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Volume I

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Quality Assurance for Environmental Chemistry: 1992

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Quality Assurance for Environmental Chemistry: 1992

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QUALITY ASSURANCE FOR ENVIRONMENTAL CHEMISTRY: 1992

by

Margaret A. Gautier, Elizabeth A. Jones, and Nancy L. Koski

ABSTRACT

This report documents the continuing quality assurance efforts of the Environmental Chemistry Group (EM-9) at the Los Alamos National Laboratory. The philosophy, methodology, computing resources, and laboratory information management system used by the quality assurance program to encompass the diversity of analytical chemistry practiced in the group are described. Included in the report are all quality assurance reference materials used, along with their certified or consensus concentrations, and all analytical chemistry quality assurance measurements made by EM-9 during 1992.

OVERVIEW OF 1992 QUALITY ASSURANCE PERFORMANCE

OVERVIEW OF 1992 QUALITY ASSURANCE PERFORMANCE

A total of 54,028 quality control (QC) analytes were analyzed by the Environmental Chemistry Group (EM-9) during 1992 in conjunction with the routine analysis of approximately 260,476 determinations giving an overall QC level of effort of 21%. The total number of QC samples analyzed includes all of the analysts' internal QC as well as the blind QC samples submitted by the Quality Assurance and Data Management (QADM) Section. More than 14,248 of these QC analytes were spiked on various matrices by the QADM section, representing a 51% increase of in-house prepared QC samples over 1991. Of the 14,248 analytes spiked, 2,580 analytes were used to monitor the performance of our analytical contractors who completed analyses for 45,774 analytes. The 200,219 analytical determinations represent a 7.8% increase in workload for EM-9 analysts over the 1991 level. The workload for EM-9 has increased by 318% since the group was formed in 1984 and is displayed in Fig. 1 for the years 1984 through 1992. A summary of mean ratio data for bioassay, environmental, waste treatment, and industrial hygiene QC samples is presented in App. C, Tables C-I to C-III. The mean ratios have been calculated as a function of analysis and matrix and are summarized as a mean ± one standard deviation for each matrix type.

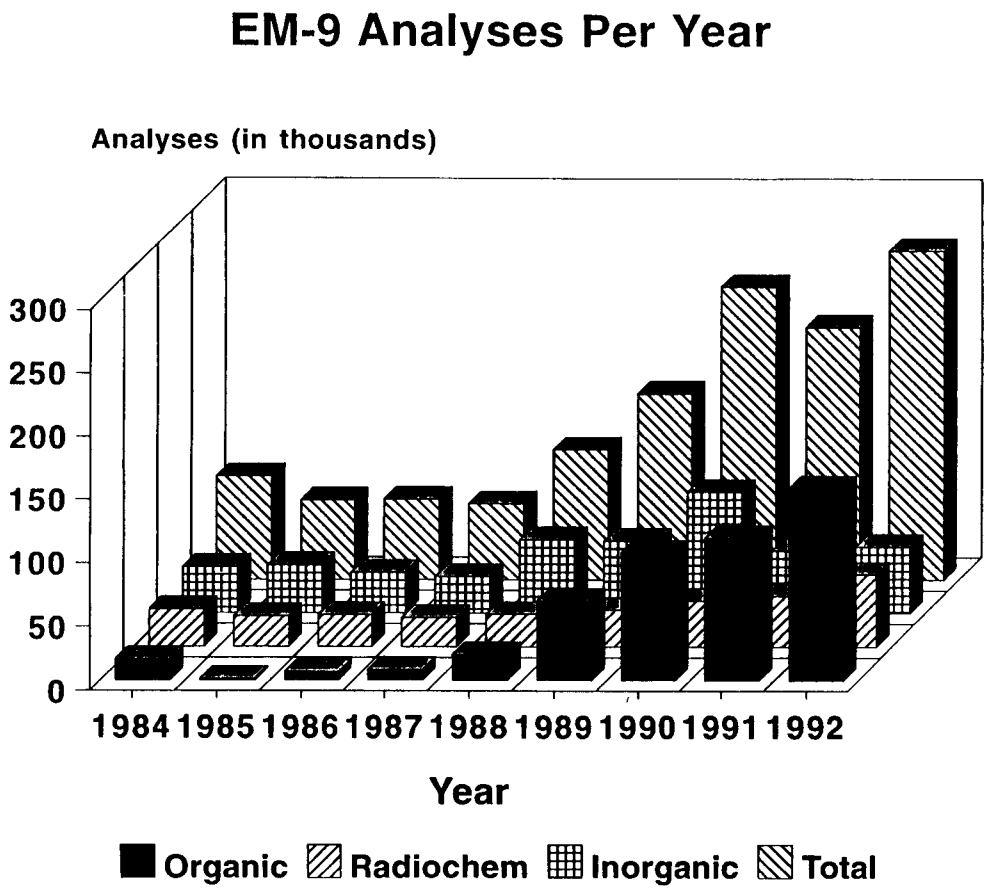

Fig. 1. Number of analytical determinations performed per year.

This is an appropriate way to display data for our laboratory, which operates on a demand basis and may perform any given analysis only infrequently. Analyses are considered under control when the absolute value of the difference between our result and the certified or consensus mean is within two propagated standard deviations of the experimental uncertainty and of the certified means.

The data in Table I provide a summary of the overall state of statistical control for analytical work performed by EM-9 during 1992. More than 90% of all inorganic analyses are within the ±2 propagated standard deviations of the certified/consensus mean values and are considered under control. All radiochemical analyses with the exception of biologicals and filters had more than 90% of the reported values within ±2 standard deviations. During 1992 recovery of the ^{242}Pu tracer used in the routine plutonium analysis in the bioassay program averaged 88% ± 6% and in the environmental program averaged 62% ± 16% for vegetation, 76% ± 10% for waters, and 71% ± 25% for soils. Americium-243 tracer recovery for the bioassay program averaged 77% ± 10% and for the environmental program averaged 65% ± 25% for water. Uranium-232 tracer recovery for the bioassay program averaged 54% ± 8% and for the environmental program averaged 72% ± 15% for water samples.

TABLE I. Summary of Quality Assurance Tests for Analytical Data Completed During 1992

Analysis and Matrix	No. of QCs	<2 Sigma (%)	2-3 Sigma (%)	>3 Sigma (%)
Stable Elements				
Bulk Materials	7	100	0	0
Filters	718	93	3	4
Silicates	1904	91	5	4
Urine	12	100	0	0
Water	7667	95	3	2
Radiochemical				
Biological Materials	100	87	5	8
Filters	356	88	3	9
Silicates	919	91	5	4
Urine	973	95	3	2
Water	3112	97	2	1
Organic				
Bulk Materials	636	96	2	3
Charcoal Tubes	2932	95	4	1
Filters	260	98	1	1
Silicates	16075	95	2	3
Sludge	131	95	1	4
Water	15548	91	2	7

More than 90% of all organic analyses are within the ±2 propagated standard deviations of the experimental uncertainty and of the certified means. Table II shows that 87% of all extraction holding times and 97% of all instrument analysis holding times were met for organic analyses during 1992. On organic analyses, we currently monitor the rate of occurrence of false positives and false negatives, as well as the analyst's success in hitting the actual spiked concentrations. The false positive calculation is based upon data being reported that are two standard deviations above the detection limit for a particular method on a given day for compounds that were not intentionally spiked in the QC sample. A false negative occurs when a compound that was intentionally spiked in a QC sample is not detected or when the experimental result is more than two standard deviations below the actual amount added. Observations of false positives may represent unintentional contamination of the QC during preparation, storage, or analysis, and is not immediately identified as a purely analytical problem. Frequent recurrence of either false condition indicates that either an analytical procedure or a QC preparation procedure needs careful review. A summary table of false positive and false negative occurences is found in App. C, Table C-IV.

Table III summarizes our recovery information on organic surrogate compounds required for use in the Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) protocol. Approximately 90% of all surrogates analyzed were within the EPA limits.

A summary of the organic matrix spike compliance with EPA SW-846 criteria is given in Table IV. Approximately 94% of all matrix spikes analyzed were within EPA limits.

TABLE II. EPA CLP Holding Time Summary for January 1992 to December 1992

Organic Analysis Type	% Extractions Meeting EPA Criteria	% Instrument Analyses Meeting EPA Criteria	Total Number Analyses Performed
Volatiles in soils	92.5	100.0	719
Volatiles in waters	76.2	100.0	446
Semivolatiles in soils	91.8	100.0	1022
Semivolatiles in waters	90.5	97.5	398
Pesticides in soils	100.0	100.0	75
Pesticides in waters	100.0	100.0	7
Herbicides in soils	98.7	100.0	75
Herbicides in waters	83.3	100.0	6
PCBs in soils	73.2	100.0	276
PCBs in waters	67.5	67.5	40

TABLE III. Summary of Organic Surrogate Compliance for 1992

Surrogate Type	No. of Samples	Samples in-range (%)	EPA CLP Limits (%)
Pesticides in Soil			
Dibutyl chlorendate	99	94	20 - 150
Semivolatiles in Soil			
2-Fluorophenol	919	97	25 - 121
Phenol d6	919	99	24 - 113
Nitrobenzene-d5	919	98	23 - 120
2-Fluorobiphenyl	919	98	30 - 115
2,4,6-Tribromopehnol	919	96	19 - 122
Terphenyl-d14	919	95	18 - 137
Volatiles in Soil			
1,2-Dichloroethane d4	471	68	70 - 121
Toluene d8	471	90	81 - 117
Bromofluorobenzene	471	83	74 - 121
Pesticides in Water			
Dibutyl chlorendate	15	93	24 - 154
Semivolatiles in Water			
2-Fluorophenol	371	85	21 - 100
Phenol d6	371	91	10 - 94
Nitrobenzene-d5	371	90	35 - 114
2-Fluorobiphenyl	371	90	43 - 116
2,4,6-Tribromophenol	371	95	10 - 123
Terphenyl-d14	371	95	33 - 141
Volatiles in Water			
1,2-Dichloroethane d4	432	80	76 - 114
Toluene d8	432	84	88 - 110
Bromofluorobenzene	432	72	86 - 115

TABLE IV. Summary of Organic Matrix Spike Compliance for 1992

Surrogate Type	No. of Samples	Samples in-range (%)	EPA CLP Limits (%)
Pesticide MS on Soil			
Heptachlor epoxide	9	100	37 - 142
Endosulfan sulfate	9	89	26 - 144
alpha-BHC	10	90	37 - 133
beta-BHC	9	100	17 - 147
delta-BHC	9	89	19 - 140
Endosulfan II	9	100	0 - 202
4,4'-DDD	9	89	31 - 141
4,4'-DDE	9	89	30 - 145
Endosulfan I	9	100	45 - 153
Semivolatile MS on Soil			
4-Nitrophenol	85	95	11 - 114
1,4-Dichlorobenzene	85	95	28 - 104
Phenol	85	95	26 - 90
1,2,4-Trichlorobenzene	85	95	38 - 107
2,4-Dinitrotoluene	81	90	28 - 89
Pyrene	85	95	35 - 142
4-Chloro-3-methylphenol	85	95	26 - 103
N-Nitroso-di-n-propylamine	83	94	41 - 126
Acenaphthene	85	98	31 - 137
Pentachlorophenol	85	95	17 - 109
2-Chlorophenol	85	95	25 - 102
Volatile MS on Soil			
Toluene	50	100	59 - 139
Chlorobenzene	50	100	60 - 133
Benzene	50	94	66 - 142
1,1-Dichloroethene	50	90	59 - 172
Trichloroethene	50	100	62 - 137

TABLE IV. Summary of Organic Matrix Spike Compliance for 1992 (cont)

Surrogate Type	No. of Samples	Samples in-range (%)	EPA CLP Limits (%)
Pesticide MS in Water			
Heptachlor epoxide	4	100	37 - 142
Endosulfan sulfate	4	100	26 - 144
alpha-BHC	4	100	37 - 133
beta-BHC	4	100	17 - 147
delta-BHC	4	100	19 - 140
Endosulfan II	4	100	0 - 202
4,4'-DDD	4	100	31 - 141
4,4'-DDE	4	100	30 - 145
Endosulfan I	4	75	45 - 153
Semivolatile MS in Water			
4-Nitrophenol	25	88	10 - 80
1,4-Dichlorobenzene	22	82	36 - 97
Phenol	24	100	12 - 89
1,2,4-Trichlorobenzene	24	83	39 - 98
2,4-Dinitrotoluene	27	93	24 - 96
Pyrene	29	93	26 - 127
4-Chloro-3-methylphenol	29	90	23 - 97
N-Nitroso-di-n-propylamine	26	85	41 - 116
Acenaphthene	26	89	46 - 118
Pentachlorophenol	27	100	9 - 103
2-Chlorophenol	24	92	27 - 123
Volatile MS in Water			
Toluene	66	99	76 - 125
Chlorobenzene	66	100	75 - 130
Benzene	66	83	76 - 127
1,1-Dichloroethene	59	90	61 - 145
Trichloroethene	66	89	71 - 120

I. INTRODUCTION

I. INTRODUCTION

A. Group Mission

The analytical chemistry activities in EM-9 are diverse and encompass industrial hygiene, environmental surveillance, compliance and restoration, bioassay, industrial waste water, and US Transuranium Registry (USTR) tissue studies. This report is the ninth in an annual series from the Environmental Chemistry Group (EM-9) of the Environmental Management (EM) Division and succeeds those issued previously by the Environmental Protection Group.[1]

The mission of our group at Los Alamos National Laboratory (LANL) is to provide qualitative and quantitative analytical data to health physicists, industrial hygienists, environmental surveillance scientists, environmental compliance managers, environmental restoration operable unit project leaders, epidemiologists, waste managers, and waste treatment plant operators. These data describe concentrations of materials in samples submitted for analysis. Incorrect results may lead to erroneous interpretation by management or operations personnel, which could adversely affect the health and safety of exposed personnel or could affect Laboratory compliance with environmental and waste disposal regulations.

B. Quality Assurance Program Plan

EM-9 works under a formal written Quality Assurance Program Plan (QAPP). The written plan, along with appropriate supporting procedures, makes it less likely that actions that are known to be essential to superior performance will be neglected through oversight or the ever-present pressures of time, cost, and schedule. The Quality Assurance Program Plan is distributed to all EM-9 personnel as a controlled document and includes the following written procedures: (1) Indoctrination and Training, (2) Analytical Service Agreements, (3) Records Management, (4) Inspection and Testing Status and Tagging, (5) Nonconformance Reports, (6) Bioassay Analysis and Reporting, (7) Chain of Custody, (8) On-Site Transportation of Environmental Laboratory Samples, (9) Corrective Action System, (10) Internal Audits, (11) External Audits, (12) Qualification and Certification of Audit/Appraisal Personnel, (13) Document Control, (14) Calibration Control System, (15) Disposal of Samples, (16) Chemical Inventory System, (17) Property Management of Precious Metals, (18) Archive Database Access and Data Modification, (19) Storage of Standards, Samples, and Sample Extracts, (20) Chemicals, Reagents, and Solutions, (21) Stop Work Request, and (22) Root Cause Analysis.

The laboratory quality assurance (QA) plan makes clear to all members of EM-9 the standards that the group intends to maintain. It also provides for continuity in maintaining those standards as the membership of the group changes. Because the plan is periodically reviewed, the group can regularly evaluate the effectiveness of its quality activities, eliminate ineffective procedures, and consider the advisability of any new measures. Finally, the plan provides documented evidence of our commitment to excellence in all facets of our analytical work. Successful implementation of the plan depends on the cooperation and support from all levels of management and staff. An effective QA program will enhance confidence in our work for the internal and external organizations that support us, and for the public.

An outgrowth of the quality assurance program plan is the formal corrective action system that adddresses conditions adverse to quality. This system uses corrective action requests (CARs) to ask the appropriate manager to identify the cause of the condition and to document the corrective action taken to preclude repetition of the problem.

One of the fundamental responsibilities of EM-9 management is to maintain a continuing program to ensure the reliability and validity of analytical laboratory data. The QA program addresses small, single-investigator projects (in which one person conducts all sampling, analytical, and interpretive functions) through large-scale facilities-monitoring programs requiring year-to-year continuity. We believe that a QA program should apply to all aspects of sample and information management. The program should begin at the inception of a project, follow through collection and storage of samples before analysis, include all phases of chemical and physical analyses, extend through interpretation and data entry into the EM-9 laboratory information management system (LIMS), and conclude with the final reporting of results.

We use two concepts in our QA program to provide confidence in each analytical result reported by our laboratory: quality control, the mechanism established to control errors, and quality assessment, the system used to verify that our entire analytical process is operating within limits we consider acceptable.

Our goal is to include the following elements in our QC program: (1) development of and adherence to principles of good laboratory practice, (2) consistent use of standard operating procedures, and (3) establishment of and adherence to carefully designed protocols for specific analytical processes. Consistent use of qualified personnel, reliable and well-maintained equipment, appropriate calibrations and standards, blind QC samples, and close supervision of all operations are primary components of our QC system. Proper conception and execution of this QC program have resulted in our analytical system operating in a state of control, in which errors are within acceptable levels and are characterized statistically.

Quality assessment describes the techniques we use to assess the quality of our analytical process. We have established a system of control charts, which are plots of multiple data points from the same or similar samples versus time. These charts are used to determine if our system is in a state of statistical control and to visualize and monitor the relative variability of repetitive data. These control charts are also used with reference materials and spiked samples to assess the accuracy of our measurements. These concepts are further discussed by Keith et al.[2] A complete listing of definitions of terms, acronyms, and abbreviations used in this report along with standard quality assurance and statistical terms used routinely by EM-9 is given in App. A. This listing was compiled from the EPA, the National Institute of Standards and Technology (NIST), formerly the National Bureau of Standards (NBS), and the Department of Energy (DOE).[3-5]

C. Analytical Quality Assurance Philosophy

The approach to QA in our analytical chemistry operation is based firmly on the concept of traceability through concurrent analysis of matrix-based certified QC materials. Traceability is a hierarchical system developed largely for regulatory purposes whereby transfer of accuracy among various components or institutions of a measurement system is established. Uriano and Gravatt[6] have examined this concept in detail. Taylor[7,8] has pointed out that this process has its limitations because the achievement of an acceptable result on a reference material does not guarantee a unique foundation for the result. Traceability may more often be based on inference than on firmly established scientific fact.

Laboratory policy[9] is to maintain traceability to NIST, which in turn maintains traceability to international metrology standards where applicable. We cannot achieve this traceability in all cases because NIST has limited resources for certification of matrix-based standard reference materials (SRMs) for as many elements and compounds as we need to measure.

We have a large library of over 300 reference materials from other national and international agencies [EPA, US Geological Survey (USGS), DOE Environmental Measurements Laboratory (EML), Canadian Geological Survey (CGS), Canadian Certified Reference Materials Project (CCRMP), International Atomic Energy Agency (IAEA), Centre de Recherces Petrographiques et Geochimiques, and the Japanese Geological Survey] in addition to the available NIST biological and environmental SRMs. Secondary QC materials are prepared in-house. All reference materials are inventoried and are organized by agency (for example, NIST, USGS, IAEA, EPA, etc.) to facilitate retrieval of the materials. As materials are expended and as new materials are received, databases are updated to accurately reflect the supply of reference materials in our library.

Some agencies recommend that splitting and analysis of duplicates on 5% of the samples is sufficient QC. We believe that this approach is inadequate, providing at best only an assessment of precision, not accuracy. Our alternative is concurrent analysis of reference materials of similar matrix with every batch of samples. In this fashion, both precision and accuracy may be assessed, and traceability to a national standards laboratory is maintained. Because the compositional properties of these reference materials simulate those of the samples routinely measured, their correct measurement can imply correct measurement of routine samples. When sufficient quantities of reference materials are not available, we develop our own secondary materials that are traceable to agency reference materials where possible. Participation in intercomparison studies is a necessary but not sufficient component of our QA program because these samples appear too infrequently to ensure that day-to-day control is maintained. We strive to run a minimum of 10% of all analyses as either matrix-based QC reference materials or in-house-developed materials.

Certain agencies are attempting to legislate QA through promulgation of analytical methods regulations, through licensing requirements for analysts, and through laboratory certification programs. The rapid pace of technological change in chemical instrumentation, the wide variety of sample matrices, and the broad dispersion of procedures throughout the literature make it difficult to establish a definitive method for any given determination that is not soon outdated. Licensing and certification address the qualifications of personnel and the adequacy of facilities on an infrequent basis and do not address the day-to-day data quality. A preferable alternative to the legislative approach to QA management is the development and implementation of a detailed, yet flexible QA program. Such a program would permit each laboratory to use its existing expertise and facilities, to employ a variety of methods in the solution of ever-changing problems, and to encourage continuing innovation and adoption of the latest technology.

II. QUALITY ASSURANCE OBJECTIVES AND POLICIES

II. QUALITY ASSURANCE OBJECTIVES AND POLICIES

The purpose of the analytical QA program in EM-9 is to continually monitor the scientific reliability (accuracy and precision) of reported laboratory data that are generated for use in EM Division activities related to health and the environment. These data are also used by other organizations both within and outside the Laboratory.

Specific QA program objectives are (1) to assess the capabilities of analytical methods for meeting users' needs regarding precision, accuracy, sensitivity, and specificity; (2) to establish and monitor the routine operational performance of our laboratory through appropriate systems checks for ensuring that all aspects of the QA program are operative; (3) to run blind intercomparison samples for external evaluation of our laboratory; (4) to participate in collaborative test programs with peer laboratories to achieve and maintain consistent and uniform levels of quality; and (5) to perform corrective actions as necessary.

A. Quality Assurance Program Policies.

1. *Frequency of quality control.* Blind quality control materials, prepared by the QADM Section, will be a minimum of 10% of all analyses. Bench-level QC is the responsibility of each analyst. QC materials will be run with each batch and will include reagent blanks or samples that represent an appropriate blank.

2. *Program QACHECK.* Analysts will check with the QA officer or QA computer database (through program QACHECK) to determine whether their analyses are under control for a particular batch. Appendix D contains a printed copy of this program and shows a typical terminal session.

3. *Under-control conditions.* Analyses are considered under control if the absolute value of the difference between our result ($\overline{X}_e$) and the certified or consensus mean ($\overline{X}_c$) is within the propagated standard deviation of the experimental uncertainty (U_e) and of the certified means (S_c). N is equal to the number of measurements on a sample and in our case is equal to 1. This concept is formulated in Eq. (1) and is an adaptation of Dixon and Massey to include the experimental uncertainty.[10]

$$z = \frac{|\overline{X}_e - \overline{X}_c|}{\sqrt{(U_e)^2 / N + (S_c)^2}} \qquad (1)$$

The test statistics used in this document are based on 5% and 0.2% levels of significance. The respective critical regions are defined using the z statistics 2 and 3. Data having a calculated z value ≤ 2 are accepted as in control at the 5% level of significance. Data that have a calculated z value > 2 and ≤ 3 are considered at the warning level. Data with a z value > 3 are considered out of control. This criterion is also incorporated in the QACHECK computer program. Quality assurance tests for analyses completed during 1992, which used Eq. (1), are reported in App. C, Tables C-I to C-III.

4. *Out-of-control conditions.* Analyses that are out of control by criterion 3 are not reported to the SAMPLES database or the requesting investigator and are performed again on new aliquots of the original sample, if that sample is available.

5. *Assessing analytical performance.* An additional approach for assessing overall performance on a variety of QC materials over longer times (for example, annually) involves the calculation of the mean of the ratios of $X_e/\overline{X}_c$ as a function of analysis and matrix types. These data are summarized as a mean ± one standard deviation for each determination in each matrix type, and σ is the standard deviation of the ratios [Eq. (2)]:

$$\frac{\sum (X_e \ / \ \overline{X}_c)}{n} \pm \sigma \quad . \qquad (2)$$

Results of this mean ratio approach for stable element, radiochemical, and organic analyses for all 1992 QC measurements made by EM-9 are shown in App. C, Tables C-I to C-III. All raw data used for these calculations, the certified or consensus values, and the sources of the reference materials are given in App. E, Tables E-IV and E-VI. Summaries of analytical determinations on NIST, CCRMP, and USGS reference materials are also given in this appendix in Tables E-I to E-III. Appendix F (Figs. F-1 to F-8) contains plots showing 5-year trends for routine analyses that have sufficient ratio data for evaluation, plots of 5-year trends in various EPA Quality Assurance Programs, and plots of percent recovery data for organic surrogates. Appendix B (Tables B-I to B-III) summarizes inorganic, radiochemical, and organic compound analyses completed by EM-9 in 1992.

6. *Analytical procedure control.* Reliable, verified analytical techniques, drawn primarily from the EPA, American Association of Official Analytical Chemists, American Society for Testing Materials, NIST, and similar sources, are used. Standard methods, however, do not ensure accuracy and may in fact provide false confidence. Methods often include an assemblage of techniques that do not fully address potential problems caused by samples containing, for example, large quantities of total dissolved solids. We continually develop improved procedures, which are verified through successful analyses of various agency reference materials and of duplicate and spiked samples of the same matrix as those being routinely analyzed before the procedure becomes part of our routine analytical program. All data compiled in the validation study is to be kept in a Laboratory notebook and should be summarized in the accuracy and precision section of the analytical procedure. All procedural development should be justified and planned before it is undertaken.

All EM-9 analytical procedures have been under a document control system since 1991. This system is described in detail in EM-9's Administrative Procedure AP-15, "Document Control." Each procedure is printed on special paper that has CONTROLLED printed in red at the top of each page. Each manual is numbered and is assigned to a specific individual. Document control in the analytical laboratory is needed to ensure that personnel have current methods, specifications, and standards and that documents are not obsolete. A document control system establishes controls to ensure that (1) analyses and calibrations are carried out in accordance with the latest analytical document issue; (2) an effective communication system among personnel is developed; (3) a central storage, issue, and

archival point for analytical documents and changes is established; and (4) the legal and accreditation requirements are met. Our current methods used for routine analytical work are contained in Gautier.[11] Each method has a unique number, and the manual is in loose-leaf form so that new methods can be added and obsolete methods removed. EM-9 uses the analytical protocol required by the customer to meet the specific needs of their programs. For example, SW-846 methodology is used for solid waste and the environmental restoration program.

7. *Laboratory notebooks.* The distribution of Laboratory notebooks used for raw data collection is recorded in the NOTEBOOK database. This database contains the notebook number, dates it was in use, analyst number, where the notebook is located, and a brief description of the contents. The analyst number is a unique number assigned to each analyst employed by EM-9 and is stored in the analyst database along with the analyst's full name. All notebooks are bound and pages are consecutively numbered. All notebook entries are in ink; blank pages and large blank spaces are X'd; cancellation is by means of a single line that does not obscure the entry canceled; and all entries are dated and signed with full, legal signature (not initialed) at least once per page. The section leader periodically signs and dates the book, for example, "Read and understood, pp._____ to _____, John Smith, Section Leader, 3-27-92." Completed notebooks are stored by the QADM Section for two years. After two years the notebooks are sent to the Laboratory's records storage facility for permanent archiving.

8. *Analytical data packages.* Analytical results are stored in the EM-9 LIMS. All EM-9 analytical records were collected from the Laboratory's records storage facility, EM-9 storage areas, and from individual analytical sections' filing cabinets in August, 1991. All data was organized by request number. Since the regulated retention time for health and environmental data is 75 years and records storage space is at a premium, EM-9 looked into microfilming by the Micrographics Section of the Laboratory's Archives, Forms, and Records Management Group (CRM-1). Permission was sought from the National Archives and Records Administration to microfilm the records and then destroy the originals after inspecting the microfilm to satisfy 36 CFR (Code of Federal Regulations) requirements. This permission was granted on August 30, 1991. All analytical raw data now comes to the QADM Section along with the final analytical report after the data is reviewed by the analyst and the section leader. The QA officer reviews the data package, signs the report, and section personnel send the original report to the customer and file a copy of the report and the raw data by request number. AP-4, "Records Management," documents the maintenance, storage, and final disposition of EM-9 analytical records.

9. *Personnel training.* Users of analytical data have become increasingly concerned about the degree of proficiency of personnel working in the laboratory. As part of the quality assurance program, group training policy and procedures were documented in AP-1, "Indoctrination and Training," and a training database was set up on the VAX. Traditionally, training of technicians on analytical procedures has been informal and "on the job." We document this technical training by recording the dates on which a given individual was trained in specific

analytical procedures, viewed training tapes, etc. Similar records are kept of training of degreed personnel in the areas of seminars and meetings attended, special courses taken, or training in advanced instrumental techniques. Continued analytical proficiency is documented for each analyst by having them analyze blind QC samples submitted with routine sample batches. These records are a valuable tool in assessing the employee's analytical abilities. The section leader and the individual employee are responsible for keeping this database up to date.

B. Quality Control Guidelines for the Analysts in Our Laboratory.

1. *Reagents, chemicals, and glassware.* Use fresh reagents and chemicals. Chemical calibration or standardization depends critically upon the quality of the chemicals used to provide the necessary standard solutions and upon the care exercised in their preparation. Use clean glassware of appropriate calibration. Formalized guidance for the use of chemicals is given in AP-24, "Chemicals, Reagents and Solutions."

2. *Instrument calibration.* Analytical instruments are designated Category 2 measuring and test equipment (M&TE) by AP-16, "Calibration Control System," and are calibrated by the user. Calibrate instruments daily. Record calibration results in a bound notebook and date and sign the entry. Each instrument should have its own calibration notebook kept near the instrument. Calibrate, when possible, by regression analysis of the net signal on the analyte concentration. Measure in triplicate at least three different concentrations of calibration standards. However, we recommend using more than three different concentrations. The concentrations of these standards must bracket the expected concentration of the analyte in the samples. For instruments in which absolute linearity cannot be established (for example, atomic absorption spectrophotometers), use a calibration scheme of three standards per concentration decade. For example, run the following standard concentrations to calibrate over the region of 1-100 ppm: 1, 5, 10, 50, and 100 ppm. Record instrument response to the standards and compare with previous standards run under the same conditions to ensure that system response is not degrading. Record all instrument maintenance work in the notebook.

3. *Instrument linearity.* Do NOT report extrapolated results from instruments without evidence of linearity. Bracket all samples by two standards with concentrations near the expected concentration of the unknown and determine sample concentration by interpolation.

4. *Instrument operating procedures.* Use the written, updated, instrument operating instructions and logbooks available at the bench.

5. *Balance and weight calibration.* Calibrate balances and weights using standards traceable to NIST. AP-16 classifies balances and weights as Category 1 M&TE. EM-9 participates in a balance and weight calibration program run by the Standards and Calibration Group (MEC-8). Calibration of all balances and weight sets is achieved through the use of standards traceable to national standards. Values reported on weight sets are those that would be observed in comparing the weights to standards of density 8.0 g/cc in local air density of 0.923 mg/cc. MEC-8 states that

the balances will remain within the stated accuracy for one year and the weight sets for two years, provided they are used in accordance with generally accepted operational conditions. Calibration certificates are issued by MEC-8 along with calibration labels that are affixed to each balance and weight set.

6. *Analytical procedures.* Publish, distribute, and maintain current and complete analytical methods and procedures. All analytical procedures used by EM-9 are available at the bench. The Laboratory requires that these procedures undergo formal editing by the Information Services Division before they can be externally distributed. After completion of this editing process, procedures are issued as updates to LA-10300-M, "Health and Environmental Chemistry: Analytical Techniques, Data Management, and Quality Assurance."[11] The manual is issued in three-ring binders for ease in updating. To date, analytical procedures have been issued externally for the Radiobioassay, Radiotissue, Industrial Hygiene, Environmental, Waste Water Chemistry, and Quality Control sections of the manual.

C. Alpha Spectrometry Procedures for Calibration of Instruments and Standards.

During 1991, an operating plan was developed for use by the QADM Section to independently monitor the performance of the alpha counting equipment used for measuring concentrations of radionuclides in bioassay and environmental samples. Sixteen low-level electroplated alpha standards were prepared for use and data were collected. The ranges of alpha activity for the standards were 0.06, 0.10, and 0.30 pCi of ^{239}Pu and ^{241}Am. Each standard was prepared using 4 pCi of ^{242}Pu tracer. Preliminary measurements made in the Alpha-48 system suggested that the activity on the plates was equally characterized by all detectors in the counting system, and all data were within the ±2-sigma control limits established for the mean level of alpha activity after correction for tracer recovery. During 1992, additional data was collected on the other systems and control charts were prepared.

The Radiochemistry Section utilizes alpha tracer methodology using ^{242}Pu or ^{243}Am radionuclides to analyze for ^{238}Pu, ^{239}Pu, and ^{241}Am. Six alpha spectrometers, each equipped with 16 surface barrier detectors, are used to measure electroplated sample sources for their analyte and tracer alpha concentrations.

1. *Alpha spectrometer calibration methodology.* Sixteen secondary standards, designated No. 89-1-16 standards, are used to calibrate each detector weekly. Each standard has the following assigned concentrations: 11.77 Bq (706 dis/min) ^{242}Pu; 5.45 Bq (327 dis/min) ^{239}Pu; 16.87 Bq (1012 dis/min) ^{241}Am; and 2045 dis/min gross alpha. Estimates of the alpha concentrations for the three isotopes are determined from the percentage of the alpha counts in each isotope's energy spectrum relative to the sum of the alpha counts recorded in the three spectra. For example, 345 ^{242}Pu counts/min divided by 1000 summed counts equals 34.5% ^{242}Pu. Thirty-four and one-half percent of the standard's 2045 gross dis/min equals 706 dis/min of ^{242}Pu for the standard. Estimates of the ^{239}Pu and ^{241}Am alpha concentrations were similarly calculated.

Evidence of a detector's weekly calibration performance is relative to the following test parameters: (1) maximum energy peak position for each radionuclide per 128 storage channels set to collect at a 10-keV

response per channel, (2) full-width at half maximum (FWHM) alpha energy peak resolution, and (3) counting efficiency. A FORTRAN code, ALPHA, is used to reduce the calibration data.

2. *Background testing*. Stainless-steel blank planchets, identical to the planchets used to prepare the routine sample sources, are used for instrument background testing. Each detector is tested for evidence of a consistent background of four or less counts per 70,000 s for each radionuclide's designated alpha energy storage channels. The ALPHA code reduces the background data and maintains a running mean background count rate for each detector based on 10 previous measurements.

3. *Control charts*. The calibration and background data are displayed on Shewhart control charts to indicate the need for corrective action. Warning level data are ±2 standard deviations and out-of-control data are ±3 standard deviations beyond the calculated mean performance for each calibration parameter. Corrective actions are taken when calibration records and background checks indicate out-of-control measurements relative to 10 previous performance tests.

4. *Counting efficiency calculation*. A detector's percent counting efficiency is determined by the net counts per minute in an integrated, 19-channel storage spectrum (per a 10-keV energy calibration record designated for each of the standards' three isotopes) divided by the assigned concentration (dis/min) for each isotope. For example, 100 net counts of ^{239}Pu divided by 327 dis/min times 100 equals 30.6% counting efficiency. Estimates for the ^{239}Pu and ^{241}Am isotopes' counting efficiencies are similarly calculated. The average of the three isotopes' counting efficiencies is used to calculate each detector's mean counting efficiency factor for each calibration record. A running mean for each detector's mean counting efficiency is used to judge reproducible performance relative to 10 previous counting geometry records.

Estimates of a detector's counting efficiency made against a standard containing a single ^{239}Pu isotope demonstrated the validity of using the above method for calculating a detector's counting efficiency factor.

The counting efficiencies for the 16 detectors in each spectrometer system are calculated against the mean activity assigned for the 16 calibration standards rather than against each standard's individual alpha activity. This procedure is used to facilitate data reduction by the ALPHA computer code, which was written to use a single calibration source. The original intention was to modify the computer code to identify each of the 16 standards' gross and individual isotope alpha activity estimates. However, because of the requirement for a weekly calibration record and because the difference between the individual standards' gross activity and the mean gross activity for the 16 standards was less than 5%, it was concluded that the code could be used without making extensive modifications.

We recognize that the use of the mean gross alpha activity, rather than individual gross activities, to calculate each detector's average counting efficiency contributes a bias in the calculated estimate of each sample's tracer recovery. However, because tracer recovery is not reported to the customer and does not affect the reported

concentration of the analytes, use of the mean for calibration is an accepted practice. Additionally, because tracer recovery data are used primarily to monitor the analytical procedure and to evaluate analyst performance, highly accurate estimates of tracer recovery are not especially critical.

5. *Tracer recovery yields.* Tracer recovery yields, expressed as percent chemical recovery of tracer added to a sample, are calculated from the net tracer counts per minute divided by the detector's calculated assigned counting efficiency and the concentration (dis/min) of tracer added. For example, 2.43 net tracer counts/min ÷ (0.305 counting efficiency × 9 dis/ min of tracer) × 100 equals 88% tracer recovery.

   The current overall mean tracer recovery for the Pu and Am bioassay analytical procedures average 88% ± 6% standard deviation. Recoveries that are less than 70% and greater than 110% are reviewed for evidence of poor energy resolution or other factors that may contribute to significant errors in the reported data, e.g., records identifying sample spillage, source preparations that degrade the energy spectrum, or evidence suggesting a double spike of the tracer. Measurement data that are subject to apparent or suspected instrument failure are recounted after evidence for in-control instrument performance is reestablished.

6. *Sources of bias in reported tracer recovery data.* The tracer yield provides a means to monitor analysts' performance and to provide evidence that the spectrometer operated in an in-control mode during the sample measurement process. The FWHM resolution of the routine sample source's energy spectra will generally be comparable replicates of the calibration source's FWHM resolution. If the sample source's FWHM resolution is broader than the calibration source's FWHM, there may be a low bias in the reported tracer yield. This matter is not considered highly significant unless the tracer and analyte spectra overlap each other. In the case of questionable spectrum resolution, the sample should be reanalyzed or a new sample should be requested for reanalysis. As stated earlier, the use of a common assigned alpha concentration for the three isotopes in each of the 16 standards introduces a source of bias in the reported tracer yields.

7. *Analyte concentrations.* Estimates of an analyte's alpha concentration, for example ^{239}Pu, are corrected for chemical loss by dividing the net analyte counts per minute by a ratio factor derived from the net tracer counts per minute divided by the concentration (dis/min) of tracer added. For example, 0.085 net analyte counts/min ÷ (2.43 net tracer counts/min ÷ 9 dis/min of tracer) equals 0.31 dis/min analyte concentration. The analyte energy spectrum and tracer energy spectrum will always be replicates of each other. Therefore, the accuracy of the certified alpha concentration of the tracer is critical for calculating the estimate of the analyte's alpha concentration.

8. *Calibration standard history.*

   a. **Plutonium-236 tracer: 1965-1974.** Beginning in 1965, with the use of ^{236}Pu tracer, a single multi-isotope standard containing approximately 1200 dis/min of gross alpha activity (divided equally between the ^{236}Pu, ^{239}Pu, and ^{238}Pu isotopes) was used for calibration and to establish each detector's counting efficiency factor. The standard, designated Standard Alpha No. 1 (an

electroplated stainless-steel source with a 7-mm-diam plated area), was a likeness of sample sources obtained from the radioanalytical procedures. This standard was calibrated each month in a gas-flow proportional counter for its gross alpha activity relative to NIST SRM alpha standards. Correction for the decay of the ^{238}Pu was applied each year. The assigned alpha concentrations of the three Pu isotopes were determined as described above for the 89-1-16 standards, and the procedure for their use to calibrate each spectrometer was also identical to that described above. The ALPHA code was written to reduce the calibration data obtained against the No. 1 standard.

b. **Plutonium-242 tracer: 1970s.** With the availability of ^{242}Pu tracer in the 1970s, an electroplated, electropolished (7-mm-diam plated area) secondary standard containing approximately 1800 dis/min of gross alpha activity (divided equally between the ^{242}Pu, ^{239}Pu, and ^{238}Pu isotopes) was prepared. This standard, referred to as Boyd's standard, was calibrated once a month in a gas-flow counter for its gross alpha activity relative to the NIST SRMs. Correction for the decay of the ^{238}Pu was applied each year. The assigned alpha concentrations of the three Pu isotopes were determined as described above. Each detector in each spectrometer (three spectrometers with 16 detectors each) was calibrated as outlined above. The ALPHA code was modified to accept the alpha concentrations for this standard.

c. **Sixteen standards: 1980s.** In the 1980s, with the purchase of two additional multidetector spectrometers, each with 16 alpha detectors, a set of 16 electroplated secondary standards (7-mm-diam plated area) containing approximately equal amounts (600 dis/min) of ^{242}Pu, ^{239}Pu, and ^{238}Pu was prepared. The 16 standards, referred to as Ide's Standards, were required in order to achieve a weekly calibration record for the five instruments. The assigned concentrations of the three Pu isotopes were determined for each standard as described above for the 89-1-16 standards.

The 16 calibration standards were re-certified for their gross activity on a quarterly schedule against NIST SRMs by measurements made in a gas-flow proportional counter. The gross alpha activity from the quarterly measurements was averaged, and a new estimate based on the measurements was entered into the ALPHA code on January 1 of each year.

d. **New standards: 1989.** In 1989, with the use of a 10-mm-diam plating area for the routine sample source preparations, a set of 16 stainless-steel, electroplated, electropolished standards designated No. 89-1-16 standards (10-mm-diam plated area) was prepared. The ^{241}Am radionuclide, rather than ^{238}Pu, was used to minimize the change in the gross alpha activity due to the decay of ^{238}Pu. The new standards were used to calibrate the spectrometers as outlined above.

The ^{242}Pu used to make these standards contained a small quantity of ^{238}Pu alpha activity, <1% of the gross alpha estimate. Therefore, the gross alpha concentrations for these standards are reassigned on a yearly schedule to

correct for the ^{238}Pu decay. The mean gross alpha activity for the 89-1-16 standards determined in January 1990 was 2074 ± 58 dis/min. The assigned mean gross activity for 1992 was 2045 ± 65 dis/min.

The 89-1-16 standards are recalibrated monthly in a gas-flow proportional counter against NIST SRMs. The recalculated mean gross alpha activity and the recalculated estimates of alpha concentrations for the three isotopes are entered into the ALPHA code in January of each year. As was the case for the previously used Ide's standards, the difference between the 89-1-16 standards and their mean gross alpha activity was less than 5%. This source of bias in calculating each spectrometer's 16 detectors was recognized and accepted in order to achieve a weekly calibration record for each counting system.

D. Quality Control Guidelines for Radionuclide Counting Instrumentation.

A formal documented quality assurance program is in place for all nuclear counting systems used by EM-9. This includes the alpha and gamma spectrometer systems and the liquid scintillation, gas-flow proportional, and zinc sulphide counters. This program is in compliance with current EPA and DOE regulations concerning calibration, background, and efficiency measurements, and provides a measure of the performance of the various systems. These data will provide accurate records of each system's performance and will document when a system has mechanical/electrical problems that should be investigated and remedied.

1. *Alpha spectrometer systems.* Background and calibration databases are maintained that contain 10 measurements from which a running average is calculated. Each new calibration and background are compared against the database mean and standard deviation for each detector. New calibration and background data are not added to the database if they show evidence of out-of-control conditions. Because each system and each detector in the system is independent, control charts are kept on each detector for the spectrum of interest. Appendix H (Tables H-I to H-IV) shows four quarters of 1992 data. Tables H-V and H-VI show data on the 16 plates used for all routine alpha spectrometer calibrations. Changes in the counting efficiency, other than random fluctuation, are documented in Laboratory notebooks A8192 and 10105 and are generally due to a detector being replaced or needing cleaning, electrical power surges and outright failures, vacuum system leaks, and electronic noise. When a detector is replaced, new parameters are established based on 10 measurements before the background and calibration data are utilized. The count room QC program developed for our seven alpha spectrometer systems is described below.

   a. **Backgrounds.** Run at least one 70,000-s background per week on each system. Environmental samples use an 80,000-s background. Keep a QC chart for each detector showing counts for the ^{238}Pu, ^{239}Pu, and ^{242}Pu areas (Fig. H-1). The background count distribution in these areas of the spectrum, for each detector, is described by a Poisson distribution.

      (1) Probabilities. Apply probabilities associated with the upper 99% limit of the mean count for each detector

to determine out-of-control conditions.

(2) Corrective action. Take corrective action if individual background counts are greater than four for two consecutive counts for the ^{239}Pu areas. The ^{238}Pu areas average four counts in 70,000 s. A measurement of two consecutive counts out of nine is considered out of control. The detector shall be cleaned or replaced when an out-of-control state is noted.

(3) Bioassay samples. The desired detection limit, at the 0.05 confidence level, for the plutonium bioassay procedure is 0.03 pCi per 700-mL sample. To detect this concentration in routine samples, apply the following conditions to the sample for acceptance of individual sample control: 700-mL sample volume, ^{242}Pu tracer recovery greater than 40%, detector efficiency greater than 30%, count length of 70,000 s (1167 min), and background counts of two or less in 70,000 s.

(a) The calculation for the detection limit of the minimum detectable amount (MDA) of activity, based on Currie,[12,13] is

$$MDA = \frac{\sqrt{2} \times 4.65 + 2.71}{1167 \times .40 \times .30 \times 2.22}$$

$$= 0.03\ pCi/700\ mL\ . \qquad (3)$$

(b) Because the ^{242}Pu tracer recovery averages greater than 85%, the detection limit for the majority of the samples analyzed is 0.01 pCi/700-mL sample.

(4) Environmental samples. The desired detection limit, at the 0.05 confidence level, for environmental samples is 0.03 pCi/aliquot of sample. The calculation for the detection limit of the MDA of activity is based on Currie.[12,13]

b. **Calibrations.** Run at least one calibration per week on each system and keep a QC chart for each detector (Fig. H-2). Use the set of 16 matched plates, which are calibrated against NIST SRM 4906-B33, a ^{238}Pu standard plate. The 16 calibration plates are electropolished and electroplated standards prepared in 1989. These new standard plates were prepared so that the calibration plates would more closely approximate the routine samples submitted for counting. The standard plates contain 706 dis/min ^{242}Pu, 327 dis/min ^{239}Pu, and 1012 dis/min ^{241}Am and ^{238}Pu. Because these plates contain a trace amount (< 1%) of ^{238}Pu, they will be evaluated each year for ^{238}Pu decay. Apply the following criteria to evaluate whether an out-of-control condition exists for calibration data:

- One point outside the 3-sigma control limits.
- Eight successive points on one side of the mean (or 10 out of 11, or 12 out of 14).
- Two out of three successive points between ± 2 and 3 standard deviations from the mean.

- Four out of five successive points between ± 1 and 2 standard deviations from the mean.

- A definite trend in the data.

Calibration records date to 1953. The ^{239}Pu standard, No. 2B, was prepared by what was then the Chemical Metallurgical Research Group (CMR-1). The electroplated plutonium is contained in a 1-in.-diam area on a 2-in.-diam platinum-plated copper disk. The original estimates and subsequent measurements of the gross alpha activity on this standard, made in a 2π gas-flow proportional counting system, are given in Table H-VII. An alpha-energy spectrum made of this standard in 1990 demonstrates that 97% of the total alpha activity is consistent with decay energies of $^{239/240}Pu$ (5.11 and 5.16 MeV). The remaining 3% was associated with the energies of ^{238}Pu (5.46 and 5.5 MeV). Based on alpha-energy peak locations and ratios of the alpha counts under each peak area, we conclude that the standard's alpha activity results from decay of ^{238}Pu and $^{239/240}Pu$ radionuclides. The measurement was made using a 300-mm surface barrier detector rated to give an alpha particle resolution of 19.7 keV. The data demonstrate 20-keV energy resolution. This energy resolution was achieved at a sample-to-detector separation of 2.7 cm and a counting geometry of 1.3%.

The percent alpha activities of these two isotopes of plutonium, back-calculated to 1953, show that the plutonium electroplated on this source is characteristic of isotopic ratios for plutonium processed at Los Alamos in the 1950s, i.e., the gross alpha activity is ~3.8% ^{238}Pu (~0.02 at. %) and 96.2% $^{239/240}Pu$ (~98 at. %). The measurement made in 1990 suggests that the gross activity for this standard has decreased by about 1% over the 38-year study period due to the decay of the ^{238}Pu. Information obtained from D. W. Efurd,[14] of the Nuclear and Radiochemistry Group (INC-11), provided information on the isotopic atom percent of plutonium processed at Los Alamos during the years 1944, 1951, 1952, 1957, and 1968, as shown in Table V. The data may be used to explain changes noted for plutonium alpha reference standards as a function of time and their isotopic makeup. The information may also be of interest to health physicists evaluating occupational exposure to plutonium as a function of exposure date. The specific composition of plutonium associated with occupational exposures or bioassay analytical procedures should be established for exposure assessment.

NIST alpha standard SRM 4906-28 was obtained in 1973, and this standard or similar NIST SRMs have been used since 1973 as the primary alpha calibration standard for calibration of our gas-flow proportional counters. We have continued (from 1973 to the present) to reference measurements made against the NIST standards with measurements of the activity of standard No. 2B. The No. 2B standard was used to calibrate the instruments that were used for measuring the plutonium concentrations in bioassay urine samples collected from Los Alamos workers between 1953 and 1973. Before 1953, bioassay results were expressed in counts per minute because there was no

TABLE V. Isotopic Composition of Plutonium Processed at Los Alamos

Year Processed	Isotope	Average Atom Percent	High (%)	Low (%)
1944	Pu-238	below limit of detection[a]		
	Pu-239	99.9515		
	Pu-240	0.0482		
	Pu-241	0.0001		
	Pu-242	0.0002		
	Pu-244	below limit of detection		
1951	Pu-238	0.02	0.041	0.0006
	Pu-239	97.8	100.0	95.0
	Pu-240	2.1	4.8	0.04
	Pu-241	0.09	0.15	0.04
	Pu-242	not determined	—	—
1952	Pu-238	0.039	0.123	0.019
	Pu-239	97.7	99.9	96.5
	Pu-240	2.3	4.8	0.08
	Pu-241	0.12	0.27	0.05
	Pu-242	0.035	0.066	0.004
1957	Pu-238	0.009	0.011	0.0076
	Pu-239	94.2	95.2	93.5
	Pu-240	5.4	6.1	4.4
	Pu-241	0.41	0.49	0.33
	Pu-242	not determined	—	—
1968	Pu-238	0.011	0.019	0.004
	Pu-239	93.8	97.3	93.2
	Pu-240	5.7	6.1	2.6
	Pu-241	0.45	0.68	0.10
	Pu-242	0.021	0.023	0.0095

[a]Clinton (Oak Ridge) Plutonium measurement made on 01/15/82.
Other data measurements made during the year of processing.

standard available to relate counts to ^{239}Pu mass.

At the end of 1992, NIST standard 4906-28 was retired as the primary means of calibration on the gas-flow proportional counter. After careful examination of the data, it was found that the sample plate had decayed by approximately 1%. Even though this percent decay is minimal and has no significant effect on the routine data, it will be replaced with NIST SRM4906H-C12 (^{238}Pu) and 4904S-G80 (^{241}Am).

(1) Record keeping. Print copies of all calibration and background data. The count room manager will review and sign all data and give them to QA for approval before release to other data-reduction codes. Keep printed copies of calibration and background data indefinitely in notebooks.

(2) NIST standards. Use a NIST standard plate as the primary standard with which to calibrate secondary standard plates. Reference the same NIST standard plate in all computer data-reduction codes.

(3) Plate size. Use the 5/8-in. standard plate size with a 1/2-in. plating area.

(4) System names. Refer to the alpha systems as Alpha 16, Alpha 32, Alpha 48, Alpha 64, Alpha 80, Alpha 96, and Alpha 112. The Alpha 96 is calibrated for the measurement of uranium, thorium, and americium in addition to plutonium.

2. *High-resolution gamma spectroscopy systems.*

a. **Backgrounds.** Run at least one 50,000-s background bimonthly for each detector for each matrix (water, soil, and vegetation). Transfer the data to the VAX data storage disk and integrate the gamma-ray photopeaks of interest using the GAMS or NGAM data-reduction code. Record the results in a Laboratory notebook. Archive all background spectra to hard copy and store with the count room records.

b. **Energy calibrations.** Run one energy calibration per week on each detector after filling the detector Dewars with liquid nitrogen. Use either the NIST SRM 4370B ^{152}Eu solution or the NIST SRM 4218E ^{152}Eu point source as the full-spectrum energy source. Use three primary photopeaks (122-, 779-, and 1408-keV lines) for calibration. Transfer the spectrum to the VAX data disk and archive the data to hard copy. Record the information (date, analyst, detector, calibration line, etc.) in the lithium-drifted germanium detector (GeLi) calibration logbook. Plot the data semiannually to provide quality assurance documentation of the stability of the detectors (Fig. H-3).

c. **Efficiency calibrations.**

(1) Absolute efficiencies. For absolute efficiency determinations, obtain a broad-energy based standard solution, such as QCY.48 from Amersham Corporation. Calculate the appropriate activity level and spike directly on the matrix of choice. Matrix configurations utilized within the nuclear counting

facility include 500-mL liquid Nalgene bottles, 1-L Marinelli beakers, 100 g of vegetation or soil within a 500-mL Nalgene bottle, 2-in. filter media mounted on a standard stainless-steel planchet, and charcoal cartridges. Count these samples on at least an annual basis for 50,000 s for each matrix and/or configuration for each detector system. Transfer the data to disk, reduce the data using the GAMS or NGAM data-reduction program, and log the results into the efficiency notebook for the gamma-counting facility. Archive all data to hard copy.

(2) Relative efficiencies. Another technique is used in the gamma-counting facility to address system performance over time. Once a month, measure the ^{152}Eu (NIST SRM 4370B) point source at a fixed distance and position from the detector face on each of our six detectors. Reduce the spectra using the GAMS or NGAM data-reduction code to generate an efficiency for each of 11 different ^{152}Eu gamma energies present in the point source. Calculate the mean values of these efficiencies each month and compare them to those of the previous month. Plot the data to give a visual record of each detector's performance.

3. *Liquid scintillation counting systems.*

a. **Backgrounds.** Run triplicate background measurements with every sample set using "blank" deep-well water to determine background levels. The count length will vary according to the matrix and sample with which it is counted. Print the data file and tape the printed copy to the appropriate instrument performance assessment (IPA) notebook for archival data storage. Plot the data to determine if trends are present (Fig. H-4). This information is used to determine if the instrument parameters are operating properly or if the well water is contaminated.

b. **Quench curves.** Run a quench curve at least biannually. A standard set that contains a known amount of ^{3}H, with varying amounts of quenching agent (ethyl iodide or sodium iodide) in each sample (n=10), is counted for 30 min. The automated program on the liquid scintillation counter will automatically generate a new quench curve with each sample set run. Print out the quench curve and tape the hard copy in the appropriate IPA notebook. The Spectral Index of External Standard values generated by the program are copied to other programs that are in use to provide those programs the most current quench curve information.

c. **Efficiency calibrations.** Run an efficiency measurement each week to provide an alternate measure of system performance. Run standards, analyze trends, and record data in the liquid scintillation counter IPA verification notebook. If the variation of the standards exceeds ±15% and/or the value of the standard is less than 60% for the 2200CA or the 2500TR liquid scintillation counters, the systems are considered to be operating outside the allowable performance parameters and are in need of alignment or repair. See Fig. H-5 for a representation of what an efficiency curve should look like.

d. **Figure of merit.** Another method of examining liquid scintillation system performance is the figure of merit (Fig. H-6). It is a numerical value calculated by dividing the efficiency squared by the background. This value indicates how efficiency and background interact and how the system measures an event in the presence of background. If this value goes below 150 (as determined by the manufacturer), the cause should be investigated and the system repaired.

4. *Gas-flow proportional counting systems.*

a. **Backgrounds.** There are currently five gas-flow proportional counting systems in use, each requiring varying times for background information collection. The alpha count room proportional counting systems count backgrounds for 30 and 300 min each week. The gamma count room proportional counting system has background counts run with each sample set. Record all data in the appropriate notebooks. This information is tabulated to show trends that may lead to corrective action as required.

b. **Voltage plateaus.**

(1) Alpha-counting facility. Run voltage plateaus each time a new argon/methane (P-10) or argon gas supply tank is put on the system or when instrumentation changes require a new plateau. There are four gas-flow proportional counting systems in the alpha counting facility. Three are windowless (two for alpha and one for beta) and the fourth is windowed and is dedicated to ^{90}Sr analysis.

(2) Gamma-counting facility. Create a new voltage plateau on a semiannual basis for the gamma facility proportional counter. This counter is set for both alpha and beta counting.

Plot the data for all systems, generating a curve of voltage versus count rate. The point at which the voltage is set is determined to be within 10% of the "knee" of the curve. Record these values in the appropriate notebooks for archival purposes.

c. **Efficiency calibrations.**

(1) Alpha-counting facility. Generate the efficiency values for the windowless gas-flow proportional systems on a weekly basis. For the alpha counting systems, measure NIST SRM 4906-B33 and 4906-B94 ^{239}Pu standards. Plot the data to determine if problems exist. See Fig. H-7. Count NIST secondary ^{210}Pb sources, nos. 7432 and 8357, on the beta counting system. Plot this data to determine if problems exist. See Fig. H-8. The windowed gas-flow counting system dedicated to ^{90}Sr analysis utilizes a secondary calibrated New England Nuclear ^{234}Pa source to monitor the relative efficiencies of each of the four detectors. Plot the data to monitor trends and to determine if the instruments are operating within acceptable limits. Record all data in the appropriate IPA notebooks.

(2) Gamma-counting facility. A different means of efficiency measurement is used in the gamma-counting facility. Because the samples have an associated

volume/mass, it is important to know the amount of self-absorption occurring within each sample. Calculate the self-absorption by counting a series of planchets with varying, known amounts of potassium salts (KCl) and plot the count rate versus the amount of precipitate on the planchet (precipitation curves). This curve yields an equation of the line that will allow the calculation of the correct activity on a planchet, regardless of the amount of mass associated with the sample. During 1993, we will begin examining our procedures for the determination of these mass/efficiency curves. Past practices dictated that the curve run from 0.025 to 2.0 g of residual mass. We are proposing that sample mass does not exceed 0.2 g of mass within the sample. This has caused a variation within our procedures and the chemistry must be changed to produce samples of this quality. Record all values in the appropriate notebooks for archival purposes.

d. **Relative efficiency measurements.** These data record relative performance of the gas-flow detectors over time.

(1) Alpha-counting facility. Measure a known set of secondary standards each week on the alpha and beta counters. System performance is measured by comparing the calculated value of these standards to their consensus values.

(2) Gamma-counting facility. Measure, with each sample set, a NIST secondary source of ^{239}Pu as the alpha standard and a NIST secondary source of $^{90}Sr/^{90}Y$ as the beta standard. Record the data in the counting notebook. See Fig. H-9.

e. **Quality control measurements.** A QC material should be counted on all systems to provide an additional measure of performance. The only counter among the gas-flow proportional counting systems to which this currently applies is the windowed counter located in the gamma counting facility. Data from a QC sample that was repeatedly measured during the year was plotted for alpha and beta performance to provide this additional oversight. See Fig. H-10.

5. *Zinc sulfide counting system.*

a. **Backgrounds.** Accumulate backgrounds each week. Count a blank planchet for 100 min on each of the eight detectors. Record the data in the appropriate notebook.

b. **Efficiency calibrations.** Take efficiency measurements each month. Perform the efficiency measurements using a NIST SRM 4904L-F83 ^{241}Am standard. Count the sample in triplicate for 10 min on each system. The mean value associated with the set of data will consist of the efficiency value for that particular detector. Log the data onto a data logging sheet and store it in the appropriate notebook.

c. **Relative efficiency measurements.** Measure a set of internal secondary standards (NIST-traceable ^{239}Pu) of known value each week. Record the calculated value of the standards in the appropriate notebooks. Examine the data to determine if trends are appearing.

Take the appropriate corrective action when necessary.

6. *Gross gamma counting system.*

   a. **Backgrounds.** Accumulate a series of at least three 5-min backgrounds with each sample set measured. Record the data on the data analysis sheet for use in determining final sample activity.

   b. **Efficiency calibrations.** Count in duplicate for 5 min either a soil or water matrix, prepared from a NIST 4233-B ^{137}Cs standard solution, with each sample set. Record these values on the data analysis sheet. These data are matrix dependent and are utilized in the data-reduction code to determine the counting efficiency for each sample set. The counting efficiency is used to calculate the activity of the samples.

   c. **Quality control measurements.** Count a QC sample (either soil or water) in triplicate for 5 min with each sample set. Record the data on the data analysis sheet. The data provide information on the performance of the counting system during the time that the samples are being counted. The measured QC value is divided by the calculated value providing a ratio that is used to judge system performance. If the measured QC value is in good agreement with the true value of the QC, the ratio should be close to one.

III. AUTOMATED NUCLEAR COUNTING FACILITY

III. AUTOMATED NUCLEAR COUNTING FACILITY

Our Automated Nuclear Counting Facility (ANCF), which automates sample changing, data collection, and data reduction for four high-performance germanium detectors, was completed during 1989. It utilizes software and computer-controlled hardware that provide the following functions: (1) keyboard entry of sample and counting parameters, (2) automated data acquisition, (3) manipulation of samples using robotics, (4) peak identification and spectral analysis, (5) report generation, (6) insertion of data into the SAMPLES database through the EM-9 LIMS, and (7) archiving of spectral data.

A. Automated System.

An EG&G ORTEC ADCAM multichannel analyzer (MCA) system is the center of functionality in the ANCF. The ADCAM system runs on a personal computer (PC) and allows the automation software to directly reference supporting files during the gamma analysis process. These files contain calibration, background, detector description, sample description, and nuclide library information. The automation software integrates the ORTEC MCA with the rest of the system to provide a completely menu-driven environment for the end user. It can process up to 72 samples per run with minimal human intervention. These samples may be of a variety of matrices that include water, soil, vegetation, charcoal cartridges, and filters. The sample carrier vessels manipulated by the robot are designed to accommodate the various sizes and shapes of sample matrices. The system analyzes the spectral data collected from each sample. The activity and uncertainty information may be reported based on activity per sample or on weight/volume. The ANCF saves significant personnel time, eliminates keyboard transcription errors, and dramatically reduces sample turnaround time.

B. System Configuration.

Four intrinsic germanium detectors are connected to the MCA and are mounted on a precision-machined aluminum table. The table is 15 feet long by 4 feet wide and supports a lead cave with a pneumatically controlled top door for each of the four detectors. The robot is manufactured by PRI and moves the length of the table on a rail using a rack-and-pinion drive. A rack designed to hold the 72 samples sits between the shielded caves. The MCA emulator runs on an IBM PC/AT clone using the DOS 3.3 operating system. The emulator communicates with the multichannel buffer (MCB) module, based in a Nuclear Instrumentation Module bin, via a PC-based interface card and shielded cable. The communication is either in the form of direct memory access or mailbox reads and writes. The mailbox allows the programmer to directly control the MCB to start the count, store the spectrum, and collect real-time and live-time values. The PC-based emulator enables storage and retrieval of the spectrum directly from the hard disk. Since the actual counting is buffered in the MCB, the PC can be used by the operator for other tasks. The PC can even be rebooted without affecting the operation of the MCB.

The PC is configured on an 80386 20-MHz platform. It uses a math coprocessor, 40 megabytes of hard disk space, and a 3.5-in. high-density floppy drive. The PC also contains 2 megabytes of RAM memory, part of which is sectioned off as a RAM disk. The RAM disk adds considerable computer

processing performance gains within the application because executable and library files that are often used (some of them as often as once per second) are stored there. In addition to the regular hardware on the PC bus, there is an MCB interface and an IBM transistor-transistor logic (TTL) (0 V dc or 5 V dc) interface with 16 bits of binary input and output. The TTL interface collects 4 TTL input signals, one from each cave door, and distributes 4 output signals. The automation software is synchronized with the robot through these signals. The two subsystems derive critical software flow control information based on the position of the cave doors. The automation software and the robot change the state of the cave doors when needed.

C. General Operation.

Each of the following paragraphs corresponds to a menu selection in the automation software.

1. A fast and flexible Lotus-style input screen allows the user to enter the following sample and count information: sample numbers, request numbers, sample owners, sample weights and/or volumes, count time, analyst, matrix, analysis nuclide list, calibration filename, and background filename. Upon exiting, a file containing this information is created and is used by subsequent parts of the automation software.

2. The second data input screen prompts the user to specify the exact gamma analysis parameters to be used in the analysis phase. These parameters include decay correction, use of minimum detection limits, background subtraction, sorption correction, calculations used to adjust the activities based on sample weight or volume, units for adjusted activity, and the type of uncertainty to report (activity, percent, or total).

3. The counting process begins with the third menu selection. It initializes the cave door position to closed, prompts the user for which caves to count from, and instructs the user to load samples into the rack in the same order as the sample numbers were added in menu selection one. After the robot is initialized, the sample run begins. At this point, a counting screen is displayed that contains the following information about each detector: MCA and segment number, cave number, number of samples to be counted, the current sample being counted, total count time, real time, live time, and dead time. The status of each cave is also displayed in terms of whether it is being used during this run or is disabled. The screen is updated each second to reflect new counting statistics. If dead time exceeds 20%, a yellow warning message for that cave is displayed. At any time during the run, the user may type control-Y and a small screen of three choices will appear on top of the counting screen. This screen allows the user to branch to DOS to perform any DOS operation, to invoke the MCA emulation to visually inspect the spectrum being counted, or to abort the count, specifying whether or not to erase the files created for that particular run. The user eventually exits DOS or the MCA emulator and automatically reverts back to the counting screen.

4. Menu selection four invokes a complex and sophisticated software application that analyzes the spectrum with the aid of numerous supporting files. These files contain calibration, background, detector description, sample description, and nuclide library information. The software produces a report file for each sample and ensures

that spectral data are analyzed consistently and accurately for each run. The user interface requires no keyboard input. The menu displays which reports have been processed, which report is currently being processed, and in which part of the analysis phase it is currently working (Convert, BackGround Strip, Analyze Spectrum, and Create Report). This information allows the user to determine the length of time needed for each part of the analysis and thus obtain an accurate estimate of when the process will be completed. Approximately 20 s are required per report.

5. In screen five, the automation software opens each report file, parses that file based on knowledge of how the report is formatted, and intelligently extracts each important data item required by the EM-9 QADM Section for insertion into the SAMPLES database. The activities associated with each nuclide in each report file are converted to results per weight or volume as specified by the user in menu selection one. If those activities are below minimum detection limits, a file is opened, based on the combination of sample matrix and detector. This file contains uncertainties derived from each nuclide within each specific matrix. When all reports have been parsed, the information gathered from them is stored in a single file with an .ENT extension.

6. VT100 terminal emulation software is invoked in menu selection six, creating a link to the VAX. The user logs onto the VAX and calls up the LIMS menu. PCENTER is selected to invoke a program written to process the .ENT files created in menu five. PCENTER stores the sample analysis information for each sample number and nuclide in the SAMPLES database and produces a log file for the user. This log file contains status information about the database update.

7. An additional software application was created to convert the raw spectrum files created by this system or any ADCAM system to MCA.DAT format. MCA.DAT files are directly compatible with all of the analysis and LIMS database insertion software residing on the VAX used by other analysts in the group. This allows downward compatibility between the new ANCF and the older gamma spectroscopy software used by EM-9.

8. An additional software module transfers sample and analytical data, contained in the reports generated by the automation software, to the EM9VAX-based LIMS database. This process involves parsing the report files with software that recognizes the report format and extracting pertinent data items. When all report files have been parsed, the activities and uncertainites associated with each sample and nuclide are adjusted to compensate for sample weight or volume. A single file is created with all of the information extracted from the report files and formatted for the PCENTER program. PCENTER processes the file and updates the appropriate LIMS database.

IV. QUALITY ASSURANCE MANAGEMENT AND COMPUTING RESOURCES

IV. QUALITY ASSURANCE MANAGEMENT AND COMPUTING RESOURCES

The quality assurance program is run by a QA officer, who heads an independent QADM Section within the group. The QA officer is responsible for carrying out our QA program and for taking or recommending measures to fulfill the quality objectives in the most efficient and economical manner possible, while ensuring continuing accuracy and precision of all data produced. The QA officer evaluates data as they are reported, prepares a written report quarterly about critical issues, and publishes this annual summary.

A. System Configuration.

Our ability to address this diverse mission is strongly based on our overall QA management system. Our computing facility consists of a Micro VAX 4000/300 central processing unit (CPU) clustered to a Micro VAX 3800, so that both CPUs share a total of 2 Gbytes of disk capacity (Fig. 2). The VAX 4000/300 is the primary LIMS processor, which schedules batch processing jobs on the 3800 when additional processing power is needed. There are three tape drives connected to the Micro VAX 3800 that provide backup and software update capability to the cluster. These tape drives are a tridensity 1600-BPI 9-track transport, a 2.4-Gbyte 8-mm drive, and a TK70 120-Mbyte drive. The VAXes are connected to a local area network (LAN) running the local area transmission (LAT) and DECnet protocols. The LAN also has connected to it eight 8-port terminal servers. These servers interface terminals, personal computers, data acquisition stations, and printers to the VAXes. Additionally, the LAN has PCs connected to it that are running Digital's Pathworks for DOS network software. These PCs function as network clients being served by the VAXes in the cluster. They have print and file services available to them and are able to transfer data at 10 Mbits/s or approximately 3 Mbytes of data per minute.

Our system manager and information management staff maintain over 400 existing programs and 160 data tables containing over one million records. Our in-house LIMS has been structured around the VAX Datatrieve software system, which permits users to tailor databases and interactive software to suit their particular needs. A primer entitled "Introduction to VAX/VMS" is distributed to EM-9 users. It is an extensive introduction to the VAX/VMS operating system that consolidates a vast amount of usable information from numerous reference manuals.

B. System Backups.

The EM-9 data processing environment receives many daily updates to large databases. It can be difficult to back up these files during normal working hours due to the number of open files and to the verification errors that result. Since so much of the information on the disks changes each day, it is important to back up that information on a daily basis. A complete backup system includes both incremental backups (involving only the files that have changed since the last time backups were done) and image backups (involving all files on all disks, maintaining the directory tree structures). Historical image backup save sets are also necessary so that old raw data files from years past can be restored to disk.

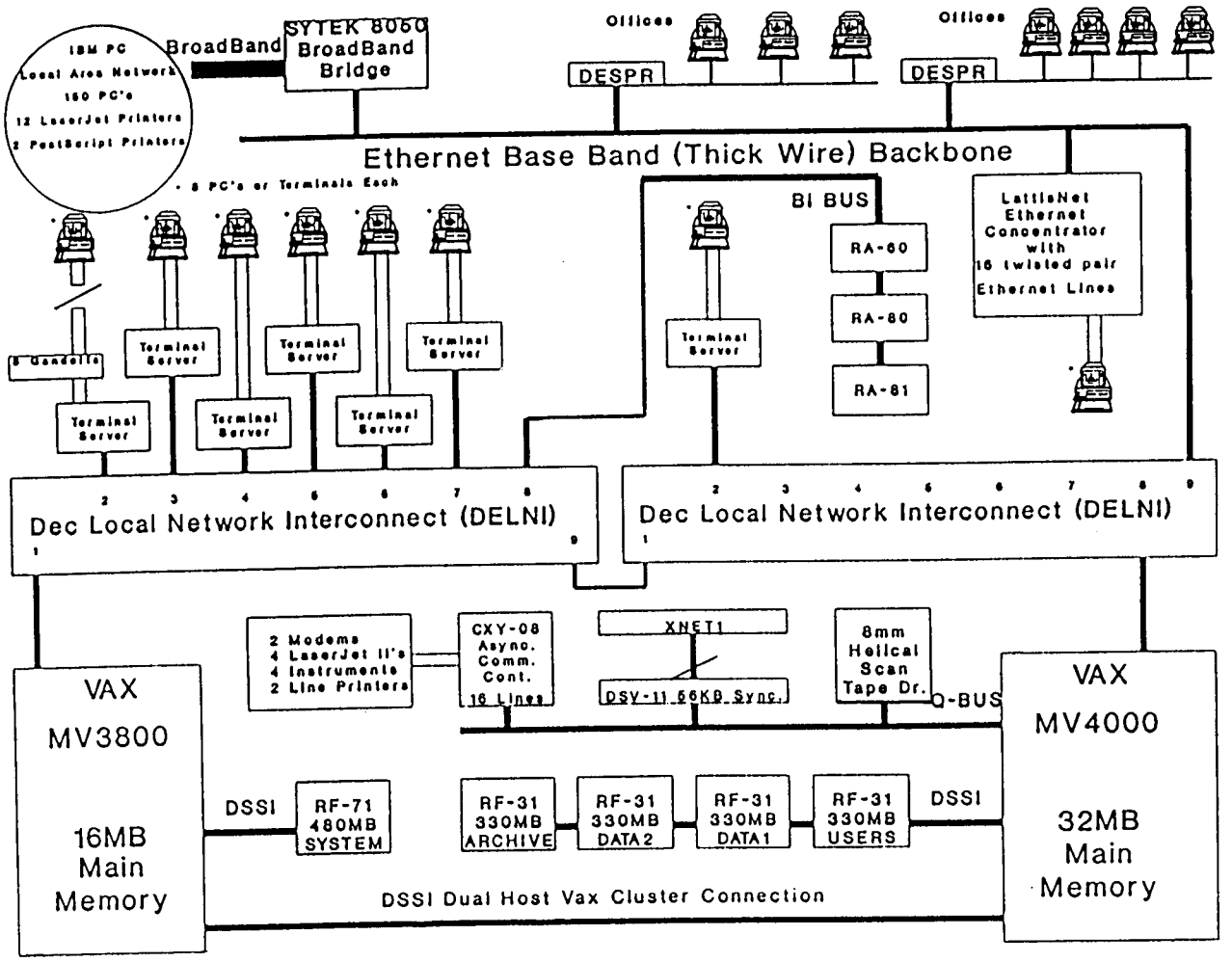

Fig. 2. Diagram of the EM-9 VAX cluster.

We can perform unattended incremental backups late at night for up to a month's worth of data because of the introduction of helical scan technology and an 8-mm tape cartridge, approximately the size of an audiocassette cartridge. Since the physical size of the cartridge is small, it is no longer necessary to rotate image backup save sets. This has allowed a much greater level of insurance against catastrophic loss of data such as from the very gradual or subtle introduction of bad data into backup save sets as good data gets rotated off the tapes. The Transition Technologies Inc. (TTI) CTS-8000 UD Cartridge Tape Subsystem is a high-performance, high-capacity, 8-mm tape subsystem. The tape drive is capable of storing more than two billion bytes of formatted computer data on a single cartridge. Features of this subsystem include (1) a powerful internal error correction code, (2) error recovery procedures implemented in the cartridge tape subsystem controller, (3) read-after-write error checking and automatic rewrite, (4) a nonrecoverable error rate of less than 1 bit in 1013 bits, and (5) high-performance SCSI-bus data transfer rates of up to 1.5 Mbytes per second. The CTS-8000 UD is an add-on subsystem designed to be integrated into the Digital Equipment Corporation (DEC) Q-BUS-based CPUs. The

operating system considers the tape subsystem to look and act like a TK50 tape drive, and it uses the standard VMS TUDRIVER tape driver. This feature of compatibility ensures that the subsystem will be compatible with future DEC upgrades to the VMS operating system.

The backup program, EM9BACKUPS, runs continuously in a special batch queue or until the system is restarted. The tape drive is initially mounted and is not dismounted until the type of backup changes from incremental to image. This happens twice a month when the day of the month is equal to 1 or 15. Because the tape is mounted for two weeks at a time, the possibility of mount failures, each time an incremental backup is begun, is eliminated. The tape is left positioned just after the last written incremental save set and at the location where the new save set is to be written.

EM9BACKUPS uses two disk files. One is entitled BACKUPS.LOG, and the other is a backup journal file whose file name depends on the month of the year and the type of backup. For example, if H9BACKUPS is doing incremental backups and the date is February 1992, the backup journal file would be FEB1992-INC.BJL. The BACKUPS.LOG file contains a complete account of each backup operation performed each day. The log file is closed, and a new revision is created each time image backups are run (the 1st and 15th of each month). This file logs the status of the backups and notes if there are any problems with the program as it runs in the batch queue. The journal file is an RMS sequential file that contains information about every file that gets backed up. This file is specifically formatted so that the backup utility can scan it based on any combination of disk name, save set name, creation date, or file name to find the exact information needed from any number of different backup save sets. This functionality is very useful when a user needs an old file restored and the system manager is not sure on which physical volume the file is located.

Each morning at 12:00 a.m., EM9BACKUPS checks the day of the month. If the day is equal to Saturday or Sunday, backups are not begun, and the program reverts to standby mode until Monday morning at 12:00 a.m. If the day is not equal to 1 or 15, incremental backups are performed, and the program reverts to standby mode until the next day at 12:00 a.m. If the day is equal to 1 or 15, image backups are needed, and at 8:30 a.m., the program notifies the system console and all terminals enabled as operator consoles that the incremental tape needs to be replaced with that month's image backup tape. A unique message number is printed with this message, and a mail file is sent to SYSTEM and MANAGER detailing what needs to be done by the operator. When changing the tape, the operator logs onto the system at a keyboard terminal and does a REPLY/TO=message-number. EM9BACKUPS receives the REPLY from the operator, proceeds to initialize the image backup tape, if it is the first of the month, and mounts the tape. The program then waits until 8:30 p.m. before it proceeds to do image backups. When image backups are completed, EM9BACKUPS again waits until 8:30 a.m., mails a message, requests an operator to replace the image tape with the incremental tape, waits for a reply, initializes the incremental tape, closes the log file, resubmits itself to the batch queue to begin running at 12:00 a.m. the next day, and exits.

C. Sample Management.

EM-9 believes that analytical service work is not simply a linear transfer of samples from customer to analyst and of analytical results from analyst to customer. Continuing

interaction between these parties is required and alerts EM-9 management to future research needs for new technology. Appropriate EM-9 managers and professional staff should be brought into the project at its inception and participate in its experimental design.

1. *Analytical Service Agreement.* EM-9 uses an Analytical Service Agreement (Fig. 3) that is completed by the EM-9 Sample Management Section and a potential customer. EM-9 analytical capabilities and customer sampling and analytical requirements are discussed at this time and

EM-9 ANALYTICAL SERVICE AGREEMENT			REQUEST NUMBER:_____
I. PRESAMPLING CONFERENCE:			
Program Code:	Task ID#:		No. Samples Expected:
Request Date:		Completion Date:	
Chain of Custody:		Special Protocol:	
Container Type:	Preservative:		Storage Conditions:
Sample Hazards Present:			
Sample Disposal:	(All hazardous samples or TRU Wastes will be returned to the Customer.)		
Customer:		EM-9 Section Leader:	
Customer Initials:	Customer Phone:	Mail Stop:	Date:
II. EMERGENCY SAMPLES: Emergency status REQUIRES the following approvals:			
Customer Group Leader_____		EM-9 Group Leader_____	Date:_____
III. SAMPLE RECEIPT			
Signature_____		Date:_____	Total No. Received:_____
MATRIX	INITIAL SAMPLE NO.	FINAL SAMPLE NO.	NO. RECEIVED
Translation table of EM-9/Customer numbers will be provided by Sample Management and appear on each final data report.			

Fig. 3. Analytical Service Agreement form.

agreement is reached on the number and types of samples to be submitted, the types of containers and the sample preservation methods,[15] and any special protocol that may need to be followed.

2. *Assigning priority.* Scheduling requirements of both customer and analysts are considered. A priority is assigned to the request by the EM-9 Sample Management Section. Priority 1 is the highest priority level that can be assigned to any sample. Samples assigned a priority 1 status will be moved to the top of the assignment queue. The analyst will complete the analysis and issue a final report as soon as possible. This priority gives the analyst preapproval for overtime if it is required for the timely completion of the required analysis. Samples assigned a priority 2 status will be moved to the top of the analysis queue but will not supersede any existing or future priority 1 status samples. The analyst will complete the analysis as soon as possible during the analyst's normal working hours. Overtime will not be authorized for samples with a priority 2 status. Samples with this status will be scheduled for analysis on a first-come, first-served basis. Priority 3 is for routine samples that will be analyzed, in the order received, during normal working hours. The EM-9 Analytical Service Agreement is available in electronic form from any group keyboard terminal. All information is documented on the Analytical Service Agreement that is signed by both Sample Management and the customer. In the event of emergency sampling, additional signatures from the EM-9 group leader and the customer's group leader are required.

3. *Sample numbering.* Customer-collected samples are each identified with a unique descriptor of up to 12 characters. Bioassay samples are identified by a customer number supplied by Health Physics Policies and Programs (HS-12) and by an EM-9 sample number rather than by the name of the individual. HS-12 is responsible for associating the EM-9 sample number and the HS-12 customer number with the employee's name.

   The EM-9 sample-numbering system continues to use a sample number of the structure AA.xxxxx, in which AA designates the last two digits of the current calendar year and xxxxx is a five-digit number serially assigned during the sample-receiving process. This structure facilitates efficient computer management of the data. Because open QC samples may carry over each year (e.g., NIST SRM 1633a Fly Ash), we assign them constant numbers in the series 00.xxxxx to make them easily distinguishable from various years' samples. Blind QC samples are assigned sample numbers but are eventually tied back to the QC system through the use of the 00.xxxxx number in the customer number field. In the past, sample numbers were assigned in blocks to specific customers. The introduction of a blind QC system necessitated changing this approach. Analytical work performed for the Waste Management Group (EM-7) still retains the block approach to permit easy association of individual outfalls with previous data for the National Pollutant Discharge Elimination System (NPDES) reporting purposes.

4. *Sample submission.* Samples are submitted to the EM-9 Sample Management Section and an Analytical Chemistry Request form (Fig. 4) is generated. Sample Management generates a computer-printed, bar-coded label (Fig. 5) bearing a unique EM-9 analytical number for each sample, and

EM-9 ANALYTICAL CHEMISTRY REQUEST		REQUEST NUMBER:_____
Program Code:	Task ID Number:	Request Date:
Customer Initials:	Customer Phone:	Mail Stop:

MATRIX	INITIAL SAMPLE NO.	FINAL SAMPLE NO.

SECTION	ANALYSIS	TECHNIQUE	ANALYST	DUE DATE

REMARKS:

Fig. 4. Analytical Chemistry Request form.

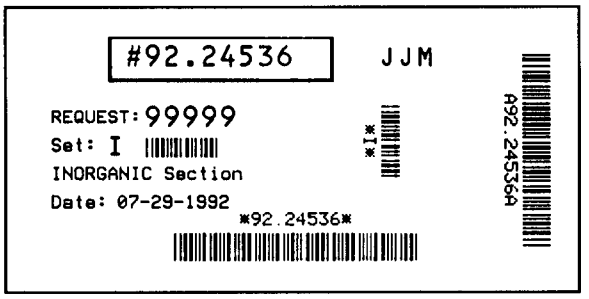

Fig. 5. Sample label.

places the stick-on label on the sample container. Label information includes the date received, request number, sample number, and the name of the appropriate analytical chemistry section. This numbering protocol avoids sample number duplication, eliminates computer-incompatible customer-generated numbering systems, and minimizes transcription errors between customer and analyst. Multiple aliquots of any one sample will bear the same EM-9 sample number, followed by a letter designating that each aliquot is one of a set. Sample Management began using bar-coded labels in 1991.

The EM-9 CUSTOMER-NUMBER database stores the customer's sample number, the EM-9 sample number, and the date the sample was collected. This information is accessed by other programs that monitor EPA holding times. Only the EM-9 sample number is used to identify the sample to the analysts, allowing the QADM Section to prepare and submit blind QC samples along with the customer samples. The Sample Management Section enters the EM-9 sample numbers and the blind QCs on the Analytical Chemistry Request form.

The Sample Management Section is responsible for logging sample information into the EM-9 LIMS from a keyboard terminal using the interactive programs AGREEMENT, CUSTOMER-NUMBER, and SAMPLES-RECEIVED. Copies of the Analytical Service Agreement are distributed to the analytical chemistry section leaders and to the analysts using VAX-Mail. A copy of the completed Analytical Service Agreement is also sent to the customer. The customer copy and the copy filed in Sample Management include a cross-reference listing of the customer numbers and the associated EM-9 sample numbers. The analyst and section leader copies do not include this information in order to keep the QC samples blind. Both numbers appear on all analytical reports and are stored in the annual archives along with the analytical data.

D. Laboratory Information Management.

The draft Software Quality Assurance Plan written during 1991 was developed in accordance with the guidance in DOE Order 1330 and the draft computing section of the DOE Laboratory Management Branch's national Quality Assurance Plan. Our software QA plan was designed to assure a high standard of quality and to protect the integrity of computer-resident data produced in support of the Laboratory's health and environmental programs. It is the goal of EM-9 to build and maintain a fully documented, controlled, and auditable software management system. During 1992, we began to implement EPA's *Good Automated Laboratory Practices*. This document establishes acceptable data management practices for laboratories that provide analytical data to EPA.

The Laboratory Information Management System (LIMS) is a software package written by EM-9 programmers over a period of 15 years. LIMS is based on Digital's Datatrieve Report and Query Language (DTR) and their Common Data Dictionary (CDD). LIMS also includes many FORTRAN and Pascal programs that perform data entry, data-reduction, and data-loading tasks that typically execute in the VMS batch processing queues. There are over 5,000 transactions per day on LIMS.

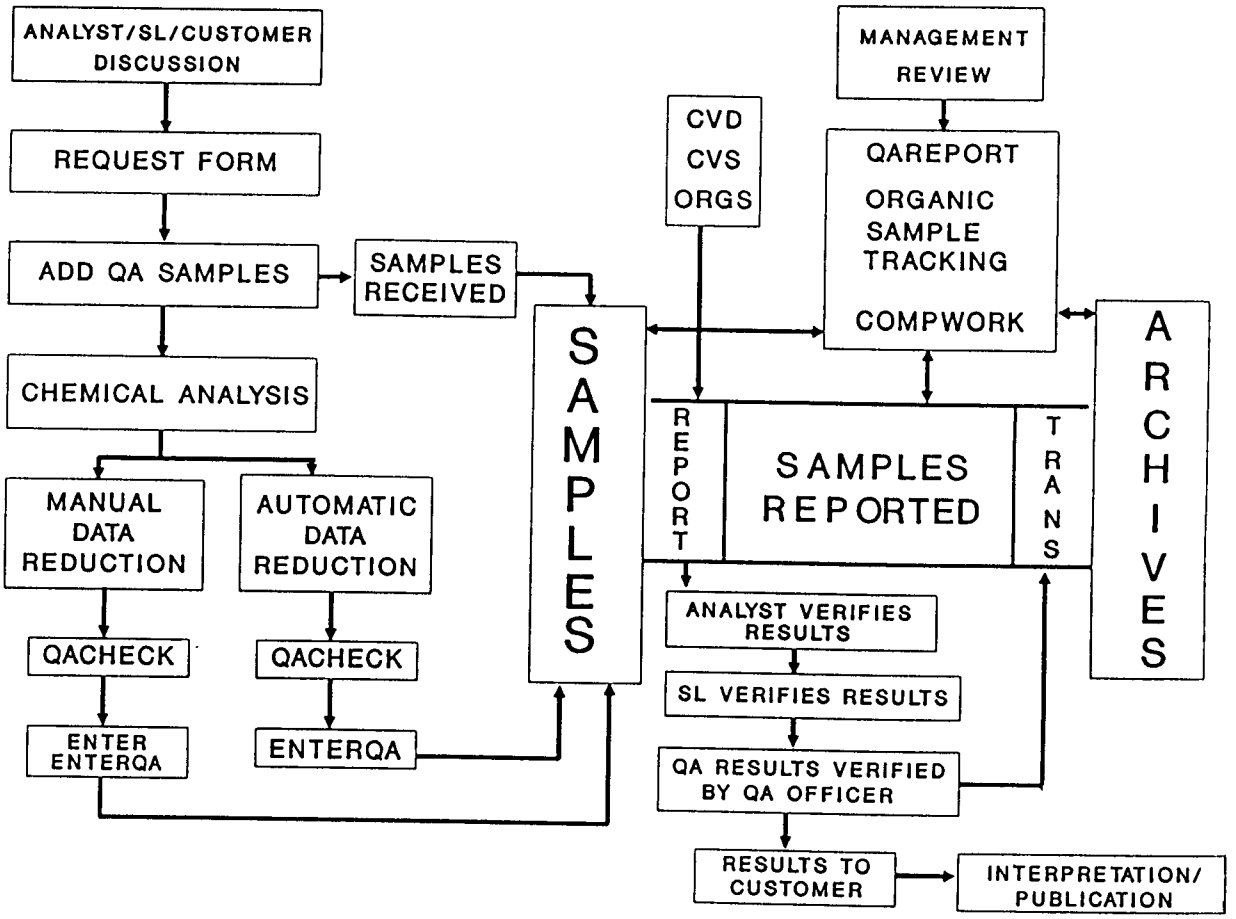

Fig. 6. Diagram of the overall work flow and data review process.

The central portion of the group's work flow is shown in Fig. 6. LIMS provides menu-driven access to all information-handling software. All software approved for sample submission, data reduction, data entry, report writing, QADM Section data maintenance, training documentation, audits, corrective actions, priority reporting, bookkeeping, and other miscellaneous functions is available through one of the menus. The menu screens are shown in App. D, Tables D-I to D-XI. The EM-9 LIMS operates as a set of stacked menus, and most submenu items call other Digital Command Language (DCL) command files or Datatrieve procedures. The compiled EM-9 LIMS program is installed in memory to increase speed and to protect the program from inadvertent modification.

1. *Analytical data storage.* The SAMPLES database contains records on work that has been requested but not analyzed and records with initial data that have not undergone analyst review. SAMPLES-REPORTED contains data for which formal reports have been written but that

have not yet been released to the customer pending completion of formal review by the analyst, section leader, and QA officer. H9DATA1992 contains data that received formal approval and was released to the customer. The archival databases contain data as a function of completion date of the analytical work (i.e., H9DATA1989 archives only contain data produced during 1989). A new archival database is created each calendar year, and archived data from 1981 to the present are available on-line with read access through the EM-9 LIMS using the ALL-DATA-SEARCH software.

The SAMPLES, SAMPLES-REPORTED, and H9DATA1992 databases have similar structures, and all three contain the following information: EM-9 sample number, customer sample number, owner, matrix, phase, analysis, request number, request date, due date, project number, analyst, technique, symbol, result, uncertainty, units, completion date, status, notebook, page, analytical procedure number, batch number, special codes, analytical comment, and sample type. The batch number allows the reporting of QC data that apply to more than one request number on individual reports without having to reenter the QC data. The special codes field provides for improved bookkeeping by screening individual analyses within certain groups [e.g., inductively coupled plasma (ICP) mass scans, volatiles, semivolatiles] from the work summary programs. The special codes field within H9DATA1990 and subsequent annual archives has the additional function of flagging data that were changed after the formal report was released to the customer. The original data record is retained without modification (other than addition of the special codes flag) and the superseding record is added to the archive to provide additional audit trail capability. The sample type field is used to identify different categories of samples: customer sample duplicates, matrix spikes, matrix spike duplicates, blanks, blank spikes, and blank spike duplicates.

In addition to the above-mentioned information, the SAMPLES-REPORTED, H9DATA1990, and subsequent annual archives also have a report number field. This field permits rapid location and transfer of data that have been collected by the report writer to prepare a final report for release to the customer. This report number is generated by the report writer software and is unique to each report.

More than 300,000 analyses per year flow between our 60 analysts and the SAMPLES, SAMPLES-REPORTED, and H9DATA19XX databases. Datatrieve permits a search of the databases as a function of any single parameter or any logical combination of parameters. These data can be transmitted to the analyst by video terminal or hard-copy line or laser printers. Using logical combinations of Datatrieve commands, the analyst can get a real-time assessment of what has been requested, what remains to be completed, and what procedures have been suggested for certain determinations. This eliminates the need for each analyst to maintain his or her own hard-copy record system and offers the analytical manager quick access to the overall status of a section or the entire group.

2. *Electronic Analytical Service Agreement.* Initiation of the work flow process is largely automated through the use of an on-line Analytical Service Agreement. The electronic service agreement may be

invoked from any VAX terminal on our network. To minimize keyboard entry errors that can plague an electronic data management system, the specific work request section is prepared from preexisting templates that contain analyses, analytical techniques, and responsible analysts. The record of the completed agreement is electronically stored in a central database, ANALYTICAL-AGREEMENT. We have reduced the overhead in the SAMPLES database by not creating records in this database until samples arrive in Sample Management. This eliminates the problem of carrying requested work in SAMPLES for customer samples that are never delivered. The SAMPLES-RECEIVED section of the service agreement automatically creates space in the SAMPLES database for each sample and analysis requested, including all appropriate date, status, and holding time flags. Actual creation of these data records is done in batch mode, permitting Sample Management personnel to interactively initiate another request while the previous one is processed.

3. *Organic sample tracking.* Creating space in the database upon receipt of samples allows receiving-to-reporting accountability for customer samples. This tracking includes holding and instrument analysis times specified by EPA primarily for organic determinations. At the time of receipt, a record is created in ORGANIC-SAMPLE-TRACKING (OST) for the major classes of organic analyses (e.g., volatiles, semivolatiles, PCBs). OST accepts the system date as the receipt date and automatically calculates the 7-day or 14-day extraction holding time. Upon entry of the extraction date, OST calculates the 40-day instrument analysis holding time. When analysts complete instrumental analysis, they may also enter the analysis date. Final reporting and archiving are automatically date-stamped in OST by the final report writer and the TRANS program.

4. *Class-specific compound entry software.* We have reduced the overhead in SAMPLES by using only single-entry master records for the major classes of organic analyses and for ICP mass scans from the time that the work is requested until the analyst is ready to enter the 60-70 elements/compounds that are individually determined. The master record contains all the bookkeeping information for the following classes of analyses: MSCAN, VOLATILES, SEMIVOL, PESTICIDES, HERBICIDES, POREGAS, and PCB (1336363). For most of these analyses, Lotus-spreadsheet-based software permits direct uploading of the individual elements/compounds while reading the bookkeeping information from the master record and storing it in each individual analytical data record. This software uses local copies of Lotus 123 running on each user's PC to facilitate the data entry process. The basic design of the Lotus macros that manage the data entry process involves the use of predefined templates with lists of target compounds, tentative IDs, minimum detection limits, units of reporting, and conversion factors. The data entry person need only use cursor control keys to move to the parts of the template he or she wishes to change. As the templates are "worked" up to a level of correctness, a menu command allows the user to save this information. The PC workstations are integrated with the VAX over a network link utilizing VAX disk space as a virtual disk drive on the workstations. Thus, when Lotus is told to store the template information, the

information is actually stored on the virtual drive, eliminating the time-consuming steps of explicitly moving that data from the PC workstations to the VAX with file transfer software running under a terminal emulation package. The data are now on the VAX, which runs the EM-9 LIMS. The user invokes the LIMS database update software, and the software processes the data from the templates and stores it in the appropriate parts of the LIMS system. To facilitate the rapid summary of backlog and completed work for these classes of analyses, the special codes field of the individual records is flagged so that these records will not be counted by the bookkeeping programs, while the master record is retained so that it may be counted in these summaries.

Special software (ORGANIC-IDENT) permits unrestricted entry of compounds identified for any IDENT request, with provision to read all bookkeeping information from the master record and store it with each compound identified.

Datatrieve-based, class-specific software permits the entry of QC sample data into CVS, the certified/consensus value database for the six major classes of organic analyses (CVS-VOLATILES, CVS-SEMIVOLATILES, CVS-PCB, CVS-HERBICIDES, CVS-PESTICIDES, and CVS-POREGAS). The entire target list of compounds for a given class of organic analysis is now entered for each QC sample prepared for that class of analysis. The concentrations and uncertainties of compounds actually spiked are then entered, and the remaining records show both a concentration and uncertainty of zero, indicating that these compounds were NOT intentionally added by the QADM Section. When the analyst's data are submitted to the LIMS, we can monitor the rate of occurrence of false positives and false negatives, as well as the analyst's success in hitting the actual spiked concentrations, using procedures FALSEPOSITIVE, SPIKERECOVERY, and QAREPORT. Observations of false positives may represent unintentional contamination of the QC during preparation, storage, or analysis and is not immediately identified as a purely analytical problem. Frequent recurrence of either false condition indicates that either an analytical procedure or a QC preparation procedure needs careful review.

5. *Report writer*. Preliminary and final report writing functions are provided in the EM-9 LIMS as shown in App. D, Table D-V. Our current philosophy is that the analyst maintains control of the data during the preliminary reporting process, as long as the data are not released to the customer. Any errors identified by the analyst during the data review may be corrected easily in SAMPLES without keeping the erroneous record for audit trail purposes. The production of a final report indicates the analyst's commitment to the accuracy of the data, and the data are transferred to SAMPLES-REPORTED. Access to SAMPLES-REPORTED is allowed for only three personnel from the QADM Section who are not directly associated with the analytical production sections. Any further changes to the data require justification to the QA officer.

   Preliminary Reports. These short reports run in a special queue to enhance turnaround time. The preliminary report writer permits the analyst to produce a hard copy of the QC and customer data to review for data entry errors before formal

reporting, without revealing the identity or control status of the blind QCs. Four types of preliminary reports are available: (1) a single analysis by one analyst on one request number; (2) multiple analyses by the same analyst on one request number; (3) multiple elements for a single sample done by ICP mass scan; and (4) multiple organic compounds by the same analyst on one request number. Option four provides a preliminary report as a function of organic class (i.e., volatiles, semivolatiles, pesticides, herbicides, pore gas, PCBs, or other).

If the analyst detects errors in the analytical data during review of the preliminary report, the ENTER program may be used to modify the data in the SAMPLES database. This does not require management approval and no record of these changes is kept, since the data are still under the control of the analyst and have not been reported to the customer. Revised preliminary reports can be written as many times as desired without triggering software that transfers the data to SAMPLES-REPORTED, thus passing control to the QADM Section.

Final Reports. When the analyst is confident that data are accurate, the final report writer permits the analyst to produce a hard copy of all customer data and both open and blind QCs for management and QA review for completeness and compliance with group QA standards and policies. The use of the final report software triggers the transfer of the data from SAMPLES to SAMPLES-REPORTED and the transfer of control of the data to the QADM Section. The same four report types listed in the preliminary report section are also produced by the final report writer. Examples of these reports are shown in App. D. Customer samples, sample duplicates, matrix spikes, and matrix spike duplicates are printed in separate, clearly labeled sections of both the organic and inorganic reports. Organic reports also include specially formatted sections for surrogates, blanks, blank spikes, and blank spike duplicates. Dates of organic sample collection, receipt, extraction, and analysis are also displayed with the heading for each customer sample. The results of both open and blind QC samples analyzed with the sample batch are printed on a separate page of the report package for all report types. The software recognizes blind QCs and prints the current certified or consensus value on these reports along with the calculated control status from Eq. (1) of Section II. The analyst, data reviewer, and section leader review and sign the final reports, which then go to the QA officer for approval before release to the customer. Since the final report writer entails access to databases containing certified/consensus values for QC not available to the analyst, special privileges are built into the final report writer to give it restricted read access for each reporting session.

If errors are detected in the final report during data review and sign-off before release to the customer, the QA officer must evaluate the reasons and determine the course of action. Simple problems that should have been detected during the preliminary report review (such as inappropriate units) that do not result in changes to actual results may be modified and the report rewritten with QA officer approval. Data that fail to meet the QA criteria of the group may be rejected by the QA officer, and the samples will be reanalyzed without reporting the out-of-control data to the customer. No changes

can be made to data in SAMPLES-REPORTED by other group personnel.

Final reports are now issued to customers directly from the QA officer, rather than from the section leaders. A database and software were developed on LIMS to track the release of approved final reports.

After QA approval of the final report for release to the customer, the TRANS program is invoked, and the approved data are moved from SAMPLES-REPORTED to one of the annual archives as determined by the completion date entered by the analyst in the original data record. Changes shall not be made to records in the archives. Approved changes will be made to a new record with the original defective record remaining unchanged, except for the status and special codes flags. These flags provide an audit trail for all data changes made following formal approval and release of analytical data. All justifications for change are kept in bound Laboratory notebooks that are signed and dated by the individual authorized to make the change. All changed data will be re-reported to the customer.

6. *Electronic reporting.* An electronic reporting system was developed for data obtained from analytical work performed for EM-7. The data are now automatically moved to the archives upon completion of the "electronic report," making this reporting consistent with the rest of the system.

   Software creates two different data files for electronic shipment to HS-12. One file is created nightly so that HS-12 can identify the EM-9 sample number assigned to all bioassay samples logged in that day. The other file lists completed results of bioassay analyses and is generated automatically when a bioassay request is archived by the QA officer using the TRANS program. HS-12 loads the electronically shipped data into an ORACLE database.

7. *Quality assurance software.* We have a utility program, QAREPORT, that looks at QC data in two-week windows. The report runs automatically in the report batch queue, mails a message to appropriate QADM personnel, and resubmits itself to run again in two weeks. This program permits the QA officer to assess, on a biweekly basis, our success in meeting the analytical QA objectives and policies described in Section II.

   QAREPORT automatically generates 10 biweekly reports that assist in the overall management of the group's workload. Several of these reports determine the current backlog of unfinished work as a function of analyst, requested determination, sample number, request number, and matrix. Other reports monitor sample holding times for extraction and instrument analysis; list completed work needing formal reporting, formal reports that have not received QA sign-off, and unfinished work that is past the agreed due date; and check for typographic errors in the analysis, analyst, program code, matrix, and analytical technique fields. Other software tools remain basically unchanged. WORKCOMP (work completed) and REPBYMAT (report by matrix) are utilities that facilitate rapid generation of reports for management concerning the number and type of determinations requested or completed during a given time and the associated cost code information. Tables B-I to B-III of App. B are generated directly by REPBYMAT.

With the Datatrieve view concept, program QAREPORT associates data from several databases that include routine QC results as well as certified and consensus values for a given material and constituent. For a user-selected time frame (usually quarterly or annually), the resulting report consists of (1) the ratio, by matrix and analysis, of QC samples to customer samples submitted, (2) a detailed list of submitted QC samples that have matrix or units conflicts with the certified data, and (3) a listing of QC data falling above or below our acceptable limits of analytical error as defined by Eqs. (1) and (2) from Section II. Tables C-I to C-III in App. C are generated directly by QAREPORT.

8. *Other periodic reports.* Daily and weekly status reports are produced automatically in batch mode for priority 1 and 2 samples, for organic holding times, for QC results on waste treatment plant samples, and for the overall group workload.

9. *Analyst proficiency software.* This software is available on LIMS and summarizes QC results for individual analysts as a function of analysis and technique for both open and blind QC samples run during a user-selected time period. The results are displayed as the percent of each analysis/technique combination that were either under control, in the 2- to 3-sigma warning region, or out of control. Proficiency to perform a particular EM-9 technical procedure is evaluated by each section leader and the QA officer using the criteria set forth in EM-9 Administrative Procedure AP-1.

10. *Scheduled audits and corrective actions.* Databases and software have been developed to enable the group management to monitor the performance of routine audit functions, track the resolution of any resulting corrective actions, and archive evidence of periodic electronic audits of selected data management functions. The AUDIT-SCHEDULE database contains fields for audit frequency, a sequentially assigned audit number, next audit date, and two lines of description of the function to be audited. Corrective actions that are issued due to these audits or any other audit/review activity within the group are entered into the CORRECTIVE-ACTION database so that their resolution may be tracked electronically. CORRECTIVE-ACTION contains fields for audit number, corrective action number, date due, responder, status (active or closed), person who approved closure of the finding, and the closure date. Both of these databases are reviewed weekly and listings of overdue audits and corrective actions are electronically mailed to group management. Both databases have companion databases in the group's archives (AUDIT-SCHEDULE-ARCHIVE and CORRECTIVE-ACTION-ARCHIVE) so that every audit conducted and every corrective action that is closed is electronically archived and kept for documentation purposes. Audits that result in no corrective action are similarly documented in these archives.

E. LIMS Upgrades.

The following changes, upgrades, and enhancements were made to LIMS during 1992.

1. *ORACLE LIMS.* Work continued on the design and implementation of an ORACLE version of EM-9 LIMS. The ORACLE Relational Database Management System was selected for this project because of ease of future growth and flexibility for modification, availability of functionality requested by the LIMS user community, and the presence of an adequate security system.

   - Prototype data tables needed to support sample management activities were established, and sample management data entry menus and screens were designed.

   - Sample management reports, including analytical service agreements and chain-of-custody forms, were designed using the SQL Report-Writer.

   - Data validation tables were constructed, containing valid entries for fields in the data tables that have a restricted set of legitimate values, such as analyte, matrix, and technique. Pop-up windows were developed to allow selection of legal field values from the validation tables during data entry. This will reduce the potential for typographical errors and invalid entries in the ORACLE database.

   - Help files were created to provide users with one keystroke access to field-level help while using the ORACLE LIMS.

   - Until the ORACLE LIMS is completely implemented, the existing Datatrieve LIMS must continue to run in parallel. FORTRAN data conversion routines were developed to move data entered into the ORACLE LIMS to the Datatrieve LIMS.

2. *Electronic time sheet software.* An electronic time sheet system was implemented for EM-9 personnel. Software was written to permit employees to enter hours worked as a function of request number, program code, or overhead function. Additional software was written to produce summary time sheet reports for an individual, section, or the entire group for any user-defined period of time. These reports are used by individuals, section leaders, and the group leader to track time and effort spent on specific program codes and activities. The automated batch software that generates daily and weekly management reports was upgraded to produce section-specific and group-wide daily or weekly listings of each individual's hours worked. These reports are automatically E-mailed to each section leader and the group leader.

3. *Contractor analytical data entry.* The increased use of commercial analytical laboratories necessitated several enhancements to LIMS. When the first contractor data packages were returned to EM-9, no software existed to facilitate uploading it to the VAX. Most of the early data was entered manually. A LOTUS spreadsheet was created to allow data entry personnel to key in semivolatile data from hard-copy reports submitted by the contract laboratory. The spreadsheet data is then uploaded to the VAX. Spreadsheets for uploading volatile, pesticide, herbicide, PCB, and metals data are currently under development. Inorganic and radiochemistry data are being entered manually using the ENTER program. Electronic data requirements from contractor labs are being defined and will be used to design an EXCEL spreadsheet that will allow contractors to submit their data in electronic format for

direct uploading to the VAX with no manual data entry required.

Software was written to produce a backlog listing of all contractor samples that were submitted more than four months before the program run-date and still have no data entered.

4. *Sample discrepancy reporting.* New software was written to allow sample discrepancy reports to be created and appended to the final analytical reports prepared by EM-9. A text file containing the sample discrepancy information is created by Sample Management personnel at the time of sample login. The file name of this text file contains the service agreement number under which the samples were logged in. These reports are stored in a special directory until the samples are analyzed and final analytical reports are written. The final report writer searches this directory for existing discrepancy reports with the same request number as the data being reported and appends a printed copy of the discrepancy report(s) to the final report. If no discrepancy reports exist for the request, this fact is noted just below the signature line at the end of the quality assurance section of each final report.

5. *Report writer.* The software that produces EM-9 final reports was modified to take advantage of the parallel processing capability now available on the multiple report batch queues on LIMS1 and LIMS2. It is now possible to run up to three simultaneous final reports on each of three different report queues with no conflicting file names or inadvertent file deletions by other report processes. This has significantly improved the amount of time required to generate final reports.

6. *Radiochemistry software.* The BIOALPHA and BIOTRIT programs used by the Radiochemistry Section for data reduction were revised to allow electronic entry of the data run on the NOS system in the Laboratory's Central Computing Facility. These routines read the files copied back to the count room from NOS, extract the results from the file, and write the records into the SAMPLES database on the VAX. The analysts had been entering this data manually through the ENTER program. The software upgrade provides increased efficiency of data entry with less potential for human error.

   Work was begun on a program to transfer radiochemistry field screening data from a portable computer on which it is collected in the field into the SAMPLES database on the VAX.

7. *Equipment database.* An equipment database was developed to track instrument availability information that is required for laboratory accreditation packages. This database was merged with the calibration schedule database that is used to track due dates for instruments requiring periodic calibration. All instrument information now resides in one database. Software was written to 1) generate reports of instrument availability for group management and 2) print calibration schedules for the calibration control officer.

8. *Accounting software.* Work was begun on the EM-9 Time, Cost, and Project Accounting software needs analysis and the review of available products. This has led to a joint effort with Environmental Protection Group (EM-8) computer staff and project management personnel to evaluate and implement a common solution for both groups.

F. Chemical Abstracts Service Organic Compound Numbering System.

Organic chemistry nomenclature is complex and readily subject to typographical errors during entry into SAMPLES. In 1984, we adopted a modified version of the Chemical Abstracts Service (CAS) compound numbering system to facilitate our recordkeeping for the diversity of organic analyses performed. The CAS number for a given compound is stripped of the dashes and entered into the "analysis" field in SAMPLES. An organics database, ORGS, is kept on the VAX to facilitate translation of these numbers to compound names before the data are reported to the customer. New compounds are added to this database by the LIMS manager at the request of the Organic Analysis Section, and listings of the database can be generated alphabetically by compound name or numerically by CAS number.

G. Instrument-to-VAX Interfaces.

Many of our analytical instruments store their raw data directly on the VAX disks for off-line data-reduction, and in several cases, the entire data-generation process is computer controlled. A battery of data reduction programs are available to analysts that in most cases generate Datatrieve executable command files to input final analytical results directly into SAMPLES after analyst approval. For those instruments that still take raw data in the form of chart recordings, the analysts use one of the interactive data entry programs shown in the LIMS menu (App. D, Table D-I) to transfer final calculated values back to SAMPLES. When a set of samples has been completed for a given analysis, the analyst uses the report writer menu, App. D, Table D-V, to generate preliminary or final reports.

H. Administrative Computing.

The Laboratory considers sample data from the bioassay and tissue analysis programs to be confidential personal information. Formerly, these data were kept on the NOS administrative machine at the Central Computing Facility. In 1991, we began maintaining bioassay data and associated QC sample information in the databases on the EM-9 VAX. Bioassay samples are now only identified by an EM-9 sample number and a customer number assigned by HS-12. No information exists in the EM-9 databases that will directly link sample data to an individual. It is the responsibility of HS-12 to maintain the association between the EM-9 sample number, the HS-12 customer number, and the employee name.

The bioassay program has been computing in the administrative partition of the Integrated Computer Network (ICN) for the last 15 years. During 1990, all codes used by the bioassay program were converted from machine N, the CDC 7600 machine running NOS, to VAX/VMS.

All codes used in the alpha-counting facility are being converted to run on VAX/VMS. Many of the current functions of the ALPHA data-reduction codes are being combined into as few separate programs as possible to make both operation and maintenance easier. The codes are now easier to follow, and all instances of nonstandard FORTRAN have been removed. Additional functionality was added to the ALPHA code to accommodate the uranium alpha spectrometry data that the Radiochemistry Section began producing for bioassay samples in July 1991.

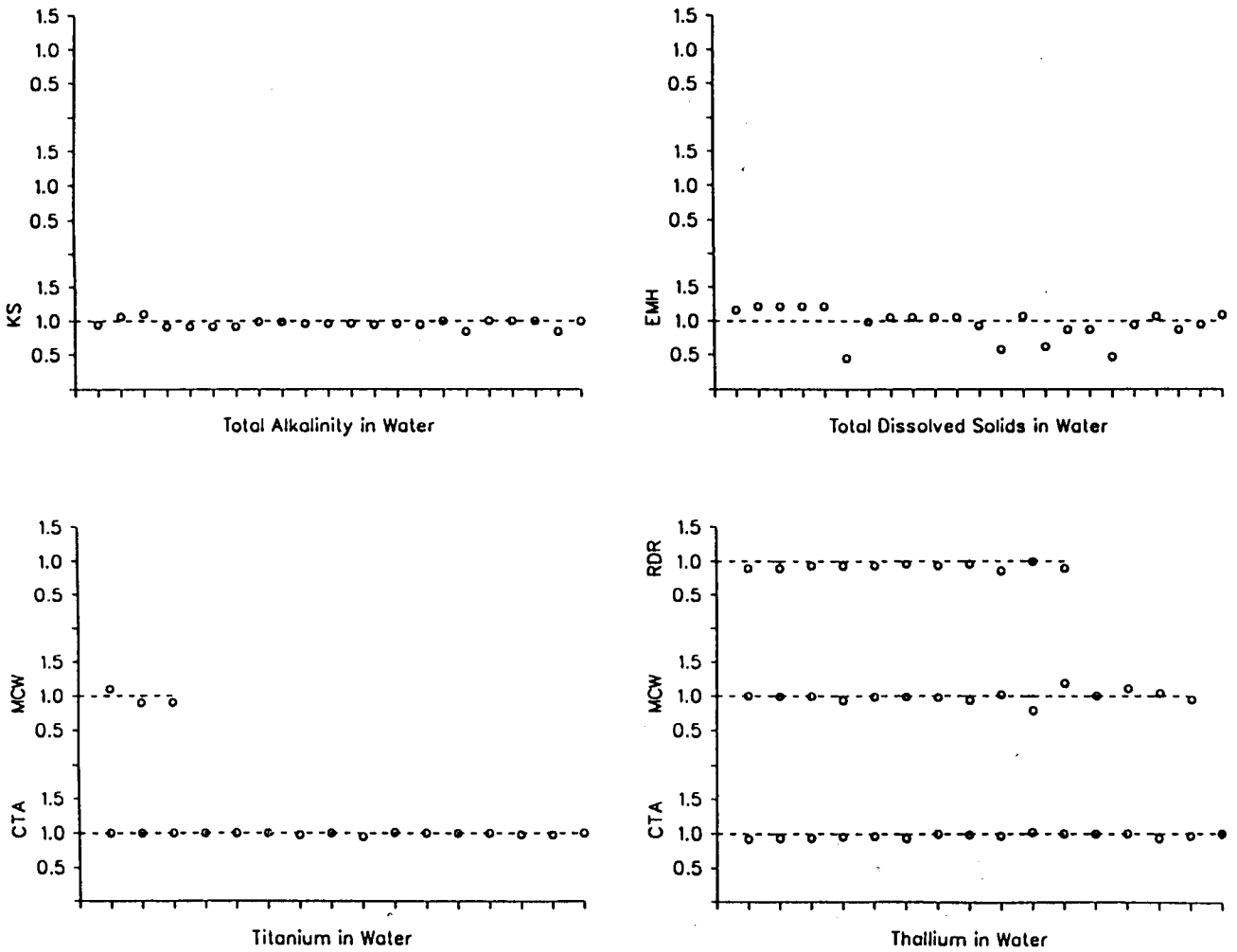

Fig. 7. Quality control performance charts.

I. Control Charts.

One of the oldest methods used to monitor and control the quality of a procedure is the control chart. The control chart is a graphic representation on which the values of the characteristic under investigation are plotted sequentially. Analysts prepare real-time control charts. They use the type of chart (devised by Shewhart[16]) that consists of a central line and two limit lines spaced above and below the central line. These are usually termed the inner and outer control limits. The distribution of the plotted values with respect to the control limits provides valuable statistical information on the quality of our analytical results.The QADM Section uses a computerized graphics package that imports a summary file created by QAREPORT to produce quality control performance charts (Fig. 7). This summary file is transferred each quarter from the EM-9 VAX over the network to a VAX within the Central Computing Facility. DISSPLA is then used to create graphic representation of our QC data. These performance charts are based on analyte, matrix, and analyst, and four charts are plotted on each page (Fig. 7). More than 500 plots, containing over 3000 data points, are prepared each quarter. The mean of all data for a give analyte and

matrix is computed each quarter by this program and is stored in a file called YEARLY. This data file is used in the 5-year trend plots of organic, inorganic, and radiochemistry QC data produced by EM-9 (see App. F, Figs. F-1 to F-3).

Harvard Graphics software is being employed to produce the organic surrogate recovery plots shown in App. F (Fig. F-8). LIMS software facilitates the collection of these data from the annual archives, sorting by matrix and analyte, and printing on individual files for downloading to Harvard Graphics running on an IBM PC. Individual data are given in App. E, Table E-IV.

V. CHEMICAL INVENTORY AND TRACKING SYSTEM

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EM-9 maintains an inventory of all chemicals in the group as part of the Federal Hazard Communication (Right-to-Know) legislation, 29 CFR 1910.1200. We designed and developed a chemical inventory and tracking system in 1987 using the latest bar-code and database technology. All new chemicals are given a bar code and are logged into the system immediately upon receipt by the group. Our stock of more than 8,000 chemicals is one of the Laboratory's largest and is spread throughout our three locations at TA-35, TA-50, and TA-59.

A. Chemical Safety.

The Laboratory's Chemical Hygiene Plan (CHP) was adopted by EM-9 to meet the requirements of 29 CFR 1910.1450, "Occupational Exposure to Hazardous Chemicals in Laboratories," an Occupational Safety and Health Administration (OSHA) standard. The Laboratory CHP sets forth prudent work practices and procedures that will minimize the potential for employee exposure to chemical hazards and reduce the consequences of an exposure should one occur. In compliance with the CHP, EM-9 routinely reviews chemical storage areas during safety inspections to look for proper storage and chemical compatibility.

B. Inventory System.

The inventory is located in a database named CHEMINV. It is critical for compliance with the law and provides an excellent vehicle for locating available chemicals and avoiding unnecessary purchases. The inventory system utilizes two different bar-code reading devices. One device is attached to a VT220 terminal that communicates with the VAX and allows immediate deletion of expended chemicals from CHEMINV, the active-inventory database. At the same time, all information associated with that particular chemical is automatically moved to EXPENDED-CHEMINV, the expended chemicals database from which reorder lists and estimated usage data can be derived. The second bar-code reading device communicates with a programmable hand-held computer terminal that facilitates taking the annual inventory.

EM-9 chemical inventory records are available in the QADM Section. EXPENDED-CHEMINV will be maintained indefinitely to meet legal requirements. All records are auditable and include the following information: (1) the identity of each chemical as it is referenced on an appropriate material safety data sheet (MSDS); (2) the CAS registry number; (3) the location(s) in which the chemicals are kept; and (4) the estimated amount of the chemical on hand. MSDSs for all our chemicals are available in alphabetical order in three-ring binders that are distributed throughout our group.

During the fourth quarter of 1991, our inventory of radioactive materials, which resided in a separate database called RMD (radioactive materials database), was merged with CHEMINV, and RMD was disabled.

C. Annual Chemical Inventory Process.

Each year, the inventory process is begun by running an initialization program that is activated by selecting INITIALIZE ANNUAL CHEMICAL INVENTORY from the menu. This program initializes the ANNUAL-

CHEMINV and NOTENTERED-CHEMINV data files and modifies every record in the CHEMINV domain by setting the audit bit to 0. This bit will later be set to 1 by the PROCESS-ANNUAL-CHEMINV procedure and the STORE-CHEM procedure. The audit bit will be used again by the procedure FIND-LOST-CHEMICALS after the physical inventory is completed. This procedure moves all records with audit equal to 0 from the CHEMINV domain to the LOST-CHEMINV domain, where that information will reside indefinitely unless PROCESS-ANNUAL-CHEMINV.DTR moves it back to the CHEMINV domain in a subsequent annual inventory, or STORE-CHEM erases it.

Small adhesive dots printed with the last two digits of the year are used with the annual inventory. As each chemical is inventoried, a dot is placed on the container to indicate that the chemical was accounted for. A hand-held portable data terminal (PDT) is used to take the annual inventory. It has a small keyboard that allows entry of alphanumeric characters and has a four-line liquid-crystal display. It records the bar code, either scanned with the gun or typed in, and the location information typed in by the user. The location information consists of technical area, building, room number, and a field called "other" into which more specific information can be typed. When the user finishes scanning an area, the PDT is returned to the QADM Section, and the information within the memory of the PDT is transferred to a file on an IBM PC using software that came with the PDT unit. The data is then cleared from the PDT memory, and the unit is given to the next user.

Menu selection LOAD BARCODE FILE INTO ANNUAL-CHEMINV is chosen, and the PC file is transferred to the VAX using VTERM. Information scanned with the PDT is loaded into the ANNUAL-CHEMINV domain, and the original data file is stored in a subdirectory.

The 1992 inventory of EM-9's chemicals was performed during June. This inventory processed 8,068 chemicals, and 80 chemicals were missing. The list of missing chemicals was sorted by location and was distributed to the section leaders for resolution. Approximately 10,009 chemicals have been expended since 1987, with 845 chemicals not accounted for. The large number of missing chemicals was probably due to personnel failing to remove bar codes from chemicals that were either expended or disposed of through EM-7. If a bar code is not removed when we are finished with a chemical, that chemical will never be moved to EXPENDED_CHEMINV. For this reason, a special database called LOST_CHEMINV was set up at the end of the 1990 inventory to store these chemicals. If any of these chemicals are located in a subsequent inventory, they will be moved from LOST_CHEMINV back to CHEMINV.

D. Annual Chemical Inventory Software.

Menu item PROCESS BARCODE DATA loads the ANNUAL-CHEMINV domain into CHEMINV based on criteria documented in the software flow chart that is part of the program ANNUAL_CHEMINV as shown in App. D of the 1991 annual QA report.[1] This step processes data in the following two phases: (1) each bar code is looked up in the EXPENDED-CHEMINV domain and if found is moved back to the CHEMINV domain and (2) each bar code is looked up in CHEMINV and if found the location is updated and the audit bit is changed to 1. Bar-coded chemicals found during the inventory that were not in either CHEMINV or EXPENDED-CHEMINV are stored in NOTENTERED-CHEMINV. Upon completion of PROCESS-ANNUAL-

CHEMINV, the contents of the domain NOTENTERED-CHEMINV are printed on the system line printer. The analyst must locate these bar-coded chemicals in the laboratories and record the complete chemical inventory information on a predefined form available from the QADM Section. The menu selection DISPLAY OR PRINT ALL BARCODES SCANNED BUT NOT FOUND IN THE INVENTORY may be invoked at any time to reprint this list.

The QADM Section enters information from the form into the inventory with the menu selection STORE CHEMICAL. After data entry is completed, the contents of the domain NOTENTERED-CHEMINV will again be printed on the line printer. This is the new list of bar codes scanned but not found in the inventory. This loop should be continued until the NOTENTERED-CHEMINV domain is empty. STORE CHEMICAL also looks into the LOST-CHEMINV and NOTENTERED-CHEMINV domains for bar codes the user is entering. If the bar codes are found in either of these two domains, they are erased. The STORE CHEMICAL menu selection invokes the same STORE-CHEM procedure used routinely by the QADM Section. After the domain NOTENTERED-CHEMINV is empty, menu selection FIND ALL CHEMICALS IN THE CHEMICAL INVENTORY WHICH HAVE NOT BEEN SCANNED IN THE LABORATORIES (lost chemicals) is run. This selection invokes the procedure FIND-LOST-CHEMICALS that looks at the audit field in each record in CHEMINV. If the audit field is equal to 0, that record is moved to the domain LOST-CHEMINV. This procedure also prints the contents of LOST-CHEMINV on the system line printer.

VI. INTERLABORATORY QUALITY ASSURANCE PROGRAM

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We use the terms reproducibility, repeatability, intralaboratory variability, and interlaboratory variability in describing the various aspects of our measurement process. Repeatability is the variation in data generated on one sample by one analyst or instrument or both over a short time. Reproducibility is the variation over an extended time or by different laboratories or analysts. Intralaboratory variability is the difference in results obtained when a single laboratory repeatedly measures aliquots of the same sample, whereas interlaboratory variability is the difference in results obtained by various laboratories in measurements of aliquots of the same sample. Variabilities caused by equipment, conditions, and different operators (but independent of sample variabilities) affect reproducibility and are parts of intralaboratory variability. Laboratory biases, paired with differences in the capabilities of various laboratories, result in an interlaboratory variability that can be much larger than intralaboratory variability. Our well-designed and well-executed QA program helps to reduce both intralaboratory and interlaboratory variability.

An effective QC program should have external quality assessment to confirm the effectiveness of the internal program.[17] Proficiency testing creates a strong incentive for laboratories to maintain high standards of quality and provides interested agencies with a tangible record of laboratory performance. An argument sometimes put forth by critics of proficiency testing is that laboratories concentrate their best efforts on proficiency test samples.[18] Although this may be true, a laboratory's competency is nonetheless tested, even if it is not truly representative of their day-to-day operation. If a laboratory is indeed incompetent, it is not likely to do well on a proficiency test no matter what special efforts are made. Our experience indicates that proficiency testing serves as an incentive for our laboratory to maintain a high level of performance and that it generally leads to analytical improvement.

EM-9 maintains widespread participation in intragroup, intergroup, and interlaboratory quality evaluation programs that use blind samples. We currently participate in the intercomparison programs described below, and App. E, Table E-IV, reports data from these studies. Five-year trend plots of our results on several EPA intercomparison studies are shown in App. F (Figs. F-4 to F-7).

A. National Institute for Occupational Safety and Health (NIOSH) Proficiency Analytical Testing (PAT) Program.

This program provides reference samples for our industrial hygiene chemistry efforts. Each quarter, sample kits are mailed to participating laboratories, and data analysis is completed in time to allow participants to obtain repeat samples and correct analytical problems before the next round starts. The reference samples are designed to cover a variety of analytical methods used by occupational health laboratories and include contaminants for which analytical agreement is often poor. We receive metals on filters (a combination of lead, cadmium, chromium, and zinc) and organic solvents on charcoal tubes (a combination of up to three of the following: benzene; carbon tetrachloride; chloroform; 1,2-dichloroethane; methylene chloride; methyl chloroform; methyl ethyl ketone; methyl isobutyl ketone; p-dioxane; toluene; trichloroethylene; cellosolve acetate; and o-xylene). The concentration levels are randomly selected from a range of concentrations that is typical of samples taken

near current or proposed 8-h time-weighted-average threshold limit values (TLVs).

B. **Environmental Monitoring and Support Laboratory-Cincinnati (EMSL-CI) Drinking Water Program.**

As part of an independent evaluation of US EPA regional laboratories, state laboratories, and other selected laboratories for the drinking-water certification program, EMSL-CI sends us Water Supply Performance Evaluation (PE) Study samples twice a year. The study covers an ever-growing list of analytes: nitrate, nitrite, fluoride, turbidity, trace metals (a combination of aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc), residual free chlorine, corrosivity, sodium, total cyanide, sulfate, chlorinated hydrocarbon pesticides (insecticides) and herbicides, trihalomethanes, and regulated and unregulated volatile organic compounds (VOCs). Four VOC samples were shipped with each study. VOC sample 1 contained the eight Phase I regulated VOCs: trichloroethylene; carbon tetrachloride; 1,1,1-trichloroethane; 1,2-dichloroethane; vinyl chloride; benzene; 1,1-dichloroethylene; and 1,4-dichlorobenzene. VOC sample 2 contained the Phase II regulated VOCs: 1,2-dichlorobenzene; cis-1,2-dichloroethylene; trans-1,2-dichloroethylene; 1,2-dichloropropane; ethylbenzene; chlorobenzene; styrene; tetrachloroethylene; toluene; and total xylenes. VOC sample 3 contained some of the Section 1445 unregulated VOCs listed on page 25,710 of the Federal Register of July 8, 1987. The third sample is a greater analytical challenge since the analyst is not informed of the number of compounds present, their identities, or concentrations. Samples 1 and 3 are to be analyzed using EPA Methods 502.1, 502.2, 503.1, 524.1, or 524.2. Due to the complexity of the analytes in VOC sample 2, only methods 502.2 or 524.2 will offer sufficient resolution for the anaylsis. If any results are reported for VOC sample 3, results <u>must</u> be reported for every VOC that is present in that sample. VOC sample 4 contained EDB and DCBP and must be analyzed by Method 504. EMSL-CI prepares reports for each laboratory and reviews unacceptable data with the laboratory to identify and resolve problems.

C. **Environmental Monitoring and Support Laboratory-Cincinnati (EMSL-CI) Water Pollution Study.**

These studies are part of a continuing effort to provide independent evaluation of US EPA regional laboratories, state laboratories, and other selected laboratories analyzing for water pollution parameters. EMSL-CI sends Water Supply PE Study samples twice a year. The study covers the following list of analytes, most at two concentration levels: trace metals (aluminum, antimony, arsenic, beryllium, cadmium, cobalt, copper, chromium, iron, manganese, mercury, molybdenum, nickel, lead, selenium, silver, strontium, thallium, titanium, vanadium, and zinc), minerals (pH, conductivity, hardness, total dissolved solids, calcium, magnesium, sodium, potassium, total alkalinity, chloride, fluoride, and sulfate), nutrients(ammonia-nitrogen,nitrate-nitrogen, orthophosphate, and total phosphorus), demands [chemical oxygen demand (COD), and 5-day biological oxygen demand (BOD)], cyanide, nonfilterable residue, oil and grease, total residual chlorine, PCBs in water and transformer oil, chlorinated hydrocarbon pesticides (insecticides), volatile halocarbons, and volatile aromatics. EMSL-CI prepares reports for each laboratory and reviews unacceptable data with the laboratory to identify and resolve problems.

D. **EPA Environmental Monitoring Systems Laboratory-Las Vegas (EMSL-LV).**

The Quality Assurance Division of EMSL-LV has been assigned the responsibility for radiation QC on environmental measurements. The EPA supplies samples to us through an extensive laboratory intercomparison studies program involving environmental media (milk, water, and air) and a variety of radionuclides with activities at or near environmental levels. Simulated environmental samples, containing one or more radionuclides, are prepared and periodically distributed to laboratories upon request. A report is returned to each participant. This program enables us to document the precision and accuracy of our radiation data, to identify instrument and procedural problems, and to compare our performance with that of other laboratories. Drinking-water laboratories certified for radiochemistry must satisfactorily analyze two intercomparison crosscheck samples and a set of PE samples annually. Intercomparison samples differ from PE samples in that the former contain only one or two radionuclides (for example, ^{226}Ra and ^{228}Ra), whereas PE samples for radiochemistry are complex mixtures of alpha-, beta-, and photon-emitting radionuclides. Contaminant concentrations are furnished to the laboratory after completion of the study.

E. **Environmental Measurements Laboratory (EML).**

EML operates the Quality Assessment Program (QAP) for the DOE. The program is designed to test the quality of the environmental measurements being reported to the DOE by its contractors. Since 1976, real or synthetic environmental samples that have been prepared and thoroughly analyzed at EML have been distributed to these contractors. We receive semiannual samples for various radionuclide determinations. The sample matrices include soil, water, vegetation, and air filters. Our results are returned to EML within 90 days, compiled with EML's results, and reported to us 30 days later.

F. **National Pollutant Discharge Elimination System (NPDES).**

The US EPA and state agencies with approved programs are continuing a QA program initiated in 1980 for all major permittees under the NPDES. The purpose of the program is to evaluate the analytical ability of laboratories analyzing NPDES samples. We receive performance samples containing constituents normally found in industrial and municipal waste waters. Participation in this program, including proper analyses and record retention, is mandatory based on the authority of Sec. 308(a) of the Clean Water Act. We are required to analyze and report only those pollutants specified in our NPDES permit (aluminum, arsenic, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, vanadium, zinc, pH, total suspended solids, oil and grease, ammonia as N, nitrate as N, total phosphorus as P, orthophosphate, chemical oxygen demand, cyanide, and total residual chlorine). The analyses are to be performed and the data reported within 30 calendar days after receipt of the sample. An evaluation of our results is returned along with the true values. A copy of the evaluation is also sent to the appropriate EPA regional office and state agency.

G. **DOE Beryllium Intercomparison.**

We participate in a beryllium filter analysis "round-robin" intercomparison with three other DOE laboratories that routinely perform beryllium analyses: Rocky Flats, Oak Ridge, and Livermore. The intercomparison study was initiated by Rocky Flats in 1986. The

DOE Beryllium Monitoring Subcommittee met in June 1990 and added three new facilities to the study: Brush Wellman, Lovelace ITRI, and Atomic Weapons Establishment in Aldermaston, England, and Cardiff, Wales. The committee recommended that the following levels be used in the study: 0.5 μg, 2.0 μg, 10 μg, and 25 μg. These levels correspond to the full range of total beryllium expected for breathing zone, permanent air samples, and smear samples. Results are to be reported within 30 days after receipt of the samples. Oak Ridge prepared all samples for 1992 and conducted the statistical evaluation of the analytical results.

H. DOE Laboratory Accreditation Program (DOELAP) In-Vitro Performance Evaluation Study.

EM-9 participated in the DOELAP pilot test session for in-vitro bioassay. Artificial fecal samples were sent in July, 1992, for radiometric analyses. The radionuclides used in the pilot test included ^{238}Pu, ^{239}Pu, ^{241}Am, ^{234}U, ^{238}U, ^{90}Sr, ^{137}Cs, and ^{134}Cs.

VII. SURVEILLANCE AND AUDITS

VII. SURVEILLANCE AND AUDITS

Formal planning was continued during 1992 to provide EM-9 with a system for conducting and documenting internal audits of the production chemistry areas: organic, inorganic, and radiochemistry. A comprehensive system of planned and scheduled audits will be performed to verify compliance with all aspects of the quality assurance program and to determine its effectiveness. These audits will be performed in accordance with written procedures or check lists by personnel who do not have direct responsibility for performing the activities being audited. Audit results will be documented and reported to and reviewed by responsible management. Follow-up action, including reaudit of deficient areas, will be taken where indicated. The internal audit system was only partially implemented during 1992 because of insufficient personnel within the QADM Section.

A. Scheduling.

Both internal and external audits will be scheduled in a manner to provide coverage and coordination with ongoing quality assurance activities. Audits will be conducted at a frequency commensurate with the status and importance of the activity. The audit schedule will be reviewed periodically and revised as necessary to assure that coverage is current. Regularly scheduled audits will be supplemented by additional audits of specific subjects when necessary to provide adequate coverage.

B. Preparation.

The QADM Section will develop and document an audit plan for each audit. The plan will identify the audit scope, requirements, audit personnel, activity to be audited, organizations to be notified, applicable documents, schedule, and written procedures or check lists.

The quality assurance officer will select and assign auditors who are members of the QADM Section who are independent of any direct responsibility for performance of the activities that they will audit. In the case of internal audits, personnel having direct responsibility for performing the activities being audited will not be involved in the selection of the audit team. *Audit personnel will have sufficient authority and organizational freedom to make the audit process meaningful and effective.*

An audit team will be identified before the beginning of each audit. This team will contain one or more auditors and will have an individual appointed to lead the team who organizes and directs the audit, coordinates the preparation and issuance of the audit report, and evaluates responses. The audit team leader will ensure that the audit team is prepared before initiation of the audit.

C. Performance.

Audits will be performed in accordance with written procedures and check lists. Auditing will begin as early in the life of the activity as practicable and will be continued at intervals consistent with the schedule for accomplishing the activity. Elements selected for audit will be evaluated against specified requirements. Objective evidence will be examined to the extent necessary to determine if these elements are being implemented effectively. Audit results will be documented by auditing personnel and will be reviewed by management having responsibility for the area audited. Conditions requiring prompt

corrective action will be reported immediately to management of the audited organization.

D. Reporting.

The audit report will be signed by the audit team leader, issued to management, and will contain the following information:

- description of the audit scope;
- identification of the auditors;
- identification of persons contacted during the audit activities;
- summary of audit results, including a statement on the effectiveness of the quality assurance program elements that were audited; and
- description of each reported adverse audit finding in sufficient detail to enable corrective action to be taken by the audited organization.

E. Response, Follow-Up Action, and Records.

Managers of the audited organization or activity will investigate adverse audit findings, schedule corrective action, including measures to prevent recurrence, and notify the appropriate organization, in writing, of action taken or planned. The adequacy of audit responses will be evaluated by the QADM Section.

Follow-up action will be taken to verify that corrective action is accomplished as scheduled.

Audit records will include audit plans, audit reports, written replies, and the record of completion of corrective action.

F. Qualification of Auditors.

The quality assurance officer will establish the audit personnel qualifications to accomplish the auditing of the quality assurance program. Personnel selected for quality assurance auditing assignments will have experience or training commensurate with the scope of the activities to be audited. Auditors will have or will be given appropriate training or orientation to develop their competence for performing required audits. Competence of personnel for performance of the various auditing functions will be developed by one or more of the following methods:

- Training programs to provide both general and specialized training in audit performance. General training will include fundamentals, objectives, characteristics, organization, performance, and results of quality auditing. Specialized training will include methods of examining, questioning, evaluating, and documenting specific audit items and methods of closing out audit findings.
- On-the-job training, guidance, and counseling under the direct supervision of a lead auditor. Such training will include planning, performing, reporting, and follow-up action involved in conducting audits.

G. Internal Audit Plan.

We use blind QC samples as a regular part of our routine QA/QC program and have written software to audit these data for overall performance. We anticipate conducting only systems, records, and follow-up audits as a regular part of our internal program.

Internal audits will be conducted in the same fashion as formal external audits. A regular

schedule will be established in consultation with the organizations to be audited. Preaudit meetings will occur between the auditor and section leader. After the audit is performed, the auditor will evaluate the findings and conduct a postaudit meeting with the section leader. A formal report of findings and noteworthy practices will be prepared and submitted to the group leader, section leader of the audited organization, and the QADM section leader. Where appropriate, unannounced follow-up audits will be used to verify corrective action implementation.

Systems audits will be of two distinct types: procedural and overall. Audits will be conducted by an auditor selected from qualified members of the QADM Section. We will audit the conduct of specific analytical procedures against the written and approved versions in LA-10300-M[11] to assure that analysts are conducting routine analytical procedures in conformance with approved written instructions. This will be done by observation of the procedure during its execution in routine analysis. Overall systems audits will ideally be conducted by selecting an analytical result that has been published in one of our customer's reports and requiring the section that produced the data to trace its production from sample receipt to the reporting of the final result. Specific check lists will be developed for each systems audit and should include all of the following: instrument calibration data, original sample data, calculations, ability to duplicate the values that are resident in the databases, evidence of VAX data input, use of bound Laboratory notebooks for associated analytical information, storage and retrieval of raw data, chain-of-custody evidence, ability to associate QCs with sample batch, and current written procedures available at the bench.

Schedules, requirements, and check lists were developed during 1992 for implementation during 1993.

H. Corrective Action System.

A formal corrective action system is set up in EM-9. Findings from internal electronic audits of the databases and from all internal and external audits conducted in EM-9 during 1992 were documented and issued as EM-9 Internal Audit Memos with overall findings and Corrective Action Requests (CARs). Each CAR was assigned a number (e.g., CAR 92.003 is the third action for 1992) and a folder was created to receive the documentation related to each CAR. Datatrieve databases provide for automatic tracking of the resolution status of each CAR. These databases are described in Section IV.D.10.

I. Audits of EM-9 During 1992.

1. *DOE Tiger Team assessment.* The DOE Tiger Team assessment of Los Alamos National Laboratory began on September 23, 1991, and continued until the November 8th closeout. Peggy Gautier was the counterpart for Hilton Rivera, who assessed analytical laboratory quality assurance for the environmental subteam. Specific deficiencies were observed in recordkeeping and management, calibration and the use of standards, sample storage, computer program validation, procurement, audits, and corrective action. In addition, inadequate workspace in laboratories was identified as a weakness. Some corrective actions were completed on these findings during 1992.

   - **Finding QA/CF-3: Sample analyses and data management activities at the Laboratory are either performed**

without standard operating procedures (SOPs) or using unapproved procedures.

Basis. The EM-9 radiochemistry laboratory, located at TA-59, is using SOPs for radium determination, isotopic uranium analysis, and gamma analysis that have not undergone quality assurance review and approval.

Corrective Action. The following procedures were completed and received QA review and approval on the following dates: radium in water (ER180) in February, 1992; isotopic uranium in urine (R261) in September, 1992; and gamma analysis in environmental matrices (ER140) in March, 1992.

Basis. The computer backup SOP for data generated by EM-9 was not prepared in the required controlled format.

Corrective Action. Not completed.

Basis. EM-9 has been conducting data reviews of all the analyses performed at the organic laboratory, TA-59, Bldg. 1, without SOPs. SOPs were either recently developed and are still in draft form or are currently being developed.

Corrective Action. Not completed.

- **Finding QA/CF-4: EM Division has not developed or implemented procedures in support of its QAP.**

Basis. EM-9 has quality assurance procedures within the Laboratory Quality Assurance Program Plan. The program plan lists 28 administrative quality assurance procedures. Only 10 of 28 procedures have been implemented.

Corrective Action. Twenty-three administrative procedures were completed by the end of 1992.

- **Finding QA/CF-5: The Laboratory does not have a system in place to ensure that environmental quality requirements are applied to the procurement of materials and services.**

Basis. EM-9 has no procedures that require that purchase requisitions undergo review for environmental quality requirements.

Corrective Action. Not completed.

Basis. In the past year, EM-9 has used the services of two off-site analytical laboratories. No documented source evaluations or on-site quality assurance reviews were performed on these laboratories as required by NQA-1[19]. However, to ensure the accuracy of the analyses performed by these laboratories, quality control samples (spike and blanks) were included with the samples sent for analysis.

Corrective Action. During 1992, AP-13, "External Audits," was written and received QA review and approval. Twenty-seven pages of audit questions were prepared for use during audits of off-site analytical laboratories. These audit questions were divided into check lists for the various areas to be audited, such as management, QA/QC, computing, sample management, laboratory information management, and analytical work.

Ten laboratories that will potentially be placed under contract for the overflow work from the Environmental Restoration (ER) Program were audited during 1992. Formal responses to audit deficiencies will be required as part of the best-and-final-offer submission from the off-site laboratories.

- **Finding QA/CF-6: EM Division does not have a program to ensure that computer software undergoes formal validation or verification.**

Basis. EM-9 has not implemented procedures requiring the verification and validation of computer programs.

Corrective Action. EM-9 has adopted EPA's *Good Automated Laboratory Practices* as its model for development of a software QA plan.

Basis. In EM-9, the software used for radiological analysis has not been subjected to documented validation.

Corrective Action. Documented validation on this software was begun during 1992 but is not completed.

Basis. In EM-9, the software used to transfer data from analytical instruments to the VAX database has not undergone documented verification or validation.

Corrective Action. Not completed.

Basis. In EM-9, the Lotus and Excel spreadsheet programs used for data manipulation and analysis in the organic, inorganic, and radiochemistry laboratories have not been verified or validated.

Corrective Action. Not completed.

- **Finding QA/CF-8: Some Laboratory environmental sampling and analytical activities do not meet the requirements for the proper use of standards and instrument calibration.**

Basis. At the EM-9 inorganics laboratory, TA-50, Bldg. 1, over half the standards used for metals analyses are being used well after their expiration dates. At the ICP laboratory and the inorganic preparation laboratory, approximately 60% of the standards have exceeded their shelf life. These standards are generally very stable; however, evaporation, light, heat, and moisture can alter their original concentration. This might cause the analyst to calibrate against an incorrect standard concentration, resulting in a potential source of error, affecting the calculation of sample concentration.

Corrective Action. All standards that exceeded their shelf life were removed from service and were replaced with new standards. AP-24, "Chemicals, Reagents, and Solutions," was written and states that a chemical must not be used for quantitative analytical work on customer samples after its shelf life has expired.

Basis. The digital pipettes used for precise measurement of reagent volume during solution preparation at the inorganic preparation laboratory, TA-50, have not been calibrated, and there are no written procedures addressing the calibration process. The possibility of measuring incorrect volumes introduces a potential source of error, affecting the calculation of sample concentration.

Corrective Action. Digital pipettes at TA-50 are now being calibrated, but the procedure describing the calibration process had not been written.

- **Finding QA/CF-10: Sample storage practices by EM-9 do not ensure the integrity of analytical samples.**

Basis. PCB sample storage at the EM-9 organic laboratory is inadequate. Samples are stored in a cabinet without refrigeration.

Basis. Sample storage at the EM-9 pore gas laboratory at TA-59, organic preparation laboratory at TA-50, and mixed waste laboratory at TA-35 is deficient. Standards used in these laboratories were improperly stored in the same refrigerated storage as the samples, thereby creating the potential for cross contamination. This situation was also observed in the waste treatment laboratory at TA-50 where a tritium source was stored with the samples.

Corrective Action. Standards are being stored in refrigerators separate from those storing samples. Sample storage refrigeration units are marked "Samples Only." AP-23, "Storage of Standards, Samples, and Sample Extracts," was written to address proper storage requirements.

- **Finding QA/CF-11: Analytical records at the Laboratory's environmental laboratories are deficient or lacking.**

Basis. The EM-9 organic laboratory at TA-59 is not keeping sample logs for their PCB, volatile, semivolatile, and pore gas analyses.

Corrective Action. Sample run logs are now being kept by organic analysis personnel for all analyses.

Basis. The EM-9 quality assurance laboratory at TA-59 and organic preparation laboratory at TA-50 are not documenting expiration dates for prepared stock solutions in the logs and on the vial labels. This practice could result in stock solutions being used after their expiration dates.

Corrective Action. Expiration dates were added to the labels of stock solutions.

Basis. The EM-9 waste treatment laboratory at TA-50 keeps no formal, permanent record of the flow measurements used in the calculation of influent and effluent concentrations of the various parameters that the laboratory analyzes. The flow measurements are recorded on a form that is taped to the wall and discarded monthly.

Corrective Action. This information is kept by EM-7.

Basis. At the inductively coupled plasma—atomic emission spectrometry (ICPAES) and inductively coupled plasma—mass spectrometry (ICPMS) laboratories at TA-50 and the mixed waste laboratory at TA-35, diskettes containing raw data for analyses are not catalogued appropriately, making it difficult to locate appropriate data for the multiple samples analyzed at the location.

Corrective Action. Not completed.

- **Finding QA/CF-12: Practices of EM Division do not ensure the maintenance, security, preservation of, and access to records of continuing value.**

  Basis. EM-9 has a records storage facility used to store records for two years before archiving. This temporary storage facility is in an unsecured area. Records being prepared for microfilming are stored in cardboard boxes and non-fire-rated cabinets. This area currently stores records generated before June 1991. Some records generated after that date are in custody of staff members in unsecured office files. These storage methods do not meet the NQA-1 requirement for the temporary storage of records because they do not provide a minimum of one-hour fire protection and are not properly protected against loss.

  Corrective Action. EM-9 analytical records storage has been centralized, and records are no longer in the custody of staff members in unsecured office files. EM-9 has purchased 21 one-hour fire-proof safes, and records older than six months are kept in these safes at the EM-9 records storage facility at TA-3, Bldg. 105, Rm. 184.

  Basis. In the EM-9 ICPMS laboratory at TA-50, notebooks containing original data are stored on an open shelf within the laboratory instead of in one-hour fire-rated cabinets before archiving.

  Corrective Action. Not completed.

  Basis. The EM-9 sample management data are stored in a non-fire-rated cabinet for up to one year before archiving. This storage method does not meet the one-hour fire protection requirement for temporary storage set forth in NQA-1.

  Corrective Action. Not completed.

- **Finding QA/CF-13: The Laboratory has not developed programs for auditing the quality assurance activities of the EM Division and its component groups.**

  Basis. EM-9 has an audit program and procedure. The audits performed, however, have been limited to the electronic audit of analytical data. There have been no audits of environmental quality practices within the group. No audit check lists or schedules have been developed.

  Corrective Action. During 1992, 27 pages of audit questions were prepared for use during audits of internal and off-site analytical laboratories. These audit questions were formalized and divided into check lists for the various areas to be audited, such as management, QA/QC, computing, sample management, laboratory information management, and analytical work. An internal audit schedule was developed, and two internal audits were performed during 1992.

- **Finding QA/CF-14: EM Division does not have a documented program for determining root causes of and implementing corrective actions for conditions adverse to environmental quality.**

  Basis. EM-9 has a documented program for determining and tracking corrective actions; however, this program does not

determine the root causes of conditions adverse to quality. The corrective actions it tracks address the correction of defects. This does not meet the requirements of a corrective action program because correction of defects does not prevent recurrence of conditions adverse to quality.

Corrective Action. AP-22, "Root Cause Analysis," was written during 1992, and root cause has become a formal part of the EM-9 corrective action program.

- **Finding QA/BMPF-1: EM-9 laboratories do not have adequate workspace to ensure the integrity of their analyses.**

Basis. At the EM-9 organic laboratory, TA-59, Bldg. OH-1, the space available for performing analytical work for volatile organics and semivolatile organics analyses is inadequate. It provides approximately 100 square feet/laboratory person, which is less than the recommended 150 to 200 square feet/laboratory person. This insufficient space impedes efficient work flow and affects sample integrity by introducing the chance of sample cross contamination.

Corrective Action. Not completed.

Basis. At the EM-9 organic laboratory, TA-59, Bldg. OH-1, the liquid nitrogen tanks used for cooling the gas chromatography/mass spectrometry instruments are improperly located in front of vent hoods. These tanks represent an obstacle for the technician handling the samples and might cause spillage or cross contamination.

Corrective Action. Not completed.

Basis. At the EM-9 organic and radiochemistry laboratories, TA-59, Bldg. OH-1, desks are not sufficiently isolated from the bench areas, introducing the possibility of contamination from supplies ordinarily used in an office, such as markers, pens, and adhesive tapes.

Corrective Action. Not completed.

2. *EPA Region VI audit.* Charles Ritchey and Kendall Young of EPA Region VI conducted an audit of EM-9 analytical areas on October 22-23, 1991. This was an invited audit arranged by Larry Maassen of the Environmental Restoration Program Office. The formal audit report was written by Kendall Young and was received on January 8, 1992. The audit conclusions, findings, and corrective actions are listed below.

Conclusion. The Laboratory has the capabilities in personnel, instruments, and facilities to analyze environmental samples for EPA programs. There has been considerable energy exerted to develop a strong analytical resource with good laboratory practices. The current efforts to strengthen the laboratory was evident, and specific procedures leading to that end were being implemented. As with the best of laboratories, there are always deficiencies and error. The findings reported define some of the deficiencies and errors and suggest opportunity for correction.

EM-9 has the necessary qualifications to meet the criteria for analyzing environmental samples by EPA-regulated programs, and the group has the essential equipment for analyzing environmental

samples for most programs. Their provisions for safety and health are at a higher level of concern than in most laboratories across the country. Opportunity for unauthorized personnel to enter the facility or to alter records is minimal.

For the most part, the findings are of a minor nature and can be easily corrected or improved. The area of major concern is the failure to analyze the Water Supply and Water Pollution studies in an acceptable manner for all parameters. Attention must be given to this problem with a demonstration that all of the required analytes can be analyzed satisfactorily. The window into the Laboratory's operation is available to EPA Region VI and to EPA generally because these results are available to the Quality Assurance Management Staff.

The assistance given to the auditors was considerable, cooperative, and given freely. This was appreciated by the evaluators.

- **Finding 1. There are some areas where the control of temperature is not adequate.**

  Recommendation. Temperature control in the laboratory spaces must be provided, ensuring proper operation of instruments so that performance of EPA procedures according to the conditions specified in the methods is not impacted. Room temperature logs should be maintained and operations shut down when out-of-bounds conditions occur.

  Corrective Action. Air conditioners have been installed in organic analysis laboratories 109, 115 (volatile analyses), and 123. The alpha counting facility, room 107, the gamma counting facility, room B8D, and the computing facility, room 120A, are also air conditioned. Room temperature logs are not kept.

- **Finding 2. There are some areas where an uninterrupted power supply is not provided to protect against power outages. Interrupted power could lead to loss of reagents and samples.**

  Recommendation. Emergency procedures are a must to preserve samples and reagents.

  Corrective Action. Backup power supplies are not available. Continuous temperature recording devices, which will notify personnel if power has been interrupted, are in place on critical refrigeration units . If power was lost and sample integrity compromised, resampling would have to occur.

- **Finding 3. Continuous temperature records are not maintained on refrigerators, and alarms are not provided.**

  Recommendation. There should be recording temperature devices on all critical refrigerators that would record if refrigeration was off during the night or weekend.

  Corrective Action. Continuous temperature recording devices have been installed on critical refrigeration units that contain samples and reagents. Monitoring these charts will alert personnel to any fluctuations in temperature. Refrigeration units are not alarmed.

- **Finding 4. The external exhausts and intakes at both TA-50 and TA-59 are**

not located appropriately to prevent exhausted air from being recirculated into the building. At both TA-59 and TA-50, incompatible materials may be exhausted through common hood ductwork.

Recommendation. Air intakes should be located away from exhaust (could harm personnel and contaminate samples). Each bank of hoods should be separate.

Corrective Action. Because of the age of our facilities and cost, it is not feasible to redesign the ventilation systems and physically relocate air intakes. Operations that produce odors or that could potentially contaminate samples are now scheduled for weekend hours when routine analytical work is not being performed. General plant pojects (GPP) money was requested for upgrade of hoods and has been allocated in the FY94 budget.

- **Finding 5. Space is not sufficient to meet the criteria for laboratory space as defined in the Manual for the Certification of Drinking Water Laboratories.**

Recommendation. A growth plan which involves the need to meet analytical demands with each new EPA regulation must be addressed.

Corrective Action. A growth plan has not been written but additional space has been formally requested through the Laboratory's Space Committee. Our request for additional laboratory and sample management space has not been met but approximately 670 square feet was acquired for analytical records storage.

- **Finding 6. A compressed gas cylinder in the organic extraction laboratory was not secured to keep it from falling.**

Recommendation. All compressed gas tanks must be secured at all times to prevent injury of personnel or damage to equipment.

Corrective Action. The gas cylinder in question was secured immediately after it was discovered. The monitoring of gas cylinders has become a routine part of our monthly safety inspections.

- **Finding 7. There were no provisions for opening sample coolers under hoods where hazardous materials may contaminate laboratory personnel should containers be broken during shipment.**

Recommendation. A hood must be provided for opening sample chests to prevent exposure to hazardous materials. Written procedures are needed to provide instructions regarding broken sample containers and/or contaminated containers or packing materials.

Corrective Action. Only one small hood is available in the sample management laboratory. It is located in the southwest corner of room 190 and is not of adequate design to handle coolers. The sample management section leader has made several requests to the Laboratory Space Committee for additional space for the sample management operation and to date has not been granted additional space. AP-2, "Sample Management," has been written to address sample-receiving issues. Hazard warnings are placed on samples according to Section 7.2 of the procedure. A red dot indicates

radioactivity above background levels, and an orange dot indicates toxic materials. Cleanup procedures for broken samples are discussed in Section 4.5.

- **Finding 8. Shower inspections are not documented on the equipment by the inspector showing the date it was inspected.**

  Recommendation. Showers and eye wash equipment must be checked on a frequency that ensures efficient operation. This check must be documented on the shower and eye wash equipment in order for supervisors to be assured that personnel will have the protective measures required of the equipment at all times.

  Corrective Action. EM-9 has worked with the OH-1 building manager to get a work order in place to have the showers inspected on a regular basis. The showers are now tagged and were last inspected in June, 1993. Eye wash equipment is currently inspected on a monthly basis, and the inspection is documented on a card located near the eye wash.

- **Finding 9. Hallway traffic was restricted at places due to the storage of materials along their walls.**

  Recommendation. Hallways must be kept free and clear to permit rapid evacuation in the event of an emergency.

  Corrective Action. Hallways are not clear of equipment and storage cabinets, but every effort is made to keep them in compliance with the life safety code. The requirement is that main exit paths provide at least 44 in. of clear exit space and that one wall of the exit path be kept clear at all times. This requirement is enforced through monthly safety inspections and by managers walking their spaces.

- **Finding 10. EM-9 has established methods for the various environmental requirements; however, the method required for regulatory purposes is not always used.**

  Recommendation. The method required by a regulated program must be used.

  Corrective Action. It is EM-9 policy to run the methodology required by the customers to meet their regulatory needs. If no regulated program or method is specified by the customer, EM-9 will select the method that in their best technical judgement will meet the customer's needs.

- **Finding 11. Method detection limits had not been determined for all parameters.**

  Recommendation. The principle of 40 CFR 136 Appendix B must be used for NPDES and Drinking Water samples. This can be accomplished by the use of the matrix spike and matrix spike duplicate for a number of replicates for that matrix type and calculating the variance of those duplicates.

  Corrective Action. The organic analysis section of EM-9 performs method detection limit studies that use the standard deviation of seven replicate samples spiked at 5-25 times the practical quantitation limit and then processes the samples through the entire

analytical procedure. This process is in accordance with 40 CFR 136.

- **Finding 12. The instruments have been maintained by vendor contracts, and maintenance records are documented. Copies of all vendor maintenance sheets need to be a permanent part of the instrument logbook record. The records have not been initialed and dated in every case.**

  Recommendation. Maintenance records must be maintained on all instruments and certified by the operator by initialing and dating the record for each entry.

  Corrective Action. Binders have been established for each instrument in the Organic Analysis Section to store vendor maintenance records. Instrument maintenance logs are also maintained. The section leader reviews these logs to ensure that they are being dated and signed.

- **Finding 13. The linear response of all instruments had not been established.**

  Recommendation. Analyses must be performed within linear operating ranges; this must be documented for each method. Linearity of the ICP should be determined down to the detection limit by the use of serial dilutions of the standards.

  Corrective Action. The linearity of instrument response in the organic analysis area is verified during instrument calibration. This is documented in the analytical procedures for all organic analyses performed. The calibration data is part of the final organic analysis data package.

  The instrument linearity in the inorganic analysis area is established and verified each time an instrument is run through the initial, daily, and continuing calibration data. This information is included with each data package.

- **Finding 14. The results for the Water Pollution Study (WP series) and the Water Supply Study (WS series) have been below expectations with unacceptable values reported for many analytes. (Specifically mentioned were volatiles, trace metals, minerals, and gamma-emitting isotopes).**

  Recommendation. Improved performance must be demonstrated in this area. The failure to analyze these survey samples properly would be the basis for denial of certification under the Safe Drinking Water Act. The failure to analyze the samples in the Water Pollution Study must be of concern for NPDES permits where particular analytes are required to be measured. The ability to perform those analyses reported with unacceptable values must be demonstrated immediately by determining the problem which caused the out-of-limit result, correcting the problem, and reporting the action taken to the EPA. The correction of this problem is deemed to be very critical in establishing acceptable operations in EM-9.

  Corrective Action. EM-9 management and personnel did not place enough emphasis on successful performance of these studies. Each section leader is now aware of the importance of these studies

and has communicated this to their personnel. Performance on each study is being monitored by management with fully acceptable results being our goal. Organic analytical performance has improved to where there is only an occasional outlier. Inorganic performance improved and then slid backward with problems in the metals area. The inorganic area is under new management that is making QA and resolution of analytical problems a high priority. Additional shielding has been put in place around detectors used for low -evel radioactive measurements to lower background levels and allow us to measure levels that were below our detection limits in the past.

- **Finding 15. EM-9 is collecting data for the measurement of precision and accuracy. Duplicates and spikes are used to measure quality control.**

  Recommendation. Use matrix spike and matrix spike duplicate analyses for each laboratory batch of samples in a given media. This data should be plotted on quality control charts.

  Corrective Action. Matrix spike and matrix spike duplicate data is being extracted from EM-9 databases by personnel in organic analysis. This data will be tabulated and used to determine the precision and accuracy of each method. This process has not been completed.

  Data from duplicates and spikes are being plotted on quality control charts.

- **Finding 16. The raw data sheets, chromatograms, and working documents are not always initialed and dated.**

  Recommendation. Each item of data that is to be construed as the raw data (the essential data for deriving intermittent or final reports such as chromatograms, manual computations, or results) must be authenticated by initials and dates.

  Corrective Action. Organic analysis personnel have implemented a policy of initialing and dating each page of raw data.

- **Finding 17. SOPs have not been written and approved for all parameters. Marginal notes written on SOPs did not show approval by the supervisor as official changes.**

  Recommendation. Completion of the analytical procedures and their approval must be done at the earliest date. Any change in the SOP must be authorized by the supervisor and authenticated by the supervisor's signature and date. The analytical procedures in use by the analysts, technicians, or assistants must be the current and approved edition.

  Corrective Action. Significant progress has been made in EM-9 documentation efforts. EM-9 analytical procedures are between 90 and 95% completed as compared to 70% completed at the time of this audit. The analytical procedures in use by the analysts are current and approved and are regulated by the requirements of AP-15, "Document Control." Document change is regulated by the "Document Control and Document Change" procedure located in the General Information section of Vol. I of LA-10300-M[11]. This procedure states that any change must be approved by the group leader, section

leader, and the QA officer before the change is used and distributed.

- **Finding 18. Data is validated before reporting. Computerized systems are in place for this purpose. The generation of data that requires computer-based manipulation for conversion of data into a reportable form *assumes* that the computer always performs the correct steps using the correct factors. The verification that the computer-processed data is correct is not routinely verified.**

  Recommendation. The correctness of the computerized processes must be verified by manual calculations. The frequency of verification and results of the verification process must be documented. An SOP for this verification should be developed.

  Corrective Action. EM-9 has adopted EPA's *Good Automated Laboratory Practices* as its standard for software quality assurance. We will follow the protocols in its Section 7.9 on software. We have begun to collect standard data sets to periodically run through the software to document that the software is giving us consistent results. This process is in its initial implementation stage with a two-year target for completion. EM-9 has obtained a copy of EPA's RLIMS, and its laboratory information management system is currently under evaluation for use by EM-9.

- **Finding 19. Data is stored in a protected environment. The retrieval of data was satisfactory; however, the requirements for the life of data was not certain.**

  Recommendation. Consideration must be given to the kind of storage media used for the storage of data over long periods. Magnetic media can deteriorate with time. An SOP for updating the data to new media must be considered.

  Corrective Action. DOE has placed environmental data on a permanent retention schedule. All raw data for an analysis set that is necessary for data defensibility is printed in hard copy and added to the analytical data package. The hard copy data is transferred to microfilm within two to three years after it was generated. After the film has undergone quality control checks, we have been given permission by the National Archives in conjunction with CRM-1 to destroy the paper copy.

- **Finding 20. Laboratory reagents exceeded the expiration date in some instances. Reagents that had passed their expiration date were still in the laboratory.**

  Recommendation. All reagent containers must show an expiration date. If the reagent is beyond the expiration date, it must be removed or separated from working reagents and clearly labeled so that there is no possibility it could be used.

  Corrective Action. The purchased metal standards that had exceeded their expiration dates were removed from use, and new standards were ordered. Because some of the standards are used infrequently, a company was located that packaged the standards in a smaller volume so that waste disposal is not as significant an issue when the standards expire.

- **Finding 21. Routine sample preservation status checks should be performed, and a system to make this check a part of the record is needed for those samples that are not in compliance when the preservation was not maintained.**

  Recommendation. A check must be made to ensure that all samples have been preserved in the manner required for the specific analysis. When the preservation was not proper, this information must be reported to the data user and shown on the final report.

  Corrective Action. Organic analysis personnel include a bench sheet in their data packages on which the pH of the sample is recorded along with other pertinent information such as percent moisture or extraction volume.

  An electronic discrepancy report was developed to permit sample management personnel to enter sample discrepancy information into the database at the time of sample receipt. The report writer appends this information to the final report that is sent to the customer.

- **Finding 22. Conductivity meters are in use in the laboratory water supply system; however, an independent check of the conductivity of the laboratory water is not performed throughout the laboratory.**

  Recommendation. The conductivity should be periodically and independently checked and documented.

  Corrective Action. QA personnel began taking weekly independent measurements of conductivity/resistivity in September, 1992, and wrote an analytical procedure describing the process.

3. *Contract laboratory audits.* Twenty-seven pages of audit questions were prepared for the audits of the laboratories that will be placed under contract for the overflow work from the ER Program. These audit questions were divided into check lists for the various areas to be audited, such as management, QA/QC, sample management, laboratory information management, and analytical work.

   Ten facilities were audited during 1992, and audit responses are required to be a part of the best and final offer.

4. *Precious metals audit.* A precious metal audit was performed on February 25, 1992, by Toby Trujillo of EM Division. Everything was in order, and no recommendations were deemed necessary as a result of this audit. Six platinum disks were disposed of, and the property transfer slip was filled out. The custodian is maintaining acceptable precious metal records and controls.

   Efforts to find the unlocated precious metals from the September, 1991, audit were unsuccessful. Since these precious metals have been missing through two consecutive audits, they were removed from accountability.

5. *Internal audit of Sample Management Section.* Peggy Gautier and Ernie Gladney conducted an internal audit of the Sample Management Section on March 27, 1992. The findings were listed on corrective action forms and were distributed to the Sample Management Section for response.

6. *Los Alamos Technical Associates (LATA) audit of Sample Management Section.* On April 23-24, 1992, LATA performed a limited-scope audit of the Sample Management Section for the ER Program. Nancy Koski was the EM-9 representative for the audit. Only minor findings were presented at the closeout meeting. The formal audit report was received on July 31, 1992.

Conclusion. QA program adequacy and effectiveness. Sample Coordination Facility (SCF) personnel were knowledgeable regarding their positions and responsibilities and presented objective evidence to support their understanding and implementation of the ER Quality Program Plan (QPP) requirements. The deficiency reports initiated indicate that EM-9 Administrative Procedure No. AP-8, Rev. 0, should be revised to reflect current practice. The audit team appreciated the cooperation and professionalism of the EM-9 staff during the audit.

Two observations pertaining to EM-9 operations were noted during this audit.

- **Observation 1. EM-9 Administrative Procedure No. AP-8, "Chain of Custody," requires that a list be maintained in the group office of authorized personnel with keys to secured areas and containers. It is recommended that this list be posted at the entrances to the secured areas.**

  Corrective Action. The list of personnel authorized to accept samples was posted on the door to Sample Management, Room 190, on July 12, 1992, and is updated when new personnel are added to the section.

- **Observation 2. Workspace in the SCF for receiving and storing samples is limited. These areas will be inadequate for efficient processing and control of samples generated by an expected increase of sampling activity in the ER Program.**

  Corrective Action. Additional space for Sample Management was requested from the Space Committee, chaired by Ellen Morris of the Engineering (ENG) Division. Approximately 5,000 square feet was acquired in the Sherwood Building and will be refurbished and ready for occupancy by October 1993.

  Two deficiency reports were initiated for EM-9 as a result of this audit.

- **Deficiency 1. A new form (Chain-of-Custody, Form 1304) is being used instead of the EM-9 Chain-of-Custody Record Form (Form AP-8A) and the Transfer of Samples Form (Form AP-8C). The new form is not referenced in the procedure.**

  Corrective Action. Procedure AP-8, "Chain of Custody," was updated and approved on March 2, 1993. The new form 1034 is part of the procedure and the form for Transfer of Samples was removed because it was no longer used.

- **Deficiency 2. Padlocked ice chests were not used when samples were shipped to Chem-Nuclear Geotech for analysis in April 1992.**

  Corrective Action. AP-8 was revised on March 2, 1993, to delete the requirement to use padlocked ice chests when shipping samples to external laboratories. The procedure now states

that chain-of-custody tape will protect the integrity of the samples.

7. *Nuclear materials audit.* A nuclear materials audit was performed on May 15, 1992, by Frank Ortiz. All special nuclear material (SNM) in our account, MBA 460, was accounted for. The safe containing our SNM had been moved into the hall to make room for a new employee. This was not an acceptable location, so the safe was moved back into room 118.

8. *LATA audit of EM-9 laboratory activities.* On June 1-3, 1992, LATA performed an audit of EM-9. The scope of this audit was limited to the EM-9 analytical laboratory's activities being performed in support of the ER Program. Activities were evaluated using requirements specified in the Environmental Chemistry Quality Assurance Program and applicable implementing procedures. Areas evaluated included chain of custody of samples, M&TE control, document control, procurement, quality assurance, quality control, and personnel qualification and training. Laboratory analysis and testing methods were not within the scope of this audit. Only minor findings were presented at the closeout meeting. The formal audit report was received on July 31, 1992.

   Conclusion. QA program adequacy and effectiveness. Analytical laboratory personnel were knowledgeable regarding their positions and responsibilities and presented objective evidence to support their understanding and implementation of the QAPP requirements; however, implementation of QAPP requirements in criteria 6 and 17 needed improvement in order to be considered effective. The audit team appreciated the cooperation and professionalism of the EM-9 staff during the audit.

   There were 14 observations noted during this audit.

   - **Observation 1. The quality control laboratory is well organized and efficient and is providing excellent assurance of the quality of analyses being performed by the analytical laboratories.**

     Corrective Action. None required.

   - **Observation 2. EM-9 Administrative Procedure AP-16, Rev. 1, "Calibration Control System," Section 2.4, requires the section leader to ensure that the M&TE Control Listing be reviewed and updated on an annual basis. In order to provide more timely information, it is recommended that the list be updated when new M&TE is entered into the system, distributed after each update, and reviewed more frequently than on an annual basis to verify that the list reflects actual M&TE in the system.**

     In addition, the development of a computerized database listing should be considered to replace the M&TE Control Listing required by the procedure.

     Corrective Action. AP-16, Step 2.5, has been modified to require that M&TE listings be updated on a semiannual basis. A computer database for M&TE was developed and implementation was completed by February 15, 1993.

