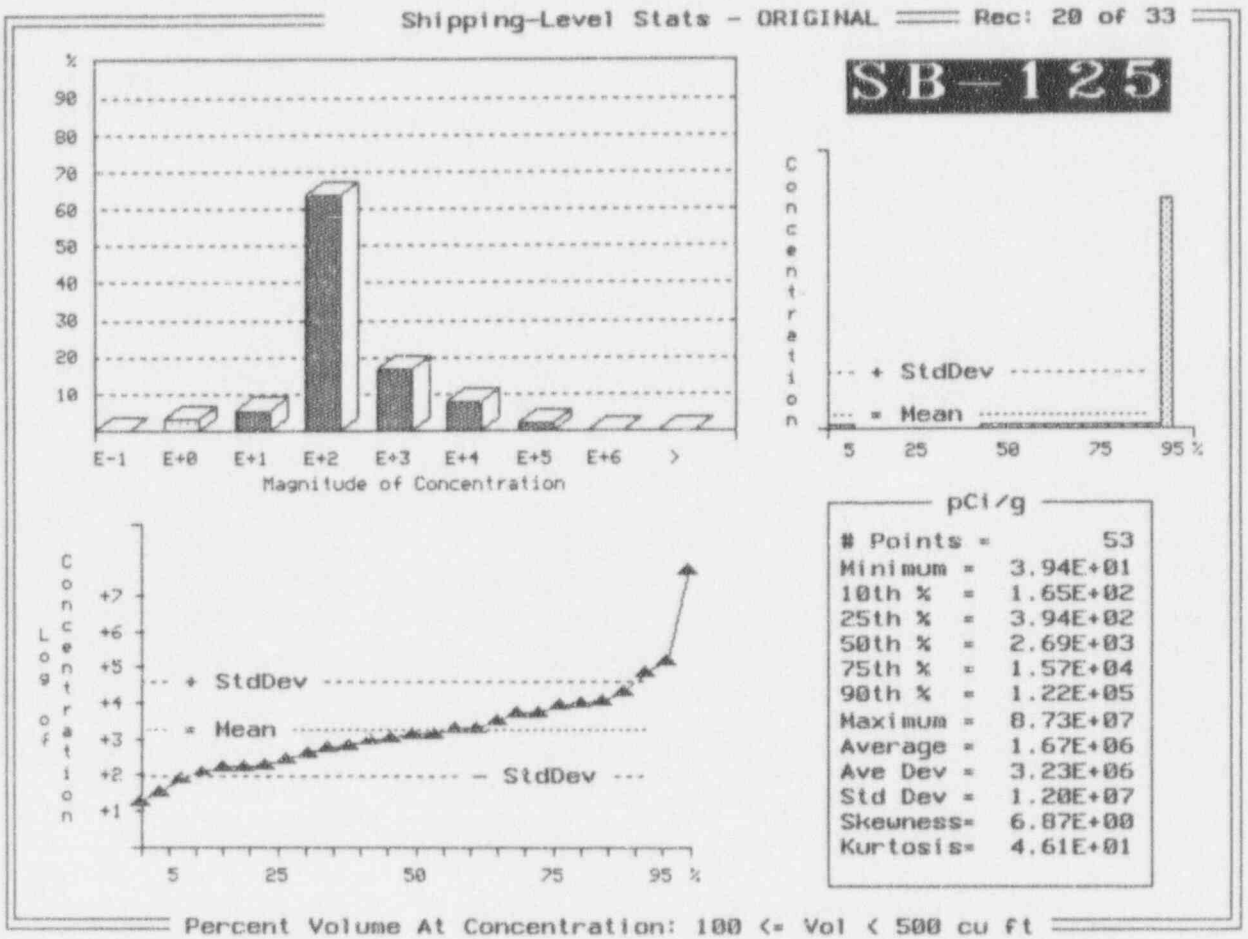

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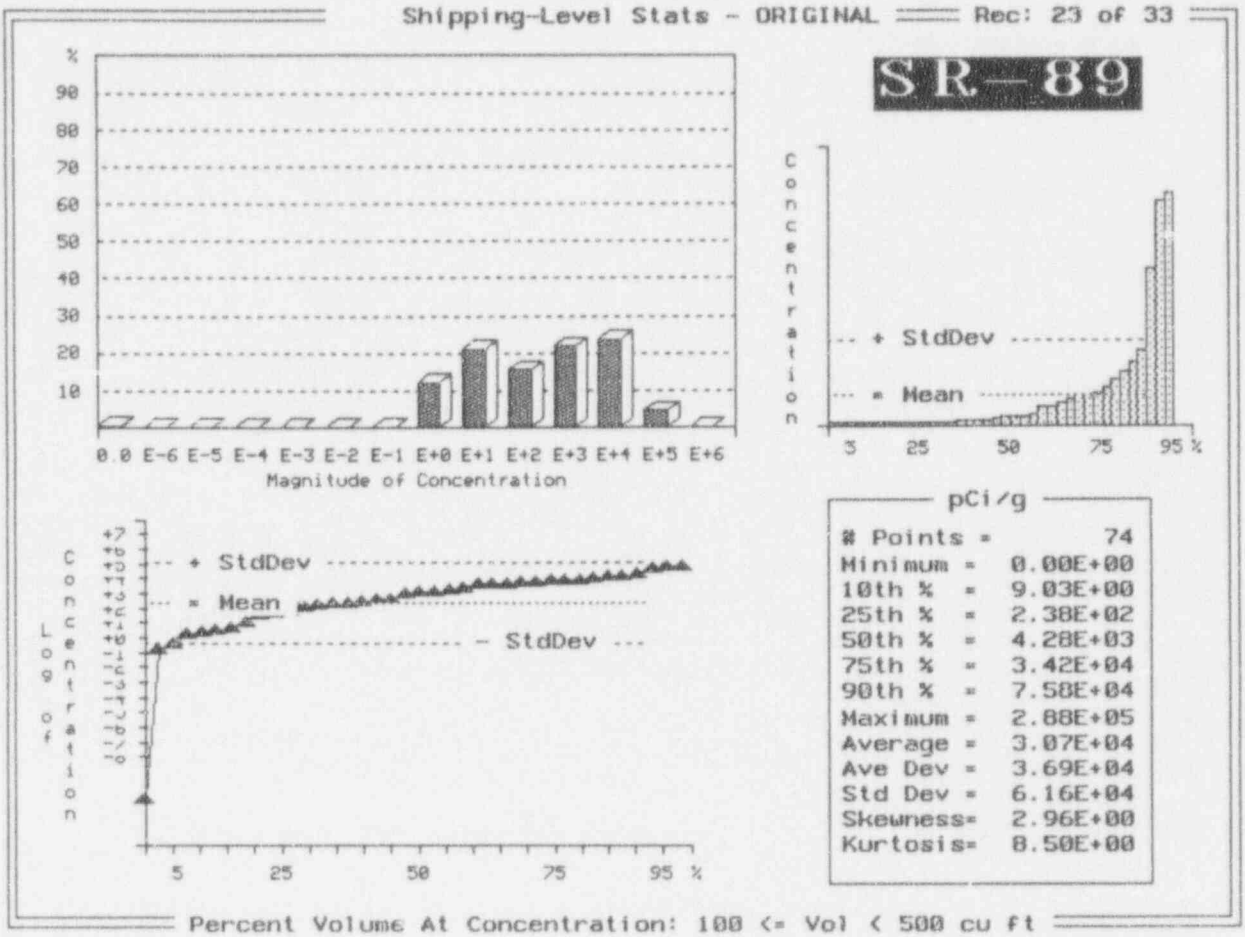

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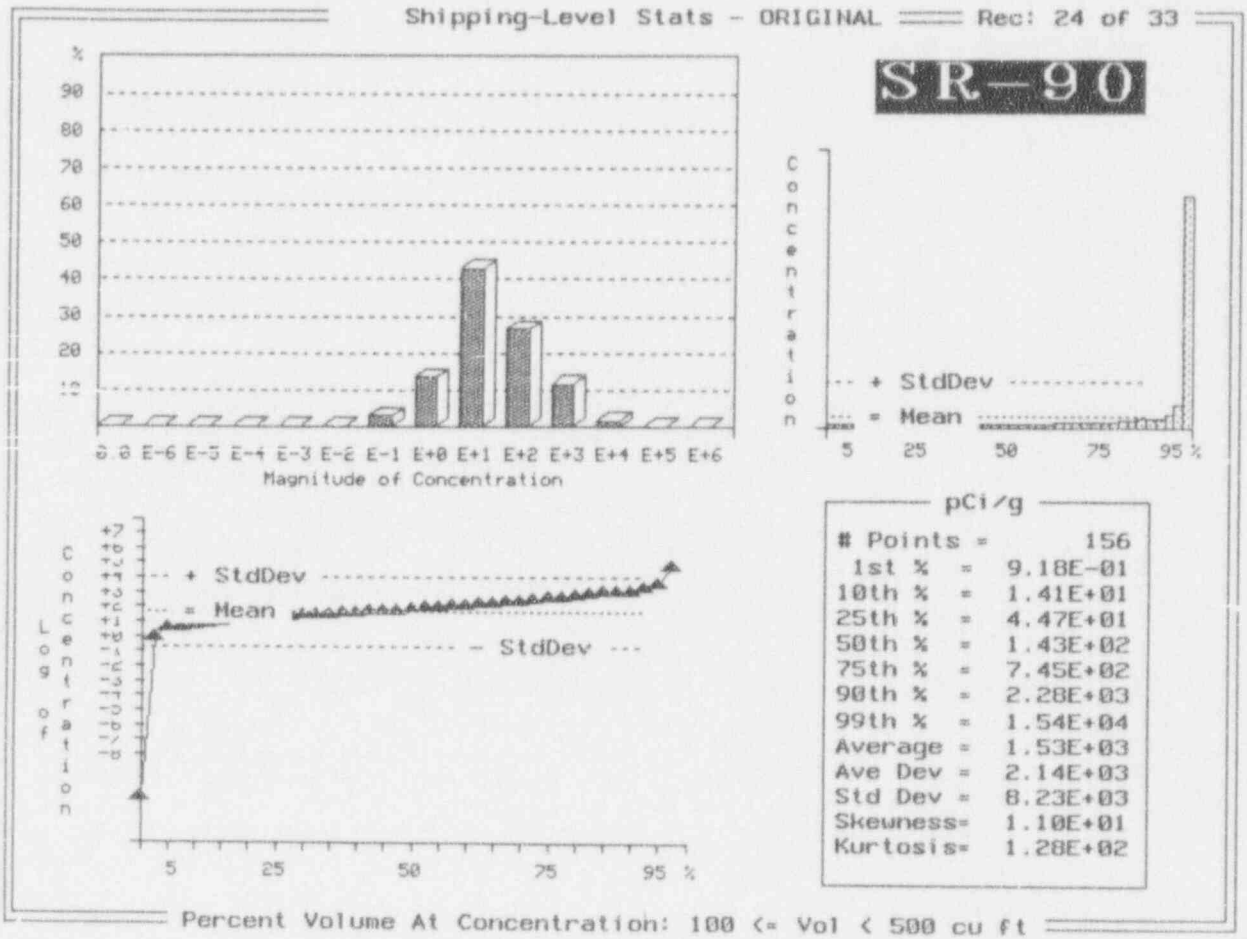

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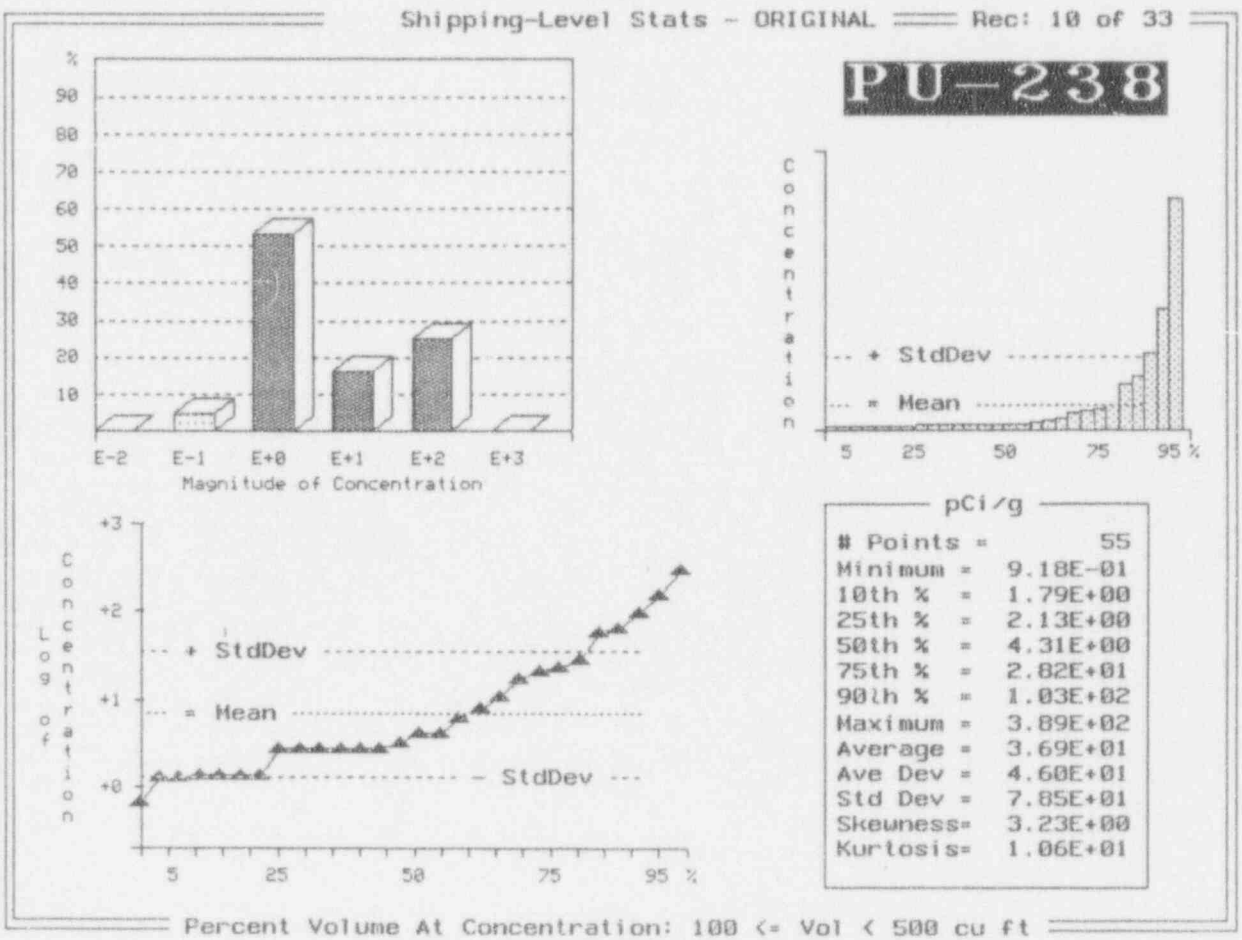

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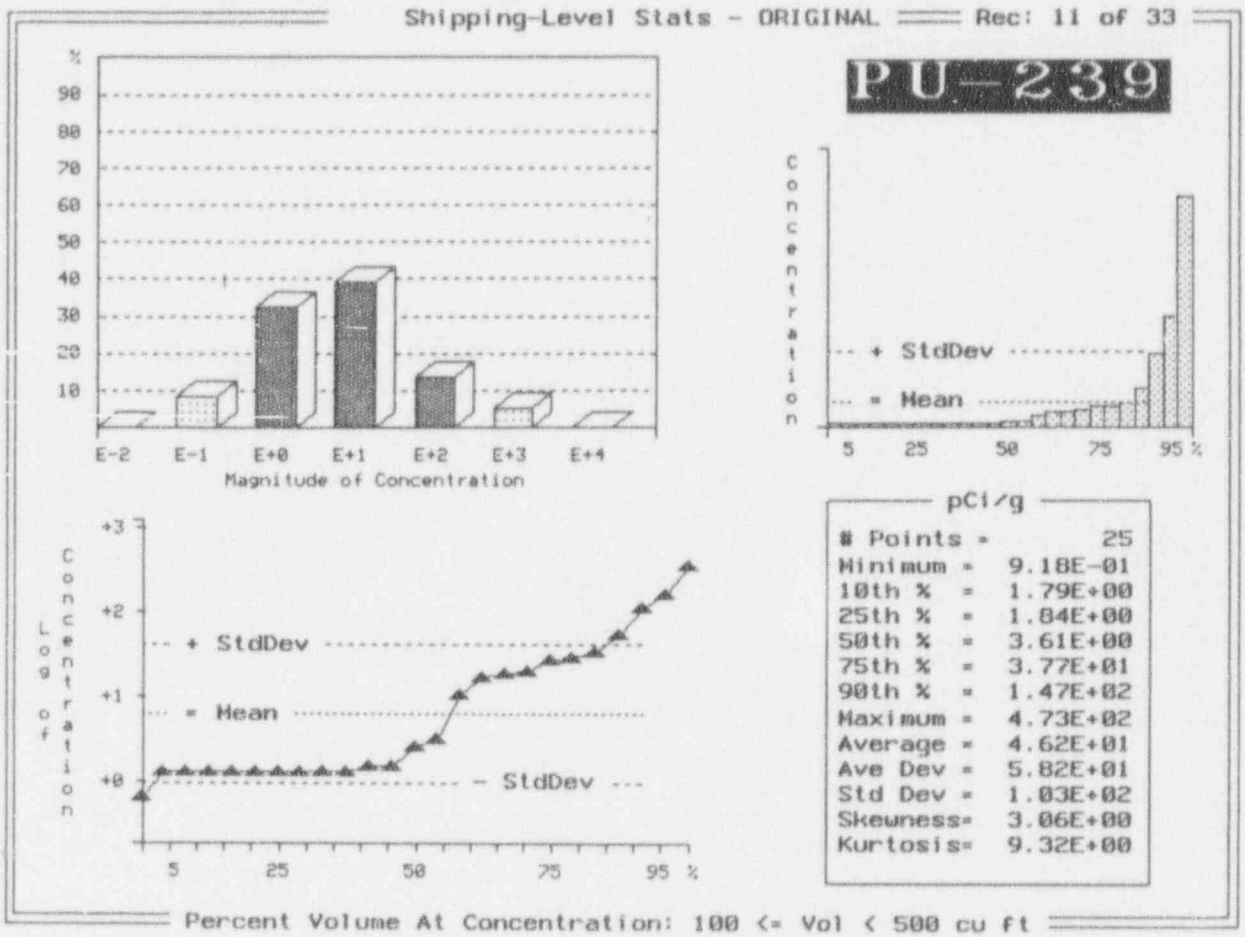

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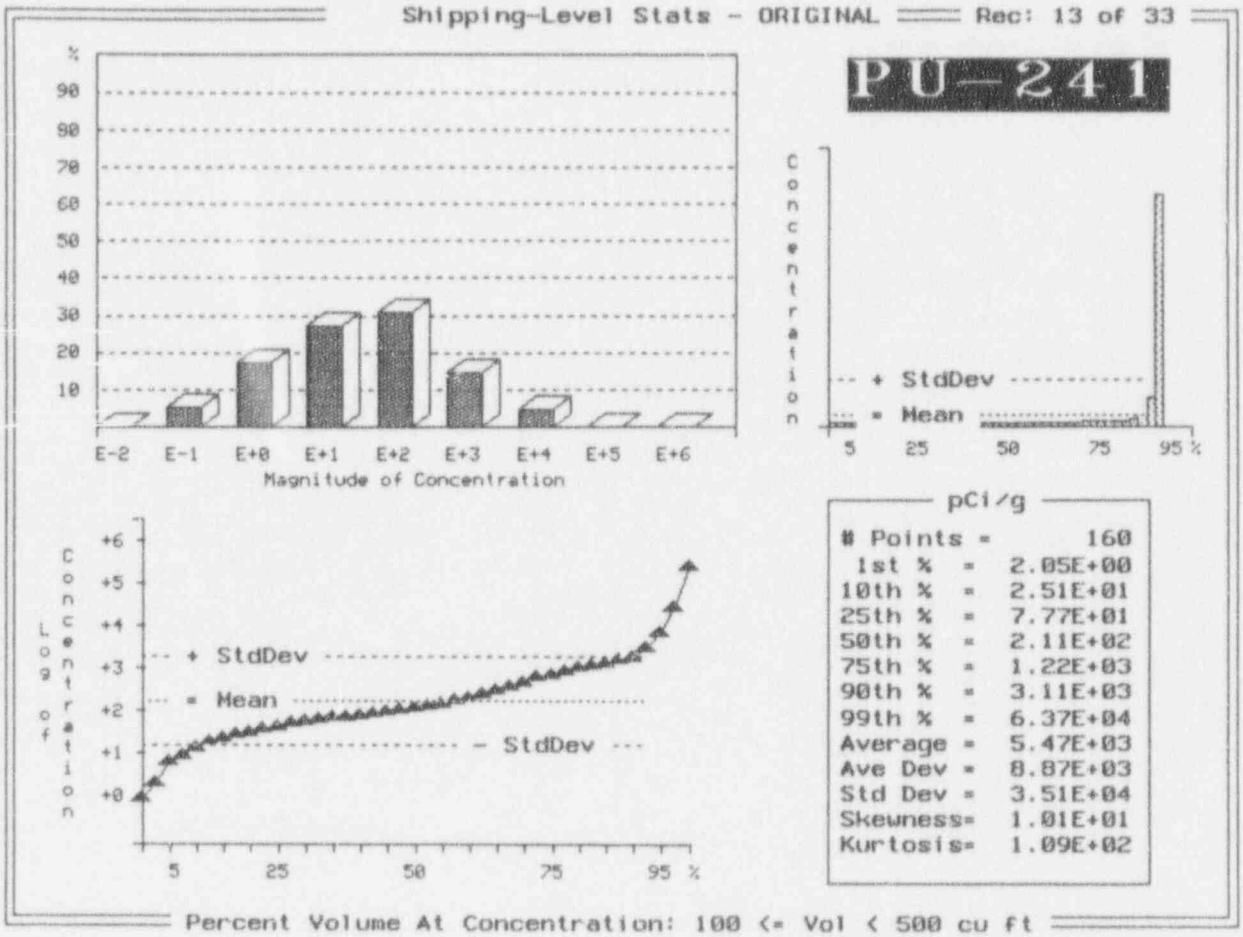

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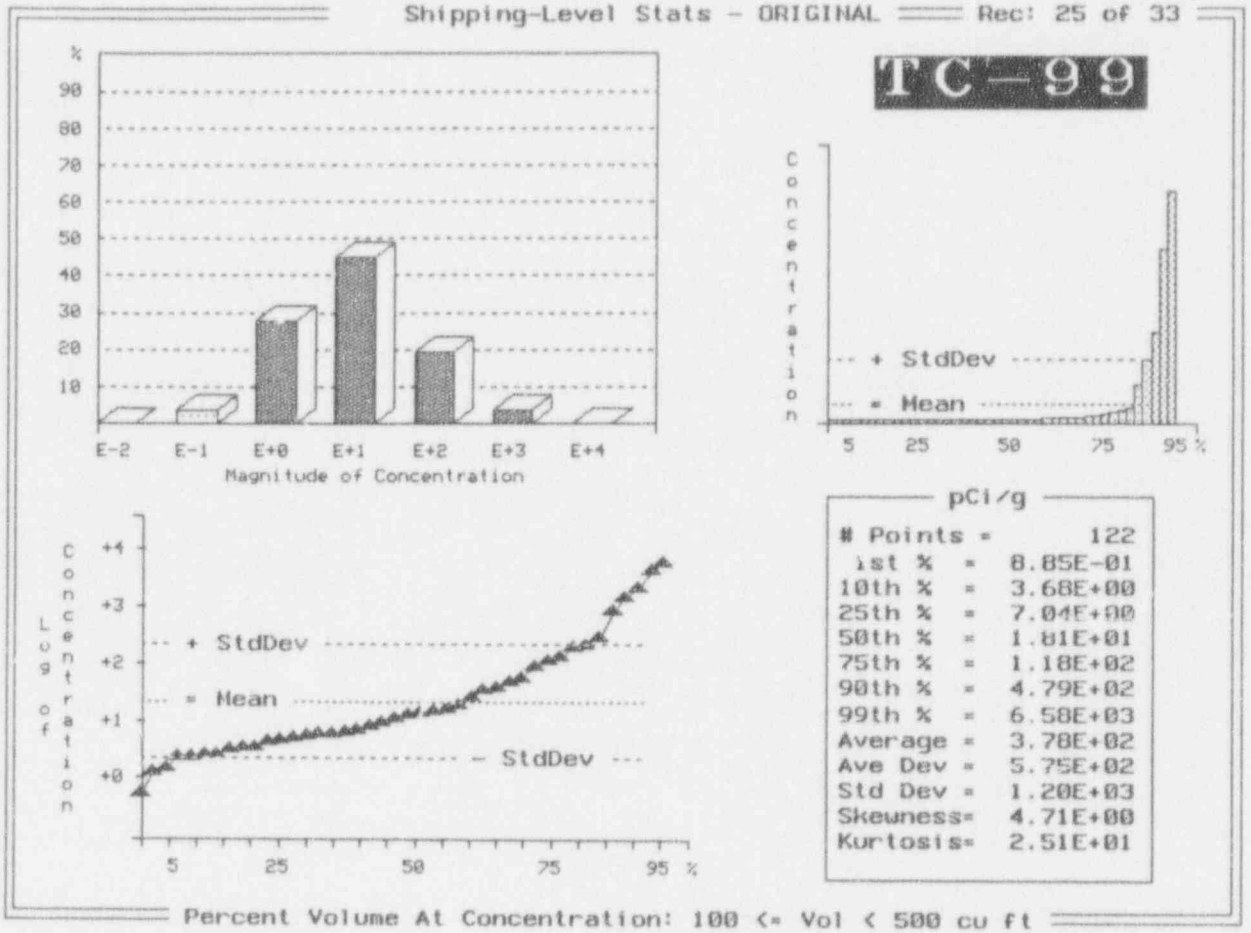

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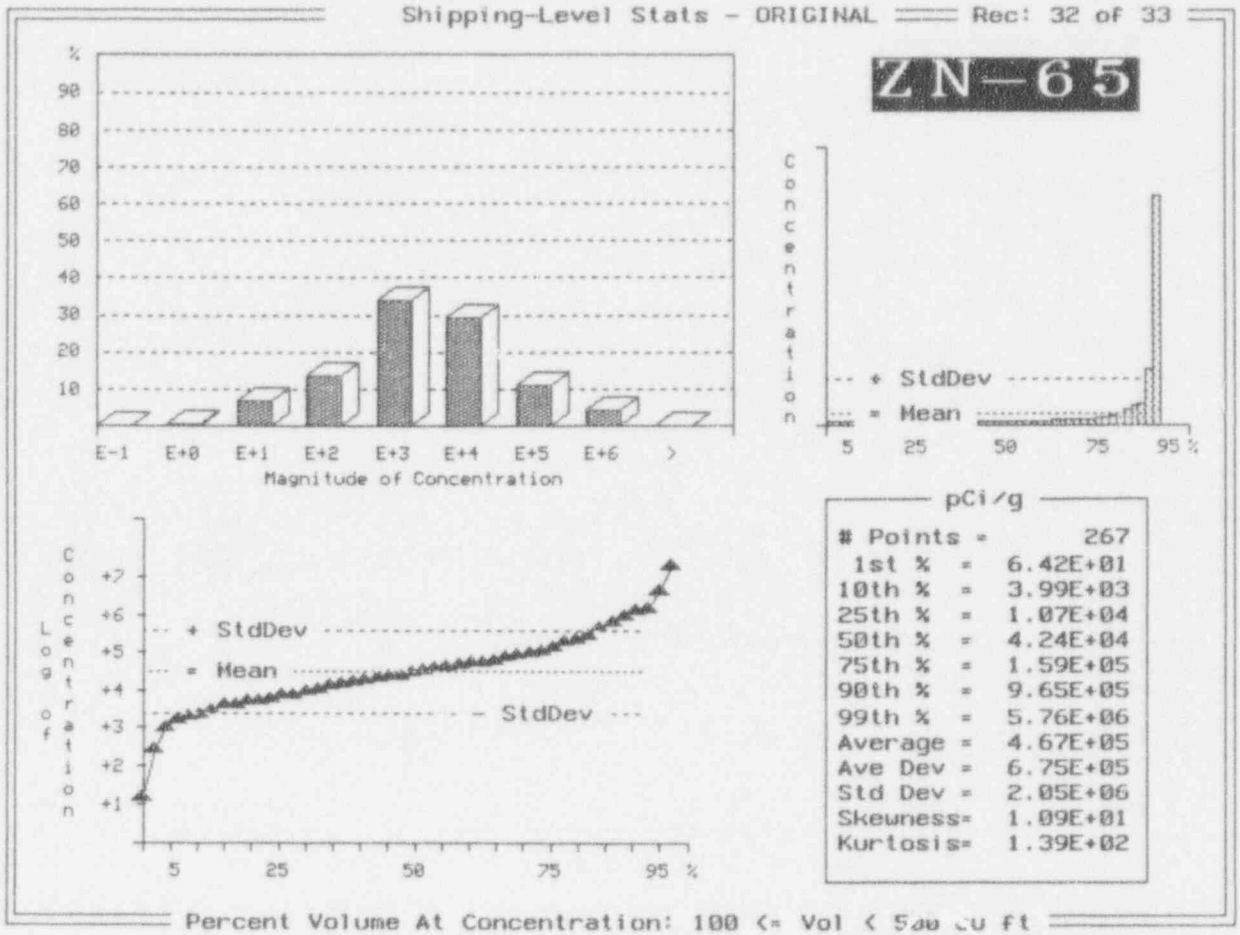

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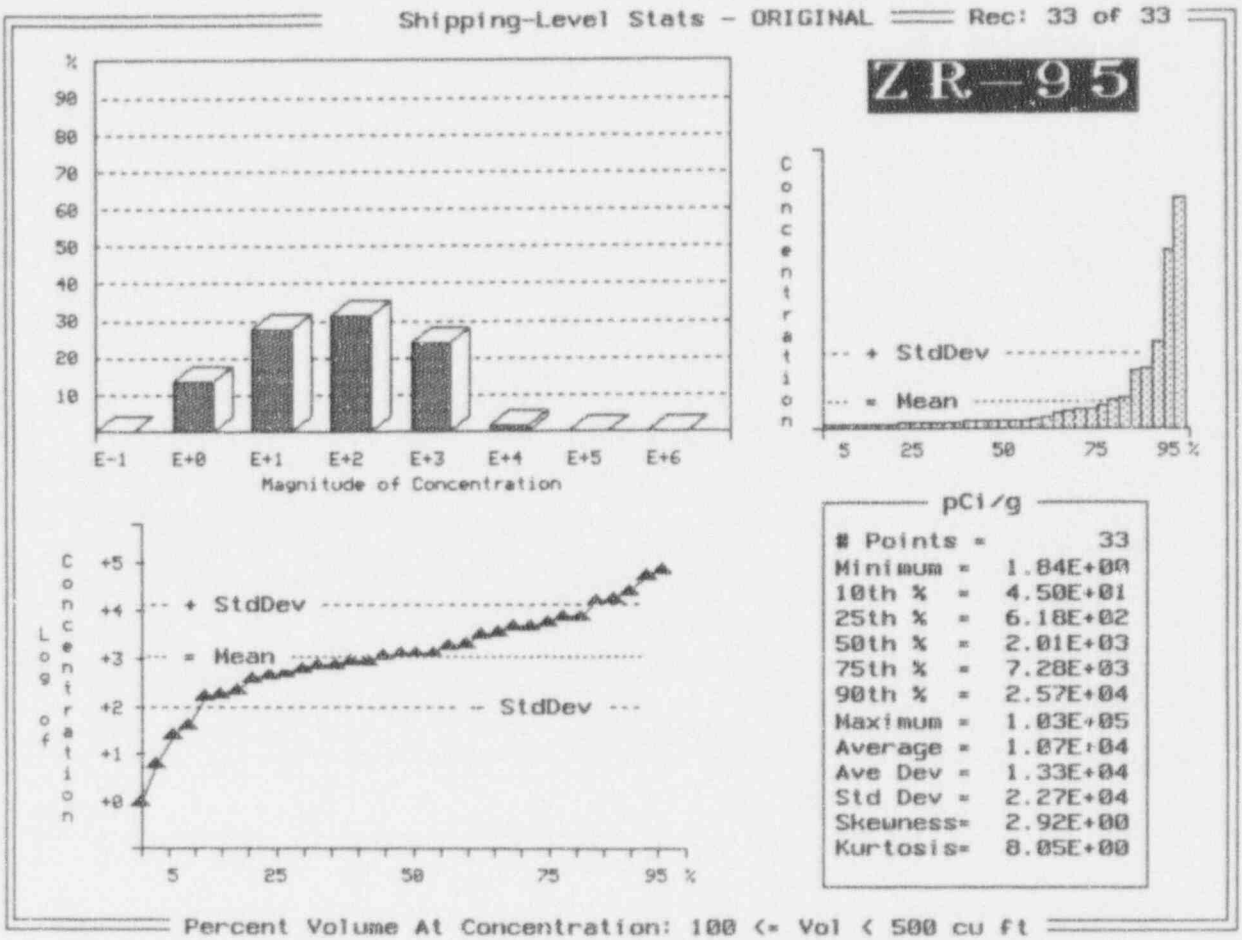


Exhibit J-2 Radionuclide Distributions Shipment Level Analysis Richland 1989 Non-Brokered Utility Waste and All Regions and States[a]

Waste Class: A-Unstable and A-Stable
Number of shipping records: 346
Number of shipping containers: 6,304
Total waste volume: 3,798 m^3
Total waste mass: 3,608,000 Kg
Assumed waste density: 0.92 g/cm^3

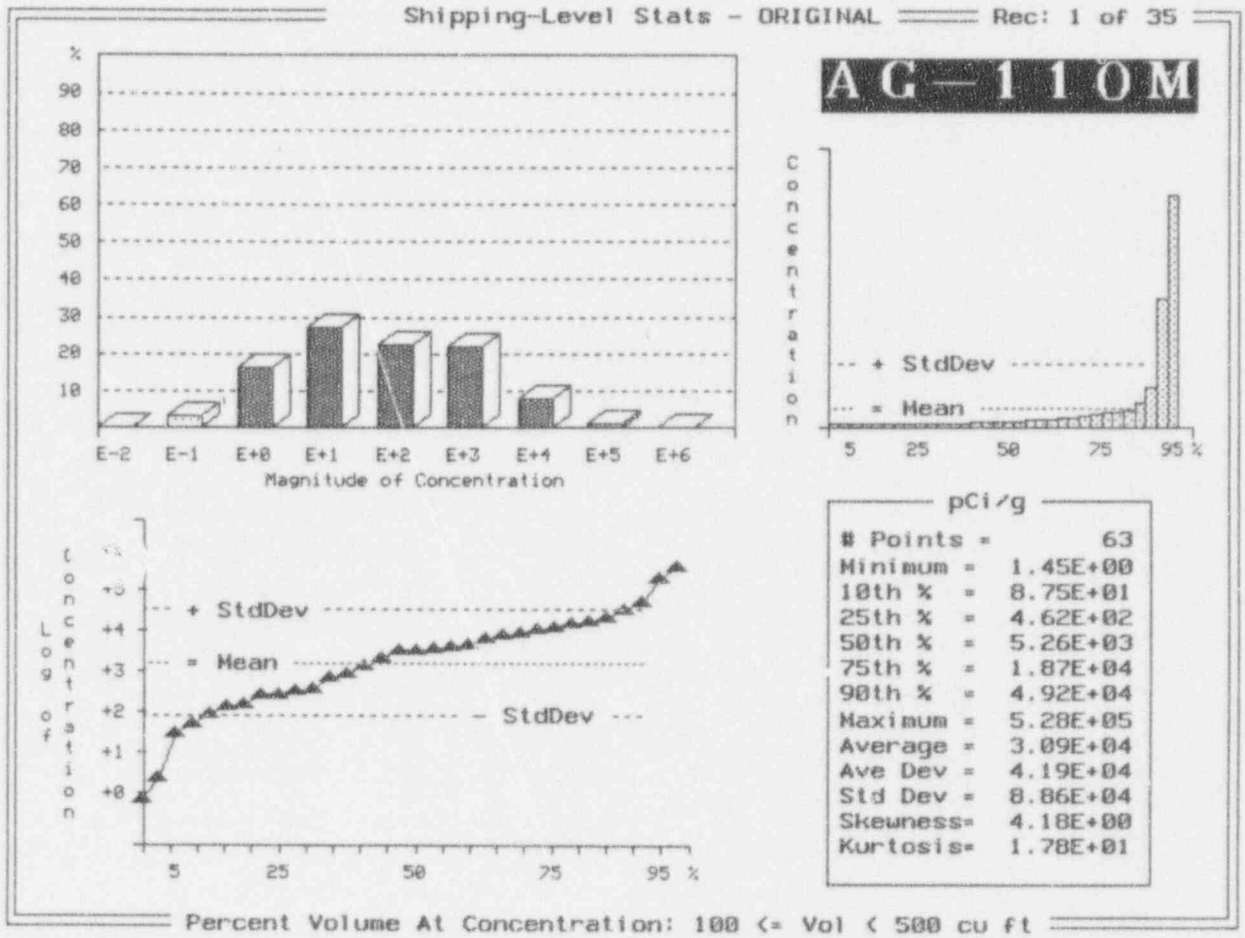
	Concentration Ranges - Percentile[b] - Ci/m^3 -			- pCi/g -		
Nuclide	1st	50th	99th	1st	50th	99th
Ag-110m	1.02E-06	4.20E-03	4.63E-01	1.45E+00	5.26E+03	5.28E+05
Am-241	7.33E-08	2.60E-06	7.83E-05	7.92E-02	2.84E+00	1.13E+02
Ba-140	2.12E-07	1.60E-04	1.73E-02	2.69E-01	1.94E+02	1.97E+04
C-14	2.08E-07	6.74E-04	3.10E-02	2.14E-01	6.98E+02	3.94E+04
Ce-141	4.23E-06	6.77E-05	2.22E-02	5.12E+00	1.10E+02	2.20E+04
Ce-144	7.33E-08	1.85E-03	1.25E-01	7.90E-02	3.13E+03	9.50E+04
Cm-242	7.33E-08	1.92E-06	9.99E-05	7.90E-02	2.64E+00	1.23E+02
Cm-243	7.33E-08	1.98E-06	7.80E-06	7.90E-02	1.86E+00	2.64E+01
Cm-244	1.77E-07	8.86E-07	1.90E-05	1.69E-01	1.10E+00	2.38E+01
Co-57	7.88E-08	1.88E-04	8.64E-03	1.11E-01	2.49E+02	7.59E+03
Co-58	2.08E-07	1.28E-02	3.40E+00	2.22E-01	1.37E+04	3.57E+06
Co-60	2.39E-06	4.68E-02	8.84E+00	1.71E+00	5.60E+04	1.08E+07
Cr-51	1.53E-06	1.37E-02	2.73E+01	1.53E+00	1.67E+04	3.40E+07
Cs-134	1.49E-06	5.00E-03	2.83E-01	1.18E+00	4.67E+03	3.35E+05
Cs-136	2.12E-07	6.96E-05	1.60E-02	2.69E-01	8.53E+01	9.30E+03
Cs-137	4.71E-06	9.58E-03	3.51E-01	3.53E+00	1.30E+04	4.49E+05
Fe-55	2.28E-06	5.24E-02	2.21E+01	1.98E+00	5.00E+04	2.49E+07
Fe-59	3.66E-07	4.67E-03	1.79E+00	3.95E-01	5.24E+03	2.33E+06
H-3	4.23E-07	1.52E-03	1.66E-01	5.37E-01	1.72E+03	2.41E+05
I-129	7.47E-08	3.59E-06	1.15E-03	6.11E-02	2.61E+00	1.41E+03
I-131	2.12E-07	7.04E-04	2.22E-02	2.45E-01	8.06E+02	2.84E+04

Exhibit J-2 Radionuclide Distributions Shipment Level Analysis Richland 1989 Non-Brokered Utility Waste and All Regions and States[a], Cont'd

Nuclide	Concentration Ranges - Percentile[b] - Ci/m³ - 1st	50th	99th	- pCi/g - 1st	50th	99th
La-140	2.12E-07	1.77E-04	1.96E-02	2.69E-01	2.12E+02	2.23E+04
Mn-54	1.04E-07	3.89E-02	2.41E+00	1.34E-01	4.43E+04	2.74E+06
Nb-95	3.40E-07	2.64E-03	3.15E+00	2.41E-01	3.32E+03	3.59E+06
Ni-59	3.66E-07	3.34E-04	6.09E-04	3.95E-01	2.89E+02	4.79E+02
Ni-63	3.04E-06	8.59E-03	4.62E-01	1.97E+00	1.11E+04	4.65E+05
Pu-238	7.33E-08	5.04E-06	8.72E-05	7.90E-02	5.57E+00	1.99E+02
Pu-239	7.33E-08	4.60E-06	2.70E-04	7.90E-02	4.20E+00	3.91E+02
Pu-240	1.94E-07	1.39E-05	8.19E-05	1.77E-01	2.00E+01	1.68E+02
Pu-241	1.04E-07	1.27E-04	2.20E-02	1.42E-01	1.42E+02	2.71E+04
Pu-242	1.98E-07	2.60E-07	9.05E-06	2.32E-01	8.81E-01	9.04E+00
Rh-106	1.93E-04	8.40E-04	1.95E-03	3.07E+02	1.14E+03	2.46E+03
Ru-103	2.69E-05	9.82E-04	1.10E-02	6.13E+01	1.34E+03	3.91E+04
Ru-106	1.33E-03	2.62E-03	1.38E-02	1.79E+03	3.79E+03	3.05E+04
Sb-124	1.90E-06	2.53E-03	3.95E-01	2.42E+00	1.71E+03	5.05E+05
Sb-125	4.15E-07	1.01E-03	3.24E-01	5.54E-01	6.81E+02	5.10E+05
Sn-113	1.15E-05	2.58E-04	5.01E-01	1.99E+01	3.08E+02	1.36E+06
Sr-89	4.40E-07	9.41E-05	1.46E-02	4.74E-01	5.90E+01	4.14E+04
Sr-90	7.88E-08	1.27E-04	3.91E-02	5.48E-02	1.63E+02	5.81E+04
Tc-99	1.70E-07	4.52E-06	1.16E-03	1.06E-01	3.56E+00	1.58E+03
Te-125m	7.88E-08	2.39E-05	8.99E-02	5.48E-02	2.46E+01	1.42E+05
Xe-131m	2.12E-07	4.65E-06	4.80E-04	2.50E-01	5.59E+00	5.44E+02
Zn-65	3.74E-05	5.37E-02	2.34E+01	5.04E+01	6.02E+04	2.66E+07
Zr-95	2.05E-06	2.60E-03	2.09E+00	1.71E+00	3.96E+03	2.38E+06

(a) Based on 1989 Richland LLW data only.
(b) Includes only radionuclides with 30 or more data points characterizing concentration ranges.