   - **Observation 3. EM-9 Administrative Procedure AP-8, Rev. 0, "Chain of Custody," Section 3, requires individuals to sign the Chain-of-Custody form to**

document sample custody transfer from analyst to analyst. In actual practice, a section leader may accept responsibility for a sample by signing the Chain-of-Custody form but then transfer a portion of the sample to another individual within the section leader's group to perform the required analysis. This 'transfer' is documented in a laboratory notebook rather than on the Chain-of-Custody form. Although chain of custody is maintained by this process, the procedure does not address this method of maintaining chain of custody. It is recommended that the procedure be revised to reflect actual practice.

Corrective Action. Procedure AP-8 was revised to state in Step 3 that "Once analysis is started, the custody of that portion of the sample is tracked in a Laboratory notebook."

- **Observation 4. Procurement of materials and services for the analytical laboratory is conducted through the Laboratory's Materials Management (MAT) Division in accordance with MAT procedures and the applicable requirements specified in Sections 4 and 7 of the QAPP. The need for administrative procedures necessary for EM-9 to govern internal processing and control of procurement activities should be evaluated.**

  Corrective Action. Since procurement of materials and services is conducted through the Laboratory's MAT Division, EM-9 feels that following MAT procedures is sufficient and that we do not need an internal procedure at this time.

- **Observation 5. An EM-9 Record of Lead Auditor Qualification indicates that an individual completed lead auditor training in January 1991; however, a certificate of completion is not in the file. A certificate or other documentation should be obtained and placed in the file.**

  Corrective Action. This individual is no longer working in EM-9. Personnel currently qualified as lead auditors have the proper certificates in their training files.

- **Observation 6. EM-9 Administrative Procedure AP-1, Rev. 1, "Indoctrination and Training," Section 4.5, the second bullet, states that the section leader signs the Training Document Form to indicate review. It is unclear whether all such forms are to be signed or only those generated by EM-9. Training documents examined during this audit that were generated by organizations outside EM-9 were not signed by the section leader. AP-1 should be clarified to state which documents the section leader is required to sign.**

  Corrective Action. Steps 4.4 and 4.5 of AP-1 have been revised to state that section leaders will sign Training Document forms generated by EM-9 to indicate review. Section leaders are not required to sign training forms generated by other organizations.

- **Observation 7. EM-9 Administrative Procedure AP-1, Rev. 1, "Indoctrination and Training," has no stated provisions for retraining the affected EM-9 staff when a major revision is made to a procedure governing the work**

performed. The procedure should be revised to provide guidance in this area.

Corrective Action. Step 5.2 was added to AP-1 stating that "All EM-9 personnel should be retrained to a procedure when major revisions are made to the procedure."

- **Observation 8. EM-9 Administrative Procedure AP-15, Rev. 1, "Document Control," Section 2, states that the Controlled Document Transmittal/Receipt (Form AP15-A) is used to transmit document updates to copyholders. The form does not list the revision number of documents transmitted. It is recommended that AP-15 be revised to state that the revision number of documents transmitted should be listed on the Controlled Document Transmittal/Receipt to assist the copyholder in effective maintenance of manuals.**

  Corrective Action. Revision No. has been added to the Controlled Document Transmittal/Receipt form that is part of AP-15.

- **Observation 9. Some pages in the Environmental Chemistry Quality Assurance Program, Rev. 1, are blank and unnumbered (e.g., what would be pp. 12, 16, and 22 if the pages were numbered). It is recommended that the blank pages be numbered and labeled with "THIS PAGE INTENTIONALLY LEFT BLANK."**

  Corrective Action. Blank pages will be numbered and labeled with "This page intentionally left blank" when the Quality Assurance Program Plan is next revised.

- **Observation 10. Pages in the APs are blank and unnumbered. Pages containing forms and procedure approvals are also not numbered. It is recommended that the blank pages be numbered and labeled with "THIS PAGE INTENTIONALLY LEFT BLANK." Pages containing forms and procedure approvals should also be sequentially numbered as part of the AP.**

  Corrective Action. Blank pages in the APs will be marked with "This page intentionally left blank" when they are next updated. Pages containing forms will not be numbered because these same forms are not examples but the actual form that is in use. The forms would need extensive modification to make them smaller so that the footer with the page numbers could be added.

- **Observation 11. Table of contents pages for APs do not include the EM-9 group name and are unnumbered, which could be confusing to copyholders when updating manuals. It is recommended that the group name and page numbers be added to the table of contents.**

  Corrective Action. The table of contents page has been revised to include the EM-9 group name, and the pages have been numbered.

- **Observation 12. EM-9 Administrative Procedure AP-15, Rev. 1, "Document Control," Section 3.5.2, refers to procedure AP-17, but this procedure does not exist. Section 3.5 provides direction for revisions of controlled**

documents. It is recommended that this section be deleted from AP-15 and the requirements be included in a separate procedure for preparation, review, and approval of controlled documents and their subsequent revision.

Corrective Action. Reference to AP-17 was not removed from AP-15. AP-17 will be written in the future as time and resources are acquired.

- **Observation 13. The Environmental Chemistry Quality Assurance Program, Rev. 1, contains an Appendix A that is the table of contents for the APs. It is not listed on the QAPP table of contents and is not the current revision. It is recommended that it be removed from the QAPP.**

  Corrective Action. Appendix A will be removed the next time that the QAPP is updated.

- **Observation 14. The availability of workspace in the analytical laboratory is marginal. With the planned increase in laboratory staff and the expected increase in the number of samples that will be processed by the laboratory, the facility working environment will become inadequate and could be detrimental to the efficiency and quality of work conducted.**

  Corrective Action. Three additional offices were acquired for data assessment staff in building RC97 at TA-59. Additional space for records management and sample management has been acquired in the Sherwood building at TA-1. Additional space is being sought.

Four deficiency reports were initiated as a result of this audit.

- **Deficiency 1. There is no EM-9 procedure for the implementation of the Environmental Chemistry Quality Assurance Program, Section 17, "Records."**

  Corrective Action. AP-4, "Records Management," was written and was approved on June 15, 1993.

- **Deficiency 2. The controlled document distribution lists did not contain the location (address) of recipient(s). The Controlled Document Master List and Administrative Procedures table of contents did not contain the revision numbers of the APs.**

  Corrective Action. AP-15 was updated and the requirement in Step 3.1.1 requiring the location (address) of recipients was deleted since all recipients are EM-9 personnel. The table of contents for the Administrative Procedures has been revised to include the revision of each procedure.

- **Deficiency 3. A Controlled Document Transmittal/Receipt form for Administrative Procedures was transmitted to copyholders on April 27, 1992, and was required to be returned by May 11, 1992. Copyholder of controlled manual Copy 1 had not returned the form as of the closing date of audit ER-92A3, June 3, 1992.**

  A Controlled Document Transmittal/Receipt form for the AP table of contents and various APs with effective dates of March 24, 1992, were transmitted to copyholders on March 24,

1992. Copyholder of controlled manual Copy 1 signed the form on April 1, 1992, and returned it to the Custodian, but the AP table of contents in controlled manual Copy 1 was dated December 1, 1991.

A Controlled Document Transmittal/Receipt form for the AP table of contents and various APs with effective dates of May 19, 1992, were transmitted to copyholders on May 19, 1992. Copyholder of controlled manual Copy 36 signed the form on May 20, 1992, and returned it to the custodian, but the first page of the AP table of contents in controlled manual Copy 36 was missing. The first page of the AP table of contents dated April 27,1992, was inserted in controlled manual Copy 36 just after the tab for AP-8.

Corrective Action. Other Controlled Document Transmittal/Receipt forms and manuals were examined during the audit, and it was determined that these deficiencies were isolated cases. The holders of the above documents were made aware of the deficiencies and were cautioned to be more careful in updating their manuals.

- **Deficiency 4. A Controlled Document Transmittal/Receipt form for Administrative Procedures was transmitted to copyholders on April 27, 1992, and was required to be returned by May 11, 1992. Copyholder of controlled manual Copy 1 had not returned the form and no delinquency notification had been sent as of the closing date of audit ER-9203, June 3, 1992.**

  Corrective Action. EM-9 has cut down the issuance of updates to our manuals to once a month in order to make compliance with AP-15 easier to accomplish. This has made fewer document updates for the custodian to track, and delinquency notices are now sent out by their due date. EM-9 is also investigating document control software called OMNUS 7+ from the Laboratory's Administrative Data Processing (ADP) Division that the ER Program is using to track their controlled documents.

9. *Internal audit of Inorganic Analysis Section.* Peggy Gautier, Nancy Koski, and Ernie Gladney conducted an internal audit of the Inorganic Analysis Section on July 9-10, 1992. The findings were listed on corrective action forms and were distributed to the Inorganic Analysis Section for response.

VIII. CONTRACT LABORATORY QUALITY ASSURANCE

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Our laboratory contracted approximately 1,300 samples for over 20,000 analytes to outside laboratories during 1992. Controls are exercised over procured analytical services to assure that these services conform to the same specifications as the analytical services provided in-house. These controls provide for source evaluation and selection, evaluation of objective evidence of quality furnished by the contract laboratory, periodic audits, and examination of analytical data upon completion, and required participation in intercomparison studies such as DOE's EML Quality Assessment Program and EPA's Drinking Water and Water Pollution studies.

The selection of contractors was based on evaluation of their capability to provide analytical services comparable in quality to those of EM-9 and in accordance with the requirements of the procurement documents prior to award of the contract. Measures for evaluation and selection of contract laboratories will be documented and will include the following: (a) the contractor's current quality records supported by documented qualitative and quantitative information that can be objectively evaluated, and (b) the contractor's technical and quality capability as determined by a direct evaluation of its facilities and personnel and the implementation of its quality program.

Verification activities were accomplished by qualified personnel assigned to audit the activities of contractors. All activities performed to verify conformance to requirements were recorded. Audits, nonconformances, and corrective actions were also documented. Contract laboratory analytical data is being validated and approved in accordance with established EM-9 data review procedures.

The Sample Management Section of EM-9 in conjunction with data assessment staff and the contractor will establish and document methods for disposition of analytical services that do not meet procurement document requirements. These methods will contain provisions for the following: (a) evaluation of nonconforming data, (b) submittal of nonconformance reports to the contractor, and (c) maintenance of records of contractor nonconformances.

When analytical work needs to be contracted, the QADM Section will (1) perform preaward surveys and periodic audits of the contract laboratories, (2) select qualified personnel that will judge performance and carry out audits in accordance with approved procedures and instructions, and (3) maintain and evaluate records of the contract laboratory's quality history.

The laboratories selected for this work were chosen on their performance rather than on cost or reputation. Quality control samples were submitted with all contracted work as a check on the reliability of the analysis. These QC samples consist of matrix-based NIST and EPA reference materials as well as duplicates and matrix-based spikes. Analytical reports to our customers indicate when a contract laboratory performed the analyses.

EM-9 wrote a statement of work in 1991 that stated: "Los Alamos National Laboratory requires support services to assist in implementing requirements of the Laboratory's Resource Conservation and Recovery Act (RCRA) operating permit. The Laboratory requires subcontract work to be performed in the area of environmental analytical chemistry." This work is being directed by EM-9, which provides analytical services to the Laboratory. EM-9 will use subcontractors to support the expected increase in samples from RCRA-related sampling activities. The statement of work was sent out

with a request for proposals in February 1991. Proposals were received and evaluated and preaward audits were performed between January and July of 1992. Extensive audit checklists were developed and the audits were performed using the criteria of "Chapter One, Test Methods for Evaluating Solid Waste, Physical and Chemical Methods (SW846)," the "Manual for the Certification of Laboratories Analyzing Drinking Water," and policies and guidance for the analysis of environmental samples used in studies related to the restoration and protection of the environment.

IX. QUALITY CONTROL SAMPLE PREPARATION

IX. QUALITY CONTROL SAMPLE PREPARATION

In-house QC samples are prepared from stock standards of chemicals representative of the analytes of concern. The stock is spiked onto the same matrix as or one similar to that of the samples to be analyzed. QC samples are usually prepared in-house after the samples have been collected in the field. QCs are analyzed along with the samples under the same analytical conditions. The identification and quantitation of analytes in the QC samples help to determine our analytical accuracy and precision, and help to evaluate analytical methodology.

An analyte spiked directly onto a blank matrix and then immediately extracted may be easier to recover than the same analyte present in a sample. This may be due to naturally occurring or environmental contaminants in the sample that may react strongly with the analytes of interest. Analyte recovery is also influenced by analyte concentration and storage time. Because recovery often varies with concentration, the concentration of the QC samples and the expected values for unknowns are kept within the same range. For many of our programs, recoveries of the analytes of interest in the unknown samples are inferred from those found in the QC samples. Recovery data for the bioassay program, as well as a comparison of recovery of EM-9 spiked samples with recovery of samples from the NIOSH PAT Program, are shown in App. G (Tables G-I to G-VII). QC samples analyzed by EM-9 during 1992 were prepared using the following procedures. These procedures are evaluated and revised as needed.

A. Bioassay Quality Assurance Program.

QC samples for the bioassay program are prepared by spiking the analytes of interest into blank urine or fecal samples. These spiked samples compose 10% of the routine sample load. Appendix G summarizes spike recovery results. The QC procedures used for the bioassay program are discussed below. All recovery data are reported at the one-sigma level.

1. *Tritium in urine.* The results reported in 1992 were obtained on a Packard Model 2200CA liquid scintillation analyzer. All tritium QC solutions and routine reference standards were calibrated against NIST SRM 4927-B. The mean background of blank urine data for 1992 was 141 counts in 10 min, and the 0.05 confidence level was 0.1 μCi/L of urine. The recovery of tritium in QC samples averaged 102% ± 9%.

2. *Uranium in urine.* Alpha spectrometry is used for the measurement of uranium in urine to achieve lower detection limits and obtain a more accurate measure of an employee's total alpha exposure. It also provides a more accurate assessment of the total alpha dose received by an employee because the concentrations of the individual uranium isotopes in the urine sample are measured directly. To meet current toxicity standards, we also determine total uranium concentration in the urine.

   An enriched uranium (97.663 at. % ^{235}U) spiking solution containing 450 μg/L total uranium was prepared from NIST SRM U-970. A depleted uranium (0.182 at. % ^{235}U) spiking solution containing 3 mg/L total uranium was prepared by mixing NIST SRM U-0002 with NIST SRM U-010. A natural uranium spiking solution (99.24 at. % ^{238}U, 0.747 at. % ^{235}U) containing 4 mg/L total uranium was prepared by mixing NIST SRM U-005 with NIST SRM U-010.

Quality control samples are prepared by spiking an aliquot of enriched, depleted, or natural uranium spiking solution into 400 mL of artificial urine. Artificial urine was used because the high uranium background in urine collected from nonexposed employees living in this geographic area precludes its use as a matrix for this determination. Quality control samples are analyzed concurrently with routine urine samples. The analyst adds a dilution of NIST SRM 4324 as a ^{232}U internal tracer to determine chemical recovery. The mean tracer recovery of all samples containing 2.5 pCi/mL of ^{232}U, added by the analyst at the beginning of analysis, was 54% ± 8%. The mean recovery of QC samples, prepared by adding uranium to artificial urine samples, averaged 101% ± 15% for ^{234}U, 101% ± 33% for ^{235}U, and 104% ± 13% for ^{238}U.

3. *Plutonium in urine.* During 1992, the mean recovery of QC samples, prepared by adding ^{239}Pu to blank urine samples, averaged 99% ± 10% after correction for the ^{242}Pu tracer chemical losses. The mean recovery of ^{238}Pu was 92% ± 10%. The mean tracer recovery of all samples containing 4.07 pCi of ^{242}Pu, added by the analyst at the beginning of analysis, was 88% ± 6%. Minimum tracer yield for individual analyses is 40%. Analyses not meeting this yield specification shall be reported as lost in analysis by EM-9.

The distribution of alpha activity associated with the analysis of blank urine samples was used to determine the detection limits for the plutonium bioassay procedure. These data demonstrated a Poisson distribution about a mean of 1.68 counts/1167 min in the ^{239}Pu area and 3.01 counts/1167 min in the ^{238}Pu area. By the use of the Currie method[12,13] for calculation of the detection limit for low alpha activity, the MDA for ^{239}Pu is as follows:

$$MDA = \sqrt{1.68} \times 4.65 + 2.71$$

$$= 9 \textit{ counts} \quad . \qquad (4)$$

The MDA for ^{238}Pu is 11 counts. The introduction of 2.71 counts in Eq. (4) follows Currie's theory that 2.71 counts may be associated with a zero blank case. Currie also recommends, for extreme low-level counting, that the value 2.71 be added if fewer than 70 background counts are observed. Samples with 11 or fewer counts are considered not detected at the 0.05 confidence level. Twelve counts represent a measurement level of 0.01 pCi/L of sample for ^{239}Pu, of 0.02 pCi/L for ^{238}Pu, and of 0.02 pCi/L for ^{241}Am.

4. *Americium in urine.* The mean recovery of ^{241}Am added to blank urine QC samples averaged 116% ± 5% after correction for the ^{243}Am tracer chemical losses. The mean tracer recovery of all samples containing 1.8 pCi of ^{243}Am, added by the analyst at the beginning of analysis, was 77% ± 10%. The standard deviation associated with the QC sample recovery was a function of the ^{241}Am activity level.

5. *Plutonium in feces.* Fecal material from omnivorous animals, such as dogs, which have a high fat content in their diet, provides a suitable blank matrix for QC samples. The spike range for these QC samples is 1 - 10 pCi/sample. A 100-g blank fecal sample is weighed into a sealable plastic bag. Plutonium-238 or ^{239}Pu standards at concentrations of approximately 180 pCi/mL are spiked onto the blank fecal sample to reach the desired

spike range. The plastic bag is sealed, and the sample is stored in a freezer. The bag and contents are ashed, and the concentrations of the radionuclides are measured by radiochemical separation and alpha spectrometry. During 1992, the mean recovery of five analyses was 84% ± 16% for ^{238}Pu and 91% ± 14% for ^{239}Pu.

B. Tissue Quality Assurance Program.

The USTR is interested in the uptake, distribution, and retention of all of the transuranic elements in the human body. The greatest concerns at the present time are for the isotopes of plutonium and americium because production and use of these radionuclides has been more extensive than production of the other transuranic elements, resulting in a greater number of workers potentially or actually exposed to internal depositions.

Extensive animal studies have been made of the biokinetics and toxicology of transuranics. Extrapolation of these findings from animals to humans cannot be considered reliable until supplemented and supported by human data. Therefore, the primary objective of the USTR is to obtain improved understanding of the biokinetics and dosimetry of the transuranic elements in humans through analysis of autopsy tissues from occupationally exposed workers and to provide basic scientific data for radiation protection standards.

The USTR program relies entirely upon securing samples of various organs at autopsy or on receipt of donated whole bodies of occupationally exposed personnel. EM-9 performs the radiochemical analysis of USTR autopsy tissue samples.

Attempts have been made to use several different matrices for the preparation of routine QC samples that simulate bone and tissue. Among the matrices used were spiked aliquots of calcium phosphate; human tissues spiked with ^{238}Pu (liver, lung, bone, kidney, lymph node, and thyroid); and animal liver, lung, and bone spiked with ^{238}Pu. Previously analyzed tissue samples overspiked with ^{238}Pu were also used as QC samples.

None of these matrices was entirely satisfactory because the characteristics of individual sets of human tissues were not predictable (they had different ashing and dissolution characteristics). The addition of ^{242}Pu tracer is a more realistic method of monitoring the chemical procedure and satisfies the needs of the QC program.

We have decided to analyze either NIST SRM 4351, human lung, or NIST SRM 4352, human liver, quarterly. NIST states that there is such significant inhomogeneity in the lung SRM, primarily because of fine particles containing plutonium, that a working sample should be an entire bottle (45 g). Smaller aliquots are not certified. More frequent analysis of entire bottles of these SRMs is prohibitive because of cost. NIST does not mention inhomogeneity in the liver SRM. Two-gram aliquots of NIST SRM 4352 have been overspiked with ^{238}Pu and were run as QC samples during 1989. This type of QC sample was not run during 1992.

C. Organic Analysis Quality Assurance Program.

The Organic Analysis Section analyzes a variety of matrices for a wide selection of organic compounds in support of the Laboratory's industrial hygiene program. Most industrial hygiene samples are collected on charcoal, silica, tenax, XAD, and florisil tubes, as well as organic vapor monitors. Volatile (VOC) and semivolatile (SVOC) organic compounds, herbicides, and pesticides in water and soil samples are analyzed for

environmental compliance requirements. In addition, environmental pore gas samples are collected on charcoal tubes for quantitation of a select group of VOCs. PCBs are analyzed in soil, water, oil, organic solvents, and on swipes. Organic data for the recovery of surrogates added by the analyst before analysis to bulk, charcoal tube, sludge, soil, and water matrices are shown in App. F, Fig. F-8. Glass equipment is used when preparing stock solutions and QC samples for all organic analyses. This eliminates most contamination from phthalates that are leached from many kinds of plastic tubing, connectors, bottles, and other plastic equipment. The following organic QC sample preparation procedures are extracted from written QC procedures developed for use in our laboratory.

1. *Charcoal tubes.* The majority of industrial hygiene samples are collected on charcoal tubes for identification of any VOC. Pore gas samples are collected on charcoal tubes for quantitation of a set list of volatiles. These compounds are analyzed by gas chromatography using a mass-selective detector. To run these samples as routinely as possible, the Organic Analysis Section analysts assume that a standard 10 L of air was sampled, and they set up the calibration curve accordingly. A typical calibration range is 0.1 - 2 times the TLV of the compound of interest. TLVs are obtained from "Threshold Limit Values and Biological Exposure Indices for 1990-1991" by the American Conference of Governmental Industrial Hygienists.[20] If a TLV is not available for a certain compound, a range of 1 - 10 mg per tube is assumed. QC samples prepared to accompany the NIOSH PAT samples are spiked between 0.05 - 2.0 mg/tube. QCs to accompany routine samples for compounds of lower volatility, such as 1,1,1-trichloroethane and nonane, are spiked between 30 - 100 μg/tube. Compounds of higher volatility, alcohols and acetone, are spiked between 100 - 300 μg/tube. Recoveries on QC samples showed that low-molecular-weight alcohols adsorb strongly to the charcoal, and those recoveries run less than 50% of the spiked value. The recommended analytical method calls for desorption with a carbon disulfide/5% butanol mixture that will flood the charcoal with butanol to help recovery of the alcohols of interest. Carbon disulfide is generally the solvent of choice for the QC stock solutions and for desorption of the tubes by the analyst, except when methylene chloride or carbon disulfide is being analyzed. Since these two compounds coelute, 1,2-dichloroethane is used as the solvent when analyzing for these compounds.

A stock solution is prepared gravimetrically by adding 1 - 5 organic compounds to the solvent at a concentration such that a 2- to 15-μL spike on the small tube falls in the desired spike range. Up to 30 μL can be spiked onto large charcoal tubes used for pore gas analysis. Larger volumes may cause saturation of the charcoal and subsequent loss of analytes to the inside walls of the tubes. Further loss of the volatile analytes may be prevented by spiking onto the middle 80% of the charcoal bed instead of near either end. Since these analytes are spiked onto the charcoal beds, instead of adsorbing on the charcoal as an air sample is pumped through the tube, it is important not to spike onto the back, smaller charcoal bed. The presence of analytes on the back bed indicates sample breakthrough, due to saturation of the first bed or inadequate adsorption of the compound of interest on the charcoal. The following procedure is used in spiking charcoal tubes.

Stock preparation.

(1) Add approximately 0.5 mL of carbon disulfide to a 1.0-mL volumetric flask. Stopper the flask and tare the balance.

(2) Determine the volume of neat analyte to be added based upon its density. Measure the chosen volume of analyte into a syringe and add it just above the surface of the carbon disulfide. Restopper the flask and record the mass of analyte added. Tare the flask.

(3) Repeat step (2) for each analyte desired in the stock and dilute to volume with carbon disulfide. Invert three times to mix.

QC sample preparation.

(1) Using a syringe, spike 2 - 15 μL of the stock onto a small charcoal tube or 5 - 30 μL onto a large charcoal tube (pore gas analysis) by placing the needle into the center of the tube and deep into the front charcoal bed.

(2) Expel the solution while slowly moving the needle up through the charcoal bed to distribute the solution evenly and to make certain no glass surfaces become wet.

(3) Withdraw the needle, cap the tube, and seal with Teflon tape. Allow this solution to adsorb on the charcoal for at least 4 h.

(4) Refrigerate all samples pending analysis.

2. *Organic vapor monitors.* Compounds will occasionally be sampled by diffusion onto an organic vapor monitor (OVM) manufactured by 3M Corporation. These monitors are not suitable for all organics, and the calculations to obtain spike ranges are different from those used for charcoal tubes. Information on suitable solvents and calculations is obtained from the "Organic Vapor Monitor #3500 Compound Guide" available from the Occupational Health and Safety Products Division of 3M.[21] Analysis of OVM badges over the years has determined that most analytes are found at levels considerably less than the TLVs. Therefore, most QC samples are spiked in the range of 30 - 100 μg/badge, falling within the range of the analyst's standard curves, and approximating the levels found in the unknown samples.

Stock preparation.

(1) Add approximately 0.5 mL of carbon disulfide to a 1.0-mL volumetric flask. Stopper the flask and tare the balance.

(2) Determine the volume of neat analyte to be added based upon its density. Measure the chosen volume of analyte into a syringe and add it dropwise, just above the surface of the carbon disulfide. Record the mass of analyte added.

(3) Repeat step (2) for each analyte used and dilute to volume with carbon disulfide.

QC sample preparation.

(1) Remove the plastic ring and white film from a vapor monitor.

(2) Place a 25- to 28-mm-diameter Whatman No. 2, 41, or 42 filter paper on the spacer plate.

(3) Snap the closure cap on the monitor and close the side port.

(4) Inject 5 - 12 μL of the stock solution onto the filter paper through the center port.

(5) Allow the monitor to sit 16 - 24 h to allow the organic material from the filter paper to adsorb onto the charcoal before elution.

(6) Refrigerate the sample pending analysis.

3. *Formaldehyde on sorbent tubes.* Outgassing of new construction materials makes formaldehyde a frequent contaminant in workplace atmospheres. Samples are collected on sorbent tubes specially designed to absorb formaldehyde on a solid sorbent bed of XAD-2 coated with 2-(hydroxymethyl)piperidine. The formaldehyde is extracted with toluene and the analysis is completed by gas chromatography with a mass-selective detector. The QC sample is prepared by emptying the beads out of the blank sorbent tube into an autosampler vial before the beads are spiked, instead of spiking them directly in the tube. The tube is emptied because the static charge that develops on the wetted beads prohibits quantitative transfer of the beads from the sorbent tube to an extraction vessel. Repeated analysis shows that the QC samples are stable for up to 4 months when stored at -4°C.

Stock preparation.

(1) Place approximately 3 mL of distilled water into a 5-mL volumetric flask. Stopper the flask and tare the balance.

(2) Add approximately 25 μL of a 37.4% formaldehyde solution from a syringe to just above the surface of the water. Record the mass of formaldehyde solution added.

(3) Dilute the stock solution to volume with distilled water and invert to mix.

(4) Include the purity of the formaldehyde reagent when calculating the concentration of the stock solution.

QC Sample preparation.

(1) The spike range for formaldehyde on sorbent tube QC samples is 4 - 60 μg/sample.

(2) Open a sorbent tube coated for formaldehyde sampling and divide the beads from both beds evenly between two autosampler vials.

(3) Spike an aliquot of the stock solution onto the beads in the autosampler vial, using a syringe, to reach the desired spike range.

(4) Seal a cap onto the vial.

(5) The sample may be stored at -4°C for up to 4 months pending analysis.

4. *Oil samples.* In the United States, Aroclors 1242, 1254, and 1260 were used as dielectrics in transformers. As transformers at the Laboratory are decommissioned, the

oil must be tested for PCBs before disposal. The remaining oil samples received by EM-9 were environmental or industrial hygiene samples taken from areas of possible contamination by PCBs or organic solvents.

Quality control samples for PCBs were spiked with in-house standards prepared from pure compounds diluted in hexane. Since the only PCBs used as dielectric fluids in transformers in the United States were Aroclors 1242, 1254, and 1260, only these PCBs have been used to spike routine QC samples.

Vacuum pump oil was chosen for the oil base blank after an experiment with various brands of motor oil showed excessive matrix interferences. Methods for preparing PCB-in-oil QC samples follow.

Stock preparation.

(1) Prepare an in-house stock standard by adding 250 - 300 mg of neat PCB to the bottom of a clean, tared, 5-mL volumetric flask with a clean glass Pasteur pipet or glass rod. Record the weight added and dilute to volume with hexane.

(2) The standard concentration will be 50,000 - 60,000 μg/mL.

QC sample preparation.

(1) The spike range for these analytes is 10 - 500 μg/g oil.

(2) Add 20 μL - 2 mL of stock PCB at various concentration levels to approximately 220 g of blank vacuum pump oil.

(3) Shake samples overnight in an ultrasonic mixer before aliquots are taken and submitted for analysis.

5. *Filter media.* In the event of a possible spill or after the cleanup of a known spill of PCBs, the Industrial Hygiene Group (HS-5) or the Physical Plant Support Group will sample the potentially contaminated surfaces for the presence of PCBs. A piece of gauze, 2 by 2 in., is wetted with cyclohexane and swiped across the suspect surface. For QC samples, the same type of gauze is spiked with Aroclors 1242, 1254, or 1260 standards diluted in isooctane or methanol. These EPA-traceable standards are available comercially in concentrations from 500 - 3000 μg/mL.

Stock preparation.

(1) Obtain an EPA-traceable PCB standard in isooctane or methanol in the range of 500 - 3000 μg/mL.

QC sample preparation.

(1) The spike range for these samples is 5 - 20 μg/sample.

(2) Place a 2- by 2-in. gauze pad into a 20-mL glass vial fitted with a Teflon lid. Spike 5 - 40 μL of the PCB standard directly onto the pad to reach the desired spike range.

(3) Store the sample at room temperature pending analysis.

6. *Soil samples.* Soil samples are received for the analysis of VOCs, SVOCs, pesticides, herbicides, and PCBs for compliance work done under RCRA. Certified matrix-based reference materials were not available for these analyses, so stock solutions of the

analytes were prepared using compounds of the highest purity available. The stock solutions were spiked directly onto blank soil. Several soil types were used, including relatively organic-free surface soil, deep-well soil, and Ottawa sand. The surface and deep-well soils were heated at 100 - 200°C for up to 3 days, and the Ottawa sand was muffled at 500°C for 2 - 4 h to drive off volatile compounds. Aliquots of the soils were tested for volatile organic contamination to determine their suitability as a blank matrix. The surface soil was used as a matrix for SVOC, herbicide, PCB, and pesticide QC samples. QC samples for the determination of VOCs on soil were made by preparing a spiking solution in methanol that is spiked onto an aliquot of blank Ottawa sand just before analysis.

The VOCs are collected by a purge-and-trap technique followed by gas chromatographic analysis with a mass-selective detector. Analysis of VOC-on-soil samples uses heated purge-and-trap methodology, and analysis of VOC-in-water samples uses purge-and-trap at ambient temperature. SVOCs are extracted by continuous liquid-liquid or Soxhlet techniques and are analyzed by gas chromatography followed by mass-selective detection. Pesticide analysis uses a Soxhlet extraction, gas chromatography, and electron capture detection. Herbicides are extracted using a solid-phase technique, esterified, and analyzed by gas chromatography with electron capture detection. PCBs are extracted from soil with a hexane/acetone solvent followed by gas chromatography with an electron capture detector. The following procedures were used in the preparation of these samples.

a. Volatile organic compounds.

Stock preparation.

(1) Place 3 mL of methanol in a 5-mL volumetric flask. Stopper the flask and tare the balance.

(2) Dilute a neat VOC by adding 5 - 15 μL (approximately 10 mg) to the methanol. Add the compound, using a syringe, just above the surface of the methanol. This technique eliminates loss resulting from syringe emplacement in the solvent. Record the mass of the compound added and retare the balance.

(3) Repeat step (2) for each of 3 - 5 different VOCs. Dilute the stock to volume with methanol. Invert the flask three times to mix.

(4) Discard the solution in the neck of the volumetric flask to minimize concentration changes due to loss of VOCs from the surface of the solution.

(5) Store the stock solutions in vials with zero headspace at -20°C for up to 3 months.

QC sample preparation.

(1) The spike range for volatile analytes on soil is 100 - 200 μg/kg.

(2) Place 1500 μL of methanol, as a matrix for the spiking solution, into an autosampler vial using a 2500 μL syringe. Seal a cap containing a septum on the vial.

(3) Add a volume of a concentrated VOC stock solution to the methanol from a syringe, piercing the septum cap with the syringe. The volume of stock added should be such that a 10-μL aliquot of the methanol spiking solution on 5.00 g of blank soil will bring the concentration of the volatile analytes on the soil into the desired spike range.

(4) Vary the analytes included in the spiking solution by adding more than one concentrated VOC stock solution to the methanol.

(5) Replace the punctured autosampler vial cap with a new one.

(6) Store the spiking solution in a freezer until it is used to spike the blank soil sample. The EPA holding time for VOCs on soil is 14 days.

(7) Immediately before analysis, 10 μL of the spiking solution is added to 5.00 g of blank soil from a syringe to make the soil QC sample.

b. Semivolatile organic compounds.

Stock preparation.

(1) Add 10 - 15 mg of a standard-grade SVOC to a clean, tared, 5-mL volumetric flask. Add solid compounds first, record the mass and tare the balance. Repeat for each solid compound.

(2) Add approximately 2 mL of acetone and retare the balance. Add liquid compounds next, record the mass and retare the balance after addition of each liquid compound. Add a total of 3 - 5 different SVOCs.

(3) Dilute the sample to volume with acetone after adding the last compound. Invert to mix.

(4) Store the stock solution at -20°C for up to 3 months in an amber vial fitted with a screw cap and Teflon septum.

QC sample preparation.

(1) The spike range for these analytes is 0.7 - 6.7 mg/kg.

(2) Tare a clean, 2-oz glass vial fitted with a Teflon-lined cap. Add 30 g of blank soil to the vial and record the mass.

(3) Spike the soil with up to 100 μL of stock to reach the desired spike range, replace the lid, and refrigerate until analysis. This QC sample is subject to a 14-day holding time for extraction.

c. Pesticides.

Stock preparation.

(1) Add approximately 10 - 20 mg of lindane or a related pesticide, 20 - 40 mg of DDD or a related pesticide, or 50 - 150 mg of methoxychlor to a clean, tared, 10-mL volumetric flask and record the weight.

(2) Tare the balance. Repeat step (1) for each of 2 - 7 standards used.

(3) Dilute to volume with acetone and mix by inversion.

(4) Store the stock at room temperature.

(5) Prepare a 1:100 dilution of stock by diluting 100 μL of stock to volume with methanol in a 10-mL volumetric flask. Store the dilution at room temperature in an amber bottle with a Teflon-lined screw cap.

QC sample preparation.

(1) The spike range is 0.01 - 0.02 μg/g of soil for lindane and related compounds, 0.02 - 0.04 μg/g of soil for DDD and related compounds, and 0.05 - 0.15 μg/g of soil for methoxychlor.

(2) Weigh 30-g aliquots of soil into 2-oz glass vials fitted with Teflon-lined caps. Record the mass of the soil sample.

(3) Spike soils with 10 - 90 μL of 1:100 dilution of stock to reach the desired spike range. Cap the vials and refrigerate pending analysis. The EPA holding time for the extraction of a pesticide on soil is 14 days.

d. **Herbicides.** The only herbicides that were routinely included in the QC samples are 2,4-D, Dinoseb, 2,4,5-T, and Silvex. Free-acid herbicides, not methyl esters, are used since the extraction is followed by an esterification step.

Stock preparation.

(1) Add 10 - 20 mg of Silvex, 2,4,5-T, or Dinoseb or 30 - 60 mg of 2,4-D to a clean, tared, 25-mL volumetric flask and record the weight. Tare the balance. Repeat for each standard used.

(2) Dilute to volume with methanol and mix by inversion.

(3) Prepare a 1:10 dilution in methanol by adding 1.0 mL of stock to a 10-mL volumetric flask and diluting to volume with methanol.

(4) Refrigerate the undiluted stock in the 25-mL volumetric flask and the 1:10 dilution in amber bottles with septum caps for up to 3 months.

QC sample preparation.

(1) The spike range for these analytes is 0.05 - 0.15 μg/g soil for Silvex, 2,4,5-T, and Dinoseb and 0.15 - 0.45 μg/g for 2,4-D.

(2) Weigh a 50-g aliquot of soil into a 2-oz glass vial fitted with a Teflon-lined cap. Record the mass of the soil.

(3) Spike the soil with 30 - 200 μL of 1:10 dilution of stock solution to reach the desired spike range. Cap the vial and refrigerate until analysis. The EPA holding time is 7 days.

e. **Polychlorinated biphenyls.** Most of the soil samples received for PCB analysis are environmental samples potentially contaminated after a spill of capacitor or transformer oil suspected of containing PCBs. Compliance samples are also analyzed for PCBs before the closure of a site.

Stock preparation.

(1) EPA-traceable PCB standards are available commercially at a concentration of 3000 - 5000 μg/mL in methanol or isooctane. Routine QC samples are prepared from Aroclors 1242, 1254, and 1260.

QC sample preparation.

(1) The spike range for these analytes is 10 - 30 μg/g soil.

(2) Weigh 8 g of blank soil into a clean, 1/2-oz glass jar with a Teflon-lined screw cap. Record the mass of the soil.

(3) Spike 16 - 80 μL of a PCB standard onto the surface of the soil to reach the desired spike range. Replace the Teflon-lined screw top and submit for analysis or store at room temperature pending analysis.

7. *Water samples.* The majority of samples submitted during 1992 were environmental compliance samples for the analysis of pesticides, herbicides, semivolatiles, volatiles, and PCBs.

a. **Volatile organic compounds.**

Stock preparation.

(1) Place 3 mL of methanol into a 5-mL volumetric flask. Stopper and tare the flask on an analytical balance.

(2) Dilute a neat VOC by adding 5 - 15 μL (approximately 10 mg) to the methanol. Add the compound, using a syringe, just above the surface of the methanol. This technique eliminates losses resulting from syringe emplacement in the solvent. Record the mass of the compound added and retare the balance.

(3) Repeat step (2) for each of 3 - 5 different compounds. Dilute the stock to volume with methanol. Invert the flask three times to mix.

(4) Discard the solution in the neck of the volumetric flask to minimize concentration changes due to loss of VOCs from the surface of the solution.

(5) Prepare a 1:20 dilution of the above solution by adding 250 μL of the stock to a 5-mL volumetric flask and diluting to volume with methanol. Invert the flask three times to mix. Discard the solution in the neck of the flask.

(6) Store stock solutions and their dilutions in vials with zero headspace at -20°C for up to 3 months.

QC sample preparation.

(1) The spike range for these analytes is 30 - 150 μg/L of water.

(2) Place approximately 45 mL of distilled water into a 50-mL volumetric flask.

(3) Add 500 μL of concentrated HCl as a preservative.

(4) Spike 15 - 75 μL of the 1:20 dilution of stock solution below the surface of the water to reach the desired spike range. Dilute to volume with distilled water. Stopper the flask and invert three times to mix.

(5) Discard the solution in the neck of the flask and transfer the remaining sample to a 1-oz bottle with zero headspace. Stopper with a cap fitted with a Teflon-lined septum.

(6) Refrigerate pending analysis.

(7) The EPA holding time for these samples is 14 days when preserved in 1% HCl.

b. Semivolatile organic compounds.

Stock preparation.

(1) Add 10 - 15 mg of a standard-grade SVOC to a clean, tared, 5-mL volumetric flask. Add solid compounds first, record the mass and tare the balance. Repeat for each solid compound.

(2) Add approximately 2 mL of acetone and retare the balance. Add liquid compounds next, record the mass and retare the balance after each addition. Use a total of 3 - 5 different SVOCs.

(3) Dilute the sample to volume with acetone after adding the last compound. Invert to mix.

(4) Store the stock solution at -20°C for up to 3 months in an amber vial fitted with a screw cap and Teflon septum.

QC sample preparation.

(1) The spike range for these analytes is 20 - 200 μg/L of water.

(2) Fill a 1-L amber bottle having a Teflon-lined lid with distilled water. Since there are several phthalates among the semivolatile target compounds, the distilled water should never be stored in plastic vessels or run through tubing because phthalates are readily leached from plastics, causing false positive results.

(3) Spike 10 - 100 μL of the stock solution below the surface of the water to reach the desired spike range.

(4) Cap the bottle and refrigerate pending analysis. The entire sample is analyzed assuming a 1-L volume.

(5) The EPA holding time for these samples is 7 days.

c. **Herbicides.** The only herbicides that were routinely included in the QC samples are 2,4-D, Dinoseb, 2,4,5-T, and Silvex. Free-acid herbicides, not methyl esters, are used since the extraction is followed by an esterification step.

Stock preparation.

(1) Add 10 - 20 mg of Silvex, 2,4,5-T, or Dinoseb or 30 - 60 mg of 2,4-D to a clean, tared, 25-mL volumetric flask and record the weight. Tare the balance. Repeat for each standard used.

(2) Dilute to volume with methanol and mix by inversion.

(3) Prepare a 1:100 dilution in methanol by adding 100 µL of stock to a 10-mL volumetric flask and diluting to volume with methanol.

(4) Refrigerate the undiluted stock in the 25-mL volumetric flask and the 1:100 dilution in amber bottles with septum caps for up to 3 months.

QC sample preparation.

(1) The spike range for these analytes is 0.06 - 1.2 µg/L for 2,4-D and 0.02 - 0.4 µg/L for Silvex, Dinoseb, and 2,4,5-T.

(2) Fill a 500-mL volumetric flask nearly to volume with distilled water.

(3) Spike 5 - 50 µL of the 1:100 dilution of the stock solution below the surface of the water to reach the desired spike range.

(4) Dilute to volume with distilled water and invert to mix.

(5) Transfer the sample to a 500-mL amber bottle with a Teflon-lined lid.

(6) Refrigerate the sample pending analysis.

(7) The EPA holding time for these samples is 7 days.

d. **Pesticides.**

Stock preparation.

(1) Add approximately 10 - 20 mg of lindane or a related pesticide, 20 - 40 mg of DDD or a related pesticide, or 50 - 150 mg of methoxychlor to a clean, tared, 10-mL volumetric flask and record the weight.

(2) Tare the balance. Repeat step (1) for each of 2 - 7 standards used.

(3) Dilute to volume with acetone and mix by inversion. Store the stock at room temperature.

(4) Prepare a 1:1000 dilution of stock by diluting 100 µL of stock to volume with methanol in a 100-mL volumetric flask. Store the dilution at room temperature in an amber bottle with a Teflon-lined screw cap.

QC sample preparation.

(1) The spike range for these analytes is 0.1 - 0.2 μg/L for lindane and related pesticides, 0.2 - 0.4 μg/L for DDD and related pesticides, and 0.5 - 1.5 μg/L for methoxychlor.

(2) Fill a 500-mL volumetric flask nearly to volume with distilled water.

(3) Spike 17 - 150 μL of the 1:1000 dilution of stock solution below the surface of the water to reach the desired spike range.

(4) Dilute to volume with distilled water and invert to mix.

(5) Transfer the sample to a 500-mL amber bottle with a Teflon-lined lid.

(6) The EPA holding time for these samples is 7 days.

e. **Polychlorinated biphenyls.** The EPA supplies PCB-in-water QC samples in vials to be diluted 1.0 mL to 1.0 L of distilled water. Most of the QC samples we supplied were these EPA samples. During 1992, some PCB-in-water QC samples were made by spiking distilled water with a stock solution of pure PCBs dissolved in methanol.

Stock preparation.

(1) Add 10 - 15 mg of a pure PCB to a clean, tared, 10-mL volumetric flask. Record the mass of PCB added.

(2) Dissolve the PCB in methanol and dilute to volume with methanol.

(3) Prepare a dilution of the above solution containing approximately 50 μg/mL of PCB by adding an appropriate amount of the concentrated PCB solution to a 5-mL volumetric flask and diluting to volume with methanol.

(4) Store the concentrated stocks and the dilutions in vials with Teflon-lined caps in a freezer.

QC sample preparation.

(1) The spike range for these samples is 1 - 25 μg/L.

(2) Measure 500 mL of distilled water into a 500-mL amber bottle with a Teflon-lined lid. Use water that has not been stored in plastic containers to avoid interference from phthalates that may have leached from the plastic.

(3) Spike 10 - 250 μL of the diluted stock containing 50 μg/mL of PCB below the surface of the water to reach the desired spike range.

(4) Cap the bottle and refrigerate the sample pending analysis.

D. Environmental Radiochemistry Quality Assurance Program.

Quality control samples for radioactive constituents are obtained from outside agencies and are prepared in-house. The Quality Assurance Division of EMSL-LV distributes reference soil samples that have been characterized for ^{235}U, ^{238}U, ^{228}Th, ^{230}Th,

^{232}Th, ^{226}Ra, ^{228}Ra, and ^{210}Pb. The NIST provides several soil and sediment SRMs for environmental radioactivity. Soil, rock, and ore samples obtained from the CGS and the CCRMP are used for the quality control of uranium, thorium, and radium analyses in silicate matrices. Our in-house QC samples are prepared by adding known quantities of liquid radioactivity standards to blank soil, water, and vegetation ash matrices. The constituent of interest should ideally be present in the same form in the QCs as it occurs in the samples, but this has not yet been achieved in all cases.

Because a blank matrix in the same form as the sample matrix was not always available, a blank matrix, which could act in a similar manner to the sample matrix, was substituted. Use of a NIST-, CGS-, or CCRMP-certified uranium-in-soil sample for the determination of uranium on vegetation ash is an example of this matrix substitution.

1. *Soil samples.* Surface soils have been contaminated with radionuclides as a result of the use and testing of nuclear weapons. The soil used as a matrix for QC samples should be dry and contaminant-free in order to prepare accurately weighed QC samples free from analytical interferents. A suitable blank soil would have been collected before World War II or would be collected from a deep well or other excavation where radioactive contamination is not likely to have occurred. Before use, a representative aliquot of the soil is analyzed to determine if it will provide a suitably blank matrix.

   a. Strontium-90.

   (1) The spike range for ^{90}Sr on soil is 5 - 45 pCi/g of soil.

   (2) Tare a clean, 250-mL Teflon beaker. Weigh 2 g of clean, dry, blank soil into the beaker.

   (3) Spike the blank soil with a ^{90}Sr standard with a concentration of approximately 870 pCi/mL in 2 M HCl. Add a volume of standard to the soil sample to give the desired spike value.

   (4) Dry the spiked sample under a heat lamp if the volume of standard added produces an excessively wet sample.

   (5) Cover the beaker with aluminum foil and store at room temperature pending analysis.

   b. Cesium-137. Analysis for ^{137}Cs by gamma spectroscopy is nondestructive, and a QC standard may be used indefinitely if periodically corrected for ^{137}Cs decay.

   (1) The spike range for ^{137}Cs on soil is 5 - 60 pCi/g of soil.

   (2) Tare a 500-mL high-density polyethylene bottle. Weigh 100.0 g of clean, dry soil into the bottle.

   (3) Spike the blank soil using a ^{137}Cs standard with a concentration of 350 pCi/mL in 1 M HCl. Add a volume of standard to the soil to reach the desired spike range.

   (4) Dry the spiked soil under a heat lamp, periodically mixing it with a vortex mixer, until all the large clumps are broken up and the soil is dry.

(5) Cap the bottle and submit for analysis or store at room temperature for future use.

c. Plutonium and americium.

(1) The spike range for ^{238}Pu, ^{239}Pu, or ^{241}Am on soil is 0.1 - 1 pCi/g of soil.

(2) Tare a 500-mL high-density polyethylene bottle. Weigh 10.0 g of clean, dry, deep-well soil into the bottle.

(3) Use ^{238}Pu, ^{239}Pu, and ^{241}Am standards with concentrations of approximately 180 pCi/mL in 2 - 4 N HNO_3 to spike the blank soil. Add a volume of each standard to the blank soil to reach the desired spike range.

(4) Dry the spiked soil under a heat lamp, periodically mixing it with a vortex mixer, until all the large clumps are broken up and the soil is dry.

(5) Cap the bottle and submit for analysis or store at room temperature for future use.

d. Tritium. The tritium standard is spiked on soil as tritiated water, and the spiked sample is used for the determination of both tritium and unbound moisture.

(1) The spike range for tritium is 80 pCi/L - 400 nCi/L. Unbound water is spiked at 2-5 wt %. The concentration of tritium is expressed in pCi/L because it is a measure of the tritium concentration in the water extracted from the soil and is not a measure of the tritium concentration in the soil itself. Tritium concentration may be related to sample weight through the wt % of extractable water in the sample.

(2) Prepare several tritiated water standards covering the concentration range 80 pCi/L - 400 nCi/L.

(3) For each QC sample, dry 600 g of clean soil in a 1-L beaker at 105 - 110°C for 12 - 15 h. Cool the soil in a desiccator.

(4) Tare a 600-mL glass beaker. Add 300.0 g of soil to the beaker and record the weight of soil added.

(5) Tare the balance. Add 15-25 mL of a tritiated water standard to the center of the soil. Record the weight of water added.

(6) Tare the balance. Add 200.0 g of dry soil to the beaker to cover the wet soil, bringing the total dry weight of soil to 500 ± 1 g.

(7) The tritium concentration of the sample is equal to the tritium concentration of the water spiked onto the sand.

(8) Total sample weight is the weight of the sand plus the weight of the water. The wt % of unbound water is the product of water weight divided by total sample weight.

(9) Cover the beaker securely with plastic wrap and submit for analysis or store at below 0°C to prevent evaporation of the moisture until submitted for analysis.

e. **Uranium.** None of the soils tested for use as a blank matrix had a sufficiently low and consistent background for use in the determination of uranium in soil. For this reason, CCRMP soils with certified uranium content are used to make QC samples for the measurement of uranium.

(1) The concentration range for the determination of uranium in soil by DNA is 10 - 500 μg/g of soil.

(2) Obtain CCRMP soils with certified uranium contents from 1 - 500 μg/g.

(3) Use either one soil or a combination of two soils in varying ratios to make QC samples covering the entire spike range.

(4) Submit a 1.0-g aliquot for analysis.

f. **Gross alpha and gross beta.**

(1) Spike range for gross alpha and gross beta on soil is 2.5 - 10 pCi/g.

(2) Determine the gross alpha and gross beta backgrounds of the sand selected as a QC matrix.

(3) Tare a 100-mL glass beaker. Weigh 2.0 g of clean, dry sand into the beaker.

(4) Spike the sand using an ^{241}Am standard with a concentration of 180 pCi/mL in 4 M HNO_3 for the gross alpha component. Add a volume of standard to the sand to reach the desired spike range.

(5) Add the gross alpha background to the gross alpha contributed by the ^{241}Am to determine the total gross alpha concentration.

(6) Spike the sand using a ^{90}Sr standard with a concentration of 180 pCi/mL in 2 M HCl for the gross beta component.

(7) The gross beta component is contributed equally by the ^{90}Sr parent and the ^{90}Y daughter decay product in equilibrium in the standard. The concentration of the standard is expressed in terms of ^{90}Sr only.

(8) Divide the desired gross beta spike range in half and use the concentration of the standard expressed in terms of ^{90}Sr to calculate the volume of standard needed to reach the calculated spike range of 1.25 - 5 pCi/g.

(9) Add a volume of ^{90}Sr standard to the sand in the beaker to reach the calculated spike range.

(10) The gross beta component, based on the ^{90}Sr concentration alone, must be multiplied by 2 to determine the gross beta concentration contributed by both the ^{90}Sr and the ^{90}Y in equilibrium in the standard.

(11) Add the gross beta background to the gross beta component contributed by the ^{90}Sr and ^{90}Y to determine the total gross beta concentration.

(12) Dry the sand under a heat lamp.

(13) Cover the beaker with plastic wrap and store at room temperature pending analysis.

g. Gross gamma.

Analysis by gamma spectroscopy is nondestructive, and a QC sample may be used indefinitely if the gross gamma concentration is decayed periodically. Cesium-137 is spiked onto blank soil as the gamma emitter. Only the gamma radiation emitted at energies above the lower energy threshold of the analytical method used to measure the QC samples may be included in calculating the gross gamma concentration of the QC sample. If the lower energy threshold of the analytical method is 100 KeV, only 0.851 of the gamma radiation of ^{137}Cs is emitted at a higher energy level (662 KeV) and may be included in calculating the concentration of the QC sample.

(1) Calculate the applicable gross gamma concentration of the ^{137}Cs standard by multiplying the ^{137}Cs concentration by the fraction of the gamma radiation emitted at energy levels exceeding the lower energy threshold of the analytical method.

(2) The spike range for gross gamma on soil is 5 - 15 pCi/g of soil.

(3) Tare a 500-mL high-density polyethylene bottle and weigh 100.0 g of clean, dry soil into the bottle.

(4) Spike the blank soil with a ^{137}Cs standard with an applicable gross gamma concentration of approximately 300 pCi/mL in 1 M HCl. Add a volume of standard to the soil to reach the desired spike range.

(5) Dry the spiked soil under a heat lamp, periodically mixing it with a vortex mixer, until all the large clumps are broken up and the soil is dry.

(6) Cap the bottle and submit for analysis or store at room temperature for future use.

2. *Water samples.* Distilled water with the appropriate acid concentration is used as a blank.

a. Gross alpha/beta.

(1) The spike range for gross alpha/beta in water is 5 - 20 pCi/L.

(2) Fill a 1-L volumetric flask to approximately 700 mL with distilled water.

(3) Add 43 mL of 12 M HCl to produce a final acid concentration of 0.5 M.

(4) Use an ^{241}Am standard with a concentration of approximately 18 pCi/mL in 4 M HNO_3 for the gross alpha component. Add a volume of

standard to the acid in the flask to reach the desired spike range.

(5) Use a ^{90}Sr standard with a concentration of approximately 225 pCi/mL in 2 M HCl for the gross beta component.

(6) The gross beta component is contributed equally by the ^{90}Sr parent and the ^{90}Y daughter decay product in equilibrium in the standard. The concentration of the standard is expressed in terms of ^{90}Sr only.

(7) Divide the desired gross beta spike range in half and use the concentration of the standard expressed in terms of ^{90}Sr to calculate the volume of standard needed to reach the calculated spike range of 2.5 - 10 pCi/L.

(8) Add a volume of ^{90}Sr standard to the acid in the flask to reach the calculated spike range.

(9) The gross beta component, based on the ^{90}Sr concentration alone, must be multiplied by 2 to determine the gross beta concentration contributed by both the ^{90}Sr and the ^{90}Y in equilibrium in the standard.

(10) Dilute the standard to volume with distilled water and invert to mix.

(11) The standard may be stored in the flask at room temperature pending analysis.

b. Cesium-137. Analysis for ^{137}Cs by gamma spectroscopy is nondestructive, and a QC sample may be used indefinitely if periodically corrected for ^{137}Cs decay.

(1) The spike range for ^{137}Cs in water is 500 - 2000 pCi/L.

(2) Fill a 500-mL volumetric flask to approximately 400 mL with distilled water.

(3) Add 1.25 mL of 16 M HNO_3 to bring the final solution to a pH of approximately 1.

(4) Use a ^{137}Cs standard with a concentration of approximately 350 pCi/mL in water to spike the acid solution. Add a volume of standard to the acid to reach the desired spike range.

(5) Dilute the standard to volume with distilled water. Invert to mix.

(6) Transfer the solution to a 500-mL high-density polyethylene bottle, cap it, and submit for analysis or store at room temperature for future use.

c. Plutonium and americium.

(1) The spike range for ^{238}Pu, ^{239}Pu, or ^{241}Am in water is 0.1 - 5 pCi/L.

(2) Fill a 500-mL volumetric flask to approximately 300 mL with distilled water.

(3) Carefully add 125 mL of 12 M HCl to the water in the flask.

(4) Use ^{238}Pu and ^{239}Pu standards with concentrations of approximately

2 pCi/mL in 2 N HNO_3 and an ^{241}Am standard with a concentration of approximately 6 pCi/mL in 4 N HNO_3 to spike the solution in the flask. Add a volume of standard to the acid in the flask to reach the desired spike range.

(5) Dilute the standard to volume with distilled water. Invert to mix.

(6) The standard may be stored in the 500-mL flask at room temperature pending analysis.

d. Strontium-90.

(1) The spike range for ^{90}Sr in water is 200 - 400 pCi/L.

(2) Fill a 500-mL volumetric flask to approximately 400 mL with distilled water.

(3) Add 3.5 mL of 12 M HCl to achieve a final acid concentration of 0.08 M.

(4) Use a ^{90}Sr standard with a concentration of approximately 870 pCi/mL in 2 M HCl to spike the solution in the flask. Add a volume of standard to the acid in the flask to reach the desired spike range.

(5) Dilute the standard to volume with distilled water. Invert to mix.

(6) The standard may be stored at room temperature in the 500-mL flask pending analysis.

e. Uranium and $^{235}U/^{238}U$ ratio. NIST SRM 950a, natural uranium oxide, or other NIST-certified natural uranium SRMs are used to prepare the uranium standard solution. Although SRM 950a does not have a certified $^{235}U/^{238}U$ isotopic ratio, the natural ratio of 0.72% ^{235}U was assumed and was later confirmed by isotope-dilution mass spectrometry. A standard solution of depleted uranium in water may be made by using a mixture of a NIST-certified natural uranium SRM with NIST-certified depleted uranium SRM U 0002, a uranium isotopic standard. To minimize interference by trace impurities, double-deionized, 18-μmho/cm-conductivity water and ultrapure HNO_3 are used to make QC samples for the determination of uranium and the $^{235}U/^{238}U$ ratio in water by ICPMS.

(1) Prepare a 1-g/L stock solution of natural uranium in 1% HNO_3 by heating 1 g of NIST 950a, natural uranium oxide, in a platinum crucible to 900°C in a muffle furnace for 1 h and then dissolving 0.5896 g of the U_3O_8 in 20 mL of 8 M HNO_3. Evaporate the solution to near dryness and redissolve in 10 mL of 1.6 M HNO_3. Quantitatively transfer the solution to a 1-L volumetric flask and bring to volume with 1% HNO_3. Dilute 1 mL of the 1-g/L uranium stock solution to 10 mL with 5% HNO_3 to produce a standard solution with a uranium concentration of 100 μg/mL.

(2) The spike range for uranium in water quality control standards is 50 - 100 μg/L.

(3) Fill a 250-mL volumetric flask to about 90% capacity with double-deionized, 18-μmho/cm-conductivity water.

(4) Add 7.5 mL of ultrapure HNO_3 to the water in the flask.

(5) Use a natural uranium standard with a concentration of approximately 100 μg/mL in 3% HNO_3 to spike the solution in the flask. Add a volume of standard to the acid in the flask to reach the desired spike range.

(6) Dilute the standard to volume with double-deionized, 18-μmho/cm-conductivity water. Invert to mix.

(7) Pour the standard into a high-density polyethylene bottle and store at room temperature pending analysis.

f. Tritium.

(1) The spike range for tritium in water is 10 - 20 nCi/L. *Blank tritium standards should be made, transferred to glass vials, and sealed before spiked tritium standards are made, to avoid contamination of the blank by tritiated water vapor in the air.*

(2) Place approximately 3 mL of distilled water into a 10-mL volumetric flask.

(3) Use a tritium-in-water standard with a concentration of approximately 300 pCi/mL to spike the water in the flask. Add a volume of tritium standard to the water in the flask to reach the desired spike range.

(4) Dilute the standard to volume with distilled water. Invert to mix.

(5) Transfer the solution to a glass vial, cap the vial, and wrap Parafilm around the cap to prevent evaporation.

(6) Store the QC sample in the glass vial at room temperature pending analysis.

(7) For analysis, an aliquot of the QC sample is pipetted into liquid-scintillation cocktail, and the activity is measured by liquid-scintillation counting.

g. Radium-226.

(1) The spike range for ^{226}Ra in water is 0.5 - 5.0 pCi/L.

(2) Fill a 1-L volumetric flask to approximately 900 mL with distilled water.

(3) Add 10 mL of 12 M HCl to achieve a final acid concentration of 0.12 M.

(4) Use a ^{226}Ra standard with a concentration of approximately 10 pCi/mL in 0.1 M HNO_3 to the solution in the flask to reach the desired spike range.

(5) Dilute the standard to volume with distilled water and invert to mix.

(6) Submit the sample for analysis or store it at room temperature in the 1-L flask pending analysis.

h. **Gross gamma.** Analysis by gamma spectroscopy is nondestructive, and a QC sample may be used indefinitely if the gross gamma concentration is decayed periodically. Cesium-137 is spiked into distilled water as a gamma emitter. Only the gamma radiation emitted at energies above the lower energy threshold of the analytical method used to measure the QC samples may be included in calculating the gross gamma concentration of the QC sample. If the lower energy threshold of the analytical method is 100 KeV, only 0.815 of the gamma radiation of ^{137}Cs is emitted at a higher energy level (662 KeV) and may be included in calculating the concentration of the QC sample.

(1) Calculate the applicable gross gamma concentration of the ^{137}Cs standard by multiplying the ^{137}Cs concentration by the fraction of the gamma radiation emitted at energy levels exceeding the lower energy threshold of the analytical method.

(2) The spike range for gross gamma in water is 1000 - 1500 pCi/L.

(3) Fill a 500-mL volumetric flask to approximately 400 mL with distilled water.

(4) Add 1.25 mL of 16 M HNO_3 to bring the final solution to a pH of appromimately 1.

(5) Spike the acid solution with a ^{137}Cs standard with an applicable gross gamma concentration of approximately 300 pCi/mL in 1 M HCl. Add a volume of standard to the acid to reach the desired spike range.

(6) Dilute the standard to volume with distilled water and invert to mix.

(7) Transfer the solution to a 500-mL high-density polyethylene bottle, cap it, and submit for analysis or store at room temperature for future use.

3. *Vegetation and vegetation ash.* Vegetation samples are ashed in a muffle furnace before analysis. Ash samples that were previously analyzed and were determined to be blank are used as a matrix for QC samples. Commercial chicken feed that was ashed was also used as a vegetation matrix.

a. **Preparation of the ash matrix.** Commercial chicken feed is ashed slowly to produce an ash matrix for QC samples. Before use as a matrix, the pooled and homogenized ash is determined to be suitably blank by analyzing a representative aliquot. All of the ash tested had high uranium backgrounds, prohibiting their use as a matrix material for the determination of uranium in ash by DNA.

(1) Weigh 200 g of chicken feed into a 1-L beaker.

(2) Cover the beaker with aluminum foil perforated with ¼- to ½-in. holes. *The muffle furnace should be equipped with a safety switch that shuts the furnace off if the temperature exceeds its setting. The furnace should also be vented or located so that fumes are directed away from the work area.*

(3) Ash the food at 100°C for approximately 55 h.

(4) Continue to ash the food at 250°C for approximately 16 h.

(5) Continue to ash the food at 400°C for approximately 12 h.

(6) Complete the ashing of the food at 500°C for approximately 60 h.

(7) Allow the sample to cool in the furnace for approximately 24 h.

(8) Using insulated gloves, remove the beaker from the furnace. Crush the large chunks of ash with a spatula.

(9) Return the ash to the furnace and continue heating it at 500°C until the ash is grey and no weight change occurs over a 3-day heating period. Because all flammable matter has already been burned off, up to 1.5 kg of ash can be put into the muffle furnace at one time.

(10) Store the ash in a polyethylene bottle until it is homogenized and characterized for use as a QC matrix.

b. Cesium-137. Analysis for ^{137}Cs by gamma spectroscopy is nondestructive, and a QC sample may be used indefinitely if periodically corrected for ^{137}Cs decay.

(1) The spike range for ^{137}Cs in vegetation ash is 5 - 60 pCi/g of vegetation.

(2) Tare a 500-mL high-density polyethylene bottle. Weigh 100.0 g of ashed feed into the bottle.

(3) Use a ^{137}Cs standard with a concentration of approximately 350 pCi/mL in 1 M HCl to spike the ash. Add a volume of standard to the ash to reach the desired spike range.

(4) Dry the spiked sample under a heat lamp, periodically mixing it with a vortex mixer, until all large clumps are broken up and the sample is dry.

(5) Cap the bottle and store at room temperature pending analysis.

c. Plutonium, americium, and strontium.

(1) The spike range for ^{238}Pu, ^{239}Pu, ^{241}Am, or ^{90}Sr on vegetation ash is 1 - 10 pCi/g of ash.

(2) Tare a 600-mL glass beaker. Weigh 1.0 g of vegetation ash into the beaker.

(3) Use ^{238}Pu, ^{239}Pu, and ^{241}Am standards with concentrations of approximately 180 pCi/mL in 2-4 N HNO_3 or a ^{90}Sr standard with a concentration of approximately 200 pCi/mL in 2 M HCl to spike the ash. Add a volume of the selected standard to the ash to reach the desired spike range.

(4) Cover the beaker with plastic wrap and store at room temperature pending analysis.

4. Filter samples.

a. Plutonium and americium. Microsorban (polystyrene) filters are used to collect plutonium and americium by air filtration. Because the filters are hydrophobic, a small amount of soil is placed on top of the filter to absorb the QC solutions.

(1) The spike range for ^{238}Pu, ^{239}Pu, or ^{241}Am on filters is 1 - 5 dpm/filter.

(2) Fold half of a Microsorban filter and place it into a 50-mL platinum crucible.

(3) Tare the filter and crucible. Add 0.1000 g of clean, dry soil on top of the filter.

(4) Use ^{238}Pu and ^{239}Pu standards with concentrations of approximately 2 pCi/mL in 2 M HNO_3 and an ^{241}Am standard with a concentration of approximately 18 pCi/mL in 4 N HNO_3 to spike the filters. Add a volume of the standard to the soil to reach the desired spike range.

(5) Dry the spiked soil and filter under a heat lamp.

(6) Cover the crucible with a platinum lid and submit for analysis.

b. Uranium.

(1) A natural uranium standard may be made from NIST 950a, uranium oxide, or another NIST-certified natural uranium standard as described in Section D.2.e, "Uranium and $^{235}U/^{238}U$ ratio." Dilute 10 mL of the original 1-g/L uranium standard to 100 mL with 1% - 10% ultrapure HNO_3 to make a standard solution with a uranium concentration of 100 μg/mL.

(2) The spike range for uranium on filters is 1 - 5 μg/filter.

(3) Spike an aliquot of standard with a uranium concentration of 100 μg/mL on a filter paper using the procedure described below in Section E.1.a, "Stable elements."

E. Environmental Inorganic Quality Assurance Program.

Quality control for the stable-constituent analysis program is maintained by analysis of certified or well-characterized environmental samples. The NIST has a large set of silicate, water, and biological SRMs. The EPA distributes mineral analysis and trace analysis water standards. Rock and soil reference materials have been obtained from the CGS and the USGS. Commercial stock solutions of stable elements are available in the range of 100 - 10,000 μg/mL in a matrix of dilute HNO_3 or HCl. The environmental standards certified by outside agencies are used to validate new procedures and to check established procedures at intermittent intervals or when problems occur. If the desired standard concentration is not available commercially, an available commercial standard may be diluted, or an in-house standard may be prepared from reagent-grade chemicals, provided that the solution is prepared in a suitable acidic or basic matrix. Most routine blind and nonblind QC samples are made in-house. The spike range for in-house QC samples depends upon the analytical

methodology used and the sensitivity of analysis requested by the customer.

1. Filter samples.

a. **Stable elements.** HS-5 and EM-8 sample for the presence of airborne stable elements in Laboratory work areas and in the local air-shed by passing a measured volume of air through filters. Work surfaces, such as laboratory benches, fume hoods, and machine tools, are swiped to monitor for the presence of selected elements. QC samples are matrix-matched to the samples whenever possible to avoid problems due to differences in filter type. Most filters are prepared for analysis by digestion, desorption, or dry ashing. Analysis is completed by instrumental thermal neutron activation (ITNA), DNA, ICPMS, ICPAES, or atomic absorption (AA) spectrometry. The following technique is used to prepare QC samples for these analyses.

(1) Determine the desired spike range for the element of interest.

(2) Determine the concentration of standard needed to spike a volume of 10 - 50 μL onto the filter. If a stock solution is available at the appropriate concentration, use a direct spike of the standard. If the proper concentration is not available, prepare a dilution of one of the available standards using the same matrix as the standard.

(3) Place a blank filter on a clean beaker or bottle cap for support such that 80% - 95% of the filter surface is within the rim of the beaker.

(4) Spike 10 - 50 μL of the stock standard or an appropriate dilution onto the middle of the filter. Repeat for each analyte. If several analytes are spiked onto the same filter or if the total volume spiked exceeds 50 μL, drying may be necessary between spikes.

(5) Dot the spiking solution evenly around the filter to assure the proper geometry for irradiation when preparing samples for analysis by ITNA or DNA.

(6) Dry the filters in the air or under a heat lamp. Submit the samples for analysis or store for future use.

2. Oil-based solvents

a. **Stable elements.** EM-7 samples many oil drums to determine disposal protocol. The Inorganic Analysis Section analyzes these samples for As, Ba, Cd, Cr, Pb, Hg, Ni, Se, Tl, and Zn. The three techniques employed in analysis are ICPMS, electrothermal vaporization atomic absorption (ETVAA), and flame atomic absorption (FAA). Commercial organometallic standards were available for all of the above elements except thallium, and we developed a method for making an organothallium standard by combining thallium acetylacetonate with 2-ethylhexanoic acid that acts as a stabilizer. All of the commercial standards were available at concentrations of 5000 μg/g except for As, Se, and Hg, which were available at 100-μg/g levels. The following technique is used to prepare these QC samples.

(1) Prepare a working standard that is 100 μg/g (wt/wt) of each element by adding 2 g of a 5000-μg/g organometallic standard to a clean, tared, 100-mL polypropylene bottle. Record the mass added but DO NOT tare the balance. Repeat for the remaining 5000-μg/g elemental standards. Add 1 mL of commercial stabilizer solution. Add the manufacturer's 75 Base Oil to bring the total mass to 100 g. This is the working standard for Ba, Cd, Cr, Pb, Ni, Ag, and Zn. Wrap with foil or use an amber polyethylene bottle to prevent the deterioration of silver due to light.

(2) Prepare a 100-μg/mL (wt/v) working standard of thallium acetylacetonate. Add 3.7 mg of thallium acetylacetonate and 250 μL of 2-ethylhexanoic acid to a 25-mL volumetric flask. Dilute to volume with xylene.

(3) Preparation of the in-house QC sample depends upon the instrument that will be used for the analysis. Both the solvent of choice and the spike range vary with the analytical technique as listed in Table VI.

(4) Determine the number of μg of each element necessary to give the appropriate concentration in a total volume of 50.0 mL.

(5) Add the desired amount of the first standard solution to a 50-mL graduated polyethylene centrifuge tube with a screw cap. Record the mass. Tare the balance and repeat for all remaining standards, except thallium. Add the desired volume of thallium standard. Dilute to volume with the appropriate solvent. Mix well.

(6) Submit the QC sample for analysis. QC samples must be prepared for each sample set.

TABLE VI. QC Preparation Based on Analytical Technique

Instrument	Spike Range	Solvent
ICPMS	0.5 - 1.0 μg/mL	kerosene
ETVAA	0.5 - 1.0 μg/mL	methylisobutyl ketone
FAA	4 - 6 μg/mL	d-limonene methylisobutyl ketone

3. *Water Samples.*

a. **Trace elements.** Water samples are received for the analysis of many stable elements and compounds, some of which are unique to our work environments at the Laboratory and to northern New Mexico, where levels of silicates and natural uranium are higher than in other parts of the country. Quality control efforts involve preparation of samples with single and multiple elements or compounds in dilute acid matrices. The acid matrix of choice depends upon the elements present. Most samples are prepared in 3% HNO_3 or HCl. Nitric acid is the matrix of choice for analyses performed by ICPMS or FAA because Cl^- will cause spectral interferences. Several different commercially available single- and multiple-element aqueous standards are used, including solutions prepared by EPA and NIST. For some QC analytes, such as Cr^{+6}, the sample is prepared gravimetrically from a pure inorganic compound. A natural uranium standard is prepared gravimetrically from NIST SRM 950a, natural U_3O_8, as described under Section D.2.e, "Uranium and $^{235}U/^{238}U$ ratio." When silver is included in a trace element QC in water, the QC solution must be stored in the dark to avoid the reduction and subsequent loss of the silver. Wrapping the sample container in aluminum foil or using an amber polyethylene bottle adequately preserves the silver. The water samples are analyzed by a variety of techniques, including ICPMS, ICPAES, ETVAA, cold vapor atomic absorption (CVAA) spectroscopy, FAA, ion chromatography (IC), ion-selective electrodes (ISE), and spectrophotometry.

(1) For commercial aqueous standards, the concentration is given for the analyte of interest.

(2) For standards prepared from pure compounds, the wt % of the element of interest must be used to correctly determine the concentration of the standard. For example, 294.2 mg of $K_2Cr_2O_7$ contains 104 mg of Cr^{+6}. If 283 mg of reagent-grade $K_2Cr_2O_7$ is dissolved in 100 mL of double-deionized water, the final Cr^{+6} concentration of the standard solution will be 1000 μg/mL.

$$X = \frac{(283\ mg)\ (2 \times 52)\ (1000\ \mu g/mg)}{(100\ mL)\ (294.2)} \qquad (5)$$

where X = final Cr^{+6} concentration of standard solution,
52 = atomic weight of Cr, 1 molecular weight of $K_2Cr_2O_7$ contains 2 atomic weights of Cr,
294.2 = molecular weight of $K_2Cr_2O_7$,
283 = weight of $K_2Cr_2O_7$ dissolved (mg),
100 = final volume of standard (mL), and
1000 = conversion factor (μg/mg).

(3) Determine the total volume of QC sample needed by the analyst for analysis of all the elements of interest by the appropriate techniques.

(4) Determine the final concentration for each element or compound included in the QC sample.

(5) Fill the appropriate size volumetric flask with double-deionized, 18-μmho/cm-conductivity water to approximately 80% - 90% capacity. Add enough concentrated acid to achieve the desired final acid concentration. Use ultrapure acids suitable for trace metal analysis.

(6) Spike the analytes of interest into the acid solution to reach the desired spike range for each analyte.

(7) Dilute the solution to volume with double-deionized, 18-μmho/cm-conductivity water and mix by inversion.

(8) Submit the sample for analysis or store it at room temperature pending analysis.

b. Mercury. Low-level mercury solutions must be stabilized to maintain their certified concentration for longer than a few hours. Studies on the preservation of dilute mercury solutions[22] show that a dilute solution will maintain its concentration for as long as 5 months if it is preserved with 0.01% $Cr_2O_7^=$ and 5% HNO_3 and is stored in a glass container.

(1) The spike range for Hg in water is 1 - 4 μg/L. *In preparing a dilute mercury standard, the acid and $Cr_2O_7^=$ must be added to the water before the mercury spike to prevent the immediate loss of mercury.*

(2) Prepare a stabilizing solution with a $Cr_2O_7^=$ concentration of 50 mg/mL by dissolving 341 mg of potassium dichromate in distilled water in a 5-mL flask. Dilute to volume with distilled water.

(3) Because the final concentration of the mercury QC is very low, an intermediate stock solution is prepared.

(a) Put 15 mL of distilled water into a 25-mL volumetric flask.

(b) Add 2.5 mL of ultrapure HNO_3 to the solution in the flask.

(c) Add 50 μL of the stabilizing solution with a $Cr_2O_7^=$ concentration of 50 mg/mL to the flask to achieve a $Cr_2O_7^=$ concentration of 0.01% by weight.

(d) Use a mercury solution with a concentration of 1000 μg Hg/mL in 10% HNO_3. Add 250 μL of 1000-μg Hg/mL stock to the solution in the flask.

(e) Dilute the solution to volume with distilled water to produce a solution at a concentration level of 10 μg Hg/mL in 10% HNO_3 acid and 0.01 wt % $Cr_2O_7^=$.

(4) The final QC standard is in 5% HNO_3 and at least 0.01% $Cr_2O_7^=$ solution.

(a) Fill a 100-mL flask to 80 mL with distilled water.

(b) Add 5 mL of ultrapure HNO_3.

(c) Add 200 μL of the 50-mg/mL $Cr_2O_7^{=}$ stabilizing solution to the acid solution in the flask.

(d) Use the 10-μg Hg/mL intermediate stock solution to spike the solution in the flask. Add a volume of standard to the solution in the flask to reach the desired spike range.

(e) Store the QC standard in glass until needed for analysis for up to 5 months.

c. Oil and grease.

(1) The spike range for oil and grease in water is 20 - 100 mg/L.

(2) Fill a 1-L glass jar with a Teflon-lined lid nearly full of distilled water. The entire sample will be analyzed assuming a 1-L volume.

(3) Tare a small polyethylene weighing dish on a balance.

(4) Using a sample dropper, add vegetable oil to the weighing dish to reach the desired spike range.

(5) Quantitatively transfer the oil from the weighing dish into the water in the jar using a clean sample dropper and less than 3 mL of Freon.

(6) Cap the jar and submit the sample for analysis or refrigerate the sample pending analysis.

d. Nitrite-nitrogen. Almost immediately upon being dissolved in water, a nitrite salt is oxidized to nitrate, and the integrity of the nitrite sample is lost. Therefore, a QC sample for the analysis of nitrite-nitrogen is distributed as a weighed aliquot of sodium nitrite salt that is dissolved just before analysis.

(1) The spike range for NO_2-N in water is 0.1 - 1.0 mg/L.

(2) Tare a 10-mL glass volumetric flask.

(3) Accurately weigh 10 - 100 mg of $NaNO_2$ salt into the flask.

(4) The wt % of N in the $NaNO_2$ must be calculated to determine the concentration of NO_2-N in the resultant QC sample. For example, 50 mg of $NaNO_2$ salt produces 10 mg of NO_2-N.

$$X = A \times B \quad . \qquad (6)$$

where X = weight of N in $NaNO_2$ added,
A = 50 mg $NaNO_2$,
B = (14 mg N)/(69 mg $NaNO_2$),
14 = atomic weight of N, and
69 = molecular weight of $NaNO_2$.

(5) Stopper the flask and store it at room temperature pending final dilution and analysis of the sample.

(6) Just before analysis, dissolve the $NaNO_2$ salt in the flask in approximately 8 mL of double-deionized water.

(7) Dilute the solution to volume with double-deionized water. Mix by inversion.

(8) Put approximately 90 mL of double-deionized water into a 100-mL glass volumetric flask.

(9) Spike 50 μL of the $NaNO_2$ solution from the 10-mL flask into the water in the 100-mL flask.

(10) Dilute the QC sample in the 100-mL flask to volume with double-deionized water. Mix by inversion.

(11) Analyze the QC sample in the 100-mL flask immediately after preparation.

e. Cyanide.

(1) The spike range for CN^- in water is 0.1 - 0.5 mg/L.

(2) EPA-traceable cyanide QC samples are used as standards. The concentration of the undiluted standard is used to determine the volume needed to prepare a QC sample in the desired spike range. The CN^- concentration given by EPA is the concentration of the sample after dilution according to EPA instructions. The concentration of the undiluted CN^- sample must be back-calculated from the postdilution values supplied by EPA.

(3) Place approximately 40 mL of double-deionized water into a 50-mL glass volumetric flask.

(4) Add 100 μL of 50% NaOH to the water to produce a final alkaline concentration of 0.02 M. Add the NaOH to the water before spiking it with the CN^- sample so that the CN^- is always added to a basic solution.

(5) Spike an aliquot of the undiluted EPA CN^- standard to the basic solution in the flask to reach the desired spike range.

(6) Dilute the QC sample to volume with double-deionized water. Mix by inversion.

(7) Refrigerate the sample pending analysis.

4. *Trace elements in soil.* Soils with certified concentrations of many trace elements are available from NIST, USGS, and CCRMP. A QC sample should ideally contain the constituent of interest in the same form in which it is present in the sample. At present, this is not always possible, and QC samples for the determination of trace elements in soil may be made in aqueous solutions to correspond to the aqueous solutions resulting from the extraction of the trace elements from the soil samples. The preparation of trace elements in aqueous solution QC samples is described in Sections 3.a and 3.b.

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APPENDIX A

GLOSSARY

Accreditation. A formal process by which a laboratory is evaluated with respect to established criteria for its competence to perform specified types of measurements.

Accuracy. The degree of agreement of a measurement with an accepted reference or true value, usually expressed as the difference between the two values.

ACS. American Chemical Society.

Adsorption. The physical process in which molecules of gas, dissolved substances, or liquids adhere in an extremely thin layer to the surface of solid bodies with which they are in contact.

Aliquot. Measured portion of a sample that is used in an analysis.

Alpha (α) probability. The proportion of false detection. Detection of an analyte that is not present.

AMDA. Acceptable minimum detectable amount. See detection limit.

Analyte. The specific component measured in a chemical analysis.

Analytical batch. Samples that are analyzed together with the same method sequence, the same lots of reagents, and with the manipulations common to each sample within the same time period. Samples in each batch should be of similar composition.

ANSI. American National Standards Institute.

AP. Administrative Procedure, an EM-9 document that sets down in writing the quality control procedures and other processes that apply to laboratory activities in general. These procedures are intended to implement the requirements contained in the Quality Assurance Program Plan. Other manuals contain the technical procedures that describe specific analytical techniques.

Aroclor. Chlorinated diphenyl resin; dielectric; plasticizer. Monsanto Corporation marketed PCBs under the tradename Aroclor from 1930 to 1977. Aroclors were marketed for use in transformers, capacitors, printing inks, paints, dedusting agents, pesticides, and many other applications.

Audit. A systematic check to determine the quality of operation of a function or activity. Audits may be of two basic types:

Performance audits. Quantitative data are independently obtained for comparison with data routinely obtained in a measurement system.

System audits. A systematic on-site qualitative review of facilities, equipment, training, procedures, recordkeeping, data validation, data management, and reporting aspects of a total QA system to arrive at a measure of capability of the measurement system to generate data of the required quality.

Average (mean). The sum of a series of results divided by the number of results. The symbol is $\overline{X}$.

Beta (β) probability. The proportion of false nondetection. The nondetection of an analyte that is present.

Bias. An effect that systematically distorts a statistical result. A systematic displacement of all the observations in a sample from the true or accepted value.

Bioassay. Measurements to determine the amount of material in the excreta or in other biological materials removed from the body.

Biokinetics. The science of the movements within developing organisms.

Blank. A sample that is identical, in principle, to the sample of interest, except that the substance being analyzed is absent. The measured value or signal for the substance being analyzed is believed to be due to artifacts and should be subtracted from measured sample values to give a net value caused by the substance contained in the sample. We differentiate blanks into the following categories:

Analytical or reagent blank. A blank used as a baseline for the analytical portion of a method. It may be an aliquot of analyte-free water, solvent, or carrier gas analyzed with the analytical batch and used to adjust or correct routine analytical results.

Equipment blank. A blank prepared in the field by collecting water that has been run over the sampling equipment before use to show if samples were contaminated by the sampling equipment.

Field blank. A blank that is an aliquot of analyte-free water or a solvent brought to the field in sealed containers and transported back to the laboratory with the sample containers.

Trip blank. A blank that checks on sample contamination originating from sample transport, shipping, and from site conditions.

Blind sample. A sample submitted for analysis with a composition known to the submitter but unknown to the analyst. A blind sample is one way to test proficiency of the measurement process.

Calibration. Comparison of one measurement standard or instrument with another standard or instrument to report or eliminate by adjustment any variation in the accuracy of the item being compared.

Calibration check. Verification of the ratio of instrument response to analyte amount, performed by analyzing for analyte standards in an appropriate solvent. Calibration check solutions are made from a stock solution that is different from the stock used to prepare standards.

CAR. Corrective action request.

CAS number. An organic compound numbering system developed by the Chemical Abstract Service.

CCRMP. Canadian Certified Reference Materials Project.

Certified reference material. A reference material with one or more property values certified by a technically valid procedure, accompanied by or traceable to a certificate or other documentation issued by a certifying body such as NIST.

Certified value. The value that appears in a certificate as the best estimate of the value for a property of a reference material.

Chain of custody. A procedure for preserving the integrity of a sample or of data. A written record that lists the location of the sample and data at all times; a procedure complete with signatures of those responsible for the sample.

Check sample. A blank that has been spiked with the analyte from an independent source in order to monitor the performance of the analytical method. The level of the spike should be at the regulatory action level when applicable. Otherwise, the spike shall be five times the estimate of the quantification limit. The matrix used shall be phase-matched with the samples and well characterized.

CHP. Chemical Hygiene Plan, a Laboratory plan developed to meet the requirements of Occupational Safety and Health Administration standard 29 CFR 1910.1450, "Occupational Exposure to Hazardous Chemicals in Laboratories."

COD. Chemical oxygen demand.

Concentration. The quantity of material in activity, or mass per unit volume, or mass of a sample.

Cond. Conductivity.

Confidence interval. The interval within which the estimated parameter may lie with some given degree of probability.

Confidence level. The probability associated with a confidence interval.

Consensus value. A value assigned to the concentration of an element in a reference material by an investigator who compiles available literature data on international reference materials. Many methods exist for arriving at the assigned value; the most common is the calculation of a mean and standard deviation following the elimination of obvious outliers.

Control chart. The graphic record of values, results, samples, or controls recorded successively. The ordinate of the graph is scaled in units of the test result, and the abscissa is scaled in units of time or sequence of results.

Control limit. Limits on the control chart, established at ± 2 or 3 standard deviations from the mean, that are used as criteria for action or for judging the significance of variations between duplicate samples. Values falling outside the upper or lower control limit are considered out of control.

Data validation. The systematic review of a data set to identify outliers, suspect values, and transcription errors.

Desorption. The process of freeing a substance from a sorbed state.

Detection limit. Examination of the analytical and radiochemical literature for an appropriate definition of the limit of detection revealed an abundance of widely ranging terminology.

Acceptable minimum detectable amount. The amount of radioactive material that analytical measurement procedures should measure with the assumption that the material is free of interference from other radionuclides.

Environmental detection limit. The smallest level at which an analyte in an environmental medium can be unambiguously distinguished, for a given confidence level, by the use of a particular combination of sampling and measurement procedures, sample volume, analytical detection limit, and processing procedure.

Limit of detection. The smallest concentration of a substance that can be measured by a single measurement with a stated level of confidence.

MDA. Minimum detectable amount. The smallest amount of an analyte in a sample that will be detected with a beta probability of nondetection (type II error) while accepting an alpha probability of erroneously detecting that analyte in an appropriate blank sample (type I error). The alpha and beta probabilities are commonly set at 0.05.

MDL. Minimum detectable level (limit of detection). The limit of detection of an analytical method is the minimum concentration of the analyte of interest that can be observed by the instrument and

distinguished from instrument noise with a specified degree of probability.

MQL. Method quantification limit. The minimum concentration of a substance that can be measured and reported.

DNA. Delayed neutron activation. The determination of fissionable materials through measurement of neutron emission from their neutron-rich fission products. Most commonly used for the measurement of uranium using calibration standards with a known atomic percent of ^{235}U.

DOE. Department of Energy.

Duplicate analysis. An analysis performed at the same time on equal quantities taken from the same sample or on two samples collected at the same time and place.

EM-7. Waste Management Group, Los Alamos National Laboratory.

EM-8. Environmental Protection Group, Los Alamos National Laboratory.

EM-9. Environmental Chemistry Group, Los Alamos National Laboratory.

EML. Environmental Measurements Laboratory, New York, which operates the Quality Assessment Program for the DOE.

EMSL. Environmental Monitoring and Support Laboratory of the EPA, Las Vegas (LV), Nevada, and Cincinnati (CI), Ohio.

Environmental detection limit. See detection limit.

Environmental surveillance. The collection and analysis of samples of air, water, soil, foodstuffs, biota, and other environmental media from Laboratory sites and their environs and the measurement of various analytes for purposes of demonstrating compliance with applicable standards and assessing effects, if any, on the local environment.

EPA. Environmental Protection Agency.

Error. The difference between an observed value and its true value.

Gross alpha. The total amount of measured alpha activity without identification of specific radionuclides.

Gross beta. The total amount of measured beta activity without identification of specific radionuclides.

H_2O^+. Bound water removed from geological materials by heating at 1,000°C after removal of unbound water.

H_2O^-. Unbound water removable by drying at 110°C for 24 h.

Hard. Hardness.

Homogeneity. The degree to which a property or substance is randomly distributed throughout a material.

IAEA. International Atomic Energy Agency, Vienna, Austria.

Interlaboratory variability. The difference in results obtained by different laboratories when portions of a common sample are measured.

Intralaboratory variability. The difference in results when a single laboratory repeatedly measures portions of a common sample.

In vitro. Measurements to determine the presence of or to estimate the amount of radioactive

material in the excreta or in other biological materials removed from the body.

In vivo. The measurement of radioactive material in the human body using instrumentation that detects radiation emitted from the radioactive material in the body.

LIMS. Laboratory information management system.

Matrix/spike-duplicate analysis. Predetermined quantities of stock solutions of certain analytes added to a sample matrix before sample extraction/digestion and analysis. Samples are split into duplicates and are spiked and analyzed. Percent recoveries are calculated for each of the analytes detected. The relative percent difference between the samples is calculated and used to assess analytical precision. The concentration of the spike should be at the regulatory standard level or the estimated or actual method quantification limit.

MDA. See detection limit.

MDL. See detection limit.

Mean. Equal to the sum of units divided by the number of units (arithmetic average).

Measures of central tendency. Measures of the tendency of values within a set of data to be centered at some location (e.g., median, mode, arithmetic mean).

Measures of dispersion or variability. Measures of the differences, scatter, or variability of values within a set of numbers. Commonly used measures of the dispersion or variability are the range, standard deviation, variance, and coefficient of variation.

Median. The middle value of a set of data when the set is ranked in increasing or decreasing order.

Mode. The value occurring most frequently in a data set.

MQL. See detection limit.

MSDS. Material safety data sheet. Written data on the hazards and properties of a particular material, including instructions for its safe use.

M&TE. Measuring and test equipment. Devices or systems used to calibrate, measure, gauge, test, inspect, or control in order to acquire routine analytical, research, development, or test data.

NBS. National Bureau of Standards. See NIST.

NIOSH. National Institute for Occupational Safety and Health.

NIST. National Institute of Standards and Technology (formerly the National Bureau of Standards), Gaithersburg, Maryland.

NPDES. National Pollutant Discharge Elimination System.

NRC. Nuclear Regulatory Commission.

Outlier. A value that appears to deviate markedly from the value for other members of the data set in which it occurs. The chance probability of its being a valid member of the group is very small. Such a questionable value may be eliminated from the group on the basis of further statistical investigation of the data set.

Overspike. The addition to a sample of a known amount of analyte over and above that which may be already present in the sample.

OVM. Organic vapor monitor.

P Alk. Phenolphthalein alkalinity.

PAT. Proficiency Analytical Testing Program from NIOSH.

PCB. Polychlorinated biphenyls are a class of 209 discrete chemical compounds, called congeners, in which 1 to 10 chlorine atoms are attached to a biphenyl.

PE. Performance evaluation samples from EML.

Poisson distribution. The exponential limit of a binomial distribution as the probability (p) approaches zero and the number of events (n) approaches infinity. Describes the frequency pattern of counts emitted by radioactive decay in a continuous interval of time. A distribution of counts from radioactive decay greater than 20 events may be considered normally distributed and the t distribution statistics may be used to test results obtained.

Precision. The degree to which data generated from replicate or repetitive measurements agree. Frequently assessed by calculating the standard deviation in a set of data points.

Preventive maintenance. An orderly program of positive actions for preventing failure of equipment and ensuring, as much as possible, that the equipment is operating with the reliability required for quality results.

Primary standards. A class of single elements or compounds that are well characterized, stable, homogeneous, and produced in quantity. Their physical or chemical properties have been determined within specified measurement uncertainties by a recognized national standards laboratory such as NIST. Examples include NIST SRM 83c (As_2O_3) and NIST SRM 950b (U_3O_8).

Probability. The likelihood of the occurrence of any particular form of an event, estimated as the ratio of the number of ways or times that the event may occur in that form to the total number of ways that it could occur in any form.

Proficiency testing. A systematic testing program in which a sample, or random series of samples, is analyzed by a number of laboratories to determine the accuracy of each laboratory's analysis.

QA. Quality assurance. The total integrated program of planned and systematic actions necessary to provide confidence in and assure the reliability of each analytical result or measurement reported by a laboratory.

QADM. Quality Assurance and Data Management Section.

QAP. Quality Assessment Program from EML.

QAPP. Quality Assurance Program Plan.

QC. Quality control. Actions taken within a QA program to ensure validity of results. As used in this document, QC means all routine activities and checks, such as calibration of equipment, duplicate analyses, use of certified reagents, and use of spiked samples, included in normal internal procedures to control the accuracy and precision of a measurement process.

QNS. Quantity not sufficient.

Quality assessment. The system or techniques used to verify that the entire analytical process is operating within acceptable limits. Control charts are an example.

Quality assurance manual. A written document that identifies the policies, organization, objectives, functional activities, and specific quality assurance activities designed to achieve the quality goal desired for the operation of a laboratory.

Radiobioassay. Measurements to determine the presence of or to estimate the amount of radioactive material in the excreta or in other biological materials removed from the body.

Radiotissue. Measurements to determine the presence of or to estimate the amount of radioactive material in tissues removed from the body.

Random error. Variations of repeated measurements made within a sample set that are random in nature and individually not predictable. The causes of random error are assumed to be indeterminate or nonassignable and are generally assumed to be normally distributed.

Range. The absolute value of the difference between the maximum and minimum values in a set of results.

RCRA. Resource Conservation and Recovery Act.

Reagent grade. Analytical reagent (AR) grade, ACS reagent grade, and reagent grade are synonymous terms for reagents that conform to the current specifications of the Committee on Analytical Reagent of the American Chemical Society.

Reference material. A material or substance with one or more properties that are sufficiently well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for the assignment of values to materials.

Regression. A statistical method for investigating the relationship between a dependent variable or response and one or more independent or predicated variables.

Reliability. The ability of an item or a system to perform a required function under stated conditions for a stated period of time.

Repeatability. The variation in data generated on a single sample by a single analyst or instrument or both over a short period of time.

Replicate analysis. Repeated but independent determinations of the same sample, by the same analyst, at essentially the same time, and under the same conditions.

Replicate sample. Prepared by dividing a sample into two or more separate aliquots.

Representative sample. A sample taken to depict the characteristics of a population as accurately and precisely as possible.

Reproducibility. Variation over an extended time or by various analysts or laboratories.

RSD. Relative standard deviation. The standard deviation (precision) of a set of values divided by the arithmetic mean, $S/\overline{X}$. In this document it is expressed as percentage (%). The term is equivalent to coefficient of variation.

Secondary standards. Materials produced by commercial organizations, laboratories, or governmental agencies that are well characterized, stable, and homogeneous. The secondary standards are produced in quantity and have one or more physical or chemical properties experimentally determined within stated measurement uncertainties. The important distinction between primary and secondary standards is that the latter may be complex natural materials (such as rocks or vegetation) as well as high-purity compounds or elements.

We differentiate secondary standards between two classes:

Class I. Complex materials whose composition or physical properties have been determined and certified within specified measurement uncertainties by a recognized national

standards laboratory. The NIST SRM program has produced a large number of such materials for use in bioassay and environmental analyses.

Class II. Complex materials whose preparation has been similar to that of Class I materials but whose composition has not been certified by a national standards laboratory. Certain elements in NIST SRMs and all materials from USGS, CCRMP, IAEA, or EPA fall in this category. Mean elemental concentrations are frequently established by consensus.

Sensitivity. The degree to which an instrument or method can detect a particular analyte.

Shall statements. Indicate performance criteria and procedures required to operate and maintain an acceptable QA program.

Should statements. Indicate flexible guidance for an acceptable QA program.

SNM. Special nuclear materials. Transuranic elements that fall under special accountability requirements.

SOP. Standard operating procedure. A procedure adopted for repetitive use when performing a specific measurement or sampling operation.

Spike. The addition to a blank sample of a known amount of a reference material, containing the analyte of interest.

SRM. Standard reference material. A reference material distributed and certified by the National Institute of Standards and Technology.

Standard addition. A method in which small increments of a substance under measurement are added to a sample under analysis to establish a response function, or by extrapolation, to determine the amount of a constituent originally present in the test sample.

Standard curve. A curve that plots concentrations of known analyte standard versus the instrument response to the analyte.

Standard deviation. The square root of the average of the squares of the deviations of single observations from their arithmetic mean.

Standard method. A test method or procedure developed by a standards-writing organization, based on consensus opinion or other criteria, and often evaluated for its reliability by a collaborative testing procedure.

Statistical control. Errors are within acceptable levels based on values calculated from a sample of observations.

Surrogate. Organic compounds that are similar to analytes of interest in chemical composition, extraction, and chromatography that are not normally found in environmental samples. These compounds are spiked into all blanks, standards, samples, and spiked samples before analysis. Percent recoveries are calculated for each surrogate and are an indication of the percent recovery of the analytes in the sample.

Systematic error. The condition in which there is a consistent deviation of the results from the actual or true values by a measurement process. The cause for the deviation or bias may be known or unknown but is considered assignable.

TDS. Total dissolved solids.

TLV. Threshold limit values. Airborne concentrations of substances that represent conditions under which nearly all workers may be repeatedly exposed without adverse effect.

Tot alk. Total alkalinity.

Traceability. A hierarchical system used largely for regulatory purposes wherein transfer of

accuracy among various components of a measurement system is established or inferred. For example, a working standard should be traceable to a secondary standard, Class II secondary standards to Class I secondary standards, and secondary standards to primary standards. A documented chain of comparisons connecting a working standard to a national standard such as those maintained by NIST.

Tritium. A radioisotope of hydrogen with a half-life of 12.3 years.

TSS. Total suspended solids.

Uncertainty. The range of values within which the true value is estimated to lie. It is a best estimate of possible inaccuracy due to both random and systematic error.

Uranium, natural. Uranium having an isotopic abundance the same as that normally found in the earth's crust. The $^{235}U/^{238}U$ ratio is 0.00725 (0.72 wt % ^{235}U).

Uranium, depleted. Uranium having isotopic abundance that is altered from that normally found in the earth's crust. The $^{235}U/^{238}U$ ratio is less than 0.00725. Depleted uranium is almost exclusively anthropogenic, occurring only very rarely in nature (Oklo Mine, Africa).

Uranium, enriched. Uranium having isotopic abundance that is altered from that normally found in the earth's crust, with ^{235}U in excess of 0.72 wt %. The $^{235}U/^{238}U$ ratio is greater than 0.00725. Enriched uranium is exclusively anthropogenic in origin.

Uranium, total. The amount of uranium in a sample, calculated by summing the contributions from all the isotopes. Total uranium in a sample may be derived from enriched, depleted, or natural isotopic abundance uranium, or any combination of the three.

USGS. United States Geological Survey.

USTR. United States Transuranium Registry.

Variance. The sum of the squares of the difference between the individual values of a set and the arithmetic mean of the set, divided by one less than the number of values. The square of the standard deviation.

VAX. Virtual Address Extension. VAX is a high-performance, multiprocessing computer system based on a 32-bit architecture. VAX is made by Digital Equipment Corporation.

VAX/VMS. The abbreviation for Virtual Address Extension/Virtual Memory System. The operating system for VAX computer systems.

Working standard. A secondary or in-house standard that has been calibrated against a primary reference standard.

APPENDIX B

SUMMARY OF ANALYSES COMPLETED

TABLE B-I

INORGANIC ANALYSES COMPLETED BY EM-9 IN 1992

ANALYSIS	SILICATE	SLUDGE	WATER	BIOLOGICAL	FILTER	BULK	TUBE	BIOASSAY	TISSUE	TOTAL
Ag	1129	85	863	-	34	6	-	-	-	2117
Al	869	-	356	-	11	13	-	-	-	1249
As	1044	82	624	28	35	2	-	-	-	1815
Au	357	-	3	-	11	-	-	-	-	371
B	104	-	185	28	-	-	-	-	-	317
Ba	968	75	528	-	54	1	-	-	-	1626
Be	475	-	510	28	1474	-	-	-	-	2487
Bi	12	-	3	-	16	-	-	-	-	31
Bio O2 Demand	-	-	10	-	-	-	-	-	-	10
Br	345	-	-	-	-	-	-	-	-	345
Ca	680	-	365	-	4	-	-	-	-	1049
Cd	546	78	672	28	108	4	-	-	-	1436
Ce	357	-	3	-	11	-	-	-	-	371
Cl	345	-	238	-	-	-	-	-	-	583
Cl2 (Free)	-	-	12	-	-	-	-	-	-	12
ClO4	-	-	2	-	-	-	-	-	-	2
Cyanide	25	2	276	-	-	1	-	-	-	304
Co	450	-	335	-	11	2	-	-	-	798
CO	-	-	-	-	-	6	-	-	-	6
CO2	-	-	-	-	-	6	-	-	-	6
Chem O2 Demand	-	3	426	-	-	-	-	-	-	429
Conductivity	-	-	221	-	-	-	-	-	-	221
Corrosivity	-	-	-	-	-	1	-	-	-	1
Cr	899	81	831	28	120	15	-	-	-	1974
Cr(+6)	-	-	-	-	5	-	-	-	-	5
Cs	357	-	3	-	11	-	-	-	-	371
Cu	768	-	844	-	32	13	-	-	-	1657
Dy	357	-	3	-	11	-	-	-	-	371
Er	12	-	3	-	11	-	-	-	-	26
Eu	357	-	3	-	11	-	-	-	-	371
F	-	-	257	-	-	-	-	-	-	257
Fe	803	3	823	-	8	2	-	-	-	1639
Flashpoint	-	-	5	-	-	11	-	-	-	16
Ga	357	-	3	-	11	-	-	-	-	371
Gd	12	-	3	-	11	-	-	-	-	26
Ge	12	-	3	-	11	-	-	-	-	26
H2O- (Unbound)	30	-	-	-	-	-	-	-	-	30
Hardness	-	-	137	-	-	-	-	-	-	137
Hf	357	-	3	-	11	-	-	-	-	371
Hg	939	96	859	33	13	-	5	-	-	1945
Ho	12	-	3	-	11	-	-	-	-	26
I	345	-	-	-	-	-	-	-	-	345
In	357	-	3	-	11	-	-	-	-	371
Ir	12	-	3	-	11	-	-	-	-	26
K	680	-	359	-	-	-	-	-	-	1039
La	357	-	3	-	11	-	-	-	-	371
Li	276	-	138	-	11	-	-	-	-	425

TABLE B-I (cont)

ANALYSIS	SILICATE	SLUDGE	WATER	BIOLOGICAL	FILTER	BULK	TUBE	BIOASSAY	TISSUE	TOTAL
Lu	357	-	3	-	11	-	-	-	-	371
Mg	702	-	402	-	13	-	-	-	-	1117
Mn	731	-	323	-	11	2	-	-	-	1067
Mo	624	-	264	-	11	-	-	-	-	899
Na	680	-	368	-	-	-	-	-	-	1048
Nb	12	-	3	-	11	-	-	-	-	26
Nd	357	-	3	-	11	-	-	-	-	371
Ammonia-N	12	-	565	-	-	-	-	-	-	577
Ni	489	14	628	-	117	2	-	-	-	1250
N2O	-	-	-	-	-	6	-	-	-	6
NO2	-	-	-	-	-	6	-	-	-	6
Nitrite-N	-	-	158	-	-	-	-	-	-	158
Nitrate-N	61	-	430	-	-	-	-	-	-	491
Normality	-	-	20	-	-	-	-	-	-	20
O2	-	-	-	-	-	-	-	-	-	6
Oil/Grease	-	-	30	-	-	-	-	-	-	30
P	-	-	422	-	7	-	-	-	-	429
P Alkalinity	-	-	173	-	-	-	-	-	-	173
Pb	636	77	765	28	982	7	-	-	-	2495
Pd	12	-	3	-	11	-	-	-	-	26
pH	-	2	1388	-	-	-	-	-	-	1390
Phosphate-P	24	-	135	-	-	-	-	-	-	159
Pr	12	-	3	-	11	-	-	-	-	26
Pt	12	-	3	-	11	-	-	-	-	26
Rb	357	-	3	-	11	-	-	-	-	371
Rh	12	-	3	-	11	-	-	-	-	26
Ru	12	-	3	-	11	-	-	-	-	26
Sb	749	-	293	-	11	2	-	-	-	1055
Sc	345	-	-	-	-	-	-	-	-	345
Se	1040	82	544	28	30	1	-	-	-	1725
SiO2	-	-	234	-	-	-	-	-	-	234
SO2	-	-	-	-	6	-	-	-	-	6
Sm	357	-	3	-	11	-	-	-	-	371
Sn	19	-	40	-	18	-	-	-	-	77
SO4	12	-	249	-	-	-	-	-	-	261
Solids	-	14	-	-	-	-	-	-	-	14
Sp Gravity	-	2	-	-	-	-	-	-	-	2
Sr	637	-	239	-	16	-	-	-	-	892
Ta	357	-	3	-	20	-	-	-	-	380
Tot Alkalinity	-	-	277	-	-	-	-	-	-	277
Tb	357	-	3	-	11	-	-	-	-	371
Total Cations	-	-	26	-	-	-	-	-	-	26
Total Dis Solids	-	-	262	-	-	-	-	-	-	262
Te	12	-	3	-	16	1	-	-	-	32
Th	357	-	3	-	11	-	-	-	-	371
Ti	357	-	9	-	11	-	-	-	-	377
Tot Kjeldahl N	-	-	81	-	-	-	-	-	-	81
Tl	404	12	383	-	65	-	-	27	-	891
Tm	12	-	3	-	11	-	-	-	-	26
Tot Sus Solids	-	-	456	-	-	-	-	-	-	456

TABLE B-I (cont)

ANALYSIS	SILICATE	SLUDGE	WATER	BIOLOGICAL	FILTER	BULK	TUBE	BIOASSAY	TISSUE	TOTAL
V	731	-	479	-	16	2	-	-	-	1228
W	357	-	3	-	11	-	-	-	-	371
Y	12	-	3	-	19	-	-	-	-	34
Yb	357	-	3	-	11	-	-	-	-	371
Zn	732	-	550	-	39	2	-	-	-	1323
Zr	357	-	3	-	11	-	-	-	-	371

TOTAL INORGANIC ANALYSES 52,602

1,590 of the 52,602 analytes were from the following categories:

Mass Scan	26 samples x 60 analytes/sample =	1,560
Breathing Air	6 samples x 5 analytes/sample =	30

ANALYSIS	SILICATE	SLUDGE	WATER	BIOLOGICAL	FILTER	BULK	TUBE	BIOASSAY	TISSUE	TOTAL
Mass Scan	12	-	3	-	11	-	-	-	-	26
Breathing Air	-	-	-	-	-	6	-	-	-	6

TABLE B-II

RADIOCHEMICAL ANALYSES COMPLETED BY EM-9 IN 1992

ANALYSIS	SILICATE	SLUDGE	WATER	BIOLOGICAL	FILTER	BULK	TUBE	BIOASSAY	TISSUE	TOTAL
Alpha	270	17	2371	-	691	17	-	-	-	3366
Alpha, Rad Van	887	-	-	-	-	-	-	-	-	887
Am-241	68	16	485	14	68	-	-	71	-	722
Am-243 Tracer	-	-	58	10	6	-	-	45	-	119
As-73	-	-	-	549	584	-	-	-	-	1133
As-74	-	-	-	548	584	-	-	-	-	1132
Ba-133	-	-	9	-	-	-	-	-	-	9
Be-7	-	-	12	562	587	-	-	-	-	1161
Beta	270	4	2102	-	691	16	-	-	-	3083
Beta, Rad Van	887	-	-	-	-	-	-	-	-	887
Cd-109	-	-	2	548	582	-	-	-	-	1132
Ce-139	-	-	2	-	-	-	-	-	-	2
Ce-144	-	-	6	-	6	-	-	-	-	12
Co-56	-	-	11	-	-	-	-	-	-	11
Co-57	7	-	56	563	588	-	-	-	-	1214
Co-58	-	-	14	-	-	-	-	-	-	14
Co-60	12	1	86	548	589	-	-	-	-	1236
Cr-51	-	-	3	-	-	-	-	-	-	3
Cs-134	-	-	21	548	588	-	-	14	-	1171
Cs-137	256	2	353	687	602	-	-	14	-	1914
Gamma	259	4	1641	5	2	18	-	-	-	1929
Gamma, Rad Van	887	-	-	-	-	-	-	-	-	887
Gamma Scan	744	-	32	-	-	-	-	-	-	776
H-3	1096	-	1365	29	-	155	37	2499	-	5181
H-3 Screen	-	-	-	-	-	-	-	21	-	21
Hg-203	-	-	2	-	-	-	-	-	-	2
I-131	-	-	-	590	604	-	-	-	-	1194
K-40	7	-	-	-	-	-	-	-	-	7
Mn-52	-	-	1	-	-	-	-	-	-	1
Mn-54	-	1	75	563	590	-	-	-	-	1229
Na-22	-	-	16	563	582	-	-	-	-	1161
Nb-95	-	-	6	-	-	-	-	-	-	6
Pu-238	355	26	302	133	138	-	-	2240	-	3194
Pu-239	357	26	291	135	138	-	-	2240	-	3187
Pu-242 Tracer	49	-	33	39	-	-	-	1412	-	1533
Ra-226	-	-	31	-	-	-	-	-	-	31
Rb-83	7	-	4	562	585	-	-	-	-	1158
Rb-86	-	-	-	548	582	-	-	-	-	1130
Rn-222	-	-	11	-	-	-	-	-	-	11
Ru-103	-	-	-	548	582	-	-	-	-	1130
Ru-106	-	-	9	-	-	-	-	-	-	9
Sc-46	-	-	1	-	-	-	-	-	-	1
Se-72	-	-	-	548	582	-	-	-	-	1130
Se-75	7	-	9	548	584	-	-	-	-	1148
Sn-113	-	-	2	-	-	-	-	-	-	2
Sr-85	-	2	41	-	-	-	-	-	-	43
Sr-89	-	-	60	-	-	-	-	-	-	60

TABLE B-II (cont)

ANALYSIS	SILICATE	SLUDGE	WATER	BIOLOGICAL	FILTER	BULK	TUBE	BIOASSAY	TISSUE	TOTAL
Sr-90	181	4	177	105	14	-	-	-	-	481
Th-228	-	-	7	-	-	-	-	-	-	7
Th-230	-	-	8	-	-	-	-	-	-	8
U	2103	-	610	134	244	12	-	-	-	3103
U-232 Tracer	-	-	7	-	-	-	-	1439	-	1446
U-234	14	22	80	-	-	-	-	1431	-	1547
U-235	14	21	79	-	-	-	-	1431	-	1545
U-235/238	298	-	175	-	13	7	-	-	-	493
U-238	14	-	8	-	-	-	-	1431	-	1453
V-48	-	-	1	-	-	-	-	-	-	1
Y-88	-	-	15	-	-	-	-	-	-	15
Zn-65	-	-	16	548	583	-	-	-	-	1147

TOTAL RADIOCHEMICAL ANALYSES 56,615

TABLE B-III

ORGANIC ANALYSES COMPLETED BY EM-9 IN 1992

ANALYSIS	SIL	SLU	WAT	BIOL	FIL	BULK	TUBE	BIOA	TIS	TOT
Acenaphthene	691	57	360	-	-	9	-	-	-	1117
Acenaphthylene	631	47	331	-	-	9	-	-	-	1018
Acetone	412	63	367	-	-	11	17	-	-	870
Acetylene	-	-	-	-	-	6	-	-	-	6
Acrolein	-	-	-	-	-	-	4	-	-	4
Acrylonitrile	-	-	-	-	-	-	2	-	-	2
Aliphatic Hydrocarbons	-	-	-	-	9	3	100	-	-	112
Amines	-	-	-	-	-	1	-	-	-	1
Aniline	631	47	331	-	-	9	-	-	-	1018
Anthracene	631	47	331	-	-	9	-	-	-	1018
Mixed-Aroclor	302	52	40	-	318	875	4	-	-	1591
Aroclor 1242	302	52	40	-	318	788	4	-	-	1504
Aroclor 1248	-	-	2	-	-	-	-	-	-	2
Aroclor 1254	302	52	40	-	318	788	4	-	-	1504
Aroclor 1260	302	52	40	-	318	788	4	-	-	1504
Aromatic hydrocarbons	-	-	-	-	-	1	2	-	-	3
Azobenzene	631	47	331	-	-	9	-	-	-	1018
Benzaldehyde	1	-	-	-	-	1	-	-	-	2
Benzene	460	72	433	-	-	19	1575	-	-	2559
Benzenes, substituted	3	-	-	-	-	4	-	-	-	7
m-Benzidine	631	47	331	-	-	9	-	-	-	1018
Benzo[a]anthracene	631	47	331	-	-	9	-	-	-	1018
Benzo[a]pyrene	631	47	331	-	-	9	-	-	-	1018
Benzo[b]fluoranthene	631	47	331	-	-	9	-	-	-	1018
Benzo[g,h,i]perylene	631	47	331	-	-	9	-	-	-	1018
Benzo[k]fluoranthene	631	47	331	-	-	9	-	-	-	1018
Benzoic acid	631	47	331	-	-	9	-	-	-	1018
Benzoquinone, 2,5-Di-t-butyl	-	-	-	-	6	-	2	-	-	8
Benzyl alcohol	631	47	331	-	-	9	-	-	-	1018
Biphenyl, 2,2'-diethyl-1,1'-	-	-	-	-	-	-	1	-	-	1
Bis(2-chloroethoxy)methane	631	47	331	-	-	9	-	-	-	1018
Bis(2-chloroethyl)ether	631	47	336	-	-	9	-	-	-	1023
Bis(2-chloroisopropyl)ether	631	47	331	-	-	9	-	-	-	1018
Bis(2-ethylhexyl)phthalate	631	47	331	-	-	9	-	-	-	1018
Bis(pentafluorophenyl)phenylphosphine	-	-	1	-	-	-	-	-	-	1
Bisphenol A	3	-	-	-	-	-	-	-	-	3
Bromobenzene	412	63	367	-	-	10	1552	-	-	2404
Bromochloromethane	412	63	367	-	-	10	-	-	-	852
Bromodichloromethane	412	63	367	-	-	10	-	-	-	852
Bromoform	412	63	367	-	-	10	-	-	-	852
Bromomethane	412	63	367	-	-	10	-	-	-	852
4-Bromophenylphenyl ether	631	47	331	-	-	9	-	-	-	1018
Butanal	-	-	1	-	-	-	-	-	-	1
2-Butanone	412	63	367	-	-	10	-	-	-	852
Butoxy-2-ethanol	-	-	-	-	-	-	3	-	-	3
Butyl benzyl phthalate	631	47	331	-	-	9	-	-	-	1018
n-Butylbenzene	412	63	367	-	-	10	-	-	-	852

TABLE B-III (cont)

ANALYSIS	SIL	SLU	WAT	BIOL	FIL	BULK	TUBE	BIOA	TIS	TOT
sec-Butylbenzene	412	63	367	-	-	10	-	-	-	852
tert-Butylbenzene	412	63	367	-	-	10	-	-	-	852
Caprolactam	-	-	-	-	-	-	21	-	-	21
Carbon disulfide	412	63	367	-	-	10	-	-	-	852
Carbon tetrachloride	412	63	367	-	-	10	1572	-	-	2424
Carbonodithioic acid, O,S-Dimethyl ester	-	-	-	-	-	-	1	-	-	1
Cedrol	6	-	-	-	-	-	-	-	-	6
Chlorinated compounds	-	-	-	-	-	-	14	-	-	14
4-Chloro-3-methylphenol	691	57	360	-	-	9	-	-	-	1117
4-Chloroaniline	631	47	331	-	-	9	-	-	-	1018
Chlorobenzene	460	72	433	-	-	14	1552	-	-	2531
Chlorodibromomethane	412	63	367	-	-	10	-	-	-	852
Chloroethane	412	63	367	-	-	10	-	-	-	852
Chloroform	412	63	367	-	-	10	1567	-	-	2419
Chloromethane	412	63	367	-	-	10	-	-	-	852
2-Chloronaphthalene	631	47	331	-	-	9	-	-	-	1018
o-Chlorophenol	691	57	360	-	-	9	-	-	-	1117
4-Chlorophenylphenyl ether	631	47	331	-	-	9	-	-	-	1018
o-Chlorotoluene	412	63	367	-	-	10	-	-	-	852
p-Chlorotoluene	412	63	367	-	-	10	-	-	-	852
Chrysene	631	47	331	-	-	9	-	-	-	1018
Cyclic Hydrocarbons	6	-	-	-	-	2	-	-	-	8
Cyclohexanol	-	-	1	-	-	1	-	-	-	2
Cyclohexylamine	-	-	2	-	-	-	-	-	-	2
2,4-D (sec-butyl ester)	-	-	-	-	-	-	3	-	-	3
Di(2-ethylhexyl) sebacate (DEHS) (DOS)	-	-	-	-	-	2	-	-	-	2
Di-n-butyl phthalate	631	47	331	-	-	9	-	-	-	1018
Di-n-octyl phthalate	631	47	331	-	-	10	-	-	-	1019
Dibenzo[a,h]anthracene	631	47	331	-	-	9	-	-	-	1018
Dibenzofuran	631	47	331	-	-	9	-	-	-	1018
1,2-Dibromo-3-chloropropane	412	63	369	-	-	10	-	-	-	854
Dibromomethane	412	63	367	-	-	10	-	-	-	852
o-Dichlorobenzene (1,2)	1043	110	698	-	-	19	-	-	-	1870
m-Dichlorobenzene (1,3)	1043	110	698	-	-	19	-	-	-	1870
p-Dichlorobenzene (1,4)	1103	120	727	-	-	19	-	-	-	1969
3,3'-Dichlorobenzidine	631	47	331	-	-	9	-	-	-	1018
Dichlorodifluoromethane	412	63	367	-	-	10	-	-	-	852
1,2-Dichloroethane	412	63	367	-	-	10	25	-	-	877
1,1-Dichloroethane	460	72	433	-	-	15	6	-	-	986
trans-1,2-Dichloroethene	412	63	367	-	-	10	-	-	-	852
1,1-Dichloroethene	412	63	367	-	-	10	5	-	-	857
cis-1,2-Dichloroethylene	412	63	367	-	-	10	-	-	-	852
2,4-Dichlorophenol	631	47	331	-	-	9	-	-	-	1018
1,3-Dichloropropane	412	63	367	-	-	10	-	-	-	852
2,2-Dichloropropane	412	63	367	-	-	10	-	-	-	852
1,2-Dichloropropane	412	63	367	-	-	10	-	-	-	852
trans-1,3-Dichloropropene	412	63	367	-	-	10	-	-	-	852
1,1-Dichloropropene	412	63	367	-	-	10	-	-	-	852
cis-1,3-Dichloropropene	412	63	367	-	-	10	-	-	-	852
1,2-Diethoxyethane	-	-	1	-	-	-	-	-	-	1

TABLE B-III (cont)

ANALYSIS	SIL	SLU	WAT	BIOL	FIL	BULK	TUBE	BIOA	TIS	TOT
Diethyl phthalate	631	47	331	-	-	9	-	-	-	1018
N,N-Diethyl-2-aminoethanol	-	-	2	-	-	-	-	-	-	2
Diethylene glycol	1	-	-	-	-	-	-	-	-	1
Dimethoxymethane	-	-	-	-	-	1	-	-	-	1
Dimethyl disulfide	-	-	-	-	-	-	1	-	-	1
Dimethyl phthalate	631	47	331	-	-	9	-	-	-	1018
4,4-Dimethyl-1-pentene	1	-	-	-	-	-	-	-	-	1
n,n-Dimethylacetamide	-	-	-	-	-	-	1	-	-	1
Dimethylnaphthalenes	-	-	-	-	-	1	-	-	-	1
2,4-Dimethylphenol	631	47	331	-	-	9	-	-	-	1018
2,4-Dinitrophenol	631	47	331	-	-	9	-	-	-	1018
2,6-Dinitrotoluene	631	47	331	-	-	9	-	-	-	1018
2,4-Dinitrotoluene	691	57	360	-	-	9	-	-	-	1117
1,4-Dioxane	-	-	-	-	-	1	13	-	-	14
1,3-Dioxane-4,6-dione,2,2-Dimethyl-	-	-	-	-	-	1	-	-	-	1
1,3-Dioxolane, 2,2-Dimethyl	-	-	-	-	-	1	-	-	-	1
n-Dodecane	-	-	-	-	-	1	-	-	-	1
Epichlorohydrin	-	-	-	-	-	1	5	-	-	6
Epon resin	-	-	-	-	-	1	-	-	-	1
Esters	4	-	-	-	-	18	-	-	-	22
Ethanol	-	-	-	-	-	1	18	-	-	19
Ethanol, 1-Methoxy-, Acetate	-	-	-	-	-	1	-	-	-	1
Ethylbenzene	412	63	367	-	-	10	1552	-	-	2404
Ethylene dibromide	412	63	369	-	-	10	-	-	-	854
Fluoranthene	631	47	331	-	-	9	-	-	-	1018
Fluorene	631	47	331	-	-	9	-	-	-	1018
Formaldehyde	-	-	-	-	-	-	23	-	-	23
Halogenated hydrocarbons	-	1	-	-	-	6	1	-	-	8
Hexachlorobenzene	631	47	331	-	-	9	-	-	-	1018
Hexachlorobutadiene	634	47	331	-	-	9	-	-	-	1021
Hexachlorocyclopentadiene	631	47	331	-	-	9	-	-	-	1018
Hexachloroethane	631	47	331	-	-	10	-	-	-	1019
Hexane	-	-	-	-	-	-	4	-	-	4
2-Hexanone	412	63	367	-	-	10	-	-	-	852
3-Hexen-2-one, 5-methyl	-	-	-	-	-	2	-	-	-	2
Hydrocarbon, Terpene	-	-	-	-	-	-	9	-	-	9
Indene	-	-	-	-	-	1	-	-	-	1
Indeno[1,2,3-cd]pyrene	631	47	331	-	-	9	-	-	-	1018
Isophorone	631	47	331	-	-	9	-	-	-	1018
Isopropylbenzene	412	63	367	-	-	10	-	-	-	852
4-Isopropyltoluene	412	63	367	-	-	10	-	-	-	852
a-Limonene	-	1	-	-	-	1	-	-	-	2
Methanamine, N-Methoxy-	-	-	-	-	-	1	-	-	-	1
Methane	-	-	-	-	-	6	-	-	-	6
Methoxyethane	-	-	-	-	-	-	1	-	-	1
1-ethoxy-1Methoxyethane	-	-	1	-	-	-	-	-	-	1
Methyl ether	-	-	1	-	-	-	-	-	-	1
Methyl iodide	412	63	367	-	-	10	-	-	-	852
Methyl methacrylate	-	-	-	-	-	-	1	-	-	1
2-Methyl-1-propene	-	-	-	-	-	2	-	-	-	2

TABLE B-III (cont)

ANALYSIS	SIL	SLU	WAT	BIOL	FIL	BULK	TUBE	BIOA	TIS	TOT
4-Methyl-2-pentanone	412	63	367	-	-	10	-	-	-	852
2-Methyl-2-propanol	-	-	-	-	-	1	-	-	-	1
2-Methyl-4,6-dinitrophenol	631	47	331	-	-	9	-	-	-	1018
Methylene chloride	412	63	367	-	-	10	42	-	-	894
2-Methylnaphthalene	631	47	331	-	-	10	-	-	-	1019
1-Methylnaphthalene	-	-	-	-	-	1	-	-	-	1
4-Methylphenol	631	47	331	-	-	9	-	-	-	1018
2-Methylphenol	631	47	331	-	-	9	-	-	-	1018
2-Methylpropanal	-	-	1	-	-	-	-	-	-	1
2-Methylsuccinic anhydride	-	-	-	-	-	1	-	-	-	1
Mineral oil	-	-	-	-	2	-	-	-	-	2
Mineral spirits	-	-	-	-	-	-	4	-	-	4
Morpholine	-	-	2	-	-	-	-	-	-	2
Naphthalene	636	47	332	-	-	10	1	-	-	1026
4-Nitroaniline	631	47	331	-	-	9	-	-	-	1018
2-Nitroaniline	631	47	331	-	-	9	-	-	-	1018
3-Nitroaniline	631	47	331	-	-	9	-	-	-	1018
Nitrobenzene	631	47	331	-	-	9	-	-	-	1018
Nitrogenous Hydrocarbon	3	-	-	-	-	3	-	-	-	6
4-Nitrophenol	691	57	360	-	-	9	-	-	-	1117
2-Nitrophenol	631	47	331	-	-	9	-	-	-	1018
N-Nitrosodi-n-propylamine	691	57	360	-	-	9	-	-	-	1117
N-Nitrosodimethylamine	631	47	331	-	-	9	-	-	-	1018
N-Nitrosodiphenylamine	631	47	331	-	-	9	-	-	-	1018
Octadecylamine	-	-	2	-	-	-	-	-	-	2
Oxidized Aliphatic Hydrocarbons	-	-	-	-	-	2	-	-	-	2
Oxygenated Hydrocarbon	5	-	-	-	-	5	-	-	-	10
Pentachlorophenol	691	57	360	-	-	9	-	-	-	1117
3-Pentene-2-one	-	-	-	-	-	1	-	-	-	1
Petroleum Hydrocarbons, Total Recoverable	49	-	-	-	-	-	-	-	-	49
Phenanthrene	631	47	331	-	-	9	-	-	-	1018
Phenol	691	57	360	-	-	10	-	-	-	1118
Phenol, 2,3',5',6-tetra-t-butyl-4,4'-methylenedi-	-	-	-	-	-	1	-	-	-	1
Phosphate Esters	-	-	-	-	6	-	2	-	-	8
Phthalate ester	-	-	-	-	6	2	3	-	-	11
Phthalic anhydride	1	-	-	-	-	1	-	-	-	2
alpha-Pinene	1	-	-	-	-	-	-	-	-	1
1,2-Propanediol	-	-	-	-	-	2	-	-	-	2
2-Propanol	-	-	2	-	-	-	2	-	-	4
Propylbenzene	412	63	367	-	-	10	-	-	-	852
Pyrene	691	57	360	-	-	9	-	-	-	1117
Saturated Hydrocarbons	53	3	2	-	-	34	-	-	-	92
Silicone oligomers	-	-	1	-	-	-	-	-	-	1
Styrene	412	63	367	-	-	10	-	-	-	852
Sulfur dioxide	-	-	-	-	-	6	-	-	-	6
Terpene Hydrocarbons	9	-	-	-	-	1	20	-	-	30
1,1,1,2-Tetrachloroethane	412	63	367	-	-	10	-	-	-	852
1,1,2,2-Tetrachloroethane	412	63	367	-	-	10	-	-	-	852
Tetrachloroethylene	412	63	367	-	-	10	1567	-	-	2419
Tetrahydrofuran	1	-	-	-	-	-	-	-	-	1

TABLE B-III (cont)

ANALYSIS	SIL	SLU	WAT	BIOL	FIL	BULK	TUBE	BIOA	TIS	TOT
Thiophene	-	-	-	-	-	-	2	-	-	2
Toluene	460	72	433	-	-	15	1610	-	-	2590
Tribromoethene	-	-	2	-	-	-	-	-	-	2
1,1,2-Trichloro-1,2,2-trifluoroethane	412	63	368	-	-	10	17	-	-	870
1,2,4-Trichlorobenzene	694	57	361	-	-	9	-	-	-	1121
1,1,2-Trichloroethane	412	63	367	-	-	10	-	-	-	852
1,1,1-Trichloroethane	412	63	367	-	-	12	1622	-	-	2476
Trichloroethene	460	72	433	-	-	14	1583	-	-	2562
Trichlorofluoromethane	412	63	367	-	-	16	2	-	-	860
2,4,6-Trichlorophenol	631	47	331	-	-	9	-	-	-	1018
2,4,5-Trichlorophenol	631	47	331	-	-	9	-	-	-	1018
1,2,3-Trichloropropane	412	63	367	-	-	10	-	-	-	852
1,2,4-Trimethylbenzene	412	63	367	-	-	10	1562	-	-	2414
1,3,5-Trimethylbenzene	412	63	367	-	-	10	-	-	-	852
Trimethylbenzenes	-	-	-	-	-	1	40	-	-	41
Trisulfide, Dimethyl	-	-	-	-	-	-	1	-	-	1
Tritetracontane	1	-	-	-	-	-	-	-	-	1
Triton x-100(nonionic surfactant)	-	-	4	-	-	-	-	-	-	4
Unknown Alcohol	17	-	2	-	-	5	-	-	-	24
Unknown Aldehydes	-	-	-	-	-	1	-	-	-	1
Unknown Ethers	-	-	-	-	-	2	-	-	-	2
Unknown Ketone	2	-	-	-	-	-	-	-	-	2
Unknown Phenolics	-	-	-	-	6	1	23	-	-	30
Unknown Polynuclear Aromatic Hydrocarbon	7	-	-	-	-	3	-	-	-	10
Unknown Sulfur compounds	-	-	-	-	-	-	1	-	-	1
Unknown alkanes	-	-	-	-	-	2	-	-	-	2
Unknown ester	-	-	-	-	-	5	4	-	-	9
Unknown organic compound	84	-	2	-	-	10	47	-	-	143
Unsaturated Hydrocarbons	17	-	-	-	-	2	-	-	-	19
Vinyl acetate	412	63	367	-	-	10	-	-	-	852
Vinyl chloride	412	63	367	-	-	10	-	-	-	852
p-Xylene	-	-	-	-	-	-	14	-	-	14
m-Xylene	-	-	-	-	-	-	12	-	-	12
o-Xylene	-	-	-	-	-	-	397	-	-	397
Mixed-Xylenes (o + m + p)	412	63	367	-	-	11	1588	-	-	2441
TOTAL ORGANIC ANALYSES										151,259

TABLE B-III (cont)

133,543 of the 151,259 analytes were from the following categories:

PCBs	1,539 samples x variable analytes/sample	=	4,448
Poregas	1,552 samples x 13 analytes/sample	=	20,176
Semivolatiles	921 samples x 69 analytes/sample	=	63,549
Volatiles	698 samples x 65 analytes/sample	=	45,370

ANALYSIS	SIL	SLU	WAT	BIOL	FIL	BULK	TUBE	BIOA	TIS	TOT
PCBs	302	52	20	-	318	872	4	-	-	1568
Poregas	-	-	-	-	-	-	1552	-	-	1552
Semivolatiles	582	56	274	-	-	9	-	-	-	921
Volatiles	324	71	289	-	-	14	-	-	-	698

GRAND TOTAL EM-9 INORGANIC, RADIOCHEMICAL, AND ORGANIC ANALYSES IN 1992 260,476

APPENDIX C

QC SAMPLE CONTROL STATUS AND FALSE POSITIVE/FALSE NEGATIVE SUMMARY

TABLE C-I

CONTROL STATUS OF QC SAMPLES ANALYZED BY EM-9: STABLE ELEMENT ANALYSES

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NUMBER SAMPLES	% QC SAMPLES	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
C	Ag	-	-	-	-	85	0	-	-	-	-	-
F	Ag	-	2	2	4	30	11.8	4	100	-	-	.89 ± .07
M	Ag	-	-	-	-	6	0	-	-	-	-	-
S	Ag	-	-	25	25	1104	2.2	20	100	-	-	1.06
W	Ag	-	143	227	370	493	42.9	444	94	-	6	.99 ± .18
F	Al	-	-	-	-	11	0	-	-	-	-	-
M	Al	-	1	1	2	11	15.4	2	100	-	-	1.00
S	Al	-	-	76	76	793	8.7	76	78	12	11	.84 ± .20
W	Al	-	83	127	210	146	59.0	271	94	2	4	.98 ± .08
B	As	-	-	-	-	28	0	-	-	-	-	-
C	As	-	-	-	-	82	0	-	-	-	-	-
F	As	-	1	2	3	32	8.6	3	100	-	-	.82 ± .02
M	As	-	-	-	-	2	0	-	-	-	-	-
S	As	-	-	31	31	1013	3.0	26	88	8	4	1.05 ± .33
W	As	-	130	184	314	310	50.3	388	96	2	2	1.01 ± .24
F	Au	-	-	-	-	11	0	-	-	-	-	-
S	Au	-	-	22	22	335	6.2	17	94	-	6	6.32 ± 9.19
W	Au	-	-	3	3	-	100.0	3	100	-	-	-
B	B	-	-	-	-	28	0	-	-	-	-	-
S	B	-	-	15	15	89	14.4	15	93	7	-	1.33 ± .34
W	B	-	33	39	72	113	38.9	72	100	-	-	1.03 ± .06
C	Ba	-	-	-	-	75	0	-	-	-	-	-
F	Ba	-	4	4	8	46	14.8	8	100	-	-	.98 ± .05
M	Ba	-	-	-	-	1	0	-	-	-	-	-
S	Ba	-	-	71	71	897	7.3	69	93	4	3	.89 ± .12
W	Ba	-	117	209	326	202	61.7	402	95	2	3	1.01 ± .09
B	Be	-	-	-	-	28	0	-	-	-	-	-
F	Be	-	228	105	333	1141	22.6	321	96	2	2	1.08 ± .59
S	Be	-	-	47	47	428	9.9	47	100	-	-	1.10 ± .26
W	Be	-	91	242	333	177	65.3	409	99	-	1	1.02 ± .25
F	Bi	-	1	1	2	14	12.5	2	100	-	-	1.13
S	Bi	-	-	-	-	12	0	-	-	-	-	-
W	Bi	-	-	3	3	-	100.0	3	100	-	-	-
W	Bio 02 Demand	-	8	2	10	-	100.0	10	100	-	-	1.15 ± .20
S	Br	-	-	22	22	323	6.4	17	100	-	-	.93 ± .15
F	Ca	-	1	1	2	2	50.0	2	100	-	-	.99
S	Ca	-	-	59	59	621	8.7	59	97	3	-	.92 ± .11
W	Ca	-	62	79	141	224	38.6	203	95	3	2	1.05 ± .47
M	Carbon dioxide	-	-	-	-	6	0	-	-	-	-	-
M	Carbon monoxide	-	-	-	-	6	0	-	-	-	-	-
B	Cd	-	-	-	-	28	0	-	-	-	-	-
C	Cd	-	-	-	-	78	0	-	-	-	-	-
F	Cd	-	41	8	49	59	45.4	46	98	2	-	1.00 ± .10

TABLE C-I (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NUMBER SAMPLES	% QC SAMPLES	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
M	Cd	-	-	-	-	4	0	-	-	-	-	-
S	Cd	-	-	45	45	501	8.2	45	96	4	-	1.64 ± .62
W	Cd	-	134	214	348	324	51.8	424	91	4	6	1.01 ± .25
F	Ce	-	-	-	-	11	0	-	-	-	-	-
S	Ce	-	-	22	22	335	6.2	17	82	6	12	.99 ± .08
W	Ce	-	-	3	3	-	100.0	3	100	-	-	-
S	Cl	-	-	22	22	323	6.4	17	88	-	12	1.30 ± .31
W	Cl	-	34	26	60	178	25.2	60	98	2	-	.97 ± .08
W	Cl2 (Free)	-	10	2	12	-	100.0	11	100	-	-	.91 ± .07
W	ClO4	-	-	-	-	2	0	-	-	-	-	-
C	CN	-	-	-	-	2	0	-	-	-	-	-
M	CN	-	-	-	-	1	0	-	-	-	-	-
S	CN	-	-	-	-	25	0	1	-	-	100	.30
W	CN	-	48	44	92	184	33.3	92	78	17	4	.80 ± .10
F	Co	-	-	-	-	11	0	-	-	-	-	-
M	Co	-	-	-	-	2	0	-	-	-	-	-
S	Co	-	-	46	46	404	10.2	46	96	2	2	1.14 ± 1.23
W	Co	-	71	124	195	140	58.2	257	97	2	-	1.02 ± .14
C	Chem O2 Demand	-	-	-	-	3	0	-	-	-	-	-
W	Chem O2 Demand	-	11	41	52	374	12.2	52	100	-	-	.94 ± .08
W	Conductivity	-	28	35	63	158	28.5	63	95	2	3	.97 ± .06
M	Corrosivity	-	-	-	-	1	0	-	-	-	-	-
B	Cr	-	-	-	-	28	0	-	-	-	-	-
C	Cr	-	-	-	-	81	0	-	-	-	-	-
F	Cr	-	25	9	34	86	28.3	33	85	12	3	1.19 ± .35
M	Cr	-	-	-	-	15	0	-	-	-	-	-
S	Cr	-	-	71	71	828	7.9	66	76	11	14	.92 ± .43
W	Cr	-	141	235	376	455	45.2	452	93	5	3	1.03 ± .31
F	Cr(+6)	-	1	1	2	3	40.0	2	100	-	-	.83
F	Cs	-	-	-	-	11	0	-	-	-	-	-
S	Cs	-	-	22	22	335	6.2	17	94	6	-	1.02 ± .10
W	Cs	-	-	3	3	-	100.0	3	100	-	-	-
F	Cu	-	4	4	8	24	25.0	8	50	25	25	1.32 ± .28
M	Cu	-	1	1	2	11	15.4	2	100	-	-	.95
S	Cu	-	-	58	58	710	7.6	53	81	8	11	.80 ± .16
W	Cu	-	94	181	275	569	32.6	332	95	4	2	1.05 ± .55
F	Dy	-	-	-	-	11	0	-	-	-	-	-
S	Dy	-	-	22	22	335	6.2	17	100	-	-	.93 ± .09
W	Dy	-	-	3	3	-	100.0	3	100	-	-	-
F	Er	-	-	-	-	11	0	-	-	-	-	-
S	Er	-	-	-	-	12	0	-	-	-	-	-
W	Er	-	-	3	3	-	100.0	3	100	-	-	-
F	Eu	-	-	-	-	11	0	-	-	-	-	-
S	Eu	-	-	22	22	335	6.2	17	76	24	-	.96 ± .11
W	Eu	-	-	3	3	-	100.0	3	100	-	-	-

TABLE C-I (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NUMBER SAMPLES	% QC SAMPLES	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
W	F	-	32	31	63	194	24.5	63	100	-	-	1.01 ± .09
C	Fe	-	-	-	-	3	0	-	-	-	-	-
F	Fe	-	2	2	4	4	50.0	4	25	-	75	.68
M	Fe	-	-	-	-	2	0	-	-	-	-	-
S	Fe	-	-	73	73	730	9.1	73	93	4	3	.90 ± .11
W	Fe	-	88	133	221	602	26.9	283	93	6	1	1.00 ± .20
M	Flashpoint	-	-	5	5	6	45.5	5	100	-	-	1.02 ± .02
W	Flashpoint	-	-	-	-	5	0	-	-	-	-	-
F	Ga	-	-	-	-	11	0	-	-	-	-	-
S	Ga	-	-	22	22	335	6.2	17	100	-	-	.92 ± .08
W	Ga	-	-	3	3	-	100.0	3	100	-	-	-
F	Gd	-	-	-	-	11	0	-	-	-	-	-
S	Gd	-	-	-	-	12	0	-	-	-	-	-
W	Gd	-	-	3	3	-	100.0	3	100	-	-	-
F	Ge	-	-	-	-	11	0	-	-	-	-	-
S	Ge	-	-	-	-	12	0	-	-	-	-	-
W	Ge	-	-	3	3	-	100.0	3	100	-	-	-
S	H2O- (unbound)	-	5	-	5	25	16.7	10	80	10	10	.84 ± .11
W	Hardness	-	25	1	26	111	19.0	26	88	8	4	1.12 ± .17
F	Hf	-	-	-	-	11	0	-	-	-	-	-
S	Hf	-	-	22	22	335	6.2	17	94	6	-	1.02 ± .09
W	Hf	-	-	3	3	-	100.0	3	100	-	-	-
B	Hg	-	-	-	-	33	0	-	-	-	-	-
C	Hg	-	-	-	-	96	0	-	-	-	-	-
F	Hg	-	1	1	2	11	15.4	2	50	50	-	1.28
S	Hg	-	1	33	34	905	3.6	30	93	7	-	1.03 ± .46
T	Hg	-	-	-	-	5	0	-	-	-	-	-
W	Hg	-	159	183	342	517	39.8	350	95	2	3	.99 ± .27
F	Ho	-	-	-	-	11	0	-	-	-	-	-
S	Ho	-	-	-	-	12	0	-	-	-	-	-
W	Ho	-	-	3	3	-	100.0	3	100	-	-	-
S	I	-	-	22	22	323	6.4	17	100	-	-	-
F	In	-	-	-	-	11	0	-	-	-	-	-
S	In	-	-	22	22	335	6.2	17	100	-	-	-
W	In	-	-	3	3	-	100.0	3	100	-	-	-
F	Ir	-	-	-	-	11	0	-	-	-	-	-
S	Ir	-	-	-	-	12	0	-	-	-	-	-
W	Ir	-	-	3	3	-	100.0	3	100	-	-	-
S	K	-	-	59	59	621	8.7	59	98	-	2	.97 ± .11
W	K	-	59	76	135	224	37.6	197	96	3	1	.98 ± .10
F	La	-	-	-	-	11	0	-	-	-	-	-
S	La	-	-	22	22	335	6.2	17	94	6	-	1.02 ± .07
W	La	-	-	3	3	-	100.0	3	100	-	-	-
F	Li	-	-	-	-	11	0	-	-	-	-	-
S	Li	-	-	23	23	253	8.3	22	100	-	-	1.04 ± .23

TABLE C-I (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NUMBER SAMPLES	% QC SAMPLES	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
W	Li	-	33	35	68	70	49.3	129	79	12	9	.94 ± .16
F	Lu	-	-	-	-	11	0	-	-	-	-	-
S	Lu	-	-	22	22	335	6.2	17	76	24	-	1.04 ± .18
W	Lu	-	-	3	3	-	100.0	3	100	-	-	-
F	Mg	-	1	1	2	11	15.4	2	100	-	-	1.02
S	Mg	-	-	62	62	640	8.8	62	92	3	5	.87 ± .16
W	Mg	-	64	112	176	226	43.8	238	95	1	4	.99 ± .11
F	Mn	-	-	-	-	11	0	-	-	-	-	-
M	Mn	-	-	-	-	2	0	-	-	-	-	-
S	Mn	-	-	63	63	668	8.6	61	98	2	-	.95 ± .13
W	Mn	-	66	125	191	132	59.1	248	98	2	-	1.01 ± .10
F	Mo	-	-	-	-	11	0	-	-	-	-	-
S	Mo	-	-	42	42	582	6.7	36	97	-	3	5.94 ± 8.13
W	Mo	-	53	87	140	124	53.0	202	99	1	-	1.05 ± .13
M	N2O	-	-	-	-	6	0	-	-	-	-	-
M	NO2	-	-	-	-	6	0	-	-	-	-	-
S	Na	-	-	59	59	621	8.7	59	85	7	8	.88 ± .21
W	Na	-	66	79	145	223	39.4	207	99	1	-	1.02 ± .06
F	Nb	-	-	-	-	11	0	-	-	-	-	-
S	Nb	-	-	-	-	12	0	-	-	-	-	-
W	Nb	-	-	3	3	-	100.0	3	100	-	-	-
F	Nd	-	-	-	-	11	0	-	-	-	-	-
S	Nd	-	-	22	22	335	6.2	17	71	12	18	.88 ± .17
W	Nd	-	-	3	3	-	100.0	3	100	-	-	-
S	Ammonia-N	-	-	-	-	12	0	-	-	-	-	-
W	Ammonia-N	-	18	26	44	521	7.8	39	100	-	-	.98 ± .06
C	Ni	-	-	-	-	14	0	-	-	-	-	-
F	Ni	-	11	11	22	95	18.8	22	95	5	-	1.01 ± .14
M	Ni	-	-	-	-	2	0	-	-	-	-	-
S	Ni	-	-	55	55	434	11.2	55	80	15	5	.91 ± 1.15
W	Ni	-	106	204	310	318	49.4	386	97	1	2	1.03 ± .32
W	Nitrite-N	-	9	-	9	149	5.7	9	89	-	11	1.07 ± .14
S	Nitrate-N	-	-	-	-	61	0	-	-	-	-	-
W	Nitrate-N	-	44	30	74	356	17.2	71	97	3	-	.99 ± .07
W	Normality	-	-	-	-	20	0	-	-	-	-	-
W	Oil/Grease	-	11	10	21	9	70.0	21	95	-	5	.94 ± .09
M	Oxygen	-	-	-	-	6	0	-	-	-	-	-
F	P	-	5	2	7	-	100.0	7	43	14	43	.28 ± .03
W	P	-	24	36	60	362	14.2	60	88	8	3	1.06 ± .38
W	P Alkalinity	-	-	-	-	173	0	-	-	-	-	-
B	Pb	-	-	-	-	28	0	-	-	-	-	-
C	Pb	-	-	-	-	77	0	-	-	-	-	-
F	Pb	-	112	78	190	792	19.3	190	95	1	4	1.11 ± .75
M	Pb	-	-	-	-	7	0	-	-	-	-	-
S	Pb	-	-	53	53	583	8.3	53	89	4	8	1.13 ± .85

TABLE C-I (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NUMBER SAMPLES	% QC SAMPLES	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
W	Pb	-	148	276	424	341	55.4	500	94	1	5	1.01 ± .16
F	Pd	-	-	-	-	11	0	-	-	-	-	-
S	Pd	-	-	-	-	12	0	-	-	-	-	-
W	Pd	-	-	3	3	-	100.0	3	100	-	-	-
C	pH	-	-	-	-	2	0	-	-	-	-	-
W	pH	-	30	269	299	1089	21.5	299	100	-	-	1.00 ± .01
S	Phosphate-P	-	-	-	-	24	0	-	-	-	-	-
W	Phosphate-P	-	30	13	43	92	31.9	38	100	-	-	.96 ± .07
F	Pr	-	-	-	-	11	0	-	-	-	-	-
S	Pr	-	-	-	-	12	0	-	-	-	-	-
W	Pr	-	-	3	3	-	100.0	3	100	-	-	-
F	Pt	-	-	-	-	11	0	-	-	-	-	-
S	Pt	-	-	-	-	12	0	-	-	-	-	-
W	Pt	-	-	3	3	-	100.0	3	100	-	-	-
F	Rb	-	-	-	-	11	0	-	-	-	-	-
S	Rb	-	-	22	22	335	6.2	17	100	-	-	.97 ± .10
W	Rb	-	-	3	3	-	100.0	3	100	-	-	-
F	Rh	-	-	-	-	11	0	-	-	-	-	-
S	Rh	-	-	-	-	12	0	-	-	-	-	-
W	Rh	-	-	3	3	-	100.0	3	100	-	-	-
F	Ru	-	-	-	-	11	0	-	-	-	-	-
S	Ru	-	-	-	-	12	0	-	-	-	-	-
W	Ru	-	-	3	3	-	100.0	3	100	-	-	-
F	Sb	-	-	-	-	11	0	-	-	-	-	-
M	Sb	-	-	-	-	2	0	-	-	-	-	-
S	Sb	-	-	64	64	685	8.5	59	92	3	5	15.48 ± 40.54
W	Sb	-	69	102	171	122	58.4	247	91	3	5	1.61 ± 9.19
S	Sc	-	-	22	22	323	6.4	17	88	-	12	.98 ± .08
B	Se	-	-	-	-	28	0	-	-	-	-	-
C	Se	-	-	-	-	82	0	-	-	-	-	-
F	Se	-	1	1	2	28	6.7	2	50	-	50	1.31
M	Se	-	-	-	-	1	0	-	-	-	-	-
S	Se	-	-	24	24	1016	2.3	19	100	-	-	1.07
W	Se	-	123	156	279	265	51.3	354	95	2	3	1.01 ± .49
W	SiO2	-	23	21	44	190	18.8	44	100	-	-	1.05 ± .06
F	Sm	-	-	-	-	11	0	-	-	-	-	-
S	Sm	-	-	22	22	335	6.2	17	100	-	-	1.02 ± .07
W	Sm	-	-	3	3	-	100.0	3	100	-	-	-
F	Sn	-	1	1	2	16	11.1	2	100	-	-	.99
S	Sn	-	-	2	2	17	10.5	2	100	-	-	.95
W	Sn	-	4	6	10	30	25.0	10	90	-	10	4.36 ± 8.19
S	SO4	-	-	-	-	12	0	-	-	-	-	-
W	SO4	-	43	30	73	176	29.3	73	97	3	-	.98 ± .10
C	Solids	-	-	-	-	14	0	-	-	-	-	-
C	Sp Gravity	-	-	-	-	2	0	-	-	-	-	-

TABLE C-I (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NUMBER SAMPLES	% QC SAMPLES	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
F	Sr	-	1	1	2	14	12.5	2	100	-	-	.89
S	Sr	-	-	47	47	590	7.4	45	89	9	2	.89 ± .20
W	Sr	-	48	64	112	127	46.9	174	98	2	1	1.02 ± .11
M	Sulfur dioxide	-	-	-	-	6	0	-	-	-	-	-
F	Ta	-	1	1	2	18	10.0	2	-	-	100	.02
S	Ta	-	-	22	22	335	6.2	17	100	-	-	.96 ± .09
W	Ta	-	-	3	3	-	100.0	3	100	-	-	-
W	Tot Alkalinity	-	29	35	64	213	23.1	64	98	2	-	1.10 ± .10
F	Tb	-	-	-	-	11	0	-	-	-	-	-
S	Tb	-	-	22	22	335	6.2	17	76	12	12	1.01 ± .20
W	Tb	-	-	3	3	-	100.0	3	100	-	-	-
W	Tot Cations	-	-	-	-	26	0	-	-	-	-	-
W	Tot Dis Solids	-	30	33	63	199	24.0	63	95	3	2	1.00 ± .14
F	Te	-	-	1	1	15	6.3	1	100	-	-	.70
M	Te	-	-	-	-	1	0	-	-	-	-	-
S	Te	-	-	-	-	12	0	-	-	-	-	-
W	Te	-	-	3	3	-	100.0	3	100	-	-	-
F	Th	-	-	-	-	11	0	-	-	-	-	-
S	Th	-	-	22	22	335	6.2	17	82	12	6	1.08 ± .23
W	Th	-	-	3	3	-	100.0	3	100	-	-	-
F	Ti	-	-	-	-	11	0	-	-	-	-	-
S	Ti	-	-	22	22	335	6.2	22	100	-	-	1.08 ± .32
W	Ti	-	3	6	9	-	100.0	9	100	-	-	1.03 ± .04
W	Tot Kjeldahl N	-	1	-	1	80	1.2	1	100	-	-	1.12
C	Tl	-	-	-	-	12	0	-	-	-	-	-
F	Tl	-	5	6	11	54	16.9	11	82	9	9	1.36 ± 1.06
S	Tl	-	-	42	42	362	10.4	42	74	14	12	88.69 ± 45.97
U	Tl	-	3	9	12	15	44.4	12	100	-	-	.98 ± .07
W	Tl	-	78	150	228	155	59.5	304	92	7	2	.98 ± .15
F	Tm	-	-	-	-	11	0	-	-	-	-	-
S	Tm	-	-	-	-	12	0	-	-	-	-	-
W	Tm	-	-	3	3	-	100.0	3	100	-	-	-
W	Tot Sus Solids	-	12	35	47	409	10.3	47	100	-	-	.95 ± .08
F	V	-	1	1	2	14	12.5	2	100	-	-	1.16
M	V	-	-	-	-	2	0	-	-	-	-	-
S	V	-	-	63	63	668	8.6	58	90	7	3	1.04 ± .60
W	V	-	61	126	187	292	39.0	249	96	4	-	1.01 ± .09
F	W	-	-	-	-	11	0	-	-	-	-	-
S	W	-	-	22	22	335	6.2	17	94	6	-	.68
W	W	-	-	3	3	-	100.0	3	100	-	-	-
F	Y	-	1	1	2	17	10.5	2	100	-	-	1.13
S	Y	-	-	-	-	12	0	-	-	-	-	-
W	Y	-	-	3	3	-	100.0	3	100	-	-	-
F	Yb	-	-	-	-	11	0	-	-	-	-	-
S	Yb	-	-	22	22	335	6.2	17	100	-	-	.91 ± .09

TABLE C-I (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NUMBER SAMPLES	% QC SAMPLES	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
W	Yb	-	-	3	3	-	100.0	3	100	-	-	-
F	Zn	-	20	2	22	17	56.4	20	80	5	15	1.27 ± .73
M	Zn	-	-	-	-	2	0	-	-	-	-	-
S	Zn	-	-	62	62	670	8.5	57	82	7	11	.91 ± .23
W	Zn	-	86	151	237	313	43.1	299	86	9	5	.99 ± .18
F	Zr	-	-	-	-	11	0	-	-	-	-	-
S	Zr	-	-	22	22	335	6.2	17	100	-	-	.99 ± .14
W	Zr	-	-	3	3	-	100.0	3	67	-	33	-

TABLE C-II

CONTROL STATUS OF QC SAMPLES ANALYZED BY EM-9: RADIOCHEMICAL ANALYSES

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NUMBER SAMPLES	% QC SAMPLES	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
C	Alpha	-	-	-	-	17	0	-	-	-	-	-
F	Alpha	-	4	90	94	597	13.6	94	100	-	-	.89 ± .08
M	Alpha	-	-	-	-	17	0	-	-	-	-	-
S	Alpha	-	27	-	27	243	10.0	27	78	15	7	1.23 ± .54
W	Alpha	-	53	680	733	1638	30.9	733	99	1	1	1.02 ± .20
S	Alpha, Rad Van	-	-	-	-	887	0	-	-	-	-	-
B	Am-241	-	7	1	8	6	57.1	8	88	13	-	1.27 ± .47
C	Am-241	-	-	-	-	16	0	-	-	-	-	-
F	Am-241	-	17	-	17	51	25.0	17	59	6	35	.87 ± .09
P	Am-241	-	-	-	-	26	0	-	-	-	-	-
S	Am-241	-	11	7	18	50	26.5	62	97	3	-	1.09 ± .32
U	Am-241	-	6	-	6	39	13.3	6	100	-	-	1.17 ± .04
W	Am-241	-	25	72	97	388	20.0	99	92	3	5	.96 ± .19
B	Am-243 Tracer	-	4	-	4	6	40.0	-	-	-	-	-
F	Am-243 Tracer	-	6	-	6	-	100.0	-	-	-	-	-
U	Am-243 Tracer	-	6	-	6	39	13.3	-	-	-	-	-
W	Am-243 Tracer	-	13	-	13	45	22.4	-	-	-	-	-
B	As-73	-	-	-	-	549	0	-	-	-	-	-
F	As-73	-	-	-	-	584	0	-	-	-	-	-
B	As-74	-	-	-	-	548	0	-	-	-	-	-
F	As-74	-	-	-	-	584	0	-	-	-	-	-
W	Ba-133	-	9	-	9	-	100.0	9	44	33	22	.52 ± .25
B	Be-7	-	-	-	-	562	0	-	-	-	-	-
F	Be-7	-	6	-	6	581	1.0	6	-	-	100	.37 ± .29
W	Be-7	-	-	-	-	12	0	-	-	-	-	-
C	Beta	-	-	-	-	4	0	-	-	-	-	-
F	Beta	-	4	90	94	597	13.6	94	100	-	-	.83 ± .06
M	Beta	-	-	-	-	16	0	-	-	-	-	-
S	Beta	-	27	-	27	243	10.0	27	81	15	4	1.15 ± .24
W	Beta	-	50	678	728	1374	34.6	728	97	1	2	.96 ± .16
S	Beta, Rad Van	-	-	-	-	887	0	-	-	-	-	-
B	Cd-109	-	-	-	-	548	0	-	-	-	-	-
F	Cd-109	-	-	-	-	582	0	-	-	-	-	-
W	Cd-109	-	2	-	2	-	100.0	1	-	-	100	.43
W	Ce-139	-	2	-	2	-	100.0	1	100	-	-	.76
F	Ce-144	-	6	-	6	-	100.0	6	33	17	50	.45 ± .34
W	Ce-144	-	6	-	6	-	100.0	6	50	-	50	.52 ± .44
W	Co-56	-	-	-	-	11	0	-	-	-	-	-
B	Co-57	-	-	-	-	563	0	-	-	-	-	-
F	Co-57	-	6	-	6	582	1.0	6	-	33	67	.67 ± .02
S	Co-57	-	-	-	-	7	0	-	-	-	-	-
W	Co-57	-	2	30	32	24	57.1	31	90	-	10	.99 ± .35
W	Co-58	-	-	-	-	14	0	-	-	-	-	-
B	Co-60	-	-	-	-	548	0	-	-	-	-	-

TABLE C-II (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NUMBER SAMPLES	% QC SAMPLES	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
C	Co-60	-	-	-	-	1	0	-	-	-	-	-
F	Co-60	-	6	-	6	583	1.0	6	100	-	-	.87 ± .05
S	Co-60	-	-	-	-	12	0	-	-	-	-	-
W	Co-60	-	25	39	64	22	74.4	62	90	8	2	1.04 ± .72
W	Cr-51	-	-	-	-	3	0	-	-	-	-	-
B	Cs-134	-	-	-	-	548	0	-	-	-	-	-
F	Cs-134	-	6	-	6	582	1.0	6	-	-	100	.58 ± .02
P	Cs-134	-	-	-	-	14	0	-	-	-	-	-
W	Cs-134	-	21	-	21	-	100.0	21	71	14	14	.49 ± 3.22
B	Cs-137	-	16	7	23	664	3.3	23	87	9	4	.89 ± .38
C	Cs-137	-	-	-	-	2	0	-	-	-	-	-
F	Cs-137	-	13	-	13	589	2.2	13	54	23	23	.76 ± .26
P	Cs-137	-	-	-	-	14	0	-	-	-	-	-
S	Cs-137	-	28	25	53	203	20.7	59	88	10	2	1.11 ± .33
W	Cs-137	-	35	69	104	249	29.5	104	88	11	1	.89 ± 1.05
B	Gamma	-	-	-	-	5	0	-	-	-	-	-
C	Gamma	-	-	-	-	4	0	-	-	-	-	-
F	Gamma	-	-	-	-	2	0	-	-	-	-	-
M	Gamma	-	-	-	-	18	0	-	-	-	-	-
S	Gamma	-	15	23	38	221	14.7	38	87	8	5	.95 ± .26
W	Gamma	-	36	177	213	1428	13.0	213	99	1	-	1.01 ± .14
S	Gamma, Rad Van	-	-	-	-	887	0	-	-	-	-	-
S	Gamma Scan	-	2	-	2	742	0.3	-	-	-	-	-
W	Gamma Scan	-	-	-	-	32	0	-	-	-	-	-
B	H-3	-	-	-	-	29	0	-	-	-	-	-
M	H-3	-	-	-	-	155	0	-	-	-	-	-
S	H-3	-	106	-	106	990	9.7	112	79	12	10	1.03 ± .21
T	H-3	-	-	-	-	37	0	-	-	-	-	-
U	H-3	-	236	-	236	2263	9.4	236	96	3	1	1.03 ± .10
W	H-3	-	90	290	380	985	27.8	368	98	1	1	1.00 ± .12
U	H-3 Screen	-	-	-	-	21	0	-	-	-	-	-
W	Hg-203	-	2	-	2	-	100.0	1	100	-	-	1.13
B	I-131	-	3	-	3	587	0.5	3	67	33	-	.69 ± .03
F	I-131	-	-	-	-	604	0	-	-	-	-	-
S	K-40	-	6	1	7	-	100.0	7	57	14	29	1.71 ± .70
W	Mn-52	-	-	-	-	1	0	-	-	-	-	-
B	Mn-54	-	-	-	-	563	0	-	-	-	-	-
C	Mn-54	-	-	-	-	1	0	-	-	-	-	-
F	Mn-54	-	6	-	6	584	1.0	6	33	33	33	.73 ± .05
W	Mn-54	-	6	40	46	29	61.3	46	96	4	-	.95 ± .08
B	Na-22	-	-	-	-	563	0	-	-	-	-	-
F	Na-22	-	-	-	-	582	0	-	-	-	-	-
W	Na-22	-	-	-	-	16	0	-	-	-	-	-
W	Nb-95	-	-	-	-	6	0	-	-	-	-	-
B	Pu-238	1	17	-	18	115	13.5	17	82	-	18	1.32 ± .41
C	Pu-238	-	-	-	-	26	0	-	-	-	-	-

TABLE C-II (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NUMBER SAMPLES	% QC SAMPLES	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
F	Pu-238	-	17	-	17	121	12.3	17	100	-	-	.95 ± .09
P	Pu-238	-	8	2	10	32	23.8	10	80	-	20	.94 ± .14
S	Pu-238	-	39	-	39	316	11.0	105	91	5	4	2.17 ± 7.44
U	Pu-238	-	175	-	175	2023	8.0	175	89	6	5	.93 ± .17
W	Pu-238	-	29	30	59	243	19.5	62	100	-	-	1.01 ± .08
B	Pu-239	1	17	-	18	117	13.3	17	82	-	18	1.32 ± .51
C	Pu-239	-	-	-	-	26	0	-	-	-	-	-
F	Pu-239	-	17	-	17	121	12.3	17	88	12	-	1.00 ± .06
P	Pu-239	-	8	2	10	32	23.8	10	70	10	20	.91 ± .13
S	Pu-239	-	39	-	39	318	10.9	103	93	5	2	1.01 ± .23
U	Pu-239	-	175	-	175	2023	8.0	175	95	4	1	1.00 ± .11
W	Pu-239	-	50	-	50	241	17.2	53	92	8	-	1.02 ± .16
B	Pu-242 Tracer	-	3	-	3	36	7.7	-	-	-	-	-
S	Pu-242 Tracer	-	4	-	4	45	8.2	-	-	-	-	-
U	Pu-242 Tracer	-	113	-	113	1299	8.0	-	-	-	-	-
W	Pu-242 Tracer	-	7	-	7	26	21.2	-	-	-	-	-
W	Ra-226	-	20	1	21	10	67.7	21	86	5	10	.81 ± .19
B	Rb-83	-	-	-	-	562	0	-	-	-	-	-
F	Rb-83	-	-	-	-	585	0	-	-	-	-	-
S	Rb-83	-	-	-	-	7	0	-	-	-	-	-
W	Rb-83	-	-	-	-	4	0	-	-	-	-	-
B	Rb-86	-	-	-	-	548	0	-	-	-	-	-
F	Rb-86	-	-	-	-	582	0	-	-	-	-	-
W	Rn-222	-	-	-	-	11	0	-	-	-	-	-
B	Ru-103	-	-	-	-	548	0	-	-	-	-	-
F	Ru-103	-	-	-	-	582	0	-	-	-	-	-
W	Ru-106	-	9	-	9	-	100.0	9	89	11	-	.48 ± .57
W	Sc-46	-	-	-	-	1	0	-	-	-	-	-
B	Se-72	-	-	-	-	548	0	-	-	-	-	-
F	Se-72	-	-	-	-	582	0	-	-	-	-	-
B	Se-75	-	-	-	-	548	0	-	-	-	-	-
F	Se-75	-	-	-	-	584	0	-	-	-	-	-
S	Se-75	-	-	-	-	7	0	-	-	-	-	-
W	Se-75	-	-	-	-	9	0	-	-	-	-	-
W	Sn-113	-	2	-	2	-	100.0	1	-	100	-	1.44
C	Sr-85	-	-	-	-	2	0	-	-	-	-	-
W	Sr-85	-	2	-	2	39	4.9	1	100	-	-	1.02
W	Sr-89	-	-	-	-	60	0	-	-	-	-	-
B	Sr-90	-	21	-	21	84	20.0	20	90	5	5	1.35 ± .93
C	Sr-90	-	-	-	-	4	0	-	-	-	-	-
F	Sr-90	-	13	-	13	1	92.9	13	77	-	23	1.36 ± .70
S	Sr-90	-	25	-	25	156	13.8	70	97	1	1	1.02 ± .34
W	Sr-90	2	24	44	70	107	39.5	70	99	-	1	1.01 ± .07
W	Th-228	-	-	-	-	7	0	-	-	-	-	-
W	Th-230	-	-	-	-	8	0	-	-	-	-	-
B	U	-	-	9	9	125	6.7	9	89	11	-	1.08 ± .15

TABLE C-II (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NUMBER SAMPLES	% QC SAMPLES	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
F	U	-	21	34	55	189	22.5	55	96	2	2	1.04 ± .12
M	U	-	-	1	1	11	8.3	-	-	-	-	-
S	U	-	116	379	495	1608	23.5	490	96	2	2	.95 ± .08
W	U	-	96	187	283	329	46.2	287	96	2	1	.99 ± .11
U	U-232 Tracer	-	128	-	128	1311	8.9	-	-	-	-	-
W	U-232 Tracer	-	7	-	7	-	100.0	-	-	-	-	-
C	U-234	-	-	-	-	22	0	-	-	-	-	-
S	U-234	-	1	-	1	13	7.1	23	100	-	-	.97 ± .09
U	U-234	-	127	-	127	1304	8.9	127	97	2	1	1.03 ± .32
W	U-234	-	7	23	30	50	37.5	24	100	-	-	1.05 ± .08
C	U-235	-	-	-	-	21	0	-	-	-	-	-
S	U-235	-	1	-	1	13	7.1	23	100	-	-	1.23 ± .62
U	U-235	-	127	-	127	1304	8.9	127	99	1	-	.63 ± 2.67
W	U-235	-	7	22	29	50	36.7	23	100	-	-	.94 ± .10
F	U-235/238	-	-	-	-	13	0	-	-	-	-	-
M	U-235/238	-	-	-	-	7	0	-	-	-	-	-
S	U-235/238	-	-	42	42	256	14.1	42	90	5	5	.98 ± .08
W	U-235/238	-	28	74	102	73	58.3	102	100	-	-	.99 ± .08
S	U-238	-	1	-	1	13	7.1	23	100	-	-	1.03 ± .08
U	U-238	-	127	-	127	1304	8.9	127	94	3	3	5.72 ± 54.41
W	U-238	-	7	-	7	1	87.5	1	100	-	-	1.18
W	V-48	-	-	-	-	1	0	-	-	-	-	-
W	Y-88	-	4	-	4	11	26.7	2	100	-	-	.99
B	Zn-65	-	-	-	-	548	0	-	-	-	-	-
F	Zn-65	-	-	-	-	583	0	-	-	-	-	-
W	Zn-65	-	9	-	9	7	56.3	9	67	33	-	.71 ± .13
W	Zr-88	-	-	-	-	9	0	-	-	-	-	-

TABLE C-III

CONTROL STATUS OF QC SAMPLES ANALYZED BY EM-9: ORGANIC ANALYSES

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
C	Acenaphthene	-	1	-	1	56	1.8	1	100	-	-	-
M	Acenaphthene	-	-	-	-	9	0	-	-	-	-	-
S	Acenaphthene	56	53	-	109	582	15.8	70	96	3	1	.65 ± .10
W	Acenaphthene	71	42	-	113	247	31.4	44	89	5	7	.58 ± .14
C	Acenaphthylene	-	1	-	1	46	2.1	1	100	-	-	-
M	Acenaphthylene	-	-	-	-	9	0	-	-	-	-	-
S	Acenaphthylene	56	53	-	109	522	17.3	70	100	-	-	-
W	Acenaphthylene	42	42	-	84	247	25.4	44	98	-	2	-
C	Acetone	-	1	-	1	62	1.6	1	-	-	100	.29
M	Acetone	-	-	-	-	11	0	-	-	-	-	-
S	Acetone	94	42	-	136	276	33.0	43	23	23	53	.49 ± .19
T	Acetone	-	1	-	1	16	5.9	1	-	-	100	.44
W	Acetone	83	63	-	146	221	39.8	51	63	12	25	.66 ± .29
M	Acetylene	-	-	-	-	6	0	-	-	-	-	-
T	Acrolein	-	1	1	2	2	50.0	2	100	-	-	.71
T	Acrylonitrile	-	-	-	-	2	0	-	-	-	-	-
F	Aliphatic Hydrocarbons	-	-	-	-	9	0	-	-	-	-	-
M	Aliphatic Hydrocarbons	-	-	-	-	3	0	-	-	-	-	-
T	Aliphatic Hydrocarbons	-	-	-	-	100	0	-	-	-	-	-
M	Amines	-	-	-	-	1	0	-	-	-	-	-
C	Aniline	-	1	-	1	46	2.1	1	100	-	-	-
M	Aniline	-	-	-	-	9	0	-	-	-	-	-
S	Aniline	56	53	-	109	522	17.3	66	82	2	17	.37 ± .36
W	Aniline	42	42	-	84	247	25.4	44	89	7	5	.59 ± .15
C	Anthracene	-	1	-	1	46	2.1	1	100	-	-	-
M	Anthracene	-	-	-	-	9	0	-	-	-	-	-
S	Anthracene	56	53	-	109	522	17.3	70	99	1	-	.75 ± .11
W	Anthracene	42	42	-	84	247	25.4	44	77	2	20	.34 ± .13
C	Mixed-Aroclor	-	-	-	-	52	0	-	-	-	-	-
F	Mixed-Aroclor	-	40	25	65	253	20.4	65	97	2	2	1.08 ± .71
M	Mixed-Aroclor	-	102	57	159	716	18.2	159	93	4	3	1.14 ± 1.12
S	Mixed-Aroclor	-	43	12	55	247	18.2	57	91	2	7	.82 ± .31
T	Mixed-Aroclor	-	1	1	2	2	50.0	2	100	-	-	.86
W	Mixed-Aroclor	-	19	1	20	20	50.0	20	80	-	20	.66 ± .26
C	Aroclor 1242	-	-	-	-	52	0	-	-	-	-	-
F	Aroclor 1242	-	40	25	65	253	20.4	65	98	2	-	.86 ± .29
M	Aroclor 1242	-	102	57	159	629	20.2	159	97	1	3	1.21 ± .38
S	Aroclor 1242	-	43	12	55	247	18.2	57	98	-	2	.88 ± .28
T	Aroclor 1242	-	1	1	2	2	50.0	2	100	-	-	-
W	Aroclor 1242	-	19	1	20	20	50.0	20	80	-	20	.65 ± .13
W	Aroclor 1248	-	2	-	2	-	100.0	2	100	-	-	.72
C	Aroclor 1254	-	-	-	-	52	0	-	-	-	-	-
F	Aroclor 1254	-	40	25	65	253	20.4	65	98	-	2	1.11 ± .24

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
M	Aroclor 1254	-	102	57	159	629	20.2	159	98	1	1	1.42 ± 1.72
S	Aroclor 1254	-	43	12	55	247	18.2	57	96	-	4	.69 ± .30
T	Aroclor 1254	-	1	1	2	2	50.0	2	100	-	-	.86
W	Aroclor 1254	-	19	1	20	20	50.0	20	100	-	-	.77 ± .18
C	Aroclor 1260	-	-	-	-	52	0	-	-	-	-	-
F	Aroclor 1260	-	40	25	65	253	20.4	65	100	-	-	.89 ± .11
M	Aroclor 1260	-	102	57	159	629	20.2	159	96	2	3	.87 ± .30
S	Aroclor 1260	-	43	12	55	247	18.2	57	96	2	2	.84 ± .33
T	Aroclor 1260	-	1	1	2	2	50.0	2	100	-	-	-
W	Aroclor 1260	-	19	1	20	20	50.0	20	100	-	-	.74
M	Aromatic hydrocarbons	-	-	-	-	1	0	-	-	-	-	-
T	Aromatic hydrocarbons	-	-	-	-	2	0	-	-	-	-	-
C	Azobenzene	-	1	-	1	46	2.1	1	100	-	-	-
M	Azobenzene	-	-	-	-	9	0	-	-	-	-	-
S	Azobenzene	56	53	-	109	522	17.3	69	100	-	-	-
W	Azobenzene	42	42	-	84	247	25.4	44	100	-	-	-
M	Benzaldehyde	-	-	-	-	1	0	-	-	-	-	-
S	Benzaldehyde	-	-	-	-	1	0	-	-	-	-	-
C	Benzene	-	1	-	1	71	1.4	1	100	-	-	.86
M	Benzene	-	-	-	-	19	0	-	-	-	-	-
S	Benzene	94	42	-	136	324	29.6	43	98	-	2	1.02 ± .37
T	Benzene	87	151	1	239	1336	15.2	151	95	4	1	.89 ± .20
W	Benzene	83	63	-	146	287	33.7	56	100	-	-	.89 ± .13
M	Benzenes, substituted	-	-	-	-	4	0	-	-	-	-	-
S	Benzenes, substituted	-	-	-	-	3	0	-	-	-	-	-
C	m-Benzidine	-	1	-	1	46	2.1	1	100	-	-	-
M	m-Benzidine	-	-	-	-	9	0	-	-	-	-	-
S	m-Benzidine	56	53	-	109	522	17.3	68	100	-	-	-
W	m-Benzidine	42	42	-	84	247	25.4	44	100	-	-	-
C	Benzo[a]anthracene	-	1	-	1	46	2.1	1	100	-	-	-
M	Benzo[a]anthracene	-	-	-	-	9	0	-	-	-	-	-
S	Benzo[a]anthracene	56	53	-	109	522	17.3	70	96	1	3	.76 ± .13
W	Benzo[a]anthracene	42	42	-	84	247	25.4	44	75	5	20	.26 ± .10
C	Benzo[a]pyrene	-	1	-	1	46	2.1	1	100	-	-	-
M	Benzo[a]pyrene	-	-	-	-	9	0	-	-	-	-	-
S	Benzo[a]pyrene	56	53	-	109	522	17.3	70	100	-	-	-
W	Benzo[a]pyrene	42	42	-	84	247	25.4	44	100	-	-	-
C	Benzo[b]fluoranthene	-	1	-	1	46	2.1	1	100	-	-	-
M	Benzo[b]fluoranthene	-	-	-	-	9	0	-	-	-	-	-
S	Benzo[b]fluoranthene	56	53	-	109	522	17.3	70	100	-	-	.72 ± .12
W	Benzo[b]fluoranthene	42	42	-	84	247	25.4	44	77	16	7	.53 ± .10
C	Benzo[g,h,i]perylene	-	1	-	1	46	2.1	1	100	-	-	-
M	Benzo[g,h,i]perylene	-	-	-	-	9	0	-	-	-	-	-
S	Benzo[g,h,i]perylene	56	53	-	109	522	17.3	70	100	-	-	-
W	Benzo[g,h,i]perylene	42	42	-	84	247	25.4	44	100	-	-	-
C	Benzo[k]fluoranthene	-	1	-	1	46	2.1	1	100	-	-	-

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
M	Benzo[k]fluoranthene	-	-	-	-	9	0	-	-	-	-	-
S	Benzo[k]fluoranthene	56	53	-	109	522	17.3	70	100	-	-	.60
W	Benzo[k]fluoranthene	42	42	-	84	247	25.4	44	98	-	2	.18
C	Benzoic acid	-	1	-	1	46	2.1	1	-	-	100	-
M	Benzoic acid	-	-	-	-	9	0	-	-	-	-	-
S	Benzoic acid	56	53	-	109	522	17.3	70	74	1	24	.15
W	Benzoic acid	42	42	-	84	247	25.4	44	91	-	9	.62 ± .36
F	Benzoquinone, 2,5-Di-t-butyl	-	-	-	-	6	0	-	-	-	-	-
T	Benzoquinone, 2,5-Di-t-butyl	-	-	-	-	2	0	-	-	-	-	-
C	Benzyl alcohol	-	1	-	1	46	2.1	1	100	-	-	-
M	Benzyl alcohol	-	-	-	-	9	0	-	-	-	-	-
S	Benzyl alcohol	56	53	-	109	522	17.3	70	100	-	-	-
W	Benzyl alcohol	42	42	-	84	247	25.4	44	100	-	-	-
T	Biphenyl, 2,2'-diethyl-1,1'-	-	-	-	-	1	0	-	-	-	-	-
C	Bis(2-chloroethoxy)methane	-	1	-	1	46	2.1	1	100	-	-	-
M	Bis(2-chloroethoxy)methane	-	-	-	-	9	0	-	-	-	-	-
S	Bis(2-chloroethoxy)methane	56	53	-	109	522	17.3	70	94	4	1	.63 ± .12
W	Bis(2-chloroethoxy)methane	42	42	-	84	247	25.4	44	93	5	2	.56 ± .20
C	Bis(2-chloroethyl)ether	-	1	-	1	46	2.1	1	100	-	-	-
M	Bis(2-chloroethyl)ether	-	-	-	-	9	0	-	-	-	-	-
S	Bis(2-chloroethyl)ether	56	53	-	109	522	17.3	70	99	-	1	.46
W	Bis(2-chloroethyl)ether	42	43	-	85	251	25.3	44	98	-	2	.39
C	Bis(2-chloroisopropyl)ether	-	1	-	1	46	2.1	1	100	-	-	-
M	Bis(2-chloroisopropyl)ether	-	-	-	-	9	0	-	-	-	-	-
S	Bis(2-chloroisopropyl)ether	56	53	-	109	522	17.3	68	100	-	-	-
W	Bis(2-chloroisopropyl)ether	42	42	-	84	247	25.4	44	100	-	-	-
C	Bis(2-ethylhexyl)phthalate	-	1	-	1	46	2.1	1	100	-	-	-
M	Bis(2-ethylhexyl)phthalate	-	-	-	-	9	0	-	-	-	-	-
S	Bis(2-ethylhexyl)phthalate	56	53	-	109	522	17.3	70	97	-	3	-
W	Bis(2-ethylhexyl)phthalate	42	42	-	84	247	25.4	44	98	-	2	-
W	Bis(pentafluorophenyl)phenylph	-	-	-	-	1	0	-	-	-	-	-
S	Bisphenol A	-	-	-	-	3	0	-	-	-	-	-
C	Bromobenzene	-	1	-	1	62	1.6	1	100	-	-	-
M	Bromobenzene	-	-	-	-	10	0	-	-	-	-	-
S	Bromobenzene	94	42	-	136	276	33.0	43	98	2	-	.61
T	Bromobenzene	87	140	-	227	1325	14.6	140	94	5	1	.88 ± .19
W	Bromobenzene	83	63	-	146	221	39.8	51	100	-	-	.93
C	Bromochloromethane	-	1	-	1	62	1.6	1	100	-	-	.78
M	Bromochloromethane	-	-	-	-	10	0	-	-	-	-	-
S	Bromochloromethane	94	42	-	136	276	33.0	43	98	-	2	1.04 ± .39
W	Bromochloromethane	83	63	-	146	221	39.8	51	100	-	-	1.04 ± .15
C	Bromodichloromethane	-	1	-	1	62	1.6	1	100	-	-	-
M	Bromodichloromethane	-	-	-	-	10	0	-	-	-	-	-
S	Bromodichloromethane	94	42	-	136	276	33.0	43	100	-	-	1.25 ± .28
W	Bromodichloromethane	83	63	-	146	221	39.8	57	100	-	-	1.02 ± .15
C	Bromoform	-	1	-	1	62	1.6	1	100	-	-	-

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
M	Bromoform	-	-	-	-	10	0	-	-	-	-	-
S	Bromoform	94	42	-	136	276	33.0	43	100	-	-	.91 ± .10
W	Bromoform	83	63	-	146	221	39.8	57	98	-	2	1.01 ± .20
C	Bromomethane	-	1	-	1	62	1.6	1	100	-	-	-
M	Bromomethane	-	-	-	-	10	0	-	-	-	-	-
S	Bromomethane	94	42	-	136	276	33.0	43	100	-	-	-
W	Bromomethane	83	63	-	146	221	39.8	51	100	-	-	-
C	4-Bromophenylphenyl ether	-	1	-	1	46	2.1	1	100	-	-	-
M	4-Bromophenylphenyl ether	-	-	-	-	9	0	-	-	-	-	-
S	4-Bromophenylphenyl ether	56	53	-	109	522	17.3	70	100	-	-	-
W	4-Bromophenylphenyl ether	42	42	-	84	247	25.4	44	100	-	-	-
W	Butanal	-	-	-	-	1	0	-	-	-	-	-
C	2-Butanone	-	1	-	1	62	1.6	1	-	-	100	.33
M	2-Butanone	-	-	-	-	10	0	-	-	-	-	-
S	2-Butanone	94	42	-	136	276	33.0	43	44	26	30	.61 ± .19
W	2-Butanone	83	63	-	146	221	39.8	51	59	20	22	1.21 ± 1.63
T	Butoxy-2-ethanol	-	-	-	-	3	0	-	-	-	-	-
C	Butyl benzyl phthalate	-	1	-	1	46	2.1	1	100	-	-	-
M	Butyl benzyl phthalate	-	-	-	-	9	0	-	-	-	-	-
S	Butyl benzyl phthalate	56	53	-	109	522	17.3	70	100	-	-	-
W	Butyl benzyl phthalate	42	42	-	84	247	25.4	44	100	-	-	-
C	tert-Butylbenzene	-	1	-	1	62	1.6	1	100	-	-	-
C	n-Butylbenzene	-	1	-	1	62	1.6	1	100	-	-	-
C	sec-Butylbenzene	-	1	-	1	62	1.6	1	100	-	-	-
M	n-Butylbenzene	-	-	-	-	10	0	-	-	-	-	-
M	sec-Butylbenzene	-	-	-	-	10	0	-	-	-	-	-
M	tert-Butylbenzene	-	-	-	-	10	0	-	-	-	-	-
S	tert-Butylbenzene	94	42	-	136	276	33.0	43	98	-	2	.80 ± .39
S	sec-Butylbenzene	94	42	-	136	276	33.0	43	100	-	-	.69
S	n-Butylbenzene	94	42	-	136	276	33.0	43	100	-	-	1.02 ± .04
W	tert-Butylbenzene	83	63	-	146	221	39.8	51	96	2	2	.73 ± .11
W	n-Butylbenzene	83	63	-	146	221	39.8	51	100	-	-	.84
W	sec-Butylbenzene	83	63	-	146	221	39.8	51	100	-	-	.70
T	Caprolactam	-	-	-	-	21	0	-	-	-	-	-
C	Carbon disulfide	-	1	-	1	62	1.6	1	100	-	-	-
M	Carbon disulfide	-	-	-	-	10	0	-	-	-	-	-
S	Carbon disulfide	94	42	-	136	276	33.0	43	100	-	-	1.18 ± .39
W	Carbon disulfide	83	63	-	146	221	39.8	51	98	2	-	.70 ± .13
C	Carbon tetrachloride	-	1	-	1	62	1.6	1	100	-	-	-
M	Carbon tetrachloride	-	-	-	-	10	0	-	-	-	-	-
S	Carbon tetrachloride	94	42	-	136	276	33.0	43	100	-	-	1.11 ± .13
T	Carbon tetrachloride	87	158	-	245	1327	15.6	157	92	4	4	.85 ± .23
W	Carbon tetrachloride	83	63	-	146	221	39.8	57	91	2	7	.76 ± .27
T	Carbonodithioic acid, O,S-Dimethyl ester	-	-	-	-	1	0	-	-	-	-	-
S	Cedrol	-	-	-	-	6	0	-	-	-	-	-

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
T	Chlorinated compounds	-	-	-	-	14	0	-	-	-	-	-
C	4-Chloro-3-methylphenol	-	1	-	1	56	1.8	1	100	-	-	-
M	4-Chloro-3-methylphenol	-	-	-	-	9	0	-	-	-	-	-
S	4-Chloro-3-methylphenol	56	53	-	109	582	15.8	70	96	1	3	.78 ± .15
W	4-Chloro-3-methylphenol	71	42	-	113	247	31.4	44	89	7	5	.72 ± .19
C	4-Chloroaniline	-	1	-	1	46	2.1	1	100	-	-	-
M	4-Chloroaniline	-	-	-	-	9	0	-	-	-	-	-
S	4-Chloroaniline	56	53	-	109	522	17.3	70	79	3	19	.27 ± .10
W	4-Chloroaniline	42	42	-	84	247	25.4	44	82	9	9	.61 ± .21
C	Chlorobenzene	-	1	-	1	71	1.4	1	100	-	-	-
M	Chlorobenzene	-	-	-	-	14	0	-	-	-	-	-
S	Chlorobenzene	94	42	-	136	324	29.6	43	100	-	-	1.08 ± .11
T	Chlorobenzene	87	140	-	227	1325	14.6	140	94	4	2	.82 ± .16
W	Chlorobenzene	83	63	-	146	287	33.7	57	100	-	-	.84 ± .12
C	Chlorodibromomethane	-	1	-	1	62	1.6	1	100	-	-	-
M	Chlorodibromomethane	-	-	-	-	10	0	-	-	-	-	-
S	Chlorodibromomethane	94	42	-	136	276	33.0	43	100	-	-	1.35 ± .39
W	Chlorodibromomethane	83	63	-	146	221	39.8	57	100	-	-	.95 ± .17
C	Chloroethane	-	1	-	1	62	1.6	1	100	-	-	-
M	Chloroethane	-	-	-	-	10	0	-	-	-	-	-
S	Chloroethane	94	42	-	136	276	33.0	43	100	-	-	-
W	Chloroethane	83	63	-	146	221	39.8	51	100	-	-	-
C	Chloroform	-	1	-	1	62	1.6	1	100	-	-	-
M	Chloroform	-	-	-	-	10	0	-	-	-	-	-
S	Chloroform	94	42	-	136	276	33.0	43	100	-	-	.95 ± .17
T	Chloroform	87	150	-	237	1330	15.1	150	95	3	2	.91 ± .30
W	Chloroform	83	63	-	146	221	39.8	57	100	-	-	.91 ± .17
C	Chloromethane	-	1	-	1	62	1.6	1	100	-	-	-
M	Chloromethane	-	-	-	-	10	0	-	-	-	-	-
S	Chloromethane	94	42	-	136	276	33.0	43	98	-	2	-
W	Chloromethane	83	63	-	146	221	39.8	51	100	-	-	-
C	2-Chloronaphthalene	-	1	-	1	46	2.1	1	100	-	-	-
M	2-Chloronaphthalene	-	-	-	-	9	0	-	-	-	-	-
S	2-Chloronaphthalene	56	53	-	109	522	17.3	70	93	6	1	.56 ± .06
W	2-Chloronaphthalene	42	42	-	84	247	25.4	44	98	-	2	.58 ± .12
C	o-Chlorophenol	-	1	-	1	56	1.8	1	100	-	-	-
M	o-Chlorophenol	-	-	-	-	9	0	-	-	-	-	-
S	o-Chlorophenol	56	53	-	109	582	15.8	70	84	13	3	.58 ± .11
W	o-Chlorophenol	71	42	-	113	247	31.4	44	89	7	5	.60 ± .13
C	4-Chlorophenylphenyl ether	-	1	-	1	46	2.1	1	100	-	-	-
M	4-Chlorophenylphenyl ether	-	-	-	-	9	0	-	-	-	-	-
S	4-Chlorophenylphenyl ether	56	53	-	109	522	17.3	70	100	-	-	-
W	4-Chlorophenylphenyl ether	42	42	-	84	247	25.4	44	100	-	-	-
C	o-Chlorotoluene	-	1	-	1	62	1.6	1	100	-	-	.67
C	p-Chlorotoluene	-	1	-	1	62	1.6	1	100	-	-	.63
M	o-Chlorotoluene	-	-	-	-	10	0	-	-	-	-	-

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
M	p-Chlorotoluene	-	-	-	-	10	0	-	-	-	-	-
S	o-Chlorotoluene	94	42	-	136	276	33.0	43	88	7	5	.95 ± .33
S	p-Chlorotoluene	94	42	-	136	276	33.0	43	84	-	16	.73 ± .35
W	o-Chlorotoluene	83	63	-	146	221	39.8	51	84	16	-	.72 ± .13
W	p-Chlorotoluene	83	63	-	146	221	39.8	51	90	4	6	.72 ± .13
C	Chrysene	-	1	-	1	46	2.1	1	100	-	-	-
M	Chrysene	-	-	-	-	9	0	-	-	-	-	-
S	Chrysene	56	53	-	109	522	17.3	70	96	-	4	.85 ± .20
W	Chrysene	42	42	-	84	247	25.4	44	75	5	20	.28 ± .09
M	Cyclic Hydrocarbons	-	-	-	-	2	0	-	-	-	-	-
S	Cyclic Hydrocarbons	-	-	-	-	6	0	-	-	-	-	-
M	Cyclohexanol	-	-	-	-	1	0	-	-	-	-	-
W	Cyclohexanol	-	-	-	-	1	0	-	-	-	-	-
W	Cyclohexylamine	-	-	-	-	2	0	-	-	-	-	-
T	2,4-D (sec-butyl ester)	-	2	-	2	1	66.7	-	-	-	-	-
M	Di(2-ethylhexyl) sebacate (DEHS) (DOS)	-	-	-	-	2	0	-	-	-	-	-
C	Di-n-butyl phthalate	-	1	-	1	46	2.1	1	100	-	-	-
M	Di-n-butyl phthalate	-	-	-	-	9	0	-	-	-	-	-
S	Di-n-butyl phthalate	56	53	-	109	522	17.3	70	94	-	6	-
W	Di-n-butyl phthalate	42	42	-	84	247	25.4	44	100	-	-	-
C	Di-n-octyl phthalate	-	1	-	1	46	2.1	1	100	-	-	-
M	Di-n-octyl phthalate	-	-	-	-	10	0	-	-	-	-	-
S	Di-n-octyl phthalate	56	53	-	109	522	17.3	70	99	1	-	.52
W	Di-n-octyl phthalate	42	42	-	84	247	25.4	44	98	-	2	.17
C	Dibenzo[a,h]anthracene	-	1	-	1	46	2.1	1	100	-	-	-
M	Dibenzo[a,h]anthracene	-	-	-	-	9	0	-	-	-	-	-
S	Dibenzo[a,h]anthracene	56	53	-	109	522	17.3	70	100	-	-	-
W	Dibenzo[a,h]anthracene	42	42	-	84	247	25.4	44	100	-	-	-
C	Dibenzofuran	-	1	-	1	46	2.1	1	100	-	-	-
M	Dibenzofuran	-	-	-	-	9	0	-	-	-	-	-
S	Dibenzofuran	56	53	-	109	522	17.3	70	96	3	1	.65 ± .11
W	Dibenzofuran	42	42	-	84	247	25.4	44	95	2	2	.63 ± .09
C	1,2-Dibromo-3-chloropropane	-	1	-	1	62	1.6	1	100	-	-	-
M	1,2-Dibromo-3-chloropropane	-	-	-	-	10	0	-	-	-	-	-
S	1,2-Dibromo-3-chloropropane	94	42	-	136	276	33.0	43	100	-	-	1.42 ± .40
W	1,2-Dibromo-3-chloropropane	83	65	-	148	221	40.1	53	98	-	2	1.12 ± .28
C	Dibromomethane	-	1	-	1	62	1.6	1	100	-	-	-
M	Dibromomethane	-	-	-	-	10	0	-	-	-	-	-
S	Dibromomethane	94	42	-	136	276	33.0	43	98	2	-	.98 ± .36
W	Dibromomethane	83	63	-	146	221	39.8	51	100	-	-	.95 ± .07
C	o-Dichlorobenzene (1,2)	-	2	-	2	108	1.8	2	100	-	-	-
M	o-Dichlorobenzene (1,2)	-	-	-	-	19	0	-	-	-	-	-
S	o-Dichlorobenzene (1,2)	150	95	-	245	798	23.5	113	88	4	8	.52 ± .14
W	o-Dichlorobenzene (1,2)	125	105	-	230	468	33.0	100	87	3	10	.61 ± .38
C	m-Dichlorobenzene (1,3)	-	2	-	2	108	1.8	2	100	-	-	-

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
M	m-Dichlorobenzene (1,3)	-	-	-	-	19	0	-	-	-	-	-
S	m-Dichlorobenzene (1,3)	150	95	-	245	798	23.5	113	92	2	6	.73 ± .30
W	m-Dichlorobenzene (1,3)	125	105	-	230	468	33.0	99	93	2	5	.70 ± .22
C	p-Dichlorobenzene (1,4)	-	2	-	2	118	1.7	2	50	50	-	.56
M	p-Dichlorobenzene (1,4)	-	-	-	-	19	0	-	-	-	-	-
S	p-Dichlorobenzene (1,4)	150	95	-	245	858	22.2	113	90	5	4	.78 ± .25
W	p-Dichlorobenzene (1,4)	154	105	-	259	468	35.6	100	85	10	5	.70 ± .17
C	3,3′-Dichlorobenzidine	-	1	-	1	46	2.1	1	100	-	-	-
M	3,3′-Dichlorobenzidine	-	-	-	-	9	0	-	-	-	-	-
S	3,3′-Dichlorobenzidine	56	53	-	109	522	17.3	70	100	-	-	-
W	3,3′-Dichlorobenzidine	42	42	-	84	247	25.4	44	100	-	-	-
C	Dichlorodifluoromethane	-	1	-	1	62	1.6	1	100	-	-	-
M	Dichlorodifluoromethane	-	-	-	-	10	0	-	-	-	-	-
S	Dichlorodifluoromethane	94	42	-	136	276	33.0	43	100	-	-	-
W	Dichlorodifluoromethane	83	63	-	146	221	39.8	51	100	-	-	-
C	1,1-Dichloroethane	-	1	-	1	71	1.4	1	100	-	-	-
C	1,2-Dichloroethane	-	1	-	1	62	1.6	1	100	-	-	-
M	1,2-Dichloroethane	-	-	-	-	10	0	-	-	-	-	-
M	1,1-Dichloroethane	-	-	-	-	15	0	-	-	-	-	-
S	1,2-Dichloroethane	94	42	-	136	276	33.0	43	100	-	-	1.36 ± .32
S	1,1-Dichloroethane	94	42	-	136	324	29.6	43	98	2	-	1.10 ± .51
T	1,1-Dichloroethane	-	-	-	-	6	0	-	-	-	-	-
T	1,2-Dichloroethane	-	19	1	20	5	80.0	19	100	-	-	.99 ± .08
W	1,2-Dichloroethane	83	63	-	146	221	39.8	57	100	-	-	1.04 ± .14
W	1,1-Dichloroethane	83	63	-	146	287	33.7	51	100	-	-	1.17 ± .29
C	1,1-Dichloroethene	-	1	-	1	62	1.6	1	100	-	-	-
C	trans-1,2-Dichloroethene	-	1	-	1	62	1.6	1	100	-	-	-
M	trans-1,2-Dichloroethene	-	-	-	-	10	0	-	-	-	-	-
M	1,1-Dichloroethene	-	-	-	-	10	0	-	-	-	-	-
S	1,1-Dichloroethene	94	42	-	136	276	33.0	43	100	-	-	1.47 ± .24
S	trans-1,2-Dichloroethene	94	42	-	136	276	33.0	43	100	-	-	-
T	1,1-Dichloroethene	-	-	-	-	5	0	-	-	-	-	-
W	1,1-Dichloroethene	83	63	-	146	221	39.8	52	98	-	2	1.03 ± .18
W	trans-1,2-Dichloroethene	83	63	-	146	221	39.8	52	98	-	2	1.20 ± .25
C	cis-1,2-Dichloroethylene	-	1	-	1	62	1.6	1	100	-	-	-
M	cis-1,2-Dichloroethylene	-	-	-	-	10	0	-	-	-	-	-
S	cis-1,2-Dichloroethylene	94	42	-	136	276	33.0	43	100	-	-	1.42 ± .24
W	cis-1,2-Dichloroethylene	83	63	-	146	221	39.8	52	100	-	-	.85 ± .16
C	2,4-Dichlorophenol	-	1	-	1	46	2.1	1	100	-	-	-
M	2,4-Dichlorophenol	-	-	-	-	9	0	-	-	-	-	-
S	2,4-Dichlorophenol	56	53	-	109	522	17.3	70	87	7	6	.56 ± .10
W	2,4-Dichlorophenol	42	42	-	84	247	25.4	44	91	5	5	.62 ± .20
C	1,2-Dichloropropane	-	1	-	1	62	1.6	1	100	-	-	-
C	2,2-Dichloropropane	-	1	-	1	62	1.6	1	100	-	-	-
C	1,3-Dichloropropane	-	1	-	1	62	1.6	1	100	-	-	.64
M	1,3-Dichloropropane	-	-	-	-	10	0	-	-	-	-	-

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
M	1,2-Dichloropropane	-	-	-	-	10	0	-	-	-	-	-
M	2,2-Dichloropropane	-	-	-	-	10	0	-	-	-	-	-
S	1,3-Dichloropropane	94	42	-	136	276	33.0	43	98	-	2	1.12 ± .25
S	2,2-Dichloropropane	94	42	-	136	276	33.0	43	100	-	-	1.54
S	1,2-Dichloropropane	94	42	-	136	276	33.0	43	98	-	2	.91 ± .38
W	2,2-Dichloropropane	83	63	-	146	221	39.8	51	98	-	2	.62 ± .20
W	1,3-Dichloropropane	83	63	-	146	221	39.8	51	100	-	-	.96 ± .21
W	1,2-Dichloropropane	83	63	-	146	221	39.8	52	100	-	-	.79 ± .08
C	1,1-Dichloropropene	-	1	-	1	62	1.6	1	100	-	-	-
C	trans-1,3-Dichloropropene	-	1	-	1	62	1.6	1	100	-	-	-
C	cis-1,3-Dichloropropene	-	1	-	1	62	1.6	1	100	-	-	-
M	1,1-Dichloropropene	-	-	-	-	10	0	-	-	-	-	-
M	cis-1,3-Dichloropropene	-	-	-	-	10	0	-	-	-	-	-
M	trans-1,3-Dichloropropene	-	-	-	-	10	0	-	-	-	-	-
S	1,1-Dichloropropene	94	42	-	136	276	33.0	43	100	-	-	-
S	cis-1,3-Dichloropropene	94	42	-	136	276	33.0	43	100	-	-	-
S	trans-1,3-Dichloropropene	94	42	-	136	276	33.0	43	100	-	-	-
W	cis-1,3-Dichloropropene	83	63	-	146	221	39.8	51	98	-	2	1.22
W	trans-1,3-Dichloropropene	83	63	-	146	221	39.8	51	98	-	2	-
W	1,1-Dichloropropene	83	63	-	146	221	39.8	51	100	-	-	.90
W	1,2-Diethoxyethane	-	-	-	-	1	0	-	-	-	-	-
C	Diethyl phthalate	-	1	-	1	46	2.1	1	100	-	-	-
M	Diethyl phthalate	-	-	-	-	9	0	-	-	-	-	-
S	Diethyl phthalate	56	53	-	109	522	17.3	71	97	1	1	.77 ± .11
W	Diethyl phthalate	42	42	-	84	247	25.4	44	91	-	9	.21 ± .02
W	N,N-Diethyl-2-aminoethanol	-	-	-	-	2	0	-	-	-	-	-
S	Diethylene glycol	-	-	-	-	1	0	-	-	-	-	-
M	Dimethoxymethane	-	-	-	-	1	0	-	-	-	-	-
T	Dimethyl disulfide	-	-	-	-	1	0	-	-	-	-	-
C	Dimethyl phthalate	-	1	-	1	46	2.1	1	100	-	-	-
M	Dimethyl phthalate	-	-	-	-	9	0	-	-	-	-	-
S	Dimethyl phthalate	56	53	-	109	522	17.3	70	100	-	-	-
W	Dimethyl phthalate	42	42	-	84	247	25.4	44	100	-	-	-
S	4,4-Dimethyl-1-pentene	1	-	-	1	-	100.0	-	-	-	-	-
T	n,n-Dimethylacetamide	-	-	-	-	1	0	-	-	-	-	-
M	Dimethylnaphthalenes	-	-	-	-	1	0	-	-	-	-	-
C	2,4-Dimethylphenol	-	1	-	1	46	2.1	1	100	-	-	-
M	2,4-Dimethylphenol	-	-	-	-	9	0	-	-	-	-	-
S	2,4-Dimethylphenol	56	53	-	109	522	17.3	70	84	7	9	.44 ± .09
W	2,4-Dimethylphenol	42	42	-	84	247	25.4	44	91	2	7	.62 ± .40
C	2,4-Dinitrophenol	-	1	-	1	46	2.1	1	100	-	-	-
M	2,4-Dinitrophenol	-	-	-	-	9	0	-	-	-	-	-
S	2,4-Dinitrophenol	56	53	-	109	522	17.3	70	87	1	11	.54 ± .23
W	2,4-Dinitrophenol	42	42	-	84	247	25.4	44	84	2	14	.49 ± .26
C	2,4-Dinitrotoluene	-	1	-	1	56	1.8	1	100	-	-	-
C	2,6-Dinitrotoluene	-	1	-	1	46	2.1	1	100	-	-	-

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
M	2,4-Dinitrotoluene	-	-	-	-	9	0	-	-	-	-	-
M	2,6-Dinitrotoluene	-	-	-	-	9	0	-	-	-	-	-
S	2,6-Dinitrotoluene	56	53	-	109	522	17.3	69	100	-	-	-
S	2,4-Dinitrotoluene	56	53	-	109	582	15.8	70	91	6	3	.60 ± .08
W	2,4-Dinitrotoluene	71	42	-	113	247	31.4	44	98	2	-	.68 ± .06
W	2,6-Dinitrotoluene	42	42	-	84	247	25.4	44	100	-	-	-
M	1,4-Dioxane	-	-	-	-	1	0	-	-	-	-	-
T	1,4-Dioxane	-	-	-	-	13	0	-	-	-	-	-
M	1,3-Dioxane-4,6-dione, 2,2-Dimethyl-	-	-	-	-	1	0	-	-	-	-	-
M	1,3-Dioxolane, 2,2-Dimethyl	-	-	-	-	1	0	-	-	-	-	-
M	n-Dodecane	-	-	-	-	1	0	-	-	-	-	-
M	Epichlorohydrin	-	-	-	-	1	0	-	-	-	-	-
T	Epichlorohydrin	-	1	1	2	3	40.0	2	100	-	-	.99
M	Epon resin	-	-	-	-	1	0	-	-	-	-	-
M	Esters	-	-	-	-	18	0	-	-	-	-	-
S	Esters	-	-	-	-	4	0	-	-	-	-	-
M	Ethanol	-	-	-	-	1	0	-	-	-	-	-
T	Ethanol	-	1	-	1	17	5.6	1	100	-	-	.84
M	Ethanol, 1-Methoxy-, Acetate	-	-	-	-	1	0	-	-	-	-	-
C	Ethylbenzene	-	1	-	1	62	1.6	1	100	-	-	-
M	Ethylbenzene	-	-	-	-	10	0	-	-	-	-	-
S	Ethylbenzene	94	42	-	136	276	33.0	43	98	-	2	.97 ± .16
T	Ethylbenzene	87	140	-	227	1325	14.6	140	99	1	-	.96 ± .22
W	Ethylbenzene	83	63	-	146	221	39.8	56	95	2	4	.77 ± .17
C	Ethylene dibromide	-	1	-	1	62	1.6	1	100	-	-	-
M	Ethylene dibromide	-	-	-	-	10	0	-	-	-	-	-
S	Ethylene dibromide	94	42	-	136	276	33.0	43	100	-	-	1.95
W	Ethylene dibromide	83	65	-	148	221	40.1	53	100	-	-	.81 ± .06
C	Fluoranthene	-	1	-	1	46	2.1	1	100	-	-	-
M	Fluoranthene	-	-	-	-	9	0	-	-	-	-	-
S	Fluoranthene	56	53	-	109	522	17.3	70	100	-	-	-
W	Fluoranthene	42	42	-	84	247	25.4	44	100	-	-	-
C	Fluorene	-	1	-	1	46	2.1	1	100	-	-	.72
M	Fluorene	-	-	-	-	9	0	-	-	-	-	-
S	Fluorene	56	53	-	109	522	17.3	70	99	-	1	.81 ± .11
W	Fluorene	42	42	-	84	247	25.4	45	93	4	2	.94 ± .65
T	Formaldehyde	-	4	4	8	15	34.8	8	100	-	-	.92 ± .13
C	Halogenated hydrocarbons	-	-	-	-	1	0	-	-	-	-	-
M	Halogenated hydrocarbons	-	-	-	-	6	0	-	-	-	-	-
T	Halogenated hydrocarbons	-	-	-	-	1	0	-	-	-	-	-
C	Hexachlorobenzene	-	1	-	1	46	2.1	1	100	-	-	.76
M	Hexachlorobenzene	-	-	-	-	9	0	-	-	-	-	-
S	Hexachlorobenzene	56	53	-	109	522	17.3	70	97	1	1	.78 ± .14
W	Hexachlorobenzene	42	42	-	84	247	25.4	44	80	14	7	.67 ± .35
C	Hexachlorobutadiene	-	1	-	1	46	2.1	1	100	-	-	.68

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
M	Hexachlorobutadiene	-	-	-	-	9	0	-	-	-	-	-
S	Hexachlorobutadiene	59	53	-	112	522	17.7	71	83	8	8	.56 ± .17
W	Hexachlorobutadiene	42	42	-	84	247	25.4	44	73	2	25	.39 ± .30
C	Hexachlorocyclopentadiene	-	1	-	1	46	2.1	1	100	-	-	-
M	Hexachlorocyclopentadiene	-	-	-	-	9	0	-	-	-	-	-
S	Hexachlorocyclopentadiene	56	53	-	109	522	17.3	70	100	-	-	-
W	Hexachlorocyclopentadiene	42	42	-	84	247	25.4	44	100	-	-	-
C	Hexachloroethane	-	1	-	1	46	2.1	1	100	-	-	-
M	Hexachloroethane	-	-	-	-	10	0	-	-	-	-	-
S	Hexachloroethane	56	53	-	109	522	17.3	70	79	4	17	.41 ± .09
W	Hexachloroethane	42	42	-	84	247	25.4	44	84	2	14	.41 ± .23
T	Hexane	-	1	1	2	2	50.0	2	100	-	-	1.00
C	2-Hexanone	-	1	-	1	62	1.6	1	-	-	100	.44
M	2-Hexanone	-	-	-	-	10	0	-	-	-	-	-
S	2-Hexanone	94	42	-	136	276	33.0	43	72	19	9	.74 ± .23
W	2-Hexanone	83	63	-	146	221	39.8	51	82	14	4	.80 ± .26
M	3-Hexen-2-one, 5-methyl	-	-	-	-	2	0	-	-	-	-	-
T	Hydrocarbon, Terpene	-	-	-	-	9	0	-	-	-	-	-
F	Hydrocarbons	-	-	-	-	3	0	-	-	-	-	-
M	Hydrocarbons	-	-	-	-	6	0	-	-	-	-	-
T	Hydrocarbons	-	-	-	-	3	0	-	-	-	-	-
M	Indene	-	-	-	-	1	0	-	-	-	-	-
C	Indeno[1,2,3-cd]pyrene	-	1	-	1	46	2.1	1	100	-	-	-
M	Indeno[1,2,3-cd]pyrene	-	-	-	-	9	0	-	-	-	-	-
S	Indeno[1,2,3-cd]pyrene	56	53	-	109	522	17.3	70	100	-	-	-
W	Indeno[1,2,3-cd]pyrene	42	42	-	84	247	25.4	44	100	-	-	-
C	Isophorone	-	1	-	1	46	2.1	1	100	-	-	-
M	Isophorone	-	-	-	-	9	0	-	-	-	-	-
S	Isophorone	56	53	-	109	522	17.3	70	100	-	-	.82 ± .15
W	Isophorone	42	42	-	84	247	25.4	44	100	-	-	.90 ± .14
C	Isopropylbenzene	-	1	-	1	62	1.6	1	100	-	-	-
M	Isopropylbenzene	-	-	-	-	10	0	-	-	-	-	-
S	Isopropylbenzene	94	42	-	136	276	33.0	43	100	-	-	.74
W	Isopropylbenzene	83	63	-	146	221	39.8	51	98	-	2	.48
C	4-Isopropyltoluene	-	1	-	1	62	1.6	1	100	-	-	-
M	4-Isopropyltoluene	-	-	-	-	10	0	-	-	-	-	-
S	4-Isopropyltoluene	94	42	-	136	276	33.0	43	100	-	-	-
W	4-Isopropyltoluene	83	63	-	146	221	39.8	51	98	-	2	.80
C	a-Limonene	-	-	-	-	1	0	-	-	-	-	-
M	a-Limonene	-	-	-	-	1	0	-	-	-	-	-
M	Methanamine, N-Methoxy-	-	-	-	-	1	0	-	-	-	-	-
M	Methane	-	-	-	-	6	0	-	-	-	-	-
T	Methoxyethane	-	-	-	-	1	0	-	-	-	-	-
W	1-ethoxy-1Methoxyethane	-	-	-	-	1	0	-	-	-	-	-
W	Methyl ether	-	-	-	-	1	0	-	-	-	-	-
C	Methyl iodide	-	1	-	1	62	1.6	1	100	-	-	-

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
M	Methyl iodide	-	-	-	-	10	0	-	-	-	-	-
S	Methyl iodide	94	42	-	136	276	33.0	43	100	-	-	-
W	Methyl iodide	83	63	-	146	221	39.8	51	100	-	-	-
T	Methyl methacrylate	-	-	-	-	1	0	-	-	-	-	-
M	2-Methyl-1-propene	-	-	-	-	2	0	-	-	-	-	-
C	4-Methyl-2-pentanone	-	1	-	1	62	1.6	1	-	100	-	.57
M	4-Methyl-2-pentanone	-	-	-	-	10	0	-	-	-	-	-
S	4-Methyl-2-pentanone	94	42	-	136	276	33.0	43	100	-	-	1.09 ± .27
W	4-Methyl-2-pentanone	83	63	-	146	221	39.8	51	98	-	2	1.07 ± .33
M	2-Methyl-2-propanol	-	-	-	-	1	0	-	-	-	-	-
C	2-Methyl-4,6-dinitrophenol	-	1	-	1	46	2.1	1	100	-	-	-
M	2-Methyl-4,6-dinitrophenol	-	-	-	-	9	0	-	-	-	-	-
S	2-Methyl-4,6-dinitrophenol	56	53	-	109	522	17.3	70	89	7	4	.55 ± .13
W	2-Methyl-4,6-dinitrophenol	42	42	-	84	247	25.4	44	98	2	-	.97 ± .47
C	Methylene chloride	-	1	-	1	62	1.6	1	100	-	-	.73
M	Methylene chloride	-	-	-	-	10	0	-	-	-	-	-
S	Methylene chloride	94	42	-	136	276	33.0	43	93	2	5	1.01 ± .31
T	Methylene chloride	-	5	-	5	37	11.9	5	100	-	-	.98 ± .14
W	Methylene chloride	83	63	-	146	221	39.8	56	98	-	2	.91 ± .17
C	2-Methylnaphthalene	-	1	-	1	46	2.1	1	100	-	-	-
M	2-Methylnaphthalene	-	-	-	-	10	0	-	-	-	-	-
M	1-Methylnaphthalene	-	-	-	-	1	0	-	-	-	-	-
S	2-Methylnaphthalene	56	53	-	109	522	17.3	70	100	-	-	-
W	2-Methylnaphthalene	42	42	-	84	247	25.4	44	100	-	-	-
C	4-Methylphenol	-	1	-	1	46	2.1	1	100	-	-	-
C	2-Methylphenol	-	1	-	1	46	2.1	1	100	-	-	.68
M	4-Methylphenol	-	-	-	-	9	0	-	-	-	-	-
M	2-Methylphenol	-	-	-	-	9	0	-	-	-	-	-
S	4-Methylphenol	56	53	-	109	522	17.3	70	99	-	1	-
S	2-Methylphenol	56	53	-	109	522	17.3	70	81	11	7	.56 ± .14
W	2-Methylphenol	42	42	-	84	247	25.4	44	82	9	9	.79 ± .77
W	4-Methylphenol	42	42	-	84	247	25.4	44	100	-	-	-
W	2-Methylpropanal	-	-	-	-	1	0	-	-	-	-	-
M	2-Methylsuccinic anhydride	-	-	-	-	1	0	-	-	-	-	-
F	Mineral oil	-	-	-	-	2	0	-	-	-	-	-
T	Mineral spirits	-	-	-	-	4	0	-	-	-	-	-
W	Morpholine	-	-	-	-	2	0	-	-	-	-	-
C	Naphthalene	-	1	-	1	46	2.1	1	100	-	-	-
M	Naphthalene	-	-	-	-	10	0	-	-	-	-	-
S	Naphthalene	61	53	-	114	522	17.9	71	90	7	3	.55 ± .09
T	Naphthalene	-	-	-	-	1	0	-	-	-	-	-
W	Naphthalene	43	42	-	85	247	25.6	45	93	2	4	.64 ± .30
C	4-Nitroaniline	-	1	-	1	46	2.1	1	100	-	-	-
C	2-Nitroaniline	-	1	-	1	46	2.1	1	100	-	-	-
C	3-Nitroaniline	-	1	-	1	46	2.1	1	-	-	100	-
M	2-Nitroaniline	-	-	-	-	9	0	-	-	-	-	-

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
M	4-Nitroaniline	-	-	-	-	9	0	-	-	-	-	-
M	3-Nitroaniline	-	-	-	-	9	0	-	-	-	-	-
S	4-Nitroaniline	56	53	-	109	522	17.3	70	100	-	-	-
S	2-Nitroaniline	56	53	-	109	522	17.3	70	96	3	1	.63 ± .10
S	3-Nitroaniline	56	53	-	109	522	17.3	70	81	6	13	.42 ± .11
W	3-Nitroaniline	42	42	-	84	247	25.4	44	84	7	9	.96 ± 1.12
W	4-Nitroaniline	42	42	-	84	247	25.4	44	100	-	-	-
W	2-Nitroaniline	42	42	-	84	247	25.4	44	95	-	5	.53 ± .21
C	Nitrobenzene	-	1	-	1	46	2.1	1	100	-	-	-
M	Nitrobenzene	-	-	-	-	9	0	-	-	-	-	-
S	Nitrobenzene	56	53	-	109	522	17.3	70	100	-	-	-
W	Nitrobenzene	42	42	-	84	247	25.4	44	100	-	-	-
M	Nitrogenous Hydrocarbon	-	-	-	-	3	0	-	-	-	-	-
S	Nitrogenous Hydrocarbon	-	-	-	-	3	0	-	-	-	-	-
C	4-Nitrophenol	-	1	-	1	56	1.8	1	100	-	-	-
C	2-Nitrophenol	-	1	-	1	46	2.1	1	100	-	-	.63
M	4-Nitrophenol	-	-	-	-	9	0	-	-	-	-	-
M	2-Nitrophenol	-	-	-	-	9	0	-	-	-	-	-
S	4-Nitrophenol	56	53	-	109	582	15.8	70	89	10	1	.59 ± .13
S	2-Nitrophenol	56	53	-	109	522	17.3	70	77	9	14	.50 ± .10
W	4-Nitrophenol	71	42	-	113	247	31.4	44	95	2	2	.68 ± .09
W	2-Nitrophenol	42	42	-	84	247	25.4	44	75	5	20	.60 ± .52
C	N-Nitrosodi-n-propylamine	-	1	-	1	56	1.8	1	100	-	-	-
M	N-Nitrosodi-n-propylamine	-	-	-	-	9	0	-	-	-	-	-
S	N-Nitrosodi-n-propylamine	56	53	-	109	582	15.8	70	100	-	-	-
W	N-Nitrosodi-n-propylamine	71	42	-	113	247	31.4	44	100	-	-	-
C	N-Nitrosodimethylamine	-	1	-	1	46	2.1	1	100	-	-	-
M	N-Nitrosodimethylamine	-	-	-	-	9	0	-	-	-	-	-
S	N-Nitrosodimethylamine	56	53	-	109	522	17.3	67	100	-	-	-
W	N-Nitrosodimethylamine	42	42	-	84	247	25.4	44	100	-	-	-
C	N-Nitrosodiphenylamine	-	1	-	1	46	2.1	1	100	-	-	-
M	N-Nitrosodiphenylamine	-	-	-	-	9	0	-	-	-	-	-
S	N-Nitrosodiphenylamine	56	53	-	109	522	17.3	70	99	1	-	.71 ± .11
W	N-Nitrosodiphenylamine	42	42	-	84	247	25.4	44	98	-	2	.72 ± .22
W	Octadecylamine	-	-	-	-	2	0	-	-	-	-	-
M	Oxidized Aliphatic Hydrocarbon	-	-	-	-	2	0	-	-	-	-	-
M	Oxygenated Hydrocarbon	-	-	-	-	5	0	-	-	-	-	-
S	Oxygenated Hydrocarbon	-	-	-	-	5	0	-	-	-	-	-
C	Pentachlorophenol	-	1	-	1	56	1.8	1	100	-	-	-
M	Pentachlorophenol	-	-	-	-	9	0	-	-	-	-	-
S	Pentachlorophenol	56	53	-	109	582	15.8	70	100	-	-	-
W	Pentachlorophenol	71	42	-	113	247	31.4	44	100	-	-	-
M	3-Pentene-2-one	-	-	-	-	1	0	-	-	-	-	-
S	Petroleum Hydrocarbons, Total	-	-	-	-	49	0	-	-	-	-	-
C	Phenanthrene	-	1	-	1	46	2.1	1	100	-	-	-
M	Phenanthrene	-	-	-	-	9	0	-	-	-	-	-

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
S	Phenanthrene	56	53	-	109	522	17.3	70	99	-	1	-
W	Phenanthrene	42	42	-	84	247	25.4	45	100	-	-	-
C	Phenol	-	1	-	1	56	1.8	1	100	-	-	-
M	Phenol	-	-	-	-	10	0	-	-	-	-	-
S	Phenol	56	53	-	109	582	15.8	70	94	3	3	.55 ± .09
W	Phenol	71	42	-	113	247	31.4	44	84	2	14	.82 ± .41
M	Phenol, 2,3',5',6-tetra-t-buty-4,4'-methylenedi-	-	-	-	-	1	0	-	-	-	-	-
F	Phosphate Esters	-	-	-	-	6	0	-	-	-	-	-
F	Phosphate Esters	-	-	-	-	6	0	-	-	-	-	-
T	Phosphate Esters	-	-	-	-	2	0	-	-	-	-	-
F	Phthalate ester	-	-	-	-	6	0	-	-	-	-	-
M	Phthalate ester	-	-	-	-	2	0	-	-	-	-	-
T	Phthalate ester	-	-	-	-	3	0	-	-	-	-	-
M	Phthalic anhydride	-	-	-	-	1	0	-	-	-	-	-
S	Phthalic anhydride	-	-	-	-	1	0	-	-	-	-	-
S	alpha-Pinene	-	-	-	-	1	0	-	-	-	-	-
M	1,2-Propanediol	-	-	-	-	2	0	-	-	-	-	-
T	2-Propanol	-	-	-	-	2	0	-	-	-	-	-
W	2-Propanol	-	-	-	-	2	0	-	-	-	-	-
C	Propylbenzene	-	1	-	1	62	1.6	1	100	-	-	-
M	Propylbenzene	-	-	-	-	10	0	-	-	-	-	-
S	Propylbenzene	94	42	-	136	276	33.0	43	98	-	2	.79 ± .37
W	Propylbenzene	83	63	-	146	221	39.8	51	98	-	2	.75 ± .08
C	Pyrene	-	1	-	1	56	1.8	1	100	-	-	-
M	Pyrene	-	-	-	-	9	0	-	-	-	-	-
S	Pyrene	56	53	-	109	582	15.8	70	99	1	-	.68 ± .07
W	Pyrene	71	42	-	113	247	31.4	44	82	14	5	.51 ± .09
C	Saturated Hydrocarbons	-	-	-	-	3	0	-	-	-	-	-
M	Saturated Hydrocarbons	-	-	-	-	34	0	-	-	-	-	-
S	Saturated Hydrocarbons	-	-	-	-	53	0	-	-	-	-	-
W	Saturated Hydrocarbons	-	-	-	-	2	0	-	-	-	-	-
W	Silicone oligomers	-	-	-	-	1	0	-	-	-	-	-
C	Styrene	-	1	-	1	62	1.6	1	100	-	-	-
M	Styrene	-	-	-	-	10	0	-	-	-	-	-
S	Styrene	94	42	-	136	276	33.0	43	100	-	-	.86 ± .11
W	Styrene	83	63	-	146	221	39.8	52	90	4	6	.62 ± .20
M	Terpene Hydrocarbons	-	-	-	-	1	0	-	-	-	-	-
S	Terpene Hydrocarbons	-	-	-	-	9	0	-	-	-	-	-
T	Terpene Hydrocarbons	-	-	-	-	20	0	-	-	-	-	-
C	1,1,1,2-Tetrachloroethane	-	1	-	1	62	1.6	1	100	-	-	-
C	1,1,2,2-Tetrachloroethane	-	1	-	1	62	1.6	1	100	-	-	-
M	1,1,2,2-Tetrachloroethane	-	-	-	-	10	0	-	-	-	-	-
M	1,1,1,2-Tetrachloroethane	-	-	-	-	10	0	-	-	-	-	-
S	1,1,1,2-Tetrachloroethane	94	42	-	136	276	33.0	43	100	-	-	-
S	1,1,2,2-Tetrachloroethane	94	42	-	136	276	33.0	43	100	-	-	-

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
W	1,1,1,2-Tetrachloroethane	83	63	-	146	221	39.8	51	100	-	-	1.12
W	1,1,2,2-Tetrachloroethane	83	63	-	146	221	39.8	51	100	-	-	-
C	Tetrachloroethylene	-	1	-	1	62	1.6	1	100	-	-	.79
M	Tetrachloroethylene	-	-	-	-	10	0	-	-	-	-	-
S	Tetrachloroethylene	94	42	-	136	276	33.0	43	98	-	2	.85 ± .38
T	Tetrachloroethylene	87	149	-	236	1331	15.1	148	97	3	1	11.81 ± 2.36
W	Tetrachloroethylene	83	63	-	146	221	39.8	57	95	5	-	.77 ± .22
S	Tetrahydrofuran	-	-	-	-	1	0	-	-	-	-	-
T	Thiophene	-	-	-	-	2	0	-	-	-	-	-
C	Toluene	-	1	-	1	71	1.4	1	100	-	-	-
M	Toluene	-	-	-	-	15	0	-	-	-	-	-
S	Toluene	94	42	-	136	324	29.6	43	100	-	-	1.05 ± .22
T	Toluene	87	149	-	236	1374	14.7	148	95	5	1	.92 ± .21
W	Toluene	83	63	-	146	287	33.7	56	98	2	-	.80 ± .13
F	Total organics, Identification	-	-	-	-	8	0	-	-	-	-	-
M	Total organics, Identification	-	-	-	-	13	0	-	-	-	-	-
T	Total organics, Identification	-	-	-	-	117	0	-	-	-	-	-
W	Total organics, Identification	-	-	-	-	1	0	-	-	-	-	-
W	Tribromoethene	-	-	-	-	2	0	-	-	-	-	-
C	1,1,2-Trichloro-1,2,2-trifluoroethane	-	1	-	1	62	1.6	1	100	-	-	-
M	1,1,2-Trichloro-1,2,2-trifluorethane	-	-	-	-	10	0	-	-	-	-	-
S	1,1,2-Trichloro-1,2,2-trifluorethane	94	42	-	136	276	33.0	43	100	-	-	-
T	1,1,2-Trichloro-1,2,2-trifluorethane	-	1	1	2	15	11.8	2	100	-	-	.94
W	1,1,2-Trichloro-1,2,2-trifluorethane	83	63	-	146	222	39.7	51	100	-	-	-
C	1,2,4-Trichlorobenzene	-	1	-	1	56	1.8	1	100	-	-	-
M	1,2,4-Trichlorobenzene	-	-	-	-	9	0	-	-	-	-	-
S	1,2,4-Trichlorobenzene	59	53	-	112	582	16.1	71	90	6	4	.58 ± .11
W	1,2,4-Trichlorobenzene	71	43	-	114	247	31.6	45	78	7	16	.47 ± .21
C	1,1,1-Trichloroethane	-	1	-	1	62	1.6	1	100	-	-	-
C	1,1,2-Trichloroethane	-	1	-	1	62	1.6	1	100	-	-	-
M	1,1,1-Trichloroethane	-	-	-	-	12	0	-	-	-	-	-
M	1,1,2-Trichloroethane	-	-	-	-	10	0	-	-	-	-	-
S	1,1,1-Trichloroethane	94	42	-	136	276	33.0	43	100	-	-	-
S	1,1,2-Trichloroethane	94	42	-	136	276	33.0	43	100	-	-	-
T	1,1,1-Trichloroethane	87	152	1	240	1382	14.8	152	95	4	1	.91 ± .25
W	1,1,1-Trichloroethane	83	63	-	146	221	39.8	57	98	-	2	.92 ± .11
W	1,1,2-Trichloroethane	83	63	-	146	221	39.8	51	100	-	-	.96
C	Trichloroethene	-	1	-	1	71	1.4	1	100	-	-	-
M	Trichloroethene	-	-	-	-	14	0	-	-	-	-	-
S	Trichloroethene	94	42	-	136	324	29.6	43	98	-	2	.85 ± .42
T	Trichloroethene	87	158	-	245	1338	15.5	156	97	3	-	.96 ± .19

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
W	Trichloroethene	83	63	-	146	287	33.7	57	98	2	-	.79 ± .12
C	Trichlorofluoromethane	-	1	-	1	62	1.6	1	100	-	-	-
M	Trichlorofluoromethane	-	-	-	-	16	0	-	-	-	-	-
S	Trichlorofluoromethane	94	42	-	136	276	33.0	43	100	-	-	-
T	Trichlorofluoromethane	-	-	-	-	2	0	-	-	-	-	-
W	Trichlorofluoromethane	83	63	-	146	221	39.8	51	100	-	-	1.03
C	2,4,6-Trichlorophenol	-	1	-	1	46	2.1	1	100	-	-	-
C	2,4,5-Trichlorophenol	-	1	-	1	46	2.1	1	100	-	-	-
M	2,4,6-Trichlorophenol	-	-	-	-	9	0	-	-	-	-	-
M	2,4,5-Trichlorophenol	-	-	-	-	9	0	-	-	-	-	-
S	2,4,6-Trichlorophenol	56	53	-	109	522	17.3	70	93	3	4	.71 ± .10
S	2,4,5-Trichlorophenol	56	53	-	109	522	17.3	70	97	-	3	-
W	2,4,6-Trichlorophenol	42	42	-	84	247	25.4	44	95	2	2	.80 ± .45
W	2,4,5-Trichlorophenol	42	42	-	84	247	25.4	44	98	-	2	-
C	1,2,3-Trichloropropane	-	1	-	1	62	1.6	1	100	-	-	-
M	1,2,3-Trichloropropane	-	-	-	-	10	0	-	-	-	-	-
S	1,2,3-Trichloropropane	94	42	-	136	276	33.0	43	98	2	-	1.21 ± .46
W	1,2,3-Trichloropropane	83	63	-	146	221	39.8	51	98	2	-	1.13 ± .31
C	1,2,4-Trimethylbenzene	-	1	-	1	62	1.6	1	100	-	-	-
C	1,3,5-Trimethylbenzene	-	1	-	1	62	1.6	1	100	-	-	-
M	1,2,4-Trimethylbenzene	-	-	-	-	10	0	-	-	-	-	-
M	1,3,5-Trimethylbenzene	-	-	-	-	10	0	-	-	-	-	-
S	1,3,5-Trimethylbenzene	94	42	-	136	276	33.0	43	100	-	-	-
S	1,2,4-Trimethylbenzene	94	42	-	136	276	33.0	43	98	-	2	-
T	1,2,4-Trimethylbenzene	87	142	-	229	1333	14.7	142	96	3	1	.81 ± .16
W	1,2,4-Trimethylbenzene	83	63	-	146	221	39.8	51	100	-	-	-
W	1,3,5-Trimethylbenzene	83	63	-	146	221	39.8	51	100	-	-	-
M	Trimethylbenzenes	-	-	-	-	1	0	-	-	-	-	-
T	Trimethylbenzenes	-	-	-	-	40	0	-	-	-	-	-
T	Trisulfide, Dimethyl	-	-	-	-	1	0	-	-	-	-	-
S	Tritetracontane	-	1	-	1	-	100.0	-	-	-	-	-
W	Triton x-100(nonionic surfactant)	-	-	-	-	4	0	-	-	-	-	-
M	Unknown Alcohol	-	-	-	-	5	0	-	-	-	-	-
S	Unknown Alcohol	-	-	-	-	17	0	-	-	-	-	-
W	Unknown Alcohol	-	-	-	-	2	0	-	-	-	-	-
M	Unknown Aldehydes	-	-	-	-	1	0	-	-	-	-	-
M	Unknown Ethers	-	-	-	-	2	0	-	-	-	-	-
S	Unknown Ketone	-	-	-	-	2	0	-	-	-	-	-
F	Unknown Phenolics	-	-	-	-	6	0	-	-	-	-	-
M	Unknown Phenolics	-	-	-	-	1	0	-	-	-	-	-
T	Unknown Phenolics	-	-	-	-	23	0	-	-	-	-	-
M	Unknown Polynuclear Aromatic Hydrocarbon	-	-	-	-	3	0	-	-	-	-	-
S	Unknown Polynuclear Aromatic Hydrocarbon	-	-	-	-	7	0	-	-	-	-	-

TABLE C-III (cont)

MATRIX	ANALYSIS	NO. BLANKS	NO. BLINDS	NO. OPENS	TOTAL NO. QCS	NO. SAMP.	% QC SAMP.	NO. QC WITH CV	UNDER CONTROL <2 SIGMA (%)	WARNING 2-3 SIGMA (%)	OUT OF CONTROL >3 SIGMA (%)	EM-9 CV RATIO ± SD
T	Unknown Sulfur compounds	-	-	-	-	1	0	-	-	-	-	-
M	Unknown alkanes	-	-	-	-	2	0	-	-	-	-	-
M	Unknown ester	-	-	-	-	5	0	-	-	-	-	-
T	Unknown ester	-	-	-	-	4	0	-	-	-	-	-
M	Unknown organic compound	-	-	-	-	10	0	-	-	-	-	-
S	Unknown organic compound	-	1	-	1	83	1.2	-	-	-	-	-
T	Unknown organic compound	-	2	-	2	45	4.3	-	-	-	-	-
W	Unknown organic compound	-	-	-	-	2	0	-	-	-	-	-
M	Unsaturated Hydrocarbons	-	-	-	-	2	0	-	-	-	-	-
S	Unsaturated Hydrocarbons	-	-	-	-	17	0	-	-	-	-	-
C	Vinyl acetate	-	1	-	1	62	1.6	1	100	-	-	.62
M	Vinyl acetate	-	-	-	-	10	0	-	-	-	-	-
S	Vinyl acetate	94	42	-	136	276	33.0	43	86	5	9	1.15 ± .42
W	Vinyl acetate	83	63	-	146	221	39.8	51	33	10	57	.52 ± .34
C	Vinyl chloride	-	1	-	1	62	1.6	1	100	-	-	-
M	Vinyl chloride	-	-	-	-	10	0	-	-	-	-	-
S	Vinyl chloride	94	42	-	136	276	33.0	43	100	-	-	-
W	Vinyl chloride	83	63	-	146	221	39.8	53	100	-	-	1.01
T	m-Xylene	-	-	-	-	12	0	-	-	-	-	-
T	p-Xylene	-	-	-	-	14	0	-	-	-	-	-
T	o-Xylene	25	41	-	66	331	16.6	40	100	-	-	.91 ± .12
C	Mixed-Xylenes (o + m + p)	-	1	-	1	62	1.6	1	100	-	-	-
M	Mixed-Xylenes (o + m + p)	-	-	-	-	11	0	-	-	-	-	-
S	Mixed-Xylenes (o + m + p)	94	42	-	136	276	33.0	43	91	-	9	-
T	Mixed-Xylenes (o + m + p)	87	140	-	227	1361	14.3	140	91	6	3	.83 ± .20
W	Mixed-Xylenes (o + m + p)	83	63	-	146	221	39.8	52	98	-	2	.95 ± .05

TABLE C-IV

SUMMARY OF FALSE POSITIVE/FALSE NEGATIVE RESULTS FOR EM-9 IN 1992

Biological Materials: Radiochemical Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Am-241	-	-	8	Pu-239	-	-	18
Cs-137	1	-	23	Sr-90	-	-	20
I-131	-	-	3	U	-	-	9
Pu-238	-	-	18				
Total:	1	-	99				

Bulk Materials: Inorganic Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Al	-	-	2	Flashpoint	-	-	5
Cu	-	-	2				
Total:	-	-	9				

Bulk Materials: Organic Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
mixed-Aroclor	-	-	159	Aroclor 1254	1	-	159
Aroclor 1242	2	1	159	Aroclor 1260	1	2	159
Total:	1	-	636				

Charcoal Tubes: Organic Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Acetone	-	-	1	Ethylbenzene	-	-	227
Acrolein	-	-	2	Formaldehyde	-	-	8
mixed-Aroclor	-	-	2	Hexane	-	-	2
Aroclor 1242	-	-	2	Methylene chloride	-	-	5
Aroclor 1254	-	-	2	Tetrachloroethylene	-	-	235
Aroclor 1260	-	-	2	Toluene	3	-	235
Benzene	1	-	238	1,1,2-Trichloro-1,2,2-trifluoroethane	-	-	2
Bromobenzene	3	-	227	1,1,1-Trichloroethane	-	-	239
Carbon tetrachloride	-	-	244	Trichloroethene	-	-	243
Chlorobenzene	3	-	227	1,2,4-Trimethylbenzene	-	-	229
Chloroform	-	-	237	o-Xylene	-	-	65
1,2-Dichloroethane	-	-	19	mixed-Xylenes (o + m + p)	-	-	227
Epichlorohydrin	-	-	2				
Ethanol	-	-	1				
Total:	10	0	2923				

TABLE C-IV (cont)

Fecal Materials: Radiochemical Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Pu-238	2	-	10	Pu-239	3	-	10
Total:	5	0	20				

Filter Materials: Inorganic Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Ag	-	-	4	Ni	-	-	22
As	-	-	3	P	-	-	7
Ba	-	-	8	Pb	-	2	190
Be	1	-	321	Se	-	-	2
Bi	-	-	2	Sn	-	-	2
Ca	-	-	2	Sr	-	-	2
Cd	-	-	46	Ta	-	-	2
Cr	-	-	33	Te	-	-	1
Cr(+6)	-	-	2	Tl	-	-	11
Cu	-	-	8	U	-	-	55
Fe	2	-	4	V	-	-	2
Hg	-	-	2	Y	-	-	2
Mg	-	-	2	Zn	-	-	20
Total:	3	2	755				

Filter Materials: Radiochemical Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Alpha	-	-	94	Cs-134	-	-	6
Am-241	-	-	17	Cs-137	-	-	13
Be-7	-	-	6	Mn-54	-	-	6
Beta	-	-	94	Pu-238	-	-	17
Ce-144	-	-	6	Pu-239	-	-	17
Co-57	-	-	6	Sr-90	-	-	13
Co-60	-	-	6				
Total:	-	-	301				

Filter Materials: Organic Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
mixed-Aroclor	-	-	65	Aroclor 1254	1	-	65
Aroclor 1242	-	-	65	Aroclor 1260	-	-	65
Total:	1	-	260				

TABLE C-IV (cont)

Silicate Materials: Inorganic Constituents

Analyte	False +	False -	Total QCs	Analtye	False +	False -	Total QCs
Ag	-	1	72	Li	-	1	64
Al	13	-	118	Lu	-	-	17
As	2	-	78	Mg	7	1	104
Au	-	-	17	Mn	2	-	98
B	-	-	15	Mo	-	-	78
Ba	5	3	121	Na	5	-	101
Be	-	-	99	Nd	-	-	17
Br	-	-	17	Ni	-	2	106
Ca	17	1	101	P	-	-	2
Cd	1	-	97	Pb	2	12	107
Ce	-	2	17	Rb	-	-	17
Cl	-	2	17	Sb	1	2	112
CN	-	-	1	Sc	-	-	17
Co	1	1	88	Se	-	-	71
Cr	4	-	118	Sm	-	-	17
Cs	-	-	17	Sn	-	-	2
Cu	5	4	90	Sr	3	5	87
Dy	-	-	17	Ta	-	-	17
Eu	-	-	17	Tb	2	1	17
Fe	16	-	115	Th	-	-	17
Ga	-	-	17	Ti	-	-	22
H_2O^- (unbound water)	-	-	10	Tl	1	2	95
Hf	-	-	17	U	-	-	490
Hg	-	-	45	V	3	-	100
I	-	-	17	W	-	-	17
In	-	-	17	Yb	-	-	17
K	-	-	101	Zn	10	4	99
La	-	-	17	Zr	-	-	17
Total:	100	44	3398				

Silicate Materials: Radiochemical Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Alpha	-	-	27	Sr-90	-	-	70
Am-241	-	-	62	Th-228	-	-	20
Beta	-	-	27	Th-230	-	-	20
Cs-137	-	-	59	Th-232	-	-	19
Gamma	-	3	38	U-234	-	-	23
H-3	16	-	112	U-235	-	-	23
K-40	-	-	7	U-235/238	-	-	42
Pu-238	-	-	105	U-238	-	-	23
Pu-239	1	-	103				
Total:	17	3	780				

TABLE C-IV (cont)

Silicate Materials: Organic Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Acenaphthene	-	-	149	Chloroform	-	-	137
Acenaphthylene	-	-	149	Chloromethane	1	-	137
Acetone	11	1	137	2-Chloronaphthalene	-	-	149
Acrolein	-	-	1	o-Chlorophenol	-	-	149
Acrylonitrile	-	-	1	4-Chlorophenylphenyl ether	-	-	149
Aldrin	-	-	22	o-Chlorotoluene	-	-	137
Aniline	-	10	132	p-Chlorotoluene	5	-	137
Anthracene	-	1	149	Chrysene	-	1	149
mixed-Aroclor	-	-	57	2,4-D	1	1	18
Aroclor 1016	-	-	2	p,p'-DDD	1	1	22
Aroclor 1221	-	-	2	p,p'-DDE	1	-	21
Aroclor 1232	-	-	2	p,p'-DDT	-	2	21
Aroclor 1242	-	-	57	Di-n-butyl phthalate	8	-	149
Aroclor 1248	-	-	2	Di-n-octyl phthalate	-	-	149
Aroclor 1254	-	-	57	Dibenzo[a,h]anthracene	-	-	149
Aroclor 1260	-	-	57	Dibenzofuran	-	-	149
Azobenzene	-	-	146	1,2-Dibromo-3-chloropropane	1	-	137
alpha-BHC	1	1	22	Dibromomethane	-	-	137
beta-BHC	1	-	21	o-Dichlorobenzene (1,2)	-	8	286
delta-BHC	1	-	22	m-Dichlorobenzene (1,3)	-	-	286
Benzene	-	-	137	p-Dichlorobenzene (1,4)	-	-	286
m-Benzidine	2	-	144	3,3'-Dichlorobenzidine	-	-	149
Benzo[a]anthracene	-	-	149	Dichlorodifluoromethane	-	-	137
Benzo[a]pyrene	-	-	149	1,1-Dichloroethane	-	-	137
Benzo[b]fluoranthene	-	-	149	1,2-Dichloroethane	-	-	137
Benzo[g,h,i]perylene	-	-	149	1,1-Dichloroethene	-	-	137
Benzo[k]fluoranthene	-	-	149	trans-1,2-Dichloroethene	-	-	137
Benzoic acid	9	11	149	cis-1,2-Dichloroethylene	-	-	137
Benzyl alcohol	-	-	149	2,4-Dichlorophenol	-	-	149
Bis(2-cholorethoxy)methane	-	-	149	2,4-Dichlorophenylacetic acid	1	-	2
Bis(2-chloroethyl)ether	-	-	149	1,2-Dichloropropane	-	-	137
Bis(2-chloroisopropyl)ether	-	-	145	1,3-Dichloropropane	-	1	137
Bis(2-ethylhexyl)phthalate	3	-	149	2,2-Dichloropropane	-	-	137
Bromobenzene	-	-	137	1,1-Dichloropropene	-	-	137
Bromochloromethane	-	1	137	cis-1,3-Dichloropropene	-	-	137
Bromodichloromethane	-	-	137	trans-1,3-Dichloropropene	-	-	137
Bromoform	-	-	137	Dieldrin	-	-	22
Bromomethane	-	-	137	Diethyl phthalate	3	-	151
4-Bromophenylphenyl ether	-	-	149	Dimethyl phthalate	-	-	149
2-Butanone	1	1	137	2,4-Dimethylphenol	-	1	149
Butyl benzyl phthalate	-	-	149	1,3-Dinitrobenzene	-	-	1
n-Butylbenzene	-	-	137	2,4-Dinitrophenol	2	6	149
sec-Butylbenzene	-	-	137	2,4-Dinitrotoluene	-	-	150
tert-Butylbenzene	-	-	137	2,6-Dinitrotoluene	-	-	143
Carbon disulfide	-	-	137	Endosulfan I	-	-	22
Carbon tetrachloride	-	-	137	Endosulfan II	-	-	22
Chlordane	-	-	11	Endosulfan sulfate	1	-	22
alpha-Chlordane	-	-	2	Endrin	1	2	21
gamma-Chlordane	-	-	2	Endrin ketone	-	-	2
4-Chloro-3-methylphenol	-	1	149	Ethylbenzene	-	1	137
4-Chloroaniline	1	13	149	Ethylene dibromide	-	-	137
Chlorobenzene	-	-	137	Fluoranthene	-	-	149
Chlorodibromomethane	-	-	137	Fluorene	-	-	149
Chloroethane	-	-	137	HMX	-	-	1

TABLE C-IV (cont)

Silicate Materials: Organic Constituents (cont)

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Heptachlor	-	-	22	Pentachlorophenol	-	-	149
Heptachlor epoxide	-	1	21	Phenanthrene	1	-	149
Hexachlorobenzene	-	-	149	Phenol	-	-	149
Hexachlorobutadiene	3	3	153	Propylbenzene	-	-	137
Hexachlorocyclopentadiene	-	-	149	Pyrene	-	-	149
Hexachloroethane	-	1	149	RDX	-	-	1
2-Hexanone	-	1	137	Stryene	-	-	137
Indeno[1,2,3-cd]pyrene	-	-	149	2,4,5-T	1	1	18
Isophorone	-	-	149	2,4,5-TP	1	1	18
Isopropylbenzene	-	-	137	1,1,1,2-Tetrachloroethane	-	-	137
4-Isopropyltoluene	-	-	137	1,1,2,2-Tetrachloroethane	-	-	137
Lindane	-	-	21	Tetrachloroethylene	-	-	137
Methoxychlor	-	3	22	Tetryl(methyl-2,4,6-trinitrophenylnitramine)	-	-	1
Methyl iodide	-	-	137	Toluene	1	-	137
4-Methyl-2-pentanone	-	-	137	Toxaphene	-	-	13
2-Methyl-4,6-dinitrophenol	1	1	149	1,1,2-Trichloro-1,2,2-trifluoroethane	1	-	137
Methylene chloride	-	-	137	1,2,3-Trichlorobenzene	-	-	1
2-Methylnaphthalene	-	-	149	1,2,4-Trichlorobenzene	3	-	153
2-Methylphenol	1	-	149	1,1,1-Trichloroethane	-	-	137
4-Methylphenol	1	-	149	1,1,2-Trichloroethane	-	-	137
Naphthalene	5	-	155	Trichloroethene	-	-	137
4-Nitro-ethylbenzene	1	-	1	Trichlorofluoromethane	-	-	137
2-Nitroaniline	-	1	149	2,4,5-Trichlorophenol	3	-	149
3-Nitroaniline	1	9	149	2,4,6-Trichlorophenol	-	3	149
4-Nitroaniline	-	-	149	1,2,3-Trichloropropane	-	-	137
Nitrobenzene	-	-	150	1,2,4-Trimethylbenzene	1	-	137
2-Nitrophenol	-	-	149	1,3,5-Trimethylbenzene	-	-	137
4-Nitrophenol	-	-	149	1,3,5-Trinitrobenzene	-	-	1
N-Nitrosodi-n-propylamine	-	-	149	2,4,6-Trinitrotoluene	-	-	1
N-Nitrosodimethylamine	-	-	143	Vinyl acetate	-	3	137
N-Nitrosodiphenylamine	-	-	149	Vinyl chloride	-	-	137
m-Nitrotoluene	-	-	1	mixed-Xylenes (o + m + p)	4	-	137
o-Nitrotoluene	-	-	1				
p-Nitrotoluene	-	-	1				
Total:	85	92	19433				

Sludge: Organic Constituents

Analyte	False +	False -	Total QCs	Analtye	False +	False -	Total QCs
Acenaphthene	-	-	1	Benzo[b]fluoranthene	-	-	1
Acenaphthylene	-	-	1	Benzo[g,h,i]perylene	-	-	1
Acetone	-	-	1	Benzo[k]fluoranthene	-	-	1
Aniline	-	-	1	Benzoic acid	1	-	1
Anthracene	-	-	1	Benzyl alcohol	-	-	1
Azobenzene	-	-	1	Bis(2-chloroethoxy)methane	-	-	1
Benzene	-	-	1	Bis(2-chloroethyl)ether	-	-	1
m-Benzidine	-	-	1	Bis(2-chloroisopropyl)ether	-	-	1
Benzo[a]anthracene	-	-	1	Bis(2-ethylhexyl)phthalate	-	-	1
Benzo[a]pyrene	-	-	1	Bromobenzene	-	-	1

TABLE C-IV (cont)

Sludge: Organic Constituents (cont)

Analyte	False +	False -	Total QCs	Analtye	False +	False -	Total QCs
Bromochloromethane	-	-	1	2,4-Dinitrotoluene	-	-	1
Bromodichloromethane	-	-	1	2,6-Dinitrotoluene	-	-	1
Bromoform	-	-	1	Ethylbenzene	-	-	1
Bromomethane	-	-	1	Ethylene dibromide	-	-	1
4-Bromophenylphenyl ether	-	-	1	Fluoranthene	-	-	1
2-Butanone	-	-	1	Fluorene	-	-	1
Butyl benzyl phthalate	-	-	1	Hexachlorobenzene	-	-	1
n-Butylbenzene	-	-	1	Hexachlorobutadiene	-	-	1
sec-Butylbenzene	-	-	1	Hexachlorocyclopentadiene	-	-	1
tert-Butylbenzene	-	-	1	Hexachloroethane	-	-	1
Carbon disulfide	-	-	1	2-Hexanone	-	-	1
Carbon tetrachloride	-	-	1	Indeno[1,2,3-cd]pyrene	-	-	1
4-Chloro-3-methylphenol	-	-	1	Isophorone	-	-	1
4-Chloroaniline	-	-	1	Isopropylbenzene	-	-	1
Chlorobenzene	-	-	1	4-Isopropyltoluene	-	-	1
Chlorodibromomethane	-	-	1	Methyl iodide	-	-	1
Chloroethane	-	-	1	4-Methyl-2-pentanone	-	-	1
Chloroform	-	-	1	2-Methyl-4,6-dinitrophenol	-	-	1
Chloromethane	-	-	1	Methylene chloride	-	-	1
2-Chloronaphthalene	-	-	1	2-Methylnaphthalene	-	-	1
o-Chlorophenol	-	-	1	2-Methylphenol	-	-	1
4-Chlorophenylphenyl ether	-	-	1	4-Methylphenol	-	-	1
o-Chlorotoluene	-	-	1	Naphthalene	-	-	1
p-Chlorotoluene	-	-	1	2-Nitroaniline	-	-	1
Chrysene	-	-	1	3-Nitroaniline	-	1	1
Di-n-butyl phthalate	-	-	1	4-Nitroaniline	-	-	1
Di-n-octyl phthalate	-	-	1	Nitrobenzene	-	-	1
Dibenzo[a,h]anthracene	-	-	1	2-Nitrophenol	-	-	1
Dibenzofuran	-	-	1	4-Nitrophenol	-	-	1
1,2-Dibromo-3-chloropropane	-	-	1	N-Nitrosodi-n-propylamine	-	-	1
Dibromomethane	-	-	1	N-Nitrosodimethylamine	-	-	1
o-Dichlorobenzene (1,2)	-	-	2	N-Nitrosodiphenylamine	-	-	1
m-Dichlorobenzene (1,3)	-	-	2	Pentachlorophenol	-	-	1
p-Dichlorobenzene (1,4)	-	-	2	Phenanthrene	-	-	1
3,3'-Dichlorobenzidine	-	-	1	Phenol	-	-	1
Dichlorodifluoromethane	-	-	1	Propylbenzene	-	-	1
1,1-Dichloroethane	-	-	1	Pyrene	-	-	1
1,2-Dichloroethane	-	-	1	Styrene	-	-	1
1,1-Dichloroethene	-	-	1	1,1,1,2-Tetrachloroethane	-	-	1
trans-1,2-Dichloroethene	-	-	1	1,1,2,2-Tetrachloroethane	-	-	1
cis-1,2-Dichloroethylene	-	-	1	Tetrachloroethylene	-	-	1
2,4-Dichlorophenol	-	-	1	Toluene	-	-	1
1,2-Dichloropropane	-	-	1	1,1,2-Trichloro-1,2,2-			
1,3-Dichloropropane	-	-	1	trifluoroethane	-	-	1
2,2-Dichloropropane	-	-	1	1,2,4-Trichlorobenzene	-	-	1
1,1-Dichloropropene	-	-	1	1,1,1-Trichloroethane	-	-	1
cis-1,3-Dichloropropene	-	-	1	1,1,2-Trichloroethane	-	-	1
trans-1,3-Dichloropropene	-	-	1	Trichloroethene	-	-	1
Diethyl phthalate	-	-	1	Trichlorofluoromethane	-	-	1
Dimethyl phthalate	-	-	1	2,4,5-Trichlorophenol	-	-	1
2,4-Dimethylphenol	-	-	1	2,4,6-Trichlorophenol	-	-	1
2.4-Dinitrophenol	-	-	1	1,2,3-Trichloropropane	-	-	1

TABLE C-IV (cont)

Sludge: Organic Constituents (cont)

Analyte	False +	False -	Total QCs	Analtye	False +	False -	Total QCs
1,2,4-Trimethylbenzene	-	-	1	Vinyl chloride	-	-	1
1,3,5-Trimethylbenzene	-	-	1	mixed-Xylenes (o + m + p)	-	-	1
Vinyl acetate	-	-	1				
Total:	1	1	131				

Urine: Inorganic Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Tl	-	-	12				
Total:	-	-	12				

Urine: Radiochemical Constituents

Analtye	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Am-241	-	-	6	U-234	1	-	127
H-3	1	-	236	U-235	-	-	127
Pu-238	-	-	175	U-238	-	3	127
Pu-239	5	-	175				
Total:	7	3	973				

Water: Inorganic Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Ag	-	1	468	Dy	-	-	3
Al	11	-	287	Er	-	-	3
As	2	2	415	Eu	-	-	3
Au	-	-	3	F	-	-	63
B	-	-	72	Fe	2	-	297
Ba	11	-	425	Ga	-	-	3
Be	3	1	432	Gd	-	-	3
Bi	-	-	3	Ge	-	-	3
Biological Oxygen Demand	-	-	10	Hardness	-	-	26
Ca	4	-	217	Hf	-	-	3
Cd	12	-	447	Hg	4	-	371
Ce	-	-	3	Ho	-	-	3
Cl	-	-	60	In	-	-	3
Cl_2 (Free)	-	-	12	Ir	-	-	3
CN	-	-	92	K	1	-	211
Co	-	-	271	La	-	-	3
Chemical Oxygen Demand	-	-	52	Li	1	-	143
Conductivity	-	-	63	Lu	-	-	3
Cr	1	3	475	Mg	3	-	252
Cs	-	-	3	Mn	1	1	260
Cu	-	-	344	Mo	-	-	216

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TABLE C-IV (cont)

Water: Inorganic Constituents (cont)

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Na	-	-	221	Sn	-	-	10
Nb	-	-	3	SO_4	-	-	73
Nd	-	-	3	Sr	-	-	188
NH_3-N (Ammonia Nitrogen)	-	-	39	Ta	-	-	3
Ni	1	-	409	Total Alkalinity	-	-	64
NO_2-N (Nitrite Nitrogen)	-	-	9	Tb	-	-	3
NO_3-N (Nitrate Nitrogen)	-	-	71	Total Dissolved Solids	-	-	63
Oil/Grease	-	-	21	Te	-	-	3
P	-	-	60	Th	-	-	3
Pb	3	-	524	Ti	-	-	9
Pd	-	-	3	Total Kjeldahl Nitrogen	-	-	1
pH	-	-	299	Tl	1	-	327
PO_4-P (Phosphate Phosphorous)	-	-	38	Tm	-	-	3
Pr	-	-	3	Total Suspended Solids	-	-	47
Pt	-	-	3	U	-	-	287
Rb	-	-	3	V	-	-	263
Rh	-	-	3	W	-	-	3
Ru	-	-	3	Y	-	-	3
Sb	2	1	270	Yb	-	-	3
Se	-	-	381	Zn	-	-	313
SiO2	-	-	44	Zr	1	-	3
Sm	-	-	3				
Total:	64	9	10114				

Water: Radiochemical Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Alpha	3	-	733	Mn-54	-	-	46
Am-241	1	-	99	Pu-238	-	-	62
Ba-133	-	-	9	Pu-239	-	-	53
Beta	7	-	728	Ra-226	-	-	21
Cd-109	-	-	1	Ru-106	-	-	9
Ce-139	-	-	1	Sn-113	-	-	1
Ce-144	-	-	6	Sr-85	-	-	1
Co-57	-	-	31	Sr-90	-	-	73
Co-60	-	-	62	U-234	-	-	24
Cs-134	-	3	21	U-235	-	-	23
Cs-137	-	2	104	U-235/238	-	-	102
Gamma	2	-	213	U-238	-	-	1
H-3	-	2	368	Y-88	-	-	2
Hg-203	-	-	1	Zn-65	-	-	9
Total:	13	7	2804				

TABLE C-IV (cont)

Water: Organic Constituents

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Acenaphthene	9	1	120	2,4-D	-	-	8
Acenaphthylene	1	-	91	p,p'-DDD	-	-	8
Acetone	5	4	137	p,p'-DDE	-	-	8
Aldrin	-	-	8	p,p'-DDT	-	-	8
Aniline	-	1	91	Di-n-butyl phthalate	-	1	91
Anthracene	-	4	91	Di-n-octyl phthalate	-	-	91
mixed-Aroclor	1	-	20	Dibenzo[a,h]anthracene	-	-	91
Aroclor 1242	1	2	20	Dibenzofuran	-	-	91
Aroclor 1248	-	-	2	1,2-Dibromo-3-chloropropane	1	1	139
Aroclor 1254	-	-	20	Dibromomethane	-	-	137
Aroclor 1260	-	-	20	o-Dichlorobenzene (1,2)	3	3	232
Azobenzene	-	-	91	m-Dichlorobenzene (1,3)	-	2	232
alpha-BHC	-	-	8	p-Dichlorobenzene (1,4)	13	1	261
beta-BHC	-	-	8	3,3'-Dichlorobenzidine	-	-	91
delta-BHC	-	-	8	Dichlorodifluoromethane	-	-	137
Benzene	-	1	141	1,1-Dichloroethane	-	-	137
m-Benzidine	-	-	91	1,2-Dichloroethane	-	-	142
Benzo[a]anthracene	-	3	91	1,1-Dichloroethene	-	1	137
Benzo[a]pyrene	-	-	91	trans-1,2-Dichloroethene	-	1	137
Benzo[b]fluoranthene	-	-	91	cis-1,2-Dichloroethylene	-	-	137
Benzo[g,h,i]perylene	-	-	91	2,4-Dichlorophenol	-	-	91
Benzo[k]fluoranthene	-	-	91	1,2-Dichloropropane	-	-	137
Benzoic acid	-	-	91	1,3-Dichloropropane	-	-	137
Benzyl alcohol	-	-	91	2,2-Dichloropropane	-	-	137
Bis(2-chloroethoxy)methane	-	-	91	1,1-Dichloropropene	-	-	137
Bis(2-chloroethyl)ether	-	-	91	cis-1,3-Dichloropropene	-	1	137
Bis(2-chloroisopropyl)ether	-	-	91	trans-1,3-Dichloropropene	1	-	137
Bis(2-ethylhexyl)phthalate	6	-	91	Dieldrin	-	-	8
Bromobenzene	-	-	137	Diethyl phthalate	-	2	91
Bromochloromethane	-	-	137	Dimethyl phthalate	-	-	91
Bromodichloromethane	-	1	142	2,4-Dimethylphenol	-	1	91
Bromoform	-	2	142	2,4-Dinitrophenol	-	6	91
Bromomethane	-	-	137	2,4-Dinitrotoluene	2	-	120
4-Bromophenylphenyl ether	-	-	91	2,6-Dintrotoluene	-	-	91
2-Butanone	-	4	137	Endosulfan I	-	-	8
Butyl benzyl phthalate	-	-	91	Endosulfan II	-	-	8
n-Butylbenzene	-	-	137	Endosulfan sulfate	-	-	8
sec-Butylbenzene	-	-	137	Endrin	-	-	8
tert-Butylbenzene	1	-	137	Ethylbenzene	-	-	140
Carbon disulfide	-	-	137	Ethylene dibromide	-	-	139
Carbon tetrachloride	-	2	142	Fluoranthene	-	-	91
Chlordane	-	-	4	Fluorene	-	1	92
4-Chloro-3-methylphenol	9	2	120	Heptachlor	-	-	8
4-Chloroaniline	-	1	91	Heptachlor epoxide	-	-	8
Chlorobenzene	-	-	142	Hexachlorobenzene	-	-	91
Chlorodibromomethane	-	1	142	Hexachlorobutadiene	-	3	91
Chloroethane	-	-	137	Hexachlorocyclopentadiene	-	-	91
Chloroform	-	-	142	Hexachloroethane	-	1	91
Chloromethane	-	-	137	2-Hexanone	-	1	137
2-Chloronaphthalene	-	-	91	Indeno[1,2,3-cd]pyrene	-	-	91
o-Chlorophenol	15	1	120	Isophorone	-	-	91
4-Chlorophenylphenyl ether	-	-	91	Isopropylbenzene	-	-	137
o-Chlorotoluene	-	-	137	4-Isopropyltoluene	-	1	137
p-Chlorotoluene	2	1	137	Lindane	-	-	8
Chrysene	-	3	91	Methoxychlor	-	-	8

TABLE C-IV (cont)

Water: Organic Constituents (cont)

Analyte	False +	False -	Total QCs	Analyte	False +	False -	Total QCs
Methyl iodide	-	-	137	2,4,5-T	-	-	8
4-Methyl-2-pentanone	-	1	137	2,4,5-TP	-	-	8
2-Methyl-4,6-dinitrophenol	-	1	91	1,1,1,2-Tetrachloroethane	-	-	137
Methylene chloride	-	1	142	1,1,2,2-Tetrachloroethane	-	-	137
2-Methylnaphthalene	-	-	91	Tetrachloroethylene	-	-	142
2-Methylphenol	-	-	91	Toluene	-	-	141
4-Methylphenol	-	-	91	Toxaphene	-	-	4
Naphthalene	1	1	93	1,1,2-Trichloro-1,2,2-			
2-Nitroaniline	-	1	91	trifluoroethane	-	-	137
3-Nitroaniline	-	2	91	1,2,4-Trichlorobenzene	12	2	121
4-Nitroaniline	-	-	91	1,1,1-Trichloroethane	4	-	142
Nitrobenzene	-	-	91	1,1,2-Trichloroethane	-	-	137
2-Nitrophenol	-	-	91	Trichloroethene	-	-	142
4-Nitrophenol	15	1	120	Trichlorofluoromethane	-	-	137
N-Nitrosodi-n-propylamine	10	-	120	2,4,5-Trichlorophenol	1	-	91
N-Nitrosodimethylamine	-	-	91	2,4,6-Trichlorophenol	1	1	91
N-Nitrosodiphenylamine	-	-	91	1,2,3-Trichloropropane	-	-	137
Pentachlorophenol	3	-	120	1,2,4-Trimethylbenzene	-	-	137
Phenanthrene	-	-	92	1,3,5-Trimethylbenzene	-	-	137
Phenol	21	-	120	Vinyl acetate	-	5	135
Propylbenzene	1	-	137	Vinyl chloride	-	-	138
Pyrene	4	-	120	mixed-Xylenes (o + m + p)	-	1	137
Styrene	-	1	137				
Total:	143	79	15420				

August 1994

[redacted]

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NATIONAL LABORATORY

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APPENDIX D

COMPUTER SOFTWARE

Typical Terminal Session for

QACHECK Computer Program

TYPICAL TERMINAL SESSION FOR QACHECK COMPUTER PROGRAM

```
Username:  USER
Password:  XXXXXXX

*********************************************************************
*********************************************************************


LIMS1_USER$ LIMS


EM-9 LIMS:    DATA ENTRY PROGRAM MENU

        A.      ENTER
        B.      MSCAN
        C.      ALL ORGANICS
        D.      QACHECK (does NOT write to SAMPLES)
        E.      QACHECK-WRITE (does write to SAMPLES)
        F.      TA50ENTER
        G.      SPIKES AND DUPLICATES (INORG. & RADIO)
        H.      FLUB
        I.      FLUB 50
        J.      PC-ENTER
        K.      BATCHNUMBER-CHECK

        Y.      RETURN TO MAIN LIMS MENU

        Z.      EXIT FROM LIMS.  RETURN TO YOUR USER PROMPT.

Enter the LETTER of your choice and <CR>, i.e.  A <CR>

E


Readying NINE different databases:  SAMPLES, CVS, CVD, REQUEST-ANALYSIS,
REQUEST-TECHNIQUE, REQUEST-ANALYST, PROGRAM-FUNDING, ORG, REQUEST-MATRIX


** USAGE NOTES **
OPEN QC samples only (00.xxxxx).  Nothing else will be checked here.
Batch number prompt occurs only once.  All samples must have same batch number.
```

```
Enter ANALYST initials you wish to assign to this work: EOZ
Enter # OF DIFFERENT QA MATERIALS TO BE CHECKED AT THIS SESSION: 3
Enter EM-9 OPEN QC SAMPLE NUMBER (00.xxxxx): 00.00533
Enter ANALYTICAL TECHNIQUE USED (UP TO 5 CHARACTERS): TCGS
Enter REQUEST NUMBER FOR THIS QA: 12779

** The BATCH number must be the same for all analyses on the same QA sample**

Enter BATCH NUMBER FOR THIS QA (ENTER A BLANK SPACE IF NO BATCH NUMBER):
Enter # OF ANALYSES OF THE SAME QA MATERIAL AND ANALYTICAL METHOD: 2
Enter ANALYSIS (UP TO 10 CHARACTERS): B
UNITS OF ENTRY MUST BE:   UG/G
Enter RESULT     : 30.0
Enter UNCERTAINTY (enter blank space if preceeding is DL): 1.0
************************************
Analysis    (A):  B
Result      (B):     30.0
Uncertainty (C):      1.0
Enter  are all entries above CORRECT [Y/N]?: Y
*********************************************
ANALYSIS UNDER CONTROL FOR 00.00533 B
*********************************************
```

```
Enter ANALYSIS (UP TO 10 CHARACTERS): B
UNITS OF ENTRY MUST BE:   UG/G
Enter RESULT     : 20.0
Enter UNCERTAINTY (enter blank space if preceeding is DL): 1.0
************************************
Analysis    (A):  B
Result      (B):     20.0
Uncertainty (C):      1.0
Enter  are all entries above CORRECT [Y/N]?: N
Enter Which lettered item do you wish to CHANGE?: B
Enter Revised result: 25.0
************************************
Analysis    (A):  B
Result      (B):     25.0
Uncertainty (C):      1.0
Enter  are all entries above CORRECT [Y/N]?: Y
*********************************************
ANALYSIS UNDER CONTROL FOR 00.00533 B
*********************************************
```

```
Enter EM-9 OPEN QC SAMPLE NUMBER (00.xxxxx): 00.00576
Enter ANALYTICAL TECHNIQUE USED (UP TO 5 CHARACTERS): ITNA
Enter REQUEST NUMBER FOR THIS QA: 12779

**The BATCH number must be the same for all analyses on the same QA sample**

Enter BATCH NUMBER FOR THIS QA (ENTER A BLANK SPACE IF NO BATCH NUMBER):
Enter # OF ANALYSES OF THE SAME QA MATERIAL AND ANALYTICAL METHOD: 2
Enter ANALYSIS (UP TO 10 CHARACTERS): AL
UNITS OF ENTRY MUST BE:   %
Enter RESULT      : 6.0
Enter UNCERTAINTY (enter blank space if preceeding is DL): .01
************************************
Analysis     (A):  AL
Result       (B):      6.0
Uncertainty (C):       0.01
Enter  are all entries above CORRECT [Y/N]?: Y
*********************************************
ANALYSIS UNDER CONTROL FOR 00.00576 AL
*********************************************
Enter ANALYSIS (UP TO 10 CHARACTERS): CA
UNITS OF ENTRY MUST BE:   UG/G
Enter RESULT      : 6000.0
Enter UNCERTAINTY (enter blank space if preceeding is DL): 100.0
************************************
Analysis     (A):  CA
Result       (B):   6000.0
Uncertainty (C):    100.0
Enter  are all entries above CORRECT [Y/N]?: Y
*********************************************
ANALYSIS OUT OF CONTROL FOR 00.00576 CA        **REPEAT SAMPLE BATCH
*********************************************


AGAIN? [Y/N]: N

EXIT FROM LIMS
```

Program QACHECK

```
!QACHECK2A.DTR
!*******************************
!
!  Written by E. S. Gladney
!             E. A. JONES
!       Feb. 1988
!
! Last Modification 13 APR 1991
!
!*******************************
! COMPARES USER INPUT VALUES FOR QAS WITH CVS DATABASE AND WRITES QA RECORDS
! TO SAMPLES DATABASE FOR SUBSEQUENT REPORTING; PERMITS THE ENTRY OF SEVERAL
! QA'S AND/OR SEVERAL ELEMENTS PER QA AND/OR SEVERAL REQUEST-NUMBERS PER QA
! WITH MINIMAL RETYPING OF COMMON INPUT PARAMETERS.  STATUS="X" USED TO
! DENOTE REUSE OF QA'S THAT DO NOT REPRESENT INDEPENDENT ANALYSES OF THAT QA
! SETS CUSTOMER-NUMBER = SAMPLE-NUMBER
!
! BATCH NUMBERING AND FIELD CHECKING ADDED 1/90, BATCH MUST BE SAME FOR ALL SAMPLES
!
DECLARE CHANGEITEM PIC X.
DECLARE ERRORCHECK PIC X.
DECLARE XOWNER PIC X(3).
DECLARE XBATCH PIC X(11).
DECLARE R USAGE REAL.
DECLARE XRES USAGE REAL
          EDIT_STRING ZZZZ9.9(4).
DECLARE XXRES USAGE REAL
          EDIT_STRING ZZZZ9.9(4).
DECLARE XUN  USAGE REAL
          EDIT_STRING ZZZZ9.9(4).
DECLARE XXUN  USAGE REAL
          EDIT_STRING ZZZZ9.9(4).
DECLARE XUNITS PIC X(10).
DECLARE XSN PIC X(8).
DECLARE XANAL PIC X(10).
DECLARE CVRES USAGE REAL.
DECLARE CVUNC USAGE REAL.
DECLARE NOW USAGE DATE.
DECLARE QUALITY PIC X(20).
DECLARE XRN PIC X(5).
DECLARE XTECH PIC X(5).
DECLARE XMAT PIC X(3).
DECLARE XSYM PIC X(1).
DECLARE XANALYST PIC X(3).
DECLARE A PIC X(2).
DECLARE B PIC X(1).
DECLARE Y PIC X(3).
DECLARE Z PIC X(3).
DECLARE COUNT1 PIC X(4).
DECLARE COUNT2 PIC X.
DECLARE XPN PIC X(4).
SET ABORT
!
PRINT " "
```

```
PRINT "Readying NINE different databases"
PRINT " "
READY SAMPLES SHARED WRITE;
PRINT "SAMPLES ready"
READY CVS SHARED READ;
PRINT "CVS ready"
READY CVD SHARED READ;
print "CVD ready"
READY REQUEST_ANALYSIS SHARED
print "REQUEST-ANALYSIS ready"
READY REQUEST_TECHNIQUE SHARED
print "REQUEST-TECHNIQUE ready"
READY REQUEST_ANALYST SHARED
print "REQUEST-ANALYST ready"
READY PROGRAM_FUNDING SHARED
print "PROGRAM-FUNDING ready"
READY ORGS SHARED
print "ORGS ready"
READY REQUEST_MATRIX SHARED
print "REQUEST-MATRIX ready"
PRINT " "
PRINT " "
PRINT "QACHECK2A    -    write data to SAMPLES database"
PRINT " "
PRINT " "
PRINT "  ****** USAGE NOTES *******"
PRINT " "
PRINT "   OPEN QC samples only (00.xxxxx)!  Nothing else may be checked here."
PRINT "   Batch number prompt occurs only once.  All samples must have same batch"
PRINT " "
      XANALYST=*."ANALYST initials you wish to assign to this work"
      COUNT1 = COUNT OF REQUEST_ANALYST WITH ANALYST_CODE = XANALYST
      WHILE (COUNT1 LT 1) BEGIN
        PRINT " "
        PRINT "Your proposed ANALYST is not among our acceptable entries,"
        PRINT "Please check your entry and try again."
        PRINT " "
        XANALYST = *."Revised ANALYST"
        COUNT1 = COUNT OF REQUEST_ANALYST WITH ANALYST_CODE = XANALYST
      END ! while count1
 PRINT ""
 Y =*."# OF DIFFERENT QA MATERIALS TO BE CHECKED AT THIS SESSION"
 PRINT " "
 REPEAT Y BEGIN
   XSN=*."HSE-9 OPEN QC SAMPLE NUMBER (00.xxxxx)"
 !
 ! SN range check added 8/90 to enable only open QC data entry
 !
   REPEAT 2 BEGIN
     PRINT " "
     IF XSN NOT BETWEEN "00.00001" AND "00.99999" THEN BEGIN
       PRINT ""
       PRINT "Your proposed QC sample number is outside the normal range for open QC's"
       PRINT ""
```

```
      XSN=*."HSE-9 OPEN QC SAMPLE NUMBER (00.xxxxx)"
    END ! if xsn
  END ! repeat 2
  IF XSN NOT BETWEEN "00.00001" AND "00.99999" THEN ABORT "INVALID QC SAMPLE NUMBERS"
  COUNT1 = COUNT OF CVS WITH SN=XSN
  PRINT " "
  IF (COUNT1 NE 0) THEN BEGIN
    XMAT = SAMPLE_TYPE FROM CVD WITH SN=XSN
  END ! IF COUNT1 NE 0
  IF (COUNT1 = 0) THEN BEGIN
    PRINT "*****************************************************************"
    PRINT "THIS QA NUMBER NOT IN OUR QA DATABASE, SO YOU WILL BE ASKED TO"
    PRINT "SOME ADDITIONAL DATA ABOUT THIS MATERIAL"
    PRINT "*****************************************************************"
    PRINT " "
    XMAT = *."MATRIX type of this QA (1 character, only)"
    COUNT1 = COUNT OF REQUEST_MATRIX WITH MC = XMAT
    WHILE (COUNT1 LT 1) BEGIN
      PRINT " "
      PRINT "Your proposed MATRIX is not among our acceptable entries,"
      PRINT "Please check your entry and try again."
      PRINT " "
      XMAT = *."Revised MATRIX"
      COUNT1 = COUNT OF REQUEST_MATRIX WITH MC = XMAT
    END ! while count1
  END ! IF COUNT1=0
  PRINT " "
  XTECH=*."ANALYTICAL TECHNIQUE USED (UP TO 5 CHARACTERS)"
  COUNT1 = COUNT OF REQUEST_TECHNIQUE WITH CT = XTECH
  WHILE (COUNT1 LT 1) BEGIN
    PRINT " "
    PRINT "Your proposed TECHNIQUE is not among our acceptable entries,"
    PRINT "Please check your entry and try again."
    PRINT " "
    XTECH = *."Revised TECHNIQUE"
    COUNT1 = COUNT OF REQUEST_TECHNIQUE WITH CT = XTECH
  END ! while count1
  PRINT " "
  XRN=*."REQUEST NUMBER FOR THIS QA"
  COUNT1 = COUNT OF FIRST 1 SAMPLES WITH RN=XRN
  WHILE COUNT1 LT 1 BEGIN
    PRINT ""
    PRINT "*******************************************************"
    PRINT "The Request Number you selected is not a valid request"
    PRINT "  You may not enter QC data on this request number"
    PRINT ""
    PRINT "You may select another request number or EXIT from QACHECK"
    PRINT ""
    XRN = *."New Request Number or EXIT"
    WHILE XRN GT "A" AND XRN NE "EXIT" XRN = *."Try again: New Request Number or EXIT"
    IF XRN = "EXIT" THEN ABORT
    COUNT1 = COUNT OF FIRST 1 SAMPLES WITH RN=XRN
  END ! while count 1
  XPN = PN FROM FIRST 1 SAMPLES WITH RN=XRN AND PN NE ""
```

```
PRINT " "
PRINT " "
PRINT " The BATCH number must be the same for all analyses on the same QA sample"
PRINT ""
XBATCH = *."BATCH NUMBER FOR THIS QA (ENTER A BLANK SPACE IF NO BATCH NUMBER)"
PRINT " "
Z = *."# OF ANALYSES OF THE SAME QA MATERIAL AND ANALYTICAL METHOD"
REPEAT Z BEGIN
  PRINT " "
  :QACHECK2-ANALYSIS
  COUNT1 = COUNT OF CVS WITH SN=XSN AND CVN=XANAL
  IF (COUNT1=0) THEN BEGIN
    PRINT " "
    PRINT "NO DATA AVAILABLE FOR "|||XSN|||XANAL
    PRINT " "
    QUALITY="NO DATA AVAIL."
    XRES=*."RESULT      "
    XUN=*."UNCERTAINTY (enter blank space if preceeding is DL)"
    XUNITS=*."UNITS"
    NOW="TODAY";
  END | IF COUNT1=0 BEGIN
  IF (COUNT1 NE 0) THEN BEGIN
      XUNITS=CV_UNITS FROM CVS WITH SN=XSN AND CVN=XANAL
      PRINT " "
      PRINT "UNITS OF ENTRY MUST BE:  ",XUNITS(-)
      PRINT " "
      XRES=*."RESULT      "
      XUN= *."UNCERTAINTY (enter blank space if preceeding is DL)"
      PRINT " "
      ERRORCHECK = "N"
    WHILE (ERRORCHECK = "N") BEGIN
      PRINT "************************************"
      PRINT ""
      PRINT "Analysis    (A): ",XANAL(-)
      PRINT "Result      (B): ",XRES(-)
      PRINT "Uncertainty (C): ",XUN(-)
      PRINT ""
      print ""
      ERRORCHECK = *." are all entries above CORRECT [Y/N]?"
      WHILE ERRORCHECK NE "Y","N" ERRORCHECK = *."Y or N, please"
      IF (ERRORCHECK = "N") THEN BEGIN
        CHANGEITEM = *."Which lettered item do you wish to CHANGE?"
        IF (CHANGEITEM = "A") THEN BEGIN
          PRINT " "
          PRINT "Since you need to change the analysis you will be asked to re-enter"
          PRINT "  both the RESULT and UNCERTAINTY, in case the new ANALYSIS"
          PRINT "  needs different units than the original one."
          print " "
          :QACHECK2-ANALYSIS
          XUNITS=CV_UNITS FROM CVS WITH SN=XSN AND CVN=XANAL
          PRINT " "
          PRINT "UNITS OF ENTRY MUST BE:  ",XUNITS(-)
          PRINT " "
```

```
            XRES=*."RESULT      "
            XUN= *."UNCERTAINTY (enter blank space if preceeding is DL)"
            PRINT " "
          END ! if changeitem = a
          IF (CHANGEITEM = "B") THEN BEGIN
            XRES = *."Revised result"
          END ! if changeitem = b
          IF (CHANGEITEM = "C") THEN BEGIN
            XUN = *."Revised uncertainty"
          END ! if changeitem = c
        END ! if errorcheck = n
      END ! while errorcheck
      CVRES=CV FROM CVS WITH SN=XSN AND CVN=XANAL
      CVUNC=CVU FROM CVS WITH SN=XSN AND CVN=XANAL
      IF (CVUNC LT 0.0001) THEN CVUNC = 0.1*CVRES
      NOW="TODAY";
!
! swap res and un for calculation purposes if this is a detection limit
!  i.e. xun = 0
!
      IF (XUN GT 0) THEN XXRES=XRES ELSE XXRES = XUN
      IF (XUN GT 0) THEN XXUN = XUN ELSE XXUN = XRES
      R=(FN$ABS(XXRES - CVRES))/(FN$SQRT(XXUN*XXUN + CVUNC*CVUNC))
      IF (R LT 2) THEN BEGIN
        PRINT " "
        PRINT "*********************************************"
        PRINT "ANALYSIS UNDER CONTROL FOR "|||XSN|||XANAL;.
        PRINT "*********************************************"
        PRINT " "
        QUALITY="UNDER CONTROL"
      END ! IF R LT 1 BEGIN
      IF ((R GE 2) AND (R LE 3)) THEN BEGIN
        PRINT " "
        PRINT "*********************************************************"
        PRINT "WARNING-ANALYSIS IN 2-3 SIGMA REGION FOR "|||XSN|||XANAL;
        PRINT "*********************************************************"
        PRINT " "
        QUALITY="WARNING 2-3 SIGMA"
      END ! IF R GE 2 AND LE 3 BEGIN
      IF (R GT 3) THEN BEGIN
        PRINT " "
        PRINT "*********************************************"
        PRINT "ANALYSIS OUT OF CONTROL FOR "|||XSN|||XANAL|"**REPEAT SAMPLE BATCH"
        PRINT "*********************************************"
        PRINT " "
        QUALITY="OUT OF CONTROL"
      END ! IF R GT 3 BEGIN
    END ! IF COUNT1 NE 0 BEGIN
    IF (XUN GT 0) THEN XSYM=" " ELSE XSYM="<"
    STORE SAMPLES USING BEGIN
      SN=XSN;
      CN=XSN
      ANALYSIS=XANAL;
      MATRIX=XMAT
```

```
        BATCH = XBATCH
        PN = XPN
        TECHNIQUE=XTECH
        SYMBOL=XSYM
        RESULT=XRES;
        UNCERTAINTY=XUN;
        UNITS=XUNITS;
        COMMENT=QUALITY
        RN=XRN
        CD=NOW;
        ANALYST=XANALYST
        STATUS = "T"
      END ! store SAMPLES
    END !repeat z
  END !repeat y
  FINISH CVS;
  FINISH CVD;
  FINISH SAMPLES;
  EXIT
```

LIMS Menus

TABLE D-I

MAIN MENU FROM EM-9 LIMS

EM-9 LABORATORY INFORMATION MANAGEMENT SYSTEM (LIMS)

EM-9 LIMS: MAIN MENU: (6/10/92)

X. SAMPLE MANAGEMENT

A. DATA REDUCTION PROGRAMS

B. DATA ENTRY PROGRAMS

C. DATA REPORTING PROGRAMS

D. MISCELLANEOUS (NONE OF THE ABOVE)

E. QA SECTION MAINTENANCE

F. RECORDS MANAGEMENT

G. LIMS MAINTENANCE

H. TIMESHEETS AND GROUP FINANCIAL MANAGEMENT

Z. EXIT FROM LIMS AND RETURN TO USER PROMPT

ENTER THE LETTER OF YOUR CHOICE AND <CR>, I.E. A <CR>

TABLE D-II

ANALYTICAL SERVICE AGREEMENT AND SAMPLE RECEIVING MENU
CALLED BY EM-9 LIMS MAIN MENU

EM-9 LIMS: SAMPLE MANAGEMENT MENU

A. ANALYTICAL AGREEMENT FORM
B. STORE-CUSTOMER, S-C-BARCODE and FIND-CN2
C. DISCREPANCY REPORT TEXT ENTRY
D. CUSTODY FORM TRACKING
E. SAMPLES RECEIVED
F. PRINT PREVIOUS REQUEST FORM
G. ADD SN TO EXISTING REQUEST

H. REQUEST-NUMBER PRIORITY SYSTEM
I. LABEL
J. WASTE DISPOSAL
K. ADD NEW PROGRAM CODE TO PROGRAM-FUNDING
L. REPORT ON SAMPLES-RECEIVED BY RECEIVER & PROG. CODE
M. UPDATE ANALYSIS COST AND/OR ISSUE NEW BILL
N. REACTIVATE PREVIOUSLY ARCHIVED ANALYTICAL AGREEMENTS

Y. RETURN TO MAIN MENU

Z. EXIT FROM LIMS. RETURN TO YOUR USER PROMPT.

ENTER THE LETTER OF YOUR CHOICE AND <CR>, I.E. A <CR>

TABLE D-III

DATA REDUCTION MENU CALLED BY EM-9 LIMS MAIN MENU

EM-9 LIMS: DATA REDUCTION PROGRAM MENU

A. REDUCE (ALPHA, BETA, H-3, SR-90, GAMMA)

B. GAMS (GAMMA-RAY SPECTROMETRY)
C. NGAM (GAMMA-RAY SPECTROMETRY, AUTO MOD OF SAMPLES)
D. EGAMS (GAMMA-RAY SPECTROMETRY, AUTO DATA ENTRY)

E. GSCAN
F. EFF
G. LSC
H. RAD. SCREENING

I. AA
J. AAS

Y. RETURN TO MAIN LIMS MENU

Z. EXIT FROM LIMS AND RETURN TO USER PROMPT

ENTER THE LETTER OF YOUR CHOICE AND <CR>, I.E. A <CR>

TABLE D-IV

DATA ENTRY MENU CALLED BY EM-9 LIMS MAIN MENU

EM-9 LIMS: DATA ENTRY PROGRAM MENU

A. ENTER
B. MSCAN
C. ALL ORGANICS
D. QACHECK (DOES NOT WRITE TO SAMPLES)
E. QACHECK-WRITE (WRITES TO SAMPLES)
F. TA50ENTER
G. SPIKES AND DUPLICATES (INORG & RADIO)
H. FLUB
I. FLUB 50
J. PC-ENTER
K. BATCHNUMBER-CHECK

Y. RETURN TO MAIN LIMS MENU

Z. EXIT FROM LIMS AND RETURN TO USER PROMPT

ENTER THE LETTER OF YOUR CHOICE AND <CR>, I.E. A <CR>

TABLE D-V

REPORT WRITING MENU CALLED BY EM-9 LIMS MAIN MENU

EM-9 LIMS: REPORT WRITING PROGRAMS

A. PRELIMINARY REPORT

B. FINAL REPORT FOR INORGANICS, ORGANICS, MSCAN

C. REPORT HSE-7 DATA ELECTRONICALLY

D. EM-8 POREGAS SUMMARY REPORT

Y. RETURN TO MAIN LIMS MENU

Z. EXIT FROM LIMS AND RETURN TO USER PROMPT

ENTER THE LETTER OF YOUR CHOICE AND <CR>, I.E. A <CR>

TABLE D-VI

MISCELLANEOUS MENU CALLED BY EM-9 LIMS MAIN MENU

EM-9 LIMS: MISCELLANEOUS MENU

A. MEAN
B. STDDEV (STANDARD DEVIATION)
C. ALLDATA-SEARCH (ARCHIVE-SEARCH)
D. QA-HELP
E. G. BROOKS FIX
F. EM-8 GROUP SOFTWARE
G. LINREG (LINEAR REGRESSION)
H. POLY (POLYNOMINAL FITTING)
I. LSQ (LEAST SQUARES FITTING)

Y. RETURN TO MAIN LIMS MENU

Z. EXIT FROM LIMS AND RETURN TO USER PROMPT

ENTER THE LETTER OF YOUR CHOICE AND <CR>, I.E. A <CR>

TABLE D-VII

QA SECTION MAINTENANCE MENU CALLED BY EM-9 LIMS MAIN MENU

EM-9 LIMS: QA SECTION MAINTENANCE MENU

A. SUBMIT
B. TRANS (ARCHIVING OF FORMAL REPORTS)
C. CORRECTIVE ACTIONS: ADD, CHANGE, ARCHIVE
D. NOT-RUN
E. TRAINING REPORT - GROUP WIDE
F. QASECTION-REPORT
G. BIOASSAY ISOTOPIC URANIUM IN URINE SPIKE TABLES
H. CVS-STORE ROUTINES
I. ANALYST PROFICIENCY
J. AUDITS-INTERNAL AUTOMATED
K. SURROGATE CHART PLOTS
L. PERIODIC REPORTS - RESTART BATCH FOR AUTO MODE
M. CALIBRATION-SCHEDULE FOR BALANCES, WEIGHTS, THERMOMETERS
N. ARCHIVE COMPLETED GSCAN REQUESTS

Y. RETURN TO MAIN LIMS MENU

Z. EXIT FROM LIMS AND RETURN TO USER PROMPT

ENTER THE LETTER OF YOUR CHOICE AND <CR>, I.E. A <CR>

TABLE D-VIII

RECORDS MANAGEMENT MENU CALLED BY EM-9 LIMS MAIN MENU

EM-9 LIMS: RECORDS MANAGEMENT MENU

A. ORGANIC SAMPLE TRACKING

C. BIOASSAY PROGRAM RECORDS
D. DATABASE LISTINGS
E.G. ORGS, OWNER, ANALYST, ANALYSIS, ETC.

E. ARCHIVE-SEARCH (ALLDATA-SEARCH)
F. GENERATE CUSTOMER LIST
G. CHEMICAL INVENTORY
H. ANALYST REASSIGNMENT-INORGANIC SECTION
I. DISPLAY SAMPLE COLLECTION DATES
J. FINALREPORT DISPATCH LOG

Y. RETURN TO MAIN LIMS MENU

Z. EXIT FROM LIMS AND RETURN TO USER PROMPT

ENTER THE LETTER OF YOUR CHOICE AND <CR>, I.E. A <CR>

TABLE D-IX

LIMS MAINTENANCE MENU CALLED BY EM-9 LIMS MAIN MENU

EM-9 LIMS: LIMS MAINTENANCE MENU

A. PROGRAM CODE UPDATES

B. ORGANIC SECTION STATUS REPORT

C. COMPWORK OR WORKCOMPLETED

E. BAD QC VERIFICATION - UPDATE SPECIAL CODES

F. LISTING OF SOFTWARE REQUIRING ANNUAL UPDATE

G. MANUAL ARCHIVING OF ANALYTICAL AGREEMENTS

Y. RETURN TO MAIN LIMS MENU

Z. EXIT FROM LIMS AND RETURN TO USER PROMPT

ENTER THE LETTER OF YOUR CHOICE AND <CR>, I.E. A <CR>

TABLE D-X

FINANCIAL MANAGEMENT MENU CALLED BY EM-9 LIMS MAIN MENU

EM-9 LIMS: FINANCIAL MANAGEMENT SYSTEM (FMS)

A. ANALYST TIMESHEETS

B. PROGRAM CODES

C. ALLOCATIONS

D. FTE

E. EXTERNAL PURCHASE ORDERS

F. TRAVEL

G. VWR ORDERS

Z. EXIT FROM LIMS. RETURN TO YOUR USER PROMPT.

TABLE D-XI

ORGANIC SECTION DATA ENTRY MENU CALLED BY EM-9 DATA ENTRY MENU

EM-9 LIMS: ORGANIC SECTION DATA ENTRY MENU

A. VOLATILE DATA ENTRY (SAMPLES, DUPS, BLANKS, AND SPIKES)

B. SEMIVOLATILES

C. PCB'S (SPREAD SHEET VERSION)

D. HERBICIDES

E. PHENOLS

F. PESTICIDES

G. POREGAS

H. INDUSTIRAL HYGIENE (ANALYSIS = 04, 07, AND/OR BREATH-AIR))
I. TENTITIVELY IDENTIFIED COMPOUNDS (TIC)
J. PCB'S (OLD DTR VERSION)

K. HIGH EXPLOSIVES

Y. RETURN TO MAIN LIMS MENU

ENTER THE LETTER OF YOUR CHOICE AND <CR>, I.E. A <CR>

Examples of Analytical Reports

REPORT NUMBER: 20119

********** EM-9 ANALYTICAL REPORT **********

Prepared by: BATES on 14-Aug-1992

ANALYSIS: SR-90 REQUEST NUMBER: 11321 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WA52

OWNER: Max Maes GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0817

ANALYTICAL TECHNIQUE: PC ANALYTICAL PROCEDURE :

CUSTOMER NUM	SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
DP@DPS-1	92.14395	0.26	0.17	PCI/G	8/07/92	
LA@TOTAVI	92.14396	0.12	0.16	PCI/G	8/07/92	
LA@OTOWI	92.14397	0.39	0.27	PCI/G	8/07/92	

********** EM-9 QUALITY ASSURANCE REPORT *********

Prepared by: BATES on 14-Aug-1992

ANALYSIS: SR-90 REQUEST NUMBER: 11321 MATRIX: SS ANALYST: Richard Peters PROGRAM CODE: WA52

OWNER: Max Maes GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0817

There were no open (non-blind) Quality Control materials run with the samples reported above for one of the following reasons:

____ Only qualitative data requested

____ Only Blind QC samples run with this sample batch.

____ No QC samples run with this sample batch.

____ No QC samples for this constituent and matrix type available within EM-9

SUMMARY OF CONTROL STATUS OF BLIND QA SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT
92.14411	5.22	0.32	PCI/G	5.6	0.6	8/14/92	UNDER CONTROL

Analyst	Reviewer	Section Leader	QA Officer
Date	Date	Date	Date

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in "Quality Assurance for Health and Environmental Chemistry: 1991," LA-12436-MS, pp. 21-22.

REPORT NUMBER: 20120

********** EM-9 ANALYTICAL REPORT **********

Prepared by: CB on 14-Aug-1992

REQUEST NUMBER: 10612 MATRIX: W ANALYST: Janet Morgan PROGRAM CODE: M211

OWNER: Richard Romero GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-2212

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
92.00051 RR	92.16095	BA	0.01	0.003	MG/L	8/14/92	3010
92.00051 RR	92.16095	CD	< 0.08		MG/L	8/14/92	3010
92.00051 RR	92.16095	CR	< 0.1		MG/L	8/14/92	3010
92.00052 RR	92.16096	BA	0.07	0.007	MG/L	8/14/92	3010
92.00052 RR	92.16096	CD	< 0.08		MG/L	8/14/92	3010
92.00052 RR	92.16096	CR	< 0.1		MG/L	8/14/92	3010

********** EM-9 QUALITY ASSURANCE REPORT *********

Prepared by: CB on 14-Aug-1992

REQUEST NUMBER: 10612 MATRIX: W ANALYST: Janet Morgan PROGRAM CODE: M211

OWNER: Richard Romero GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-2212

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCER	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCER	COMPLETION DATE	COMMENT
00.20193	00.20193	BA	11.	1.1	MG/L	10.	1.	8/14/92	UNDER CONTROL
00.20193	00.20193	CD	10.3	1.	MG/L	10.	1.	8/14/92	UNDER CONTROL
00.20193	00.20193	CR	10.4	1.	MG/L	10.	1.	8/14/92	UNDER CONTROL

SUMMARY OF CONTROL STATUS OF BLIND QA SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	RESULT	UNCER	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCER	COMPLETION DATE	COMMENT
92.16076	BA	1.04	0.1	MG/L	1.	0.1	8/14/92	UNDER CONTROL
92.16076	CD	4.1	0.4	MG/L	4.	0.4	8/14/92	UNDER CONTROL
92.16076	CR	5.1	0.4	MG/L	4.	0.4	8/14/92	WARNING 2-3 SIG

Analyst	Reviewer	Section Leader	QA Officer
Date	Date	Date	Date

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in "Quality Assurance for Health and Environmental Chemistry: 1991," LA-12436-MS, pp. 21-22.

REPORT NUMBER: 20121

********** EM-9 ANALYTICAL REPORT **********

Prepared by: MB on 15-Aug-1992

ICP MASS SCAN

REQUEST NUMBER: 10629 MATRIX: W ANALYST: Mike Bell PROGRAM CODE: WA57

OWNER: Janeen Robertson GROUP: HS-5 MAIL-STOP: K494 PHONE: 7-7801

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
92-569-B	92.16195	AG	< 50.		UG/L	8/12/92	
92-569-B	92.16195	AS	19.	57.	MG/L	8/12/92	
.							
.							
.							
92-569-B	92.16195	ZN	4.7	14.1	MG/L	8/12/92	
92-569-B	92.16195	ZR	< 50.		UG/L	8/12/92	

********** EM-9 QUALITY ASSURANCE REPORT *********

ICP MASS SCAN

Prepared by: MB on 15-Aug-1992

REQUEST NUMBER: 10629 MATRIX: W ANALYST: Mike Bell PROGRAM CODE: WA57

OWNER: Janeen Robertson GROUP: HS-5 MAIL-STOP: K494 PHONE: 7-7801

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCER	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCER	COMPLETION DATE	COMMENT
00.98625	00.98625	AG	70.	210.	UG/L	100.	10.	8/12/92	UNDER CONTROL
00.98625	00.98625	AS	81.	240.	UG/L	100.	10.	8/12/92	UNDER CONTROL
.									
.									
.									
00.98625	00.98625	ZN	65.	191.	UG/L	100.	10.	8/12/92	UNDER CONTROL
00.98625	00.98625	ZR	< 1.		UG/L			8/12/92	UNDER CONTROL

The following analyst QA's have no CV data for comparison

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT
00.98625	00.98625	RE	< 1.		UG/L	8/12/92	NO DATA AVAIL.

Analyst	Reviewer	Section Leader	QA Officer
Date	Date	Date	Date

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in "Quality Assurance for Health and Environmental Chemistry: 1991," LA-12436-MS, pp. 21-22.

REPORT NUMBER: 20135

********** EM-9 ANALYTICAL REPORT **********

Prepared by: TRB on 15-Aug-1992

EPA VOLATILES

REQUEST NUMBER: 10659 MATRIX: SS ANALYST: Toney Begay PROGRAM CODE: CU1C

OWNER: Dave McInroy GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0819

CUSTOMER NUMBER	SAMPLE NUMBER	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
LAGC-01-05	92.16412	67641	< 20.		UG/KG	8/10/92		Acetone
LAGC-01-05	92.16412	107028	< 100.		UG/KG	8/10/92		Acrolein
LAGC-01-05	92.16412	107131	< 100.		UG/KG	8/10/92		Acrylonitrile
LAGC-01-05	92.16412	71432	< 5.		UG/KG	8/10/92		Benzene
LAGC-01-05	92.16412	108861	< 5.		UG/KG	8/10/92		Bromobenzene
.								
.								
.								
LAGC-01-05	92.16412	95636	< 5.		UG/KG	8/10/92		1,2,4-Trimethylbenzene
LAGC-01-05	92.16412	108678	< 5.		UG/KG	8/10/92		1,3,5-Trimethylbenzene
LAGC-01-05	92.16412	108054	< 10.		UG/KG	8/10/92		Vinyl acetate
LAGC-01-05	92.16412	75014	< 10.		UG/KG	8/10/92		Vinyl chloride
LAGC-01-05	92.16412	1330207	< 5.		UG/KG	8/10/92		Mixed-Xylenes (o ± m ± p)

REPORT NUMBER: 20135 (continued)

********** EM-9 QUALITY ASSURANCE REPORT **********

Prepared by: TRB on 15-Aug-1992

EPA VOLATILES

REQUEST NUMBER: 10659 MATRIX: SS ANALYST: Toney Begay PROGRAM CODE: CU1C

OWNER: Dave McInroy GROUP: EM-8 MAIL-STOP: K490 PHONE: 7-0819

SUMMARY OF CONTROL STATUS OF BLIND QA SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND-NAME
92.16599	67641	177.	53.1	UG/KG			8/10/92	OUT OF CONTROL	Acetone
92.16599	107028	< 100.		UG/KG			8/10/92	UNDER CONTROL	Acrolein
.									
.									
.									
92.16599	75014	< 10.		UG/KG			8/10/92	UNDER CONTROL	Vinyl chloride
92.16599	1330207	< 5.		UG/KG			8/10/92	UNDER CONTROL	Mixed-Xylenes (o ± m ± p)

SURROGATE RESULTS FOR EPA VOLATILES

Surrogate 1 = 1,2-Dichloroethane d4 (CAS # = 17060070)
Surrogate 2 = Toluene d8 (CAS # = 2037265)
Surrogate 3 = 4-Bromofluorobenzene (CAS # = 460004)

SAMPLE NUMBER	UNITS	Surrogate 1	Surrogate 2	Surrogate 3	COMPLETION DATE
92.16412	%	83.2	86.9	103.	10-Aug-1992
92.16599	%	110.	91.5	102.	10-Aug-1992
EPA Limits:					
Water	%	76 - 114	88 - 110	86 - 115	
Soil	%	70 - 121	81 - 117	74 - 121	

Analyst	Reviewer	Section Leader	QA Officer
Date	Date	Date	Date

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in "Quality Assurance for Health and Environmental Chemistry: 1991," LA-12436-MS, pp. 21-22.

REPORT NUMBER: 20143

********** EM-9 ANALYTICAL REPORT **********

Prepared by: DN on 13-Aug-1992

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 10673 MATRIX: MOL ANALYST: Diane Noveroske PROGRAM CODE: WA56

OWNER: Lee Esquibel GROUP: EM-7 MAIL-STOP: E518 PHONE: 7-7316

SUMMARY of TOTAL PCB's for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
41-4-5	92.16597	1336363	< 4.		UG/G	8/13/92		Mixed-Aroclor

DETAILED PCB DATA for customer samples on this report

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	COMPLETION DATE	COMMENT	COMPOUND NAME
41-4-5	92.16597	1336363	< 4.		UG/G	8/13/92		Mixed-Aroclor
41-4-5	92.16597	53469219	< 4.		UG/G	8/13/92		Aroclor 1242
41-4-5	92.16597	11097691	< 4.		UG/G	8/13/92		Aroclor 1254
41-4-5	92.16597	11096825	< 4.		UG/G	8/13/92		Aroclor 1260

REPORT NUMBER: 10143 (continued)

********** EM-9 QUALITY ASSURANCE REPORT **********

Prepared by: DN on 13-Aug-1992

POLYCHLORINATED BIPHENYLS

REQUEST NUMBER: 10673 MATRIX: MOL ANALYST: Diane Noveroske PROGRAM CODE: WA56

OWNER: Lee Esquibel GROUP: EM-7 MAIL-STOP: E518 PHONE: 7-7316

CUSTOMER NUM	SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND
00.96842	00.96842	1336363	17.	3.4	UG/G	24.6	2.5	8/13/92	UNDER CONTROL	Mixed-Aroclor
00.96842	00.96842	53469219	< 4.		UG/G			8/13/92	UNDER CONTROL	Aroclor 1242
00.96842	00.96842	11097691	< 4.		UG/G			8/13/92	UNDER CONTROL	Aroclor 1254
00.96842	00.96842	11096825	17.	3.4	UG/G	24.6	2.5	8/13/92	UNDER CONTROL	Aroclor 1260

SUMMARY OF CONTROL STATUS OF BLIND QA SAMPLES RUN WITH THIS BATCH

SAMPLE NUM	ANALYSIS	RESULT	UNCERTAINTY	UNITS	CERTIFIED VALUE	CERTIFIED VALUE UNCERTAINTY	COMPLETION DATE	COMMENT	COMPOUND-NAME
92.16598	1336363	37.5	7.5	UG/G	57.	6.	8/13/92	WARNING 2-3 SIG	Mixed-Aroclor
92.16598	53469219	< 4.		UG/G			8/13/92	UNDER CONTROL	Aroclor 1242
92.16598	11097691	< 4.		UG/G			8/13/92	UNDER CONTROL	Aroclor 1254
92.16598	11096825	37.5	7.5	UG/G	57.	6.	8/13/92	WARNING 2-3 SIG	Aroclor 1260

Analyst	Reviewer	Section Leader	QA Officer
Date	Date	Date	Date

The control status of the preceeding data was evaluated using the standard statistical criteria set forth in "Quality Assurance for Health and Environmental Chemistry: 1991," LA-12346-MS, pp. 21-22.

APPENDIX E

SUMMARY TABLES OF QUALITY ASSURANCE DATA

TABLE E-I

SUMMARY OF ANALYTICAL DETERMINATIONS ON NIST STANDARD REFERENCE MATERIALS BY EM-9

Material	Constituent	Mean ± Std Dev	Units	N [a]	Technique [b]
NBS 45b Homogeneous River Sediment	Cs-137	2.35	pCi/g	2	G
	Cs-137	1.8	pCi/g	1	GELI
NBS 278 Obsidian Rock	U	4.4 ± 0.2	ug/g	111	DNA
	U	4.5 ± 0.1	ug/g	14	G
	U	4.5 ± 0.2	ug/g	31	PC
NBS 1566 Oyster Tissue	U	107 ± 6	ng/g	3	DNA
	U	137 ± 12	ng/g	6	G
NBS 1633a Trace Elements in Coal Fly Ash	Ag	< 11000	ng/g	1	ATNA
	Al	14.6	%	1	ATNA
	As	160	ug/g	1	ATNA
	Au	< 0.011	ug/g	1	ATNA
	Ba	1500	ug/g	1	ATNA
	Br	2	ug/g	1	ATNA
	Ca	1.04	%	1	ATNA
	Ce	178	ug/g	1	ATNA
	Cl	< 40	ug/g	1	ATNA
	Cr	187	ug/g	1	ATNA
	Cs	11.9	ug/g	1	ATNA
	Cu	200	ug/g	1	ATNA
	Dy	16.9	ug/g	1	ATNA
	Eu	3.73	ug/g	1	ATNA
	Fe	10.2	%	1	ATNA
	Ga	50	ug/g	1	ATNA
	Hf	7.6	ug/g	1	ATNA
	Hg	2000	ng/g	1	ATNA
	I	< 10	ug/g	1	ATNA
	In	150	ng/g	1	ATNA
	K	1.9	%	1	ATNA
	La	86	ug/g	1	ATNA
	Lu	1.13	ug/g	1	ATNA
	Mg	5900	ug/g	1	ATNA
	Mn	183	ug/g	1	ATNA
	Mo	23	ug/g	1	ATNA
	Na	1750	ug/g	1	ATNA
	Nd	75	ug/g	1	ATNA
	Rb	151	ug/g	1	ATNA
	Sb	3.9	ug/g	1	ATNA
	Sc	38.3	ug/g	1	ATNA
	Se	11	ug/g	1	ATNA
	Sm	17.6	ug/g	1	ATNA
	Sr	1070	ug/g	1	ATNA
	Ta	1.6	ug/g	1	ATNA
	Tb	2.6	ug/g	1	ATNA
	Th	26.8	ug/g	1	ATNA
	Ti	9300	ug/g	1	ATNA
	U	10.7	ug/g	1	ATNA
	V	316	ug/g	1	ATNA
	W	5.1	ug/g	1	ATNA
	Yb	6.1	ug/g	1	ATNA
	Zn	60	ug/g	1	ATNA
	Zr	390	ug/g	1	ATNA
NBS 1643b Trace Elements in Water	Ag	11 ± 1	ug/l	27	ICPMS
	Al	942	ug/l	1	ICPMS
	As	59 ± 12	ug/l	25	ICPMS
	Ba	45 ± 1	ug/l	10	ICPMS
	Be	21 ± 13	ug/l	26	ICPMS
	Cd	21	ug/l	2	ETVAA
	Cd	20 ± 1	ug/l	10	ICPMS
	Co	34 ± 13	ug/l	10	ICPMS
	Cr	22 ± 3	ug/l	19	ICPMS
	Cu	22 ± 4	ug/l	14	FAA

TABLE E-I (cont)

Material	Constituent	Mean ± Std Dev	Units	N [a]	Technique [b]
NBS 1643b Trace Elements in Water (cont)	Cu	31 ± 39	ug/l	25	ICPMS
	Fe	104 ± 9	ug/l	15	FAA
	Mn	34 ± 2	ug/l	26	ICPMS
	Mo	105 ± 9	ug/l	21	ICPMS
	Ni	48 ± 4	ug/l	5	FAA
	Ni	53 ± 20	ug/l	14	ICPMS
	Pb	23 ± 1	ug/l	4	ETVAA
	Pb	25 ± 2	ug/l	14	ICPMS
	Se	440	ug/l	1	ICPMS
	Sr	236 ± 8	ug/l	21	ICPMS
	Tl	7 ± 1	ug/l	7	ICPMS
	V	49 ± 5	ug/l	40	ICPMS
	Zn	69 ± 2	ug/l	9	FAA
	Zn	68 ± 10	ug/l	25	ICPMS
NBS 1643c Trace Elements in Water	Ag	2 ± 0.4	ug/l	8	ICPMS
	Al	120	ug/l	1	ICPMS
	Ba	52 ± 5	ug/l	14	ICPMS
	Be	24 ± 3	ug/l	8	ICPMS
	Cd	13 ± 2	ug/l	12	ICPMS
	Cr	22 ± 2	ug/l	8	ICPMS
	Cu	22 ± 1	ug/l	10	ICPMS
	Li	18 ± 3	ug/l	7	ICPMS
	Mn	36 ± 4	ug/l	10	ICPMS
	Mo	108 ± 4	ug/l	11	ICPMS
	Pb	36 ± 3	ug/l	14	ICPMS
	Sr	266 ± 9	ug/l	11	ICPMS
	Tl	8 ± 0.5	ug/l	10	ICPMS
	V	34 ± 3	ug/l	6	ICPMS
	Zn	76 ± 5	ug/l	10	ICPMS
NBS 1645 River Sediment	Ag	2	ug/g	2	ATNA
	Ag	28	ug/g	1	ICPMS
	Al	3	%	2	ATNA
	Al	0.36	%	1	ICPES
	Al	2	%	1	ICPMS
	As	75	ug/g	2	ATNA
	As	91	ug/g	1	ICPMS
	Au	17	ng/g	2	ATNA
	Ba	270	ug/g	2	ATNA
	Ba	0.8	ug/g	1	ICPES
	Ba	340	ug/g	2	ICPMS
	Be	0.9	ug/g	1	ICPES
	Be	25	ug/g	1	ICPMS
	Br	2	ug/g	2	ATNA
	Ca	3	%	2	ATNA
	Cd	16 ± 9	ug/g	3	ICPES
	Cd	87	ug/g	1	ICPMS
	Ce	5	ug/g	2	ATNA
	Cl	120	ug/g	2	ATNA
	Co	11	ug/g	1	ICPES
	Co	15	ug/g	1	ICPMS
	Cr	2.7	%	2	ATNA
	Cr	2.4 ± 0.2	%	3	ICPES
	Cr	3.3	%	1	ICPMS
	Cs	2.6	ug/g	2	ATNA
	Cu	215	ug/g	2	ATNA
	Cu	77	ug/g	1	ICPES
	Cu	110	ug/g	1	ICPMS
	Dy	5.5	ug/g	2	ATNA
	Eu	364	ng/g	2	ATNA
	Fe	10.5	%	2	ATNA
	Fe	11	%	1	ICPES
	Ga	16.5	ug/g	2	ATNA
	Hf	1.2	ug/g	2	ATNA
	Hg	1.9	ug/g	2	ATNA
	Hg	0.96	ug/g	1	CVAA

TABLE E-I (cont)

Material	Constituent	Mean ± Std Dev	Units	N [a]	Technique [b]
NBS 1645 River Sediment (cont)	I	< 18	ug/g	2	ATNA
	In	< 225	ng/g	2	ATNA
	K	1.4	%	2	ATNA
	La	8.3	ug/g	2	ATNA
	Lu	< 550	ng/g	2	ATNA
	Mg	7150	ug/g	2	ATNA
	Mg	5800	ug/g	1	ICPES
	Mn	755	ug/g	2	ATNA
	Mn	510	ug/g	1	ICPES
	Mn	1100	ug/g	1	ICPMS
	Mo	120	ug/g	2	ATNA
	Mo	94	ug/g	1	ICPMS
	Na	5650	ug/g	2	ATNA
	Na	920	ug/g	1	ICPES
	Nd	< 18	ug/g	2	ATNA
	Ni	29	ug/g	1	ICPES
	Ni	410	ug/g	1	ICPMS
	Pb	867 ± 188	ug/g	3	ICPES
	Pb	720	ug/g	2	ICPMS
	Rb	42	ug/g	2	ATNA
	Sb	39	ug/g	2	ATNA
	Sb	180	ug/g	1	ICPES
	Sb	57	ug/g	2	ICPMS
	Sc	2	ug/g	2	ATNA
	Se	12	ug/g	2	ATNA
	Se	370	ug/g	1	ICPMS
	Sm	1.3	ug/g	2	ATNA
	Sn	340	ug/g	1	ICPMS
	Sr	855	ug/g	2	ATNA
	Sr	870	ug/g	1	ICPMS
	Ta	600	ng/g	2	ATNA
	Tb	< 6	ug/g	2	ATNA
	Th	2.6	ug/g	2	ATNA
	Ti	950	ug/g	2	ATNA
	Tl	33	ug/g	2	ICPMS
	U	1.2	ug/g	2	ATNA
	U	1.07 ± 0.06	ug/g	112	DNA
	U	1.12 ± 0.05	ug/g	13	G
	U	8 ± 28	ug/g	18	ICPMS
	U	1.04 ± 0.06	ug/g	31	PC
	U-235/238	0.0071 ± 0.0006	Ratio	17	ICPMS
	V	25.9	ug/g	2	ATNA
	V	22	ug/g	1	ICPES
	V	110	ug/g	1	ICPMS
	W	3	ug/g	2	ATNA
	Yb	1100	ng/g	2	ATNA
	Zn	2250	ug/g	2	ATNA
	Zn	1300	ug/g	1	ICPES
	Zn	990	ug/g	1	ICPMS
	Zr	205	ug/g	2	ATNA
NBS 1882 Ca-Al Cement (Orange Cap)	Al	19.6	%	1	ATNA
	Fe	11.1	%	1	ATNA
	K	700	ug/g	1	ATNA
	Mg	6700	ug/g	1	ATNA
	Na	316	ppm	1	ATNA
	Ti	1.1	%	1	ATNA
NBS 1883 Ca-Al Cement (Silver Cap)	Al	36.3	%	1	ATNA
	Ca	21.1	%	1	ATNA
	Fe	560	ug/g	1	ATNA
	K	700	ug/g	1	ATNA
	Mg	1800	ug/g	1	ATNA
	Na	2840	ug/g	1	ATNA
	Ti	3000	ug/g	1	ATNA
NBS 2689 Coal Fly Ash	Al	12.3	%	1	ATNA

TABLE E-I (cont)

Material	Constituent	Mean ± Std Dev	Units	N [a]	Technique [b]
NBS 2689 Coal Fly Ash (cont)	Ba	820	ug/g	1	ATNA
	Ca	2.15	%	1	ATNA
	Fe	8.4	%	1	ATNA
	K	2.13	%	1	ATNA
	Mg	5400	ug/g	1	ATNA
	Mn	290	ug/g	1	ATNA
	Na	2910	ug/g	1	ATNA
	Sr	370	ug/g	1	ATNA
	Ti	7500	ug/g	1	ATNA
NBS 2690 Coal Fly Ash	Al	11.9	%	1	ATNA
	Ba	5600	ug/g	1	ATNA
	Ca	5.76	%	1	ATNA
	Fe	3.32	%	1	ATNA
	K	1.09	%	1	ATNA
	Mg	1.48	%	1	ATNA
	Mn	290	ug/g	1	ATNA
	Na	2480	ug/g	1	ATNA
	Sr	2450	ug/g	1	ATNA
	Ti	5500	ug/g	1	ATNA
NBS 2691 Coal Fly Ash	Al	9.26	%	1	ATNA
	Ba	4800	ug/g	1	ATNA
	Ca	18.4	%	1	ATNA
	Fe	3.9	%	1	ATNA
	K	3700	ug/g	1	ATNA
	Mg	3.2	%	1	ATNA
	Mn	174	ug/g	1	ATNA
	Na	1.14	%	1	ATNA
	Sr	2280	ug/g	1	ATNA
	Ti	9200	ug/g	1	ATNA
NBS 2704 Buffalo River Sediment	Ag	< 4	ug/g	1	ATNA
	Al	6.45	%	1	ATNA
	As	23	ug/g	1	ATNA
	Au	13	ng/g	1	ATNA
	Ba	480	ug/g	1	ATNA
	Br	6.8	ug/g	1	ATNA
	Ca	2.58	%	1	ATNA
	Ce	62	ug/g	1	ATNA
	Cl	< 130	ug/g	1	ATNA
	Cr	139	ug/g	1	ATNA
	Cs	5.2	ug/g	1	ATNA
	Cu	300	ug/g	1	ATNA
	Dy	5	ug/g	1	ATNA
	Eu	1.25	ug/g	1	ATNA
	Fe	4.14	%	1	ATNA
	Ga	25	ug/g	1	ATNA
	Hf	8.2	ug/g	1	ATNA
	Hg	1.8	ug/g	1	ATNA
	I	30	ug/g	1	ATNA
	In	300	ng/g	1	ATNA
	K	2.21	%	1	ATNA
	La	30.7	ug/g	1	ATNA
	Lu	0.45	ug/g	1	ATNA
	Mg	1.08	%	1	ATNA
	Mn	597	ug/g	1	ATNA
	Na	6310	ug/g	1	ATNA
	Nd	24	ug/g	1	ATNA
	Pb	130	ug/g	1	ICPES
	Rb	107	ug/g	1	ATNA
	Sb	6.2	ug/g	1	ATNA
	Sc	11	ug/g	1	ATNA
	Se	4	ug/g	1	ATNA
	Sm	6.9	ug/g	1	ATNA
	Sr	130	ug/g	1	ATNA
	Ta	1.04	ug/g	1	ATNA

TABLE E-I (cont)

Material	Constituent	Mean ± Std Dev	Units	N [a]	Technique [b]
NBS 2704 Buffalo River Sediment (cont)	Tb	1	ug/g	1	ATNA
	Th	10	ug/g	1	ATNA
	Ti	4900	ug/g	1	ATNA
	U	3.38	ug/g	1	ATNA
	V	98	ug/g	1	ATNA
	W	6	ug/g	1	ATNA
	Yb	2.9	ug/g	1	ATNA
	Zn	390	ug/g	1	ATNA
	Zr	310	ug/g	1	ATNA
NBS 4350 Environmental Radioactivity Sediment	Cs-137	2.4	pCi/g	1	G
NBS 4350B River Sediment	Cs-137	0.8 ± 0.2	pCi/g	6	G
NBS 4353 Rocky-Flats Soil No. 1	Am-241	0.04	pCi/g	1	G
	Cs-137	0.4 ± 0.1	pCi/g	8	G
	Cs-137	0.51 ± 0.09	pCi/g	5	GELI
	K-40	21	pCi/g	1	G
	U-234	1.02	pCi/g	1	RAS
	U-235	0.044	pCi/g	1	RAS
	U-238	1	pCi/g	1	RAS

[a] Total number of analyses included in the mean.
[b] Analytical technique codes:
ATNA = Automated Thermal Neutron Activation
CVAA = Cold Vapor Atomic Absorption Spectrometry
DNA = Delayed-Neutron Assay
ETVAA = Electrothermal Vaporization Atomic Absorption
FAA = Flame Atomic Absorption
G = Gamma Spectroscopy - Ge(Li) or HPGE
GELI = Gamma Spectroscopy - Ge(Li)
ICPES = Inductively Coupled Plasma Atomic Emission Spectrometry
ICPMS = Inductively Coupled Plasma Mass Spectrometry
PC = Proportional Counting
RAS = Radiochemical Alpha Spectrometry

TABLE E-II

SUMMARY OF ANALYTICAL DETERMINATIONS ON CCRMP REFERENCE MATERIALS BY EM-9

Material	Constituent	Mean ± Std Dev	Units	N [a]	Technique [b]
CCRMP CLV-1 Vegetative Radionuclide	Cs-137	3.0 ± 0.1	pCi/g	3	G
	Cs-137	3.2	pCi/g	1	GELI
	Cs-137	1.1	pCi/g	2	G
	Cs-137	1.2	pCi/g	1	GELI
CCRMP MRG-1 Gabbro	Ag	11000	ng/g	1	ATNA
	Al	4.42	%	1	ATNA
	As	1500	ng/g	1	ATNA
	Au	10	ng/g	1	ATNA
	Ba	900	ug/g	1	ATNA
	Br	< 2.2	ug/g	1	ATNA
	Ca	10.6	%	1	ATNA
	Ce	29	ug/g	1	ATNA
	Cl	100	ug/g	1	ATNA
	Cr	510	ug/g	1	ATNA
	Cs	4000	ng/g	1	ATNA
	Cu	300	ug/g	1	ATNA
	Dy	3	ug/g	1	ATNA
	Eu	1.38	ug/g	1	ATNA
	Fe	13.6	%	1	ATNA
	Ga	18	ug/g	1	ATNA
	Hf	4.1	ug/g	1	ATNA
	Hg	1900	ng/g	1	ATNA
	I	< 19	ug/g	1	ATNA
	In	< 200	ng/g	1	ATNA
	K	1300	ug/g	1	ATNA
	La	9.4	ug/g	1	ATNA
	Lu	300	ng/g	1	ATNA
	Mg	7.8	%	1	ATNA
	Mn	1370	ug/g	1	ATNA
	Mo	60000	ng/g	1	ATNA
	Na	5500	ug/g	1	ATNA
	Nd	15	ug/g	1	ATNA
	Rb	30	ug/g	1	ATNA
	Sb	3000	ng/g	1	ATNA
	Sc	60	ug/g	1	ATNA
	Se	11000	ng/g	1	ATNA
	Sm	4.34	ug/g	1	ATNA
	Sr	400	ug/g	1	ATNA
	Ta	1500	ng/g	1	ATNA
	Tb	1600	ng/g	1	ATNA
	Th	1.3	ug/g	1	ATNA
	Ti	2.2	%	1	ATNA
	U	259	ng/g	1	ATNA
	V	530	ug/g	1	ATNA
	W	4000	ng/g	1	ATNA
	Yb	900	ng/g	1	ATNA
	Zn	50	ug/g	1	ATNA
	Zr	500	ug/g	1	ATNA
CCRMP SO-1 Regosolic Soil	Ag	5200 ± 1470	ng/g	4	ATNA
	Ag	28000	ng/g	1	ICPMS
	Al	9.3 ± 0.2	%	4	ATNA
	Al	8.2 ± 0.5	%	18	ICPES
	Al	7.4	%	1	ICPMS
	As	2.7 ± 1.0	ug/g	4	ATNA
	As	1.35	ug/g	2	ETVAA
	As	85	ug/g	1	ICPMS
	Au	17 ± 4	ng/g	4	ATNA
	B	26 ± 8	ug/g	8	ICPES
	Ba	836 ± 84	ug/g	4	ATNA
	Ba	754 ± 60	ug/g	13	ICPES
	Ba	690	ug/g	2	ICPMS
	Be	1.9 ± 0.2	ug/g	13	ICPES
	Be	12	ug/g	2	ICPMS

TABLE E-II (cont)

Material	Constituent	Mean ± Std Dev	Units	N [a]	Technique [b]
CCRMP SO-1 Regosolic Soil (cont)	Br	2.7 ± 2.2	ug/g	4	ATNA
	Ca	1.9 ± 0.2	%	4	ATNA
	Ca	1.5 ± 0.08	%	12	ICPES
	Cd	1600 ± 800	ng/g	13	ICPES
	Cd	164	ng/g	2	ICPMS
	Ce	104 ± 5	ug/g	4	ATNA
	Cl	168 ± 28	ug/g	4	ATNA
	Co	27 ± 3	ug/g	15	ICPES
	Co	290	ug/g	1	ICPMS
	Cr	165 ± 5	ug/g	4	ATNA
	Cr	162 ± 10	ug/g	13	ICPES
	Cr	293 ± 214	ug/g	3	ICPMS
	Cs	5 ± 0.6	ug/g	4	ATNA
	Cu	313 ± 25	ug/g	4	ATNA
	Cu	53 ± 6	ug/g	10	ICPES
	Cu	58 ± 6	ug/g	3	ICPMS
	Dy	4 ± 0.2	ug/g	4	ATNA
	Eu	1.43 ± 0.05	ug/g	4	ATNA
	Fe	5.8 ± 0.2	%	4	ATNA
	Fe	5.6 ± 0.3	%	19	ICPES
	Ga	180 ± 280	ug/g	4	ATNA
	Hf	2.6 ± 0.2	ug/g	4	ATNA
	Hg	1025 ± 260	ng/g	4	ATNA
	Hg	19 ± 4	ng/g	4	CVAA
	I	26 ± 6	ug/g	4	ATNA
	In	300 ± 45	ng/g	4	ATNA
	K	2.75 ± 0.12	%	4	ATNA
	K	2.6 ± 0.1	%	11	ICPES
	La	59 ± 3	ug/g	4	ATNA
	Li	44 ± 7	ug/g	9	ICPES
	Li	40	ug/g	1	ICPMS
	Lu	317 ± 31	ng/g	4	ATNA
	Mg	2.1 ± 0.2	%	4	ATNA
	Mg	2 ± 0.2	%	13	ICPES
	Mn	918 ± 25	ug/g	4	ATNA
	Mn	809 ± 60	ug/g	11	ICPES
	Mn	977 ± 215	ug/g	3	ICPMS
	Mo	73 ± 31	ug/g	3	ATNA
	Mo	4 ± 0.5	ug/g	10	ICPES
	Mo	93	ug/g	1	ICPMS
	Na	2.07 ± 0.06	%	4	ATNA
	Na	1.75 ± 0.10	%	11	ICPES
	Nd	45 ± 3	ug/g	4	ATNA
	Ni	87 ± 5	ug/g	20	ICPES
	Ni	270	ug/g	1	ICPMS
	Pb	14 ± 10	ug/g	13	ICPES
	Pb	48 ± 54	ug/g	3	ICPMS
	Rb	132 ± 6	ug/g	4	ATNA
	Sb	1375 ± 320	ng/g	4	ATNA
	Sb	8500 ± 10100	ng/g	12	ICPES
	Sb	44000	ng/g	2	ICPMS
	Sc	17 ± 0.6	ug/g	4	ATNA
	Se	6500 ± 1000	ng/g	4	ATNA
	Se	350	ng/g	1	ICPMS
	Sm	8 ± 0.4	ug/g	4	ATNA
	Sn	63	ug/g	1	ICPMS
	Sr	280 ± 76	ug/g	4	ATNA
	Sr	283 ± 23	ug/g	9	ICPES
	Sr	290	ug/g	2	ICPMS
	Ta	0.69 ± 0.06	ug/g	4	ATNA
	Tb	0.88 ± 0.17	ug/g	4	ATNA
	Th	11.4 ± 0.7	ug/g	4	ATNA
	Ti	4975 ± 275	ug/g	4	ATNA
	Tl	24500 ± 18800	ng/g	13	ICPES
	Tl	32835	ng/g	2	ICPMS
	U	1.70 ± 0.01	ug/g	4	ATNA
	U	6 ± 25	ug/g	26	ICPMS
	U-235/238	0.0071 ± 0.0006	ratio	24	ICPMS

TABLE E-II (cont)

Material	Constituent	Mean ± Std Dev	Units	N [a]	Technique [b]
CCRMP SO-1 Regosolic Soil (cont)	V	133 ± 5	ug/g	4	ATNA
	V	125 ± 8	ug/g	11	ICPES
	V	247 ± 186	ug/g	3	ICPMS
	W	13 ± 11	ug/g	4	ATNA
	Yb	1.90 ± 0.14	ug/g	4	ATNA
	Zn	110 ± 54	ug/g	4	ATNA
	Zn	132 ± 10	ug/g	11	ICPES
	Zn	173 ± 35	ug/g	3	ICPMS
	Zr	243 ± 56	ug/g	4	ATNA
CCRMP SO-2 Podzolic Soil	Ag	4600 ± 1000	ng/g	3	ATNA
	Al	8.2 ± 0.3	%	3	ATNA
	Al	7.6 ± 0.6	%	9	ICPES
	As	3 ± 0.6	ug/g	3	ATNA
	Au	20 ± 11	ng/g	3	ATNA
	Ba	920 ± 27	ug/g	3	ATNA
	Ba	1008 ± 48	ug/g	11	ICPES
	Be	1.9 ± 0.4	ug/g	9	ICPES
	Br	16 ± 1.5	ug/g	3	ATNA
	Ca	2 ± 0.1	%	3	ATNA
	Ca	1.6 ± 0.17	%	8	ICPES
	Cd	911 ± 176	ng/g	9	ICPES
	Ce	104 ± 9	ug/g	3	ATNA
	Cl	120 ± 36	ug/g	3	ATNA
	Co	9 ± 2	ug/g	8	ICPES
	Cr	19 ± 10	ug/g	3	ATNA
	Cr	8 ± 3	ug/g	8	ICPES
	Cs	1.3 ± 0.2	ug/g	3	ATNA
	Cu	317 ± 29	ug/g	3	ATNA
	Cu	2.6 ± 3.6	ug/g	5	ICPES
	Dy	7.7 ± 1.2	ug/g	3	ATNA
	Eu	3.3 ± 0.3	ug/g	3	ATNA
	Fe	5.2 ± 0.3	%	3	ATNA
	Fe	5.0 ± 0.6	%	8	ICPES
	Ga	216 ± 333	ug/g	3	ATNA
	Hf	18.5 ± 1.5	ug/g	3	ATNA
	Hg	833 ± 153	ng/g	3	ATNA
	I	22 ± 5	ug/g	3	ATNA
	In	263 ± 110	ng/g	3	ATNA
	K	2.47 ± 0.12	%	3	ATNA
	K	2.2 ± 0.2	%	8	ICPES
	La	46.8 ± 1.0	ug/g	3	ATNA
	Li	11.5	ug/g	2	ICPES
	Lu	556 ± 56	ng/g	3	ATNA
	Mg	5000 ± 1500	ug/g	3	ATNA
	Mg	4900 ± 300	ug/g	8	ICPES
	Mn	735 ± 5	ug/g	3	ATNA
	Mn	680 ± 75	ug/g	8	ICPES
	Mo	95	ug/g	2	ATNA
	Mo	2	ug/g	1	ICPES
	Na	1.89 ± 0.04	%	3	ATNA
	Na	1.80 ± 0.16	%	8	ICPES
	Nd	46 ± 12	ug/g	3	ATNA
	Ni	4.0 ± 1.5	ug/g	5	ICPES
	Pb	22 ± 14	ug/g	9	ICPES
	Rb	69 ± 7	ug/g	3	ATNA
	Sb	1100 ± 300	ng/g	3	ATNA
	Sb	3300 ± 1600	ng/g	7	ICPES
	Sc	10.4 ± 0.7	ug/g	3	ATNA
	Se	4600 ± 1000	ng/g	3	ATNA
	Sm	11.7 ± 0.4	ug/g	3	ATNA
	Sr	277 ± 38	ug/g	3	ATNA
	Sr	330	ug/g	2	ICPES
	Ta	1.2 ± 0.1	ug/g	3	ATNA
	Tb	1.3 ± 0.2	ug/g	3	ATNA
	Th	3.6 ± 0.2	ug/g	3	ATNA
	Ti	8300 ± 200	ug/g	3	ATNA
	Tl	14000 ± 15000	ng/g	8	ICPES

TABLE E-II (cont)

Material	Constituent	Mean ± Std Dev	Units	N [a]	Technique [b]
CCRMP SO-2 Podzolic Soil (cont)	U	0.95 ± 0.03	ug/g	3	ATNA
	V	56 ± 3	ug/g	3	ATNA
	V	53 ± 5	ug/g	8	ICPES
	W	14 ± 14	ug/g	3	ATNA
	Yb	3.1 ± 0.3	ug/g	3	ATNA
	Zn	121 ± 2	ug/g	3	ATNA
	Zn	76 ± 36	ug/g	6	ICPES
	Zr	670 ± 26	ug/g	3	ATNA
CCRMP SO-3 Calcareous C Horizon Soil	Ag	< 3500	ng/g	2	ATNA
	Ag	< 1000	ng/g	1	FAA
	Al	3.16	%	2	ATNA
	Al	2 ± 0.6	%	24	ICPES
	As	2	ug/g	2	ATNA
	As	2.6 ± 1	ug/g	5	ETVAA
	Au	12	ng/g	2	ATNA
	B	32 ± 7	ug/g	7	ICPES
	Ba	258	ug/g	2	ATNA
	Ba	242 ± 26	ug/g	20	ICPES
	Be	1.0 ± 0.2	ug/g	20	ICPES
	Be	1	ug/g	1	ICPMS
	Br	5.1	ug/g	2	ATNA
	Ca	15.3	%	2	ATNA
	Ca	13 ± 1	%	17	ICPES
	Cd	1300 ± 700	ng/g	17	ICPES
	Ce	35	ug/g	2	ATNA
	Cl	365	ug/g	2	ATNA
	Co	5 ± 1.4	ug/g	20	ICPES
	Cr	34	ug/g	2	ATNA
	Cr	17 ± 2.4	ug/g	21	ICPES
	Cs	1.23	ug/g	2	ATNA
	Cu	295	ug/g	2	ATNA
	Cu	13 ± 3	ug/g	16	ICPES
	Dy	2.7	ug/g	2	ATNA
	Eu	0.77	ug/g	2	ATNA
	Fe	1.53	%	2	ATNA
	Fe	1.20 ± 0.16	%	23	ICPES
	Ga	29.5	ug/g	2	ATNA
	Hf	4.6	ug/g	2	ATNA
	Hg	600	ng/g	2	ATNA
	Hg	22 ± 17	ng/g	3	CVAA
	I	30	ug/g	2	ATNA
	In	290	ng/g	2	ATNA
	K	1.1	%	2	ATNA
	K	1.1 ± 0.16	%	18	ICPES
	La	17	ug/g	2	ATNA
	Li	9.9 ± 2.4	ug/g	10	ICPES
	Lu	230	ng/g	2	ATNA
	Mg	4.8	%	2	ATNA
	Mg	4 ± 1	%	18	ICPES
	Mn	563	ug/g	2	ATNA
	Mn	440 ± 32	ug/g	17	ICPES
	Mo	50	ug/g	1	ATNA
	Mo	3.5 ± 1.2	ug/g	11	ICPES
	Na	7590	ug/g	2	ATNA
	Na	5200 ± 1700	ug/g	17	ICPES
	Nd	16.5	ug/g	2	ATNA
	Ni	10 ± 2.5	ug/g	27	ICPES
	Pb	16 ± 15	ug/g	22	ICPES
	Rb	35.5	ug/g	2	ATNA
	Sb	580	ng/g	2	ATNA
	Sb	8000 ± 11000	ng/g	18	ICPES
	Sc	5.2	ug/g	2	ATNA
	Se	3350	ng/g	2	ATNA
	Sm	3.6	ug/g	2	ATNA
	Sr	150	ug/g	2	ATNA
	Sr	178 ± 25	ug/g	11	ICPES
	Ta	0.365	ug/g	2	ATNA

TABLE E-II (cont)

Material	Constituent	Mean ± Std Dev	Units	N [a]	Technique [b]
CCRMP SO-3 Calcareous C Horizon Soil (cont)	Tb	0.3	ug/g	2	ATNA
	Th	4.2	ug/g	2	ATNA
	Ti	2250	ug/g	2	ATNA
	Tl	43000 ± 27000	ng/g	17	ICPES
	U	1.1	ug/g	2	ATNA
	U	0.84	ug/g	1	ICPMS
	U-235/238	0.0067	ratio	1	ICPMS
	V	42	ug/g	2	ATNA
	V	29 ± 7	ug/g	17	ICPES
	W	5	ug/g	2	ATNA
	Yb	1.7	ug/g	2	ATNA
	Zn	33	ug/g	2	ATNA
	Zn	42 ± 9	ug/g	18	ICPES
	Zr	145	ug/g	2	ATNA
CCRMP SO-4 Chernozemic A Horizon Soil	Ag	5300	ng/g	2	ATNA
	Al	5.6	%	2	ATNA
	As	7.8	ug/g	2	ATNA
	Au	12	ng/g	2	ATNA
	Ba	680	ug/g	2	ATNA
	Br	5.7	ug/g	2	ATNA
	Ca	1.1	%	2	ATNA
	Ce	51	ug/g	2	ATNA
	Cl	100	ug/g	2	ATNA
	Cr	69	ug/g	2	ATNA
	Cs	2.7	ug/g	2	ATNA
	Cu	280	ug/g	2	ATNA
	Dy	3.3	ug/g	2	ATNA
	Eu	1	ug/g	2	ATNA
	Fe	2.3	%	2	ATNA
	Ga	32	ug/g	2	ATNA
	Hf	7.4	ug/g	2	ATNA
	Hg	1000	ng/g	2	ATNA
	Hg	31 ± 9	ng/g	3	CVAA
	I	17	ug/g	2	ATNA
	In	200	ng/g	2	ATNA
	K	1.7	%	2	ATNA
	La	29	ug/g	2	ATNA
	Lu	375	ng/g	2	ATNA
	Mg	5200	ug/g	2	ATNA
	Mn	609	ug/g	2	ATNA
	Mo	60	ug/g	1	ATNA
	Na	1.02	%	2	ATNA
	Nd	22	ug/g	2	ATNA
	Rb	66	ug/g	2	ATNA
	Sb	550	ng/g	2	ATNA
	Sc	8	ug/g	2	ATNA
	Se	6550	ng/g	2	ATNA
	Sm	4.7	ug/g	2	ATNA
	Sr	150	ug/g	2	ATNA
	Ta	0.60	ug/g	2	ATNA
	Tb	0.83	ug/g	2	ATNA
	Th	8.2	ug/g	2	ATNA
	Ti	3000	ug/g	2	ATNA
	U	2.3	ug/g	2	ATNA
	V	90	ug/g	2	ATNA
	W	5.9	ug/g	2	ATNA
	Yb	2	ug/g	2	ATNA
	Zn	99	ug/g	2	ATNA
	Zr	305	ug/g	2	ATNA

[a] Total number of analyses included in the mean.
[b] Analytical technique codes:
ATNA = Automated Thermal Neutron Activation
CVAA = Cold Vapor Atomic Absorption Spectrometry
ETVAA = Electrothermal Vaporization Atomic Absorption

TABLE E-II (cont)

FAA = Flame Atomic Absorption
G = Gamma Spectroscopy - Ge(Li) or HPGE
GELI = Gamma Spectroscopy - Ge(Li)
ICPES = Inductively Coupled Plasma Atomic Emission Spectrometry
ICPMS = Inductively Coupled Plasma Mass Spectrometry

TABLE E-III

SUMMARY OF ANALYTICAL DETERMINATIONS ON USGS REFERENCE MATERIALS BY EM-9

Material	Constituent	Mean ± Std Dev	Units	N [a]	Technique [b]
USGS GXR-6 Soil	Ag	7	ppm	1	ATNA
	Al	17.5	%	1	ATNA
	As	310	ppm	1	ATNA
	Au	99	ppb	1	ATNA
	Ba	1210	ppm	1	ATNA
	Br	1.8	ppm	1	ATNA
	Ca	0.18	%	1	ATNA
	Ce	38	ppm	1	ATNA
	Cl	80	ppm	1	ATNA
	Cr	98	ppm	1	ATNA
	Cs	4.7	ppm	1	ATNA
	Cu	300	ppm	1	ATNA
	Dy	2.9	ppm	1	ATNA
	Eu	0.81	ppm	1	ATNA
	Fe	6	%	1	ATNA
	Ga	32	ppm	1	ATNA
	Hf	4	ppm	1	ATNA
	Hg	1.2	ppm	1	ATNA
	I	30	ppm	1	ATNA
	In	300	ppb	1	ATNA
	K	1.8	%	1	ATNA
	La	12.7	ppm	1	ATNA
	Lu	360	ppb	1	ATNA
	Mg	0.67	%	1	ATNA
	Mn	1230	ppm	1	ATNA
	Mo	80	ppm	1	ATNA
	Na	1050	ppm	1	ATNA
	Nd	8	ppm	1	ATNA
	Rb	98	ppm	1	ATNA
	Sb	4	ppm	1	ATNA
	Sc	27.9	ppm	1	ATNA
	Se	7	ppm	1	ATNA
	Sm	2.43	ppm	1	ATNA
	Sr	190	ppm	1	ATNA
	Ta	490	ppb	1	ATNA
	Tb	540	ppb	1	ATNA
	Th	6.3	ppm	1	ATNA
	Ti	5400	ppm	1	ATNA
	U	1.82	ppm	1	ATNA
	V	198	ppm	1	ATNA
	W	5	ppm	1	ATNA
	Yb	2.05	ppm	1	ATNA
	Zn	170	ppm	1	ATNA
	Zr	300	ppm	1	ATNA

[a] Total number of analyses included in the mean.
[b] Analytical technique codes:
ATNA = Automated Thermal Neutron Activation

KEY TO TABLE E-IV

****

EPA Beta Performance
Evaluation in Water, May 1992[a]

****

Beta[b] 87EPA 01[c] PC[d]

CV = 35. ± 5. pCi/L[e] [ ][f]

Result	Uncer.	Date[g]
23.	2.	6/03
25.	3.	6/03
27.	3.	6/03

Co-60 87EPA 01 G

CV = No Data Available (pCi/L)[e]

Result	Uncer.	Date
7.2	3.	5/10
6.3	3.	5/10
8.0	3.	5/10

---

[a]Quality assurance material name.
[b]Analyte.
[c]Reference code.
[d]Analytical technique.
[e]Certified value. "No Data Available" means that this analyte does not have a certified value and that data is being collected to determine a consensus value.
[f]Contract laboratory code.
[g]Result, uncertainty, and date analyzed.

Uncertainties quoted in this table are those calculated and reported by the analyst. At present there is no uniform policy concerning the calculation of uncertainties in EM-9. This need is being addressed.