Exhibit J-2 (Continued)



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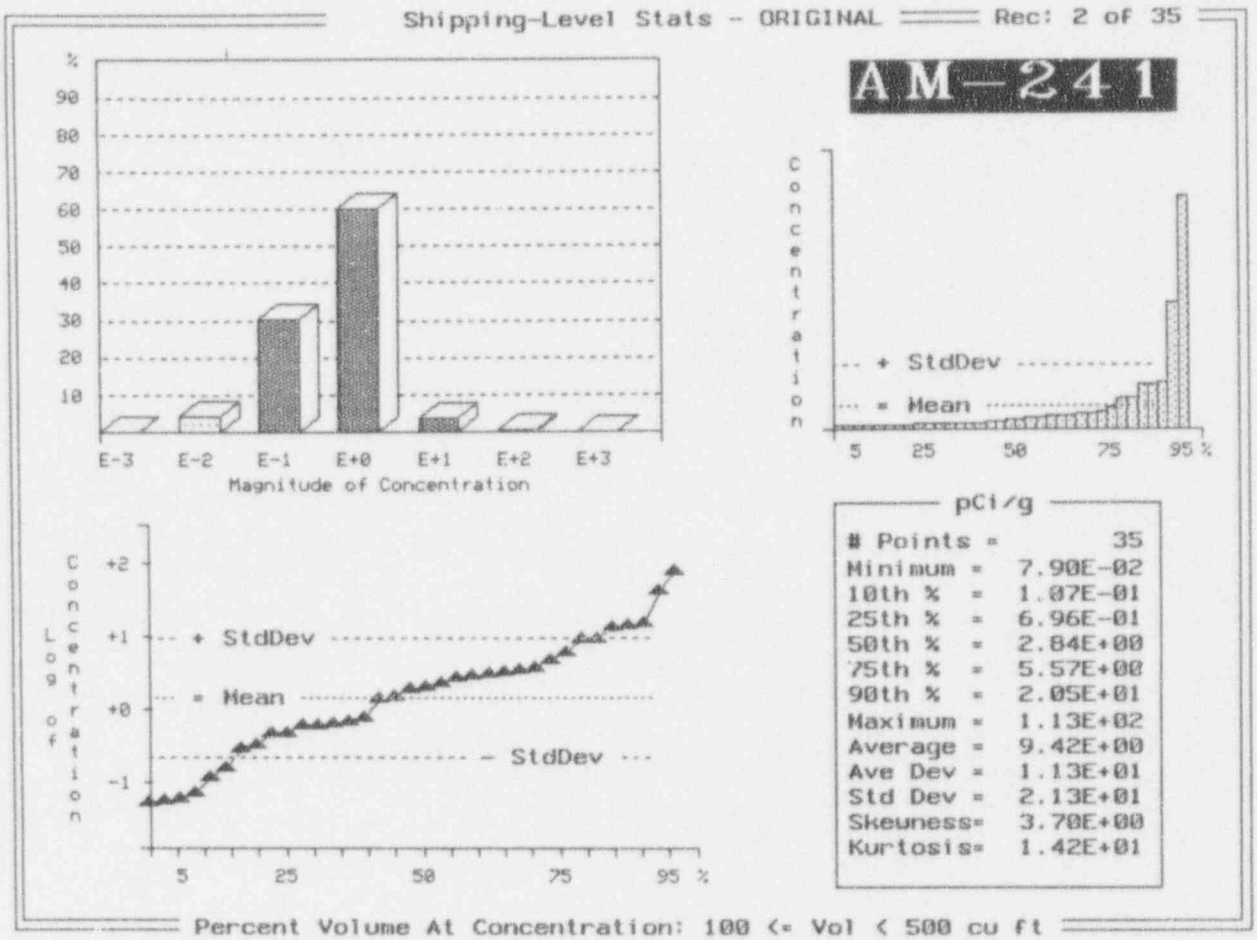

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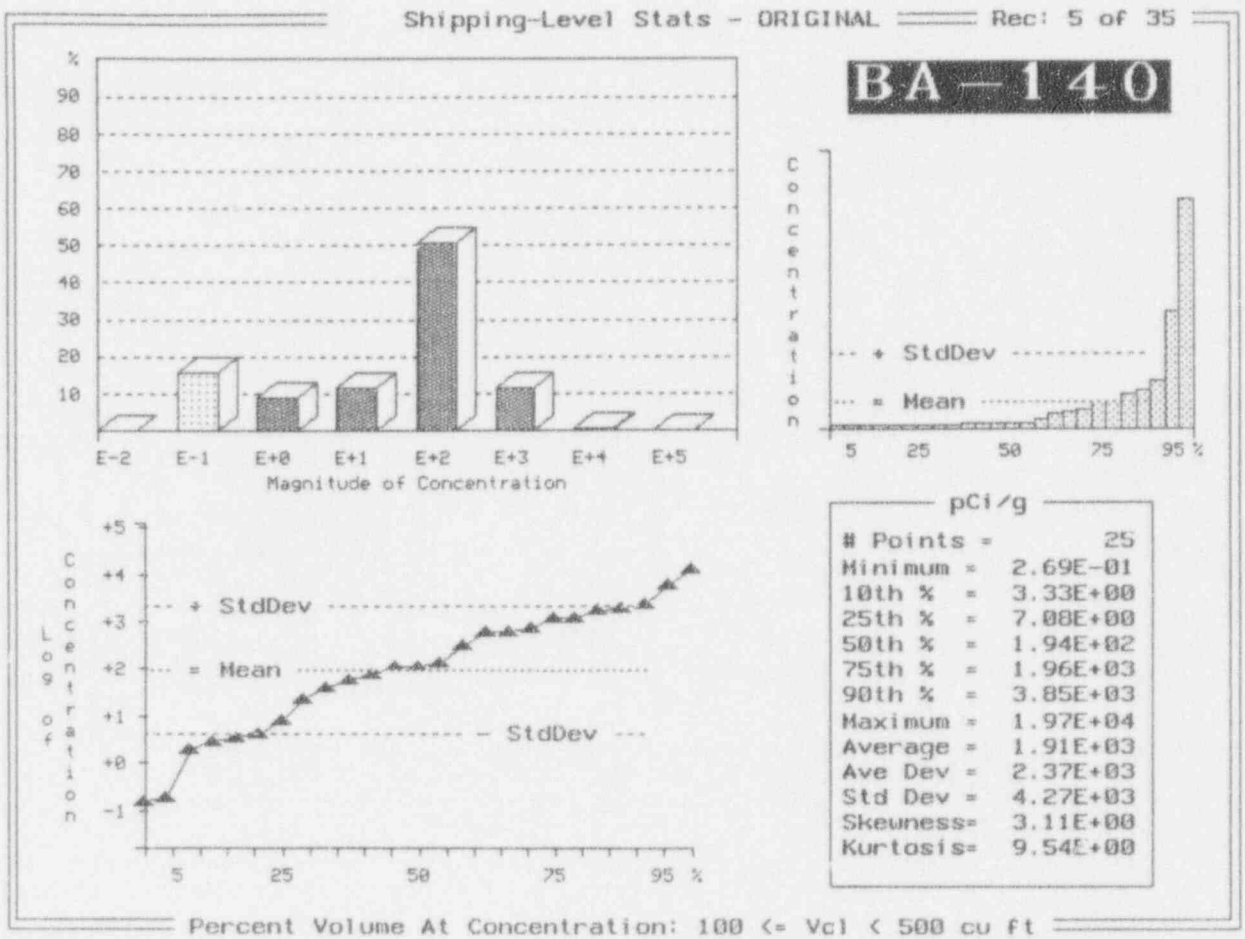

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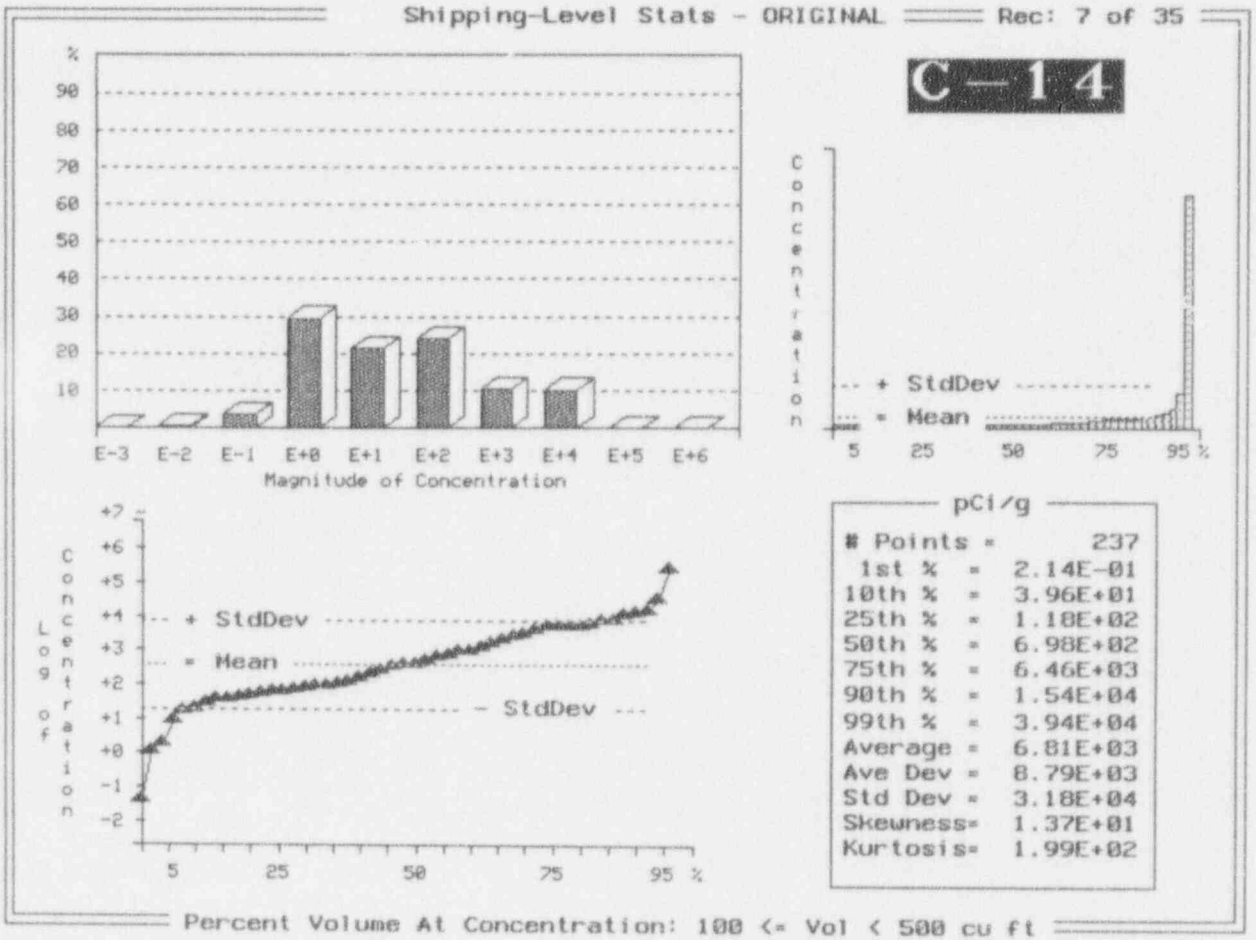

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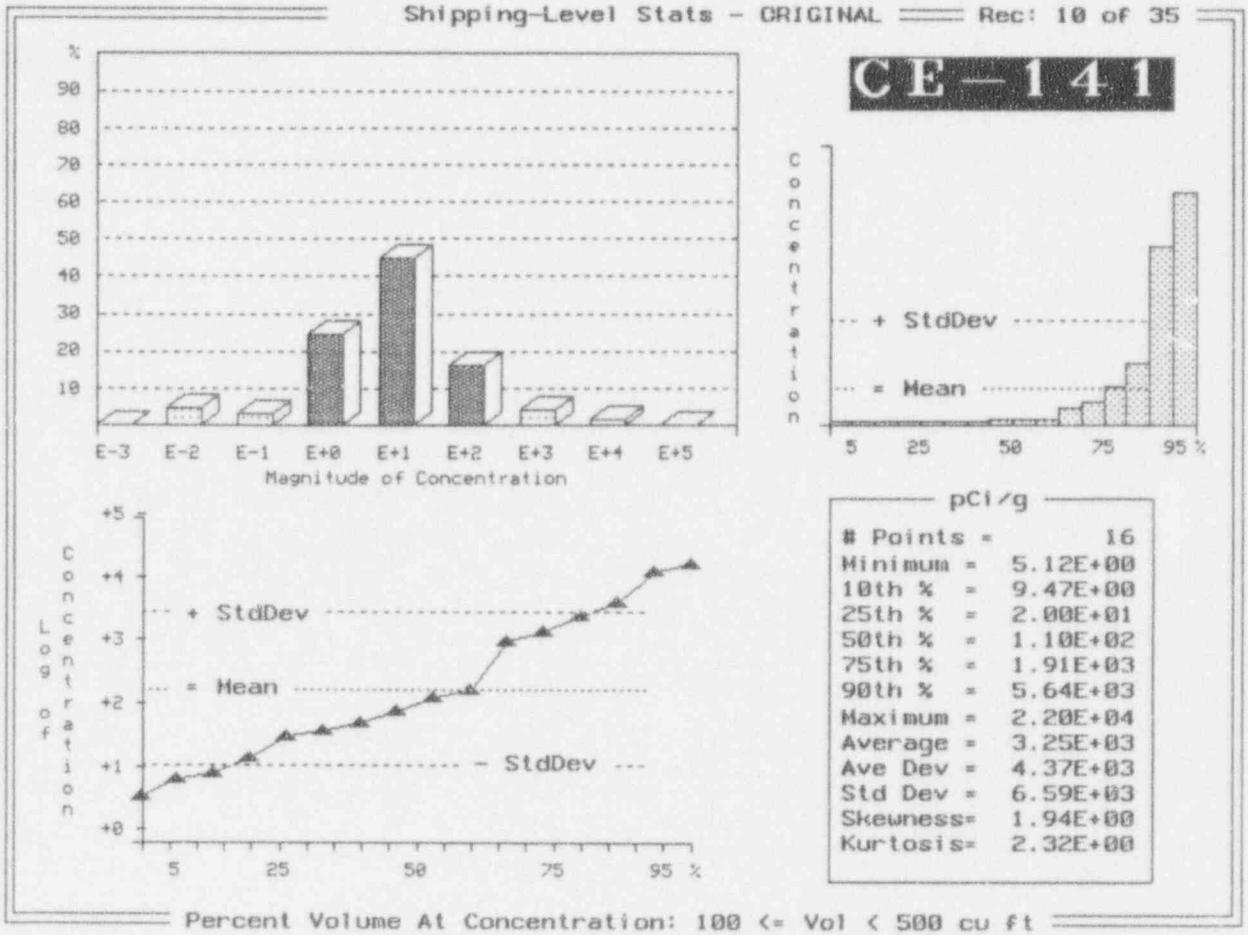

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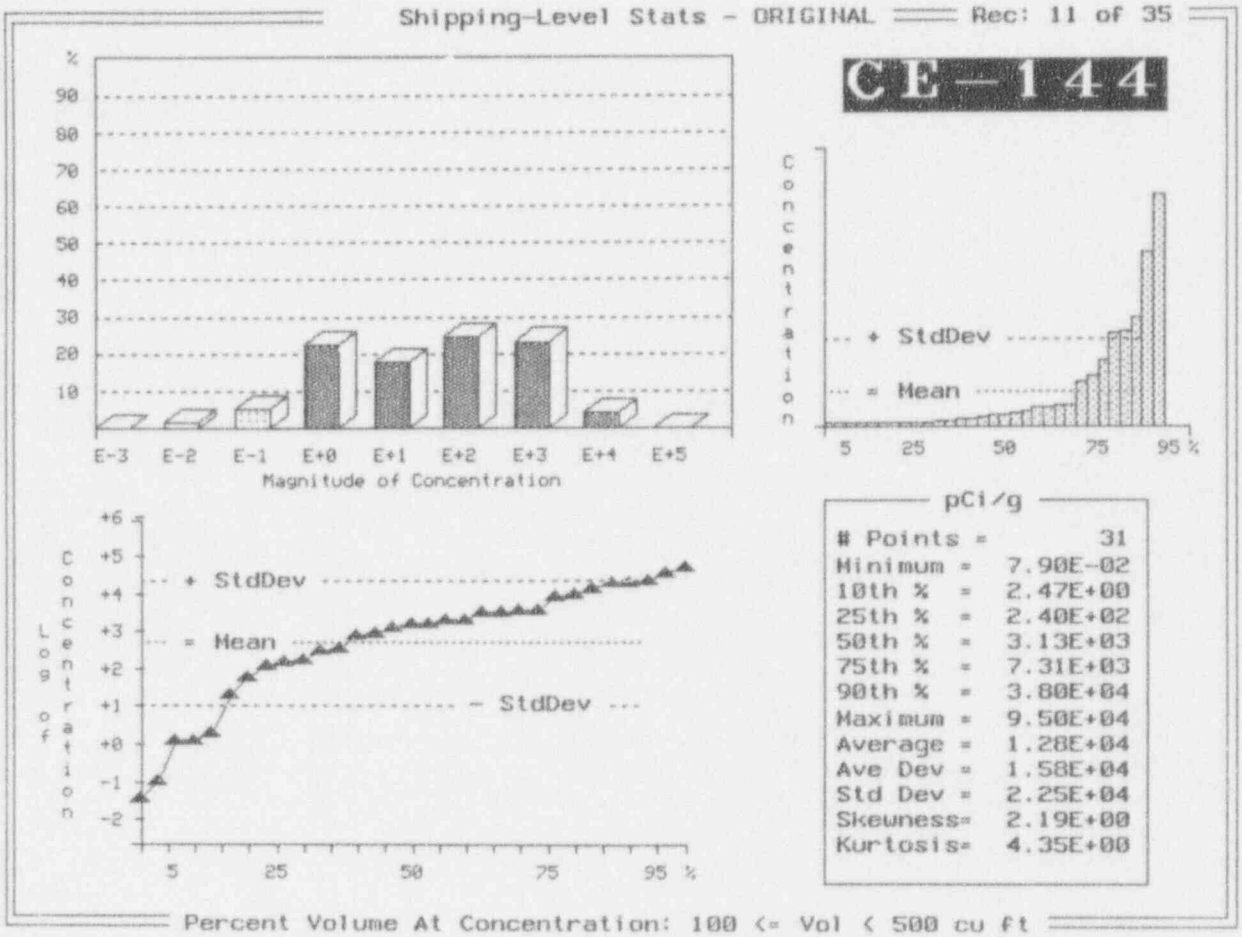

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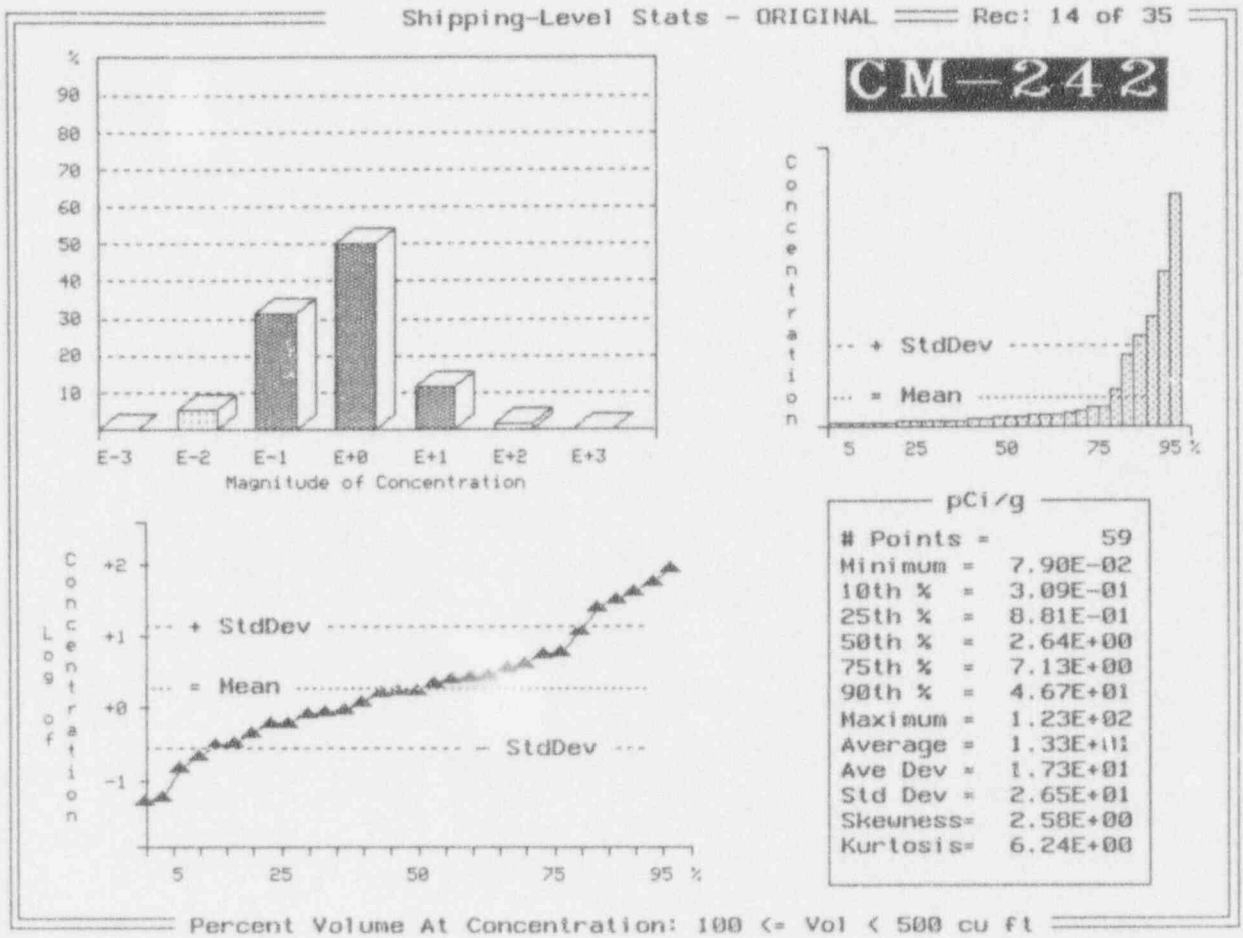

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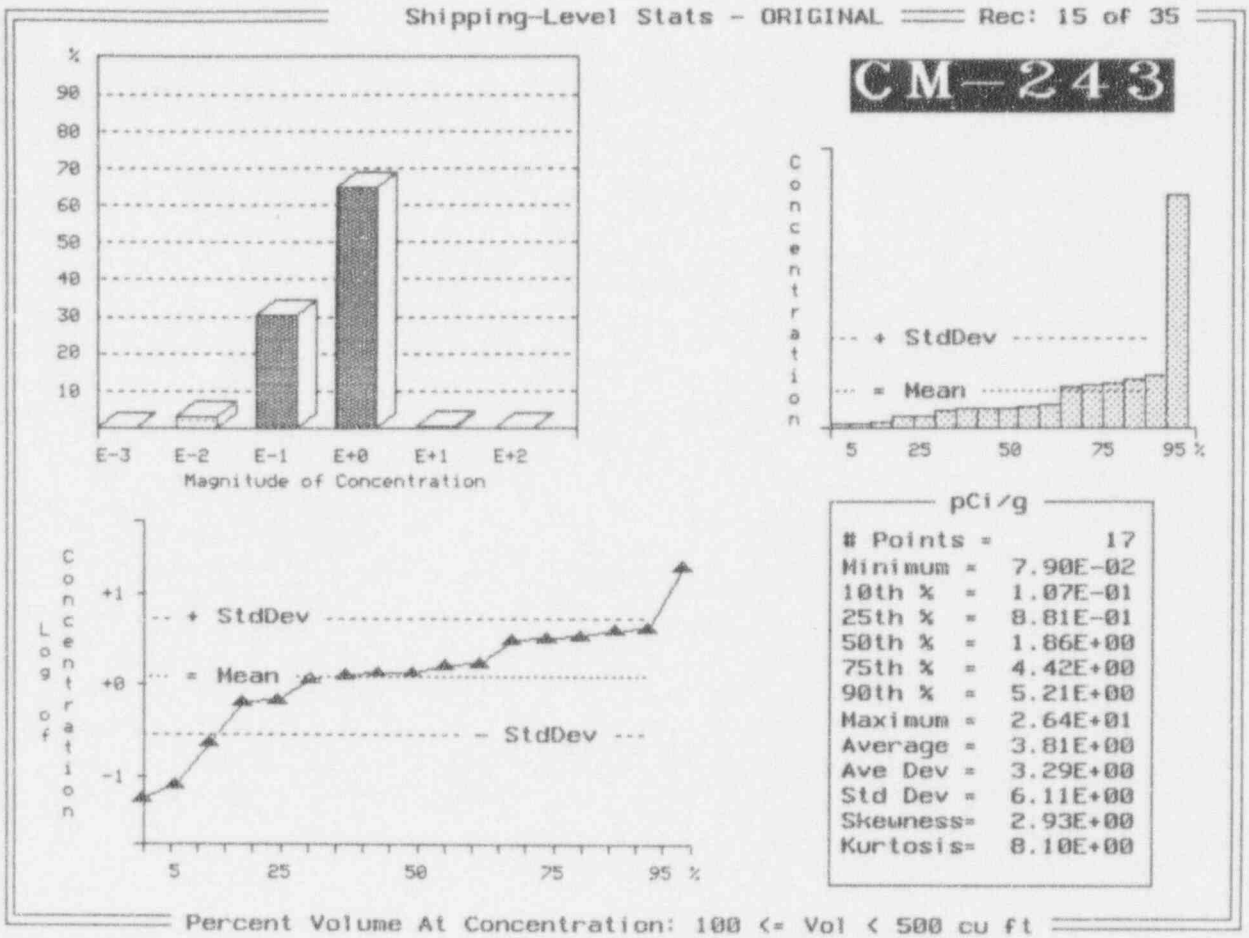

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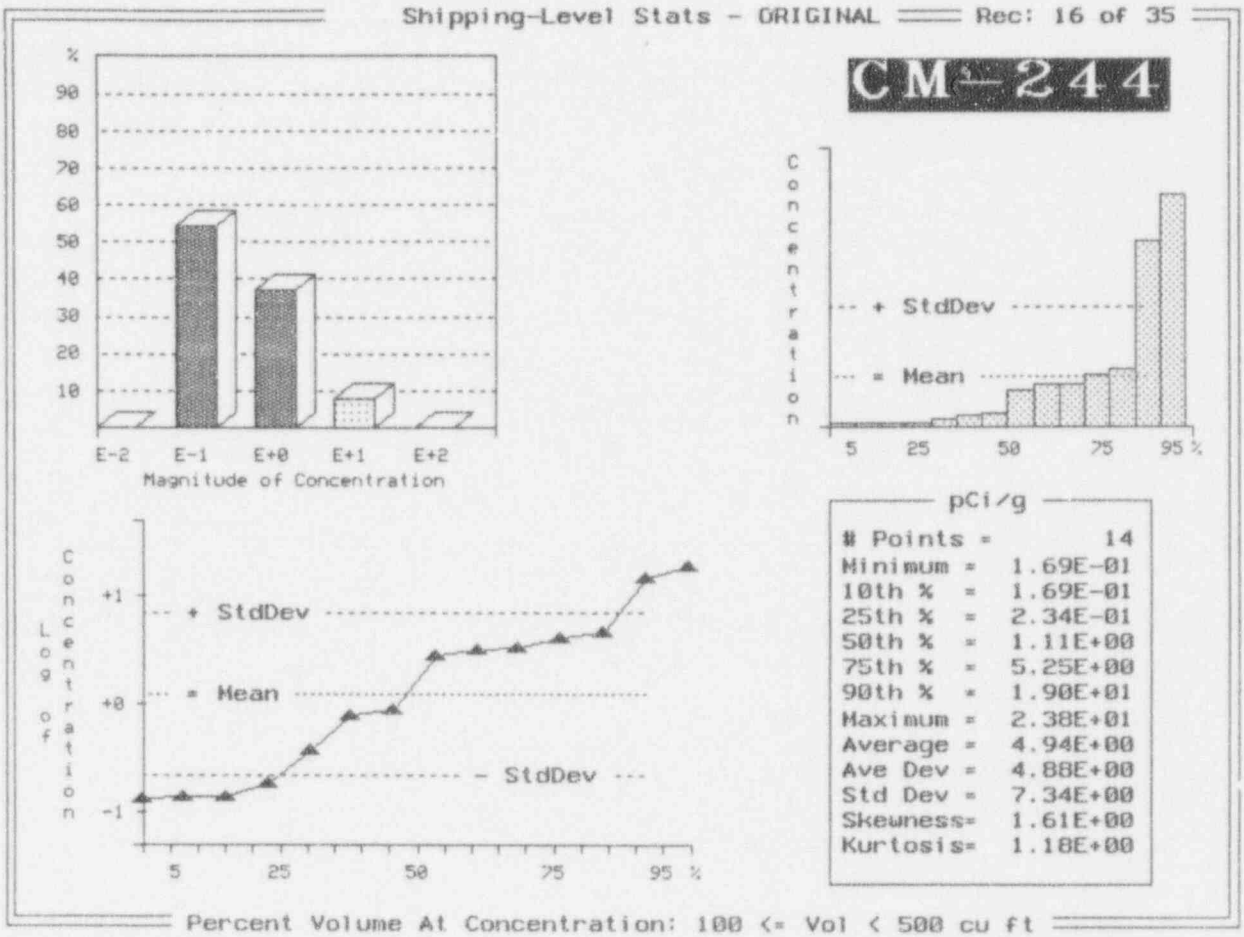

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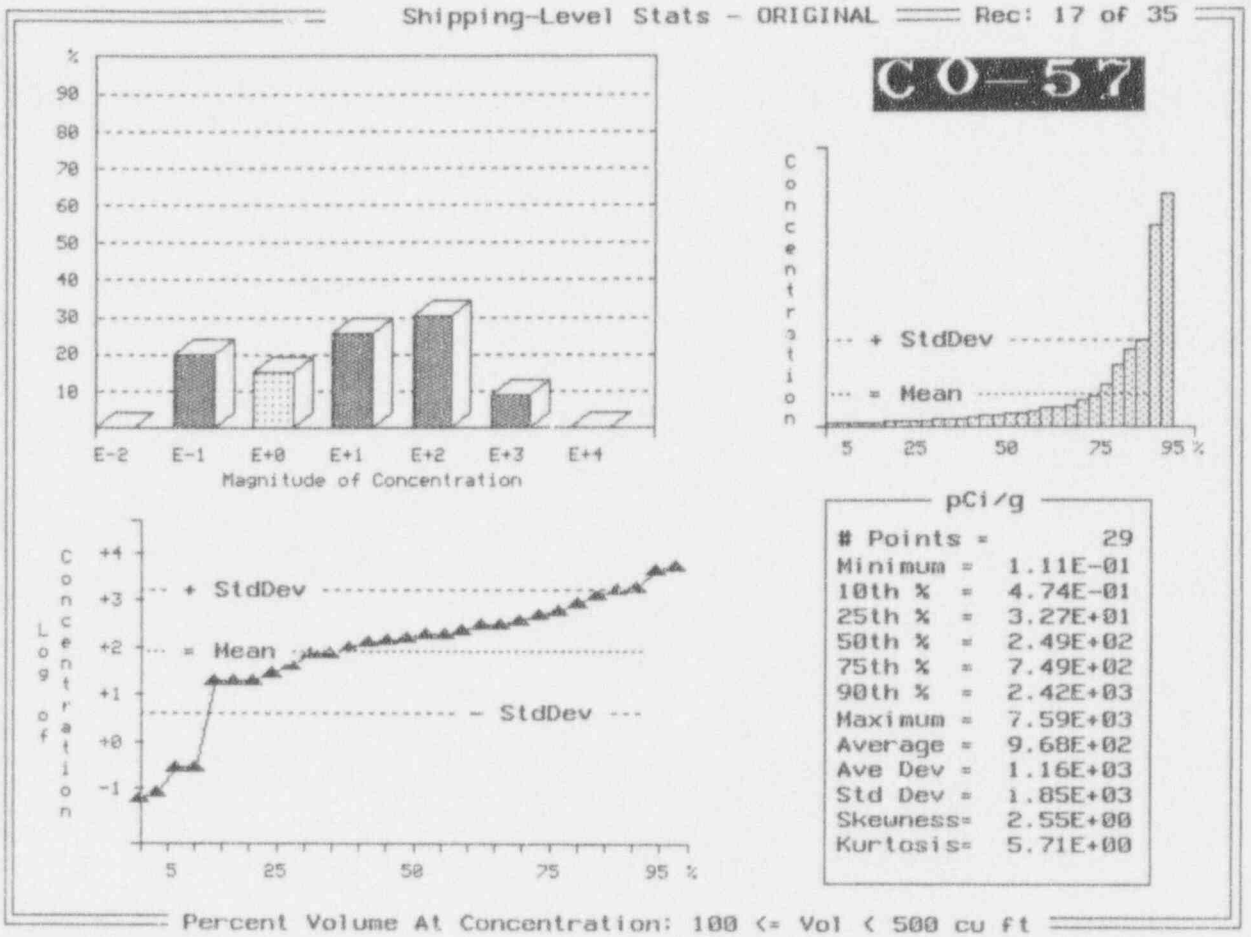

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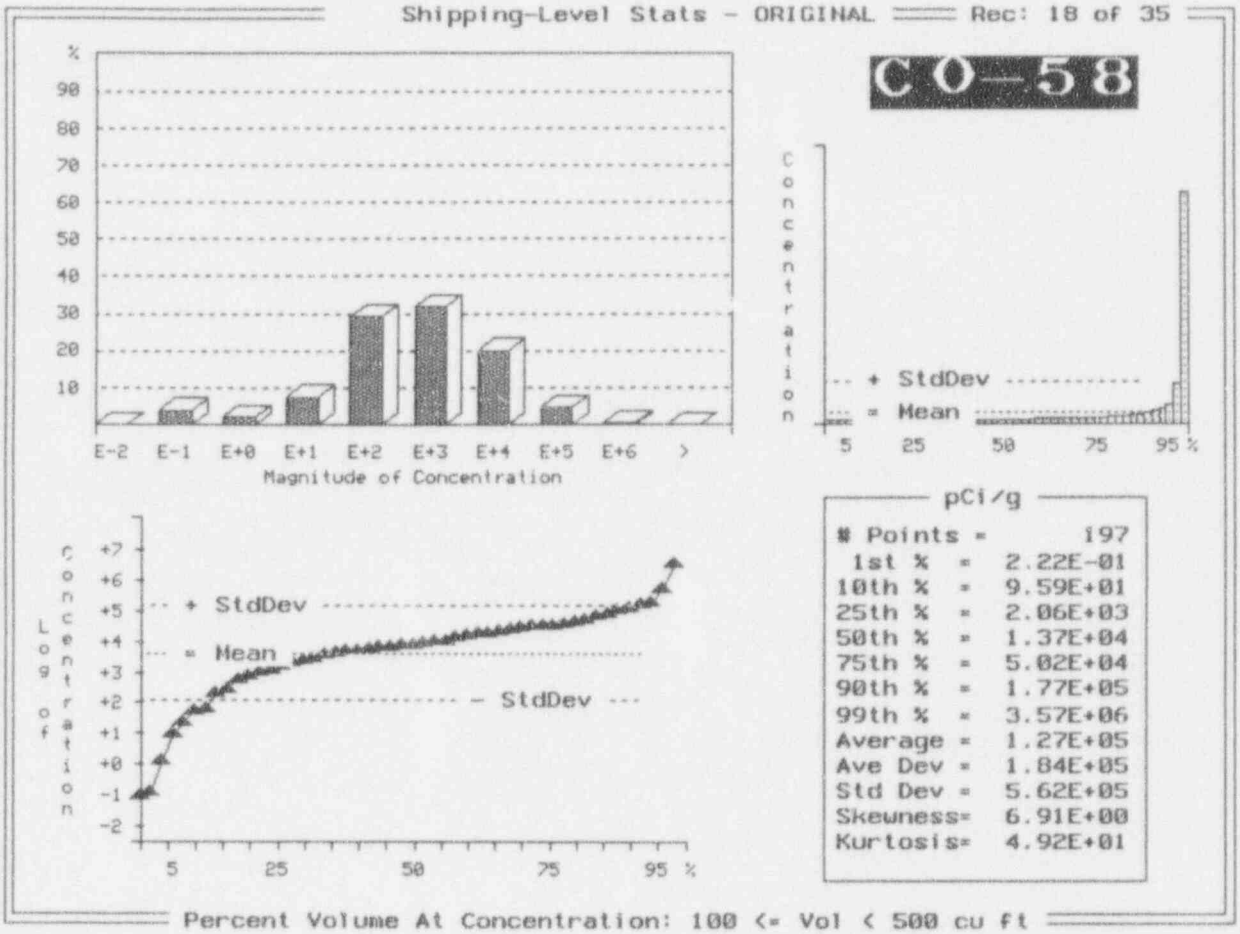