KEY (cont)

Analytical technique codes:

ACOLR	=	Automated Colorimetry
ATNA	=	Automated Instrumental Thermal Neutron Activation
BOM	=	Beckman Oxygen Meter
CALC	=	Calculation
CB	=	Conductivity Bridge
CEA	=	Combustion-Elemental Analyzer
COLOR	=	Spectrophotometric, colorimetric
CVAA	=	Cold Vapor Atomic Absorbtion Spectroscopy
DNA	=	Delayed Neutron Assay
ETVAA	=	Electrothermal Vaporation Atomic Absorption
FAA	=	Flame Atomic Absorption Spectroscopy
FIA	=	Flow Injection Analysis
FP	=	Flash Point
FTIR	=	Fourier Transformation Infrared Spectroscopy
G	=	Gamma Spectroscopy - Ge(Li) or HPGE
GCEC	=	Gas Chromatography with Electron Capture
GCMS	=	Gas Chromatography/Mass Spectrometry
GE	=	Glass Electrode
GELI	=	Ge(Li), Gamma Spectroscopy
GRAV	=	Gravimetry (evaporation)
HPLC	=	High Performance Liquid Chromatography
IC	=	Ion Chromatography
ICPES	=	Inductively Coupled Plasma Atomic Emission Spectrometry
ICPMS	=	Inductively Coupled Plasma Mass Spectrometry
IR	=	Infrared Spectrometry
ISE	=	Ion Selective Electrodes
KIT	=	PCB Field Test Kits
KPA	=	Kinetic Phosphorescence Analysis
LS	=	Liquid Scintillation Counting
MSCAN	=	Mass Scan by ICPMS
NAI	=	Sodium iodide, Gamma Spectroscopy
PC	=	Proportional Counting
PHW	=	Phoswich
PTGC	=	Purge & Trap/Gas Chromatography
PTITR	=	Potentiometric Titration
RAS	=	Radiochemical Alpha Spectrometry
SC	=	Scintillation Counting with Na(I) Crystal
TITR	=	Titration

TABLE E-IV

INDIVIDUAL CONSTITUENT CONCENTRATIONS IN QUALITY ASSURANCE MATERIALS MEASURED BY EM-9 IN 1992

****

CCRMP CLV-1
Vegetative Radionuclide

****

Cs-137 86DAL 01 G

CV = 3 pCi/g

Result	Uncer.	Date
2.9	0.5	7/21
3.1	0.5	8/13
3	0.5	8/13

Cs-137 86DAL 01 GELI

CV = 3 pCi/g

Result	Uncer.	Date
3.2	0.6	12/09

****

CCRMP CLV-2
Vegetative Radionuclide

****

Cs-137 86DAL 01 G

CV = 0.92 pCi/g

Result	Uncer.	Date
0.81	0.21	3/12
1.3	0.3	7/21

Cs-137 86DAL 01 GELI

CV = 0.92 pCi/g

Result	Uncer.	Date
1.2	0.2	12/09

****

CCRMP MRG-1 Gabbro

****

Ag 90GLA 01 ATNA

CV = 110 ± 27 ng/g

Result	Uncer.	Date
<11000		3/29

Al 90GLA 01 ATNA

CV = 4.48 ± 0.15 %

Result	Uncer.	Date
4.42	0.13	3/29

As 90GLA 01 ATNA

CV = 730 ± 370 ng/g

Result	Uncer.	Date
< 1500		3/29

Au 90GLA 01 ATNA

CV = 5.4 ng/g

Result	Uncer.	Date
< 10		3/29

Ba 90GLA 01 ATNA

CV = 61 ± 23 ug/g

Result	Uncer.	Date
< 900		3/29

Br 91GLA 01 ATNA

CV = < 3 ug/g

Result	Uncer.	Date
< 2.2		3/29

Ca 90GLA 01 ATNA

CV = 10.51 ± 0.24 %

Result	Uncer.	Date
10.6	0.4	3/29

Ce 90GLA 01 ATNA

CV = 26 ± 4 ug/g

Result	Uncer.	Date
29	1.8	3/29

Cl 90GLA 01 ATNA

CV = 170 ± 30 ug/g

Result	Uncer.	Date
< 100		3/29

Cr 90GLA 01 ATNA

CV = 430 ± 80 ug/g

Result	Uncer.	Date
510	30	3/29

Cs 90GLA 01 ATNA

CV = 570 ± 160 ng/g

Result	Uncer.	Date
< 4000		3/29

Cu 90GLA 01 ATNA

CV = 134 ± 14 ug/g

Result	Uncer.	Date
< 300		3/29

Dy 90GLA 01 ATNA

CV = 2.9 ± 0.9 ug/g

Result	Uncer.	Date
3	0.4	3/29

Eu 90GLA 01 ATNA

CV = 1.39 ± 0.12 ug/g

Result	Uncer.	Date
1.38	0.09	3/29

Fe 90GLA 01 ATNA

CV = 12.54 ± 0.27 %

Result	Uncer.	Date
13.6	0.7	3/29

Ga 90GLA 01 ATNA

CV = 17 ± 4 ug/g

Result	Uncer.	Date
< 18		3/29

Hf 90GLA 01 ATNA

CV = 3.76 ± 0.22 ug/g

Result	Uncer.	Date
4.1	0.6	3/29

Hg 90GLA 01 ATNA

CV = 140 ± 40 ng/g

Result	Uncer.	Date
< 1900		3/29

I 91GLA 01 ATNA

CV = < 25 ug/g

Result	Uncer.	Date
< 19		3/29

In 90GLA 01 ATNA

CV = < 500 ng/g

Result	Uncer.	Date
< 200		3/29

K 90GLA 01 ATNA

CV = 1510 ± 220 ug/g

Result	Uncer.	Date
1300	300	3/29

La 90GLA 01 ATNA

CV = 9.8 ± 0.8 ug/g

Result	Uncer.	Date
9.4	0.5	3/29

Lu 90GLA 01 ATNA

CV = 120 ± 40 ng/g

Result	Uncer.	Date
< 300		3/29

Mg 90GLA 01 ATNA

CV = 8.17 ± 0.19 %

Result	Uncer.	Date
7.8	0.4	3/29

Mn 90GLA 01 ATNA

CV = 1310 ± 100 ug/g

Result	Uncer.	Date
1370	50	3/29

Mo 90GLA 01 ATNA

CV = 870 ± 180 ng/g

Result	Uncer.	Date
<60000		3/29

Na 90GLA 01 ATNA

CV = 5500 ± 600 ug/g

Result	Uncer.	Date
5500	300	3/29

Nd 90GLA 01 ATNA

CV = 19.2 ± 2.2 ug/g

Result	Uncer.	Date
15	2	3/29

Rb 90GLA 01 ATNA

CV = 8.5 ± 2.4 ug/g

Result	Uncer.	Date
< 30		3/29

Sb 90GLA 01 ATNA

CV = 860 ± 160 ng/g

Result	Uncer.	Date
< 3000		3/29

Sc 90GLA 01 ATNA

CV = 55 ± 5 ug/g

Result	Uncer.	Date
60	3	3/29

Se 90GLA 01 ATNA

CV = 194 ± 5 ng/g

Result	Uncer.	Date
<11000		3/29

Sm 90GLA 01 ATNA

CV = 4.5 ± 0.5 ug/g

Result	Uncer.	Date
4.34	0.2	3/29

Sr 90GLA 01 ATNA

CV = 266 ± 13 ug/g

Result	Uncer.	Date
< 400		3/29

Ta 90GLA 01 ATNA

CV = 800 ± 50 ng/g

Result	Uncer.	Date
< 1500		3/29

Tb 90GLA 01 ATNA

CV = 510 ± 60 ng/g

Result	Uncer.	Date
< 1600		3/29

Th 90GLA 01 ATNA

CV = 0.93 ± 0.18 ug/g

Result	Uncer.	Date
< 1.3		3/29

Ti 90GLA 01 ATNA

CV = 2.26 ± 0.09 %

Result	Uncer.	Date
2.2	0.3	3/29

U 90GLA 01 ATNA

CV = 240 ± 40 ng/g

Result	Uncer.	Date
259	15	3/29

V 90GLA 01 ATNA

CV = 526 ± 33 ug/g

Result	Uncer.	Date
530	19	3/29

W 90GLA 01 ATNA

CV = 300 ± 60 ng/g

Result	Uncer.	Date
< 4000		3/29

Yb 90GLA 01 ATNA

CV = 600 ng/g

Result	Uncer.	Date
< 900		3/29

Zn 90GLA 01 ATNA

CV = 191 ± 15 ug/g

Result	Uncer.	Date
< 50		3/29

Zr 90GLA 01 ATNA

CV = 108 ± 16 ug/g

Result	Uncer.	Date
< 500		3/29

****

CCRMP SO-1 Regosolic Soil

****

Ag 89GLA 03 ATNA

CV = 100 ng/g

Result	Uncer.	Date
< 5800		2/28
< 4000		3/07
< 7000		4/25
< 4000		5/04

Ag 89GLA 03 ICPMS

CV = 100 ng/g

Result	Uncer.	Date
<28000		8/31

TABLE E-IV (cont)

****

CCRMP SO-1 Regosolic Soil
(cont)

****

Al 85CAN 01 ATNA

CV = 9.38 ± 0.17 %

Result	Uncer.	Date
9.43	0.26	2/28
9.4	0.3	3/07
9.4	0.3	4/25
9.1	0.3	5/04

Al 85CAN 01 ICPES

CV = 9.38 ± 0.17 %

Result	Uncer.	Date
8.4	1.7	6/11
8.1	1.6	7/16
7.6	1.5	7/16
8.8	1.8	8/06
7.3	1.5	8/17
8.2	1.6	8/21
8.3	1.7	8/25
8.7	1.7	8/27
8.4	1.7	8/31
8.4	1.7	9/10
8.3	1.7	9/14
7.9	1.6	10/26
8.6	0.9	10/26
8.7	1.7	11/09
8.5	1.7	11/09
7.8	1.6	11/13
7.5	1.5	11/13
7.6	1.5	11/30

Al 85CAN 01 ICPMS

CV = 9.38 ± 0.17 %

Result	Uncer.	Date
7.4	1.5	8/31

As 89GLA 03 ATNA

CV = 2 ± 0.2 ug/g

Result	Uncer.	Date
2.6	0.6	2/28
1.8	0.4	3/07
2.3	0.5	4/25
4.2	0.7	5/04

As 89GLA 03 ETVAA

CV = 2 ± 0.2 ug/g

Result	Uncer.	Date
1.3	0.4	1/16
1.4	0.4	1/23

As 89GLA 03 ICPMS

CV = 2 ± 0.2 ug/g

Result	Uncer.	Date
< 85		8/31

Au 89GLA 03 ATNA

CV = 1 ng/g

Result	Uncer.	Date
< 22		2/28
< 16		3/07
< 14		4/25
< 14		5/04

B 89GLA 03 ICPES

CV = 19 ± 2 ug/g

Result	Uncer.	Date
21	4	10/26
25	8	10/26
37	7	11/09
14	3	11/09
35	10	11/13
29	9	11/13
27	8	11/30
< 20		12/07

Ba 85CAN 01 ATNA

CV = 879 ± 47 ug/g

Result	Uncer.	Date
736	58	2/28
890	80	3/07
920	60	4/25
800	80	5/04

Ba 85CAN 01 ICPES

CV = 879 ± 47 ug/g

Result	Uncer.	Date
860	170	6/11
760	150	7/16
760	150	7/16
820	160	8/06
760	150	8/17
640	130	8/17
650	130	8/21
760	150	8/25
770	150	8/27
740	150	8/31
730	150	9/10
750	150	9/14
800	160	12/07

Ba 85CAN 01 ICPMS

CV = 879 ± 47 ug/g

Result	Uncer.	Date
800	160	8/31
580	60	10/26

Low value on 10/26 because digestion not appropriate for total metals.

Be 89GLA 03 ICPES

CV = 1.98 ± 0.29 ug/g

Result	Uncer.	Date
2.2	0.5	6/11
1.6	0.3	8/06
2	0.4	8/17
1.9	0.4	8/17
2.1	0.4	8/21
2.1	0.4	8/25
1.9	0.4	8/27
1.9	0.4	8/31
2	0.2	9/10
2.1	0.4	9/14
1.3	0.3	9/23
1.9	0.2	10/07
2.1	0.7	12/07

Be 89GLA 03 ICPMS

CV = 1.98 ± 0.29 ug/g

Result	Uncer.	Date
< 23		8/31
1.2	0.5	10/16

Br 89GLA 03 ATNA

CV = 2.15 ug/g

Result	Uncer.	Date
1.5	0.5	2/28
1.5	0.3	3/07
1.7	0.4	4/25
< 6		5/04

Ca 85CAN 01 ATNA

CV = 1.8 ± 0.07 %

Result	Uncer.	Date
2.02	0.13	2/28
1.61	0.1	3/07
1.93	0.1	4/25
1.84	0.1	5/04

Ca 85CAN 01 ICPES

CV = 1.8 ± 0.07 %

Result	Uncer.	Date
1.5	0.3	6/11
1.5	0.3	7/16
1.5	0.3	7/16
1.5	0.3	8/06
1.3	0.3	8/17

Ca (cont)

1.4	0.3	8/21
1.6	0.3	8/25
1.5	0.3	8/27
1.5	0.3	8/31
1.5	0.3	9/10
1.5	0.3	9/14
1.6	0.3	9/14

Cd 89GLA 03 ICPES

CV = 130 ± 40 ng/g

Result	Uncer.	Date
< 400		6/11
< 300		7/16
< 3000		7/16
< 700		8/07
< 2000		8/17
< 2000		8/17
< 2000		8/21
< 2000		8/25
< 2000		8/27
< 2000		8/31
< 2000		9/10
< 2000		9/14
< 700		12/07

Cd 89GLA 03 ICPMS

CV = 130 ± 40 ng/g

Result	Uncer.	Date
< 88		8/31
240	200	10/26

Ce 89GLA 03 ATNA

CV = 102 ± 10 ug/g

Result	Uncer.	Date
97.8	4.6	2/28
108	5	3/07
105	5	4/25
107	5	5/04

Cl 89GLA 03 ATNA

CV = 150 ug/g

Result	Uncer.	Date
< 200		2/28
180	30	3/07
150	20	4/25
< 140		5/04

Co 85CAN 01 ICPES

CV = 32 ± 3 ug/g

Result	Uncer.	Date
37	7	6/11
28	6	7/16
27	5	7/16
32	8	8/06
24	5	8/17
27	5	8/21
29	6	8/25
25	5	8/27

Co (cont)

28	6	8/31
26	5	9/10
23	5	9/14
27	3	10/26
27	5	11/09
24	5	11/09
27	6	11/30

Co 85CAN 01 ICPMS

CV = 32 ± 3 ug/g

Result	Uncer.	Date
290	60	8/31

Cr 85CAN 01 ATNA

CV = 160 ± 15 ug/g

Result	Uncer.	Date
169	10	2/28
160	10	3/07
169	10	4/25
160	10	5/04

Cr 85CAN 01 ICPES

CV = 160 ± 15 ug/g

Result	Uncer.	Date
160	30	6/11
160	30	7/16
170	30	7/16
180	40	8/06
160	30	8/17
170	30	8/17
160	30	8/21
180	40	8/25
150	30	8/27
160	30	8/31
150	30	9/10
150	30	9/14
160	30	12/07

Cr 85CAN 01 ICPMS

CV = 160 ± 15 ug/g

Result	Uncer.	Date
540	110	8/31
160	20	9/22
180	20	10/21

Cs 89GLA 03 ATNA

CV = 5.07 ± 0.18 ug/g

Result	Uncer.	Date
5.18	0.35	2/28
5.8	0.3	3/07
4.5	0.3	4/25
5.6	0.3	5/04

Cu 85CAN 01 ATNA

CV = 61 ± 3 ug/g

Result	Uncer.	Date
< 350		2/28
< 300		3/07
< 300		4/25
< 300		5/04

Cu 85CAN 01 ICPES

CV = 61 ± 3 ug/g

Result	Uncer.	Date
48	10	7/16
44	9	7/16
54	11	8/06
51	10	8/17
65	13	8/21
53	11	8/25
57	11	8/27
56	11	8/31
49	10	9/10
48	10	9/14

Cu 85CAN 01 ICPMS

CV = 61 ± 3 ug/g

Result	Uncer.	Date
< 65		8/31
56	6	9/21
53	5	10/20

Dy 89GLA 03 ATNA

CV = 4.5 ± 0.4 ug/g

Result	Uncer.	Date
4	0.5	2/28
3.8	0.4	3/07
3.9	0.4	4/25
4.3	0.4	5/04

Eu 89GLA 03 ATNA

CV = 1.57 ± 0.05 ug/g

Result	Uncer.	Date
1.36	0.06	2/28
1.44	0.08	3/07
1.43	0.06	4/25
1.48	0.06	5/04

Fe 85CAN 01 ATNA

CV = 6 ± 0.13 %

Result	Uncer.	Date
5.52	0.35	2/28
5.8	0.3	3/07
6.1	0.3	4/25
5.8	0.3	5/04

TABLE E-IV (cont)

****

CCRMP SO-1 Regosolic Soil (cont)

****

Fe 85CAN 01 ICPES

CV = 6 ± 0.13 %

Result	Uncer.	Date
6	1.2	6/11
5.9	1.2	7/16
6.2	1.2	7/16
6	1.2	8/06
5.6	1.1	8/17
5.3	1.1	8/21
5.4	1.1	8/25
5.1	1	8/27
5.4	1.1	8/31
5.2	1	9/10
5.1	1	9/14
5.2	1.1	10/26
5.8	0.6	10/26
5.8	1.2	10/26
5.7	1.1	11/09
5.3	1.1	11/09
6	1.2	11/13
5.6	1.1	11/13
5.5	1.1	11/30

Ga 89GLA 03 ATNA

CV = 24.1 ± 0.8 ug/g

Result	Uncer.	Date
< 35		2/28
19	5	3/07
< 60		4/25
< 600		5/04

Hf 89GLA 03 ATNA

CV = 2.5 ± 0.4 ug/g

Result	Uncer.	Date
2.83	0.25	2/28
2.6	0.3	3/07
2.45	0.2	4/25
2.5	0.3	5/04

Hg 85CAN 01 ATNA

CV = 22 ± 3 ng/g

Result	Uncer.	Date
< 1200		2/28
< 800		3/07
< 1300		4/25
< 800		5/04

Hg 85CAN 01 CVAA

CV = 22 ± 3 ng/g

Result	Uncer.	Date
15	2	1/23
17	2	4/21
18	2	6/08
24	2	6/22

I 89GLA 03 ATNA

CV = 12 ug/g

Result	Uncer.	Date
< 35		2/28
< 24		3/07
< 21		4/25
< 23		5/04

In 89GLA 03 ATNA

CV = 100 ng/g

Result	Uncer.	Date
< 350		2/28
< 300		3/07
< 300		4/25
< 240		5/04

K 85CAN 01 ATNA

CV = 2.68 ± 0.08 %

Result	Uncer.	Date
2.63	0.18	2/28
2.78	0.19	3/07
2.7	0.22	4/25
2.9	0.3	5/04

K 85CAN 01 ICPES

CV = 2.68 ± 0.08 %

Result	Uncer.	Date
2.6	0.5	6/11
2.4	0.5	7/16
2.7	0.5	7/16
2.7	0.5	8/06
2.6	0.5	8/17
2.6	0.5	8/21
2.7	0.5	8/25
2.5	0.5	8/27
2.6	0.5	8/31
2.8	0.6	9/10
2.6	0.5	9/14

La 89GLA 03 ATNA

CV = 54 ± 2 ug/g

Result	Uncer.	Date
63.3	3.5	2/28
59	4	3/07
59	4	4/25
56	3	5/04

Li 89GLA 03 ICPES

CV = 48 ± 2 ug/g

Result	Uncer.	Date
45	9	7/16
36	7	7/16
57	11	8/06
48	10	8/17
52	10	8/25

Li (cont)

44	9	8/27
40	8	8/31
38	8	9/10
37	7	9/14

Li 89GLA 03 ICPMS

CV = 48 ± 2 ug/g

Result	Uncer.	Date
< 40		8/31

Lu 89GLA 03 ATNA

CV = 310 ± 20 ng/g

Result	Uncer.	Date
280	30	2/28
356	21	3/07
310	30	4/25
320	30	5/04

Mg 85CAN 01 ATNA

CV = 2.31 ± 0.11 %

Result	Uncer.	Date
1.99	0.14	2/28
2.1	0.13	3/07
2.38	0.15	4/25
2.09	0.12	5/04

Mg 85CAN 01 ICPES

CV = 2.31 ± 0.11 %

Result	Uncer.	Date
2	0.4	6/11
2	0.4	7/16
1.8	0.4	7/16
2	0.4	8/06
1.6	0.3	8/17
1.8	0.4	8/21
1.9	0.4	8/25
2.2	0.4	8/27
2	0.4	8/27
2	0.4	8/31
2.2	0.4	9/10
1.9	0.4	9/10
2.2	0.4	9/14

Mn 85CAN 01 ATNA

CV = 890 ± 30 ug/g

Result	Uncer.	Date
932	35	2/28
880	40	3/07
930	40	4/25
930	40	5/04

Mn 85CAN 01 ICPES

CV = 890 ± 30 ug/g

Result	Uncer.	Date
940	190	6/11
850	170	7/16
840	170	7/16
830	170	8/06
740	150	8/17
730	150	8/21
830	170	8/25
790	160	8/27
810	160	8/31
770	150	9/10
770	150	9/14

Mn 85CAN 01 ICPMS

CV = 890 ± 30 ug/g

Result	Uncer.	Date
1200	200	8/31
770	80	9/21
960	100	10/21

Mo 89GLA 03 ATNA

CV = 2 ± 1 ug/g

Result	Uncer.	Date
< 100		3/07
< 80		4/25
40	8	5/04

Mo 89GLA 03 ICPES

CV = 2 ± 1 ug/g

Result	Uncer.	Date
< 3		7/16
4	3	7/16
< 5		8/06
< 4		8/17
< 4		8/21
< 4		8/25
< 4		8/27
< 4		8/31
< 4		9/10
< 4		9/14

Mo 89GLA 03 ICPMS

CV = 2 ± 1 ug/g

Result	Uncer.	Date
< 93		8/31

Na 85CAN 01 ATNA

CV = 1.97 ± 0.08 %

Result	Uncer.	Date
2.1	0.09	2/28
2.09	0.1	3/07
2.11	0.06	4/25
1.99	0.06	5/04

Na 85CAN 01 ICPES

CV = 1.97 ± 0.08 %

Result	Uncer.	Date
1.8	0.4	6/11
1.8	0.4	7/16
1.8	0.4	7/16
1.8	0.4	8/06
1.5	0.3	8/17
1.7	0.3	8/21
1.7	0.3	8/25
1.9	0.4	8/27
1.8	0.4	8/31
1.7	0.3	9/10
1.7	0.3	9/14

Nd 89GLA 03 ATNA

CV = 44 ± 3 ug/g

Result	Uncer.	Date
41.4	3.5	2/28
49	4	3/07
44	4	4/25
44	4	5/04

Ni 85CAN 01 ICPES

CV = 94 ± 7 ug/g

Result	Uncer.	Date
87	17	6/11
90	18	7/16
70	14	7/16
90	18	8/06
93	19	8/17
81	16	8/17
88	17	8/21
95	19	8/25
83	17	8/27
88	18	8/31
86	17	9/10
85	17	9/14
90	9	10/26
86	17	10/26
89	18	11/09
85	17	11/09
95	19	11/13
86	17	11/13
87	17	11/30
88	17	12/07

Ni 85CAN 01 ICPMS

CV = 94 ± 7 ug/g

Result	Uncer.	Date
270	50	8/31

Pb 85CAN 01 ICPES

CV = 21 ± 4 ug/g

Result	Uncer.	Date
25	5	6/11
< 30		7/16
< 30		7/16
20	4	8/07
< 7		8/17
21	7	8/17

Pb (cont)

< 7		8/21
8	7	8/25
< 7		8/27
< 7		8/31
< 7		9/10
< 7		9/14
7	4	12/07

Pb 85CAN 01 ICPMS

CV = 21 ± 4 ug/g

Result	Uncer.	Date
< 110		8/31
17	2	9/02
17	2	10/23

Rb 85CAN 01 ATNA

CV = 139 ± 12 ug/g

Result	Uncer.	Date
125	8	2/28
130	7	3/07
134	8	4/25
138	8	5/04

Sb 89GLA 03 ATNA

CV = 297 ± 25 ng/g

Result	Uncer.	Date
< 1600		2/28
< 1100		3/07
< 1700		4/25
< 1100		5/04

Sb 89GLA 03 ICPES

CV = 297 ± 25 ng/g

Result	Uncer.	Date
< 200		6/11
<10000		7/16
<40000		8/06
< 6000		8/17
< 6000		8/17
< 6000		8/21
< 6000		8/25
< 6000		8/27
< 6000		8/31
< 6000		9/10
< 6000		9/14
< 4000		12/07

Sb 89GLA 03 ICPMS

CV = 297 ± 25 ng/g

Result	Uncer.	Date
<88000		8/31
230	50	10/26

Low value on 10/26 because digestion not appropriate for total metals.

TABLE E-IV (cont)

****

CCRMP SO-1 Regosolic Soil (cont)

****

Sc 89GLA 03 ATNA

CV = 17.7 ± 0.8 ug/g

Result	Uncer.	Date
17	0.9	2/28
17.6	0.9	3/07
16.5	0.9	4/25
17.8	0.9	5/04

Se 89GLA 03 ATNA

CV = 91 ± 7 ng/g

Result	Uncer.	Date
< 6900		2/28
< 7000		3/07
< 7000		4/25
< 5000		5/04

Se 89GLA 03 ICPMS

CV = 91 ± 7 ng/g

Result	Uncer.	Date
< 350		8/31

Sm 89GLA 03 ATNA

CV = 7.9 ± 0.5 ug/g

Result	Uncer.	Date
8.86	0.35	2/28
8.1	0.4	3/07
8.2	0.4	4/25
7.8	0.4	5/04

Sn 89GLA 03 ICPMS

CV = 2.6 ± 0.7 ug/g

Result	Uncer.	Date
< 63		8/31

Sr 85CAN 01 ATNA

CV = 328 ± 29 ug/g

Result	Uncer.	Date
380	60	2/28
250	40	3/07
< 200		4/25
280	40	5/04

Sr 85CAN 01 ICPES

CV = 328 ± 29 ug/g

Result	Uncer.	Date
300	60	7/16
270	50	7/16
290	60	8/06
230	50	8/17
290	60	8/25
310	60	8/27
300	60	8/31
280	60	9/10
280	60	9/14

Sr 85CAN 01 ICPMS

CV = 328 ± 29 ug/g

Result	Uncer.	Date
300	60	8/31
280	30	10/20

Ta 89GLA 03 ATNA

CV = 0.7 ± 0.12 ug/g

Result	Uncer.	Date
0.7	0.1	2/28
0.76	0.08	3/07
0.66	0.07	4/25
0.63	0.06	5/04

Tb 89GLA 03 ATNA

CV = 0.88 ± 0.07 ug/g

Result	Uncer.	Date
0.94	0.1	2/28
1.1	0.1	3/07
0.71	0.08	4/25
0.78	0.08	5/04

Th 89GLA 03 ATNA

CV = 12.4 ± 1.2 ug/g

Result	Uncer.	Date
11	0.5	2/28
12.4	0.8	3/07
10.7	0.4	4/25
11.5	0.5	5/04

Ti 85CAN 01 ATNA

CV = 5300 ± 200 ug/g

Result	Uncer.	Date
4800	700	2/28
4700	600	3/07
5100	700	4/25
5300	700	5/04

Tl 89GLA 03 ICPES

CV = 640 ng/g

Result	Uncer.	Date
<20000		6/11
<20000		7/16
45000	20000	7/16
76000	20000	8/06
31000	20000	8/17
<20000		8/17
4400	2000	8/21
<20000		8/25
<20000		8/27
<20000		8/31
<20000		9/10
25000	20000	9/14
<20000		12/07

Tl 89GLA 03 ICPMS

CV = 640 ng/g

Result	Uncer.	Date
<65000		8/31
670	100	10/26

U 89GLA 03 ATNA

CV = 1.71 ± 0.04 ug/g

Result	Uncer.	Date
1.69	0.07	2/28
1.71	0.07	3/07
1.69	0.07	4/25
1.71	0.07	5/04

U 89GLA 03 ICPMS

CV = 1.71 ± 0.04 ug/g

Result	Uncer.	Date
1.6	0.2	1/08
1.67	0.09	2/03
1.72	0.08	2/03
1.5	0.2	2/11
1.6	0.2	2/21
1.7	0.2	2/21
1.5	0.2	2/27
1.6	0.2	2/27
1.6	0.2	2/27
1.6	0.2	3/27
1.2	0.1	4/07
1.06	0.1	4/07
1.5	0.2	4/08
1.5	0.2	5/04
1.4	0.1	5/04
1.5	0.2	5/04
1.7	0.2	5/08
0.62	0.06	6/17
1.5	0.2	6/17
1.6	0.2	7/01
1.6	0.2	7/01
1.4	0.1	7/02
1.4	0.1	8/26
< 130		8/31
1.5	0.2	9/17
1.4	0.2	9/17

U-235/238 81N-8 03 ICPMS

CV = 0.0072 ± 0.0001 ratio

Result	Uncer.	Date
0.0071	0.0007	1/13
0.0072	0.0004	1/17
0.0072	0.0002	1/27
0.0072	0.0003	1/27
0.0077	0.0006	2/03
0.0074	0.0007	2/03
0.0081	0.0002	2/11
0.0071	0.0003	2/21
0.0072	0.0002	2/21
0.0062	0.0015	2/27
0.0071	0.0004	2/27
0.0074	0.0013	2/27
0.0072	0.002	4/07
0.0064	0.001	4/07
0.0062	0.0005	4/08
0.006	0.0009	5/04
0.0071	0.0011	5/04
0.0064	0.0005	5/04
0.007	0.0002	5/08
0.0075	0.0008	7/01
0.0086	0.0013	7/01
0.0072	0.0009	7/02
0.007	0.0012	9/17
0.006	0.0007	9/17

V 89GLA 03 ATNA

CV = 133 ± 4 ug/g

Result	Uncer.	Date
132	6	2/28
126	5	3/07
138	6	4/25
135	6	5/04

V 89GLA 03 ICPES

CV = 133 ± 4 ug/g

Result	Uncer.	Date
130	30	6/11
130	30	7/16
110	20	7/16
140	30	8/06
120	20	8/17
120	20	8/21
130	30	8/25
120	20	8/27
130	30	8/31
120	20	9/10
120	20	9/14

V 89GLA 03 ICPMS

CV = 133 ± 4 ug/g

Result	Uncer.	Date
460	90	8/31
120	10	9/22
160	20	10/21

W 89GLA 03 ATNA

CV = 0.7 ug/g

Result	Uncer.	Date
< 8.1		2/28
< 6		3/07
< 9		4/25
< 30		5/04

Yb 89GLA 03 ATNA

CV = 2.24 ± 0.25 ug/g

Result	Uncer.	Date
1.7	0.2	2/28
1.96	0.14	3/07
2	0.15	4/25
1.95	0.14	5/04

Zn 85CAN 01 ATNA

CV = 146 ± 5 ug/g

Result	Uncer.	Date
140	20	2/28
130	20	3/07
< 30		4/25
140	20	5/04

Zn 85CAN 01 ICPES

CV = 146 ± 5 ug/g

Result	Uncer.	Date
140	30	6/11
140	30	7/16
130	30	7/16
130	30	8/06
120	20	8/17
130	30	8/21
150	30	8/25
130	30	8/27
140	30	8/31
120	30	9/10
120	20	9/14

Zn 85CAN 01 ICPMS

CV = 146 ± 5 ug/g

Result	Uncer.	Date
210	40	8/31
140	20	9/22
170	20	10/21

Zr 89GLA 03 ATNA

CV = 84 ± 10 ug/g

Result	Uncer.	Date
< 280		2/28
< 190		3/07
< 300		4/25
< 200		5/04

****

CCRMP SO-2 Podzolic Soil

****

Ag 89GLA 03 ATNA

CV = 190 ng/g

Result	Uncer.	Date
< 5800		2/28
< 4000		3/07
< 4000		5/04

Al 85CAN 01 ATNA

CV = 8.07 ± 0.18 %

Result	Uncer.	Date
8.15	0.24	2/28
8.5	0.3	3/07
7.99	0.22	5/04

Al 85CAN 01 ICPES

CV = 8.07 ± 0.18 %

Result	Uncer.	Date
8.3	1.6	3/11
6.3	1.3	3/16
8.5	1.6	3/23
7.5	1.5	3/30
7.6	1.5	4/01
7.54	0.015	6/08
7.6	1.5	7/29
7.7	1.5	7/29
7.5	1.5	8/04

As 89GLA 03 ATNA

CV = 1.17 ± 0.13 ug/g

Result	Uncer.	Date
< 3.5		2/28
< 2.3		3/07
< 3		5/04

Au 89GLA 03 ATNA

CV = 1.5 ng/g

Result	Uncer.	Date
33	8	2/28
< 14		3/07
< 13		5/04

Ba 85CAN 01 ATNA

CV = 966 ± 67 ug/g

Result	Uncer.	Date
909	81	2/28
950	100	3/07
900	60	5/04

TABLE E-IV (cont)

****

CCRMP SO-2 Podzolic Soil
(cont)

****

Ba 85CAN 01 ICPES

CV = 966 ± 67 ug/g

Result	Uncer.	Date
960	190	1/27
990	200	1/27
1100	200	2/24
990	200	3/03
1000	200	3/03
1100	200	3/23
960	190	4/01
1000	200	6/08
1000	200	7/29
1000	200	7/29
990	200	8/04

Be 89GLA 03 ICPES

CV = 2 ± 0.3 ug/g

Result	Uncer.	Date
1.5	0.3	3/11
1.3	0.3	3/16
2.09	0.03	3/23
2.1	0.4	3/30
1.9	0.4	4/01
2.7	0.5	6/08
1.8	0.4	7/29
1.9	0.4	7/29
1.7	0.3	8/04

Br 89GLA 03 ATNA

CV = 17 ± 2 ug/g

Result	Uncer.	Date
15	2	2/28
18	2	3/07
16	2	5/04

Ca 85CAN 01 ATNA

CV = 1.96 ± 0.1 %

Result	Uncer.	Date
1.83	0.13	2/28
2.1	0.11	3/07
1.97	0.11	5/04

Ca 85CAN 01 ICPES

CV = 1.96 ± 0.1 %

Result	Uncer.	Date
1.5	0.3	3/11
1.4	0.3	3/16
1.9	0.4	3/23
1.8	0.4	3/30
1.5	0.3	4/01
1.6	0.3	7/29
1.7	0.3	7/29
1.6	0.3	8/04

Cd 89GLA 03 ICPES

CV = 130 ± 40 ng/g

Result	Uncer.	Date
< 600		1/27
< 600		1/27
< 1000		3/11
< 1000		3/16
< 1000		3/23
< 1000		3/30
< 1000		4/01
< 1000		7/29
< 1000		8/04

Ce 89GLA 03 ATNA

CV = 112 ± 8 ug/g

Result	Uncer.	Date
93.2	4.6	2/28
110	5	3/07
108	5	5/04

Cl 89GLA 03 ATNA

CV = 84 ug/g

Result	Uncer.	Date
< 160		2/28
90	20	3/07
< 110		5/04

Co 89GLA 03 ICPES

CV = 7.6 ± 0.6 ug/g

Result	Uncer.	Date
7	1.4	3/11
8.3	1.7	3/16
12	2	3/23
9.8	2	3/30
10	2	4/01
12	4	7/29
8	1.6	7/29
7	1.4	8/04

Cr 89GLA 03 ATNA

CV = 12.3 ± 1.3 ug/g

Result	Uncer.	Date
29.2	2.3	2/28
10	1	3/07
17.9	1.3	5/04

Cr 89GLA 03 ICPES

CV = 12.3 ± 1.3 ug/g

Result	Uncer.	Date
7.2	1.4	1/27
5.4	1.1	1/27
5.6	1.1	3/16
8.2	1.6	3/23
6.9	1	3/30
7	1.4	4/01
10	2	7/29
< 15		8/04

Cs 89GLA 03 ATNA

CV = 0.41 ± 0.05 ug/g

Result	Uncer.	Date
< 1.5		2/28
< 1.3		3/07
< 1.1		5/04

Cu 85CAN 01 ATNA

CV = 7 ± 1 ug/g

Result	Uncer.	Date
< 350		2/28
< 300		3/07
< 300		5/04

Cu 85CAN 01 ICPES

CV = 7 ± 1 ug/g

Result	Uncer.	Date
< 1		4/01
< 0.3		6/08
< 0.8		7/29
< 2		7/29
< 9		8/04

Dy 89GLA 03 ATNA

CV = 8.8 ± 1.4 ug/g

Result	Uncer.	Date
6.8	0.7	2/28
9	0.8	3/07
7.2	0.6	5/04

Eu 89GLA 03 ATNA

CV = 3.15 ± 0.06 ug/g

Result	Uncer.	Date
3.05	0.14	2/28
3.59	0.19	3/07
3.37	0.19	5/04

Fe 85CAN 01 ATNA

CV = 5.56 ± 0.16 %

Result	Uncer.	Date
4.95	0.35	2/28
5.2	0.3	3/07
5.5	0.3	5/04

Fe 85CAN 01 ICPES

CV = 5.56 ± 0.16 %

Result	Uncer.	Date
5.9	1.2	3/11
4	0.8	3/16
5.3	1	3/23
4.7	0.9	3/30

Fe (cont)

4.6	0.9	4/01
5.1	1	7/29
5.6	1.1	7/29
5	1	8/04

Ga 89GLA 03 ATNA

CV = 24.3 ± 0.3 ug/g

Result	Uncer.	Date
25	6	2/28
23	4	3/07
< 600		5/04

Hf 89GLA 03 ATNA

CV = 17.4 ± 1.3 ug/g

Result	Uncer.	Date
16.8	1	2/28
19.5	1.8	3/07
19.1	1.8	5/04

Hg 85CAN 01 ATNA

CV = 82 ± 9 ng/g

Result	Uncer.	Date
< 1000		2/28
< 700		3/07
< 800		5/04

I 89GLA 03 ATNA

CV = 15 ug/g

Result	Uncer.	Date
< 28		2/28
< 19		3/07
< 19		5/04

In 89GLA 03 ATNA

CV = < 300 ng/g

Result	Uncer.	Date
< 350		2/28
< 300		3/07
140	50	5/04

K 85CAN 01 ATNA

CV = 2.45 ± 0.04 %

Result	Uncer.	Date
2.38	0.17	2/28
2.42	0.16	3/07
2.6	0.3	5/04

K 85CAN 01 ICPES

CV = 2.45 ± 0.04 %

Result	Uncer.	Date
2	0.4	3/11
1.8	0.4	3/16
2.3	0.4	3/23
2	0.4	3/30
2.3	0.5	4/01
2.4	0.5	7/29
2.3	0.5	7/29
2.2	0.5	8/04

La 89GLA 03 ATNA

CV = 46.5 ± 0.7 ug/g

Result	Uncer.	Date
46	2.6	2/28
48	3	3/07
46.5	2.4	5/04

Li 89GLA 03 ICPES

CV = 9 ± 2 ug/g

Result	Uncer.	Date
11	2	7/29
12	2	7/29

Lu 89GLA 03 ATNA

CV = 460 ± 60 ng/g

Result	Uncer.	Date
518	46	2/28
530	30	3/07
620	50	5/04

Mg 85CAN 01 ATNA

CV = 5400 ± 300 ug/g

Result	Uncer.	Date
7000	1000	2/28
4100	600	3/07
4600	700	5/04

Mg 85CAN 01 ICPES

CV = 5400 ± 300 ug/g

Result	Uncer.	Date
4900	1000	3/11
4400	900	3/16
5300	1100	3/23
4900	1000	3/30
5000	1000	4/01
5100	1000	7/29
4900	100	7/29
4800	1000	8/04

Mn 85CAN 01 ATNA

CV = 720 ± 20 ug/g

Result	Uncer.	Date
736	35	2/28
740	30	3/07
730	40	5/04

Mn 85CAN 01 ICPES

CV = 720 ± 20 ug/g

Result	Uncer.	Date
800	160	3/11
580	120	3/16
780	160	3/23
690	140	3/30
640	130	4/01
690	140	7/29
650	130	7/29
620	130	8/04

Mo 89GLA 03 ATNA

CV = 2 ± 1 ug/g

Result	Uncer.	Date
< 90		3/07
< 100		5/04

Mo 89GLA 03 ICPES

CV = 2 ± 1 ug/g

Result	Uncer.	Date
2	0.5	7/29

Na 85CAN 01 ATNA

CV = 1.9 ± 0.05 %

Result	Uncer.	Date
1.84	0.08	2/28
1.91	0.08	3/07
1.91	0.05	5/04

Na 85CAN 01 ICPES

CV = 1.9 ± 0.05 %

Result	Uncer.	Date
1.9	0.4	3/11
1.5	0.3	3/16
2	0.4	3/23
1.7	0.3	3/30
1.9	0.4	4/01
1.9	0.4	7/29
1.8	0.4	7/29
1.7	0.3	8/04

TABLE E-IV (cont)

****

CCRMP SO-2 Podzolic Soil
(cont)

****

Nd 89GLA 03 ATNA

CV = 57 ± 2 ug/g

Result	Uncer.	Date
36.8	3.5	2/28
59	5	3/07
42	4	5/04

Ni 85CAN 01 ICPES

CV = 8 ± 2 ug/g

Result	Uncer.	Date
2.6	0.5	3/16
3.8	0.8	3/31
2.5	0.5	4/01
6	6	7/29
5	3	8/04

Pb 89GLA 03 ICPES

CV = 20 ± 2 ug/g

Result	Uncer.	Date
< 1.8		1/27
< 1.8		1/27
34	7	3/16
33	7	3/16
31	6	3/31
24	5	3/31
36	7	6/08
5	4	7/29
27	5	8/04

Rb 85CAN 01 ATNA

CV = 78 ± 6 ug/g

Result	Uncer.	Date
63	7	2/28
68	5	3/07
77	6	5/04

Sb 89GLA 03 ATNA

CV = 106 ± 18 ng/g

Result	Uncer.	Date
< 1400		2/28
< 800		3/07
< 1100		5/04

Sb 89GLA 03 ICPES

CV = 106 ± 18 ng/g

Result	Uncer.	Date
< 2000		3/11
< 2000		3/16
< 5000		3/23
< 3000		3/30

Sb (cont)

< 2000		4/01
< 3000		7/29
< 6000		8/04

Sc 89GLA 03 ATNA

CV = 11.3 ± 0.3 ug/g

Result	Uncer.	Date
9.55	0.46	2/28
11	0.6	3/07
10.6	0.6	5/04

Se 89GLA 03 ATNA

CV = 400 ± 80 ng/g

Result	Uncer.	Date
< 5800		2/28
< 4000		3/07
< 4000		5/04

Sm 89GLA 03 ATNA

CV = 11.8 ± 1.2 ug/g

Result	Uncer.	Date
11.3	0.5	2/28
12.1	0.6	3/07
11.6	0.6	5/04

Sr 85CAN 01 ATNA

CV = 340 ± 50 ug/g

Result	Uncer.	Date
320	50	2/28
250	30	3/07
260	30	5/04

Sr 85CAN 01 ICPES

CV = 340 ± 50 ug/g

Result	Uncer.	Date
340	70	7/29
320	70	7/29

Ta 89GLA 03 ATNA

CV = 1.15 ± 0.13 ug/g

Result	Uncer.	Date
1.1	0.1	2/28
1.1	0.1	3/07
1.3	0.1	5/04

Tb 89GLA 03 ATNA

CV = 1.62 ± 0.19 ug/g

Result	Uncer.	Date
1.1	0.1	2/28
1.5	0.2	3/07
1.3	0.1	5/04

Th 89GLA 03 ATNA

CV = 3.8 ± 0.4 ug/g

Result	Uncer.	Date
3.34	0.18	2/28
3.57	0.17	3/07
3.77	0.18	5/04

Ti 85CAN 01 ATNA

CV = 8600 ± 200 ug/g

Result	Uncer.	Date
8100	1000	2/28
8300	1100	3/07
8500	1100	5/04

Tl 89GLA 03 ICPES

CV = 580 ng/g

Result	Uncer.	Date
< 4000		3/11
< 4000		3/16
< 3000		3/23
< 4000		3/30
< 1000		4/01
35000	20000	7/29
31000	20000	7/29
30000	20000	8/04

U 89GLA 03 ATNA

CV = 0.98 ± 0.05 ug/g

Result	Uncer.	Date
0.92	0.046	2/28
0.95	0.04	3/07
0.97	0.04	5/04

V 89GLA 03 ATNA

CV = 57 ± 4 ug/g

Result	Uncer.	Date
52.9	3.5	2/28
59	3	3/07
57	3	5/04

V 89GLA 03 ICPES

CV = 57 ± 4 ug/g

Result	Uncer.	Date
48	10	3/11
49	10	3/16
64	13	3/23

V (cont)

53	11	3/30
52	10	4/01
56	11	7/29
51	10	7/29
52	10	8/04

W 89GLA 03 ATNA

CV = 0.4 ug/g

Result	Uncer.	Date
< 6.9		2/28
< 5		3/07
< 30		5/04

Yb 89GLA 03 ATNA

CV = 3.5 ± 0.4 ug/g

Result	Uncer.	Date
2.9	0.3	2/28
3.1	0.3	3/07
3.4	0.4	5/04

Zn 85CAN 01 ATNA

CV = 124 ± 5 ug/g

Result	Uncer.	Date
120	20	2/28
120	20	3/07
124	7	5/04

Zn 85CAN 01 ICPES

CV = 124 ± 5 ug/g

Result	Uncer.	Date
20	4	3/16
72	14	3/23
48	10	4/01
110	20	7/29
110	20	7/29
95	19	8/04

Zr 89GLA 03 ATNA

CV = 760 ± 60 ug/g

Result	Uncer.	Date
660	90	2/28
650	120	3/07
700	100	5/04

****

CCRMP SO-3
Calcareous C Horizon Soil

****

Ag 89GLA 03 ATNA

CV = < 50 ng/g

Result	Uncer.	Date
< 4600		2/28
< 2400		3/08

Ag 89GLA 03 FAA

CV = < 50 ng/g

Result	Uncer.	Date
< 1000		6/12

Al 85CAN 01 ATNA

CV = 3.06 ± 0.11 %

Result	Uncer.	Date
3.2	0.1	2/28
3.11	0.09	3/08

Al 85CAN 01 ICPES

CV = 3.06 ± 0.11 %

Result	Uncer.	Date
0.98	0.2	1/07
2.4	0.5	3/30
2.7	0.5	4/01
1.45	0.003	6/08
2	0.4	6/11
1.2	0.2	7/16
2.1	0.4	7/16
0.67	0.13	7/29
0.63	0.13	7/29
2.4	0.5	8/04
1.9	0.4	8/06
2.2	0.4	8/17
2.3	0.5	8/21
2.4	0.5	8/25
2.3	0.5	8/27
2.6	0.5	8/31
1.8	0.4	9/10
2.4	0.5	9/14
2	0.4	10/26
2.7	0.3	10/26
2	0.4	11/09
2.1	0.4	11/13
2.2	0.4	11/13
1.8	0.4	11/30

As 89GLA 03 ATNA

CV = 2.51 ± 0.13 ug/g

Result	Uncer.	Date
2.4	0.5	2/28
1.7	0.3	3/08

As 89GLA 03 ETVAA

CV = 2.51 ± 0.13 ug/g

Result	Uncer.	Date
1.7	0.4	1/16
1.6	0.4	1/23
2.7	0.5	6/08
3.7	0.7	6/10
3.3	0.6	6/30

Au 89GLA 03 ATNA

CV = 0.49 ng/g

Result	Uncer.	Date
< 16		2/28
< 7		3/08

B 89GLA 03 ICPES

CV = 26 ± 3 ug/g

Result	Uncer.	Date
31	6	10/26
39	12	10/26
36	7	11/09
30	9	11/13
29	9	11/13
41	12	11/30
20	20	12/07

Ba 85CAN 01 ATNA

CV = 300 ± 40 ug/g

Result	Uncer.	Date
250	30	2/28
265	25	3/08

Ba 85CAN 01 ICPES

CV = 300 ± 40 ug/g

Result	Uncer.	Date
260	50	1/07
230	50	3/30
250	50	4/01
170	40	6/08
260	50	6/11
230	50	7/16
230	50	7/16
230	50	7/16
200	40	7/29
280	60	8/04
290	60	8/06
240	50	8/17
270	50	8/17
240	50	8/21
250	50	8/25
230	50	8/27
240	50	8/31
240	50	9/10
250	50	9/14
240	50	12/07

TABLE E-IV (cont)

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CCRMP SO-3
Calcareous C Horizon Soil
(cont)

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Be 89GLA 03 ICPES

CV = 0.81 ± 0.15 ug/g

Result	Uncer.	Date
0.76	0.15	1/07
1	0.2	3/30
0.88	0.18	4/01
1.2	0.2	6/08
1.1	0.2	6/11
0.86	0.17	7/16
1	0.2	7/29
0.73	0.15	7/29
0.93	0.2	8/04
0.9	0.5	8/06
1.2	0.2	8/17
1	0.2	8/17
1.1	0.2	8/21
1.2	0.2	8/25
1.1	0.2	8/27
1.1	0.2	8/31
1	0.2	9/10
1.2	0.2	9/14
0.99	0.1	10/07
1.6	0.5	12/07

Be 89GLA 03 ICPMS

CV = 0.81 ± 0.15 ug/g

Result	Uncer.	Date
1	0.1	10/20

Br 89GLA 03 ATNA

CV = 5.5 ug/g

Result	Uncer.	Date
4.7	0.6	2/28
5.5	0.8	3/08

Ca 85CAN 01 ATNA

CV = 14.63 ± 0.4 %

Result	Uncer.	Date
15.1	0.7	2/28
15.4	0.6	3/08

Ca 85CAN 01 ICPES

CV = 14.63 ± 0.4 %

Result	Uncer.	Date
15	3	1/07
13	3	3/30
13	3	4/01
12	2	6/11
12	3	7/16
13	3	7/16
9.6	1.9	7/29
13	3	8/04
13	3	8/06

Ca (cont)

14	3	8/17
12	3	8/17
14	3	8/21
14	3	8/25
13	3	8/27
14	3	8/31
14	3	9/10
15	3	9/14

Cd 89GLA 03 ICPES

CV = 120 ± 30 ng/g

Result	Uncer.	Date
< 140		1/07
< 1000		3/30
< 1000		4/01
< 400		6/11
< 600		7/16
< 1000		7/29
< 1000		8/04
< 700		8/07
< 2000		8/17
< 2000		8/17
< 2000		8/21
< 2000		8/25
< 2000		8/27
< 2000		8/31
< 2000		9/10
< 2000		9/14
< 700		12/07

Ce 89GLA 03 ATNA

CV = 34 ± 2 ug/g

Result	Uncer.	Date
35.4	2	2/28
34.7	1.8	3/08

Cl 89GLA 03 ATNA

CV = 210 ug/g

Result	Uncer.	Date
400	60	2/28
330	30	3/08

Co 89GLA 03 ICPES

CV = 5.5 ± 0.8 ug/g

Result	Uncer.	Date
8.8	2.2	1/07
5	1	3/30
5	1	4/01
6	1.2	6/11
< 3		7/16
4.9	1	7/16
6	4	7/29
4.8	0.9	7/29
4.4	0.9	8/04
4	0.8	8/07
4	1	8/17
4	0.8	8/21
5	1	8/25
3	1	8/27
5	1	8/31
4.5	1	9/10
4	1	9/14

Co (cont)

3.6	0.4	10/26
5.9	1.2	11/09
7.6	1.5	11/30

Cr 85CAN 01 ATNA

CV = 26 ± 3 ug/g

Result	Uncer.	Date
39	2.4	2/28
29.2	1.8	3/08

Cr 85CAN 01 ICPES

CV = 26 ± 3 ug/g

Result	Uncer.	Date
12	2	1/07
10	2	3/16
18	4	3/30
17	3	4/01
15	3	6/01
18	4	6/11
18	4	7/16
17	3	7/16
16	3	7/29
18	4	7/29
18	4	8/04
20	4	8/07
19	4	8/17
19	4	8/17
18	4	8/21
20	4	8/25
18	4	8/27
19	4	8/31
17	3	9/10
16	3	9/14
18	4	12/07

Cs 89GLA 03 ATNA

CV = 1.12 ± 0.09 ug/g

Result	Uncer.	Date
1.22	0.1	2/28
1.23	0.09	3/08

Cu 85CAN 01 ATNA

CV = 17 ± 1 ug/g

Result	Uncer.	Date
< 350		2/28
< 240		3/08

Cu 85CAN 01 ICPES

CV = 17 ± 1 ug/g

Result	Uncer.	Date
9.7	1.9	3/16
24	5	3/30
10	2	4/01
11	2	6/08
12	2	7/16
13	3	7/29
13	3	7/29
12	2	8/04

Cu (cont)

13	3	8/07
12	5	8/17
14	3	8/21
13	3	8/25
14	3	8/27
13	3	8/31
11	2	9/10
10	2	9/14

Dy 89GLA 03 ATNA

CV = 2.8 ± 0.3 ug/g

Result	Uncer.	Date
2.6	0.3	2/28
2.8	0.3	3/08

Eu 89GLA 03 ATNA

CV = 0.74 ± 0.05 ug/g

Result	Uncer.	Date
0.81	0.14	2/28
0.73	0.1	3/08

Fe 85CAN 01 ATNA

CV = 1.51 ± 0.06 %

Result	Uncer.	Date
1.5	0.08	2/28
1.55	0.09	3/08

Fe 85CAN 01 ICPES

CV = 1.51 ± 0.06 %

Result	Uncer.	Date
1.2	0.2	1/07
1.2	0.2	3/30
1.4	0.3	4/01
1.3	0.3	6/11
1.3	0.3	7/16
1.1	0.2	7/16
0.79	0.16	7/29
0.9	0.18	7/29
1.3	0.3	8/04
1.3	0.3	8/06
1.4	0.3	8/17
1.2	0.2	8/21
1.3	0.3	8/25
1.2	0.2	8/27
1.3	0.3	8/31
1	0.2	9/10
1.2	0.2	9/14
1.2	0.2	10/26
1.5	0.2	10/26
1.2	0.2	11/09
1.3	0.3	11/13
1.4	0.3	11/13
1.2	0.2	11/30

Ga 89GLA 03 ATNA

CV = 6.4 ± 0.3 ug/g

Result	Uncer.	Date
< 29		2/28
< 30		3/08

Hf 89GLA 03 ATNA

CV = 4.29 ± 0.24 ug/g

Result	Uncer.	Date
4.37	0.35	2/28
4.9	0.4	3/08

Hg 89GLA 03 ATNA

CV = 17 ± 7 ng/g

Result	Uncer.	Date
< 810		2/28
< 400		3/08

Hg 89GLA 03 CVAA

CV = 17 ± 7 ng/g

Result	Uncer.	Date
18	2	1/23
42	10	1/30
8	0.8	2/06

I 89GLA 03 ATNA

CV = 1 ug/g

Result	Uncer.	Date
< 35		2/28
< 24		3/08

In 89GLA 03 ATNA

CV = 100 ng/g

Result	Uncer.	Date
< 350		2/28
< 230		3/08

K 85CAN 01 ATNA

CV = 1.16 ± 0.05 %

Result	Uncer.	Date
1.33	0.12	2/28
0.96	0.11	3/08

K 85CAN 01 ICPES

CV = 1.16 ± 0.05 %

Result	Uncer.	Date
0.57	0.11	1/07
1.1	0.2	3/30
1.2	0.2	4/01

K (cont)

1.2	0.2	6/11
1	0.2	7/16
1.2	0.2	7/16
1.3	0.3	7/16
0.96	0.19	7/29
1	0.2	7/29
1.2	0.2	8/04
1.1	0.2	8/06
1.2	0.2	8/17
1.2	0.2	8/21
1.2	0.2	8/25
1.1	0.2	8/27
1.2	0.3	8/31
1.2	0.2	9/10
1.2	0.2	9/14

La 89GLA 03 ATNA

CV = 16.9 ± 1.3 ug/g

Result	Uncer.	Date
16.8	0.8	2/28
17.4	0.8	3/08

Li 89GLA 03 ICPES

CV = 9 ± 3 ug/g

Result	Uncer.	Date
12	2	7/16
6.1	1.2	7/29
6.9	1	7/29
11	2	8/06
13	3	8/17
13	3	8/25
9.7	1.9	8/27
10	2	8/31
8	1.6	9/10
9	1.8	9/14

Lu 89GLA 03 ATNA

CV = 230 ± 50 ng/g

Result	Uncer.	Date
222	17	2/28
237	19	3/08

Mg 85CAN 01 ATNA

CV = 4.98 ± 0.1 %

Result	Uncer.	Date
4.96	0.26	2/28
4.65	0.24	3/08

Mg 85CAN 01 ICPES

CV = 4.98 ± 0.1 %

Result	Uncer.	Date
5.1	1	1/07
4.3	0.9	3/30
4.8	1	4/01
3.8	0.8	6/11
2.7	0.5	7/16
3.8	0.8	7/16
1.6	0.3	7/29

TABLE E-IV (cont)

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CCRMP SO-3
Calcareous C Horizon Soil
(cont)

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Mg (cont)

1.6	0.3	7/29
4.2	0.9	8/04
3.4	0.7	8/06
4.3	0.9	8/17
4.1	0.8	8/21
4.3	0.9	8/25
4.3	0.9	8/27
4.3	0.9	8/31
3.6	0.7	9/10
4	0.8	9/10
4.9	1	9/14

Mn 85CAN 01 ATNA

CV = 520 ± 20 ug/g

Result	Uncer.	Date
546	23	2/28
580	30	3/08

Mn 85CAN 01 ICPES

CV = 520 ± 20 ug/g

Result	Uncer.	Date
400	80	1/07
480	100	3/30
440	90	4/01
500	100	6/11
430	90	7/16
440	90	7/16
410	80	7/29
370	70	7/29
460	80	8/04
460	90	8/06
440	90	8/17
430	90	8/21
470	100	8/25
430	90	8/27
470	90	8/31
410	80	9/10
440	90	9/14

Mo 89GLA 03 ATNA

CV = 2 ± 1 ug/g

Result	Uncer.	Date
< 50		3/08

Mo 89GLA 03 ICPES

CV = 2 ± 1 ug/g

Result	Uncer.	Date
< 3		7/16
< 0.5		7/16
< 4		7/29
< 5		8/06
< 4		8/17
< 4		8/21
< 4		8/25

Mo (cont)

< 4		8/27
< 4		8/31
< 2		9/10
< 4		9/14

Na 85CAN 01 ATNA

CV = 7400 ± 400 ug/g

Result	Uncer.	Date
7480	350	2/28
7700	400	3/08

Na 85CAN 01 ICPES

CV = 7400 ± 400 ug/g

Result	Uncer.	Date
310	60	1/07
5900	1200	3/30
6700	1300	4/01
5400	1100	6/11
4800	900	7/16
5600	1100	7/16
3000	600	7/29
2700	500	7/29
6200	1200	8/04
4900	1000	8/06
5900	1200	8/17
6200	1200	8/21
6400	1300	8/25
6100	1200	8/27
6600	1300	8/31
5000	1000	9/10
6300	1300	9/14

Nd 89GLA 03 ATNA

CV = 17.2 ± 1 ug/g

Result	Uncer.	Date
16	2	2/28
17	2	3/08

Ni 85CAN 01 ICPES

CV = 16 ± 3 ug/g

Result	Uncer.	Date
7.7	1.5	1/07
0.7	0.2	3/16
7.6	1.5	3/23
12	2	3/30
9	2	4/01
10	2	6/11
7.9	1.6	7/16
10	3	7/16
11	6	7/29
9	2	7/29
14	3	8/04
11	2	8/07
11	3	8/17
10	3	8/17
10	3	8/21
12	3	8/25
9	3	8/27
11	3	8/31
10	3	9/10
9	3	9/14
9.7	1	10/26

Ni (cont)

10	2	10/26
8	2	11/09
10	3	11/13
13	3	11/13
14	3	11/30
10	2	12/07

Pb 85CAN 01 ICPES

CV = 14 ± 3 ug/g

Result	Uncer.	Date
80	16	1/07
16	3	3/16
16	3	3/23
15	3	3/31
8.8	3	3/31
14	3	6/08
14	3	6/11
< 30		7/16
12	5	7/16
< 20		7/29
9	4	7/29
16	3	8/04
15	4	8/07
9	2	8/17
15	7	8/17
< 7		8/21
11	7	8/25
< 7		8/27
7	7	8/31
< 7		9/10
< 7		9/14
12	2	12/07

Rb 85CAN 01 ATNA

CV = 39 ± 3 ug/g

Result	Uncer.	Date
36	3	2/28
35	3	3/08

Sb 89GLA 03 ATNA

CV = 323 ± 6 ng/g

Result	Uncer.	Date
< 810		2/28
350	110	3/08

Sb 89GLA 03 ICPES

CV = 323 ± 6 ng/g

Result	Uncer.	Date
< 620		1/07
< 3000		3/30
< 2000		4/01
5000	2000	6/11
<10000		7/16
<10000		7/16
5000	3000	7/29
< 6000		8/04
50000	40000	8/06
< 6000		8/17
< 6000		8/17
< 6000		8/21
< 6000		8/25
< 6000		8/27

Sb (cont)

< 6000		8/31
< 6000		9/10
< 6000		9/14
< 4000		12/07

Sc 89GLA 03 ATNA

CV = 5.2 ± 0.3 ug/g

Result	Uncer.	Date
5.29	0.35	2/28
5.2	0.3	3/08

Se 89GLA 03 ATNA

CV = 34 ± 15 ng/g

Result	Uncer.	Date
< 4600		2/28
< 2100		3/08

Sm 89GLA 03 ATNA

CV = 3.47 ± 0.19 ug/g

Result	Uncer.	Date
3.85	0.17	2/28
3.44	0.16	3/08

Sr 85CAN 01 ATNA

CV = 220 ± 30 ug/g

Result	Uncer.	Date
< 120		2/28
180	30	3/08

Sr 85CAN 01 ICPES

CV = 220 ± 30 ug/g

Result	Uncer.	Date
160	30	7/16
180	40	7/16
130	30	7/29
140	30	7/29
200	40	8/06
200	40	8/17
200	40	8/25
190	40	8/27
200	40	8/31
170	30	9/10
190	40	9/14

Ta 89GLA 03 ATNA

CV = 0.43 ± 0.06 ug/g

Result	Uncer.	Date
0.37	0.05	2/28
0.36	0.04	3/08

Tb 89GLA 03 ATNA

CV = 0.5 ± 0.01 ug/g

Result	Uncer.	Date
< 0.17		2/28
0.46	0.05	3/08

Th 89GLA 03 ATNA

CV = 3.88 ± 0.21 ug/g

Result	Uncer.	Date
4.1	0.6	2/28
4.38	0.19	3/08

Ti 85CAN 01 ATNA

CV = 2000 ± 200 ug/g

Result	Uncer.	Date
2300	500	2/28
2200	300	3/08

Tl 89GLA 03 ICPES

CV = 180 ng/g

Result	Uncer.	Date
< 1700		1/07
< 4000		3/30
< 1000		4/01
<20000		6/11
25000	20000	7/16
80000	20000	7/16
36000	20000	7/29
89000	20000	8/07
30000	20000	8/17
63000	20000	8/17
70000	20000	8/21
58000	20000	8/25
53000	20000	8/27
57000	20000	8/31
37000	20000	9/10
53000	20000	9/14
49000	20000	12/07

U 89GLA 03 ATNA

CV = 1.11 ± 0.02 ug/g

Result	Uncer.	Date
1.23	0.06	2/28
0.99	0.04	3/08

U 89GLA 03 ICPMS

CV = 1.11 ± 0.02 ug/g

Result	Uncer.	Date
0.84	0.08	7/02

U-235/238 81H-8 03 ICPMS

CV = 0.0072 ± 0.0001 ratio

Result	Uncer.	Date
0.0067	0.0022	7/02

V 89GLA 03 ATNA

CV = 36 ± 4 ug/g

Result	Uncer.	Date
47.2	3.5	2/28
36.8	2.4	3/08

V 89GLA 03 ICPES

CV = 36 ± 4 ug/g

Result	Uncer.	Date
50	10	1/07
38	8	3/30
37	7	4/01
25	5	6/11
29	6	7/16
23	5	7/16
22	4	7/29
21	4	7/29
29	6	8/04
29	6	8/06
27	5	8/17
27	5	8/21
29	6	8/25
27	5	8/27
31	6	8/31
24	5	9/10
26	5	9/14

W 89GLA 03 ATNA

CV = 0.6 ug/g

Result	Uncer.	Date
< 6.9		2/28
< 4		3/08

Yb 89GLA 03 ATNA

CV = 1.67 ± 0.18 ug/g

Result	Uncer.	Date
1.8	0.2	2/28
1.5	0.3	3/08

Zn 89GLA 03 ATNA

CV = 48.3 ± 1.8 ug/g

Result	Uncer.	Date
< 17		2/28
49	7	3/08

TABLE E-IV (cont)

****

CCRMP SO-3
Calcareous C Horizon Soil
(cont)

****

Zn 89GLA 03 ICPES

CV = 48.3 ± 1.8 ug/g

Result	Uncer.	Date
65	13	1/07
27	5	3/16
40	8	3/30
26	5	4/01
45	9	6/11
52	10	7/16
34	7	7/16
49	9	7/29
40	8	7/29
33	7	8/04
45	9	8/06
42	8	8/17
45	9	8/21
50	10	8/25
40	8	8/27
46	9	8/31
39	8	9/10
39	8	9/14

Zr 89GLA 03 ATNA

CV = 156 ± 13 ug/g

Result	Uncer.	Date
160	30	2/28
130	40	3/08

****

CCRMP SO-4
Chernozemic A Horizon Soil

****

Ag 89GLA 03 ATNA

CV = 120 ng/g

Result	Uncer.	Date
< 6900		2/28
< 4000		3/08

Al 85CAN 01 ATNA

CV = 5.46 ± 0.15 %

Result	Uncer.	Date
5.51	0.16	2/28
5.6	0.16	3/08

As 89GLA 03 ATNA

CV = 7.4 ± 0.22 ug/g

Result	Uncer.	Date
8.3	1	2/28
7.2	0.8	3/08

Au 89GLA 03 ATNA

CV = 0.64 ng/g

Result	Uncer.	Date
< 15		2/28
< 9		3/08

Ba 89GLA 03 ATNA

CV = 700 ± 40 ug/g

Result	Uncer.	Date
670	150	2/28
690	40	3/08

Br 89GLA 03 ATNA

CV = 5.2 ± 0.4 ug/g

Result	Uncer.	Date
5.8	1.3	2/28
5.6	0.8	3/08

Ca 85CAN 01 ATNA

CV = 1.11 ± 0.05 %

Result	Uncer.	Date
1.15	0.09	2/28
1.01	0.06	3/08

Ce 89GLA 03 ATNA

CV = 54 ± 1 ug/g

Result	Uncer.	Date
48.8	2.6	2/28
54	3	3/08

Cl 89GLA 03 ATNA

CV = 30 ug/g

Result	Uncer.	Date
< 120		2/28
< 80		3/08

Cr 85CAN 01 ATNA

CV = 61 ± 6 ug/g

Result	Uncer.	Date
63.3	3.5	2/28
74	5	3/08

Cs 89GLA 03 ATNA

CV = 2.88 ± 0.19 ug/g

Result	Uncer.	Date
2.67	0.23	2/28
2.73	0.19	3/08

Cu 85CAN 01 ATNA

CV = 22 ± 1 ug/g

Result	Uncer.	Date
< 350		2/28
< 210		3/08

Dy 89GLA 03 ATNA

CV = 3.5 ± 0.6 ug/g

Result	Uncer.	Date
3	0.5	2/28
3.6	0.4	3/08

Eu 89GLA 03 ATNA

CV = 0.97 ± 0.07 ug/g

Result	Uncer.	Date
0.909	0.081	2/28
1.03	0.06	3/08

Fe 85CAN 01 ATNA

CV = 2.37 ± 0.07 %

Result	Uncer.	Date
2.09	0.1	2/28
2.41	0.12	3/08

Ga 89GLA 03 ATNA

CV = 10.7 ± 0.2 ug/g

Result	Uncer.	Date
< 23		2/28
< 40		3/08

Hf 89GLA 03 ATNA

CV = 8 ± 0.3 ug/g

Result	Uncer.	Date
7.02	0.35	2/28
7.8	0.4	3/08

Hg 89GLA 03 ATNA

CV = 32 ± 10 ng/g

Result	Uncer.	Date
< 1300		2/28
< 700		3/08

Hg 89GLA 03 CVAA

CV = 32 ± 10 ng/g

Result	Uncer.	Date
36	10	1/30
36	10	1/30
21	2	2/11

I 89GLA 03 ATNA

CV = 3 ug/g

Result	Uncer.	Date
< 20		2/28
< 13		3/08

In 89GLA 03 ATNA

CV = 100 ng/g

Result	Uncer.	Date
< 240		2/28
< 160		3/08

K 85CAN 01 ATNA

CV = 1.73 ± 0.03 %

Result	Uncer.	Date
1.66	0.13	2/28
1.83	0.16	3/08

La 89GLA 03 ATNA

CV = 28.2 ± 1.7 ug/g

Result	Uncer.	Date
28.6	1.4	2/28
29.7	1.8	3/08

Lu 89GLA 03 ATNA

CV = 370 ± 40 ng/g

Result	Uncer.	Date
260	24	2/28
490	30	3/08

Mg 85CAN 01 ATNA

CV = 5600 ± 400 ug/g

Result	Uncer.	Date
5500	800	2/28
4900	500	3/08

Mn 85CAN 01 ATNA

CV = 600 ± 20 ug/g

Result	Uncer.	Date
608	28	2/28
610	30	3/08

Mo 89GLA 03 ATNA

CV = 1 ± 0.3 ug/g

Result	Uncer.	Date
< 60		3/08

Na 85CAN 01 ATNA

CV = 1 ± 0.02 %

Result	Uncer.	Date
1.02	0.05	2/28
1.02	0.05	3/08

Nd 89GLA 03 ATNA

CV = 25 ± 2 ug/g

Result	Uncer.	Date
16	2	2/28
27	3	3/08

Rb 89GLA 03 ATNA

CV = 69 ± 8 ug/g

Result	Uncer.	Date
56.4	4.6	2/28
75	5	3/08

Sb 89GLA 03 ATNA

CV = 710 ± 30 ng/g

Result	Uncer.	Date
< 220		2/28
880	240	3/08

Sc 89GLA 03 ATNA

CV = 8.4 ± 0.4 ug/g

Result	Uncer.	Date
6.79	0.35	2/28
8.4	0.5	3/08

Se 89GLA 03 ATNA

CV = 490 ± 110 ng/g

Result	Uncer.	Date
< 8100		2/28
< 5000		3/08

Sm 89GLA 03 ATNA

CV = 4.7 ± 0.2 ug/g

Result	Uncer.	Date
4.83	0.22	2/28
4.61	0.21	3/08

Sr 85CAN 01 ATNA

CV = 170 ± 20 ug/g

Result	Uncer.	Date
< 180		2/28
< 120		3/08

Ta 89GLA 03 ATNA

CV = 0.62 ± 0.11 ug/g

Result	Uncer.	Date
0.54	0.07	2/28
0.65	0.05	3/08

Tb 89GLA 03 ATNA

CV = 0.61 ± 0.03 ug/g

Result	Uncer.	Date
< 0.81		2/28
0.85	0.08	3/08

Th 89GLA 03 ATNA

CV = 8.6 ± 0.7 ug/g

Result	Uncer.	Date
7.8	0.9	2/28
8.6	1	3/08

Ti 85CAN 01 ATNA

CV = 3400 ± 200 ug/g

Result	Uncer.	Date
2800	500	2/28
3200	400	3/08

U 89GLA 03 ATNA

CV = 2.38 ± 0.07 ug/g

Result	Uncer.	Date
2.43	0.1	2/28
2.22	0.08	3/08

V 89GLA 03 ATNA

CV = 85 ± 5 ug/g

Result	Uncer.	Date
97.8	4.6	2/28
84	4	3/08

W 89GLA 03 ATNA

CV = 1 ug/g

Result	Uncer.	Date
< 5.8		2/28
< 6		3/08

Yb 89GLA 03 ATNA

CV = 2.1 ± 0.4 ug/g

Result	Uncer.	Date
1.8	0.3	2/28
2.24	[illegible]	3/08

TABLE E-IV (cont)

****

CCRMP SO-4
Chernozemic A Horizon Soil
(cont)

****

Zn 85CAN 01 ATNA

CV = 94 ± 3 ug/g

Result	Uncer.	Date
87	14	2/28
110	30	3/08

Zr 89GLA 03 ATNA

CV = 270 ± 15 ug/g

Result	Uncer.	Date
< 280		2/28
330	50	3/08

****

DOE Be Intercomparison Study, Round 1

****

Be 93DOE 03 FAA

CV = not spiked ug/filter

Result	Uncer.	Date
< 0.1		3/24
< 0.1		3/24
< 0.1		3/24
< 0.1		3/24
< 0.1		3/24
< 0.1		3/24
< 0.1		3/24
< 0.1		3/24

CV = 0.103 ± 0.01 ug/filter

Result	Uncer.	Date
0.1	0.1	3/24
< 0.1		3/24
0.1	0.1	3/24
0.1	0.1	3/24

CV = 0.51 ± 0.05 ug/filter

Result	Uncer.	Date
0.5	0.1	3/24
0.5	0.1	3/24
0.5	0.1	3/24
0.5	0.1	3/24

CV = 1.033 ± 0.1 ug/filter

Result	Uncer.	Date
1.1	0.1	3/24
1.1	0.1	3/24
1.1	0.1	3/24
1.1	0.1	3/24

Be (cont)

CV = 10.23 ± 1.02 ug/filter

Result	Uncer.	Date
10	1	3/24
11	1	3/24
11	1	3/24
11	1	3/24

CV = 25.52 ± 2.55 ug/filter

Result	Uncer.	Date
26	3	3/24
26	3	3/24
26	3	3/24
27	3	3/24

****

DOE Be Intercomparison Study, Round 2

****

Be 92DOE 03 FAA

CV = not spiked ug/filter

Result	Uncer.	Date
< 0.1		6/18
< 0.1		6/18
< 0.1		6/18
< 0.1		6/18
< 0.1		6/18
< 0.1		6/18
< 0.1		6/18
< 0.1		6/18

CV = 0.156 ± 0.016 ug/filter

Result	Uncer.	Date
0.2	0.1	6/18
0.2	0.1	6/18
0.3	0.1	6/18
0.1	0.1	6/18

CV = 0.617 ± 0.062 ug/filter

Result	Uncer.	Date
0.7	0.1	6/18
0.8	0.1	6/18
0.6	0.1	6/18
0.7	0.1	6/18

CV = 0.933 ± 0.093 ug/filter

Result	Uncer.	Date
1	0.1	6/18
1	0.1	6/18
1	0.1	6/18
1	0.1	6/18

CV = 15.5 ± 1.55 ug/filter

Result	Uncer.	Date
15	2	6/18
15	2	6/18
16	2	6/18
16	2	6/18

Be (cont)

CV = 30.37 ± 3.04 ug/filter

Result	Uncer.	Date
31	3	6/18
30	3	6/18
30	3	6/18
30	3	6/18

****

DOE Be Intercomparison Study, Round 3

****

Be 92DOE 03 FAA

CV = not spiked ug/filter

Result	Uncer.	Date
< 0.1		9/01
< 0.1		9/01
< 0.1		9/01
< 0.1		9/01
< 0.1		9/01
< 0.1		9/01
< 0.1		9/01
< 0.1		9/01

CV = 0.126 ± 0.013 ug/filter

Result	Uncer.	Date
0.1	0.1	9/01
0.2	0.1	9/01
< 0.1		9/01
< 0.1		9/01

CV = 0.417 ± 0.042 ug/filter

Result	Uncer.	Date
0.4	0.1	9/01
0.5	0.1	9/01
0.4	0.1	9/01
0.4	0.1	9/01

CV = 0.985 ± 0.099 ug/filter

Result	Uncer.	Date
1	0.1	9/01
0.9	0.1	9/01
1	0.1	9/01
0.9	0.1	9/01

CV = 12.5 ± 1.25 ug/filter

Result	Uncer.	Date
12	1	9/01
13	1	9/01
13	1	9/01
13	1	9/01

CV = 20.76 ± 2.08 ug/filter

Result	Uncer.	Date
20	2	9/01
21	2	9/01
20	2	9/01
20	2	9/01

****

DOE Be Intercomparison Study, Round 4

****

Be 92DOE 03 FAA

CV = not spiked ug/filter

Result	Uncer.	Date
0.2	0.1	11/19
< 0.1		11/19
< 0.1		11/19
0.5	0.1	11/19

CV = 0.135 ± 0.01 ug/filter

Result	Uncer.	Date
0.74	0.1	11/19
0.25	0.1	11/19
0.34	0.1	11/19
0.29	0.1	11/19

CV = 0.567 ± 0.06 ug/filter

Result	Uncer.	Date
0.77	0.1	11/19
0.64	0.1	11/19
0.7	0.1	11/19
1.15	0.1	11/19

CV = 1 ± 0.1 ug/filter

Result	Uncer.	Date
1.5	0.2	11/19
1.06	0.1	11/19
1	0.1	11/19
1.11	0.1	11/19

CV = 13.4 ± 1.3 ug/filter

Result	Uncer.	Date
11	1	11/19

CV = 13.43 ± 1.34 ug/filter

Result	Uncer.	Date
13	1	11/19
13	1	11/19
14	1	11/19

CV = 23.55 ± 2.4 ug/filter

Result	Uncer.	Date
25	3	11/19
23	2	11/19
25	3	11/19
22	2	11/19

****

EM-9 Flash Point of 1-Hexanol

****

Flash Point 86WIL 01 FP

CV = 145 degrees F

Result	Uncer.	Date
148	4	1/24
148	4	1/24
146	4	6/10
147	4	8/05
152	6	8/20

****

EM-9 Gross Alpha/Beta in Water

****

Alpha 92GAU 01 PC

CV = not spiked pCi/L

Result	Uncer.	Date
0.8	0.4	4/03
3.7	0.9	4/22
0.5	0.4	6/15
- 0.5	0.3	7/21
0.6	0.3	8/17
1.2	0.5	9/15

CV = 6 ± 0.2 pCi/L

Result	Uncer.	Date
10	2	5/06
7	2	7/28

CV = 6.4 ± 0.2 pCi/L

Result	Uncer.	Date
9	2	8/10

CV = 7.9 ± 0.3 pCi/L

Result	Uncer.	Date
12	3	8/10

CV = 8.9 ± 0.3 pCi/L

Result	Uncer.	Date
14	3	4/22

CV = 10.9 ± 0.4 pCi/L

Result	Uncer.	Date
16	3	12/02

CV = 11.9 ± 0.4 pCi/L

Result	Uncer.	Date
12	3	5/07
15	3	7/21

Beta 92GAU 04 PC

CV = not spiked pCi/L

Result	Uncer.	Date
16	2	4/03
0.9	0.3	4/22
20	2	5/06
- 0.1	0.3	7/21
0.3	0.3	8/10
0.1	0.2	8/17

CV = 5.2 ± 0.2 pCi/L

Result	Uncer.	Date
5.2	0.6	7/28

CV = 6.4 ± 0.3 pCi/L

Result	Uncer.	Date
7.4	0.9	4/22

CV = 7 ± 0.3 pCi/L

Result	Uncer.	Date
8	0.9	6/15

CV = 7.7 ± 0.3 pCi/L

Result	Uncer.	Date
5.6	0.7	5/07

CV = 8.6 ± 0.4 pCi/L

Result	Uncer.	Date
15	2	9/15

CV = 8.7 ± 0.3 pCi/L

Result	Uncer.	Date
7.2	0.8	7/21

CV = 10.4 ± 0.5 pCi/L

Result	Uncer.	Date
9	1	8/10

CV = 18.5 ± 0.6 pCi/L

Result	Uncer.	Date
17	2	12/02

****

EM-9 Gross Alpha/Beta on Soil

****

Alpha 91GAU 01 PC

CV = 4.9 ± 1.3 pCi/g

Result	Uncer.	Date
2.6	0.7	1/09
1.1	0.4	1/27
3.1	0.8	2/24

TABLE E-IV (cont)

****

EM-9 Gross Alpha/Beta on Soil (cont)

****

Alpha (cont)

CV = 7.6 ± 0.1 pCi/g

Result	Uncer.	Date
5	1	1/27

CV = 13.8 ± 0.3 pCi/g

Result	Uncer.	Date
10	2	1/27

Beta 91GAU 04 PC

CV = 2.4 ± 1.5 pCi/g

Result	Uncer.	Date
2.4	0.3	1/27
2.1	0.3	2/24

CV = 5.6 ± 0.1 pCi/g

Result	Uncer.	Date
3	0.4	1/27

CV = 8.8 ± 0.3 pCi/g

Result	Uncer.	Date
8.9	0.9	1/09

CV = 11 ± 0.4 pCi/g

Result	Uncer.	Date
11	1	1/27

****

EM-9 Gross Gamma in Soil

****

Gamma 85GAU 01 G

CV = 219 ± 11 pCi/g

Result	Uncer.	Date
180	20	2/21
190	20	2/21
180	20	2/21
190	20	5/19
190	20	5/19
190	20	5/19
190	20	6/16
190	20	6/16
190	20	6/16
180	20	8/04
190	20	8/04
190	20	8/04
180	20	8/20
180	20	8/20
180	20	8/20
180	20	9/02
180	20	9/02
180	20	9/02
190	20	9/21

Gamma 85GAU 01 GELI

CV = 219 ± 11 pCi/g

Result	Uncer.	Date
190	20	9/21
190	20	9/21

Gamma 85GAU 01 PC

CV = 219 ± 11 pCi/g

Result	Uncer.	Date
190	20	9/16
180	20	9/16

****

EM-9 Gross Gamma in Water

****

Gamma 85GAU 01 G

CV = 1360 ± 68 pCi/L

Result	Uncer.	Date
1200	200	1/22
1400	200	1/22
1100	200	1/22
1300	200	2/04
1300	200	2/04
1300	200	2/04
1700	200	2/15
1500	200	2/15
1600	200	2/15
1400	200	2/24
1200	200	2/24
1000	200	3/12
1300	200	3/12
1200	200	3/12
1400	200	4/01
1200	200	4/01
1200	200	4/01
1300	200	4/07
1300	200	4/07
1300	200	4/07
1300	200	4/20
1200	200	4/20
1500	200	4/20
1500	200	4/20
1200	200	4/20
1200	200	4/24
1300	200	4/24
1300	200	4/24
1200	200	4/24
1100	200	4/24
1100	200	4/24
1500	300	5/06
1300	300	5/06
1500	300	5/06
1300	300	5/06
1100	200	5/11
1500	200	5/11
1500	200	5/11
1900	300	6/15
1100	200	6/15
1700	300	6/15
1900	300	6/15
1000	200	6/15
1500	300	6/16
1500	300	6/16
1100	200	6/16
1200	200	6/16
1100	200	6/16
1200	200	6/16

Gamma (cont)

1200	200	6/29
1100	200	6/29
1200	200	6/29
1100	200	6/29
1300	200	7/13
1300	200	7/13
1200	200	7/13
1700	200	7/13
1700	200	7/13
1300	200	7/13
1400	200	7/13
1400	200	7/20
1400	200	7/20
1400	200	7/20
1400	200	7/20
1400	200	7/20
1400	200	7/20
1400	200	7/20
1400	200	7/24
1600	200	7/28
1700	200	7/28
1800	300	7/28
1700	200	7/28
1600	200	7/28
1500	200	7/28
1300	200	7/28
1600	200	7/28
1900	300	7/28
1600	200	7/28
1800	300	7/28
1600	200	7/28
1600	200	7/28
1800	300	7/28
1800	300	7/28
1500	200	7/28
1700	200	7/28
1300	200	8/06
1500	200	8/06
1400	200	8/10
1400	200	8/10
1300	200	8/10
1500	200	8/10
1100	200	8/10
1300	200	8/10
1500	200	8/10
1200	200	8/13
1000	200	8/13
1000	200	8/13
1700	200	8/20
1600	200	8/20
1600	200	8/20
1500	200	8/20
1400	200	9/01
1500	200	9/01
1400	200	9/01
1500	200	9/01
1300	200	9/01
1200	200	9/01
1300	200	9/01
1200	200	9/01
1300	200	9/01
1500	200	9/01
1200	200	9/01
1300	200	9/01
1300	200	9/16
1300	200	9/16
1300	200	9/16
1300	200	9/16
1300	200	9/16
1300	200	9/16
1300	200	9/16
1300	200	9/16
1400	200	9/23
1300	200	9/23
1200	200	9/23
1400	200	9/30
1200	200	9/30
1000	200	10/02
1200	200	10/02
1300	200	10/19

Gamma (cont)

1500	200	10/19
1400	200	10/19
1500	200	10/19
1300	200	10/19
1100	200	10/19
1400	200	10/19
1400	200	10/19
1500	200	10/19
1500	200	10/19
1300	200	11/04
1300	200	11/04
1500	200	11/04
1500	200	11/04
1300	200	11/04
1400	200	11/04
1500	200	11/04
1400	200	11/16
1400	200	11/16
1300	200	11/16
1300	200	11/16
1300	200	11/16
1400	200	11/16
1400	200	11/16
1400	200	11/16
1400	200	11/30
1300	200	11/30
1200	200	11/30
1200	200	11/30
1300	200	11/30
1300	200	11/30
1200	200	11/30
1300	200	11/30
1200	200	11/30
1300	200	11/30
1300	200	11/30
1200	200	11/30
1300	200	12/17
1300	200	12/17
1400	200	12/17
1400	200	12/17
1700	200	12/17
1600	200	12/17
1700	200	12/17
1200	200	12/17
1400	200	12/17
1200	200	12/17
1300	200	12/17
1600	200	12/17
1400	200	12/17

Gamma 85GAU 01 PC

CV = 1360 ± 68 pCi/L

Result	Uncer.	Date
1200	200	2/24

****

EM-9 Oil and Grease in Water

****

Oil/Grease 91GAU 01 GRAV

CV = 29 ± 3 mg/L

Result	Uncer.	Date
25	5	4/06

CV = 35 ± 4 mg/L

Result	Uncer.	Date
32	6	3/16

Oil/Grease (cont)

CV = 46 ± 5 mg/L

Result	Uncer.	Date
49	10	9/11

CV = 66 ± 7 mg/L

Result	Uncer.	Date
60	12	4/22

CV = 84 ± 8 mg/L

Result	Uncer.	Date
79	16	4/06

****

EM-9 Radionuclides in Urine

****

Am-241 91GAU 01 RAS

CV = not spiked pCi/sample

Result	Uncer.	Date
	0.01	2/25
0.004	0.02	10/28
0.003	0.02	12/21

CV = 0.24 ± 0.01 pCi/sample

Result	Uncer.	Date
0.292	0.026	12/21

CV = 0.48 ± 0.02 pCi/sample

Result	Uncer.	Date
0.54	0.033	10/28

CV = 0.9 ± 0.04 pCi/sample

Result	Uncer.	Date
1.04	0.08	10/01

H-3 91GAU 03 LS

CV = not spiked uCi/L

Result	Uncer.	Date
0	0.04	1/07
0	0.04	1/10
0	0.04	1/24
- 0.01	0.03	2/05
0	0.03	2/05
0.01	0.04	3/04
0.05	0.05	3/17
0	0.04	3/17
0.02	0.04	3/17
0.03	0.04	3/31
0	0.03	3/31
- 0.01	0.03	4/07
- 0.01	0.03	4/21
0	0.01	5/07
0	0.01	5/15
0.01	0.01	5/15
0	0.01	5/21
0.01	0.01	5/28
0.01	0.01	5/28

H-3 (cont)

Result	Uncer.	Date
0	0.01	6/01
0	0.01	6/01
0	0.01	6/10
0.01	0.01	6/15
- 0.01	0.01	6/19
0.01	0.01	6/30
0.01	0.01	7/07
0	0.01	7/20
0	0.01	7/20
0	0.01	8/24
0.01	0.01	8/28
0	0.01	9/10
- 0.01	0.01	9/10
- 0.01	0.01	10/02
0	0.01	10/02
0	0.01	10/02
0.02	0.01	10/06
0.22	0.02	10/15
0.01	0.01	10/21
0	0.01	10/27
- 0.01	0.01	10/30
0.01	0.01	11/09
0.01	0.01	11/19
0.02	0.01	11/23
0.01	0.01	12/02
0	0.01	12/08

CV = 0.39 ± 0.01 uCi/L

Result	Uncer.	Date
0.44	0.03	8/18
0.42	0.03	8/28
0.43	0.03	9/10
0.42	0.03	9/15
0.39	0.03	10/02
0.38	0.03	10/02
0.34	0.03	10/02
0.36	0.03	10/06
0.39	0.03	10/06
0.36	0.03	10/09
0.35	0.03	10/09
0.35	0.03	10/09
0.36	0.03	10/21
0.34	0.03	10/27
0.37	0.03	10/30
0.38	0.03	11/19
0.36	0.03	11/23
0.67	0.04	12/02
0.39	0.03	12/02
0.34	0.03	12/08

CV = 0.4 ± 0.01 uCi/L

Result	Uncer.	Date
0.47	0.1	3/04
0.42	0.1	3/17
0.41	0.1	3/17
0.46	0.1	3/17
0.38	0.1	3/25
0.48	0.1	3/31
0.46	0.1	4/07
0.44	0.1	4/13
0.46	0.1	4/21
0.48	0.1	4/28
0.46	0.04	5/07
0.44	0.03	5/15
0.42	0.03	5/21
0.41	0.03	5/28
0.38	0.03	6/01
0.35	0.03	6/10
0.43	0.03	6/15
0.51	0.04	6/15
0.44	0.03	6/30
0.43	0.03	7/07
0.45	0.04	7/07
0.42	0.03	7/17

TABLE E-IV (cont)

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EM-9 Radionuclides in Urine
(cont)

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H-3 (cont)

0.38	0.03	8/11
0.41	0.03	8/24

CV = 0.43 ± 0.02 uCi/L

Result	Uncer.	Date
0.43	0.1	1/06
0.42	0.1	1/06
0.44	0.1	1/07
0.45	0.1	1/10
0.42	0.1	1/24
0.44	0.1	2/12
0.45	0.1	2/19

CV = 0.66 ± 0.02 uCi/L

Result	Uncer.	Date
0.69	0.05	8/18
0.7	0.05	8/24
0.7	0.05	9/10
0.65	0.04	10/02
0.61	0.04	10/02
0.65	0.04	10/02
0.58	0.04	10/02
0.61	0.04	10/15
0.59	0.04	10/15
0.64	0.04	10/15
0.62	0.04	10/21
0.61	0.04	10/27
0.6	0.04	10/30
0.63	0.04	11/09
0.65	0.04	11/19

CV = 0.67 ± 0.02 uCi/L

Result	Uncer.	Date
0.71	0.12	3/04
0.71	0.13	3/04
0.73	0.13	3/09
0.78	0.13	3/17
0.72	0.13	3/25
0.81	0.13	4/07
0.72	0.13	4/07
0.75	0.13	4/13
0.72	0.13	4/21
0.72	0.13	4/28
0.72	0.05	5/07
0.72	0.05	5/15
0.72	0.05	5/21
0.75	0.05	5/28
0.76	0.05	5/28
0.6	0.04	6/10
0.67	0.05	6/15
0.74	0.05	6/19
0.71	0.05	7/07
0.68	0.05	7/07
0.72	0.05	7/27
0.7	0.05	7/31
0.68	0.05	8/11
0.66	0.04	8/18

H-3 (cont)

CV = 0.71 ± 0.03 uCi/L

Result	Uncer.	Date
0.75	0.13	1/06
0.71	0.12	1/06
0.79	0.13	1/24
0.77	0.13	2/05
1	0.2	2/05
0.78	0.13	2/12
0.74	0.13	2/19

CV = 3.97 ± 0.15 uCi/L

Result	Uncer.	Date
4.32	0.18	7/31
4.17	0.17	8/28
4.34	0.18	9/10
4.14	0.17	9/15
4.33	0.18	9/15
3.57	0.15	10/02
3.63	0.15	10/02
3.52	0.15	10/09
3.65	0.15	10/09
3.56	0.15	10/15
3.65	0.15	10/15
3.62	0.15	10/15
3.77	0.16	10/15
3.6	0.15	10/21
3.63	0.15	10/30
3.63	0.15	11/09
3.57	0.15	11/19
3.74	0.16	11/23
3.52	0.15	12/02
3.75	0.16	12/08

CV = 4.09 ± 0.15 uCi/L

Result	Uncer.	Date
4.6	0.31	2/19
4.55	0.31	3/04
4.42	0.3	3/04
4.67	0.31	3/09
4.44	0.3	3/25
4.41	0.3	3/31
4.47	0.3	4/07
4.77	0.31	4/13
4.37	0.3	4/21
4.46	0.3	4/28
4.31	0.18	5/07
4.38	0.18	5/15
4.33	0.18	5/21
4.49	0.18	5/28
3.39	0.14	6/10
4.12	0.17	6/15
4.2	0.17	6/30
4.2	0.17	7/17
4.14	0.17	7/17
4.18	0.17	7/20
4.14	0.17	7/31
4.12	0.17	7/31
4.18	0.17	8/11
4.02	0.16	8/24

CV = 4.17 ± 0.15 uCi/L

Result	Uncer.	Date
4.7	0.31	1/24
4.45	0.3	1/24
4.46	0.3	2/05
4.2	0.29	2/05
4.35	0.3	2/12

H-3 (cont)

CV = 7.95 ± 0.29 uCi/L

Result	Uncer.	Date
8.48	0.32	7/27
8.3	0.31	8/24
8.7	0.32	8/28
8.24	0.31	9/15
7.46	0.28	10/02
7.22	0.27	10/06
7.09	0.27	10/09
7.27	0.28	10/15
7.43	0.28	10/15
7.15	0.27	10/27
7.34	0.28	10/27
7.2	0.27	11/09
7.36	0.28	11/09
7.22	0.27	11/23
7.16	0.27	12/08

CV = 8.17 ± 0.3 uCi/L

Result	Uncer.	Date
8.82	0.42	2/19
9.16	0.43	3/04
8.93	0.43	3/09
9.12	0.43	3/17
9.07	0.43	3/25
8.77	0.42	3/31
9.11	0.43	4/13
8.77	0.42	4/21
8.63	0.42	4/28
8.54	0.32	5/07
8.54	0.32	5/15
8.39	0.31	5/15
8.86	0.33	5/28
7.09	0.27	6/01
7.67	0.29	6/01
7.71	0.29	6/10
8.5	0.32	6/19
8.28	0.31	6/30
8.44	0.31	7/17
8.41	0.31	7/20
8.23	0.31	7/20
8.21	0.31	7/27
8.63	0.32	7/27
8.13	0.3	8/11

CV = 8.34 ± 0.31 uCi/L

Result	Uncer.	Date
8.95	0.43	1/07
8.97	0.43	2/05
9.04	0.43	2/05
8.95	0.43	2/05
9.05	0.43	2/12
9.04	0.43	2/19

Pu-238 91GAU 01 RAS

CV = not spiked pCi/sample

Result	Uncer.	Date
0	0.01	1/10
- 0.003	0.0036	1/10
0	0.01	1/17
- 0.001	0.0023	1/17
0	0.01	2/07
0.008	0.0047	2/07
0	0.01	2/07
0	0.01	2/07
0.003	0.003	2/14
- 0.004	0.0025	2/14
0	0.01	2/14

Pu-238 (cont)

0.009	0.0054	2/14
0.007	0.0044	2/20
- 0.006	0.0034	2/20
0.003	0.0029	3/04
0.003	0.004	3/04
- 0.003	0.0032	3/04
0	0.01	3/05
0.009	0.0048	3/20
0.005	0.0045	3/20
0	0.01	3/20
- 0.001	0.0023	3/31
- 0.001	0.0028	4/02
0.003	0.0041	4/02
0.003	0.0038	4/10
0.004	0.0038	4/10
- 0.001	0.0028	4/10
0	0.01	4/14
0.002	0.003	4/14
- 0.003	0.003	4/14
0.004	0.02	5/22
0.002	0.02	5/22
0.003	0.02	5/22
- 0.002	0.02	5/26
0.003	0.01	6/03
0.001	0.02	6/03
0	0.02	6/03
0.002	0.02	6/03
0.002	0.02	6/10
0.004	0.02	6/19
- 0.003	0.02	6/22
0.001	0.02	6/22
- 0.001	0.02	6/22
0.003	0.02	6/22
- 0.005	0.02	6/23
- 0.002	0.02	7/13
0.004	0.02	7/13
- 0.006	0.02	7/13
0.002	0.02	7/20
0	0.02	7/20
0.004	0.02	7/20
0.005	0.02	7/20
0.001	0.02	7/31
0.004	0.02	7/31
0.001	0.02	7/31
0.003	0.02	7/31
0	0.02	8/18
0.004	0.02	8/18
0.003	0.02	8/18
0	0.02	8/21
- 0.003	0.02	8/21
0	0.02	8/28
- 0.002	0.02	8/28
0.001	0.02	8/28
0	0.02	9/11
0.004	0.02	9/11
- 0.001	0.02	9/11
- 0.001	0.02	9/11
0.004	0.02	9/28
0.001	0.02	9/28
- 0.001	0.02	9/29
0	0.02	10/15
- 0.004	0.02	10/15
0	0.02	10/15
- 0.001	0.02	10/15
- 0.003	0.02	10/15
0	0.02	10/28
0	0.02	10/28
0.001	0.02	10/28
- 0.002	0.02	10/28
0	0.02	12/04
- 0.001	0.02	12/04
0	0.02	12/04
- 0.006	0.02	12/21
- 0.003	0.02	12/21

Pu-238 (cont)

CV = 0.06 ± 0.002 pCi/sample

Result	Uncer.	Date
0.084	0.012	1/17
0.074	0.01	2/07
0.072	0.011	2/14

CV = 0.07 ± 0.003 pCi/sample

Result	Uncer.	Date
0.078	0.011	2/20
0.077	0.011	3/05
0.07	0.01	3/31
0.081	0.011	4/10
0.066	0.02	4/14
0.053	0.02	5/22
0.084	0.02	6/22
0.073	0.02	7/13
0.068	0.02	7/20
0.07	0.02	8/18
0.068	0.02	8/18
0.075	0.02	8/21
0.066	0.02	9/11
0.067	0.02	10/15
0.074	0.02	10/28
0.082	0.02	12/04
0.077	0.02	12/21
0.068	0.02	12/21

CV = 0.12 ± 0.004 pCi/sample

Result	Uncer.	Date
0.11	0.01	2/07
0.099	0.013	2/14
0.1	0.01	2/20

CV = 0.14 ± 0.005 pCi/sample

Result	Uncer.	Date
0.12	0.02	2/20
0.15	0.02	3/31
0.152	0.014	4/02
0.12	0.01	4/10
0.14	0.01	4/14
0.13	0.02	5/22
0.15	0.02	6/03
0.13	0.02	6/22
0.13	0.02	7/13
0.13	0.02	7/20
0.11	0.02	8/18
0.13	0.02	8/21
0.11	0.02	8/24
0.11	0.02	9/11
0.14	0.02	10/15
0.1	0.02	10/15
0.13	0.02	10/15
0.12	0.02	10/28
0.1	0.02	12/04
0.13	0.02	12/21

CV = 0.2 ± 0.007 pCi/sample

Result	Uncer.	Date
- 0.001	0.0027	1/10
0.211	0.017	1/24
0.18	0.02	2/07
0.221	0.02	2/14

Sample analyzed on 1/10 was inadvertently not spiked.

Pu-238 (cont)

CV = 0.25 ± 0.009 pCi/sample

Result	Uncer.	Date
0.201	0.018	3/20
0.21	0.019	3/20
0.243	0.019	4/02
0.247	0.019	4/14
0.244	0.023	5/22
0.23	0.03	6/03
0.221	0.02	6/03
0.24	0.02	6/23
0.226	0.02	7/20
0.15	0.02	7/20
0.262	0.021	8/18
0.2	0.02	8/21
0.2	0.02	9/11
0.223	0.02	9/28
0.241	0.02	10/15
0.21	0.02	10/28
0.216	0.02	10/28
0.2	0.02	12/21

CV = 0.4 ± 0.01 pCi/sample

Result	Uncer.	Date
0.364	0.023	1/10
0.49	0.031	2/07
0.421	0.027	2/07
0.448	0.029	2/19

CV = 0.5 ± 0.018 pCi/sample

Result	Uncer.	Date
0.437	0.026	2/20
0.434	0.027	3/31
0.474	0.028	4/10
0.512	0.028	4/14
0.456	0.028	5/22
0.5	0.029	6/22
0.409	0.025	7/13
0.446	0.027	7/20
0.486	0.028	7/20
0.441	0.027	7/20
0.398	0.025	7/31
0.405	0.025	8/21
0.4	0.024	8/28
0.386	0.024	9/11
0.39	0.024	9/28
0.379	0.022	10/15
0.394	0.025	10/28
0.412	0.026	12/04
0.42	0.025	12/21
0.428	0.026	12/21

Pu-239 91GAU 01 RAS

CV = not spiked pCi/sample

Result	Uncer.	Date
0	0.01	1/10
- 0.001	0.0012	1/10
0.003	0.003	1/17
0.005	0.0031	1/24
0.002	0.0028	2/07
0.012	0.005	2/07
- 0.001	0.0013	2/07
0.002	0.0028	2/07
0.011	0.004	2/07
0.004	0.0033	2/14
0.009	0.0044	2/14
0.004	0.0026	2/14
0.003	0.0032	2/19
0	0.01	2/20

TABLE E-IV (cont)

****

EM-9 Radionuclides in Urine
(cont)

****

Pu-239 (cont)

0.005	0.0037	2/20
0.008	0.0041	2/20
0.003	0.0023	2/20
0	0.01	3/05
0.003	0.0027	3/20
0.003	0.003	3/20
0.001	0.0024	3/31
0.003	0.0027	3/31
0.001	0.0024	3/31
0.004	0.0024	4/02
0.001	0.0028	4/02
0	0.01	4/10
0.004	0.0034	4/10
0.007	0.0035	4/10
0.008	0.003	4/14
0.006	0.003	4/14
0.005	0.003	4/16
0.008	0.01	5/22
0.006	0.01	5/22
0.002	0.01	5/22
0.001	0.01	5/22
- 0.001	0.01	5/26
0.008	0.01	6/03
0.003	0.01	6/03
0.003	0.01	6/03
0.001	0.01	6/22
0.002	0.01	6/22
0.004	0.01	6/22
0.005	0.01	6/24
0.006	0.01	7/13
0.004	0.01	7/13
0.001	0.01	7/13
0.009	0.01	7/20
0.004	0.01	7/20
0.003	0.01	7/20
0.003	0.01	7/20
0.003	0.01	7/20
0.005	0.01	7/20
0.003	0.01	7/20
0.001	0.01	7/31
0.006	0.01	8/18
0.001	0.01	8/18
0.003	0.01	8/18
0.003	0.01	8/18
0.004	0.01	8/21
0.001	0.01	8/21
0.001	0.01	8/21
0	0.01	8/21
- 0.001	0.01	8/24
0.001	0.01	8/28
0.003	0.01	9/11
0.002	0.01	9/11
0.001	0.01	9/11
- 0.002	0.01	9/11
0.004	0.01	9/28
0.001	0.01	9/28
0.004	0.01	10/15
0.009	0.01	10/15
- 0.001	0.01	10/15
0.003	0.01	10/15
0	0.01	10/15
- 0.003	0.01	10/15
0.001	0.01	10/28
- 0.001	0.01	10/28
0.004	0.01	10/28
0	0.01	10/28
0.001	0.01	10/28
0.003	0.01	12/04
- 0.002	0.01	12/04
0.004	0.01	12/04
0.002	0.01	12/21

Pu-239 (cont)

- 0.003	0.01	12/21
0.004	0.01	12/21
0.005	0.01	12/21
0.12	0.01	12/21
0.001	0.01	12/21

CV = 0.05 ± 0.002 pCi/sample

Result	Uncer.	Date
0.066	0.009	1/10
0.061	0.009	1/17
0.07	0.01	2/14
0.058	0.009	2/20

CV = 0.06 ± 0.002 pCi/sample

Result	Uncer.	Date
0.066	0.01	3/20
0.061	0.009	4/02
0.048	0.008	4/14
0.056	0.01	5/26
0.063	0.012	6/10
0.063	0.01	6/22
0.054	0.01	6/22
0.061	0.01	7/13
0.043	0.01	7/31
0.058	0.01	7/31
0.047	0.01	8/21
0.06	0.01	9/11
0.057	0.01	10/15
0.059	0.01	10/28
0.066	0.01	12/04
0.063	0.01	12/04

CV = 0.14 ± 0.005 pCi/sample

Result	Uncer.	Date
0.13	0.01	1/17
0.15	0.02	2/07
0.14	0.01	2/21

CV = 0.15 ± 0.005 pCi/sample

Result	Uncer.	Date
0.16	0.02	3/04
0.13	0.01	3/05
0.18	0.016	4/10
0.161	0.015	4/16
0.13	0.02	5/22
0.173	0.016	6/03
0.15	0.01	6/19
0.162	0.015	6/22
0.12	0.01	6/22
0.12	0.01	8/18
0.13	0.01	8/18
0.13	0.01	8/18
0.14	0.01	9/11
0.13	0.01	9/11
0.14	0.01	9/28
0.15	0.01	9/28
0.16	0.02	10/28
0.13	0.01	12/04

CV = 0.21 ± 0.007 pCi/sample

Result	Uncer.	Date
0.218	0.018	1/10
0.209	0.018	2/07
0.224	0.019	2/14
0.213	0.019	2/14

Pu-239 (cont)

CV = 0.22 ± 0.007 pCi/sample

Result	Uncer.	Date
0.221	0.018	3/04
0.256	0.02	3/20
0.228	0.019	3/31
0.223	0.018	4/10
0.211	0.018	4/10
0.217	0.02	5/22
0.222	0.018	6/03
0.225	0.02	6/23
0.241	0.019	7/13
0.204	0.017	7/20
0.24	0.02	7/20
0.2	0.016	7/31
0.226	0.017	8/28
0.215	0.018	8/28
0.236	0.019	9/29
0.226	0.017	10/15
0.208	0.017	10/15
0.224	0.018	10/28
0.215	0.019	12/21
0.19	0.02	12/21

CV = 0.41 ± 0.01 pCi/sample

Result	Uncer.	Date
0.422	0.026	2/07
0.444	0.028	2/07
0.433	0.027	3/04

CV = 0.44 ± 0.014 pCi/sample

Result	Uncer.	Date
0.452	0.027	2/20
0.408	0.025	3/20
0.407	0.025	4/02
0.519	0.03	4/14
0.448	0.027	5/22
0.428	0.025	6/03
0.453	0.03	6/03
0.458	0.03	7/13
0.478	0.03	7/20
0.43	0.026	7/20
0.438	0.027	7/31
0.456	0.026	8/21
0.469	0.027	8/28
0.422	0.025	9/11
0.442	0.026	10/15
0.411	0.024	10/15
0.415	0.025	10/28

Tl 92GAU 02 ICPMS

CV = 40 ± 4 ug/L

Result	Uncer.	Date
37	4	7/09
37	4	9/25

CV = 80 ± 8 ug/L

Result	Uncer.	Date
86	9	1/06
79	8	1/06
82	8	1/06
63	6	7/09
79	8	7/09
79	8	7/09
81	8	7/09
77	8	9/25
80	8	9/25

U-234 91GAU 03 RAS

CV = not spiked pCi/L

Result	Uncer.	Date
0.059	0.047	2/07
0.024	0.027	2/11
0.092	0.109	2/12
0.082	0.03	3/20
0	0.03	3/20
- 0.02	0.058	4/28
- 0.0234	0.03	4/29
0.016	0.03	5/05
0	0.03	5/18
0.017	0.03	5/19
0.011	0.04	6/15
- 0.027	0.04	6/29
- 0.012	0.04	6/29
- 0.015	0.04	7/13
- 0.006	0.04	8/07
- 0.014	0.04	8/10
0	0.04	8/10
0.007	0.04	8/20
- 0.014	0.04	9/04
0	0.04	9/09
- 0.025	0.04	9/10
0.023	0.04	9/14
0	0.04	9/17
- 0.022	0.04	10/15
0	0.04	10/30
0.045	0.04	11/10
0.027	0.04	11/16
0	0.04	11/20
- 0.014	0.04	11/30
0.057	0.047	12/08
0	0.04	12/15

CV = 0.024 ± 0.0024 pCi/L

Result	Uncer.	Date
0.072	0.034	2/28
0.028	0.022	3/26
- 0.006	0.04	8/21

CV = 0.072 ± 0.0072 pCi/L

Result	Uncer.	Date
0.037	0.017	2/28
0.088	0.03	4/03
0.077	0.03	4/30
0.05	0.04	8/20
0.052	0.04	11/10
0.058	0.04	12/15

CV = 0.117 ± 0.0117 pCi/L

Result	Uncer.	Date
0.16	0.04	4/02
0.14	0.03	4/08
0.13	0.04	6/30
0.12	0.04	7/14
0.01	0.04	10/06
0.11	0.04	11/16

CV = 0.12 ± 0.012 pCi/L

Result	Uncer.	Date
0.11	0.03	2/03
0.15	0.03	3/20
0.16	0.06	6/16
0.16	0.04	6/22
0.077	0.04	7/09
0.12	0.04	8/10
0.092	0.04	10/28
0.15	0.04	12/15

U-234 (cont)

CV = 0.168 ± 0.0168 pCi/L

Result	Uncer.	Date
0.22	0.04	3/16
0.18	0.04	5/14
0.19	0.04	6/30
0.2	0.04	8/06
0.064	0.059	10/09
0.15	0.06	10/09
0.31	0.07	11/13

CV = 0.24 ± 0.024 pCi/L

Result	Uncer.	Date
0.23	0.04	2/03
0.3	0.05	4/06
0.28	0.05	6/10
0.28	0.05	7/02
0.26	0.05	8/03
0.28	0.04	9/04
0.21	0.06	10/14

CV = 0.352 ± 0.0352 pCi/L

Result	Uncer.	Date
0.3	0.05	4/22
0.46	0.06	6/10
0.35	0.06	6/25
0.37	0.06	8/05
0.36	0.05	9/04
0.29	0.06	11/13
0.37	0.07	12/15
0.34	0.07	12/15

CV = 0.586 ± 0.0586 pCi/L

Result	Uncer.	Date
0.62	0.07	2/11
0.48	0.07	3/03
0.51	0.06	3/16
0.59	0.07	5/07
0.68	0.08	6/15
0.63	0.08	7/20
0.63	0.07	8/21
0.61	0.12	10/13
0	0.04	12/15

CV = 0.821 ± 0.0821 pCi/L

Result	Uncer.	Date
1	0.1	2/03
1	0.1	3/10
0.83	0.09	3/20
0.83	0.12	4/23
0.88	0.09	5/14
0.856	0.08	7/14
0.995	0.093	9/04
0.81	0.13	10/14
0.89	0.13	11/10

CV = 1.17 ± 0.12 pCi/L

Result	Uncer.	Date
1.2	0.1	4/22
1.18	0.1	8/11
1.2	0.2	11/10
1.1	0.2	12/08

U-234 (cont)

CV = 5.79 ± 0.58 pCi/L

Result	Uncer.	Date
5.29	0.29	2/28
5.92	0.33	3/24
6.04	0.36	4/30
6.1	0.35	6/11
5.7	0.33	7/20
5.5	0.7	10/19
5.8	0.8	11/10

CV = 17.37 ± 1.74 pCi/L

Result	Uncer.	Date
16.7	0.8	2/28
16.5	0.8	4/20
17.5	1	6/10
18.2	1	7/02
16.6	1	7/15
17	2	10/13

CV = 28.94 ± 2.89 pCi/L

Result	Uncer.	Date
27.7	1.4	3/25
29.2	1.8	5/07
29.7	1.5	6/17
28.6	1.9	8/13
27.5	1.9	8/17
28	4	10/30

CV = 40.52 ± 4.05 pCi/L

Result	Uncer.	Date
41.3	2.4	4/27
42.6	2.1	5/15
41.5	2	9/04
40	5	11/10
41	7	11/19

CV = 57.89 ± 5.79 pCi/L

Result	Uncer.	Date
60	3.4	2/03
57.6	2.8	3/20
59	3.5	3/27
58.2	2.9	9/09
59	7	10/16

U-235 91GAU 03 RAS

CV = not spiked pCi/L

Result	Uncer.	Date
- 0.0162	0.045	2/07
- 0.018	0.0275	2/11
0	0.03	2/12
- 0.0153	0.0252	3/20
- 0.0063	0.018	3/20
- 0.09	0.128	4/28
- 0.0351	0.0676	4/29
- 0.0117	0.03	5/05
- 0.0243	0.0473	5/18
- 0.0252	0.041	5/19
- 0.03	0.04	6/15
- 0.007	0.04	6/29
0	0.04	6/29
- 0.068	0.089	7/13
- 0.014	0.04	8/07
- 0.016	0.04	8/10
0	0.04	8/10

TABLE E-IV (cont)

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EM-9 Radionuclides in Urine (cont)

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U-235 (cont)

0	0.04	8/20
- 0.016	0.04	9/04
0.007	0.04	9/09
- 0.018	0.04	9/10
- 0.006	0.04	9/14
- 0.006	0.04	9/17
- 0.012	0.04	10/15
- 0.006	0.04	10/30
- 0.025	0.04	11/10
0.015	0.04	11/16
- 0.064	0.106	11/20
0	0.04	11/30
0	0.04	12/08
0.011	0.04	12/15

CV = 0.002 ± 0.0002 pCi/L

Result	Uncer.	Date
0.02	0.032	2/28
0.024	0.015	3/26
- 0.007	0.04	8/21

CV = 0.004 ± 0.0004 pCi/L

Result	Uncer.	Date
- 0.005	0.0054	2/28
- 0.0063	0.03	4/03
- 0.0122	0.0405	4/30
0.007	0.04	8/20
- 0.041	0.086	11/10
- 0.007	0.04	12/15

CV = 0.008 ± 0.0008 pCi/L

Result	Uncer.	Date
0.014	0.023	2/03
0.035	0.018	3/20
0.013	0.025	4/02
0	0.03	4/08
- 0.026	0.074	6/16
- 0.011	0.044	6/22
0.02	0.04	6/30
- 0.031	0.044	7/09
- 0.012	0.066	7/14
- 0.023	0.051	8/10
- 0.023	0.047	10/06
- 0.085	0.114	10/28
- 0.011	0.09	11/16
0.024	0.04	12/15

CV = 0.01 ± 0.001 pCi/L

Result	Uncer.	Date
0.012	0.014	3/16
0.0063	0.03	5/14
0.005	0.04	6/30
- 0.007	0.04	8/06
0	0.04	10/09
0.023	0.04	10/09
0.008	0.04	11/13

U-235 (cont)

CV = 0.015 ± 0.0015 pCi/L

Result	Uncer.	Date
0.021	0.027	2/03
0.048	0.03	4/06
0.012	0.04	6/10
- 0.041	0.06	7/02
- 0.006	0.066	8/03
0.035	0.04	9/04
0.041	0.04	10/14

CV = 0.025 ± 0.0025 pCi/L

Result	Uncer.	Date
0.014	0.038	4/22
0.026	0.04	6/10
0.014	0.058	6/25
0.02	0.04	8/05
0	0.04	9/04
0.032	0.056	11/13
0.007	0.04	12/15
0.067	0.04	12/15

CV = 0.041 ± 0.0041 pCi/L

Result	Uncer.	Date
0.014	0.024	2/11
0.057	0.032	3/03
0.078	0.023	3/16
0	0.03	5/07
0.042	0.04	6/15
0.056	0.04	7/20
0.038	0.04	8/21
0.019	0.04	10/13
0.023	0.04	12/15

CV = 0.057 ± 0.0057 pCi/L

Result	Uncer.	Date
0.055	0.031	2/03
0.054	0.027	3/10
0.052	0.03	3/20
0.068	0.037	4/23
0.042	0.046	5/14
0.063	0.04	7/14
0.033	0.04	9/04
0.046	0.04	10/14
0.018	0.045	11/10

CV = 0.082 ± 0.0082 pCi/L

Result	Uncer.	Date
0.16	0.03	4/22
0.062	0.054	8/11
0.057	0.04	11/10
0.035	0.141	12/08

CV = 0.121 ± 0.0121 pCi/L

Result	Uncer.	Date
0.2	0.04	2/28
0.069	0.039	3/24
0.13	0.04	4/30
0.18	0.04	6/11
0.2	0.08	7/20
0.14	0.07	10/19
0.11	0.04	11/10

U-235 (cont)

CV = 0.363 ± 0.0363 pCi/L

Result	Uncer.	Date
0.39	0.07	2/28
0.33	0.05	4/20
0.33	0.07	6/10
0.5	0.06	7/02
0.35	0.06	7/15
0.26	0.07	10/13

CV = 0.604 ± 0.0604 pCi/L

Result	Uncer.	Date
0.61	0.07	3/25
0.62	0.07	5/07
0.69	0.07	6/17
0.66	0.11	8/13
0.55	0.08	8/17
0.58	0.1	10/30

CV = 0.846 ± 0.0846 pCi/L

Result	Uncer.	Date
0.85	0.13	4/27
1	0.1	5/15
0.99	0.093	9/04
0.78	0.13	11/10
0.81	0.16	11/19

CV = 1.21 ± 0.12 pCi/L

Result	Uncer.	Date
1.3	0.2	2/03
1.26	0.11	3/20
1.3	0.2	3/27
1.3	0.11	9/09
1.3	0.2	10/16

U-238 91GAU 03 RAS

CV = not spiked pCi/L

Result	Uncer.	Date
- 0.0149	0.0171	2/07
0	0.03	2/11
0	0.03	2/12
0.028	0.018	3/20
- 0.0113	0.0288	3/20
0	0.03	4/28
0.019	0.03	4/29
0.0012	0.03	5/05
0.0024	0.03	5/18
- 0.0033	0.03	5/19
- 0.008	0.03	6/15
- 0.006	0.03	6/29
- 0.009	0.03	6/29
- 0.016	0.034	7/13
0.001	0.03	8/07
0.023	0.03	8/10
- 0.006	0.03	8/10
0.007	0.03	8/20
- 0.013	0.03	9/04
0.006	0.03	9/09
0.002	0.03	9/10
0.001	0.03	9/14
0.011	0.03	9/17
- 0.015	0.03	10/15
- 0.011	0.032	10/30
0.01	0.033	11/10
- 0.008	0.03	11/16

U-238 (cont)

0.006	0.03	11/20
- 0.007	0.031	11/30
0	0.03	12/08
0.008	0.03	12/15

CV = 0.0001 pCi/L

Result	Uncer.	Date
0.0054	0.0126	2/28
0.013	0.016	3/24
- 0.0067	0.03	4/30
- 0.001	0.03	6/11
0.009	0.03	7/20
0.014	0.03	10/19
0.025	0.03	11/10

CV = 0.0003 pCi/L

Result	Uncer.	Date
	0.03	2/28
0.015	0.03	4/20
0.024	0.03	6/10
- 0.012	0.03	7/02
- 0.004	0.03	7/15
0.01	0.03	10/13

CV = 0.0005 ± 0.0001 pCi/L

Result	Uncer.	Date
0.075	0.023	3/25
- 0.0521	0.03	5/07
0.008	0.03	6/17
- 0.06	0.037	8/13
- 0.005	0.03	8/17
- 0.064	0.03	10/30

CV = 0.0007 ± 0.0001 pCi/L

Result	Uncer.	Date
- 0.0349	0.03	4/27
0.0048	0.03	5/15
- 0.009	0.033	9/04
- 0.088	0.041	11/10
- 0.053	0.03	11/19

CV = 0.001 ± 0.0001 pCi/L

Result	Uncer.	Date
0.052	0.032	2/03
0.16	0.03	3/20
0.17	0.05	3/27
- 0.063	0.032	9/09
- 0.087	0.033	10/16

CV = 0.125 ± 0.0125 pCi/L

Result	Uncer.	Date
0.14	0.04	2/28
0.13	0.03	3/26
0.11	0.03	8/21

CV = 0.165 ± 0.0165 pCi/L

Result	Uncer.	Date
0.23	0.04	4/02
0.18	0.03	4/08
0.18	0.05	6/30
0.13	0.04	7/14
0.14	0.06	10/06
0.21	0.05	11/16

U-238 (cont)

CV = 0.374 ± 0.0374 pCi/L

Result	Uncer.	Date
0.4	0.05	2/28
0.38	0.05	4/03
0.4	0.05	4/30
0.41	0.06	8/20
0.32	0.06	11/10
0.44	0.08	12/15

CV = 0.496 ± 0.0496 pCi/L

Result	Uncer.	Date
0.47	0.06	4/22
0.55	0.07	6/10
0.49	0.06	6/25
0.5	0.06	8/05
0.53	0.06	9/04
0.48	0.09	11/13
0.48	0.08	12/15
0.51	0.09	12/15

CV = 0.623 ± 0.0623 pCi/L

Result	Uncer.	Date
0.74	0.08	2/03
0.56	0.07	3/20
0.54	0.09	6/16
0.61	0.06	6/22
0.67	0.08	7/09
0.65	0.07	8/10
0.66	0.12	10/28
0.66	0.11	12/15

CV = 0.826 ± 0.0826 pCi/L

Result	Uncer.	Date
0.91	0.09	2/11
0.92	0.09	3/03
0.778	0.071	3/16
0.937	0.087	5/07
1.12	0.1	6/15
0.96	0.1	7/20
0.86	0.09	8/21
0.92	0.14	10/13
0.018	0.03	12/15

CV = 0.872 ± 0.0872 pCi/L

Result	Uncer.	Date
0.8	0.075	3/16
0.91	0.09	5/14
0.91	0.09	6/30
0.94	0.1	8/06
0.87	0.13	10/09
0.89	0.14	10/09
1	0.2	11/13

CV = 1.16 ± 0.12 pCi/L

Result	Uncer.	Date
1.12	0.1	2/03
1.2	0.1	3/10
1.2	0.11	3/20
1.4	0.2	4/23
1.23	0.11	5/14
1.22	0.1	7/14
1.2	0.11	9/04
1.1	0.2	10/14
1.1	0.2	11/10

U-238 (cont)

CV = 1.25 ± 0.12 pCi/L

Result	Uncer.	Date
1.24	0.1	2/03
1.28	0.11	4/06
1.14	0.11	6/10
1.31	0.11	7/02
1.47	0.13	8/03
1.43	0.11	9/04
1.3	0.2	10/14

CV = 1.65 ± 0.165 pCi/L

Result	Uncer.	Date
1.6	0.15	4/22
1.75	0.13	8/11
1.8	0.3	11/10
1.4	0.2	12/08

****

EM-9 Radionuclides in Water

****

Alpha 91GAU 01 PC

CV = not spiked pCi/L

Result	Uncer.	Date
2.8	0.7	1/09
0.1	0.5	9/14
0	0.5	9/29
0.1	0.3	10/28
0.1	0.3	10/29

CV = 5 ± 0.2 pCi/L

Result	Uncer.	Date
8	2	11/18

CV = 5.16 ± 0.18 pCi/L

Result	Uncer.	Date
9	2	11/18

CV = 5.3 ± 0.18 pCi/L

Result	Uncer.	Date
9	2	2/13

CV = 5.4 ± 0.2 pCi/L

Result	Uncer.	Date
9	2	9/14

CV = 5.5 ± 0.2 pCi/L

Result	Uncer.	Date
< 63		8/03

CV = 5.75 ± 0.2 pCi/L

Result	Uncer.	Date
6	1	11/20

TABLE E-IV (cont)

****

EM-9 Radionuclides in Water
(cont)

****

Alpha (cont)

CV = 6 ± 0.2 pCi/L

Result	Uncer.	Date
9	2	6/04
10	2	10/20

CV = 6.2 ± 0.2 pCi/L

Result	Uncer.	Date
11	2	9/10

CV = 6.3 ± 0.2 pCi/L

Result	Uncer.	Date
11	2	12/03

CV = 6.9 ± 0.2 pCi/L

Result	Uncer.	Date
6	1	6/04

CV = 7.1 ± 0.24 pCi/L

Result	Uncer.	Date
12	3	2/24

CV = 7.9 ± 0.3 pCi/L

Result	Uncer.	Date
12	3	10/20

CV = 7.94 ± 0.27 pCi/L

Result	Uncer.	Date
14	3	10/05

CV = 8.3 ± 0.3 pCi/L

Result	Uncer.	Date
8	2	9/10

CV = 9.9 ± 0.3 pCi/L

Result	Uncer.	Date
11	2	6/08

CV = 9.92 ± 0.34 pCi/L

Result	Uncer.	Date
9	2	11/18

CV = 10.6 ± 0.4 pCi/L

Result	Uncer.	Date
13	3	2/13

Alpha (cont)

CV = 10.7 ± 0.4 pCi/L

Result	Uncer.	Date
14	3	9/29

CV = 51 ± 5 nCi/L

Result	Uncer.	Date
53	5	1/02
57	6	1/02
55	5	1/03
56	6	1/03
54	5	1/06
58	6	1/06
59	6	1/07
53	5	1/07
59	6	1/09
58	6	1/09
52	5	1/10
58	6	1/10
60	6	1/13
55	6	1/13
60	6	1/14
53	5	1/14
54	5	1/15
58	6	1/15
53	5	1/16
57	6	1/16
57	6	1/17
55	6	1/17
54	5	1/21
59	6	1/21
58	6	1/22
58	6	1/23
54	5	1/23
54	5	1/24
61	6	1/24
54	5	1/27
61	6	1/27
58	6	1/28
54	5	1/28
54	5	1/29
60	6	1/29
54	5	1/30
60	6	1/30
58	6	1/31
54	5	1/31
57	6	2/03
54	5	2/03
53	5	2/04
59	6	2/04
59	6	2/05
54	5	2/06
59	6	2/06
56	6	2/07
58	6	2/07
60	6	2/10
54	5	2/10
58	6	2/11
55	6	2/11
55	6	2/12
60	6	2/12
61	6	2/13
55	6	2/13
54	5	2/14
58	6	2/14
54	5	2/18
58	6	2/18
58	6	2/19
55	6	2/19
58	6	2/20
54	5	2/20
61	6	2/21
55	6	2/24
54	5	2/24
58	6	2/25

Alpha (cont)

54	5	2/27
57	6	2/27
54	5	2/27
56	6	2/27
54	5	2/28
56	6	2/28
53	5	3/02
56	6	3/02
53	5	3/03
57	6	3/03
59	6	3/04
57	6	3/05
54	5	3/05
55	6	3/06
57	6	3/06
56	6	3/09
59	6	3/09
56	6	3/10
58	6	3/10
54	5	3/11
58	6	3/11
54	5	3/12
59	6	3/12
60	6	3/13
55	6	3/16
59	6	3/16
60	6	3/17
56	6	3/17
59	6	3/18
56	6	3/18
55	6	3/20
58	6	3/20
55	6	3/20
55	6	3/23
56	6	3/23
56	6	3/25
56	6	3/25
57	6	3/25
55	6	3/25
56	6	3/26
57	6	3/26
55	6	3/27
57	6	3/27
58	6	4/06
54	5	4/06
58	6	4/06
54	5	4/06
57	6	4/06
53	5	4/06
55	6	4/06
55	6	4/06
57	6	4/06
57	6	4/06
53	5	4/07
56	6	4/07
53	5	4/08
56	6	4/08
55	6	4/09
53	5	4/09
52	5	4/10
56	6	4/10
54	5	4/13
57	6	4/13
56	6	4/14
52	5	4/14
56	6	4/15
52	5	4/16
56	6	4/16
52	5	4/20
56	6	4/20
53	5	4/20
54	5	4/20
56	6	4/21
52	5	4/21
53	5	4/22
56	6	4/22
56	6	4/22
53	5	4/23

Alpha (cont)

53	5	4/23
53	6	4/23
53	5	4/24
56	6	4/24
53	5	4/27
58	6	4/27
53	5	4/28
55	6	4/28
56	6	4/29
52	5	4/29
53	5	4/30
57	6	4/30
52	5	5/01
57	6	5/01
53	5	5/04
54	5	5/04
57	6	5/05
52	5	5/05
51	5	5/06
57	6	5/06
58	6	5/07
52	5	5/07
59	6	5/08
52	5	5/08
57	6	5/11
53	5	5/11
56	6	5/12
53	5	5/13
56	6	5/13
58	6	5/14
53	5	5/14
56	6	5/15
54	5	5/15
52	5	5/18
53	5	5/18
52	5	5/19
55	6	5/19
56	6	5/20
57	6	5/21
54	5	5/21
57	6	5/22
53	5	5/22
58	6	5/26
54	5	5/26
58	6	5/27
53	5	5/27
53	5	5/28
55	6	5/28
53	5	5/29
57	6	5/29
54	5	6/01
55	6	6/01
53	5	6/02
55	6	6/02
52	5	6/03
55	6	6/03
54	5	6/04
55	6	6/04
56	6	6/05
56	6	6/08
53.5	5	6/08
58	6	6/09
53	5	6/09
53	5	6/10
59	6	6/10
57	6	6/11
53	5	6/11
55	6	6/12
58	6	6/15
52	5	6/15
57	6	6/16
55	6	6/17
54	5	6/18
57	6	6/19
51	5	6/19
56	6	6/22
54	5	6/22
57	6	6/22

Alpha (cont)

56	6	6/23
53	5	6/23
53	5	6/24
58	6	6/24
58	6	6/25
52	5	6/25
52	5	6/26
56	6	6/26
56	6	6/29
53	5	6/29
57	6	6/30
53	5	6/30
55	6	7/01
59	6	7/02
55	6	7/02
52	5	7/06
58	6	7/06
54	5	7/07
55	6	7/08
53	5	7/08
53	5	7/09
55	6	7/09
55	6	7/10
53	5	7/10
56	6	7/14
54	5	7/14
56	6	7/14
52	5	7/14
55	6	7/15
49	5	7/16
53	5	7/16
54	5	7/17
56	6	7/17
56	6	7/20
54	5	7/20
53	5	7/21
55	6	7/21
53	5	7/22
56	6	7/22
56	6	7/23
54	5	7/23
56	6	7/24
57	6	7/28
52	5	7/28
53.3	5	7/29
52	5	7/29
52.9	5	7/29
54.3	5	7/31
55.2	5	7/31
53.7	5	8/03
53	5	8/03
53.3	5	8/04
53.7	5	8/05
53.7	5	8/05
53.9	5	8/06
54.9	5	8/07
55.3	5	8/07
48	5	8/07
47	5	8/10
52	5	8/10
53	5	8/10
47	5	8/11
53	5	8/11
53	5	8/12
48	5	8/12
54	5	8/14
47	5	8/14
46	5	8/14
52	5	8/14
52	5	8/17
48	5	8/17
53	5	8/18
48	5	8/18
48	5	8/19
51	5	8/19
50	5	8/21
47	5	8/21
47	5	8/21

Alpha (cont)

50	5	8/21
50	5	8/24
50	5	8/25
49	5	8/26
51	5	8/27
51	5	8/28
51	5	8/28
51	5	8/28
50	5	8/31
56	6	9/01
52	5	9/01
51	5	9/02
58	6	9/02
58	5	9/03
48	5	9/03
52	5	9/08
57	6	9/09
56	6	9/09
51	5	9/09
56	6	9/09
52	5	9/10
54	5	9/10
55	6	9/11
59	6	9/14
52	5	9/14
55	6	9/15
51	5	9/15
51	5	9/16
57	6	9/16
50	5	9/17
58	6	9/17
57	6	9/21
58	6	9/21
50	5	9/21
51	5	9/21
55	6	9/22
51	5	9/22
56	6	9/23
49	5	9/23
57	6	9/24
51	5	9/24
52	5	9/25
58	6	9/25
58	6	9/28
52	5	9/28
51	5	9/29
59	6	9/29
57	6	9/30
55	6	10/01
52	5	10/01
55	6	10/02
52	5	10/02
57	6	10/05
51	5	10/05
51	5	10/06
59	6	10/06
59	6	10/07
51	5	10/08
58	6	10/08
49	5	10/13
58	6	10/13
59	6	10/15
51	5	10/15
51	5	10/16
60	6	10/16
52	5	10/19
61	6	10/19
52	5	10/20
59	6	10/20
52	5	10/21
42	4	10/21
51	5	10/23
50	5	10/23
54	5	10/23
57	6	10/23
55	6	10/26
58	6	10/27
57	6	10/28

TABLE E-IV (cont)

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EM-9 Radionuclides in Water
(cont)

****

Alpha (cont)

53	5	10/29
58	6	10/29
57	6	10/30
50	5	11/02
58	6	11/02
52	5	11/03
57	6	11/03
51	5	11/04
58	6	11/04
59	6	11/05
50	5	11/05
57	6	11/06
52	5	11/06
59	6	11/09
50	5	11/09
53	5	11/09
51	5	11/10
57	6	11/10
52	5	11/12
58	6	11/12
51	5	11/13
57	6	11/13
51	5	11/16
57	6	11/16
51	5	11/18
57	6	11/18
52	5	11/18
57	6	11/18
51	5	11/20
56	6	11/20
59	6	11/20
58	6	11/23
52	5	11/23
51	5	11/24
59	6	11/24
52	5	11/25
58	6	11/25
59	6	11/30
50	5	11/30
58	6	12/01
51	5	12/01
56	6	12/02
50	5	12/02
50	5	12/03
58	6	12/03
61	6	12/04
56	6	12/07
57	6	12/08
51	5	12/09
57	6	12/09
57	6	12/10
51	5	12/10
57	6	12/11
51	5	12/11
50	5	12/14
58	6	12/14
57	6	12/15
52	5	12/15
51	5	12/16
58	6	12/16
57	6	12/17
52	5	12/17
59	6	12/18
52	5	12/18
59	6	12/23
57	6	12/23
59	6	12/23
51	5	12/23

Am-241 91GAU 01 G

CV = 16241 ± 1624 pCi/L

Result	Uncer.	Date
2100	1000	1/28

Am-241 85GAU 01 GELI

CV = 46 ± 7 nCi/L

Result	Uncer.	Date
62	9	2/10

CV = 62.7 ± 0.3 nCi/L

Result	Uncer.	Date
63	9	1/02
66	10	1/06
65	10	1/13
64	10	1/21
64	10	1/27
63	10	2/03
62	9	2/10
63	10	2/18
63	9	2/24
66	10	3/02
65	10	3/09
64	10	3/16
62.5	1.2	3/23
63.9	1.3	4/06
63.7	1.3	4/13
63.9	1.3	4/15
64	1.3	4/20
63.6	1.3	4/27
62.5	1.3	5/04
64.3	1.3	5/11
63	1.3	5/18
63.2	1.3	5/26
64.7	1.3	6/01
63.6	1.3	6/08
62.4	1.2	6/29
62.3	1.4	7/06
61.4	1.2	7/14
64.2	1.4	7/20
63	1.3	10/06
62	6	10/16
60	6	10/19
58	9	10/27
58	9	11/09
56	8	11/16
59	9	11/23
59	9	11/30
63	9	12/07
60	9	12/14
61	9	12/23

Am-241 91FIL 01 NAI

CV = 245 ± 3 nCi/L

Result	Uncer.	Date
239	18	1/07
240	18	2/12
251	19	3/11
247	18	4/13
246	18	5/01
242	18	6/11
250	20	8/14
249	19	8/18
242	18	8/24
248	19	9/01
248	18	9/10
249	19	9/15

Am-241 (cont)

241	18	9/21
257	19	9/29
255	19	10/19
239	18	10/27
246	18	11/02
241	18	11/09
254	19	11/20
238	18	12/01
244	18	12/14

Am-241 91GAU 01 RAS

CV = not spiked pCi/L

Result	Uncer.	Date
0.037	0.022	3/30
0.009	0.027	3/31
0.032	0.024	3/31
0.019	0.012	8/28
0.03	0.01	8/28
0.012	0.03	10/20

CV = 0.14 ± 0.003 pCi/L

Result	Uncer.	Date
0.15	0.02	3/03

CV = 0.171 ± 0.003 pCi/L

Result	Uncer.	Date
0.22	0.03	12/02

CV = 0.23 ± 0.004 pCi/L

Result	Uncer.	Date
0.215	0.018	3/03

CV = 0.27 ± 0.005 pCi/L

Result	Uncer.	Date
0.2	0.03	12/09

CV = 0.29 ± 0.005 pCi/L

Result	Uncer.	Date
0.4	0.09	3/30

CV = 0.57 ± 0.01 pCi/L

Result	Uncer.	Date
0.48	0.05	8/28

CV = 1.71 ± 0.03 pCi/L

Result	Uncer.	Date
1.52	0.09	8/28
1.68	0.1	12/09

CV = 1.94 ± 0.04 pCi/L

Result	Uncer.	Date
1.8	0.2	8/28

Am-241 (cont)

CV = 2.28 ± 0.04 pCi/L

Result	Uncer.	Date
2.24	0.1	3/03
1.86	0.1	9/03

CV = 12.41 ± 0.09 nCi/L

Result	Uncer.	Date
13	2	1/13
10	2	2/03
12	2	3/02
13	2	4/06
12	2	5/01
11	2	6/02
12	2	7/01
14	2	7/24
14	2	8/31
12	2	10/05
12	2	12/02

Beta 91GAU 04 PC

CV = not spiked pCi/L

Result	Uncer.	Date
0.4	0.3	2/13
0	0.3	6/04
0.6	0.3	9/10
11	1	9/14
1	0.3	10/20
5.7	0.7	11/18
1.8	0.4	11/18
- 0.1	0.3	12/03

CV = 5.23 ± 0.17 pCi/L

Result	Uncer.	Date
4	0.5	11/20

CV = 5.6 ± 0.2 pCi/L

Result	Uncer.	Date
8.1	0.9	9/14
6.6	0.8	10/29

CV = 6.97 ± 0.2 pCi/L

Result	Uncer.	Date
12	1	10/05

CV = 7.3 ± 0.32 pCi/L

Result	Uncer.	Date
7.7	0.9	1/09

CV = 8.6 ± 0.38 pCi/L

Result	Uncer.	Date
6.9	0.8	2/13

CV = 8.7 ± 0.3 pCi/L

Result	Uncer.	Date
8.7	1	9/10

Beta (cont)

CV = 8.71 ± 0.28 pCi/L

Result	Uncer.	Date
7.8	0.9	11/18

CV = 9.4 ± 0.4 pCi/L

Result	Uncer.	Date
6.8	0.8	6/08
< 96		8/03

CV = 10.5 ± 0.3 pCi/L

Result	Uncer.	Date
13	1	10/28

CV = 10.7 ± 0.47 pCi/L

Result	Uncer.	Date
10	1	2/24

CV = 11.8 ± 0.4 pCi/L

Result	Uncer.	Date
22	2	9/29

CV = 12.2 ± 0.4 pCi/L

Result	Uncer.	Date
14	1	10/20

CV = 12.8 ± 0.6 pCi/L

Result	Uncer.	Date
13	1	6/04

CV = 13.9 ± 0.4 pCi/L

Result	Uncer.	Date
16	2	9/29

CV = 62 ± 6 nCi/L

Result	Uncer.	Date
65	6	1/02
62	6	1/02
65	6	1/03
63	6	1/03
64	6	1/06
62	6	1/06
63	6	1/07
64	6	1/07
62	6	1/09
63	6	1/09
64	6	1/10
63	6	1/10
65	7	1/13
64	6	1/13
63	6	1/14
64	6	1/14
64	6	1/15
63	6	1/15
63	6	1/16
62	6	1/16
64	6	1/17
63	6	1/17
65	7	1/21
63	6	1/21
63	6	1/22

Beta (cont)

66	7	1/23
64	6	1/23
62	6	1/24
65	6	1/24
62	6	1/27
65	7	1/27
63	6	1/28
64	6	1/28
62	6	1/29
64	6	1/29
64	6	1/30
62	6	1/30
64	6	1/31
63	6	1/31
65	7	2/03
61	6	2/03
62	6	2/04
64	6	2/04
63	6	2/05
66	7	2/06
65	7	2/06
68	7	2/07
65	7	2/07
62	6	2/10
66	7	2/10
64	6	2/11
65	7	2/11
65	7	2/12
65	7	2/12
65	7	2/13
64	6	2/13
63	6	2/14
64	6	2/14
64	6	2/18
63	6	2/18
66	7	2/19
63	6	2/19
64	6	2/20
64	6	2/20
62	6	2/21
64	6	2/24
65	7	2/24
64	6	2/25
63	6	2/27
66	7	2/27
63	6	2/27
67	7	2/27
65	7	2/28
62	6	2/28
63	6	3/02
63	6	3/02
63	6	3/03
65	7	3/03
64	6	3/04
66	7	3/05
64	6	3/05
65	7	3/06
63	6	3/06
65	7	3/09
62	6	3/09
62	6	3/10
65	7	3/10
62	6	3/11
66	7	3/11
67	7	3/12
64	6	3/12
63	6	3/13
66	7	3/16
62	6	3/16
66	6	3/17
61	6	3/17
65	7	3/18
61	6	3/18
60	6	3/20
62	6	3/20
64	6	3/20
63	6	3/23
60	6	3/23

TABLE E-IV (cont)

****

EM-9 Radionuclides in Water
(cont)

****

Beta (cont)

62	6	3/25
65	7	3/25
64	6	3/25
62	6	3/25
64	6	3/26
62	6	3/26
63	6	3/27
61	6	3/27
60	6	4/06
64	6	4/06
65	7	4/06
62	6	4/06
64	6	4/06
61	6	4/06
63	6	4/06
62	6	4/06
63	6	4/06
64	6	4/06
62	6	4/06
62	6	4/07
64	6	4/07
65	6	4/08
62	6	4/08
63	6	4/09
65	7	4/09
63	6	4/10
62	6	4/10
62	6	4/13
63	6	4/13
61	6	4/14
63	6	4/14
62	6	4/15
65	6	4/16
60	6	4/16
61	6	4/20
65	7	4/20
62	6	4/20
65	7	4/20
62	6	4/21
64	6	4/21
64	6	4/22
61	6	4/22
61	6	4/22
61	6	4/23
65	7	4/23
62	6	4/23
60	6	4/24
64	6	4/24
65	7	4/27
63	6	4/27
62	6	4/28
64	6	4/28
65	7	4/29
63	6	4/29
64	6	4/30
64	6	4/30
63	6	5/01
65	7	5/01
62	6	5/04
64	6	5/04
63	6	5/05
62	6	5/05
64	6	5/06
65	7	5/06
64	6	5/07
63	6	5/07
61	6	5/08
65	7	5/08
64	6	5/11
62	6	5/11
62	6	5/12

Beta (cont)

63	6	5/13
64	6	5/13
64	6	5/14
62	6	5/14
62	6	5/15
66	7	5/15
61	6	5/18
63	6	5/18
64	6	5/19
61	6	5/19
62	6	5/20
65	7	5/21
61	6	5/21
65	7	5/22
61	6	5/22
61	6	5/26
67	7	5/26
67	7	5/27
62	6	5/27
62	6	5/28
65	7	5/28
61	6	5/29
66	7	5/29
60	6	6/01
66	7	6/01
65	7	6/02
60	6	6/02
60	6	6/03
67	6	6/03
66	7	6/04
59	6	6/04
62	6	6/05
61	6	6/08
66	7	6/08
67	7	6/09
63	6	6/09
60	6	6/10
67	7	6/10
61	6	6/11
64	6	6/11
64	6	6/12
62	6	6/15
68	7	6/15
63	6	6/16
62	6	6/17
67	7	6/18
63	6	6/19
67	7	6/19
62	6	6/22
67	7	6/22
62	6	6/22
61	6	6/23
67	7	6/23
66	7	6/24
62	6	6/24
63	6	6/25
67	7	6/25
62	6	6/26
66	7	6/26
67	7	6/29
61	6	6/29
67	7	6/30
62	6	6/30
63	6	7/01
63	6	7/02
67	7	7/02
61	6	7/06
67	7	7/06
62	6	7/07
67	7	7/08
61	6	7/08
67	7	7/09
62	6	7/09
61	6	7/10
66	7	7/10
66	7	7/14
60	6	7/14
65	6	7/14

Beta (cont)

61	6	7/14
62	6	7/15
62	6	7/16
67	7	7/16
66	7	7/17
61	6	7/17
64	6	7/20
65	7	7/20
66	7	7/21
64	6	7/21
66	7	7/22
63	6	7/22
63	6	7/23
66	7	7/23
65	7	7/24
63	6	7/28
66	7	7/28
67	7	7/29
67	7	7/29
62	6	7/29
66	7	7/31
62	6	7/31
66	7	8/03
61	6	8/03
67	7	8/04
67	7	8/05
62	6	8/05
65.3	6	8/06
61	6	8/07
56	6	8/07
61	6	8/07
66	7	8/10
65	7	8/10
55	6	8/10
54	5	8/11
66	7	8/11
55	6	8/12
66	7	8/12
62	6	8/14
65	6	8/14
54	5	8/14
55	6	8/14
54	5	8/17
63	6	8/17
53	5	8/18
63	6	8/18
60	6	8/19
55	6	8/19
54	5	8/21
62	6	8/21
54	5	8/21
62	6	8/21
62	6	8/24
62	6	8/25
63	6	8/26
62	6	8/27
64	6	8/28
62	6	8/28
62	6	8/28
64	6	8/31
64	6	9/01
63	6	9/01
66	7	9/02
64	6	9/02
66	7	9/03
63	6	9/03
63	6	9/08
64	6	9/09
62	6	9/09
62	6	9/09
62	6	9/09
62	6	9/10
63	6	9/10
61	6	9/11
63	6	9/14
65	7	9/14
61	6	9/15
64	6	9/15

Beta (cont)

61	6	9/16
63	6	9/16
64	6	9/17
64	6	9/17
63	6	9/21
62	6	9/21
64	6	9/21
64	6	9/21
64	6	9/22
63	6	9/22
64	6	9/23
62	6	9/23
65	7	9/24
63	6	9/24
64	6	9/25
64	6	9/25
61	6	9/28
68	7	9/28
60	6	9/29
64	6	9/29
67	7	9/30
59	6	10/01
67	7	10/01
68	7	10/02
61	6	10/02
66	7	10/05
60	6	10/05
67	7	10/06
61	6	10/06
66	7	10/07
68	7	10/08
62	6	10/08
67	7	10/13
60	6	10/13
67	7	10/15
61	6	10/15
61	6	10/16
67	7	10/16
62	6	10/19
66	7	10/19
61	6	10/20
68	7	10/20
66	7	10/21
62	6	10/21
60	6	10/23
66	7	10/23
66	7	10/23
60	6	10/23
66	7	10/26
66	7	10/27
66	7	10/28
66	7	10/29
61	6	10/29
66	7	10/30
61	6	11/02
66	7	11/02
61	6	11/03
67	7	11/03
66	7	11/04
61	6	11/04
62	6	11/05
66	7	11/05
60	6	11/06
66	7	11/06
66	7	11/09
61	6	11/09
60	6	11/10
67	7	11/10
66	7	11/12
61	6	11/12
62	6	11/13
66	7	11/13
60	6	11/16
66	7	11/16
60	6	11/18
67	7	11/18
60	6	11/18
67	7	11/18

Beta (cont)

68	7	11/20
62	6	11/20
66	7	11/20
65	7	11/23
69	7	11/23
66	7	11/24
64	6	11/24
66	7	11/25
63	6	11/25
68	7	11/30
63	6	11/30
63	6	12/01
66	7	12/01
66	7	12/02
60	6	12/02
65	7	12/03
63	6	12/03
66	7	12/04
67	7	12/07
66	7	12/08
62	6	12/09
68	7	12/09
66	7	12/10
62	6	12/10
62	6	12/11
67	7	12/11
67	7	12/14
62	6	12/14
67	7	12/15
62	6	12/15
63	6	12/16
68	7	12/16
68	7	12/17
63	6	12/17
68	7	12/18
63	6	12/18
70	7	12/23
62	6	12/23
69	7	12/23
69	7	12/23

Cd-109 91GAU 01 G

CV = 9223 ± 922 pCi/L

Result	Uncer.	Date
4000	1000	1/28

Ce-139 91GAU 01 G

CV = 11543 ± 1154 pCi/L

Result	Uncer.	Date
8800	1000	1/28

Co-57 91GAU 01 G

CV = 8445 ± 844 pCi/L

Result	Uncer.	Date
5000	800	1/28

Co-57 85GAU 01 GELI

CV = 40 ± 6 nCi/L

Result	Uncer.	Date
120	20	2/10

Co-57 (cont)

CV = 117 ± 1 nCi/L

Result	Uncer.	Date
110	20	1/02
110	20	1/06
110	20	1/13
110	20	1/21
120	20	1/27
120	20	2/03
120	20	2/10
120	20	2/18
120	20	2/24
110	20	3/02
120	20	3/09
110	20	3/16
113	2	3/23
110	2	4/06
114	2	4/13
114	2	4/20
114	2	4/27
114	2	5/26
114	2	6/01
113	2	6/22
114	2	6/29
115	2	7/06
115	2	10/06
100	10	10/16
110	10	10/19
100	20	11/16
94	14	12/07
95	14	12/14
91	14	12/23

Co-60 91GAU 01 G

CV = 50452 ± 5045 pCi/L

Result	Uncer.	Date
51000	8000	1/28
46000	7000	2/09

Co-60 91FIL 01 GELI

CV = 44.1 ± 0.3 nCi/L

Result	Uncer.	Date
43	6	1/02
42	6	1/06
41	6	1/13
36	5	1/21
45	7	1/27
43	6	2/03
44	6	2/10
43	6	2/18
43	6	2/24
43	6	3/02
40	6	3/09
43	6	3/16
42.8	0.9	3/23
39.1	0.8	4/06
40.1	1.6	4/13
44.1	0.9	4/20
44.3	0.9	5/04
43.5	0.9	5/11
43.7	0.9	5/18
43.4	0.9	5/26
44	0.9	6/01
43.9	0.9	6/08
44.1	0.9	6/22
42.8	0.9	6/29
43.6	0.9	7/06
43.1	0.9	7/14
43.4	0.9	7/20

TABLE E-IV (cont)

****

EM-9 Radionuclides in Water (cont)

****

Co-60 (cont)

43.9	0.9	10/06
42	4	10/16
48	4	10/19
43	6	10/27
42	6	11/02
40	6	11/09
43	6	11/16
42	6	11/23
42	6	11/30
42	6	12/07
42	6	12/14
41	6	12/23

Cs-137 92GAU 01 G

CV = not spiked pCi/L

Result	Uncer.	Date
- 37.4	41.1	11/04
- 18.6	16.5	11/11

CV = 496 ± 27 pCi/L

Result	Uncer.	Date
800	140	6/29
620	120	6/29
370	70	10/29
420	80	12/07

CV = 563 ± 30 pCi/L

Result	Uncer.	Date
760	140	6/29
390	70	11/30

CV = 624 ± 34 pCi/L

Result	Uncer.	Date
870	140	12/23

CV = 881 ± 48 pCi/L

Result	Uncer.	Date
1200	200	2/05

CV = 1990 ± 110 pCi/L

Result	Uncer.	Date
2100	300	3/26

CV = 35955 ± 3596 pCi/L

Result	Uncer.	Date
43000	6000	1/28

CV = 1.02 ± 0.06 nCi/L

Result	Uncer.	Date
1.1	0.2	1/28

Cs-137 (cont)

CV = 1.32 ± 0.07 nCi/L

Result	Uncer.	Date
1.4	0.2	4/29

Cs-137 91FIL 01 GELI

CV = 61 ± 2 nCi/L

Result	Uncer.	Date
64	10	1/02
62	9	1/06
63	9	1/13
63	9	1/21
62	9	1/27
62	9	2/03
62	9	2/10
61	9	2/18
62	9	2/24
61	9	3/02
60	9	3/09
59	9	3/16
60.9	1.2	3/23
61.7	1.2	4/06
61.8	1.2	4/13
61.7	1.2	4/15
61.7	1.2	4/20
60	1.2	4/27
62.6	1.2	5/04
61.7	1.2	5/11
61.6	1.2	5/18
61.5	1.2	5/26
60.4	1.2	6/01
62.1	1.2	6/08
61.5	1.2	6/22
61.1	1.2	6/29
62.6	1.3	7/06
59.9	1.2	7/14
61.2	1.2	7/20
62.6	1.3	10/06
59	6	10/16
56	6	10/19
55	8	10/27
57	9	11/02
56	8	11/09
53	8	11/16
55	8	11/23
58	9	11/30
60	9	12/07
53	8	12/14
52	8	12/23

Gamma 92GAU 01 G

CV = not spiked pCi/L

Result	Uncer.	Date
- 200	200	4/01
500	200	4/27
- 119.0476	166.6667	5/20
- 200	200	6/16
100	200	7/16
300	200	7/28
200	200	8/20
0	200	8/20
200	90	9/01
- 20	90	9/16
120	90	10/19
60	90	11/16
180	90	12/01
90	90	12/17
200	100	12/17
50	90	12/17

Gamma (cont)

CV = 933 ± 50 pCi/L

Result	Uncer.	Date
900	100	11/30

CV = 992 ± 53 pCi/L

Result	Uncer.	Date
1100	100	12/17

CV = 1050 ± 56 pCi/L

Result	Uncer.	Date
1400	200	6/15
1300	200	7/28

CV = 1108 ± 60 pCi/L

Result	Uncer.	Date
1200	200	7/13
1700	200	7/28
1200	200	9/23
1200	100	10/02
1200	200	10/19
1300	200	11/03
1100	100	11/16

CV = 1225 ± 66 pCi/L

Result	Uncer.	Date
1300	200	9/02
1300	200	9/16
1200	200	9/30

CV = 1238 ± 67 pCi/L

Result	Uncer.	Date
1200	200	6/29
<13000		8/03

CV = 1341 ± 72 pCi/L

Result	Uncer.	Date
1500	200	9/01

CV = 1516 ± 82 pCi/L

Result	Uncer.	Date
1300	200	8/10

Gamma 92GAU 01 NAI

CV = 1238 ± 67 pCi/L

Result	Uncer.	Date
1000	200	4/28

CV = 1516 ± 82 pCi/L

Result	Uncer.	Date
1200	200	5/20

H-3 92GAU 01 LS

CV = not spiked pCi/L

Result	Uncer.	Date
200	300	1/06
- 0.01	0.03	1/06
- 400	300	1/06
0.01	0.04	1/07
- 0.01	0.03	1/10
- 100	300	1/13
200	300	1/21
0.01	0.04	1/24
0	0.04	2/05
0.01	0.04	2/05
370	300	2/05
300	300	2/10
0	0.03	2/12
300	300	2/18
- 200	300	2/19
0	0.04	2/19
- 200	300	2/25
100	300	2/27
400	300	2/27
400	300	2/27
0.01	0.04	3/04
0.01	0.04	3/04
0	0.04	3/09
300	300	3/09
100	300	3/12
200	300	3/12
- 200	300	3/16
250	300	3/16
400	300	3/16
370	300	3/17
- 100	300	3/17
50	300	3/17
0.01	0.04	3/17
350	300	3/17
- 200	300	3/17
50	300	3/17
0.01	0.04	3/17
0	0.03	3/25
0	0.04	3/31
400	300	4/02
0	0.03	4/07
500	300	4/08
500	300	4/09
100	300	4/09
0	300	4/13
250	300	4/13
400	300	4/13
250	300	4/13
0.09	0.06	4/13
500	300	4/13
400	300	4/20
0	0.03	4/21
400	300	4/22
300	300	4/23
0.01	0.04	4/28
0	300	4/28
600	300	5/07
100	300	5/07
0	300	5/07
0	300	5/11
150	300	5/13
0	300	5/13
300	300	5/13
- 0.01	0.01	5/13
0	0.01	5/15
0	0.01	5/15
- 0.01	0.01	5/15
100	300	5/15
560	300	5/19
0	0.01	5/21
- 64	300	5/27
- 64.35	300	5/27
400	300	5/28
- 0.01	0.01	5/28

H-3 (cont)

- 0.01	0.01	6/01
0	0.01	6/10
- 100	300	6/12
0	0.01	6/15
300	300	6/17
0.01	0.01	6/19
- 100	300	6/24
- 200	300	6/24
- 500	300	6/24
0.02	0.01	6/30
0.05	0.03	7/07
- 500	300	7/13
0	300	7/14
- 200	300	7/14
0	0.01	7/17
0	0.01	7/20
- 100	300	7/20
400	300	7/22
0	0.01	7/27
0	300	7/27
0	300	7/30
- 200	300	7/30
- 0.01	0.01	7/31
- 400	300	8/05
200	300	8/05
0	0.01	8/11
- 400	300	8/17
100	300	8/18
0	300	8/18
- 100	300	8/18
- 0.01	0.01	8/18
0	300	8/21
0	300	8/21
200	300	8/21
0.01	0.01	8/24
0	0.01	8/28
0	0.01	8/28
- 100	300	9/03
0	300	9/03
- 0.01	0.01	9/10
0.01	0.01	9/15
100	300	9/16
- 400	300	9/16
- 100	300	9/16
- 100	300	9/22
- 1000	300	10/08
- 900	300	11/03
200	300	11/03
400	300	11/03
400	300	11/10
0	300	11/10
300	300	11/17
300	300	11/17
- 200	300	11/17
200	300	11/20
400	300	12/09
300	300	12/09
200	300	12/11
500	300	12/17
200	300	12/17

CV = 16600 ± 400 pCi/L

Result	Uncer.	Date
16000	1000	3/12

CV = 17307 ± 1730 pCi/L

Result	Uncer.	Date
19000	1300	5/15
18500	1000	5/27
18600	1000	5/27
18400	1300	5/28
19000	1300	6/17
18700	1300	6/24
18400	1300	6/24

H-3 (cont)

17800	1300	7/13
19100	1300	7/14
19500	1300	7/20
19000	1300	7/22
18800	1300	7/27
18800	1300	7/30
18400	1300	8/05
18900	1300	8/17
19300	1300	8/18
18700	1300	8/18
18500	1300	8/21
18500	1300	8/21
19300	1300	9/03
19000	1300	9/16
18200	1300	9/22
13000	1000	11/03
16000	2000	11/10
15000	2000	11/17
16000	2000	11/17
15000	2000	12/09

CV = 17427 ± 349 pCi/L

Result	Uncer.	Date
16700	400	1/06
17000	2000	1/21
18000	2000	2/10
18000	2000	2/18
17000	2000	2/19
17100	300	2/25
17200	300	2/27
17200	300	2/27
17300	900	2/27
18000	2000	3/09
17900	1000	3/12
17000	2000	3/12
19000	2000	3/16
19000	2000	3/16
17000	2000	3/16
17000	2000	3/17
18000	2000	3/17
18000	2000	3/17
17000	2000	3/17
17000	2000	3/17
18000	2000	3/17
18100	1000	4/02
17200	1000	4/08
17000	2000	4/09
18000	2000	4/13
18000	2000	4/13
18000	2000	4/13
17000	2000	4/13
17400	1000	4/20
17000	2000	4/22
18700	1000	4/23
17500	1000	4/28
17700	1300	5/07
18600	1300	5/07
17400	1300	5/11
18000	2000	5/13
18200	1300	5/13

CV = 18100 ± 400 pCi/L

Result	Uncer.	Date
18000	2000	2/13
19600	1400	5/13

CV = 10.3 ± 0.2 nCi/L

Result	Uncer.	Date
10.8	1	7/20
11.5	1	8/21
8.3	0.9	11/03

TABLE E-IV (cont)

****

EM-9 Radionuclides in Water
(cont)

****

H-3 (cont)

8.8	0.9	11/17
9.4	0.9	12/09
9.6	0.9	12/17

CV = 10.6 ± 0.2 nCi/L

Result	Uncer.	Date
11.1	1	5/29

CV = 10.9 ± 0.2 nCi/L

Result	Uncer.	Date
9.9	0.9	1/06

CV = 11.7 ± 0.3 nCi/L

Result	Uncer.	Date
12.4	1.1	7/22
10	1	11/03
9.7	0.9	11/17
10	1	12/09

CV = 12.1 ± 0.3 nCi/L

Result	Uncer.	Date
11.4	1	5/11

CV = 12.4 ± 0.3 nCi/L

Result	Uncer.	Date
10.6	1	1/06
11.3	1	1/13

CV = 13.2 ± 0.3 nCi/L

Result	Uncer.	Date
13.5	1.1	7/13
13.3	1.1	9/22

CV = 13.6 ± 0.3 nCi/L

Result	Uncer.	Date
12.7	1	5/27

CV = 14.7 ± 0.3 nCi/L

Result	Uncer.	Date
15.9	1.2	7/13
12.7	1.1	11/03
12.5	1.1	11/03

CV = 15.1 ± 0.3 nCi/L

Result	Uncer.	Date
16.4	1.2	5/11
14.7	1.2	5/29

H-3 (cont)

CV = 16.1 ± 0.4 nCi/L

Result	Uncer.	Date
17.1	1.3	9/22
14.1	1.1	11/10

CV = 17.6 ± 0.4 nCi/L

Result	Uncer.	Date
14.6	1.2	11/03

CV = 19.1 ± 0.4 nCi/L

Result	Uncer.	Date
20.6	1.4	9/22

CV = 0.2932 ± 0.0067 uCi/L

Result	Uncer.	Date
0.33	0.02	7/27

CV = 2.94 ± 0.07 uCi/L

Result	Uncer.	Date
3.1	0.3	8/11

CV = 5 ± 0.2 uCi/L

Result	Uncer.	Date
4.97	0.14	1/13
5.18	0.15	1/28
5.04	0.14	2/10
5.06	0.14	2/25
5.01	0.14	3/03
4.98	0.14	3/11
5	0.14	3/20
5.02	0.14	3/25
4.98	0.14	4/06
5.08	0.14	4/10
5.06	0.14	4/23
5	0.14	4/27
5.02	0.14	5/01
4.98	0.14	5/11
4.98	0.14	5/11
5.01	0.14	5/14
5.07	0.14	5/14
5.03	0.14	5/15
5.1	0.14	5/18
5.01	0.14	5/21
4.93	0.14	5/27
5.03	0.14	6/04
4.94	0.14	6/11
4.98	0.14	6/24
4.99	0.14	7/06
4.83	0.14	7/21
5.37	0.5	8/11
5.37	0.5	8/11
5.35	0.5	8/14
4.6	0.5	8/25
4.6	0.5	8/28
4.6	0.5	8/28
4.6	0.5	9/10
4.88	0.14	9/22
4.94	0.14	9/29
5.11	0.14	10/27
5.01	0.14	11/24
5.11	0.14	12/23

H-3 (cont)

CV = 5.86 ± 0.13 uCi/L

Result	Uncer.	Date
5.2	0.5	7/30

CV = 26.55 ± 3 uCi/L

Result	Uncer.	Date
28.8	0.8	7/07
29.6	1	7/17
29.5	1	7/20
29.4	1	7/27
28.7	1	7/31
29.2	1	8/11
29.2	1	8/18
28.7	1	8/24
28.5	1	8/28
28.5	1	8/28
28.3	1	9/10
28.5	1	9/15

CV = 28.06 ± 3 uCi/L

Result	Uncer.	Date
31	0.8	1/06
30.4	0.8	1/07
30	3	1/10
30.5	0.8	1/24
30.6	0.8	2/05
30.5	0.8	2/05
30.7	0.8	2/12
30.5	0.8	2/19
30.8	0.8	3/04
30.9	0.8	3/04
30.5	0.8	3/09
30.9	0.8	3/17
30.9	0.8	3/17
30	0.8	3/25
31	0.8	3/31
30.6	0.8	4/07
31	0.8	4/13
30.9	0.8	4/21
31.2	0.8	4/28
30.2	1.1	5/13
30.3	1.1	5/15
30.4	1.1	5/15
30.2	1.1	5/15
29.9	1	5/21
30.5	1.1	5/28
26.3	0.9	6/01
25.2	0.9	6/10
29.2	1	6/15
29.2	1	6/19
29.3	1	6/30

Hg-203 91GAU 01 G

CV = 28072 ± 2807 pCi/L

Result	Uncer.	Date
31800	3000	1/28

Mn-54 91FIL 01 GELI

CV = 446 ± 8 nCi/L

Result	Uncer.	Date
460	70	1/02
430	70	1/06
450	70	1/13
450	70	1/21

Mn-54 (cont)

450	70	1/27
450	70	2/03
450	70	2/10
450	70	2/18
450	70	2/24
450	70	3/02
440	70	3/09
440	70	3/16
442	9	3/23
444	9	4/06
452	9	4/13
453	9	4/20
446	9	4/27
454	9	5/04
448	9	5/11
451	9	5/18
445	9	5/26
447	9	6/01
452	9	6/08
453	9	6/22
441	9	6/29
447	9	7/06
445	9	7/14
452	9	7/20
452	9	10/06
400	40	10/16
420	40	10/19
400	60	10/27
410	60	11/02
420	60	11/09
390	60	11/16
390	60	11/23
410	60	11/30
400	60	12/07
390	60	12/14
400	60	12/23

Pu-238 89GAU 01 RAS

CV = not spiked pCi/L

Result	Uncer.	Date
0.016	0.013	2/25
- 0.004	0.004	6/09
- 0.013	0.013	8/20
0	0.02	8/21

CV = 0.1 ± 0.005 pCi/L

Result	Uncer.	Date
0.11	0.01	10/09

CV = 0.105 ± 0.005 pCi/L

Result	Uncer.	Date
0.12	0.04	3/20

CV = 0.11 ± 0.006 pCi/L

Result	Uncer.	Date
0.14	0.06	11/19

CV = 0.15 ± 0.01 pCi/L

Result	Uncer.	Date
0.17	0.03	6/12

CV = 0.19 ± 0.01 pCi/L

Result	Uncer.	Date
0.18	0.03	9/30

Pu-238 (cont)

CV = 0.24 ± 0.01 pCi/L

Result	Uncer.	Date
0.221	0.016	5/19

CV = 0.35 ± 0.02 pCi/L

Result	Uncer.	Date
0.4	0.05	6/09

CV = 0.44 ± 0.02 pCi/L

Result	Uncer.	Date
0.46	0.06	1/07

CV = 0.94 ± 0.05 pCi/L

Result	Uncer.	Date
0.885	0.049	8/24

CV = 1.21 ± 0.06 pCi/L

Result	Uncer.	Date
1.2	0.2	8/20

CV = 1.36 ± 0.07 pCi/L

Result	Uncer.	Date
1.25	0.09	7/30

CV = 1.4 ± 0.07 pCi/L

Result	Uncer.	Date
1.7	0.4	6/09

CV = 1.51 ± 0.08 pCi/L

Result	Uncer.	Date
1.59	0.11	11/19

CV = 1.75 ± 0.09 pCi/L

Result	Uncer.	Date
1.81	0.08	2/19

CV = 2.27 ± 0.12 pCi/L

Result	Uncer.	Date
2.1	0.2	8/20

CV = 2.49 ± 0.13 pCi/L

Result	Uncer.	Date
2.47	0.14	12/02

CV = 2.84 ± 0.15 pCi/L

Result	Uncer.	Date
2.86	0.12	8/24

CV = 3.5 ± 0.18 pCi/L

Result	Uncer.	Date
3.41	0.19	5/19

Pu-238 (cont)

CV = 4.72 ± 0.25 pCi/L

Result	Uncer.	Date
4.78	0.17	10/09

CV = 11.09 ± 0.06 nCi/L

Result	Uncer.	Date
11	2	1/13
12	2	2/03
10	2	3/02
11	2	4/06
11	2	5/01
11	2	6/02
12	2	7/01
12	2	7/24
11	2	8/31
11	2	10/05
9.5	1.7	11/02
12	2	12/02

CV = 62 ± 7 nCi/L

Result	Uncer.	Date
60	7	1/14
56	7	1/16
59	7	2/14
63	7	3/13
58	7	4/15
61	7	4/15
62	7	4/20
64	7	5/14
60	7	5/20
62	7	7/02
60	7	7/10
62	6	7/17
60	7	8/20
59	7	10/07
60	7	10/29
64	7	11/06
62	7	12/03
60	7	12/11

Pu-239 89GAU 01 RAS

CV = not spiked pCi/L

Result	Uncer.	Date
- 0.004	0.009	2/25
0.004	0.006	3/20
0.01	0.007	6/09
0	0.01	8/20
0	0.01	8/20
- 0.005	0.01	11/19
0.01	0.01	12/02

CV = 0.11 ± 0.002 pCi/L

Result	Uncer.	Date
0.07	0.05	9/30

CV = 0.119 ± 0.002 pCi/L

Result	Uncer.	Date
0.18	0.03	7/30

CV = 0.12 ± 0.002 pCi/L

Result	Uncer.	Date
0.149	0.013	10/09

TABLE E-IV (cont)

****

EM-9 Radionuclides in Water (cont)

****

Pu-239 (cont)

CV = 0.22 ± 0.004 pCi/L

Result	Uncer.	Date
0.242	0.019	8/24

CV = 0.297 ± 0.005 pCi/L

Result	Uncer.	Date
0.27	0.04	11/19

CV = 0.3 ± 0.005 pCi/L

Result	Uncer.	Date
0.35	0.05	1/07

CV = 0.59 ± 0.01 pCi/L

Result	Uncer.	Date
0.643	0.053	5/19
0.74	0.22	6/09
0.54	0.1	8/21
0.67	0.06	9/30

CV = 1.04 ± 0.02 pCi/L

Result	Uncer.	Date
0.917	0.042	5/19

CV = 1.34 ± 0.02 pCi/L

Result	Uncer.	Date
1.4	0.07	10/09

CV = 1.78 ± 0.03 pCi/L

Result	Uncer.	Date
1.92	0.11	6/09

CV = 1.9 ± 0.03 pCi/L

Result	Uncer.	Date
2	0.2	8/20

CV = 2.38 ± 0.04 pCi/L

Result	Uncer.	Date
2.46	0.1	9/28

CV = 2.44 ± 0.04 pCi/L

Result	Uncer.	Date
2.48	0.15	6/12

CV = 2.97 ± 0.05 pCi/L

Result	Uncer.	Date
2.85	0.12	8/24
3	0.3	10/08

Pu-239 (cont)

CV = 4.45 ± 0.08 pCi/L

Result	Uncer.	Date
4.29	0.16	2/19

Ra-226 90GAU 01 RAS

CV = not spiked pCi/L

Result	Uncer.	Date
0.05	0.05	1/23
0	0.1	5/05
0.1	0.1	5/28

CV = 0.64 ± 0.06 pCi/L

Result	Uncer.	Date
0.7	0.07	1/23

CV = 1 ± 0.02 pCi/L

Result	Uncer.	Date
0.7	0.1	12/15

CV = 2.2 ± 0.2 pCi/L

Result	Uncer.	Date
2.2	0.2	12/16

CV = 4.7 ± 0.5 pCi/L

Result	Uncer.	Date
4.3	0.4	8/13

Sn-113 91GAU 01 G

CV = 30147 ± 3015 pCi/L

Result	Uncer.	Date
43400	4000	1/28

Sr-85 91GAU 01 G

CV = 57989 ± 5799 pCi/L

Result	Uncer.	Date
59400	5000	1/28

Sr-90 91GAU 04 PC

CV = not spiked pCi/L

Result	Uncer.	Date
0	0.6	7/09
0	0.7	8/10

CV = 174 ± 6 pCi/L

Result	Uncer.	Date
178	12	11/18

Sr-90 (cont)

CV = 209 ± 7 pCi/L

Result	Uncer.	Date
210	20	11/18

CV = 235 ± 9 pCi/L

Result	Uncer.	Date
172	13	8/04

CV = 256 ± 8 pCi/L

Result	Uncer.	Date
246	16	9/01

CV = 278 ± 11 pCi/L

Result	Uncer.	Date
268	18	7/09

CV = 279 ± 9 pCi/L

Result	Uncer.	Date
280	30	12/10

CV = 465 ± 9 pCi/mL

Result	Uncer.	Date
470	18	1/22
472	18	1/22
470	12	1/22
485	10	1/23
478	9	1/23
490	50	2/10
480	50	2/13
511	34	2/28
492	20	3/05
497	31	3/09
475	31	3/10
495	32	3/16
490	34	3/16
500	50	4/06
472	30	4/06
480	50	4/29
460	50	5/11
476	30	7/09
483	32	7/27
470	60	7/30
488	32	8/06
492	33	8/10
490	60	8/28
471	33	9/01
496	33	9/03
482	30	9/04
499	33	9/10
472	32	9/10
486	33	9/16
465	32	9/16
474	31	9/23
440	40	10/08
450	50	10/16
480	32	10/22
451	30	10/23
478	43	11/16
482	31	11/19
461	36	11/23
482	32	11/25
478	31	12/11
490	32	12/14
479	30	12/15
482	32	12/16
474	31	12/21

U-234 92GAU 03 RAS

CV = 0.582 ± 0.058 pCi/L

Result	Uncer.	Date
0.57	0.06	8/28

CV = 13.45 ± 0.16 nCi/L

Result	Uncer.	Date
13	2	1/13
14	2	2/03
13	2	3/02
13	2	4/06
13	2	5/01
14	2	6/02
15	2	7/01
14	2	7/24
15	2	8/31
14	2	10/05
16	2	11/02
15	2	12/02

CV = 54 ± 6 nCi/L

Result	Uncer.	Date
54	7	1/21
56	7	4/15
55	7	4/21
55	7	5/20
55	7	5/21
70	8	7/06
58	7	7/10
59	7	8/20
60	7	10/08
50	13	11/06
58	7	12/16

U-235 92GAU 03 RAS

CV = 0.041 ± 0.004 pCi/L

Result	Uncer.	Date
0.05	0.018	8/28

CV = 10.56 ± 0.21 nCi/L

Result	Uncer.	Date
9	1	1/13
9	1	2/03
10	2	3/02
9.8	1.5	4/06
9.8	1.5	5/01
9.9	1.6	6/02
9.8	1.5	7/01
11	2	8/31
9.1	1.4	10/05
9.3	1.5	11/02
11	2	12/02

CV = 42 ± 4 nCi/L

Result	Uncer.	Date
41	5	1/21
37	5	4/15
36	5	4/21
37	5	5/20
37	5	5/21
51	6	7/06
39	5	7/10
39	5	8/20

U-235 (cont)

35	5	10/08
38	11	11/06
38	5	12/16

U-238 92GAU 03 RAS

CV = 0.82 ± 0.08 pCi/L

Result	Uncer.	Date
0.965	0.085	8/28

Y-88 91GAU 01 G

CV = 96062 ± 9606 pCi/L

Result	Uncer.	Date
98100	9000	1/28
93000	9000	2/09

****

EM-9 Radionuclides on Ash

****

Sr-90 91GAU 01 PC

CV = 1.7 ± 0.07 pCi/g

Result	Uncer.	Date
2.7	1.5	1/22

CV = 3.2 ± 0.1 pCi/g

Result	Uncer.	Date
4.4	1.5	1/22

CV = 4.3 ± 0.2 pCi/g

Result	Uncer.	Date
4.9	1.5	1/22

CV = 6.4 ± 0.2 pCi/g

Result	Uncer.	Date
7.2	1.5	1/22

****

EM-9 Radionuclides on Fecal Material

****

Pu-238 91GAU 01 RAS

CV = not spiked pCi/sample

Result	Uncer.	Date
0.33	0.05	2/21
0.01	0.02	5/13
0.005	0.02	5/13
0.022	0.02	5/13
0.065	0.019	7/01

Pu-238 (cont)

CV = 4.7 ± 0.5 pCi/sample

Result	Uncer.	Date
3.68	0.15	7/01

CV = 5 ± 0.5 pCi/sample

Result	Uncer.	Date
5.05	0.29	2/21
5.64	0.23	2/21
5.07	0.4	5/13

CV = 9.3 ± 0.9 pCi/sample

Result	Uncer.	Date
7.1	0.7	7/01

Pu-239 91GAU 01 RAS

CV = not spiked pCi/sample

Result	Uncer.	Date
0.071	0.017	2/21
0.58	0.07	2/21
0.047	0.02	2/21
0.026	0.02	5/13
0.03	0.02	5/13
0.024	0.013	7/01

CV = 3.3 ± 0.3 pCi/sample

Result	Uncer.	Date
2.5	0.3	7/01

CV = 5.1 ± 0.5 pCi/sample

Result	Uncer.	Date
5.24	0.4	5/13
5.31	0.4	5/13

CV = 9.3 ± 0.9 pCi/sample

Result	Uncer.	Date
7.6	0.3	7/01

****

EM-9 Radionuclides on Filter Media

****

Alpha 92GAU 01 PC

CV = 20 ± 2 pCi/filter

Result	Uncer.	Date
15	3	9/14
20	4	9/14
17	4	9/14
19	4	9/28
16	4	9/28
15	3	9/28
19	4	10/21
17	4	10/21
14	3	10/21
15	3	12/17
16	4	12/17
18	4	12/17

TABLE E-IV (cont)

****

EM-9 Radionuclides
on Filter Media
(cont)

****

Alpha (cont)

21	4	12/18
16	3	12/18
21	4	12/18
16	3	12/18

Am-241 92GAU 01 RAS

CV = 0.6 ± 0.01 pCi/filter

Result	Uncer.	Date
0.536	0.041	4/10

CV = 0.71 ± 0.01 pCi/filter

Result	Uncer.	Date
0.658	0.044	4/06

CV = 0.99 ± 0.02 pCi/filter

Result	Uncer.	Date
0.786	0.054	4/10
0.8	0.052	4/10

CV = 1.06 ± 0.02 pCi/filter

Result	Uncer.	Date
1	0.06	4/06

CV = 1.19 ± 0.02 pCi/filter

Result	Uncer.	Date
0.959	0.059	4/10

CV = 1.39 ± 0.03 pCi/filter

Result	Uncer.	Date
1.38	0.08	4/10
1.12	0.07	4/10

CV = 1.6 ± 0.03 pCi/filter

Result	Uncer.	Date
1.45	0.07	4/06

CV = 1.78 ± 0.03 pCi/filter

Result	Uncer.	Date
1.53	0.08	4/10

CV = 1.98 ± 0.04 pCi/filter

Result	Uncer.	Date
1.49	0.08	4/10

Beta 92GAU 03 PC

CV = 61 ± 6 pCi/filter

Result	Uncer.	Date
60	8	9/14
60	8	9/14
53	7	9/14
57	7	9/28
58	8	9/28
59	8	9/28
56	7	10/21
59	8	10/21
58	8	10/21
53	7	12/17
58	7	12/17
57	7	12/17
57	7	12/18
58	7	12/18
58	7	12/18
57	7	12/18

Pu-238 92GAU 01 RAS

CV = 0.57 ± 0.03 pCi/filter

Result	Uncer.	Date
0.613	0.045	3/18

CV = 0.66 ± 0.03 pCi/filter

Result	Uncer.	Date
0.65	0.04	3/10

CV = 0.7 ± 0.04 pCi/filter

Result	Uncer.	Date
0.654	0.041	2/24

CV = 0.94 ± 0.05 pCi/filter

Result	Uncer.	Date
1.04	0.06	3/10
0.835	0.054	3/18

CV = 1.13 ± 0.06 pCi/filter

Result	Uncer.	Date
1.13	0.06	3/10

CV = 1.4 ± 0.07 pCi/filter

Result	Uncer.	Date
1.47	0.07	2/24

CV = 1.42 ± 0.07 pCi/filter

Result	Uncer.	Date
1.36	0.07	3/18

CV = 1.51 ± 0.08 pCi/filter

Result	Uncer.	Date
1.53	0.07	3/10

CV = 1.75 ± 0.09 pCi/filter

Result	Uncer.	Date
1.69	0.12	2/24

Pu-238 (cont)

CV = 1.89 ± 0.1 pCi/filter

Result	Uncer.	Date
1.88	0.08	3/18

Pu-239 92GAU 01 RAS

CV = 0.59 ± 0.01 pCi/filter

Result	Uncer.	Date
0.65	0.04	3/10
0.613	0.045	3/18

CV = 0.71 ± 0.01 pCi/filter

Result	Uncer.	Date
0.82	0.05	3/10

CV = 0.74 ± 0.01 pCi/filter

Result	Uncer.	Date
0.69	0.07	2/24

CV = 0.95 ± 0.02 pCi/filter

Result	Uncer.	Date
1	0.05	3/10

CV = 1.04 ± 0.02 pCi/filter

Result	Uncer.	Date
0.959	0.051	2/24

CV = 1.19 ± 0.02 pCi/filter

Result	Uncer.	Date
1.19	0.06	3/10
1.13	0.06	3/18

CV = 1.48 ± 0.03 pCi/filter

Result	Uncer.	Date
1.45	0.07	2/24
1.49	0.08	3/18

CV = 2.08 ± 0.04 pCi/filter

Result	Uncer.	Date
1.9	0.08	3/18

****

EM-9 Radionuclides on Soil

****

Alpha 91GAU 03 PC

CV = 2.4 ± 0.6 pCi/g

Result	Uncer.	Date
2	0.5	1/09
5	1	1/09
3.1	0.8	4/21
3.2	0.8	7/21

Alpha (cont)

6	1	8/10
6	1	8/26
5	1	10/02

CV = 5 ± 0.7 pCi/g

Result	Uncer.	Date
7	2	8/26

CV = 5.2 ± 0.7 pCi/g

Result	Uncer.	Date
7	2	1/09
6	1	9/14
5	1	10/02

CV = 5.5 ± 0.7 pCi/g

Result	Uncer.	Date
6	1	10/02

CV = 5.6 ± 0.7 pCi/g

Result	Uncer.	Date
9	2	7/21

CV = 5.7 ± 0.7 pCi/g

Result	Uncer.	Date
9	2	5/19

CV = 6.1 ± 0.7 pCi/g

Result	Uncer.	Date
6	1	1/09
7	2	6/04
7	2	10/02

CV = 6.9 ± 0.8 pCi/g

Result	Uncer.	Date
7	2	8/26

CV = 7 ± 0.8 pCi/g

Result	Uncer.	Date
7	2	9/14

CV = 8 ± 0.8 pCi/g

Result	Uncer.	Date
10	2	1/09
8	2	6/04

CV = 10.8 ± 0.9 pCi/g

Result	Uncer.	Date
13	3	1/09

Am-241 91GAU 01 G

CV = 0.35 ± 0.006 pCi/g

Result	Uncer.	Date
0.46	0.23	3/16

Am-241 (cont)

CV = 1.9 ± 0.2 pCi/g

Result	Uncer.	Date
2.2	0.3	11/19

CV = 19 ± 1.9 pCi/g

Result	Uncer.	Date
22	3	9/23

Am-241 91GAU 01 RAS

CV = not spiked pCi/g

Result	Uncer.	Date
0	0.001	10/20

CV = 0.11 ± 0.002 pCi/g

Result	Uncer.	Date
0.11	0.01	5/04

CV = 0.86 ± 0.09 pCi/g

Result	Uncer.	Date
0.79	0.06	5/04

Beta 91GAU 04 PC

CV = 1.7 ± 0.2 pCi/g

Result	Uncer.	Date
1.8	0.3	1/09
2.7	0.4	1/09
1.4	0.2	6/04
2.7	0.3	8/26
2.8	0.4	9/14
2.6	0.3	10/02
2.2	0.3	10/02

CV = 4.3 ± 0.3 pCi/g

Result	Uncer.	Date
5.3	0.6	10/02

CV = 4.9 ± 0.3 pCi/g

Result	Uncer.	Date
5.8	0.6	1/09
6	0.7	1/09
4.8	0.5	5/19

CV = 5.2 ± 0.3 pCi/g

Result	Uncer.	Date
5.6	0.6	8/26
6	0.7	9/14

CV = 5.5 ± 0.4 pCi/g

Result	Uncer.	Date
6	0.7	8/10

Beta (cont)

CV = 5.7 ± 0.3 pCi/g

Result	Uncer.	Date
6.5	0.7	8/26

CV = 6 ± 0.4 pCi/g

Result	Uncer.	Date
7.5	0.8	7/21

CV = 6.7 ± 0.5 pCi/g

Result	Uncer.	Date
6.4	0.7	10/02

CV = 6.9 ± 0.4 pCi/g

Result	Uncer.	Date
8.3	0.9	7/21

CV = 7 ± 0.4 pCi/g

Result	Uncer.	Date
8	0.9	6/04

CV = 8.1 ± 0.5 pCi/g

Result	Uncer.	Date
10	1	1/09

CV = 9.2 ± 0.5 pCi/g

Result	Uncer.	Date
9.3	1	4/21

CV = 10.2 ± 0.6 pCi/g

Result	Uncer.	Date
12	1	1/09

Cs-137 89GAU 01 G

CV = not spiked pCi/g

Result	Uncer.	Date
- 0.004	0.0872	3/12
- 0.109	0.0901	6/25

CV = 0.99 ± 0.05 pCi/g

Result	Uncer.	Date
1.2	0.2	8/03

CV = 2.32 ± 0.12 pCi/g

Result	Uncer.	Date
2.8	0.4	3/16

CV = 2.4 ± 0.13 pCi/g

Result	Uncer.	Date
0.32	0.11	2/20

TABLE E-IV (cont)

****

EM-9 Radionuclides on Soil
(cont)

****

Cs-137 (cont)

CV = 2.98 ± 0.16 pCi/g

Result	Uncer.	Date
3.5	0.5	4/13
3.4	0.5	7/21

CV = 3.1 ± 0.17 pCi/g

Result	Uncer.	Date
3.5	0.5	10/28

CV = 5.1 ± 0.27 pCi/g

Result	Uncer.	Date
5.1	0.8	2/20

CV = 9.4 ± 0.51 pCi/g

Result	Uncer.	Date
7.6	1.2	11/19

CV = 11.8 ± 0.64 pCi/g

Result	Uncer.	Date
14	2	2/20

CV = 16.6 ± 0.9 pCi/g

Result	Uncer.	Date
17	3	7/21

CV = 18.7 ± 1.01 pCi/g

Result	Uncer.	Date
25	4	10/28

CV = 24.8 ± 1.3 pCi/g

Result	Uncer.	Date
29	4	9/28

CV = 28.1 ± 1.5 pCi/g

Result	Uncer.	Date
34	5	3/12
35	5	4/13
32	5	9/23
37	6	12/16

CV = 39.7 ± 2.1 pCi/g

Result	Uncer.	Date
45	7	8/07

CV = 43.7 ± 2.36 pCi/g

Result	Uncer.	Date
61	9	9/28

Cs-137 (cont)

CV = 46.8 ± 2.53 pCi/g

Result	Uncer.	Date
49	7	10/28

CV = 62.4 ± 3.37 pCi/g

Result	Uncer.	Date
85	13	10/28

Gamma 92GAU 01 G

CV = not spiked pCi/g

Result	Uncer.	Date
- 5.7	0.8	9/01
- 5.4	0.8	9/01
- 10	1	12/03

CV = 4.67 ± 0.25 pCi/g

Result	Uncer.	Date
3.6	1	7/13

CV = 5.83 ± 0.31 pCi/g

Result	Uncer.	Date
11	1	9/21

CV = 6.19 ± 0.33 pCi/g

Result	Uncer.	Date
9	1	9/21

CV = 7.29 ± 0.39 pCi/g

Result	Uncer.	Date
12	1	9/21

CV = 8.75 ± 0.47 pCi/g

Result	Uncer.	Date
8.3	1.2	7/29
10	1	8/20

CV = 12.2 ± 0.7 pCi/g

Result	Uncer.	Date
14	2	8/20

CV = 13.1 ± 0.7 pCi/g

Result	Uncer.	Date
10	1	8/20

CV = 14.58 ± 0.8 pCi/g

Result	Uncer.	Date
20	2	9/21

Gamma 92GAU 01 NAI

CV = not spiked pCi/g

Result	Uncer.	Date
- 0.6	0.8	6/16

CV = 6.19 ± 0.33 pCi/g

Result	Uncer.	Date
5	1	6/16

CV = 13.9 ± 0.8 pCi/g

Result	Uncer.	Date
12	1	4/21

H-3 91GAU 01 LS

CV = not spiked pCi/L

Result	Uncer.	Date
1600	300	1/21
1500	300	1/21
0.88	0.3	2/05
1	0.3	2/05
0.75	0.3	2/05
1.2	0.3	2/05
1000	300	2/10
1200	300	2/27
700	300	2/27
700	300	4/13
800	300	4/13
700	300	4/13
150	300	4/13
1700	300	4/13
500	300	4/22
300	300	4/22
900	300	5/07
600	300	5/07
400	300	5/11
500	300	5/13
200	300	5/13
300	300	5/13
200	300	5/26
400	300	5/26
200	300	6/24
0	300	6/24
- 100	300	6/24
- 300	300	7/13
- 400	300	7/13
- 100	300	7/13
400	300	7/22
0	300	7/24
300	300	7/24
0	300	7/27
- 100	300	7/29
300	300	7/30
600	300	7/30
200	300	8/05
200	300	8/05
400	300	8/05
0	300	8/05
300	300	8/12
500	300	8/17
600	300	8/17
200	300	8/18
200	300	8/18
400	300	8/18
200	300	8/18
200	300	8/18
300	300	8/18
700	300	8/21

H-3 (cont)

100	300	9/16
400	300	9/17
1000	300	9/17

CV = 980 ± 20 pCi/L

Result	Uncer.	Date
1800	400	11/17

CV = 1010 ± 30 pCi/L

Result	Uncer.	Date
1400	300	3/12
950	300	3/12
1000	300	3/12
950	300	3/12
1400	300	4/22
800	300	6/24
1700	400	7/13
1600	400	7/20
900	300	7/27

CV = 3280 ± 80 pCi/L

Result	Uncer.	Date
3600	600	8/17
4100	600	8/17
2100	400	10/07
3000	300	11/18

CV = 3370 ± 90 pCi/L

Result	Uncer.	Date
3500	400	4/13
3500	400	4/16
4300	400	4/22
3700	600	7/29
3400	600	7/29
3400	600	8/18

CV = 8200 ± 210 pCi/L

Result	Uncer.	Date
8800	900	8/12
8800	900	8/12
8300	900	9/17

CV = 8430 ± 220 pCi/L

Result	Uncer.	Date
8700	900	2/13
10000	1000	4/13
8500	900	4/13
8100	900	7/20
8300	900	7/22

CV = 16400 ± 430 pCi/L

Result	Uncer.	Date
16400	1200	8/18
17300	1300	8/18
12100	1100	10/07
13000	1000	11/18
13200	1100	11/20

H-3 (cont)

CV = 16860 ± 440 pCi/L

Result	Uncer.	Date
17000	2000	4/13
18000	2000	4/22
16300	1200	6/24
16700	1200	7/13
16800	1200	7/22

CV = 22950 ± 600 pCi/L

Result	Uncer.	Date
22400	1500	8/21
21200	1400	9/17

CV = 23600 ± 610 pCi/L

Result	Uncer.	Date
25000	2000	4/13
24000	2000	4/16
23400	1500	7/13
22200	1400	7/22

CV = 33720 ± 880 pCi/L

Result	Uncer.	Date
33000	3000	4/13
32600	1800	7/13
33000	1800	7/24

CV = 50580 ± 1300 pCi/L

Result	Uncer.	Date
51000	5000	3/17
49000	5000	3/17
50000	5000	4/13
48600	2200	6/24
48700	2200	7/20

H2O- 91GAU 01 GRAV

CV = 2.89 ± 0.26 %

Result	Uncer.	Date
2.6	0.3	7/22
2.9	0.3	9/18

CV = 3.85 ± 0.35 %

Result	Uncer.	Date
3.26	0.03	6/30

CV = 4.74 ± 0.43 %

Result	Uncer.	Date
3.9	0.4	3/12

CV = 4.76 ± 0.43 %

Result	Uncer.	Date
4	0.4	3/12

Pu-238 91GAU 01 RAS

CV = not spiked pCi/g

Result	Uncer.	Date
0.002	0.001	1/02
0.0015	0.0012	1/24
0.002	0.002	2/21
0.003	0.002	2/21
0.001	0.001	2/25
0.002	0.001	3/03
0	0.002	3/03
0.0005	0.0003	3/10
0.001	0.001	3/20
0.001	0.001	4/06
0.001	0.001	7/01
0.001	0.001	7/30
0.002	0.002	11/03
0.001	0.003	11/03
0.002	0.002	12/09

CV = 0.09 ± 0.01 pCi/g

Result	Uncer.	Date
0.093	0.005	1/22

CV = 0.1 ± 0.005 pCi/g

Result	Uncer.	Date
0.148	0.007	2/21

CV = 0.16 ± 0.01 pCi/g

Result	Uncer.	Date
0.171	0.008	2/25

CV = 0.28 ± 0.01 pCi/g

Result	Uncer.	Date
0.311	0.027	8/17

CV = 0.35 ± 0.02 pCi/g

Result	Uncer.	Date
0.38	0.015	1/21
0.37	0.02	3/20
0.39	0.03	8/20

CV = 0.44 ± 0.02 pCi/g

Result	Uncer.	Date
0.486	0.018	7/01

CV = 0.52 ± 0.03 pCi/g

Result	Uncer.	Date
0.546	0.019	1/21
0.54	0.02	5/26

CV = 0.58 ± 0.02 pCi/g

Result	Uncer.	Date
0.595	0.026	11/19

CV = 0.7 ± 0.04 pCi/g

Result	Uncer.	Date
0.789	0.028	2/21
0.754	0.035	5/12

TABLE E-IV (cont)

****

EM-9 Radionuclides on Soil
(cont)

****

Pu-238 (cont)

CV = 0.76 ± 0.04 pCi/g

Result	Uncer.	Date
0.801	0.032	9/30

CV = 0.8 ± 0.03 pCi/g

Result	Uncer.	Date
0.701	0.027	11/03

CV = 0.88 ± 0.03 pCi/g

Result	Uncer.	Date
0.821	0.031	10/09

CV = 0.95 ± 0.05 pCi/g

Result	Uncer.	Date
0.946	0.039	6/24

CV = 0.99 ± 0.03 pCi/g

Result	Uncer.	Date
0.955	0.034	11/03

Pu-239 91GAU 01 RAS

CV = not spiked pCi/g

Result	Uncer.	Date
0.002	0.001	1/21
0.0007	0.0008	1/24
0.001	0.001	2/21
0.001	0.001	2/21
0.054	0.004	2/21
0.001	0.002	2/25
0	0.001	3/03
0	0.001	3/03
0	0.001	5/12
0.002	0.002	5/26
0.006	0.004	10/09

CV = 0.1 ± 0.002 pCi/g

Result	Uncer.	Date
0.107	0.006	3/20

CV = 0.13 ± 0.002 pCi/g

Result	Uncer.	Date
0.14	0.01	3/10

CV = 0.15 ± 0.002 pCi/g

Result	Uncer.	Date
0.151	0.007	1/02
0.156	0.008	1/21

Pu-239 (cont)

CV = 0.18 ± 0.003 pCi/g

Result	Uncer.	Date
0.187	0.008	2/25

CV = 0.19 ± 0.003 pCi/g

Result	Uncer.	Date
0.204	0.01	7/01

CV = 0.3 ± 0.005 pCi/g

Result	Uncer.	Date
0.305	0.014	3/20
0.305	0.012	7/01
0.3	0.02	8/20

CV = 0.31 ± 0.01 pCi/g

Result	Uncer.	Date
0.321	0.016	6/24
0.345	0.014	11/03

CV = 0.4 ± 0.01 pCi/g

Result	Uncer.	Date
0.432	0.018	9/30

CV = 0.44 ± 0.01 pCi/g

Result	Uncer.	Date
0.45	0.04	12/09

CV = 0.46 ± 0.01 pCi/g

Result	Uncer.	Date
0.457	0.019	11/19

CV = 0.58 ± 0.02 pCi/g

Result	Uncer.	Date
0.547	0.021	11/03

CV = 0.59 ± 0.01 pCi/g

Result	Uncer.	Date
0.596	0.024	7/30

CV = 0.68 ± 0.02 pCi/g

Result	Uncer.	Date
0.656	0.025	11/03

CV = 0.75 ± 0.08 pCi/g

Result	Uncer.	Date
0.86	0.03	1/22
0.715	0.026	11/03

CV = 0.77 ± 0.01 pCi/g

Result	Uncer.	Date
0.872	0.065	8/17

Pu-239 (cont)

CV = 0.89 ± 0.02 pCi/g

Result	Uncer.	Date
0.876	0.028	2/21
0.885	0.031	4/06

Sr-90 89GAU 04, 91GAU 04 PC

CV = not spiked pCi/g

Result	Uncer.	Date
0.2	0.2	3/05
0.1	0.2	3/09
0	0.2	3/09
0.1	0.2	3/10
0.1	0.2	9/10
0	0.2	10/22

CV = 5 ± 0.2 pCi/g

Result	Uncer.	Date
5.7	0.4	9/16

CV = 5.3 ± 0.2 pCi/g

Result	Uncer.	Date
5.3	0.4	3/05

CV = 8.7 ± 0.3 pCi/g

Result	Uncer.	Date
8.8	0.7	11/17
8	0.7	12/21

CV = 10.9 ± 0.3 pCi/g

Result	Uncer.	Date
9.6	1	11/24

CV = 11 ± 0.4 pCi/g

Result	Uncer.	Date
11	0.8	3/05
10.5	0.7	3/16

CV = 13.1 ± 0.4 pCi/g

Result	Uncer.	Date
13	2	11/13

CV = 15.2 ± 0.4 pCi/g

Result	Uncer.	Date
13	1	12/09

CV = 16 ± 0.6 pCi/g

Result	Uncer.	Date
15.4	1	9/04

CV = 17.4 ± 0.5 pCi/g

Result	Uncer.	Date
18	2	11/10

Sr-90 (cont)

CV = 23.9 ± 0.7 pCi/g

Result	Uncer.	Date
26.2	1.7	10/13

CV = 26.1 ± 0.8 pCi/g

Result	Uncer.	Date
26	3	11/02

CV = 30.5 ± 0.9 pCi/g

Result	Uncer.	Date
29	3	11/06

U 92GAU 05 DNA

CV = 1.11 ± 0.03 ug/g

Result	Uncer.	Date
1	0.1	8/17

CV = 11 ± 1 ug/g

Result	Uncer.	Date
11	11	10/02

CV = 12.6 ± 0.42 ug/g

Result	Uncer.	Date
12.4	1	6/25

CV = 14.1 ± 0.5 ug/g

Result	Uncer.	Date
13.2	1	7/30

CV = 19 ± 2 ug/g

Result	Uncer.	Date
19	2	1/27

CV = 19.1 ± 0.6 ug/g

Result	Uncer.	Date
18	2	10/07

CV = 19.5 ± 0.6 ug/g

Result	Uncer.	Date
18	2	11/10

CV = 23.4 ± 0.8 ug/g

Result	Uncer.	Date
23.3	2	8/19

CV = 24 ± 0.8 ug/g

Result	Uncer.	Date
23.1	2	4/21

U (cont)

CV = 27.4 ± 0.9 ug/g

Result	Uncer.	Date
26	3	2/25

CV = 28.3 ± 0.9 ug/g

Result	Uncer.	Date
28	3	6/25

CV = 31.5 ± 1 ug/g

Result	Uncer.	Date
30	3	7/30

CV = 34.4 ± 1.1 ug/g

Result	Uncer.	Date
32.8	3	7/30

CV = 35.6 ± 1.2 ug/g

Result	Uncer.	Date
36	4	3/26

CV = 36.3 ± 1.2 ug/g

Result	Uncer.	Date
32.9	3	9/01

CV = 42.2 ± 1.4 ug/g

Result	Uncer.	Date
39	4	8/17

CV = 43.3 ± 1.4 ug/g

Result	Uncer.	Date
42.2	4	4/21

CV = 46.5 ± 1.5 ug/g

Result	Uncer.	Date
44	4	7/30

CV = 48.4 ± 1.6 ug/g

Result	Uncer.	Date
45	5	9/28

CV = 50.7 ± 1.7 ug/g

Result	Uncer.	Date
46	5	8/17

CV = 54.3 ± 1.8 ug/g

Result	Uncer.	Date
52	5	8/19

CV = 54.4 ± 1.8 ug/g

Result	Uncer.	Date
49	5	4/21

U (cont)

CV = 55.8 ± 1.8 ug/g

Result	Uncer.	Date
51	5	9/02

CV = 57.4 ± 1.89 ug/g

Result	Uncer.	Date
52.8	5	5/18

CV = 59.6 ± 2 ug/g

Result	Uncer.	Date
56	6	9/01

CV = 67.2 ± 2.22 ug/g

Result	Uncer.	Date
64.4	6	6/25

CV = 67.8 ± 2.2 ug/g

Result	Uncer.	Date
64	6	2/04

CV = 68.6 ± 2.3 ug/g

Result	Uncer.	Date
65	7	9/01

CV = 72.1 ± 2.4 ug/g

Result	Uncer.	Date
70	7	7/30

CV = 73 ± 2.4 ug/g

Result	Uncer.	Date
66	7	9/01

CV = 76 ± 2.51 ug/g

Result	Uncer.	Date
70	7	5/18

CV = 77.5 ± 2.6 ug/g

Result	Uncer.	Date
75	7	7/30

CV = 80.6 ± 2.7 ug/g

Result	Uncer.	Date
77	8	9/01

CV = 81.4 ± 2.7 ug/g

Result	Uncer.	Date
77	8	6/25

CV = 84.5 ± 2.79 ug/g

Result	Uncer.	Date
78	8	5/18

TABLE E-IV (cont)

****

EM-9 Radionuclides on Soil (cont)

****

U (cont)

CV = 86.4 ± 2.8 ug/g

Result	Uncer.	Date
80	8	9/01

CV = 91 ± 3 ug/g

Result	Uncer.	Date
88	9	6/25

CV = 94 ± 9 ug/g

Result	Uncer.	Date
91	9	2/25
89	9	6/25

CV = 98.3 ± 3.2 ug/g

Result	Uncer.	Date
95	95	2/04

CV = 99.7 ± 3.3 ug/g

Result	Uncer.	Date
92	9	9/02

CV = 101 ± 3.3 ug/g

Result	Uncer.	Date
93	9	7/30

CV = 104 ± 3.4 ug/g

Result	Uncer.	Date
96	10	7/30

CV = 109 ± 3.6 ug/g

Result	Uncer.	Date
100	10	8/19

CV = 118 ± 3.9 ug/g

Result	Uncer.	Date
110	10	7/30

CV = 123 ± 4.1 ug/g

Result	Uncer.	Date
120	10	4/29

CV = 124 ± 4.1 ug/g

Result	Uncer.	Date
120	10	4/29
110	10	9/01

U (cont)

CV = 127 ± 4.2 ug/g

Result	Uncer.	Date
110	10	9/02

CV = 128 ± 4.2 ug/g

Result	Uncer.	Date
110	10	7/30

CV = 129 ± 4.3 ug/g

Result	Uncer.	Date
120	10	11/23

CV = 133 ± 4.4 ug/g

Result	Uncer.	Date
130	10	9/01

CV = 134 ± 4.4 ug/g

Result	Uncer.	Date
120	10	9/02

CV = 136 ± 4.5 ug/g

Result	Uncer.	Date
130	10	6/25
130	10	7/30

CV = 141 ± 4.6 ug/g

Result	Uncer.	Date
130	10	6/25
130	10	7/30

CV = 146 ± 4.8 ug/g

Result	Uncer.	Date
130	10	9/02
130	10	11/19

CV = 148 ± 4.9 ug/g

Result	Uncer.	Date
140	10	2/25

CV = 151 ± 5 ug/g

Result	Uncer.	Date
140	10	9/01

CV = 152 ± 5 ug/g

Result	Uncer.	Date
150	20	1/27

CV = 153 ± 5 ug/g

Result	Uncer.	Date
140	10	10/02

U (cont)

CV = 154 ± 5.1 ug/g

Result	Uncer.	Date
140	10	8/17
150	20	8/19

CV = 156 ± 5.1 ug/g

Result	Uncer.	Date
150	20	3/26

CV = 158 ± 5.2 ug/g

Result	Uncer.	Date
150	20	9/01

CV = 163 ± 5.4 ug/g

Result	Uncer.	Date
150	20	11/19

CV = 165 ± 5.5 ug/g

Result	Uncer.	Date
150	20	6/25

CV = 170 ± 20 ug/g

Result	Uncer.	Date
160	20	4/21

CV = 172 ± 5.7 ug/g

Result	Uncer.	Date
160	20	7/30

CV = 176 ± 5.8 ug/g

Result	Uncer.	Date
160	20	4/29

CV = 177 ± 5.8 ug/g

Result	Uncer.	Date
170	20	9/01
164	15	9/28

CV = 182 ± 6 ug/g

Result	Uncer.	Date
170	20	10/07

CV = 185 ± 6.1 ug/g

Result	Uncer.	Date
170	20	10/02

CV = 192 ± 6.3 ug/g

Result	Uncer.	Date
170	20	10/07

U (cont)

CV = 193 ± 6.4 ug/g

Result	Uncer.	Date
170	20	10/02

CV = 198 ± 6.5 ug/g

Result	Uncer.	Date
190	20	2/25

CV = 201 ± 6.6 ug/g

Result	Uncer.	Date
180	20	11/19

CV = 202 ± 6.7 ug/g

Result	Uncer.	Date
190	20	6/25

CV = 205 ± 6.8 ug/g

Result	Uncer.	Date
190	20	9/01

CV = 209 ± 6.9 ug/g

Result	Uncer.	Date
200	20	4/21
190	20	6/25
190	20	9/01

CV = 213 ± 7 ug/g

Result	Uncer.	Date
200	20	6/25

CV = 218 ± 7.2 ug/g

Result	Uncer.	Date
200	20	10/07

CV = 220 ± 7.3 ug/g

Result	Uncer.	Date
200	20	6/25

CV = 224 ± 7.4 ug/g

Result	Uncer.	Date
210	20	8/17

CV = 227 ± 7.5 ug/g

Result	Uncer.	Date
210	20	9/01

CV = 228 ± 7.5 ug/g

Result	Uncer.	Date
210	20	6/25

U (cont)

CV = 231 ± 7.6 ug/g

Result	Uncer.	Date
210	20	9/28

CV = 233 ± 7.7 ug/g

Result	Uncer.	Date
220	20	4/29

CV = 238 ± 7.9 ug/g

Result	Uncer.	Date
220	20	8/19

CV = 240 ± 7.9 ug/g

Result	Uncer.	Date
220	20	5/18
230	20	9/01

CV = 246 ± 8.1 ug/g

Result	Uncer.	Date
230	20	8/17
230	20	10/07

CV = 252 ± 8.3 ug/g

Result	Uncer.	Date
230	20	11/19

CV = 253 ± 8.3 ug/g

Result	Uncer.	Date
240	20	2/25
240	20	4/29

CV = 254 ± 8.4 ug/g

Result	Uncer.	Date
240	20	8/19

CV = 256 ± 8.4 ug/g

Result	Uncer.	Date
240	20	8/19

CV = 264 ± 8.7 ug/g

Result	Uncer.	Date
240	20	10/07

CV = 265 ± 8.7 ug/g

Result	Uncer.	Date
240	20	9/01

CV = 267 ± 8.8 ug/g

Result	Uncer.	Date
250	30	9/28

U (cont)

CV = 274 ± 9 ug/g

Result	Uncer.	Date
270	30	8/19

CV = 275 ± 9.1 ug/g

Result	Uncer.	Date
250	30	11/19

CV = 280 ± 9.2 ug/g

Result	Uncer.	Date
270	30	1/27
270	30	2/25

****

EM-9 Radionuclides on Vegetation

****

Am-241 88GAU 01 G

CV = 6.9 ± 0.7 pCi/g

Result	Uncer.	Date
6.8	1	3/26

Pu-238 91GAU 01 RAS

CV = not spiked pCi/g

Result	Uncer.	Date
0.0004	0.0003	3/06

Pu-239 91GAU 01 RAS

CV = not spiked pCi/g

Result	Uncer.	Date
0.0002	0.0002	3/06

****

EM-9 Radionuclides on Vegetation Ash

****

Am-241 92GAU 01 RAS

CV = 2.8 ± 0.1 pCi/g

Result	Uncer.	Date
2.5	0.2	12/02

Cs-137 92GAU 01 G

CV = not spiked pCi/g

Result	Uncer.	Date
0.38	0.2	12/09
0.43	0.15	12/09
0.24	0.13	12/09
0.222	0.217	12/09

TABLE E-IV (cont)

****

EM-9 Radionuclides
on Vegetation Ash
(cont)

****

Cs-137 (cont)

CV = 0.22 ± 0.01 pCi/g

Result	Uncer.	Date
- 0.0097	0.131	3/12

CV = 5 ± 0.3 pCi/g

Result	Uncer.	Date
5.7	0.9	12/09

CV = 16.6 ± 0.9 pCi/g

Result	Uncer.	Date
24	4	12/09

Pu-238 90GAU 01 PC

CV = not spiked pCi/g

Result	Uncer.	Date
0.004	0.005	2/12

CV = 1 ± 0.05 pCi/g

Result	Uncer.	Date
1.01	0.06	2/12

CV = 1.4 ± 0.1 pCi/g

Result	Uncer.	Date
1.53	0.07	2/12

CV = 2.6 ± 0.3 pCi/g

Result	Uncer.	Date
2.76	0.11	2/12

Pu-238 91GAU 01 RAS

CV = not spiked pCi/g

Result	Uncer.	Date
0.032	0.018	4/01
0.01	0.02	4/29
0.008	0.009	7/30

CV = 1.1 ± 0.06 pCi/g

Result	Uncer.	Date
1.2	0.1	7/30

CV = 1.4 ± 0.07 pCi/g

Result	Uncer.	Date
1.6	0.15	7/30

Pu-238 (cont)

CV = 1.7 ± 0.2 pCi/g

Result	Uncer.	Date
2	0.1	3/06

CV = 3.72 ± 0.13 pCi/g

Result	Uncer.	Date
3.73	0.16	11/19

Pu-239 90GAU 01 RAS

CV = not spiked pCi/g

Result	Uncer.	Date
0.013	0.013	2/12
0.011	0.01	2/12
0.006	0.006	7/30
0.01	0.009	7/30

CV = 1.2 ± 0.1 pCi/g

Result	Uncer.	Date
1.19	0.06	2/12
1.3	0.1	4/01

CV = 2.1 ± 0.04 pCi/g

Result	Uncer.	Date
2.15	0.19	7/30

CV = 2.7 ± 0.3 pCi/g

Result	Uncer.	Date
2.9	0.12	2/12
3	0.2	4/29

CV = 4.55 ± 0.14 pCi/g

Result	Uncer.	Date
4.63	0.19	11/19

CV = 5.9 ± 0.6 pCi/g

Result	Uncer.	Date
6.5	0.3	3/06

Sr-90 91GAU 04 PC

CV = 0.5 ± 0.4 pCi/g

Result	Uncer.	Date
2.4	1.5	10/08
0.7	1.5	10/08

CV = 3.1 ± 0.5 pCi/g

Result	Uncer.	Date
3.8	1.5	10/08

CV = 4.8 ± 0.6 pCi/g

Result	Uncer.	Date
4.5	1.5	10/08

****

EM-9 Trace Elements in Ethanol

****

Al 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.16		1/13

CV = 15 ± 0.6 mg/L

Result	Uncer.	Date
15	2	1/13

Cu 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.04		1/13

CV = 2 ± 0.9 mg/L

Result	Uncer.	Date
1.9	1.9	1/13

****

EM-9 Trace Elements in Urine

****

Tl 91GAU 02 ICPMS

CV = 40 ± 4 ug/L

Result	Uncer.	Date
43	4	1/06

****

EM-9 Trace Elements in Water

****

Ag 91GAU 02 FAA

CV = not spiked ug/L

Result	Uncer.	Date
< 10		1/31
< 10		12/17

CV = 4.01 ± 0.2 ug/L

Result	Uncer.	Date
10	10	10/26

CV = 8 ± 0.3 ug/L

Result	Uncer.	Date
14	10	10/26

Ag (cont)

CV = 210 ± 9 ug/L

Result	Uncer.	Date
210	20	8/17

CV = 281 ± 12 ug/L

Result	Uncer.	Date
280	30	5/05

CV = 300 ± 13 ug/L

Result	Uncer.	Date
300	30	7/01
300	30	8/17

CV = 321 ± 14 ug/L

Result	Uncer.	Date
330	30	6/16
310	50	7/15
310	30	8/17

CV = 350 ± 20 ug/L

Result	Uncer.	Date
440	40	8/31

CV = 361 ± 16 ug/L

Result	Uncer.	Date
350	40	4/30
360	40	7/06

CV = 400 ± 17 ug/L

Result	Uncer.	Date
390	40	1/14
400	40	1/14
420	40	1/31

CV = 401 ± 17 ug/L

Result	Uncer.	Date
400	40	6/12
400	40	11/23
390	40	12/18

CV = 441 ± 19 ug/L

Result	Uncer.	Date
420	40	6/12
420	40	6/16

CV = 481 ± 21 ug/L

Result	Uncer.	Date
480	50	1/30
480	50	1/30
500	50	1/31
500	50	1/31
500	50	2/06
480	50	2/14
480	50	2/14
470	50	2/14
480	50	3/11
480	50	3/11
470	50	3/17

Ag (cont)

480	50	3/23
480	50	3/23
480	50	3/27
470	50	3/27
470	50	4/24
470	50	4/24
470	50	4/24
470	50	4/24
470	50	4/24
470	50	4/30
470	50	4/30
470	50	4/30
470	50	4/30
470	50	5/05
460	50	5/05
470	50	6/08
480	50	6/08
470	50	6/08
490	50	6/11
470	50	6/12
480	50	6/12
480	50	6/16
480	50	6/16
490	50	6/16
490	50	6/16
490	50	6/16
480	50	6/24
480	50	6/24
470	50	6/24
480	50	7/01
470	50	7/01
480	50	7/06
460	50	7/06
470	50	7/06
470	50	7/07
460	50	7/07
470	50	7/15
470	50	7/23
470	50	8/11
450	50	8/11
470	50	8/17
480	50	8/17
480	50	8/17
480	50	8/21
480	50	8/21
470	50	8/27
480	50	8/27
480	50	8/31
470	50	8/31
480	50	9/25
470	50	9/25
470	50	9/28
480	50	9/28
470	50	9/28
490	50	9/28
480	50	9/28
490	50	10/21
510	50	10/21
490	50	10/22
500	50	10/22
510	50	10/26
470	50	11/23
490	50	11/23
470	50	12/09
480	50	12/09
470	50	12/18
460	50	12/18
500	50	12/18
460	50	12/18
490	50	12/18
480	50	12/18
470	50	12/18
470	50	12/18
480	50	12/18

Ag (cont)

CV = 500 ± 50 ug/L

Result	Uncer.	Date
480	50	1/17
490	50	1/17
500	50	1/29
500	50	1/29
520	50	1/31
530	50	2/05

CV = 501 ± 22 ug/L

Result	Uncer.	Date
500	50	3/23
490	50	5/05

CV = 510 ± 51 ug/L

Result	Uncer.	Date
540	50	1/23
540	50	1/23
540	50	1/29
550	60	1/29

CV = 521 ± 22 ug/L

Result	Uncer.	Date
500	50	4/30
530	50	6/16
500	50	8/27

CV = 562 ± 24 ug/L

Result	Uncer.	Date
530	50	4/24
580	60	6/12

CV = 570 ± 60 ug/L

Result	Uncer.	Date
600	60	1/29
600	60	1/29

CV = 600 ± 26 ug/L

Result	Uncer.	Date
590	60	2/14
590	60	2/14

CV = 601 ± 60 ug/L

Result	Uncer.	Date
600	60	12/17

CV = 602 ± 26 ug/L

Result	Uncer.	Date
570	60	4/24
590	60	8/27
610	60	10/22

CV = 627 ± 27 ug/L

Result	Uncer.	Date
620	60	12/17

TABLE E-IV (cont)

****

EM-9 Trace Elements in Water
(cont)

****

Ag (cont)

CV = 640 ± 28 ug/L

Result	Uncer.	Date
680	70	4/24
690	70	5/05
640	60	8/11

CV = 642 ± 28 ug/L

Result	Uncer.	Date
650	70	3/23
650	70	6/16

CV = 682 ± 29 ug/L

Result	Uncer.	Date
680	70	6/16
670	70	9/28
690	70	9/28

CV = 700 ± 30 ug/L

Result	Uncer.	Date
700	70	3/11
680	70	7/23

CV = 722 ± 31 ug/L

Result	Uncer.	Date
700	70	3/17
710	70	3/17
730	70	6/11
710	70	6/16
750	80	10/21

CV = 760 ± 33 ug/L

Result	Uncer.	Date
800	80	3/27
780	80	3/27

CV = 762 ± 33 ug/L

Result	Uncer.	Date
750	80	3/27
750	80	3/27
834	73	6/08
740	70	7/07
740	70	12/17

CV = 800 ± 34 ug/L

Result	Uncer.	Date
800	80	1/30
800	80	2/12
800	80	2/12

Ag (cont)

CV = 802 ± 35 ug/L

Result	Uncer.	Date
800	80	1/30
790	80	1/30
790	80	5/05
850	90	10/20
800	80	11/23
730	70	12/17

CV = 842 ± 36 ug/L

Result	Uncer.	Date
820	80	7/06
850	90	9/28
850	90	9/28
840	80	12/18

CV = 883 ± 38 ug/L

Result	Uncer.	Date
900	90	6/16
880	90	9/28
820	80	12/18

CV = 900 ± 39 ug/L

Result	Uncer.	Date
900	90	1/30
900	90	2/12
900	90	2/12

CV = 923 ± 40 ug/L

Result	Uncer.	Date
920	90	2/14
930	90	2/14
870	90	4/30
930	90	9/24

CV = 963 ± 41 ug/L

Result	Uncer.	Date
940	90	6/12
940	90	6/16

CV = 0.5 ± 0.05 mg/L

Result	Uncer.	Date
0.5	0.05	1/06
0.48	0.05	1/14
0.49	0.05	1/14
0.48	0.05	1/17
0.49	0.05	1/17
0.5	0.05	1/23
0.48	0.05	1/23

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
1	0.1	6/08
1	0.1	6/16
0.99	0.1	8/21
1	0.1	9/24
1	0.1	12/18

Ag 92GAU 02 ICPMS

CV = not spiked ug/L

Result	Uncer.	Date
< 0.6		11/16
1	0.6	11/19

CV = 3 ± 0.1 ug/L

Result	Uncer.	Date
5.3	0.5	4/27
3	0.3	4/27

CV = 5 ± 0.2 ug/L

Result	Uncer.	Date
6.5	0.6	6/02
5	1	6/26
< 200		8/31
5.6	0.6	10/13

CV = 8 ± 0.3 ug/L

Result	Uncer.	Date
5.3	0.5	3/09
6.6	0.7	4/06
8.3	1	6/26

CV = 12.5 ± 1.3 ug/L

Result	Uncer.	Date
12	1	1/07
13	1	2/24

CV = 16 ± 0.7 ug/L

Result	Uncer.	Date
18	2	6/11

CV = 20 ± 0.9 ug/L

Result	Uncer.	Date
20	2	6/29
20	2	6/30

CV = 32 ± 1.4 ug/L

Result	Uncer.	Date
43	9	2/27
33.3	3	6/30

CV = 40 ± 4 ug/L

Result	Uncer.	Date
39	4	3/03
40	4	4/06
38	4	6/26
37	4	9/02
37	4	9/04
36	4	10/26

CV = 48 ± 2.1 ug/L

Result	Uncer.	Date
49	5	6/26

Ag (cont)

CV = 50 ± 5 ug/L

Result	Uncer.	Date
45	5	3/02
51	5	4/27

CV = 80 ± 8 ug/L

Result	Uncer.	Date
79	8	3/09
79	8	3/09
76	8	3/09
76	8	3/09
79	8	5/06
80	8	5/06

CV = 100 ± 10 ug/L

Result	Uncer.	Date
99	10	1/08
93	9	1/08
89	9	1/08
100	10	2/12
90	9	2/28
97	10	4/03
97	10	4/03
100	10	4/03
97	10	4/03
84	8	4/24
91	9	4/24
100	10	4/28
100	10	4/28
100	10	5/06
93	9	5/06
100	10	5/06
110	10	5/06
110	10	5/06
120	10	6/02
106	10	6/05
110	10	6/05
106	10	6/26
100	10	6/26
106	10	6/26
100	10	6/26
98	10	6/26
100	10	6/26
98	10	6/26
94	10	6/30
106	10	6/30
100	10	6/30
100	10	6/30
106	10	6/30
100	10	6/30
100	10	6/30
110	10	7/02
96	10	7/27
98	10	7/27
110	10	7/27
98	10	7/27
99	10	8/31
130	10	8/31
120	10	8/31
130	10	8/31
98	9	8/31
111	10	10/19
100	10	10/19
110	10	10/19
99	10	12/15
88	9	12/15
120	10	12/15
100	10	12/15
110	10	12/15

Ag (cont)

CV = 180 ± 20 ug/L

Result	Uncer.	Date
190	20	7/27
190	20	7/27

CV = 220 ± 20 ug/L

Result	Uncer.	Date
220	20	1/08
220	20	1/08
210	20	2/12
210	20	2/12
220	20	4/02
220	20	4/02
220	20	4/02
220	20	6/04
210	20	8/31
210	20	8/31

CV = 251 ± 25 ug/L

Result	Uncer.	Date
280	30	12/11

CV = 1 ± 0.1 mg/L

Result	Uncer.	Date
1.1	0.1	12/11

Ag 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	20	3/27
110	20	8/05
110	20	8/11

Al 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.8		3/11
0.022	0.008	6/08
< 0.03		6/22
20	10	7/16
< 0.01		7/16
< 0.01		8/04
< 0.03		9/08
< 0.03		9/10
< 0.02		12/08
< 0.02		12/10

CV = 60 ± 3 ug/L

Result	Uncer.	Date
50	20	10/21

CV = 0.8 ± 0.03 mg/L

Result	Uncer.	Date
0.78	0.08	12/02

Al (cont)

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
0.84	0.08	12/10

CV = 1.2 ± 0.05 mg/L

Result	Uncer.	Date
1.2	0.1	8/24
1.2	0.1	8/27
1.3	0.1	9/23

CV = 1.4 ± 0.06 mg/L

Result	Uncer.	Date
1	0.1	11/25

CV = 1.5 ± 0.06 mg/L

Result	Uncer.	Date
1.5	0.2	5/20
1.4	0.1	12/15

CV = 1.6 ± 0.07 mg/L

Result	Uncer.	Date
1.58	0.01	10/21

CV = 2 ± 0.09 mg/L

Result	Uncer.	Date
2.1	0.2	3/23
1.9	0.2	6/08

CV = 4 ± 0.4 mg/L

Result	Uncer.	Date
3.9	0.4	1/13
3.7	0.4	5/20
3.8	0.4	5/21
4.4	0.4	6/08
4.3	0.4	6/08
4.4	0.4	6/19
4.3	0.4	6/22
3.9	0.4	7/16
3.9	0.4	7/16
3.9	0.4	7/16
3.8	0.4	7/16
3.8	0.4	7/28
3.8	0.4	7/28
4.2	0.4	7/29
4.1	0.4	7/29
3.9	0.4	8/04
4.2	0.4	8/04
4.3	0.4	8/05
4.2	0.4	8/05
3.8	0.4	8/17
3.7	0.4	8/17
3.6	0.4	8/25
3.7	0.4	8/25
3.6	0.4	8/27
3.6	0.4	9/10
3.7	0.4	9/10
3.7	0.4	9/14
3.9	0.4	9/14
3.9	0.4	9/23
4.33	0.08	10/21
3.7	0.4	12/08

TABLE E-IV (cont)

****

EM-9 Trace Elements in Water
(cont)

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Al (cont)

CV = 5 ± 0.2 mg/L

Result	Uncer.	Date
5.1	0.5	5/20
5.2	0.5	5/20

CV = 5.6 ± 0.2 mg/L

Result	Uncer.	Date
5.4	0.5	7/15
5.4	0.5	7/28
5.3	0.5	7/28
5.7	0.6	8/05
5.4	0.5	10/26
5	0.5	11/25
5	0.5	11/25

CV = 6 ± 0.3 mg/L

Result	Uncer.	Date
5.9	0.6	12/15

CV = 8 ± 0.34 mg/L

Result	Uncer.	Date
7.7	1.5	1/07
7.8	0.8	3/30
8.3	0.8	6/19
7.6	0.8	8/13
7.6	0.8	8/20
7.7	0.8	8/24

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	2	1/07
9.7	1	3/11
13	1	3/11
9.3	0.9	3/16
10	1	3/23
9.9	1	3/23
10	1	3/24
10	1	3/30
11	1	4/01
9.45	0.47	4/23
10.4	0.5	4/23
9.97	0.5	4/24
9.7	1	5/20
10	1	5/20
10	1	5/20
11	1	5/21
12	1	6/08
11.6	1	6/08
9.8	1	6/11
10	1	6/19
11	1	6/19
10	1	6/22
11	1	6/23
9.5	1	8/13
9.6	1	8/31
11	1	9/23
11	1	9/23
11	1	9/24
9.9	1	9/24

Al (cont)

11	1	9/24
11	1	9/24
9.9	1	11/13

CV = 12.8 ± 0.5 mg/L

Result	Uncer.	Date
12	1	7/15
12	1	9/10
12	1	12/23

CV = 14 ± 0.6 mg/L

Result	Uncer.	Date
14	1	3/11
14	1	6/08
14	1	9/24
13	1	11/09
13	1	11/09
14	1	12/15

CV = 16 ± 0.7 mg/L

Result	Uncer.	Date
15	2	6/23
15	2	8/27
15	2	9/09
15	2	9/10

CV = 19 ± 0.8 mg/L

Result	Uncer.	Date
18	2	7/28
19	2	8/24
18	2	8/31
18	2	12/23

CV = 20 ± 0.9 mg/L

Result	Uncer.	Date
20	2	3/24
21	2	5/20
21	2	5/21
20	2	6/11
20	2	9/24
19	2	10/26
20	2	12/09
20	2	12/09

CV = 49.92 ± 2.15 mg/L

Result	Uncer.	Date
48	5	3/24
49	5	3/30
48	5	7/16
47	5	7/16
48	5	7/16
47	5	7/16
47	5	7/28
48	5	7/28
49	5	7/29
44	4	7/29
51	5	8/04
51	5	8/04
51	5	8/05
51	5	8/05
47	5	8/17
48	5	8/17
48	5	8/21
48	5	8/25
48	5	8/25
48	5	8/27

Al (cont)

48	5	8/31
46	5	8/31
48	5	9/10
47	5	9/10
48	5	9/14
47	5	9/14

CV = 80 ± 3 mg/L

Result	Uncer.	Date
80	4	4/23

CV = 200 ± 9 ug/L

Result	Uncer.	Date
240	20	4/23

CV = 250 ± 11 mg/L

Result	Uncer.	Date
236	2	10/21
240	20	10/26
240	20	10/26
230	20	11/09
230	20	11/09
230	20	11/09
230	20	11/13
240	20	11/13
240	20	11/25
240	20	11/25
250	30	12/08
250	30	12/08
250	30	12/09
240	20	12/09
240	20	12/09
250	30	12/09
250	30	12/09
240	20	12/09
250	30	12/10
250	30	12/10
250	20	12/15
250	30	12/15
230	20	12/15
230	20	12/15
240	20	12/23
230	20	12/23

Al 92GAU 02 ICPMS

CV = not spiked mg/L

Result	Uncer.	Date
0.17	0.03	12/11
0.16	0.03	12/11
0.17	0.03	12/17

CV = 100 ± 10 ug/L

Result	Uncer.	Date
110	10	4/24
100	10	4/24
100	10	10/06
71	7	10/06
98	10	12/15
98	10	12/15
96	10	12/15
98	10	12/15
91	9	12/15
90	9	12/15
100	10	12/15
100	10	12/15

Al (cont)

CV = 359 ± 15 ug/L

Result	Uncer.	Date
370	40	8/31

CV = 1002 ± 43 ug/L

Result	Uncer.	Date
1210	60	11/19

CV = 16 ± 0.7 mg/L

Result	Uncer.	Date
18	2	4/24
24	2	4/24

Al 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
99	20	3/27
110	20	8/05
100	20	8/11

As 92GAU 02 CVAA

CV = 55 ± 2.4 ug/L

Result	Uncer.	Date
57	6	6/12

As 91GAU 02 ETVAA

CV = not spiked mg/L

Result	Uncer.	Date
0.03	0.006	1/10
0.026	0.006	1/10
< 2		1/30
< 2		10/23

CV = 8 ± 0.3 ug/L

Result	Uncer.	Date
8.6	0.9	6/10

CV = 10 ± 0.4 ug/L

Result	Uncer.	Date
9.6	1	5/02
9.3	0.9	5/02
12	2	6/30
11	2	6/30
12	2	6/30

CV = 11 ± 0.5 ug/L

Result	Uncer.	Date
11	2	3/20

As (cont)

CV = 12 ± 0.5 ug/L

Result	Uncer.	Date
12	2	3/11
12	2	3/11
11	1	5/02
12	1	5/02

CV = 14 ± 0.6 ug/L

Result	Uncer.	Date
13	2	11/25

CV = 18 ± 0.8 ug/L

Result	Uncer.	Date
17	3	9/18

CV = 20 ± 0.9 ug/L

Result	Uncer.	Date
19	2	5/02
21	2	5/02
22	4	5/26
22	4	5/26
27	5	5/27
21	2	6/12
20	2	6/12
22	4	8/18
20	4	8/27

CV = 22 ± 0.9 ug/L

Result	Uncer.	Date
20	4	4/06
16	4	4/06
23	4	8/18

CV = 24 ± 1 ug/L

Result	Uncer.	Date
26	5	7/17
24	5	7/17
21	4	9/18

CV = 28 ± 1 ug/L

Result	Uncer.	Date
28	6	8/11

CV = 30 ± 1.3 ug/L

Result	Uncer.	Date
30	6	3/27
32	6	5/27
31	6	5/27
32	7	6/08
32	3	6/11
33	6	6/29
30	6	11/19

CV = 32 ± 1.4 ug/L

Result	Uncer.	Date
41	8	10/23
30	6	10/23

As (cont)

CV = 36 ± 1.5 ug/L

Result	Uncer.	Date
37	4	3/20
39	4	3/20
36	8	3/24
35	7	8/12
36	7	8/12

CV = 40 ± 1.7 ug/L

Result	Uncer.	Date
40	8	3/24
36	4	5/02
36	4	5/02
40	4	6/11
42	8	6/29
42	8	6/30
40	8	7/02
41	8	7/02

CV = 44 ± 1.9 ug/L

Result	Uncer.	Date
43	8	3/24
43	8	3/24
46	9	9/18
43	8	11/06

CV = 45 ± 1.9 ug/L

Result	Uncer.	Date
50	5	7/02
42	8	12/08

CV = 48 ± 2.1 ug/L

Result	Uncer.	Date
49	9	6/10
54	10	10/23
52.8	5	10/27

CV = 49 ± 5 ug/L

Result	Uncer.	Date
50	10	1/27
51	10	1/27
46	10	1/29
44	8	1/29
50	10	2/13
49	10	2/13

CV = 50 ± 2.2 ug/L

Result	Uncer.	Date
51	10	5/28
46	10	5/28
59	12	6/08
50	5	6/12
47	9	9/18

CV = 52 ± 5 ug/L

Result	Uncer.	Date
50	10	1/16
52	10	1/16
53	10	2/11

TABLE E-IV (cont)

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EM-9 Trace Elements in Water
(cont)

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As (cont)

52	10	2/11
50	10	2/11
66	13	2/28
51	10	8/17

CV = 55 ± 6 ug/L

Result	Uncer.	Date
44	8	1/29
43	8	1/29
53	10	2/11
57	12	2/28
56	12	3/02
56	12	3/11
58	12	3/11
58	6	6/10
60	6	6/10
58	6	6/11
60	6	6/11
60	6	6/11
59	6	6/11
57	6	6/12
56	6	6/12
57	6	6/12
57	6	6/12

CV = 56 ± 2 ug/L

Result	Uncer.	Date
55	10	8/27
55	11	9/18

CV = 58 ± 2 ug/L

Result	Uncer.	Date
59	12	8/17
58	12	8/28

CV = 60 ± 2.6 ug/L

Result	Uncer.	Date
58	6	5/02
64	6	5/02
69	14	5/26
69	14	5/28
59	6	6/11
57	11	8/28
54.3	5	11/25

CV = 62 ± 3 ug/L

Result	Uncer.	Date
65	13	8/14

CV = 64 ± 2.8 ug/L

Result	Uncer.	Date
66	13	9/17

As (cont)

CV = 70 ± 3 ug/L

Result	Uncer.	Date
74	7	5/02
66	7	5/02
53	5	5/02
63	6	5/02
65	12	5/07
68	7	5/13
75	14	5/27
65	12	5/27
74	14	5/27
72	14	5/27
74	14	5/27
71	14	5/28
74	14	5/28
72	14	6/08
65	13	6/10
70	14	6/29
68	14	6/30
68	14	6/30
71	7	7/02
65	7	7/02
73	14	7/02
66	7	7/02
61	12	7/17
65	7	8/05
70	7	8/05
60	12	8/11
62	12	8/12
60	12	8/12
61	12	8/14
62	12	8/17
64	12	8/17
63	12	8/18
60	12	8/18
63	12	8/27
62	12	8/28
63	12	8/28
61	12	9/17
62	12	9/18
61	12	9/18
61	12	9/18
60	12	9/18
60	12	9/18
71	14	10/23
74	14	10/23
70	14	10/23
57	12	10/23
73	14	10/23
73	14	10/23
60	12	10/26
60	12	10/27
65	12	11/06
66	14	11/25
72	14	11/25
66	7	12/03
69	14	12/08

CV = 75 ± 3 ug/L

Result	Uncer.	Date
77	15	6/10

CV = 100 ± 4.3 ug/L

Result	Uncer.	Date
97	19	11/19

CV = 2 ± 0.08 mg/L

Result	Uncer.	Date
1.9	0.2	10/27

As 91GAU 02 FAA

CV = 8 ± 0.3 mg/L

Result	Uncer.	Date
7.9	2	1/23
8	2	1/23

As 91GAU 02 ICPES

CV = 15772 ± 678 ug/L

Result	Uncer.	Date
17000	2000	5/08

CV = 2 ± 0.08 mg/L

Result	Uncer.	Date
2.2	0.2	5/27

CV = 10 ± 1 mg/L

Result	Uncer.	Date
11	1	5/08
10	1	5/27
11	1	5/27
11	1	5/28
11	1	5/28

CV = 20 ± 0.8 mg/L

Result	Uncer.	Date
21	2	5/27

CV = 24.96 ± 1.07 mg/L

Result	Uncer.	Date
25	3	5/08

As 92GAU 02 ICPMS

CV = 4 ± 0.2 ug/L

Result	Uncer.	Date
15	2	4/27

CV = 5 ± 0.2 ug/L

Result	Uncer.	Date
< 200		8/31

CV = 6 ± 0.3 ug/L

Result	Uncer.	Date
5.5	1	6/29

CV = 7 ± 0.3 ug/L

Result	Uncer.	Date
26	3	6/26

CV = 10 ± 0.4 ug/L

Result	Uncer.	Date
8.1	0.8	12/11

As (cont)

CV = 14 ± 1 ug/L

Result	Uncer.	Date
15	2	1/13
12	1	3/02
14	1	3/20
10	1	3/23
14	1	3/23

CV = 20 ± 0.9 ug/L

Result	Uncer.	Date
19	2	6/26

CV = 30 ± 3 ug/L

Result	Uncer.	Date
23	2	3/02

CV = 40 ± 1.7 ug/L

Result	Uncer.	Date
39	4	3/18
52	5	4/27
36	4	6/29
42	4	6/30
34	3	6/30

CV = 45 ± 1.9 ug/L

Result	Uncer.	Date
45	5	6/26
40	4	6/26

CV = 48 ± 5 ug/L

Result	Uncer.	Date
44.6	3.3	2/10

CV = 56 ± 2.4 ug/L

Result	Uncer.	Date
48	5	12/11

CV = 100 ± 10 ug/L

Result	Uncer.	Date
78	8	4/24
85	9	4/24
99	10	4/28
100	10	4/28
110	10	5/06
110	10	5/06
110	10	5/06
112	10	6/26
110	10	6/26
100	10	6/26
112	10	6/26
125	10	6/26
125	10	6/26
100	10	6/26
106	10	6/30
99	10	6/30
100	10	6/30
100	10	6/30
100	10	6/30
92	10	6/30
98	10	6/30
98	10	12/15
100	10	12/15

As (cont)

98	10	12/15
100	10	12/15
110	10	12/15
98	10	12/15
76	8	12/15
110	10	12/15

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
3	0.3	4/27

As 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
99	20	3/27
92	18	8/05
95	19	8/11

Au 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

B 92GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.02		9/23
< 0.006		12/02
< 0.01		12/10

CV = 152 ± 7 ug/L

Result	Uncer.	Date
150	5	11/19

CV = 200 ± 20 ug/L

Result	Uncer.	Date
230	20	5/20

CV = 378 ± 16 ug/L

Result	Uncer.	Date
400	40	1/10

CV = 500 ± 50 ug/L

Result	Uncer.	Date
540	50	5/27
504	6	11/19

CV = 800 ± 80 ug/L

Result	Uncer.	Date
900	90	11/13

B (cont)

CV = 0.2 ± 0.009 mg/L

Result	Uncer.	Date
0.2	0.02	12/04

CV = 0.5 ± 0.015 mg/L

Result	Uncer.	Date
0.51	0.05	12/15

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
0.96	0.1	9/23
0.95	0.09	9/24
0.92	0.1	11/09
0.91	0.1	11/09

CV = 1.5 ± 0.06 mg/L

Result	Uncer.	Date
1.6	0.2	5/20
1.6	0.2	5/27

CV = 2 ± 0.2 mg/L

Result	Uncer.	Date
2.1	0.2	5/20
2.1	0.2	10/26

CV = 2.5 ± 0.075 mg/L

Result	Uncer.	Date
2.5	0.3	9/24
2.5	0.3	12/08
2.5	0.3	12/09

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
3.1	0.3	10/26
< 20		11/25
< 20		11/25

CV = 3.6 ± 0.2 mg/L

Result	Uncer.	Date
< 20		11/25

CV = 4 ± 0.2 mg/L

Result	Uncer.	Date
4	0.4	12/08
4.1	0.4	12/10

CV = 4.5 ± 0.2 mg/L

Result	Uncer.	Date
4.8	0.5	5/21

CV = 5 ± 0.5 mg/L

Result	Uncer.	Date
5.5	0.6	5/20
5.4	0.5	5/21
5.1	0.5	10/26
5.1	0.5	10/26

TABLE E-IV (cont)

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EM-9 Trace Elements in Water
(cont)

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B (cont)

5.3	0.5	11/09
4.4	0.4	11/09
4.6	0.5	11/09
5.4	0.5	11/13
5.4	0.5	11/13
4.7	0.5	11/25
4.9	0.5	11/25
5	0.5	12/04
4.9	0.5	12/04
5.3	0.5	12/08
5.2	0.5	12/08
5.5	0.6	12/09
5.5	0.6	12/09
5.3	0.5	12/09
5.4	0.5	12/09
5.8	0.6	12/15
5.3	0.5	12/15
6.4	1.3	12/15
5.1	0.5	12/15
5.3	0.5	12/15

CV = 6 ± 0.3 mg/L

Result	Uncer.	Date
6.3	0.6	5/20

CV = 7 ± 0.21 mg/L

Result	Uncer.	Date
7.3	0.7	9/24
7.1	0.7	12/15

CV = 8 ± 0.8 mg/L

Result	Uncer.	Date
8.5	0.9	5/20
8.2	0.8	5/21

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	1	5/20
10	1	5/20
10	1	5/20
10	1	5/21
9.9	1	5/27
10	1	5/27
9.9	1	5/28
10	1	5/28
10	1	9/23
10	1	9/23
11	1	9/24
10	1	9/24
10	1	9/24

Ba 91GAU 02 FAA

CV = 7 ± 0.3 mg/L

Result	Uncer.	Date
7.2	0.7	4/06
7	0.7	4/23
6.9	0.7	6/11
7.1	0.7	7/06
7.1	0.7	7/06

Ba 91GAU 02 ICPES

CV = not spiked ug/L

Result	Uncer.	Date
< 2		2/25
< 0.001		3/23
< 0.0005		3/24
< 0.04		6/11
< 0.5		7/16
< 0.0003		8/25
< 0.002		8/27
< 0.05		11/09

CV = 300 ± 13 ug/L

Result	Uncer.	Date
280	30	4/21
260	30	5/08
240	20	9/22
250	70	11/25
240	30	12/09

CV = 398 ± 17 ug/L

Result	Uncer.	Date
390	40	5/08

CV = 428 ± 18 ug/L

Result	Uncer.	Date
440	40	12/08

CV = 498 ± 21 ug/L

Result	Uncer.	Date
550	60	8/17

CV = 554 ± 24 ug/L

Result	Uncer.	Date
559	5	11/19

CV = 600 ± 30 ug/L

Result	Uncer.	Date
660	70	2/24
620	60	6/08

CV = 800 ± 34 ug/L

Result	Uncer.	Date
700	140	1/27

CV = 952 ± 41 ug/L

Result	Uncer.	Date
953	7	11/19

CV = 0.21 ± 0.01 mg/L

Result	Uncer.	Date
0.18	0.08	11/19

Ba (cont)

CV = 0.5 ± 0.02 mg/L

Result	Uncer.	Date
0.49	0.05	6/22
0.5	0.05	7/16
0.52	0.05	8/04
0.5	0.05	9/08
0.5	0.05	9/10

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
1.2	0.1	11/19

CV = 1.2 ± 0.05 mg/L

Result	Uncer.	Date
1.2	0.1	6/23
1.1	0.1	8/27
1.2	0.1	9/09
1.2	0.1	9/10

CV = 1.8 ± 0.08 mg/L

Result	Uncer.	Date
1.8	0.2	7/15
1.8	0.2	7/28
1.8	0.2	7/28
1.9	0.2	8/05

CV = 2 ± 0.2 mg/L

Result	Uncer.	Date
2.4	0.2	6/11

CV = 2.5 ± 0.25 mg/L

Result	Uncer.	Date
2.3	0.5	1/27
2.5	0.3	2/20
2.5	0.3	2/25
2.7	0.3	2/27
2.7	0.3	3/03

CV = 2.6 ± 0.1 mg/L

Result	Uncer.	Date
2.7	0.3	2/24
2.5	0.3	8/13
2.4	0.2	8/31

CV = 2.8 ± 0.1 mg/L

Result	Uncer.	Date
2.6	0.3	2/25
2.8	0.3	2/25
2.8	0.3	11/23
2.8	0.3	11/23

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
3.1	0.3	2/20
2.9	0.3	3/03
2.9	0.3	3/23
3	0.3	4/24

Ba (cont)

CV = 3.2 ± 0.14 mg/L

Result	Uncer.	Date
3.2	0.3	3/23
3.2	0.3	6/08

CV = 3.6 ± 0.2 mg/L

Result	Uncer.	Date
3.6	0.4	3/30
3.6	0.4	6/19
3.5	0.4	8/13
3.4	0.3	8/20
3.6	0.4	8/24

CV = 4 ± 0.17 mg/L

Result	Uncer.	Date
4.2	0.4	2/24
4.1	0.4	6/08
4	0.4	6/08
4.2	0.4	6/08
4.2	0.4	6/19
4	0.4	6/22
3.9	0.4	7/15
4.1	0.4	7/16
4.2	0.4	7/16
4.1	0.4	7/16
4.2	0.4	7/16
4.1	0.4	7/28
4.2	0.4	7/28
4.3	0.4	7/29
3.5	0.4	7/29
4.2	0.4	8/04
4.2	0.4	8/04
4.3	0.4	8/05
4.3	0.4	8/05
4	0.4	8/17
3.9	0.4	8/17
3.9	0.4	8/25
4	0.4	8/25
3.8	0.4	8/27
4.1	0.4	9/10
4.1	0.4	9/10
4	0.4	9/10
4.1	0.4	9/14
4	0.4	9/14
3.6	0.4	9/22
4.2	0.4	10/07
4.1	0.4	12/23

CV = 4.4 ± 0.19 mg/L

Result	Uncer.	Date
4.3	0.9	1/07
4.1	0.4	7/07

CV = 4.5 ± 0.2 mg/L

Result	Uncer.	Date
4.5	0.5	2/27
4.5	0.5	5/01
4.9	0.5	11/25

CV = 4.7 ± 0.2 mg/L

Result	Uncer.	Date
5.4	0.5	9/22

Ba (cont)

CV = 4.8 ± 0.2 mg/L

Result	Uncer.	Date
4.7	0.5	7/28
4.8	0.5	8/24
4.5	0.5	8/31
4.9	4.9	12/04
4.8	0.5	12/23

CV = 4.98 ± 0.21 mg/L

Result	Uncer.	Date
4.9	0.5	3/24
4.8	0.5	3/30
5.2	0.5	5/08
4.9	0.5	7/16
5.1	0.5	7/16
5.1	0.5	7/16
5	0.5	7/16
5	0.5	7/28
4.9	0.5	7/28
4.2	0.4	7/29
5	0.5	7/29
5.1	0.5	8/04
5.1	0.5	8/04
5	0.5	8/05
5.1	0.5	8/05
5.3	0.5	8/17
5.4	0.5	8/17
5	0.5	8/17
4.9	0.5	8/17
4.7	0.5	8/21
5	0.5	8/25
5	0.5	8/25
4.7	0.5	8/27
4.7	0.5	8/31
4.4	0.4	8/31
5	0.5	9/10
5.1	0.5	9/10
5	0.5	9/14
5.1	0.5	9/14

CV = 5 ± 0.5 mg/L

Result	Uncer.	Date
5	0.5	3/23
5.4	0.5	5/01
5.6	0.6	6/11
5.4	0.5	6/12
5.3	0.5	6/12
4.3	0.4	7/07
5	0.5	7/07

CV = 5.6 ± 0.2 mg/L

Result	Uncer.	Date
6.1	0.6	6/12
6.2	0.6	6/12

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	2	1/07
10	2	1/27
10	1	2/24
11	1	2/25
10	1	2/25
10	1	2/27
11	1	3/03
9.9	1	3/03
9.9	1	3/03
9.9	1	3/23
10	1	3/23

Ba (cont)

9.8	1	3/23
10	1	3/23
9.7	1	3/24
9.8	1	3/30
9.9	1	4/01
11	1	4/21
11	1	4/24
11	1	5/01
11	1	5/08
10	1	5/08
9.2	0.9	5/12
9.6	1	6/08
9.8	1	6/08
10	1	6/11
9.8	1	6/19
9.6	1	6/19
9.6	1	6/22
9.8	1	6/23
11	1	9/22
11	1	9/22
11	1	9/22
11	1	10/07
10	1	10/07
11	1	11/09
11	1	11/19
11	1	11/19
11	1	11/23
10	1	11/23
11	1	11/25
11	1	11/25
12	1	11/25
10	1	12/04
10	1	12/04
9.5	1	12/08
10	1	12/08
9.8	1	12/09
10	1	12/09
10	1	12/23
10	1	12/23

Ba 92GAU 02 ICPMS

CV = not spiked ug/L

Result	Uncer.	Date
3.5	0.3	4/27
4.1	0.4	4/27
2	0.2	4/27
< 1		6/02
< 1.2		10/26
1.1	0.5	12/11

CV = 4 ± 0.2 ug/L

Result	Uncer.	Date
3.7	0.4	6/11

CV = 7.5 ± 0.3 ug/L

Result	Uncer.	Date
8.4	0.8	10/09
7.7	0.8	11/13

CV = 8 ± 0.3 ug/L

Result	Uncer.	Date
8.3	1	6/26
9.2	1	6/26

TABLE E-IV (cont)

****

EM-9 Trace Elements in Water
(cont)

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Ba (cont)

CV = 10 ± 0.4 ug/L

Result	Uncer.	Date
12.6	0.6	2/07
9.8	1	6/30

CV = 17.4 ± 0.7 ug/L

Result	Uncer.	Date
20	2	12/18

CV = 20 ± 0.9 ug/L

Result	Uncer.	Date
19	4	2/27
21.3	1	3/05
21.4	1	3/09
21.1	2	6/26
18	2	6/29
21	2	6/30
28	1.4	9/04

CV = 36 ± 1.5 ug/L

Result	Uncer.	Date
33.6	3	6/29

CV = 40 ± 1.7 ug/L

Result	Uncer.	Date
39	4	6/26
43.3	2.2	9/02

CV = 47.3 ± 2 ug/L

Result	Uncer.	Date
49	5	12/16

CV = 50 ± 5 ug/L

Result	Uncer.	Date
59	6	1/08
60	6	1/08
56	6	2/12
60	6	2/12
66	7	4/02
68	7	4/02
63	6	6/04
68	7	8/31
< 200		8/31
60	6	8/31

CV = 100 ± 10 ug/L

Result	Uncer.	Date
96	10	1/08
98	10	1/08
99	10	1/08
93	9	2/12
91	9	2/28
100	10	4/03
99	10	4/03
100	10	4/03

Ba (cont)

100	10	4/03
110	10	4/28
110	10	4/28
97	10	5/06
110	10	5/06
110	10	5/06
100	10	5/06
100	10	5/06
110	10	5/06
110	10	5/06
120	10	5/06
100	10	6/01
106	10	6/01
110	10	6/02
99	10	6/05
97	10	6/05
98	10	6/26
112	10	6/26
98	10	6/26
112	10	6/26
99	10	6/26
99	10	6/26
98	10	6/26
106	10	6/30
108	10	6/30
100	10	6/30
97	10	6/30
100	10	6/30
100	10	7/02
110	10	7/27
110	10	7/27
110	10	7/27
110	10	7/27
110	10	8/31
100	10	8/31
100	10	8/31
110	10	8/31
110	10	8/31
86	9	12/15
120	10	12/15
99	10	12/15
120	10	12/15
110	10	12/15
99	10	12/15
110	10	12/15
110	10	12/15

CV = 160 ± 20 ug/L

Result	Uncer.	Date
180	20	3/09
180	20	3/09
180	20	3/09
180	20	3/09
170	20	5/06
190	20	5/06

CV = 210 ± 20 ug/L

Result	Uncer.	Date
140	10	7/27
140	10	7/27

CV = 1.2 ± 0.05 mg/L

Result	Uncer.	Date
1.27	0.1	4/23

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
3.1	0.3	4/28

Ba (cont)

CV = 3.19 ± 0.32 mg/L

Result	Uncer.	Date
3.7	0.4	12/11

CV = 7.97 ± 0.8 mg/L

Result	Uncer.	Date
9.4	0.9	12/11

Ba 91MGB 01 MSCAM

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	20	3/27
110	20	8/05
100	20	8/11

Be 93GAU 02 FAA

CV = 15 ± 0.6 ug/L

Result	Uncer.	Date
14	2	5/07

CV = 24 ± 1 ug/L

Result	Uncer.	Date
20	10	10/13

CV = 210 ± 9 ug/L

Result	Uncer.	Date
220	20	1/31
220	20	1/31
220	20	1/31
210	20	2/28
210	20	2/28
220	20	3/16
220	20	3/16
220	20	6/17

CV = 519 ± 22 ug/L

Result	Uncer.	Date
530	50	10/13

CV = 899 ± 39 ug/L

Result	Uncer.	Date
920	90	1/30
940	90	2/05
960	100	2/05
880	90	5/07

CV = 1299 ± 56 ug/L

Result	Uncer.	Date
1300	100	4/14
1300	100	4/14
1300	100	4/14

Be (cont)

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
1	0.1	6/18
1	0.1	6/18
1	0.1	6/18
1	0.1	6/18
1	0.1	6/26
1	0.1	6/26
1	0.1	6/26
1	0.1	6/26
1	0.1	6/26
1	0.1	7/07
1	0.1	7/07
1	0.1	7/07
0.99	0.1	7/14
1	0.1	7/16
1	0.1	7/21
1	0.1	8/04
1	0.1	8/04
0.99	0.1	8/12
1	0.1	8/12
1	0.1	8/21
1	0.1	8/21
1	0.1	8/21
1	0.1	10/27

Be 92GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
0.007	0.0007	6/23
0.6	0.5	7/16
< 0.001		8/27
< 0.001		9/10

CV = 8 ± 0.34 ug/L

Result	Uncer.	Date
9	1	11/19

CV = 20 ± 0.9 ug/L

Result	Uncer.	Date
18.3	0.9	4/23

CV = 50 ± 2 ug/L

Result	Uncer.	Date
51	5	5/08

CV = 250 ± 11 ug/L

Result	Uncer.	Date
270	30	5/08

CV = 450 ± 19 ug/L

Result	Uncer.	Date
480	50	5/27

CV = 880 ± 40 ug/L

Result	Uncer.	Date
870	180	1/07

Be (cont)

CV = 4146 ± 178 ug/L

Result	Uncer.	Date
4300	400	12/08

CV = 0.25 ± 0.01 mg/L

Result	Uncer.	Date
0.24	0.02	3/24
0.24	0.02	3/30
0.26	0.04	7/16
0.24	0.02	7/16
0.24	0.02	7/16
0.24	0.02	7/16
0.25	0.03	7/28
0.24	0.02	7/28
0.23	0.02	7/29
0.25	0.03	7/29
0.24	0.02	8/04
0.24	0.02	8/04
0.24	0.02	8/05
0.24	0.02	8/05
0.27	0.03	8/17
0.27	0.03	8/17
0.27	0.03	8/17
0.28	0.03	8/17
0.26	0.03	8/21
0.27	0.03	8/25
0.28	0.1	8/25
0.26	0.03	8/27
0.26	0.03	8/31
0.25	0.03	8/31
0.26	0.03	9/10
0.27	0.03	9/10
0.27	0.03	9/14
0.26	0.03	9/14

CV = 0.4 ± 0.02 mg/L

Result	Uncer.	Date
0.38	0.04	7/28
0.44	0.04	8/24
0.4	0.04	8/31
0.43	0.04	12/04
0.38	0.04	12/23

CV = 1 ± 0.1 mg/L

Result	Uncer.	Date
0.9	0.09	3/23
1.1	0.1	3/30
1	0.1	6/11
1.2	0.1	6/19
1.1	0.1	8/13
1.1	0.1	8/20
1.2	0.1	8/24
4.2	1	11/19

CV = 1.4 ± 0.06 mg/L

Result	Uncer.	Date
1.3	0.1	3/11
1.5	0.2	8/13
1.5	0.2	8/31

CV = 1.8 ± 0.08 mg/L

Result	Uncer.	Date
1.8	0.2	7/15
2	0.2	9/10

Be (cont)

2	0.2	9/23
1.8	0.2	10/07
1.9	0.2	12/23

CV = 1.92 ± 0.08 mg/L

Result	Uncer.	Date
1.85	0.09	3/11
2	0.2	6/08

CV = 2 ± 0.08 mg/L

Result	Uncer.	Date
2.3	0.2	8/17

CV = 2.2 ± 0.09 mg/L

Result	Uncer.	Date
2.4	0.2	12/09

CV = 2.4 ± 0.1 mg/L

Result	Uncer.	Date
2.3	0.2	7/15
2.4	0.2	7/28
2.3	0.2	7/28
2.3	0.2	8/05

CV = 2.5 ± 0.1 mg/L

Result	Uncer.	Date
2.6	0.3	9/23
2.4	0.2	10/07
2.8	0.3	12/04
2.9	0.3	12/04
2.5	0.3	12/08
2.6	0.3	12/08
2.6	0.3	12/09
2.7	0.3	12/09
2.5	0.3	12/23
2.7	0.3	12/23

CV = 2.6 ± 0.11 mg/L

Result	Uncer.	Date
2.5	0.3	3/11
2.7	0.3	6/08

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
2.91	0.14	4/23

CV = 3.04 ± 0.13 mg/L

Result	Uncer.	Date
3.1	0.3	3/24
3.1	0.3	6/11

CV = 3.2 ± 0.3 mg/L

Result	Uncer.	Date
4	0.4	6/08
3.9	0.4	6/08
3.8	0.4	6/19
3.4	0.3	6/22
3.4	0.3	7/16
3.4	0.3	7/16
3.4	0.3	7/16

TABLE E-IV (cont)

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EM-9 Trace Elements in Water (cont)

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Be (cont)

3.3	0.3	7/16
3.5	0.4	7/28
3.5	0.4	7/28
3.4	0.3	7/29
3.6	0.4	7/29
3.4	0.3	8/04
3.4	0.3	8/04
3.5	0.4	8/05
3.5	0.4	8/05
3.7	0.4	8/17
3.6	0.4	8/17
3.5	0.4	8/24
3.7	0.4	8/25
3.7	0.4	8/25
3.5	0.4	8/27
3.3	0.3	8/27
3.5	0.4	9/10
3.5	0.4	9/10
3.5	0.4	9/14
3.5	0.4	9/14

CV = 4 ± 0.17 mg/L

Result	Uncer.	Date
4	0.4	3/23
3.8	0.4	4/03
4.4	0.4	5/27
4.09	0.04	6/08
4.1	0.4	6/22
4	0.4	7/16
4	0.4	8/04
4.4	0.4	9/10

CV = 10 ± 1 mg/L

Result	Uncer.	Date
9.8	2	1/07
9.8	1	3/11
9	0.9	3/16
8.9	0.9	3/23
10	1	3/23
9.8	1	3/24
10	1	3/30
10	1	4/01
9.44	0.47	4/23
9.14	0.46	4/24
10	1	5/12
9.9	1	5/27
10	1	5/27
10	1	5/28
10	1	5/28
11	1	6/08
11	1	6/08
9.7	1	6/11
11	1	6/19
11	1	6/19
10	1	6/22
11	1	6/23

CV = 16 ± 0.7 mg/L

Result	Uncer.	Date
15.1	0.8	4/23

Be 91GAU 02 ICPMS

CV = not spiked ug/L

Result	Uncer.	Date
< 0.5		1/09
< 1		12/11

CV = 5 ± 0.2 ug/L

Result	Uncer.	Date
5	1	12/04

CV = 8 ± 0.3 ug/L

Result	Uncer.	Date
15	1	4/27

CV = 9 ± 0.4 ug/L

Result	Uncer.	Date
8	0.8	9/01

CV = 10 ± 1 ug/L

Result	Uncer.	Date
9.2	0.9	3/20

CV = 15 ± 2 ug/L

Result	Uncer.	Date
14	1	1/07
14	1	6/11

CV = 16 ± 0.7 ug/L

Result	Uncer.	Date
15.6	0.8	3/16

CV = 30 ± 1.3 ug/L

Result	Uncer.	Date
27	6	2/27
< 200		8/31

CV = 40 ± 1.7 ug/L

Result	Uncer.	Date
44	4	10/16
32	3	11/25

CV = 42 ± 1.8 ug/L

Result	Uncer.	Date
36	4	10/16

CV = 45 ± 1.9 ug/L

Result	Uncer.	Date
44.5	4	6/02
44	4	10/20

CV = 50 ± 5 ug/L

Result	Uncer.	Date
48	5	3/20
49	5	4/27

Be (cont)

CV = 70 ± 7 ug/L

Result	Uncer.	Date
58	6	3/09
66	7	3/09
58	6	3/09
66	7	3/09
69	7	5/06
55	6	5/06

CV = 90 ± 9 ug/L

Result	Uncer.	Date
100	10	7/27
91	9	7/27

CV = 100 ± 10 ug/L

Result	Uncer.	Date
89	9	1/08
93	9	1/08
96	10	1/08
110	10	2/12
82	8	2/28
100	10	4/03
110	10	4/03
110	10	4/24
100	10	4/24
86	9	4/28
98	10	4/28
85	9	5/06
93	9	5/06
100	10	6/01
100	10	6/01
100	10	6/02
100	10	6/05
98	10	6/05
110	10	7/02
100	10	7/27
95	10	7/27
110	10	7/27
110	10	7/27
120	10	8/31
110	10	8/31
100	10	12/15
92	9	12/15
95	10	12/15
88	9	12/15
97	10	12/15
110	10	12/15
91	9	12/15

CV = 190 ± 20 ug/L

Result	Uncer.	Date
200	20	1/08
170	20	1/08
160	20	2/12
180	20	2/12
190	20	4/02
220	20	4/02
160	20	6/04
190	20	7/02
200	20	8/31

CV = 1.2 ± 0.12 mg/L

Result	Uncer.	Date
1	0.1	12/11

Be (cont)

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
3.2	0.3	4/27

Be 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
110	20	3/27
110	20	8/05
100	20	8/11

Bi 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Ca 92GAU 02 FAA

CV = 6.2 ± 0.3 mg/L

Result	Uncer.	Date
< 25		4/23

CV = 90 ± 3.9 mg/L

Result	Uncer.	Date
84	8	1/08
85	9	1/08
91	9	3/10
93	25	4/06
93	25	4/06
110	30	4/23
76	8	5/13
72	7	5/13
100	10	7/02
110	10	7/02

Ca 92GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
0.094	0.009	7/15
8	4	7/16
< 0.02		9/10
< 0.02		9/23
< 0.01		12/08

CV = 100 ± 4 ug/L

Result	Uncer.	Date
110	10	4/23

CV = 0.6 ± 0.02 mg/L

Result	Uncer.	Date
0.7	0.07	5/20

Ca (cont)

CV = 0.8 ± 0.03 mg/L

Result	Uncer.	Date
0.8	0.08	3/11
0.75	0.08	8/13
0.77	0.08	8/31
0.78	0.08	9/24

CV = 1.2 ± 0.05 mg/L

Result	Uncer.	Date
1.1	0.1	3/11

CV = 3.2 ± 0.1 mg/L

Result	Uncer.	Date
3.2	0.3	3/30
3.2	0.3	6/19
3	0.3	8/13
3	0.3	8/20
3.2	0.3	8/24

CV = 4 ± 0.2 mg/L

Result	Uncer.	Date
3.8	0.4	7/15
3.9	0.4	7/28
3.8	0.4	7/28
3.8	0.4	8/05
4.1	0.4	9/24
4.3	0.4	12/09

CV = 5 ± 0.22 mg/L

Result	Uncer.	Date
4.9	0.5	3/23

CV = 6.2 ± 0.3 mg/L

Result	Uncer.	Date
5.9	0.6	6/23
6	0.6	8/27
6.3	0.6	9/09
6.4	0.6	9/10

CV = 6.8 ± 0.29 mg/L

Result	Uncer.	Date
6.5	0.7	3/11

CV = 8 ± 0.8 mg/L

Result	Uncer.	Date
8.6	0.9	9/24

CV = 8.8 ± 0.4 mg/L

Result	Uncer.	Date
8.5	0.9	8/24
8.4	0.8	8/27
9	0.9	9/23

CV = 9.6 ± 0.4 mg/L

Result	Uncer.	Date
9.3	0.9	3/24
9.2	0.9	6/11

Ca (cont)

CV = 10 ± 1 mg/L

Result	Uncer.	Date
9.6	1.9	1/07
10	1	3/11
9.2	0.9	3/16
9.8	1	3/23
10	1	3/23
10	1	3/24
10	1	3/30
10	1	4/01
9.14	0.46	4/23
11	1	5/20
11	1	5/20
12	1	5/20
11	1	5/20
12	1	5/21
12	1	5/21
12	1	6/11
9.6	1	6/17
9.6	1	6/17
9.8	1	6/19
9.6	1	6/19
9.3	0.9	6/22
9.5	1	6/23
9.5	1	7/28
10	1	8/24
9.5	1	8/31
10	1	9/23
10	1	9/23
10	1	9/24
10	1	9/24
10	1	9/24

CV = 10.6 ± 0.5 mg/L

Result	Uncer.	Date
11	1	12/10

CV = 11 ± 0.5 mg/L

Result	Uncer.	Date
12	1	12/09

CV = 12 ± 0.52 mg/L

Result	Uncer.	Date
11	2	1/07
11	1	6/22
12	1	7/16
11	1	8/04
12	1	9/08
12	1	9/10

CV = 16 ± 0.78 mg/L

Result	Uncer.	Date
23	2	5/20
17	2	6/02
18	2	12/15

CV = 18 ± 0.88 mg/L

Result	Uncer.	Date
19	2	6/17
18	2	12/08

TABLE E-IV (cont)

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EM-9 Trace Elements in Water (cont)

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Ca (cont)

CV = 24 ± 1.18 mg/L

Result	Uncer.	Date
28	3	5/20
30	3	5/21
28	1	10/09
28	3	12/10
27	3	12/15

CV = 25.02 ± 1.08 mg/L

Result	Uncer.	Date
24	2	3/24
25	3	3/30
26	3	7/16
25	3	7/16
26	3	7/16
24	2	7/16
24	2	7/28
24	2	7/28
24	2	7/29
21	2	7/29
23	2	8/04
23	2	8/04
23	2	8/05
23	2	8/05
24	2	8/17
24	2	8/17
24	2	8/21
24	2	8/25
25	3	8/25
24	2	8/27
23	2	8/31
24	2	8/31
24	2	8/31
25	3	9/10
26	3	9/10
25	3	9/14
26	3	9/14

CV = 30 ± 1.3 mg/L

Result	Uncer.	Date
26.3	1.3	4/23

CV = 130 ± 6 mg/L

Result	Uncer.	Date
140	10	12/08
140	10	12/08
140	10	12/09
140	10	12/09
130	10	12/09
140	10	12/09
130	10	12/09
130	10	12/09
140	10	12/10
140	10	12/10
130	10	12/15
140	10	12/15
130	10	12/15
140	10	12/15

Cd 92GAU 02 ETVAA

CV = 2 ± 0.1 ug/L

Result	Uncer.	Date
2.1	0.4	3/31
2.1	0.4	4/09
2.1	0.4	4/09

CV = 2.5 ± 0.1 ug/L

Result	Uncer.	Date
2.4	0.2	6/26
3	0.6	7/02

CV = 2.6 ± 0.1 ug/L

Result	Uncer.	Date
2.4	0.5	8/21

CV = 3 ± 0.1 ug/L

Result	Uncer.	Date
3.1	0.3	5/05

CV = 3.4 ± 0.1 ug/L

Result	Uncer.	Date
3.3	0.6	11/05

CV = 4 ± 0.2 ug/L

Result	Uncer.	Date
4	0.8	2/05
3.8	0.4	2/06
3.8	0.4	2/06
3.8	0.4	2/06
3.9	1	3/12
3.9	1	3/12
4	1	3/12
4.1	1	3/12
4.3	0.8	3/31
4	0.8	3/31
3.9	0.8	3/31
3.9	0.8	3/31
3.9	0.8	3/31
3.8	0.4	4/09
3.8	0.4	4/09
3.9	0.4	5/05
3.6	0.4	6/26
3.4	0.3	6/26
3.8	0.8	8/21
3.8	0.8	8/21
3.8	0.4	9/03
3.8	0.4	9/03
4	0.8	11/05
3.5	0.7	11/20
3.6	1	12/08

CV = 4.4 ± 0.2 ug/L

Result	Uncer.	Date
3.9	0.8	8/03
4.1	0.8	8/03

CV = 5 ± 0.5 ug/L

Result	Uncer.	Date
4.8	1	1/06
4.5	0.9	11/20

Cd 93GAU 02 FAA

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
1	0.1	7/16

Cd 92GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
0.02	0.002	7/15
< 5		7/16
0.021	0.004	7/28
0.02	0.004	7/28
0.029	0.006	8/05

CV = 12 ± 0.5 ug/L

Result	Uncer.	Date
8	6	10/21

CV = 19.9 ± 0.9 ug/L

Result	Uncer.	Date
99	5	4/23

CV = 30 ± 1.3 ug/L

Result	Uncer.	Date
30	4	11/19

CV = 179 ± 8 ug/L

Result	Uncer.	Date
182	8	10/21

CV = 299 ± 13 ug/L

Result	Uncer.	Date
290	30	5/08

CV = 320 ± 13 ug/L

Result	Uncer.	Date
320	30	2/25
350	40	5/27

CV = 400 ± 17 ug/L

Result	Uncer.	Date
400	40	2/20
370	40	3/03
410	40	3/23
380	40	4/24

CV = 493 ± 21 ug/L

Result	Uncer.	Date
530	50	12/08

CV = 800 ± 30 ug/L

Result	Uncer.	Date
800	80	3/23
440	40	12/09

Cd (cont)

CV = 0.28 ± 0.01 mg/L

Result	Uncer.	Date
0.28	0.03	11/23
0.28	0.03	11/23

CV = 0.29 ± 0.01 mg/L

Result	Uncer.	Date
0.31	0.03	9/22

CV = 0.3 ± 0.01 mg/L

Result	Uncer.	Date
0.31	0.03	6/22
0.34	0.03	7/16
0.34	0.03	8/04
0.33	0.03	9/08
0.31	0.03	9/10

CV = 0.5 ± 0.02 mg/L

Result	Uncer.	Date
0.48	0.05	3/24
0.52	0.05	3/30
0.46	0.05	7/16
0.47	0.05	7/16
0.53	0.05	7/16
0.55	0.06	7/16
0.49	0.05	7/28
0.49	0.07	7/28
0.56	0.06	7/29
0.5	0.05	7/29
0.62	0.06	8/04
0.63	0.06	8/04
0.78	0.08	8/05
0.61	0.06	8/05
0.54	0.05	8/17
0.64	0.06	8/17
0.58	0.06	8/17
0.64	0.06	8/17
0.42	0.04	8/21
0.65	0.06	8/25
0.65	0.07	8/25
0.57	0.06	8/27
0.58	0.06	8/31
0.63	0.06	8/31
0.53	0.05	9/10
0.57	0.06	9/10
0.52	0.05	9/14
0.55	0.06	9/14

CV = 0.66 ± 0.03 mg/L

Result	Uncer.	Date
0.85	0.09	12/10

CV = 0.8 ± 0.03 mg/L

Result	Uncer.	Date
0.822	0.008	7/28
0.88	0.09	8/24
0.86	0.09	8/31
0.84	0.08	12/04

CV = 1.08 ± 0.05 mg/L

Result	Uncer.	Date
1.1	0.1	6/12
1.1	0.1	6/12

Cd (cont)

CV = 1.2 ± 0.05 mg/L

Result	Uncer.	Date
1.4	0.1	5/27
1.3	0.1	8/24
1.3	0.1	8/27

CV = 1.28 ± 0.06 mg/L

Result	Uncer.	Date
1.3	0.1	3/11

CV = 1.4 ± 0.06 mg/L

Result	Uncer.	Date
1.5	0.2	4/21
1.4	0.1	9/22
1.5	0.2	11/25

CV = 1.5 ± 0.15 mg/L

Result	Uncer.	Date
1.6	0.3	1/27
1.7	0.3	1/27
1.6	0.2	2/20
1.5	0.2	2/25
1.5	0.2	2/27
1.6	0.2	3/03

CV = 1.6 ± 0.07 mg/L

Result	Uncer.	Date
1.6	0.2	6/23
1.7	0.2	8/27
1.6	0.2	9/09
1.6	0.2	9/10

CV = 1.67 ± 0.07 mg/L

Result	Uncer.	Date
1.7	0.2	9/22

CV = 1.84 ± 0.08 mg/L

Result	Uncer.	Date
1.9	0.2	3/24
2.1	0.2	6/11

CV = 2 ± 0.08 mg/L

Result	Uncer.	Date
1.9	0.2	2/25
2	0.2	2/25
1.9	0.2	2/27
1.92	0.09	4/23
1.9	0.2	5/01
1.9	0.2	5/08
2	0.2	7/15
2	0.2	9/10
2.1	0.2	10/07
2.1	0.2	11/25

CV = 2.4 ± 0.1 mg/L

Result	Uncer.	Date
2.4	0.2	3/11
2.5	0.3	3/30
2.4	0.2	6/19

Cd (cont)

2.4	0.2	8/13
2.5	0.3	8/20
2.6	0.3	8/24
2.6	0.3	11/19

CV = 2.5 ± 0.1 mg/L

Result	Uncer.	Date
2.8	0.3	8/17

CV = 2.8 ± 0.12 mg/L

Result	Uncer.	Date
2.9	0.6	1/07
3	0.6	1/27

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
2.9	0.3	3/11
3.1	0.3	3/23
2.9	0.3	8/13
3.2	0.3	8/31
3.3	0.3	11/19

CV = 5 ± 0.5 mg/L

Result	Uncer.	Date
5.3	0.5	3/23
5.1	0.5	5/01
5.9	0.6	6/11
5.2	0.5	6/12
5.2	0.5	6/12
6	3	11/19

CV = 8 ± 0.3 mg/L

Result	Uncer.	Date
8.3	0.4	4/23

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	2	1/07
10	2	1/27
10	2	1/27
12	1	2/25
11	1	2/25
10	1	2/27
11	1	3/03
11	1	3/11
9.6	1	3/16
10	1	3/23
10	1	3/23
11	1	3/23
10	1	3/23
10	1	3/24
10	1	3/30
10	1	4/01
11	1	4/21
10.1	0.5	4/23
9.89	0.49	4/24
11	1	4/24
11	1	5/01
9.4	0.9	5/12
10	1	5/27
10	1	5/27
10	1	5/28
10	1	5/28
12	1	6/11
10	1	6/19
9.9	1	6/19

TABLE E-IV (cont)

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EM-9 Trace Elements in Water (cont)

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Cd (cont)

9.4	0.9	6/22
10	1	6/23
11	1	9/22
11	1	9/22
11	1	9/22
11	1	10/07
10	1	10/07
9.49	0.08	10/21
10	1	11/19
11	1	11/19
9.2	0.9	11/23
10	1	11/23
10	1	11/25
11	1	11/25
10	1	11/25
10	1	12/04
11	1	12/04
10	1	12/08
10	1	12/08
10	1	12/09
9.9	1	12/09
10	1	12/10
10	1	12/10

Cd 91GAU 02 ICPMS

CV = not spiked ug/L

Result	Uncer.	Date
0.55	0.55	6/29
< 1		6/30
< 1		10/19

CV = 4 ± 0.2 ug/L

Result	Uncer.	Date
10	1	4/27

CV = 5 ± 0.2 ug/L

Result	Uncer.	Date
4.3	0.5	6/11

CV = 6 ± 0.3 ug/L

Result	Uncer.	Date
5.6	1	6/26
5	0.5	9/04

CV = 7.5 ± 0.3 ug/L

Result	Uncer.	Date
< 200		8/31
8.3	0.8	12/18

CV = 16 ± 0.7 ug/L

Result	Uncer.	Date
15	2	6/26
14	1	6/26

Cd (cont)

CV = 17.4 ± 0.7 ug/L

Result	Uncer.	Date
21	2	12/18

CV = 20 ± 0.9 ug/L

Result	Uncer.	Date
19	4	2/27

CV = 26 ± 1.1 ug/L

Result	Uncer.	Date
26	5	2/07
25	3	6/30

CV = 27.4 ± 1.2 ug/L

Result	Uncer.	Date
28	3	10/09
29	3	11/12

CV = 30 ± 1.3 ug/L

Result	Uncer.	Date
28	3	6/26
36	4	9/02

CV = 39.8 ± 1.7 ug/L

Result	Uncer.	Date
43.4	4	6/02
39	4	10/26

CV = 40 ± 2 ug/L

Result	Uncer.	Date
46	5	4/27

CV = 44 ± 1.9 ug/L

Result	Uncer.	Date
42	4	6/29

CV = 44.8 ± 1.9 ug/L

Result	Uncer.	Date
44	5	12/11

CV = 45 ± 4 ug/L

Result	Uncer.	Date
41	4	3/26
48	7	3/26

CV = 100 ± 10 ug/L

Result	Uncer.	Date
99	10	1/08
100	10	1/08
100	10	1/08
120	10	2/12
83	8	2/28
100	10	4/03
96	10	4/03
96	10	4/03
98	10	4/03

Cd (cont)

83	8	4/24
73	7	4/24
100	10	4/28
100	10	4/28
100	10	5/06
99	10	5/06
100	10	5/06
100	10	5/06
99	10	5/06
100	10	6/01
100	10	6/01
110	10	6/02
100	10	6/05
100	10	6/05
100	10	6/26
106	10	6/26
100	10	6/26
100	10	6/26
100	10	6/26
100	10	6/26
106	10	6/26
100	10	6/30
100	10	6/30
89	10	6/30
87	10	6/30
108	10	6/30
100	10	6/30
100	10	6/30
110	10	6/30
100	10	6/30
110	10	7/02
100	10	7/27
100	10	7/27
100	10	7/27
100	10	7/27
120	10	8/31
100	10	8/31
130	10	8/31
130	10	8/31
110	10	8/31
110	10	10/06
100	10	10/06
100	10	10/19
100	10	10/19
100	10	10/19
100	10	10/19
106	10	10/19
106	10	10/19
110	10	12/15
97	10	12/15
110	10	12/15
85	9	12/15
96	10	12/15

CV = 110 ± 10 ug/L

Result	Uncer.	Date
110	10	3/09
110	10	3/09
110	10	3/09
110	10	3/09
110	10	5/06
100	10	5/06

CV = 170 ± 20 ug/L

Result	Uncer.	Date
160	20	1/08
170	20	1/08
160	20	2/12
160	20	4/02
160	20	4/02
150	20	6/04
170	20	8/31
160	20	8/31

Cd (cont)

CV = 230 ± 20 ug/L

Result	Uncer.	Date
230	20	7/27
230	20	7/27

CV = 400 ± 17 ug/L

Result	Uncer.	Date
400	40	4/28

CV = 598 ± 60 ug/L

Result	Uncer.	Date
580	60	12/11

CV = 1.2 ± 0.12 mg/L

Result	Uncer.	Date
1.2	0.1	12/11

CV = 1.6 ± 0.07 mg/L

Result	Uncer.	Date
1.7	0.2	4/24

CV = 2.8 ± 0.1 mg/L

Result	Uncer.	Date
2.7	0.3	4/27

Cd 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	20	3/27
99	20	8/05
100	20	8/11

Ce 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Cl 91GAU 01 IC

CV = 5 ± 0.5 mg/L

Result	Uncer.	Date
5	0.5	2/13
5	0.5	5/14

CV = 14 ± 0.4 mg/L

Result	Uncer.	Date
16	2	7/07

Cl (cont)

CV = 30 ± 3 mg/L

Result	Uncer.	Date
31	3	6/09

CV = 40 ± 4 mg/L

Result	Uncer.	Date
39	4	6/03

CV = 41.1 ± 1.48 mg/L

Result	Uncer.	Date
47	5	1/15
42	4	3/06
39	4	8/13
38	4	8/26
39	4	8/27
38	4	10/22

CV = 46.3 ± 1.66 mg/L

Result	Uncer.	Date
44	4	8/26
44	4	9/11
43	4	10/27
44	4	11/25

CV = 48 ± 1 mg/L

Result	Uncer.	Date
45	5	12/03

CV = 50 ± 5 mg/L

Result	Uncer.	Date
43	4	1/15

CV = 54 ± 1.94 mg/L

Result	Uncer.	Date
54	5	4/13
49	5	6/09

CV = 61.7 ± 2.22 mg/L

Result	Uncer.	Date
57	6	10/16
57	6	10/16
56	6	10/22

CN 92GAU 04 ACOLR

CV = 0.1 ± 0.01 mg/L

Result	Uncer.	Date
0.074	0.01	6/12

CV = 0.11 ± 0.01 mg/L

Result	Uncer.	Date
0.085	0.01	6/25
0.079	0.01	6/29
0.079	0.01	6/29
0.074	0.01	6/29

CN (cont)

0.074	0.01	6/29
0.074	0.01	6/30
0.074	0.01	6/30
0.074	0.01	6/30

CV = 0.18 ± 0.02 mg/L

Result	Uncer.	Date
0.125	0.01	10/15
0.137	0.01	10/22

CV = 0.2 ± 0.02 mg/L

Result	Uncer.	Date
0.119	0.01	2/21

CV = 0.22 ± 0.03 mg/L

Result	Uncer.	Date
0.156	0.01	2/21
0.16	0.02	3/04

CV = 0.23 ± 0.03 mg/L

Result	Uncer.	Date
0.18	0.02	4/21
0.17	0.02	5/19
0.17	0.02	5/19

CV = 0.25 ± 0.03 mg/L

Result	Uncer.	Date
0.211	0.02	9/03
0.222	0.02	10/22

CV = 0.3 ± 0.04 mg/L

Result	Uncer.	Date
0.148	0.01	3/05

CV = 0.34 ± 0.04 mg/L

Result	Uncer.	Date
0.26	0.03	4/10
0.26	0.03	4/10
0.228	0.02	6/01

CV = 0.35 ± 0.04 mg/L

Result	Uncer.	Date
0.16	0.02	3/05
0.29	0.03	4/06
0.348	0.03	4/10
0.346	0.03	4/10

CV = 0.38 ± 0.05 mg/L

Result	Uncer.	Date
0.321	0.01	10/22
0.324	0.01	10/22

CV = 0.4 ± 0.05 mg/L

Result	Uncer.	Date
0.18	0.02	2/27

TABLE E-IV (cont)

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EM-9 Trace Elements in Water (cont)

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CN (cont)

CV = 0.45 ± 0.05 mg/L

Result	Uncer.	Date
0.329	0.01	1/24
0.327	0.01	1/24
0.326	0.03	2/18
0.44	0.04	4/06
0.42	0.04	4/06
0.324	0.03	7/08
0.34	0.03	7/15

CV = 0.47 ± 0.05 mg/L

Result	Uncer.	Date
0.38	0.04	1/09
0.342	0.03	3/04

CV = 0.5 ± 0.06 mg/L

Result	Uncer.	Date
0.41	0.04	7/15
0.42	0.04	7/15

Co 92GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.007		3/11
< 2		7/16
< 0.008		8/13
< 0.008		8/31
< 0.02		9/24
< 0.002		11/25
< 0.01		12/15

CV = 20 ± 0.9 ug/L

Result	Uncer.	Date
22	1	4/23
20	1	10/21

CV = 120 ± 5 ug/L

Result	Uncer.	Date
126	2	10/21

CV = 300 ± 10 ug/L

Result	Uncer.	Date
290	30	12/10

CV = 400 ± 20 ug/L

Result	Uncer.	Date
410	80	1/07

CV = 1000 ± 43 ug/L

Result	Uncer.	Date
1200	100	5/20

Co (cont)

CV = 0.2 ± 0.009 mg/L

Result	Uncer.	Date
0.21	0.02	12/15

CV = 0.36 ± 0.02 mg/L

Result	Uncer.	Date
0.33	0.03	6/22
0.4	0.04	7/16
0.37	0.04	8/04
0.36	0.04	9/08
0.34	0.03	9/10

CV = 0.5 ± 0.02 mg/L

Result	Uncer.	Date
0.52	0.05	3/24
0.53	0.05	3/30
0.52	0.05	7/16
0.58	0.06	7/16
0.49	0.05	7/16
0.56	0.06	7/16
0.52	0.05	7/28
0.51	0.05	7/28
0.55	0.06	7/29
0.48	0.05	7/29
0.52	0.05	8/04
0.51	0.05	8/04
0.53	0.05	8/05
0.52	0.05	8/05
0.51	0.05	8/17
0.51	0.05	8/17
0.5	0.05	8/21
0.53	0.05	8/25
0.53	0.05	8/25
0.53	0.05	8/27
0.54	0.05	8/31
0.5	0.05	8/31
0.52	0.05	9/10
0.51	0.05	9/10
0.49	0.05	9/14
0.47	0.05	9/14

CV = 0.54 ± 0.02 mg/L

Result	Uncer.	Date
0.55	0.06	7/28
0.58	0.06	8/24
0.58	0.06	8/31

CV = 0.6 ± 0.03 mg/L

Result	Uncer.	Date
0.61	0.06	12/15

CV = 0.8 ± 0.03 mg/L

Result	Uncer.	Date
0.84	0.1	11/09
0.84	0.1	11/09

CV = 1.04 ± 0.04 mg/L

Result	Uncer.	Date
1.1	0.1	3/24
1.2	0.1	6/11

Co (cont)

CV = 1.24 ± 0.05 mg/L

Result	Uncer.	Date
1.3	0.1	8/24
1.3	0.1	8/27
1.3	0.1	9/23

CV = 1.6 ± 0.07 mg/L

Result	Uncer.	Date
1.6	0.2	12/09

CV = 1.8 ± 0.08 mg/L

Result	Uncer.	Date
1.8	0.2	12/08
1.8	0.2	12/10

CV = 1.88 ± 0.08 mg/L

Result	Uncer.	Date
1.9	0.2	6/23
2	0.2	8/27
2	0.2	9/09
1.9	0.2	9/10

CV = 2 ± 0.2 mg/L

Result	Uncer.	Date
2.5	0.3	6/11

CV = 2.2 ± 0.09 mg/L

Result	Uncer.	Date
2.2	0.2	7/15
2.3	0.3	7/28
2.3	0.2	7/28
2.3	0.2	8/05

CV = 2.32 ± 0.1 mg/L

Result	Uncer.	Date
2.4	0.2	3/23

CV = 2.5 ± 0.25 mg/L

Result	Uncer.	Date
3.02	0.15	4/13

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
3.1	0.2	4/23

CV = 3.4 ± 0.1 mg/L

Result	Uncer.	Date
3.2	0.3	12/02

CV = 3.5 ± 0.4 mg/L

Result	Uncer.	Date
3.63	0.18	4/13

Co (cont)

CV = 3.6 ± 0.15 mg/L

Result	Uncer.	Date
3.6	0.4	3/11
3.7	0.4	7/15
3.5	0.4	9/10

CV = 4 ± 0.2 mg/L

Result	Uncer.	Date
4.3	0.4	3/30
4.3	0.4	6/19
4	0.4	8/13
4.2	0.4	8/20
4.5	0.5	8/24
4.2	0.4	9/24
4.3	0.4	10/26
3.8	0.4	11/25
3.8	0.4	11/25
4	0.4	12/09

CV = 4.4 ± 0.19 mg/L

Result	Uncer.	Date
4.4	0.4	3/11

CV = 6 ± 0.3 mg/L

Result	Uncer.	Date
6.3	0.6	9/23
6.1	0.6	12/08

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	2	1/07
11	1	3/11
9.8	1	3/16
10	1	3/23
10	1	3/23
10	1	3/24
11	1	3/30
11	1	4/01
10.1	0.5	4/23
9.98	0.5	4/24
11	1	5/20
11	1	5/20
12	1	6/11
10	1	6/19
10	1	6/19
9.6	1	6/22
10	1	6/23
11	1	9/23
11	1	9/23
10	1	9/24
11	1	9/24
10	1	9/24
9.77	0.02	10/21
11	1	10/26
9.5	1	11/09
10	1	11/09
10	1	11/09
9.3	0.9	11/25
10	1	11/25
9.9	1	12/08
9.9	1	12/08
9.6	1	12/09
9.6	1	12/09
9.9	1	12/09
9.9	1	12/09
9.7	1	12/09
9.9	1	12/09
9.9	1	12/10

Co (cont)

9.9	1	12/10
9.9	1	12/15
9.6	1	12/15
9.5	1	12/15
10	1	12/15

CV = 12 ± 0.5 mg/L

Result	Uncer.	Date
12	0.6	4/23

CV = 40 ± 4 mg/L

Result	Uncer.	Date
46	5	5/20
43	4	6/19
39	4	6/22
46	5	7/16
40	4	7/16
41	4	7/16
47	5	7/16
42	4	7/28
42	4	7/28
47	5	7/29
43	4	7/29
45	5	8/04
45	5	8/04
45	5	8/05
46	5	8/05
43	4	8/17
42	4	8/17
43	4	8/25
44	4	8/25
43	4	8/27
42	4	9/10
42	4	9/10
39	4	9/14
41.1	0.1	10/21

Co 92GAU 02 ICPMS

CV = 40 ± 1.7 ug/L

Result	Uncer.	Date
< 200		8/31

CV = 100 ± 10 ug/L

Result	Uncer.	Date
86	9	4/24
100	10	4/24
89	9	10/06
98	10	10/06
97	10	12/15
98	10	12/15
96	10	12/15
96	10	12/15
99	10	12/15
98	10	12/15

CV = 0.8 ± 0.03 mg/L

Result	Uncer.	Date
0.77	0.08	12/11
0.76	0.08	12/11
0.76	0.15	12/17

Co (cont)

CV = 1.88 ± 0.08 mg/L

Result	Uncer.	Date
2.7	0.3	4/24
2.1	0.2	4/24

Co 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	20	3/27
100	20	8/05
100	20	8/11

Chemical Oxygen Demand
92GAU 04 COLOR

CV = 209 ± 21 mg/L

Result	Uncer.	Date
160	30	12/08

Conductivity 91GAU 04 CB

CV = 224 ± 8.9 umhos/cm

Result	Uncer.	Date
274	14	2/21
207	10	8/11
207	10	8/19
211	10	10/23

CV = 252 ± 10 umhos/cm

Result	Uncer.	Date
242	12	6/08
235	12	8/20
227	11	9/04
238	12	10/23
237	12	12/16

CV = 294 ± 11.7 umhos/cm

Result	Uncer.	Date
284	14	4/08
260	13	6/08

CV = 308 ± 12.2 umhos/cm

Result	Uncer.	Date
285	14	12/16
299	15	12/16

CV = 336 ± 13.3 umhos/cm

Result	Uncer.	Date
320	16	10/15
319	16	10/23
312	16	12/16
327	16	12/16
306	15	12/16

TABLE E-IV (cont)

****

EM-9 Trace Elements in Water (cont)

****

Cr 92GAU 02 ETVAA

CV = 7.5 ± 0.3 ug/L

Result	Uncer.	Date
9.2	1.8	8/21

CV = 10 ± 0.4 ug/L

Result	Uncer.	Date
8.2	1	10/27

CV = 11 ± 0.5 ug/L

Result	Uncer.	Date
11	1	5/06
12	1	5/06

CV = 25 ± 1.1 ug/L

Result	Uncer.	Date
26	3	7/01

CV = 26 ± 1.1 ug/L

Result	Uncer.	Date
24	2	5/06
26	3	5/06
24	2	5/06
25	3	5/06
24	2	5/06
27	3	6/26
26	3	6/26
25	3	6/26
30	3	6/26
25	3	7/01
26	3	7/01
24	2	7/01
27	5	8/21
26	5	8/21
22	2	9/03
23	2	9/03
22	2	9/21
26	3	10/27
25	5	11/05
24	5	11/20
20	4	12/08

CV = 34 ± 1.5 ug/L

Result	Uncer.	Date
35	7	2/05
34	6	3/12
37	8	3/12

CV = 36 ± 2 ug/L

Result	Uncer.	Date
38	8	11/20

CV = 41 ± 1.8 ug/L

Result	Uncer.	Date
44	8	4/06
44	8	4/06

Cr (cont)

CV = 46 ± 5 ug/L

Result	Uncer.	Date
49	10	1/06
49	10	1/06

CV = 50 ± 2 ug/L

Result	Uncer.	Date
49	10	12/08

Cr 92GAU 02 FAA

CV = 60 ± 2.6 ug/L

Result	Uncer.	Date
56	6	7/01
56	6	7/01
58	6	7/02

CV = 220 ± 9 ug/L

Result	Uncer.	Date
210	20	10/26

CV = 802 ± 34 ug/L

Result	Uncer.	Date
870	90	8/27

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
1.1	0.1	7/02
1	0.1	7/16
0.94	0.1	8/10
0.94	0.1	8/10
0.97	0.1	8/24
0.96	0.1	8/27

Cr 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.007		1/07
< 330		1/27
< 0.01		2/27
< 0.01		3/23
< 0.01		5/01
0.01	0.005	6/19
< 5		7/16
< 0.01		8/13
< 0.01		8/20
< 0.01		8/24
< 0.01		11/25
< 0.004		12/09

CV = 80 ± 3.4 ug/L

Result	Uncer.	Date
52	10	11/19

CV = 100 ± 4 ug/L

Result	Uncer.	Date
95	9	5/08

Cr (cont)

CV = 200 ± 9 ug/L

Result	Uncer.	Date
206	4	11/19

CV = 400 ± 17 ug/L

Result	Uncer.	Date
400	40	2/25
430	40	5/28

CV = 600 ± 30 ug/L

Result	Uncer.	Date
610	60	3/17

CV = 800 ± 34 ug/L

Result	Uncer.	Date
880	90	4/21
860	90	5/08
810	80	9/22
890	90	11/25

CV = 5010 ± 215 ug/L

Result	Uncer.	Date
5100	500	12/08

CV = 0.31 ± 0.01 mg/L

Result	Uncer.	Date
0.35	0.04	11/19

CV = 0.4 ± 0.02 mg/L

Result	Uncer.	Date
0.42	0.04	6/22
0.43	0.04	7/16
0.41	0.04	8/04
0.4	0.04	9/08
0.39	0.04	9/10

CV = 0.8 ± 0.03 mg/L

Result	Uncer.	Date
0.79	0.08	7/28
0.89	0.09	8/24
0.81	0.08	8/31
0.8	0.08	12/04

CV = 1.2 ± 0.05 mg/L

Result	Uncer.	Date
1.3	0.1	6/12
1.3	0.1	6/12

CV = 1.6 ± 0.07 mg/L

Result	Uncer.	Date
1.8	0.2	8/24
1.6	0.2	8/27

CV = 1.76 ± 0.08 mg/L

Result	Uncer.	Date
1.9	0.2	8/17

Cr (cont)

CV = 2 ± 0.09 mg/L

Result	Uncer.	Date
2.2	0.2	1/10
2.1	0.2	2/20
2	0.2	3/03
2	0.2	3/23
2	0.2	4/24

CV = 2.2 ± 0.09 mg/L

Result	Uncer.	Date
2.1	0.2	3/24
2.1	0.2	6/11
2.2	0.2	6/23
2.2	0.2	8/27
2.2	0.2	9/09
2.1	0.2	9/10

CV = 2.51 ± 0.11 mg/L

Result	Uncer.	Date
2.4	0.2	3/24
2.4	0.2	3/30
2.5	0.3	5/08
2.7	0.3	7/16
2.4	0.2	7/16
2.6	0.3	7/16
2.6	0.3	7/16
2.5	0.3	7/28
2.4	0.2	7/28
2.2	0.2	7/28
2.3	0.2	7/28
2.5	0.3	7/29
2.2	0.2	7/29
2.5	0.3	8/04
2.5	0.3	8/04
2.7	0.3	8/05
2.7	0.3	8/05
2.6	0.3	8/17
2.6	0.3	8/17
2.7	0.3	8/17
2.6	0.3	8/17
2.4	0.2	8/21
2.7	0.3	8/25
2.7	0.3	8/25
2.5	0.3	8/27
2.5	0.3	8/31
2.4	0.2	8/31
2.5	0.3	9/10
2.4	0.2	9/10
2.4	2.4	9/14
2.3	0.2	9/14

CV = 3 ± 0.3 mg/L

Result	Uncer.	Date
2.9	0.6	1/27
3.1	0.6	1/27
3.2	0.3	2/20
3.2	0.3	2/25
3.1	0.3	2/27
3.3	0.3	3/03
2.89	0.15	4/23

CV = 3.28 ± 0.14 mg/L

Result	Uncer.	Date
3.3	0.3	3/23

Cr (cont)

CV = 3.6 ± 0.2 mg/L

Result	Uncer.	Date
3.8	0.4	5/28
3.7	0.4	8/28
3.7	0.4	9/22
4	0.4	9/22

CV = 3.8 ± 0.2 mg/L

Result	Uncer.	Date
4.3	0.4	5/20
3.7	0.4	7/15
3.7	0.4	7/28
3.7	0.4	7/28
4.1	0.4	8/05

CV = 4 ± 0.2 mg/L

Result	Uncer.	Date
3.9	0.4	3/23
3.7	0.4	7/28

CV = 4.8 ± 0.2 mg/L

Result	Uncer.	Date
4.8	0.5	7/15
4.7	0.5	9/10
5	0.5	10/07

CV = 5 ± 0.5 mg/L

Result	Uncer.	Date
5.6	0.6	1/10
4.9	0.5	3/23
5.1	0.5	5/01
< 6		5/08
5.3	0.5	6/01
4.9	0.5	6/11
5.3	0.5	6/12
5.3	0.5	6/12
5.1	0.5	7/28
5.2	0.5	7/28

CV = 5.2 ± 0.2 mg/L

Result	Uncer.	Date
5.2	0.5	2/25
5.5	0.6	2/25
4.9	0.5	3/17

CV = 5.6 ± 0.2 mg/L

Result	Uncer.	Date
5.4	0.5	3/17
5.8	0.6	8/13
5.7	0.6	8/31
6.2	0.6	11/19

CV = 7.2 ± 0.3 mg/L

Result	Uncer.	Date
7.3	0.7	11/23
7.4	0.7	11/23

Cr (cont)

CV = 10 ± 1 mg/L

Result	Uncer.	Date
9.7	1.9	1/07
9.8	2	1/27
9.6	1.9	1/27
11	1	2/25
12	1	2/25
10	1	2/27
11	1	3/03
11	1	3/16
10	1	3/23
9.8	1	3/23
10	1	3/23
9.9	1	3/23
9.9	1	3/24
10	1	3/30
10	1	4/01
11	1	4/21
9.86	0.49	4/23
11	1	4/24
9.61	0.48	4/24
10	1	5/01
11	1	5/08
9.4	0.9	5/12
11	1	5/20
9.9	1	5/27
9.9	1	5/27
10	1	5/28
9.9	1	5/28
9.3	0.9	6/11
10	1	6/19
10	1	6/19
10	1	6/22
10	1	6/23
11	1	8/28
10	1	9/22
11	1	9/22
11	1	9/22
11	1	10/07
10	1	10/07
11	1	11/19
10	1	11/19
9.9	1	11/23
10	1	11/23
11	1	11/25
11	1	11/25
11	1	11/25
9.6	0.9	12/04
10	1	12/04
9.9	1	12/08
9.5	1	12/08
9.6	1	12/09
10	1	12/09

CV = 16 ± 0.7 mg/L

Result	Uncer.	Date
14.2	0.7	4/23

CV = 30 ± 1 mg/L

Result	Uncer.	Date
20.5	1.1	4/23

Cr 91GAU 02 ICPMS

CV = 6 ± 0.6 ug/L

Result	Uncer.	Date
6	0.6	1/16
7.8	1.7	3/23
5	0.5	3/23

TABLE E-IV (cont)

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EM-9 Trace Elements in Water (cont)

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Cr (cont)

CV = 8 ± 0.3 ug/L

Result	Uncer.	Date
54	5	4/27
10.6	1	6/29
10.6	1	6/30

CV = 10 ± 0.4 ug/L

Result	Uncer.	Date
11	10	6/26
< 200		8/31
15	2	9/01
7	5	10/16
16	2	11/20

CV = 14 ± 0.6 ug/L

Result	Uncer.	Date
13	3	2/27
14	1	4/14

CV = 18 ± 0.8 ug/L

Result	Uncer.	Date
18	2	3/16
20	2	6/30

CV = 20 ± 0.9 ug/L

Result	Uncer.	Date
21	2	6/02
22.5	2	6/26
20	2	9/22
26	3	10/21

CV = 30 ± 1.3 ug/L

Result	Uncer.	Date
31	3	6/29

CV = 31.5 ± 1.4 ug/L

Result	Uncer.	Date
30	3	12/03

CV = 40 ± 2 ug/L

Result	Uncer.	Date
87	9	4/27

CV = 42 ± 1.8 ug/L

Result	Uncer.	Date
42	4	6/26
46	5	6/26

CV = 45 ± 1.9 ug/L

Result	Uncer.	Date
48	5	10/19

Cr (cont)

CV = 48 ± 5 ug/L

Result	Uncer.	Date
48	5	1/06

CV = 60 ± 2.6 ug/L

Result	Uncer.	Date
71	7	6/11

CV = 80 ± 8 ug/L

Result	Uncer.	Date
75	8	1/08
73	7	1/08
96	10	2/12
77	8	2/12
83	8	4/02
77	8	4/02
78	8	6/04
84	8	8/31

CV = 100 ± 10 ug/L

Result	Uncer.	Date
86	9	1/08
95	9	1/08
92	9	1/08
92	9	2/12
82	8	2/28
96	10	4/03
110	10	4/03
100	10	4/03
99	10	4/03
110	10	4/24
84	8	4/24
97	9	4/28
98	10	4/28
110	10	5/06
100	10	5/06
93	9	5/06
110	10	5/06
97	10	5/06
110	10	5/06
110	10	5/06
110	10	5/06
106	10	6/01
107	10	6/01
120	10	6/02
99	10	6/05
99	10	6/05
100	10	6/26
100	10	6/26
96	10	6/26
108	10	6/26
110	10	6/26
96	10	6/26
110	10	6/26
118	10	6/30
111	10	6/30
99	10	6/30
107	10	6/30
118	10	6/30
89	10	6/30
100	10	6/30
110	10	7/02
100	10	7/27
110	10	7/27
99	10	7/27
100	10	7/27
100	10	8/31
100	10	8/31
107	10	10/06
96	10	10/06

Cr (cont)

110	10	10/19
120	10	10/19
110	10	10/19
100	10	12/15
98	10	12/15
100	10	12/15
97	10	12/15
99	10	12/15
95	10	12/15

CV = 160 ± 20 ug/L

Result	Uncer.	Date
170	20	7/27
160	20	7/27

CV = 250 ± 20 ug/L

Result	Uncer.	Date
200	20	3/09
220	20	3/09
220	20	3/09
200	20	3/09
250	30	5/06
250	30	5/06

CV = 502 ± 50 ug/L

Result	Uncer.	Date
460	50	12/11

CV = 602 ± 60 ug/L

Result	Uncer.	Date
580	60	12/11

CV = 2 ± 0.09 mg/L

Result	Uncer.	Date
2	0.2	4/28

CV = 2.2 ± 0.09 mg/L

Result	Uncer.	Date
2.2	0.2	4/24
2.9	0.3	4/24

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
3.2	0.3	4/27

Cr 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	20	3/27
160	30	8/05
110	20	8/11

Cs 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Cu 93GAU 02 FAA

CV = 24 ± 1 ug/L

Result	Uncer.	Date
18	10	10/26

CV = 500 ± 20 ug/L

Result	Uncer.	Date
490	50	8/31

CV = 598 ± 26 ug/L

Result	Uncer.	Date
640	60	2/06
630	60	2/06
610	60	3/12
610	60	3/12
600	60	3/12
600	60	3/12
610	60	3/28
610	60	3/28
610	60	3/28
600	60	4/24
610	60	4/24
610	60	4/24
610	60	4/24
610	60	5/05
600	60	5/05

CV = 650 ± 28 ug/L

Result	Uncer.	Date
660	70	5/05

CV = 797 ± 34 ug/L

Result	Uncer.	Date
790	80	10/26

CV = 840 ± 80 ug/L

Result	Uncer.	Date
870	90	1/06

CV = 900 ± 39 ug/L

Result	Uncer.	Date
900	90	7/01

CV = 986 ± 42 ug/L

Result	Uncer.	Date
960	100	6/25
980	100	6/25
980	100	6/25
970	100	7/01
970	100	7/01

Cu (cont)

CV = 1250 ± 54 ug/L

Result	Uncer.	Date
1300	100	2/05
1300	100	3/28
1200	100	3/28
1200	100	3/28

CV = 1400 ± 60 ug/L

Result	Uncer.	Date
1400	100	6/01

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
1	0.1	8/03
1	0.1	8/21
1.1	0.1	8/21
1	0.1	8/21
0.99	0.1	8/31
1	0.1	8/31
0.99	0.1	10/26
1	0.1	12/09
1	0.1	12/09

CV = 1.05 ± 0.04 mg/L

Result	Uncer.	Date
1.1	0.1	8/21

Cu 92GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.005		6/22
< 3		7/16
< 0.003		7/16
< 0.004		8/04
< 0.01		9/08
< 0.01		9/10

CV = 19.9 ± 0.9 ug/L

Result	Uncer.	Date
27	3	4/23

CV = 129 ± 6 ug/L

Result	Uncer.	Date
133	4	11/19

CV = 249 ± 11 ug/L

Result	Uncer.	Date
240	20	5/08

CV = 320 ± 10 ug/L

Result	Uncer.	Date
320	30	6/08

CV = 398 ± 17 ug/L

Result	Uncer.	Date
410	40	5/12

Cu (cont)

CV = 800 ± 30 ug/L

Result	Uncer.	Date
790	80	3/17
800	80	6/08

CV = 900 ± 39 ug/L

Result	Uncer.	Date
900	6	11/19

CV = 996 ± 43 ug/L

Result	Uncer.	Date
940	50	4/23

CV = 0.26 ± 0.01 mg/L

Result	Uncer.	Date
0.26	0.03	3/17
0.26	0.03	8/13
0.31	0.03	8/31

CV = 0.34 ± 0.01 mg/L

Result	Uncer.	Date
0.33	0.03	3/30
0.33	0.03	6/19
0.33	0.03	8/13
0.39	0.04	8/20
0.35	0.04	8/24

CV = 0.48 ± 0.02 mg/L

Result	Uncer.	Date
0.46	0.05	7/15
0.47	0.05	9/10
0.47	0.05	12/23

CV = 0.96 ± 0.04 mg/L

Result	Uncer.	Date
0.94	0.09	7/15
0.94	0.09	7/28
0.94	0.09	7/28
0.96	0.1	8/05

CV = 1.43 ± 0.06 mg/L

Result	Uncer.	Date
1.4	0.1	6/23
1.7	0.2	8/27
1.4	0.1	9/09
1.4	0.1	9/10

CV = 2 ± 0.2 mg/L

Result	Uncer.	Date
2.1	0.2	6/11
2	0.2	12/09

CV = 2.16 ± 0.09 mg/L

Result	Uncer.	Date
2.1	0.2	3/17
2.1	0.2	6/08

TABLE E-IV (cont)

****

EM-9 Trace Elements in Water
(cont)

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Cu (cont)

CV = 2.19 ± 0.09 mg/L

Result	Uncer.	Date
2.3	0.2	8/24
2.6	0.3	8/27

CV = 2.49 ± 0.11 mg/L

Result	Uncer.	Date
2.2	0.2	3/24
2.3	0.2	3/30
2.4	0.2	7/16
2.4	0.2	7/16
2.5	0.3	7/16
2.5	0.3	7/16
2.4	0.2	7/28
2.4	0.2	7/28
2.6	0.3	7/29
2.3	0.2	7/29
2.6	0.3	8/04
2.6	0.3	8/04
2.5	0.3	8/05
2.5	0.3	8/05
2.4	0.2	8/17
2.5	0.3	8/17
2.9	0.3	8/21
2.5	0.3	8/25
2.5	0.3	8/25
2.9	0.3	8/27
2.9	0.3	8/31
2.7	0.3	8/31
2.4	0.2	9/10
2.5	0.3	9/10
2.4	0.3	9/14
2.4	0.2	9/14

CV = 2.6 ± 0.1 mg/L

Result	Uncer.	Date
2.5	0.3	7/28
2.7	0.3	8/24
3	0.3	8/31
2.6	0.2	12/23

CV = 8 ± 0.8 mg/L

Result	Uncer.	Date
8.4	0.8	1/13
8.3	0.4	4/23

CV = 10 ± 1 mg/L

Result	Uncer.	Date
11	1	3/16
10	1	3/23
9.9	1	3/30
10	1	4/01
9.82	0.49	4/23
9.7	0.49	4/24
9.2	0.9	5/12
9.6	1	6/08
9.8	1	6/08
9.5	1	6/19
9.7	1	6/19
9.6	1	6/22
9.7	1	6/23

Cu (cont)

9.9	1	12/09
9.5	1	12/09
9.8	1	12/23
9.4	0.9	12/23

Cu 92GAU 02 ICPMS

CV = not spiked ug/L

Result	Uncer.	Date
< 200		8/31
< 6.3		9/21

CV = 3 ± 0.1 ug/L

Result	Uncer.	Date
12	1	4/27

CV = 5 ± 0.5 ug/L

Result	Uncer.	Date
17	2	3/22
6	1	12/24

CV = 10 ± 1 ug/L

Result	Uncer.	Date
17	2	3/03

CV = 20.9 ± 0.9 ug/L

Result	Uncer.	Date
23	2	10/16
23	3	11/20

CV = 40 ± 1.7 ug/L

Result	Uncer.	Date
32	7	2/27
39	5	9/02

CV = 70 ± 7 ug/L

Result	Uncer.	Date
65	7	1/08
65	7	1/08
65	7	2/12
70	7	4/02
74	7	4/02
66	7	6/04
72	7	8/31

CV = 82 ± 4 ug/L

Result	Uncer.	Date
71	7	12/03

CV = 100 ± 10 ug/L

Result	Uncer.	Date
93	9	1/08
96	10	1/08
91	9	1/08
93	9	2/12
82	8	2/28
110	10	3/22
110	10	4/03
120	10	4/03

Cu (cont)

100	10	4/03
100	10	4/03
88	9	4/24
100	10	4/24
110	10	4/27
120	10	4/28
110	10	4/28
95.3	9	5/05
96	10	5/06
93	9	5/06
110	10	6/02
100	10	6/05
100	10	6/05
110	10	7/02
100	10	7/27
100	10	7/27
100	10	7/27
110	10	7/27
100	10	8/31
100	10	8/31
94	9	10/06
106	10	10/06
110	10	10/19
113	10	10/19
130	10	10/19
110	10	10/19
130	10	10/19
110	10	10/19
99	10	12/15
97	10	12/15
100	10	12/15
100	10	12/15
100	10	12/15
98	10	12/15

CV = 120 ± 10 ug/L

Result	Uncer.	Date
130	10	7/27
130	10	7/27

CV = 130 ± 5.6 ug/L

Result	Uncer.	Date
140	10	3/16

CV = 150 ± 15 ug/L

Result	Uncer.	Date
150	10	1/07
150	10	3/02
152	8	3/03

CV = 200 ± 20 ug/L

Result	Uncer.	Date
160	20	3/09
180	20	3/09
180	20	3/09
160	20	3/09
200	20	5/06
210	20	5/06

CV = 214 ± 9 ug/L

Result	Uncer.	Date
270	30	10/19

Cu (cont)

CV = 224 ± 10 ug/L

Result	Uncer.	Date
220	20	6/02
250	30	10/20

CV = 0.3 ± 0.01 mg/L

Result	Uncer.	Date
0.28	0.03	12/11
0.27	0.03	12/11

CV = 1.43 ± 0.06 mg/L

Result	Uncer.	Date
1.6	0.2	4/24
2.1	0.2	4/24

CV = 3.2 ± 0.1 mg/L

Result	Uncer.	Date
3	0.3	4/27

Cu 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
99	20	3/27
100	20	8/05
100	20	8/11

Dy 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Er 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Eu 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

F 90GAU 01 FIA

CV = 0.4 ± 0.04 mg/L

Result	Uncer.	Date
0.41	0.1	8/21

F 91GAU 01 ISE

CV = 0.1 ± 0.01 mg/L

Result	Uncer.	Date
0.07	0.02	5/20

CV = 0.8 ± 0.04 mg/L

Result	Uncer.	Date
0.87	0.2	1/14
1.1	0.2	3/06
0.75	0.1	8/25
0.79	0.1	9/21
0.81	0.1	10/21

CV = 0.9 ± 0.04 mg/L

Result	Uncer.	Date
0.9	0.1	9/23
0.92	0.1	9/23
0.98	0.1	10/13
0.95	0.1	11/04
0.91	0.1	11/04

CV = 1.05 ± 0.05 mg/L

Result	Uncer.	Date
1.2	0.2	4/09
1.1	0.1	5/20
1	0.1	5/20

CV = 1.2 ± 0.06 mg/L

Result	Uncer.	Date
1.2	0.1	10/09
1.2	0.1	10/21

Fe 93GAU 02 FAA

CV = 60 ± 3 ug/L

Result	Uncer.	Date
62	20	10/26

CV = 500 ± 50 ug/L

Result	Uncer.	Date
490	50	1/06

CV = 600 ± 30 ug/L

Result	Uncer.	Date
610	60	8/21

CV = 750 ± 32 ug/L

Result	Uncer.	Date
750	80	7/01

Fe (cont)

CV = 800 ± 34 ug/L

Result	Uncer.	Date
850	90	5/05
810	80	6/25
790	80	6/25
790	80	6/25
800	80	6/25
790	80	7/01
790	80	7/01
790	80	7/01

CV = 950 ± 41 ug/L

Result	Uncer.	Date
720	70	2/06
720	70	2/06
750	80	3/12
790	80	3/12
730	70	3/12
780	80	3/12
780	80	3/12
770	80	3/28
790	80	3/28
770	80	4/24
770	80	4/24
760	80	5/05
780	80	5/05

CV = 960 ± 40 ug/L

Result	Uncer.	Date
960	100	9/03

CV = 1300 ± 56 ug/L

Result	Uncer.	Date
1300	100	2/05
1400	100	3/28
1300	100	3/28

CV = 1450 ± 62 ug/L

Result	Uncer.	Date
1410	100	4/09
1400	100	4/09
1400	100	4/09

CV = 4950 ± 213 ug/L

Result	Uncer.	Date
5100	500	4/09
5000	500	4/09
5000	500	4/23

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
1	0.1	7/16
1	0.1	8/03
1.1	0.1	8/21
1	0.1	8/21
1	0.1	8/21
1	0.1	8/31
1	0.1	8/31
1	0.1	9/03
1	0.1	10/26
1	0.1	12/09
1	0.1	12/09

TABLE E-IV (cont)

****

EM-9 Trace Elements in Water
(cont)

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Fe (cont)

CV = 1.25 ± 0.05 mg/L

Result	Uncer.	Date
1.3	0.1	8/31

CV = 1.6 ± 0.07 mg/L

Result	Uncer.	Date
1.6	0.2	10/26

CV = 2.02 ± 0.09 mg/L

Result	Uncer.	Date
2	0.2	4/23

Fe 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.05		3/11
< 10		7/16
< 0.007		7/28
< 0.02		8/24
< 0.02		8/31
0.01	0.01	10/26
< 0.02		11/25
< 0.02		11/25
0.01		12/23

CV = 20 ± 0.9 ug/L

Result	Uncer.	Date
80	5	4/23

CV = 160 ± 7 ug/L

Result	Uncer.	Date
130	20	10/26

CV = 480 ± 20 ug/L

Result	Uncer.	Date
430	40	3/24
500	50	6/11

CV = 500 ± 50 ug/L

Result	Uncer.	Date
550	60	5/20

CV = 2000 ± 86 ug/L

Result	Uncer.	Date
2200	200	5/20
2300	200	5/20
2100	200	10/26
2200	200	11/13

Fe (cont)

CV = 0.2 ± 0.009 mg/L

Result	Uncer.	Date
0.21	0.02	12/15

CV = 0.303 ± 0.01 mg/L

Result	Uncer.	Date
0.26	0.03	9/24
0.31	0.1	11/09
0.3	0.1	11/09

CV = 0.31 ± 0.01 mg/L

Result	Uncer.	Date
0.3	0.2	3/11
0.35	0.04	8/13
0.35	0.04	8/31
0.3	0.03	9/24

CV = 0.5 ± 0.02 mg/L

Result	Uncer.	Date
0.51	0.05	12/09

CV = 0.61 ± 0.03 mg/L

Result	Uncer.	Date
0.62	0.06	12/15

CV = 0.81 ± 0.03 mg/L

Result	Uncer.	Date
0.81	0.08	3/30
0.82	0.08	6/19
0.85	0.09	8/13
0.86	0.09	8/20
0.87	0.09	8/24

CV = 1.04 ± 0.04 mg/L

Result	Uncer.	Date
1	0.2	1/07

CV = 1.11 ± 0.05 mg/L

Result	Uncer.	Date
1	0.1	9/23
1.1	0.1	12/08

CV = 1.45 ± 0.06 mg/L

Result	Uncer.	Date
1.5	0.2	12/15

CV = 1.5 ± 0.2 mg/L

Result	Uncer.	Date
1.7	0.2	5/21

CV = 1.52 ± 0.06 mg/L

Result	Uncer.	Date
1.7	0.2	4/23
1.6	0.2	9/24
1.6	0.2	12/09

Fe (cont)

CV = 1.62 ± 0.07 mg/L

Result	Uncer.	Date
1.8	0.2	7/15
1.7	0.2	9/10
2	1	12/23

CV = 1.64 ± 0.07 mg/L

Result	Uncer.	Date
1.6	0.2	3/23

CV = 1.82 ± 0.08 mg/L

Result	Uncer.	Date
2.1	0.2	5/20
2	0.2	7/15
2	0.2	7/28
2	0.2	7/28
2	0.2	8/05

CV = 2 ± 0.2 mg/L

Result	Uncer.	Date
2.4	0.2	6/11

CV = 2.02 ± 0.09 mg/L

Result	Uncer.	Date
1.9	0.2	6/23
2.1	0.2	8/27
2.1	0.2	9/09
2.2	0.2	9/10
1.9	0.2	12/02

CV = 2.4 ± 0.1 mg/L

Result	Uncer.	Date
2.4	0.2	3/11
2.5	0.3	12/10

CV = 2.42 ± 0.1 mg/L

Result	Uncer.	Date
2.5	0.3	8/24
2.5	0.3	8/27
2.5	0.3	9/23

CV = 2.63 ± 0.1 mg/L

Result	Uncer.	Date
2.7	0.3	12/08
2.8	0.3	12/10

CV = 2.8 ± 0.1 mg/L

Result	Uncer.	Date
2.6	0.3	6/22
3	0.3	7/16
2.9	0.3	8/04
2.9	0.3	9/08
2.9	0.3	9/10

CV = 3 ± 0.3 mg/L

Result	Uncer.	Date
3.4	0.3	5/20
3	3	11/25

Fe (cont)

CV = 6.1 ± 0.3 mg/L

Result	Uncer.	Date
5.54	0.28	4/23

CV = 10 ± 1 mg/L

Result	Uncer.	Date
9.3	1.9	1/07
11	1	3/11
9.2	0.9	3/16
9.7	1	3/23
9.9	1	3/23
10	1	3/24
10	1	3/30
10	1	4/01
9.44	0.47	4/23
9.19	0.46	4/24
11	1	5/20
11	1	5/20
11	1	5/20
11	1	5/20
11	1	5/21
11	1	6/11
9.6	1	6/19
9.8	1	6/19
9.4	0.9	6/22
9.8	1	6/23
8.6	0.9	9/23
11	1	9/23
11	1	9/24
11	1	9/24
11	1	9/24

CV = 101 ± 4.3 mg/L

Result	Uncer.	Date
98	10	3/24
98	10	3/30
110	10	7/16
110	10	7/16
110	10	7/16
110	10	7/16
110	10	7/28
106	10	7/28
110	10	7/29
93	9	7/29
100	10	8/04
100	10	8/04
110	10	8/05
110	10	8/05
100	10	8/17
100	10	8/17
100	10	8/21
100	10	8/25
100	10	8/25
100	10	8/27
100	10	8/31
98	10	8/31
100	10	9/10
100	10	9/10
110	10	9/14
100	10	9/14

CV = 253 ± 11 mg/L

Result	Uncer.	Date
270	30	10/26
260	30	10/26
260	30	10/26
250	30	11/09
250	30	11/09
230	20	11/09
260	30	11/13

Fe (cont)

280	30	11/13
250	30	11/25
270	30	11/25
260	30	12/08
260	30	12/08
270	30	12/09
260	30	12/09
270	30	12/09
260	30	12/09
260	30	12/09
270	30	12/09
270	30	12/10
270	30	12/10
260	30	12/15
270	30	12/15
250	30	12/15
250	30	12/15
270	30	12/23
250	30	12/23

Fe 92GAU 02 ICPMS

CV = 800 ± 34 ug/L

Result	Uncer.	Date
820	80	10/06

CV = 4950 ± 213 ug/L

Result	Uncer.	Date
4900	500	10/06

Ga 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Gd 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Ge 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Hardness 91GAU 04 CALC

CV = 56.4 ± 2.12 mg/L

Result	Uncer.	Date
80	8	5/27
61	6	6/02
61	6	9/18
61	6	9/18
62	6	12/17

CV = 63.4 ± 2.38 mg/L

Result	Uncer.	Date
58	6	5/20
67	7	6/23
69	7	9/18
69	7	9/18
68	7	12/17
68	7	12/17

CV = 74 ± 2.78 mg/L

Result	Uncer.	Date
68	7	4/15

CV = 84.6 ± 3.18 mg/L

Result	Uncer.	Date
100	10	5/27
97	10	10/15
93	9	12/17
93	9	12/17

Hf 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Hg 92GAU 02 CVAA

CV = not spiked ug/L

Result	Uncer.	Date
0.1	0.1	1/30
0.22	0.1	1/30
< 0.1		2/11
< 0.1		3/09
< 0.1		3/18
< 0.1		3/27
< 0.1		6/08
< 0.1		9/16
< 0.1		9/18
< 0.1		9/18
< 0.1		10/06
< 0.1		10/27
< 0.1		11/03
< 0.1		11/20
< 0.1		12/07
< 0.1		12/24

TABLE E-IV (cont)

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EM-9 Trace Elements in Water (cont)

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Hg (cont)

CV = 1 ± 0.06 ug/L

Result	Uncer.	Date
0.99	0.1	1/30
0.9	0.1	2/13
4.1	0.4	3/18
4.2	0.4	4/21
0.5	0.1	4/23
0.9	0.1	5/01
1	0.1	6/10
1.1	0.1	6/11
0.9	0.1	8/11
1	0.1	8/14
0.79	0.1	8/21
0.85	0.1	9/11
0.8	0.1	9/11
0.8	0.08	10/20
1	0.2	11/18
1	0.1	12/04
0.8	0.08	12/04

CV = 1.5 ± 0.09 ug/L

Result	Uncer.	Date
1.4	0.2	1/30
1.1	0.1	2/11
1.4	0.1	3/26
1.5	0.2	3/26
1.5	0.2	4/24
1.5	0.2	6/08
1.2	0.1	8/07
1.5	0.2	8/14
1.5	0.2	9/11
1.3	0.2	9/18
1.4	0.1	11/05
1.3	0.1	11/20
1.6	0.2	12/08
1.5	0.2	12/24
1.5	0.2	12/24

CV = 2 ± 0.12 ug/L

Result	Uncer.	Date
2	0.2	1/13
2	0.2	1/23
1.7	0.2	2/06
1.3	0.1	4/21
1.4	0.2	6/08
2	0.2	6/08
2.2	0.2	6/10
1.8	0.5	8/12
2	0.2	8/21
2	0.2	8/21
1.8	0.2	10/05
1.7	0.2	10/06
1.9	0.2	11/03
1.8	0.2	11/03
2.4	0.2	11/05
2	0.02	11/20
1.8	0.2	12/11
1.7	0.2	12/14
2.3	0.2	12/24

Hg (cont)

CV = 2.5 ± 0.15 ug/L

Result	Uncer.	Date
2.4	0.2	1/13
1.3	0.2	1/30
2.4	0.2	2/11
2.3	0.2	2/11
2.1	0.2	2/12
2.3	0.2	4/23
2.3	0.2	4/23
2.4	0.2	5/01
2.5	0.3	6/08
2.6	0.3	10/06
2.3	0.2	10/06
2.4	0.2	10/06
2.3	0.2	10/23
2.1	0.2	10/23
2.35	0.2	12/14
2.2	0.2	12/24

CV = 3 ± 0.18 ug/L

Result	Uncer.	Date
3	0.3	1/23
2.5	0.3	2/06
3	0.3	2/12
3.1	0.3	6/08
2.5	0.2	6/10
2.8	0.3	6/10
2.9	0.3	6/22
2.2	0.2	7/01
2.8	0.3	8/13
2.7	0.3	9/18
2.8	0.3	10/27
3	0.3	11/02
2.9	0.3	11/03
3.1	0.3	11/06
2.7	0.3	11/20
2.8	0.3	11/23
2.4	0.2	12/07
3.1	0.3	12/11
2.5	0.3	12/24

CV = 3.5 ± 0.21 ug/L

Result	Uncer.	Date
2.9	0.3	1/06
2.8	0.3	1/06
3.2	0.3	2/06
3.3	0.3	2/11
3.5	0.3	2/11
3.6	0.4	2/12
3.2	0.3	3/27
3.6	0.4	6/11
3.7	0.4	8/06
3.6	0.4	8/13
3.5	0.4	8/14
3.3	0.3	9/18
3.6	0.4	9/18
3	0.3	10/05
2.7	0.3	10/27
4.1	0.4	11/05

CV = 4 ± 0.2 ug/L

Result	Uncer.	Date
3.8	0.4	1/06
3.8	0.4	1/06
4.4	0.4	1/13
4.3	0.2	1/13
3.9	0.4	1/23
3.9	0.4	1/23
3.9	0.4	1/23
3.9	0.4	1/23

Hg (cont)

3.9	0.4	1/30
4	0.4	1/30
3.8	0.4	1/30
3.9	0.4	1/30
3.8	0.4	1/30
4	0.4	1/30
4.1	0.4	1/30
4.5	0.5	2/06
4.5	0.5	2/06
4.4	0.4	2/06
4.5	0.5	2/06
4.6	0.5	2/06
3.8	0.4	2/06
4.1	0.4	2/11
4.1	0.4	2/11
4.1	0.4	2/11
4.2	0.4	2/11
4.1	0.4	2/11
4.1	0.4	2/11
4.1	0.4	2/11
4.2	0.4	2/11
4.2	0.4	2/11
4	0.4	2/12
4	0.4	2/12
4	0.4	2/12
4	0.4	2/12
4	0.4	2/13
3.9	0.4	2/13
3.9	0.4	2/24
3.9	0.1	3/06
3.4	0.3	3/18
3.9	0.4	3/18
4	0.4	3/18
4	0.4	3/18
4	0.4	3/26
4	0.4	3/26
3.9	0.4	3/27
3.8	0.4	3/27
3.9	0.4	3/27
3.9	0.4	3/27
2.1	0.2	3/27
3.9	0.4	3/27
3.7	0.4	3/27
4.2	0.4	4/21
4.1	0.4	4/21
4.2	0.4	4/21
4.2	0.4	4/21
3.9	0.4	4/21
3.9	0.4	4/23
3.9	0.4	4/23
4	0.4	4/23
4.1	0.4	4/23
3.9	0.4	4/23
3.7	0.4	4/23
3.7	0.4	4/23
4	0.4	5/01
4	0.4	5/01
4.3	0.4	6/08
4.1	0.4	6/08
4.2	0.4	6/08
4.2	0.4	6/08
4	0.4	6/08
3.8	0.4	6/08
4.1	0.4	6/08
4.2	0.4	6/08
4	0.4	6/10
4.3	0.4	6/10
4.2	0.4	6/10
3.9	0.4	6/10
4.2	0.4	6/11
4.3	0.4	6/11
4.3	0.4	6/11
4.6	0.5	6/22
4.6	0.5	6/25
3.9	0.4	7/01
3.9	0.4	7/01
4.1	0.5	7/15
3.4	0.5	7/15

Hg (cont)

3.5	0.5	7/15
4.2	0.4	7/29
4.2	0.4	7/29
4.2	0.4	7/29
4.3	0.4	7/29
4.2	0.4	7/29
4.1	0.4	8/06
4.2	0.4	8/06
4.2	0.4	8/07
4.2	0.4	8/11
3.9	0.4	8/12
4.2	0.4	8/13
4.3	0.4	8/14
3.9	0.4	8/21
4	0.4	8/21
4.2	0.4	8/21
4	0.4	8/21
4.1	0.4	8/21
4.1	0.4	9/11
3.8	0.4	9/11
4.1	0.4	9/11
4	0.4	9/11
4.1	0.4	9/11
4	0.4	9/11
3.9	0.4	9/18
3.9	0.4	9/18
3.9	0.4	9/18
3.9	0.4	9/18
3.9	0.4	10/05
4.1	0.4	10/06
3.7	0.4	11/20
4.1	0.4	12/04
3.8	0.4	12/07
3.8	0.4	12/07
4.42	0.4	12/08
3.7	0.4	12/14
4	0.4	12/14
3.8	0.4	12/24
3.34	0.3	12/24
3.5	0.4	12/24
4	0.4	12/24
4.1	0.4	12/24
4	0.4	12/24
4	0.4	12/24
3.5	0.4	12/24
3.3	0.3	12/24
4	0.4	12/24
3.9	0.4	12/24
3.9	0.4	12/24
3.6	0.4	12/24
4.2	0.4	12/24
3.9	0.4	12/24
3.8	0.4	12/24
3.9	0.4	12/24

CV = 6 ± 0.36 ug/L

Result	Uncer.	Date
5.9	0.6	11/18

CV = 7 ± 0.41 ug/L

Result	Uncer.	Date
6.8	0.4	2/24
6.9	0.4	2/24
5.8	0.6	3/26
5.7	0.6	3/26
7	0.7	3/27
7	0.7	3/27
6.7	0.7	3/27
7	0.7	3/27
7	0.7	3/27
7.1	0.7	4/21
6.9	0.7	4/21
7.1	0.7	4/21
7.1	0.7	4/21

Hg (cont)

6.5	0.6	4/23
6.5	0.6	4/23
6.7	0.6	4/23
6.8	0.7	5/01
6.9	0.7	5/01
7.1	0.7	6/08
7.3	0.7	6/08
6.5	0.7	6/08
7.4	0.7	6/10
7.1	0.7	7/15
7.6	0.8	7/29
7.6	0.8	7/29
7.5	0.8	8/11
6.9	0.7	8/12
6.8	0.7	8/13
7.6	0.7	8/14
7.2	0.7	8/14
7	0.7	9/11
7.1	0.7	9/11
6.8	0.7	9/11
7	0.7	9/11
6.8	0.7	9/18
6.2	0.6	9/18
6.2	0.6	9/18
7.3	0.7	12/04
6.9	0.7	12/04
6.9	0.7	12/07
7.3	0.7	12/08
6.32	0.6	12/14
6.3	0.6	12/24
6.6	0.7	12/24
7	0.7	12/24
7.6	0.8	12/24
6.9	0.7	12/24
6.2	0.6	12/24
7	0.7	12/24
6.7	0.7	12/24
6.7	0.7	12/24
6.8	0.7	12/24
6.8	0.7	12/24
6.3	0.6	12/24
7.2	0.7	12/24
6.7	0.7	12/24

Ho 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

In 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Ir 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

K 91GAU 02 FAA

CV = 9 ± 0.4 mg/L

Result	Uncer.	Date
8.5	2	1/08
8.7	2	1/08
8.6	0.9	3/10
8.8	2	4/06
8.8	2	4/06
9	2	4/23
7.8	0.8	4/23
8.9	0.9	5/14
9	0.9	5/14
8.9	0.9	7/06
8.9	0.9	7/06

K 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.4		3/11
0.8	0.3	7/15
< 600		7/16
< 1		9/10

CV = 4 ± 0.26 mg/L

Result	Uncer.	Date
4.6	0.5	5/20
4.4	0.5	12/10
4.7	0.5	12/15

CV = 4.5 ± 0.3 mg/L

Result	Uncer.	Date
4.7	0.5	6/17

CV = 6 ± 0.4 mg/L

Result	Uncer.	Date
5.8	0.6	5/20
6.6	0.7	5/21
6.3	0.1	10/09
6.8	0.7	12/15

CV = 8.5 ± 0.4 mg/L

Result	Uncer.	Date
8.5	0.9	12/08

CV = 9 ± 0.4 mg/L

Result	Uncer.	Date
8.4	0.8	6/23
9.3	0.9	8/27
10	1	9/09
9.9	1	9/10

CV = 12 ± 0.52 mg/L

Result	Uncer.	Date
11	1	3/23
11	1	5/20
13	1	9/24

TABLE E-IV (cont)

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EM-9 Trace Elements in Water
(cont)

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K (cont)

CV = 16.1 ± 0.7 mg/L

Result	Uncer.	Date
16	2	12/09

CV = 16.7 ± 0.7 mg/L

Result	Uncer.	Date
17	2	9/24
16.8	0.5	12/09

CV = 18.1 ± 0.8 mg/L

Result	Uncer.	Date
19	2	7/15
17	2	7/28
17	2	7/28
19	2	8/05

CV = 26 ± 1 mg/L

Result	Uncer.	Date
19	2	3/30
27	3	6/19
27	3	8/13
26	3	8/20
27	3	8/24

CV = 32 ± 1.4 mg/L

Result	Uncer.	Date
25	5	3/11

CV = 34 ± 1.5 mg/L

Result	Uncer.	Date
35	4	8/24
35	4	8/27
35	4	9/23

CV = 40 ± 1.72 mg/L

Result	Uncer.	Date
32	3	3/24
39	4	6/11
39	4	7/28
42	4	8/24
42	4	8/31

CV = 50.2 ± 2.16 mg/L

Result	Uncer.	Date
39	4	3/24
48	10	3/30
46	5	7/16
54	5	7/16
54	5	7/16
57	6	7/16
46	5	7/28
50	5	7/28
44	4	7/29
50	5	7/29
50	5	8/04

K (cont)

50	5	8/04
52	5	8/05
50	5	8/05
52	5	8/17
54	5	8/17
50	5	8/21
53	5	8/25
51	5	8/25
52	5	8/27
49	5	8/31
52	5	8/31
54	5	9/10
55	6	9/10
55	6	9/14
54	5	9/14

CV = 54 ± 2.3 mg/L

Result	Uncer.	Date
53	5	12/10

CV = 60 ± 2.6 mg/L

Result	Uncer.	Date
61	6	6/22
68	7	7/16
61	6	8/04
63	6	9/08
66	7	9/10

CV = 80 ± 3.4 mg/L

Result	Uncer.	Date
75	15	1/07
63	13	3/11
72	14	5/20
84	17	5/21
80	8	6/17
80	8	6/17
82	8	8/13
83	8	8/31
81	8	9/23
85	9	9/24
81	8	12/08

CV = 100 ± 10 mg/L

Result	Uncer.	Date
100	20	1/07
87	9	3/11
83	8	3/16
90	9	3/23
67	7	3/23
85	17	3/24
100	20	3/30
97	10	4/01
70	14	5/20
89	18	5/20
84	17	5/20
87	17	5/21
100	10	6/11
88	9	6/19
88	9	6/19
89	9	6/22
93.3	0.9	6/23
110	10	9/23
110	10	9/23
100	10	9/24
110	10	9/24
110	10	9/24

K (cont)

CV = 131 ± 6 mg/L

Result	Uncer.	Date
130	10	12/08
130	10	12/08
150	20	12/09
130	10	12/09
130	10	12/09
140	10	12/09
130	10	12/09
140	10	12/09
130	10	12/10
130	10	12/10
130	10	12/15
180	20	12/15
140	10	12/15
170	20	12/15

La 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Li 92GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.001		6/23
< 0.001		7/16
0.01	0.003	8/13
0.003	0.003	9/08

CV = 200 ± 8 ug/L

Result	Uncer.	Date
200	20	6/23
190	20	7/16
210	20	7/16
190	20	7/16
200	20	7/16
170	20	7/28
190	20	7/28
190	20	7/29
170	20	7/29
247	20	8/05
250	30	8/05
230	20	8/17
250	30	8/17
240	20	8/25
250	30	8/25
180	20	8/27
180	20	8/31
170	20	8/31
190	20	9/10
170	20	9/14
180	20	9/14

CV = 300 ± 10 ug/L

Result	Uncer.	Date
270	30	12/09

Li (cont)

CV = 0.2 ± 0.01 mg/L

Result	Uncer.	Date
0.223	0.02	7/15
0.19	0.02	7/28
0.18	0.02	9/10

CV = 0.22 ± 0.01 mg/L

Result	Uncer.	Date
0.21	0.02	6/19
0.28	0.03	8/06
0.2	0.02	8/31

CV = 1.6 ± 0.07 mg/L

Result	Uncer.	Date
1.7	0.2	6/22
1.7	0.2	8/13
2	0.2	8/24
1.5	0.2	8/27
1.5	0.2	9/10

CV = 3 ± 0.13 mg/L

Result	Uncer.	Date
3.1	0.3	7/15
3	0.3	7/16
2.7	0.3	7/28
3.7	0.4	8/24
2.7	0.3	9/10

CV = 4.5 ± 0.19 mg/L

Result	Uncer.	Date
5.5	0.6	8/24
4.2	0.4	8/27
4.1	0.4	8/31
4.2	0.4	9/08

CV = 8 ± 0.8 mg/L

Result	Uncer.	Date
7.8	0.8	9/24

CV = 10 ± 0.4 mg/L

Result	Uncer.	Date
9.1	0.9	12/09
9	0.9	12/09

Li 92GAU 02 ICPMS

CV = not spiked ug/L

Result	Uncer.	Date
< 200		8/31
< 1		12/18

CV = 50 ± 2 ug/L

Result	Uncer.	Date
55	6	11/25
41	5	11/25

Li (cont)

CV = 135 ± 6 ug/L

Result	Uncer.	Date
180	30	12/03

CV = 0.24 ± 0.01 mg/L

Result	Uncer.	Date
0.11	0.01	12/11
0.15	0.01	12/11
0.15	0.03	12/17

Li 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 10		3/27
< 1		8/05
< 100		8/11

Lu 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Mg 92GAU 02 FAA

CV = not spiked mg/L

Result	Uncer.	Date
< 0.25		4/23

CV = 5 ± 0.2 mg/L

Result	Uncer.	Date
5	0.5	1/08
4.6	0.5	1/08
5	0.5	3/10
5.1	0.5	4/06
5.1	0.5	4/06
5	0.5	4/23
4.9	0.5	5/13
5.1	0.5	5/27
5	0.5	7/02
5	0.5	7/02

Mg 92GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.02		6/23
< 10		7/16
< 0.06		8/27
< 0.06		9/09
< 0.06		9/10

CV = 253 ± 11 ug/L

Result	Uncer.	Date
210	40	4/23

Mg (cont)