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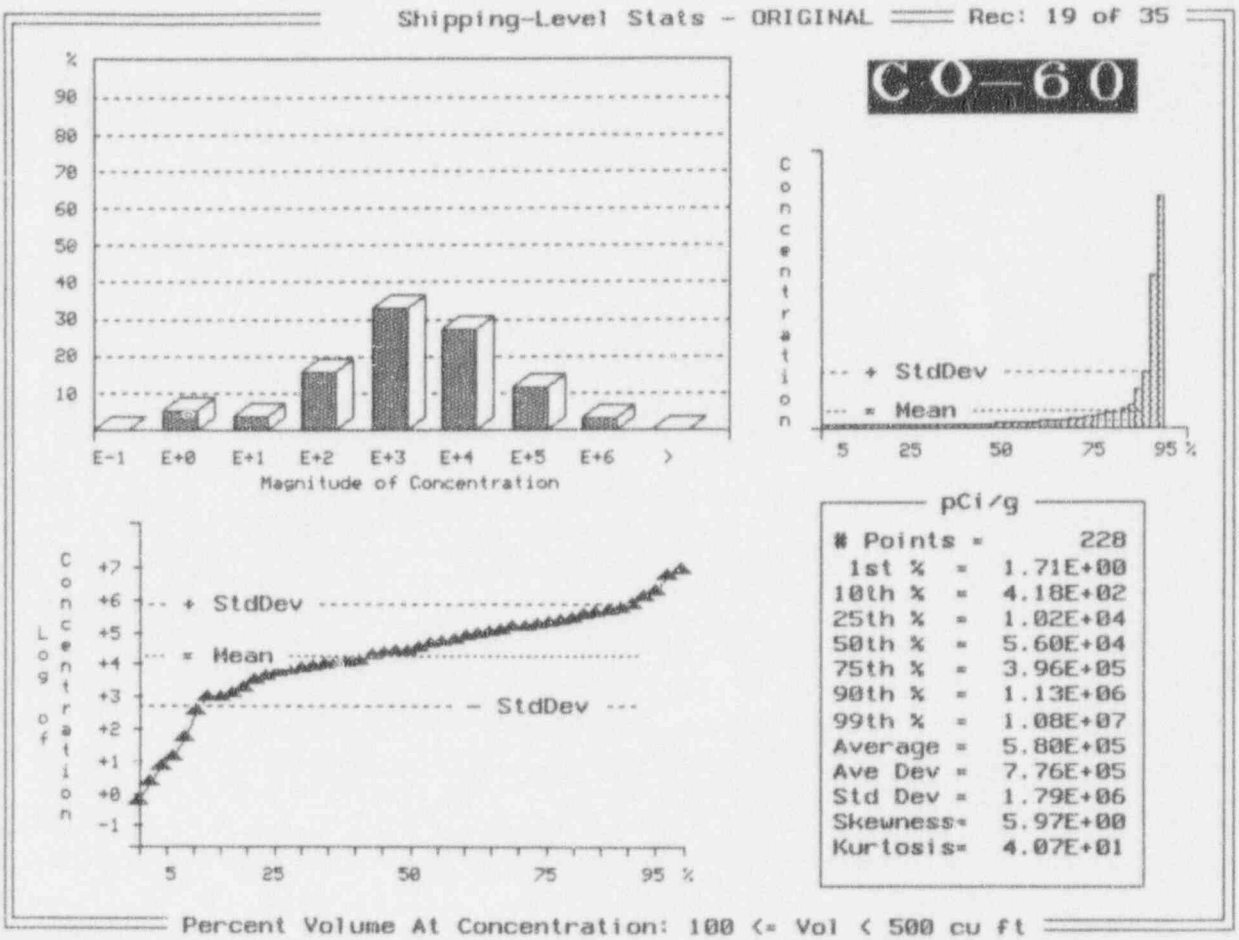

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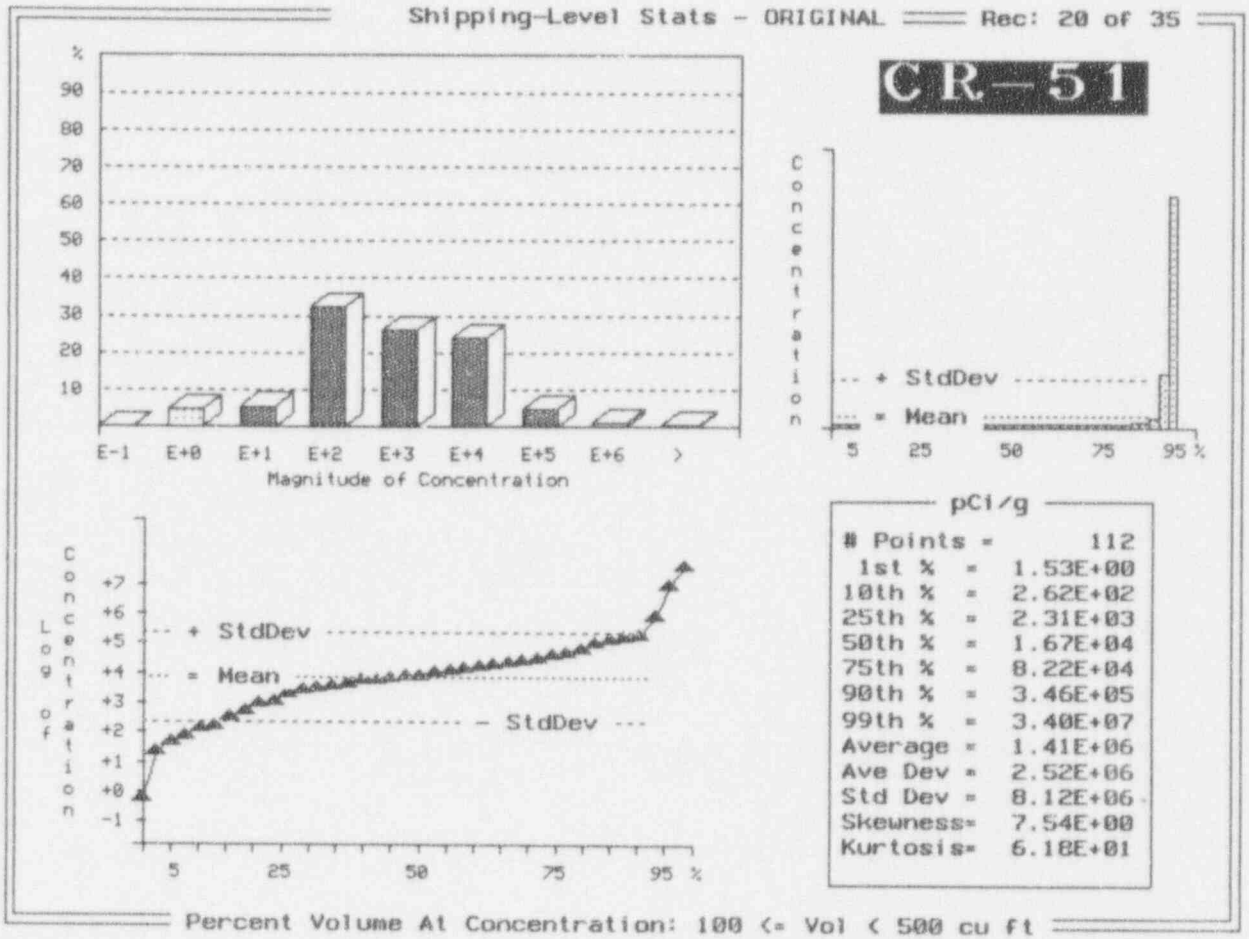

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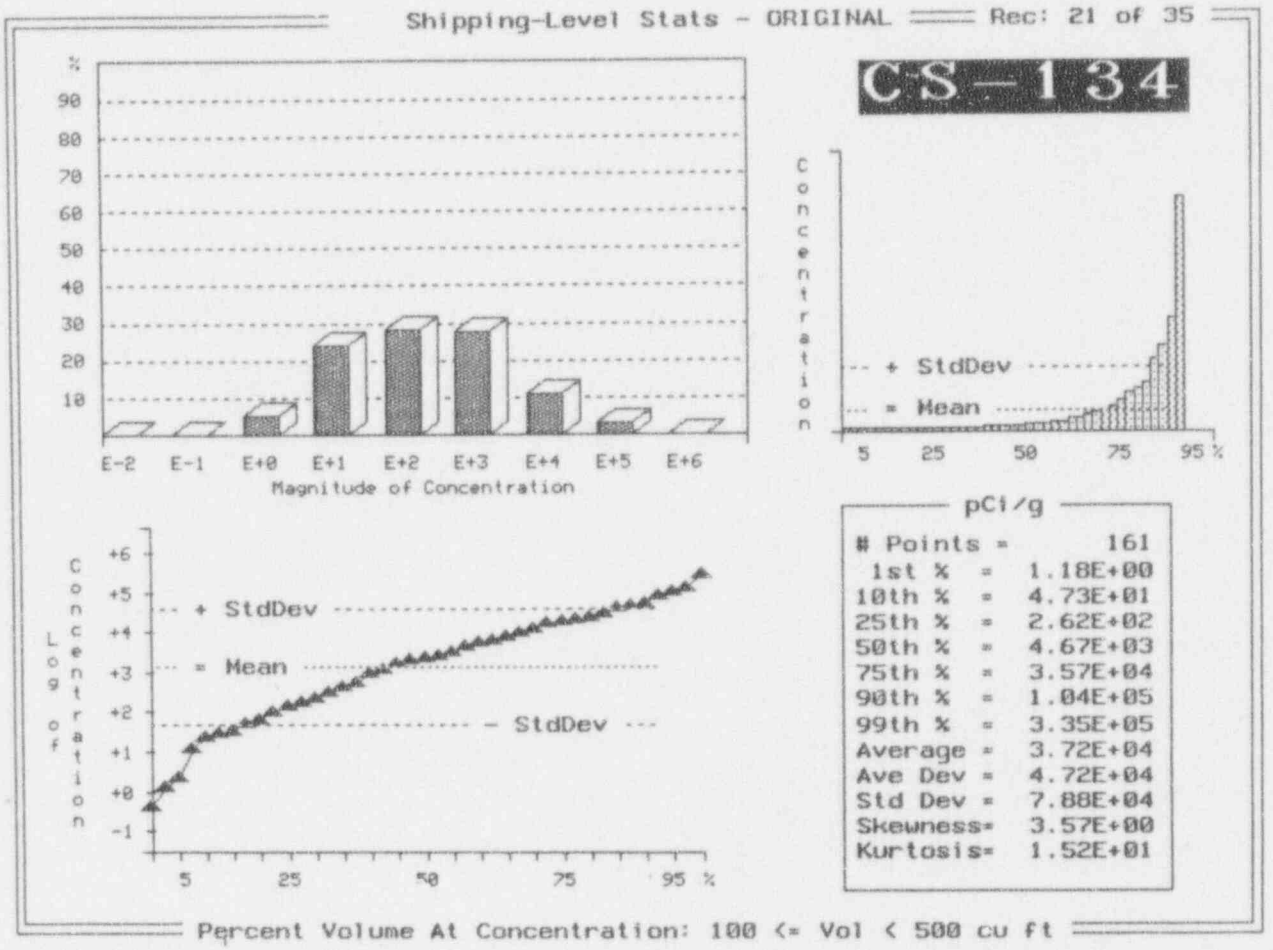

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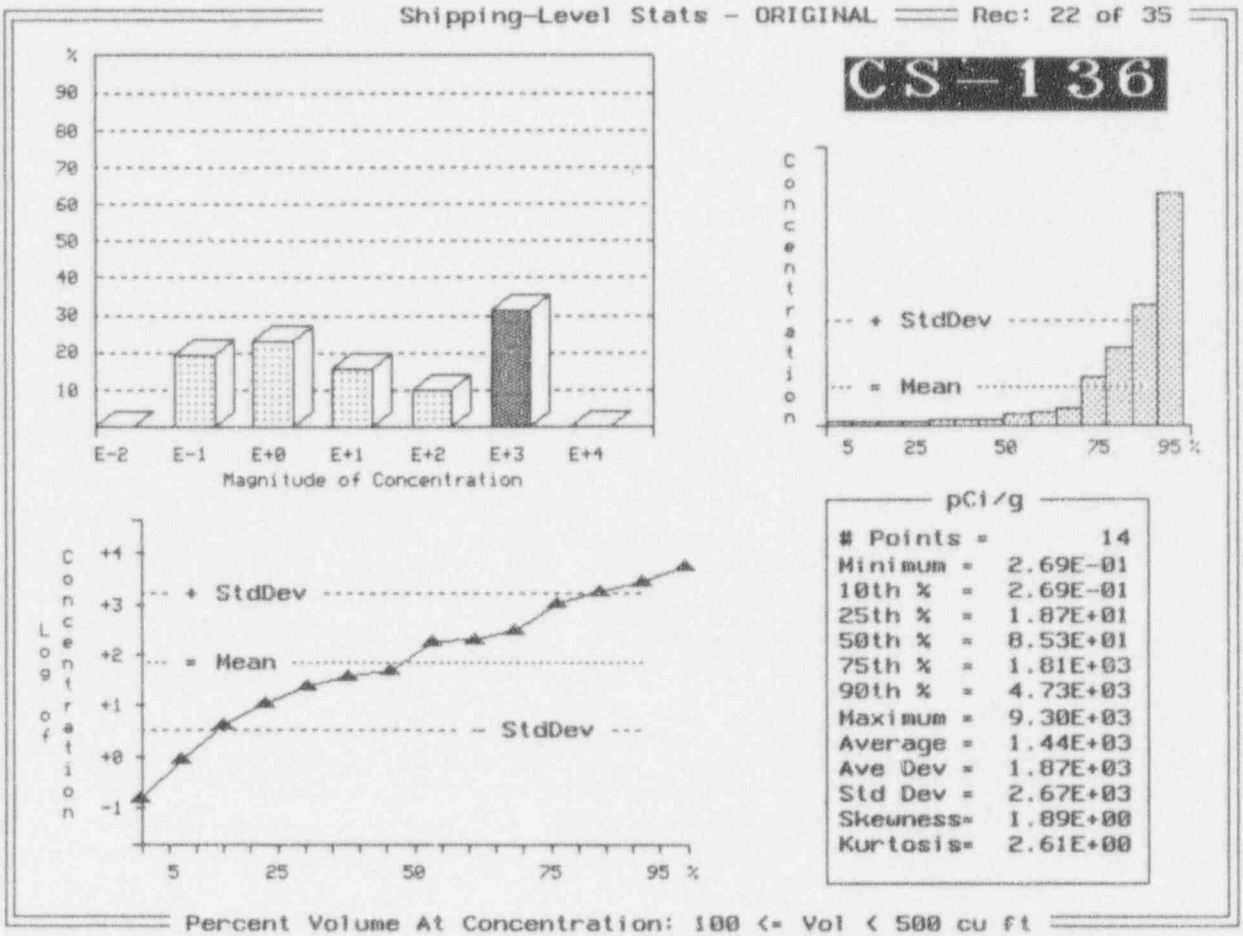

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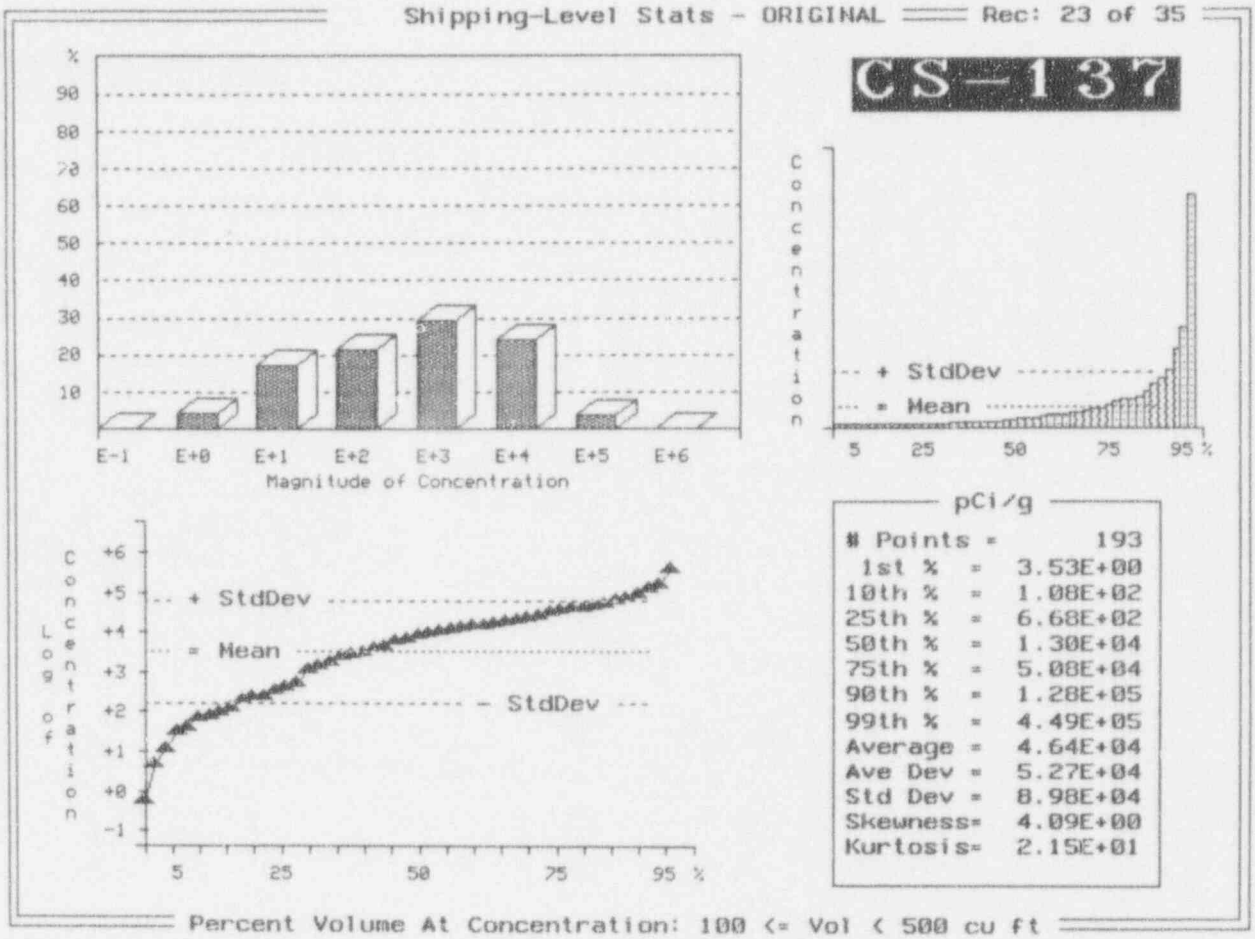

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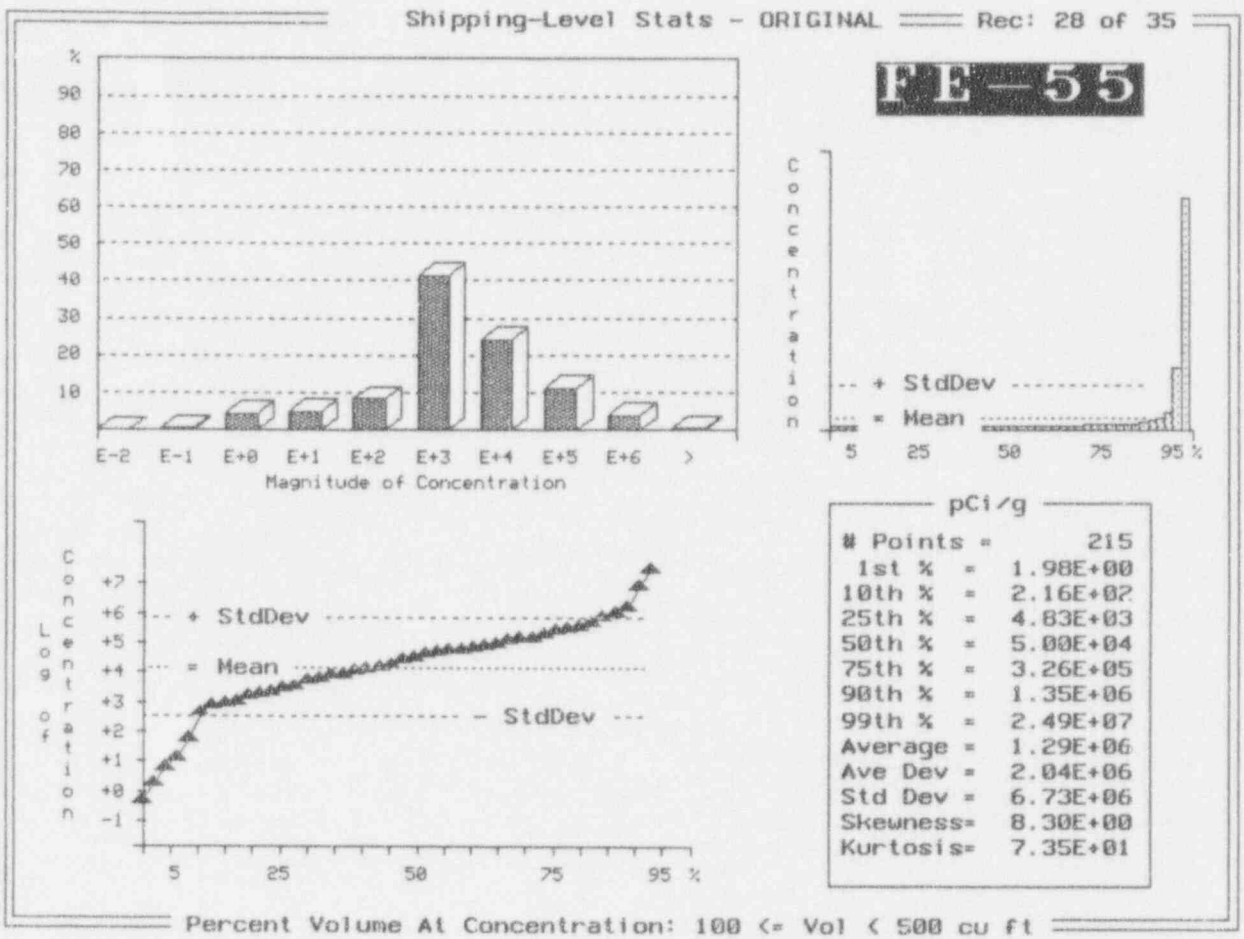

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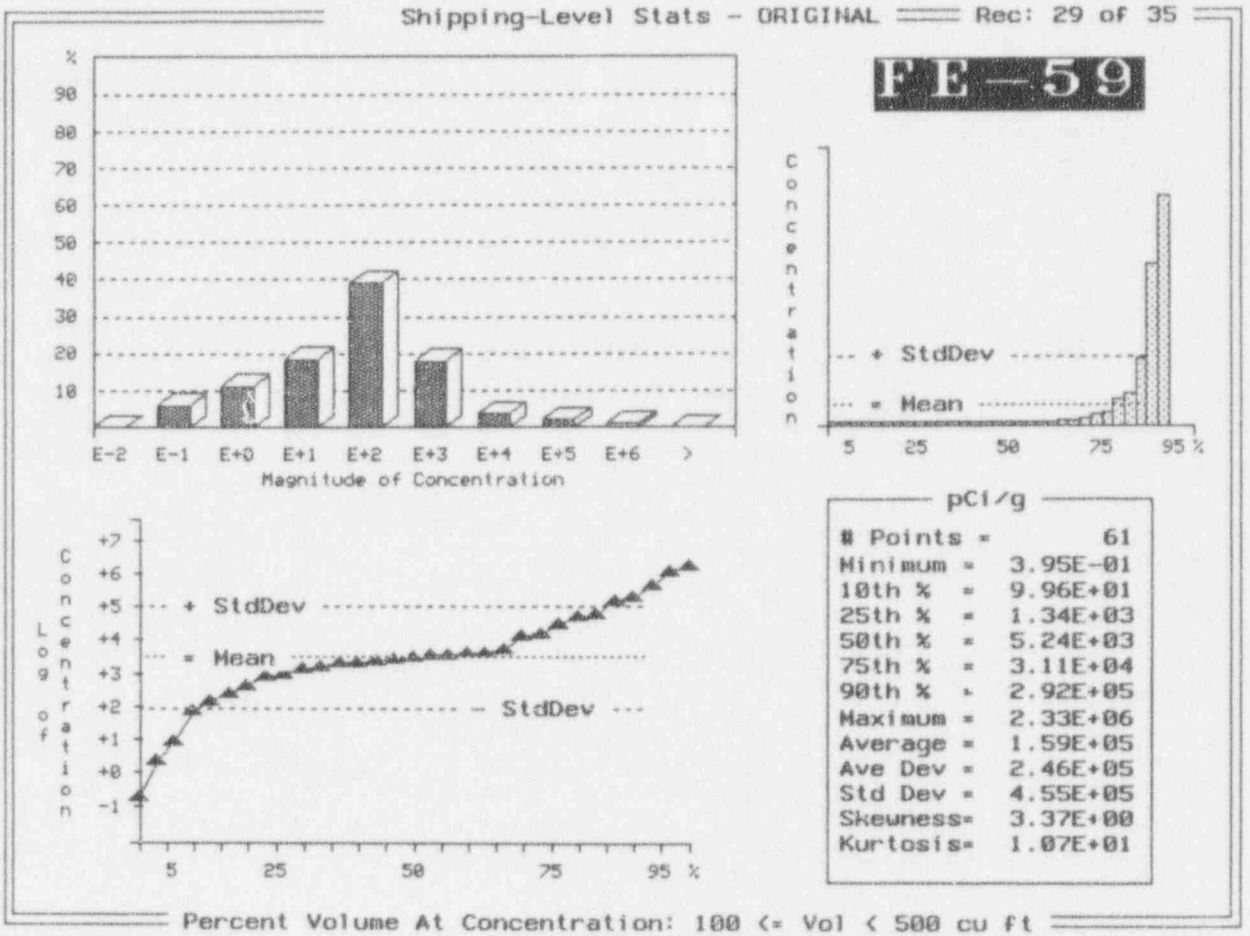

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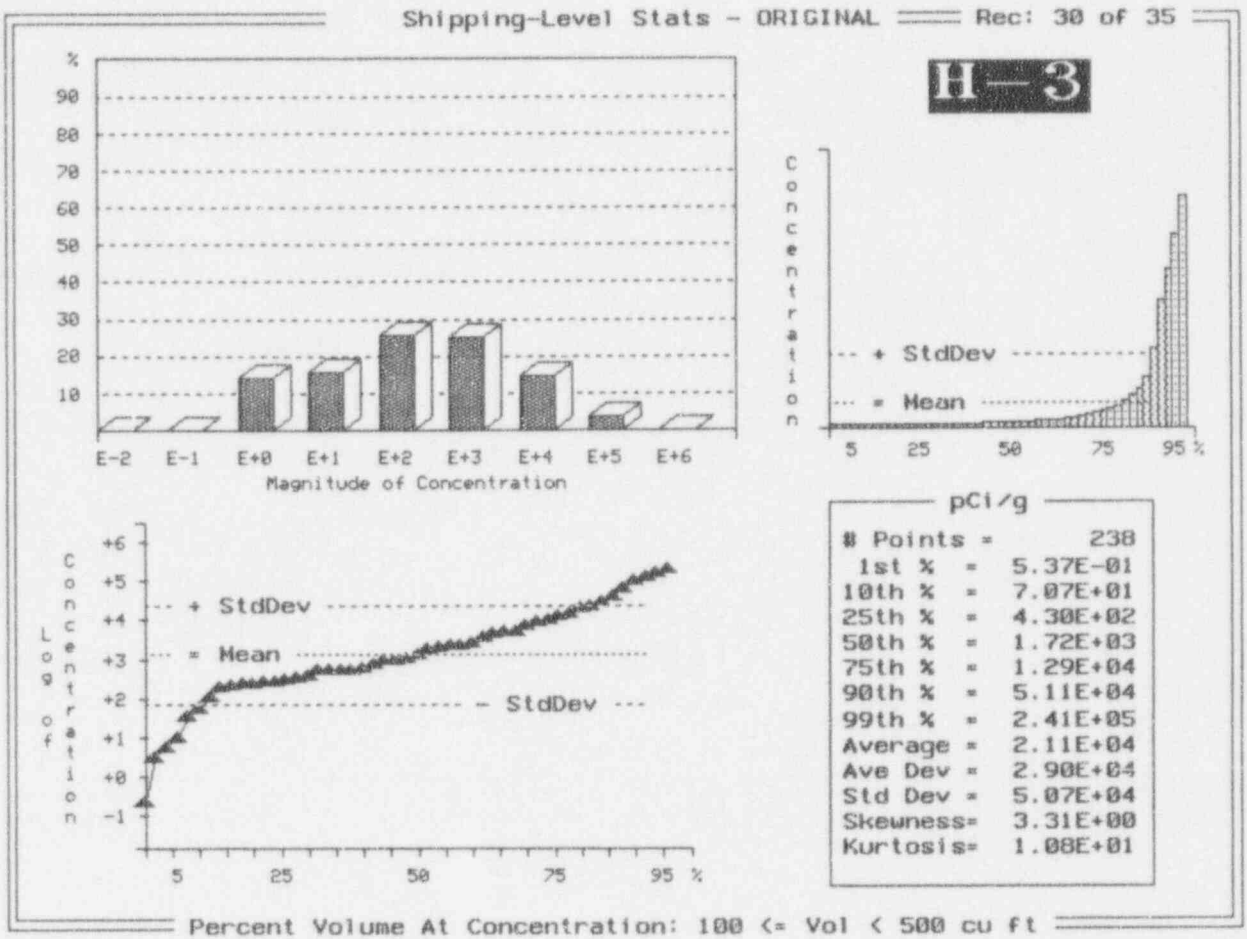

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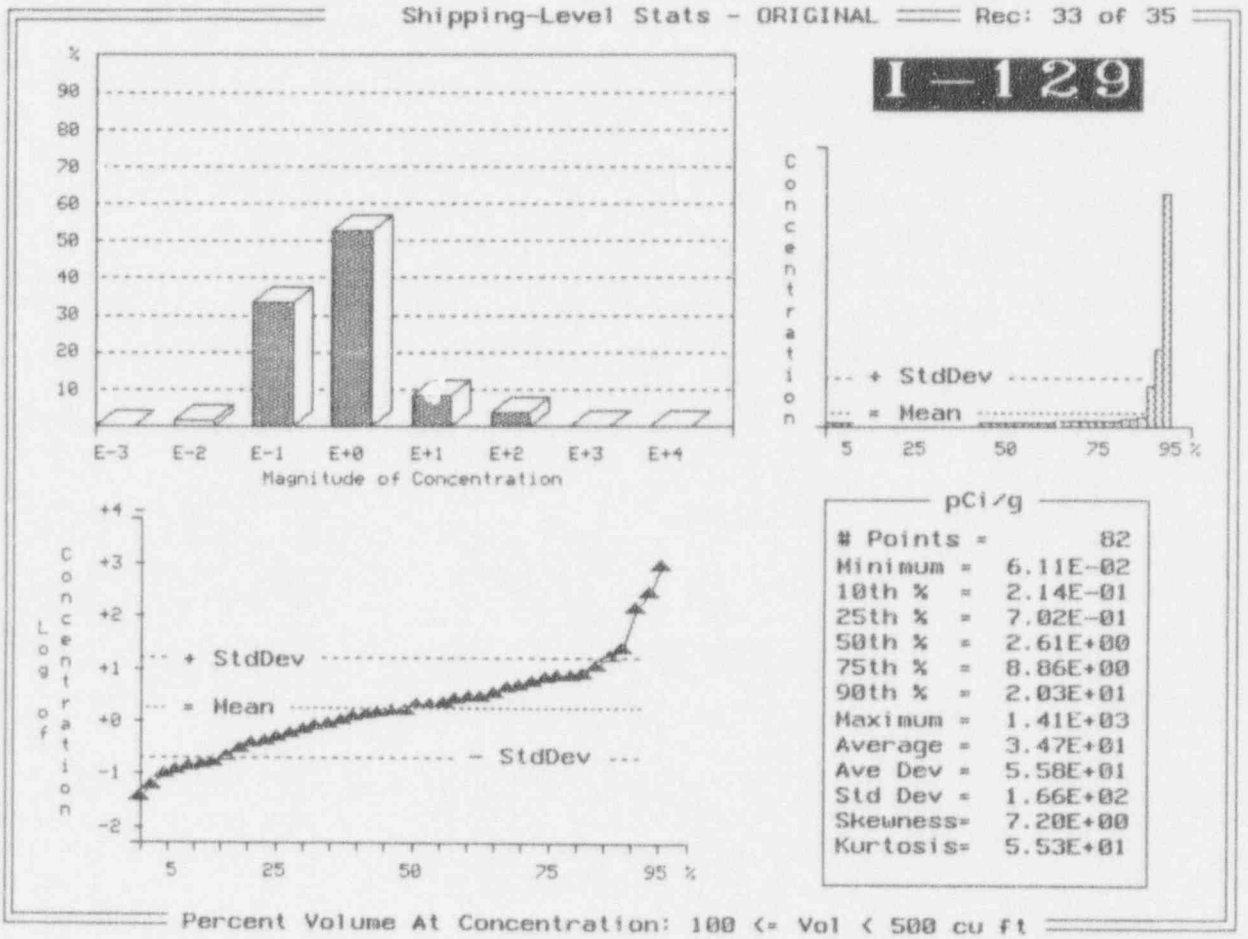

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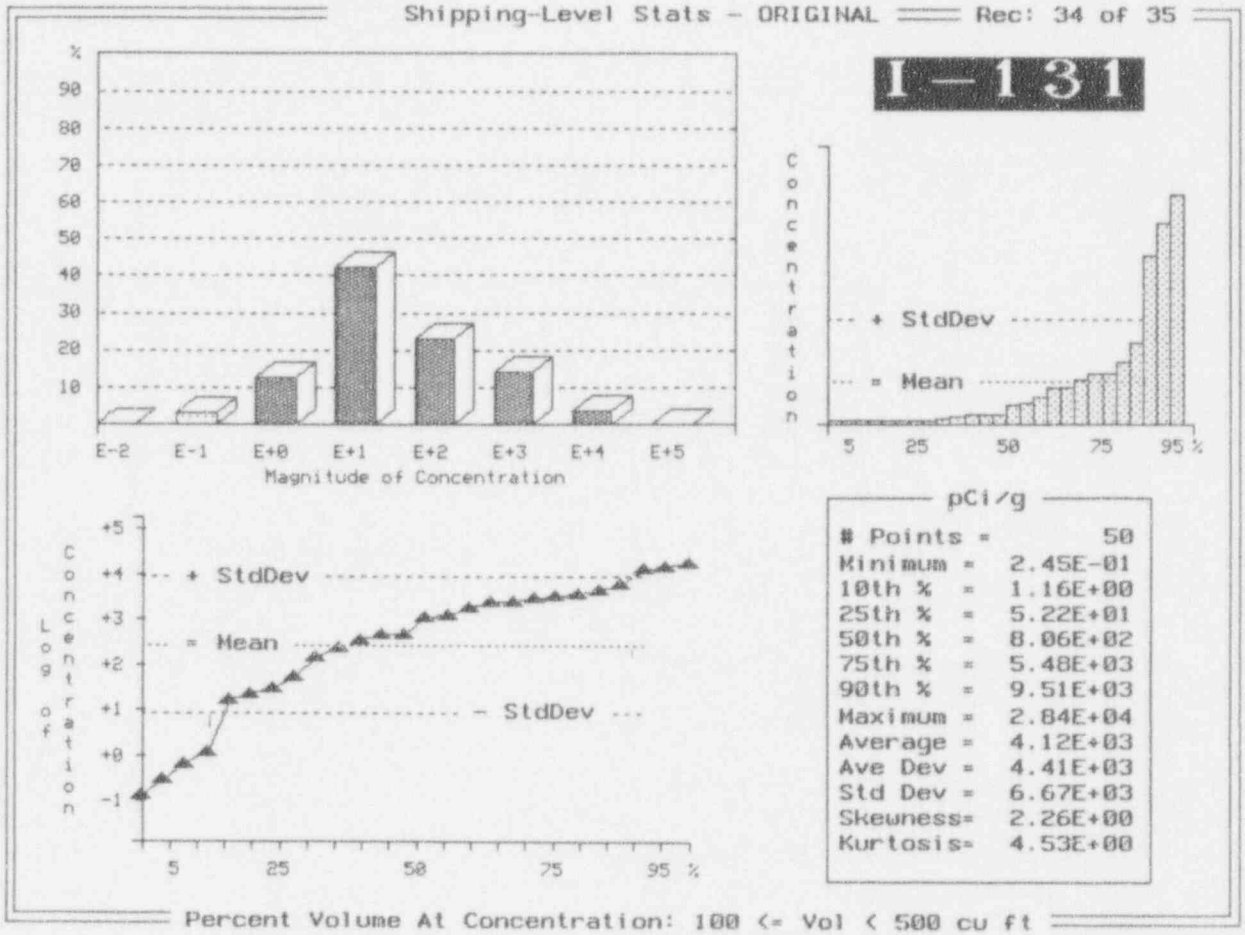

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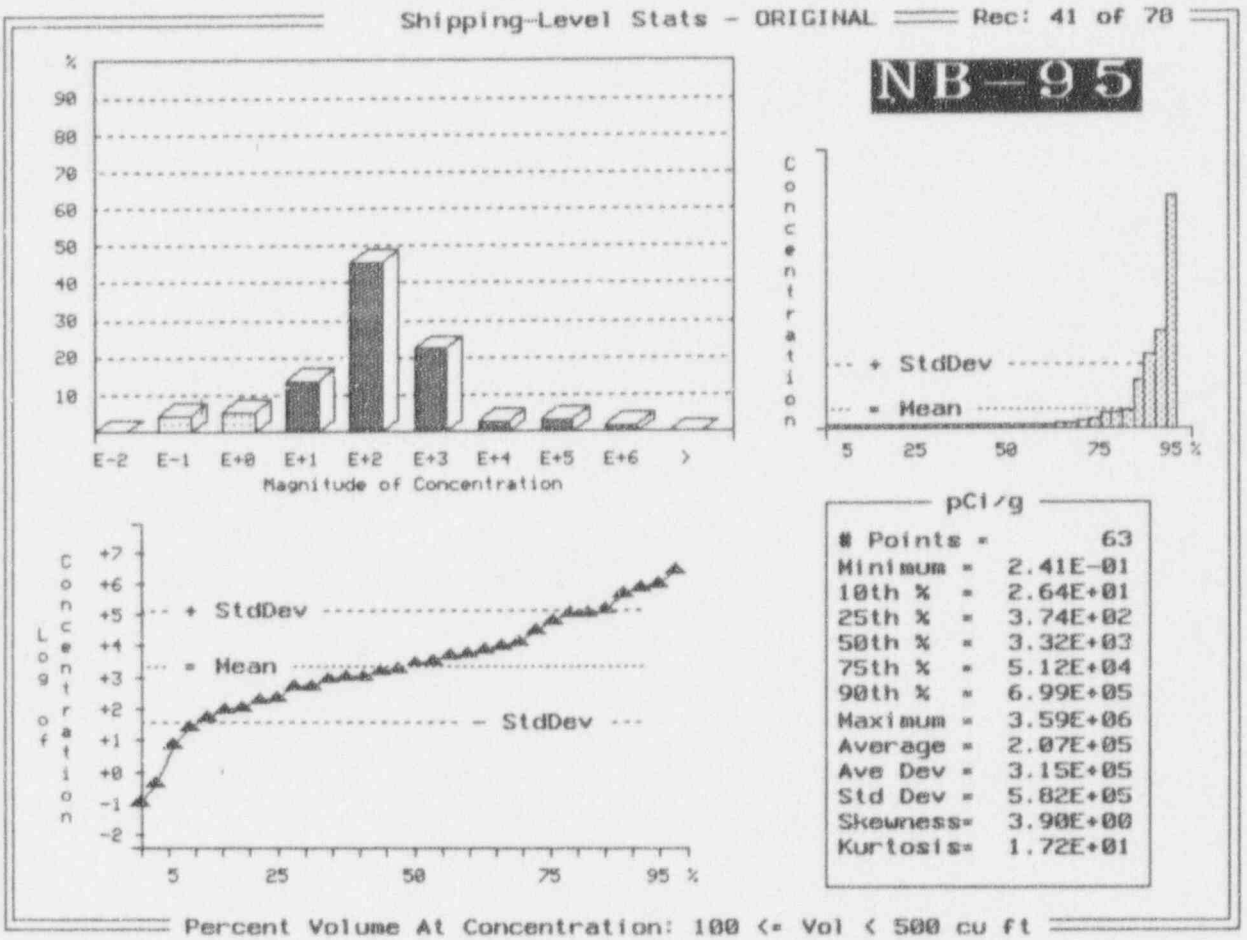