CV = 1.99 ± 0.08 mg/L

Result	Uncer.	Date
1.9	0.2	12/08
1.9	0.2	12/09

CV = 3.12 ± 0.13 mg/L

Result	Uncer.	Date
3.3	0.3	3/23

CV = 3.8 ± 0.2 mg/L

Result	Uncer.	Date
3.9	0.4	6/22
3.8	0.4	7/16
3.8	0.4	8/04
4	0.4	9/08
4	0.4	9/10

CV = 4 ± 0.22 mg/L

Result	Uncer.	Date
5.7	0.6	5/20
4.4	0.4	6/02
4.1	0.4	9/24
4.3	0.4	12/15

CV = 4.4 ± 0.2 mg/L

Result	Uncer.	Date
4.4	0.4	3/11
4.3	0.4	8/13
4.1	0.4	8/31
4.2	0.4	9/24

CV = 4.5 ± 0.24 mg/L

Result	Uncer.	Date
4.8	0.5	6/17

CV = 5 ± 0.2 mg/L

Result	Uncer.	Date
5.4	0.5	5/20

CV = 6 ± 0.32 mg/L

Result	Uncer.	Date
6.9	0.7	5/20
7	0.7	5/21
6.62	0.02	10/09
6.4	0.6	12/15

CV = 7.6 ± 0.3 mg/L

Result	Uncer.	Date
7.5	0.8	12/10

CV = 9.2 ± 0.4 mg/L

Result	Uncer.	Date
9.2	0.9	3/11

TABLE E-IV (cont)

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EM-9 Trace Elements in Water
(cont)

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Mg (cont)

CV = 9.6 ± 0.4 mg/L

Result	Uncer.	Date
9.3	0.9	9/23
9.4	0.9	12/08

CV = 9.9 ± 0.4 mg/L

Result	Uncer.	Date
9.4	0.5	4/23
9.3	0.9	7/28
10	1	8/24
9.5	1	8/31

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	2	1/07
10	1	3/11
10	1	3/16
9.5	1	3/23
10	1	3/23
10	1	3/24
10	1	3/30
11	1	4/01
11	1	5/20
11	1	5/20
11	1	5/20
11	1	5/21
10	1	6/11
10	1	6/19
10	1	6/19
9.9	1	6/22
10	1	6/23
9.9	1	9/23
9.8	1	9/23
9.6	1	9/24
9.6	1	9/24
9.6	1	9/24

CV = 10.11 ± 0.43 mg/L

Result	Uncer.	Date
10	1	3/24
10	1	3/30
10	1	7/16
10	1	7/16
10	1	7/16
10	1	7/16
9.8	1	7/28
9.7	1	7/28
10	1	7/29
9	0.9	7/29
10	1	8/04
10	1	8/04
10	1	8/05
10	1	8/05
9.7	1	8/17
10	1	8/17
9.8	1	8/21
10	1	8/25
10	1	8/25
9.7	1	8/27
9.3	0.9	8/31
9.8	1	8/31

Mg (cont)

11	1	9/10
11	1	9/10
11	1	9/14
11	1	9/14

CV = 16 ± 0.69 mg/L

Result	Uncer.	Date
16	2	3/11
17	2	12/10

CV = 16.3 ± 0.7 mg/L

Result	Uncer.	Date
17	2	3/30
17	2	6/19
16	2	8/13
16	2	8/20
17	2	8/24

CV = 20 ± 0.8 mg/L

Result	Uncer.	Date
20	2	7/15
21	2	9/10

CV = 20.4 ± 0.9 mg/L

Result	Uncer.	Date
21	2	3/24
21	2	6/11

CV = 24 ± 2.4 mg/L

Result	Uncer.	Date
25	3	5/20
27	3	5/21
26	3	6/19
25	3	6/22
24	2	7/15
24	2	7/16
23	2	7/16
24	2	7/16
24	2	7/16
22	2	7/28
23	2	7/28
23	2	7/28
23	2	7/28
25	3	7/29
23	2	7/29
25	3	8/04
25	3	8/04
25	3	8/05
24	2	8/05
25	3	8/05
23	2	8/17
24	2	8/17
23	2	8/25
24	2	8/25
22	2	8/27
25	3	9/10
25	3	9/10
24	2	9/14
25	3	9/14

CV = 26 ± 1.1 mg/L

Result	Uncer.	Date
27	5	1/07

Mg (cont)

CV = 28 ± 1 mg/L

Result	Uncer.	Date
28	3	8/24
27	3	8/27
28	3	9/23
28	3	9/24
28	3	12/09

CV = 40 ± 4 mg/L

Result	Uncer.	Date
42	4	5/20
45	5	5/21
40	4	6/17
40	4	6/17

CV = 80 ± 3 mg/L

Result	Uncer.	Date
81.9	4.1	4/23

CV = 129 ± 6 mg/L

Result	Uncer.	Date
130	10	12/08
130	10	12/08
130	10	12/09
130	10	12/09
120	10	12/09
130	10	12/09
130	10	12/09
130	10	12/09
130	10	12/10
130	10	12/10
130	10	12/15
120	10	12/15
130	10	12/15
120	10	12/15

Mg 92GAU 02 ICPMS

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	10	10/29
100	10	10/29
81	8	12/15
120	10	12/15
60	6	12/15
75	8	12/15
120	10	12/15
120	10	12/15
74	7	12/15
120	10	12/15

CV = 1.99 ± 0.08 mg/L

Result	Uncer.	Date
2.1	0.2	12/11
2	0.2	12/11

Mn 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
0.003	0.001	3/24
< 0.01		6/11
< 2		7/16

CV = 7 ± 0.3 ug/L

Result	Uncer.	Date
5	2	4/23

CV = 40 ± 1.7 ug/L

Result	Uncer.	Date
41	2	11/19

CV = 80 ± 3 ug/L

Result	Uncer.	Date
80	8	3/11

CV = 100 ± 4 ug/L

Result	Uncer.	Date
106	2	10/21

CV = 200 ± 9 ug/L

Result	Uncer.	Date
184	9	4/23
205	4	11/19
200	20	12/09

CV = 340 ± 10 ug/L

Result	Uncer.	Date
350	70	1/07

CV = 560 ± 20 ug/L

Result	Uncer.	Date
550	60	3/11

CV = 800 ± 34 ug/L

Result	Uncer.	Date
830	4	10/21

CV = 900 ± 40 ug/L

Result	Uncer.	Date
930	90	3/23

CV = 0.06 ± 0.002 mg/L

Result	Uncer.	Date
0.065	0.007	6/23
0.06	0.006	8/27
< 0.06		9/09
0.06	0.006	9/10

Mn (cont)

CV = 0.1 ± 0.004 mg/L

Result	Uncer.	Date
0.097	0.01	7/15
0.095	0.009	7/28
0.095	0.009	7/28
0.1	0.01	8/05

CV = 0.16 ± 0.007 mg/L

Result	Uncer.	Date
0.16	0.02	8/24
0.16	0.02	8/27

CV = 0.28 ± 0.01 mg/L

Result	Uncer.	Date
0.27	0.03	7/15
0.28	0.03	9/10

CV = 0.48 ± 0.02 mg/L

Result	Uncer.	Date
0.51	0.05	3/30
0.5	0.05	6/19
0.47	0.05	8/13
0.46	0.05	8/20
0.49	0.05	8/24

CV = 0.6 ± 0.02 mg/L

Result	Uncer.	Date
0.56	0.06	7/28
0.61	0.06	8/24
0.59	0.06	8/31

CV = 0.8 ± 0.03 mg/L

Result	Uncer.	Date
0.79	0.08	3/11
0.77	0.08	8/13
0.79	0.08	8/31

CV = 0.96 ± 0.04 mg/L

Result	Uncer.	Date
0.87	0.09	6/22
1	0.1	7/16
0.93	0.09	8/04
0.94	0.09	9/08
0.94	0.09	9/10

CV = 2 ± 0.2 mg/L

Result	Uncer.	Date
2.5	0.3	6/11

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
2.82	0.14	4/23

CV = 4.8 ± 0.5 mg/L

Result	Uncer.	Date
5.2	0.5	6/19
4.7	0.5	6/22
5.4	0.5	7/16

Mn (cont)

4.8	0.5	7/16
4.8	0.5	7/16
5.3	0.5	7/16
4.82	0.45	7/28
4.8	0.5	7/28
5.2	0.5	7/29
4.7	0.5	7/29
5	0.5	8/04
5.1	0.5	8/04
5.1	0.5	8/05
5.2	0.5	8/05
4.8	0.5	8/17
4.9	0.5	8/17
5	0.5	8/25
5	0.5	8/25
4.8	0.5	8/27
4.9	0.5	9/10
4.9	0.5	9/10
4.8	0.5	9/14
4.8	0.5	9/14
5.01	0.03	10/21

CV = 5 ± 0.22 mg/L

Result	Uncer.	Date
5	0.5	3/24
5.1	0.5	3/30
5.3	0.5	7/16
4.8	0.5	7/16
5.29	0.5	7/16
5.1	0.5	7/16
4.8	0.5	7/28
4.7	0.5	7/28
4.4	0.4	7/29
4.9	0.5	7/29
4.8	0.5	8/04
4.9	0.5	8/04
4.9	0.5	8/05
4.9	0.5	8/05
4.9	0.5	8/17
5	0.5	8/17
4.8	0.5	8/21
5.1	5.1	8/25
5.1	0.5	8/25
4.9	0.5	8/27
4.9	0.5	8/31
4.7	0.5	8/31
4.9	0.5	9/10
5	0.5	9/10
4.8	0.5	9/14
5	0.5	9/14

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	2	1/07
11	1	3/11
9.7	1	3/16
11	1	3/23
11	1	3/23
10	1	3/24
11	1	3/30
10	1	4/01
9.53	0.48	4/23
9.52	0.48	4/24
11	1	6/11
10	1	6/19
10	1	6/19
9.4	0.9	6/22
10	1	6/23
9.83	0.01	10/21
10	1	12/09
9.6	1	12/09

TABLE E-IV (cont)

****

EM-9 Trace Elements in Water (cont)

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Mn 91GAU 02 ICPMS

CV = not spiked ug/L

Result	Uncer.	Date
< 1		1/10
< 5		10/16
< 1		11/20

CV = 6 ± 0.6 ug/L

Result	Uncer.	Date
6.4	1	1/07
5.2	0.5	1/21

CV = 10 ± 0.4 ug/L

Result	Uncer.	Date
8.3	2	2/27
11	2	3/20
< 6.3		9/21

CV = 11 ± 0.5 ug/L

Result	Uncer.	Date
13.4	1	6/02
11	1	10/21

CV = 11.5 ± 0.5 ug/L

Result	Uncer.	Date
8.6	1	12/03

CV = 20 ± 0.9 ug/L

Result	Uncer.	Date
15	5	9/02

CV = 46 ± 2 ug/L

Result	Uncer.	Date
44	4	12/18

CV = 48 ± 2.1 ug/L

Result	Uncer.	Date
49	5	3/22

CV = 50 ± 5 ug/L

Result	Uncer.	Date
58	9	3/20

CV = 65 ± 3 ug/L

Result	Uncer.	Date
< 200		8/31

Mn (cont)

CV = 100 ± 10 ug/L

Result	Uncer.	Date
84	8	2/28
140	10	4/24
87	9	4/24
110	10	6/02
97	10	10/06
89	9	10/06
88	9	12/15
91	9	12/15
94	9	12/15
90	9	12/15

CV = 0.06 ± 0.002 mg/L

Result	Uncer.	Date
0.05	0.005	4/24
0.06	0.006	4/24

CV = 1.8 ± 0.08 mg/L

Result	Uncer.	Date
1.8	0.2	12/11
1.6	0.2	12/11
1.8	0.4	12/17

Mn 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	20	3/27
100	20	8/05
100	20	8/11

Mo 92GAU 02 ICPES

CV = 8 ± 0.3 ug/L

Result	Uncer.	Date
7	2	10/21

CV = 24 ± 1 ug/L

Result	Uncer.	Date
23	3	10/21

CV = 30 ± 1 ug/L

Result	Uncer.	Date
59	3	4/23

CV = 200 ± 9 ug/L

Result	Uncer.	Date
205	4	11/19

CV = 300 ± 13 ug/L

Result	Uncer.	Date
330	30	6/19
320	30	8/13
280	30	8/20
280	30	8/27

Mo (cont)

CV = 500 ± 21 ug/L

Result	Uncer.	Date
510	10	11/19

CV = 599 ± 26 ug/L

Result	Uncer.	Date
640	60	6/23
680	70	7/16
600	60	7/28
640	60	8/13
570	60	8/27

CV = 999 ± 43 ug/L

Result	Uncer.	Date
1000	100	6/22
1100	100	7/15
1100	100	7/16
1000	100	7/28
1000	100	8/05

CV = 2 ± 0.09 mg/L

Result	Uncer.	Date
2.07	0.1	4/23
2.1	0.2	7/15
2	0.2	7/28
2.1	0.2	9/08
2.1	0.2	9/08

CV = 2.02 ± 0.09 mg/L

Result	Uncer.	Date
2.1	0.2	12/09

CV = 3 ± 0.13 mg/L

Result	Uncer.	Date
3.3	0.3	8/24
3.3	0.3	8/24
2.8	0.3	8/31
2.8	0.3	8/31

CV = 4 ± 0.17 mg/L

Result	Uncer.	Date
4.4	0.4	8/24
4.3	0.4	9/10
4.3	0.4	9/10
4.3	0.4	9/10

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	1	6/19
10	1	6/19
10	1	6/22
10	1	6/23
9.67	0.08	10/21
10	1	12/09
9.8	1	12/09

CV = 10.1 ± 0.4 mg/L

Result	Uncer.	Date
9.95	0.49	4/23

Mo (cont)

CV = 32 ± 3.2 mg/L

Result	Uncer.	Date
35	4	6/19
33	3	6/22
36	4	7/16
33	3	7/16
37	4	7/16
34	3	7/16
33	3	7/28
32	3	7/28
36	4	7/29
32	3	7/29
35	4	8/05
36	4	8/05
34	3	8/17
35	4	8/17
30	3	8/21
30	3	8/21
35	4	8/25
34	3	8/25
30	3	8/27
28	3	8/31
30	3	8/31
34	3	9/10
34	3	9/10
33	3	9/14
34	3	9/14
33.1	0.1	10/21

Mo 91GAU 02 ICPMS

CV = not spiked ug/L

Result	Uncer.	Date
< 1		1/28
< 1		1/28
< 0.2		12/03

CV = 5 ± 0.5 ug/L

Result	Uncer.	Date
5	1	3/22

CV = 10 ± 0.4 ug/L

Result	Uncer.	Date
10	1	9/02

CV = 15 ± 0.6 ug/L

Result	Uncer.	Date
< 200		8/31

CV = 16 ± 0.7 ug/L

Result	Uncer.	Date
15	2	1/28

CV = 28.5 ± 1.2 ug/L

Result	Uncer.	Date
28	3	12/18

CV = 30 ± 3 ug/L

Result	Uncer.	Date
32	5	1/06
36	4	3/22

Mo (cont)

CV = 38 ± 1.6 ug/L

Result	Uncer.	Date
40	4	10/16
41	4	11/20

CV = 40 ± 4 ug/L

Result	Uncer.	Date
46	7	1/09
38	4	9/21

CV = 42 ± 1.8 ug/L

Result	Uncer.	Date
39	8	2/27

CV = 90 ± 4 ug/L

Result	Uncer.	Date
84	8	6/02
96	10	10/20

CV = 100 ± 10 ug/L

Result	Uncer.	Date
86	9	2/28
110	10	6/02
120	10	12/15
130	10	12/15
95	10	12/15
130	10	12/15
110	10	12/15
110	10	12/15
120	10	12/15
130	10	12/15

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
0.96	0.1	8/31
0.94	0.09	8/31
1.1	0.1	8/31

CV = 6 ± 0.3 mg/L

Result	Uncer.	Date
7.5	0.7	12/11
7.6	0.8	12/11
7.5	1.5	12/17

Mo 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	20	3/27
100	20	8/05
98	20	8/11

Na 92GAU 02 FAA

CV = 7.2 ± 0.3 mg/L

Result	Uncer.	Date
6.5	0.7	4/23

Na (cont)

CV = 130 ± 5.6 mg/L

Result	Uncer.	Date
130	10	1/08
140	10	1/08
130	10	3/10
140	10	4/06
140	10	4/06
130	10	4/23
120	10	5/13
130	10	5/13
130	10	7/06
130	10	7/06

Na 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.05		1/07
< 0.01		3/30
< 0.004		6/19
10	10	7/16
< 0.01		8/13
< 0.01		8/20
< 0.01		8/24

CV = 149 ± 6 ug/L

Result	Uncer.	Date
160	20	4/23

CV = 1.19 ± 0.05 mg/L

Result	Uncer.	Date
1.2	0.1	6/22
1.4	0.1	7/16
1.2	0.1	8/04
1.3	0.1	9/08
1.2	0.1	9/10

CV = 1.99 ± 0.08 mg/L

Result	Uncer.	Date
2	0.2	3/11
2	0.2	8/13
2	0.2	8/31
2.1	0.2	9/24

CV = 2 ± 0.09 mg/L

Result	Uncer.	Date
2	0.2	3/11
2.1	0.2	5/20
2	0.2	5/21
2	0.2	6/17
2	0.2	6/17

CV = 2.98 ± 0.1 mg/L

Result	Uncer.	Date
3.1	0.3	12/09

CV = 4.4 ± 0.2 mg/L

Result	Uncer.	Date
5	0.5	7/15
4.5	0.5	9/10

TABLE E-IV (cont)

****

EN-9 Trace Elements in Water (cont)

****

Na (cont)

CV = 4.97 ± 0.21 mg/L

Result	Uncer.	Date
5.2	0.5	3/24
5	0.5	3/30
5.4	0.5	7/16
5.5	0.6	7/16
4.9	0.5	7/16
5.4	0.5	7/16
5.3	0.5	7/28
5.6	0.6	7/28
4.7	0.5	7/29
5.1	0.5	7/29
5.1	0.5	8/04
5.1	0.5	8/04
5	0.5	8/05
5	0.5	8/05
5.2	0.5	8/17
5	0.5	8/17
5.1	0.5	8/21
5.2	0.5	8/25
5.1	0.5	8/25
5.1	0.5	8/27
5.1	0.5	8/31
5.1	0.5	8/31
5.1	0.5	9/10
5.1	0.5	9/10
5	0.5	9/14
5.1	0.5	9/14

CV = 5.2 ± 0.2 mg/L

Result	Uncer.	Date
5.2	0.5	3/24
5.1	0.5	6/11

CV = 5.6 ± 0.2 mg/L

Result	Uncer.	Date
5.9	0.6	9/24
5.8	0.6	12/09

CV = 6 ± 0.6 mg/L

Result	Uncer.	Date
6.5	0.7	12/10

CV = 7.2 ± 0.3 mg/L

Result	Uncer.	Date
6.7	0.7	6/23
7.4	0.7	8/27
7.3	0.7	9/09
7.3	0.7	9/10

CV = 7.9 ± 0.3 mg/L

Result	Uncer.	Date
8.2	0.8	8/24
8.1	0.8	8/27
8.3	0.8	9/23

Na (cont)

CV = 9.9 ± 0.4 mg/L

Result	Uncer.	Date
9.6	0.5	4/23
9.8	1	5/20

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	2	1/07
10	1	3/11
9.5	1	3/16
10	1	3/23
10	1	3/23
10	1	3/24
10	1	3/30
11	1	4/01
8.8	0.9	5/12
9.6	1	5/20
9.7	1	5/20
9.3	0.9	5/20
9.5	1	5/21
11	1	6/11
9.2	0.9	6/19
9.1	0.9	6/19
9.7	1	6/22
9.8	1	6/23
11	1	9/23
11	1	9/23
11	1	9/24
11	1	9/24
11	1	9/24

CV = 11.9 ± 0.5 mg/L

Result	Uncer.	Date
12	1	12/08

CV = 13.6 ± 0.58 mg/L

Result	Uncer.	Date
14	1	3/23

CV = 15.9 ± 0.66 mg/L

Result	Uncer.	Date
21	2	5/20
17	2	12/15

CV = 16.7 ± 0.7 mg/L

Result	Uncer.	Date
17	2	7/28
17	2	8/24
17	2	8/31

CV = 17.9 ± 0.75 mg/L

Result	Uncer.	Date
18	2	5/08
19	2	6/17
19	2	9/23
19	2	12/08

CV = 18.9 ± 0.8 mg/L

Result	Uncer.	Date
19	2	12/10

Na (cont)

CV = 19.9 ± 0.9 mg/L

Result	Uncer.	Date
19.3	0.9	4/23
22	2	7/15
20	2	7/28
21	2	7/28
20	2	8/05

CV = 20 ± 0.86 mg/L

Result	Uncer.	Date
20	2	3/11

CV = 23.9 ± 1 mg/L

Result	Uncer.	Date
26	3	5/20
25	3	5/21
25.5	0.2	10/09
26	3	12/15

CV = 28 ± 3 mg/L

Result	Uncer.	Date
31	3	9/24

CV = 129 ± 6 mg/L

Result	Uncer.	Date
130	10	12/08
130	10	12/08
130	10	12/09
130	10	12/09
130	10	12/09
130	10	12/09
130	10	12/09
130	10	12/09
130	10	12/10
130	10	12/10
130	10	12/15
130	10	12/15
130	10	12/15
130	10	12/15

Nb 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Nd 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

NH3-N 91GAU 04, 92GAU 04 FIA

CV = 456 ± 46 ug/L

Result	Uncer.	Date
400	40	4/10

CV = 500 ± 50 ug/L

Result	Uncer.	Date
500	50	3/06
500	50	3/06

CV = 1.06 ± 0.1 mg/L

Result	Uncer.	Date
0.92	0.09	4/10

CV = 1.52 ± 0.15 mg/L

Result	Uncer.	Date
1.42	0.1	1/27
1.42	0.1	1/27

NH3-N 91GAU 04 IC

CV = 0.6 ± 0.06 mg/L

Result	Uncer.	Date
0.6	0.06	1/30
0.6	0.06	1/30

Ni 93GAU 02 FAA

CV = 201 ± 9 ug/L

Result	Uncer.	Date
190	20	10/26

CV = 262 ± 11 ug/L

Result	Uncer.	Date
270	30	6/25
270	30	6/25
280	30	6/30
280	30	6/30
280	30	6/30
260	30	7/01
260	30	7/01

CV = 433 ± 19 ug/L

Result	Uncer.	Date
430	40	2/06
440	40	2/06
430	40	2/07
430	40	3/12
430	40	3/12

CV = 550 ± 24 ug/L

Result	Uncer.	Date
540	50	7/01

Ni (cont)

CV = 650 ± 30 ug/L

Result	Uncer.	Date
660	70	8/31
660	70	8/31

CV = 800 ± 34 ug/L

Result	Uncer.	Date
810	80	2/05

CV = 1200 ± 52 ug/L

Result	Uncer.	Date
1200	100	5/05

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
0.98	0.09	7/02
0.93	0.09	7/02
1.1	0.1	8/10
1.1	0.1	8/10
1.1	0.1	8/21
1	0.1	8/21
1	0.1	8/31
1	0.1	8/31
0.95	0.09	10/26
1.1	0.1	12/04
1.1	0.1	12/09
1	0.1	12/09

CV = 1.31 ± 0.06 mg/L

Result	Uncer.	Date
1.4	0.1	8/21

CV = 1.5 ± 0.15 mg/L

Result	Uncer.	Date
1.5	0.2	1/06

CV = 1.51 ± 0.06 mg/L

Result	Uncer.	Date
1.4	0.1	10/26

Ni 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.04		3/17
< 0.003		7/15
< 5		7/16
0.006	0.004	7/28
0.006	0.004	7/28
< 0.01		8/05
< 0.01		11/09
< 0.01		11/09

CV = 40 ± 2 ug/L

Result	Uncer.	Date
84	4	4/23
40	10	11/19

Ni (cont)

CV = 500 ± 20 ug/L

Result	Uncer.	Date
530	50	9/24
530	50	10/26
530	50	12/09

CV = 600 ± 30 ug/L

Result	Uncer.	Date
620	60	3/23

CV = 653 ± 28 ug/L

Result	Uncer.	Date
664	20	11/19

CV = 800 ± 80 ug/L

Result	Uncer.	Date
880	90	5/21

CV = 1108 ± 48 ug/L

Result	Uncer.	Date
1100	100	12/08

CV = 0.4 ± 0.02 mg/L

Result	Uncer.	Date
0.42	0.04	12/08
0.43	0.04	12/10

CV = 0.5 ± 0.02 mg/L

Result	Uncer.	Date
0.55	0.06	3/24
0.52	0.05	3/31
0.48	0.05	7/16
0.49	0.05	7/16
0.51	0.05	7/16
0.5	0.05	7/16
0.51	0.05	7/28
0.51	0.05	7/28
0.47	0.05	7/29
0.5	0.05	7/29
0.54	0.05	8/04
0.55	0.05	8/04
0.53	0.05	8/05
0.52	0.05	8/05
0.54	0.05	8/17
0.56	0.06	8/17
0.54	0.05	8/17
0.54	0.05	8/17
0.53	0.05	8/21
0.56	0.06	8/25
0.55	0.06	8/25
0.53	0.05	8/27
0.51	0.05	8/31
0.54	0.05	8/31
0.53	0.05	9/10
0.53	0.05	9/10
0.53	0.05	9/14
0.54	0.05	9/14

TABLE E-IV (cont)

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EM-9 Trace Elements in Water (cont)

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Ni (cont)

CV = 0.6 ± 0.03 mg/L

Result	Uncer.	Date
0.61	0.06	3/17
0.62	0.06	8/13
0.65	0.07	8/31
0.65	0.07	9/24

CV = 0.8 ± 0.03 mg/L

Result	Uncer.	Date
0.76	0.08	6/22
0.8	0.08	7/16
0.85	0.08	8/04
0.9	0.09	9/08
0.87	0.09	9/10

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
1	0.1	8/17

CV = 1.68 ± 0.07 mg/L

Result	Uncer.	Date
1.7	0.3	1/07

CV = 2 ± 0.09 mg/L

Result	Uncer.	Date
1.6	0.2	5/08
2.1	0.2	6/11
2	0.02	7/28
2.2	0.2	8/24
2.1	0.2	8/31
1.8	0.2	12/02
2.2	0.2	12/04
2.1	0.2	12/15

CV = 2.5 ± 0.3 mg/L

Result	Uncer.	Date
2.7	0.3	5/20

CV = 2.7 ± 0.1 mg/L

Result	Uncer.	Date
2.7	0.3	12/10

CV = 3.6 ± 0.2 mg/L

Result	Uncer.	Date
3.8	0.4	9/23
3.7	0.4	12/08

Ni (cont)

CV = 3.8 ± 0.2 mg/L

Result	Uncer.	Date
[illegible]	0.4	3/31
3.9	0.4	6/19
3.9	0.4	8/13
4	0.4	8/20
4.2	0.4	8/24

CV = 4 ± 0.2 mg/L

Result	Uncer.	Date
4.7	0.2	4/23
4.4	0.4	6/19
4	0.4	6/22
[illegible]	0.4	7/16
3.9	0.4	7/16
4.2	0.4	7/16
4.1	0.4	7/16
4	0.4	7/28
4.2	0.4	7/28
4.6	0.5	7/29
4	0.4	7/29
4.5	0.5	8/04
4.7	0.5	8/04
4.5	0.5	8/05
4.5	0.5	8/05
4.5	0.5	8/17
4.4	0.4	8/17
4.5	0.5	8/25
4.5	0.5	8/25
4.3	0.4	8/27
4.3	0.4	9/10
4.3	0.4	9/10
4.4	0.4	9/14
4.3	0.4	9/14
4.4	0.4	10/26
3.9	0.4	11/25
3.9	0.4	11/25

CV = 4.2 ± 0.2 mg/L

Result	Uncer.	Date
4.4	0.4	12/15

CV = 4.6 ± 0.2 mg/L

Result	Uncer.	Date
4.5	0.5	7/15
5	0.5	9/10

CV = 5 ± 0.5 mg/L

Result	Uncer.	Date
5	0.5	3/23
5.1	0.5	6/11

CV = 5.2 ± 0.2 mg/L

Result	Uncer.	Date
5.2	0.5	11/25

CV = 5.5 ± 0.6 mg/L

Result	Uncer.	Date
6	0.6	[illegible]
5.9	0.6	5/20

Ni (cont)

CV = 5.52 ± 0.24 mg/L

Result	Uncer.	Date
5.8	0.6	3/24
5.3	0.5	6/11

CV = 5.6 ± 0.2 mg/L

Result	Uncer.	Date
6.1	0.6	8/24
6	0.6	8/27
5.9	0.6	9/23

CV = 6 ± 0.6 mg/L

Result	Uncer.	Date
6.5	0.7	11/13

CV = 6.2 ± 0.3 mg/L

Result	Uncer.	Date
6.6	0.7	12/15

CV = 6.4 ± 0.3 mg/L

Result	Uncer.	Date
6.2	0.6	6/23
6.9	0.7	8/27
6.9	0.7	9/09
7	0.7	9/10

CV = 6.8 ± 0.29 mg/L

Result	Uncer.	Date
6.7	0.7	3/17

CV = 7 ± 0.3 mg/L

Result	Uncer.	Date
7.1	0.8	4/23
7.4	0.7	12/09

CV = 10 ± 1 mg/L

Result	Uncer.	Date
9.8	2	1/07
10	1	3/16
10	1	3/23
10	1	3/23
10	1	3/23
11	1	3/24
11	1	3/30
11	1	4/01
10	0.5	4/23
9.83	0.49	4/24
10	1	5/12
11	1	5/20
11	1	5/20
11	1	5/20
11	1	5/21
9.8	1	6/11
10	1	6/19
10	1	6/19
9.6	1	6/22
11	1	6/23
11	1	9/23
11	1	9/23
11	1	9/24
11	1	9/24
11	1	9/24

Ni (cont)

11	1	10/26
11	1	10/26
11	1	11/09
9.8	1	11/09
10	1	11/09
11	1	11/13
10	1	11/13
11	1	11/25
9.7	1	11/25
10	1	12/04
10.9	1	12/04
9.8	1	12/08
10	1	12/08
10	1	12/08
10	1	12/08
10	1	12/09
10	1	12/09
9.8	1	12/09
11	1	12/09
10	1	12/09
9.8	1	12/09
11	1	12/10
11	1	12/10
10	1	12/15
10	1	12/15
11	1	12/15
9.7	1	12/15

CV = 20 ± 0.9 mg/L

Result	Uncer.	Date
21	2	5/08

Ni 92GAU 02 ICPMS

CV = not spiked ug/L

Result	Uncer.	Date
1	1	12/11

CV = 10 ± 0.4 ug/L

Result	Uncer.	Date
67	7	4/27

CV = 37 ± 1.6 ug/L

Result	Uncer.	Date
< 200		8/31
27	3	10/19

CV = 50 ± 5 ug/L

Result	Uncer.	Date
38	4	3/09
43.4	4	3/09
38	4	3/09
43.4	4	3/09
52	5	5/06
54	5	5/06

CV = 91 ± 4 ug/L

Result	Uncer.	Date
150	20	4/27

Ni (cont)

CV = 100 ± 10 ug/L

Result	Uncer.	Date
89	9	1/08
94	9	1/08
86	9	1/08
93	9	2/12
110	10	4/03
99	10	4/03
110	10	4/03
110	10	4/03
88	9	4/24
97	10	4/24
94	9	4/28
93	9	4/28
96	10	5/06
100	10	5/06
97	10	6/01
98	10	6/01
100	10	6/05
98	10	6/05
110	10	7/02
99	10	7/27
98	10	7/27
110	10	7/27
100	10	7/27
100	10	8/31
100	10	8/31
108	10	10/01
109	10	10/01
94	9	10/06
100	10	10/06
87	9	10/19
98	10	10/19
110	10	10/19
92	9	12/15
94	9	12/15
90	9	12/15
90	9	12/15
97	10	12/15
91	9	12/15

CV = 180 ± 20 ug/L

Result	Uncer.	Date
190	20	7/27
190	20	7/27

CV = 220 ± 20 ug/L

Result	Uncer.	Date
210	20	1/08
200	20	1/08
210	20	2/12
210	20	2/12
220	20	4/02
220	20	4/02
210	20	6/04
230	20	8/31

CV = 604 ± 60 ug/L

Result	Uncer.	Date
560	60	12/11

CV = 2.8 ± 0.1 mg/L

Result	Uncer.	Date
2.8	0.3	4/27

Ni (cont)

CV = 3.2 ± 0.3 mg/L

Result	Uncer.	Date
3	0.3	6/11

CV = 6.4 ± 0.3 mg/L

Result	Uncer.	Date
9.7	1	4/24
7.2	0.7	4/24

Ni 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
95	19	3/27
100	[illegible]	8/05
100	20	8/11

NO2-N 92GAU 01 FIA

CV = 0.3 ± 0.017 mg/L

Result	Uncer.	Date
0.31	0.03	3/10
0.31	0.03	3/10

CV = 0.66 ± 0.07 mg/L

Result	Uncer.	Date
0.73	0.07	12/03

CV = 0.7 ± 0.041 mg/L

Result	Uncer.	Date
0.71	0.07	8/26

CV = 1 ± 0.059 mg/L

Result	Uncer.	Date
0.72	0.07	4/03

NO3-N 91GAU 04 FIA

CV = 480 ± 48 ug/L

Result	Uncer.	Date
480	50	4/10
480	50	10/20

CV = 500 ± 50 ug/L

Result	Uncer.	Date
470	50	5/15

CV = 800 ± 80 ug/L

Result	Uncer.	Date
810	80	8/18
780	80	9/17

TABLE E-IV (cont)

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EM-9 Trace Elements in Water (cont)

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NO3-N (cont)

CV = 0.8 ± 0.08 mg/L

Result	Uncer.	Date
0.737	0.07	2/26
0.7	0.07	2/26
0.7	0.07	2/26
0.737	0.07	2/26
0.79	0.08	12/03

CV = 1 ± 0.1 mg/L

Result	Uncer.	Date
0.96	0.1	1/16
0.96	0.1	1/16
0.92	0.09	2/26
0.92	0.09	2/26
1.12	0.1	12/03

CV = 1.12 ± 0.1 mg/L

Result	Uncer.	Date
1.13	0.1	4/10

CV = 1.2 ± 0.1 mg/L

Result	Uncer.	Date
1.21	0.1	12/03

CV = 1.4 ± 0.1 mg/L

Result	Uncer.	Date
1.4	0.1	9/17
1.38	0.1	9/17

CV = 1.44 ± 0.1 mg/L

Result	Uncer.	Date
1.45	0.1	8/26

CV = 1.6 ± 0.16 mg/L

Result	Uncer.	Date
1.5	0.2	1/16
1.51	0.04	1/16
1.5	0.04	1/16
1.5	0.2	1/16
1.5	0.2	1/16
1.5	0.2	1/16
1.6	0.2	8/26
1.6	0.2	9/17
1.6	0.2	10/01

CV = 1.8 ± 0.2 mg/L

Result	Uncer.	Date
1.9	0.2	8/18

NO3-N 91GAU 04 IC

CV = 0.6 ± 0.06 mg/L

Result	Uncer.	Date
0.58	0.06	2/10

Oil/Grease 92GAU 01 GRAV

CV = 24.6 ± 0.2 mg/L

Result	Uncer.	Date
19	4	9/11

CV = 42.9 ± 0.3 mg/L

Result	Uncer.	Date
29	3	10/15

P 90GAU 02 ACOLR

CV = 280 ± 30 ug/L

Result	Uncer.	Date
260	50	1/09
260	50	1/09
450	90	9/01
350	70	12/03

CV = 420 ± 40 ug/L

Result	Uncer.	Date
270	50	5/29

CV = 580 ± 60 ug/L

Result	Uncer.	Date
1100	200	4/08
1000	200	4/08
440	90	7/01
550	100	8/05
550	100	8/05
550	110	11/06

CV = 850 ± 80 ug/L

Result	Uncer.	Date
780	160	3/04
780	160	3/04
320	60	5/20
860	200	6/26

CV = 0.05 ± 0.005 mg/L

Result	Uncer.	Date
0.16	0.04	4/08

CV = 0.44 ± 0.04 mg/L

Result	Uncer.	Date
0.5	0.1	4/08
0.49	0.1	4/08

CV = 1 ± 0.1 mg/L

Result	Uncer.	Date
1.1	0.2	8/24

Pb 91GAU 02 ETVAA

CV = 10 ± 1 ug/L

Result	Uncer.	Date
10	2	1/06
11	2	11/05

CV = 15 ± 0.6 ug/L

Result	Uncer.	Date
12	2	2/06
13	2	2/06
13	2	2/06
12	2	3/12
14	2	3/12
12	2	3/31
14	2	3/31
13	2	3/31
13	2	3/31
14	2	4/09
14	2	4/09
16	4	5/05
14	2	5/06
15	2	5/06
14	3	8/21
13	3	8/21
13	1	9/03
13	1	9/03
14	3	11/05
13	3	11/20
13	2	12/08

CV = 17.5 ± 0.7 ug/L

Result	Uncer.	Date
17	3	8/21

CV = 20 ± 0.9 ug/L

Result	Uncer.	Date
19	4	2/05
18	4	2/05
19	4	3/31

CV = 33 ± 1.4 ug/L

Result	Uncer.	Date
33	6	3/31
34	6	4/09
34	6	4/09

CV = 40 ± 4 ug/L

Result	Uncer.	Date
< 50		7/23

CV = 50 ± 2.2 ug/L

Result	Uncer.	Date
43	4	8/06
49	10	11/20

CV = 56 ± 2.4 ug/L

Result	Uncer.	Date
54	5	6/26
58	12	7/02

Pb 92GAU 02 FAA

CV = 10 ± 0.4 ug/L

Result	Uncer.	Date
< 100		3/17

CV = 15 ± 0.6 ug/L

Result	Uncer.	Date
< 500		1/29

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
1.14	0.1	2/28
1	0.1	6/30
1	0.1	6/30
1	0.1	6/30
0.94	0.1	7/07
1.09	0.1	7/07
1	0.1	7/07
1	0.1	7/09
0.99	0.1	7/14
1	0.1	7/16
1	0.1	7/16
1	0.1	7/21
1.1	0.1	7/23
1.09	0.1	8/04
1	0.1	8/05
1	0.1	8/06
1	0.1	8/12
1	0.1	8/12
1	0.1	8/21
1	0.1	8/21
1	0.1	9/10
1	0.1	9/10
0.95	0.1	9/10
0.99	0.1	9/10
1	0.1	9/18
0.98	0.09	9/18
1	0.1	10/27

CV = 26 ± 1.1 mg/L

Result	Uncer.	Date
28	3	1/29

Pb 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.05		2/20
< 0.05		2/25
< 0.05		2/25
< 0.05		3/03
< 0.06		3/23
< 0.05		4/24
30	20	6/11
< 30		7/16
< 0.08		8/24
< 0.08		8/27

CV = 24 ± 1 ug/L

Result	Uncer.	Date
27	24	10/23

Pb (cont)

CV = 35 ± 1.5 ug/L

Result	Uncer.	Date
< 50		7/10

CV = 4479 ± 193 ug/L

Result	Uncer.	Date
4600	500	12/08

CV = 1.61 ± 0.07 mg/L

Result	Uncer.	Date
1.6	0.02	10/23

CV = 2.01 ± 0.09 mg/L

Result	Uncer.	Date
2.1	0.2	8/17

CV = 2.4 ± 0.1 mg/L

Result	Uncer.	Date
2.2	0.2	9/22

CV = 2.51 ± 0.11 mg/L

Result	Uncer.	Date
2.7	0.3	3/24
2.8	2.7	3/31
2.2	0.2	5/08
2.4	0.2	7/16
2.6	0.3	7/16
2.5	0.3	7/16
2.6	0.3	7/16
2.4	0.2	7/28
2.3	0.2	7/28
2.2	0.2	7/29
2.4	0.2	7/29
2.5	0.3	8/04
2.5	0.3	8/04
2.5	0.3	8/05
2.5	0.3	8/05
2.4	0.2	8/17
2.4	0.2	8/17
2.6	0.3	8/17
2.5	0.3	8/17
2.4	0.2	8/21
2.6	0.3	8/25
2.5	0.3	8/25
2.4	0.2	8/27
2.3	0.2	8/31
2.4	0.2	8/31
2.3	0.2	9/10
2.4	0.2	9/10
2.3	0.2	9/14
2.4	0.2	9/14

CV = 3 ± 0.13 mg/L

Result	Uncer.	Date
3.1	0.6	1/07

CV = 4 ± 0.2 mg/L

Result	Uncer.	Date
3.7	0.4	3/17
3.9	0.4	8/13
3.7	0.4	8/31

Pb (cont)

CV = 6 ± 0.3 mg/L

Result	Uncer.	Date
6.4	0.6	2/27
6.7	0.7	4/21
6.5	0.7	5/08
5.8	0.6	9/22
6.7	0.7	11/25

CV = 7.9 ± 0.3 mg/L

Result	Uncer.	Date
9.3	0.9	12/10

CV = 8 ± 0.3 mg/L

Result	Uncer.	Date
8.5	0.9	3/31
8.5	0.9	5/27
7.9	0.8	6/19
7.9	0.8	8/13
7.6	0.8	8/20
8.4	0.8	8/24

CV = 8.8 ± 0.38 mg/L

Result	Uncer.	Date
8.5	0.9	3/17
8.7	0.9	6/08

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	2	1/07
10	2	1/27
10	2	1/27
11	2	1/27
10	2	1/27
11	1	2/20
11	1	2/25
10	1	2/25
11	1	2/25
10	1	2/27
11	1	2/27
12	1	3/03
11	1	3/03
11	1	3/16
9.9	1	3/23
10	1	3/23
10	1	3/23
11	1	3/23
11	1	3/24
10	1	3/30
11	1	3/31
11	1	4/21
10.4	0.5	4/23
10.1	0.5	4/24
11	1	4/24
11	1	5/01
12	1	5/08
11	1	5/12
9.9	1	5/27
9.9	1	5/27
9.9	1	5/28
9.9	1	5/28
9.7	1	6/08
10	1	6/08
10	1	6/11
10	1	6/19
9.8	1	6/19
10	1	6/22
10	1	6/23
11	1	7/10

TABLE E-IV (cont)

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EM-9 Trace Elements in Water
(cont)

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Pb (cont)

11	1	9/22
11	1	9/22
11	1	9/22
11	1	10/07
10	1	10/07
8.3	0.8	10/21
11	1	11/19
11	1	11/19
13	1	11/23
11	1	11/23
11	1	11/25
11	1	11/25
10	1	11/25
9.3	0.9	12/04
9.9	1	12/04
11	1	12/08
10	1	12/08
10	1	12/09
10	1	12/09
10	1	12/10
11	1	12/10
9.1	0.9	12/23
9.4	0.9	12/23

CV = 10.1 ± 0.4 mg/L

Result	Uncer.	Date
9.9	1	7/15
9.7	1	9/10
9.9	1	10/07
10	1	12/23

CV = 12 ± 0.5 mg/L

Result	Uncer.	Date
12	1	3/24
12	1	6/11

CV = 12.5 ± 0.5 mg/L

Result	Uncer.	Date
13	1	6/09

CV = 13 ± 1 mg/L

Result	Uncer.	Date
15	2	9/22

CV = 13.1 ± 0.6 mg/L

Result	Uncer.	Date
13	1	7/15
12	1	7/28
12	1	7/28
13	1	8/05

CV = 14.1 ± 0.6 mg/L

Result	Uncer.	Date
13	1	6/23
14	1	8/27
14	1	9/09
14	1	9/10

Pb (cont)

CV = 15 ± 2 mg/L

Result	Uncer.	Date
16	2	3/23
16	2	5/01
16	2	6/11
16	2	6/11
15	2	6/11
16	2	6/12
16	2	6/12

CV = 16 ± 0.7 mg/L

Result	Uncer.	Date
17	2	3/23

CV = 20 ± 0.8 mg/L

Result	Uncer.	Date
20	2	2/25
20	2	5/27
19	2	7/28
21	2	8/24
20	2	8/31
20	2	12/04
19	2	12/23

CV = 20.9 ± 0.9 mg/L

Result	Uncer.	Date
22	2	11/23
22	2	11/23

CV = 21 ± 1 mg/L

Result	Uncer.	Date
23	2	11/19

CV = 21.2 ± 0.91 mg/L

Result	Uncer.	Date
22	2	3/23
21.1	0.2	6/08

CV = 24.8 ± 1.1 mg/L

Result	Uncer.	Date
24	2	3/17
24.7	0.3	6/08

CV = 26 ± 1.1 mg/L

Result	Uncer.	Date
26	3	2/27
25	3	5/01
25	3	6/11
26	3	6/22
27	3	7/16
26	3	8/04
25	3	9/08
25	3	9/10
27.4	0.3	11/25

CV = 28 ± 1.2 mg/L

Result	Uncer.	Date
20	2	12/09

Pb (cont)

CV = 29 ± 1 mg/L

Result	Uncer.	Date
34	3	11/19

CV = 29.4 ± 1.3 mg/L

Result	Uncer.	Date
31	3	6/12
31	3	6/12

CV = 30 ± 1.3 mg/L

Result	Uncer.	Date
30	6	1/27
29	3	5/12

CV = 80 ± 3.5 mg/L

Result	Uncer.	Date
75	8	5/08

Pb 91GAU 02 ICPMS

CV = not spiked mg/L

Result	Uncer.	Date
< 5		4/28
< 1		6/26
3	0.3	9/02
0.4	0.2	12/18

CV = 4 ± 0.2 ug/L

Result	Uncer.	Date
< 200		8/31

CV = 5 ± 0.5 ug/L

Result	Uncer.	Date
5.2	0.5	3/04
6.1	0.6	3/05
5.2	1	10/19

CV = 6 ± 0.26 ug/L

Result	Uncer.	Date
7.6	0.8	11/19

CV = 7.5 ± 0.3 ug/L

Result	Uncer.	Date
7.4	0.7	6/02
6.5	0.7	10/23

CV = 8 ± 0.3 ug/L

Result	Uncer.	Date
8.6	0.4	1/30
17	2	4/27
7.9	1	4/27
7.9	1	6/26
9.1	1	6/26
6.2	1	6/29
6.5	1	6/30

Pb (cont)

CV = 11 ± 0.5 ug/L

Result	Uncer.	Date
11	1	12/16

CV = 12 ± 0.5 ug/L

Result	Uncer.	Date
7.2	1	6/29
8.6	1	6/30

CV = 17 ± 0.7 ug/L

Result	Uncer.	Date
17	2	10/13
18	2	11/13

CV = 18 ± 0.8 ug/L

Result	Uncer.	Date
45	9	2/27
17	2	6/26
38	4	9/02

CV = 20 ± 0.9 ug/L

Result	Uncer.	Date
29	3	4/27

CV = 29 ± 1.2 ug/L

Result	Uncer.	Date
32	3	12/11

CV = 35 ± 1.5 ug/L

Result	Uncer.	Date
31	3	6/11

CV = 100 ± 10 ug/L

Result	Uncer.	Date
98	10	1/08
98	10	1/08
97	10	1/08
120	10	2/12
110	10	2/28
99	10	4/03
100	10	4/03
100	10	4/03
100	10	4/03
77	8	4/24
88	9	4/24
91	9	4/27
92	9	4/27
110	10	4/28
100	10	4/28
110	10	5/05
100	10	5/06
120	10	5/06
130	10	5/06
140	10	5/06
110	10	5/06
100	10	5/06
110	10	5/06
100	10	5/06
107	10	6/01
118	10	6/01
94	9	6/02
94	9	6/05

Pb (cont)

98	10	6/05
86	10	6/26
86	10	6/26
107	10	6/26
89	10	6/26
90	10	6/26
107	10	6/26
90	10	6/26
88	10	6/30
55	10	6/30
127	10	6/30
126	10	6/30
77	10	6/30
72	10	6/30
100	10	7/02
100	10	7/27
100	10	7/27
100	10	7/27
100	10	7/27
160	20	8/31
94	9	8/31
110	10	8/31
110	10	8/31
120	10	10/06
100	10	10/06
110	10	10/19
120	10	10/19
108	10	10/19
100	10	12/15
110	10	12/15
120	10	12/15
92	9	12/15
100	10	12/15
92	9	12/15
91	9	12/15
110	10	12/16

CV = 150 ± 20 ug/L

Result	Uncer.	Date
150	20	7/28
150	20	7/28

CV = 180 ± 20 ug/L

Result	Uncer.	Date
170	20	1/08
170	20	1/08
190	20	2/12
180	20	4/02
170	20	4/02
170	20	6/04
170	20	8/31
170	20	8/31

CV = 240 ± 20 ug/L

Result	Uncer.	Date
220	20	3/09
220	20	3/09
210	20	3/09
210	20	3/09
240	20	5/06
240	20	5/06

CV = 503 ± 50 ug/L

Result	Uncer.	Date
570	60	12/11

Pb (cont)

CV = 1.51 ± 0.15 mg/L

Result	Uncer.	Date
1.4	0.1	12/11

CV = 3.2 ± 0.1 mg/L

Result	Uncer.	Date
3.4	0.3	4/27

CV = 14.1 ± 0.6 mg/L

Result	Uncer.	Date
16	2	4/24
16	2	4/24

Pb 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	20	3/27
100	20	8/05
100	20	8/11

Pd 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

---

pH 92GAU 01 GE

CV = 4 ± 0.4 units

Result	Uncer.	Date
3.99	0.1	2/21
4.05	0.1	5/01
4.1	0.1	8/13
3.98	0.1	9/04
4.06	0.1	12/16

CV = 7 ± 0.7 units

Result	Uncer.	Date
7.03	0.1	4/08
7.04	0.1	6/08
7.04	0.1	8/11
7.03	0.1	8/20
7.09	0.1	12/16
7.11	0.1	12/16

CV = 10 ± 1 units

Result	Uncer.	Date
10.1	0.1	4/08
10.1	0.1	6/08
10.2	0.1	8/19
10.1	0.2	10/15
10.3	0.2	12/16

TABLE E-IV (cont)

****

EM-9 Trace Elements in Water (cont)

****

PO4-P 91GAU 04 ACOLR

CV = 81 ± 8 ug/L

Result	Uncer.	Date
52	40	4/10
90	20	10/15

CV = 156 ± 16 ug/L

Result	Uncer.	Date
140	20	9/21

CV = 189 ± 19 ug/L

Result	Uncer.	Date
210	40	4/10
180	40	4/15
180	40	4/15

CV = 195 ± 20 ug/L

Result	Uncer.	Date
200	40	1/10

CV = 270 ± 27 ug/L

Result	Uncer.	Date
260	50	1/10
270	50	1/10
270	30	9/21

CV = 351 ± 35 ug/L

Result	Uncer.	Date
345	30	10/22

CV = 0.15 ± 0.02 mg/L

Result	Uncer.	Date
0.15	0.03	2/03
0.16	0.03	2/03

CV = 0.25 ± 0.02 mg/L

Result	Uncer.	Date
0.23	0.04	3/04
0.23	0.04	3/04

PO4-P 91GAU 04 FIA

CV = 156 ± 16 ug/L

Result	Uncer.	Date
140	30	10/15

CV = 400 ± 40 ug/L

Result	Uncer.	Date
380	80	10/15

PO4-P (cont)

CV = 0.27 ± 0.03 mg/L

Result	Uncer.	Date
0.25	0.05	10/15

Pr 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Pt 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Rb 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Rh 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Ru 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Sb 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
0.04	0.01	3/11
< 30		7/16
< 0.02		7/28
< 60		8/17
< 0.06		8/24
< 0.06		8/31
< 0.02		12/04
0.02	0.02	12/09

Sb (cont)

CV = 30 ± 1.3 ug/L

Result	Uncer.	Date
30	20	11/19

CV = 149 ± 6 ug/L

Result	Uncer.	Date
180	30	4/23

CV = 29343 ± 1262 ug/L

Result	Uncer.	Date
30000	3000	12/08

CV = 2.48 ± 0.11 mg/L

Result	Uncer.	Date
2.6	0.3	3/24
2.6	0.3	3/30
2.4	0.2	7/16
2.6	0.3	7/16
2.6	0.3	7/16
2.4	0.3	7/16
2.4	0.2	7/28
2.5	0.3	7/28
2.2	0.2	7/29
2.5	0.3	7/29
2.4	0.2	8/04
2.4	0.2	8/04
2.5	0.3	8/05
2.5	0.3	8/05
2.6	0.3	8/17
2.7	0.3	8/17
2.6	0.3	8/17
2.6	0.3	8/17
2.5	0.3	8/21
2.7	0.3	8/25
2.7	0.3	8/25
2.5	0.3	8/27
2.5	0.3	8/31
2.5	0.3	9/10
2.5	0.3	9/10
2.5	0.3	9/14
2.5	0.3	9/14

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
2.8	0.3	6/22
2.7	0.3	7/16
2.7	0.3	8/04
2.8	0.3	9/08
2.8	0.3	9/10

CV = 4 ± 0.17 mg/L

Result	Uncer.	Date
4.1	0.4	3/23

CV = 5 ± 0.2 mg/L

Result	Uncer.	Date
4.5	0.5	6/23
5	0.5	8/27
5	0.5	9/09
5.1	0.5	9/10

Sb (cont)

CV = 9.9 ± 0.4 mg/L

Result	Uncer.	Date
9.8	1	7/15
10	1	9/10

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	2	1/07
11	1	3/11
9.7	1	3/16
9.6	1	3/23
9.8	1	3/23
9.5	1	3/23
11	1	3/24
11	1	3/30
11	1	4/01
9.3	0.9	5/12
10	1	6/11
10	1	6/11
9.6	1	6/19
9.2	0.9	6/19
9.8	1	6/22
9.7	1	6/23
< 10		11/19

CV = 12 ± 0.5 mg/L

Result	Uncer.	Date
13	1	3/24
12	1	6/11

CV = 13.9 ± 0.6 mg/L

Result	Uncer.	Date
14	1	3/11
14	1	8/13
13	1	8/31

CV = 15.9 ± 0.7 mg/L

Result	Uncer.	Date
17	2	3/30
15	2	6/19
16	2	8/13
16	2	8/20
17	2	8/24

CV = 19.9 ± 0.8 mg/L

Result	Uncer.	Date
18	2	5/08
20	2	7/15
19	2	7/28
19	2	7/28
20	2	8/05

CV = 20 ± 0.86 mg/L

Result	Uncer.	Date
20	4	1/07
7.2	0.4	4/23

CV = 25 ± 1 mg/L

Result	Uncer.	Date
24	2	5/08

Sb (cont)

CV = 25.8 ± 1.1 mg/L

Result	Uncer.	Date
28	3	8/24
26	3	8/27

CV = 28 ± 1.2 mg/L

Result	Uncer.	Date
29	3	3/11

CV = 50 ± 2 mg/L

Result	Uncer.	Date
50	5	12/04
51	5	12/04
49	5	12/08
46	5	12/08
47	5	12/09
50	5	12/09

CV = 79 ± 3 mg/L

Result	Uncer.	Date
80	4	4/23

Sb 92GAU 02 ICPMS

CV = not spiked ug/L

Result	Uncer.	Date
< 1		12/11

CV = 9.9 ± 0.4 ug/L

Result	Uncer.	Date
14	1	4/27
< 200		8/31

CV = 16 ± 0.7 ug/L

Result	Uncer.	Date
19	2	9/04

CV = 24.8 ± 1.1 ug/L

Result	Uncer.	Date
17	2	6/11

CV = 28 ± 1 ug/L

Result	Uncer.	Date
29.7	1.5	9/28

CV = 30.8 ± 1.3 ug/L

Result	Uncer.	Date
33	3	12/16

CV = 32 ± 1.4 ug/L

Result	Uncer.	Date
31.4	1.6	2/07

Sb (cont)

CV = 36 ± 1.5 ug/L

Result	Uncer.	Date
30	6	2/27

CV = 38.7 ± 1.7 ug/L

Result	Uncer.	Date
40	4	11/16
41	4	11/19

CV = 40 ± 1.7 ug/L

Result	Uncer.	Date
45	5	9/02

CV = 43.2 ± 1.8 ug/L

Result	Uncer.	Date
40	4	12/14

CV = 44 ± 2 ug/L

Result	Uncer.	Date
41	4	4/27

CV = 45 ± 2 ug/L

Result	Uncer.	Date
47.4	2.3	2/04
44.3	2.2	2/04
45.8	2.3	2/04
45.7	2.3	3/04
45.2	2.2	3/04
45	2.2	3/04
47	5	3/26
35	4	3/26
42	4	6/11
170	20	9/02
160	20	9/02
45	5	9/04
47.7	2.4	9/28
46.9	2.4	9/28
51	5	10/13
46	2	10/26
47	5	11/16
44	4	11/19
55	6	11/19
41	4	12/11
42	4	12/11
42	4	12/14
41	4	12/14
54	5	12/16
51	5	12/16
47	5	12/18
52	5	12/18
48	5	12/18

CV = 46 ± 5 ug/L

Result	Uncer.	Date
43.7	2.2	3/04
44	4	3/26

CV = 49.6 ± 2.1 ug/L

Result	Uncer.	Date
55	6	12/18

TABLE E-IV (cont)

****

EM-9 Trace Elements in Water
(cont)

****

Sb (cont)

CV = 70 ± 3 ug/L

Result	Uncer.	Date
62	6	6/02
44	3	10/26

CV = 100 ± 10 ug/L

Result	Uncer.	Date
84	8	2/28
82	8	4/24
58	6	4/24
100	10	4/28
100	10	4/28
120	10	6/02
140	10	8/31
130	10	8/31
120	10	8/31
110	10	10/06
100	10	10/06
48	48	12/15
42	42	12/15
45	45	12/15
44	44	12/15
42	42	12/15

CV = 1.2 ± 0.12 mg/L

Result	Uncer.	Date
1.3	0.1	12/11

CV = 2.8 ± 0.1 mg/L

Result	Uncer.	Date
2.7	0.3	4/27

CV = 5 ± 0.2 mg/L

Result	Uncer.	Date
5.6	0.6	4/24
6.8	0.7	4/24

Sb 91MGB 01 MSCAM

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	20	3/27
100	20	8/05
100	20	8/11

Se 92GAU 02 CVAA

CV = 79 ± 3.4 ug/L

Result	Uncer.	Date
81	8	6/12
86	9	6/12
77	8	6/12

Se 90GAU 01 ETVAA

CV = not spiked ug/L

Result	Uncer.	Date
< 2		1/30
< 2		8/28
< 2		10/23
< 2		10/23
< 2		12/09

CV = 8 ± 0.3 ug/L

Result	Uncer.	Date
8.3	2	8/14

CV = 10 ± 1 ug/L

Result	Uncer.	Date
7.3	2	1/10
11	2	1/10
9.8	2	5/28
11	2	5/28
9.5	2	6/12
8.4	2	6/12

CV = 12 ± 0.5 ug/L

Result	Uncer.	Date
10	2	7/17
11	2	8/17
12	2	8/28

CV = 16 ± 0.7 ug/L

Result	Uncer.	Date
14	2	8/27

CV = 18 ± 0.8 ug/L

Result	Uncer.	Date
19	2	7/02
20	4	12/08

CV = 20 ± 0.9 ug/L

Result	Uncer.	Date
22	4	3/20
20	4	3/20
19	4	3/24
19	2	5/02
18	2	5/02
21	4	5/26
20	4	5/26
19	4	5/28
19	2	6/12
20	2	6/12
23	5	10/26
17	3	11/19

CV = 22 ± 1 ug/L

Result	Uncer.	Date
21	4	9/18

CV = 24 ± 1 ug/L

Result	Uncer.	Date
21	4	8/17

Se (cont)

CV = 25 ± 1.1 ug/L

Result	Uncer.	Date
27	6	3/20

CV = 26 ± 1 ug/L

Result	Uncer.	Date
23	5	8/12
24	5	8/12

CV = 30 ± 1.3 ug/L

Result	Uncer.	Date
28	6	3/24
29	6	3/24
29	3	5/02
27	3	5/02
30	3	6/11
34	7	6/29
29	6	6/30
30	6	7/02
29	6	7/02
31	6	11/06

CV = 32 ± 1 ug/L

Result	Uncer.	Date
30	6	8/11

CV = 33 ± 1.4 ug/L

Result	Uncer.	Date
31	6	8/27

CV = 36 ± 1.5 ug/L

Result	Uncer.	Date
40	8	3/11
37	8	3/11
33	3	5/02
36	4	5/02

CV = 38 ± 1.6 ug/L

Result	Uncer.	Date
37	4	9/17

CV = 40 ± 1.7 ug/L

Result	Uncer.	Date
39	8	4/06
38	8	4/06
39	4	5/02
34	3	5/02
40	8	5/26
37	8	5/28
40	4	6/11
42	8	10/23
43	8	10/23

CV = 44 ± 2 ug/L

Result	Uncer.	Date
38	8	7/17
42	8	9/18
40	8	9/18

Se (cont)

CV = 45 ± 1.9 ug/L

Result	Uncer.	Date
46	9	6/10

CV = 46 ± 2 ug/L

Result	Uncer.	Date
46	9	8/18

CV = 48 ± 2.1 ug/L

Result	Uncer.	Date
48	10	3/27
51	10	8/18

CV = 50 ± 2 ug/L

Result	Uncer.	Date
48	5	5/02
45	5	5/02
45	5	5/02
48	5	5/02
48	5	5/02
49	5	5/02
57	6	5/13
57	6	5/13
46	10	5/27
48	9	5/27
46	9	5/27
43	8	5/28
42	8	5/28
52	10	5/28
48	10	5/28
49	10	6/10
47	9	6/12
54	10	6/29
52	10	6/30
50	10	6/30
49	10	6/30
46	9	6/30
53	10	6/30
50	5	7/02
50	5	7/02
51	10	7/02
48	5	7/02
44	9	7/17
52	5	8/05
49	5	8/05
46	9	8/11
47	10	8/12
48	10	8/12
49	10	8/14
48	10	8/17
45	9	8/17
48	10	8/18
50	10	8/18
47	9	8/27
50	10	8/28
48	9	8/28
48	9	9/17
44	8	9/18
48	10	9/18
47	9	9/18
47	8	9/18
55	10	10/23
53	10	10/23
53	10	10/23
52	10	10/23
53	10	10/23
44	8	10/26
56	6	10/26

Se (cont)

52	10	10/26
50	10	11/06
49	5	12/03
48	9	12/08

CV = 52 ± 2.2 ug/L

Result	Uncer.	Date
53	10	9/18

CV = 53 ± 5 ug/L

Result	Uncer.	Date
57	10	1/27
59	10	1/27
49	9	1/29
50	10	1/29
50	10	2/13
52	10	2/13

CV = 54 ± 2.3 ug/L

Result	Uncer.	Date
51	10	3/24
55	6	6/11

CV = 56 ± 6 ug/L

Result	Uncer.	Date
44	8	1/16
58	11	1/16
58	12	2/11
60	12	2/11
61	12	2/11
57	11	2/28
56	10	12/09

CV = 59 ± 6 ug/L

Result	Uncer.	Date
53	10	1/29
51	10	1/29
66	14	2/11
56	11	2/28
62	12	3/02
65	14	3/11
70	14	3/11

CV = 60 ± 2.6 ug/L

Result	Uncer.	Date
57	11	5/27
55	10	5/27
53	10	6/12
66	13	6/29

CV = 64 ± 3 ug/L

Result	Uncer.	Date
68	7	6/10

CV = 79 ± 3.4 ug/L

Result	Uncer.	Date
85	9	6/10
84	8	6/10
84	8	6/11
83	8	6/11

Se (cont)

80	8	6/11
83	8	6/11
79	8	6/12
82	8	6/12

CV = 80 ± 3.5 ug/L

Result	Uncer.	Date
83	16	6/10
73	15	11/19

CV = 1.21 ± 0.05 mg/L

Result	Uncer.	Date
1.4	0.3	10/26

Se 91GAU 02 FAA

CV = 3.2 ± 0.1 mg/L

Result	Uncer.	Date
3.3	0.7	1/23
3.5	0.7	1/23

Se 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.04		5/27

CV = 15995 ± 688 ug/L

Result	Uncer.	Date
17000	2000	5/08

CV = 1.4 ± 0.06 mg/L

Result	Uncer.	Date
1.5	0.2	5/21

CV = 2 ± 0.2 mg/L

Result	Uncer.	Date
2	0.2	5/20

CV = 5 ± 0.5 mg/L

Result	Uncer.	Date
5.6	0.6	5/20
5.5	0.6	5/21

CV = 8 ± 0.3 mg/L

Result	Uncer.	Date
8.1	0.8	5/27

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	1	5/08
11	1	5/20
10	1	5/20
10	1	5/21

TABLE E-IV (cont)

****

EM-9 Trace Elements in Water (cont)

****

Se (cont)

9.2	0.9	5/27
9	0.9	5/27
9.1	0.9	5/28
9.2	0.9	5/28

Se 92GAU 02 ICPMS

CV = 12 ± 0.5 ug/L

Result	Uncer.	Date
13	1	12/11

CV = 30 ± 1.3 ug/L

Result	Uncer.	Date
260	30	4/27

CV = 40 ± 1.7 ug/L

Result	Uncer.	Date
30	8	12/11

CV = 50 ± 2 ug/L

Result	Uncer.	Date
40	4	6/29
39	4	6/30

CV = 60 ± 2.6 ug/L

Result	Uncer.	Date
47	5	6/26
43	4	6/26

CV = 75 ± 3 ug/L

Result	Uncer.	Date
55	6	6/26
58	6	6/30

CV = 80 ± 3 ug/L

Result	Uncer.	Date
410	40	4/27

CV = 93 ± 4 ug/L

Result	Uncer.	Date
< 200		8/31

CV = 98 ± 4 ug/L

Result	Uncer.	Date
72	7	6/26
73	7	6/29

Se (cont)

CV = 100 ± 10 ug/L

Result	Uncer.	Date
110	10	4/28
110	10	4/28
100	10	5/06
110	10	5/06
100	10	5/06
109	10	6/26
112	10	6/26
123	10	6/26
110	10	6/26
107	10	6/26
123	10	6/26
112	10	6/26
98	10	6/30
96	10	6/30
86	10	6/30
100	10	6/30
100	10	6/30
95	10	6/30
92	10	6/30
97	10	12/15
86	9	12/15
91	9	12/15
90	9	12/15

CV = 4 ± 0.2 mg/L

Result	Uncer.	Date
4.3	0.4	4/27

Se 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
95	19	3/27
120	20	8/05
< 100		8/11

SiO2 91GAU 02 FIA

CV = not spiked mg/L

Result	Uncer.	Date
0	2	6/25
0	2	6/25
0	1	11/20
0	1	11/20
0	1	11/20

CV = 51 ± 5 ug/mL

Result	Uncer.	Date
56	6	1/24
55	6	1/24
56	6	1/24
54	5	3/06
49	5	9/28

CV = 6.4 ± 0.19 mg/L

Result	Uncer.	Date
6	1	1/24
7	1	9/23
7	1	11/20
6	1	11/20

SiO2 (cont)

CV = 21.4 ± 0.6 mg/L

Result	Uncer.	Date
23	2	1/24

CV = 26 ± 3 mg/L

Result	Uncer.	Date
27	3	3/02
26	3	3/02

CV = 36.4 ± 1.1 mg/L

Result	Uncer.	Date
38	4	9/23
38	4	11/20

CV = 49 ± 1.5 mg/L

Result	Uncer.	Date
50	5	9/23
51	5	9/23
50	5	9/23
50	5	9/23
49	5	9/23
52	5	9/23
58	6	11/20
55	6	11/20
52	5	11/20
51	5	11/20
51	5	11/20
48	5	11/20
49	5	11/20
49	5	11/20

CV = 57.7 ± 1.7 mg/L

Result	Uncer.	Date
61	6	3/06
60	6	6/25

CV = 85.6 ± 2.6 mg/L

Result	Uncer.	Date
84	8	9/23
94	9	11/20

CV = 86 ± 9 mg/L

Result	Uncer.	Date
93	9	1/24
87	9	3/02
89	9	3/02

CV = 128.3 ± 3.8 mg/L

Result	Uncer.	Date
140	10	9/23
140	10	9/23

SiO2 91GAU 02 ISE

CV = 51 ± 5 ug/mL

Result	Uncer.	Date
61	6	6/25
61	6	6/25

Sm 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Sn 91GAU 02 ICPES

CV = 15 ± 0.8 mg/L

Result	Uncer.	Date
15	2	5/20
15	2	5/20

CV = 16 ± 0.8 mg/L

Result	Uncer.	Date
17	2	5/20
16	2	5/20
16	2	5/21

CV = 25 ± 1 mg/L

Result	Uncer.	Date
27	3	5/20

Sn 92GAU 02 ICPMS

CV = 120 ± 6 ug/L

Result	Uncer.	Date
2900	300	9/30

Sn 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

SO4 92GAU 04 FIA

CV = 18 ± 1.28 mg/L

Result	Uncer.	Date
22	2	8/25

SO4 91GAU 01 IC

CV = 5.1 ± 0.5 mg/L

Result	Uncer.	Date
4.5	1	6/03

CV = 6 ± 0.6 mg/L

Result	Uncer.	Date
5.3	1	2/13

SO4 (cont)

CV = 15 ± 2 mg/L

Result	Uncer.	Date
14	1	1/15
14	1	10/01

CV = 16 ± 1.14 mg/L

Result	Uncer.	Date
20	2	1/15
18	2	3/06
18	2	8/13
15	2	8/26
15	2	8/27
15	2	10/22

CV = 18 ± 1.28 mg/L

Result	Uncer.	Date
17	2	8/26
17	2	9/11
17	2	10/27
17	2	11/25

CV = 20 ± 1 mg/L

Result	Uncer.	Date
18	2	12/03

CV = 21 ± 1.49 mg/L

Result	Uncer.	Date
22	2	4/10
20	2	6/09

CV = 24 ± 2 mg/L

Result	Uncer.	Date
24	2	2/13
30	3	5/14
22	2	10/16
22	2	10/16
22	2	10/22

CV = 27 ± 3 mg/L

Result	Uncer.	Date
21	2	6/09

CV = 28 ± 1 mg/L

Result	Uncer.	Date
30	3	7/07

Sr 92GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.001		7/15
< 0.0005		7/16
< 0.0005		7/28
< 0.006		8/24
< 0.006		9/10

Sr (cont)

CV = 3 ± 0.1 ug/L

Result	Uncer.	Date
5.8	3	4/23

CV = 6 ± 0.2 ug/L

Result	Uncer.	Date
6	3	10/09

CV = 30 ± 1 ug/L

Result	Uncer.	Date
33	2	10/09

CV = 150 ± 6 ug/L

Result	Uncer.	Date
156	8	4/23

CV = 260 ± 10 ug/L

Result	Uncer.	Date
280	30	12/09

CV = 500 ± 22 ug/L

Result	Uncer.	Date
530	40	10/09

CV = 1600 ± 69 ug/L

Result	Uncer.	Date
1700	200	6/23
1700	200	7/16
1700	200	7/16
1700	200	7/16
1700	200	7/16
1600	200	7/28
1600	200	7/28
1700	200	7/29
1500	200	7/29
1700	200	8/05
1700	200	8/05
1700	200	8/17
1700	200	8/17
1700	200	8/25
1700	200	8/25
1700	200	8/27
1600	200	8/31
1700	200	8/31
1700	200	9/10
1600	200	9/14
1700	200	9/14

CV = 0.03 ± 0.001 mg/L

Result	Uncer.	Date
0.032	0.003	6/22
0.03	0.006	8/13
0.032	0.006	8/24
0.02	0.006	8/27
0.03	0.006	9/10

TABLE E-IV (cont)

****

EM-9 Trace Elements in Water
(cont)

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Sr (cont)

CV = 0.04 ± 0.002 mg/L

Result	Uncer.	Date
0.044	0.006	8/24
0.04	0.006	8/27
0.04	0.01	8/31
0.04	0.006	9/08

CV = 0.26 ± 0.01 mg/L

Result	Uncer.	Date
0.28	0.03	7/15
0.27	0.03	7/28
0.27	0.03	9/10

CV = 0.5 ± 0.02 mg/L

Result	Uncer.	Date
0.53	0.05	6/23
0.54	0.05	7/16
0.31	0.03	8/13
0.54	0.05	9/08

CV = 0.75 ± 0.03 mg/L

Result	Uncer.	Date
0.8	0.08	6/19
0.8	0.08	8/06
0.81	0.08	8/31

CV = 1.5 ± 0.06 mg/L

Result	Uncer.	Date
1.59	0.08	4/23

CV = 10 ± 0.4 mg/L

Result	Uncer.	Date
10.4	0.2	10/09
10	1	12/09
11	1	12/09

Sr 91GAU 02 ICPMS

CV = not spiked ug/L

Result	Uncer.	Date
< 1		1/28
< 1		1/28

CV = 120 ± 5 ug/L

Result	Uncer.	Date
120	10	9/21

CV = 140 ± 14 ug/L

Result	Uncer.	Date
143	7	1/06
110	20	2/27
128	6	4/14

Sr (cont)

CV = 150 ± 6 ug/L

Result	Uncer.	Date
163	8	12/03

CV = 200 ± 8.6 ug/L

Result	Uncer.	Date
187	9	1/28

CV = 226 ± 10 ug/L

Result	Uncer.	Date
250	30	8/31

CV = 250 ± 11 ug/L

Result	Uncer.	Date
248	12	9/02

CV = 340 ± 34 ug/L

Result	Uncer.	Date
331	17	1/09
352	18	3/09
341	17	3/20

CV = 491 ± 21 ug/L

Result	Uncer.	Date
520	50	6/02
517	26	10/20
493	25	12/18

CV = 702 ± 30 ug/L

Result	Uncer.	Date
727	36	10/16
782	39	11/20

Sr 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Ta 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Total Alkalinity
92GAU 04 COLOR

CV = 25.4 ± 1.54 mg/L

Result	Uncer.	Date
25	4	6/17

Total Alkalinity (cont)

CV = 29 ± 1.76 mg/L

Result	Uncer.	Date
34	3	12/04

CV = 48.4 ± 2.94 mg/L

Result	Uncer.	Date
53	5	10/01
57	6	10/21
57	6	11/05
52	5	12/04

Total Alkalinity
91GAU 04 TITR

CV = 19.4 ± 1.18 mg/L

Result	Uncer.	Date
21	2	1/14
25	3	3/06
21	2	9/10
20	2	9/10
25	3	10/30

CV = 21.8 ± 1.32 mg/L

Result	Uncer.	Date
23	2	5/20
23	2	5/20
23	4	6/17
23	2	9/02
27	3	10/01
27	3	11/05

CV = 25.4 ± 1.54 mg/L

Result	Uncer.	Date
27	3	4/07

CV = 29 ± 1.76 mg/L

Result	Uncer.	Date
31	3	10/09
33	3	10/30

Tb 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Total Dissolved Solids
91GAU 04 GRAV

CV = 122 ± 15 mg/L

Result	Uncer.	Date
120	10	1/10
150	20	3/06
130	10	8/13
130	10	8/21
82	8	10/15
85	8	10/15

Total Dissolved Solids (cont)

CV = 138 ± 17 mg/L

Result	Uncer.	Date
150	20	5/14
140	10	6/10
160	20	8/26
120	10	9/11
140	10	11/12
130	10	12/04

CV = 160 ± 19.8 mg/L

Result	Uncer.	Date
150	20	4/08
190	20	6/10

CV = 184 ± 22.6 mg/L

Result	Uncer.	Date
180	20	10/15
180	20	10/15
200	20	10/15
180	20	12/04

Te 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Th 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Ti 92GAU 02 ICPES

CV = 120 ± 5 ug/L

Result	Uncer.	Date
124	1	10/21

CV = 482 ± 21 ug/L

Result	Uncer.	Date
496	3	10/21

CV = 0.4 ± 0.02 mg/L

Result	Uncer.	Date
0.42	0.01	10/21

CV = 50 ± 2 mg/L

Result	Uncer.	Date
50.4	0.1	10/21

Ti 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
96	19	3/27
110	20	8/05
100	20	8/11

Total Kjeldahl Nitrogen
92GAU 04 FIA

CV = 5.5 ± 0.48 mg/L

Result	Uncer.	Date
6.1	0.6	12/03

Tl 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
0.01	0.01	3/23
< 10		7/16

CV = 200 ± 9 ug/L

Result	Uncer.	Date
360	18	4/23

CV = 24938 ± 1072 ug/L

Result	Uncer.	Date
25000	3000	12/08

CV = 2.4 ± 0.1 mg/L

Result	Uncer.	Date
2.4	0.5	1/07

CV = 2.5 ± 0.11 mg/L

Result	Uncer.	Date
2.6	0.3	3/30
2.2	0.2	7/16
2.3	0.2	7/16
2.6	0.3	7/16
2.21	0.2	7/16
2.3	0.2	7/28
2.3	0.2	7/28
2.2	0.2	7/29
2.4	0.2	7/29
2.6	0.3	8/04
2.6	0.3	8/04
2.7	0.3	8/05
2.7	0.3	8/05
2.1	0.2	8/17
2.6	0.3	8/17
2.1	0.2	8/17
2.6	0.3	8/17
2.5	0.3	8/21
2.2	0.2	8/25
2.1	0.2	8/25
2.4	0.2	8/27
2.2	0.2	8/31
2	0.2	8/31
2.3	0.2	9/10
2.3	0.2	9/10
2.3	0.2	9/14
2.3	0.2	9/14

Tl (cont)

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
2.7	0.3	6/23
2.8	0.3	8/27
2.8	0.3	9/09
2.8	0.3	9/10

CV = 4.88 ± 0.21 mg/L

Result	Uncer.	Date
5	0.5	3/11

CV = 5 ± 0.2 mg/L

Result	Uncer.	Date
5.1	0.5	7/15
4.7	0.5	9/10

CV = 6 ± 0.3 mg/L

Result	Uncer.	Date
6	0.6	7/15
5.4	0.5	7/28
5.4	0.5	7/28
5.9	0.6	8/05

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	2	1/07
11	1	3/11
10	1	3/16
11	1	3/23
11	1	3/23
11	1	3/24
11	1	3/30
12	1	4/01
9.2	0.9	5/08
9.3	0.9	5/12
10	1	6/11
9.8	1	6/19
9.3	0.9	6/19
11	1	6/22
9.6	1	6/23
9.4	0.9	8/24
9.4	0.9	8/27
9.5	1	12/04
10	1	12/04
10	1	12/08
12	1	12/08
11	1	12/09
12	1	12/09

CV = 14.4 ± 0.6 mg/L

Result	Uncer.	Date
14	1	6/22
13	1	7/16
14	1	8/04
13	1	9/08
13	1	9/10

CV = 15 ± 2 mg/L

Result	Uncer.	Date
16	2	3/23
15	2	6/11

TABLE E-IV (cont)

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EM-9 Trace Elements in Water (cont)

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Tl (cont)

CV = 16 ± 1.6 mg/L

Result	Uncer.	Date
16	2	6/19
16	2	6/22
15	2	7/16
16	2	7/16
15	2	7/16
17	2	7/16
15	2	7/28
15	2	7/28
17	2	7/29
15	2	7/29
18	2	8/04
17	2	8/04
17	2	8/05
17	2	8/05
15	2	8/17
16	2	8/17
16	2	8/25
16	2	8/25
16	2	8/27
16	2	9/10
16	2	9/10
16	2	9/14
15	2	9/14

CV = 18 ± 0.8 mg/L

Result	Uncer.	Date
19	2	3/30
16	2	6/19
17	2	8/13
18	2	8/20
17	2	8/24

CV = 20 ± 0.9 mg/L

Result	Uncer.	Date
19	1	4/23

CV = 21.6 ± 0.9 mg/L

Result	Uncer.	Date
22	2	3/11

CV = 22 ± 0.9 mg/L

Result	Uncer.	Date
19	2	7/28
21	2	8/24
20	2	8/31
21	2	12/04

CV = 28 ± 1 mg/L

Result	Uncer.	Date
28	3	3/11
26	3	8/13
25	3	8/31

Tl (cont)

CV = 29.4 ± 1.3 mg/L

Result	Uncer.	Date
31	3	3/24
30	3	6/15

CV = 35 ± 1.5 mg/L

Result	Uncer.	Date
35	4	8/17

CV = 80 ± 3 mg/L

Result	Uncer.	Date
73.3	3.6	4/23
73	7	5/08

Tl 92GAU 02 ICPMS

CV = not spiked ug/L

Result	Uncer.	Date
< 0.2		12/18

CV = 5 ± 0.2 ug/L

Result	Uncer.	Date
5.2	0.5	6/11

CV = 6 ± 0.2 ug/L

Result	Uncer.	Date
7	1	10/27

CV = 8 ± 0.3 ug/L

Result	Uncer.	Date
8.6	1	3/09
12	1	9/02

CV = 10 ± 0.4 ug/L

Result	Uncer.	Date
10	0.5	3/04
15	2	4/27

CV = 14 ± 0.6 ug/L

Result	Uncer.	Date
35	7	2/27

CV = 15 ± 2 ug/L

Result	Uncer.	Date
14.2	0.7	2/04

CV = 16 ± 0.7 ug/L

Result	Uncer.	Date
13.8	1	6/02
< 200		8/31
16	2	10/13

Tl (cont)

CV = 24 ± 1 ug/L

Result	Uncer.	Date
22	2	9/02
20	2	10/26

CV = 36 ± 1.5 ug/L

Result	Uncer.	Date
38	4	4/27

CV = 50 ± 2.2 ug/L

Result	Uncer.	Date
48	5	11/12

CV = 100 ± 10 ug/L

Result	Uncer.	Date
99	10	1/08
100	10	1/08
100	10	1/08
97	10	2/12
96	10	2/28
96	10	4/03
99	10	4/03
97	10	4/03
100	10	4/03
94	9	4/24
81	8	4/24
100	10	4/28
100	10	4/28
100	10	5/06
100	10	5/06
111	10	6/01
122	10	6/01
94	9	6/02
97	10	6/05
100	10	6/05
92	9	7/01
87	9	7/01
110	10	7/02
99	10	7/09
100	10	7/27
100	10	7/27
100	10	7/27
100	10	7/27
100	10	7/28
100	10	7/28
85	9	7/30
89	9	8/07
100	10	8/31
130	10	8/31
110	10	8/31
120	10	8/31
98	10	9/25
120	10	12/15
130	10	12/15
94	9	12/15
97	10	12/15
110	10	12/15
120	10	12/15
120	10	12/15
94	9	12/15

CV = 120 ± 5 ug/L

Result	Uncer.	Date
130	10	10/27

Tl (cont)

CV = 200 ± 20 ug/L

Result	Uncer.	Date
200	20	3/09
180	20	3/09
180	20	3/09
200	20	3/09
200	20	5/06
200	20	5/06

CV = 230 ± 20 ug/L

Result	Uncer.	Date
240	20	1/08
230	20	1/08
240	20	2/12
230	20	4/02
240	20	4/02
230	20	6/04
240	20	8/31
240	20	8/31

CV = 800 ± 80 ug/L

Result	Uncer.	Date
880	90	12/11

CV = 1.5 ± 0.15 mg/L

Result	Uncer.	Date
1.4	0.1	12/11

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
2.6	0.3	4/24

CV = 3.2 ± 0.1 mg/L

Result	Uncer.	Date
3.1	0.3	4/27

Tl 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	20	3/27
110	20	8/05
100	20	8/11

Tm 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

U 92GAU 03 ICPMS

CV = 40 ± 1.7 ug/L

Result	Uncer.	Date
42	2.1	7/28
40.9	2	7/28
41	4	8/25
37	4	12/18

CV = 45 ± 2 ug/L

Result	Uncer.	Date
45	2	1/08
47	5	1/08
46.1	2.3	1/08
47	2.4	1/14
53	5	1/14
46	2.3	1/14
48.4	2.4	2/03
50.1	2.5	2/03
46.9	2.4	2/03
46.6	1.5	2/04
46.3	0.4	2/04
42.5	2.2	2/04
30	5	2/04
46.4	0.2	2/04
40.1	2	2/04
48.2	2.4	2/06
53.5	2.7	2/06
46.2	2.3	2/06
51.9	2.6	2/06
51.9	2.6	2/11
50.9	2.5	2/11
46	2.3	2/11
54	5	2/21
53	5	2/21
55	6	2/21
47	5	2/21
47	5	2/27
56	6	2/27
52	5	2/27
48	5	2/27
47	5	2/27
47.5	2.4	3/04
44.8	2.2	3/04
48.3	2.4	3/04
41	2.1	3/05
34.1	1.7	3/05
49	5	3/27
46	5	3/27
43	4	4/07
42	4	4/07
44	4	4/07
45	5	4/07
44	4	4/07
42	4	4/07
46	5	4/07
47	5	4/07
46	5	4/07
47	5	4/07
43	4	4/07
42	4	4/07
44	4	4/07
47	5	4/07
38	4	4/08
40	4	4/08
42	4	4/08
41	4	4/08
45	5	5/04
46	45	5/04
46	5	5/04
40.5	2.1	5/18
43.1	2.2	5/18
48.5	2.4	5/19
46	2.3	5/19
44.1	2.2	5/19
43.9	2.2	5/29

U (cont)

41.8	2.2	5/29
43	4	6/15
44	4	6/15
43	4	6/15
42	4	6/15
45	5	6/15
44	4	6/15
40	4	6/15
44	4	6/15
43	4	6/15
42.3	2.1	6/29
41.9	2.1	6/29
43.1	2.2	7/02
47.4	2.4	7/02
44.3	2.2	7/02
43.8	2.2	7/02
45.3	2.3	7/02
41.9	2.1	7/02
43.4	2.2	7/02
40.6	2	7/02
38.1	1.9	7/06
41.6	2.1	7/06
42	4	7/17
42	4	7/17
43.6	2.2	7/28
45	2.2	7/28
49.2	2.5	8/10
46.5	2.3	8/10
44	4	8/14
46	5	8/14
45	5	8/17
45	5	8/17
44.1	2.2	8/19
52	5	8/25
50	5	8/25
46	5	8/25
47	5	8/25
47	5	8/25
44	4	8/26
49	5	8/26
46	5	9/01
41	4	9/01
47	5	9/01
42.3	2.1	9/02
44.6	2.2	9/02
48.4	2.4	9/02
43.7	2.2	9/08
44	2.3	9/17
45.4	2.3	9/17
43.8	2.3	9/17
49	5	10/13
45.8	2.3	10/27
44.5	2.2	11/13
43.6	2.2	11/13
50	5	12/14
50	5	12/14
44.1	0.6	12/16
45	4	12/16
42	4	12/18
43	4	12/18
45	5	12/18

CV = 50 ± 5 ug/L

Result	Uncer.	Date
50	5	7/28
48	5	7/28

CV = 52 ± 2.2 ug/L

Result	Uncer.	Date
59.6	3	7/02
50.6	2.5	7/06

TABLE E-IV (cont)

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EM-9 Trace Elements in Water
(cont)

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U (cont)

CV = 55 ± 2.4 ug/L

Result	Uncer.	Date
55	6	3/26
50	5	4/30
51	6	5/18
57	6	8/25
58.5	2.9	9/08

CV = 56 ± 6 ug/L

Result	Uncer.	Date
56	6	6/15

CV = 60 ± 2.6 ug/L

Result	Uncer.	Date
52	5	4/29
57	6	9/01
58	6	9/01
60.4	3	9/17
70	3.5	10/27

CV = 65 ± 2.8 ug/L

Result	Uncer.	Date
62	6	4/30
62	6	5/19

CV = 66 ± 7 ug/L

Result	Uncer.	Date
63.8	3.2	5/29

CV = 70 ± 3 ug/L

Result	Uncer.	Date
68	7	8/14
67	7	8/19
70.4	3.5	9/17
73.7	3.7	11/03
73.1	3.6	11/03
74.6	3.7	11/13
58	6	12/16

CV = 72 ± 7 ug/L

Result	Uncer.	Date
74	7	5/04
79.9	4	5/22

CV = 74 ± 7 ug/L

Result	Uncer.	Date
74	7	6/15

CV = 80 ± 8 ug/L

Result	Uncer.	Date
83	8	3/27
70	7	4/29
71	7	4/29

U (cont)

77	8	4/30
72	7	5/18
80	8	6/02
85	9	12/11

CV = 84 ± 8 ug/L

Result	Uncer.	Date
71	7	2/11
80	8	2/21
71	7	2/27

CV = 86 ± 3.7 ug/L

Result	Uncer.	Date
85.6	4.3	6/29
86.8	4.4	7/02

CV = 88 ± 9 ug/L

Result	Uncer.	Date
89	9	5/04
92.3	4.6	5/22

CV = 90 ± 3.9 ug/L

Result	Uncer.	Date
96.2	4.8	3/04
45	5	4/07
120	10	5/08
89	9	6/12
100	10	8/25
85.7	4.3	9/02

Sample run on 4/7 was incorrectly spiked with the wrong solution, which was 50 ± 5 ug/L.

CV = 92 ± 9 ug/L

Result	Uncer.	Date
91	9	6/12

CV = 94 ± 9 ug/L

Result	Uncer.	Date
101	2	2/07
98	10	5/04

CV = 100 ± 10 ug/L

Result	Uncer.	Date
110	10	1/08
100	10	1/08
110	10	1/08
110	10	2/10
110	10	2/10
130	10	2/12
100	20	2/27
93	8.3	2/28
126	6	3/05
100	20	3/09
100	20	3/09
84	17	3/09
84	16	3/09
93	9	3/26
94	9	3/26
100	10	4/03
97	10	4/03
100	10	4/03

U (cont)

100	10	4/03
84	8	4/29
100	10	4/29
88	9	4/29
88	9	4/29
100	10	4/29
90	9	4/30
91	9	4/30
95	9	4/30
94.7	0.9	4/30
91	9	4/30
90	9	4/30
93	9	4/30
95	9	4/30
91	9	4/30
93	9	4/30
93	9	4/30
90	9	4/30
99	10	5/06
94	9	5/06
110	10	5/06
100	10	5/06
93	9	5/08
97	10	5/19
94	9	5/28
90	9	5/28
100	10	6/02
97	9	6/02
91	9	6/05
97	10	6/05
100	10	7/02
97	10	7/27
100	10	7/27
110	10	7/27
100	10	7/27
100	10	8/25
94	9	8/31
96	10	8/31
120	10	8/31
100	10	8/31
101	5	9/17
100	10	9/28
110	10	9/28
100	10	9/28
120	10	10/07
110	10	10/07
100	10	10/13

CV = 120 ± 5.2 ug/L

Result	Uncer.	Date
150	10	8/31

CV = 140 ± 6 ug/L

Result	Uncer.	Date
130	10	4/29
142	7	5/29
132	7	7/02
160	20	8/25
146	8	9/02

CV = 200 ± 20 ug/L

Result	Uncer.	Date
200	20	1/08
220	20	1/08
230	20	2/12
220	20	2/12
190	20	4/02
200	20	4/02
180	20	6/04
190	20	8/31
180	20	8/31

U 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	20	3/27
100	20	8/05
100	20	8/11

U-235/238 91GAU 03 ICPMS

CV = 0.0072 ± 0.0007 ratio

Result	Uncer.	Date
0.0066	0.0004	1/14
0.0066	0.0002	1/14
0.007	0.0005	1/14
0.0072	0.0003	1/17
0.0068	0.0003	1/17
0.0068	0.0003	1/17
0.0064	0.0006	1/17
0.0069	0.0004	1/17
0.0074	0.0003	1/27
0.0074	0.0002	1/27
0.0072	0.0002	1/27
0.0068	0.0002	1/27
0.0072	0.0002	1/27
0.0071	0.0002	1/27
0.0072	0.0002	1/28
0.007	0.0004	1/28
0.0078	0.0002	2/03
0.007	0.001	2/03
0.0067	0.0002	2/03
0.0082	0.0003	2/11
0.0078	0.0002	2/11
0.0076	0.0002	2/11
0.0079	0.0002	2/11
0.0071	0.0002	2/21
0.007	0.0002	2/21
0.0074	0.0005	2/21
0.0074	0.0002	2/21
0.0073	0.0004	2/21
0.0077	0.0002	2/27
0.0076	0.0002	2/27
0.0081	0.0002	2/27
0.0071	0.0004	2/27
0.0077	0.0002	2/27
0.0072	0.0003	2/27
0.0062	0.0002	3/30
0.0076	0.0002	3/30
0.0071	0.0004	4/01
0.0074	0.0002	4/07
0.0072	0.0005	4/07
0.0064	0.0002	4/07
0.0055	0.001	4/07
0.0051	0.002	4/07
0.0051	0.002	4/07
0.0066	0.002	4/07
0.0069	0.0007	4/07
0.007	0.0002	4/07
0.0062	0.0014	4/07
0.007	0.0002	4/07
0.0067	0.0037	4/07
0.0073	0.0005	4/08
0.0069	0.0001	4/08
0.0077	0.0004	4/08
0.0077	0.0003	5/04
0.0069	0.0002	5/04
0.0072	0.0005	5/04
0.0069	0.0002	5/04
0.0062	0.0018	5/04
0.0072	0.0005	5/04
0.0073	0.0002	5/08
0.0077	0.0002	5/18
0.0083	0.0006	5/18
0.0076	0.0002	5/18
0.0069	0.0007	5/18

U-235/238 (cont)

0.007	0.0006	6/15
0.0077	0.0004	6/15
0.0072	0.0005	6/15
0.0071	0.0008	6/15
0.0084	0.0017	6/15
0.0066	0.0007	6/15
0.0083	0.0015	6/15
0.0074	0.0006	6/15
0.0077	0.0005	6/15
0.0076	0.0004	6/29
0.0074	0.0013	6/29
0.008	0.0008	6/29
0.0079	0.0002	6/29
0.0073	0.0007	7/02
0.0071	0.0006	7/02
0.0071	0.0014	7/02
0.0077	0.0017	7/02
0.0072	0.0002	7/02
0.0068	0.001	8/12
0.0075	0.0004	8/12
0.0071	0.0004	8/26
0.0069	0.0002	8/26
0.0064	0.0003	8/26
0.0064	0.0002	8/26
0.0069	0.0002	8/26
0.0065	0.0002	8/26
0.0071	0.0003	8/26
0.0068	0.0003	8/26
0.0072	0.0002	8/26
0.0071	0.0003	8/26
0.007	0.0007	9/01
0.0071	0.0002	9/01
0.007	0.0008	9/01
0.0073	0.0003	9/01
0.0071	0.0002	9/17
0.0072	0.0002	9/17
0.0075	0.0002	9/17
0.0069	0.0003	9/17
0.0069	0.0004	9/17

V 92GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
< 0.006		3/11
< 0.005		3/23
< 2		7/16
< 0.007		8/13
< 0.007		8/31

CV = 30 ± 1.3 ug/L

Result	Uncer.	Date
33	4	4/23

CV = 400 ± 20 ug/L

Result	Uncer.	Date
400	80	1/07

CV = 998 ± 43 ug/L

Result	Uncer.	Date
1030	60	10/09

CV = 0.4 ± 0.02 mg/L

Result	Uncer.	Date
0.38	0.04	7/28
0.42	0.04	8/24
0.4	0.04	8/31

V (cont)

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
0.96	0.1	6/23
1	0.1	8/27
1	0.1	9/09
1	0.1	9/10

CV = 1.3 ± 0.06 mg/L

Result	Uncer.	Date
1.3	0.1	12/09

CV = 1.6 ± 0.07 mg/L

Result	Uncer.	Date
1.6	0.2	7/15
1.6	0.2	9/10
1.6	0.2	10/09

CV = 1.8 ± 0.08 mg/L

Result	Uncer.	Date
1.8	0.2	3/30
1.8	0.2	6/19
1.8	0.2	8/13
1.8	1.8	8/20
1.9	0.2	8/24

CV = 2.2 ± 0.09 mg/L

Result	Uncer.	Date
2.1	0.2	7/15
2.1	0.2	7/28
2.1	0.2	7/28
2.2	0.2	8/05

CV = 2.4 ± 0.1 mg/L

Result	Uncer.	Date
2.4	0.2	3/11

CV = 2.5 ± 0.11 mg/L

Result	Uncer.	Date
2.5	0.3	3/24
2.4	0.2	3/30
2.6	0.3	7/16
2.5	0.3	7/16
2.7	0.3	7/16
2.6	0.3	7/16
2.4	0.2	7/28
2.4	0.2	7/28
2.5	0.3	7/29
2.2	0.2	7/29
2.5	0.3	8/04
2.5	0.3	8/04
2.5	0.3	8/05
2.5	0.3	8/05
2.5	0.3	8/17
2.5	0.3	8/17
2.4	0.2	8/21
2.6	0.3	8/25
2.6	0.3	8/25
2.5	0.3	8/27
2.4	0.2	8/31
2.5	0.3	8/31
2.4	0.2	9/10
2.5	0.3	9/10
2.4	0.2	9/14
2.5	0.3	9/14

TABLE E-IV (cont)

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EM-9 Trace Elements in Water (cont)

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V (cont)

CV = 3 ± 0.1 mg/L

Result	Uncer.	Date
2.83	0.14	4/23

CV = 3.6 ± 0.2 mg/L

Result	Uncer.	Date
3.6	0.4	3/24
3.6	0.4	6/11
3.7	0.4	8/24
3.5	0.4	8/27

CV = 4.6 ± 0.2 mg/L

Result	Uncer.	Date
4.3	0.4	6/22
4.7	0.5	7/16
4.4	0.4	8/04
4.4	0.4	9/08
4.4	0.4	9/10

CV = 4.8 ± 0.2 mg/L

Result	Uncer.	Date
4.6	0.9	3/11

CV = 10 ± 1 mg/L

Result	Uncer.	Date
9.9	2	1/07
11	1	3/11
10	1	3/16
10	1	3/23
11	1	3/23
10	1	3/24
10	1	3/30
10	1	4/01
9.86	0.49	4/23
9.35	0.47	4/24
8.5	0.9	6/11
9.7	1	6/19
9.5	1	6/19
9.5	1	6/22
9.5	1	6/23
10.3	0.2	10/09
10.2	0.2	10/09
9.9	1	12/09
10	1	12/09

CV = 12 ± 0.5 mg/L

Result	Uncer.	Date
11.8	0.6	4/23

V 92GAU 02 ICPMS

CV = 31.9 ± 1.4 ug/L

Result	Uncer.	Date
34	3	6/02
35	4	10/21

V (cont)

CV = 38.9 ± 1.7 ug/L

Result	Uncer.	Date
47	5	10/16
44	4	11/20

CV = 40 ± 1.7 ug/L

Result	Uncer.	Date
42	4	9/01

CV = 50 ± 2.2 ug/L

Result	Uncer.	Date
47.2	2.4	3/16
62.2	4.4	3/20

CV = 60 ± 6 ug/L

Result	Uncer.	Date
67	7	1/14

CV = 70 ± 3 ug/L

Result	Uncer.	Date
85	17	2/27

CV = 80 ± 8 ug/L

Result	Uncer.	Date
83	8	1/06

CV = 90 ± 3.9 ug/L

Result	Uncer.	Date
92	9	9/23

CV = 100 ± 10 ug/L

Result	Uncer.	Date
85	9	2/28
117	8	3/20
74	7	4/24
90	9	4/24
110	10	6/02
140	10	6/05
70	7	6/05
84	8	6/05
100	10	6/05
101	5	8/03
100	10	8/03
99	10	8/17
100	10	8/17
110	10	9/23
100	10	9/23
120	10	9/23
99	10	9/23
106	10	9/23
100	10	9/24
100	10	10/01
110	10	10/01
99	10	10/06
91	9	10/06
100	10	12/08
98	10	12/08
100	10	12/08
108	10	12/08
93	9	12/08
100	10	12/08
97	10	12/08

V (cont)

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
0.93	0.09	4/24
0.81	0.08	4/24

V 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	20	3/27
100	20	8/05
100	20	8/11

W 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Y 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Yb 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
< 10		8/11

Zn 93GAU 02 FAA

CV = 276 ± 12 ug/L

Result	Uncer.	Date
290	30	2/06
300	30	2/06
300	30	2/07
300	30	3/12
290	30	3/12
290	30	3/28
280	30	4/24
260	30	5/05

CV = 401 ± 17 ug/L

Result	Uncer.	Date
400	40	10/26

CV = 500 ± 20 ug/L

Result	Uncer.	Date
500	50	8/21

Zn (cont)

CV = 530 ± 23 ug/L

Result	Uncer.	Date
530	50	5/05

CV = 797 ± 34 ug/L

Result	Uncer.	Date
770	80	7/01

CV = 1150 ± 49 ug/L

Result	Uncer.	Date
1100	100	2/05
1100	100	3/28

CV = 1400 ± 60 ug/L

Result	Uncer.	Date
1300	100	7/01

CV = 1 ± 0.04 mg/L

Result	Uncer.	Date
1	0.1	8/03
1	0.1	8/21
0.99	0.1	8/21
1	0.1	8/31
1	0.1	8/31
0.76	0.08	10/26
0.99	0.1	10/26
1.1	0.1	12/09
1	0.1	12/09

CV = 1.15 ± 0.05 mg/L

Result	Uncer.	Date
1.1	0.1	8/31

CV = 1.16 ± 0.11 mg/L

Result	Uncer.	Date
1.16	0.1	1/06

Zn 91GAU 02 ICPES

CV = not spiked mg/L

Result	Uncer.	Date
0.01	0.006	1/07
< 2		7/16

CV = 20.1 ± 0.8 ug/L

Result	Uncer.	Date
23	1	4/23

CV = 100 ± 4 ug/L

Result	Uncer.	Date
100	4	11/19

CV = 500 ± 20 ug/L

Result	Uncer.	Date
510	50	12/09

Zn (cont)

CV = 502 ± 22 ug/L

Result	Uncer.	Date
493	8	11/19

CV = 600 ± 30 ug/L

Result	Uncer.	Date
610	60	3/24
630	60	6/11

CV = 0.4 ± 0.02 mg/L

Result	Uncer.	Date
0.39	0.04	6/22
0.46	0.05	7/16
0.4	0.04	8/04
0.41	0.04	9/08
0.39	0.04	9/10

CV = 0.72 ± 0.03 mg/L

Result	Uncer.	Date
0.82	0.08	8/24
0.8	0.08	8/27

CV = 0.98 ± 0.04 mg/L

Result	Uncer.	Date
0.98	0.1	7/15
0.98	0.1	7/28
0.97	0.1	7/28
1	0.1	8/05

CV = 1.2 ± 0.05 mg/L

Result	Uncer.	Date
1.4	0.1	3/17

CV = 1.4 ± 0.06 mg/L

Result	Uncer.	Date
1.5	0.2	3/30
1.4	0.1	6/19
1.4	0.1	8/13
1.5	1.5	8/20
1.6	0.2	8/24

CV = 1.66 ± 0.07 mg/L

Result	Uncer.	Date
1.9	0.2	3/17
1.7	0.2	8/13
1.8	0.2	8/31

CV = 2 ± 0.09 mg/L

Result	Uncer.	Date
2.2	0.2	3/17
2.66	0.13	4/23
2.1	0.2	7/15
2	0.2	9/10

Zn (cont)

CV = 2.3 ± 0.1 mg/L

Result	Uncer.	Date
2.1	0.2	6/23
2.4	0.2	8/27
2.4	0.2	9/09
2.3	0.2	9/10

CV = 2.51 ± 0.11 mg/L

Result	Uncer.	Date
2.3	0.2	3/24
2.5	0.3	3/30
2.9	0.3	7/16
2.6	0.3	7/16
2.8	0.3	7/16
2.4	0.2	7/16
2.5	0.2	7/28
2.5	0.3	7/28
2.4	0.2	7/29
2.5	0.3	7/29
2.5	0.3	8/04
2.5	0.3	8/04
2.5	0.3	8/05
2.5	0.3	8/05
2.6	0.3	8/17
2.6	0.3	8/17
2.5	0.3	8/21
2.7	0.3	8/25
2.5	0.3	8/25
2.6	0.3	8/27
2.6	0.3	8/31
2.5	0.3	8/31
2.5	0.3	9/10
2.5	0.3	9/10
2.4	0.2	9/14
2.4	0.2	9/14

CV = 2.8 ± 0.1 mg/L

Result	Uncer.	Date
2.7	0.3	7/28
3	0.3	8/24
3	0.3	8/31

CV = 3 ± 0.13 mg/L

Result	Uncer.	Date
3.2	0.3	3/23

CV = 8 ± 0.3 mg/L

Result	Uncer.	Date
7.77	0.39	4/23

CV = 10 ± 1 mg/L

Result	Uncer.	Date
10	2	1/07
11	1	3/16
11	1	3/23
10	1	3/23
10	1	3/24
11	1	3/30
11	1	4/01
9.58	0.48	4/23
9.18	0.46	4/24
11	1	6/11
9.1	0.9	6/19
9.7	1	6/19

TABLE E-IV (cont)

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EM-9 Trace Elements in Water (cont)

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Zn (cont)

9.8	1	6/22
9.8	1	6/23
10	1	12/09
9.8	1	12/09

Zn 92GAU 02 ICPMS

CV = 10 ± 1 ug/L

Result	Uncer.	Date
27	3	3/23
15	3	10/16
13	6	11/20

CV = 15 ± 0.6 ug/L

Result	Uncer.	Date
28	3	6/02
18	2	10/21

CV = 30 ± 3 ug/L

Result	Uncer.	Date
32	3	1/21

CV = 40 ± 1.7 ug/L

Result	Uncer.	Date
45	6	9/23

CV = 50 ± 2 ug/L

Result	Uncer.	Date
31	6	2/27

CV = 60.2 ± 2.6 ug/L

Result	Uncer.	Date
57	6	12/03

CV = 100 ± 10 ug/L

Result	Uncer.	Date
94	9	1/08
96	10	1/08
97	10	1/08
96	10	2/12
72	7	2/28
130	10	3/23
96	10	4/03
110	10	4/03
110	10	4/03
100	10	4/03
71	7	4/24
130	10	4/24
94	9	5/06
100	10	5/06
110	10	6/02
106	10	6/05
100	10	6/05
110	10	7/02
100	10	7/27
110	10	7/27

Zn (cont)

110	10	7/27
110	10	7/27
110	10	8/31
94	9	8/31
180	20	10/06
128	12	10/06
120	10	10/19
120	10	10/19
100	10	10/19
112	10	10/19
100	10	10/19
112	10	10/19
110	10	12/15
52	5	12/15
72	7	12/15
100	10	12/15
110	10	12/15
120	10	12/15

CV = 110 ± 10 ug/L

Result	Uncer.	Date
130	10	7/27
120	10	7/27

CV = 120 ± 5.2 ug/L

Result	Uncer.	Date
120	10	3/16

CV = 150 ± 6 ug/L

Result	Uncer.	Date
< 200		8/31

CV = 160 ± 20 ug/L

Result	Uncer.	Date
150	20	1/08
150	20	1/08
140	10	2/12
160	20	4/02
160	20	4/02
130	10	6/04
150	20	8/31
160	20	8/31
120	10	10/19

CV = 180 ± 18 ug/L

Result	Uncer.	Date
180	20	1/06
160	20	3/03
150	20	9/02

CV = 201 ± 9 ug/L

Result	Uncer.	Date
190	20	12/24

CV = 230 ± 20 ug/L

Result	Uncer.	Date
190	20	3/09
170	20	3/09
170	20	3/09
190	20	3/09
230	20	5/06
210	20	5/06

Zn (cont)

CV = 0.8 ± 0.03 mg/L

Result	Uncer.	Date
0.61	0.06	12/11
0.66	0.07	12/11

Zn 91MGB 01 MSCAN

CV = 100 ± 10 ug/L

Result	Uncer.	Date
100	20	3/27
110	20	8/05
110	20	8/11

Zr 91MGB 01 MSCAN

CV = not spiked ug/L

Result	Uncer.	Date
< 1		3/27
< 1		8/05
26	5	8/11

****

EM-9 Trace Elements on Filter Media

****

Ag 92GAU 02 ICPMS

CV = 0.5 ± 0.02 ug/filter

Result	Uncer.	Date
0.42	0.1	5/06
0.5	0.05	10/19

CV = 0.85 ± 0.03 ug/filter

Result	Uncer.	Date
0.69	0.1	5/06

CV = 0.9 ± 0.03 ug/filter

Result	Uncer.	Date
0.83	0.08	10/19

As 92GAU 02 ICPMS

CV = 0.55 ± 0.02 ug/filter

Result	Uncer.	Date
0.43	0.1	5/06

CV = 0.75 ± 0.03 ug/filter

Result	Uncer.	Date
0.62	0.1	5/06

CV = 5 ± 0.2 ug/filter

Result	Uncer.	Date
4.2	0.8	4/22

Ba 91GAU 02 FAA

CV = 50 ± 5 ug/filter

Result	Uncer.	Date
52	5	9/22

CV = 70 ± 7 ug/filter

Result	Uncer.	Date
69	7	9/22

Ba 92GAU 02 ICPMS

CV = 0.4 ± 0.01 ug/filter

Result	Uncer.	Date
0.4	0.1	6/01

CV = 0.5 ± 0.02 ug/filter

Result	Uncer.	Date
0.48		5/06
0.5	0.1	6/01

CV = 0.8 ± 0.03 ug/filter

Result	Uncer.	Date
0.7	0.1	5/06

CV = 15 ± 0.5 ug/filter

Result	Uncer.	Date
15	2	2/19
15	2	2/19

Be 92GAU 02 FAA

CV = not spiked ug/filter

Result	Uncer.	Date
< 0.1		1/31
< 0.1		2/06
< 0.1		2/11
< 0.1		6/17
< 0.1		6/18
< 0.1		6/18
< 0.1		9/21
< 0.1		9/22
< 0.1		9/30
< 0.1		10/06
< 0.1		10/20
< 0.1		10/27
< 0.1		11/19
< 0.1		12/23

CV = 1 ± 0.036 ug/filter

Result	Uncer.	Date
1.18	0.1	2/28
1	0.1	3/05
0.97	0.1	3/05
1	0.1	4/14
1.1	0.1	5/07
1.1	0.1	5/07
1	0.1	5/12
1	0.1	5/12
1	0.1	6/02
0.9	0.1	7/14
0.97	0.1	7/14

Be (cont)

1	0.1	7/28
1	0.1	9/21
9.6	1	9/21
1	0.1	9/22
1.2	0.1	10/27
1.1	0.1	12/08
0.8	0.08	12/16

CV = 1.2 ± 0.04 ug/filter

Result	Uncer.	Date
1.2	0.1	7/16

CV = 1.4 ± 0.05 ug/filter

Result	Uncer.	Date
1.4	0.1	7/16

CV = 1.6 ± 0.06 ug/filter

Result	Uncer.	Date
1.6	0.2	7/21

CV = 2 ± 0.07 ug/filter

Result	Uncer.	Date
2	0.2	7/21

CV = 2.2 ± 0.08 ug/filter

Result	Uncer.	Date
2.4	0.2	7/28

CV = 2.4 ± 0.09 ug/filter

Result	Uncer.	Date
2.5	0.3	7/28

CV = 2.5 ± 0.09 ug/filter

Result	Uncer.	Date
2.4	0.2	8/12
2.6	0.3	8/18
2.5	0.2	9/22
2.4	0.2	10/06

CV = 2.6 ± 0.09 ug/filter

Result	Uncer.	Date
2.4	0.3	8/04

CV = 2.8 ± 0.1 ug/filter

Result	Uncer.	Date
2.9	0.3	7/28

CV = 3 ± 0.108 ug/filter

Result	Uncer.	Date
3	0.3	3/05
3.4	0.3	3/16
3.8	0.4	3/16
3.3	0.3	3/24
3	0.3	4/02
3.2	0.3	5/14
3.1	0.3	5/27
3.2	0.3	6/02
3.2	0.3	6/02

Be (cont)

3.2	0.3	6/02
3	0.3	6/05
3.1	0.3	7/07
3.2	0.3	7/28
2.8	0.3	8/04
3	0.3	8/18
3.1	0.3	10/20
2.8	0.3	11/19
3.1	0.3	12/08
3.2	0.3	12/23
3.1	0.3	12/23

CV = 3.5 ± 0.1 ug/filter

Result	Uncer.	Date
3.3	0.3	8/21
3.2	0.3	8/25
3.5	0.4	9/21
3.7	0.4	9/22

CV = 5 ± 0.18 ug/filter

Result	Uncer.	Date
5.1	0.5	2/06
5	0.5	2/11
4.7	0.5	2/11
5.5	0.5	2/19
5.6	0.6	2/28
5.6	0.6	2/28
5.4	0.5	3/18
5.4	0.5	3/18
5.3	0.5	5/07
5.1	0.5	5/07
4.7	0.5	5/12
5	0.5	5/27
5.4	0.5	6/02
5.2	0.5	6/05
5.1	0.5	6/10
5.5	0.6	6/17
5.4	0.5	6/18
5.3	0.5	8/12
5.3	0.5	8/18
5	0.5	9/21
5.3	0.5	9/30
5	0.5	9/30
5.3	0.5	12/01
4.6	0.5	12/08
4.2	0.4	12/16
5.1	0.5	12/23

CV = 6 ± 0.22 ug/filter

Result	Uncer.	Date
5.8	0.6	1/23
6.6	0.7	1/30
6.5	0.6	2/05
6	0.6	3/18
6.1	0.6	3/18
6.2	0.6	4/14
6.2	0.6	5/07
6	0.6	5/12
6.1	0.6	6/02
5.8	0.6	6/18
6.4	0.6	6/26
6.3	0.6	6/26
6.2	0.6	8/04
6.2	0.6	9/21
6.8	0.7	9/22
6.5	0.6	10/06
6.2	0.6	11/10
5.5	0.6	11/10
5.27	0.5	11/19
5.8	0.6	12/01

TABLE E-IV (cont)

****

EN-9 Trace Elements
on Filter Media
(cont)

****

Be (cont)

CV = 7 ± 0.25 ug/filter

Result	Uncer.	Date
7.4	0.7	2/06
7.4	0.7	2/11
7.4	0.7	2/19
7.4	0.7	3/05
7.3	0.7	3/18
7.6	0.8	3/24
7.7	0.8	4/03
6.5	0.6	4/14
7.3	0.7	4/14
7.5	0.8	6/02
7.6	0.8	6/18
7.1	0.7	6/18
7.1	0.7	6/26
6.4	0.6	6/26
7	0.7	8/21
7.3	0.7	9/01
6.5	0.6	9/30
7.4	0.7	10/06
6.5	0.6	10/20
7.2	0.7	10/27
7	0.7	11/04
6.7	0.7	12/08
7.2	0.7	12/23
7.4	0.7	12/23

CV = 8 ± 0.29 ug/filter

Result	Uncer.	Date
8.5	0.9	2/05
8.2	0.8	3/24
8.7	0.9	3/24
8.6	0.9	3/24
8	0.8	4/02
8	0.8	4/02
8.2	0.8	4/14
8.4	0.8	6/02
8.1	0.8	6/10
8.5	0.8	6/18
7	0.7	6/26
8.4	0.8	7/07
8.5	0.8	7/28
8.2	0.8	8/18
8.2	0.8	9/10
8.3	0.8	9/10
8.7	0.9	9/22
7.8	0.8	10/20
7.7	0.8	10/27
8.5	0.8	11/04
7.2	0.7	11/10
8.5	0.8	11/10
7.7	0.8	11/19
8	0.8	12/08
7.9	0.8	12/16
8.4	0.8	12/24

CV = 9 ± 0.32 ug/filter

Result	Uncer.	Date
9.1	0.9	1/23
9.8	1	2/06
9.4	0.9	2/11
9.8	1	2/28
9.7	1	2/28
9.5	1	3/05

Be (cont)

8.8	1	3/16
9.7	1	3/24
9.7	1	3/24
9.3	0.9	5/14
8.5	0.8	5/27
9.3	0.9	5/27
9.3	0.9	5/27
9.4	0.9	6/02
9.1	0.9	6/18
9.6	1	6/18
9.2	0.9	6/26
9.2	0.9	8/04
9.1	0.9	8/21
9	0.9	9/01
9.3	0.9	9/01
3	0.3	9/10
6	0.6	9/10
9	0.9	11/19
10	1	12/01
7.7	0.8	12/16

CV = 10 ± 0.36 ug/filter

Result	Uncer.	Date
8	0.8	1/30
9.9	0.9	1/31
11	1	2/11
11	1	3/16
12	1	3/18
10	1	4/14
10	1	5/07
11	1	5/27
11	1	6/02
10.6	1	6/18
9.1	0.9	8/21
11	1	8/25
10	1	9/01
10	1	9/01
10	1	9/21
9.7	1	9/21
6.6	0.7	9/30
9.5	1	9/30
9.6	1	10/20
9.8	1	12/01

Low value (6.6) on 9/30 is suspected to be due to incorrect sample identification

CV = 15 ± 0.54 ug/filter

Result	Uncer.	Date
12	1	4/03

CV = 20 ± 0.7 ug/filter

Result	Uncer.	Date
17	2	4/03

CV = 20 ± 0.72 ug/filter

Result	Uncer.	Date
20	2	10/20
21	2	12/23

CV = 25 ± 0.9 ug/filter

Result	Uncer.	Date
25	3	4/03

Be (cont)

CV = 26 ± 0.9 ug/filter

Result	Uncer.	Date
20	2	4/02

CV = 30 ± 1.1 ug/filter

Result	Uncer.	Date
29	3	4/02
28	3	4/03

CV = 34 ± 1.2 ug/filter

Result	Uncer.	Date
29	3	4/02

CV = 35 ± 1.2 ug/filter

Result	Uncer.	Date
37	4	4/03

CV = 40 ± 1.4 ug/filter

Result	Uncer.	Date
33	3	4/02
34	3	4/03

CV = 50 ± 1.8 ug/filter

Result	Uncer.	Date
48	5	4/03

Be 92GAU 02 ICPMS

CV = 0.3 ± 0.01 ug/filter

Result	Uncer.	Date
0.3	0.1	6/01

CV = 0.4 ± 0.01 ug/filter

Result	Uncer.	Date
0.3	0.1	6/01

Bi 92GAU 02 ICPMS

CV = 0.3 ± 0.01 ug/filter

Result	Uncer.	Date
0.35	0.04	5/05

CV = 0.5 ± 0.02 ug/filter

Result	Uncer.	Date
0.55	0.06	5/05

Ca 92GAU 02 FAA

CV = 25.1 ± 0.9 ug/filter

Result	Uncer.	Date
25	3	3/05

Ca (cont)

CV = 30.1 ± 1.08 ug/filter

Result	Uncer.	Date
30	3	3/05

Cd 92GAU 02 ETVAA

CV = 0.05 ± 0.002 ug/filter

Result	Uncer.	Date
< 0.2		6/30

CV = 0.09 ± 0.003 ug/filter

Result	Uncer.	Date
< 0.2		6/30

Cd 92GAU 02 FAA

CV = 0.07 ± 0.002 ug/filter

Result	Uncer.	Date
	0.2	6/30

CV = 0.1 ± 0.004 ug/filter

Result	Uncer.	Date
	0.2	6/30

CV = 5 ± 0.5 ug/filter

Result	Uncer.	Date
5.2	0.5	4/21

CV = 6 ± 0.22 ug/filter

Result	Uncer.	Date
6	0.6	4/14

CV = 7 ± 0.8 ug/filter

Result	Uncer.	Date
7.3	0.7	4/21

CV = 10 ± 1 ug/filter

Result	Uncer.	Date
9.7	1	1/28
10	1	7/16

CV = 10.7 ± 1.6 ug/filter

Result	Uncer.	Date
11	1	1/28

CV = 15 ± 2 ug/filter

Result	Uncer.	Date
15	2	1/28
16	2	4/21
15	2	7/16
15	1	10/20
15	2	10/20

Cd (cont)

CV = 16.8 ± 1.6 ug/filter

Result	Uncer.	Date
17	2	10/20

CV = 18.5 ± 2.8 ug/filter

Result	Uncer.	Date
18	2	1/28

CV = 19.7 ± 1.9 ug/filter

Result	Uncer.	Date
20	2	7/16

CV = 20 ± 0.72 ug/filter

Result	Uncer.	Date
20	2	4/14
20	2	7/16

CV = 21 ± 2 ug/filter

Result	Uncer.	Date
21	2	4/21

CV = 25 ± 3 ug/filter

Result	Uncer.	Date
25	3	1/28
29	3	10/20

Cd 92GAU 02 ICPMS

CV = 0.3 ± 0.01 ug/filter

Result	Uncer.	Date
0.4	0.1	6/01

CV = 0.5 ± 0.02 ug/filter

Result	Uncer.	Date
0.3	0.1	6/01

CV = 0.6 ± 0.02 ug/filter

Result	Uncer.	Date
0.51	0.05	10/19

CV = 0.65 ± 0.02 ug/filter

Result	Uncer.	Date
0.57	0.1	5/06

CV = 1 ± 0.04 ug/filter

Result	Uncer.	Date
0.87	0.1	5/06
0.8	0.08	10/19

Cr 92GAU 01 FAA

CV = not spiked ug/filter

Result	Uncer.	Date
< 0.5		7/16

CV = 5 ± 0.2 ug/filter

Result	Uncer.	Date
5	0.5	7/01
14	1	8/10
4.8	1	11/24

CV = 7 ± 0.3 ug/filter

Result	Uncer.	Date
6.5	0.7	6/30

CV = 8 ± 0.3 ug/filter

Result	Uncer.	Date
7.7	1	11/24

CV = 9 ± 0.9 ug/filter

Result	Uncer.	Date
11	1	3/17
10	1	4/21
9.1	0.9	7/01

CV = 10 ± 1 ug/filter

Result	Uncer.	Date
13	1	1/28
11	1	7/16

CV = 11 ± 0.4 ug/filter

Result	Uncer.	Date
10	1	6/30

CV = 17 ± 2 ug/filter

Result	Uncer.	Date
19	2	3/17
19	2	4/21

CV = 20 ± 2 ug/filter

Result	Uncer.	Date
19	2	8/03

CV = 30 ± 3 ug/filter

Result	Uncer.	Date
41	4	1/28
27	3	7/16

CV = 52.8 ± 9 ug/filter

Result	Uncer.	Date
65	7	1/28

CV = 60 ± 6 ug/filter

Result	Uncer.	Date
68	7	1/28

TABLE E-IV (cont)

****

EM-9 Trace Elements
on Filter Media
(cont)

****

Cr (cont)

CV = 100 ± 10 ug/filter

Result	Uncer.	Date
110	10	7/16

CV = 194.7 ± 36.8 ug/filter

Result	Uncer.	Date
280	30	1/28

Cr 92GAU 02 ICPMS

CV = 0.4 ± 0.01 ug/filter

Result	Uncer.	Date
0.6	0.1	6/01

CV = 0.5 ± 0.02 ug/filter

Result	Uncer.	Date
0.6	0.1	6/01

CV = 0.6 ± 0.02 ug/filter

Result	Uncer.	Date
0.53	0.1	5/06

Cr(+6) 91GAU 02 COLOR

CV = 0.5 ± 0.02 ug/filter

Result	Uncer.	Date
0.4	0.1	1/02
0.43	0.1	1/02

Cu 92GAU 02 FAA

CV = 14.9 ± 0.54 ug/filter

Result	Uncer.	Date
17	2	3/05

CV = 19.9 ± 0.72 ug/filter

Result	Uncer.	Date
22	2	3/05

Cu 92GAU 02 ICPMS

CV = 0.7 ± 0.03 ug/filter

Result	Uncer.	Date
1.1	0.1	10/19

Cu (cont)

CV = 1 ± 0.04 ug/filter

Result	Uncer.	Date
1.9	0.2	5/05

CV = 1.5 ± 0.05 ug/filter

Result	Uncer.	Date
2.1	0.2	10/19

CV = 1.99 ± 0.07 ug/filter

Result	Uncer.	Date
2.7	0.3	5/05

CV = 12 ± 0.4 ug/filter

Result	Uncer.	Date
13	1	2/19
12	1	2/19

Fe 92GAU 02 FAA

CV = not spiked ug/filter

Result	Uncer.	Date
2.3	0.2	3/17
1.6	0.2	3/17

CV = 8 ± 0.3 ug/filter

Result	Uncer.	Date
10	1	7/16

CV = 18 ± 0.6 ug/filter

Result	Uncer.	Date
1.9	0.8	7/16

Hg 92GAU 02 CVAA

CV = 0.04 ± 0.001 ug/filter

Result	Uncer.	Date
0.05	0.005	11/06

CV = 0.08 ± 0.003 ug/filter

Result	Uncer.	Date
0.11	0.01	11/06

Mg 92GAU 02 FAA

CV = 20.2 ± 0.7 ug/filter

Result	Uncer.	Date
20	2	5/27

CV = 30 ± 1 ug/filter

Result	Uncer.	Date
31	3	5/27

Ni 89GAU 02 FAA

CV = 2.8 ± 0.3 ug/filter

Result	Uncer.	Date
2.9	0.3	2/07

CV = 5 ± 0.5 ug/filter

Result	Uncer.	Date
5	0.5	8/10
8	1	11/24

CV = 9 ± 0.9 ug/filter

Result	Uncer.	Date
8.9	0.9	3/17
9.7	1	4/21

CV = 10 ± 0.4 ug/filter

Result	Uncer.	Date
9.5	1	6/30

CV = 12 ± 0.4 ug/filter

Result	Uncer.	Date
11	1	6/30

CV = 13 ± 1 ug/filter

Result	Uncer.	Date
13	1	2/07
14	1	3/17
14	1	4/21

CV = 14 ± 0.5 ug/filter

Result	Uncer.	Date
14	1	6/30

CV = 15 ± 0.5 ug/filter

Result	Uncer.	Date
13	1	6/30
14	1	6/30

CV = 17 ± 2 ug/filter

Result	Uncer.	Date
17	2	8/03

CV = 17.1 ± 0.6 ug/filter

Result	Uncer.	Date
17	2	11/24

CV = 18 ± 0.7 ug/filter

Result	Uncer.	Date
16	2	6/30

CV = 19 ± 0.7 ug/filter

Result	Uncer.	Date
18	2	6/30

Ni (cont)

CV = 20 ± 0.7 ug/filter

Result	Uncer.	Date
19	2	6/30

Ni 92GAU 02 ICPMS

CV = 0.7 ± 0.03 ug/filter

Result	Uncer.	Date
0.6	0.1	6/01

CV = 0.9 ± 0.03 ug/filter

Result	Uncer.	Date
0.9	0.1	6/01

CV = 15 ± 0.5 ug/filter

Result	Uncer.	Date
17	2	10/01

CV = 20 ± 0.7 ug/filter

Result	Uncer.	Date
21	2	10/01

P 91GAU 02 ACOLR

CV = 40 ± 1.4 ug/filter

Result	Uncer.	Date
12	2	1/10
13	3	1/10

CV = 90 ± 3.2 ug/filter

Result	Uncer.	Date
22	4	1/10

Pb 91GAU 02 FAA

CV = not spiked ug/filter

Result	Uncer.	Date
0.1	0.1	2/19
< 1		8/05
< 1		9/01
< 1		9/01
< 1		9/10
< 1		9/18
< 1		10/27

CV = 1 ± 0.1 ug/filter

Result	Uncer.	Date
1	1	5/12
1	1	5/12
< 1		7/14

Pb (cont)

CV = 5 ± 0.18 ug/filter

Result	Uncer.	Date
4.8	0.5	2/28
5.2	0.5	3/05
6	1	4/14
5	0.5	5/12
5.5	0.6	7/07
5.1	0.5	7/07
4.9	1	7/21
4.9	1	7/28
5.1	1	7/28
5.3	1	8/12
5.7	1	8/18
< 5		9/10
5.4	1	9/21
5.3	0.5	9/30
5.2	1	10/27
4.8	1	12/08

CV = 6 ± 0.2 ug/filter

Result	Uncer.	Date
5.9	1	7/07
6.4	1	7/21

CV = 7 ± 0.25 ug/filter

Result	Uncer.	Date
8	0.8	7/16
6.5	1	11/10
6.7	1	11/10
6.8	1	11/19

CV = 8 ± 0.8 ug/filter

Result	Uncer.	Date
8	0.8	2/06
7.5	0.7	2/19
8	0.8	2/28
8.9	0.9	5/12
9.5	1	7/28
7.9	0.8	8/12
8	1	8/21
8.1	1	8/25
8.5	1	9/01
9.1	0.9	9/01
8.4	0.8	9/10
8.8	1	9/21
8.6	1	9/21
8.8	1	9/21
7.7	1	11/10
7.6	1	11/24
8.5	1	12/01

CV = 10 ± 0.4 ug/filter

Result	Uncer.	Date
6.6	0.7	2/19
11	1	3/17
9.9	1	4/29
11	1	5/27
10	1	6/02
10	1	6/30
10	1	6/30
11	1	7/07
10	1	7/07
11	1	9/21
10	1	10/20
11	1	11/04

On 2/19, Pb filter was cut in half by analyst.

Pb (cont)

CV = 10.1 ± 0.36 ug/filter

Result	Uncer.	Date
10	1	3/05

CV = 11 ± 0.4 ug/filter

Result	Uncer.	Date
12	1	4/21
11	1	6/30
13	1	7/16
12	1	7/28
11	1	8/12
9	0.9	9/10
8	5	9/10
11	1	9/30
12	1	10/06
12	1	10/27
11	1	11/04
10	1	11/24

CV = 12 ± 0.4 ug/filter

Result	Uncer.	Date
12	1	2/19
12	1	3/05
12	1	3/18

CV = 12.1 ± 0.4 ug/filter

Result	Uncer.	Date
12	1	6/30
12	1	12/08
11	1	12/16

CV = 13.1 ± 0.5 ug/filter

Result	Uncer.	Date
13	1	8/21
13	1	8/25
14	1	9/21
13	1	9/22

CV = 14 ± 0.5 ug/filter

Result	Uncer.	Date
15	2	1/21
14	1	1/21
17	2	1/21
15	2	1/24
15	2	1/30
15	2	4/10
11	1	4/29
15	2	4/29
13	1	6/30
15	2	7/21
15	2	7/21
14	2	8/05
14	1	10/20
14	1	10/27
14	1	10/27

CV = 14.1 ± 0.5 ug/filter

Result	Uncer.	Date
14	1	11/04

TABLE E-IV (cont)

****

EM-9 Trace Elements
on Filter Media
(cont)

****

Pb (cont)

CV = 15 ± 0.54 ug/filter

Result	Uncer.	Date
16	2	7/28

CV = 15.1 ± 0.5 ug/filter

Result	Uncer.	Date
16	2	3/17
16	2	5/27
16	2	9/21
160	20	9/21
15	2	9/30
15	2	10/27
14	1	12/16

CV = 16 ± 0.58 ug/filter

Result	Uncer.	Date
15	2	8/04

CV = 17 ± 0.61 ug/filter

Result	Uncer.	Date
20	2	1/21
19	2	1/21
17	2	1/21
19	2	1/24
20	2	3/18
21	2	3/24
38	4	6/02
17	2	6/30
16	2	8/04
19	2	9/21
18	2	9/21

CV = 17.1 ± 0.6 ug/filter

Result	Uncer.	Date
18	2	11/04
16	2	11/10
18	2	11/10
21	2	11/19

CV = 18 ± 0.7 ug/filter

Result	Uncer.	Date
18	2	7/07

CV = 18.1 ± 0.6 ug/filter

Result	Uncer.	Date
18	2	11/24

CV = 19 ± 0.69 ug/filter

Result	Uncer.	Date
20	2	4/14
19	2	7/28

Pb (cont)

CV = 19.1 ± 0.7 ug/filter

Result	Uncer.	Date
21	2	5/27
19	2	12/01

CV = 20 ± 0.72 ug/filter

Result	Uncer.	Date
19	2	1/30
22	2	2/06
22	2	2/19
22	2	3/05
22	2	3/24
22	2	4/10
23	2	4/21
23	2	4/29
21	2	5/27
21	2	7/16
21	2	9/18
20	2	9/30
22	2	11/04
21	2	11/10

CV = 20.1 ± 0.7 ug/filter

Result	Uncer.	Date
21	2	8/12
21	2	8/18
20	2	9/22
21	2	10/06

CV = 24.3 ± 2.7 ug/filter

Result	Uncer.	Date
26	3	7/16

CV = 26.5 ± 4 ug/filter

Result	Uncer.	Date
26	3	1/28

CV = 40 ± 4 ug/filter

Result	Uncer.	Date
41	4	1/28
38	4	10/20

CV = 55.7 ± 6.2 ug/filter

Result	Uncer.	Date
58	6	4/21

CV = 59.8 ± 7.8 ug/filter

Result	Uncer.	Date
65	7	1/28

CV = 60 ± 6 ug/filter

Result	Uncer.	Date
62	6	4/21
62	6	4/21

CV = 61.2 ± 6.6 ug/filter

Result	Uncer.	Date
64	6	10/20

Pb (cont)

CV = 80 ± 8 ug/filter

Result	Uncer.	Date
83	8	1/28
83	8	7/16
79	8	10/20

CV = 90 ± 9 ug/filter

Result	Uncer.	Date
93	9	4/21
94	9	10/20

CV = 100 ± 10 ug/filter

Result	Uncer.	Date
100	10	1/28
100	10	7/16

Pb 92GAU 02 ICPMS

CV = 0.03 ± 0.001 ug/filter

Result	Uncer.	Date
< 0.1		6/01

CV = 0.04 ± 0.002 ug/filter

Result	Uncer.	Date
< 0.1		6/01

CV = 0.1 ± 0.004 ug/filter

Result	Uncer.	Date
0.25	0.03	5/05

CV = 0.2 ± 0.007 ug/filter

Result	Uncer.	Date
0.6	0.06	5/05

CV = 0.55 ± 0.02 ug/filter

Result	Uncer.	Date
< 0.1		5/06

CV = 0.9 ± 0.03 ug/filter

Result	Uncer.	Date
< 0.1		5/06

Se 92GAU 02 ICPMS

CV = 0.7 ± 0.03 ug/filter

Result	Uncer.	Date
0.88	0.1	5/06

CV = 0.95 ± 0.03 ug/filter

Result	Uncer.	Date
1.3	0.1	5/06

Sn 92GAU 02 FAA

CV = 10 ± 0.4 ug/filter

Result	Uncer.	Date
10	10	7/07

CV = 15 ± 0.5 ug/filter

Result	Uncer.	Date
15	10	7/07

Sr 92GAU 02 ICPMS

CV = 4 ± 0.1 ug/filter

Result	Uncer.	Date
3.6	0.4	5/05

CV = 5 ± 0.2 ug/filter

Result	Uncer.	Date
4.4	0.4	5/05

Ta 91GAU 02 ICPMS

CV = 1 ± 0.1 ug/filter

Result	Uncer.	Date
0.038	0.004	1/17

CV = 5 ± 0.5 ug/filter

Result	Uncer.	Date
0.021	0.01	1/17

Te 92GAU 02 ICPMS

CV = 5 ± 0.2 ug/filter

Result	Uncer.	Date
3.5	1	4/22

Tl 92GAU 02 ETVAA

CV = 0.04 ± 0.001 ug/filter

Result	Uncer.	Date
0.033	0.006	4/28

CV = 0.05 ± 0.002 ug/filter

Result	Uncer.	Date
0.04	0.004	4/28

CV = 0.4 ± 0.01 ug/filter

Result	Uncer.	Date
0.45	0.05	2/19

Tl 92GAU 02 ICPMS

CV = 0.03 ± 0.001 ug/filter

Result	Uncer.	Date
< 0.1		6/01

CV = 0.05 ± 0.002 ug/filter

Result	Uncer.	Date
< 0.1		6/01

CV = 25 ± 3 ng/filter

Result	Uncer.	Date
25	10	7/30
23	10	8/07

CV = 37 ± 4 ng/filter

Result	Uncer.	Date
< 100		7/01

CV = 40 ± 4 ng/filter

Result	Uncer.	Date
170	20	7/30
42	4	8/07

CV = 49 ± 5 ng/filter

Result	Uncer.	Date
50	10	7/01

U 88GAU 03 DNA

CV = 400 ± 40 ng/filter

Result	Uncer.	Date
390	40	4/11
390	40	4/11
400	40	4/11
410	40	4/11
410	40	4/11
400	40	4/11
390	40	4/28
370	40	4/28

CV = 500 ± 18 ng/filter

Result	Uncer.	Date
520	50	4/13
520	50	4/13
550	60	4/13
570	60	4/13

CV = 700 ± 70 ng/filter

Result	Uncer.	Date
390	40	1/08

CV = 800 ± 29 ng/filter

Result	Uncer.	Date
950	100	2/25
1000	100	2/25
990	100	2/25

U (cont)

840	80	4/11
830	80	4/11
800	80	4/11
696	50	4/11

CV = 900 ± 90 ng/filter

Result	Uncer.	Date
830	80	4/11
890	90	4/11
830	80	4/11
890	90	4/11
870	90	4/11
870	90	4/11
840	80	4/28
820	80	4/28

U 88GAU 03 G

CV = 400 ± 40 ng/filter

Result	Uncer.	Date
470	50	1/08
490	50	1/08
470	50	1/08
440	40	2/25
440	40	2/25
460	50	2/25

CV = 900 ± 90 ng/filter

Result	Uncer.	Date
1000	100	1/08
1000	100	1/08
1000	100	1/08
990	100	2/25
1000	100	2/25
1000	100	2/25

U 91GAU 03 ICPMS

CV = 1.5 ± 0.054 ug/filter

Result	Uncer.	Date
1.6	0.2	8/17

CV = 2 ± 0.2 ug/filter

Result	Uncer.	Date
2.1	0.1	2/06

CV = 3 ± 0.108 ug/filter

Result	Uncer.	Date
2.9	0.3	9/28
3.3	0.3	10/07

CV = 4 ± 0.4 ug/filter

Result	Uncer.	Date
3.1	0.4	2/04
4.5	0.5	2/10
4	0.4	9/28
4.2	0.4	10/07

TABLE E-IV (cont)

****

EM-9 Trace Elements
on Filter Media
(cont)

****

U (cont)

CV = 5 ± 0.5 ug/filter

Result	Uncer.	Date
4.14	0.21	2/04
6	0.3	2/06
5.1	0.5	2/10
5.2	0.5	8/17

V 92GAU 02 ICPMS

CV = 5 ± 0.2 ug/filter

Result	Uncer.	Date
5.9	0.6	10/01

CV = 10 ± 0.4 ug/filter

Result	Uncer.	Date
11.3	1	10/01

Y 92GAU 02 ICPMS

CV = 20 ± 0.7 ug/filter

Result	Uncer.	Date
23	2	2/19
23	2	2/19

Zn 92GAU 02 FAA

CV = 8 ± 0.3 ug/filter

Result	Uncer.	Date
13	1	3/17

CV = 10 ± 0.4 ug/filter

Result	Uncer.	Date
13	1	3/17

CV = 77.9 ± 10.1 ug/filter

Result	Uncer.	Date
81	8	4/21

CV = 85 ± 8 ug/filter

Result	Uncer.	Date
86	9	4/21
87	9	10/20

CV = 100 ± 10 ug/filter

Result	Uncer.	Date
100	10	10/20

Zn (cont)

CV = 177 ± 20.8 ug/filter

Result	Uncer.	Date
180	20	10/20

CV = 180 ± 18 ug/filter

Result	Uncer.	Date
180	20	4/21

CV = 200 ± 20 ug/filter

Result	Uncer.	Date
200	20	4/21
190	20	10/20

Zn 92GAU 02 ICPMS

CV = 0.8 ± 0.03 ug/filter

Result	Uncer.	Date
1.6	0.2	10/19
3.4	0.3	10/19

****

EM-9 Trace Elements on Soil

****

Hg 92GAU 02 CVAA

CV = 14.9 ± 1.5 ng/g

Result	Uncer.	Date
15	2	10/05

****

EM-9 pH, TDS,
Conductivity in Water

****

Conductivity 84ADA 01 CB

CV = 300 ± 30 umhos

Result	Uncer.	Date
277	14	1/16
293	15	1/27
302	15	2/21
296	15	2/24
295	15	3/25
291	14	4/08
302	15	4/27
294	15	5/26
295	15	6/08
295	15	6/08
298	15	6/24
290	14	7/20
293	15	8/11
291	15	8/13
311	16	8/18
288	14	8/19
293	15	8/20
293	15	8/24
307	15	9/04
307	15	9/04
294	15	9/28
301	15	10/15

Conductivity (cont)

284	14	10/23
284	14	10/23
284	14	10/23
291	15	10/26
287	14	11/23
311	16	12/16
312	16	12/16
296	15	12/16
312	16	12/16
311	16	12/16
340	17	12/23

Conductivity 84ADA 01 GE

CV = 300 ± 30 umhos

Result	Uncer.	Date
313	16	12/16

pH 84ADA 01 GE

CV = 6.87 ± 0.06 units

Result	Uncer.	Date
6.94	0.1	1/02
6.9	0.1	1/03
6.88	0.1	1/06
6.88	0.1	1/07
6.91	0.1	1/09
6.89	0.1	1/09
6.89	0.1	1/09
6.92	0.1	1/10
7.01	0.1	1/13
6.98	0.1	1/14
6.95	0.1	1/15
6.91	0.1	1/16
6.9	0.1	1/16
6.99	0.1	1/17
6.91	0.1	1/21
6.94	0.1	1/22
6.96	0.1	1/23
6.96	0.1	1/24
6.93	0.1	1/27
6.88	0.1	1/28
6.92	0.1	1/29
6.89	0.1	1/30
6.97	0.1	1/31
6.93	0.1	2/03
6.94	0.1	2/04
6.95	0.1	2/05
6.92	0.1	2/06
6.99	0.1	2/07
7	0.1	2/10
6.92	0.1	2/11
7.01	0.1	2/12
6.96	0.1	2/13
6.92	0.1	2/14
6.94	0.1	2/18
6.79	0.1	2/19
6.99	0.1	2/20
6.96	0.1	2/21
6.79	0.1	2/21
6.95	0.1	2/24
6.95	0.1	2/25
6.94	0.1	2/27
6.9	0.1	2/27
7	0.1	2/28
6.91	0.1	3/03
6.88	0.1	3/04
6.95	0.1	3/05
6.94	0.1	3/06
6.93	0.1	3/09
6.96	0.1	3/10
6.96	0.1	3/11

pH (cont)

6.89	0.1	3/12
6.99	0.1	3/13
7.04	0.1	3/16
6.95	0.1	3/17
6.97	0.1	3/18
6.92	0.1	3/20
6.93	0.1	3/20
6.96	0.1	3/23
6.92	0.1	3/25
6.93	0.1	3/25
6.9	0.1	3/26
6.97	0.1	3/27
6.98	0.1	4/06
6.98	0.1	4/06
7.02	0.1	4/06
6.89	0.1	4/06
6.99	0.1	4/06
6.89	0.1	4/06
6.98	0.1	4/07
6.89	0.1	4/08
6.91	0.1	4/08
6.89	0.1	4/08
6.93	0.1	4/09
6.95	0.1	4/10
6.93	0.1	4/13
6.85	0.1	4/14
6.75	0.1	4/15
6.94	0.1	4/16
6.96	0.1	4/20
6.89	0.1	4/20
6.92	0.1	4/21
6.94	0.1	4/22
6.97	0.1	4/23
6.95	0.1	4/24
6.9	0.1	4/27
6.9	0.1	4/28
6.94	0.1	4/29
6.93	0.1	4/30
6.99	0.1	5/01
7	0.1	5/01
6.98	0.1	5/04
6.8	0.1	5/05
6.93	0.1	5/06
6.84	0.1	5/07
6.96	0.1	5/08
7.01	0.1	5/11
6.93	0.1	5/12
6.94	0.1	5/13
6.9	0.1	5/14
6.9	0.1	5/15
6.91	0.1	5/18
6.96	0.1	5/19
6.91	0.1	5/20
6.88	0.1	5/21
6.98	0.1	5/22
6.92	0.1	5/26
6.96	0.1	5/27
6.85	0.1	5/28
6.96	0.1	5/29
6.94	0.1	6/01
6.9	0.1	6/02
6.92	0.1	6/03
6.88	0.1	6/04
6.91	0.1	6/05
6.93	0.1	6/08
6.91	0.1	6/08
6.93	0.1	6/08
6.92	0.1	6/09
6.97	0.1	6/10
6.9	0.1	6/11
6.85	0.1	6/12
6.86	0.1	6/15
6.88	0.1	6/16
7.02	0.1	6/18
6.77	0.1	6/19
6.96	0.1	6/22
6.83	0.1	6/23
6.93	0.1	6/24

pH (cont)

6.97	0.1	6/25
6.91	0.1	6/26
6.94	0.1	6/29
6.86	0.1	6/30
6.91	0.1	7/01
6.87	0.1	7/02
6.9	0.1	7/06
6.9	0.1	7/07
6.87	0.1	7/08
6.85	0.1	7/09
6.95	0.1	7/10
6.94	0.1	7/14
7.02	0.1	7/14
6.86	0.1	7/15
6.71	0.1	7/16
6.74	0.1	7/17
6.91	0.1	7/20
6.88	0.1	7/21
6.92	0.1	7/22
6.85	0.1	7/23
6.77	0.1	7/24
6.85	0.1	7/27
6.83	0.1	7/28
6.68	0.1	7/29
6.81	0.1	7/31
6.78	0.1	7/31
6.81	0.1	8/03
6.94	0.1	8/04
6.87	0.1	8/05
6.98	0.1	8/06
6.9	0.1	8/07
6.84	0.1	8/10
6.9	0.1	8/11
6.82	0.1	8/11
6.91	0.1	8/12
6.89	0.1	8/13
6.86	0.1	8/14
6.85	0.1	8/14
6.85	0.1	8/17
6.81	0.1	8/18
6.71	0.1	8/19
6.87	0.1	8/19
6.89	0.1	8/20
6.85	0.1	8/21
6.82	0.1	8/21
6.82	0.1	8/24
6.8	0.1	8/25
6.87	0.1	8/26
6.78	0.1	8/27
6.87	0.1	8/28
6.85	0.1	8/31
6.77	0.1	9/01
6.93	0.1	9/01
6.87	0.1	9/02
6.82	0.1	9/03
6.83	0.1	9/04
6.75	0.1	9/04
6.83	0.1	9/04
6.77	0.1	9/08
7.01	0.1	9/09
6.85	0.1	9/11
6.92	0.1	9/14
6.85	0.1	9/15
6.94	0.1	9/16
7.01	0.1	9/17
6.78	0.1	9/21
6.95	0.1	9/21
6.9	0.1	9/22
6.92	0.1	9/23
6.88	0.1	9/24
6.89	0.1	9/25
6.81	0.1	9/28
6.95	0.1	9/29
6.87	0.1	9/30
6.78	0.1	10/01
6.74	0.1	10/02
6.85	0.1	10/05
6.83	0.1	10/06

pH (cont)

6.87	0.1	10/07
6.85	0.1	10/08
6.87	0.1	10/13
6.83	0.1	10/15
6.84	0.1	10/15
6.77	0.1	10/16
6.88	0.1	10/19
6.88	0.1	10/20
6.9	0.1	10/21
6.93	0.1	10/23
6.93	0.1	10/23
6.89	0.1	10/23
6.95	0.1	10/23
6.93	0.1	10/23
6.82	0.1	10/26
6.78	0.1	10/27
6.84	0.1	10/28
6.81	0.1	10/29
6.83	0.1	10/30
6.81	0.1	11/02
6.8	0.1	11/03
6.78	0.1	11/04
6.75	0.1	11/05
6.83	0.1	11/06
6.75	0.1	11/09
6.78	0.1	11/10
6.79	0.1	11/12
6.8	0.1	11/13
6.83	0.1	11/16
6.82	0.1	11/18
6.78	0.1	11/18
6.77	0.1	11/20
6.88	0.1	11/20
6.84	0.1	11/23
6.77	0.1	11/24
6.76	0.1	11/25
6.86	0.1	11/30
6.82	0.1	12/01
6.81	0.1	12/02
6.77	0.1	12/03
6.81	0.1	12/04
6.8	0.1	12/07
6.77	0.1	12/08
6.81	0.1	12/09
6.85	0.1	12/10
6.79	0.1	12/11
6.8	0.1	12/14
6.78	0.1	12/15
6.84	0.1	12/16
6.92	0.1	12/16
6.85	0.1	12/16
6.87	0.1	12/16
6.85	0.1	12/16
6.81	0.1	12/16
6.88	0.1	12/16
6.83	0.1	12/17
6.79	0.1	12/18
6.73	0.1	12/23
6.78	0.1	12/23
6.73	0.1	12/23

pH 84ADA 01 PC

CV = 6.87 ± 0.06 units

Result	Uncer.	Date
6.96	0.1	3/02
6.83	0.1	9/10

TABLE E-IV (cont)

****

EM-9 pH, TDS, Conductivity in Water (cont)

****

Total Dissolved Solids
84ADA 01 GRAV

CV = 293 ± 20 mg/L

Result	Uncer.	Date
270	30	1/10
300	30	1/16
300	30	1/16
260	30	2/06
280	30	3/06
280	30	3/06
300	30	4/10
300	30	4/10
260	30	5/14
260	30	5/14
320	30	6/10
320	30	6/10
290	30	6/23
270	30	7/07
300	30	8/13
300	30	8/13
320	30	8/17
290	30	8/21
330	30	8/26
270	30	9/10
270	30	9/11
310	30	10/15
310	30	10/15
310	30	10/15
290	30	11/12
290	30	11/12
290	30	11/12
290	30	12/04
290	30	12/04
290	30	12/04
290	30	12/04
280	30	12/10

****

EML Radionuclides in Soil, April 1980

****

Cs-137 80EML 01 G

CV = 0.72 ± 0.07 pCi/g

Result	Uncer.	Date
1.8	0.4	3/16
0.72	0.17	8/03

****

EML Radionuclides in Soil, May 1984

****

Am-241 84EML 01 G

CV = 0.36 ± 0.02 pCi/g

Result	Uncer.	Date
0.57	0.13	6/22
0.44	0.11	8/03

Am-241 84EML 01 GELI

CV = 0.36 ± 0.02 pCi/g

Result	Uncer.	Date
0.49	0.12	8/07
0.51	0.11	12/17
0.51	0.11	12/17

****

EML Radionuclides in Soil, March 1992

****

Am-241 92EML 01 RAS

CV = 0.07 ± 0.007 bq/kg

Result	Uncer.	Date
0.04	0.07	5/08
0.07	0.07	5/08
0.18	0.15	5/08

Spiked below detection limit.

Cs-137 92EML 01 G

CV = 5.23 ± 0.4 bq/kg

Result	Uncer.	Date
7.9	1.7	5/19
8.3	1.7	5/19
9.1	1.8	5/19

K-40 92EML 01 G

CV = 719 ± 10 bq/kg

Result	Uncer.	Date
950	150	5/19
980	150	5/19
920	140	5/19

Pu-238 92EML 01 RAS

CV = 0.05 ± 0.01 bq/kg

Result	Uncer.	Date
0.04	0.07	4/06
0	0.07	4/06
0.04	0.07	4/06

Spiked below detection limit.

Pu-239 92EML 01 RAS

CV = 25.5 ± 2 bq/kg

Result	Uncer.	Date
29.6	1.3	4/06
31.7	1.6	4/06
28.5	1.8	4/06

Sr-90 92EML 01 PC

CV = 4.5 ± 0.4 bq/kg

Result	Uncer.	Date
15	26	4/06
0	26	4/06
4	26	4/06

Spiked below detection limit.

U 92EML 01 DNA

CV = 2.34 ± 0.05 ug/g

Result	Uncer.	Date
2.45	0.2	4/21
2.21	0.2	4/21
2.4	0.2	4/21

****

EML Radionuclides in Soil, Sept 1992

****

Am-241 92EML 01 G

CV = 1.83 ± 0.2 bq/kg

Result	Uncer.	Date
0.34	0.68	11/19
1.4	0.7	11/19
0.39	0.8	11/19

Concentration below detection limit for gamma spec.

Cs-137 92EML 01 G

CV = 285 ± 5.7 bq/kg

Result	Uncer.	Date
450	70	11/19
300	40	11/19
290	40	11/19

K-40 92EML 01 G

CV = 348 ± 11.5 bq/kg

Result	Uncer.	Date
700	110	11/19
580	90	11/19
1100	200	11/19

Incorrect background used.

Pu-238 92EML 01 RAS

CV = 21.9 ± 0.66 bq/kg

Result	Uncer.	Date
21	0.9	11/19
21.9	1	11/19
21.5	0.9	11/19

Pu-239 92EML 01 RAS

CV = 7.76 ± 0.47 bq/kg

Result	Uncer.	Date
7.88	0.37	11/19
7.14	0.37	11/19
7.33	0.37	11/19

Sr-90 92EML 01 PC

CV = 9.57 ± 0.96 bq/kg

Result	Uncer.	Date
11	26	11/17
15	26	11/17
11	26	11/17

U 92EML 01 DNA

CV = 2.32 ± 0.19 ug/g

Result	Uncer.	Date
2.3	0.3	11/23
2.4	0.3	11/23
2.4	0.3	11/23

****

EML Radionuclides in Vegetation, March 1992

****

Am-241 92EML 01 RAS

CV = 0.21 ± 0.06 bq/kg

Result	Uncer.	Date
0.17	0.03	5/08
0.2	0.03	5/08
0.22	0.04	5/08

Cs-137 92EML 01 G

CV = 24.6 ± 1 bq/kg

Result	Uncer.	Date
20	3	5/22
22	3	5/22
22	3	5/22

Pu-238 92EML 01 RAS

CV = 1.08 ± 0.04 bq/kg

Result	Uncer.	Date
1.1	0.2	4/06
1.3	0.2	4/06
1.3	0.2	4/06

Pu-239 92EML 01 RAS

CV = 0.311 ± 0.003 bq/kg

Result	Uncer.	Date
0.27	0.07	4/06
0.33	0.07	4/06
0.34	0.07	4/06

Sr-90 92EML 01 PC

CV = 376 ± 30 bq/kg

Result	Uncer.	Date
280	50	4/06
240	50	4/06
1150	50	4/06

Aliquot mixup.

****

EML Radionuclides in Vegetation, Sept 1992

****

Am-241 92EML 01 RAS

CV = 0.242 ± 0.03 bq/kg

Result	Uncer.	Date
0.37	0.11	12/02
0.52	0.11	12/02
0.44	0.11	12/02

Sample aliquot was 20 g; value used to calculate result was 10 g.

Cs-137 92EML 01 G

CV = 29.2 ± 1.17 bq/kg

Result	Uncer.	Date
30	5	11/19
- 0.426	0.449	11/19
29	5	11/19

Pu-238 92EML 01 RAS

CV = 1.25 ± 0.08 bq/kg

Result	Uncer.	Date
2.66	0.19	11/19
2.44	0.19	11/19
2.63	0.19	11/19

Sample aliquot was 20 g; value used to calculate result was 10 g.

Pu-239 92EML 01 RAS

CV = 0.379 ± 0.04 bq/kg

Result	Uncer.	Date
0.851	0.074	11/19
0.85	0.11	11/19
0.85	0.11	11/19

Sample aliquot was 20 g; value used to calculate result was 10 g.

Sr-90 92EML 01 PC

CV = 489 ± 39.1 bq/kg

Result	Uncer.	Date
444	37	11/16
585	48	11/16
448	41	11/16

****

EML Radionuclides in Water, April 1980

****

Cs-137 80EML 01 G

CV = 1020 ± 50 pCi/L

Result	Uncer.	Date
980	160	1/28
1200	200	2/05
1000	200	2/13
990	160	3/26
1100	200	4/10
1100	200	4/29
1200	200	4/29
1200	200	4/29
1200	200	4/29
1100	200	4/29
1200	200	4/29
1300	200	6/29
1300	200	6/29
1300	200	6/29
1300	200	6/29
1300	200	6/29
1300	200	8/26

Cs-137 80EML 01 GELI

CV = 1020 ± 50 pCi/L

Result	Uncer.	Date
1000	200	6/25
1400	200	6/25
710	120	10/29
680	120	11/04
750	120	11/30
810	130	11/30
730	130	12/07
750	130	12/09
1200	200	12/21
860	160	12/21

TABLE E-IV (cont)

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EML Radionuclides in Water, April 1980 (cont)

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Cs-137 80EML 01 PC

CV = 1020 ± 50 pCi/L

Result	Uncer.	Date
910	180	2/05

****

EML Radionuclides in Water, March 1992

****

Am-241 92EML 01 RAS

CV = 0.51 ± 0.005 bq/L

Result	Uncer.	Date
0.0857	0.0052	10/20
0.092	0.0052	10/20
0.0879	0.0055	10/20

Ce-144 92EML 01 G

CV = 189 ± 2 bq/L

Result	Uncer.	Date
17	3	5/19
17	3	5/19
16	2	5/19

Wrong branching ratio used.

Co-60 92EML 01 G

CV = 94 ± 1 bq/L

Result	Uncer.	Date
75	11	5/19
74	11	5/19
74	11	5/19

Cs-134 92EML 01 G

CV = 71.8 ± 1 bq/L

Result	Uncer.	Date
54	8	5/19
55	8	5/19
55	8	5/19

Cs-137 92EML 01 G

CV = 84.6 ± 2 bq/L

Result	Uncer.	Date
63	10	5/19
63	10	5/19
66	10	5/19

H-3 92EML 01 LS

CV = 227 ± 10 bq/L

Result	Uncer.	Date
280	30	4/22
280	30	4/22
290	30	4/22

Mn-54 92EML 01 G

CV = 56.6 ± 1 bq/L

Result	Uncer.	Date
48	7	5/19
47	7	5/19
46	7	5/19

Pu-238 92EML 01 RAS

CV = 0.45 ± 0.03 bq/L

Result	Uncer.	Date
0.48	0.03	5/12
0.48	0.03	5/12
0.45	0.03	5/12

Pu-239 92EML 01 RAS

CV = 0.58 ± 0.03 bq/L

Result	Uncer.	Date
0.56	0.03	5/12
0.49	0.03	5/12
0.5	0.03	5/12

Sr-90 92EML 01 PC

CV = 2.13 ± 0.04 bq/L

Result	Uncer.	Date
2.2	0.8	5/11
2.2	0.8	5/11
2.2	0.8	5/11

U 92EML 01 ICPMS

CV = 0.033 ± 0.003 ug/mL

Result	Uncer.	Date
0.036	0.004	5/28
0.036	0.004	5/28
0.036	0.004	5/28

****

EML Radionuclides in Water, Sept 1992

****

Am-241 92EML 01 RAS

CV = 0.205 ± 0.01 bq/L

Result	Uncer.	Date
0.18	0.04	12/02
0.21	0.04	12/02
0.17	0.03	12/02

Ce-144 92EML 01 G

CV = 51.2 ± 1.54 bq/L

Result	Uncer.	Date
55	11	11/19
44	9	11/19
48	10	11/19

Co-60 92EML 01 G

CV = 27.8 ± 0.83 bq/L

Result	Uncer.	Date
24	4	11/19
22	3	11/19
21	3	11/19

Cs-134 92EML 01 G

CV = 44.1 ± 1.76 bq/L

Result	Uncer.	Date
38	6	11/19
38	6	11/19
38	6	11/19

Cs-137 92EML 01 G

CV = 29 ± 0.87 bq/L

Result	Uncer.	Date
23	4	11/19
24	4	11/19
24	4	11/19

H-3 92EML 01 LS

CV = 118 ± 2.36 bq/L

Result	Uncer.	Date
33	11	11/03
22	11	11/03
15	11	11/03

Aliquot taken from wrong sample?

Mn-54 92EML 01 G

CV = 33.3 ± 0.67 bq/L

Result	Uncer.	Date
25	4	11/19
25	4	11/19
26	4	11/19

Pu-238 92EML 01 RAS

CV = 1.97 ± 0.08 bq/L

Result	Uncer.	Date
1.99	0.09	11/19
2.11	0.09	11/19
1.95	0.09	11/19

Pu-239 92EML 01 RAS

CV = 0.238 ± 0.02 bq/L

Result	Uncer.	Date
0.22	0.02	11/19
0.259	0.024	11/19
0.254	0.022	11/19

Sr-90 92EML 01 PC

CV = 2.2 ± 0.18 bq/L

Result	Uncer.	Date
2.6	1.1	11/18
2.3	1.1	11/18
2.5	1.1	11/18

U 92EML 01 ICPMS

CV = 0.0091 ± 0.0004 ug/mL

Result	Uncer.	Date
0.0095	0.001	10/27
0.009	0.0009	10/27
0.0092	0.0009	10/27

****

EML Radionuclides on Air Filter, March 1992

****

Am-241 92EML 01 RAS

CV = 0.344 ± 0.02 bq/filter

Result	Uncer.	Date
0.302	0.015	10/20
0.32	0.016	10/20
0.3	0.015	10/20

Be-7 92EML 01 G

CV = 28.6 ± 2 bq/filter

Result	Uncer.	Date
2.3	0.4	5/19
2.1	0.3	5/19
2.3	0.3	5/19

Wrong branching ratio used.

Ce-144 92EML 01 G

CV = 63.9 ± 3 bq/filter

Result	Uncer.	Date
6.9	1	5/19
7.5	1.1	5/19
7.6	1.1	5/19

Wrong branching ratio used.

Co-57 92EML 01 G

CV = 7.93 ± 0.2 bq/filter

Result	Uncer.	Date
5.3	0.8	5/19
5.3	0.8	5/19
5	0.8	5/19

Wrong branching ratio used.

Co-60 92EML 01 G

CV = 5.81 ± 0.2 bq/filter

Result	Uncer.	Date
4.6	0.7	5/19
5.3	0.8	5/19
5.3	0.8	5/19

Cs-134 92EML 01 G

CV = 4.44 ± 0.2 bq/filter

Result	Uncer.	Date
2.7	0.4	5/19
2.7	0.4	5/19
2.5	0.4	5/19

Wrong branching ratio used.

Cs-137 92EML 01 G

CV = 5.76 ± 0.2 bq/filter

Result	Uncer.	Date
3.7	0.6	5/19
3.5	0.5	5/19
3.8	0.6	5/19

Wrong branching ratio used.

Mn-54 92EML 01 G

CV = 5.97 ± 0.3 bq/filter

Result	Uncer.	Date
4.7	0.7	5/19
4.6	0.7	5/19
4.4	0.7	5/19

Pu-238 92EML 01 RAS

CV = 0.27 ± 0.01 bq/filter

Result	Uncer.	Date
0.25	0.01	5/12
0.27	0.01	5/12
0.24	0.02	5/12

Pu-239 92EML 01 RAS

CV = 0.285 ± 0.03 bq/filter

Result	Uncer.	Date
0.27	0.01	5/12
0.28	0.01	5/12
0.28	0.02	5/12

Sr-90 92EML 01 PC

CV = 0.207 ± 0.006 bq/filter

Result	Uncer.	Date
0.53	0.07	7/27
0.53	0.06	7/27
0.53	0.07	7/27

****

EML Radionuclides on Air Filter, Sept 1992

****

Am-241 92EML 01 RAS

CV = 0.032 ± 0.002 bq/filter

Result	Uncer.	Date
0.022	0.003	12/02
0.035	0.003	12/02
0.0282	0.0026	12/02

Be-7 92EML 01 G

CV = 308 ± 6.16 bq/filter

Result	Uncer.	Date
210	30	11/19
200	30	11/19
200	30	11/19

TABLE E-IV (cont)

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EML Radionuclides
on Air Filter, Sept 1992
(cont)

****

Ce-144 92EML 01 G

CV = 43.3 ± 1.3 bq/filter

Result	Uncer.	Date
36	5	11/19
33	5	11/19
34	5	11/19

Co-57 92EML 01 G

CV = 6.4 ± 0.26 bq/filter

Result	Uncer.	Date
4.6	0.7	11/19
4.3	0.6	11/19
4.4	0.7	11/19

Co-60 92EML 01 G

CV = 3.06 ± 0.18 bq/filter

Result	Uncer.	Date
2.6	0.4	11/19
2.5	0.4	11/19
2.8	0.4	11/19

Cs-134 92EML 01 G

CV = 3.72 ± 0.07 bq/filter

Result	Uncer.	Date
2.1	0.3	11/19
2.3	0.3	11/19
2.1	0.3	11/19

Cs-137 92EML 01 G

CV = 5.82 ± 0.29 bq/filter

Result	Uncer.	Date
4.2	0.6	11/19
3.9	0.6	11/19
3.9	0.6	11/19

Mn-54 92EML 01 G

CV = 25.9 ± 0.78 bq/filter

Result	Uncer.	Date
17	3	11/19
17	3	11/19
19	3	11/19

Pu-238 92EML 01 RAS

CV = 0.042 ± 0.004 bq/filter

Result	Uncer.	Date
0.033	0.003	11/19
0.034	0.004	11/19
0.0352	0.003	11/19

Pu-239 92EML 01 RAS

CV = 0.045 ± 0.003 bq/filter

Result	Uncer.	Date
0.0444	0.0033	11/19
0.0444	0.0037	11/19
0.0455	0.0041	11/19

Sr-90 92EML 01 PC

CV = 0.137 ± 0.01 bq/filter

Result	Uncer.	Date
0.12	0.06	11/19
0.14	0.06	11/19
0.11	0.06	11/19

U 92EML 01 ICPMS

CV = 1.28 ± 0.18 ug/filter

Result	Uncer.	Date
1.5	0.1	10/28
1.5	0.2	10/28
1.4	0.1	10/28

****

EPA Air Filter Intercomparison
March 1989

****

Alpha 89EPA 01 PC

CV = 21 ± 5 pCi/filter

Result	Uncer.	Date
19	4	1/09
18	4	1/09
18	4	1/09
19	4	2/04
18	4	2/04
19	4	2/04
19	4	2/05
18	4	2/05
17	4	2/05
18	4	2/24
18	4	2/24
19	4	2/24
20	4	3/25
19	4	3/25
18	4	3/25
18	4	3/25
20	4	3/25
19	4	3/25
18	4	4/21
19	4	4/21
18	4	4/21
19	4	5/07
20	4	5/07
18	4	5/07

Alpha (cont)

18	4	5/21
21	5	5/21
18	4	5/21
21	5	5/21
19	4	5/21
19	4	7/20
18	4	7/20
19	4	7/20
18	4	7/20
21	5	7/27
19	4	7/27
20	4	7/27
21	5	7/29
19	4	7/29
20	4	7/29
19	4	7/29
20	4	7/29
20	4	8/12
19	4	8/12
20	4	8/12
18	4	8/12
19	4	8/12
20	4	8/12
18	4	8/12
20	4	8/13
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18	4	8/13
19	4	8/13
19	4	8/13
17	4	8/17
19	4	8/17
19	4	8/17
17	4	10/07
19	4	10/07
19	6	10/07
17	4	10/07
18	4	11/18
19	4	11/18
18	4	11/18
18	4	11/18
18	4	11/18
18	4	11/18
19	4	11/18
19	4	11/18
10	4	11/18
19	4	11/18
21	5	11/18

Beta 89EPA 01 PC

CV = 62 ± 5 pCi/filter

Result	Uncer.	Date
51	7	1/09
50	6	1/09
50	6	1/09
51	7	2/04
52	7	2/04
51	7	2/04
49	6	2/05
49	6	2/05
51	7	2/05
50	7	2/24
49	6	2/24
48	6	2/24
50	6	3/25
50	6	3/25
50	7	3/25
51	7	3/25
51	7	3/25
50	7	3/25
50	6	4/21
51	7	4/21

Beta (cont)

50	6	4/21
52	7	5/07
50	7	5/07
50	6	5/07
50	7	5/21
51	7	5/21
51	7	5/21
49	6	5/21
49	6	5/21
50	6	7/20
50	6	7/20
49	6	7/20
49	6	7/20
49	6	7/27
50	6	7/27
51	7	7/27
49	6	7/29
50	6	7/29
51	7	7/29
49	6	7/29
50	6	7/29
49	6	8/12
50	6	8/12
49	6	8/12
50	6	8/12
50	6	8/12
49	6	8/12
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50	6	8/13
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49	6	8/13
48	6	8/13
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48	6	8/13
49	6	8/17
49	6	8/17
49	6	8/17
50	6	10/07
50	6	10/07
50	6	10/07
50	6	10/07
50	6	11/18
48	6	11/18
49	6	11/18
50	6	11/18
49	6	11/18
50	6	11/18
49	6	11/18
49	6	11/18
50	6	11/18
49	6	11/18
50	6	11/18

****

EPA Air Filter Intercomparison
April 1992

****

Cs-137 92EPA 04 G

CV = 10 ± 5 pCi/filter

Result	Uncer.	Date
5.3	1.1	5/19
4.5	1.1	5/19
6.1	1.2	5/19

Sr-90 92EPA 04 RAS

CV = 15 ± 5 pCi/filter

Result	Uncer.	Date
15	1	7/31
15	2	7/31
15	2	7/31

****

EPA Air Filter Intercomparison
Aug 1992

****

Alpha 92EPA 04 PC

CV = not spiked pCi/filter

Result	Uncer.	Date
0.04	0.08	9/14

CV = 30 ± 8 pCi/filter

Result	Uncer.	Date
25	5	9/14
28	6	9/14
30	7	9/14

Beta 92EPA 04 PC

CV = not spiked pCi/filter

Result	Uncer.	Date
0.2	0.2	9/14

CV = 69 ± 10 pCi/filter

Result	Uncer.	Date
60	8	9/14
61	8	9/14
60	8	9/14

Cs-137 92EPA 04 G

CV = not spiked pCi/filter

Result	Uncer.	Date
1.9	2.8	9/21

CV = 18 ± 5 pCi/filter

Result	Uncer.	Date
24	5	9/21
19	4	9/21
20	4	9/21

Sr-90 92EPA 04 PC

CV = not spiked pCi/filter

Result	Uncer.	Date
0	0.5	10/15

Sr-90 (cont)

CV = 25 ± 5 pCi/filter

Result	Uncer.	Date
25.3	1.7	10/15
23.4	1.6	10/15
24.6	1.6	10/15

****

EPA Alpha
Performance Evaluation
in Water, April 1992

****

Alpha 92EPA 04 PC

CV = 40 ± 10 pCi/L

Result	Uncer.	Date
50	10	4/30
50	10	4/30
50	10	4/30

Ra-226 92EPA 04 RAS

CV = 14.9 ± 2.2 pCi/L

Result	Uncer.	Date
5.5	0.6	5/28
4.9	0.5	5/28

Minor change in physical apparatus affected gas flow during transfer of Ra to the Lucas cell.

U 92EPA 04 ICPMS

CV = 4 ± 3 pCi/L

Result	Uncer.	Date
1.6	0.06	4/29
1.6	0.06	4/29
1.6	0.06	4/29

****

EPA Alpha
Performance Evaluation
in Water October 1992

****

Alpha 92EPA 04 PC

CV = 29 ± 7 pCi/L

Result	Uncer.	Date
70	10	11/20
50	10	11/20
48	10	11/20

High values possibly due to misidentification of other alpha emitters in solution.

TABLE E-IV (cont)

****

EPA Alpha
Performance Evaluation
in Water October 1992
(cont)

****

Ra-226 92EPA 04 RAS

CV = 7.4 ± 1.1 pCi/L

Result	Uncer.	Date
6.6	0.7	12/15
5.8	0.6	12/15
5.6	0.6	12/15

U 92EPA 04 ICPMS

CV = 10.2 ± 3 pCi/L

Result	Uncer.	Date
10	1	11/03
10	1	11/03
10	1	11/03

****

EPA Beta
Performance Evaluation
in Water, April 1992

****

Beta 92EPA 04 PC

CV = 140 ± 21 pCi/L

Result	Uncer.	Date
70	7	4/30
86	9	4/30
82	8	4/30

Co-60 92EPA 04 G

CV = 56 ± 5 pCi/L

Result	Uncer.	Date
39	13	5/20
39	10	5/20
44	11	5/20

Variable background rate.

Cs-134 92EPA 04 G

CV = 24 ± 5 pCi/L

Result	Uncer.	Date
19	9	5/20
29	8	5/20
19	9	5/20

Cs-137 92EPA 04 G

CV = 22 ± 5 pCi/L

Result	Uncer.	Date
19	9	5/20
21	6	5/20
24	9	5/20

Sr-90 92EPA 04 RAS

CV = 17 ± 5 pCi/L

Result	Uncer.	Date
15	5	7/30
14	5	7/30
17	6	7/30

****

EPA Beta
Performance Evaluation
in Water, October 1992

****

Beta 92EPA 04 PC

CV = 53 ± 10 pCi/L

Result	Uncer.	Date
25	3	11/20
34	4	11/20
32	3	11/20

Beta activity may have plated out on sample container due to weak acid solution used for shipping.

Co-60 92EPA 04 G

CV = 15 ± 5 pCi/L

Result	Uncer.	Date
41	15	12/21
58	15	12/21
51	15	12/21

Background levels mis-determined.

Cs-134 92EPA 04 G

CV = 5 ± 5 pCi/L

Result	Uncer.	Date
22	12	12/21
30	12	12/21
32	14	12/21

Background levels mis-determined.

Cs-137 92EPA 04 G

CV = 8 ± 5 pCi/L

Result	Uncer.	Date
23	11	12/21
26	13	12/21
18	16	12/21

Background levels mis-determined.

Sr-90 92EPA 04 PC

CV = 10 ± 5 pCi/L

Result	Uncer.	Date
10	3	12/10
8.9	3	12/10
9.9	3	12/10

****

EPA Corrosivity and Sodium
in Water

****

Na 91EPA 04 IC

CV = 7 ± 0.94 mg/L

Result	Uncer.	Date
9.7	1	11/16

pH 91EPA 04 GE

CV = 7.3 ± 0.15 units

Result	Uncer.	Date
7.38	0.1	10/23

****

EPA Cyanide in Water

****

CN 86EPA 01 ACOLR

CV = 500 ± 79 ug/L

Result	Uncer.	Date
420	40	1/09
420	40	1/09
390	40	1/24
440	40	2/21
440	40	2/21
410	40	2/27
390	40	3/05
390	40	3/05
390	40	3/05
390	40	3/05
440	40	3/12
440	40	3/12
430	40	4/06
390	40	4/10
390	40	4/10
400	40	5/07
400	40	5/19
380	40	6/01
420	40	6/12
420	40	6/12

CN (cont)

440	40	6/12
410	40	6/29
413	14	6/29
410	40	6/29
400	40	6/30
400	40	7/08
400	40	7/08
410	40	7/15
410	40	7/15
420	40	7/31
400	40	8/17
400	40	8/18
430	40	8/31
420	40	9/03
420	40	9/03
430	40	9/08
410	40	10/15
410	40	10/15
460	50	11/16
450	50	12/08

****

EPA Demand Analyses in Water

****

Biological Oxygen Demand
82EPA 01, 89EPA 02 TITR

CV = 2.6 ± 0.7 mg/L

Result	Uncer.	Date
3.7	0.4	4/13
3.7	0.4	4/13

CV = 101.3 ± 9.7 mg/L

Result	Uncer.	Date
140	20	3/14
80	8	4/13

Chemical Oxygen Demand COLOR
82EPA 01, 89EPA 02, 90EPA 04

CV = 16 ± 3 mg/L

Result	Uncer.	Date
18	10	4/06
16	10	4/06

CV = 104.5 ± 4.6 mg/L

Result	Uncer.	Date
100	20	1/07
110	20	1/07
93	19	1/07
100	20	1/07
99	20	1/17
110	20	1/17
87	18	2/12
94	19	2/12
96	19	2/12
87	18	2/12
100	20	2/19
96	19	3/06
93	19	3/06
100	20	3/12
100	20	3/12
95	19	4/06
99	20	4/06
87	17	4/24
100	20	4/24

Chemical Oxygen Demand (cont)

100	20	5/26
94	19	5/26
83	17	6/02
98	20	7/30
92	18	7/30
92	18	7/30
88	18	8/03
94	19	9/10
100	20	9/10
100	20	9/30
98	20	10/02
98	20	10/20
110	20	10/20
89	18	12/01
89	18	12/01
100	20	12/01
97	19	12/01
89	18	12/01
95	19	12/08

CV = 104.5 ± 6.4 mg/L

Result	Uncer.	Date
110	20	12/08
110	20	12/08

****

EPA Drinking Water Study 29

****

Chlorine (Free)
91EPA 04 PTITR

CV = 0.75 ± 0.067 mg/L

Result	Uncer.	Date
0.64	0.06	11/20

CN 91EPA 04 ACOLR

CV = 0.34 ± 0.038 mg/L

Result	Uncer.	Date
0.29	0.03	11/16
0.29	0.03	11/16

F 91EPA 04 ISE

CV = 0.33 ± 0.011 mg/L

Result	Uncer.	Date
0.31	0.1	11/04

NO2-N 91EPA 04 FIA

CV = 0.56 ± 0.028 mg/L

Result	Uncer.	Date
0.654	0.06	11/16
0.654	0.06	11/16

NO3-N 91EPA 04 FIA

CV = 2.2 ± 0.07 mg/L

Result	Uncer.	Date
2.9	0.3	11/13
2.9	0.3	11/13

SO4 91EPA 04 IC

CV = 21 ± 1 mg/L

Result	Uncer.	Date
19	2	11/16
19	2	11/16

****

EPA Drinking Water Study 30

****

Ba 92EPA 04 ICPES

CV = 921 ± 56.7 ug/L

Result	Uncer.	Date
920	90	5/08

Be 92EPA 04 ICPES

CV = 8.47 ± 0.86 ug/L

Result	Uncer.	Date
9.1	0.9	5/08

Cd 92EPA 04 ICPES

CV = 39 ± 3.5 ug/L

Result	Uncer.	Date
40	4	5/08

Chlorine (Free)
92EPA 04 PTITR

CV = 1.22 ± 0.19 mg/L

Result	Uncer.	Date
1.1	0.2	5/26

Cr 92EPA 04 FAA

CV = 200 ± 15 ug/L

Result	Uncer.	Date
200	20	4/21

Cu 92EPA 04 ICPES

CV = 570 ± 38 ug/L

Result	Uncer.	Date
550	60	5/08

TABLE E-IV (cont)

****

EPA Drinking Water Study 30 (cont)

****

F 92EPA 04 ISE

CV = 7.9 ± 0.53 mg/L

Result	Uncer.	Date
8.3	0.8	5/20
8.3	0.8	5/20

Hardness 92EPA 04 CALC

CV = 100 ± 5.7 mg/L

Result	Uncer.	Date
130	10	5/20

Hg 92EPA 04 CVAA

CV = 3.46 ± 0.57 ug/L

Result	Uncer.	Date
3.1	0.3	4/21
3	0.3	4/21

Na 92EPA 04 ICPES

CV = 11.5 ± 0.87 mg/L

Result	Uncer.	Date
12	1	5/08

Ni 92EPA 04 FAA

CV = 39.5 ± 3.6 ug/L

Result	Uncer.	Date
41	4	4/21
38	4	4/21

pH 92EPA 04 GE

CV = 9.13 ± 0.16 units

Result	Uncer.	Date
9.25	0.1	5/01
9.23	0.1	5/01

Sb 92EPA 04 ICPES

CV = 8.2 ± 2.1 ug/L

Result	Uncer.	Date
9	3	5/08

SO4 92EPA 04 FIA

CV = 28 ± 1.9 mg/L

Result	Uncer.	Date
35	4	5/19
35	4	5/19

Single or 2-point calibration curve used, rather than multi-point.

Total Alkalinity 92EPA 04 TITR

CV = 25 ± 2.1 mg/L

Result	Uncer.	Date
25	3	5/20
24	2	5/20

Total Dissolved Solids 92EPA 04 GRAV

CV = 200 ± 50 mg/L

Result	Uncer.	Date
270	30	5/14

Tl 92EPA 04 ETVAA

CV = 5.3 ± 0.9 ug/L

Result	Uncer.	Date
4.7	0.5	4/28

****

EPA Drinking Water Study 31

****

Ag 92EPA 04 ICPMS

CV = 109 ± 10.2 ug/L

Result	Uncer.	Date
130	10	11/18

Blank subtraction not performed.

Al 92EPA 04 ICPMS

CV = 76.3 ± 10.2 ug/L

Result	Uncer.	Date
92.4	4.5	11/18

As 92EPA 04 ETVAA

CV = 70.2 ± 7.3 ug/L

Result	Uncer.	Date
69	14	11/18

B 92EPA 04 ICPES

CV = 720 ± 54 ug/L

Result	Uncer.	Date
770	60	11/18

Ba 92EPA 04 ICPES

CV = 681 ± 68 ug/L

Result	Uncer.	Date
690	45	11/18

Be 92EPA 04 ICPES

CV = 3.27 ± 0.94 ug/L

Result	Uncer.	Date
3.4	0.8	11/18

Cd 92EPA 04 ICPES

CV = 12.8 ± 1.73 ug/L

Result	Uncer.	Date
14	5	11/18

Chlorine (Free) 92EPA 04 PTITR

CV = 0.36 ± 0.097 mg/L

Result	Uncer.	Date
340	30	11/20

CN 92EPA 04 ACOLR

CV = 0.27 ± 0.045 mg/L

Result	Uncer.	Date
0.233	0.02	11/16
0.233	0.02	11/16

Cr 92EPA 04 ICPES

CV = 81.6 ± 8.1 ug/L

Result	Uncer.	Date
82	8	11/18

Cu 92EPA 04 ICPES

CV = 110 ± 7.3 ug/L

Result	Uncer.	Date
111	2	11/18

F 92EPA 04 ISE

CV = 5.7 ± 0.38 mg/L

Result	Uncer.	Date
5.8	0.6	11/04

Hg 92EPA 04 CVAA

CV = 0.908 ± 0.181 ug/L

Result	Uncer.	Date
0.77	0.13	11/18

Mn 92EPA 04 ICPES

CV = 17 ± 1.6 ug/L

Result	Uncer.	Date
18	2	11/18

Mo 92EPA 04 ICPES

CV = 42.3 ± 8.4 ug/L

Result	Uncer.	Date
43	9	11/18

Na 92EPA 04 IC

CV = 21.1 ± 1.27 mg/L

Result	Uncer.	Date
22	2	11/16
21	2	11/16

Ni 92EPA 04 ICPES

CV = 68 ± 6.8 ug/L

Result	Uncer.	Date
68	10	11/19

NO2-N 92EPA 04 FIA

CV = 0.43 ± 0.043 mg/L

Result	Uncer.	Date
0.51	0.05	11/16
0.51	0.05	11/16

NO3-N 92EPA 04 FIA

CV = 6.5 ± 0.43 mg/L

Result	Uncer.	Date
7.1	0.7	11/13
7.1	0.7	11/13

Pb 92EPA 04 ICPMS

CV = 12.4 ± 2.5 ug/L

Result	Uncer.	Date
14	1	11/18

Sb 92EPA 04 ICPES

CV = 4.69 ± 0.94 ug/L

Result	Uncer.	Date
4.5	2	11/18

Se 92EPA 04 ETVAA

CV = 22.9 ± 3.1 ug/L

Result	Uncer.	Date
21	4	11/18

SO4 92EPA 04 IC

CV = 8.6 ± 1.39 mg/L

Result	Uncer.	Date
8.2	1	11/16
8.2	1	11/16

Tl 92EPA 04 ICPMS

CV = 1.48 ± 0.48 ug/L

Result	Uncer.	Date
1.4	0.1	11/18

V 92EPA 04 ICPES

CV = 24.2 ± 2.4 ug/L

Result	Uncer.	Date
24	18	11/18

Zn 92EPA 04 ICPES

CV = 179 ± 9.7 ug/L

Result	Uncer.	Date
181	3	11/18

****

EPA Gross Alpha/Beta in Water, May 1988

****

Alpha 88EPA 01 PC

CV = 11 ± 5 pCi/L

Result	Uncer.	Date
15	3	1/09
8	2	1/09
13	3	1/09
8	2	1/09

Alpha (cont)

13	3	1/09
10	2	1/09
8	2	1/09
13	3	1/09
8	2	1/24
9	2	1/24
9	2	1/24
6	1	1/24
6	1	1/24
9	2	1/24
10	2	1/27
7	2	1/27
12	3	1/27
8	2	2/13
9	2	2/13
8	2	2/13
9	2	2/13
12	3	2/13
12	3	2/13
8	2	2/13
12	3	2/13
9	2	2/13
9	2	2/24
7	2	2/24
12	3	2/24
12	3	2/24
9	2	2/24
7	2	2/24
9	2	2/24
12	3	2/24
8	2	2/24
12	3	2/24
7	2	2/24
10	2	2/24
8	2	2/27
13	3	2/27
11	2	2/27
10	2	3/24
5	1	3/24
10	2	3/24
10	2	3/26
8	2	3/26
11	2	3/26
7	2	4/03
13	3	4/03
11	2	4/03
11	2	4/10
10	2	4/10
10	2	4/13
11	2	4/13
8	2	4/13
12	3	4/21
13	3	4/21
7	2	4/21
7	2	4/22
7	2	4/22
11	3	4/22
7	2	4/22
11	3	4/22
9	2	4/22
12	3	4/30
8	2	4/30
12	2	4/30
8	2	4/30
12	3	4/30
12	3	4/30
6.8	0.8	4/30
12	3	4/30
12	3	4/30
12	3	4/30
12	3	4/30
12	3	4/30
8	2	4/30
8	2	4/30
12	3	4/30
7	2	5/07
7	2	5/07
12	3	5/07

TABLE E-IV (cont)

****

EPA Gross Alpha/Beta in Water,
May 1988
(cont)

****

Alpha (cont)

10	2	5/07
12	3	5/07
12	3	5/07
12	3	5/07
13	3	5/07
11	3	5/19
10	2	5/19
10	2	5/19
9	2	5/20
12	3	5/20
8	2	5/20
11	2	6/15
8	2	6/15
7	2	6/15
9	2	6/16
11	2	6/16
7	2	6/16
13	3	6/30
11	1	6/30
7	2	6/30
6	1	6/30
12	3	6/30
11	2	6/30
13	3	7/20
8.2	2	7/20
10	2	7/20
13	3	7/20
13	3	7/20
8	2	7/20
10	2	7/21
10	2	7/21
11	2	7/21
6	1	7/21
6	1	7/21
11	2	7/21
6	1	7/21
11	2	7/21
10	2	7/21
11	2	7/21
6	1	7/21
10	2	7/21
6	1	7/21
10	2	7/21
11	2	7/21
8	2	7/21
11	2	7/21
10	2	7/28
10	2	7/28
9	2	7/28
9	2	7/28
8	2	7/28
8	2	7/28
11	3	8/08
7	2	8/08
12	3	8/10
11	2	8/10
8	2	8/10
11	2	8/10
12	3	8/10
8	2	8/10
11	2	8/10
11	2	8/10
8	2	8/10
8	2	8/10
8	2	8/10
12	3	8/10
11	2	8/10
12	3	8/10
8	2	8/10
8	2	8/14

Alpha (cont)

12	3	8/14
8.2	2	8/17
12	3	8/17
8	2	8/17
10	3	8/17
8	2	8/17
8	2	8/26
7	2	8/26
11	2	8/26
11	2	9/10
7	2	9/10
12	3	9/10
9	2	9/10
14	3	9/10
7	2	9/10
14	3	9/10
7	2	9/10
9	2	9/10
8	2	9/14
13	3	9/14
10	2	9/14
7	2	9/14
10	2	9/14
13	3	9/14
13	3	9/14
7	2	9/14
7	2	9/15
14	3	9/15
10	2	9/15
9	2	9/16
12	3	9/16
12	3	9/16
7	2	9/16
11	2	9/29
11	2	9/29
10	2	9/29
10	2	9/29
13	3	10/02
11	2	10/02
7	2	10/02
12	3	10/05
8	2	10/05
9	2	10/05
12	3	10/05
8	2	10/05
11	2	10/20
8	2	10/20
12	3	10/20
7	2	10/20
11	2	10/28
6	1	10/28
11	2	10/29
7	2	10/29
13	3	11/03
7	2	11/03
12	3	11/16
21	5	11/16
16	4	11/16
6	1	11/18
12	3	11/18
9	2	11/18
6	1	11/18
12	3	11/18
8	2	11/18
13	3	11/18
13	3	11/18
10	2	11/20
11	2	11/20
10	2	11/20
7	2	11/20
6	1	11/20
10	2	12/01
9	2	12/01
8	2	12/01
6	1	12/02
9	2	12/02

Alpha (cont)

10	2	12/02
11	2	12/03
6	1	12/03
10	2	12/03

Beta 88EPA 01 PC

CV = 11 ± 5 pCi/L

Result	Uncer.	Date
11	1	1/09
7.8	0.9	1/09
11	1	1/09
7.8	0.9	1/09
11	1	1/09
6.9	0.8	1/09
11	1	1/09
10	1	1/09
9	1	1/24
5.2	0.7	1/24
8.3	1	1/24
9	1	1/24
5.2	0.7	1/24
9	1	1/24
12	1	1/27
10	1	1/27
7.2	0.8	1/27
10	1	2/13
11	1	2/13
6	0.8	2/13
10	1	2/13
6.6	0.8	2/13
6.6	0.8	2/13
11	1	2/13
11	1	2/13
10	1	2/13
10	1	2/24
7.3	0.8	2/24
7.3	0.8	2/24
10	1	2/24
10	1	2/24
7.2	0.8	2/24
11	1	2/24
7.3	0.8	2/24
10	1	2/24
10	1	2/24
10	1	2/24
10	1	2/24
11	1	2/27
7.5	0.9	2/27
10	1	2/27
6.4	0.8	3/24
12	1	3/24
10	1	3/24
10	1	3/26
11	1	3/26
6.8	0.8	3/26
11	1	4/03
6.7	0.8	4/03
10	1	4/03
11	1	4/10
11	1	4/10
11	1	4/13
6.7	0.8	4/13
10	1	4/13
11	1	4/21
7.2	0.8	4/21
11	1	4/21
11	1	4/22
6.9	0.8	4/22
11	1	4/22
6.9	0.8	4/22
6.9	0.8	4/22
11	1	4/22
8	2	4/30
10	1	4/30

Beta (cont)

6.8	0.8	4/30
10	1	4/30
6.8	0.8	4/30
10	1	4/30
10	1	4/30
10	1	4/30
6.8	0.8	4/30
10	1	4/30
10	1	4/30
6.8	0.8	4/30
10	1	4/30
10	1	4/30
9	1	5/07
10	1	5/07
10	1	5/07
6.6	0.8	5/07
11	1	5/07
6.8	0.8	5/07
10	1	5/07
10	1	5/07
6.9	0.8	5/19
10	1	5/19
10	1	5/19
10	1	5/20
6.7	0.8	5/20
10	1	5/20
11	1	6/15
10	1	6/15
7.3	0.8	6/15
10	1	6/16
10	1	6/16
7	0.8	6/16
6.6	0.8	6/30
10	1	6/30
7.1	0.8	6/30
12	1	6/30
10	1	6/30
11	1	6/30
6.6	0.8	7/20
6.6	0.8	7/20
6.6	0.8	7/20
11	1	7/20
11	1	7/20
11	1	7/20
11	1	7/21
6.7	0.8	7/21
6.8	0.8	7/21
10	1	7/21
10	1	7/21
10	1	7/21
6.7	0.8	7/21
6.7	0.8	7/21
10	1	7/21
10	1	7/21
10	1	7/21
10	1	7/21
6.7	0.8	7/21
10	1	7/21
10	1	7/21
6.7	0.8	7/21
11	1	7/21
11	1	7/28
5.9	0.7	7/28
11	1	7/28
10	1	7/28
5.9	0.7	7/28
10	1	7/28
10	1	8/08
6.3	0.8	8/08
11	1	8/10
6.3	0.7	8/10
10	1	8/10
6.3	0.7	8/10
6.3	0.7	8/10
10	1	8/10
10	1	8/10
6.3	0.7	8/10
11	1	8/10

Beta (cont)

11	1	8/10
10	1	8/10
6.3	0.7	8/10
11	1	8/10
6.3	0.7	8/10
10	1	8/10
6	0.7	8/14
10	1	8/14
6	0.7	8/17
10	1	8/17
10	1	8/17
11	1	8/17
6	0.7	8/17
10	1	8/26
10	1	8/26
6.7	0.8	8/26
10	1	9/10
10	1	9/10
6.8	0.8	9/10
11	1	9/10
11	1	9/10
11	1	9/10
10	1	9/10
6.8	0.8	9/10
7.1	0.8	9/10
6.4	0.8	9/14
6.4	0.8	9/14
10	1	9/14
10	1	9/14
9	1	9/14
9	1	9/14
10	1	9/14
11	1	9/14
11	1	9/15
6.9	0.8	9/15
11	1	9/15
11	1	9/16
11	1	9/16
6.6	0.8	9/16
11	1	9/16
9	1	9/29
9	1	9/29
9	1	9/29
9	1	9/29
10	1	10/02
6.7	0.8	10/02
10	1	10/02
11	1	10/05
6.6	0.8	10/05
6.6	0.8	10/05
10	1	10/05
10	1	10/05
9	1	10/20
11	1	10/20
11	1	10/20
6.4	0.8	10/20
6.1	0.7	10/28
11	1	10/28
6.2	0.7	10/29
9	1	10/29
5.7	0.7	11/03
10	1	11/03
18	2	11/16
19	2	11/16
12	1	11/16
6.1	0.7	11/18
9	1	11/18
6.4	0.8	11/18
10	1	11/18
6.6	0.8	11/18
10	1	11/18
10	1	11/18
6.5	0.8	11/18
6.9	0.8	11/20
10	1	11/20
6.3	0.8	11/20
11	1	11/20
10	1	11/20

Beta (cont)

10	1	12/01
10	1	12/01
6.1	0.7	12/01
5.7	0.7	12/02
10	1	12/02
9	1	12/02
5.1	0.7	12/03
10	1	12/03

****

EPA Gross Alpha/Beta in Water,
January 1992

****

Alpha 92EPA 01 PC

CV = 30 ± 8 pCi/L

Result	Uncer.	Date
17	4	2/18
16	4	2/18
17	4	2/18

****

EPA Gross Alpha/Beta in Water,
May 1992

****

Alpha 92EPA 01 PC

CV = 15 ± 5 pCi/L

Result	Uncer.	Date
11	2	6/04
12	3	6/04
10	2	6/04

Beta 92EPA 01 PC

CV = 44 ± 5 pCi/L

Result	Uncer.	Date
43	4	6/04
40	4	6/04
43	4	6/04

****

EPA Gross Alpha/Beta in Water,
September 1992

****

Alpha 92EPA 04 PC

CV = 45 ± 11 pCi/L

Result	Uncer.	Date
10	3	10/05
6	3	10/05
12	4	10/05

Activity not transferred to plate.

TABLE E-IV (cont)

****

EPA Gross Alpha/Beta in Water, September 1992 (cont)

****

Beta 92EPA 04 PC

CV = 50 ± 5 pCi/L

Result	Uncer.	Date
29	3	10/05
28	3	10/05
28	3	10/05

Activity not transferred to plate.

****

EPA Mineral Analysis in Water

****

Ca 91EPA 04 ICPES

CV = 20 ± 0.98 mg/L

Result	Uncer.	Date
19	2	5/20
23	2	12/15

Cl 89EPA 02, 91EPA 04 IC

CV = 51.4 ± 1.85 mg/L

Result	Uncer.	Date
49	5	1/15
48	5	1/17
48.4	4.5	4/13
47	5	6/09
47	5	6/09
49	5	8/13
50	5	8/18
48	5	8/18
50	5	8/19
49	5	8/24
48	5	8/26
47	5	9/10
47	5	9/11
50	5	10/16
48	5	10/22
47	5	10/22
49	5	10/27
49	5	10/27
50	5	10/27
49	5	10/27
48	5	11/16

CV = 51.6 ± 1.8 mg/L

Result	Uncer.	Date
50	5	1/15
50	5	1/15
52	5	1/15
51	5	2/13
44	4	3/06
53	5	4/13
52	5	5/14
50	5	5/27
54	5	7/07

Conductivity 91EPA 04 CB

CV = 280 ± 11.1 umhos/cm

Result	Uncer.	Date
322	16	1/16
260	13	4/08
264	13	8/13
273	14	10/23
254	13	10/23

F 91EPA 04 FIA

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
0.94	0.1	8/21
0.97	0.1	8/25
1.1	0.1	8/25
1	0.1	8/25
0.98	0.1	8/25

F 89EPA 02, 91EPA 04 ISE

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
0.7	0.2	1/14
0.96	0.1	1/14
0.96	0.1	1/14
0.82	0.2	1/16
1.1	0.1	3/06
1	0.1	4/09
1.1	0.2	4/09
1	0.1	5/20
1	0.1	5/20
1	0.1	5/20
1	0.1	5/20
1.1	0.1	8/25
1.1	0.1	9/21
0.97	0.1	9/21
0.97	0.1	9/21
0.97	0.1	9/21
0.98	0.1	9/21
0.98	0.1	10/09
0.99	0.1	10/13
1	0.1	10/13
1	0.1	10/13
1	0.1	10/13
0.98	0.1	10/13
1	0.1	10/21
1	0.1	10/21
0.99	0.1	10/21
1.1	0.1	10/29
0.99	0.1	10/29
0.99	0.1	11/04
0.99	0.1	11/04
1	0.1	11/04

Hardness 91EPA 04 CALC

CV = 70.5 ± 2.65 mg/L

Result	Uncer.	Date
63	6	4/15
66	7	5/27
76	8	9/21
76	8	12/17
78	8	12/17

K 91EPA 04 ICPES

CV = 5 ± 0.33 mg/L

Result	Uncer.	Date
3	1	5/20
5.7	0.6	12/15

Mg 91EPA 04 ICPES

CV = 5 ± 0.27 mg/L

Result	Uncer.	Date
4.5	0.5	5/20
5.4	0.5	12/15

Na 91EPA 04 IC

CV = 19.9 ± 0.83 mg/L

Result	Uncer.	Date
21	2	11/16

Na 91EPA 04 ICPES

CV = 19.9 ± 0.83 mg/L

Result	Uncer.	Date
17	2	5/20
22	2	12/15

pH 91EPA 04 GE

CV = 6 ± 0.05 units

Result	Uncer.	Date
6.06	0.1	1/16
6.11	0.1	10/22
6.07	0.1	10/22
6.09	0.1	10/22
6.08	0.1	10/23
6.11	0.1	12/16
6.16	0.1	12/16

SO4 89EPA 02, 91EPA 04 IC

CV = 20 ± 1.4 mg/L

Result	Uncer.	Date
20	2	1/15
20	2	1/15
20	2	1/15
19	2	2/13
19	2	2/13
21	2	3/06
21	2	4/13
21	2	4/13
21	2	5/14
21	2	5/27
21	2	7/07

SO4 (cont)

CV = 20 ± 1.42 mg/L

Result	Uncer.	Date
15	2	1/15
15	2	1/17
21	2	4/13
20	2	6/09
20	2	6/09
22	2	8/13
19	2	8/18
19	2	8/18
22	2	8/19
18	2	8/24
19	2	8/26
19	2	9/10
19	2	9/11
19	2	10/01
19	2	10/16
19	2	10/22
18	2	10/22
19	2	10/27
19	2	10/27
19	2	10/27
19	2	10/27
19	2	11/16
18	2	11/16

Total Alkalinity 91EPA 04 COLOR

CV = 24.2 ± 1.47 mg/L

Result	Uncer.	Date
25	3	6/17
26	3	6/17
25	3	6/25
31	3	9/30
30	3	9/30
29	3	10/01
31	3	10/07
30	3	10/21
32	3	10/30
26	3	10/30
29	3	10/30
24	2	11/05
27	3	11/05
30	3	11/05
28	3	12/04
21	2	12/04

Total Alkalinity 89EPA 02, 91EPA 04 TITR

CV = 20 ± 1.39 mg/L

Result	Uncer.	Date
24	2	1/14
24	2	1/14
22	2	3/06

CV = 24.2 ± 1.47 mg/L

Result	Uncer.	Date
26	3	1/14
20	2	1/16
25	3	4/07
26	3	4/07
28	3	5/20
26	3	6/17
24	2	7/15
27	3	7/31

Total Alkalinity (cont)

Result	Uncer.	Date
27	3	9/02
24	2	9/10
25	3	9/10
24	2	9/10
25	3	9/10
25	3	9/28
26	3	10/07
30	3	10/30
27	3	11/05

Total Dissolved Solids 91EPA 04 GRAV

CV = 153 ± 18.9 mg/L

Result	Uncer.	Date
77	8	1/10
200	20	1/16
160	20	5/15
200	20	8/17
170	20	10/15
140	10	12/04

****

EPA Nutrients in Water

****

NH3-N 84EPA 02, 86EPA 02 FIA

CV = 1.52 ± 0.09 mg/L

Result	Uncer.	Date
1.42	0.1	6/09
1.43	0.1	6/25
1.42	0.1	6/25
1.47	0.1	7/02
1.4	0.1	7/10
1.42	0.1	7/28
1.42	0.1	8/03
1.4	0.1	8/10
1.36	0.1	8/25
1.5	0.2	9/04

CV = 2 ± 0.1 mg/L

Result	Uncer.	Date
2	0.2	1/09
2	0.2	1/30
2	0.2	1/30
1.8	0.2	3/06
1.9	0.2	4/06
1.9	0.2	4/06
1.9	0.2	4/06
2.4	0.2	5/07
2.21	0.2	6/25
2.2	0.2	6/25
1.8	0.2	7/02
2	0.2	9/17
1.9	0.2	10/16
1.9	0.2	11/06
2	0.2	12/03

NO3-N 86EPA 02 FIA

CV = 2 ± 0.08 mg/L

Result	Uncer.	Date
1.9	0.2	1/16
1.9	0.2	1/16
1.9	0.2	1/16
1.9	0.2	2/07
1.9	0.2	2/07
1.9	0.2	2/26
1.9	0.2	2/26
1.9	0.2	2/26
1.9	0.2	2/26
2.1	0.2	4/07
2.1	0.2	4/07
2.1	0.2	4/07
2	0.2	8/18
2	0.2	8/18
2	0.2	8/18
2.1	0.2	8/26
2.1	0.2	8/26
2.1	0.2	8/26
2	0.2	9/17
2	0.2	9/17
2	0.2	9/17
2	0.2	10/01
2	0.2	10/16
2	0.2	10/20
2	0.2	10/20
2	0.2	12/03
2	0.2	12/03
2	0.02	12/03
2.1	0.2	12/09

P 81EPA 01, 86EPA 02, 88EPA 02 ACOLR

CV = 140 ± 40 ug/L

Result	Uncer.	Date
0.13	0.03	4/15
220	40	5/07
130	30	5/29
180	40	6/25
190	40	6/25
190	40	7/01
170	30	7/01

CV = 1.04 ± 0.06 mg/L

Result	Uncer.	Date
1	0.1	7/30
0.99	0.2	8/05
1.1	0.2	8/24
0.98	0.2	9/01
1	0.2	9/11
1	0.2	10/20
1	0.2	10/20

CV = 1.5 ± 0.07 mg/L

Result	Uncer.	Date
1.5	0.3	1/09
1.5	0.3	2/03
1.6	0.3	3/04
1.5	0.3	4/08
1.5	0.3	4/08
1.5	0.3	4/08
1.7	0.3	5/07
1.5	0.3	6/25
1.5	0.3	6/25
1.6	0.3	7/01
1.6	0.3	7/01
1.7	0.3	7/17

TABLE E-IV (cont)

****

EPA Nutrients in Water
(cont)

****

P (cont)

1.5	0.2	7/30
1.5	0.3	8/05
1.5	0.3	8/24
1.5	0.3	9/01
1.6	0.3	9/11
1.6	0.3	12/03

CV = 1.5 ± 0.11 mg/L

Result	Uncer.	Date
1.2	0.2	7/17
0.99	0.2	8/05

PO4-P
84EPA 02, 86EPA 02 ACOLR

CV = 270 ± 10 ug/L

Result	Uncer.	Date
260	50	1/16
260	50	1/16
260	50	1/16
260	50	1/16
270	50	2/03
270	50	2/03
260	50	3/04
250	50	4/10
250	50	4/10

CV = 500 ± 20 ug/L

Result	Uncer.	Date
460	90	10/15
460	90	10/15
460	90	10/15

****

EPA Oil and Grease

****

Oil/Grease GRAV
87EPA 02, 89EPA 02, 91EPA 04

CV = 20 ± 3 mg/L

Result	Uncer.	Date
21	4	3/16
20	4	3/16
19	4	4/22
19	4	4/22
18	4	9/11
18	4	9/11
18	2	10/16
18	2	10/16

CV = 20 ± 6 mg/L

Result	Uncer.	Date
19	4	4/06

****

EPA Plutonium-239 in Water,
January 1992

****

Pu-239 92EPA 01 RAS

CV = 16.8 ± 1.7 pCi/L

Result	Uncer.	Date
15.6	0.5	2/19
14.7	0.5	2/19
14.5	0.5	2/19
15.6	0.6	2/25
15.8	0.6	2/25
15.9	0.6	2/25
15	2	3/16
16	2	3/16
16	2	3/16

****

EPA Plutonium-239 in Water,
August 1992

****

Pu-239 92EPA 04 RAS

CV = 9 ± 0.9 pCi/L

Result	Uncer.	Date
8.4	0.25	9/28
8.99	0.26	9/28
8.64	0.27	9/28
9.6	0.5	9/30
9.1	0.41	9/30
9.95	0.44	9/30
9.1	1	10/08
8.6	1	10/08
9	1	10/08

****

EPA Radionuclides in Milk,
May 1992

****

Cs-137 92EPA 04 G

CV = 39 ± 5 pCi/L

Result	Uncer.	Date
28	5	5/20
27	5	5/20
28	5	5/20

No branching ratios used.

I-131 92EPA 04 G

CV = 78 ± 8 pCi/L

Result	Uncer.	Date
55	10	5/20
57	10	5/20
51	8	5/20

No branching ratios used.

Sr-90 92EPA 04 PC

CV = 29 ± 5 pCi/L

Result	Uncer.	Date
27	3	12/11
27	3	12/11
28	3	12/11

****

EPA Radionuclides in Milk,
October 1992

****

Sr-90 92EPA 04 PC

CV = 15 ± 5 pCi/L

Result	Uncer.	Date
16	3	11/18
14	3	11/18
15	3	11/18

****

EPA Radionuclides in Water,
February 1992

****

Ba-133 92EPA 01 G

CV = 76 ± 8 pCi/L

Result	Uncer.	Date
51	10	3/26
45	9	3/26
52	10	3/26

EPA samples have lower values than routine samples, so backgrounds are too high.

Co-60 92EPA 01 G

CV = 40 ± 5 pCi/L

Result	Uncer.	Date
39	11	3/26
23	11	3/26
42	11	3/26

Cs-134 92EPA 01 G

CV = 31 ± 5 pCi/L

Result	Uncer.	Date
30	8	3/26
25	7	3/26
28	8	3/26

Cs-137 92EPA 01 G

CV = 49 ± 5 pCi/L

Result	Uncer.	Date
31	8	3/26
30	7	3/26
27	7	3/26

EPA samples have lower values than routine samples, so backgrounds are too high.

Ru-106 92EPA 01 G

CV = 203 ± 20 pCi/L

Result	Uncer.	Date
160	60	3/26
130	70	3/26
120	60	3/26

EPA samples have lower values than routine samples, so backgrounds are too high.

Zn-65 92EPA 01 G

CV = 148 ± 15 pCi/L

Result	Uncer.	Date
95	20	3/26
110	20	3/26
99	20	3/26

EPA samples have lower values than routine samples, so backgrounds are too high.

****

EPA Radionuclides in Water,
June 1992

****

Ba-133 92EPA 04 G

CV = 98 ± 10 pCi/L

Result	Uncer.	Date
74	13	7/10
64	12	7/10
67	12	7/10

Interference from Ra-226 peak.

Co-60 92EPA 04 G

CV = 20 ± 5 pCi/L

Result	Uncer.	Date
39	10	7/10
46	11	7/10
35	9	7/10

Variable background rate.

Cs-134 92EPA 04 G

CV = 15 ± 5 pCi/L

Result	Uncer.	Date
13	8	7/10
5.6	10.9	7/10
14	9	7/10

Cs-137 92EPA 04 G

CV = 15 ± 5 pCi/L

Result	Uncer.	Date
17	9	7/10
23	9	7/10
17	8	7/10

Ru-106 92EPA 04 G

CV = 141 ± 5 pCi/L

Result	Uncer.	Date
130	80	7/10
140	60	7/10
60	65	7/10

Zn-65 92EPA 04 G

CV = 99 ± 10 pCi/L

Result	Uncer.	Date
82	18	7/10
90	19	7/10
85	19	7/10

****

EPA Radionuclides in Water,
October 1992

****

Ba-133 92EPA 04 G

CV = 74 ± 7 pCi/L

Result	Uncer.	Date
0.36	15.5	11/11
12	17	11/11
35	16	11/11

Marinelli beaker configuration counter not working; alternate counter had lower efficiency.

Co-60 92EPA 04 G

CV = 10 ± 5 pCi/L

Result	Uncer.	Date
11	27	11/11
- 23.1	30.1	11/11
4.9	22.6	11/11

Marinelli beaker configuration counter not working; alternate counter had lower efficiency.

Cs-134 92EPA 04 G

CV = 8 ± 5 pCi/L

Result	Uncer.	Date
- 51.5	18	11/11
- 48.5	17.8	11/11
- 50.4	18.4	11/11

Marinelli beaker configuration counter not working; alternate counter had lower efficiency.

Cs-137 92EPA 04 G

CV = 8 ± 5 pCi/L

Result	Uncer.	Date
- 44.4	17.1	11/11
- 47.4	17.1	11/11
- 15.7	16.4	11/11

Marinelli beaker configuration counter not working; alternate counter had lower efficiency.

Ru-106 92EPA 04 G

CV = 175 ± 18 pCi/L

Result	Uncer.	Date
185	127	11/11
92	124	11/11
93	129	11/11

Marinelli beaker configuration counter not working; alternate counter had lower efficiency.

Zn-65 92EPA 04 G

CV = 148 ± 15 pCi/L

Result	Uncer.	Date
100	30	11/11
75	29	11/11
81	28	11/11

Marinelli beaker configuration counter not working; alternate counter had lower efficiency.

****

EPA Radium in Water,
March 1992

****

Ra-226 92EPA 04 RAS

CV = 10.1 ± 1.5 pCi/L

Result	Uncer.	Date
8.9	0.9	4/21
10	1	4/21
9	0.9	4/21

TABLE E-IV (cont)

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EPA Radium in Water, June 1992

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Ra-226 92EPA 04 RAS

CV = 24.9 ± 3.7 pCi/L

Result	Uncer.	Date
18	2	8/13
21	2	8/13
20	2	8/13

****

EPA Radium in Water, November 1992

****

Ra-226 92EPA 04 RAS

CV = 7.5 ± 1.1 pCi/L

Result	Uncer.	Date
6.5	0.6	12/16
6.4	0.6	12/16
6.3	0.6	12/16

****

EPA Residual Chlorine in Water

****

Chlorine (Free) 89EPA 02 PTITR

CV = 4 ± 0.3 mg/L

Result	Uncer.	Date
3.7	0.7	4/13

****

EPA Residue in Water

****

Total Suspended Solids 87EPA 00, 89EPA 02 GRAV

CV = 31.5 ± 1.8 mg/L

Result	Uncer.	Date
30	3	4/09
29	3	4/09
29	3	10/15
29	3	10/15
29	3	10/15
30	3	10/27

CV = 278 ± 9 mg/L

Result	Uncer.	Date
270	30	1/09
240	20	1/14
250	30	1/27
260	30	2/03
260	30	2/14
270	30	2/27
260	30	3/05
250	30	3/13

Total Suspended Solids (cont)

250	30	3/13
300	30	4/09
290	30	4/09
260	30	4/15
250	30	4/21
260	30	4/28
300	30	5/07
270	30	5/11
310	30	5/19
290	30	5/27
310	30	6/09
310	30	6/17
270	30	6/30
260	30	7/07
260	30	7/09
260	30	7/20
250	30	7/24
260	30	8/03
280	30	8/11
270	30	8/19
250	30	8/31
270	30	9/10
290	30	9/17

****

EPA Strontium in Water January 1992

****

Sr-90 92EPA 01 RAS

CV = 20 ± 5 pCi/L

Result	Uncer.	Date
19.4	1.3	2/28
19.4	1.3	2/28
20.3	1.4	2/28

****

EPA Strontium in Water May 1992

****

Sr-90 92EPA 04 PC

CV = 8 ± 5 pCi/L

Result	Uncer.	Date
7	0.7	7/09
7.2	0.7	7/09
7.6	0.6	7/09

****

EPA Study 12 (NPDES)

****

Al 92EPA 04 ICPES

CV = 950 ± 89 ug/L

Result	Uncer.	Date
953	48	4/23

As 92EPA 04 ETVAA

CV = 430 ± 40 ug/L

Result	Uncer.	Date
420	40	4/09

Be 92EPA 04 ICPES

CV = 40 ± 5.2 ug/L

Result	Uncer.	Date
39.4	2	4/23

Biological Oxygen Demand 92EPA 04 TITR

CV = 64.2 ± 12.7 mg/L

Result	Uncer.	Date
75	8	4/13

Cd 92EPA 04 ICPES

CV = 40 ± 5.9 ug/L

Result	Uncer.	Date
43	2	4/23

Chlorine (Free) 92EPA 04 PTITR

CV = 0.97 ± - 0.145 mg/L

Result	Uncer.	Date
0.94	0.19	4/13

CN 92EPA 04 ACOLR

CV = 0.18 ± 0.029 mg/L

Result	Uncer.	Date
0.18	0.02	3/12

Co 92EPA 04 ICPES

CV = 370 ± 34.5 ug/L

Result	Uncer.	Date
367	18	5/04

Chemical Oxygen Demand 92EPA 04 COLOR

CV = 98.8 ± 10.4 mg/L

Result	Uncer.	Date
91	18	4/06
95	19	4/06

Cr 92EPA 04 ICPES

CV = 315 ± 26.3 ug/L

Result	Uncer.	Date
307	15	4/23

Cu 92EPA 04 ICPES

CV = 130 ± 7.7 ug/L

Result	Uncer.	Date
128	6	4/23

Fe 92EPA 04 ICPES

CV = 540 ± 35.3 ug/L

Result	Uncer.	Date
500	30	4/23

Hg 92EPA 04 CVAA

CV = 0.33 ± 0.133 ug/L

Result	Uncer.	Date
0.29	0.03	3/26
0.3	0.03	3/26
0.28	0.03	3/26
0.31	0.03	3/26
0.23	0.02	3/27
0.25	0.03	3/27

Mn 92EPA 04 ICPES

CV = 110 ± 7.7 ug/L

Result	Uncer.	Date
110	40	4/23

NH3-N 92EPA 04 FIA

CV = 14 ± 1.4 mg/L

Result	Uncer.	Date
14	1	4/10

Ni 92EPA 04 ICPES

CV = 2200 ± 113.3 ug/L

Result	Uncer.	Date
2160	110	4/23

NO3-N 92EPA 04 FIA

CV = 4.8 ± 0.5 mg/L

Result	Uncer.	Date
4.7	0.5	4/10

Oil/Grease 92EPA 04 GRAV

CV = 11 ± 2.87 mg/L

Result	Uncer.	Date
11	2	3/16

P 92EPA 04 ACOLR

CV = 2.3 ± 0.5 mg/L

Result	Uncer.	Date
2.5	0.5	4/08

Pb 92EPA 04 ICPES

CV = 150 ± 15 ug/L

Result	Uncer.	Date
158	8	4/23

pH 92EPA 04 GE

CV = 6.8 ± 0.0083 units

Result	Uncer.	Date
6.78	0.1	4/08

PO4-P 92EPA 04 ACOLR

CV = 2.3 ± 0.18 mg/L

Result	Uncer.	Date
2.3	0.5	4/10

Se 92EPA 04 ETVAA

CV = 55 ± 10.1 ug/L

Result	Uncer.	Date
51	10	4/09

Total Suspended Solids 92EPA 04 GRAV

CV = 40 ± 3.43 mg/L

Result	Uncer.	Date
39	4	3/13

V 92EPA 04 ICPES

CV = 6000 ± 356.7 ug/L

Result	Uncer.	Date
5770	290	4/23

Zn 92EPA 04 ICPES

CV = 1400 ± 83.3 ug/L

Result	Uncer.	Date
1310	70	4/23

****

EPA Trace Elements on Filter Media

****

P 91EPA 04 ACOLR

CV = 41.1 ± 14.63 ug/filter

Result	Uncer.	Date
12	2	1/10
11	2	1/16

CV = 63.4 ± 31.03 ug/filter

Result	Uncer.	Date
22	4	1/10
15	3	1/10

****

EPA Trace Metals in Water

****

Ag 78EPA 02 FAA

CV = 32 ± 2.45 ug/L

Result	Uncer.	Date
33	3	1/06
29	3	1/14
31	3	1/14
31	3	1/17
32	3	1/17
33	3	1/23
31	3	1/23
32	3	1/29
34	3	1/29
32	3	1/29
35	4	1/29
33	3	1/31
34	3	1/31
35	4	2/06
32	3	2/12
33	3	2/12
32	3	2/14
34	3	2/14
31	3	2/14
32	3	2/14
35	4	2/14
35	4	3/11
26	3	3/11
30	3	3/17
31	3	3/23
32	3	3/23
34	3	3/27
31	3	3/27
31	3	4/24
31	3	4/24
31	3	4/24
35	4	4/24
29	3	4/30
31	3	4/30
31	3	4/30
31	3	4/30
30	3	4/30
31	3	7/06

TABLE E-IV (cont)

****

EPA Trace Metals in Water
(cont)

****

As 78EPA 02 ETVAA

CV = 51 ± 4.28 ug/L

Result	Uncer.	Date
41	8	1/10
43	8	1/10
48	10	1/23
48	10	1/23
48	10	1/23
46	10	1/27
49	10	1/27
49	10	1/27
45	9	1/29
45	9	1/29
46	9	1/29
47	9	1/29
46	9	1/30
43	8	1/30
47	10	2/11
50	10	2/11
50	10	2/11
48	10	2/11
49	10	2/13
55	11	2/28
39	8	2/28
51	10	3/02
51	10	3/02
54	10	3/02
50	10	3/11
53	10	3/11
51	10	3/11
50	10	3/12
49	10	3/12
52	10	3/20
52	10	3/24
52	10	3/24
52	10	3/27
46	10	4/06
51	10	4/06
52	5	5/02
48	5	5/02
55	6	5/02
43	4	5/02
49	5	5/02
50	10	5/07
66	7	5/13
48	10	7/06

As 91EPA 04 ICPMS

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
1	0.1	8/31
1.1	0.1	8/31
0.98	0.1	8/31

Be 91EPA 04 FAA

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
0.98	0.1	2/19
0.99	0.1	2/28
0.99	0.1	2/28
0.97	0.1	3/05
0.98	0.1	3/05

Be (cont)

1	0.1	3/16
1	0.1	3/16
1	0.1	3/18
0.98	0.1	3/18
0.99	0.1	3/18
0.98	0.1	3/18
0.99	0.1	4/03
0.98	0.1	4/03
0.99	0.1	4/03
0.98	0.1	4/03
0.98	0.1	4/03
1	0.1	5/07
0.96	0.1	5/12
0.92	0.09	5/12
0.97	0.1	5/14
0.99	0.1	5/27
0.96	0.1	5/27
0.96	0.1	6/02
0.98	0.1	6/02
0.99	0.1	6/02
0.97	0.1	6/02
0.98	0.1	6/02
0.97	0.1	6/02
0.94	0.09	6/05
0.97	0.97	6/10
0.97	0.1	6/10
0.97	0.1	6/10
1	0.1	9/10
0.99	0.1	9/10
0.99	0.1	9/10

Be 91EPA 04 ICPMS

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
0.8	0.1	8/31
0.96	0.1	8/31
0.9	0.1	8/31

Ca 86EPA 02 FAA

CV = 5 ± 0.45 mg/L

Result	Uncer.	Date
5.41	0.5	3/05

Cd 91EPA 04 FAA

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
1	0.1	4/14

Co 91EPA 04 FAA

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
0.99	0.1	5/27

Co 91EPA 04 ICPMS

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
1	0.1	8/31
0.91	0.9	8/31
0.99	0.1	8/31

Cr 78EPA 02 ETVAA

CV = 53 ± 3.78 ug/L

Result	Uncer.	Date
61	12	1/06
59	12	1/06
53	10	2/05
54	10	2/05
58	10	4/06
55	10	4/06
58	10	4/06

Cr 91EPA 04 FAA

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
1.1	0.1	4/21
1.1	0.1	4/21

Cr 91EPA 04 ICPMS

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
0.81	0.08	8/31
0.75	0.07	8/31
0.86	0.09	8/31

Cu 91EPA 04 FAA

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
1	0.1	3/05

Cu 91EPA 04 ICPMS

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
0.94	0.1	8/31
0.97	0.1	8/31
1	0.1	8/31

Mn 91EPA 04 ICPMS

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
1	0.1	8/31
0.95	0.09	8/31
0.93	0.09	8/31

Ni 91EPA 04 CVAA

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
1	0.1	4/21

Ni 91EPA 04 FAA

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
1	0.1	4/21
1	0.1	5/05

Ni 91EPA 04 ICPMS

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
0.98	0.1	8/31
1	0.1	8/31
0.92	0.1	8/31

Pb 91EPA 04 FAA

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
1.06	0.1	2/06
1	0.1	2/19
1	0.1	2/19
1.07	0.1	2/28
0.99	0.1	2/28
1.08	0.1	3/05
1.09	0.1	3/05
1	0.1	3/18
0.97	0.1	3/18
1	0.1	3/24
1.1	0.1	4/10
1	0.1	4/10
1.1	0.1	4/10
1.1	0.1	4/10
1	0.1	4/14
1.1	0.1	4/29
1	0.1	5/12
1.1	0.1	5/12
1	0.1	5/27
1	0.1	7/06

Se 78EPA 02 ETVAA

CV = 8.1 ± 1.1 ug/L

Result	Uncer.	Date
8.2	2	1/10
5.6	2	1/10
9.1	2	1/23
8.9	2	1/23
8.7	2	1/23
8.9	2	1/27
8.5	2	1/27
9	2	1/27
8.3	2	1/29
7.7	2	1/29
7.2	2	1/29
7.1	2	1/29
7.8	2	1/30
9.6	2	1/30
9.1	2	2/11
9.7	2	2/11

Se (cont)

9.4	2	2/11
9.1	2	2/11
8	2	2/13
6.8	2	2/28
7.3	2	2/28
7.8	2	3/02
8.2	2	3/02
7.4	2	3/02
9	2	3/11
8.5	2	3/11
8.8	2	3/11
9.1	2	3/12
8.3	2	3/12
9.4	2	3/20
8	2	3/24
7	2	3/24
8.7	2	3/27
7.5	2	4/06
8.1	2	4/06
8	2	4/06
7.8	0.8	5/02
7.6	0.8	5/02
8.5	0.9	5/02
6.8	0.7	5/02
7.8	0.8	5/02
8.4	0.8	5/02
7.9	0.8	5/02
9.8	1	5/13
8.4	2	7/06

Se 91EPA 04 ICPMS

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
1	0.1	8/31
1	0.1	8/31
1	0.1	8/31

V 91EPA 04 ICPMS

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
0.84	0.8	8/31
0.81	0.08	8/31
0.76	0.08	8/31

Zn 91EPA 04 ICPMS

CV = 1 ± 0.05 mg/L

Result	Uncer.	Date
0.5	0.05	8/31
0.5	0.05	8/31
0.5	0.05	8/31

****

EPA Tritium in Water, Feb 1992

****

H-3 92EPA 01 LS

CV = not spiked pCi/L

Result	Uncer.	Date
200	300	3/11
200	300	3/11
200	300	3/11

H-3 (cont)

CV = 7904 ± 790 pCi/L

Result	Uncer.	Date
8500	700	3/11
8700	700	3/11
8700	700	3/11

****

EPA Tritium in Water
June 1992

****

H-3 92EPA 04 LS

CV = not spiked nCi/L

Result	Uncer.	Date
- 600	300	7/13
- 700	300	7/13
- 400	300	7/13

CV = 2125 ± 347 pCi/L

Result	Uncer.	Date
1700	400	7/13
1400	400	7/13
1900	400	7/13

****

EPA Tritium in Water, Oct 1992

****

H-3 92EPA 04 LS

CV = not spiked pCi/L

Result	Uncer.	Date
0	300	11/03
0	300	11/03
0	300	11/03
- 100	300	11/17
0	300	11/17
- 300	300	11/17

CV = 5962 ± 596 pCi/L

Result	Uncer.	Date
5500	700	11/03
5100	700	11/03
5300	700	11/03
5500	700	11/17
5200	700	11/17
5300	700	11/17

TABLE E-IV (cont)

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EPA Uranium in Water
March 1992

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U 92EPA 04 ICPMS

CV = 25.3 ± 3 pCi/L

Result	Uncer.	Date
25	3	3/26
24	2	3/26
24	2	3/26

****

EPA Uranium in Water
July 1992

****

U 92EPA 04 ICPMS

CV = 4 ± 3 pCi/L

Result	Uncer.	Date
3.8	0.2	8/19
3.8	0.2	8/19

****

EPA Water Pollution Study 24

****

As 90EPA 02 ETVAA

CV = 30 ± 2.8 ug/L

Result	Uncer.	Date
33	6	1/16
30	6	1/16
32	6	1/16

Cu 90EPA 02 FAA

CV = 85 ± 3.6 ug/L

Result	Uncer.	Date
87	9	1/06
89	9	1/06

Fe 90EPA 02 FAA

CV = 650 ± 30 ug/L

Result	Uncer.	Date
660	70	1/06
640	60	1/06

Pb 90EPA 02 FAA

CV = 100 ± 8 ug/L

Result	Uncer.	Date
110	10	1/21
100	10	1/29
110	10	1/30
100	10	3/17

Se 90EPA 02 ETVAA

CV = 70 ± 5.6 ug/L

Result	Uncer.	Date
68	14	1/16
71	14	1/16
71	14	1/16

Tl 90EPA 02 ETVAA

CV = 4.75 ± 0.66 ug/L

Result	Uncer.	Date
7	5	7/07
4.8	0.5	9/04

CV = 84.6 ± 7.3 ug/L

Result	Uncer.	Date
83	16	4/09
83	16	4/09
82	16	4/09
86	17	6/17
85	9	9/04

****

EPA Water Pollution Study 27

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Cl 91EPA 02 ACOLR

CV = 36.2 ± 1.9 mg/L

Result	Uncer.	Date
46	5	5/15

CV = 81.7 ± 3.7 mg/L

Result	Uncer.	Date
110	10	5/15

Required dilutions not performed.

Chlorine (Free)
91EPA 02 PTITR

CV = 1.2 ± 0.15 mg/L

Result	Uncer.	Date
0.95	0.19	11/02

CV = 2.4 ± 0.27 mg/L

Result	Uncer.	Date
2.2	0.4	4/13
2.2	0.4	4/13

NH3-N 91EPA 02 FIA

CV = 0.499 ± 0.063 mg/L

Result	Uncer.	Date
0.52	0.05	10/16

NO3-N 91EPA 02 FIA

CV = 9.1 ± 0.59 mg/L

Result	Uncer.	Date
8.9	0.9	10/16

P 91EPA 02 ACOLR

CV = 1.4 ± 0.1 mg/L

Result	Uncer.	Date
1.4	0.3	7/13

CV = 9.9 ± 0.68 mg/L

Result	Uncer.	Date
11	2	7/13

PO4-P 91EPA 02 ACOLR

CV = 0.73 ± 0.041 mg/L

Result	Uncer.	Date
0.7	0.14	10/15
0.7	0.14	10/15

SO4 91EPA 02 FIA

CV = 7.2 ± 0.99 mg/L

Result	Uncer.	Date
6.7	1	5/15

CV = 125 ± 6 mg/L

Result	Uncer.	Date
160	20	5/15

Required dilutions not performed.

Total Dissolved Solids
91EPA 02 GRAV

CV = 107 ± 17 mg/L

Result	Uncer.	Date
83	8	5/15

CV = 406 ± 34 mg/L

Result	Uncer.	Date
410	40	5/15

Total Suspended Solids
91EPA 02 GRAV

CV = 37.5 ± 3.7 mg/L

Result	Uncer.	Date
31	3	10/15

****

EPA Water Pollution Study 28

****

Ag 92EPA 04 FAA

CV = 1.03 ± 0.25 ug/L

Result	Uncer.	Date
1		4/09

CV = 10.6 ± 1.4 ug/L

Result	Uncer.	Date
10.6	1	4/09

Al 92EPA 04 ICPES

CV = 950 ± 117 ug/L

Result	Uncer.	Date
955	48	4/23

CV = 2100 ± 210 ug/L

Result	Uncer.	Date
2080	110	4/23

As 92EPA 04 ETVAA

CV = 100 ± 18.4 ug/L

Result	Uncer.	Date
100	20	4/09

CV = 430 ± 40 ug/L

Result	Uncer.	Date
420	80	4/09

Be 92EPA 04 ICPES

CV = 40 ± 7 ug/L

Result	Uncer.	Date
39	2	4/23

CV = 100 ± 17 ug/L

Result	Uncer.	Date
96.5	0.31	4/23

Biological Oxygen Demand
92EPA 04 COLOR

CV = 36 ± 10.2 mg/L

Result	Uncer.	Date
37	4	10/28

Biological Oxygen Demand
92EPA 04 TITR

CV = 36 ± 10.2 mg/L

Result	Uncer.	Date
45	4	4/13

CV = 64.2 ± 16.9 mg/L

Result	Uncer.	Date
70	7	4/13

Cd 92EPA 04 ICPES

CV = 40 ± 5.3 ug/L

Result	Uncer.	Date
42.4	2.1	4/23

CV = 250 ± 26.7 ug/L

Result	Uncer.	Date
253	13	4/23

Cl 92EPA 04 IC

CV = 108 ± 6.6 mg/L

Result	Uncer.	Date
110	10	4/13

CV = 176 ± 10.3 mg/L

Result	Uncer.	Date
200	20	4/13

Linear calibration curve used; should have used nonlinear curve.

Chlorine (Free)
92EPA 04 PTITR

CV = 0.44 ± 0.13 mg/L

Result	Uncer.	Date
0.44	0.09	4/13

CV = 0.97 ± 0.2 mg/L

Result	Uncer.	Date
0.98	0.19	4/13

CN 92EPA 04 ACOLR

CV = 0.18 ± 0.04 mg/L

Result	Uncer.	Date
0.19	0.02	4/10

CV = 0.61 ± 0.12 mg/L

Result	Uncer.	Date
0.64	0.06	4/10

Co 92EPA 04 ICPES

CV = 110 ± 10.2 ug/L

Result	Uncer.	Date
109	5	4/23

CV = 370 ± 30.7 ug/L

Result	Uncer.	Date
365	18	4/23

Chemical Oxygen Demand
92EPA 04 COLOR

CV = 56.3 ± 10.4 mg/L

Result	Uncer.	Date
52	10	4/06
56	11	4/06
49	10	10/09

CV = 98.8 ± 113.9 mg/L

Result	Uncer.	Date
93	19	4/06
93	19	4/06

Conductivity 92EPA 04 CB

CV = 545 ± 27.7 umhos/cm

Result	Uncer.	Date
529	26	4/08
535	27	4/08

CV = 742 ± 50 umhos/cm

Result	Uncer.	Date
719	36	4/08
726	36	4/08

Cr 92EPA 04 ICPES

CV = 315 ± 35 ug/L

Result	Uncer.	Date
304	15	4/23

CV = 800 ± 90 ug/L

Result	Uncer.	Date
766	38	4/23

Cu 92EPA 04 ICPES

CV = 130 ± 10.3 ug/L

Result	Uncer.	Date
127	6	4/23

CV = 790 ± 54.3 ug/L

Result	Uncer.	Date
779	39	4/23

TABLE E-IV (cont)

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EPA Water Pollution Study 28
(cont)

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F 92EPA 04 ISE

CV = 0.14 ± 0.04 mg/L

Result	Uncer.	Date
< 0.2		4/09
< 0.2		4/09

Spiked below detection limit.

CV = 1.2 ± 0.05 mg/L

Result	Uncer.	Date
1.2	0.2	4/09
1.3	0.2	4/09

Fe 92EPA 04 ICPES

CV = 540 ± 47 ug/L

Result	Uncer.	Date
499	25	4/23

CV = 1500 ± 127 ug/L

Result	Uncer.	Date
1370	70	4/23

Hardness 92EPA 04 CALC

CV = 151 ± 9.3 mg/L

Result	Uncer.	Date
150	20	4/15

CV = 247 ± 14.3 mg/L

Result	Uncer.	Date
440	40	4/15

Hg 92EPA 04 CVAA

CV = 0.33 ± 0.18 ug/L

Result	Uncer.	Date
0.33	0.03	3/26
0.32	0.03	3/26
0.27	0.03	3/26
0.29	0.03	3/26
0.31	0.03	3/27
0.28	0.03	3/27

CV = 5.3 ± 0.9 ug/L

Result	Uncer.	Date
5.4	0.5	3/26
5.5	0.6	3/26
5.4	0.5	3/26
5.4	0.5	3/26
4.9	0.5	3/27
5.1	0.5	3/27

Mn 92EPA 04 ICPES

CV = 110 ± 10 ug/L

Result	Uncer.	Date
100	40	4/23

CV = 910 ± 52 ug/L

Result	Uncer.	Date
764	38	4/23

Mo 92EPA 04 ICPES

CV = 4.79 ± 1.87 ug/L

Result	Uncer.	Date
5.1	0.3	4/23

CV = 21 ± 4.4 ug/L

Result	Uncer.	Date
22	1.1	4/23

NH3-N 92EPA 04 FIA

CV = 2.5 ± 0.4 mg/L

Result	Uncer.	Date
2.55	0.2	4/10

CV = 14 ± 1.8 mg/L

Result	Uncer.	Date
15	2	4/10

Ni 92EPA 04 ICPES

CV = 740 ± 51 ug/L

Result	Uncer.	Date
719	36	4/23

CV = 2200 ± 147 ug/L

Result	Uncer.	Date
2140	110	4/23

NO3-N 92EPA 04 FIA

CV = 4.8 ± 0.66 mg/L

Result	Uncer.	Date
4.7	0.5	4/10

CV = 15 ± 1.8 mg/L

Result	Uncer.	Date
15	2	4/10

Oil/Grease 92EPA 01 GRAV

CV = 11 ± 3.9 mg/L

Result	Uncer.	Date
11	2	4/06

CV = 19 ± 5.9 mg/L

Result	Uncer.	Date
18	4	4/06

P 92EPA 04 ACOLR

CV = 0.94 ± 0.15 mg/L

Result	Uncer.	Date
0.98	0.2	4/08

CV = 2.3 ± 0.3 mg/L

Result	Uncer.	Date
2.6	0.5	4/08

Pb 92EPA 04 ETVAA

CV = 150 ± 20 ug/L

Result	Uncer.	Date
160	20	4/09

CV = 550 ± 50 ug/L

Result	Uncer.	Date
580	60	4/09

pH 92EPA 04 GE

CV = 6.8 ± 0.11 units

Result	Uncer.	Date
6.77	0.1	4/08

CV = 9.4 ± 0.18 units

Result	Uncer.	Date
9.35	0.1	4/08

PO4-P 92EPA 04 ACOLR

CV = 0.51 ± 0.06 mg/L

Result	Uncer.	Date
0.52	0.1	4/10

CV = 2.3 ± 0.24 mg/L

Result	Uncer.	Date
2.3	0.5	4/10

Sb 92EPA 04 ICPES

CV = 39.1 ± 8.6 ug/L

Result	Uncer.	Date
37	1.8	4/23

CV = 84.9 ± 16.6 ug/L

Result	Uncer.	Date
81.7	4.1	4/23

Se 92EPA 04 ETVAA

CV = 14 ± 4 ug/L

Result	Uncer.	Date
14	2	4/09

CV = 55 ± 13.5 ug/L

Result	Uncer.	Date
52	10	4/09

SO4 92EPA 04 IC

CV = 29 ± 3.2 mg/L

Result	Uncer.	Date
25	3	4/13

CV = 63 ± 5.7 mg/L

Result	Uncer.	Date
54	5	4/13

Linear calibration curve used; should have used nonlinear curve.

Sr 92EPA 04 ICPES

CV = 9.09 ± 1.35 ug/L

Result	Uncer.	Date
9	0.45	4/23

CV = 80.9 ± 10.6 ug/L

Result	Uncer.	Date
80	4	4/23

Total Alkalinity
92EPA 04 TITR

CV = 15 ± 3.1 mg/L

Result	Uncer.	Date
15	2	4/07
16	2	4/07

CV = 36 ± 3.5 mg/L

Result	Uncer.	Date
36	4	4/07
35	4	4/07

Total Dissolved Solids
92EPA 04 GRAV

CV = 316 ± 51 mg/L

Result	Uncer.	Date
290	30	4/10

CV = 405 ± 99.7 mg/L

Result	Uncer.	Date
410	40	4/10

Tl 92EPA 04 ICPES

CV = 3.07 ± 1.25 ug/L

Result	Uncer.	Date
3.4	0.5	4/23

CV = 33.9 ± 5.3 ug/L

Result	Uncer.	Date
33.2	1.7	4/23

Total Suspended Solids
92EPA 04 GRAV

CV = 25 ± 4.7 mg/L

Result	Uncer.	Date
24	2	4/09
24	2	4/09

CV = 32 ± 4.7 mg/L

Result	Uncer.	Date
32.2	3	4/09
34	3	4/09

V 92EPA 04 ICPES

CV = 6000 ± 480 ug/L

Result	Uncer.	Date
5700	300	4/23

CV = 10000 ± 2770 ug/L

Result	Uncer.	Date
9560	480	4/23

Zn 92EPA 04 ICPES

CV = 360 ± 29 ug/L

Result	Uncer.	Date
340	40	4/23

CV = 1400 ± 113 ug/L

Result	Uncer.	Date
1300	100	4/23

****

EPA Water Pollution Study 29

****

Ag 92EPA 04 FAA

CV = 5.59 ± 0.7 ug/L

Result	Uncer.	Date
5	5	10/26

CV = 14 ± 1.4 ug/L

Result	Uncer.	Date
15	10	10/26

Al 92EPA 04 ICPES

CV = 65.9 ± 19.9 ug/L

Result	Uncer.	Date
90	30	10/21

CV = 548 ± 52.3 ug/L

Result	Uncer.	Date
580	30	10/21

As 92EPA 04 ETVAA

CV = 15 ± 2.1 ug/L

Result	Uncer.	Date
17	2	10/27

CV = 140 ± 13.7 ug/L

Result	Uncer.	Date
160	20	10/27

Be 92EPA 04 FAA

CV = 16.8 ± 2.2 ug/L

Result	Uncer.	Date
20	10	10/13

CV = 609 ± 53.7 ug/L

Result	Uncer.	Date
610	60	10/13

Biological Oxygen Demand
92EPA 04 COLOR

CV = 99.6 ± 19.1 mg/L

Result	Uncer.	Date
100	10	10/28

CV = 193 ± 36.7 mg/L

Result	Uncer.	Date
190	20	10/28

TABLE E-IV (cont)

****

EPA Water Pollution Study 29 (cont)

****

Ca 92EPA 04 ICPES

CV = 15 ± 0.77 mg/L

Result	Uncer.	Date
16.5	0.5	10/09

CV = 49 ± 2.37 mg/L

Result	Uncer.	Date
56	2	10/09

High values may be due to contamination.

Cd 92EPA 04 ICPES

CV = 16.8 ± 2.3 ug/L

Result	Uncer.	Date
19	2	10/21

CV = 380 ± 30.3 ug/L

Result	Uncer.	Date
395	2	10/21

Cl 92EPA 04 IC

CV = 33.3 ± 1.8 mg/L

Result	Uncer.	Date
31	3	10/16
32	3	10/16

CV = 159 ± 7 mg/L

Result	Uncer.	Date
160	20	10/16
160	20	10/16

Chlorine (Free) 92EPA 04 PTITR

CV = 1.8 ± 0.21 mg/L

Result	Uncer.	Date
1.6	0.3	11/02

CV = 4.8 ± 0.5 mg/L

Result	Uncer.	Date
3.8	0.8	11/02

CN 92EPA 04 ACOLR

CV = 0.04 ± 0.012 mg/L

Result	Uncer.	Date
0.036	0.01	10/15
0.035	0.01	10/15

CV = 0.35 ± 0.063 mg/L

Result	Uncer.	Date
0.29	0.03	10/15
0.29	0.03	10/15

Co 92EPA 04 ICPES

CV = 13.3 ± 1.8 ug/L

Result	Uncer.	Date
14	7	10/21

CV = 651 ± 39 ug/L

Result	Uncer.	Date
680	10	10/21

Chemical Oxygen Demand 92EPA 04 COLOR

CV = 157 ± 14.3 mg/L

Result	Uncer.	Date
190	40	10/09

CV = 304 ± 25 mg/L

Result	Uncer.	Date
270	50	10/09

Diluted by a factor of 5 to fall within analyst's calibration curve. Should have been diluted by a factor of 2.

Conductivity 92EPA 04 CB

CV = 182 ± 9 umhos/cm

Result	Uncer.	Date
134	7	10/15

CV = 812 ± 32 umhos/cm

Result	Uncer.	Date
735	37	10/15

Cr 92EPA 04 FAA

CV = 8.11 ± 2.24 ug/L

Result	Uncer.	Date
13	1	10/26

Cr (cont)

CV = 620 ± 50 ug/L

Result	Uncer.	Date
660	70	10/26

Cu 92EPA 04 FAA

CV = 6.33 ± 1.22 ug/L

Result	Uncer.	Date
8	0.8	10/26

CV = 241 ± 13.7 ug/L

Result	Uncer.	Date
250	20	10/26

F 92EPA 04 ISE

CV = 0.46 ± 0.04 mg/L

Result	Uncer.	Date
0.48	0.1	10/09

CV = 1.8 ± 0.12 mg/L

Result	Uncer.	Date
1.8	0.2	10/09

Fe 92EPA 04 FAA

CV = 83 ± 7.4 ug/L

Result	Uncer.	Date
80	20	10/26

CV = 711 ± 43.7 ug/L

Result	Uncer.	Date
720	70	10/26

Hardness 92EPA 04 CALC

CV = 46.5 ± 2.9 mg/L

Result	Uncer.	Date
52	5	10/15

CV = 221 ± 8.67 mg/L

Result	Uncer.	Date
240	20	10/15

Hardness values calculated from calcium values, which were high.

Hg 92EPA 04 CVAA

CV = 8.12 ± 1.01 ug/L

Result	Uncer.	Date
7.3	0.7	10/05

Hg (cont)

CV = 13 ± 1.8 ug/L

Result	Uncer.	Date
12	1	10/05

K 92EPA 04 ICPES

CV = 6.3 ± 0.53 mg/L

Result	Uncer.	Date
6.2	0.2	10/09

CV = 34 ± 2.4 mg/L

Result	Uncer.	Date
33	2	10/09

Mg 92EPA 04 ICPES

CV = 2.48 ± 0.2 mg/L

Result	Uncer.	Date
2.69	0.02	10/09

CV = 24 ± 1.47 mg/L

Result	Uncer.	Date
25.4	0.9	10/09

Mn 92EPA 04 ICPES

CV = 30.6 ± 2.5 ug/L

Result	Uncer.	Date
32	1	10/21

CV = 340 ± 17.3 ug/L

Result	Uncer.	Date
355	6	10/21

Mo 92EPA 04 ICPES

CV = 7.96 ± 2 ug/L

Result	Uncer.	Date
9	2	10/21

CV = 49 ± 5.7 ug/L

Result	Uncer.	Date
54	6	10/21

Na 92EPA 04 ICPES

CV = 9.68 ± 0.77 mg/L

Result	Uncer.	Date
10.2	0.1	10/09

Na (cont)

CV = 48.4 ± 3.2 mg/L

Result	Uncer.	Date
50	1	10/09

NH3-N 92EPA 04 FIA

CV = 0.35 ± 0.09 mg/L

Result	Uncer.	Date
0.35	0.04	10/16

CV = 0.96 ± 0.15 mg/L

Result	Uncer.	Date
0.96	0.1	10/16

Ni 92EPA 04 FAA

CV = 31.7 ± 3 ug/L

Result	Uncer.	Date
30	15	10/26

CV = 569 ± 33.7 ug/L

Result	Uncer.	Date
550	60	10/26

NO3-N 92EPA 04 FIA

CV = 0.17 ± 0.04 mg/L

Result	Uncer.	Date
0.17	0.02	10/16
0.17	0.02	10/16

CV = 1.3 ± 0.15 mg/L

Result	Uncer.	Date
1.3	0.1	10/16

Oil/Grease 92EPA 04 GRAV

CV = 30 ± 4.9 mg/L

Result	Uncer.	Date
31	3	10/15

CV = 72 ± 10.1 mg/L

Result	Uncer.	Date
79	8	10/15

P 92EPA 04 ACOLR

CV = 0.713 ± 0.07 mg/L

Result	Uncer.	Date
0.62	0.12	10/20

P (cont)

CV = 7.02 ± 0.64 mg/L

Result	Uncer.	Date
6.1	1.2	10/20

Pb 92EPA 04 ICPES

CV = 959 ± 62.7 ug/L

Result	Uncer.	Date
970	60	10/23

CV = 1500 ± 93.3 ug/L

Result	Uncer.	Date
1570	20	10/23

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pH 92EPA 04 GE

CV = 4.4 ± 0.05 units

Result	Uncer.	Date
4.36	0.1	10/15

CV = 8 ± 0.12 units

Result	Uncer.	Date
7.9	0.1	10/15

PO4-P 92EPA 04 FIA

CV = 0.03 ± 0.01 mg/L

Result	Uncer.	Date
0.031	0.02	10/15

CV = 0.67 ± 0.06 mg/L

Result	Uncer.	Date
0.64	0.13	10/15
0.65	0.13	10/15

Sb 92EPA 04 ICPMS

CV = 22 ± 4.3 ug/L

Result	Uncer.	Date
23	2	9/28

CV = 146 ± 21.3 ug/L

Result	Uncer.	Date
160	20	9/28

Se 92EPA 04 ETVAA

CV = 6.01 ± 1.2 ug/L

Result	Uncer.	Date
5.9	2	10/26

TABLE E-IV (cont)

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EPA Water Pollution Study 29 (cont)

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Se (cont)

CV = 170 ± 21.6 ug/L

Result	Uncer.	Date
170	40	10/26

SO4 92EPA 04 IC

CV = 17 ± 1.77 mg/L

Result	Uncer.	Date
16	2	10/16
16	2	10/16

CV = 84 ± 5.9 mg/L

Result	Uncer.	Date
83	8	10/16
83	8	10/16

Sr 92EPA 04 ICPES

CV = 12.9 ± 1.3 ug/L

Result	Uncer.	Date
13.6	0.4	10/09

CV = 61.9 ± 5.3 ug/L

Result	Uncer.	Date
64.9	0.8	10/09

Total Alkalinity 92EPA 04 TITR

CV = 9.7 ± 1.9 mg/L

Result	Uncer.	Date
12	1	10/09

CV = 52.8 ± 3.7 mg/L

Result	Uncer.	Date
53	5	10/09

Total Dissolved Solids 92EPA 04 GRAV

CV = 99.7 ± 20 mg/L

Result	Uncer.	Date
120	10	10/15

CV = 459 ± 57.7 mg/L

Result	Uncer.	Date
470	50	10/15

Ti 92EPA 04 ICPES

CV = 78 ± 2 ug/L

Result	Uncer.	Date
81	4	10/21

CV = 214 ± 12.7 ug/L

Result	Uncer.	Date
220	10	10/21

Tl 92EPA 04 ICPMS

CV = 5.3 ± 0.87 ug/L

Result	Uncer.	Date
5.4	1	10/27

CV = 76.2 ± 8.8 ug/L

Result	Uncer.	Date
84	8	10/27

Total Suspended Solids 92EPA 04 GRAV

CV = 18 ± 2.6 mg/L

Result	Uncer.	Date
14	1	10/15
13	1	10/15

CV = 93 ± 6.6 mg/L

Result	Uncer.	Date
78	8	10/15
79	8	10/15

Possible sample mixup.

V 92EPA 04 ICPES

CV = 38.2 ± 4 ug/L

Result	Uncer.	Date
40	1	10/09

CV = 490 ± 27.3 ug/L

Result	Uncer.	Date
523	9	10/09

Zn 92EPA 04 FAA

CV = 17 ± 2.9 ug/L

Result	Uncer.	Date
16	5	10/26

CV = 612 ± 38.3 ug/L

Result	Uncer.	Date
620	60	10/26

****

NBS 1566 Oyster Tissue

****

U 83NBS 02 DNA

CV = 116 ± 6 ng/g

Result	Uncer.	Date
110	10	4/11
110	10	4/11
100	10	4/11

U 83NBS 02 G

CV = 116 ± 6 ng/g

Result	Uncer.	Date
140	10	1/08
150	20	1/08
150	20	1/08
130	10	2/03
130	10	2/03
120	10	2/03

****

NBS 1633a Trace Elements in Coal Fly Ash

****

Ag 87GLA 01 ATNA

CV = < 300 ng/g

Result	Uncer.	Date
<11000		3/22

Al 85NBS 11 ATNA

CV = 14.3 ± 1 %

Result	Uncer.	Date
14.6	0.4	3/22

As 85NBS 11 ATNA

CV = 145 ± 15 ug/g

Result	Uncer.	Date
160	20	3/22

Au 91GLA 01 ATNA

CV = < 1 ug/g

Result	Uncer.	Date
< 0.011		3/22

Ba 87GLA 01 ATNA

CV = 1420 ± 100 ug/g

Result	Uncer.	Date
1500	200	3/22

Br 87GLA 01 ATNA

CV = 2.3 ug/g

Result	Uncer.	Date
2	0.4	3/22

Ca 85NBS 11 ATNA

CV = 1.11 ± 0.01 %

Result	Uncer.	Date
1.04	0.07	3/22

Ce 87GLA 01 ATNA

CV = 175 ± 7 ug/g

Result	Uncer.	Date
178	8	3/22

Cl 87GLA 01 ATNA

CV = < 69 ug/g

Result	Uncer.	Date
< 40		3/22

Cr 85NBS 11 ATNA

CV = 196 ± 6 ug/g

Result	Uncer.	Date
187	11	3/22

Cs 87GLA 01 ATNA

CV = 10.5 ± 0.7 ug/g

Result	Uncer.	Date
11.9	0.8	3/22

Cu 85NBS 11 ATNA

CV = 118 ± 3 ug/g

Result	Uncer.	Date
< 200		3/22

Dy 87GLA 01 ATNA

CV = 15.6 ± 1.2 ug/g

Result	Uncer.	Date
16.9	1.3	3/22

Eu 87GLA 01 ATNA

CV = 3.7 ± 0.2 ug/g

Result	Uncer.	Date
3.73	0.18	3/22

Fe 85NBS 11 ATNA

CV = 9.4 ± 0.1 %

Result	Uncer.	Date
10.2	0.5	3/22

Ga 87GLA 01 ATNA

CV = 56 ± 3 ug/g

Result	Uncer.	Date
50	5	3/22

Hf 87GLA 01 ATNA

CV = 7.4 ± 0.3 ug/g

Result	Uncer.	Date
7.6	0.7	3/22

Hg 85NBS 11 ATNA

CV = 160 ± 10 ng/g

Result	Uncer.	Date
< 2000		3/22

I 87GLA 01 ATNA

CV = < 4.5 ug/g

Result	Uncer.	Date
< 10		3/22

In 87GLA 01 ATNA

CV = 158 ± 5 ng/g

Result	Uncer.	Date
< 150		3/22

K 85NBS 11 ATNA

CV = 1.88 ± 0.06 %

Result	Uncer.	Date
1.9	0.13	3/22

La 87GLA 01 ATNA

CV = 84 ± 8 ug/g

Result	Uncer.	Date
86	4	3/22

Lu 87GLA 01 ATNA

CV = 1.12 ± 0.18 ug/g

Result	Uncer.	Date
1.13	0.07	3/22

Mg 85NBS 11 ATNA

CV = 4550 ± 100 ug/g

Result	Uncer.	Date
5900	1500	3/22

Mn 85NBS 11 ATNA

CV = 179 ± 8 ug/g

Result	Uncer.	Date
183	7	3/22

Mo 87GLA 01 ATNA

CV = 30 ± 3 ug/g

Result	Uncer.	Date
23	4	3/22

Na 85NBS 11 ATNA

CV = 1700 ± 100 ug/g

Result	Uncer.	Date
1750	90	3/22

Nd 87GLA 01 ATNA

CV = 74 ± 10 ug/g

Result	Uncer.	Date
75	7	3/22

Rb 85NBS 11 ATNA

CV = 131 ± 2 ug/g

Result	Uncer.	Date
151	10	3/22

Sb 85NBS 11 ATNA

CV = 6.8 ± 0.4 ug/g

Result	Uncer.	Date
3.9	0.3	3/22

Sc 87GLA 01 ATNA

CV = 39 ± 3 ug/g

Result	Uncer.	Date
38.3	2.1	3/22

Se 85NBS 11 ATNA

CV = 10.3 ± 0.6 ug/g

Result	Uncer.	Date
11	3	3/22

TABLE E-IV (cont)

****

NBS 1633a Trace Elements in Coal Fly Ash (cont)

****

Sm 87GLA 01 ATNA

CV = 17 ± 1.5 ug/g

Result	Uncer.	Date
17.6	0.8	3/22

Sr 85NBS 11 ATNA

CV = 830 ± 30 ug/g

Result	Uncer.	Date
1070	90	3/22

Ta 87GLA 01 ATNA

CV = 2 ± 0.2 ug/g

Result	Uncer.	Date
1.6	0.2	3/22

Tb 87GLA 01 ATNA

CV = 2.5 ± 0.3 ug/g

Result	Uncer.	Date
2.6	0.3	3/22

Th 85NBS 11 ATNA

CV = 24.7 ± 0.3 ug/g

Result	Uncer.	Date
26.8	1.2	3/22

Ti 87GLA 01 ATNA

CV = 8230 ± 390 ug/g

Result	Uncer.	Date
9300	1200	3/22

U 85NBS 11 ATNA

CV = 10.2 ± 0.1 ug/g

Result	Uncer.	Date
10.7	0.4	3/22

V 85NBS 11 ATNA

CV = 297 ± 6 ug/g

Result	Uncer.	Date
316	12	3/22

W 87GLA 01 ATNA

CV = 5.7 ± 0.7 ug/g

Result	Uncer.	Date
5.1	1.2	3/22

Yb 87GLA 01 ATNA

CV = 7.4 ± 0.7 ug/g

Result	Uncer.	Date
6.1	0.8	3/22

Zn 85NBS 11 ATNA

CV = 220 ± 10 ug/g

Result	Uncer.	Date
< 60		3/22

Zr 87GLA 01 ATNA

CV = 330 ± 80 ug/g

Result	Uncer.	Date
390	140	3/22

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NBS 1643b Trace Elements in Water

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Ag 84NBS 05 ICPMS

CV = 9.8 ± 0.8 ug/L

Result	Uncer.	Date
11	1	1/07
11	1	1/07
10	1	1/07
11	1	2/24
11	1	2/24
11	1	2/24
11	1	2/27
11	1	2/27
11	1	2/27
11	1	2/27
11	1	2/27
10	1	3/02
11	1	3/02
11	1	3/03
12	1	3/09
12	1	3/09
12	1	3/09
12	1	3/09
11	1	4/06
11	1	4/06
11	1	4/06
11	1	4/06
12	1	4/06
11	1	4/06
12	1	4/06
12	1	6/10
9.6	0.2	9/04

Al 93GAU 03 ICPMS

CV = not spiked ug/L

Result	Uncer.	Date
942	9	8/31

As 84NBS 05 ICPMS

CV = 49 ug/L

Result	Uncer.	Date
53.7	2.7	1/13
50.3	2.5	1/13
53.8	2.7	1/13
49	5	1/13
57	2.8	1/13
60	6	3/02
55	6	3/02
61	6	3/02
50	5	3/02
58	6	3/02
64	6	3/02
55	6	3/18
62	6	3/18
60	6	3/18
52	5	3/23
59	6	3/23
50	5	3/23
63	6	3/23
58	6	3/23
65	7	3/23
61	6	3/23
57	6	4/21
52	5	4/21
55	6	4/22
< 110		8/31

Ba 84NBS 05 ICPMS

CV = 44 ± 2 ug/L

Result	Uncer.	Date
46.4	2.3	2/04
45.2	2.2	2/04
45.5	2.3	2/04
44.3	2.2	3/05
43.3	2.2	3/05
42.8	2.2	3/05
44.8	2.3	3/09
45.1	2.3	3/09
46.9	2.4	3/09
43	4	6/10

Be 84NBS 05 ICPMS

CV = 19 ± 2 ug/L

Result	Uncer.	Date
19	2	1/06
22	2	1/06
19	2	1/06
18	2	1/06
17.6	0.9	1/09
18.2	0.9	1/09
19.1	0.9	1/09
18.2	0.9	1/09
18	2	3/12
21	2	3/12
20	2	3/12
22	2	3/12
17.8	0.9	3/16
17.2	0.9	3/16

Be (cont)

Result	Uncer.	Date
18.5	0.9	3/16
17	2	3/20
19	2	3/20
18	2	3/20
17	2	3/20
19	2	4/03
17	2	4/03
19	1.2	4/13
20.7	1.3	4/13
17.8	1.1	4/13
19	2	6/10
84	8	8/31

Cd 84NBS 05 ETVAA

CV = 20 ± 1 ug/L

Result	Uncer.	Date
21	4	1/06
21	4	1/06

Cd 84NBS 05 ICPMS

CV = 20 ± 1 ug/L

Result	Uncer.	Date
20	4	2/04
20	4	2/04
21	4	2/04
18	2	3/26
21	3	3/26
19	2	3/26
20	2	3/26
18	2	3/26
21	3	3/26
21	2	6/10

Co 84NBS 05 ICPMS

CV = 26 ± 1 ug/L

Result	Uncer.	Date
31	3	3/23
30.3	1.5	3/23
31	3	3/23
29	1.5	3/23
31	3	3/23
28.4	1.4	3/23
31.5	1.6	4/13
30.7	1.5	4/13
29.4	1.5	4/13
71	7	8/31

Cr 84NBS 05 ICPMS

CV = 18.6 ± 0.4 ug/L

Result	Uncer.	Date
23	2	1/06
20	2	1/06
27	3	1/06
16	2	1/06
21	2	1/16
22	2	1/16
28	3	1/16
23	2	1/16
21	2	3/16
20	2	3/16
23	3	3/23
21	2	3/23

Cr (cont)

Result	Uncer.	Date
21	2	3/23
24	4	3/23
22	2	3/23
19	2	4/14
21	2	4/14
24	2	4/14
< 28		8/31

Cu 84NBS 05 FAA

CV = 21.9 ± 0.4 ug/L

Result	Uncer.	Date
23	2	1/06
24	2	1/06
23	2	2/06
24	2	2/06
26	3	3/12
11	10	3/12
13	10	3/12
24	3	3/12
24	2	3/28
23	2	3/28
24	2	3/28
24	2	4/24
24	2	4/24
21	2	4/24

Cu 84NBS 05 ICPMS

CV = 21.9 ± 0.4 ug/L

Result	Uncer.	Date
21	2	1/07
21	2	1/07
22	2	1/07
25	5	3/02
19	5	3/02
19	5	3/02
24.3	1.2	3/03
22.8	1.2	3/03
23.8	1.2	3/03
22.8	1.2	3/03
25.1	1.3	3/09
21.6	1.1	3/09
25.3	1.3	3/09
24.5	1.2	3/09
21.6	1.1	3/09
24	2	3/16
24	2	3/16
24	2	3/16
27	3	3/22
26	3	3/22
25	3	3/22
25	3	3/22
23	2	4/14
21	2	4/14
220	20	8/31

Fe 84NBS 05 FAA

CV = 99 ± 8 ug/L

Result	Uncer.	Date
91	9	1/06
110	10	1/06
100	10	2/06
110	10	2/06
110	10	3/12
110	10	3/12
98	10	3/12
130	10	3/12

Fe (cont)

Result	Uncer.	Date
100	10	3/12
99	10	3/28
100	10	3/28
96	20	4/09
110	20	4/09
99	10	4/24
100	10	4/24

Mn 84NBS 05 ICPMS

CV = 28 ± 2 ug/L

Result	Uncer.	Date
33	3	1/07
33	3	1/07
33	3	1/07
33	3	1/10
34	3	1/10
32	3	1/10
31	3	1/10
35	4	1/21
34	3	1/21
34	3	1/21
31	3	1/21
33	3	3/10
35	4	3/10
34	3	3/10
36	4	3/10
37	6	3/20
36	5	3/20
35	5	3/20
35	5	3/20
36	4	3/22
35	4	3/22
35	4	3/22
33	3	4/14
32	3	4/14
33	3	4/14
38	4	8/31

Mo 84NBS 05 ICPMS

CV = 85 ± 3 ug/L

Result	Uncer.	Date
99	15	1/06
96	14	1/06
110	20	1/06
110	20	1/06
130	20	1/09
100	20	1/09
110	20	1/09
120	20	1/09
100	20	1/28
110	20	1/28
100	20	3/09
110	20	3/09
100	20	3/09
110	20	3/09
92	9	3/22
100	10	3/22
100	10	3/22
100	10	3/22
110	10	4/13
98	10	4/13
110	10	4/13

TABLE E-IV (cont)

****

NBS 1643b Trace Elements in Water (cont)

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Ni 84NBS 05 FAA

CV = 49 ± 3 ug/L

Result	Uncer.	Date
50	5	1/06
46	5	2/06
52	5	2/06
42	15	3/12
51	15	3/12

Ni 84NBS 05 ICPMS

CV = 49 ± 3 ug/L

Result	Uncer.	Date
52	5	3/25
46	5	3/25
40	4	3/25
50	5	3/25
50	5	3/25
40	4	3/25
49	3	3/25
51	5	3/25
47	5	3/25
45	5	3/25
47	5	4/14
54	5	4/14
47	5	4/14
120	10	8/31

Pb 84NBS 05 ETVAA

CV = 23.7 ± 0.7 ug/L

Result	Uncer.	Date
23	4	1/06
22	4	1/06
23	2	6/26
24	2	6/26

Pb 84NBS 05 ICPMS

CV = 23.7 ± 0.7 ug/L

Result	Uncer.	Date
24.5	1.2	1/30
24.3	1.2	1/30
25.4	1.3	2/21
25.8	1.3	2/21
23	2	2/27
24	2	2/27
24.5	1.2	3/04
24.3	1.2	3/04
24.6	1.2	3/04
24.1	1.2	3/04
29	3	3/05
27.9	1.4	3/05
24	2	3/05
23	2	6/10

Se 84NBS 05 ICPMS

CV = 9.7 ± 0.5 ug/L

Result	Uncer.	Date
< 440		8/31

Sr 84NBS 05 ICPMS

CV = 227 ± 6 ug/L

Result	Uncer.	Date
233	12	1/06
232	12	1/06
229	11	1/06
223	11	1/06
244	12	1/09
244	12	1/09
240	12	1/09
231	11	1/09
237	12	1/28
242	12	1/28
240	12	3/09
244	12	3/09
243	12	3/09
242	12	3/09
220	11	3/20
243	12	3/20
246	12	3/20
232	12	3/20
237	12	4/14
232	12	4/14
224	11	4/14

Tl 84NBS 05 ICPMS

CV = 8 ± 0.2 ug/L

Result	Uncer.	Date
7.6	0.4	2/04
7.2	0.4	2/04
7.9	0.4	2/04
7	0.7	3/09
6.4	0.6	3/09
6.4	0.6	3/09
7.6	0.8	6/10

V 84NBS 05 ICPMS

CV = 45.2 ± 0.4 ug/L

Result	Uncer.	Date
47	5	1/06
47	5	1/06
49	5	1/06
47	5	1/06
50.3	2.5	1/14
48.3	2.4	1/14
46.8	2.4	1/14
48.1	2.4	1/14
44.8	2.2	3/10
45.9	2.3	3/10
46	2.3	3/10
47.7	2.4	3/16
47.3	2.4	3/16
48.5	2.4	3/16
49.7	3.5	3/20
52.4	3.7	3/20
52.4	3.7	3/20
52.2	3.7	3/20
55	6	4/14
49	5	4/14
49	5	4/14

V (cont)

38	4	6/05
49	5	6/05
48	5	6/05
68	7	6/05
47	5	8/24
46	5	8/31
45	5	8/31
62	6	8/31
52	5	9/03
49	5	9/03
46	5	9/03
53.2	5	12/08
44.7	4	12/08
49	5	12/08
50	5	12/08
51	5	12/08
46	5	12/08
47	5	12/08
52	5	12/08

Zn 84NBS 05 FAA

CV = 66 ± 2 ug/L

Result	Uncer.	Date
68	7	1/06
67	7	2/06
73	7	2/06
69	7	3/12
69	7	3/12
70	7	3/12
68	7	3/28
67	7	4/24
70	7	4/24

Zn 84NBS 05 ICPMS

CV = 66 ± 2 ug/L

Result	Uncer.	Date
73	7	1/06
73	7	1/06
73	7	1/06
67	7	1/06
53	5	1/21
56	6	1/21
61	6	1/21
58	6	3/03
63	6	3/03
65	7	3/03
64	6	3/10
59	6	3/10
56	6	3/10
56	6	3/10
70	7	3/10
67	7	3/16
69	7	3/16
67	7	3/16
78	8	3/23
77	8	3/23
76	8	3/23
84	8	3/23
75	8	4/14
71	7	4/14
96	10	8/31

****

NBS 1643c Trace Elements in Water

****

Ag 91NBS 04 ICPMS

CV = 2.21 ± 0.3 ug/L

Result	Uncer.	Date
2.5	0.5	9/02
2	0.5	9/02
2.4	0.2	9/04
2.6	0.6	10/13
2.7	0.3	10/26
2	0.6	11/16
3.3	0.6	11/19
2.1	0.2	11/24

Al 91NBS 04 ICPMS

CV = 114.6 ± 5.1 ug/L

Result	Uncer.	Date
120	10	11/24

Ba 91NBS 04 ICPMS

CV = 49.6 ± 3.1 ug/L

Result	Uncer.	Date
49.5	2.5	9/02
48.6	2.4	9/02
48.2	2.4	9/04
51	5	10/09
52	5	10/26
54.6	2.7	11/13
55	6	11/13
45	5	12/14
41	4	12/14
55	6	12/16
54	5	12/16
60	6	12/18
55	6	12/18
57	6	12/18

Be 91NBS 04 ICPMS

CV = 23.2 ± 2.2 ug/L

Result	Uncer.	Date
28	3	9/02
28	3	9/02
24	2	10/16
19	2	10/16
23	2	11/25
24	2	11/25
21	2	12/04
23	2	12/04

Cd 91NBS 04 ICPMS

CV = 12.2 ± 1 ug/L

Result	Uncer.	Date
13	1	9/02
13	1	9/02
12	1	9/04
13	1	10/09

Cd (cont)

14	1	10/26
11	1	11/12
14	1	11/12
9.5	1	12/11
15	2	12/11
13	1	12/18
15	2	12/18
14	1	12/18

Cr 91NBS 04 ICPMS

CV = 19 ± 0.6 ug/L

Result	Uncer.	Date
20	2	9/02
24	2	9/02
20	2	9/22
22	2	10/16
24	2	11/20
22	2	11/20
19	2	12/03
22	2	12/03

Cu 91NBS 04 ICPMS

CV = 22.3 ± 2.8 ug/L

Result	Uncer.	Date
23.5	2	9/02
22	2	9/02
22	2	9/21
22	2	10/16
24	3	11/20
20	3	11/20
21	2	12/03
21	2	12/03
23	2	12/24
21	2	12/24

Li 91NBS 04 ICPMS

CV = 16.5 ± 1 ug/L

Result	Uncer.	Date
16	5	11/25
20	2	11/25
17	2	11/25
20	3	12/03
21	3	12/03
14	1	12/18
21	2	12/18

Mn 91NBS 04 ICPMS

CV = 35.1 ± 2.2 ug/L

Result	Uncer.	Date
34	5	9/02
39	5	9/02
31	3	9/21
39	4	10/16
38	4	11/20
34	3	11/20
32	3	12/03
32	3	12/03
39	4	12/18
41	4	12/18

Mo 91NBS 04 ICPMS

CV = 104.3 ± 1.9 ug/L

Result	Uncer.	Date
110	10	9/02
110	10	9/02
110	10	9/21
100	10	10/16
110	10	10/20
110	10	11/20
110	10	11/20
110	10	12/03
110	10	12/03
110	10	12/18
100	10	12/18

Pb 91NBS 04 ICPMS

CV = 35.3 ± 0.9 ug/L

Result	Uncer.	Date
33	3	9/02
34	3	9/02
33	3	9/02
39	4	10/13
38	4	10/23
35	4	11/13
37	4	11/13
43	4	12/14
35	4	12/14
35	4	12/16
43	4	12/16
33	3	12/18
35	4	12/18
34	3	12/18

Sr 91NBS 04 ICPMS

CV = 263.6 ± 2.6 ug/L

Result	Uncer.	Date
266	13	9/02
257	13	9/02
264	13	9/21
280	30	9/21
261	13	10/16
277	14	11/20
274	14	11/20
253	13	12/03
257	13	12/03
269	14	12/18
273	14	12/18

Tl 91NBS 04 ICPMS

CV = 7.9 ug/L

Result	Uncer.	Date
7.5	0.8	9/02
7.4	0.7	9/02
7.9	0.8	9/02
8.5	0.9	10/13
8.8	0.9	10/26
7.8	0.8	11/12
7.5	0.8	11/12
7.6	0.8	12/18
7.8	0.8	12/18
7.5	0.8	12/18

TABLE E-IV (cont)

****

NBS 1643c Trace Elements in Water (cont)

****

V 91NBS 04 ICPMS

CV = 31.4 ± 2.8 ug/L

Result	Uncer.	Date
39	4	9/02
32	3	9/02
30	3	9/22
35	4	10/16
35	4	11/20
33	3	11/20

Zn 91NBS 04 ICPMS

CV = 73.9 ± 0.9 ug/L

Result	Uncer.	Date
73	11	9/02
79	12	9/02
79	12	9/22
80	8	10/16
77	8	11/20
76	8	11/20
63	6	12/03
72	7	12/03
77	8	12/24
80	8	12/24

****

NBS 1645 River Sediment

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Ag 87GLA 01 ATNA

CV = 1.75 ug/g

Result	Uncer.	Date
1.7	0.4	3/22
2	0.4	4/25

Ag 87GLA 01 ICPMS

CV = 1.75 ug/g

Result	Uncer.	Date
< 28		8/31

Al 82NBS 11 ATNA

CV = 2.26 ± 0.04 %

Result	Uncer.	Date
2.49	0.08	3/22
2.52	0.08	4/25

Al 82NBS 11 ICPES

CV = 2.26 ± 0.04 %

Result	Uncer.	Date
0.36	0.07	3/25

Al 82NBS 11 ICPMS

CV = 2.26 ± 0.04 %

Result	Uncer.	Date
2	0.4	8/31

As 87GLA 01 ATNA

CV = 67 ± 3 ug/g

Result	Uncer.	Date
75	8	3/22
75	10	4/25

As 87GLA 01 ICPMS

CV = 67 ± 3 ug/g

Result	Uncer.	Date
< 91		8/31

Au 91GLA 01 ATNA

CV = 17 ng/g

Result	Uncer.	Date
11	3	3/22
23	3	4/25

Ba 87GLA 01 ATNA

CV = 374 ± 26 ug/g

Result	Uncer.	Date
280	40	3/22
260	40	4/25

Ba 87GLA 01 ICPES

CV = 374 ± 26 ug/g

Result	Uncer.	Date
< 0.8		3/25

Ba 87GLA 01 ICPMS

CV = 374 ± 26 ug/g

Result	Uncer.	Date
330	70	8/31
350	40	9/04

Be 87GLA 01 ICPES

CV = 1 ug/g

Result	Uncer.	Date
0.92	0.18	3/25

Be 87GLA 01 ICPMS

CV = 1 ug/g

Result	Uncer.	Date
< 25		8/31

Br 91GLA 01 ATNA

CV = 1.8 ug/g

Result	Uncer.	Date
1.5	0.4	3/22
1.6	0.7	4/25

Ca 87GLA 01 ATNA

CV = 2.6 ± 0.3 %

Result	Uncer.	Date
3.07	0.15	3/22
3.12	0.14	4/25

Cd 82NBS 11 ICPES

CV = 10 ± 2 ug/g

Result	Uncer.	Date
20	5	1/27
21	4	1/27
5.8	1.2	3/25

Cd 82NBS 11 ICPMS

CV = 10 ± 2 ug/g

Result	Uncer.	Date
< 87		8/31

Ce 87GLA 01 ATNA

CV = 24 ug/g

Result	Uncer.	Date
< 5		3/22
< 5		4/25

Cl 91GLA 01 ATNA

CV = 100 ug/g

Result	Uncer.	Date
130	20	3/22
110	20	4/25

Co 82NBS 11 ICPES

CV = 10.1 ± 0.6 ug/g

Result	Uncer.	Date
11	2	3/25

Co 82NBS 11 ICPMS

CV = 10.1 ± 0.6 ug/g

Result	Uncer.	Date
< 15		8/31

Cr 82NBS 11 ATNA

CV = 2.96 ± 0.28 %

Result	Uncer.	Date
2.61	0.15	3/22
2.77	0.16	4/25

Cr 82NBS 11 ICPES

CV = 2.96 ± 0.28 %

Result	Uncer.	Date
2.5	0.5	1/27
2.5	0.5	1/27
2.2	0.5	3/25

Cr 82NBS 11 ICPMS

CV = 2.96 ± 0.28 %

Result	Uncer.	Date
3.3	0.7	8/31

Cs 87GLA 01 ATNA

CV = 2.8 ± 0.5 ug/g

Result	Uncer.	Date
2.59	0.2	3/22
2.7	0.2	4/25

Cu 82NBS 11 ATNA

CV = 110 ± 20 ug/g

Result	Uncer.	Date
< 240		3/22
< 190		4/25

Cu 82NBS 11 ICPES

CV = 110 ± 20 ug/g

Result	Uncer.	Date
77	15	3/25

Cu 82NBS 11 ICPMS

CV = 110 ± 20 ug/g

Result	Uncer.	Date
110	20	8/31

Dy 87GLA 01 ATNA

CV = 2 ug/g

Result	Uncer.	Date
< 7		3/22
< 4		4/25

Eu 87GLA 01 ATNA

CV = 500 ng/g

Result	Uncer.	Date
364	24	3/22
364	24	4/25

Fe 82NBS 11 ATNA

CV = 11 ± 1 %

Result	Uncer.	Date
10.1	0.7	3/22
10.9	0.6	4/25

Fe 82NBS 11 ICPES

CV = 11 ± 1 %

Result	Uncer.	Date
11	2	10/26

Ga 87GLA 01 ATNA

CV = 41 ± 20 ug/g

Result	Uncer.	Date
< 20		3/22
< 13		4/25

Hf 87GLA 01 ATNA

CV = 1.39 ug/g

Result	Uncer.	Date
1.1	0.1	3/22
1.3y	0.1	4/25

Hg 82NBS 11 ATNA

CV = 1.1 ± 0.5 ug/g

Result	Uncer.	Date
< 1.9		3/22
< 1.9		4/25

Hg 82NBS 11 CVAA

CV = 1.1 ± 0.5 ug/g

Result	Uncer.	Date
0.96	0.1	3/18

I 91GLA 01 ATNA

CV = < 20 ug/g

Result	Uncer.	Date
< 24		3/22
< 13		4/25

In 87GLA 01 ATNA

CV = < 790 ng/g

Result	Uncer.	Date
260	50	3/22
190	30	4/25

K 82NBS 11 ATNA

CV = 1.26 ± 0.05 %

Result	Uncer.	Date
1.48	0.11	3/22
1.37	0.09	4/25

La 82NBS 11 ATNA

CV = 9 ug/g

Result	Uncer.	Date
8.5	0.5	3/22
8	0.5	4/25

Lu 91GLA 01 ATNA

CV = < 500 ng/g

Result	Uncer.	Date
< 500		3/22
< 600		4/25

Mg 82NBS 11 ATNA

CV = 7400 ± 200 ug/g

Result	Uncer.	Date
6800	600	3/22
7500	700	4/25

Mg 82NBS 11 ICPES

CV = 7400 ± 200 ug/g

Result	Uncer.	Date
5800	1200	3/25

TABLE E-IV (cont)

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NBS 1645 River Sediment
(cont)

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Mn 82NBS 11 ATNA

CV = 780 ± 100 ug/g

Result	Uncer.	Date
750	30	3/22
760	30	4/25

Mn 82NBS 11 ICPES

CV = 780 ± 100 ug/g

Result	Uncer.	Date
510	100	3/25

Mn 82NBS 11 ICPMS

CV = 780 ± 100 ug/g

Result	Uncer.	Date
1100	200	8/31

Mo 87GLA 01 ATNA

CV = 34 ± 8 ug/g

Result	Uncer.	Date
< 140		3/22
< 100		4/25

Mo 87GLA 01 ICPMS

CV = 34 ± 8 ug/g

Result	Uncer.	Date
< 94		8/31

Na 82NBS 11 ATNA

CV = 5400 ± 100 ug/g

Result	Uncer.	Date
5600	300	3/22
5700	300	4/25

Na 82NBS 11 ICPES

CV = 5400 ± 100 ug/g

Result	Uncer.	Date
920	190	3/25

Nd 91GLA 01 ATNA

CV = < 20 ug/g

Result	Uncer.	Date
< 17		3/22
< 19		4/25

Ni 82NBS 11 ICPES

CV = 45.8 ± 2.9 ug/g

Result	Uncer.	Date
29	6	3/25

Ni 82NBS 11 ICPMS

CV = 45.8 ± 2.9 ug/g

Result	Uncer.	Date
410	80	8/31

Pb 82NBS 11 ICPES

CV = 714 ± 28 ug/g

Result	Uncer.	Date
970	200	1/27
980	200	1/27
650	130	3/25

Pb 82NBS 11 ICPMS

CV = 714 ± 28 ug/g

Result	Uncer.	Date
810	160	8/31
630	60	9/02

Rb 87GLA 01 ATNA

CV = 41 ± 4 ug/g

Result	Uncer.	Date
43	5	3/22
41	5	4/25

Sb 87GLA 01 ATNA

CV = 31 ± 6 ug/g

Result	Uncer.	Date
38.3	1.9	3/22
40.6	2.1	4/25

Sb 87GLA 01 ICPES

CV = 31 ± 6 ug/g

Result	Uncer.	Date
180	40	3/25

Sb 87GLA 01 ICPMS

CV = 31 ± 6 ug/g

Result	Uncer.	Date
< 87		8/31
27	3	9/04

Sc 82NBS 11 ATNA

CV = 2 ug/g

Result	Uncer.	Date
2.22	0.12	3/22
2.29	0.13	4/25

Se 87GLA 01 ATNA

CV = 1.3 ± 0.4 ug/g

Result	Uncer.	Date
< 12		3/22
< 12		4/25

Se 87GLA 01 ICPMS

CV = 1.3 ± 0.4 ug/g

Result	Uncer.	Date
< 370		8/31

Sm 87GLA 01 ATNA

CV = 1.24 ug/g

Result	Uncer.	Date
1.51	0.07	3/22
1.15	0.06	4/25

Sn 87GLA 01 ICPMS

CV = 360 ± 50 ug/g

Result	Uncer.	Date
340	70	8/31

Sr 87GLA 01 ATNA

CV = 880 ± 90 ug/g

Result	Uncer.	Date
1500	300	3/22
< 210		4/25

Sr 87GLA 01 ICPMS

CV = 880 ± 90 ug/g

Result	Uncer.	Date
870	170	8/31

Ta 87GLA 01 ATNA

CV = 220 ng/g

Result	Uncer.	Date
< 600		3/22
< 600		4/25

Tb 91GLA 01 ATNA

CV = < 1 ug/g

Result	Uncer.	Date
5.5	1.1	3/22
6.9	1.1	4/25

Th 82NBS 11 ATNA

CV = 1.6 ± 0.2 ug/g

Result	Uncer.	Date
2.4	0.3	3/22
2.8	0.3	4/25

Ti 87GLA 01 ATNA

CV = 500 ± 200 ug/g

Result	Uncer.	Date
1200	300	3/22
700	170	4/25

Tl 82NBS 11 ICPMS

CV = 1.44 ± 0.07 ug/g

Result	Uncer.	Date
< 64		8/31
1.3	0.1	9/02

U 82NBS 11 ATNA

CV = 1.11 ± 0.05 ug/g

Result	Uncer.	Date
1.14	0.05	3/22
1.18	0.05	4/25

U 82NBS 11 DNA

CV = 1.11 ± 0.05 ug/g

Result	Uncer.	Date
1.15	0.1	3/26
1.1	1	3/26
1.1	0.1	3/26
1.08	0.1	3/26
1.08	0.1	3/26
1.15	0.1	3/26
1.15	0.1	3/26
1.1	0.1	3/26
1.08	0.1	3/26
1.06	0.1	4/23
0.96	0.1	4/23
1	0.1	4/23
1.06	0.1	4/23
1	0.1	4/23

U (cont)

1.06	0.1	4/23
0.96	0.1	4/23
1.06	0.1	4/23
0.96	0.1	4/23
0.96	0.1	4/23
0.96	0.1	4/27
1	0.1	4/27
1.06	0.1	4/27
1	0.1	4/27
1.06	0.1	4/27
0.96	0.1	4/27
1.07	0.1	4/29
0.98	0.1	4/29
0.98	0.1	4/29
1.07	0.1	4/29
1	0.1	4/29
1	0.1	4/29
1	0.1	6/25
1.1	0.1	6/25
1.1	0.1	6/25
1.2	0.1	6/25
1	0.1	6/25
1.1	0.1	6/25
1.1	0.1	6/25
1.1	0.1	6/25
1.1	0.1	6/25
1.1	0.1	6/25
1	0.1	6/25
1.1	0.1	6/25
1.1	0.1	6/25
1.1	0.1	6/25
1.06	0.1	6/25
1.1	0.1	6/25
1	0.1	6/25
1.1	0.1	6/25
1.1	0.1	8/03
1.1	0.1	8/03
1	0.1	8/03
1	0.1	8/03
1.1	0.1	8/03
1.1	0.1	8/03
0.96	0.1	8/03
1	0.1	8/03
1.1	0.1	8/03
1	0.1	8/03
1.08	0.1	8/03
1	0.1	8/03
1.1	0.1	8/03
1.11	0.1	8/03
1.08	0.1	8/03
1	0.1	8/03
0.96	1	8/03
1.1	0.1	8/17
1.1	0.1	8/17
1	0.1	8/17
1.1	0.1	8/17
1.1	0.1	8/17
1.1	0.1	8/17
1.1	0.1	8/17
1.1	0.1	8/17
1	0.1	8/17
1.1	0.1	8/17
1.1	0.1	8/17
1.1	0.1	8/17
1.1	0.1	8/17
1.14	0.1	8/20
1.14	0.1	8/20
1.12	0.1	8/20
1.14	0.1	8/20
1.1	0.1	8/20
1.14	0.1	8/20
1.12	0.1	8/20
1.14	0.1	8/20
1.1	0.1	8/20
1.1	0.1	8/20
1.12	0.1	8/20
1.1	0.1	9/28

U (cont)

1.1	0.1	9/28
1.1	0.1	9/28
1.1	0.1	9/28
1.1	0.1	9/28
1.1	0.1	9/28
1.1	0.1	9/28
1.1	0.1	9/28
1.1	0.1	9/28
1.1	0.1	11/19
1	0.1	11/19
1	0.1	11/19
1.1	0.1	11/19
1	0.1	11/19
1.1	0.1	11/19
1	0.1	11/19
1.1	0.1	11/20
1	0.1	11/20
1.1	0.2	11/23
1.1	0.2	11/23
1.1	0.2	11/23

U 82NBS 11 G

CV = 1.11 ± 0.05 ug/g

Result	Uncer.	Date
1.14	0.1	1/27
1.1	0.1	1/27
1.07	0.1	1/27
1.09	0.1	2/04
1.18	0.11	2/04
1.18	0.11	2/04
1.09	0.1	2/04
1.09	0.1	2/04
1.09	0.1	2/04
1.18	0.11	2/04
1.1	0.1	2/26
1.1	0.1	2/26
1.2	0.1	2/26

U 82NBS 11 ICPMS

CV = 1.11 ± 0.05 ug/g

Result	Uncer.	Date
0.99	0.1	1/08
0.96	0.05	2/03
1.05	0.05	2/03
0.95	0.1	2/11
0.95	0.1	2/21
0.97	0.1	2/21
0.93	0.09	2/27
0.9	0.09	2/27
0.87	0.09	2/27
0.87	0.09	2/27
0.8	0.08	3/27
0.65	0.07	4/07
0.55	0.06	4/07
0.52	0.05	4/08
0.66	0.07	6/17
1.5	0.2	6/17
1.1	0.1	6/17
< 120		8/31

U 82NBS 11 PC

CV = 1.11 ± 0.05 ug/g

Result	Uncer.	Date
1.1	0.1	5/18
1.08	0.1	5/18
1.1	0.1	5/18

TABLE E-IV (cont)

****

NBS 1645 River Sediment
(cont)

****

U (cont)

1.1	0.1	5/18
1.08	0.1	5/18
1.1	0.1	5/18
1	0.1	7/23
1.2	0.1	7/23
1	0.1	9/01
1.1	0.1	9/01
1.1	0.1	9/01
1	0.1	9/01
1	0.1	9/01
1	0.1	9/01
1	0.1	9/01
1	0.1	9/01
1	0.1	9/01
1	0.1	9/01
1	0.1	9/01
1	0.1	9/01
1	0.1	9/01
1	0.1	9/01
1.1	0.1	9/01
1	0.1	9/01
1.1	0.1	9/02
1	0.1	9/02
1	0.1	9/02
1	0.1	9/02
1.1	0.1	9/02
1.1	0.1	9/02

U-235/238 89GLA 04 ICPMS

CV = 0.0072 ± 0.0001 ratio

Result	Uncer.	Date
0.0073	0.0007	1/13
0.0071	0.0004	1/17
0.0068	0.0003	1/17
0.0077	0.0006	1/27
0.0073	0.0002	1/28
0.0077	0.0007	2/03
0.0061	0.001	2/03
0.0081	0.0003	2/11
0.0072	0.0003	2/21
0.0069	0.0002	2/21
0.007	0.0009	2/27
0.0057	0.0007	2/27
0.0065	0.0002	2/27
0.0067	0.0007	2/27
0.0073	0.001	4/07
0.0077	0.0007	4/07
0.0068	0.0015	4/08

V 82NBS 11 ATNA

CV = 23.5 ± 6.9 ug/g

Result	Uncer.	Date
26	2.1	3/22
25.8	2	4/25

V 82NBS 11 ICPES

CV = 23.5 ± 6.9 ug/g

Result	Uncer.	Date
22	4	3/25

V 82NBS 11 ICPMS

CV = 23.5 ± 6.9 ug/g

Result	Uncer.	Date
110	20	8/31

W 91GLA 01 ATNA

CV = 1.9 ug/g

Result	Uncer.	Date
< 5		3/22
0.9	0.3	4/25

Yb 87GLA 01 ATNA

CV = 600 ng/g

Result	Uncer.	Date
< 1100		3/22
< 1100		4/25

Zn 82NBS 11 ATNA

CV = 1700 ± 200 ug/g

Result	Uncer.	Date
2400	300	3/22
2100	300	4/25

Zn 82NBS 11 ICPES

CV = 1700 ± 200 ug/g

Result	Uncer.	Date
1300	300	3/25

Zn 82NBS 11 ICPMS

CV = 1700 ± 200 ug/g

Result	Uncer.	Date
990	200	8/31

Zr 87GLA 01 ATNA

CV = 61 ± 9 ug/g

Result	Uncer.	Date
< 200		3/22
< 210		4/25

****

NBS 1882 Ca-Al Cement
(Orange Cap)

****

Al 91NBS 00 ATNA

CV = 20.4 %

Result	Uncer.	Date
19.6	0.5	2/29

Ca 91NBS 00 ATNA

CV = 26.9 %

Result	Uncer.	Date
29.4	1.1	2/29

Fe 91NBS 00 ATNA

CV = 11 %

Result	Uncer.	Date
11.1	0.6	2/29

K 91NBS 00 ATNA

CV = 1000 ug/g

Result	Uncer.	Date
700	300	2/29

Mg 91NBS 00 ATNA

CV = 7540 ug/g

Result	Uncer.	Date
6700	600	2/29

Na 91NBS 00 ATNA

CV = 440 ug/g

Result	Uncer.	Date
316	14	2/29

Ti 91NBS 00 ATNA

CV = 1.1 %

Result	Uncer.	Date
1.1	0.1	2/29

****

NBS 1883 Ca-Al Cement
(Silver Cap)

****

Al 91NBS 00 ATNA

CV = 37.7 %

Result	Uncer.	Date
36.3	1	2/29

Ca 91NBS 00 ATNA

CV = 19.9 %

Result	Uncer.	Date
21.1	0.8	2/29

Fe 91NBS 00 ATNA

CV = 560 ug/g

Result	Uncer.	Date
560	40	2/29

K 91NBS 00 ATNA

CV = 80 ug/g

Result	Uncer.	Date
< 700		2/29

Mg 91NBS 00 ATNA

CV = 1750 ug/g

Result	Uncer.	Date
< 1800		2/29

Na 91NBS 00 ATNA

CV = 2370 ug/g

Result	Uncer.	Date
2840	120	2/29

Ti 91NBS 00 ATNA

CV = 60 ug/g

Result	Uncer.	Date
< 3000		2/29

****

NBS 2689 Coal Fly Ash

****

Al 86NBS 07 ATNA

CV = 12.94 ± 0.21 %

Result	Uncer.	Date
12.3	0.3	2/29

Ba 86NBS 07 ATNA

CV = 800 ug/g

Result	Uncer.	Date
820	150	2/29

Ca 86NBS 07 ATNA

CV = 2.18 ± 0.06 %

Result	Uncer.	Date
2.15	0.11	2/29

Fe 86NBS 07 ATNA

CV = 9.32 ± 0.06 %

Result	Uncer.	Date
8.4	0.5	2/29

K 86NBS 07 ATNA

CV = 2.2 ± 0.03 %

Result	Uncer.	Date
2.13	0.15	2/29

Mg 86NBS 07 ATNA

CV = 6100 ± 500 ug/g

Result	Uncer.	Date
5400	500	2/29

Mn 86NBS 07 ATNA

CV = 300 ug/g

Result	Uncer.	Date
290	12	2/29

Na 86NBS 07 ATNA

CV = 2500 ± 300 ug/g

Result	Uncer.	Date
2910	130	2/29

Sr 86NBS 07 ATNA

CV = 700 ug/g

Result	Uncer.	Date
370	50	2/29

Ti 86NBS 07 ATNA

CV = 7500 ± 100 ug/g

Result	Uncer.	Date
7500	900	2/29

****

NBS 2690 Coal Fly Ash

****

Al 86NBS 07 ATNA

CV = 12.35 ± 0.28 %

Result	Uncer.	Date
11.9	0.4	2/29

Ba 86NBS 07 ATNA

CV = 6500 ug/g

Result	Uncer.	Date
5600	300	2/29

Ca 86NBS 07 ATNA

CV = 5.71 ± 0.13 %

Result	Uncer.	Date
5.76	0.25	2/29

Fe 86NBS 07 ATNA

CV = 3.57 ± 0.06 %

Result	Uncer.	Date
3.32	0.17	2/29

K 86NBS 07 ATNA

CV = 1.04 ± 0.04 %

Result	Uncer.	Date
1.09	0.08	2/29

Mg 86NBS 07 ATNA

CV = 1.53 ± 0.05 %

Result	Uncer.	Date
1.48	0.09	2/29

TABLE E-IV (cont)

****

NBS 2690 Coal Fly Ash (cont)

****

Mn 86NBS 07 ATNA

CV = 300 ug/g

Result	Uncer.	Date
290	15	2/29

Na 86NBS 07 ATNA

CV = 2400 ± 200 ug/g

Result	Uncer.	Date
2480	110	2/29

Sr 86NBS 07 ATNA

CV = 2000 ug/g

Result	Uncer.	Date
2450	70	2/29

Ti 86NBS 07 ATNA

CV = 5200 ± 100 ug/g

Result	Uncer.	Date
5500	700	2/29

****

NBS 2691 Coal Fly Ash

****

Al 86NBS 07 ATNA

CV = 9.81 ± 0.39 %

Result	Uncer.	Date
9.26	0.25	2/29

Ba 86NBS 07 ATNA

CV = 6600 ug/g

Result	Uncer.	Date
4800	300	2/29

Ca 86NBS 07 ATNA

CV = 18.45 ± 0.32 %

Result	Uncer.	Date
18.4	0.7	2/29

Fe 86NBS 07 ATNA

CV = 4.42 ± 0.03 %

Result	Uncer.	Date
3.9	0.4	2/29

K 86NBS 07 ATNA

CV = 3400 ± 100 ug/g

Result	Uncer.	Date
3700	600	2/29

Mg 86NBS 07 ATNA

CV = 3.12 ± 0.08 %

Result	Uncer.	Date
3.2	0.18	2/29

Mn 86NBS 07 ATNA

CV = 200 ug/g

Result	Uncer.	Date
174	9	2/29

Na 86NBS 07 ATNA

CV = 1.09 ± 0.05 %

Result	Uncer.	Date
1.14	0.06	2/29

Sr 86NBS 07 ATNA

CV = 2700 ug/g

Result	Uncer.	Date
2280	70	2/29

Ti 86NBS 07 ATNA

CV = 9000 ± 200 ug/g

Result	Uncer.	Date
9200	1200	2/29

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NBS 2704 Buffalo River Sediment

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Ag 91GLA 01 ATNA

CV = < 4 ug/g

Result	Uncer.	Date
< 4		4/25

Al 88NBS 01 ATNA

CV = 6.11 ± 0.16 %

Result	Uncer.	Date
6.45	0.19	4/25

As 88NBS 01 ATNA

CV = 23.4 ± 0.8 ug/g

Result	Uncer.	Date
23	3	4/25

Au 91GLA 01 ATNA

CV = 8 ng/g

Result	Uncer.	Date
< 13		4/25

Ba 88NBS 01 ATNA

CV = 414 ± 12 ug/g

Result	Uncer.	Date
480	50	4/25

Br 88NBS 01 ATNA

CV = 7 ug/g

Result	Uncer.	Date
6.8	0.8	4/25

Ca 88NBS 01 ATNA

CV = 2.6 ± 0.03 %

Result	Uncer.	Date
2.58	0.14	4/25

Ce 88NBS 01 ATNA

CV = 72 ug/g

Result	Uncer.	Date
62	3	4/25

Cl 88NBS 01 ATNA

CV = < 100 ug/g

Result	Uncer.	Date
130	20	4/25

Cr 88NBS 01 ATNA

CV = 135 ± 5 ug/g

Result	Uncer.	Date
139	8	4/25

Cs 88NBS 01 ATNA

CV = 6 ug/g

Result	Uncer.	Date
5.2	0.4	4/25

Cu 88NBS 01 ATNA

CV = 98.6 ± 5 ug/g

Result	Uncer.	Date
< 300		4/25

Dy 88NBS 01 ATNA

CV = 6 ug/g

Result	Uncer.	Date
5	0.5	4/25

Eu 88NBS 01 ATNA

CV = 1.3 ug/g

Result	Uncer.	Date
1.25	0.06	4/25

Fe 88NBS 01 ATNA

CV = 4.11 ± 0.1 %

Result	Uncer.	Date
4.14	0.24	4/25

Ga 88NBS 01 ATNA

CV = 15 ug/g

Result	Uncer.	Date
< 25		4/25

Hf 88NBS 01 ATNA

CV = 8 ug/g

Result	Uncer.	Date
8.2	0.5	4/25

Hg 88NBS 01 ATNA

CV = 1.44 ± 0.07 ug/g

Result	Uncer.	Date
1.8	0.4	4/25

I 88NBS 01 ATNA

CV = 2 ug/g

Result	Uncer.	Date
< 30		4/25

In 91GLA 01 ATNA

CV = 100 ng/g

Result	Uncer.	Date
< 300		4/25

K 88NBS 01 ATNA

CV = 2 ± 0.04 %

Result	Uncer.	Date
2.21	0.15	4/25

La 88NBS 01 ATNA

CV = 29 ug/g

Result	Uncer.	Date
30.7	1.7	4/25

Lu 88NBS 01 ATNA

CV = 0.6 ug/g

Result	Uncer.	Date
0.45	0.04	4/25

Mg 88NBS 01 ATNA

CV = 1.2 ± 0.02 %

Result	Uncer.	Date
1.08	0.09	4/25

Mn 88NBS 01 ATNA

CV = 555 ± 19 ug/g

Result	Uncer.	Date
597	24	4/25

Na 88NBS 01 ATNA

CV = 5470 ± 140 ug/g

Result	Uncer.	Date
6310	200	4/25

Nd 91GLA 01 ATNA

CV = 36 ug/g

Result	Uncer.	Date
24	3	4/25

Pb 88NBS 01 ICPES

CV = 161 ± 17 ug/g

Result	Uncer.	Date
130	30	6/11

Rb 88NBS 01 ATNA

CV = 100 ug/g

Result	Uncer.	Date
107	7	4/25

Sb 88NBS 01 ATNA

CV = 3.79 ± 0.15 ug/g

Result	Uncer.	Date
6.2	0.5	4/25

Sc 88NBS 01 ATNA

CV = 12 ug/g

Result	Uncer.	Date
11	0.6	4/25

Se 88NBS 01 ATNA

CV = 1.1 ug/g

Result	Uncer.	Date
< 4		4/25

Sm 88NBS 01 ATNA

CV = 6.7 ug/g

Result	Uncer.	Date
6.9	0.3	4/25

Sr 88NBS 01 ATNA

CV = 130 ug/g

Result	Uncer.	Date
< 130		4/25

Ta 91GLA 01 ATNA

CV = 1 ug/g

Result	Uncer.	Date
1.04	0.09	4/25

Tb 91GLA 01 ATNA

CV = 0.94 ug/g

Result	Uncer.	Date
1	0.1	4/25

Th 88NBS 01 ATNA

CV = 9.2 ug/g

Result	Uncer.	Date
10	0.4	4/25

TABLE E-IV (cont)

****

NBS 2704 Buffalo River Sediment (cont)

****

Ti 88NBS 01 ATNA

CV = 4570 ± 180 ug/g

Result	Uncer.	Date
4900	700	4/25

U 88NBS 01 ATNA

CV = 3.13 ± 0.13 ug/g

Result	Uncer.	Date
3.38	0.13	4/25

V 88NBS 01 ATNA

CV = 95 ± 4 ug/g

Result	Uncer.	Date
98	4	4/25

W 91GLA 01 ATNA

CV = 2.6 ug/g

Result	Uncer.	Date
< 6		4/25

Yb 88NBS 01 ATNA

CV = 2.8 ug/g

Result	Uncer.	Date
2.9	0.22	4/25

Zn 88NBS 01 ATNA

CV = 438 ± 12 ug/g

Result	Uncer.	Date
390	50	4/25

Zr 88NBS 01 ATNA

CV = 300 ug/g

Result	Uncer.	Date
310	60	4/25

****

NBS 278 Obsidian Rock

****

U 81NBS 03 DNA

CV = 4.58 ± 0.04 ug/g

Result	Uncer.	Date
4.6	0.5	3/26
4.6	0.5	3/26
4.6	0.5	3/26
4.6	0.5	3/26
4.6	0.5	3/26
4.33	0.4	3/26
4.33	0.4	3/26
4.6	0.5	3/26
4.33	0.4	3/26
4.6	0.5	4/21
4.39	0.4	4/21
4.39	0.4	4/23
4.2	0.4	4/23
4.39	0.4	4/23
4.2	0.4	4/23
4.39	0.4	4/23
4.2	0.4	4/23
4.6	0.5	4/23
4.6	0.5	4/23
4.6	0.5	4/23
4.6	0.5	4/23
4.6	0.5	4/23
4.6	0.5	4/27
4.31	0.4	4/27
4.39	0.4	4/27
4.6	0.5	4/27
4.2	0.4	4/27
4.39	0.4	4/27
4.41	0.4	4/29
4.8	0.5	4/29
4.8	0.5	4/29
4.6	0.5	4/29
4.6	0.5	4/29
4.41	0.4	4/29
4.32	0.4	6/25
4	0.4	6/25
4.5	0.5	6/25
4.5	0.5	6/25
4.2	0.4	6/25
4.5	0.5	6/25
4	0.4	6/25
4.3	0.4	6/25
4.6	0.5	6/25
4.1	0.4	6/25
4.5	0.5	6/25
4.6	0.5	6/25
4.6	0.5	6/25
4.6	0.5	6/25
4.2	0.4	6/25
4	0.4	6/25
4.6	0.5	6/25
4.5	0.5	6/25
4	0.4	6/25
4.5	0.5	6/25
4	0.4	8/03
4.6	0.5	8/03
4.9	0.5	8/03
4.3	0.4	8/03
4.6	0.5	8/03
4.5	0.5	8/03
4.5	0.5	8/03
4.9	0.5	8/03
4	0.4	8/03
4	0.4	8/03
4.5	0.5	8/03
4.9	0.5	8/03
4.6	0.5	8/03
4.5	0.5	8/17

U (cont)

4.5	0.5	8/17
4.5	0.5	8/17
4	0.4	8/17
4.5	0.5	8/17
4.5	0.5	8/17
4	0.4	8/17
4	0.4	8/17
4	0.4	8/17
4	0.4	8/17
4.5	0.5	8/17
4	0.4	8/17
4.5	0.5	8/17
4.6	0.5	8/20
4.6	0.5	8/20
4.7	0.5	8/20
4.7	0.5	8/20
4.7	0.5	8/20
4.5	0.5	8/20
4.6	0.5	8/20
4.7	0.5	8/20
4.7	0.5	8/20
4.7	0.5	8/20
4.6	0.5	8/20
4.4	0.4	9/28
4.4	0.4	9/28
4.4	0.4	9/28
4.4	0.4	9/28
4.4	0.4	9/28
4.4	0.4	9/28
4.4	0.4	9/28
4.4	0.4	9/28
4	0.4	11/19
4.5	0.4	11/19
4.4	0.4	11/19
4.5	0.5	11/19
4	0.4	11/19
4.4	0.4	11/19
4	0.4	11/19
4	0.4	11/20
4.5	0.5	11/20
4.4	0.4	11/23
4.33	0.4	11/23
4.1	0.4	11/23

U 81NBS 03 G

CV = 4.58 ± 0.04 ug/g

Result	Uncer.	Date
4.56	0.4	1/27
4.2	0.4	1/27
4.47	0.4	1/27
4.6	0.5	2/04
4.48	0.4	2/04
4.48	0.4	2/04
4.6	0.5	2/04
4.6	0.5	2/04
4.45	0.4	2/04
4.48	0.4	2/04
4.45	0.4	2/04
4.4	0.4	2/26
4.5	0.5	2/26
4.3	0.4	2/26

U 81NBS 03 PC

CV = 4.58 ± 0.04 ug/g

Result	Uncer.	Date
4.6	0.5	5/18
4.6	0.5	5/18
4.6	0.5	5/18
4.5	0.5	5/18
4.5	0.5	5/18

U (cont)

4.6	0.5	5/18
4.6	0.5	7/23
4.5	0.5	7/23
4.6	0.5	9/01
4.5	0.5	9/01
4.8	0.5	9/01
4.7	0.5	9/01
4.7	0.5	9/01
4.6	0.5	9/01
4.6	0.5	9/01
4.7	0.5	9/01
4.7	0.5	9/01
4.5	0.5	9/01
4.7	0.5	9/01
4.5	0.5	9/01
4.6	0.5	9/01
4.7	0.5	9/01
4.6	0.5	9/01
4.6	0.5	9/01
4.6	0.5	9/01
4.1	0.4	9/02
4.1	0.4	9/02
4.2	0.4	9/02
4.4	0.4	9/02
4.2	0.4	9/02
4.1	0.4	9/02

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NBS 4350 Environmental Radioactivity Sediment

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Cs-137 75NBS 03 G

CV = 2.7 ± 0.12 pCi/g

Result	Uncer.	Date
2.4	0.4	3/12

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NBS 4350B River Sediment

****

Cs-137 81NBS 02 G

CV = 0.783 ± 0.049 pCi/g

Result	Uncer.	Date
0.49	0.16	4/13
0.92	0.19	4/13
0.83	0.24	4/13
0.76	0.18	6/15
1.1	0.3	7/20
0.92	0.24	9/28

****

NBS 4353 Rocky-Flats Soil No 1

****

Am-241 81NBS 01 G

CV = 0.0338 ± 0.0025 pCi/g

Result	Uncer.	Date
0.04	0.192	9/23

Cs-137 81NBS 01 G

CV = 0.464 ± 0.021 pCi/g

Result	Uncer.	Date
0.22	0.19	1/08
0.3	0.15	2/20
0.65	0.2	2/20
0.48	0.15	3/12
0.47	0.11	5/19
0.56	0.16	7/16
0.33	0.16	7/20
0.48	0.14	9/23

Cs-137 81NBS 01 GELI

CV = 0.464 ± 0.021 pCi/g

Result	Uncer.	Date
0.51	0.19	6/25
0.46	0.16	6/25
0.66	0.15	8/07
0.41	0.19	10/28
0.53	0.14	12/16

K-40 81NBS 01 G

CV = 20 ± 2 pCi/g

Result	Uncer.	Date
21	4	5/19

U-234 81NBS 01 RAS

CV = 1.06 ± 0.04 pCi/g

Result	Uncer.	Date
1.02	0.05	12/15

U-235 81NBS 01 RAS

CV = 0.051 pCi/g

Result	Uncer.	Date
0.044	0.012	12/15

U-238 81NBS 01 RAS

CV = 1.05 ± 0.05 pCi/g

Result	Uncer.	Date
1	0.05	12/15

****

NBS 45b Homogeneous River Sediment

****

Cs-137 78NBS 08 G

CV = 2.7 pCi/g

Result	Uncer.	Date
2.9	1	2/12
1.8	0.3	3/12

Cs-137 78NBS 08 GELI

CV = 2.7 pCi/g

Result	Uncer.	Date
1.8	0.3	10/28

****

NIOSH PAT Round 108 Trace Metals on Air Filter

****

Cd 92PAT 01 FAA

CV = not spiked ug/filter

Result	Uncer.	Date
< 0.1		1/28

CV = 0.0069 ± 0.0007 mg/filter

Result	Uncer.	Date
0.007	0.0007	1/28

CV = 0.0099 ± 0.001 mg/filter

Result	Uncer.	Date
0.01	0.001	1/28

CV = 0.0147 ± 0.0014 mg/filter

Result	Uncer.	Date
0.015	0.002	1/28

CV = 0.019 ± 0.0017 mg/filter

Result	Uncer.	Date
0.019	0.002	1/28

Cr 92PAT 01 FAA

CV = not spiked ug/filter

Result	Uncer.	Date
< 0.5		1/28

CV = 0.0744 ± 0.0083 mg/filter

Result	Uncer.	Date
0.11	0.01	1/28

CV = 0.101 ± 0.0114 mg/filter

Result	Uncer.	Date
0.14	0.01	1/28

CV = 0.147 ± 0.0174 mg/filter

Result	Uncer.	Date
0.19	0.02	1/28

CV = 0.1713 ± 0.0214 mg/filter

Result	Uncer.	Date
0.22	0.02	1/28

TABLE E-IV (cont)

****

NIOSH PAT Round 108
Trace Metals on Air Filter
(cont)

****

Pb 92PAT 01 FAA

CV = not spiked ug/filter

Result	Uncer.	Date
0.35	0.04	1/28

CV = 0.0304 ± 0.0025 mg/filter

Result	Uncer.	Date
0.032	0.006	1/28

CV = 0.0494 ± 0.0042 mg/filter

Result	Uncer.	Date
0.053	0.005	1/28

CV = 0.0592 ± 0.0046 mg/filter

Result	Uncer.	Date
0.061	0.006	1/28

CV = 0.0783 ± 0.0071 mg/filter

Result	Uncer.	Date
0.084	0.008	1/28

****

NIOSH PAT Round 109
Trace Metals on Air Filter

****

Cd 92PAT 01 FAA

CV = not spiked mg/filter

Result	Uncer.	Date
< 0.1		4/21

CV = 0.0079 ± 0.0007 mg/filter

Result	Uncer.	Date
0.0085	0.0008	4/21

CV = 0.0118 ± 0.001 mg/filter

Result	Uncer.	Date
0.012	0.001	4/21

CV = 0.0178 ± 0.0016 mg/filter

Result	Uncer.	Date
0.019	0.002	4/21

CV = 0.0218 ± 0.0018 mg/filter

Result	Uncer.	Date
0.024	0.002	4/21

Pb 92PAT 01 FAA

CV = not spiked mg/filter

Result	Uncer.	Date
< 0.001		4/21

CV = 0.022 ± 0.0017 mg/filter

Result	Uncer.	Date
0.023	0.002	4/21

CV = 0.0376 ± 0.0033 mg/filter

Result	Uncer.	Date
0.039	0.004	4/21

CV = 0.0474 ± 0.0039 mg/filter

Result	Uncer.	Date
0.049	0.005	4/21

CV = 0.0743 ± 0.0061 mg/filter

Result	Uncer.	Date
0.078	0.008	4/21

Zn 92PAT 01 FAA

CV = not spiked mg/filter

Result	Uncer.	Date
2	0.2	4/21

CV = 0.0809 ± 0.0092 mg/filter

Result	Uncer.	Date
0.086	0.009	4/21

CV = 0.1142 ± 0.0103 mg/filter

Result	Uncer.	Date
0.12	0.01	4/21

CV = 0.1536 ± 0.0138 mg/filter

Result	Uncer.	Date
0.16	0.02	4/21

CV = 0.1944 ± 0.0157 mg/filter

Result	Uncer.	Date
0.2	0.02	4/21

****

NIOSH PAT Round 110
Trace Metals on Air Filter

****

Cd 92PAT 01 FAA

CV = not spiked mg/filter

Result	Uncer.	Date
< 0.0001		7/16

Cd (cont)

CV = 0.005 ± 0.0004 mg/filter

Result	Uncer.	Date
0.0052	0.0005	7/16

CV = 0.0089 ± 0.0008 mg/filter

Result	Uncer.	Date
0.0092	0.0009	7/16

CV = 0.0117 ± 0.0009 mg/filter

Result	Uncer.	Date
0.012	0.001	7/16

CV = 0.0158 ± 0.0002 mg/filter

Result	Uncer.	Date
0.016	0.002	7/16

Cr 92PAT 01 FAA

CV = not spiked mg/filter

Result	Uncer.	Date
< 0.0005		7/16

CV = 0.0748 ± 0.0096 mg/filter

Result	Uncer.	Date
0.08	0.008	7/16

CV = 0.1223 ± 0.0182 mg/filter

Result	Uncer.	Date
0.13	0.01	7/16

CV = 0.178 ± 0.0246 mg/filter

Result	Uncer.	Date
0.19	0.02	7/16

CV = 0.2177 ± 0.0353 mg/filter

Result	Uncer.	Date
0.23	0.02	7/16

Pb 92PAT 01 FAA

CV = not spiked mg/filter

Result	Uncer.	Date
< 0.001		7/16

CV = 0.0275 ± 0.0027 mg/filter

Result	Uncer.	Date
0.03	0.003	7/16

CV = 0.0489 ± 0.0044 mg/filter

Result	Uncer.	Date
0.053	0.005	7/16

Pb (cont)

CV = 0.065 ± 0.0063 mg/filter

Result	Uncer.	Date
0.068	0.007	7/16

CV = 0.0785 ± 0.0061 mg/filter

Result	Uncer.	Date
0.083	0.008	7/16

****

NIOSH PAT Round 111
Trace Metals on Air Filter

****

Cd 92PAT 04 FAA

CV = not spiked mg/filter

Result	Uncer.	Date
< 0.1		10/20

CV = 0.0059 ± 0.0006 mg/filter

Result	Uncer.	Date
0.0062	0.0006	10/20

CV = 0.0098 ± 0.0009 mg/filter

Result	Uncer.	Date
0.01	0.001	10/20

CV = 0.0136 ± 0.0011 mg/filter

Result	Uncer.	Date
0.014	0.001	10/20

CV = 0.0175 ± 0.0015 mg/filter

Result	Uncer.	Date
0.017	0.002	10/20

Pb 92PAT 04 FAA

CV = not spiked mg/filter

Result	Uncer.	Date
< 1		10/20

CV = 0.0291 ± 0.0028 mg/filter

Result	Uncer.	Date
0.031	0.003	10/20

CV = 0.0414 ± 0.0026 mg/filter

Result	Uncer.	Date
0.043	0.004	10/20

CV = 0.0627 ± 0.005 mg/filter

Result	Uncer.	Date
0.067	0.007	10/20

Pb (cont)

CV = 0.0734 ± 0.0056 mg/filter

Result	Uncer.	Date
0.075	0.008	10/20

Zn 92PAT 04 FAA

CV = not spiked mg/filter

Result	Uncer.	Date
< 1		10/20

CV = 0.0745 ± 0.0085 mg/filter

Result	Uncer.	Date
0.079	0.008	10/20

CV = 0.1434 ± 0.0154 mg/filter

Result	Uncer.	Date
0.14	0.01	10/20

CV = 0.1782 ± 0.0184 mg/filter

Result	Uncer.	Date
0.18	0.02	10/20

CV = 0.2067 ± 0.0229 mg/filter

Result	Uncer.	Date
0.21	0.02	10/20

****

Packard Instruments
Radionuclides in Water

****

H-3 79PAC 01 LS

CV = 12.5 ± 0.5 uCi/L

Result	Uncer.	Date
12.9	0.4	1/13
12.4	0.3	1/28
12.4	0.3	2/10
12.4	0.3	2/25
12.4	0.3	3/03
12.4	0.3	3/11
12.6	0.4	3/20
12.3	0.3	3/20
12.4	0.3	3/25
12.4	0.3	4/06
12.4	0.3	4/10
12.5	0.3	4/23
12.5	0.3	4/27
12.4	0.3	5/01
12.4	0.3	5/11
12.4	0.3	5/11
12.4	0.3	5/14
12.4	0.3	5/14
12.4	0.3	5/15
12.4	0.3	5/18
12.4	0.3	5/21
12.4	0.3	5/27
12.4	0.3	6/04
12.4	0.3	6/11
12.4	0.3	6/24
12.5	0.4	7/06

H-3 (cont)

12.4	0.4	7/21
12.4	0.3	8/11
12.4	0.3	8/11
12.4	0.3	8/14
12.4	0.3	8/25
12.3	0.3	8/28
12.3	0.3	8/28
12.4	0.3	9/10
12.3	0.3	9/22
12.4	0.3	9/29
12.4	0.3	10/27
12.4	0.3	11/24
12.4	0.3	12/23

****

USGS GXR-6 Soil

****

Ag 89GLA 02 ATNA

CV = 1.3 ± 0.6 ug/g

Result	Uncer.	Date
< 7		3/29

Al 89GLA 02 ATNA

CV = 17.7 ± 0.6 %

Result	Uncer.	Date
17.5	0.6	3/29

As 89GLA 02 ATNA

CV = 330 ± 25 ug/g

Result	Uncer.	Date
310	30	3/29

Au 89GLA 02 ATNA

CV = 95 ± 14 ng/g

Result	Uncer.	Date
99	8	3/29

Ba 89GLA 02 ATNA

CV = 1300 ± 100 ug/g

Result	Uncer.	Date
1210	60	3/29

Br 89GLA 02 ATNA

CV = 1.4 ug/g

Result	Uncer.	Date
1.8	0.3	3/29

TABLE E-IV (cont)

****

USGS GXR-6 Soil
(cont)

****

Ca 89GLA 02 ATNA
CV = 0.18 ± 0.07 %

Result	Uncer.	Date
< 0.18		3/29

Ce 89GLA 02 ATNA
CV = 36 ± 4 ug/g

Result	Uncer.	Date
38	2	3/29

Cl 89GLA 02 ATNA
CV = not spiked ug/g

Result	Uncer.	Date
< 80		3/29

Cr 89GLA 02 ATNA
CV = 96 ± 7 ug/g

Result	Uncer.	Date
98	6	3/29

Cs 89GLA 02 ATNA
CV = 4.2 ± 0.21 ug/g

Result	Uncer.	Date
4.7	0.4	3/29

Cu 89GLA 02 ATNA
CV = 66 ± 8 ug/g

Result	Uncer.	Date
< 300		3/29

Dy 89GLA 02 ATNA
CV = 2.8 ug/g

Result	Uncer.	Date
2.9	0.4	3/29

Eu 89GLA 02 ATNA
CV = 0.76 ± 0.03 ug/g

Result	Uncer.	Date
0.81	0.08	3/29

Fe 89GLA 02 ATNA
CV = 5.58 ± 0.41 %

Result	Uncer.	Date
6	0.3	3/29

Ga 89GLA 02 ATNA
CV = 35 ± 3 ug/g

Result	Uncer.	Date
32	4	3/29

Hf 89GLA 02 ATNA
CV = 4.3 ± 0.7 ug/g

Result	Uncer.	Date
4	0.5	3/29

Hg 89GLA 02 ATNA
CV = 0.068 ± 0.014 ug/g

Result	Uncer.	Date
< 1.2		3/29

I 89GLA 02 ATNA
CV = not spiked ug/g

Result	Uncer.	Date
< 30		3/29

In 89GLA 02 ATNA
CV = 260 ng/g

Result	Uncer.	Date
< 300		3/29

K 89GLA 02 ATNA
CV = 1.87 ± 0.04 %

Result	Uncer.	Date
1.8	0.2	3/29

La 89GLA 02 ATNA
CV = 13.9 ± 0.9 ug/g

Result	Uncer.	Date
12.7	0.7	3/29

Lu 89GLA 02 ATNA
CV = 330 ng/g

Result	Uncer.	Date
360	30	3/29

Mg 89GLA 02 ATNA
CV = 0.61 ± 0.05 %

Result	Uncer.	Date
0.67	0.07	3/29

Mn 89GLA 02 ATNA
CV = 1040 ± 50 ug/g

Result	Uncer.	Date
1230	50	3/29

Mo 89GLA 02 ATNA
CV = 2.4 ± 0.8 ug/g

Result	Uncer.	Date
< 80		3/29

Na 89GLA 02 ATNA
CV = 1060 ± 90 ug/g

Result	Uncer.	Date
1050	40	3/29

Nd 89GLA 02 ATNA
CV = 13 ug/g

Result	Uncer.	Date
8	1.5	3/29

Rb 89GLA 02 ATNA
CV = 90 ± 4 ug/g

Result	Uncer.	Date
98	6	3/29

Sb 89GLA 02 ATNA
CV = 3.6 ± 1 ug/g

Result	Uncer.	Date
4	0.3	3/29

Sc 89GLA 02 ATNA
CV = 27.6 ± 2.6 ug/g

Result	Uncer.	Date
27.9	1.5	3/29

Se 89GLA 02 ATNA
CV = 0.94 ± 0.18 ug/g

Result	Uncer.	Date
< 7		3/29

Sm 89GLA 02 ATNA
CV = 2.67 ± 0.15 ug/g

Result	Uncer.	Date
2.43	0.11	3/29

Sr 89GLA 02 ATNA
CV = 35 ± 4 ug/g

Result	Uncer.	Date
< 190		3/29

Ta 89GLA 02 ATNA
CV = 485 ± 30 ng/g

Result	Uncer.	Date
490	90	3/29

Tb 89GLA 02 ATNA
CV = 415 ng/g

Result	Uncer.	Date
540	160	3/29

Th 89GLA 02 ATNA
CV = 5.3 ± 0.22 ug/g

Result	Uncer.	Date
6.3	0.3	3/29

Ti 89GLA 02 ATNA
CV = 5000 ± 100 ug/g

Result	Uncer.	Date
5400	700	3/29

U 89GLA 02 ATNA
CV = 1.54 ± 0.07 ug/g

Result	Uncer.	Date
1.82	0.07	3/29

V 89GLA 02 ATNA
CV = 186 ± 11 ug/g

Result	Uncer.	Date
198	8	3/29

W 89GLA 02 ATNA
CV = 1.9 ± 0.5 ug/g

Result	Uncer.	Date
< 5		3/29

Yb 89GLA 02 ATNA
CV = 2.4 ± 0.4 ug/g

Result	Uncer.	Date
2.05	0.15	3/29

Zn 89GLA 02 ATNA
CV = 118 ± 17 ug/g

Result	Uncer.	Date
170	40	3/29

Zr 89GLA 02 ATNA
CV = 110 ± 30 ug/g

Result	Uncer.	Date
< 300		3/29

TABLE E-IV (cont)

****

EM-9 Organics in Water

****

Acenaphthene 89GAU 01 GCMS

CV = 28 ± 3 ug/L

Result	Uncer.	Date
17	5	12/10

CV = 52 ± 5 ug/L

Result	Uncer.	Date
38	11	12/16

CV = 65 ± 7 ug/L

Result	Uncer.	Date
34	10	12/01

CV = 86 ± 9 ug/L

Result	Uncer.	Date
50	15	1/07

CV = 89 ± 9 ug/L

Result	Uncer.	Date
66	20	12/01

CV = 93 ± 9 ug/L

Result	Uncer.	Date
62	19	12/16

CV = 112 ± 11 ug/L

Result	Uncer.	Date
74	22	12/10

CV = 121 ± 12 ug/L

Result	Uncer.	Date
50	15	12/01

CV = 140 ± 14 ug/L

Result	Uncer.	Date
< 10		2/24

CV = 160 ± 16 ug/L

Result	Uncer.	Date
48	14	1/06

Acetone 89GAU 01 PTGC

CV = 36 ± 4 ug/L

Result	Uncer.	Date
< 20		9/15
45	14	10/14

Acetone (cont)

CV = 40 ± 4 ug/L

Result	Uncer.	Date
< 20		10/19
38	11	10/30

CV = 42 ± 4 ug/L

Result	Uncer.	Date
< 20		8/31

CV = 44 ± 4 ug/L

Result	Uncer.	Date
57	17	10/28

CV = 46 ± 5 ug/L

Result	Uncer.	Date
27	8	11/24

CV = 52 ± 5 ug/L

Result	Uncer.	Date
26	8	2/19

CV = 59 ± 6 ug/L

Result	Uncer.	Date
38	11	8/11

CV = 63 ± 6 ug/L

Result	Uncer.	Date
77	23	6/16

CV = 64 ± 6 ug/L

Result	Uncer.	Date
40	12	9/01
33	10	9/03

CV = 65 ± 6 ug/L

Result	Uncer.	Date
27	8	9/14
99	30	10/15

CV = 68 ± 7 ug/L

Result	Uncer.	Date
60	18	8/06
56	17	8/31

CV = 70 ± 7 ug/L

Result	Uncer.	Date
35	11	3/31
67	20	5/20
46	14	5/29

Acetone (cont)

CV = 78 ± 8 ug/L

Result	Uncer.	Date
77	23	8/27
47	14	10/21

CV = 84 ± 8 ug/L

Result	Uncer.	Date
31	9	1/30
51	15	6/16

CV = 85 ± 8 ug/L

Result	Uncer.	Date
42	13	9/18

CV = 91 ± 9 ug/L

Result	Uncer.	Date
34	10	11/18

CV = 93 ± 9 ug/L

Result	Uncer.	Date
64	19	5/29
61	18	12/09

CV = 95 ± 9 ug/L

Result	Uncer.	Date
41	12	11/16
47	14	12/01

CV = 100 ± 10 ug/L

Result	Uncer.	Date
32	10	6/09

CV = 102 ± 10 ug/L

Result	Uncer.	Date
72	22	9/14

CV = 104 ± 10 ug/L

Result	Uncer.	Date
38	11	6/01

CV = 106 ± 11 ug/L

Result	Uncer.	Date
38	11	5/19

CV = 111 ± 11 ug/L

Result	Uncer.	Date
62	19	11/19

CV = 114 ± 11 ug/L

Result	Uncer.	Date
< 20		9/11

Acetone (cont)

CV = 115 ± 12 ug/L

Result	Uncer.	Date
41	12	11/18

CV = 116 ± 12 ug/L

Result	Uncer.	Date
51	15	12/07

CV = 119 ± 12 ug/L

Result	Uncer.	Date
45	14	10/19

CV = 121 ± 12 ug/L

Result	Uncer.	Date
95	29	9/18

CV = 123 ± 12 ug/L

Result	Uncer.	Date
100	30	11/04

CV = 127 ± 13 ug/L

Result	Uncer.	Date
100	30	8/11
49	15	9/16

CV = 131 ± 13 ug/L

Result	Uncer.	Date
96	29	9/10

CV = 133 ± 13 ug/L

Result	Uncer.	Date
130	40	11/18

CV = 134 ± 13 ug/L

Result	Uncer.	Date
31	9	9/18

Aniline 89GAU 01 GCMS

CV = 33 ± 3 ug/L

Result	Uncer.	Date
< 10		12/10

CV = 61 ± 6 ug/L

Result	Uncer.	Date
43	13	12/16

CV = 76 ± 8 ug/L

Result	Uncer.	Date
31	9	12/01

Aniline (cont)

CV = 105 ± 10 ug/L

Result	Uncer.	Date
91	27	12/01

CV = 109 ± 10 ug/L

Result	Uncer.	Date
61	18	12/16

CV = 131 ± 13 ug/L

Result	Uncer.	Date
59	18	12/10

CV = 142 ± 14 ug/L

Result	Uncer.	Date
81	24	12/01

Anthracene 89GAU 01 GCMS

CV = 31 ± 3 ug/L

Result	Uncer.	Date
< 10		6/02
13	4	6/03

CV = 57 ± 6 ug/L

Result	Uncer.	Date
< 10		4/28

CV = 76 ± 8 ug/L

Result	Uncer.	Date
< 10		1/02

CV = 82 ± 8 ug/L

Result	Uncer.	Date
< 10		5/08

CV = 103 ± 10 ug/L

Result	Uncer.	Date
43	13	4/23

CV = 124 ± 12 ug/L

Result	Uncer.	Date
40	12	6/18

CV = 150 ± 15 ug/L

Result	Uncer.	Date
62	19	1/07

CV = 165 ± 16 ug/L

Result	Uncer.	Date
66	20	6/22
11	3	6/24

Benzene 89GAU 01 PTGC

CV = 38 ± 4 ug/L

Result	Uncer.	Date
34	10	8/31

CV = 50 ± 5 ug/L

Result	Uncer.	Date
37	11	2/19

CV = 53 ± 5 ug/L

Result	Uncer.	Date
42	13	8/11

CV = 57 ± 6 ug/L

Result	Uncer.	Date
41	12	9/01

CV = 61 ± 6 ug/L

Result	Uncer.	Date
51	15	8/31

CV = 70 ± 7 ug/L

Result	Uncer.	Date
87	26	10/21

CV = 103 ± 10 ug/L

Result	Uncer.	Date
100	30	9/11

CV = 114 ± 11 ug/L

Result	Uncer.	Date
130	40	9/16

CV = 120 ± 12 ug/L

Result	Uncer.	Date
100	30	9/18

Benzo[a]anthracene 89GAU 01 GCMS

CV = 36 ± 4 ug/L

Result	Uncer.	Date
< 10		10/13

CV = 63 ± 6 ug/L

Result	Uncer.	Date
15	5	9/10

CV = 69 ± 7 ug/L

Result	Uncer.	Date
13	4	8/24

TABLE E-IV (cont)

****

EM-9 Organics in Water
(cont)

****

Benzo[a]anthracene (cont)

CV = 71 ± 7 ug/L

Result	Uncer.	Date
11	3	10/22

CV = 79 ± 8 ug/L

Result	Uncer.	Date
24	7	7/28

CV = 148 ± 15 ug/L

Result	Uncer.	Date
38	11	8/19
21	6	10/22

CV = 182 ± 18 ug/L

Result	Uncer.	Date
80	24	7/14

Benzo[b]fluoranthene 89GAU 01 GCMS

CV = 36 ± 4 ug/L

Result	Uncer.	Date
16	5	12/10

CV = 55 ± 5 ug/L

Result	Uncer.	Date
22	7	12/01

CV = 82 ± 8 ug/L

Result	Uncer.	Date
46	14	1/07

CV = 85 ± 8 ug/L

Result	Uncer.	Date
46	14	12/01

CV = 90 ± 9 ug/L

Result	Uncer.	Date
42	13	12/10

CV = 113 ± 11 ug/L

Result	Uncer.	Date
64	19	12/16

CV = 130 ± 13 ug/L

Result	Uncer.	Date
66	20	2/24

Benzo[b]fluoranthene (cont)

CV = 150 ± 15 ug/L

Result	Uncer.	Date
120	40	1/06
76	23	12/09

CV = 169 ± 17 ug/L

Result	Uncer.	Date
92	28	10/28
86	26	12/01

Benzo[k]fluoranthene 89GAU 01 GCMS

CV = 60 ± 6 ug/L

Result	Uncer.	Date
11	3	1/09

Benzoic acid 89GAU 01 GCMS

CV = 32 ± 3 ug/L

Result	Uncer.	Date
23	7	6/02
15	5	6/03

CV = 83 ± 8 ug/L

Result	Uncer.	Date
84	25	1/07

CV = 86 ± 9 ug/L

Result	Uncer.	Date
100	30	5/08

CV = 108 ± 11 ug/L

Result	Uncer.	Date
21	6	4/23

CV = 130 ± 13 ug/L

Result	Uncer.	Date
94	28	6/18

CV = 140 ± 14 ug/L

Result	Uncer.	Date
12	4	2/24

CV = 160 ± 16 ug/L

Result	Uncer.	Date
110	30	1/06

CV = 173 ± 17 ug/L

Result	Uncer.	Date
170	50	6/22
24	7	6/24

Bis(2-chloroethoxy)methane 89GAU 01 GCMS

CV = 29 ± 3 ug/L

Result	Uncer.	Date
22	7	6/02
14	4	6/03

CV = 78 ± 8 ug/L

Result	Uncer.	Date
46	14	5/08

CV = 98 ± 10 ug/L

Result	Uncer.	Date
58	17	4/23

CV = 118 ± 12 ug/L

Result	Uncer.	Date
74	22	6/18

CV = 157 ± 16 ug/L

Result	Uncer.	Date
120	40	6/22
19	6	6/24

Bis(2-chloroethyl)ether 89GAU 01 GCMS

CV = 62 ± 6 ug/L

Result	Uncer.	Date
24	7	1/09

Bromobenzene 89GAU 01 PTGC

CV = 94 ± 9 ug/L

Result	Uncer.	Date
62	19	1/30

Bromochloromethane 89GAU 01 PTGC

CV = 42 ± 4 ug/L

Result	Uncer.	Date
39	12	8/31

CV = 58 ± 6 ug/L

Result	Uncer.	Date
60	18	8/11

CV = 62 ± 6 ug/L

Result	Uncer.	Date
56	17	9/01

Bromochloromethane (cont)

CV = 67 ± 7 ug/L

Result	Uncer.	Date
64	19	8/31

CV = 77 ± 8 ug/L

Result	Uncer.	Date
110	30	10/21

CV = 112 ± 11 ug/L

Result	Uncer.	Date
120	40	9/11

CV = 125 ± 12 ug/L

Result	Uncer.	Date
140	40	9/16

CV = 131 ± 13 ug/L

Result	Uncer.	Date
120	40	9/18

Bromodichloromethane 89GAU 01 PTGC

CV = 38 ± 4 ug/L

Result	Uncer.	Date
38	11	10/30

CV = 41 ± 4 ug/L

Result	Uncer.	Date
48	14	10/28

CV = 60 ± 6 ug/L

Result	Uncer.	Date
72	22	10/15

CV = 66 ± 7 ug/L

Result	Uncer.	Date
81	24	5/20
56	17	5/29

CV = 79 ± 8 ug/L

Result	Uncer.	Date
63	19	6/16
88	26	9/18

CV = 85 ± 8 ug/L

Result	Uncer.	Date
88	26	11/18

CV = 88 ± 9 ug/L

Result	Uncer.	Date
76	23	5/29

Bromodichloromethane (cont)

CV = 100 ± 10 ug/L

Result	Uncer.	Date
88	26	6/09

CV = 103 ± 10 ug/L

Result	Uncer.	Date
99	30	11/19

CV = 111 ± 11 ug/L

Result	Uncer.	Date
150	50	10/19

CV = 124 ± 12 ug/L

Result	Uncer.	Date
140	40	11/18

Bromoform 89GAU 01 PTGC

CV = 50 ± 5 ug/L

Result	Uncer.	Date
< 5		11/24

CV = 70 ± 7 ug/L

Result	Uncer.	Date
100	30	5/20
60	18	5/29

CV = 84 ± 8 ug/L

Result	Uncer.	Date
73	22	6/16

CV = 94 ± 9 ug/L

Result	Uncer.	Date
94	28	5/29

CV = 101 ± 10 ug/L

Result	Uncer.	Date
130	40	12/09

CV = 110 ± 11 ug/L

Result	Uncer.	Date
100	30	6/09

2-Butanone 89GAU 01 PTGC

CV = 34 ± 3 ug/L

Result	Uncer.	Date
< 20		9/15
270	80	10/14

2-Butanone (cont)

CV = 38 ± 4 ug/L

Result	Uncer.	Date
30	9	10/19
280	80	10/30

CV = 41 ± 4 ug/L

Result	Uncer.	Date
32	10	10/28

CV = 44 ± 4 ug/L

Result	Uncer.	Date
< 20		8/31

CV = 48 ± 5 ug/L

Result	Uncer.	Date
< 20		11/24

CV = 60 ± 6 ug/L

Result	Uncer.	Date
27	8	9/14
110	30	10/15

CV = 61 ± 6 ug/L

Result	Uncer.	Date
64	19	8/11

CV = 65 ± 6 ug/L

Result	Uncer.	Date
32	10	2/19
34	10	9/01
39	12	9/03

CV = 67 ± 7 ug/L

Result	Uncer.	Date
69	21	6/16

CV = 70 ± 7 ug/L

Result	Uncer.	Date
240	70	8/06
280	80	8/31

CV = 74 ± 7 ug/L

Result	Uncer.	Date
45	14	3/31
60	18	5/20
50	15	5/29

CV = 79 ± 8 ug/L

Result	Uncer.	Date
38	11	9/18

TABLE E-IV (cont)

****

EM-9 Organics in Water
(cont)

****

2-Butanone (cont)

CV = 81 ± 8 ug/L

Result	Uncer.	Date
97	29	8/27
62	19	10/21

CV = 85 ± 8 ug/L

Result	Uncer.	Date
37	11	11/18

CV = 88 ± 9 ug/L

Result	Uncer.	Date
49	15	11/16

CV = 89 ± 9 ug/L

Result	Uncer.	Date
65	20	6/16

CV = 97 ± 10 ug/L

Result	Uncer.	Date
150	50	12/09

CV = 98 ± 10 ug/L

Result	Uncer.	Date
43	13	12/01

CV = 99 ± 10 ug/L

Result	Uncer.	Date
63	19	5/29

CV = 100 ± 10 ug/L

Result	Uncer.	Date
42	13	1/30

CV = 103 ± 10 ug/L

Result	Uncer.	Date
58	17	11/19

CV = 105 ± 10 ug/L

Result	Uncer.	Date
72	22	9/14

CV = 107 ± 11 ug/L

Result	Uncer.	Date
48	14	11/18

2-Butanone (cont)

CV = 109 ± 11 ug/L

Result	Uncer.	Date
51	15	5/19

CV = 110 ± 11 ug/L

Result	Uncer.	Date
< 20		6/09

CV = 111 ± 11 ug/L

Result	Uncer.	Date
86	26	10/19

CV = 112 ± 11 ug/L

Result	Uncer.	Date
50	15	6/01

CV = 113 ± 11 ug/L

Result	Uncer.	Date
78	23	9/18

CV = 118 ± 12 ug/L

Result	Uncer.	Date
49	15	9/11

CV = 121 ± 12 ug/L

Result	Uncer.	Date
110	30	12/07

CV = 124 ± 12 ug/L

Result	Uncer.	Date
130	40	11/18

CV = 126 ± 13 ug/L

Result	Uncer.	Date
150	50	11/04

CV = 131 ± 13 ug/L

Result	Uncer.	Date
120	40	8/11
62	19	9/16

CV = 135 ± 14 ug/L

Result	Uncer.	Date
78	23	9/10

CV = 137 ± 14 ug/L

Result	Uncer.	Date
47	14	9/18

n-Butylbenzene
89GAU 01 PTGC

CV = 50 ± 5 ug/L

Result	Uncer.	Date
42	13	2/19

sec-Butylbenzene
89GAU 01 PTGC

CV = 81 ± 8 ug/L

Result	Uncer.	Date
57	17	1/30

tert-Butylbenzene
89GAU 01 PTGC

CV = 40 ± 4 ug/L

Result	Uncer.	Date
37	11	8/31

CV = 55 ± 6 ug/L

Result	Uncer.	Date
35	11	8/11

CV = 59 ± 6 ug/L

Result	Uncer.	Date
47	14	9/03

CV = 63 ± 6 ug/L

Result	Uncer.	Date
41	12	8/31

CV = 73 ± 7 ug/L

Result	Uncer.	Date
52	16	10/21

CV = 95 ± 10 ug/L

Result	Uncer.	Date
53	16	9/14

CV = 119 ± 12 ug/L

Result	Uncer.	Date
93	28	9/16

CV = 123 ± 12 ug/L

Result	Uncer.	Date
100	30	9/10

Carbon disulfide
89GAU 01 PTGC

CV = 50 ± 5 ug/L

Result	Uncer.	Date
29	9	11/24

Carbon disulfide (cont)