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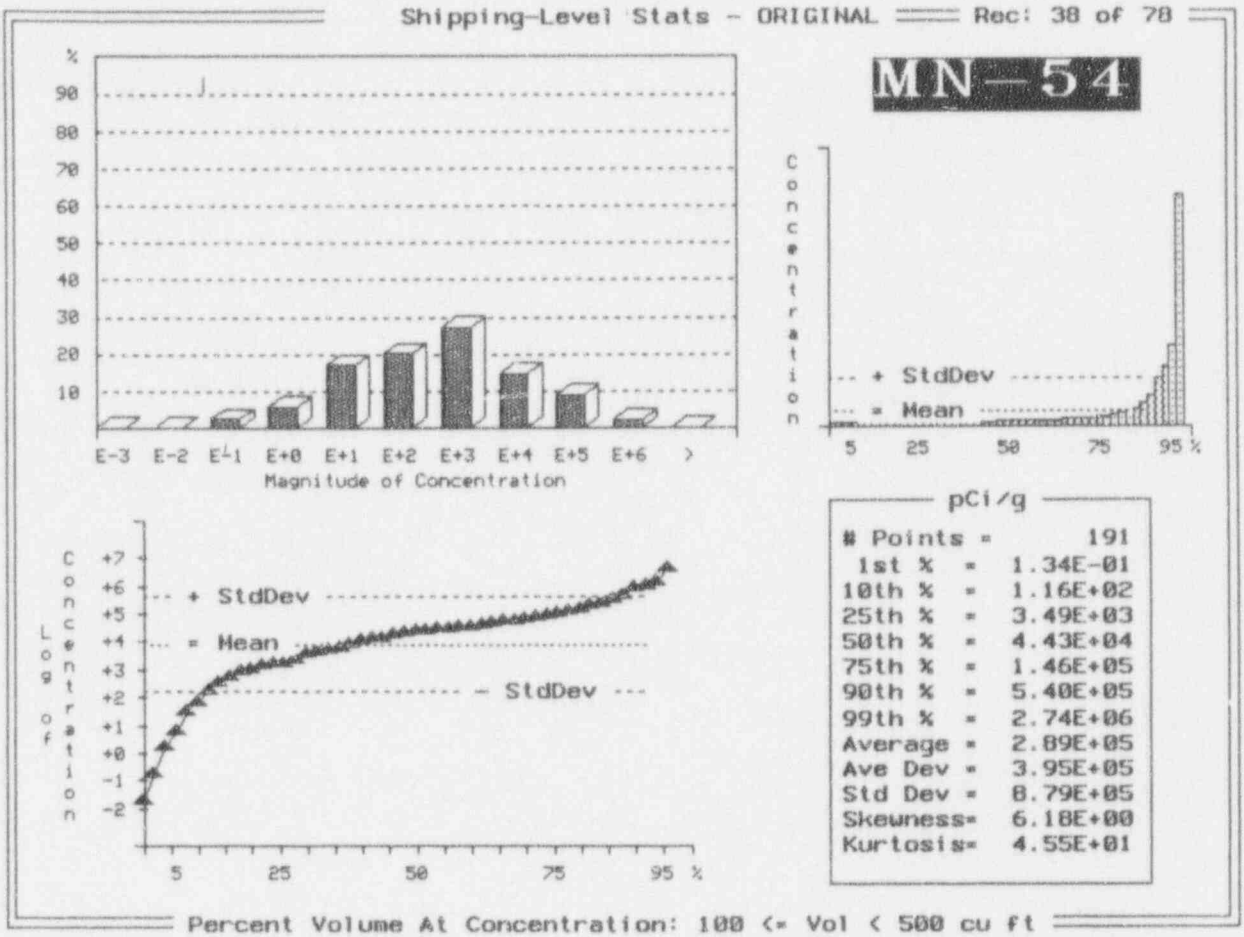

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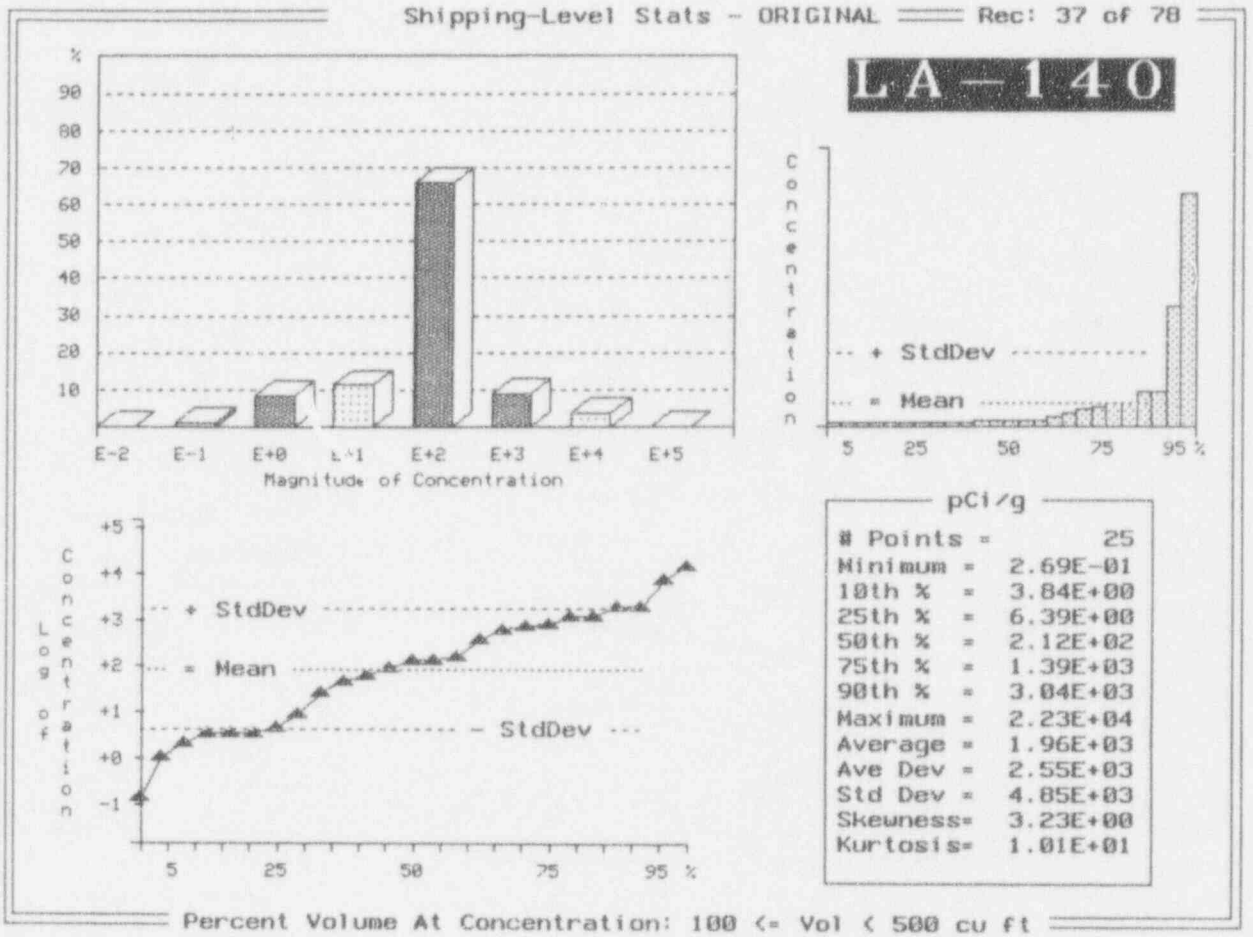

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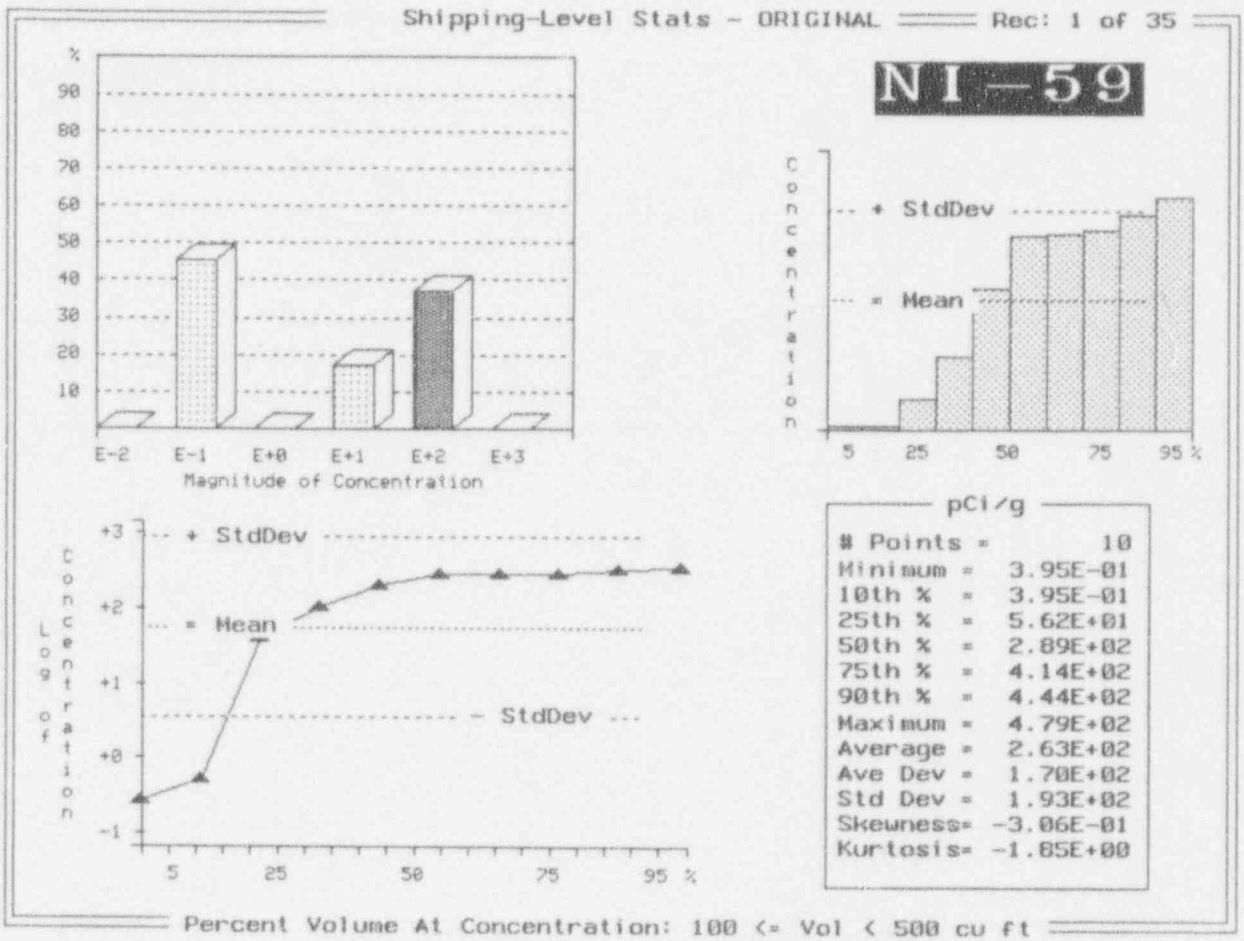

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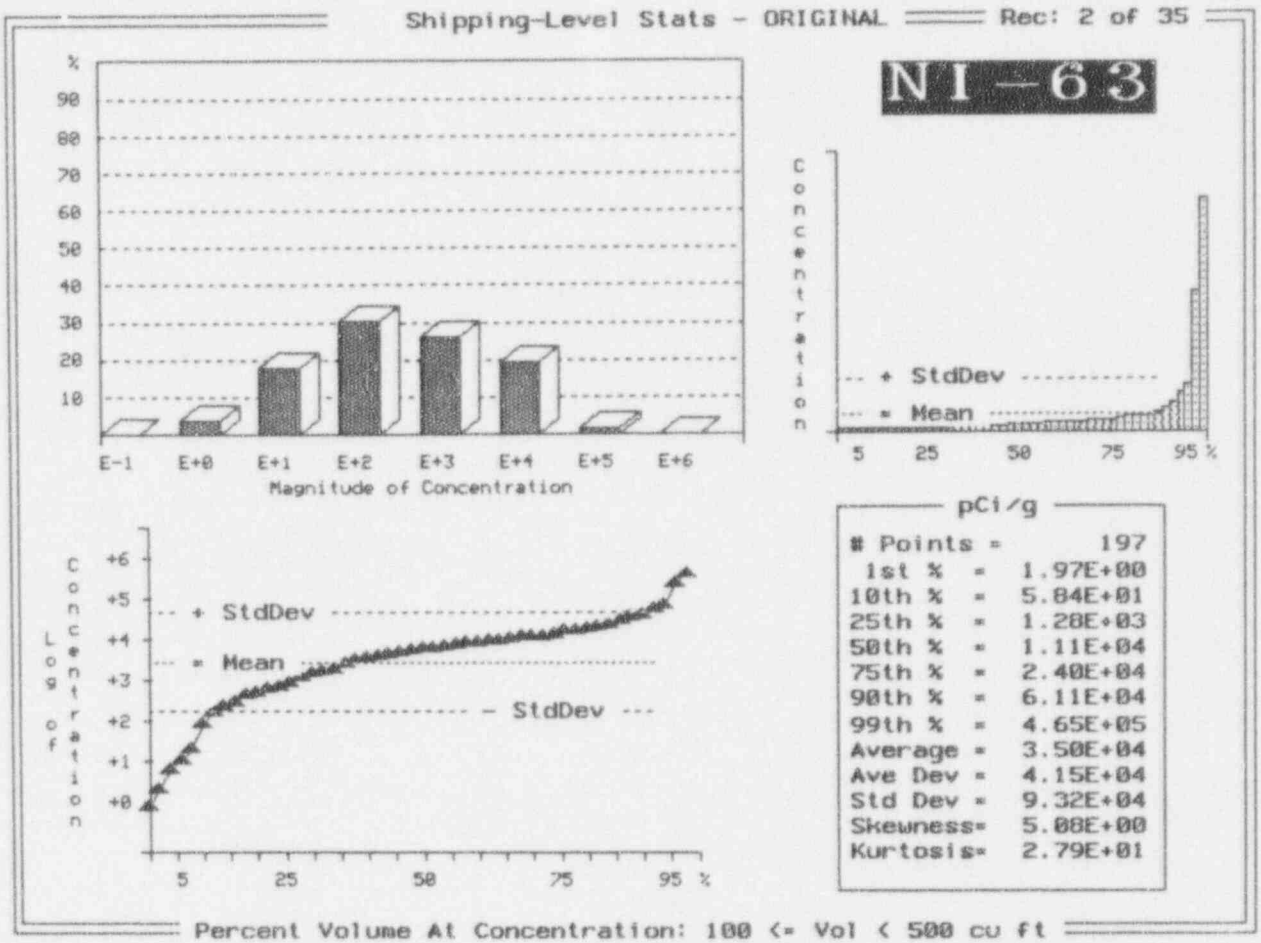

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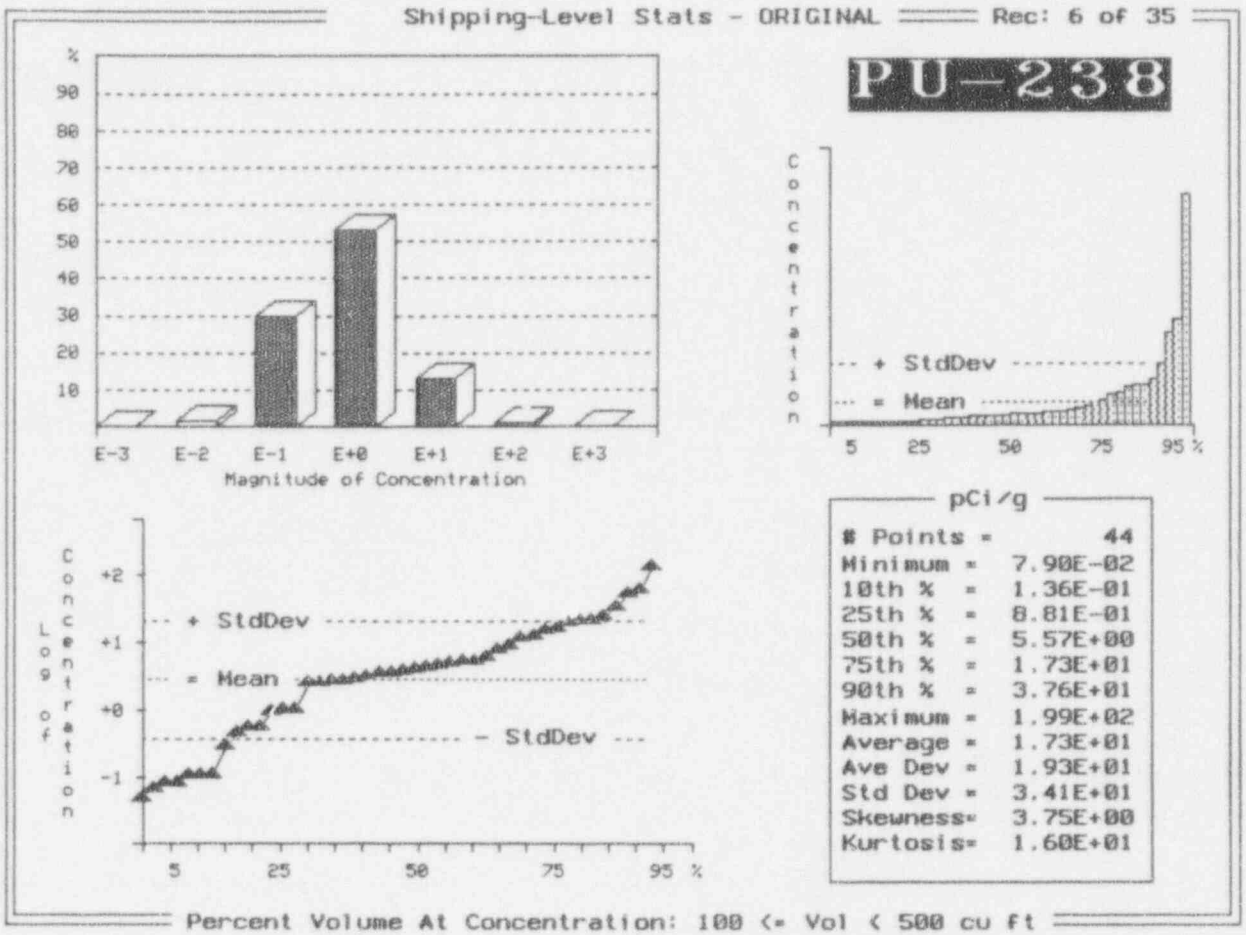

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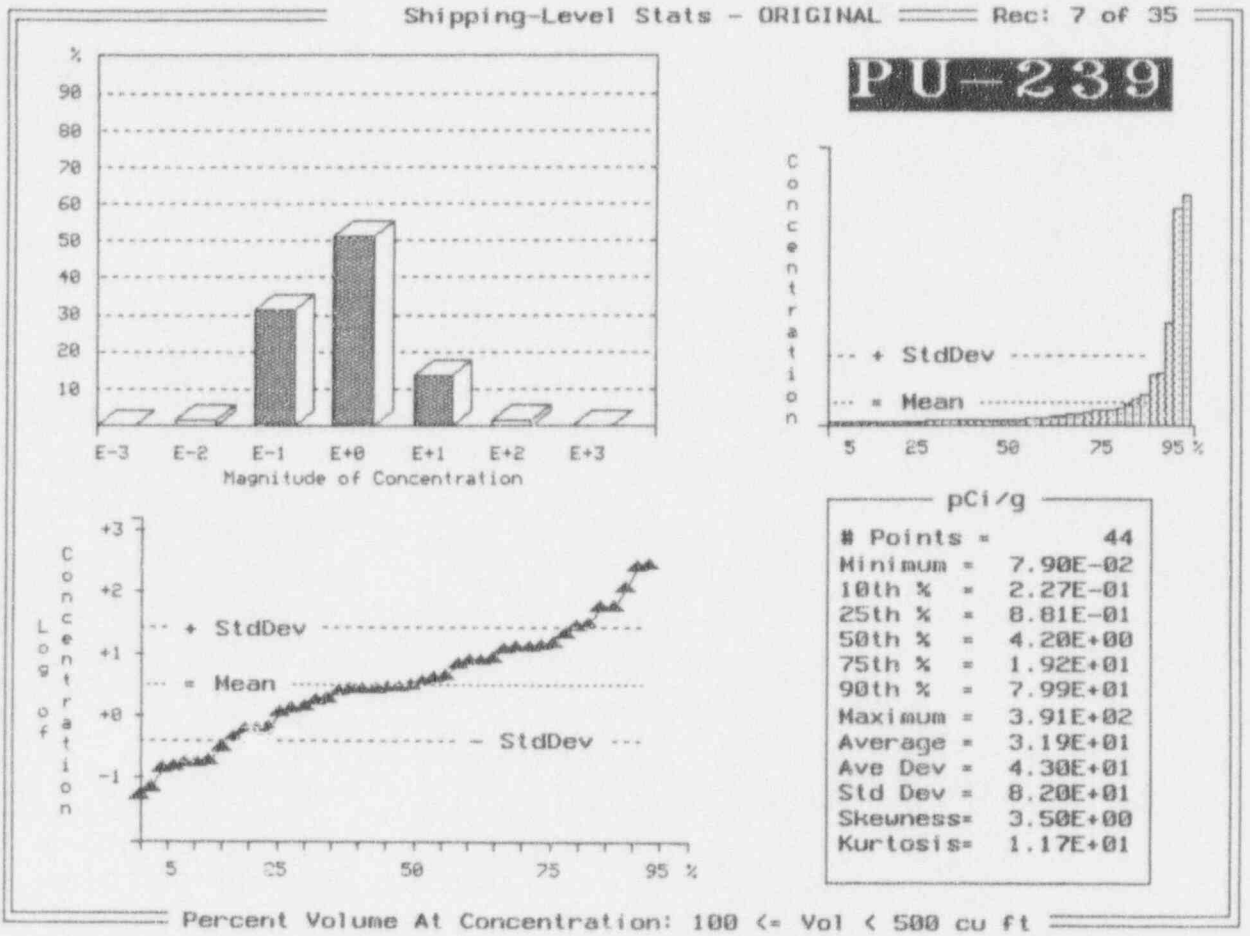

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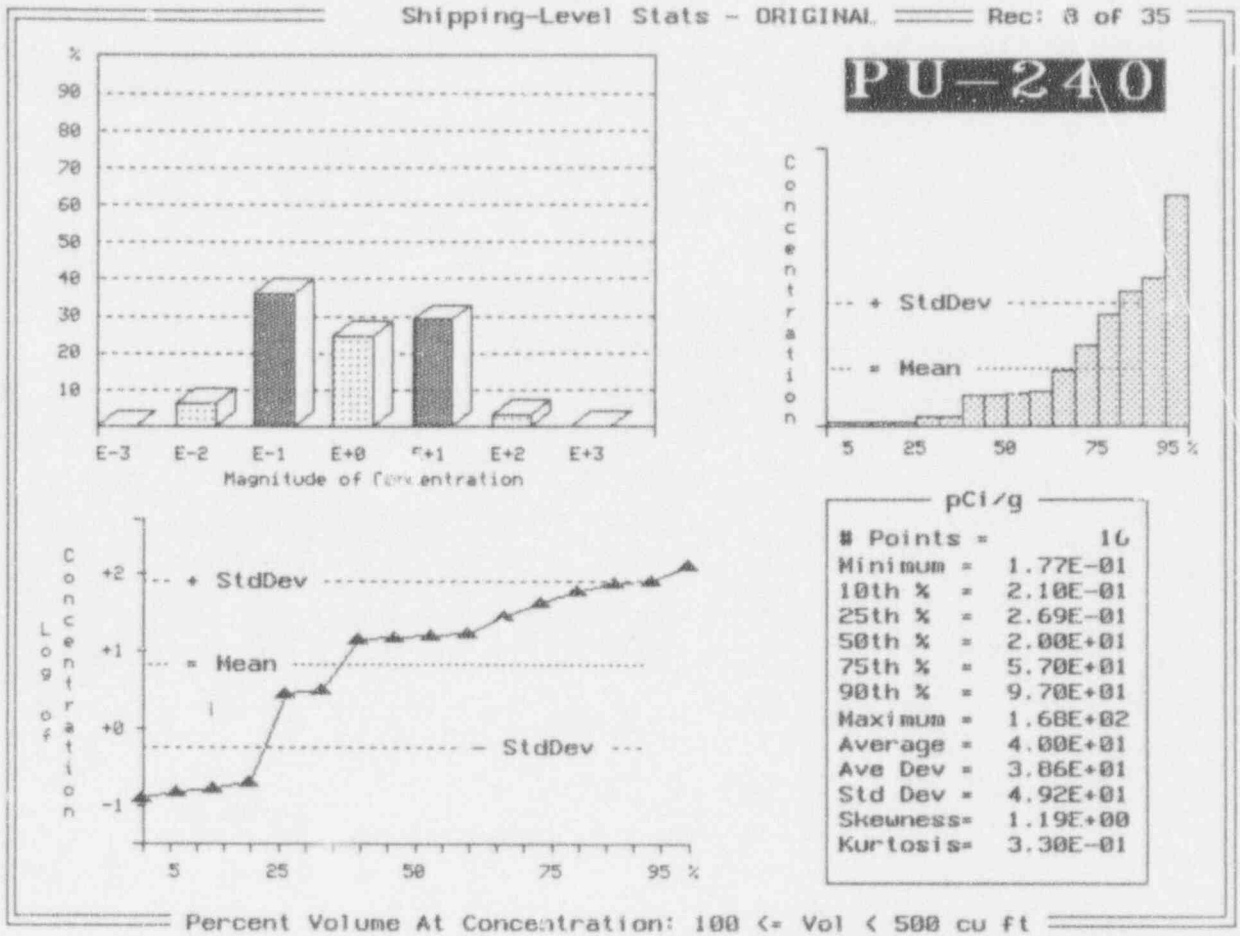

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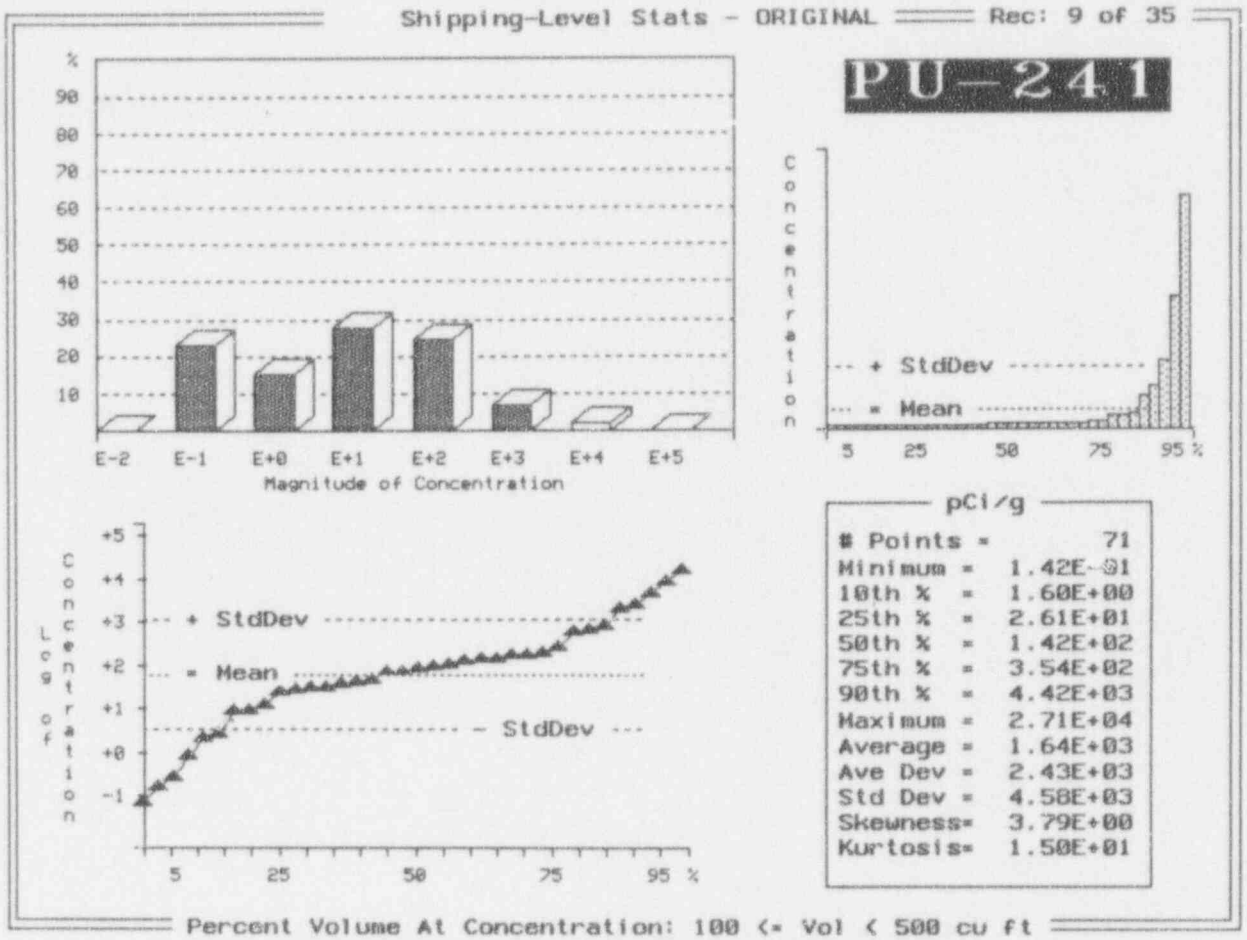

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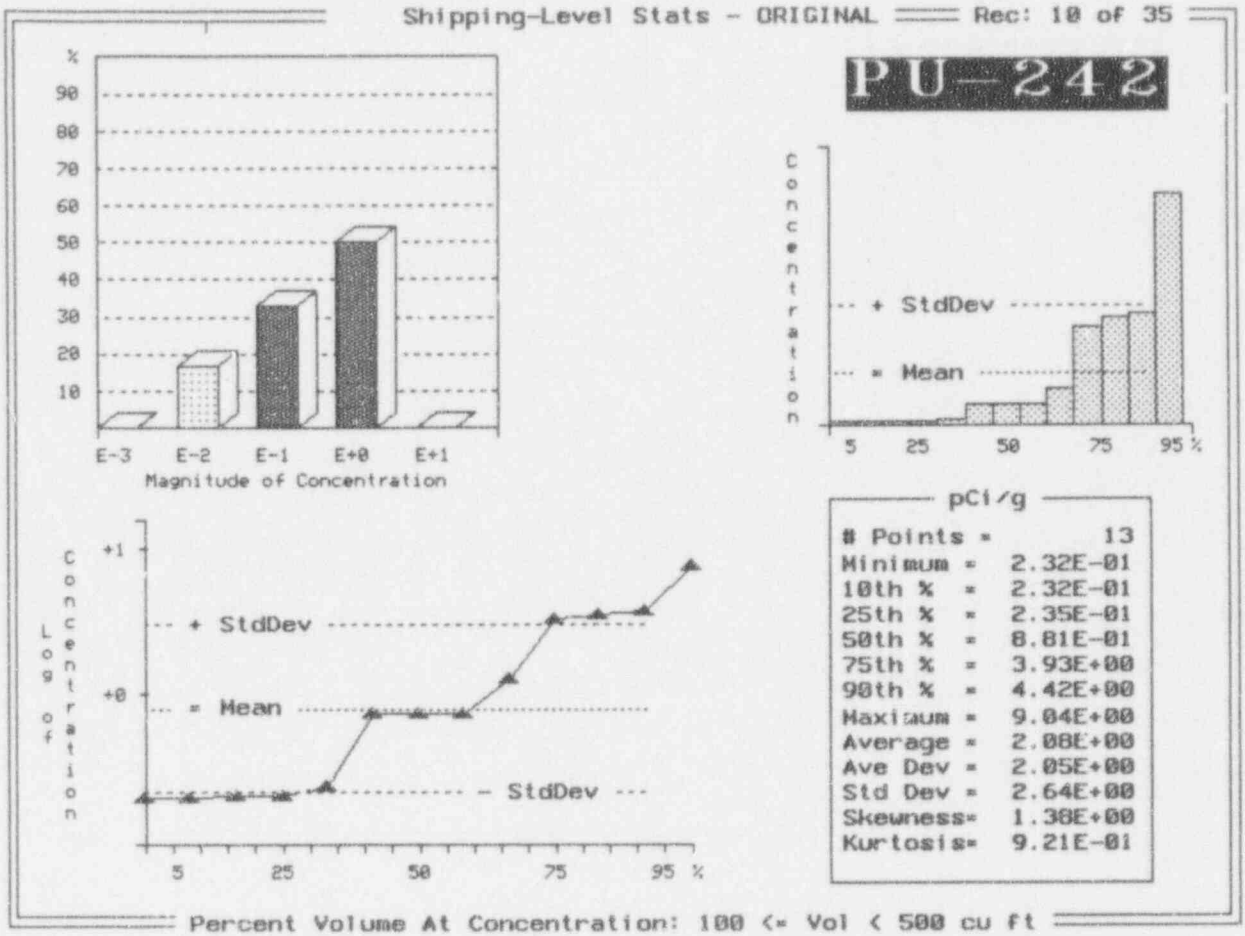

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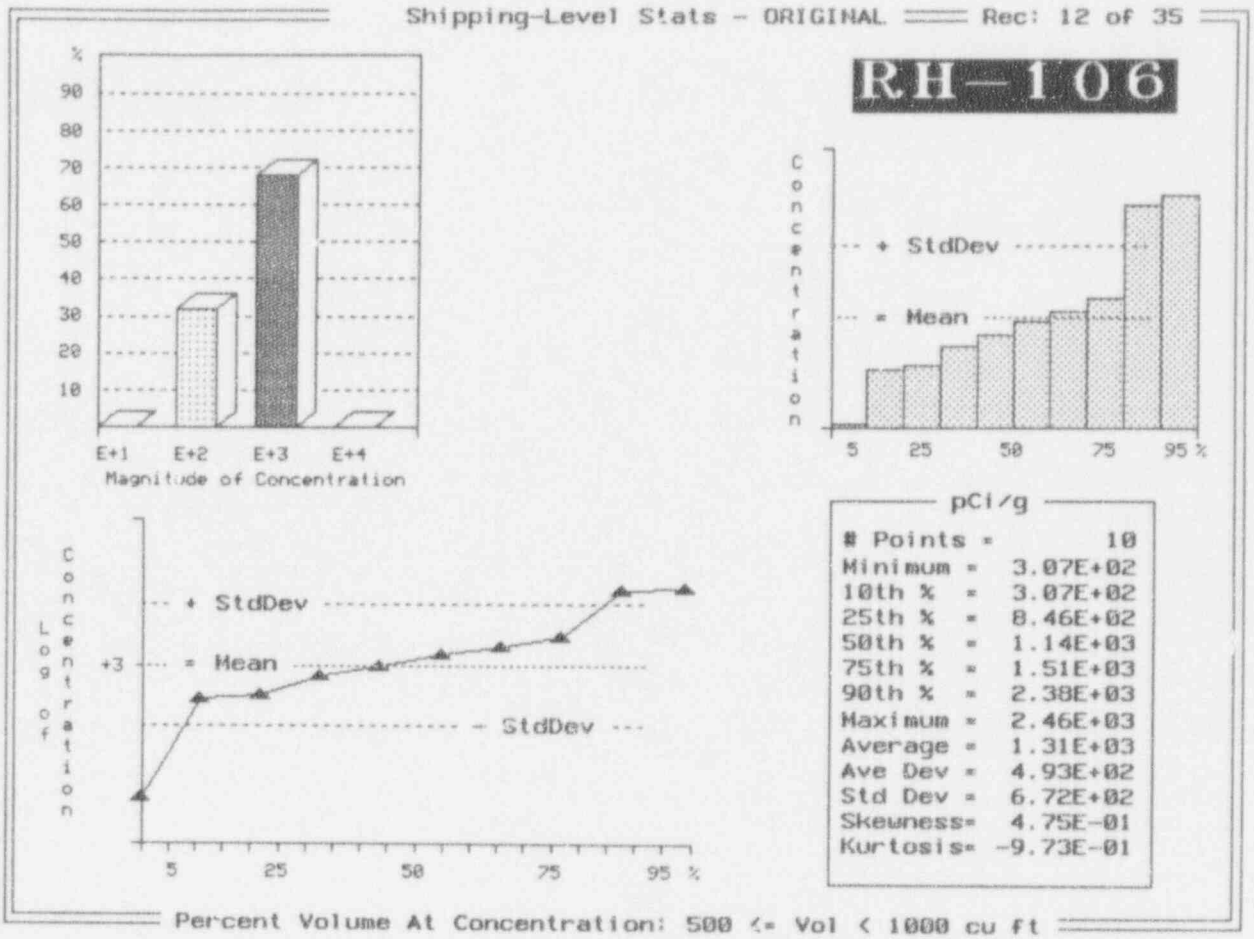

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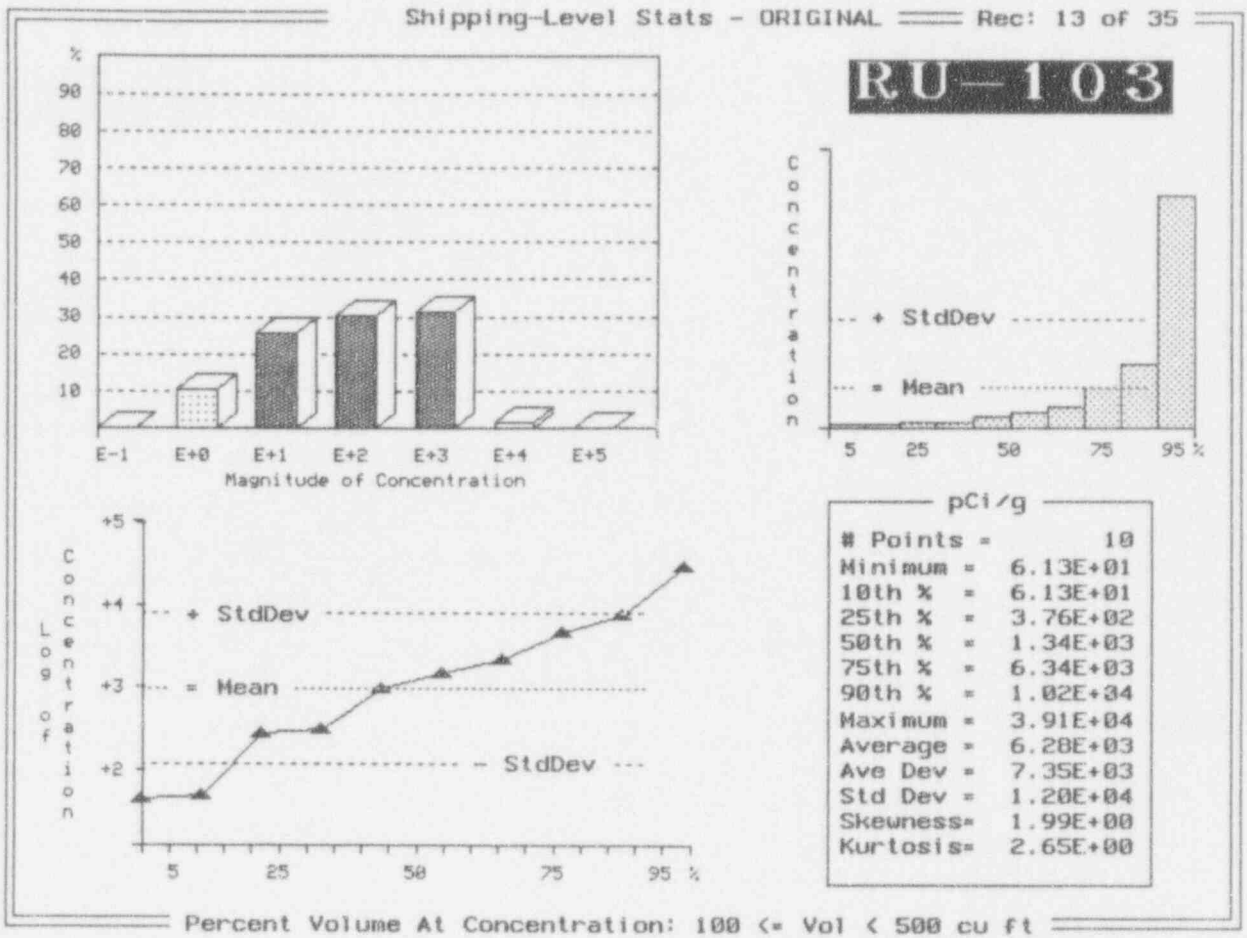


Exhibit J-2 (Continued)

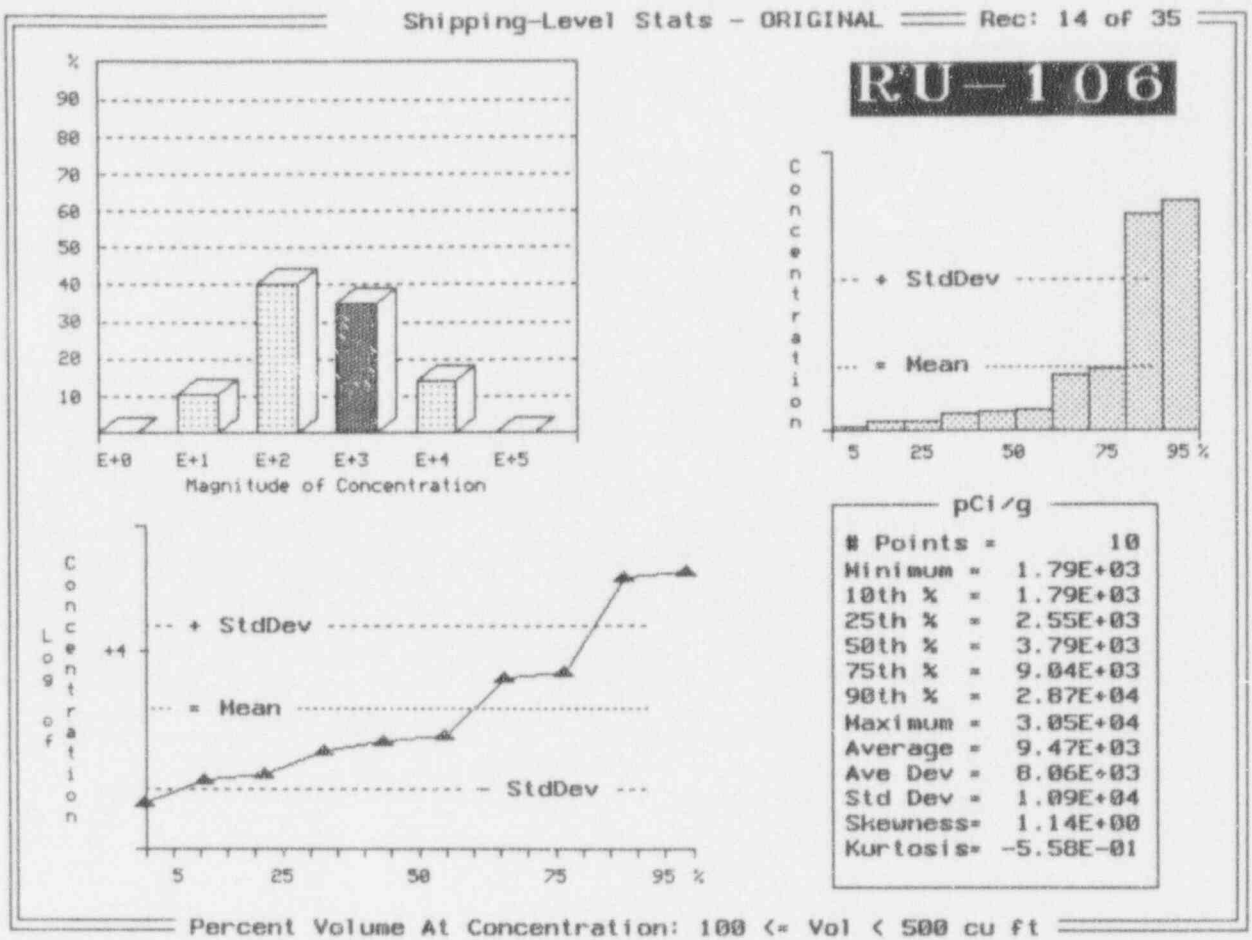


Exhibit J-2 (Continued)

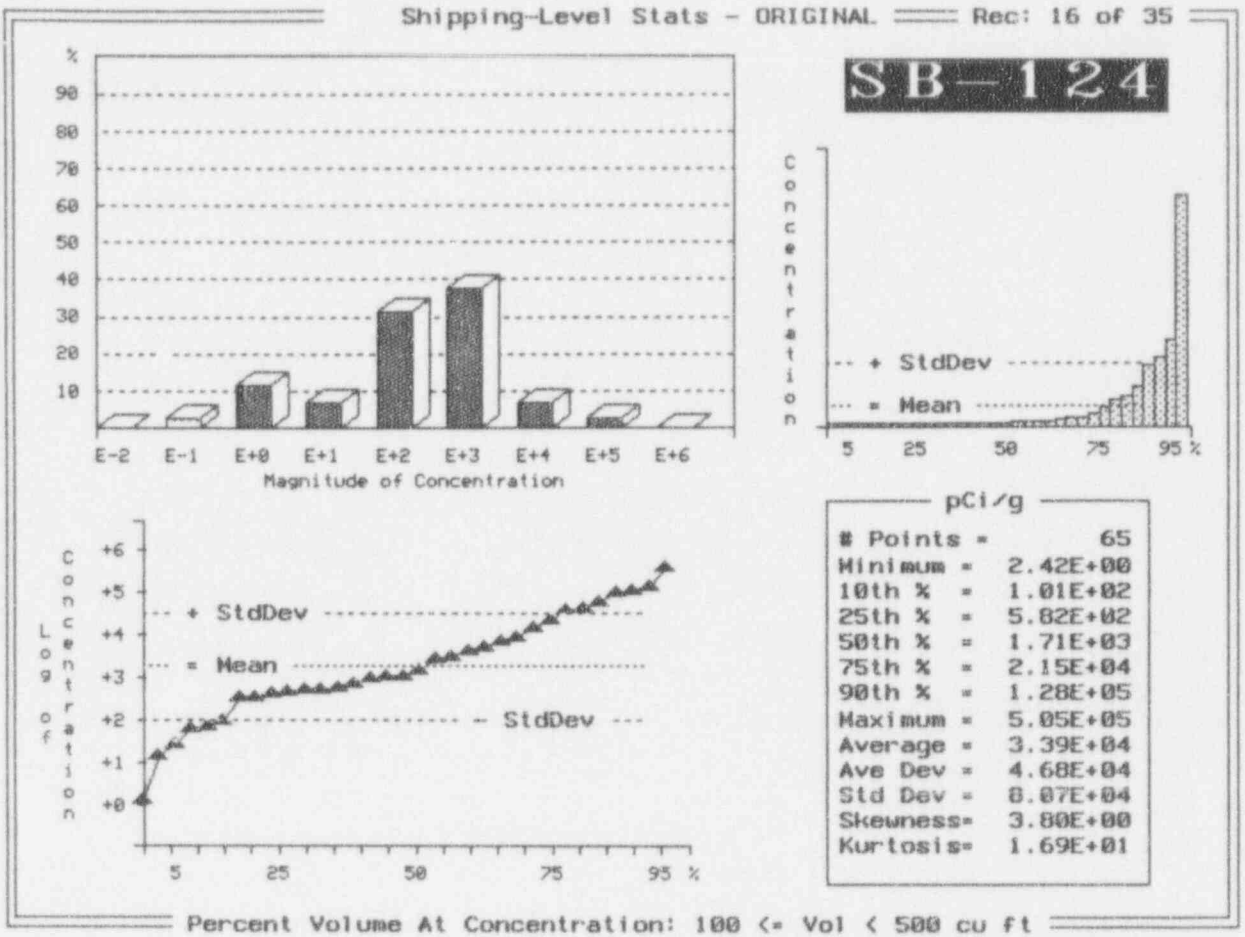
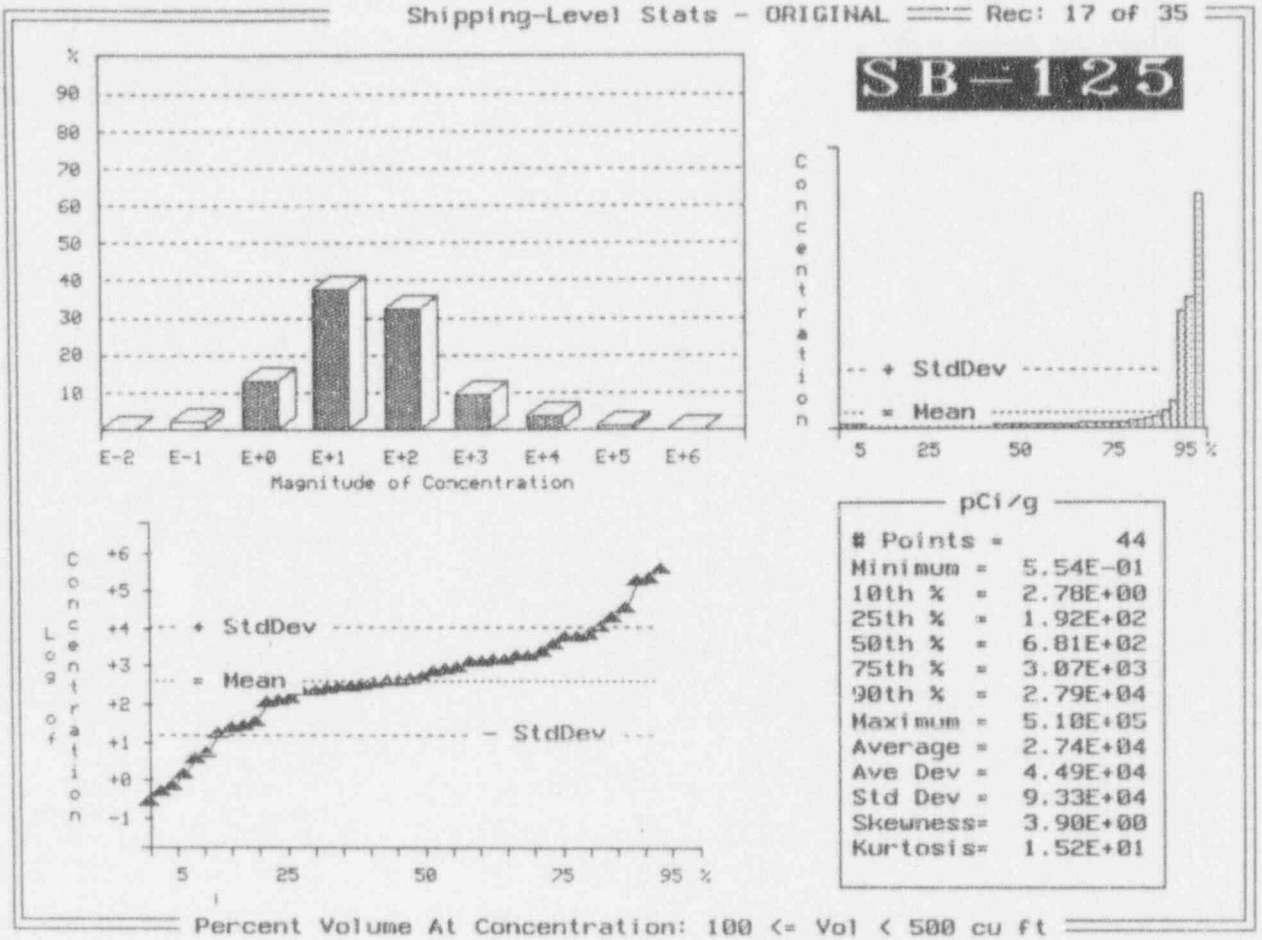


Exhibit J-2 (Continued)



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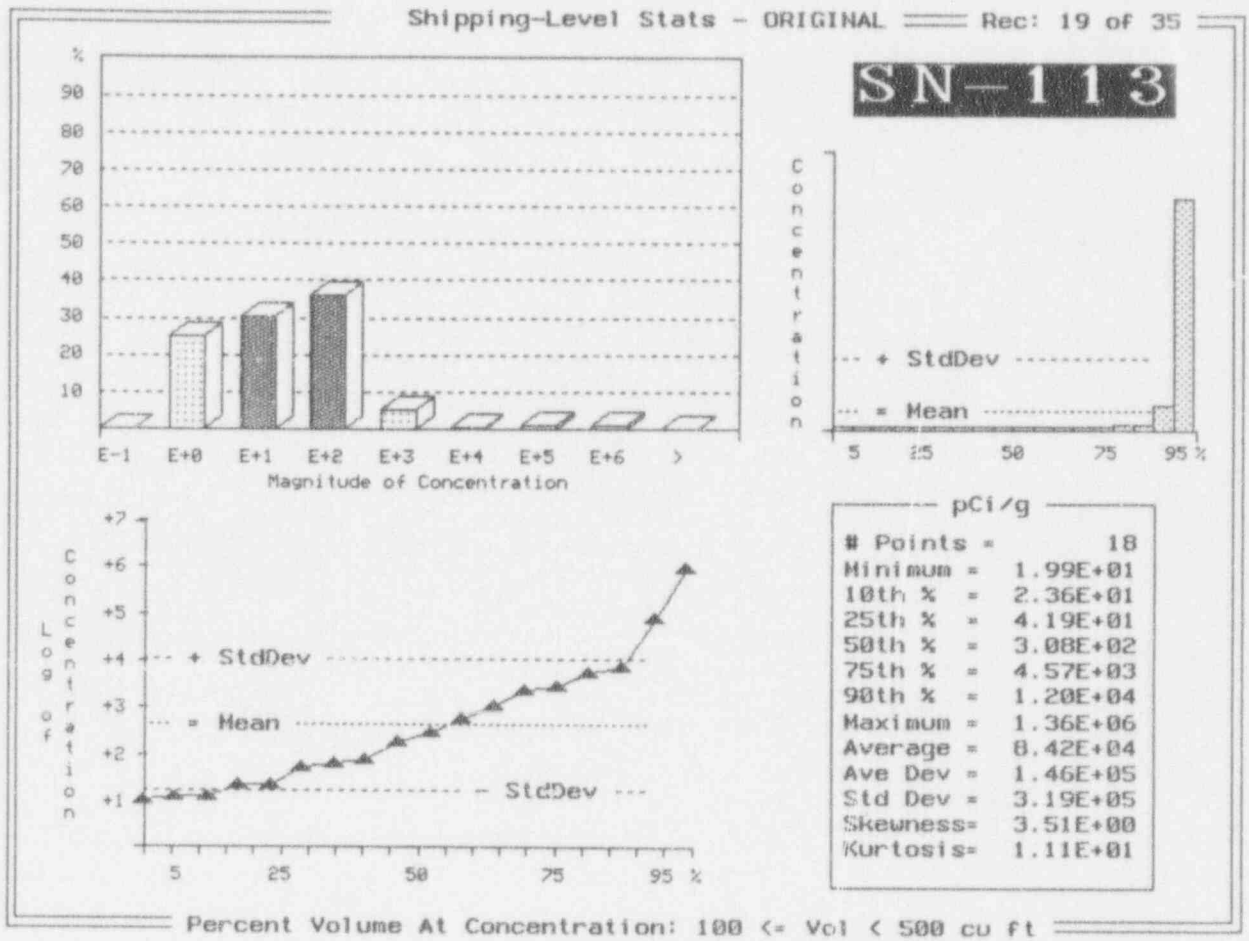
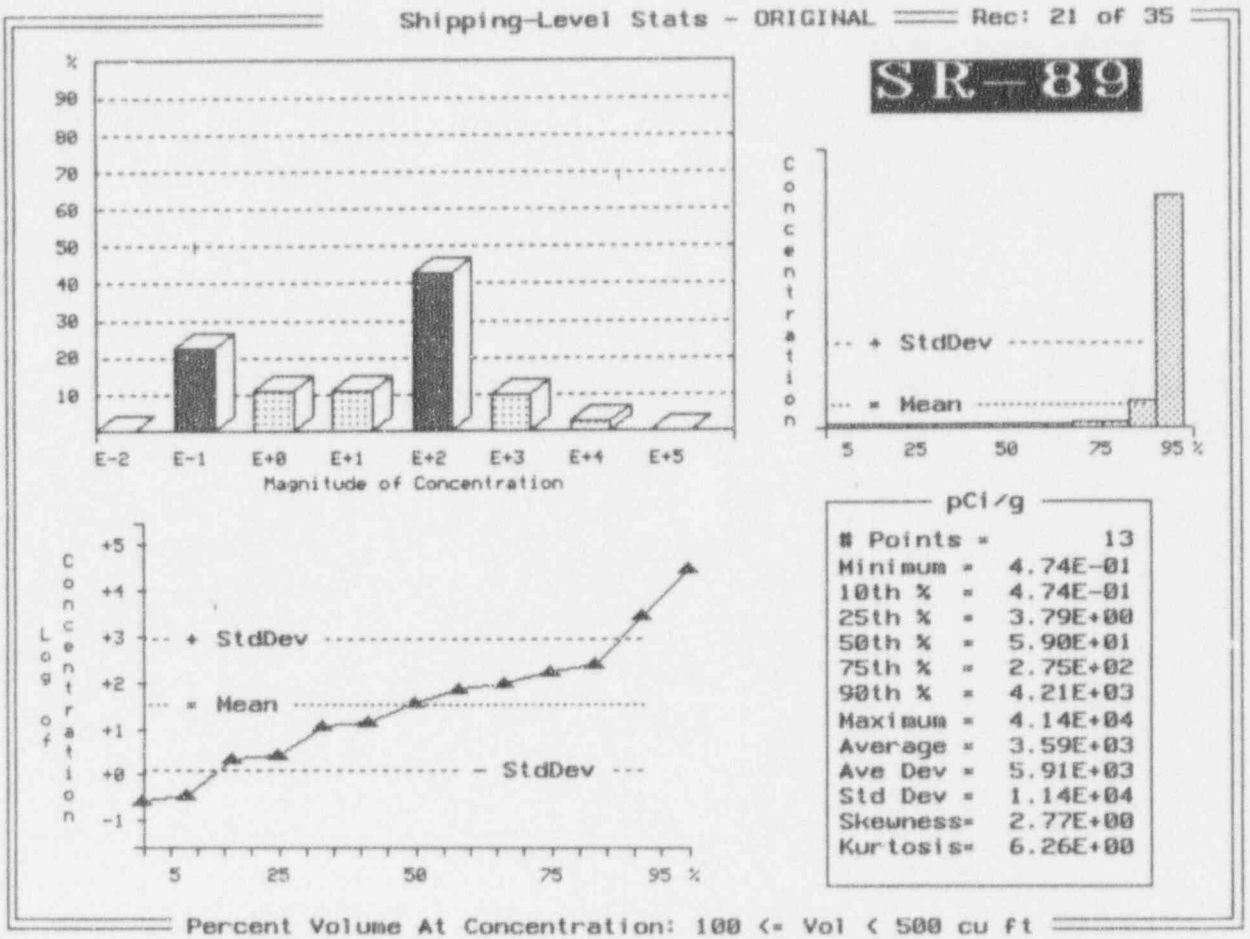


Exhibit J-2 (Continued)



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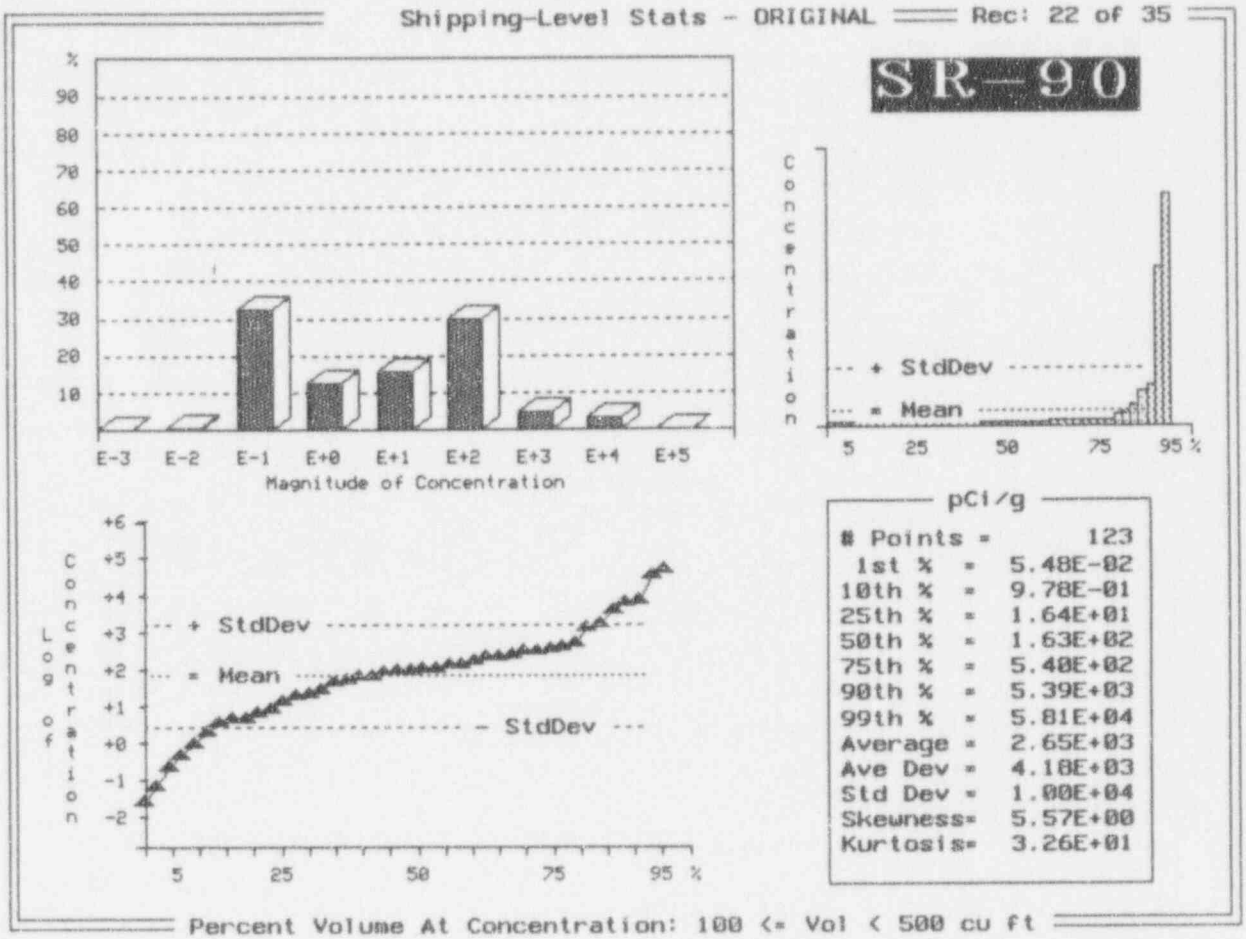
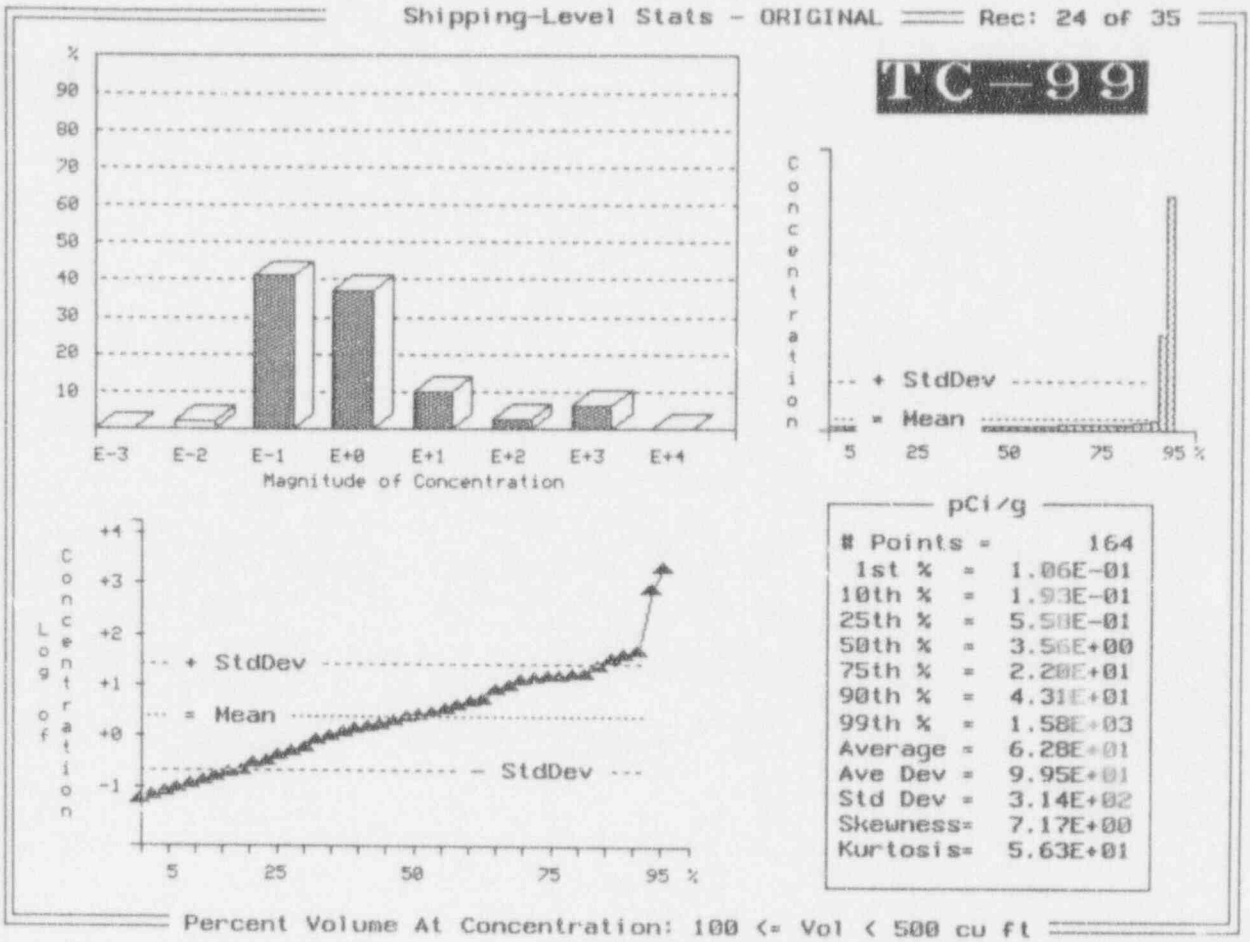


Exhibit J-2 (Continued)



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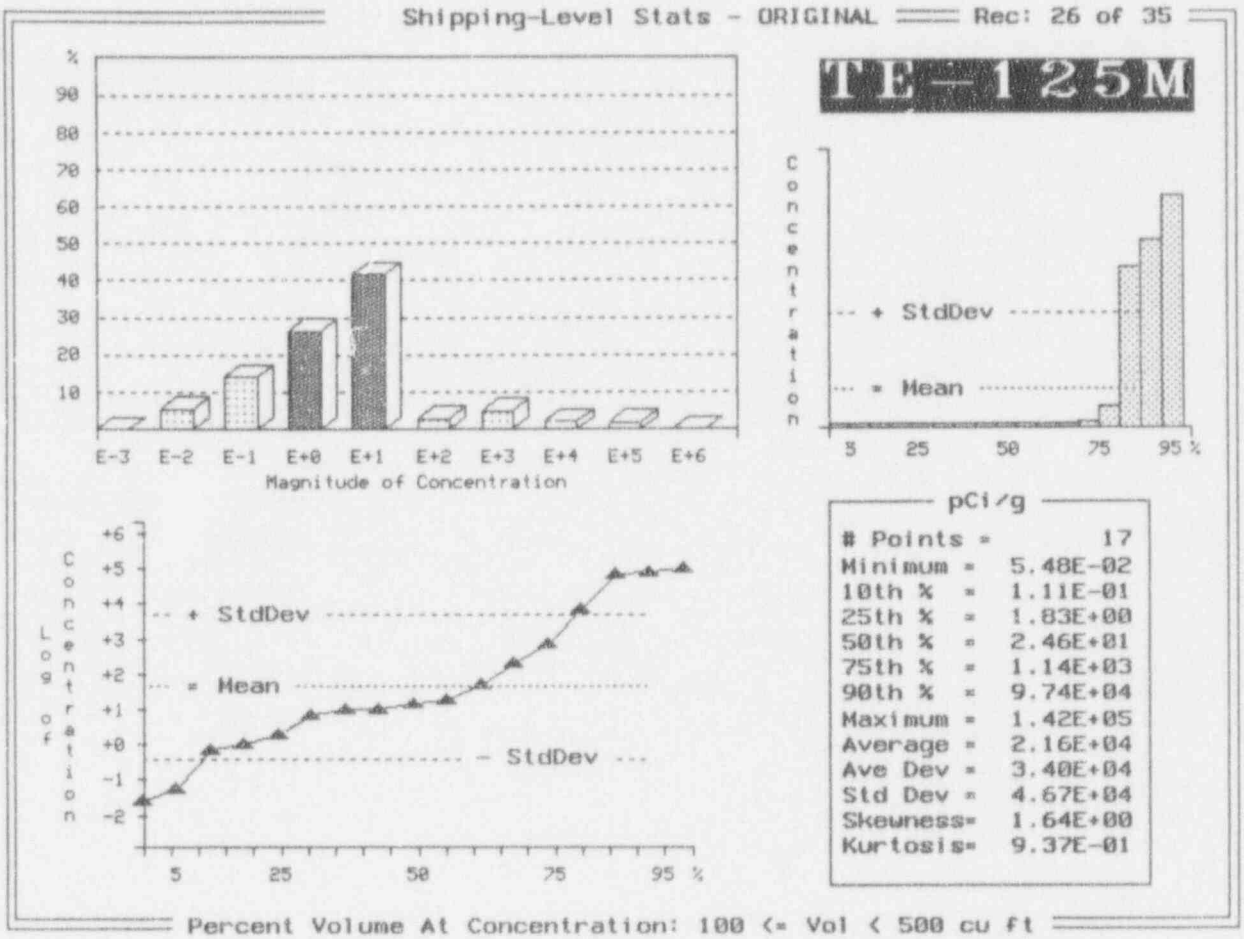
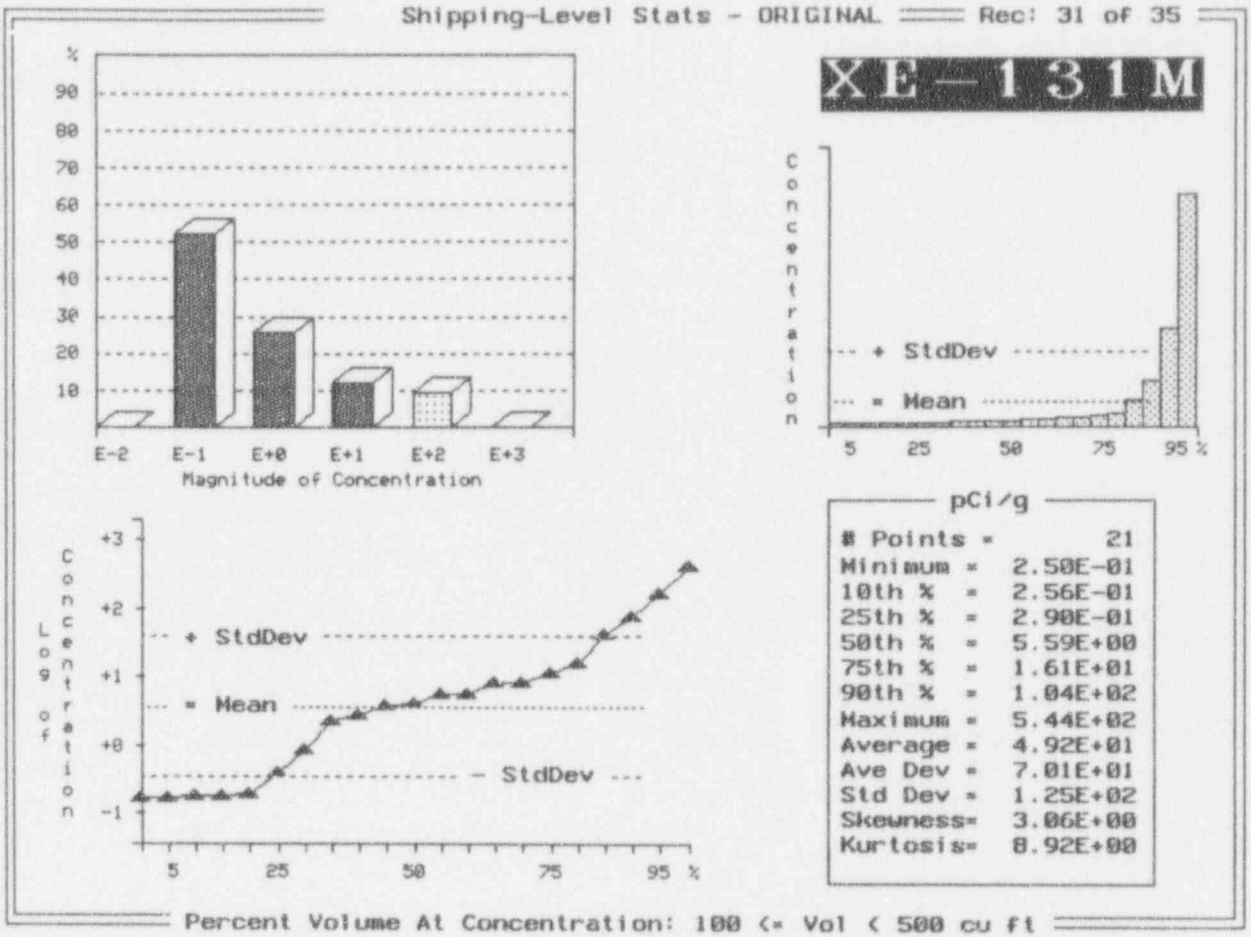


Exhibit J-2 (Continued)



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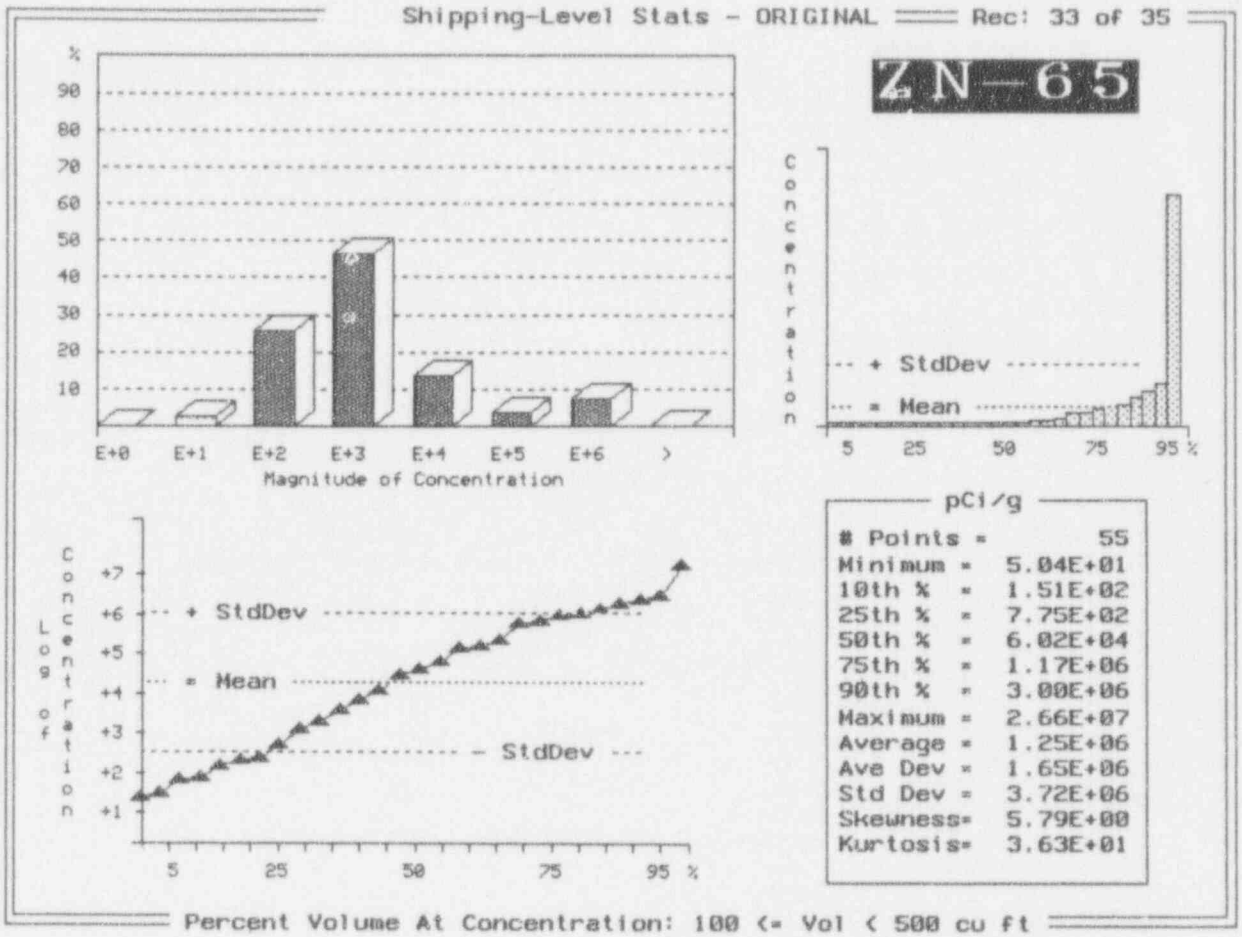

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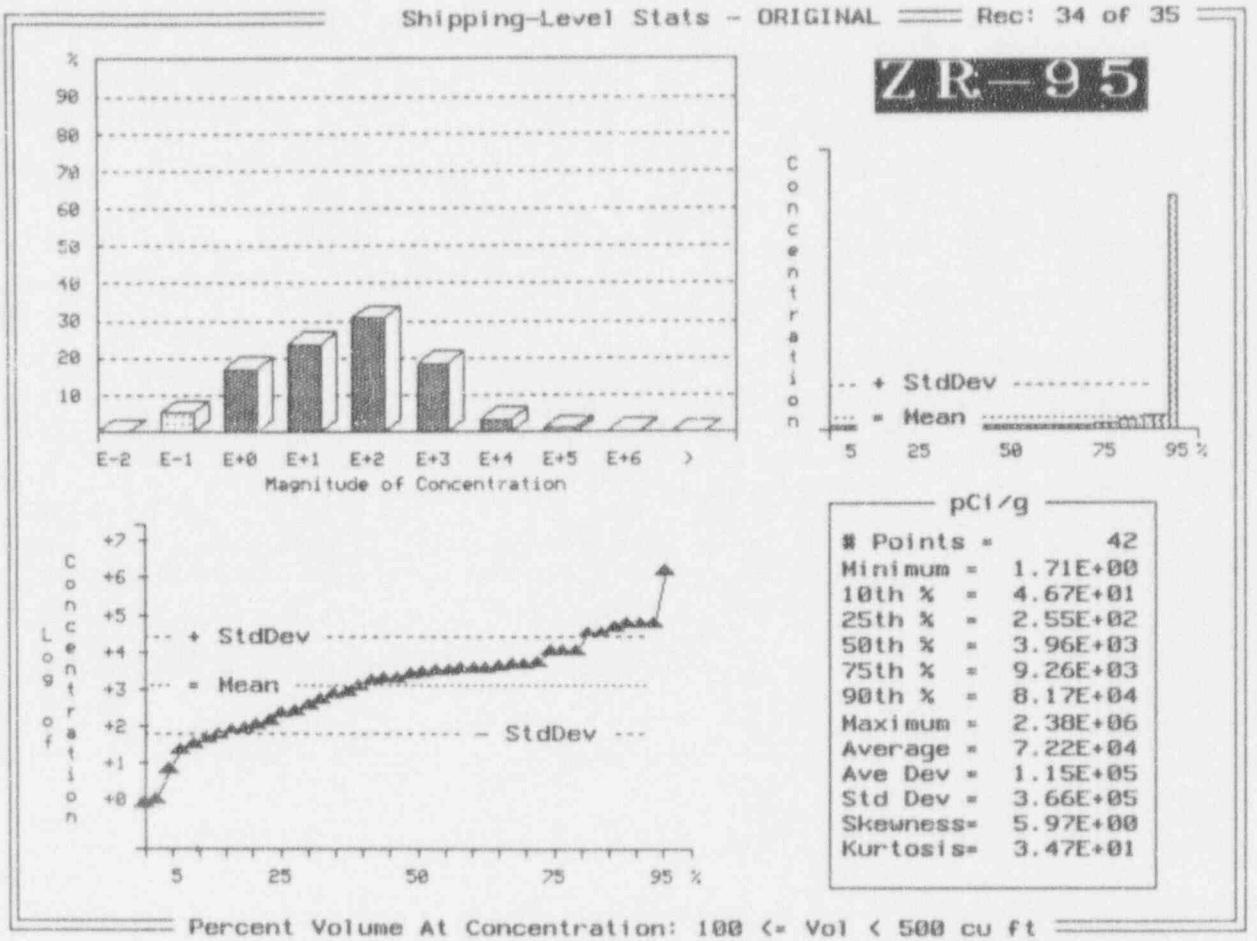


Exhibit J-3
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	Northwest
Waste generator class:	Utility
Total number of waste generators:	3
Total associated waste volume (m^3):	2,911
Total associated waste activity (Ci):	7,487
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	3
Waste volume (m^3):	2,841
Fractional waste volume (%): (this analysis/total)	97.6
Waste activity (Ci):	3,292
Fractional waste activity (%): (this analysis/total)	44.9

Exhibit J-3 (Continued)

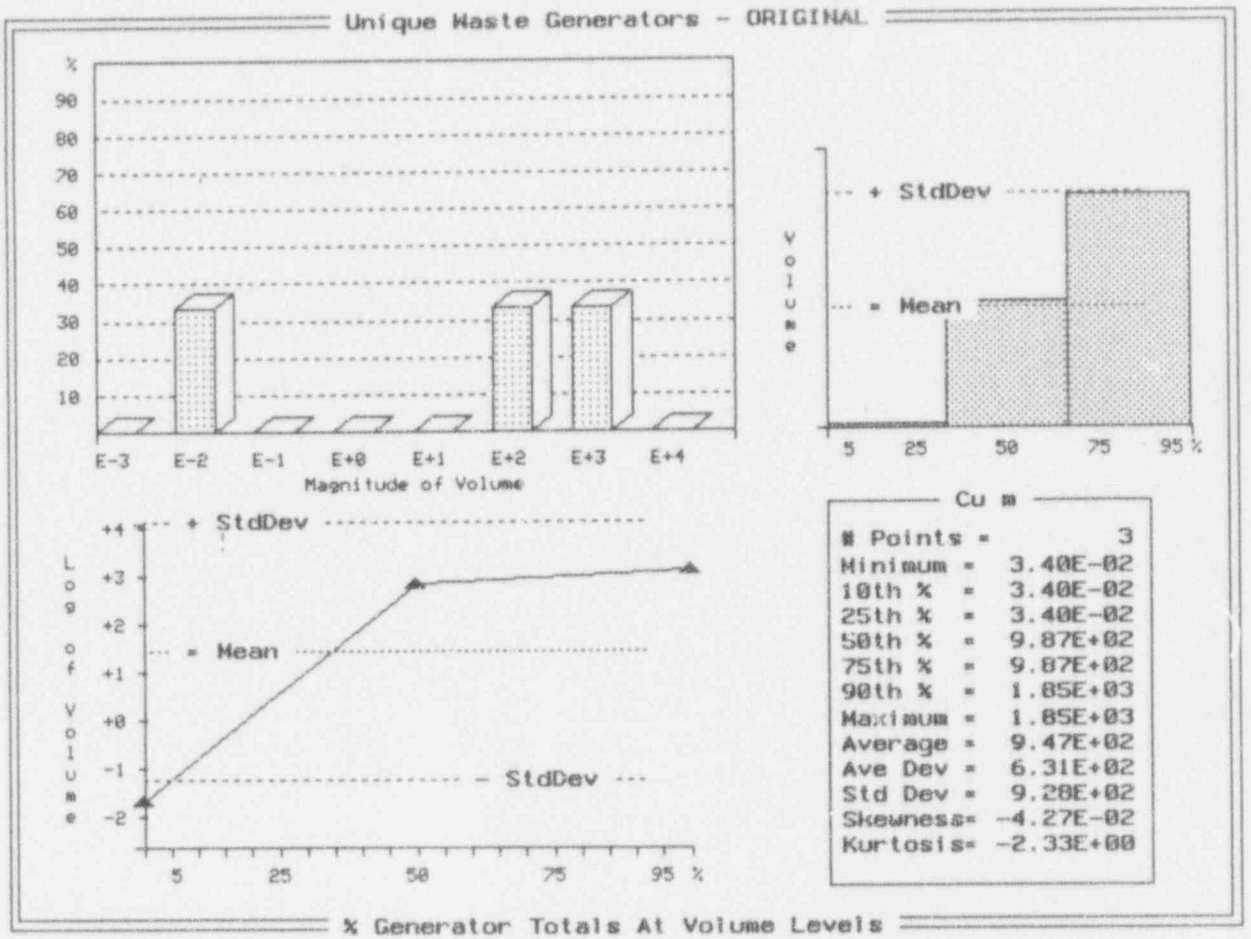


Exhibit J-3 (Continued)

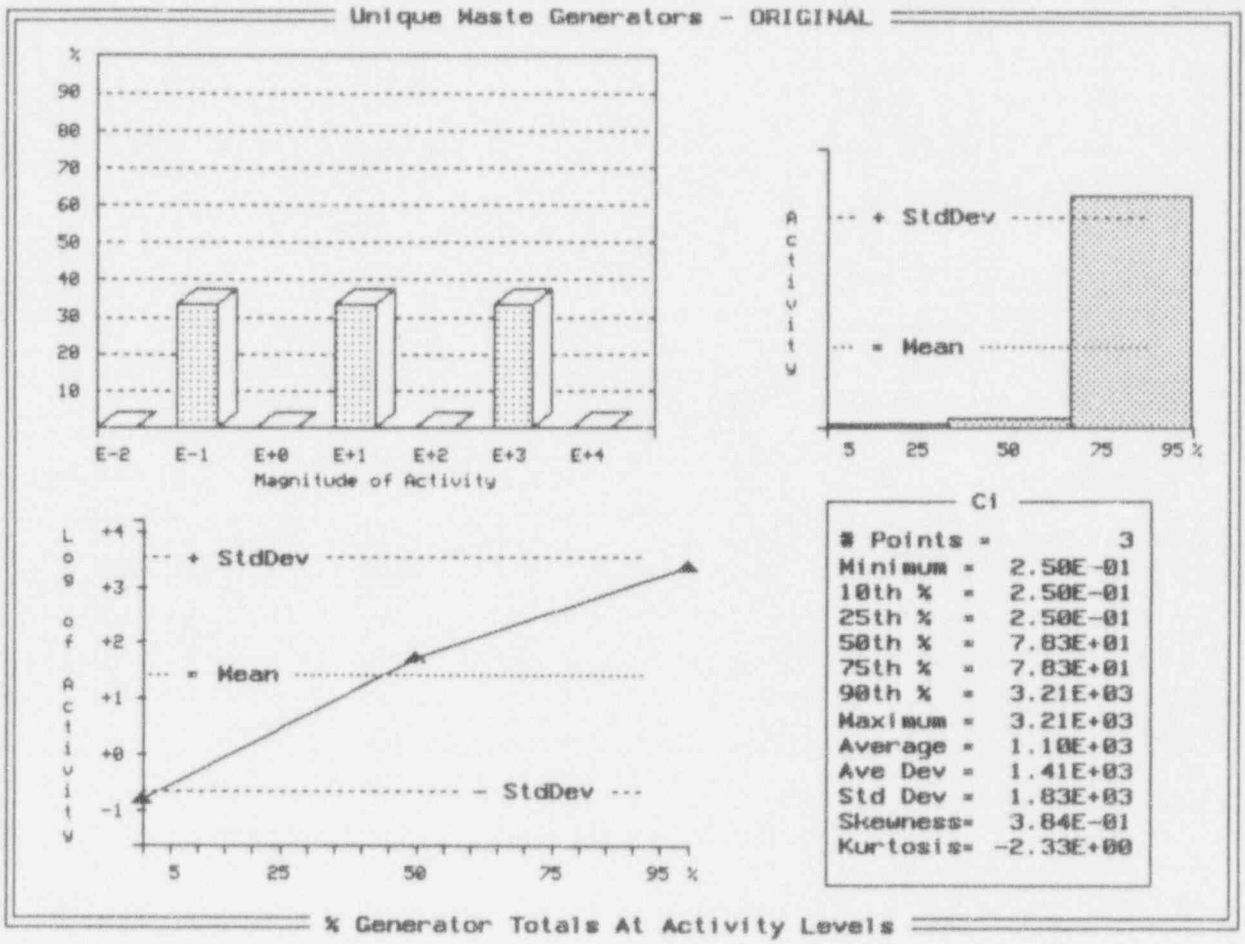


Exhibit J-4
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	Rocky Mountain
Waste generator class:	Utility
Total number of waste generators:	2
Total associated waste volume (m^3):	56.1
Total associated waste activity (Ci):	1,183
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	2
Waste volume (m^3):	54.4
Fractional waste volume (%): (this analysis/total)	96.9
Waste activity (Ci):	1,040
Fractional waste activity (%): (this analysis/total)	87.9

Exhibit J-4 (Continued)

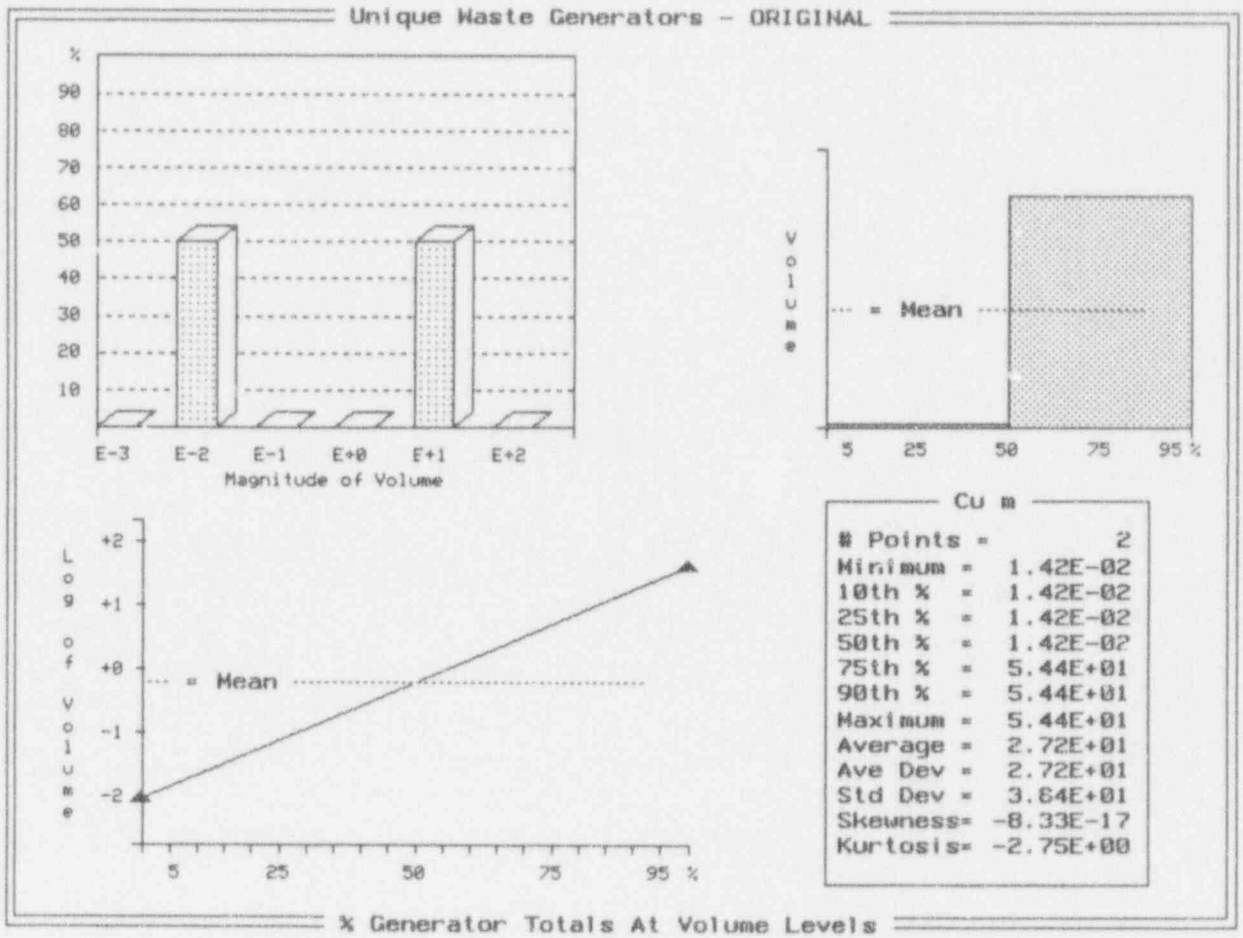


Exhibit J-4 (Continued)

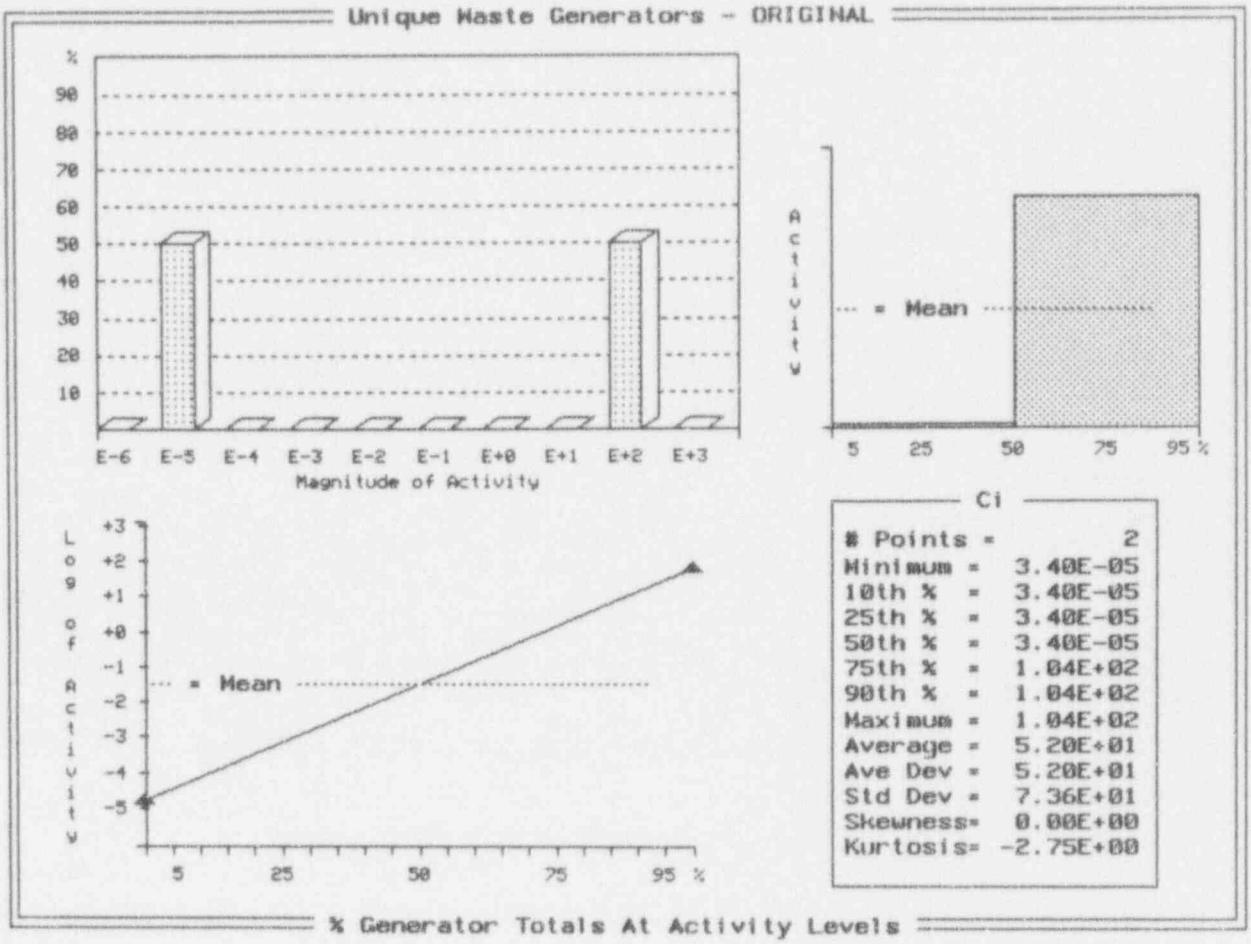
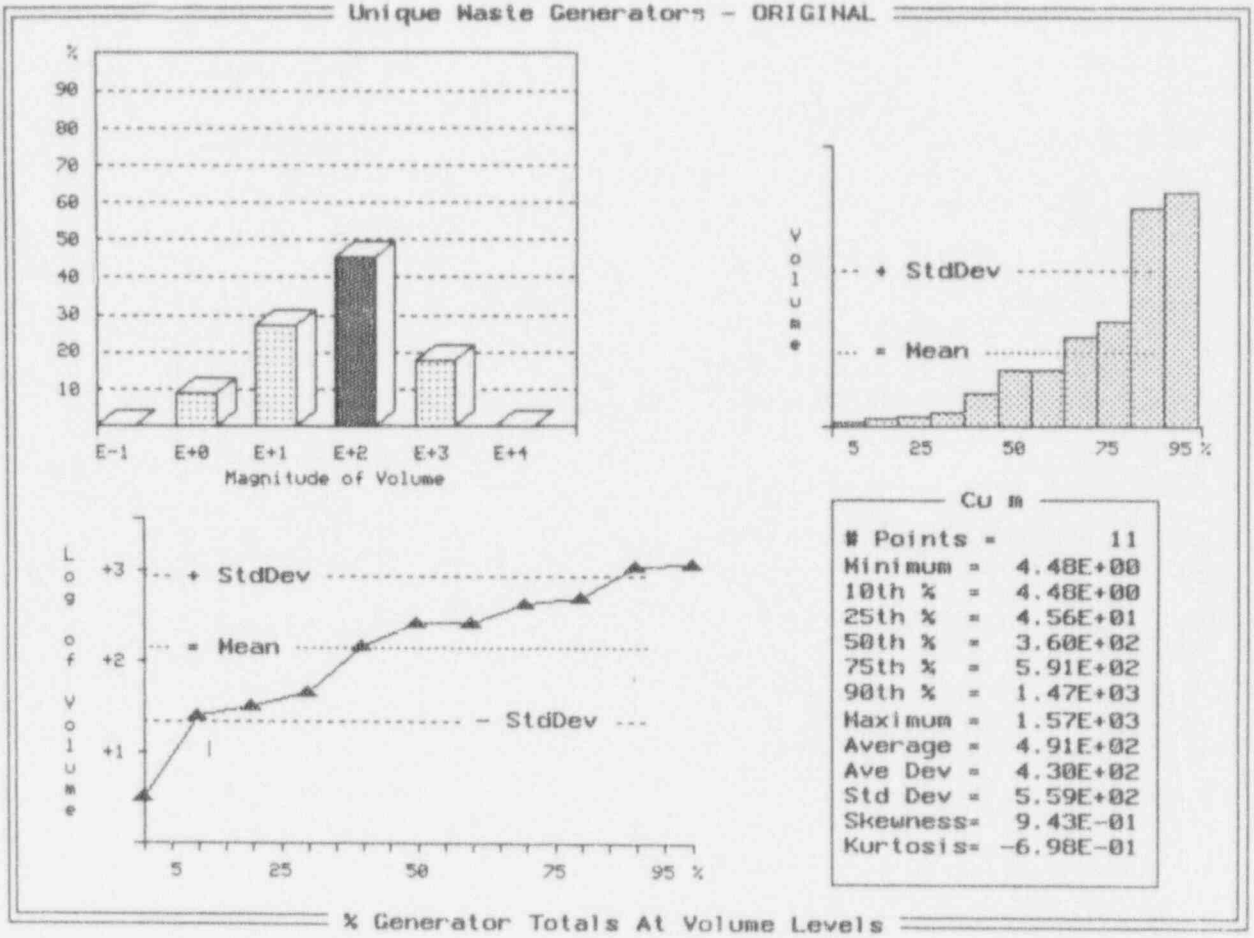


Exhibit J-5
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	Central
Waste generator class:	Utility
Total number of waste generators:	12
Total associated waste volume (m^3):	6,101
Total associated waste activity (Ci):	12,180
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	11
Waste volume (m^3):	5,401
Fractional waste volume (%): (this analysis/total)	88.5
Waste activity (Ci):	1,283
Fractional waste activity (%): (this analysis/total)	10.5

Exhibit J-5 (Continued)



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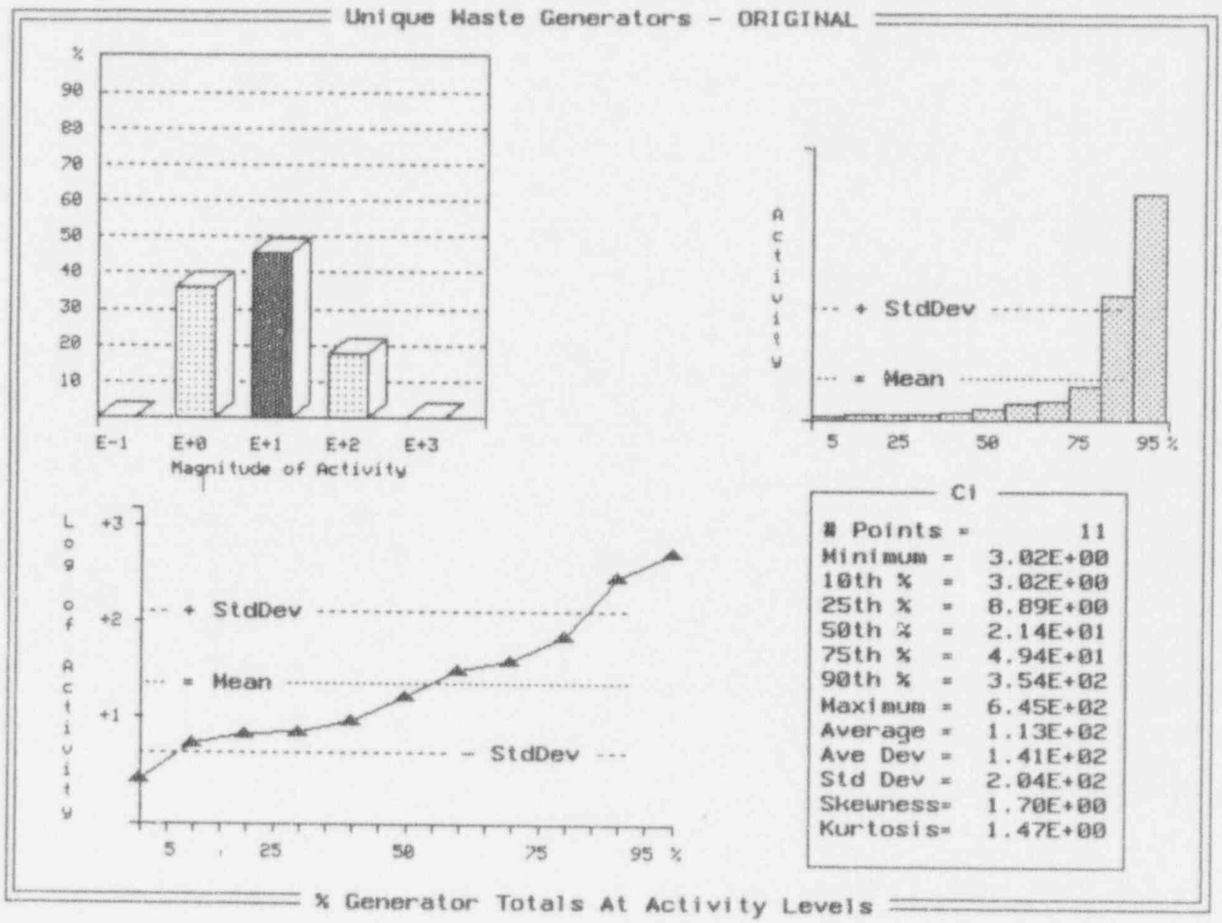


Exhibit J-6
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	Midwest
Waste generator class:	Utility
Total number of waste generators:	40
Total associated waste volume (m^3):	10,910
Total associated waste activity (Ci):	21,530
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	35
Waste volume (m^3):	9,352
Fractional waste volume (%): (this analysis/total)	85.7
Waste activity (Ci):	3,531
Fractional waste activity (%): (this analysis/total)	16.4

Exhibit J-6 (Continued)

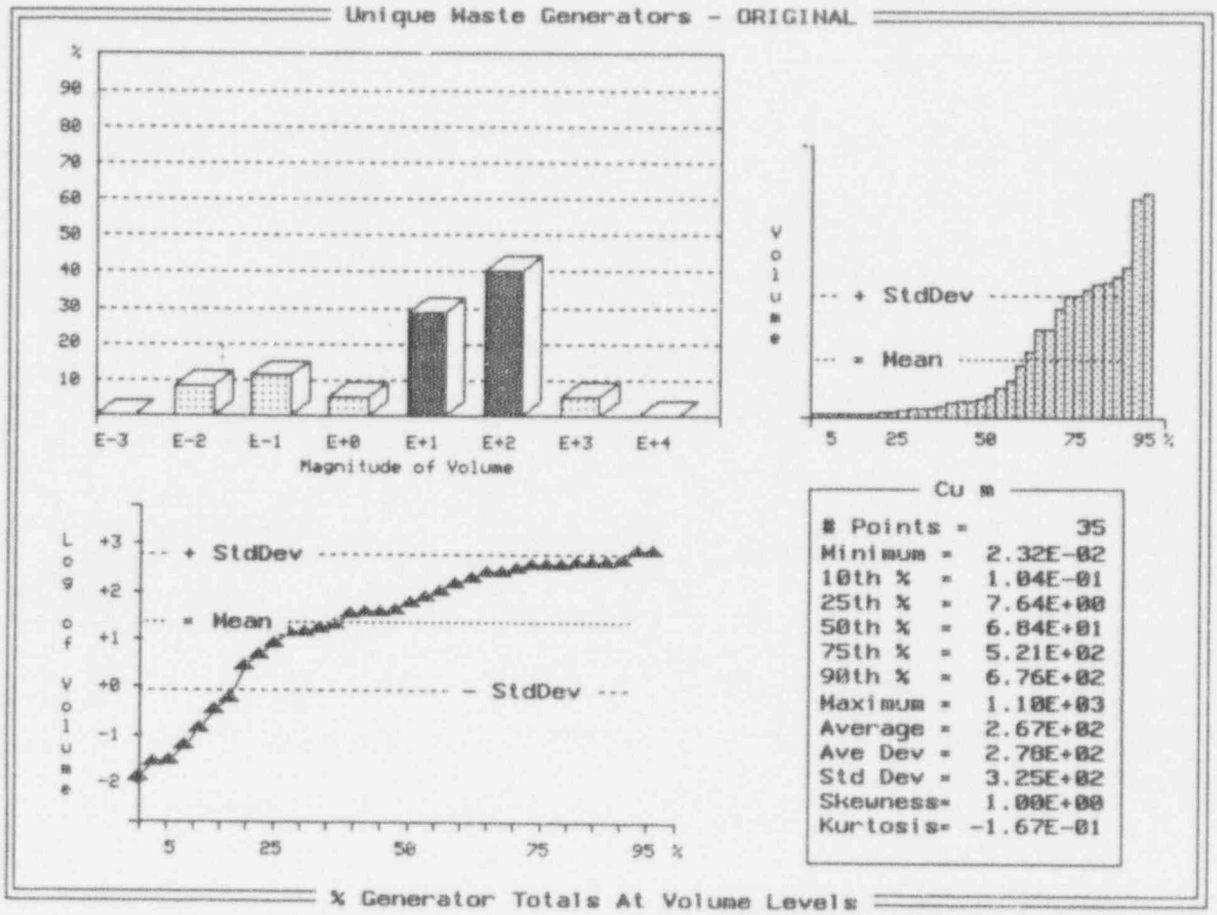


Exhibit J-6 (Continued)

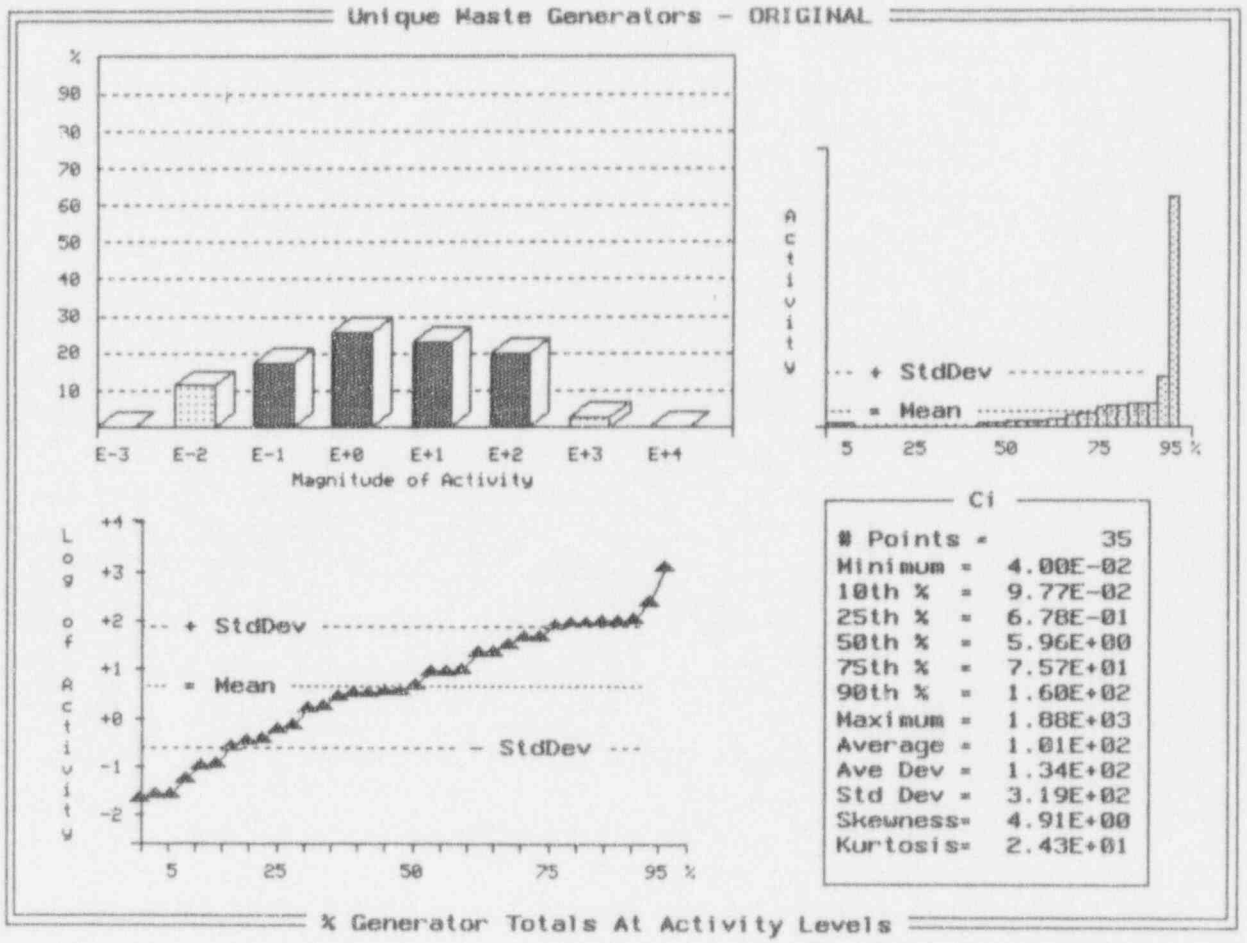


Exhibit J-7
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	Central Midwest
Waste generator class:	Utility
Total number of waste generators:	27
Total associated waste volume (m^3):	17,290
Total associated waste activity (Ci):	236,400
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	26
Waste volume (m^3):	11,630
Fractional waste volume (%): (this analysis/total)	67.3
Waste activity (Ci):	10,580
Fractional waste activity (%): (this analysis/total)	4.5

Exhibit J-7 (Continued)

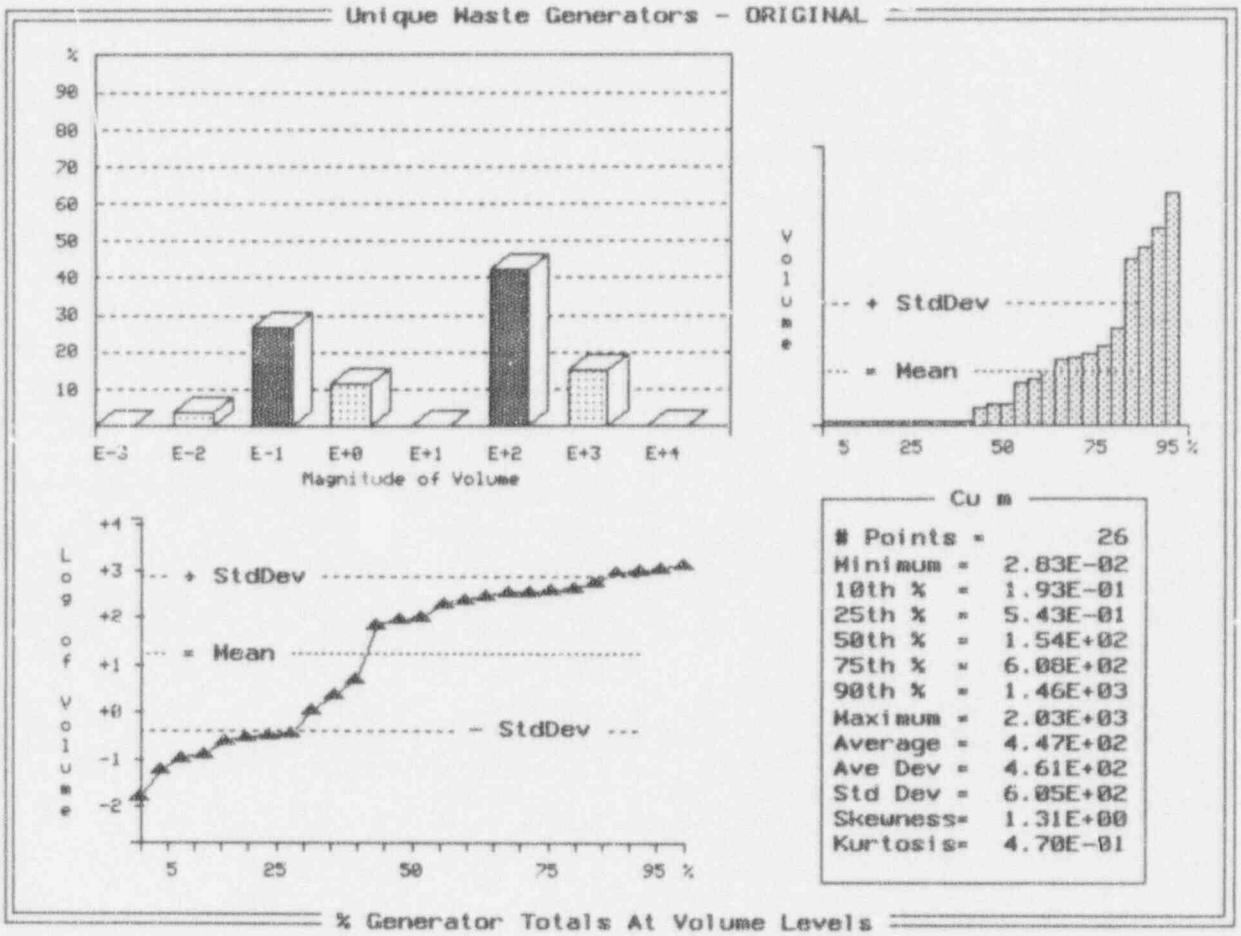


Exhibit J-7 (Continued)

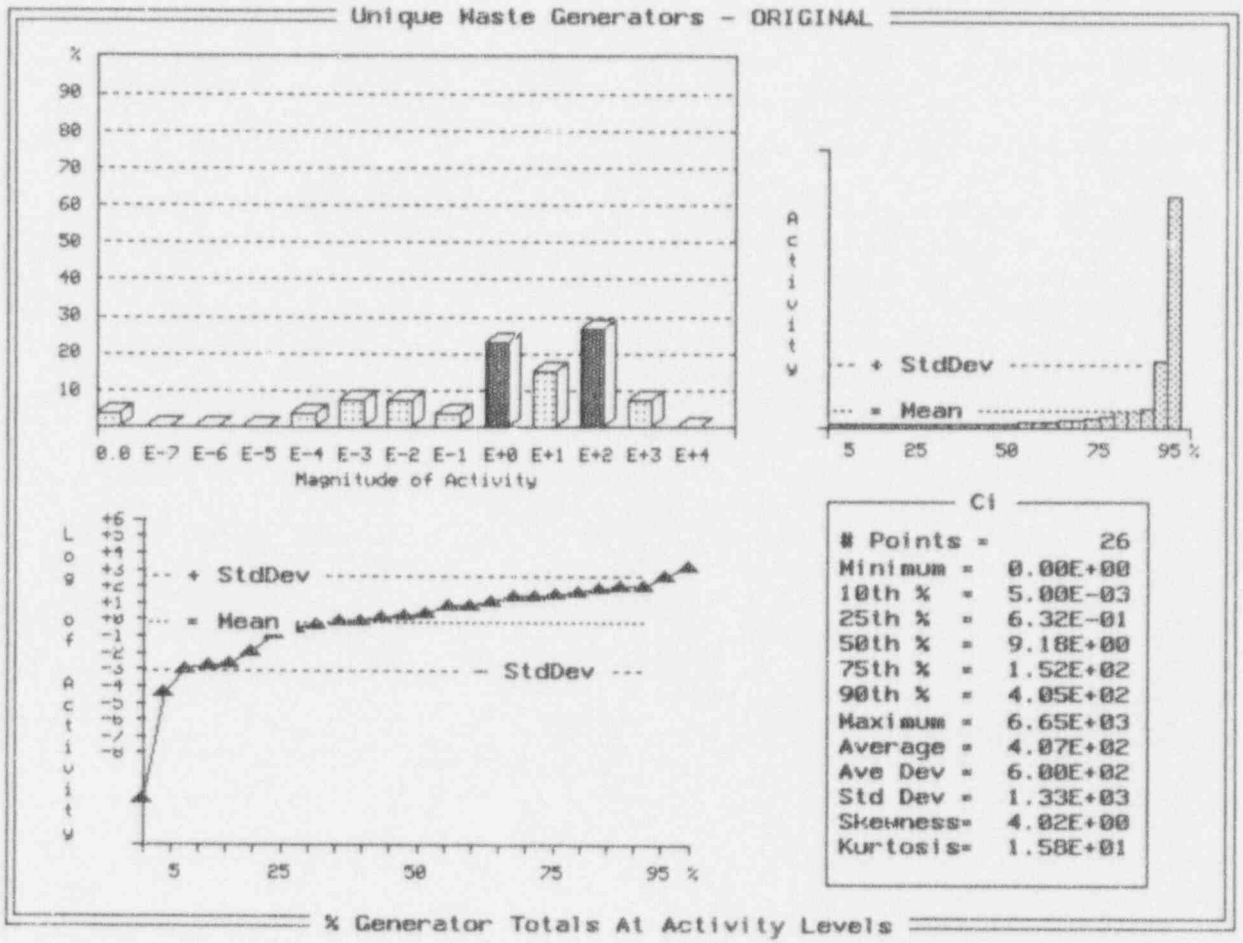


Exhibit J-8
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	Southeast
Waste generator class:	Utility
Total number of waste generators:	38
Total associated waste volume (m^3):	35,780
Total associated waste activity (Ci):	192,000
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	34
Waste volume (m^3):	29,490
Fractional waste volume (%): (this analysis/total)	82.4
Waste activity (Ci):	5,263
Fractional waste activity (%): (this analysis/total)	2.7

Exhibit J-8 (Continued)

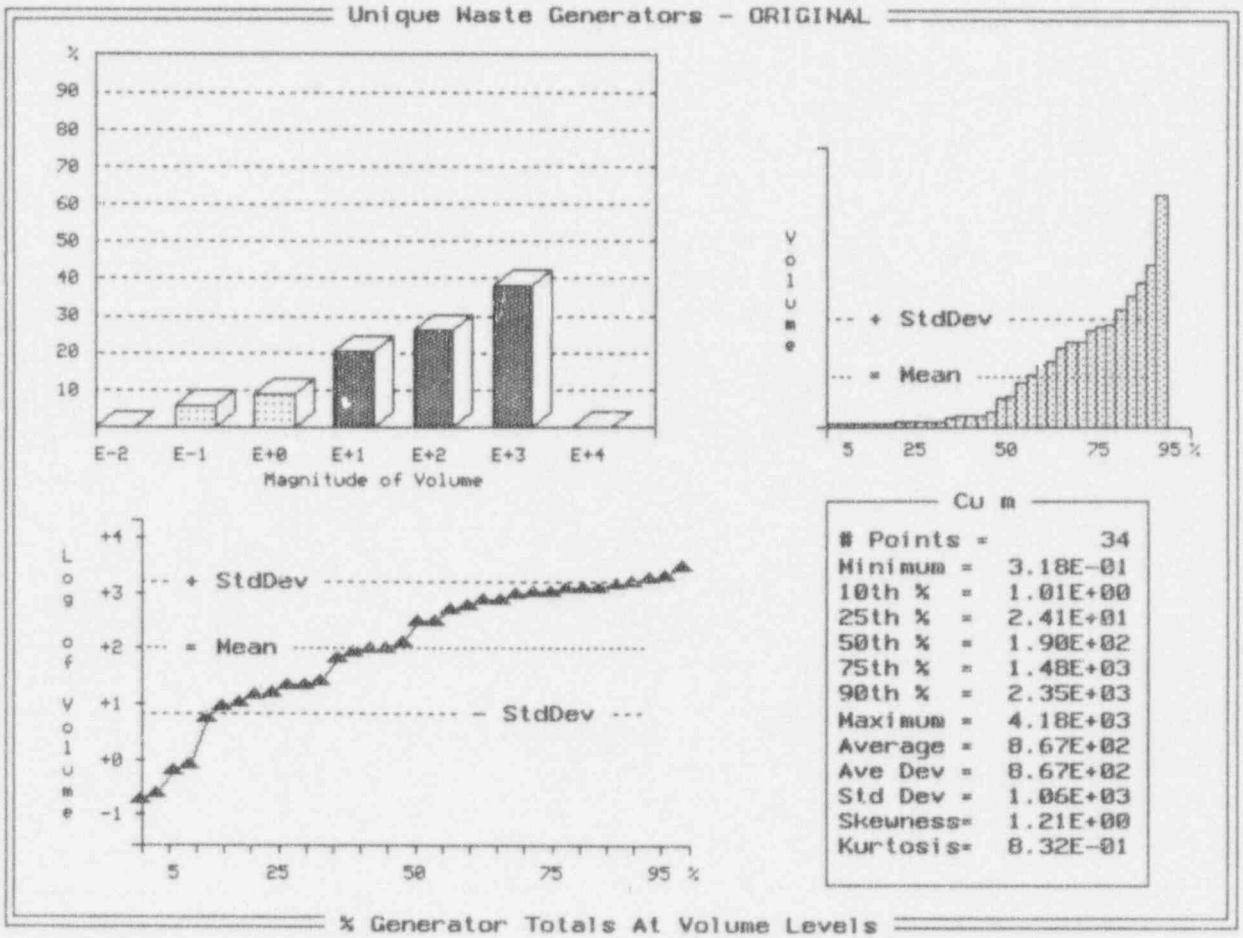


Exhibit J-8 (Continued

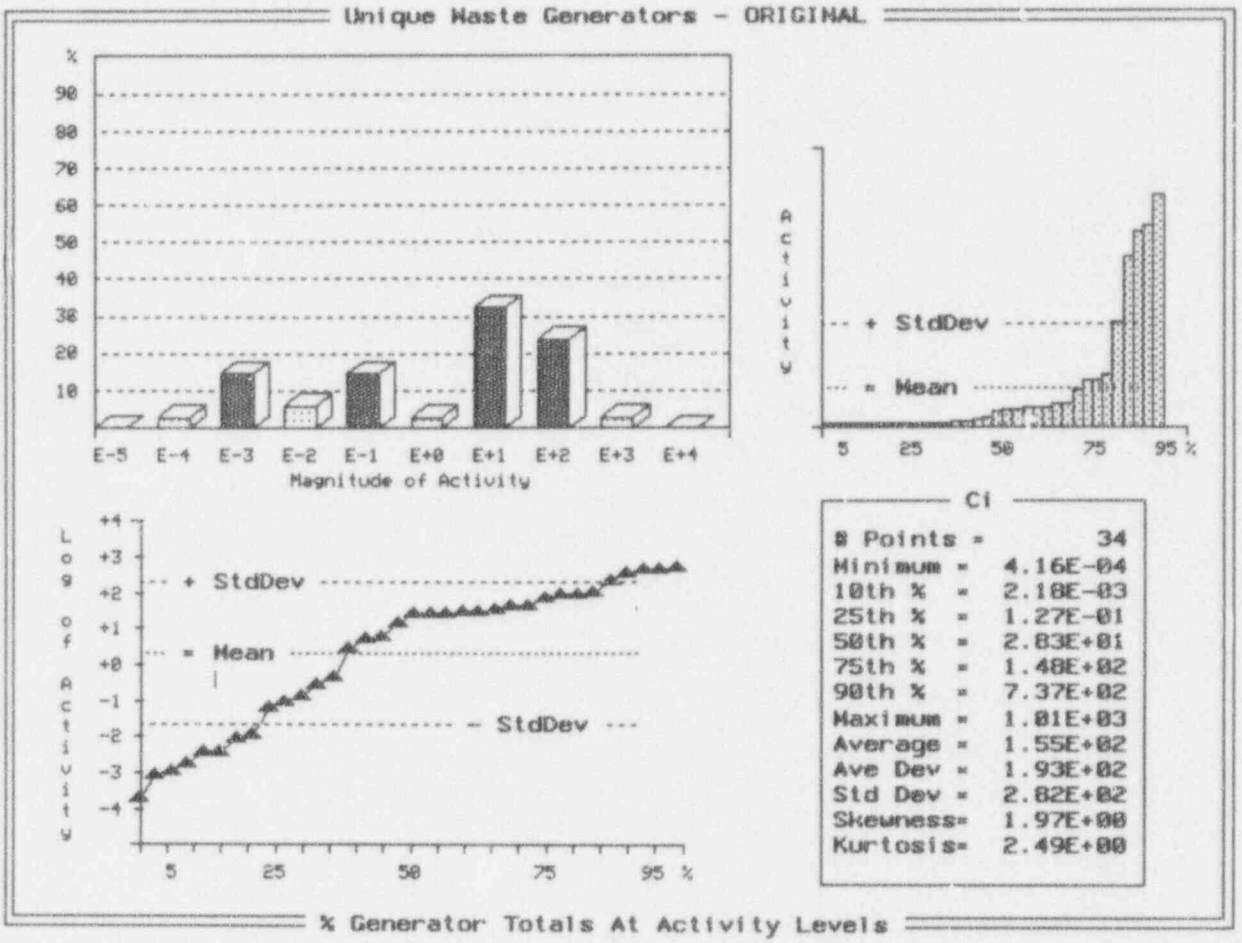


Exhibit J-9
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	Northeast
Waste generator class:	Utility
Total number of waste generators:	17
Total associated waste volume (m^3):	10,760
Total associated waste activity (Ci):	746,400
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	16
Waste volume (m^3):	8,222
Fractional waste volume (%): (this analysis/total)	76.4
Waste activity (Ci):	2,491
Fractional waste activity (%): (this analysis/total)	0.3

Exhibit J-9 (Continued)

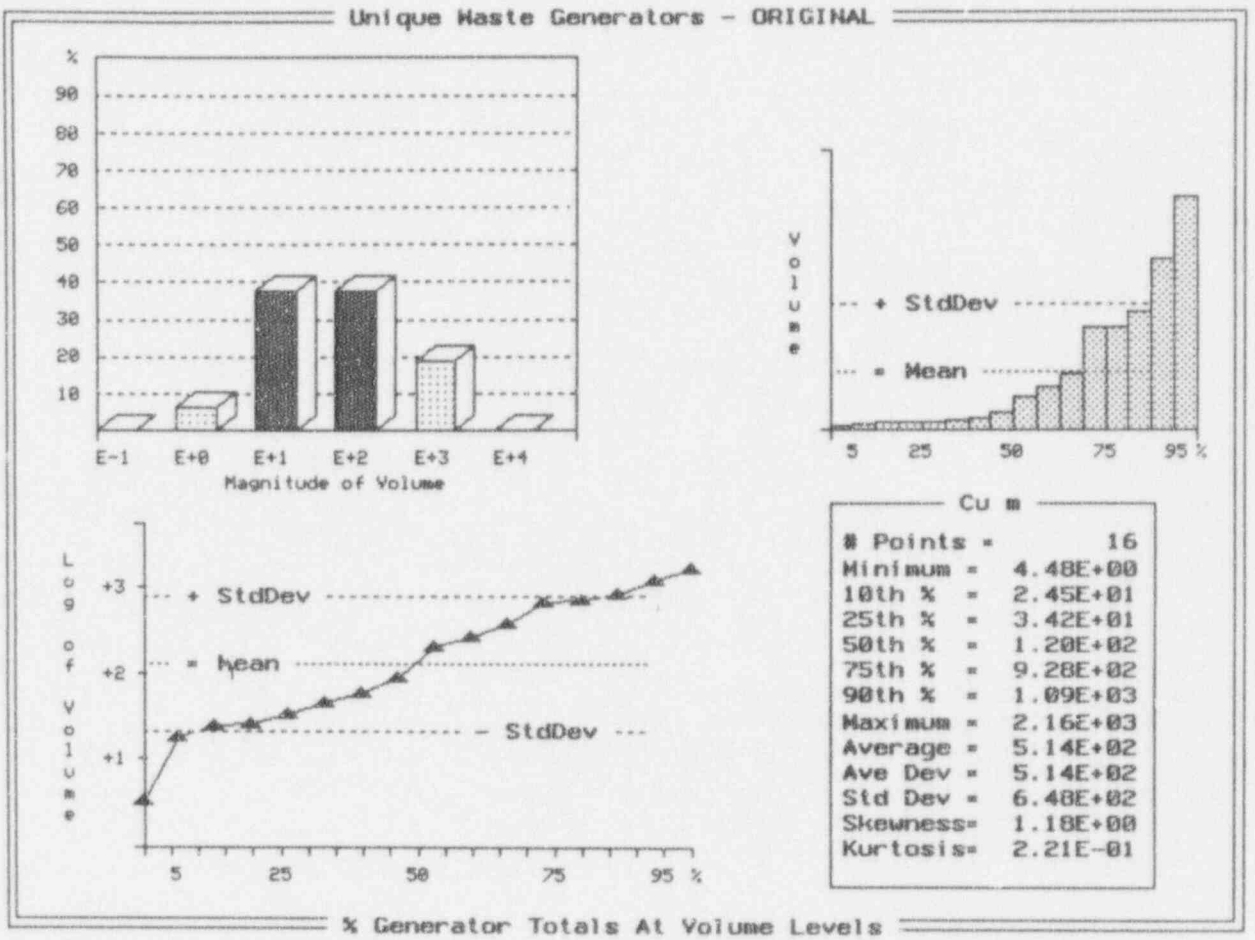


Exhibit J-9 (Continued)

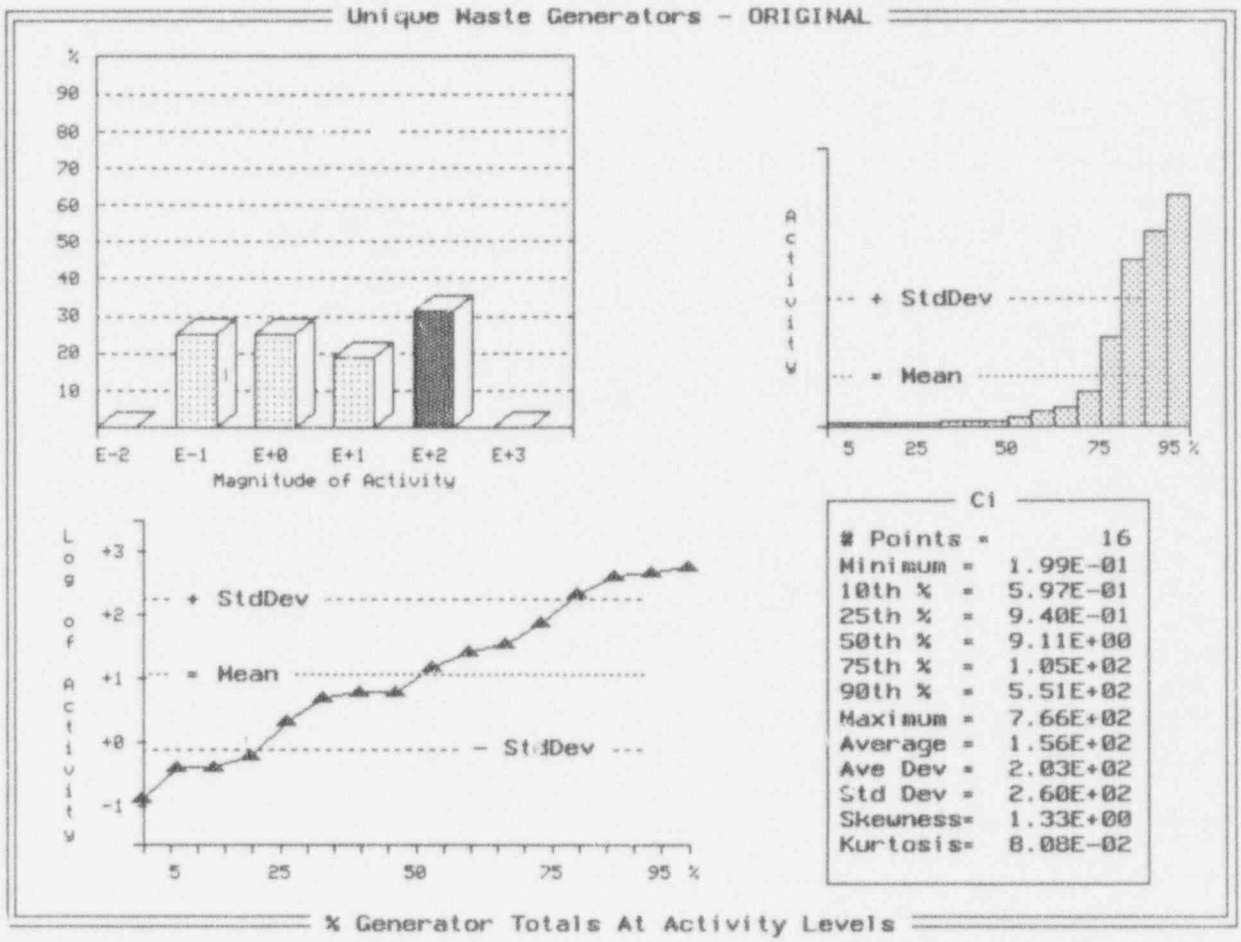


Exhibit J-10
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	Appalachian
Waste generator class:	Utility
Total number of waste generators:	19
Total associated waste volume (m^3):	16,350
Total associated waste activity (Ci):	134,200
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	19
Waste volume (m^3):	13,670
Fractional waste volume (%): (this analysis/total)	83.6
Waste activity (Ci):	4,679
Fractional waste activity (%): (this analysis/total)	3.5

Exhibit J-10 (Continued)

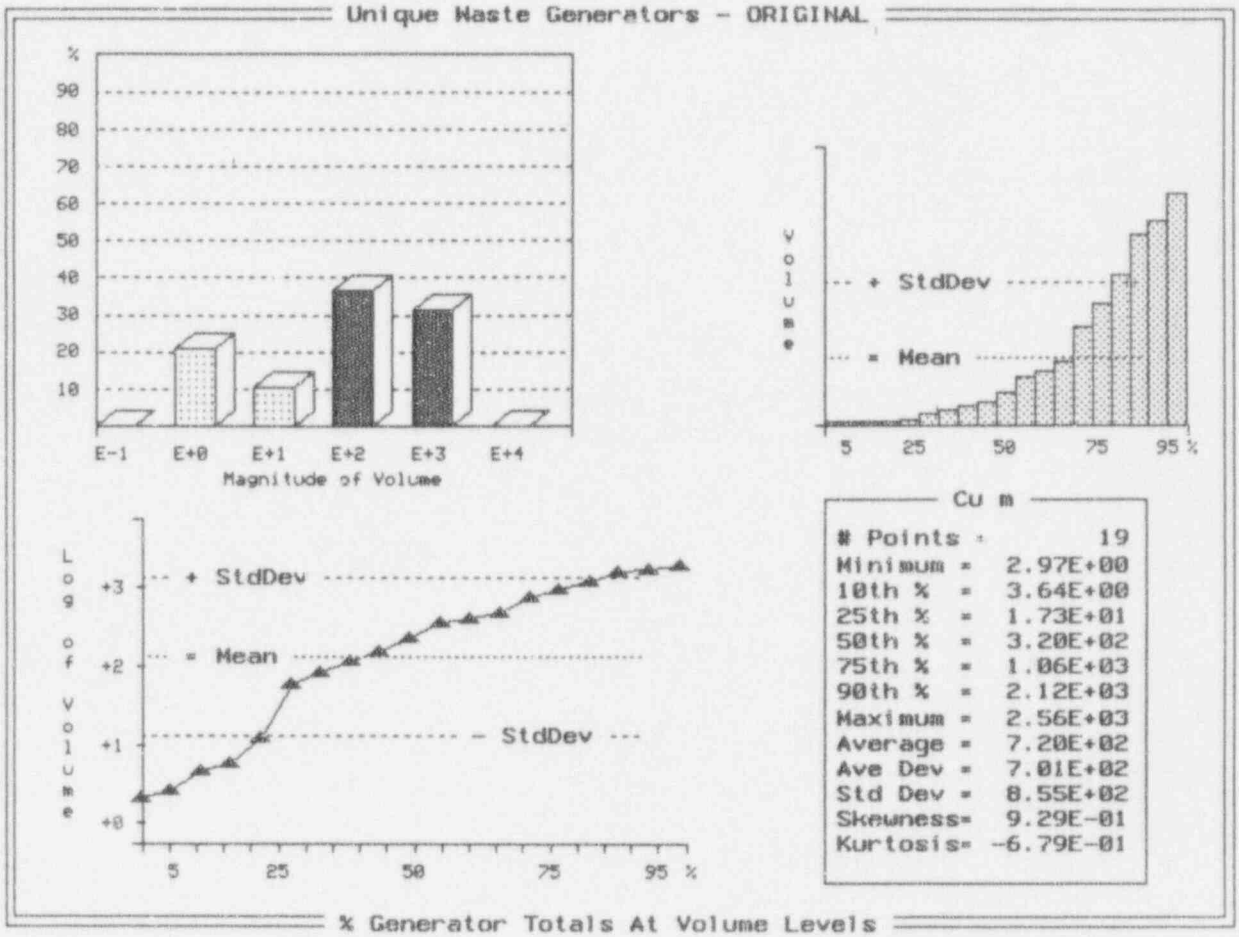


Exhibit J-10 (Continued)

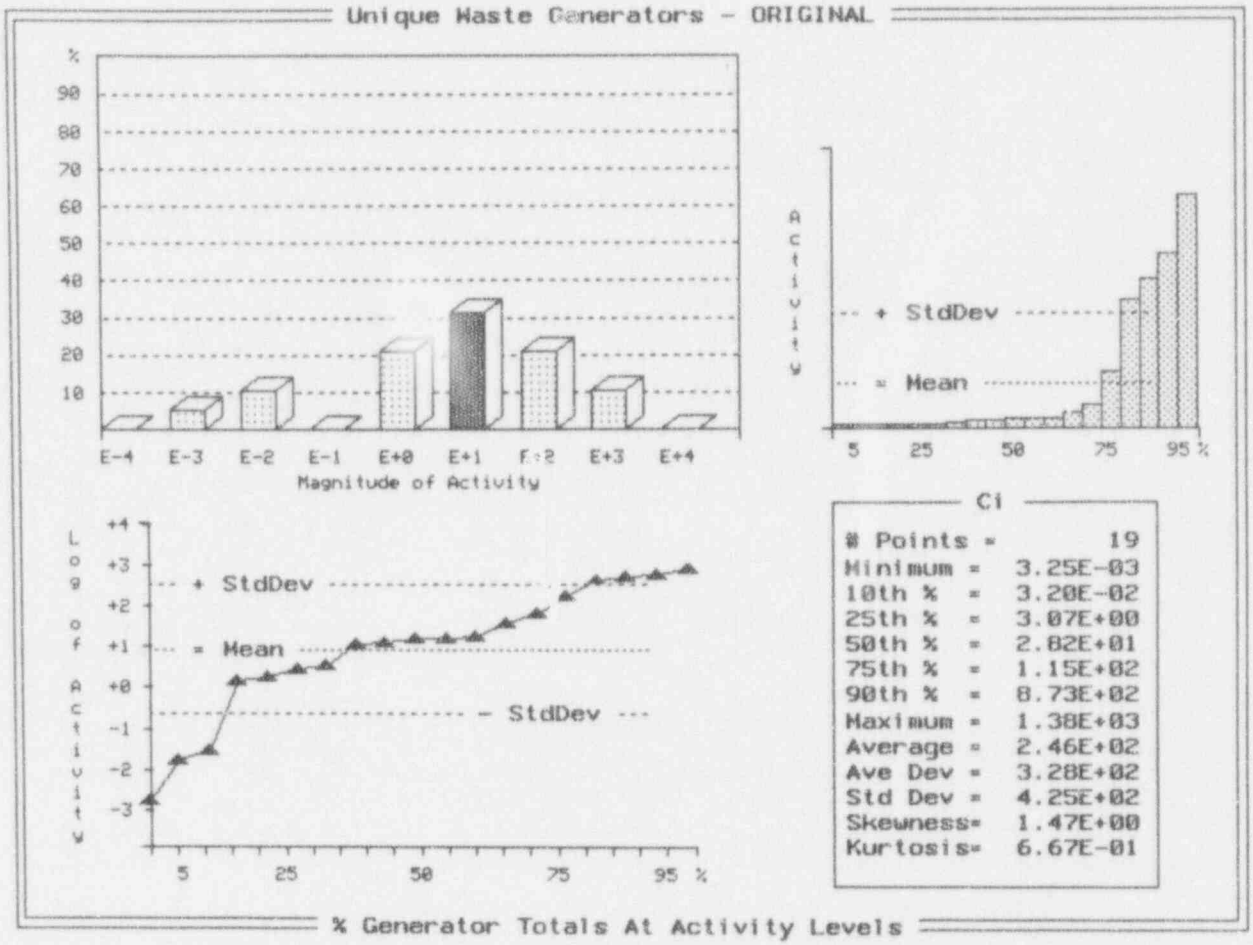


Exhibit J-11
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	Southwest
Waste generator class:	Utility
Total number of waste generators:	10
Total associated waste volume (m^3):	7,141
Total associated waste activity (Ci):	14,110
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	10
Waste volume (m^3):	6,501
Fractional waste volume (%): (this analysis/total)	91.0
Waste activity (Ci):	574
Fractional waste activity (%): (this analysis/total)	4.1

Exhibit J-11 (Continued)

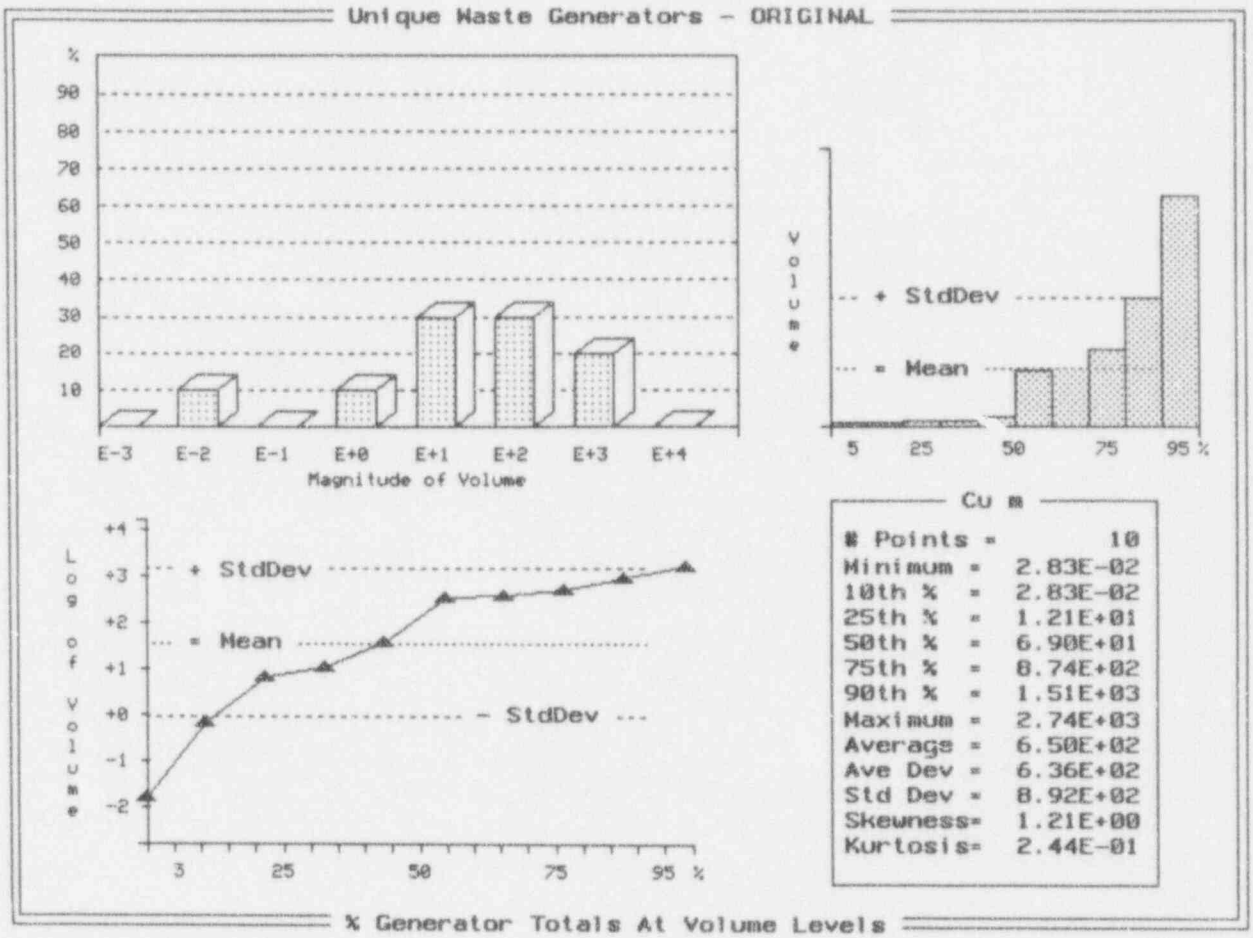


Exhibit J-11 (Continued)

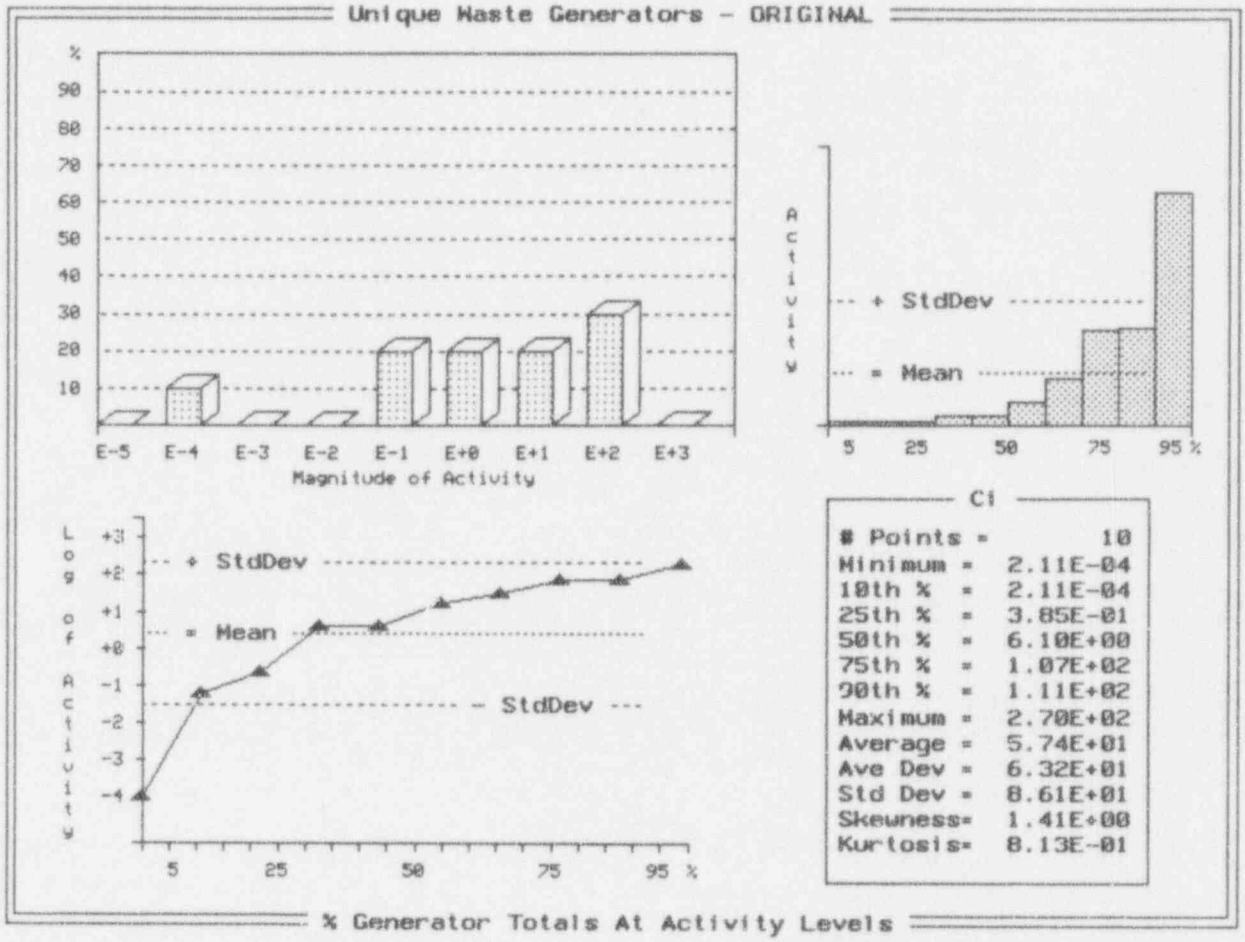


Exhibit J-12
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	Maine
Waste generator class:	Utility
Total number of waste generators:	3
Total associated waste volume (m^3):	668
Total associated waste activity (Ci):	1,287
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	3
Waste volume (m^3):	531
Fractional waste volume (%): (this analysis/total)	79.5
Waste activity (Ci):	883
Fractional waste activity (%): (this analysis/total)	68.6

Exhibit J-12 (Continued)

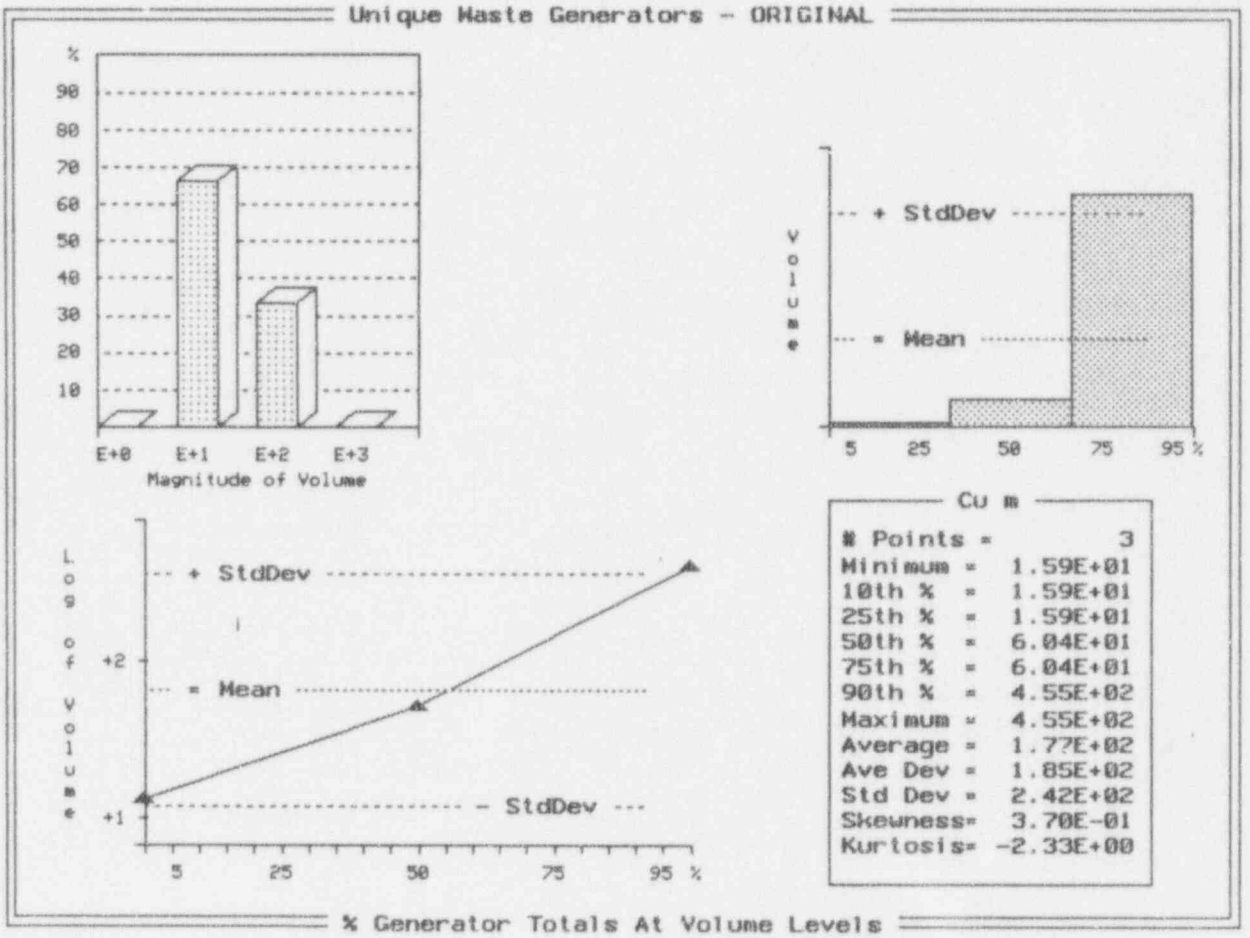


Exhibit J-12 (Continued)

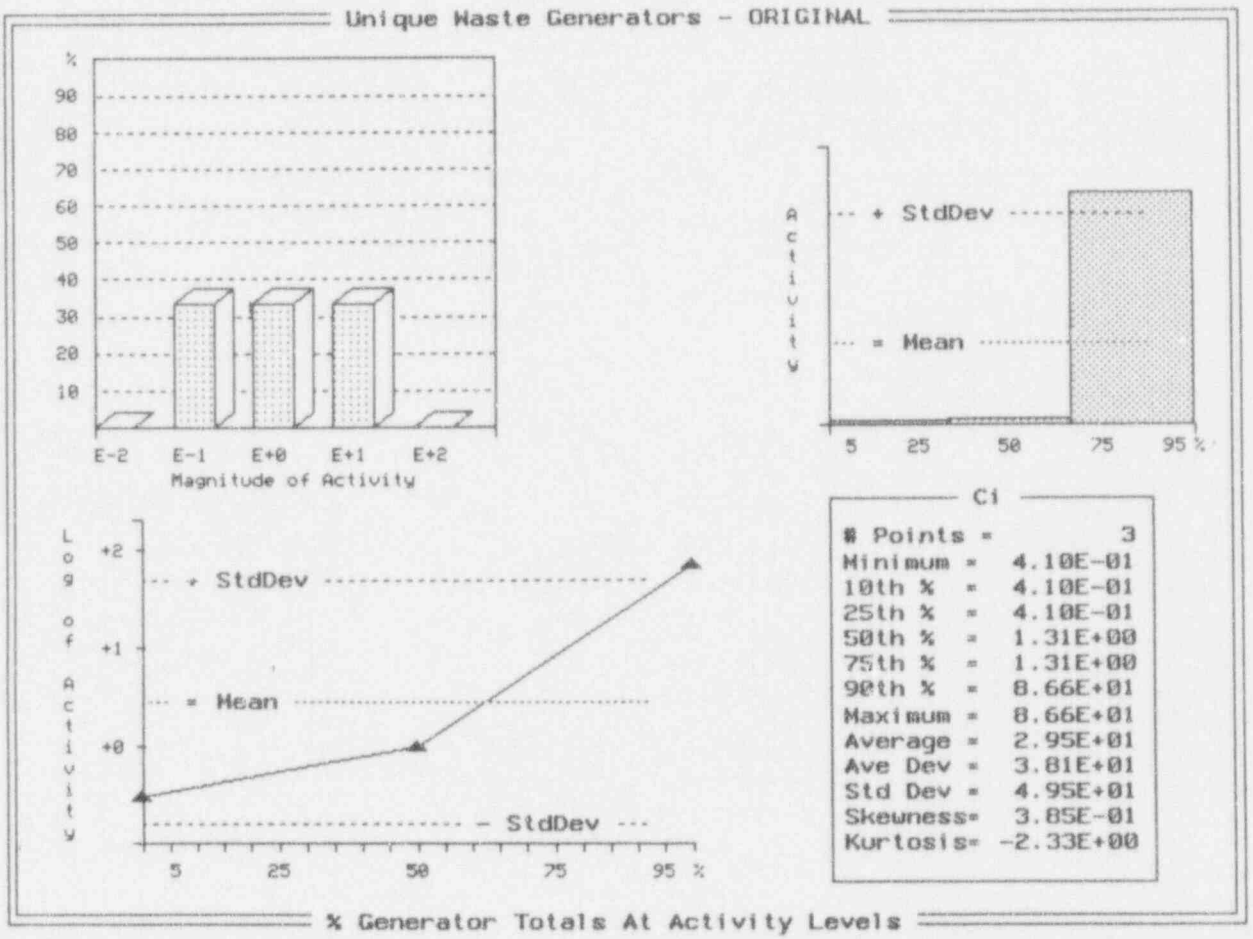


Exhibit J-13
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	Massachusetts
Waste generator class:	Utility
Total number of waste generators:	4
Total associated waste volume (m^3):	2,568
Total associated waste activity (Ci):	10,590
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	3
Waste volume (m^3):	1,859
Fractional waste volume (%): (this analysis/total)	72.4
Waste activity (Ci):	79
Fractional waste activity (%): (this analysis/total)	0.7

Exhibit J-13 (Continued)

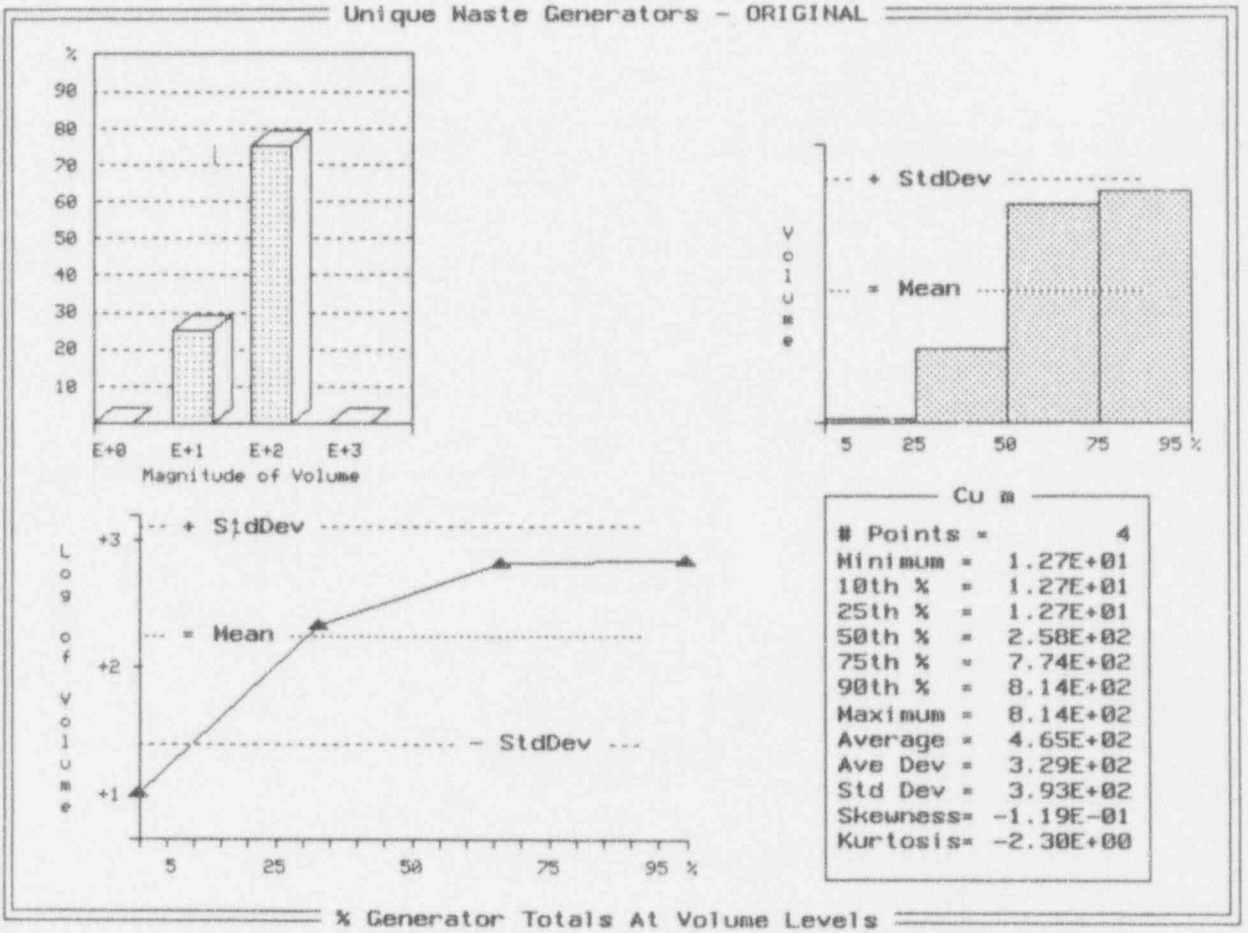


Exhibit J-13 (Continued)

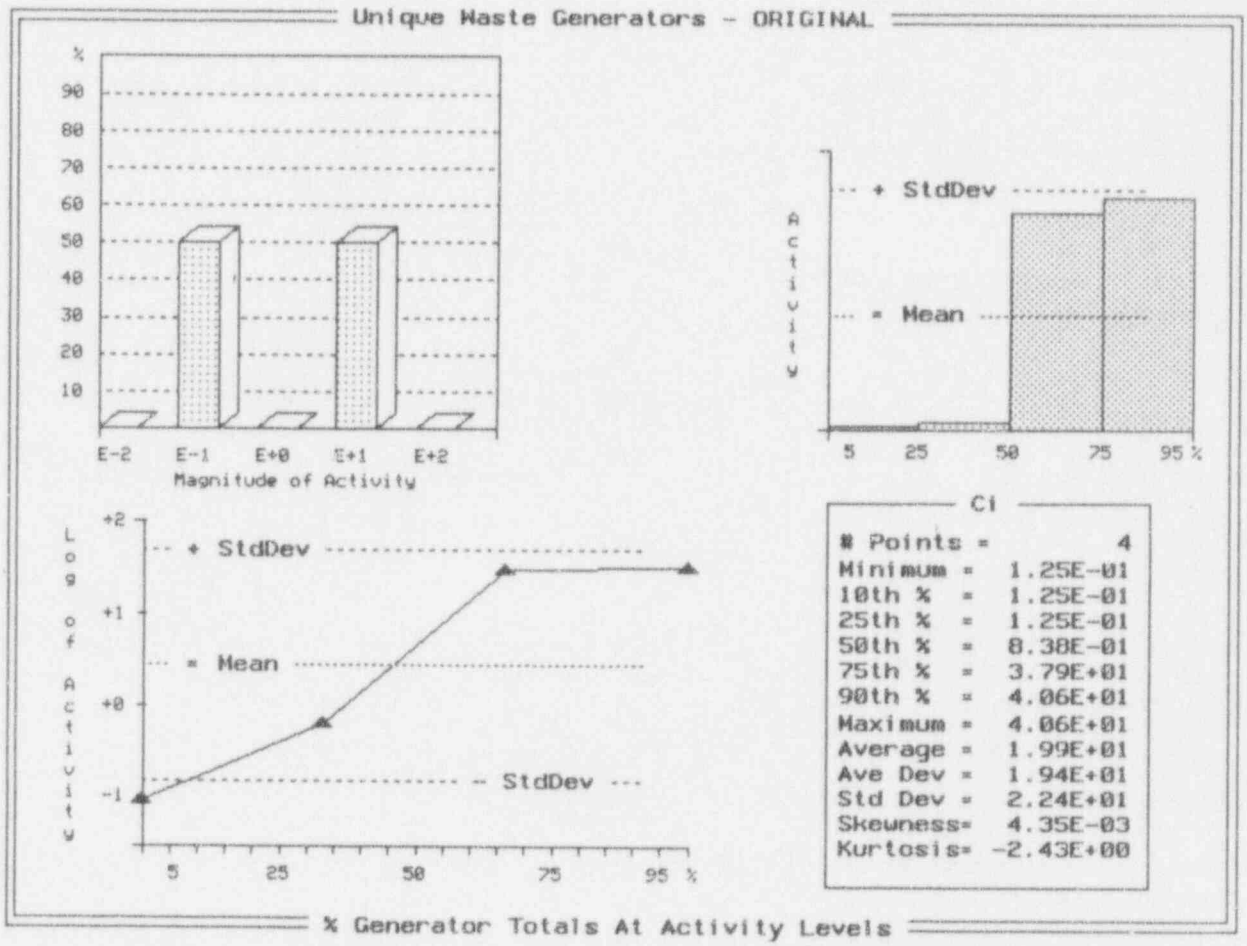


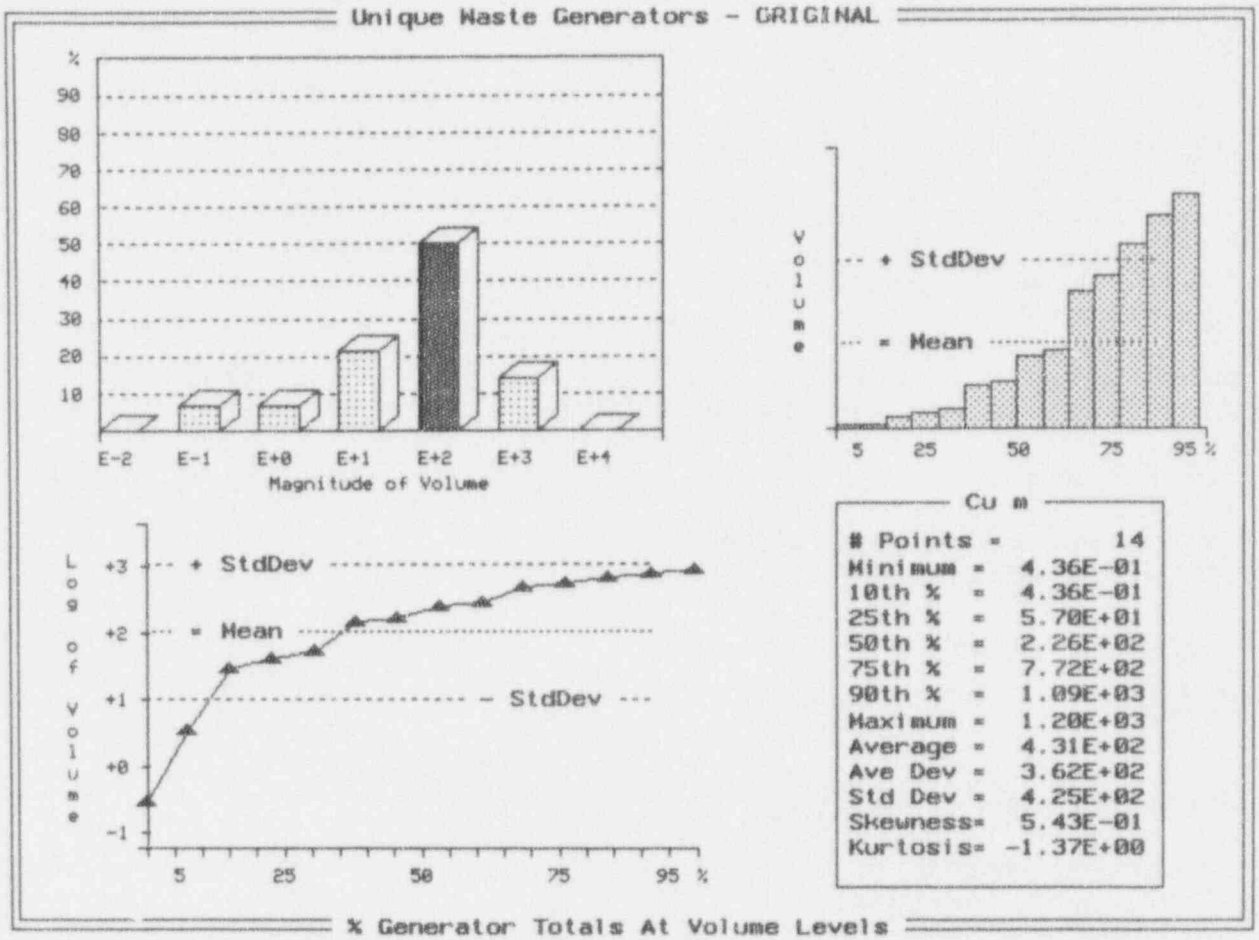
Exhibit J-14
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	New Hampshire
Waste generator class:	Utility
Total number of waste generators:	1
Total associated waste volume (m^3):	no data
Total associated waste activity (Ci):	--
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	--
Waste volume (m^3):	--
Fractional waste volume (%): (this analysis/total)	--
Waste activity (Ci):	--
Fractional waste activity (%): (this analysis/total)	--

Exhibit J-15
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

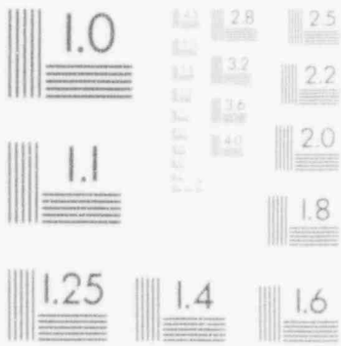
	Data or Parameters
Compact or unaffiliated state:	New York
Waste generator class:	Utility
Total number of waste generators:	15
Total associated waste volume (m^3):	7,712
Total associated waste activity (Ci):	117,700
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	14
Waste volume (m^3):	6,037
Fractional waste volume (%): (this analysis/total)	78.3
Waste activity (Ci):	1,359
Fractional waste activity (%): (this analysis/total)	1.2

Exhibit J-15 (Continued)



2

IMAGE EVALUATION TEST TARGET (MT-3)



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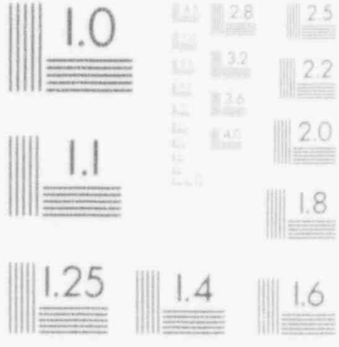
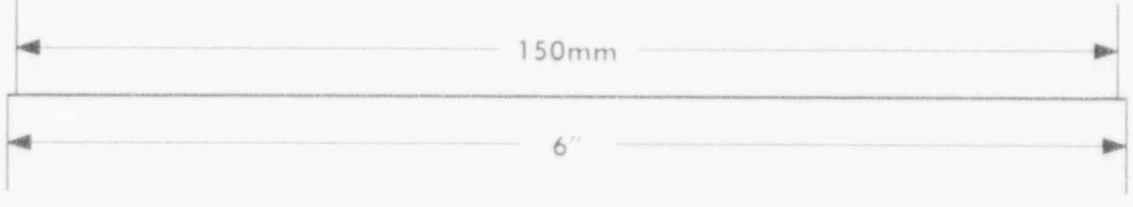
2

IMAGE EVALUATION TEST TARGET (MT-3)





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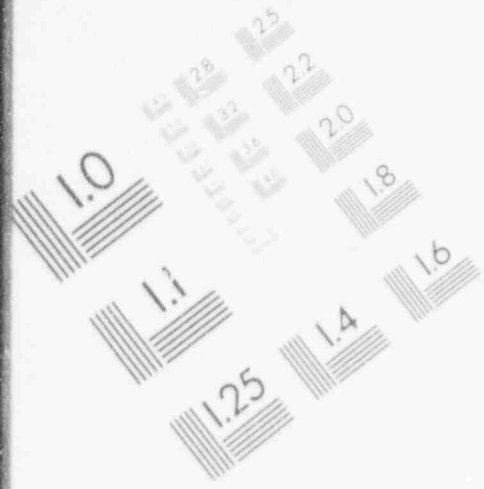
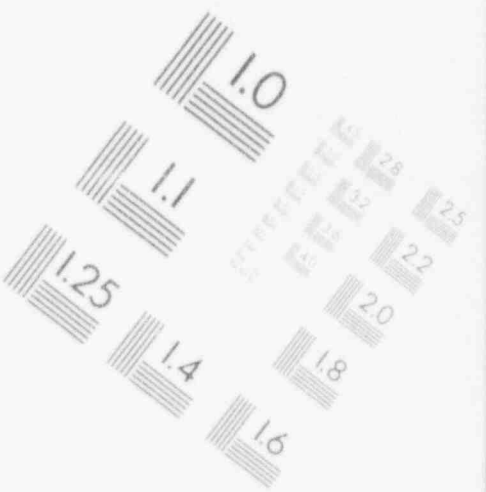
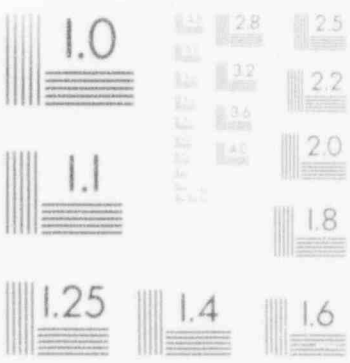
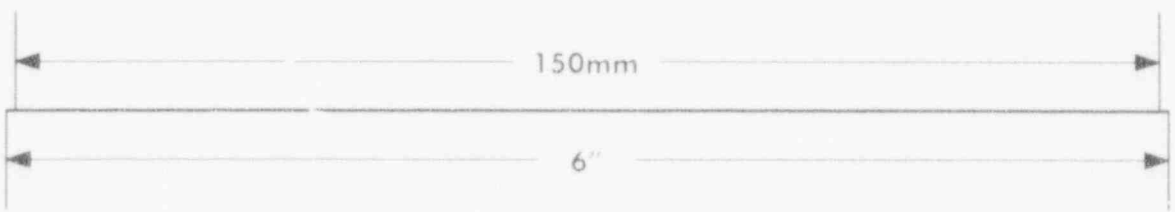
2

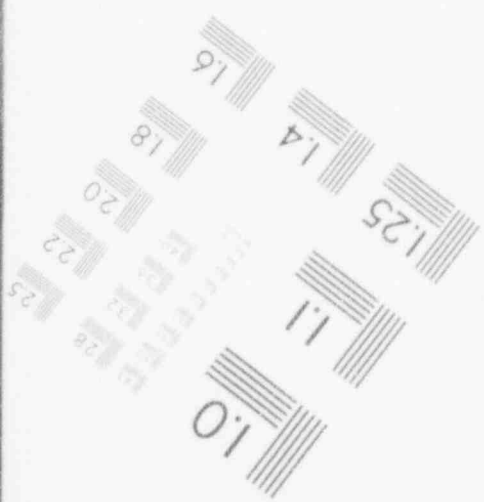
IMAGE EVALUATION TEST TARGET (MT-3)











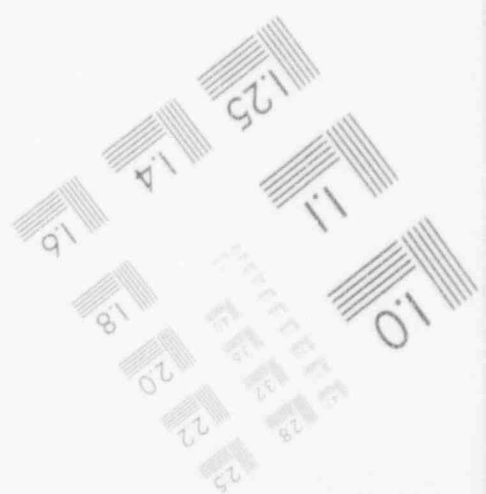


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Exhibit J-15 (Continued)

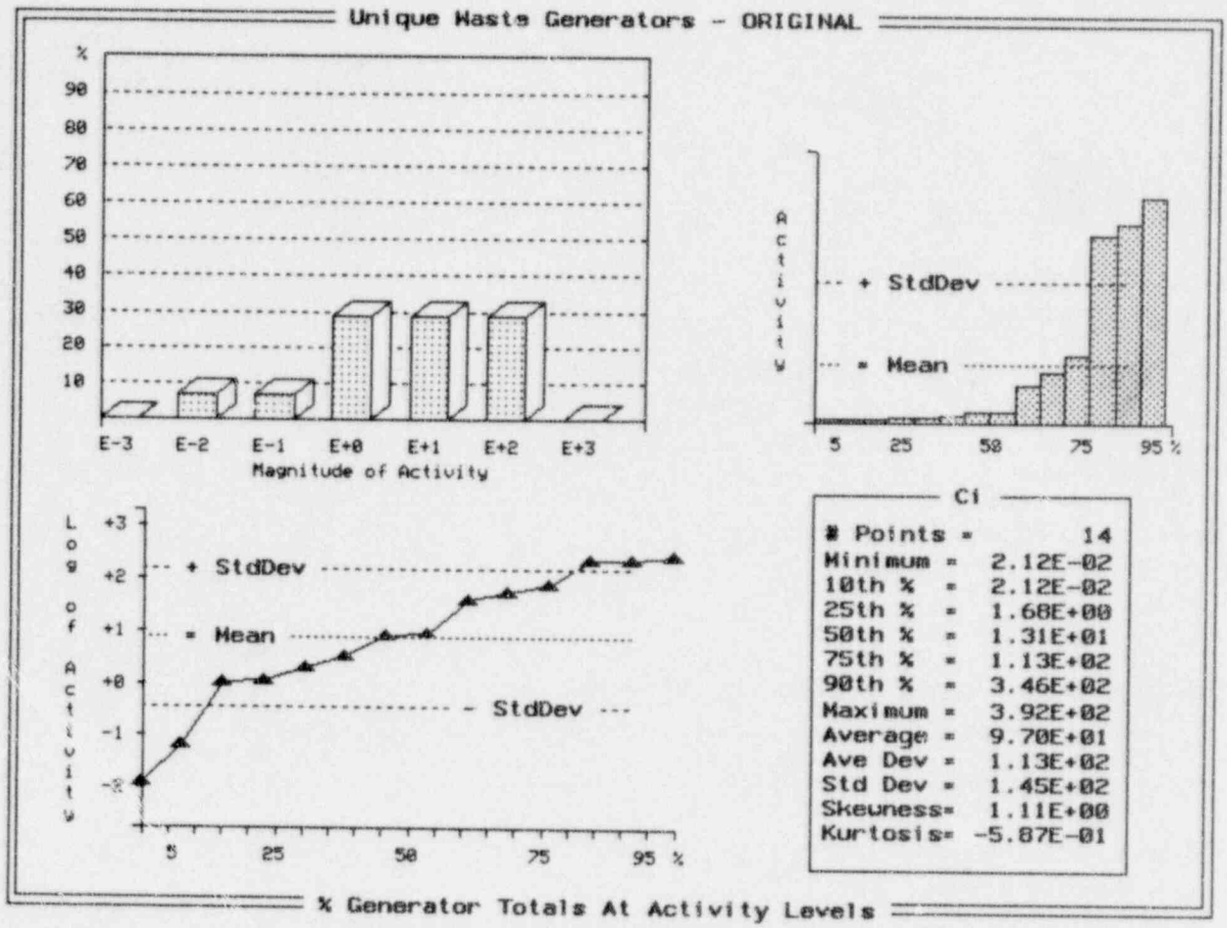
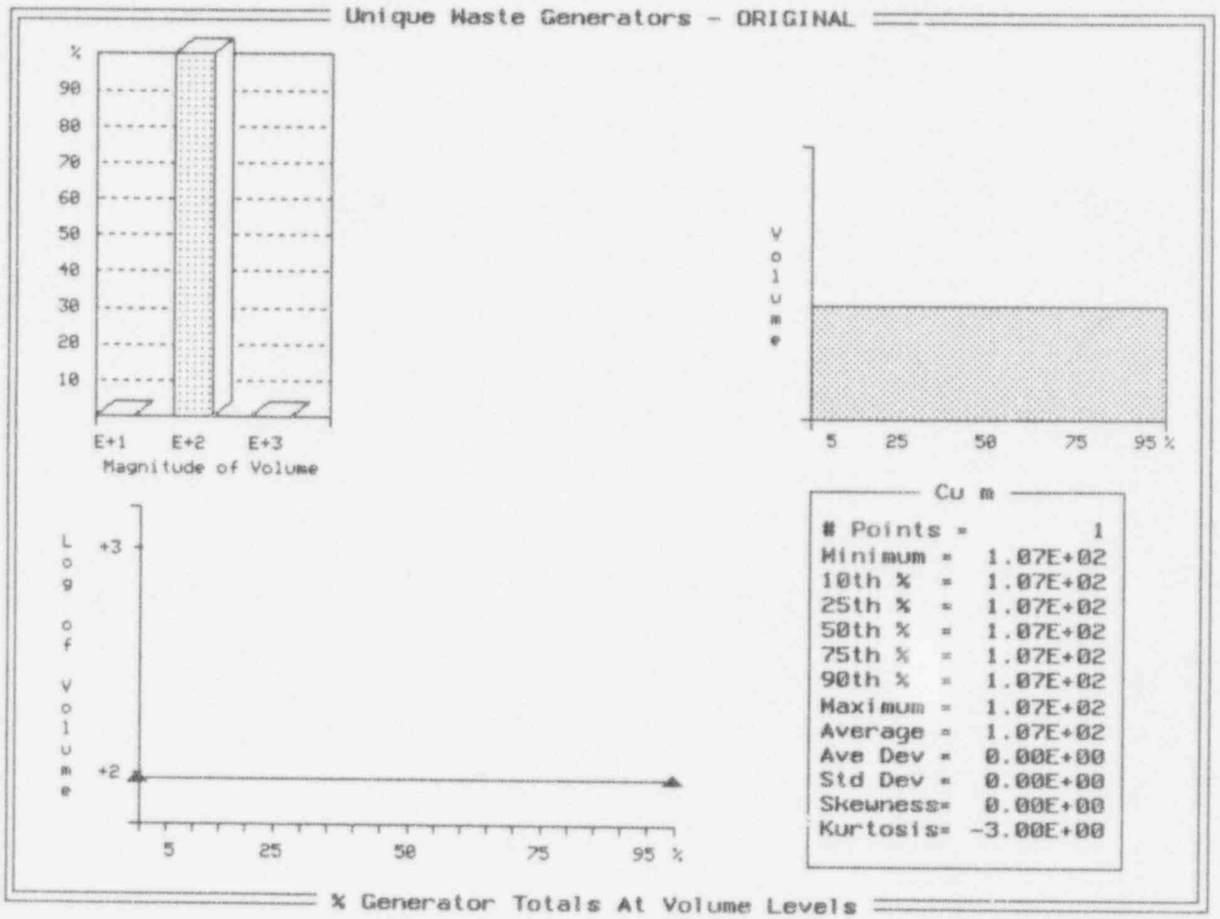


Exhibit J-16
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	Texas
Waste generator class:	Utility
Total number of waste generators:	1
Total associated waste volume (m^3):	106.7
Total associated waste activity (Ci):	21.2
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	1
Waste volume (m^3):	106.7
Fractional waste volume (%): (this analysis/total)	100
Waste activity (Ci):	21.2
Fractional waste activity (%): (this analysis/total)	100

Exhibit J-16 (Continued)



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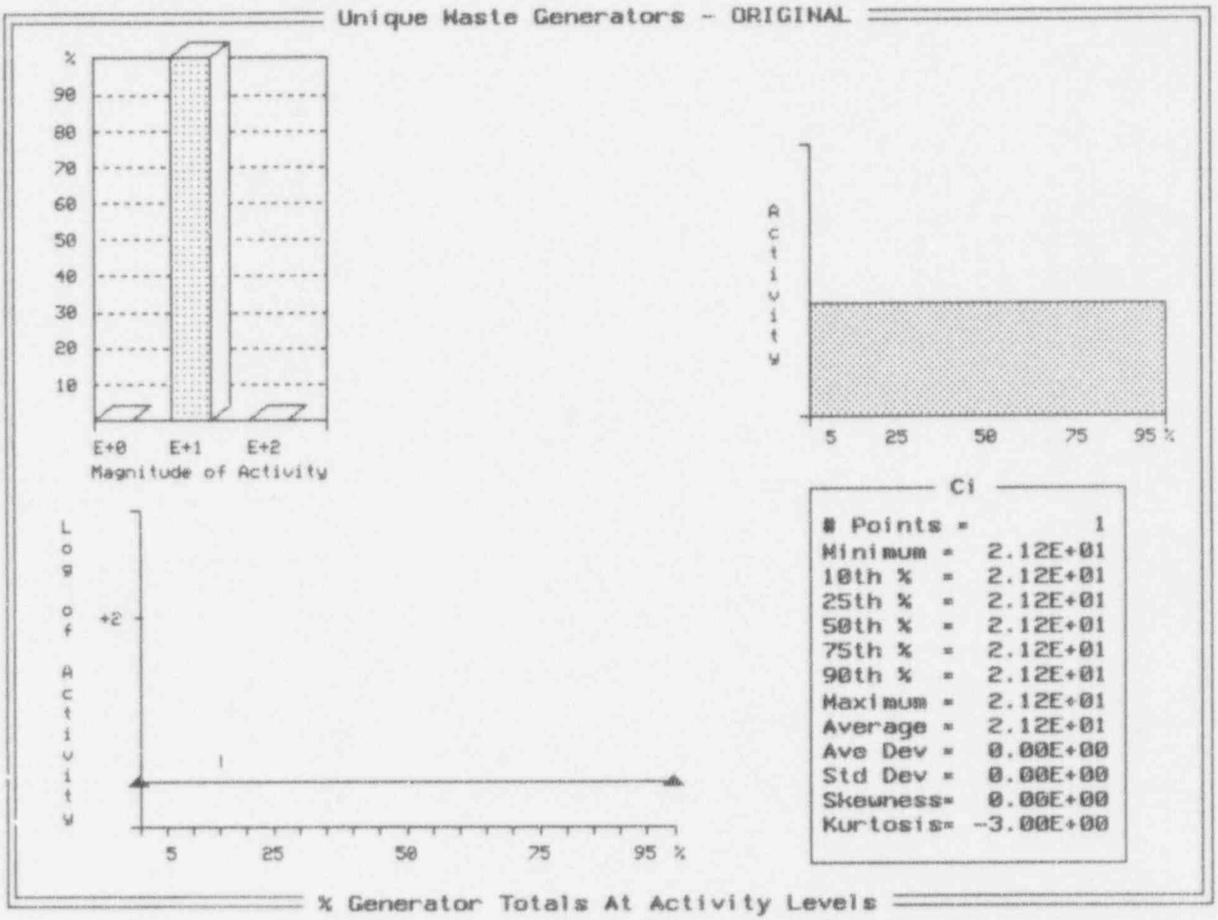
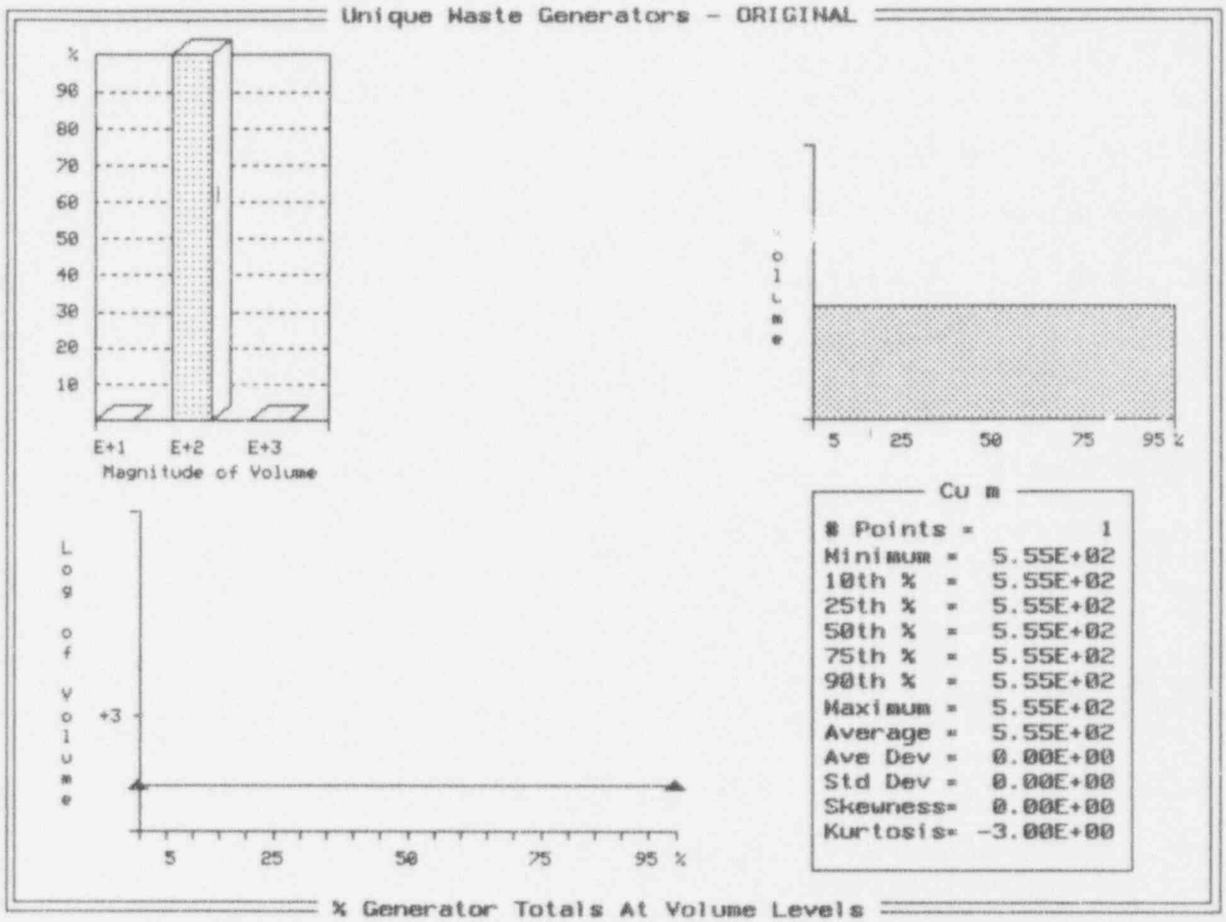


Exhibit J-17
Data Summary - Analyses at the Shipment Level
(Aggregate Practices - 1986 to 1990)

	Data or Parameters
Compact or unaffiliated state:	Vermont
Waste generator class:	Utility
Total number of waste generators:	3
Total associated waste volume (m^3):	745
Total associated waste activity (Ci):	12,740
Waste class:	A-Unstable and A-Stable
Identified waste generators for this analysis:	1
Waste volume (m^3):	555.3
Fractional waste volume (%): (this analysis/total)	74.5
Waste activity (Ci):	48.3
Fractional waste activity (%): (this analysis/total)	0.4

Exhibit J-17 (Continued)



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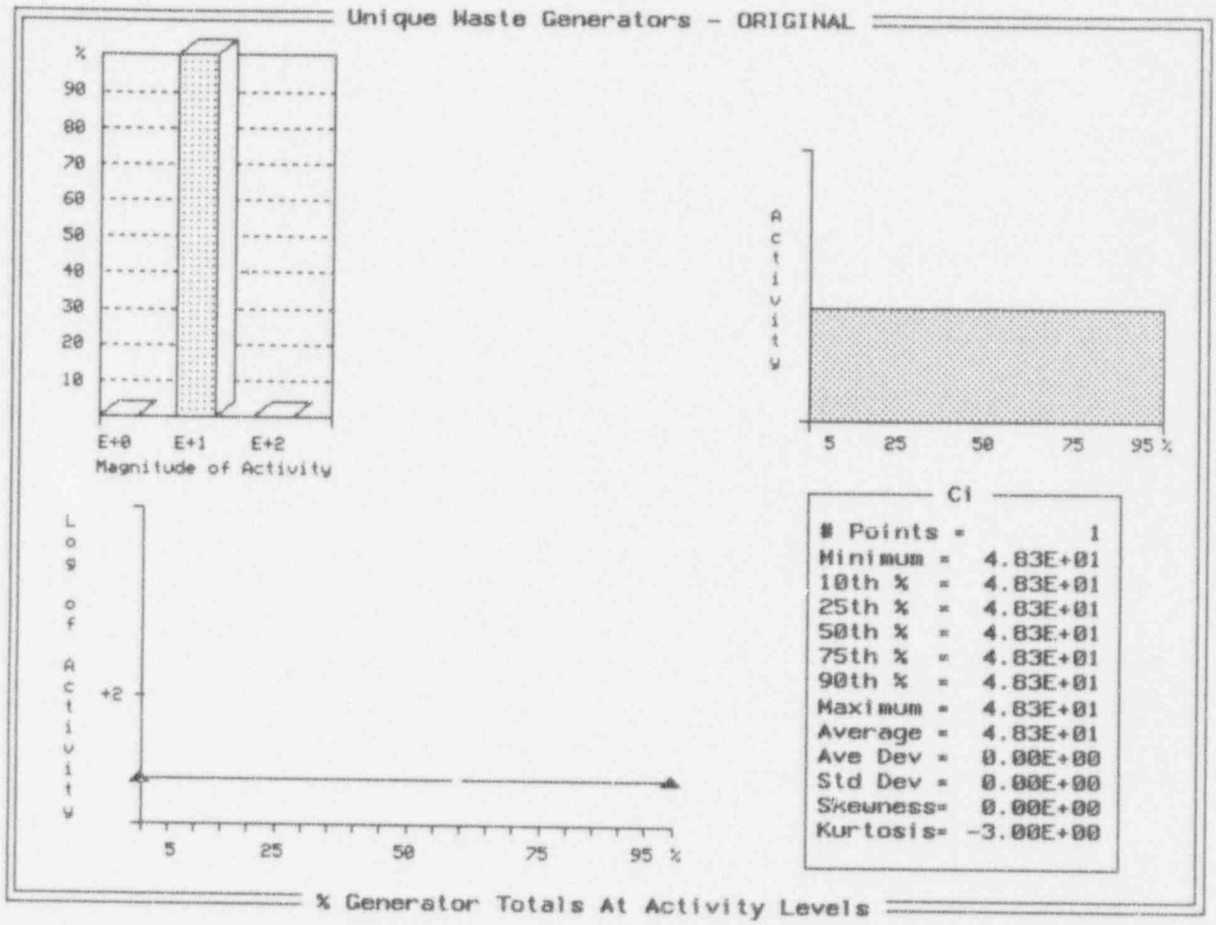

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11. ABSTRACT (200 words or less)

This report describes the physical, chemical, and radiological properties of Class A low-level radioactive waste using data contained in the Manifest Information Management System (MIMS). Other sources of information include reports prepared by the NRC, DOE, low-level waste Compacts and States, and trade industries. The database characterizes low-level waste shipped for disposal from 1986 to 1990. A computer program was developed to analyze the data, with the results summarized in tables, histograms, and cumulative distribution curves presenting radionuclide concentration distributions in Class A waste as a function of waste streams, waste generators, and by regions.

The report also provides information characterizing the methods and facilities used to treat and dispose of non-radioactive waste, including industrial, municipal, and hazardous waste regulated under Subparts C and D of RCRA. The information includes a list of disposal options, the geographical locations of such facilities, and a description of such processing and disposal facilities.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)

low-level radioactive waste
Class A waste
radionuclide concentration distributions
waste activity levels
waste volumes
waste generators/sectors
waste Compacts

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