CV = 67 ± 7 ug/L

Result	Uncer.	Date
56	17	5/20
46	14	5/29

CV = 81 ± 8 ug/L

Result	Uncer.	Date
49	15	6/16

CV = 90 ± 9 ug/L

Result	Uncer.	Date
58	17	5/29

CV = 100 ± 10 ug/L

Result	Uncer.	Date
62	19	6/09

CV = 126 ± 13 ug/L

Result	Uncer.	Date
120	40	12/07

Carbon tetrachloride
89GAU 01 PTGC

CV = 50 ± 5 ug/L

Result	Uncer.	Date
< 5		11/24

CV = 79 ± 8 ug/L

Result	Uncer.	Date
33	10	6/16

CV = 88 ± 9 ug/L

Result	Uncer.	Date
52	16	3/31
56	17	5/20

CV = 99 ± 10 ug/L

Result	Uncer.	Date
110	30	12/09

CV = 105 ± 10 ug/L

Result	Uncer.	Date
52	16	6/16

CV = 117 ± 12 ug/L

Result	Uncer.	Date
48	14	5/29

CV = 131 ± 13 ug/L

Result	Uncer.	Date
60	18	6/01

4-Chloro-3-methylphenol
89GAU 01 GCMS

CV = 37 ± 4 ug/L

Result	Uncer.	Date
< 10		10/13

CV = 65 ± 6 ug/L

Result	Uncer.	Date
48	14	9/10

CV = 71 ± 7 ug/L

Result	Uncer.	Date
51	15	8/24

CV = 73 ± 7 ug/L

Result	Uncer.	Date
47	14	10/22

CV = 80 ± 8 ug/L

Result	Uncer.	Date
45	14	1/07

CV = 82 ± 8 ug/L

Result	Uncer.	Date
43	13	7/28

CV = 130 ± 13 ug/L

Result	Uncer.	Date
< 10		2/24

CV = 150 ± 15 ug/L

Result	Uncer.	Date
71	21	1/06

CV = 153 ± 15 ug/L

Result	Uncer.	Date
100	30	8/19
110	30	10/22

CV = 187 ± 19 ug/L

Result	Uncer.	Date
120	40	7/14

4-Chloroaniline
89GAU 01 GCMS

CV = 36 ± 4 ug/L

Result	Uncer.	Date
17	5	10/13

CV = 61 ± 6 ug/L

Result	Uncer.	Date
< 10		1/09

4-Chloroaniline (cont)

CV = 62 ± 6 ug/L

Result	Uncer.	Date
19	6	9/10

CV = 68 ± 7 ug/L

Result	Uncer.	Date
40	12	8/24

CV = 70 ± 7 ug/L

Result	Uncer.	Date
45	14	10/22

CV = 78 ± 8 ug/L

Result	Uncer.	Date
35	11	7/28

CV = 147 ± 15 ug/L

Result	Uncer.	Date
84	25	8/19
86	26	10/22

CV = 179 ± 18 ug/L

Result	Uncer.	Date
74	22	7/14

Chlorobenzene
89GAU 01 PTGC

CV = 41 ± 4 ug/L

Result	Uncer.	Date
31	9	9/15
42	13	10/14

CV = 50 ± 5 ug/L

Result	Uncer.	Date
42	13	10/28

CV = 96 ± 10 ug/L

Result	Uncer.	Date
76	23	9/18

CV = 125 ± 13 ug/L

Result	Uncer.	Date
94	28	11/19

CV = 130 ± 13 ug/L

Result	Uncer.	Date
89	27	11/18

CV = 135 ± 13 ug/L

Result	Uncer.	Date
120	40	10/19

TABLE E-IV (cont)

****

EM-9 Organics in Water
(cont)

****

Chlorodibromomethane
89GAU 01 PTGC

CV = 45 ± 5 ug/L

Result	Uncer.	Date
38	11	9/15
50	15	10/14

CV = 55 ± 6 ug/L

Result	Uncer.	Date
72	22	10/28

CV = 59 ± 6 ug/L

Result	Uncer.	Date
57	17	6/16

CV = 66 ± 7 ug/L

Result	Uncer.	Date
62	19	3/31
85	26	5/20

CV = 79 ± 8 ug/L

Result	Uncer.	Date
66	20	6/16

CV = 88 ± 9 ug/L

Result	Uncer.	Date
81	24	5/29

CV = 99 ± 10 ug/L

Result	Uncer.	Date
77	23	6/01

CV = 106 ± 11 ug/L

Result	Uncer.	Date
95	29	9/18

CV = 139 ± 14 ug/L

Result	Uncer.	Date
110	30	11/19

CV = 144 ± 14 ug/L

Result	Uncer.	Date
110	30	11/18

CV = 149 ± 15 ug/L

Result	Uncer.	Date
170	50	10/19

Chloroform
89GAU 01 PTGC

CV = 59 ± 6 ug/L

Result	Uncer.	Date
51	15	6/16

CV = 66 ± 7 ug/L

Result	Uncer.	Date
49	15	3/31
66	20	5/20

CV = 79 ± 8 ug/L

Result	Uncer.	Date
59	18	6/16

CV = 88 ± 9 ug/L

Result	Uncer.	Date
59	18	5/29

CV = 99 ± 10 ug/L

Result	Uncer.	Date
77	23	6/01

2-Chloronaphthalene
89GAU 01 GCMS

CV = 59 ± 6 ug/L

Result	Uncer.	Date
38	11	4/28

CV = 79 ± 8 ug/L

Result	Uncer.	Date
55	17	1/02

CV = 160 ± 16 ug/L

Result	Uncer.	Date
66	20	1/07

---

o-Chlorophenol
89GAU 01 GCMS

CV = 31 ± 3 ug/L

Result	Uncer.	Date
13	4	12/10

CV = 57 ± 6 ug/L

Result	Uncer.	Date
45	14	12/16

CV = 71 ± 7 ug/L

Result	Uncer.	Date
35	11	12/01

o-Chlorophenol (cont)

CV = 87 ± 9 ug/L

Result	Uncer.	Date
42	13	1/07

CV = 98 ± 10 ug/L

Result	Uncer.	Date
82	25	12/01

CV = 102 ± 10 ug/L

Result	Uncer.	Date
62	19	12/16

CV = 122 ± 12 ug/L

Result	Uncer.	Date
74	22	12/10

CV = 133 ± 13 ug/L

Result	Uncer.	Date
85	26	12/01

CV = 140 ± 14 ug/L

Result	Uncer.	Date
< 10		2/24

CV = 160 ± 16 ug/L

Result	Uncer.	Date
81	24	1/06

---

o-Chlorotoluene
89GAU 01 PTGC

CV = 39 ± 4 ug/L

Result	Uncer.	Date
35	11	9/15
39	12	10/14

CV = 43 ± 4 ug/L

Result	Uncer.	Date
38	11	8/31
36	11	10/19
24	7	10/30

CV = 48 ± 5 ug/L

Result	Uncer.	Date
40	12	10/28
26	8	11/24

CV = 56 ± 6 ug/L

Result	Uncer.	Date
43	13	2/19
45	14	6/16

o-Chlorotoluene (cont)

CV = 60 ± 6 ug/L

Result	Uncer.	Date
48	14	8/11

CV = 62 ± 6 ug/L

Result	Uncer.	Date
53	16	3/31
57	17	5/20
34	10	5/29

CV = 65 ± 6 ug/L

Result	Uncer.	Date
39	12	9/01
53	16	9/03

CV = 69 ± 7 ug/L

Result	Uncer.	Date
49	15	8/06
46	14	8/31
63	19	9/14
62	19	10/15

CV = 75 ± 8 ug/L

Result	Uncer.	Date
37	11	6/16

CV = 80 ± 8 ug/L

Result	Uncer.	Date
43	13	8/27
50	15	10/21

CV = 83 ± 8 ug/L

Result	Uncer.	Date
53	16	5/29

CV = 90 ± 9 ug/L

Result	Uncer.	Date
70	21	1/30
83	25	6/09

CV = 91 ± 9 ug/L

Result	Uncer.	Date
65	20	9/18

CV = 94 ± 9 ug/L

Result	Uncer.	Date
58	17	6/01

CV = 96 ± 10 ug/L

Result	Uncer.	Date
81	24	12/09

o-Chlorotoluene (cont)

CV = 97 ± 10 ug/L

Result	Uncer.	Date
52	16	11/18
77	23	12/01

CV = 102 ± 10 ug/L

Result	Uncer.	Date
79	24	11/16

CV = 104 ± 10 ug/L

Result	Uncer.	Date
64	19	9/14

CV = 108 ± 11 ug/L

Result	Uncer.	Date
66	20	5/19

CV = 117 ± 12 ug/L

Result	Uncer.	Date
87	26	9/11

CV = 119 ± 12 ug/L

Result	Uncer.	Date
75	23	11/19

CV = 120 ± 12 ug/L

Result	Uncer.	Date
77	23	12/07

CV = 123 ± 12 ug/L

Result	Uncer.	Date
80	24	11/18

CV = 125 ± 13 ug/L

Result	Uncer.	Date
98	29	11/04

CV = 127 ± 13 ug/L

Result	Uncer.	Date
94	28	10/19

CV = 130 ± 13 ug/L

Result	Uncer.	Date
76	23	8/11
100	30	9/16
80	24	9/18

CV = 134 ± 13 ug/L

Result	Uncer.	Date
100	30	9/10

o-Chlorotoluene (cont)

CV = 136 ± 14 ug/L

Result	Uncer.	Date
92	28	9/18

CV = 143 ± 14 ug/L

Result	Uncer.	Date
84	25	11/18

---

p-Chlorotoluene
89GAU 01 PTGC

CV = 40 ± 4 ug/L

Result	Uncer.	Date
30	9	8/31

CV = 55 ± 6 ug/L

Result	Uncer.	Date
44	13	8/11

CV = 59 ± 6 ug/L

Result	Uncer.	Date
32	10	9/01

CV = 63 ± 6 ug/L

Result	Uncer.	Date
< 5		8/31

CV = 73 ± 7 ug/L

Result	Uncer.	Date
68	20	10/21

CV = 90 ± 9 ug/L

Result	Uncer.	Date
74	22	1/30

CV = 107 ± 11 ug/L

Result	Uncer.	Date
66	20	9/11

CV = 119 ± 12 ug/L

Result	Uncer.	Date
83	25	9/16

CV = 125 ± 12 ug/L

Result	Uncer.	Date
71	21	9/18

TABLE E-IV (cont)

****

EM-9 Organics in Water
(cont)

****

Chrysene
89GAU 01 GCMS

CV = 35 ± 3 ug/L

Result	Uncer.	Date
< 10		10/13

CV = 60 ± 6 ug/L

Result	Uncer.	Date
15	5	9/10

CV = 66 ± 7 ug/L

Result	Uncer.	Date
13	4	8/24

CV = 68 ± 7 ug/L

Result	Uncer.	Date
15	5	10/22

CV = 75 ± 8 ug/L

Result	Uncer.	Date
22	7	7/28

CV = 141 ± 14 ug/L

Result	Uncer.	Date
37	11	8/19
22	7	10/22

CV = 173 ± 17 ug/L

Result	Uncer.	Date
70	21	7/14

Di-n-octyl phthalate
89GAU 01 GCMS

CV = 63 ± 6 ug/L

Result	Uncer.	Date
11	3	1/09

Dibenzofuran
89GAU 01 GCMS

CV = 27 ± 3 ug/L

Result	Uncer.	Date
17	5	12/10

CV = 50 ± 5 ug/L

Result	Uncer.	Date
35	11	12/16

Dibenzofuran (cont)

CV = 62 ± 6 ug/L

Result	Uncer.	Date
35	11	12/01

CV = 85 ± 9 ug/L

Result	Uncer.	Date
62	19	12/01

CV = 89 ± 9 ug/L

Result	Uncer.	Date
59	18	12/16

CV = 107 ± 11 ug/L

Result	Uncer.	Date
71	21	12/10

CV = 116 ± 12 ug/L

Result	Uncer.	Date
51	15	12/01

1,2-Dibromo-3-chloropropane
89GAU 01 PTGC

CV = 39 ± 4 ug/L

Result	Uncer.	Date
49	15	9/15
65	20	10/14

CV = 48 ± 5 ug/L

Result	Uncer.	Date
60	18	10/28

CV = 91 ± 9 ug/L

Result	Uncer.	Date
98	29	9/18

CV = 119 ± 12 ug/L

Result	Uncer.	Date
100	30	11/19

CV = 123 ± 12 ug/L

Result	Uncer.	Date
< 10		11/18

CV = 127 ± 13 ug/L

Result	Uncer.	Date
160	50	10/19

Dibromomethane
89GAU 01 PTGC

CV = 45 ± 4 ug/L

Result	Uncer.	Date
39	12	8/31

CV = 63 ± 6 ug/L

Result	Uncer.	Date
62	19	8/11

CV = 67 ± 7 ug/L

Result	Uncer.	Date
64	19	9/03

CV = 72 ± 7 ug/L

Result	Uncer.	Date
65	20	8/31

CV = 83 ± 8 ug/L

Result	Uncer.	Date
91	27	10/21

CV = 108 ± 11 ug/L

Result	Uncer.	Date
100	30	9/14

CV = 134 ± 13 ug/L

Result	Uncer.	Date
130	40	9/16

CV = 139 ± 14 ug/L

Result	Uncer.	Date
120	40	9/10

---

o-Dichlorobenzene (1,2)
89GAU 01 GCMS

CV = 37 ± 4 ug/L

Result	Uncer.	Date
< 10		10/13

CV = 64 ± 6 ug/L

Result	Uncer.	Date
13	4	9/10

CV = 71 ± 7 ug/L

Result	Uncer.	Date
13	4	8/24

CV = 73 ± 7 ug/L

Result	Uncer.	Date
12	4	10/22

o-Dichlorobenzene (1,2) (cont)

CV = 81 ± 8 ug/L

Result	Uncer.	Date
< 10		7/28

CV = 152 ± 15 ug/L

Result	Uncer.	Date
48	14	8/19
57	17	10/22

CV = 186 ± 19 ug/L

Result	Uncer.	Date
11	3	7/14

---

m-Dichlorobenzene (1,3)
89GAU 01 GCMS

CV = 35 ± 3 ug/L

Result	Uncer.	Date
21	6	6/22

CV = 58 ± 6 ug/L

Result	Uncer.	Date
< 10		4/28

CV = 93 ± 9 ug/L

Result	Uncer.	Date
37	11	6/18
97	29	8/12

CV = 186 ± 19 ug/L

Result	Uncer.	Date
34	10	5/08

---

m-Dichlorobenzene (1,3)
89GAU 01 PTGC

CV = 43 ± 4 ug/L

Result	Uncer.	Date
20	6	10/30

CV = 48 ± 5 ug/L

Result	Uncer.	Date
35	11	10/28

CV = 63 ± 6 ug/L

Result	Uncer.	Date
57	17	2/19

CV = 69 ± 7 ug/L

Result	Uncer.	Date
52	16	10/15

m-Dichlorobenzene (1,3) (cont)

CV = 91 ± 9 ug/L

Result	Uncer.	Date
60	18	9/18

CV = 97 ± 10 ug/L

Result	Uncer.	Date
53	16	11/18

CV = 119 ± 12 ug/L

Result	Uncer.	Date
81	24	11/19

CV = 127 ± 13 ug/L

Result	Uncer.	Date
88	26	10/19

CV = 143 ± 14 ug/L

Result	Uncer.	Date
< 5		11/18

---

p-Dichlorobenzene (1,4)
89GAU 01 PTGC

CV = 40 ± 4 ug/L

Result	Uncer.	Date
32	10	9/15
38	11	10/14

CV = 41 ± 4 ug/L

Result	Uncer.	Date
33	10	8/31

CV = 44 ± 4 ug/L

Result	Uncer.	Date
33	10	10/19
19	6	10/30

CV = 48 ± 5 ug/L

Result	Uncer.	Date
32	10	10/28

CV = 52 ± 5 ug/L

Result	Uncer.	Date
50	15	2/19
28	8	11/24

CV = 55 ± 6 ug/L

Result	Uncer.	Date
44	13	6/16

CV = 58 ± 6 ug/L

Result	Uncer.	Date
50	15	8/11

p-Dichlorobenzene (1,4) (cont)

CV = 61 ± 6 ug/L

Result	Uncer.	Date
50	15	3/31
54	16	5/20
24	7	5/29

CV = 62 ± 6 ug/L

Result	Uncer.	Date
35	11	9/01
52	16	9/03

CV = 66 ± 7 ug/L

Result	Uncer.	Date
52	16	8/06
40	12	8/31

CV = 70 ± 7 ug/L

Result	Uncer.	Date
59	18	9/14
46	14	10/15

CV = 73 ± 7 ug/L

Result	Uncer.	Date
24	7	6/16

CV = 76 ± 8 ug/L

Result	Uncer.	Date
37	11	8/27
53	16	10/21

CV = 82 ± 8 ug/L

Result	Uncer.	Date
54	16	5/29

CV = 83 ± 8 ug/L

Result	Uncer.	Date
75	23	1/30

CV = 90 ± 9 ug/L

Result	Uncer.	Date
65	20	6/09

CV = 92 ± 9 ug/L

Result	Uncer.	Date
54	16	6/01
60	18	9/18

CV = 93 ± 9 ug/L

Result	Uncer.	Date
75	23	12/01

TABLE E-IV (cont)

****

EM-9 Organics in Water
(cont)

****

p-Dichlorobenzene (1,4) (cont)

CV = 99 ± 10 ug/L

Result	Uncer.	Date
60	18	9/14
51	15	11/18

CV = 103 ± 10 ug/L

Result	Uncer.	Date
61	18	5/19
76	23	11/16
83	25	12/09

CV = 111 ± 11 ug/L

Result	Uncer.	Date
73	22	9/11

CV = 119 ± 12 ug/L

Result	Uncer.	Date
69	21	11/04

CV = 121 ± 12 ug/L

Result	Uncer.	Date
76	23	11/19

CV = 124 ± 12 ug/L

Result	Uncer.	Date
82	25	8/11
83	25	9/16

CV = 125 ± 13 ug/L

Result	Uncer.	Date
73	22	11/18

CV = 128 ± 13 ug/L

Result	Uncer.	Date
89	27	9/10

CV = 129 ± 13 ug/L

Result	Uncer.	Date
65	20	12/07

CV = 130 ± 13 ug/L

Result	Uncer.	Date
< 5		9/18
80	24	10/19

CV = 132 ± 13 ug/L

Result	Uncer.	Date
72	22	9/18

p-Dichlorobenzene (1,4) (cont)

CV = 145 ± 15 ug/L

Result	Uncer.	Date
68	20	11/18

1,1-Dichloroethane
89GAU 01 PTGC

CV = 33 ± 3 ug/L

Result	Uncer.	Date
37	11	8/31

CV = 46 ± 5 ug/L

Result	Uncer.	Date
49	15	8/11

CV = 49 ± 5 ug/L

Result	Uncer.	Date
53	16	9/03

CV = 52 ± 5 ug/L

Result	Uncer.	Date
59	18	8/31

CV = 61 ± 6 ug/L

Result	Uncer.	Date
100	30	10/21

CV = 79 ± 8 ug/L

Result	Uncer.	Date
80	24	9/14

CV = 91 ± 9 ug/L

Result	Uncer.	Date
61	18	1/30

CV = 98 ± 10 ug/L

Result	Uncer.	Date
160	50	9/16

CV = 102 ± 10 ug/L

Result	Uncer.	Date
120	40	9/10

1,2-Dichloroethane
89GAU 01 PTGC

CV = 39 ± 4 ug/L

Result	Uncer.	Date
40	12	9/15
49	15	10/14

1,2-Dichloroethane (cont)

CV = 48 ± 5 ug/L

Result	Uncer.	Date
61	18	10/28

CV = 59 ± 6 ug/L

Result	Uncer.	Date
61	18	6/16

CV = 65 ± 7 ug/L

Result	Uncer.	Date
59	18	3/31
82	25	5/20

CV = 78 ± 8 ug/L

Result	Uncer.	Date
65	20	6/16

CV = 87 ± 9 ug/L

Result	Uncer.	Date
77	23	5/29

CV = 92 ± 9 ug/L

Result	Uncer.	Date
91	27	9/18

CV = 98 ± 10 ug/L

Result	Uncer.	Date
91	27	6/01

CV = 120 ± 12 ug/L

Result	Uncer.	Date
120	40	11/19

CV = 124 ± 12 ug/L

Result	Uncer.	Date
120	40	11/18

CV = 129 ± 13 ug/L

Result	Uncer.	Date
160	50	10/19

1,1-Dichloroethene
89GAU 01 PTGC

CV = 31 ± 3 ug/L

Result	Uncer.	Date
31	9	10/30

CV = 34 ± 3 ug/L

Result	Uncer.	Date
33	10	10/28

1,1-Dichloroethene (cont)

CV = 50 ± 5 ug/L

Result	Uncer.	Date
45	14	10/15

CV = 66 ± 7 ug/L

Result	Uncer.	Date
49	15	9/18

CV = 70 ± 7 ug/L

Result	Uncer.	Date
71	21	11/18

CV = 86 ± 9 ug/L

Result	Uncer.	Date
81	24	11/19

CV = 92 ± 9 ug/L

Result	Uncer.	Date
100	30	10/19

CV = 103 ± 10 ug/L

Result	Uncer.	Date
< 5		11/18

trans-1,2-Dichloroethene
89GAU 01 PTGC

CV = 46 ± 5 ug/L

Result	Uncer.	Date
< 5		11/24

CV = 91 ± 9 ug/L

Result	Uncer.	Date
140	40	12/09

cis-1,2-Dichloroethylene
89GAU 01 PTGC

CV = 40 ± 4 ug/L

Result	Uncer.	Date
30	9	9/15
39	12	10/14

CV = 48 ± 5 ug/L

Result	Uncer.	Date
57	17	10/28

CV = 92 ± 9 ug/L

Result	Uncer.	Date
70	21	9/18

cis-1,2-Dichloroethylene
(cont)

CV = 121 ± 12 ug/L

Result	Uncer.	Date
93	28	11/19

CV = 125 ± 13 ug/L

Result	Uncer.	Date
93	28	11/18

CV = 130 ± 13 ug/L

Result	Uncer.	Date
120	40	10/19

2,4-Dichlorophenol
89GAU 01 GCMS

CV = 32 ± 3 ug/L

Result	Uncer.	Date
26	8	6/02
18	5	6/03

CV = 64 ± 6 ug/L

Result	Uncer.	Date
53	16	4/28

CV = 85 ± 8 ug/L

Result	Uncer.	Date
65	20	1/02

CV = 86 ± 9 ug/L

Result	Uncer.	Date
55	17	5/08

CV = 108 ± 11 ug/L

Result	Uncer.	Date
60	18	4/23

CV = 130 ± 13 ug/L

Result	Uncer.	Date
85	26	6/18

CV = 170 ± 17 ug/L

Result	Uncer.	Date
76	23	1/07

CV = 173 ± 17 ug/L

Result	Uncer.	Date
140	40	6/22
22	7	6/24

1,2-Dichloropropane
89GAU 01 PTGC

CV = 47 ± 5 ug/L

Result	Uncer.	Date
38	11	8/31

CV = 66 ± 7 ug/L

Result	Uncer.	Date
50	15	8/11

CV = 71 ± 7 ug/L

Result	Uncer.	Date
53	16	9/03

CV = 76 ± 8 ug/L

Result	Uncer.	Date
53	16	8/31

CV = 87 ± 9 ug/L

Result	Uncer.	Date
85	26	10/21

CV = 113 ± 11 ug/L

Result	Uncer.	Date
86	26	9/14

CV = 142 ± 14 ug/L

Result	Uncer.	Date
120	40	9/16

CV = 146 ± 15 ug/L

Result	Uncer.	Date
110	30	9/10

1,3-Dichloropropane
89GAU 01 PTGC

CV = 42 ± 4 ug/L

Result	Uncer.	Date
36	11	8/31

CV = 56 ± 6 ug/L

Result	Uncer.	Date
53	16	2/19

CV = 59 ± 6 ug/L

Result	Uncer.	Date
56	17	8/11

CV = 63 ± 6 ug/L

Result	Uncer.	Date
56	17	9/01

TABLE E-IV (cont)

****

EM-9 Organics in Water
(cont)

****

1,3-Dichloropropane (cont)

CV = 67 ± 7 ug/L

Result	Uncer.	Date
58	17	8/31

CV = 78 ± 8 ug/L

Result	Uncer.	Date
120	40	10/21

CV = 113 ± 11 ug/L

Result	Uncer.	Date
100	30	9/11

CV = 126 ± 13 ug/L

Result	Uncer.	Date
120	40	9/16

CV = 132 ± 13 ug/L

Result	Uncer.	Date
100	30	9/18

2,2-Dichloropropane 89GAU 01 PTGC

CV = 47 ± 5 ug/L

Result	Uncer.	Date
16	5	11/24

CV = 118 ± 12 ug/L

Result	Uncer.	Date
81	24	12/07

cis-1,3-Dichloropropene 89GAU 01 PTGC

CV = 41 ± 4 ug/L

Result	Uncer.	Date
< 5		11/24

CV = 82 ± 8 ug/L

Result	Uncer.	Date
100	30	12/09

Diethyl phthalate 89GAU 01 GCMS

CV = 29 ± 3 ug/L

Result	Uncer.	Date
< 10		6/22

Diethyl phthalate (cont)

CV = 49 ± 5 ug/L

Result	Uncer.	Date
< 10		4/28

CV = 78 ± 8 ug/L

Result	Uncer.	Date
16	5	6/18
18	5	8/12

CV = 157 ± 16 ug/L

Result	Uncer.	Date
30	9	5/08

2,4-Dimethylphenol 89GAU 01 GCMS

CV = 26 ± 3 ug/L

Result	Uncer.	Date
20	6	6/22

CV = 43 ± 4 ug/L

Result	Uncer.	Date
< 10		4/28

CV = 65 ± 6 ug/L

Result	Uncer.	Date
13	4	1/09

CV = 69 ± 7 ug/L

Result	Uncer.	Date
23	7	6/18
91	27	8/12

CV = 138 ± 14 ug/L

Result	Uncer.	Date
68	20	5/08

2,4-Dinitrophenol 89GAU 01 GCMS

CV = 35 ± 4 ug/L

Result	Uncer.	Date
< 10		10/13

CV = 61 ± 6 ug/L

Result	Uncer.	Date
< 10		9/10

CV = 68 ± 7 ug/L

Result	Uncer.	Date
< 10		8/24

2,4-Dinitrophenol (cont)

CV = 69 ± 7 ug/L

Result	Uncer.	Date
15	5	10/22

CV = 77 ± 8 ug/L

Result	Uncer.	Date
< 10		7/28

CV = 145 ± 14 ug/L

Result	Uncer.	Date
59	18	8/19
< 10		10/22

CV = 177 ± 18 ug/L

Result	Uncer.	Date
150	50	7/14

2,4-Dinitrotoluene 89GAU 01 GCMS

CV = 39 ± 4 ug/L

Result	Uncer.	Date
23	7	12/10

CV = 73 ± 7 ug/L

Result	Uncer.	Date
52	16	12/16

CV = 92 ± 9 ug/L

Result	Uncer.	Date
59	18	12/01

CV = 126 ± 13 ug/L

Result	Uncer.	Date
100	30	12/01

CV = 131 ± 13 ug/L

Result	Uncer.	Date
96	29	12/16

CV = 157 ± 16 ug/L

Result	Uncer.	Date
100	30	12/10

CV = 170 ± 17 ug/L

Result	Uncer.	Date
110	30	12/01

Ethylbenzene 89GAU 01 PTGC

CV = 39 ± 4 ug/L

Result	Uncer.	Date
29	9	9/15
39	12	10/14

CV = 48 ± 5 ug/L

Result	Uncer.	Date
35	11	10/28

CV = 65 ± 7 ug/L

Result	Uncer.	Date
50	15	5/20
30	9	5/29

CV = 78 ± 8 ug/L

Result	Uncer.	Date
33	10	6/16

CV = 86 ± 9 ug/L

Result	Uncer.	Date
49	15	5/29

CV = 92 ± 9 ug/L

Result	Uncer.	Date
75	23	9/18

CV = 100 ± 10 ug/L

Result	Uncer.	Date
64	19	6/09

CV = 120 ± 12 ug/L

Result	Uncer.	Date
87	26	11/19

CV = 124 ± 12 ug/L

Result	Uncer.	Date
80	24	11/18

CV = 129 ± 13 ug/L

Result	Uncer.	Date
110	30	10/19

Ethylene dibromide 89GAU 01 PTGC

CV = 50 ± 5 ug/L

Result	Uncer.	Date
38	11	11/24

CV = 126 ± 13 ug/L

Result	Uncer.	Date
95	29	12/07

Fluorene 89GAU 01 GCMS

CV = 31 ± 3 ug/L

Result	Uncer.	Date
96	29	10/06
22	7	10/22

CV = 36 ± 4 ug/L

Result	Uncer.	Date
25	8	8/19
19	6	9/11

CV = 63 ± 6 ug/L

Result	Uncer.	Date
52	16	7/14

CV = 126 ± 13 ug/L

Result	Uncer.	Date
91	27	11/25

CV = 130 ± 13 ug/L

Result	Uncer.	Date
86	26	7/28

CV = 137 ± 14 ug/L

Result	Uncer.	Date
82	25	10/22

CV = 140 ± 14 ug/L

Result	Uncer.	Date
91	27	10/22

CV = 153 ± 15 ug/L

Result	Uncer.	Date
110	30	10/22

CV = 162 ± 16 ug/L

Result	Uncer.	Date
< 10		8/24

Hexachlorobenzene 89GAU 01 GCMS

CV = 31 ± 3 ug/L

Result	Uncer.	Date
56	17	10/06
13	4	10/22

CV = 37 ± 4 ug/L

Result	Uncer.	Date
22	7	8/19
13	4	9/11

Hexachlorobenzene (cont)

CV = 64 ± 6 ug/L

Result	Uncer.	Date
49	15	7/14

CV = 129 ± 13 ug/L

Result	Uncer.	Date
88	26	11/25

CV = 132 ± 13 ug/L

Result	Uncer.	Date
75	23	7/28

CV = 140 ± 14 ug/L

Result	Uncer.	Date
72	22	10/22

CV = 144 ± 14 ug/L

Result	Uncer.	Date
68	20	10/22

CV = 156 ± 16 ug/L

Result	Uncer.	Date
89	27	10/22

CV = 166 ± 17 ug/L

Result	Uncer.	Date
84	25	8/24

Hexachlorobutadiene 89GAU 01 GCMS

CV = 37 ± 4 ug/L

Result	Uncer.	Date
46	14	10/06
< 10		10/22

CV = 44 ± 4 ug/L

Result	Uncer.	Date
14	4	8/19
< 10		9/11

CV = 76 ± 8 ug/L

Result	Uncer.	Date
< 10		7/14

CV = 153 ± 15 ug/L

Result	Uncer.	Date
20	6	11/25

CV = 157 ± 16 ug/L

Result	Uncer.	Date
46	14	7/28

TABLE E-IV (cont)

****

EM-9 Organics in Water
(cont)

****

Hexachlorobutadiene (cont)

CV = 166 ± 17 ug/L

Result	Uncer.	Date
46	14	10/22

CV = 170 ± 17 ug/L

Result	Uncer.	Date
55	17	10/22

CV = 185 ± 19 ug/L

Result	Uncer.	Date
38	11	10/22

CV = 196 ± 20 ug/L

Result	Uncer.	Date
48	14	8/24

Hexachloroethane 89GAU 01 GCMS

CV = 33 ± 3 ug/L

Result	Uncer.	Date
18	5	6/22

CV = 56 ± 6 ug/L

Result	Uncer.	Date
< 10		4/28

CV = 60 ± 6 ug/L

Result	Uncer.	Date
18	5	4/28

CV = 80 ± 8 ug/L

Result	Uncer.	Date
30	9	1/02

CV = 89 ± 9 ug/L

Result	Uncer.	Date
32	10	6/18
81	24	8/12

CV = 160 ± 16 ug/L

Result	Uncer.	Date
39	12	1/07

CV = 178 ± 18 ug/L

Result	Uncer.	Date
27	8	5/08

2-Hexanone 89GAU 01 PTGC

CV = 37 ± 4 ug/L

Result	Uncer.	Date
< 20		9/15
45	14	10/14

CV = 41 ± 4 ug/L

Result	Uncer.	Date
21	6	10/19
35	11	10/30

CV = 44 ± 4 ug/L

Result	Uncer.	Date
23	7	8/31

CV = 45 ± 4 ug/L

Result	Uncer.	Date
26	8	10/28

CV = 49 ± 5 ug/L

Result	Uncer.	Date
30	9	11/24

CV = 54 ± 5 ug/L

Result	Uncer.	Date
33	10	2/19

CV = 57 ± 6 ug/L

Result	Uncer.	Date
67	20	6/16

CV = 61 ± 6 ug/L

Result	Uncer.	Date
54	16	8/11

CV = 63 ± 6 ug/L

Result	Uncer.	Date
44	13	3/31
69	21	5/20
50	15	5/29

CV = 65 ± 7 ug/L

Result	Uncer.	Date
61	18	9/01
47	14	9/03
39	12	9/14
52	16	10/15

CV = 70 ± 7 ug/L

Result	Uncer.	Date
93	28	8/06
74	22	8/31

2-Hexanone (cont)

CV = 76 ± 8 ug/L

Result	Uncer.	Date
67	20	6/16

CV = 81 ± 8 ug/L

Result	Uncer.	Date
85	26	8/27
64	19	10/21

CV = 84 ± 8 ug/L

Result	Uncer.	Date
74	22	5/29

CV = 86 ± 9 ug/L

Result	Uncer.	Date
37	11	1/30
54	16	9/18

CV = 90 ± 9 ug/L

Result	Uncer.	Date
53	16	6/09

CV = 92 ± 9 ug/L

Result	Uncer.	Date
57	17	11/18

CV = 94 ± 9 ug/L

Result	Uncer.	Date
61	18	6/01

CV = 96 ± 10 ug/L

Result	Uncer.	Date
59	18	11/16

CV = 98 ± 10 ug/L

Result	Uncer.	Date
67	20	12/01
63	19	12/09

CV = 105 ± 10 ug/L

Result	Uncer.	Date
110	30	9/14

CV = 109 ± 11 ug/L

Result	Uncer.	Date
66	20	5/19

CV = 112 ± 11 ug/L

Result	Uncer.	Date
86	26	11/19

2-Hexanone (cont)

CV = 116 ± 12 ug/L

Result	Uncer.	Date
64	19	11/18

CV = 118 ± 12 ug/L

Result	Uncer.	Date
57	17	9/11

CV = 120 ± 12 ug/L

Result	Uncer.	Date
72	22	10/19

CV = 122 ± 12 ug/L

Result	Uncer.	Date
120	40	9/18
72	22	12/07

CV = 126 ± 13 ug/L

Result	Uncer.	Date
180	50	11/04

CV = 131 ± 13 ug/L

Result	Uncer.	Date
170	50	8/11
90	27	9/16

CV = 135 ± 14 ug/L

Result	Uncer.	Date
100	30	9/10
180	50	11/18

CV = 137 ± 14 ug/L

Result	Uncer.	Date
63	19	9/18

Isophorone 89GAU 01 GCMS

CV = 33 ± 3 ug/L

Result	Uncer.	Date
30	9	12/10

CV = 51 ± 5 ug/L

Result	Uncer.	Date
33	10	12/01

CV = 79 ± 8 ug/L

Result	Uncer.	Date
73	22	12/01

CV = 84 ± 8 ug/L

Result	Uncer.	Date
86	26	12/10

Isophorone (cont)

CV = 105 ± 10 ug/L

Result	Uncer.	Date
110	30	12/16

CV = 140 ± 14 ug/L

Result	Uncer.	Date
110	30	12/09

CV = 158 ± 16 ug/L

Result	Uncer.	Date
120	40	10/28
170	50	12/01

Isopropylbenzene 89GAU 01 PTGC

CV = 43 ± 4 ug/L

Result	Uncer.	Date
16	5	11/24

CV = 108 ± 11 ug/L

Result	Uncer.	Date
64	19	12/07

4-Isopropyltoluene 89GAU 01 PTGC

CV = 42 ± 4 ug/L

Result	Uncer.	Date
< 5		11/24

CV = 85 ± 8 ug/L

Result	Uncer.	Date
68	20	12/09

4-Methyl-2-pentanone 89GAU 01 PTGC

CV = 37 ± 4 ug/L

Result	Uncer.	Date
29	9	9/15
67	20	10/14

CV = 40 ± 4 ug/L

Result	Uncer.	Date
32	10	8/31

CV = 42 ± 4 ug/L

Result	Uncer.	Date
37	11	10/19
87	26	10/30

4-Methyl-2-pentanone (cont)

CV = 46 ± 5 ug/L

Result	Uncer.	Date
50	15	10/28

CV = 47 ± 5 ug/L

Result	Uncer.	Date
38	11	11/24

CV = 54 ± 5 ug/L

Result	Uncer.	Date
48	14	2/19

CV = 55 ± 6 ug/L

Result	Uncer.	Date
52	16	8/11

CV = 59 ± 6 ug/L

Result	Uncer.	Date
60	18	9/01
62	19	9/03

CV = 62 ± 6 ug/L

Result	Uncer.	Date
47	14	6/16

CV = 63 ± 6 ug/L

Result	Uncer.	Date
96	29	8/06
90	27	8/31

CV = 67 ± 7 ug/L

Result	Uncer.	Date
60	18	9/14
97	29	10/15

CV = 69 ± 7 ug/L

Result	Uncer.	Date
68	20	3/31
91	27	5/20
58	17	5/29

CV = 73 ± 7 ug/L

Result	Uncer.	Date
130	40	8/27
97	29	10/21

CV = 83 ± 8 ug/L

Result	Uncer.	Date
76	23	6/16

CV = 87 ± 9 ug/L

Result	Uncer.	Date
65	20	1/30
72	22	9/18

TABLE E-IV (cont)

****

EM-9 Organics in Water
(cont)

****

4-Methyl-2-pentanone (cont)

CV = 89 ± 9 ug/L

Result	Uncer.	Date
81	24	12/01

CV = 92 ± 9 ug/L

Result	Uncer.	Date
93	28	5/29

CV = 94 ± 9 ug/L

Result	Uncer.	Date
76	23	11/18
140	40	12/09

CV = 95 ± 10 ug/L

Result	Uncer.	Date
100	30	9/14

CV = 98 ± 10 ug/L

Result	Uncer.	Date
120	40	11/16

CV = 99 ± 10 ug/L

Result	Uncer.	Date
91	27	5/19

CV = 100 ± 10 ug/L

Result	Uncer.	Date
80	24	6/09

CV = 104 ± 10 ug/L

Result	Uncer.	Date
100	30	6/01

CV = 107 ± 11 ug/L

Result	Uncer.	Date
77	23	9/11

CV = 114 ± 11 ug/L

Result	Uncer.	Date
100	30	11/19

CV = 115 ± 11 ug/L

Result	Uncer.	Date
190	60	11/04

4-Methyl-2-pentanone (cont)

CV = 118 ± 12 ug/L

Result	Uncer.	Date
110	30	12/07

CV = 119 ± 12 ug/L

Result	Uncer.	Date
170	50	8/11
120	40	9/16
93	28	11/18

CV = 123 ± 12 ug/L

Result	Uncer.	Date
100	30	9/10
130	40	10/19

CV = 125 ± 12 ug/L

Result	Uncer.	Date
87	26	9/18
120	40	9/18

CV = 137 ± 14 ug/L

Result	Uncer.	Date
< 20		11/18

2-Methyl-4,6-dinitrophenol 89GAU 01 GCMS

CV = 29 ± 3 ug/L

Result	Uncer.	Date
< 10		12/10

CV = 54 ± 5 ug/L

Result	Uncer.	Date
32	10	12/16

CV = 67 ± 7 ug/L

Result	Uncer.	Date
65	20	12/01

CV = 92 ± 9 ug/L

Result	Uncer.	Date
180	50	12/01

CV = 96 ± 10 ug/L

Result	Uncer.	Date
65	20	12/16

CV = 115 ± 12 ug/L

Result	Uncer.	Date
70	21	12/10

2-Methyl-4,6-dinitrophenol
(cont)

CV = 125 ± 12 ug/L

Result	Uncer.	Date
130	40	12/01

Methylene chloride 89GAU 01 PTGC

CV = 37 ± 4 ug/L

Result	Uncer.	Date
30	9	8/31

CV = 38 ± 4 ug/L

Result	Uncer.	Date
32	10	9/15
39	12	10/14

CV = 42 ± 4 ug/L

Result	Uncer.	Date
38	11	10/19
50	15	10/30

CV = 46 ± 5 ug/L

Result	Uncer.	Date
47	14	10/28

CV = 47 ± 5 ug/L

Result	Uncer.	Date
35	11	11/24

CV = 52 ± 5 ug/L

Result	Uncer.	Date
38	11	8/11

CV = 56 ± 6 ug/L

Result	Uncer.	Date
36	11	9/01
46	14	9/03

CV = 57 ± 6 ug/L

Result	Uncer.	Date
45	14	2/19

CV = 60 ± 6 ug/L

Result	Uncer.	Date
45	14	8/06
43	13	8/31

CV = 64 ± 6 ug/L

Result	Uncer.	Date
58	17	6/16

Methylene chloride (cont)

CV = 67 ± 7 ug/L

Result	Uncer.	Date
56	17	9/14
72	22	10/15

CV = 69 ± 7 ug/L

Result	Uncer.	Date
75	23	8/27
81	24	10/21

CV = 71 ± 7 ug/L

Result	Uncer.	Date
58	17	3/31
71	21	5/20
76	23	5/29

CV = 84 ± 8 ug/L

Result	Uncer.	Date
72	22	12/01

CV = 85 ± 8 ug/L

Result	Uncer.	Date
66	20	6/16

CV = 88 ± 9 ug/L

Result	Uncer.	Date
72	22	9/18

CV = 89 ± 9 ug/L

Result	Uncer.	Date
67	20	9/14

CV = 91 ± 9 ug/L

Result	Uncer.	Date
65	20	1/30

CV = 93 ± 9 ug/L

Result	Uncer.	Date
77	23	5/19

CV = 94 ± 9 ug/L

Result	Uncer.	Date
68	20	5/29
80	24	11/18
140	40	12/09

CV = 99 ± 10 ug/L

Result	Uncer.	Date
86	26	11/16

CV = 100 ± 10 ug/L

Result	Uncer.	Date
89	27	9/11

Methylene chloride (cont)

CV = 106 ± 11 ug/L

Result	Uncer.	Date
87	26	6/01

CV = 108 ± 11 ug/L

Result	Uncer.	Date
100	30	11/04

CV = 110 ± 11 ug/L

Result	Uncer.	Date
75	23	6/09

CV = 112 ± 11 ug/L

Result	Uncer.	Date
100	30	8/11
120	40	9/16

CV = 115 ± 12 ug/L

Result	Uncer.	Date
95	29	9/10

CV = 116 ± 12 ug/L

Result	Uncer.	Date
100	30	11/19

CV = 117 ± 12 ug/L

Result	Uncer.	Date
97	29	9/18
96	29	12/07

CV = 120 ± 12 ug/L

Result	Uncer.	Date
94	28	11/18

CV = 124 ± 12 ug/L

Result	Uncer.	Date
120	40	10/19

CV = 126 ± 13 ug/L

Result	Uncer.	Date
120	40	9/18

CV = 139 ± 14 ug/L

Result	Uncer.	Date
< 5		11/18

2-Methylphenol 89GAU 01 GCMS

CV = 34 ± 3 ug/L

Result	Uncer.	Date
120	40	10/06
21	6	10/22

2-Methylphenol (cont)

CV = 40 ± 4 ug/L

Result	Uncer.	Date
29	9	8/19
25	8	9/11

CV = 71 ± 7 ug/L

Result	Uncer.	Date
27	8	7/14

CV = 141 ± 14 ug/L

Result	Uncer.	Date
62	19	11/25

CV = 145 ± 15 ug/L

Result	Uncer.	Date
66	20	7/28

CV = 154 ± 15 ug/L

Result	Uncer.	Date
73	22	10/22

CV = 158 ± 16 ug/L

Result	Uncer.	Date
90	27	10/22

CV = 172 ± 17 ug/L

Result	Uncer.	Date
110	30	10/22

CV = 182 ± 18 ug/L

Result	Uncer.	Date
100	30	8/24

Naphthalene 89GAU 01 GCMS

CV = 32 ± 3 ug/L

Result	Uncer.	Date
21	6	6/22

CV = 54 ± 5 ug/L

Result	Uncer.	Date
< 10		4/28

CV = 86 ± 9 ug/L

Result	Uncer.	Date
43	13	6/18
96	29	8/12

CV = 173 ± 17 ug/L

Result	Uncer.	Date
50	15	5/08

TABLE E-IV (cont)

****

EM-9 Organics in Water
(cont)

****

2-Nitroaniline
89GAU 01 GCMS

CV = 30 ± 3 ug/L

Result	Uncer.	Date
23	7	6/02
< 10		6/03

CV = 80 ± 8 ug/L

Result	Uncer.	Date
51	15	5/08

CV = 100 ± 10 ug/L

Result	Uncer.	Date
65	20	4/23

CV = 119 ± 12 ug/L

Result	Uncer.	Date
45	14	6/18

CV = 159 ± 16 ug/L

Result	Uncer.	Date
100	30	6/22
22	7	6/24

3-Nitroaniline
89GAU 01 GCMS

CV = 32 ± 3 ug/L

Result	Uncer.	Date
160	50	10/06
22	7	10/22

CV = 38 ± 4 ug/L

Result	Uncer.	Date
17	5	8/19
< 10		9/11

CV = 66 ± 7 ug/L

Result	Uncer.	Date
33	10	7/14

CV = 89 ± 9 ug/L

Result	Uncer.	Date
22	7	1/07

CV = 133 ± 13 ug/L

Result	Uncer.	Date
160	50	11/25

3-Nitroaniline (cont)

CV = 137 ± 14 ug/L

Result	Uncer.	Date
96	29	7/28

CV = 140 ± 14 ug/L

Result	Uncer.	Date
28	8	2/24

CV = 144 ± 14 ug/L

Result	Uncer.	Date
140	40	10/22

CV = 148 ± 15 ug/L

Result	Uncer.	Date
110	30	10/22

CV = 162 ± 16 ug/L

Result	Uncer.	Date
130	40	10/22

CV = 170 ± 17 ug/L

Result	Uncer.	Date
19	6	1/06

CV = 171 ± 17 ug/L

Result	Uncer.	Date
150	50	8/24

2-Nitrophenol
89GAU 01 GCMS

CV = 34 ± 3 ug/L

Result	Uncer.	Date
81	24	10/06
16	5	10/22

CV = 40 ± 4 ug/L

Result	Uncer.	Date
21	6	8/19
18	5	9/11

CV = 69 ± 7 ug/L

Result	Uncer.	Date
18	5	7/14

CV = 139 ± 14 ug/L

Result	Uncer.	Date
44	13	11/25

CV = 143 ± 14 ug/L

Result	Uncer.	Date
45	14	7/28

2-Nitrophenol (cont)

CV = 150 ± 15 ug/L

Result	Uncer.	Date
60	18	10/22

CV = 154 ± 15 ug/L

Result	Uncer.	Date
67	20	10/22

CV = 168 ± 17 ug/L

Result	Uncer.	Date
81	24	10/22

CV = 178 ± 18 ug/L

Result	Uncer.	Date
66	20	8/24

4-Nitrophenol
89GAU 01 GCMS

CV = 33 ± 3 ug/L

Result	Uncer.	Date
17	5	12/10

CV = 51 ± 5 ug/L

Result	Uncer.	Date
< 10		12/01

CV = 64 ± 6 ug/L

Result	Uncer.	Date
48	14	4/28

CV = 79 ± 8 ug/L

Result	Uncer.	Date
54	16	12/01

CV = 84 ± 8 ug/L

Result	Uncer.	Date
61	18	12/10

CV = 85 ± 8 ug/L

Result	Uncer.	Date
71	21	1/02

CV = 106 ± 11 ug/L

Result	Uncer.	Date
84	25	12/16

CV = 141 ± 14 ug/L

Result	Uncer.	Date
90	27	12/09

4-Nitrophenol (cont)

CV = 158 ± 16 ug/L

Result	Uncer.	Date
100	30	10/28
99	30	12/01

CV = 170 ± 17 ug/L

Result	Uncer.	Date
110	30	1/07

N-Nitrosodiphenylamine
89GAU 01 GCMS

CV = 40 ± 4 ug/L

Result	Uncer.	Date
30	9	12/10

CV = 60 ± 6 ug/L

Result	Uncer.	Date
37	11	12/01

CV = 94 ± 9 ug/L

Result	Uncer.	Date
98	29	12/01

CV = 100 ± 10 ug/L

Result	Uncer.	Date
72	22	12/10

CV = 125 ± 12 ug/L

Result	Uncer.	Date
91	27	12/16

CV = 166 ± 17 ug/L

Result	Uncer.	Date
35	11	12/09

CV = 187 ± 19 ug/L

Result	Uncer.	Date
150	50	10/28
160	50	12/01

Phenol
89GAU 01 GCMS

CV = 37 ± 4 ug/L

Result	Uncer.	Date
17	5	12/10

CV = 57 ± 6 ug/L

Result	Uncer.	Date
17	5	12/01

Phenol (cont)

CV = 88 ± 9 ug/L

Result	Uncer.	Date
140	40	12/01

CV = 94 ± 9 ug/L

Result	Uncer.	Date
53	16	12/10

CV = 118 ± 12 ug/L

Result	Uncer.	Date
76	23	12/16

CV = 157 ± 16 ug/L

Result	Uncer.	Date
120	40	12/09

CV = 176 ± 18 ug/L

Result	Uncer.	Date
160	50	10/28
230	70	12/01

Propylbenzene
89GAU 01 PTGC

CV = 40 ± 4 ug/L

Result	Uncer.	Date
35	11	8/31

CV = 56 ± 6 ug/L

Result	Uncer.	Date
43	13	8/11

CV = 60 ± 6 ug/L

Result	Uncer.	Date
50	15	9/03

CV = 64 ± 6 ug/L

Result	Uncer.	Date
42	13	8/31

CV = 74 ± 7 ug/L

Result	Uncer.	Date
57	17	10/21

CV = 80 ± 8 ug/L

Result	Uncer.	Date
55	17	1/30

CV = 96 ± 10 ug/L

Result	Uncer.	Date
59	18	9/14

Propylbenzene (cont)

CV = 120 ± 12 ug/L

Result	Uncer.	Date
98	29	9/16

CV = 124 ± 12 ug/L

Result	Uncer.	Date
100	30	9/10

Pyrene
89GAU 01 GCMS

CV = 35 ± 3 ug/L

Result	Uncer.	Date
20	6	12/10

CV = 53 ± 5 ug/L

Result	Uncer.	Date
22	7	12/01

CV = 83 ± 8 ug/L

Result	Uncer.	Date
45	14	12/01

CV = 88 ± 9 ug/L

Result	Uncer.	Date
50	15	12/10

CV = 110 ± 11 ug/L

Result	Uncer.	Date
63	19	12/16

CV = 147 ± 15 ug/L

Result	Uncer.	Date
45	14	12/09

CV = 166 ± 17 ug/L

Result	Uncer.	Date
90	27	10/28
90	27	12/01

Styrene
89GAU 01 PTGC

CV = 44 ± 4 ug/L

Result	Uncer.	Date
23	7	11/24

CV = 62 ± 6 ug/L

Result	Uncer.	Date
37	11	6/16

TABLE E-IV (cont)

****

EM-9 Organics in Water
(cont)

****

Styrene (cont)

CV = 69 ± 7 ug/L

Result	Uncer.	Date
58	17	3/31
17	5	5/20

CV = 83 ± 8 ug/L

Result	Uncer.	Date
< 5		6/16

CV = 92 ± 9 ug/L

Result	Uncer.	Date
44	13	5/29

CV = 104 ± 10 ug/L

Result	Uncer.	Date
65	20	6/01

CV = 109 ± 11 ug/L

Result	Uncer.	Date
61	18	12/07

Tetrachloroethylene 89GAU 01 PTGC

CV = 42 ± 4 ug/L

Result	Uncer.	Date
30	9	8/31

CV = 59 ± 6 ug/L

Result	Uncer.	Date
35	11	8/11

CV = 63 ± 6 ug/L

Result	Uncer.	Date
38	11	9/01

CV = 67 ± 7 ug/L

Result	Uncer.	Date
36	11	8/31

CV = 78 ± 8 ug/L

Result	Uncer.	Date
66	20	10/21

CV = 113 ± 11 ug/L

Result	Uncer.	Date
84	25	9/11

Tetrachloroethylene (cont)

CV = 126 ± 13 ug/L

Result	Uncer.	Date
91	27	9/16

CV = 132 ± 13 ug/L

Result	Uncer.	Date
70	21	9/18

Toluene 89GAU 01 PTGC

CV = 41 ± 4 ug/L

Result	Uncer.	Date
25	8	10/30

CV = 45 ± 5 ug/L

Result	Uncer.	Date
39	12	10/28

CV = 59 ± 6 ug/L

Result	Uncer.	Date
47	14	6/16

CV = 66 ± 7 ug/L

Result	Uncer.	Date
53	16	3/31
54	16	5/20
53	16	10/15

CV = 79 ± 8 ug/L

Result	Uncer.	Date
41	12	6/16

CV = 87 ± 9 ug/L

Result	Uncer.	Date
68	20	9/18

CV = 88 ± 9 ug/L

Result	Uncer.	Date
53	16	5/29

CV = 93 ± 9 ug/L

Result	Uncer.	Date
67	20	11/18

CV = 99 ± 10 ug/L

Result	Uncer.	Date
62	19	6/01

CV = 113 ± 11 ug/L

Result	Uncer.	Date
83	25	11/19

Toluene (cont)

CV = 122 ± 12 ug/L

Result	Uncer.	Date
110	30	10/19

CV = 136 ± 14 ug/L

Result	Uncer.	Date
110	30	11/18

1,2,4-Trichlorobenzene 89GAU 01 GCMS

CV = 35 ± 4 ug/L

Result	Uncer.	Date
12	4	6/02
< 10		6/03

CV = 62 ± 6 ug/L

Result	Uncer.	Date
35	11	4/28

CV = 83 ± 8 ug/L

Result	Uncer.	Date
49	15	1/02

CV = 93 ± 9 ug/L

Result	Uncer.	Date
23	7	5/08

CV = 116 ± 12 ug/L

Result	Uncer.	Date
31	9	4/23

CV = 139 ± 14 ug/L

Result	Uncer.	Date
63	19	6/18

CV = 170 ± 17 ug/L

Result	Uncer.	Date
65	20	1/07

CV = 186 ± 19 ug/L

Result	Uncer.	Date
73	22	6/22
< 10		6/24

Trichloroethene 89GAU 01 PTGC

CV = 43 ± 4 ug/L

Result	Uncer.	Date
34	10	8/31

Trichloroethene (cont)

CV = 60 ± 6 ug/L

Result	Uncer.	Date
40	12	8/11

CV = 65 ± 6 ug/L

Result	Uncer.	Date
47	14	9/03

CV = 69 ± 7 ug/L

Result	Uncer.	Date
45	14	8/31

CV = 80 ± 8 ug/L

Result	Uncer.	Date
67	20	10/21

CV = 104 ± 10 ug/L

Result	Uncer.	Date
60	18	9/14

CV = 130 ± 13 ug/L

Result	Uncer.	Date
110	30	9/16

CV = 134 ± 13 ug/L

Result	Uncer.	Date
100	30	9/10

2,4,6-Trichlorophenol 89GAU 01 GCMS

CV = 32 ± 3 ug/L

Result	Uncer.	Date
< 10		6/22

CV = 53 ± 5 ug/L

Result	Uncer.	Date
16	5	4/28

CV = 85 ± 8 ug/L

Result	Uncer.	Date
61	18	6/18
130	40	8/12

CV = 170 ± 17 ug/L

Result	Uncer.	Date
110	30	5/08

1,2,3-Trichloropropene 89GAU 01 PTGC

CV = 44 ± 4 ug/L

Result	Uncer.	Date
76	23	10/30

CV = 49 ± 5 ug/L

Result	Uncer.	Date
72	22	10/28

CV = 70 ± 7 ug/L

Result	Uncer.	Date
95	29	5/20
72	22	5/29

CV = 71 ± 7 ug/L

Result	Uncer.	Date
110	30	10/15

CV = 84 ± 8 ug/L

Result	Uncer.	Date
86	26	6/16

CV = 93 ± 9 ug/L

Result	Uncer.	Date
87	26	9/18

CV = 94 ± 9 ug/L

Result	Uncer.	Date
91	27	5/29

CV = 100 ± 10 ug/L

Result	Uncer.	Date
59	18	11/18

CV = 110 ± 11 ug/L

Result	Uncer.	Date
130	40	6/09

CV = 122 ± 12 ug/L

Result	Uncer.	Date
90	27	11/19

CV = 131 ± 13 ug/L

Result	Uncer.	Date
130	40	10/19

CV = 147 ± 15 ug/L

Result	Uncer.	Date
160	50	11/18

Vinyl acetate 89GAU 01 PTGC

CV = 40 ± 4 ug/L

Result	Uncer.	Date
26	8	9/15
35	11	10/14

CV = 44 ± 4 ug/L

Result	Uncer.	Date
16	5	10/19
44	13	10/30

CV = 47 ± 5 ug/L

Result	Uncer.	Date
11	3	8/31

CV = 49 ± 5 ug/L

Result	Uncer.	Date
52	16	10/28

CV = 50 ± 5 ug/L

Result	Uncer.	Date
13	4	11/24

CV = 63 ± 6 ug/L

Result	Uncer.	Date
58	17	6/16

CV = 66 ± 7 ug/L

Result	Uncer.	Date
29	9	8/11

CV = 70 ± 7 ug/L

Result	Uncer.	Date
44	13	3/31
15	5	5/20
< 10		5/29
< 10		9/01
19	6	9/03

CV = 71 ± 7 ug/L

Result	Uncer.	Date
40	12	9/14
100	30	10/15

CV = 75 ± 7 ug/L

Result	Uncer.	Date
100	30	8/06
35	11	8/31

CV = 84 ± 8 ug/L

Result	Uncer.	Date
< 10		6/16

TABLE E-IV (cont)

****

EM-9 Organics in Water
(cont)

****

Vinyl acetate (cont)

CV = 87 ± 9 ug/L

Result	Uncer.	Date
43	13	8/27
41	12	10/21

CV = 93 ± 9 ug/L

Result	Uncer.	Date
< 10		5/29
31	9	9/18

CV = 100 ± 10 ug/L

Result	Uncer.	Date
38	11	6/09
52	16	11/18

CV = 101 ± 10 ug/L

Result	Uncer.	Date
160	50	12/09

CV = 104 ± 10 ug/L

Result	Uncer.	Date
39	12	6/01
25	8	11/16

CV = 105 ± 11 ug/L

Result	Uncer.	Date
22	7	12/01

CV = 112 ± 11 ug/L

Result	Uncer.	Date
< 10		9/14

CV = 117 ± 12 ug/L

Result	Uncer.	Date
65	20	5/19

CV = 122 ± 12 ug/L

Result	Uncer.	Date
38	11	11/19

CV = 126 ± 13 ug/L

Result	Uncer.	Date
33	10	9/11
45	14	12/07

CV = 127 ± 13 ug/L

Result	Uncer.	Date
27	8	11/18

Vinyl acetate (cont)

CV = 131 ± 13 ug/L

Result	Uncer.	Date
45	14	10/19

CV = 133 ± 13 ug/L

Result	Uncer.	Date
48	14	9/18

CV = 136 ± 14 ug/L

Result	Uncer.	Date
66	20	11/04

CV = 140 ± 14 ug/L

Result	Uncer.	Date
63	19	8/11
53	16	9/16

CV = 145 ± 15 ug/L

Result	Uncer.	Date
29	9	9/10

CV = 147 ± 15 ug/L

Result	Uncer.	Date
38	11	9/18
63	19	11/18

Mixed-Xylenes (o + m + p)
89GAU 01 PTGC

CV = 46 ± 5 ug/L

Result	Uncer.	Date
< 5		11/24

CV = 92 ± 9 ug/L

Result	Uncer.	Date
94	28	12/09

****

EM-9 Organics on Charcoal

****

Acetone
92GAU 01 GCMS

CV = 277 ± 28 ug/tube

Result	Uncer.	Date
120	40	3/02

Benzene
92GAU 01 GCMS

CV = 50 ± 5 ug/tube

Result	Uncer.	Date
46	9	10/22

Benzene (cont)

CV = 73 ± 7 ug/tube

Result	Uncer.	Date
66	13	10/22

CV = 82 ± 8 ug/tube

Result	Uncer.	Date
68	14	12/11

CV = 0.2265 ± 0.0277 mg/tube

Result	Uncer.	Date
0.22	0.04	7/14

CV = 0.542 ± 0.054 mg/tube

Result	Uncer.	Date
0.5	0.1	7/14

CV = 1.08 ± 0.1 mg/tube

Result	Uncer.	Date
1	0.2	7/14

CV = 1.63 ± 0.2 mg/tube

Result	Uncer.	Date
1.4	0.3	7/14

Benzene
91GAU 01 PTGC

CV = 52 ± 5 ug/tube

Result	Uncer.	Date
55	17	9/30

CV = 56 ± 6 ug/tube

Result	Uncer.	Date
67	20	6/23

CV = 60 ± 6 ug/tube

Result	Uncer.	Date
48	14	12/17

CV = 63 ± 6 ug/tube

Result	Uncer.	Date
66	20	9/30
60	18	9/30

CV = 73 ± 7 ug/tube

Result	Uncer.	Date
67	20	10/07
55	17	10/17

CV = 74 ± 7 ug/tube

Result	Uncer.	Date
55	17	2/28
76	23	9/30

Benzene (cont)

CV = 77 ± 8 ug/tube

Result	Uncer.	Date
61	18	2/07
53	16	2/13
62	19	2/13

CV = 78 ± 8 ug/tube

Result	Uncer.	Date
90	27	8/04
84	25	9/30
100	30	9/30

CV = 81 ± 8 ug/tube

Result	Uncer.	Date
80	24	5/18

CV = 84 ± 8 ug/tube

Result	Uncer.	Date
74	22	9/30

CV = 85 ± 8 ug/tube

Result	Uncer.	Date
51	15	10/17

CV = 87 ± 9 ug/tube

Result	Uncer.	Date
59	18	2/03
58	17	5/15
59	18	5/15

CV = 88 ± 9 ug/tube

Result	Uncer.	Date
64	19	2/03

CV = 89 ± 9 ug/tube

Result	Uncer.	Date
100	30	8/07

CV = 92 ± 9 ug/tube

Result	Uncer.	Date
80	24	6/16
85	26	6/16
94	28	6/25

CV = 94 ± 9 ug/tube

Result	Uncer.	Date
96	29	9/30
90	27	9/30
80	24	9/30

CV = 97 ± 10 ug/tube

Result	Uncer.	Date
43	13	10/07

Benzene (cont)

CV = 99 ± 10 ug/tube

Result	Uncer.	Date
59	18	2/03
69	21	2/13
77	23	2/13
73	22	2/13
61	18	4/07

CV = 100 ± 10 ug/tube

Result	Uncer.	Date
120	40	9/30

CV = 104 ± 10 ug/tube

Result	Uncer.	Date
110	30	5/26
110	30	6/16

CV = 105 ± 10 ug/tube

Result	Uncer.	Date
110	30	9/30
110	30	9/30
110	30	9/30
99	30	9/30

CV = 109 ± 11 ug/tube

Result	Uncer.	Date
100	30	10/17
110	30	12/17

CV = 110 ± 11 ug/tube

Result	Uncer.	Date
75	23	2/03
82	25	2/13
82	25	2/28
63	19	4/07
61	18	4/07
70	21	5/15

CV = 111 ± 11 ug/tube

Result	Uncer.	Date
130	40	9/30
110	30	9/30

CV = 116 ± 12 ug/tube

Result	Uncer.	Date
76	23	1/13
110	30	5/18
120	40	6/03

CV = 120 ± 12 ug/tube

Result	Uncer.	Date
90	27	2/03
90	27	2/03
87	26	2/12
66	20	4/07

Benzene (cont)

CV = 121 ± 12 ug/tube

Result	Uncer.	Date
120	40	12/17
120	40	12/17

CV = 122 ± 12 ug/tube

Result	Uncer.	Date
150	50	8/07

CV = 126 ± 13 ug/tube

Result	Uncer.	Date
130	40	9/30

CV = 127 ± 13 ug/tube

Result	Uncer.	Date
130	40	6/16

CV = 130 ± 13 ug/tube

Result	Uncer.	Date
89	27	2/13

CV = 133 ± 13 ug/tube

Result	Uncer.	Date
140	40	5/26
150	50	5/28
140	40	9/30
110	30	10/07

CV = 136 ± 14 ug/tube

Result	Uncer.	Date
130	40	9/30
120	40	9/30

CV = 139 ± 14 ug/tube

Result	Uncer.	Date
130	40	5/07
140	40	5/07

CV = 140 ± 14 ug/tube

Result	Uncer.	Date
76	23	2/03

CV = 144 ± 14 ug/tube

Result	Uncer.	Date
170	50	7/14
190	60	8/04
150	50	9/30

CV = 145 ± 14 ug/tube

Result	Uncer.	Date
76	23	10/07
99	30	10/17

TABLE E-IV (cont)

****

EM-9 Organics on Charcoal
(cont)

****

Benzene (cont)

CV = 150 ± 15 ug/tube

Result	Uncer.	Date
65	20	4/07
79	24	5/15
150	50	5/18
140	40	5/28

CV = 166 ± 17 ug/tube

Result	Uncer.	Date
190	60	6/23

Bromobenzene 91GAU 01 PTGC

CV = 54 ± 5 ug/tube

Result	Uncer.	Date
55	17	6/23
47	14	12/17

CV = 61 ± 6 ug/tube

Result	Uncer.	Date
63	19	5/18

CV = 63 ± 6 ug/tube

Result	Uncer.	Date
38	11	2/03
50	15	2/28
45	14	5/15
48	14	5/15

CV = 64 ± 6 ug/tube

Result	Uncer.	Date
63	19	9/30
58	17	12/17
67	20	12/17

CV = 71 ± 7 ug/tube

Result	Uncer.	Date
73	22	5/07
74	22	5/07
61	18	5/18

CV = 74 ± 7 ug/tube

Result	Uncer.	Date
43	13	4/07
73	22	9/30
72	22	9/30

Bromobenzene (cont)

CV = 75 ± 8 ug/tube

Result	Uncer.	Date
63	19	8/04
97	29	9/30
99	30	9/30
62	19	12/17
65	20	12/17

CV = 81 ± 8 ug/tube

Result	Uncer.	Date
69	21	5/18

CV = 84 ± 8 ug/tube

Result	Uncer.	Date
58	18	2/28
47	14	4/07

CV = 85 ± 8 ug/tube

Result	Uncer.	Date
82	25	9/30
84	25	9/30

CV = 86 ± 9 ug/tube

Result	Uncer.	Date
80	24	8/07
100	30	10/17

CV = 90 ± 9 ug/tube

Result	Uncer.	Date
74	22	2/07
56	17	2/13
70	21	2/13

CV = 91 ± 9 ug/tube

Result	Uncer.	Date
64	19	1/13
92	28	5/18
90	27	5/18

CV = 95 ± 10 ug/tube

Result	Uncer.	Date
77	23	2/03
91	27	9/30
92	28	9/30

CV = 96 ± 10 ug/tube

Result	Uncer.	Date
120	40	9/30
69	21	10/07
110	30	10/17

CV = 100 ± 10 ug/tube

Result	Uncer.	Date
65	20	2/03

Bromobenzene (cont)

CV = 101 ± 10 ug/tube

Result	Uncer.	Date
80	24	6/16
90	27	6/16

CV = 106 ± 11 ug/tube

Result	Uncer.	Date
110	30	9/30
100	30	9/30

CV = 107 ± 11 ug/tube

Result	Uncer.	Date
120	40	9/30
100	30	9/30

CV = 110 ± 11 ug/tube

Result	Uncer.	Date
85	26	2/03
60	18	4/07
68	20	5/15

CV = 111 ± 11 ug/tube

Result	Uncer.	Date
110	30	6/16
96	29	6/16

CV = 118 ± 12 ug/tube

Result	Uncer.	Date
120	40	8/07
61	18	10/17

CV = 120 ± 12 ug/tube

Result	Uncer.	Date
110	30	2/13
88	26	2/13
80	24	2/13

CV = 121 ± 12 ug/tube

Result	Uncer.	Date
110	30	6/16
120	40	6/25

CV = 127 ± 13 ug/tube

Result	Uncer.	Date
120	40	9/30
130	40	9/30

CV = 128 ± 13 ug/tube

Result	Uncer.	Date
120	40	5/28
130	40	9/30
170	50	12/17
120	40	12/17

Bromobenzene (cont)

CV = 130 ± 13 ug/tube

Result	Uncer.	Date
75	23	2/03
100	30	2/13
100	30	2/28

CV = 131 ± 13 ug/tube

Result	Uncer.	Date
140	40	5/26

CV = 138 ± 14 ug/tube

Result	Uncer.	Date
140	40	9/30

CV = 139 ± 14 ug/tube

Result	Uncer.	Date
120	40	7/14
150	50	8/04
150	50	9/30
140	40	10/07

CV = 140 ± 14 ug/tube

Result	Uncer.	Date
97	29	2/03
100	30	2/03
77	23	2/12
66	20	4/07

CV = 148 ± 15 ug/tube

Result	Uncer.	Date
150	50	9/30

CV = 150 ± 15 ug/tube

Result	Uncer.	Date
91	27	2/13
120	40	12/17

CV = 159 ± 16 ug/tube

Result	Uncer.	Date
150	50	9/30
180	50	9/30

CV = 160 ± 16 ug/tube

Result	Uncer.	Date
91	27	2/03
130	40	6/23

Carbon tetrachloride 92GAU 01 GCMS

CV = 520 ± 52 ug/tube

Result	Uncer.	Date
490	100	4/20

Carbon tetrachloride (cont)

CV = 831 ± 83 ug/tube

Result	Uncer.	Date
780	160	4/20

CV = 838 ± 84 ug/tube

Result	Uncer.	Date
790	160	10/15

CV = 1041.1 ± 667.1 ug/tube

Result	Uncer.	Date
1100	200	4/20

CV = 1558 ± 156 ug/tube

Result	Uncer.	Date
1600	300	4/20

CV = 0.7407 ± 0.1419 mg/tube

Result	Uncer.	Date
0.73	0.15	10/15

CV = 1.26 ± 0.13 mg/tube

Result	Uncer.	Date
1.2	0.2	10/15

CV = 1.78 ± 0.18 mg/tube

Result	Uncer.	Date
1.7	0.3	10/15

Carbon tetrachloride 91GAU 01 PTGC

CV = 55 ± 6 ug/tube

Result	Uncer.	Date
59	18	2/13

CV = 56 ± 6 ug/tube

Result	Uncer.	Date
46	14	9/30
47	14	12/17

CV = 63 ± 6 ug/tube

Result	Uncer.	Date
46	14	9/30
44	13	9/30

CV = 64 ± 6 ug/tube

Result	Uncer.	Date
55	17	2/03
55	17	2/12

Carbon tetrachloride (cont)

CV = 67 ± 7 ug/tube

Result	Uncer.	Date
83	25	7/14
43	13	10/07
24	7	10/17

CV = 69 ± 7 ug/tube

Result	Uncer.	Date
47	14	2/03
50	15	2/28
45	14	5/15
48	14	5/15

CV = 73 ± 7 ug/tube

Result	Uncer.	Date
63	19	2/07

CV = 74 ± 7 ug/tube

Result	Uncer.	Date
59	18	9/30
57	17	9/30

CV = 77 ± 8 ug/tube

Result	Uncer.	Date
81	24	5/18

CV = 78 ± 8 ug/tube

Result	Uncer.	Date
110	30	8/04
57	17	9/30
60	18	9/30
35	11	10/17

CV = 80 ± 8 ug/tube

Result	Uncer.	Date
45	14	4/07

CV = 82 ± 8 ug/tube

Result	Uncer.	Date
80	24	2/13
74	22	2/13
75	23	2/13

CV = 84 ± 8 ug/tube

Result	Uncer.	Date
58	17	9/30
79	24	9/30
69	21	9/30

CV = 88 ± 9 ug/tube

Result	Uncer.	Date
90	27	6/16
95	29	6/16
100	30	6/25

TABLE E-IV (cont)

****

EM-9 Organics on Charcoal (cont)

****

Carbon tetrachloride (cont)

CV = 89 ± 9 ug/tube

Result	Uncer.	Date
67	20	9/30

CV = 90 ± 9 ug/tube

Result	Uncer.	Date
37	11	10/07

CV = 92 ± 9 ug/tube

Result	Uncer.	Date
61	18	2/28
54	16	4/07

CV = 94 ± 9 ug/tube

Result	Uncer.	Date
76	23	9/30

CV = 99 ± 10 ug/tube

Result	Uncer.	Date
110	30	5/26
130	40	6/16

CV = 100 ± 10 ug/tube

Result	Uncer.	Date
70	21	2/03
120	40	2/13
74	22	9/30

CV = 101 ± 10 ug/tube

Result	Uncer.	Date
57	17	10/17
75	23	12/17

CV = 105 ± 10 ug/tube

Result	Uncer.	Date
74	22	9/30
75	23	9/30

CV = 110 ± 11 ug/tube

Result	Uncer.	Date
86	26	1/13
90	27	2/07
100	30	2/13
110	30	5/18
140	40	6/03

Carbon tetrachloride (cont)

CV = 111 ± 11 ug/tube

Result	Uncer.	Date
130	40	6/23
130	40	7/22
90	27	9/30
71	21	9/30

CV = 112 ± 11 ug/tube

Result	Uncer.	Date
76	23	12/17
72	22	12/17

CV = 116 ± 12 ug/tube

Result	Uncer.	Date
85	26	9/30

CV = 120 ± 12 ug/tube

Result	Uncer.	Date
79	24	2/03
63	19	4/07
66	20	5/15

CV = 121 ± 12 ug/tube

Result	Uncer.	Date
150	50	6/16

CV = 123 ± 12 ug/tube

Result	Uncer.	Date
85	26	10/07

CV = 126 ± 13 ug/tube

Result	Uncer.	Date
130	40	5/26
90	27	9/30

CV = 130 ± 13 ug/tube

Result	Uncer.	Date
95	29	2/04

CV = 132 ± 13 ug/tube

Result	Uncer.	Date
140	40	5/07
150	50	5/07

CV = 133 ± 13 ug/tube

Result	Uncer.	Date
160	50	8/07
170	50	9/30
68	20	9/30

CV = 134 ± 13 ug/tube

Result	Uncer.	Date
60	18	10/07
57	17	10/17

Carbon tetrachloride (cont)

CV = 136 ± 14 ug/tube

Result	Uncer.	Date
99	30	9/30
82	25	9/30

CV = 140 ± 14 ug/tube

Result	Uncer.	Date
95	29	2/28

CV = 143 ± 14 ug/tube

Result	Uncer.	Date
150	50	5/18
170	50	5/28

CV = 144 ± 14 ug/tube

Result	Uncer.	Date
95	29	9/30

CV = 150 ± 15 ug/tube

Result	Uncer.	Date
100	30	2/03
70	21	4/07

CV = 168 ± 17 ug/tube

Result	Uncer.	Date
140	40	9/30

CV = 180 ± 18 ug/tube

Result	Uncer.	Date
100	30	2/03

Chlorobenzene 91GAU 01 PTGC

CV = 52 ± 5 ug/tube

Result	Uncer.	Date
54	16	9/30

CV = 55 ± 6 ug/tube

Result	Uncer.	Date
46	14	12/17

CV = 58 ± 6 ug/tube

Result	Uncer.	Date
48	15	2/13

CV = 59 ± 6 ug/tube

Result	Uncer.	Date
52	16	5/28
55	17	8/07

Chlorobenzene (cont)

CV = 62 ± 6 ug/tube

Result	Uncer.	Date
59	18	9/30
65	20	9/30

CV = 64 ± 6 ug/tube

Result	Uncer.	Date
48	14	2/28
63	19	5/18

CV = 66 ± 7 ug/tube

Result	Uncer.	Date
55	17	12/17
77	23	12/17

CV = 67 ± 7 ug/tube

Result	Uncer.	Date
84	25	2/13

CV = 69 ± 7 ug/tube

Result	Uncer.	Date
62	19	7/14
49	15	9/30
69	21	9/30
49	15	9/30

CV = 72 ± 7 ug/tube

Result	Uncer.	Date
52	16	2/13
73	22	9/30

CV = 75 ± 8 ug/tube

Result	Uncer.	Date
52	16	2/03
72	22	5/07
71	21	5/07
50	15	5/15
51	15	5/15
59	18	5/18

CV = 77 ± 8 ug/tube

Result	Uncer.	Date
66	20	2/07
45	14	2/12
49	15	2/12
66	20	12/17
64	19	12/17

CV = 79 ± 8 ug/tube

Result	Uncer.	Date
83	25	8/07

CV = 82 ± 8 ug/tube

Result	Uncer.	Date
71	21	9/30

Chlorobenzene (cont)

CV = 86 ± 9 ug/tube

Result	Uncer.	Date
52	16	2/03
62	19	2/13
70	21	2/13
50	15	4/07
67	20	5/18

CV = 88 ± 9 ug/tube

Result	Uncer.	Date
72	22	10/17

CV = 93 ± 9 ug/tube

Result	Uncer.	Date
96	29	9/30
82	25	9/30
90	27	9/30

CV = 96 ± 10 ug/tube

Result	Uncer.	Date
68	20	2/03
85	26	2/03
63	19	2/13
73	22	2/28
64	19	4/07
52	16	4/07
61	18	5/15

CV = 97 ± 10 ug/tube

Result	Uncer.	Date
64	19	1/13
92	28	5/18
89	27	5/18

CV = 99 ± 10 ug/tube

Result	Uncer.	Date
61	18	10/07
76	23	10/17

CV = 103 ± 10 ug/tube

Result	Uncer.	Date
100	30	9/30
99	30	9/30
99	30	9/30

CV = 108 ± 11 ug/tube

Result	Uncer.	Date
81	24	6/16
90	27	6/16

CV = 110 ± 11 ug/tube

Result	Uncer.	Date
85	26	2/03
54	16	4/07
94	28	9/30

Chlorobenzene (cont)

CV = 118 ± 12 ug/tube

Result	Uncer.	Date
110	30	6/16
93	28	6/16

CV = 119 ± 12 ug/tube

Result	Uncer.	Date
110	30	7/14
110	30	9/30

CV = 120 ± 12 ug/tube

Result	Uncer.	Date
71	21	2/03
85	26	2/07
73	39	2/12

CV = 122 ± 12 ug/tube

Result	Uncer.	Date
42	13	10/17

CV = 124 ± 12 ug/tube

Result	Uncer.	Date
120	40	9/30

CV = 129 ± 13 ug/tube

Result	Uncer.	Date
110	30	6/16
120	40	6/23
120	40	6/25
110	30	9/30

CV = 130 ± 13 ug/tube

Result	Uncer.	Date
61	18	4/07
63	19	5/15

CV = 133 ± 13 ug/tube

Result	Uncer.	Date
110	30	12/17
110	30	12/17

CV = 134 ± 13 ug/tube

Result	Uncer.	Date
130	40	9/30
140	40	9/30

CV = 140 ± 14 ug/tube

Result	Uncer.	Date
130	40	5/26

CV = 144 ± 14 ug/tube

Result	Uncer.	Date
120	40	10/07

TABLE E-IV (cont)

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EM-9 Organics on Charcoal (cont)

****

Chlorobenzene (cont)

CV = 155 ± 16 ug/tube

Result	Uncer.	Date
120	40	12/17

Chloroform 92GAU 01 GCMS

CV = 96 ± 10 ug/tube

Result	Uncer.	Date
100	20	12/11

CV = 375.6 ± 205.2 ug/tube

Result	Uncer.	Date
300	60	4/20

CV = 502 ± 50 ug/tube

Result	Uncer.	Date
480	100	4/20

CV = 802 ± 80 ug/tube

Result	Uncer.	Date
790	160	4/20

CV = 1504 ± 150 ug/tube

Result	Uncer.	Date
1700	300	4/20

Chloroform 91GAU 01 PTGC

CV = 52 ± 5 ug/tube

Result	Uncer.	Date
72	22	6/23

CV = 57 ± 6 ug/tube

Result	Uncer.	Date
45	14	12/17

CV = 60 ± 6 ug/tube

Result	Uncer.	Date
84	25	5/26

CV = 63 ± 6 ug/tube

Result	Uncer.	Date
63	19	2/13

Chloroform (cont)

CV = 66 ± 7 ug/tube

Result	Uncer.	Date
53	16	9/30

CV = 67 ± 7 ug/tube

Result	Uncer.	Date
47	14	2/03
41	12	4/07

CV = 68 ± 7 ug/tube

Result	Uncer.	Date
46	14	10/07
34	10	10/17

CV = 70 ± 7 ug/tube

Result	Uncer.	Date
100	30	6/16
92	28	6/25

CV = 73 ± 7 ug/tube

Result	Uncer.	Date
110	30	8/04
74	22	9/30
64	19	9/30

CV = 74 ± 7 ug/tube

Result	Uncer.	Date
67	20	2/03
69	21	2/12

CV = 77 ± 8 ug/tube

Result	Uncer.	Date
53	16	9/30
57	17	9/30

CV = 78 ± 8 ug/tube

Result	Uncer.	Date
56	17	2/28
52	16	5/15

CV = 79 ± 8 ug/tube

Result	Uncer.	Date
40	12	10/17

CV = 80 ± 8 ug/tube

Result	Uncer.	Date
110	30	5/07
97	29	5/26
120	40	6/03

CV = 83 ± 8 ug/tube

Result	Uncer.	Date
110	30	8/07

Chloroform (cont)

CV = 84 ± 8 ug/tube

Result	Uncer.	Date
75	23	2/07

CV = 88 ± 9 ug/tube

Result	Uncer.	Date
74	22	9/30
65	20	9/30

CV = 89 ± 9 ug/tube

Result	Uncer.	Date
63	19	2/28
55	17	4/07
53	16	4/07

CV = 90 ± 9 ug/tube

Result	Uncer.	Date
75	23	1/13
130	40	6/16

CV = 91 ± 9 ug/tube

Result	Uncer.	Date
38	11	10/07

CV = 94 ± 9 ug/tube

Result	Uncer.	Date
93	28	2/13
81	24	2/13
83	25	2/13
76	23	9/30

CV = 99 ± 10 ug/tube

Result	Uncer.	Date
73	22	9/30
76	23	9/30

CV = 100 ± 10 ug/tube

Result	Uncer.	Date
68	20	2/03
120	40	5/18
140	40	5/28

CV = 102 ± 10 ug/tube

Result	Uncer.	Date
73	22	10/17
78	23	12/17

CV = 104 ± 10 ug/tube

Result	Uncer.	Date
92	28	9/30
71	21	9/30

Chloroform (cont)

CV = 110 ± 11 ug/tube

Result	Uncer.	Date
73	22	2/03
130	40	5/07
70	21	5/15
72	22	5/15
100	30	9/30
80	24	9/30

CV = 114 ± 11 ug/tube

Result	Uncer.	Date
160	50	8/07
93	28	12/17
99	30	12/17

CV = 120 ± 12 ug/tube

Result	Uncer.	Date
47	14	2/13
87	26	2/28
71	21	5/15

CV = 121 ± 12 ug/tube

Result	Uncer.	Date
140	40	5/18
180	50	6/16

CV = 125 ± 12 ug/tube

Result	Uncer.	Date
160	50	5/28
96	29	9/30
75	23	10/07

CV = 130 ± 13 ug/tube

Result	Uncer.	Date
82	25	2/03
99	30	2/07
110	30	2/13
77	23	5/15

CV = 131 ± 13 ug/tube

Result	Uncer.	Date
170	50	5/28
180	50	6/16

CV = 133 ± 13 ug/tube

Result	Uncer.	Date
96	29	9/30
98	29	9/30

CV = 135 ± 14 ug/tube

Result	Uncer.	Date
190	60	7/14
220	70	8/04
95	29	9/30

Chloroform (cont)

CV = 136 ± 14 ug/tube

Result	Uncer.	Date
58	17	10/07
70	21	10/17

CV = 140 ± 14 ug/tube

Result	Uncer.	Date
99	30	2/28

CV = 144 ± 14 ug/tube

Result	Uncer.	Date
130	40	9/30

CV = 150 ± 15 ug/tube

Result	Uncer.	Date
110	30	2/04

CV = 155 ± 16 ug/tube

Result	Uncer.	Date
130	40	9/30

CV = 156 ± 16 ug/tube

Result	Uncer.	Date
200	60	6/23

CV = 166 ± 17 ug/tube

Result	Uncer.	Date
130	40	9/30
150	50	9/30

1,2-Dichloroethane 92GAU 01 GCMS

CV = 56 ± 5 ug/tube

Result	Uncer.	Date
45	9	12/24

CV = 91 ± 7 ug/tube

Result	Uncer.	Date
78	16	12/24

CV = 512 ± 51 ug/tube

Result	Uncer.	Date
520	100	4/20

CV = 803 ± 80 ug/tube

Result	Uncer.	Date
760	150	10/15

CV = 818 ± 82 ug/tube

Result	Uncer.	Date
830	170	4/20

1,2-Dichloroethane (cont)

CV = 1534 ± 153 ug/tube

Result	Uncer.	Date
1600	300	4/20

CV = 0.9119 ± 0.1742 mg/tube

Result	Uncer.	Date
0.92	0.19	10/15

CV = 1.2 ± 0.12 mg/tube

Result	Uncer.	Date
1.1	0.2	10/15

CV = 1.71 ± 0.17 mg/tube

Result	Uncer.	Date
1.6	0.3	10/15

Epichlorohydrin 92GAU 04 GCMS

CV = 130 ± 13 ug/tube

Result	Uncer.	Date
120	20	2/03

CV = 150 ± 15 ug/tube

Result	Uncer.	Date
160	30	2/03

Ethanol 92GAU 01 GCMS

CV = 139 ± 14 ug/tube

Result	Uncer.	Date
120	20	3/05

Ethylbenzene 91GAU 01 PTGC

CV = 55 ± 6 ug/tube

Result	Uncer.	Date
62	19	9/30
48	14	10/17
63	19	10/17
76	23	12/17

CV = 60 ± 6 ug/tube

Result	Uncer.	Date
71	21	9/30
73	22	9/30

CV = 62 ± 6 ug/tube

Result	Uncer.	Date
54	16	2/03
50	15	4/07

TABLE E-IV (cont)

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EM-9 Organics on Charcoal
(cont)

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Ethylbenzene (cont)

CV = 66 ± 7 ug/tube

Result	Uncer.	Date
65	20	7/14
39	12	10/07

CV = 70 ± 7 ug/tube

Result	Uncer.	Date
94	28	9/30
79	24	9/30

CV = 72 ± 7 ug/tube

Result	Uncer.	Date
61	18	2/28
53	16	5/15

CV = 76 ± 8 ug/tube

Result	Uncer.	Date
64	19	2/07
52	16	2/13
61	18	2/13

CV = 77 ± 8 ug/tube

Result	Uncer.	Date
87	26	8/04
87	26	9/30
100	30	9/30
71	21	10/07

CV = 78 ± 8 ug/tube

Result	Uncer.	Date
70	21	5/18

CV = 80 ± 8 ug/tube

Result	Uncer.	Date
97	29	9/30
110	30	9/30
100	30	9/30

CV = 82 ± 8 ug/tube

Result	Uncer.	Date
63	19	2/28
52	16	4/07
49	15	4/07

CV = 87 ± 9 ug/tube

Result	Uncer.	Date
57	17	2/03

Ethylbenzene (cont)

CV = 88 ± 9 ug/tube

Result	Uncer.	Date
110	30	9/30
110	30	12/17
100	30	12/17

CV = 89 ± 9 ug/tube

Result	Uncer.	Date
82	25	6/16
71	21	6/16
91	27	6/25

CV = 90 ± 9 ug/tube

Result	Uncer.	Date
110	30	9/30

CV = 92 ± 9 ug/tube

Result	Uncer.	Date
72	22	2/03

CV = 98 ± 10 ug/tube

Result	Uncer.	Date
110	30	2/13
82	25	2/13
71	21	2/13

CV = 99 ± 10 ug/tube

Result	Uncer.	Date
130	40	9/30
110	30	12/17
76	23	12/17

CV = 100 ± 10 ug/tube

Result	Uncer.	Date
66	20	2/03
64	19	5/15
68	20	5/15
95	29	5/26
100	30	6/16
120	40	9/30
110	30	9/30

CV = 110 ± 11 ug/tube

Result	Uncer.	Date
66	20	2/03
89	27	2/13
88	26	2/28
70	21	5/15
120	40	6/23
100	30	7/22
140	40	9/30
80	24	9/30
110	30	9/30

CV = 112 ± 11 ug/tube

Result	Uncer.	Date
81	24	1/13
100	30	5/18
120	40	6/03

Ethylbenzene (cont)

CV = 120 ± 12 ug/tube

Result	Uncer.	Date
89	27	2/03
91	27	2/03
70	21	2/12
78	23	5/15
150	50	9/30
100	30	12/17

CV = 123 ± 12 ug/tube

Result	Uncer.	Date
120	40	6/16

CV = 128 ± 13 ug/tube

Result	Uncer.	Date
130	40	5/26

CV = 130 ± 13 ug/tube

Result	Uncer.	Date
88	26	2/13
100	30	2/28
160	50	9/30
130	40	9/30

CV = 131 ± 13 ug/tube

Result	Uncer.	Date
150	50	10/17

CV = 132 ± 13 ug/tube

Result	Uncer.	Date
130	40	8/07
180	50	9/30
110	30	9/30

CV = 134 ± 13 ug/tube

Result	Uncer.	Date
140	50	5/07
140	40	5/07

CV = 142 ± 14 ug/tube

Result	Uncer.	Date
160	50	12/17

CV = 143 ± 14 ug/tube

Result	Uncer.	Date
160	50	9/30

CV = 145 ± 14 ug/tube

Result	Uncer.	Date
150	50	5/18
120	40	5/28

CV = 160 ± 16 ug/tube

Result	Uncer.	Date
210	60	9/30

Hexane
92GAU 01 GCMS

CV = 43 ± 4 ug/tube

Result	Uncer.	Date
44	9	10/22

CV = 62 ± 6 ug/tube

Result	Uncer.	Date
61	12	10/22

Methylene chloride
92GAU 01 GCMS

CV = 56 ± 6 ug/tube

Result	Uncer.	Date
46	9	12/07

CV = 70 ± 7 ug/tube

Result	Uncer.	Date
64	13	12/07

CV = 81 ± 8 ug/tube

Result	Uncer.	Date
94	19	12/11

CV = 86 ± 9 ug/tube

Result	Uncer.	Date
99	20	4/08

Tetrachloroethylene
92GAU 01 GCMS

CV = 769.4 ± 120 ug/tube

Result	Uncer.	Date
780	160	1/10

CV = 857 ± 86 ug/tube

Result	Uncer.	Date
880	180	1/10

CV = 1.29 ± 0.13 mg/tube

Result	Uncer.	Date
1.3	0.3	1/10

CV = 1.93 ± 0.19 mg/tube

Result	Uncer.	Date
1.8	0.4	1/10

Tetrachloroethylene
91GAU 01 PTGC

CV = 58 ± 6 ug/tube

Result	Uncer.	Date
40	12	10/17
49	15	10/17
52	16	12/17

CV = 61 ± 6 ug/tube

Result	Uncer.	Date
54	16	2/13

CV = 62 ± 6 ug/tube

Result	Uncer.	Date
61	18	5/28
75	23	8/07

CV = 66 ± 7 ug/tube

Result	Uncer.	Date
62	19	5/18

CV = 68 ± 7 ug/tube

Result	Uncer.	Date
53	16	2/28

CV = 70 ± 7 ug/tube

Result	Uncer.	Date
81	24	9/30
37	11	10/07

CV = 71 ± 7 ug/tube

Result	Uncer.	Date
95	29	2/13

CV = 73 ± 7 ug/tube

Result	Uncer.	Date
71	21	7/14
62	19	9/30
82	25	9/30
58	17	9/30

CV = 76 ± 8 ug/tube

Result	Uncer.	Date
66	20	2/13

CV = 77 ± 8 ug/tube

Result	Uncer.	Date
82	25	5/07
77	23	5/07
67	20	5/18

CV = 79 ± 8 ug/tube

Result	Uncer.	Date
62	19	2/03
55	17	5/15
59	18	5/15

Tetrachloroethylene (cont)

CV = 81 ± 8 ug/tube

Result	Uncer.	Date
65	20	10/07

CV = 82 ± 8 ug/tube

Result	Uncer.	Date
89	27	2/07
61	18	2/12
63	19	2/12

CV = 83 ± 8 ug/tube

Result	Uncer.	Date
110	30	8/07

CV = 84 ± 8 ug/tube

Result	Uncer.	Date
82	25	9/30
110	30	9/30

CV = 88 ± 9 ug/tube

Result	Uncer.	Date
77	23	5/18

CV = 90 ± 9 ug/tube

Result	Uncer.	Date
60	18	2/03
60	18	4/07

CV = 92 ± 9 ug/tube

Result	Uncer.	Date
73	22	2/13
82	25	2/13

CV = 93 ± 9 ug/tube

Result	Uncer.	Date
76	23	12/17
68	20	12/17

CV = 98 ± 10 ug/tube

Result	Uncer.	Date
100	30	9/30

CV = 99 ± 10 ug/tube

Result	Uncer.	Date
76	23	1/13
76	23	5/18
98	29	5/18

CV = 100 ± 10 ug/tube

Result	Uncer.	Date
92	28	2/03
110	30	2/03
73	22	2/13

TABLE E-IV (cont)

****

EM-9 Organics on Charcoal
(cont)

****

Tetrachloroethylene (cont)

81	24	2/28
73	22	4/07
60	18	4/07
69	21	5/15

CV = 104 ± 10 ug/tube

Result	Uncer.	Date
84	25	12/17
75	23	12/17

CV = 105 ± 10 ug/tube

Result	Uncer.	Date
120	40	9/30

CV = 110 ± 11 ug/tube

Result	Uncer.	Date
96	29	2/03
63	19	4/07
81	24	6/16
92	28	6/16

CV = 112 ± 11 ug/tube

Result	Uncer.	Date
120	40	9/30

CV = 120 ± 12 ug/tube

Result	Uncer.	Date
80	24	2/03
110	30	2/07
91	45	2/12

CV = 121 ± 12 ug/tube

Result	Uncer.	Date
110	30	6/16
90	27	6/16

CV = 125 ± 12 ug/tube

Result	Uncer.	Date
120	40	7/14
130	40	9/30

CV = 126 ± 13 ug/tube

Result	Uncer.	Date
140	40	9/30
120	40	9/30
150	50	9/30

CV = 128 ± 13 ug/tube

Result	Uncer.	Date
110	30	12/17

Tetrachloroethylene (cont)

CV = 132 ± 13 ug/tube

Result	Uncer.	Date
110	30	6/16
130	40	6/25

CV = 135 ± 14 ug/tube

Result	Uncer.	Date
140	40	6/23
140	40	9/30

CV = 139 ± 14 ug/tube

Result	Uncer.	Date
100	30	10/17

CV = 140 ± 14 ug/tube

Result	Uncer.	Date
69	21	4/07
75	23	5/15
150	50	9/30
140	40	9/30
160	50	9/30

CV = 143 ± 14 ug/tube

Result	Uncer.	Date
140	40	5/26

CV = 151 ± 15 ug/tube

Result	Uncer.	Date
120	40	12/17

CV = 168 ± 17 ug/tube

Result	Uncer.	Date
170	50	9/30

CV = 182 ± 18 ug/tube

Result	Uncer.	Date
190	60	9/30
210	60	9/30

Toluene 92GAU 01 GCMS

CV = 0.49 ± 0.049 mg/tube

Result	Uncer.	Date
0.41	0.08	7/14

CV = 0.98 ± 0.098 mg/tube

Result	Uncer.	Date
0.87	0.17	7/14

CV = 1.2135 ± 0.1567 mg/tube

Result	Uncer.	Date
1.2	0.2	7/14

Toluene (cont)

CV = 1.47 ± 0.1 mg/tube

Result	Uncer.	Date
1.3	0.3	7/14

Toluene 91GAU 01 PTGC

CV = 52 ± 5 ug/tube

Result	Uncer.	Date
48	14	10/17
59	18	10/17
39	12	12/17

CV = 54 ± 5 ug/tube

Result	Uncer.	Date
61	18	9/30

CV = 62 ± 6 ug/tube

Result	Uncer.	Date
68	20	5/18

CV = 63 ± 6 ug/tube

Result	Uncer.	Date
72	22	9/30
38	11	10/07

CV = 65 ± 6 ug/tube

Result	Uncer.	Date
53	16	2/13
68	20	7/14

CV = 66 ± 7 ug/tube

Result	Uncer.	Date
50	15	2/03
47	14	4/07

CV = 73 ± 7 ug/tube

Result	Uncer.	Date
76	23	5/07
76	23	5/07
67	20	5/18

CV = 74 ± 7 ug/tube

Result	Uncer.	Date
83	25	9/30
86	26	9/30
70	21	10/07

CV = 76 ± 8 ug/tube

Result	Uncer.	Date
82	25	2/13
90	27	8/04
85	26	9/30
100	30	9/30

Toluene (cont)

CV = 77 ± 8 ug/tube

Result	Uncer.	Date
59	18	2/28
51	15	5/15

CV = 81 ± 8 ug/tube

Result	Uncer.	Date
57	17	2/13

CV = 83 ± 8 ug/tube

Result	Uncer.	Date
77	23	5/18

CV = 84 ± 8 ug/tube

Result	Uncer.	Date
97	29	9/30
90	27	9/30
110	30	12/17
82	25	12/17

CV = 86 ± 9 ug/tube

Result	Uncer.	Date
71	21	2/07
54	16	2/12
57	17	2/12

CV = 87 ± 9 ug/tube

Result	Uncer.	Date
110	30	9/30

CV = 88 ± 9 ug/tube

Result	Uncer.	Date
61	19	2/28
51	15	4/07
48	14	4/07

CV = 94 ± 9 ug/tube

Result	Uncer.	Date
67	20	1/13
97	29	5/18
94	28	5/18
110	30	9/30
110	30	9/30
86	26	12/17
83	25	12/17

CV = 97 ± 10 ug/tube

Result	Uncer.	Date
66	20	2/13
77	23	2/13

CV = 98 ± 10 ug/tube

Result	Uncer.	Date
130	40	9/30

Toluene (cont)

CV = 99 ± 10 ug/tube

Result	Uncer.	Date
68	20	2/03

CV = 104 ± 10 ug/tube

Result	Uncer.	Date
91	27	6/16
100	30	6/16

CV = 105 ± 10 ug/tube

Result	Uncer.	Date
120	40	9/30
110	30	9/30

CV = 109 ± 11 ug/tube

Result	Uncer.	Date
120	40	6/23
100	30	7/22
81	24	9/30
110	30	9/30

CV = 110 ± 11 ug/tube

Result	Uncer.	Date
63	19	2/03
75	23	2/03
93	28	2/03
68	20	2/13
63	19	5/15
65	20	5/15

CV = 114 ± 11 ug/tube

Result	Uncer.	Date
120	40	6/16
110	30	6/16

CV = 116 ± 12 ug/tube

Result	Uncer.	Date
100	30	12/17

CV = 120 ± 12 ug/tube

Result	Uncer.	Date
85	26	2/28
67	20	5/15

CV = 125 ± 12 ug/tube

Result	Uncer.	Date
120	40	6/16
120	40	6/25

CV = 126 ± 13 ug/tube

Result	Uncer.	Date
140	40	9/30
140	40	9/30
150	50	10/17

Toluene (cont)

CV = 130 ± 13 ug/tube

Result	Uncer.	Date
85	26	2/03
94	28	2/07
86	39	2/12
75	23	5/15

CV = 131 ± 13 ug/tube

Result	Uncer.	Date
130	40	8/07
160	50	9/30
100	30	9/30

CV = 135 ± 14 ug/tube

Result	Uncer.	Date
140	40	5/26

CV = 136 ± 14 ug/tube

Result	Uncer.	Date
160	50	9/30
160	50	12/17

CV = 140 ± 14 ug/tube

Result	Uncer.	Date
100	30	2/28

CV = 142 ± 14 ug/tube

Result	Uncer.	Date
160	50	9/30

CV = 147 ± 15 ug/tube

Result	Uncer.	Date
170	50	9/30

CV = 158 ± 16 ug/tube

Result	Uncer.	Date
170	50	9/30
180	50	9/30

1,1,2-Trichloro-1,2,2-trifluoroethane 92GAU 01 GCMS

CV = 145 ± 15 ug/tube

Result	Uncer.	Date
130	30	8/11

CV = 174 ± 17 ug/tube

Result	Uncer.	Date
170	30	8/11

TABLE E-IV (cont)

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EM-9 Organics on Charcoal
(cont)

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1,1,1-Trichloroethane
92GAU 01 GCMS

CV = 75 ± 8 ug/tube

Result	Uncer.	Date
68	14	3/02

CV = 822 ± 82 ug/tube

Result	Uncer.	Date
900	180	1/10

CV = 847.4 ± 106.2 ug/tube

Result	Uncer.	Date
860	170	1/10

CV = 1.23 ± 0.12 mg/tube

Result	Uncer.	Date
1.2	0.2	1/10

CV = 1.85 ± 0.18 mg/tube

Result	Uncer.	Date
1.8	0.4	1/10

1,1,1-Trichloroethane
91GAU 01 PTGC

CV = 52 ± 5 ug/tube

Result	Uncer.	Date
27	8	10/17
28	8	10/17
43	13	12/17

CV = 59 ± 6 ug/tube

Result	Uncer.	Date
46	14	9/30

CV = 63 ± 6 ug/tube

Result	Uncer.	Date
86	26	5/28
81	24	8/07
27	8	10/07

CV = 64 ± 6 ug/tube

Result	Uncer.	Date
57	17	2/07
64	19	2/13
65	20	2/13

CV = 66 ± 7 ug/tube

Result	Uncer.	Date
47	14	2/03
44	13	4/07

1,1,1-Trichloroethane (cont)

CV = 69 ± 7 ug/tube

Result	Uncer.	Date
48	14	9/30
50	15	9/30

CV = 74 ± 7 ug/tube

Result	Uncer.	Date
62	19	2/03
110	30	7/14
61	18	9/30
62	19	9/30
41	12	9/30
53	16	10/07

CV = 75 ± 8 ug/tube

Result	Uncer.	Date
100	30	5/18

CV = 77 ± 8 ug/tube

Result	Uncer.	Date
55	17	2/28
52	16	5/15

CV = 79 ± 8 ug/tube

Result	Uncer.	Date
61	18	9/30
61	18	9/30

CV = 83 ± 8 ug/tube

Result	Uncer.	Date
81	24	2/13
81	24	2/13
77	23	2/13

CV = 84 ± 8 ug/tube

Result	Uncer.	Date
120	40	8/07
69	21	12/17
64	19	12/17

CV = 86 ± 9 ug/tube

Result	Uncer.	Date
98	29	6/16
57	17	6/16
120	40	6/25

CV = 88 ± 9 ug/tube

Result	Uncer.	Date
62	19	2/28
55	17	4/07
51	15	4/07

CV = 89 ± 9 ug/tube

Result	Uncer.	Date
63	19	9/30
61	18	9/30

1,1,1-Trichloroethane (cont)

CV = 92 ± 9 ug/tube

Result	Uncer.	Date
70	21	2/03
82	25	2/13

CV = 94 ± 9 ug/tube

Result	Uncer.	Date
76	23	12/17
72	22	12/17

CV = 97 ± 10 ug/tube

Result	Uncer.	Date
130	40	5/26
150	50	6/16

CV = 99 ± 10 ug/tube

Result	Uncer.	Date
72	22	2/03
88	26	9/30
71	21	9/30

CV = 100 ± 10 ug/tube

Result	Uncer.	Date
83	25	2/03
81	24	2/12

CV = 108 ± 11 ug/tube

Result	Uncer.	Date
86	26	1/13
130	40	5/18
150	50	6/03

CV = 110 ± 11 ug/tube

Result	Uncer.	Date
73	22	2/03
110	30	2/13
66	20	5/15
69	21	5/15

CV = 116 ± 12 ug/tube

Result	Uncer.	Date
110	30	12/17

CV = 118 ± 12 ug/tube

Result	Uncer.	Date
160	50	6/16

CV = 119 ± 12 ug/tube

Result	Uncer.	Date
84	25	9/30
88	26	9/30

CV = 120 ± 12 ug/tube

Result	Uncer.	Date
84	25	2/28
67	20	5/15

1,1,1-Trichloroethane (cont)

CV = 124 ± 12 ug/tube

Result	Uncer.	Date
150	50	5/26

CV = 126 ± 13 ug/tube

Result	Uncer.	Date
170	50	7/14
120	40	9/30
100	30	10/17

CV = 129 ± 13 ug/tube

Result	Uncer.	Date
160	50	5/07
170	50	5/07
120	40	9/30

CV = 130 ± 13 ug/tube

Result	Uncer.	Date
88	26	2/03
75	23	5/15

CV = 136 ± 14 ug/tube

Result	Uncer.	Date
180	50	6/23
120	40	9/30
120	40	12/17

CV = 139 ± 14 ug/tube

Result	Uncer.	Date
120	40	9/30

CV = 140 ± 14 ug/tube

Result	Uncer.	Date
97	29	2/28
180	50	5/18
180	50	5/28

CV = 148 ± 15 ug/tube

Result	Uncer.	Date
110	30	9/30
140	40	9/30

Trichloroethene
92GAU 01 GCMS

CV = 430.5 ± 60 ug/tube

Result	Uncer.	Date
380	80	1/10

CV = 817 ± 82 ug/tube

Result	Uncer.	Date
770	150	10/15

Trichloroethene (cont)

CV = 828 ± 83 ug/tube

Result	Uncer.	Date
890	180	1/10

CV = 0.7711 ± 0.162 mg/tube

Result	Uncer.	Date
0.76	0.15	10/15

CV = 1.22 ± 0.12 mg/tube

Result	Uncer.	Date
1.2	0.2	10/15

CV = 1.24 ± 0.12 mg/tube

Result	Uncer.	Date
1.3	0.3	1/10

CV = 1.74 ± 0.17 mg/tube

Result	Uncer.	Date
1.7	0.3	10/15

CV = 1.86 ± 0.19 mg/tube

Result	Uncer.	Date
1.8	0.4	1/10

Trichloroethene
91GAU 01 PTGC

CV = 56 ± 6 ug/tube

Result	Uncer.	Date
63	19	6/23
49	15	12/17

CV = 61 ± 6 ug/tube

Result	Uncer.	Date
70	21	9/30
68	20	9/30

CV = 66 ± 7 ug/tube

Result	Uncer.	Date
44	13	2/03
51	15	2/28
45	14	5/15
49	15	5/15

CV = 67 ± 7 ug/tube

Result	Uncer.	Date
73	22	5/26
55	17	12/17
48	14	12/17

CV = 71 ± 7 ug/tube

Result	Uncer.	Date
79	24	9/30
83	25	9/30

Trichloroethene (cont)

CV = 74 ± 7 ug/tube

Result	Uncer.	Date
62	19	2/13

CV = 77 ± 8 ug/tube

Result	Uncer.	Date
45	14	4/07

CV = 78 ± 8 ug/tube

Result	Uncer.	Date
80	24	6/16
90	27	6/25
72	22	12/17
70	21	12/17

CV = 79 ± 8 ug/tube

Result	Uncer.	Date
91	27	8/04
87	26	9/30
110	30	9/30

CV = 81 ± 8 ug/tube

Result	Uncer.	Date
84	25	9/30
100	30	9/30
95	29	9/30

CV = 87 ± 9 ug/tube

Result	Uncer.	Date
87	26	2/13

CV = 88 ± 9 ug/tube

Result	Uncer.	Date
63	19	2/28
55	17	4/07

CV = 89 ± 9 ug/tube

Result	Uncer.	Date
99	30	5/07
97	29	5/26
99	30	6/03
72	22	10/17

CV = 90 ± 9 ug/tube

Result	Uncer.	Date
110	30	8/07

CV = 91 ± 9 ug/tube

Result	Uncer.	Date
100	30	9/30

CV = 93 ± 9 ug/tube

Result	Uncer.	Date
77	23	2/13

TABLE E-IV (cont)

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EM-9 Organics on Charcoal
(cont)

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Trichloroethene (cont)

CV = 99 ± 10 ug/tube

Result	Uncer.	Date
75	23	2/03
91	27	2/07
80	24	2/12
82	25	2/12

CV = 100 ± 10 ug/tube

Result	Uncer.	Date
78	23	1/13
99	30	6/16
70	21	10/07
86	26	10/17

CV = 101 ± 10 ug/tube

Result	Uncer.	Date
120	40	9/30
110	30	9/30

CV = 102 ± 10 ug/tube

Result	Uncer.	Date
130	40	9/30

CV = 110 ± 11 ug/tube

Result	Uncer.	Date
83	25	2/03
99	30	2/13
97	29	2/13
66	20	4/07
69	21	5/15

CV = 111 ± 11 ug/tube

Result	Uncer.	Date
120	40	5/18
110	30	5/28
130	40	9/30

CV = 113 ± 11 ug/tube

Result	Uncer.	Date
120	40	9/30
110	30	9/30

CV = 120 ± 12 ug/tube

Result	Uncer.	Date
100	30	2/03
120	40	2/03
99	30	2/13

CV = 121 ± 12 ug/tube

Result	Uncer.	Date
140	40	9/30

Trichloroethene (cont)

CV = 122 ± 12 ug/tube

Result	Uncer.	Date
130	40	5/07
63	19	10/17

CV = 124 ± 12 ug/tube

Result	Uncer.	Date
160	50	8/07

CV = 130 ± 13 ug/tube

Result	Uncer.	Date
98	29	2/28

CV = 131 ± 13 ug/tube

Result	Uncer.	Date
140	40	9/30
110	30	9/30

CV = 133 ± 13 ug/tube

Result	Uncer.	Date
140	40	5/18
150	50	6/16
120	40	12/17
110	30	12/17

CV = 136 ± 14 ug/tube

Result	Uncer.	Date
150	50	5/28
160	50	9/30

CV = 140 ± 14 ug/tube

Result	Uncer.	Date
100	30	2/03
72	22	4/07

CV = 144 ± 14 ug/tube

Result	Uncer.	Date
150	50	5/28
130	40	6/16
130	40	10/07

CV = 147 ± 15 ug/tube

Result	Uncer.	Date
160	50	7/14
180	50	8/04
160	50	9/30

CV = 150 ± 15 ug/tube

Result	Uncer.	Date
130	40	2/07
110	40	2/12

CV = 155 ± 16 ug/tube

Result	Uncer.	Date
120	40	12/17

Trichloroethene (cont)

CV = 162 ± 16 ug/tube

Result	Uncer.	Date
200	60	9/30

CV = 170 ± 17 ug/tube

Result	Uncer.	Date
96	29	2/03
180	50	6/23

1,2,4-Trimethylbenzene
92GAU 01 GCMS

CV = 76 ± 8 ug/tube

Result	Uncer.	Date
81	16	11/05

CV = 81 ± 8 ug/tube

Result	Uncer.	Date
75	15	11/05

1,2,4-Trimethylbenzene
91GAU 01 PTGC

CV = 51 ± 5 ug/tube

Result	Uncer.	Date
45	14	12/17

CV = 60 ± 6 ug/tube

Result	Uncer.	Date
52	16	2/13

CV = 61 ± 6 ug/tube

Result	Uncer.	Date
55	17	10/07
37	11	10/17

CV = 62 ± 6 ug/tube

Result	Uncer.	Date
53	16	9/30
52	16	9/30

CV = 68 ± 7 ug/tube

Result	Uncer.	Date
53	16	5/28
55	17	8/07

CV = 70 ± 7 ug/tube

Result	Uncer.	Date
89	27	2/13

CV = 71 ± 7 ug/tube

Result	Uncer.	Date
32	10	10/17

1,2,4-Trimethylbenzene (cont)

CV = 72 ± 7 ug/tube

Result	Uncer.	Date
71	21	9/30
55	17	9/30

CV = 75 ± 8 ug/tube

Result	Uncer.	Date
58	17	2/13

CV = 79 ± 8 ug/tube

Result	Uncer.	Date
63	19	7/14
54	16	9/30
75	23	9/30
44	13	9/30

CV = 80 ± 8 ug/tube

Result	Uncer.	Date
73	22	2/07
44	13	2/12
48	14	2/12

CV = 81 ± 8 ug/tube

Result	Uncer.	Date
38	11	10/07

CV = 82 ± 8 ug/tube

Result	Uncer.	Date
70	21	9/30
81	24	9/30
76	23	9/30

CV = 90 ± 9 ug/tube

Result	Uncer.	Date
67	20	2/13
75	23	2/13
81	24	8/07

CV = 91 ± 9 ug/tube

Result	Uncer.	Date
74	22	10/17
82	25	12/17

CV = 93 ± 9 ug/tube

Result	Uncer.	Date
90	27	9/30

CV = 100 ± 10 ug/tube

Result	Uncer.	Date
70	21	2/03
90	27	2/03
66	20	2/13

1,2,4-Trimethylbenzene (cont)

CV = 102 ± 10 ug/tube

Result	Uncer.	Date
85	26	12/17
87	26	12/17

CV = 103 ± 10 ug/tube

Result	Uncer.	Date
91	27	9/30
83	25	9/30

CV = 112 ± 11 ug/tube

Result	Uncer.	Date
88	26	10/07

CV = 113 ± 11 ug/tube

Result	Uncer.	Date
110	30	9/30

CV = 120 ± 12 ug/tube

Result	Uncer.	Date
88	26	2/07
77	24	2/12

CV = 122 ± 12 ug/tube

Result	Uncer.	Date
62	19	10/07
68	20	10/17

CV = 124 ± 12 ug/tube

Result	Uncer.	Date
110	30	9/30

CV = 134 ± 13 ug/tube

Result	Uncer.	Date
110	30	9/30
100	30	9/30

CV = 136 ± 14 ug/tube

Result	Uncer.	Date
110	30	7/14
120	40	9/30

CV = 147 ± 15 ug/tube

Result	Uncer.	Date
130	40	6/23
110	30	9/30

CV = 165 ± 16 ug/tube

Result	Uncer.	Date
170	50	9/30

o-Xylene
92GAU 01 GCMS

CV = 0.534 ± 0.053 mg/tube

Result	Uncer.	Date
0.46	0.09	7/14

CV = 1.027 ± 0.1471 mg/tube

Result	Uncer.	Date
1	0.2	7/14

CV = 1.07 ± 0.1 mg/tube

Result	Uncer.	Date
0.82	0.16	7/14

CV = 1.6 ± 0.2 mg/tube

Result	Uncer.	Date
1.3	0.3	7/14

Mixed-Xylenes (o + m + p)
91GAU 01 PTGC

CV = 52 ± 5 ug/tube

Result	Uncer.	Date
56	17	12/17

CV = 54 ± 5 ug/tube

Result	Uncer.	Date
51	15	9/30

CV = 58 ± 6 ug/tube

Result	Uncer.	Date
53	16	9/30

CV = 63 ± 6 ug/tube

Result	Uncer.	Date
46	14	2/13
67	20	12/17
77	23	12/17

CV = 64 ± 6 ug/tube

Result	Uncer.	Date
60	18	5/26
65	20	9/30
74	22	9/30

CV = 67 ± 7 ug/tube

Result	Uncer.	Date
45	14	5/15
47	14	5/15

CV = 68 ± 7 ug/tube

Result	Uncer.	Date
47	14	2/28

TABLE E-IV (cont)

****

EM-9 Organics on Charcoal (cont)

****

Mixed-Xylenes (o + m + p) (cont)

CV = 69 ± 7 ug/tube

Result	Uncer.	Date
64	19	7/14

CV = 74 ± 7 ug/tube

Result	Uncer.	Date
48	14	2/03
35	10	2/12
76	23	12/17
77	23	12/17

CV = 75 ± 8 ug/tube

Result	Uncer.	Date
74	22	6/16
76	23	6/25
72	22	9/30

CV = 79 ± 8 ug/tube

Result	Uncer.	Date
50	15	5/15
52	16	5/15

CV = 80 ± 8 ug/tube

Result	Uncer.	Date
86	26	8/04
76	23	9/30

CV = 81 ± 8 ug/tube

Result	Uncer.	Date
90	27	9/30

CV = 84 ± 8 ug/tube

Result	Uncer.	Date
47	14	2/07
80	24	10/17

CV = 86 ± 9 ug/tube

Result	Uncer.	Date
73	22	5/07
90	27	5/26
68	20	6/03
75	23	9/30

CV = 89 ± 9 ug/tube

Result	Uncer.	Date
59	18	2/28

CV = 92 ± 9 ug/tube

Result	Uncer.	Date
91	27	9/30

Mixed-Xylenes (o + m + p) (cont)

CV = 94 ± 9 ug/tube

Result	Uncer.	Date
59	18	2/13
77	23	2/13
64	19	2/13
64	19	10/07
88	26	10/17

CV = 96 ± 10 ug/tube

Result	Uncer.	Date
110	30	9/30
89	27	9/30
91	27	9/30

CV = 97 ± 10 ug/tube

Result	Uncer.	Date
70	21	1/13
73	22	6/16

CV = 99 ± 10 ug/tube

Result	Uncer.	Date
100	30	9/30

CV = 100 ± 10 ug/tube

Result	Uncer.	Date
66	20	4/07
62	19	5/15

CV = 104 ± 10 ug/tube

Result	Uncer.	Date
110	30	9/30

CV = 107 ± 11 ug/tube

Result	Uncer.	Date
100	30	9/30
99	30	9/30
110	30	9/30

CV = 108 ± 11 ug/tube

Result	Uncer.	Date
79	24	5/18
88	26	5/28

CV = 110 ± 11 ug/tube

Result	Uncer.	Date
69	21	2/03
57	17	4/07
58	17	5/15

CV = 115 ± 12 ug/tube

Result	Uncer.	Date
110	30	6/23
96	29	7/22
81	24	9/30
96	29	9/30

Mixed-Xylenes (o + m + p) (cont)

CV = 116 ± 12 ug/tube

Result	Uncer.	Date
56	17	10/17

CV = 118 ± 12 ug/tube

Result	Uncer.	Date
97	29	5/07

CV = 120 ± 12 ug/tube

Result	Uncer.	Date
72	22	2/03
160	50	2/13

CV = 126 ± 13 ug/tube

Result	Uncer.	Date
140	40	12/17
130	40	12/17

CV = 128 ± 13 ug/tube

Result	Uncer.	Date
120	40	9/30

CV = 129 ± 13 ug/tube

Result	Uncer.	Date
99	30	5/18
140	40	6/16

CV = 130 ± 13 ug/tube

Result	Uncer.	Date
110	30	2/07
100	30	2/13
79	24	2/28

CV = 136 ± 14 ug/tube

Result	Uncer.	Date
130	40	10/07

CV = 138 ± 14 ug/tube

Result	Uncer.	Date
130	40	8/07
160	50	9/30
89	27	9/30

CV = 139 ± 14 ug/tube

Result	Uncer.	Date
140	40	9/30
160	50	9/30

CV = 140 ± 14 ug/tube

Result	Uncer.	Date
65	20	4/07
66	20	5/15
100	30	5/28
110	30	6/16

Mixed-Xylenes (o + m + p) (cont)

CV = 147 ± 15 ug/tube

Result	Uncer.	Date
140	40	12/17

CV = 150 ± 15 ug/tube

Result	Uncer.	Date
86	26	2/04
140	40	9/30

CV = 160 ± 16 ug/tube

Result	Uncer.	Date
94	28	2/03

CV = 170 ± 17 ug/tube

Result	Uncer.	Date
93	28	2/03
120	40	2/28

CV = 190 ± 19 ug/tube

Result	Uncer.	Date
100	30	4/07

CV = 200 ± 20 ug/tube

Result	Uncer.	Date
100	30	4/07

CV = 210 ± 21 ug/tube

Result	Uncer.	Date
160	50	2/03

CV = 220 ± 22 ug/tube

Result	Uncer.	Date
150	50	2/03
100	30	4/07

****

EM-9 Organics on Formaldehyde Tube

****

Formaldehyde 92GAU 01 GCMS

CV = 8 ± 0.8 ug/tube

Result	Uncer.	Date
9.9	3	5/21

CV = 25 ± 2 ug/tube

Result	Uncer.	Date
21	4	12/16

Formaldehyde (cont)

CV = 27 ± 3 ug/tube

Result	Uncer.	Date
24	5	12/16

CV = 40 ± 4 ug/tube

Result	Uncer.	Date
39	12	5/21
36	7	12/16

CV = 41 ± 4 ug/tube

Result	Uncer.	Date
35	10	2/21
35	7	12/16

CV = 52 ± 5 ug/tube

Result	Uncer.	Date
42	12	2/21

****

EM-9 Organics on Orbo 24 Tube

****

Acrolein 91GAU 04 GCMS

CV = 30 ± 2 ug/tube

Result	Uncer.	Date
22	7	1/06
21	6	1/06

****

EM-9 Organics on Soil

****

Acenaphthene 89GAU 01 GCMS

CV = 0.93 ± 0.09 mg/kg

Result	Uncer.	Date
0.6	0.18	12/16

CV = 1.3 ± 0.1 mg/kg

Result	Uncer.	Date
1.1	0.3	12/15

CV = 1.4 ± 0.1 mg/kg

Result	Uncer.	Date
0.86	0.26	12/01

CV = 2 ± 0.2 mg/kg

Result	Uncer.	Date
1.4	0.4	11/04

Acenaphthene (cont)

CV = 2.2 ± 0.2 mg/kg

Result	Uncer.	Date
1.4	0.4	2/14

CV = 2.5 ± 0.2 mg/kg

Result	Uncer.	Date
1.2	0.4	12/10

CV = 2.6 ± 0.3 mg/kg

Result	Uncer.	Date
1.6	0.5	12/03

CV = 2.7 ± 0.3 mg/kg

Result	Uncer.	Date
1.9	0.6	1/03

CV = 3.1 ± 0.3 mg/kg

Result	Uncer.	Date
2.3	0.7	11/16

CV = 3.4 ± 0.3 mg/kg

Result	Uncer.	Date
2.5	0.8	12/01

CV = 3.7 ± 0.4 mg/kg

Result	Uncer.	Date
2.6	0.8	11/18

CV = 3.8 ± 0.4 mg/kg

Result	Uncer.	Date
2.8	0.8	3/25

CV = 4 ± 0.4 mg/kg

Result	Uncer.	Date
2.4	0.7	11/16

CV = 4.3 ± 0.4 mg/kg

Result	Uncer.	Date
3	0.9	12/01

CV = 4.6 ± 0.5 mg/kg

Result	Uncer.	Date
2.3	0.7	12/01

CV = 5 ± 0.5 mg/kg

Result	Uncer.	Date
2.4	0.7	12/02

TABLE E-IV (cont)

****

EM-9 Organics on Soil
(cont)

****

Acetone
89GAU 01 PTGC

CV = 79 ± 8 ug/kg

Result	Uncer.	Date
41	12	10/30

CV = 82 ± 8 ug/kg

Result	Uncer.	Date
53	16	11/03

CV = 85 ± 9 ug/kg

Result	Uncer.	Date
51	15	10/06

CV = 109 ± 11 ug/kg

Result	Uncer.	Date
46	14	9/03
35	11	10/29
110	30	11/03

CV = 112 ± 11 ug/kg

Result	Uncer.	Date
56	17	2/06

CV = 113 ± 11 ug/kg

Result	Uncer.	Date
52	16	10/23

CV = 115 ± 12 ug/kg

Result	Uncer.	Date
120	40	9/11
30	9	9/21
47	14	10/21
53	16	11/24

CV = 116 ± 12 ug/kg

Result	Uncer.	Date
58	17	11/25

CV = 117 ± 12 ug/kg

Result	Uncer.	Date
51	15	4/15
< 20		8/18

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
42	13	1/31
64	19	2/06
42	13	8/24

Acetone (cont)

CV = 121 ± 12 ug/kg

Result	Uncer.	Date
35	11	9/11

CV = 122 ± 12 ug/kg

Result	Uncer.	Date
100	30	9/18

CV = 125 ± 13 ug/kg

Result	Uncer.	Date
48	14	9/21

CV = 127 ± 13 ug/kg

Result	Uncer.	Date
29	9	10/27

CV = 130 ± 13 ug/kg

Result	Uncer.	Date
81	24	8/18

CV = 131 ± 13 ug/kg

Result	Uncer.	Date
84	25	6/10

CV = 132 ± 13 ug/kg

Result	Uncer.	Date
63	19	2/06

CV = 137 ± 14 ug/kg

Result	Uncer.	Date
38	11	9/11

CV = 140 ± 14 ug/kg

Result	Uncer.	Date
79	24	6/09

CV = 142 ± 14 ug/kg

Result	Uncer.	Date
26	8	10/27
38	11	10/27
74	22	11/03

CV = 144 ± 14 ug/kg

Result	Uncer.	Date
75	23	11/04

CV = 145 ± 14 ug/kg

Result	Uncer.	Date
73	22	2/06

Acetone (cont)

CV = 146 ± 15 ug/kg

Result	Uncer.	Date
43	13	6/10

CV = 149 ± 15 ug/kg

Result	Uncer.	Date
90	27	2/11
79	24	9/21

CV = 152 ± 15 ug/kg

Result	Uncer.	Date
59	18	11/30

CV = 158 ± 16 ug/kg

Result	Uncer.	Date
56	17	9/14

CV = 160 ± 16 ug/kg

Result	Uncer.	Date
100	30	6/09
59	18	6/10
73	22	6/17

CV = 166 ± 17 ug/kg

Result	Uncer.	Date
88	26	10/23

CV = 168 ± 17 ug/kg

Result	Uncer.	Date
54	16	10/26
52	16	11/03

Aniline
89GAU 01 GCMS

CV = 1.1 ± 0.1 mg/kg

Result	Uncer.	Date
< 0.33		12/16

CV = 1.5 ± 0.2 mg/kg

Result	Uncer.	Date
< 0.33		12/15

CV = 1.6 ± 0.2 mg/kg

Result	Uncer.	Date
< 0.33		12/01

CV = 2.4 ± 0.2 mg/kg

Result	Uncer.	Date
< 0.33		11/04

Aniline (cont)

CV = 2.9 ± 0.3 mg/kg

Result	Uncer.	Date
< 0.33		12/10

CV = 3.1 ± 0.3 mg/kg

Result	Uncer.	Date
< 0.33		12/03

CV = 3.6 ± 0.4 mg/kg

Result	Uncer.	Date
< 0.33		11/16

CV = 4 ± 0.4 mg/kg

Result	Uncer.	Date
< 0.33		12/01

CV = 4.4 ± 0.4 mg/kg

Result	Uncer.	Date
0.75	0.23	11/18

CV = 4.7 ± 0.5 mg/kg

Result	Uncer.	Date
< 0.33		11/16

CV = 5.1 ± 0.5 mg/kg

Result	Uncer.	Date
4.5	1.4	12/01

CV = 5.4 ± 0.5 mg/kg

Result	Uncer.	Date
< 0.33		12/01

CV = 5.8 ± 0.6 mg/kg

Result	Uncer.	Date
0.36	0.11	12/02

Anthracene
89GAU 01 GCMS

CV = 0.95 ± 0.1 mg/kg

Result	Uncer.	Date
0.81	0.24	2/21
< 0.33		3/24

CV = 1 ± 0.1 mg/kg

Result	Uncer.	Date
0.68	0.2	4/28

CV = 1.4 ± 0.1 mg/kg

Result	Uncer.	Date
1.3	0.4	6/09
1.2	0.4	7/02

Anthracene (cont)

CV = 2.81 ± 0.3 mg/kg

Result	Uncer.	Date
2	0.6	5/05

CV = 3.2 ± 0.3 mg/kg

Result	Uncer.	Date
2.6	0.8	2/14

CV = 3.43 ± 0.3 mg/kg

Result	Uncer.	Date
3	0.9	7/21

CV = 4.1 ± 0.4 mg/kg

Result	Uncer.	Date
3.5	1.1	3/25

CV = 4.5 ± 0.4 mg/kg

Result	Uncer.	Date
2.6	0.8	5/13
3.2	1	8/19

CV = 5.2 ± 0.5 mg/kg

Result	Uncer.	Date
4	1.2	7/21

CV = 5.4 ± 0.5 mg/kg

Result	Uncer.	Date
3.5	1.1	2/14

CV = 5.5 ± 0.6 mg/kg

Result	Uncer.	Date
3.3	1	4/15

CV = 5.7 ± 0.6 mg/kg

Result	Uncer.	Date
3.5	1.1	3/24

Benzene
89GAU 01 PTGC

CV = 95 ± 10 ug/kg

Result	Uncer.	Date
82	25	6/10

CV = 104 ± 10 ug/kg

Result	Uncer.	Date
100	30	2/06

CV = 113 ± 11 ug/kg

Result	Uncer.	Date
150	50	9/14

Benzene (cont)

CV = 114 ± 11 ug/kg

Result	Uncer.	Date
100	30	2/06

CV = 124 ± 12 ug/kg

Result	Uncer.	Date
100	30	10/27

CV = 130 ± 13 ug/kg

Result	Uncer.	Date
120	40	2/06

CV = 148 ± 15 ug/kg

Result	Uncer.	Date
48	14	10/21

CV = 149 ± 15 ug/kg

Result	Uncer.	Date
240	70	9/11

CV = 165 ± 16 ug/kg

Result	Uncer.	Date
220	70	10/23

Benzo[a]anthracene
89GAU 01 GCMS

CV = 0.9 ± 0.09 mg/kg

Result	Uncer.	Date
0.78	0.23	10/13

CV = 1.6 ± 0.2 mg/kg

Result	Uncer.	Date
1.1	0.3	8/31
1.1	0.3	9/29

CV = 1.9 ± 0.2 mg/kg

Result	Uncer.	Date
1.3	0.4	9/10

CV = 2.1 ± 0.2 mg/kg

Result	Uncer.	Date
1.5	0.5	10/20

CV = 3.3 ± 0.3 mg/kg

Result	Uncer.	Date
1.4	0.4	6/19
2.1	0.6	9/30

CV = 3.6 ± 0.4 mg/kg

Result	Uncer.	Date
3.2	1	10/20

TABLE E-IV (cont)

EM-9 Organics on Soil
(cont)

Benzo[a]anthracene (cont)

CV = 4.1 ± 0.4 mg/kg

Result	Uncer.	Date
4.2	1.3	11/20

CV = 5.5 ± 0.5 mg/kg

Result	Uncer.	Date
3.2	1	10/05

CV = 6.3 ± 0.6 mg/kg

Result	Uncer.	Date
5.6	1.7	11/01

Benzo[b]fluoranthene 89GAU 01 GCMS

CV = 2.1 ± 0.2 mg/kg

Result	Uncer.	Date
1.5	0.5	2/14

CV = 2.19 ± 0.2 mg/kg

Result	Uncer.	Date
1.7	0.5	12/16

CV = 2.5 ± 0.2 mg/kg

Result	Uncer.	Date
2.1	0.6	1/03

CV = 2.8 ± 0.3 mg/kg

Result	Uncer.	Date
1.7	0.5	12/03

CV = 3.3 ± 0.3 mg/kg

Result	Uncer.	Date
2.4	0.7	11/16

CV = 3.6 ± 0.4 mg/kg

Result	Uncer.	Date
3.7	1.1	3/25

CV = 3.8 ± 0.4 mg/kg

Result	Uncer.	Date
2.3	0.7	11/04

CV = 4.4 ± 0.4 mg/kg

Result	Uncer.	Date
3	0.9	11/16
2.8	0.8	12/01
2.7	0.8	12/02

Benzo[b]fluoranthene (cont)

CV = 4.7 ± 0.5 mg/kg

Result	Uncer.	Date
3.4	1	11/16

Benzo[k]fluoranthene 89GAU 01 GCMS

CV = 5 ± 0.5 mg/kg

Result	Uncer.	Date
3	0.9	1/06

Benzoic acid 89GAU 01 GCMS

CV = 1.1 ± 0.1 mg/kg

Result	Uncer.	Date
< 0.33		4/28

CV = 1.4 ± 0.1 mg/kg

Result	Uncer.	Date
< 0.33		6/09

CV = 1.5 ± 0.2 mg/kg

Result	Uncer.	Date
< 0.33		7/02

CV = 2.1 ± 0.2 mg/kg

Result	Uncer.	Date
< 0.33		2/14

CV = 2.6 ± 0.3 mg/kg

Result	Uncer.	Date
< 0.33		1/03

CV = 2.95 ± 0.3 mg/kg

Result	Uncer.	Date
< 0.33		5/05

CV = 3.6 ± 0.4 mg/kg

Result	Uncer.	Date
< 0.33		7/21

CV = 3.7 ± 0.4 mg/kg

Result	Uncer.	Date
< 0.33		3/25

CV = 4.7 ± 0.5 mg/kg

Result	Uncer.	Date
< 0.33		5/13
0.69	0.21	8/19

Benzoic acid (cont)

CV = 5.4 ± 0.5 mg/kg

Result	Uncer.	Date
< 0.33		7/21

CV = 5.8 ± 0.6 mg/kg

Result	Uncer.	Date
< 0.33		4/15

Bis(2-chloroethoxy)methane 89GAU 01 GCMS

CV = 0.98 ± 0.1 mg/kg

Result	Uncer.	Date
0.54	0.16	4/28

CV = 1.3 ± 0.1 mg/kg

Result	Uncer.	Date
0.93	0.28	6/09

CV = 1.4 ± 0.1 mg/kg

Result	Uncer.	Date
1	0.3	7/02

CV = 2.68 ± 0.3 mg/kg

Result	Uncer.	Date
1.7	0.5	5/05

CV = 3.27 ± 0.3 mg/kg

Result	Uncer.	Date
2.8	0.8	7/21

CV = 4.2 ± 0.4 mg/kg

Result	Uncer.	Date
1.8	0.5	5/13
2.4	0.7	8/19

CV = 4.9 ± 0.5 mg/kg

Result	Uncer.	Date
3.4	1	7/21

CV = 5.2 ± 0.5 mg/kg

Result	Uncer.	Date
2.8	0.8	4/15

Bis(2-chloroethyl)ether 89GAU 01 GCMS

CV = 5.2 ± 0.5 mg/kg

Result	Uncer.	Date
2.4	0.7	1/06

Bromobenzene 89GAU 01 PTGC

CV = 189 ± 19 ug/kg

Result	Uncer.	Date
120	40	2/06

CV = 190 ± 19 ug/kg

Result	Uncer.	Date
110	30	1/31

Bromochloromethane 89GAU 01 PTGC

CV = 104 ± 10 ug/kg

Result	Uncer.	Date
81	24	6/10

CV = 124 ± 12 ug/kg

Result	Uncer.	Date
150	50	9/14

CV = 135 ± 14 ug/kg

Result	Uncer.	Date
97	29	10/27

CV = 162 ± 16 ug/kg

Result	Uncer.	Date
100	30	10/21

CV = 163 ± 16 ug/kg

Result	Uncer.	Date
260	80	9/11

CV = 181 ± 18 ug/kg

Result	Uncer.	Date
< 5		10/23

Bromodichloromethane 89GAU 01 PTGC

CV = 84 ± 8 ug/kg

Result	Uncer.	Date
130	40	10/06

CV = 110 ± 11 ug/kg

Result	Uncer.	Date
99	30	6/17

CV = 118 ± 12 ug/kg

Result	Uncer.	Date
120	40	9/03

Bromodichloromethane (cont)

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
170	50	10/29

CV = 123 ± 12 ug/kg

Result	Uncer.	Date
170	50	11/03

CV = 124 ± 12 ug/kg

Result	Uncer.	Date
110	30	6/10

CV = 125 ± 12 ug/kg

Result	Uncer.	Date
170	50	9/18

CV = 137 ± 14 ug/kg

Result	Uncer.	Date
200	60	11/03

CV = 151 ± 15 ug/kg

Result	Uncer.	Date
140	40	8/18
260	80	11/04

CV = 154 ± 15 ug/kg

Result	Uncer.	Date
220	70	9/21

CV = 160 ± 16 ug/kg

Result	Uncer.	Date
150	50	6/09

Bromoform 89GAU 01 PTGC

CV = 117 ± 12 ug/kg

Result	Uncer.	Date
120	40	6/17

CV = 132 ± 13 ug/kg

Result	Uncer.	Date
100	30	6/10

CV = 161 ± 16 ug/kg

Result	Uncer.	Date
150	50	8/18

CV = 170 ± 17 ug/kg

Result	Uncer.	Date
160	50	6/09

2-Butanone 89GAU 01 PTGC

CV = 74 ± 7 ug/kg

Result	Uncer.	Date
51	15	10/30

CV = 77 ± 8 ug/kg

Result	Uncer.	Date
57	17	11/03

CV = 79 ± 8 ug/kg

Result	Uncer.	Date
61	18	10/06

CV = 101 ± 10 ug/kg

Result	Uncer.	Date
57	17	9/03
34	10	10/29
68	20	11/03

CV = 107 ± 11 ug/kg

Result	Uncer.	Date
41	12	9/21
62	19	11/24

CV = 112 ± 11 ug/kg

Result	Uncer.	Date
53	16	8/24

CV = 113 ± 11 ug/kg

Result	Uncer.	Date
120	40	9/18

CV = 116 ± 12 ug/kg

Result	Uncer.	Date
74	22	10/23

CV = 117 ± 12 ug/kg

Result	Uncer.	Date
56	17	9/21

CV = 118 ± 12 ug/kg

Result	Uncer.	Date
120	40	9/11
< 20		10/21

CV = 121 ± 12 ug/kg

Result	Uncer.	Date
76	23	11/25

CV = 124 ± 12 ug/kg

Result	Uncer.	Date
43	13	9/11

TABLE E-IV (cont)

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EM-9 Organics on Soil
(cont)

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2-Butanone (cont)

CV = 125 ± 12 ug/kg

Result	Uncer.	Date
72	22	4/15
99	30	8/18

CV = 131 ± 13 ug/kg

Result	Uncer.	Date
41	12	10/27

CV = 132 ± 13 ug/kg

Result	Uncer.	Date
96	29	11/03

CV = 134 ± 13 ug/kg

Result	Uncer.	Date
79	24	11/04

CV = 139 ± 14 ug/kg

Result	Uncer.	Date
82	25	2/06
95	29	8/18
97	29	9/21

CV = 140 ± 14 ug/kg

Result	Uncer.	Date
110	30	6/10

CV = 141 ± 14 ug/kg

Result	Uncer.	Date
52	16	9/11
81	24	11/30

CV = 146 ± 15 ug/kg

Result	Uncer.	Date
61	18	10/27
73	22	10/27

CV = 150 ± 15 ug/kg

Result	Uncer.	Date
60	18	1/31
93	28	2/06
82	25	6/09
49	15	6/10

CV = 156 ± 16 ug/kg

Result	Uncer.	Date
66	20	10/26
70	21	11/03

2-Butanone (cont)

CV = 163 ± 16 ug/kg

Result	Uncer.	Date
86	26	2/06
95	29	9/14

CV = 170 ± 17 ug/kg

Result	Uncer.	Date
110	30	6/09
80	24	6/10
140	40	10/23

CV = 171 ± 17 ug/kg

Result	Uncer.	Date
80	24	6/17

CV = 179 ± 18 ug/kg

Result	Uncer.	Date
110	30	2/06

CV = 184 ± 18 ug/kg

Result	Uncer.	Date
140	40	2/11

n-Butylbenzene 89GAU 01 PTGC

CV = 102 ± 10 ug/kg

Result	Uncer.	Date
110	30	2/06

CV = 112 ± 11 ug/kg

Result	Uncer.	Date
110	30	2/06

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
120	40	2/06

sec-Butylbenzene 89GAU 01 PTGC

CV = 163 ± 16 ug/kg

Result	Uncer.	Date
120	40	2/06

CV = 170 ± 17 ug/kg

Result	Uncer.	Date
110	30	1/31

tert-Butylbenzene 89GAU 01 PTGC

CV = 119 ± 12 ug/kg

Result	Uncer.	Date
150	50	9/11

CV = 131 ± 13 ug/kg

Result	Uncer.	Date
25	8	10/21

CV = 142 ± 14 ug/kg

Result	Uncer.	Date
110	30	10/27

Carbon disulfide 89GAU 01 PTGC

CV = 112 ± 11 ug/kg

Result	Uncer.	Date
100	30	6/17

CV = 126 ± 13 ug/kg

Result	Uncer.	Date
120	40	6/10

CV = 154 ± 15 ug/kg

Result	Uncer.	Date
200	60	8/18

CV = 170 ± 17 ug/kg

Result	Uncer.	Date
150	50	6/09

CV = 174 ± 17 ug/kg

Result	Uncer.	Date
330	100	11/25

Carbon tetrachloride 89GAU 01 PTGC

CV = 150 ± 15 ug/kg

Result	Uncer.	Date
160	50	6/09

CV = 151 ± 15 ug/kg

Result	Uncer.	Date
150	50	8/18

CV = 166 ± 17 ug/kg

Result	Uncer.	Date
220	70	4/15

Carbon tetrachloride (cont)

CV = 183 ± 18 ug/kg

Result	Uncer.	Date
190	60	6/10

4-Chloro-3-methylphenol 89GAU 01 GCMS

CV = 0.9 ± 0.09 mg/kg

Result	Uncer.	Date
0.9	0.27	10/13

CV = 1.7 ± 0.2 mg/kg

Result	Uncer.	Date
1.4	0.4	8/31
1.3	0.4	9/29

CV = 2 ± 0.2 mg/kg

Result	Uncer.	Date
1.2	0.4	2/14
1.6	0.5	9/10

CV = 2.2 ± 0.2 mg/kg

Result	Uncer.	Date
1.2	0.4	10/20

CV = 2.5 ± 0.2 mg/kg

Result	Uncer.	Date
1.7	0.5	1/03

CV = 3.4 ± 0.3 mg/kg

Result	Uncer.	Date
1.5	0.5	6/19
2.6	0.8	9/30

CV = 3.5 ± 0.4 mg/kg

Result	Uncer.	Date
2.6	0.8	3/25

CV = 3.7 ± 0.4 mg/kg

Result	Uncer.	Date
3	0.9	10/20

CV = 4.2 ± 0.4 mg/kg

Result	Uncer.	Date
4.5	1.4	11/20

CV = 5.7 ± 0.6 mg/kg

Result	Uncer.	Date
4	1.2	10/05

CV = 6.5 ± 0.7 mg/kg

Result	Uncer.	Date
5	1.5	11/01

4-Chloroaniline 89GAU 01 GCMS

CV = 0.9 ± 0.09 mg/kg

Result	Uncer.	Date
< 0.33		10/13

CV = 1.6 ± 0.2 mg/kg

Result	Uncer.	Date
0.43	0.13	8/31
< 0.33		9/29

CV = 1.9 ± 0.2 mg/kg

Result	Uncer.	Date
0.63	0.19	9/10

CV = 2.1 ± 0.2 mg/kg

Result	Uncer.	Date
0.42	0.13	10/20

CV = 3.3 ± 0.3 mg/kg

Result	Uncer.	Date
< 0.33		6/19
0.84	0.25	9/30

CV = 3.5 ± 0.4 mg/kg

Result	Uncer.	Date
1	0.3	10/20

CV = 4.1 ± 0.4 mg/kg

Result	Uncer.	Date
0.39	0.12	11/20

CV = 5.1 ± 0.5 mg/kg

Result	Uncer.	Date
0.69	0.21	1/06

CV = 5.4 ± 0.5 mg/kg

Result	Uncer.	Date
1.5	0.5	10/05

CV = 6.2 ± 0.6 mg/kg

Result	Uncer.	Date
2.6	0.8	11/01

Chlorobenzene 89GAU 01 PTGC

CV = 109 ± 11 ug/kg

Result	Uncer.	Date
110	30	10/29

CV = 110 ± 11 ug/kg

Result	Uncer.	Date
130	40	11/03

Chlorobenzene (cont)

CV = 111 ± 11 ug/kg

Result	Uncer.	Date
130	40	11/30

CV = 113 ± 11 ug/kg

Result	Uncer.	Date
110	30	10/06

CV = 114 ± 11 ug/kg

Result	Uncer.	Date
130	40	9/21

CV = 115 ± 12 ug/kg

Result	Uncer.	Date
140	40	11/24

CV = 146 ± 15 ug/kg

Result	Uncer.	Date
130	40	9/18

CV = 155 ± 15 ug/kg

Result	Uncer.	Date
160	50	11/03

Chlorodibromomethane 89GAU 01 PTGC

CV = 114 ± 11 ug/kg

Result	Uncer.	Date
110	30	8/18

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
110	30	6/09

CV = 121 ± 12 ug/kg

Result	Uncer.	Date
160	50	10/29

CV = 122 ± 12 ug/kg

Result	Uncer.	Date
170	50	11/03

CV = 123 ± 12 ug/kg

Result	Uncer.	Date
180	50	11/30

CV = 124 ± 12 ug/kg

Result	Uncer.	Date
140	40	4/15

TABLE E-IV (cont)

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EM-9 Organics on Soil
(cont)

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Chlorodibromomethane (cont)

CV = 126 ± 13 ug/kg

Result	Uncer.	Date
210	60	10/06

CV = 127 ± 13 ug/kg

Result	Uncer.	Date
210	60	9/21

CV = 128 ± 13 ug/kg

Result	Uncer.	Date
290	90	11/24

CV = 137 ± 14 ug/kg

Result	Uncer.	Date
130	40	6/10

CV = 162 ± 16 ug/kg

Result	Uncer.	Date
150	50	9/18

CV = 172 ± 17 ug/kg

Result	Uncer.	Date
270	80	11/03

Chloroform
89GAU 01 PTGC

CV = 114 ± 11 ug/kg

Result	Uncer.	Date
110	30	8/18

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
110	30	6/09

CV = 125 ± 12 ug/kg

Result	Uncer.	Date
150	50	4/15

CV = 183 ± 18 ug/kg

Result	Uncer.	Date
130	40	6/10

2-Chloronaphthalene
89GAU 01 GCMS

CV = 0.99 ± 0.1 mg/kg

Result	Uncer.	Date
0.56	0.17	2/21
0.52	0.16	3/24

CV = 3.3 ± 0.3 mg/kg

Result	Uncer.	Date
1.9	0.6	2/14

CV = 4.3 ± 0.4 mg/kg

Result	Uncer.	Date
2.9	0.9	3/25

CV = 5.6 ± 0.6 mg/kg

Result	Uncer.	Date
3	0.9	2/14

CV = 5.94 ± 0.6 mg/kg

Result	Uncer.	Date
2.8	0.8	3/24

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o-Chlorophenol
89GAU 01 GCMS

CV = 1 ± 0.1 mg/kg

Result	Uncer.	Date
0.54	0.16	12/16

CV = 1.4 ± 0.1 mg/kg

Result	Uncer.	Date
1.1	0.3	12/15

CV = 1.5 ± 0.1 mg/kg

Result	Uncer.	Date
0.91	0.27	12/01

CV = 2.2 ± 0.2 mg/kg

Result	Uncer.	Date
1.2	0.4	2/14
1.3	0.4	11/04

CV = 2.7 ± 0.3 mg/kg

Result	Uncer.	Date
1.8	0.5	1/03
1.4	0.4	12/10

CV = 2.9 ± 0.3 mg/kg

Result	Uncer.	Date
1.2	0.4	12/03

o-Chlorophenol (cont)

CV = 3.4 ± 0.3 mg/kg

Result	Uncer.	Date
2.6	0.8	11/16

CV = 3.7 ± 0.4 mg/kg

Result	Uncer.	Date
2.1	0.6	12/01

CV = 3.8 ± 0.4 mg/kg

Result	Uncer.	Date
2.2	0.7	3/25

CV = 4.1 ± 0.4 mg/kg

Result	Uncer.	Date
2.6	0.8	11/18

CV = 4.4 ± 0.4 mg/kg

Result	Uncer.	Date
2.4	0.7	11/16

CV = 4.8 ± 0.5 mg/kg

Result	Uncer.	Date
3.2	1	12/01

CV = 5.1 ± 0.5 mg/kg

Result	Uncer.	Date
2.8	0.8	12/01

CV = 5.4 ± 0.5 mg/kg

Result	Uncer.	Date
1.7	0.5	12/02

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o-Chlorotoluene
89GAU 01 PTGC

CV = 85 ± 9 ug/kg

Result	Uncer.	Date
79	24	10/30

CV = 88 ± 9 ug/kg

Result	Uncer.	Date
120	40	11/03

CV = 92 ± 9 ug/kg

Result	Uncer.	Date
100	30	10/06

CV = 105 ± 10 ug/kg

Result	Uncer.	Date
110	30	4/15
83	25	8/18

o-Chlorotoluene (cont)

CV = 115 ± 12 ug/kg

Result	Uncer.	Date
120	40	10/23

CV = 117 ± 12 ug/kg

Result	Uncer.	Date
93	28	6/10
96	29	8/18
68	20	9/03
150	50	9/11
14	4	10/21
110	30	10/29
120	40	11/03

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
180	50	11/25

CV = 121 ± 12 ug/kg

Result	Uncer.	Date
96	29	2/06

CV = 123 ± 12 ug/kg

Result	Uncer.	Date
110	30	9/11
190	60	11/24

CV = 124 ± 12 ug/kg

Result	Uncer.	Date
170	50	9/21

CV = 129 ± 13 ug/kg

Result	Uncer.	Date
180	50	8/24

CV = 130 ± 13 ug/kg

Result	Uncer.	Date
90	27	1/31
120	40	2/06
110	30	6/09
68	20	10/27

CV = 131 ± 13 ug/kg

Result	Uncer.	Date
86	26	9/18

CV = 135 ± 13 ug/kg

Result	Uncer.	Date
160	50	9/21

CV = 139 ± 14 ug/kg

Result	Uncer.	Date
79	24	9/11

o-Chlorotoluene (cont)

CV = 140 ± 14 ug/kg

Result	Uncer.	Date
120	40	6/09

CV = 142 ± 14 ug/kg

Result	Uncer.	Date
140	40	2/06

CV = 143 ± 14 ug/kg

Result	Uncer.	Date
97	29	6/10
86	26	6/17

CV = 145 ± 14 ug/kg

Result	Uncer.	Date
110	30	10/27
150	50	10/27

CV = 149 ± 15 ug/kg

Result	Uncer.	Date
100	30	6/10

CV = 153 ± 15 ug/kg

Result	Uncer.	Date
150	50	11/03

CV = 155 ± 16 ug/kg

Result	Uncer.	Date
280	80	11/04

CV = 156 ± 16 ug/kg

Result	Uncer.	Date
130	40	2/06

CV = 160 ± 16 ug/kg

Result	Uncer.	Date
120	40	2/11
230	70	9/21

CV = 161 ± 16 ug/kg

Result	Uncer.	Date
140	40	9/14

CV = 163 ± 16 ug/kg

Result	Uncer.	Date
190	60	11/30

CV = 169 ± 17 ug/kg

Result	Uncer.	Date
200	60	10/23

o-Chlorotoluene (cont)

CV = 180 ± 18 ug/kg

Result	Uncer.	Date
150	50	10/26
53	16	11/03

---

p-Chlorotoluene
89GAU 01 PTGC

CV = 99 ± 10 ug/kg

Result	Uncer.	Date
62	19	6/10

CV = 118 ± 12 ug/kg

Result	Uncer.	Date
98	29	9/14

CV = 129 ± 13 ug/kg

Result	Uncer.	Date
58	17	10/27

CV = 155 ± 16 ug/kg

Result	Uncer.	Date
210	60	9/11
25	8	10/21

CV = 172 ± 17 ug/kg

Result	Uncer.	Date
160	50	10/23

CV = 183 ± 18 ug/kg

Result	Uncer.	Date
140	40	2/06

CV = 190 ± 19 ug/kg

Result	Uncer.	Date
120	40	1/31

Chrysene
89GAU 01 GCMS

CV = 0.8 ± 0.08 mg/kg

Result	Uncer.	Date
0.77	0.23	10/13

CV = 1.6 ± 0.2 mg/kg

Result	Uncer.	Date
1.2	0.4	8/31
1.1	0.3	9/29

CV = 1.8 ± 0.2 mg/kg

Result	Uncer.	Date
1.3	0.4	9/10

TABLE E-IV (cont)

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EM-9 Organics on Soil
(cont)

****

Chrysene (cont)

CV = 2 ± 0.2 mg/kg

Result	Uncer.	Date
1.4	0.4	10/20

CV = 3.1 ± 0.3 mg/kg

Result	Uncer.	Date
1.1	0.3	6/19
< 0.33		9/30

CV = 3.4 ± 0.3 mg/kg

Result	Uncer.	Date
3.1	0.9	10/20

CV = 3.9 ± 0.4 mg/kg

Result	Uncer.	Date
3.9	1.2	11/20

CV = 5.2 ± 0.5 mg/kg

Result	Uncer.	Date
3.4	1	10/05

CV = 6 ± 0.6 mg/kg

Result	Uncer.	Date
8	2.4	11/01

Di-n-octyl phthalate 89GAU 01 GCMS

CV = 5.2 ± 0.5 mg/kg

Result	Uncer.	Date
2.7	0.8	1/06

Dibenzofuran 89GAU 01 GCMS

CV = 0.89 ± 0.09 mg/kg

Result	Uncer.	Date
0.56	0.17	12/16

CV = 1.2 ± 0.1 mg/kg

Result	Uncer.	Date
1	0.3	12/15

CV = 1.3 ± 0.1 mg/kg

Result	Uncer.	Date
0.91	0.27	12/01

Dibenzofuran (cont)

CV = 2 ± 0.2 mg/kg

Result	Uncer.	Date
1.3	0.4	11/04

CV = 2.4 ± 0.2 mg/kg

Result	Uncer.	Date
1.1	0.3	12/10

CV = 2.5 ± 0.2 mg/kg

Result	Uncer.	Date
1.6	0.5	12/03

CV = 3 ± 0.3 mg/kg

Result	Uncer.	Date
2.2	0.7	11/16

CV = 3.3 ± 0.3 mg/kg

Result	Uncer.	Date
2.5	0.8	12/01

CV = 3.6 ± 0.4 mg/kg

Result	Uncer.	Date
2.5	0.8	11/18

CV = 3.9 ± 0.4 mg/kg

Result	Uncer.	Date
2.4	0.7	11/16

CV = 4.2 ± 0.4 mg/kg

Result	Uncer.	Date
3.1	0.9	12/01

CV = 4.4 ± 0.4 mg/kg

Result	Uncer.	Date
2.3	0.7	12/01

CV = 4.7 ± 0.5 mg/kg

Result	Uncer.	Date
2.3	0.7	12/02

1,2-Dibromo-3-chloropropane 89GAU 01 PTGC

CV = 103 ± 10 ug/kg

Result	Uncer.	Date
64	19	10/29

CV = 105 ± 10 ug/kg

Result	Uncer.	Date
120	40	11/03
180	50	11/30

1,2-Dibromo-3-chloropropane (cont)

CV = 107 ± 11 ug/kg

Result	Uncer.	Date
170	50	10/06

CV = 108 ± 11 ug/kg

Result	Uncer.	Date
120	40	9/21

CV = 109 ± 11 ug/kg

Result	Uncer.	Date
170	50	11/24

CV = 138 ± 14 ug/kg

Result	Uncer.	Date
240	70	9/18

CV = 147 ± 15 ug/kg

Result	Uncer.	Date
280	80	11/03

Dibromomethane 89GAU 01 PTGC

CV = 135 ± 14 ug/kg

Result	Uncer.	Date
200	60	9/11

CV = 148 ± 15 ug/kg

Result	Uncer.	Date
75	23	10/21

CV = 161 ± 16 ug/kg

Result	Uncer.	Date
130	40	10/27

---

o-Dichlorobenzene (1,2) 89GAU 01 GCMS

CV = 0.9 ± 0.09 mg/kg

Result	Uncer.	Date
< 0.33		10/13

CV = 1.7 ± 0.2 mg/kg

Result	Uncer.	Date
0.82	0.25	8/31
0.97	0.29	9/29

CV = 2 ± 0.2 mg/kg

Result	Uncer.	Date
1.3	0.4	9/10

o-Dichlorobenzene (1,2) (cont)

CV = 2.1 ± 0.2 mg/kg

Result	Uncer.	Date
0.84	0.25	10/20

CV = 3.4 ± 0.3 mg/kg

Result	Uncer.	Date
1.1	0.3	6/19
1.9	0.6	9/30

CV = 3.7 ± 0.4 mg/kg

Result	Uncer.	Date
2.8	0.8	10/20

CV = 4.2 ± 0.4 mg/kg

Result	Uncer.	Date
2.6	0.8	11/20

CV = 5.6 ± 0.6 mg/kg

Result	Uncer.	Date
2.3	0.7	10/05

CV = 6.5 ± 0.6 mg/kg

Result	Uncer.	Date
4.3	1.3	11/01

---

m-Dichlorobenzene (1,3) 89GAU 01 GCMS

CV = 1.16 ± 0.1 mg/kg

Result	Uncer.	Date
0.52	0.16	5/04

CV = 1.9 ± 0.2 mg/kg

Result	Uncer.	Date
0.78	0.23	5/13
0.84	0.25	8/19

CV = 2.3 ± 0.2 mg/kg

Result	Uncer.	Date
0.94	0.28	4/15

CV = 2.7 ± 0.3 mg/kg

Result	Uncer.	Date
1.6	0.5	8/19

CV = 3.1 ± 0.3 mg/kg

Result	Uncer.	Date
1.9	0.6	7/21

CV = 5 ± 0.5 mg/kg

Result	Uncer.	Date
2.3	0.7	6/09
1.8	0.5	7/06

m-Dichlorobenzene (1,3) (cont)

CV = 5.4 ± 0.5 mg/kg

Result	Uncer.	Date
2.9	0.9	6/24

CV = 6.2 ± 0.6 mg/kg

Result	Uncer.	Date
2.6	0.8	4/28

---

m-Dichlorobenzene (1,3) 89GAU 01 PTGC

CV = 97 ± 10 ug/kg

Result	Uncer.	Date
89	27	10/06

CV = 129 ± 13 ug/kg

Result	Uncer.	Date
120	40	2/06

CV = 136 ± 14 ug/kg

Result	Uncer.	Date
78	23	9/03

CV = 137 ± 14 ug/kg

Result	Uncer.	Date
130	40	10/29

CV = 141 ± 14 ug/kg

Result	Uncer.	Date
150	50	11/03

CV = 142 ± 14 ug/kg

Result	Uncer.	Date
140	40	2/06

CV = 143 ± 14 ug/kg

Result	Uncer.	Date
91	27	9/18

CV = 157 ± 16 ug/kg

Result	Uncer.	Date
150	50	11/03

CV = 160 ± 16 ug/kg

Result	Uncer.	Date
160	50	2/06

CV = 173 ± 17 ug/kg

Result	Uncer.	Date
260	80	11/04

m-Dichlorobenzene (1,3) (cont)

CV = 177 ± 18 ug/kg

Result	Uncer.	Date
190	60	9/21

---

p-Dichlorobenzene (1,4) 89GAU 01 GCMS

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
90	27	1/31

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p-Dichlorobenzene (1,4) 89GAU 01 PTGC

CV = 86 ± 9 ug/kg

Result	Uncer.	Date
75	23	10/30

CV = 90 ± 9 ug/kg

Result	Uncer.	Date
100	30	11/03

CV = 93 ± 9 ug/kg

Result	Uncer.	Date
75	23	10/06

CV = 102 ± 10 ug/kg

Result	Uncer.	Date
93	28	4/15

CV = 103 ± 10 ug/kg

Result	Uncer.	Date
53	16	8/18

CV = 110 ± 11 ug/kg

Result	Uncer.	Date
90	27	10/23

CV = 111 ± 11 ug/kg

Result	Uncer.	Date
100	30	2/06
19	6	10/21

CV = 112 ± 11 ug/kg

Result	Uncer.	Date
130	40	9/11

CV = 114 ± 11 ug/kg

Result	Uncer.	Date
62	19	6/10
62	19	8/18

TABLE E-IV (cont)

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EM-9 Organics on Soil
(cont)

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p-Dichlorobenzene (1,4) (cont)

CV = 117 ± 12 ug/kg

Result	Uncer.	Date
92	28	9/11

CV = 118 ± 12 ug/kg

Result	Uncer.	Date
97	29	10/29

CV = 119 ± 12 ug/kg

Result	Uncer.	Date
62	19	9/03
110	30	11/03

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
130	40	2/06

CV = 124 ± 12 ug/kg

Result	Uncer.	Date
46	14	10/27

CV = 125 ± 12 ug/kg

Result	Uncer.	Date
140	40	11/24

CV = 126 ± 13 ug/kg

Result	Uncer.	Date
120	40	9/21

CV = 129 ± 13 ug/kg

Result	Uncer.	Date
110	30	11/25

CV = 130 ± 13 ug/kg

Result	Uncer.	Date
140	40	2/06
85	26	6/09

CV = 131 ± 13 ug/kg

Result	Uncer.	Date
140	40	8/24

CV = 133 ± 13 ug/kg

Result	Uncer.	Date
74	22	9/11
79	24	9/18

p-Dichlorobenzene (1,4) (cont)

CV = 136 ± 14 ug/kg

Result	Uncer.	Date
120	40	9/21

CV = 138 ± 14 ug/kg

Result	Uncer.	Date
81	24	10/27
90	27	10/27

CV = 140 ± 14 ug/kg

Result	Uncer.	Date
97	29	6/09
61	18	6/10
65	20	6/17

CV = 142 ± 14 ug/kg

Result	Uncer.	Date
79	24	6/10

CV = 143 ± 14 ug/kg

Result	Uncer.	Date
130	40	2/06

CV = 147 ± 15 ug/kg

Result	Uncer.	Date
120	40	2/11

CV = 154 ± 15 ug/kg

Result	Uncer.	Date
110	30	9/14

CV = 155 ± 15 ug/kg

Result	Uncer.	Date
130	40	11/03

CV = 157 ± 16 ug/kg

Result	Uncer.	Date
200	60	11/04

CV = 161 ± 16 ug/kg

Result	Uncer.	Date
140	40	10/23

CV = 162 ± 16 ug/kg

Result	Uncer.	Date
160	50	9/21

CV = 165 ± 17 ug/kg

Result	Uncer.	Date
190	60	11/30

p-Dichlorobenzene (1,4) (cont)

CV = 183 ± 18 ug/kg

Result	Uncer.	Date
130	40	10/26
45	14	11/03

1,1-Dichloroethane
89GAU 01 PTGC

CV = 99 ± 10 ug/kg

Result	Uncer.	Date
200	60	9/11

CV = 108 ± 11 ug/kg

Result	Uncer.	Date
62	19	10/21

CV = 118 ± 12 ug/kg

Result	Uncer.	Date
140	40	10/27

CV = 184 ± 18 ug/kg

Result	Uncer.	Date
140	40	2/06

CV = 190 ± 19 ug/kg

Result	Uncer.	Date
120	40	1/31

1,2-Dichloroethane
89GAU 01 PTGC

CV = 104 ± 10 ug/kg

Result	Uncer.	Date
140	40	10/29

CV = 106 ± 11 ug/kg

Result	Uncer.	Date
140	40	11/03
140	40	11/30

CV = 108 ± 11 ug/kg

Result	Uncer.	Date
180	50	10/06

CV = 109 ± 11 ug/kg

Result	Uncer.	Date
180	50	9/21

CV = 110 ± 11 ug/kg

Result	Uncer.	Date
99	30	6/09
220	70	11/24

1,2-Dichloroethane (cont)

CV = 113 ± 11 ug/kg

Result	Uncer.	Date
110	30	8/18

CV = 124 ± 12 ug/kg

Result	Uncer.	Date
160	50	4/15

CV = 137 ± 14 ug/kg

Result	Uncer.	Date
130	40	6/10

CV = 139 ± 14 ug/kg

Result	Uncer.	Date
180	50	9/18

CV = 148 ± 15 ug/kg

Result	Uncer.	Date
240	70	11/03

1,1-Dichloroethene
89GAU 01 PTGC

CV = 70 ± 7 ug/kg

Result	Uncer.	Date
100	30	10/06

CV = 98 ± 10 ug/kg

Result	Uncer.	Date
140	40	9/03

CV = 99 ± 10 ug/kg

Result	Uncer.	Date
160	50	10/29

CV = 102 ± 10 ug/kg

Result	Uncer.	Date
200	60	11/03

CV = 103 ± 10 ug/kg

Result	Uncer.	Date
110	30	9/18

CV = 113 ± 11 ug/kg

Result	Uncer.	Date
170	50	11/03

CV = 125 ± 12 ug/kg

Result	Uncer.	Date
190	60	11/04

1,1-Dichloroethene (cont)

CV = 128 ± 13 ug/kg

Result	Uncer.	Date
160	50	9/21

cis-1,2-Dichloroethylene
89GAU 01 PTGC

CV = 105 ± 11 ug/kg

Result	Uncer.	Date
170	50	10/29

CV = 107 ± 11 ug/kg

Result	Uncer.	Date
140	40	11/03

CV = 108 ± 11 ug/kg

Result	Uncer.	Date
130	40	11/30

CV = 110 ± 11 ug/kg

Result	Uncer.	Date
160	50	10/06

CV = 111 ± 11 ug/kg

Result	Uncer.	Date
170	50	9/21

CV = 112 ± 11 ug/kg

Result	Uncer.	Date
210	60	11/24

CV = 141 ± 14 ug/kg

Result	Uncer.	Date
150	50	9/18

CV = 150 ± 15 ug/kg

Result	Uncer.	Date
200	60	11/03

2,4-Dichlorophenol
89GAU 01 GCMS

CV = 1.1 ± 0.1 mg/kg

Result	Uncer.	Date
0.64	0.19	2/21
0.51	0.15	3/24
0.67	0.2	4/28

CV = 1.4 ± 0.1 mg/kg

Result	Uncer.	Date
0.67	0.2	6/09

2,4-Dichlorophenol (cont)

CV = 1.5 ± 0.2 mg/kg

Result	Uncer.	Date
0.73	0.22	7/02

CV = 2.95 ± 0.3 mg/kg

Result	Uncer.	Date
1.9	0.6	5/05

CV = 3.5 ± 0.4 mg/kg

Result	Uncer.	Date
1.9	0.6	2/14

CV = 3.6 ± 0.4 mg/kg

Result	Uncer.	Date
2.9	0.9	7/21

CV = 4.6 ± 0.5 mg/kg

Result	Uncer.	Date
3	0.9	3/25

CV = 4.7 ± 0.5 mg/kg

Result	Uncer.	Date
2.1	0.6	5/13
2.9	0.9	8/19

CV = 5.4 ± 0.5 mg/kg

Result	Uncer.	Date
3.8	1.1	7/21

CV = 5.8 ± 0.6 mg/kg

Result	Uncer.	Date
3.1	0.9	4/15

CV = 6 ± 0.6 mg/kg

Result	Uncer.	Date
2.9	0.9	2/14

CV = 6.36 ± 0.6 mg/kg

Result	Uncer.	Date
2.7	0.8	3/24

1,2-Dichloropropane
89GAU 01 PTGC

CV = 142 ± 14 ug/kg

Result	Uncer.	Date
200	60	9/11

CV = 156 ± 16 ug/kg

Result	Uncer.	Date
55	17	10/21

TABLE E-IV (cont)

****

EM-9 Organics on Soil
(cont)

****

1,2-Dichloropropane (cont)

CV = 170 ± 17 ug/kg

Result	Uncer.	Date
140	40	10/27

1,3-Dichloropropane 89GAU 01 PTGC

CV = 105 ± 10 ug/kg

Result	Uncer.	Date
67	20	6/10

CV = 116 ± 12 ug/kg

Result	Uncer.	Date
150	50	2/06

CV = 125 ± 13 ug/kg

Result	Uncer.	Date
140	40	9/14

CV = 128 ± 13 ug/kg

Result	Uncer.	Date
160	50	2/06

CV = 136 ± 14 ug/kg

Result	Uncer.	Date
90	27	10/27

CV = 140 ± 14 ug/kg

Result	Uncer.	Date
200	60	2/06

CV = 164 ± 16 ug/kg

Result	Uncer.	Date
< 5		9/11
140	40	10/21

CV = 182 ± 18 ug/kg

Result	Uncer.	Date
220	70	10/23

2,2-Dichloropropane 89GAU 01 PTGC

CV = 162 ± 16 ug/kg

Result	Uncer.	Date
250	80	11/25

Diethyl phthalate 89GAU 01 GCMS

CV = 0.98 ± 0.1 mg/kg

Result	Uncer.	Date
0.78	0.23	5/04

CV = 1.6 ± 0.2 mg/kg

Result	Uncer.	Date
1.2	0.4	5/13
1.4	0.4	8/19

CV = 2 ± 0.2 mg/kg

Result	Uncer.	Date
1.7	0.5	4/15

CV = 2.3 ± 0.2 mg/kg

Result	Uncer.	Date
2	0.6	8/19

CV = 2.6 ± 0.3 mg/kg

Result	Uncer.	Date
2.1	0.6	7/21

CV = 4.2 ± 0.4 mg/kg

Result	Uncer.	Date
3.2	1	6/09
2.5	0.8	7/06

CV = 4.6 ± 0.5 mg/kg

Result	Uncer.	Date
3.8	1.1	6/24

CV = 5.2 ± 0.5 mg/kg

Result	Uncer.	Date
2.7	0.8	4/28

2,4-Dimethylphenol 89GAU 01 GCMS

CV = 0.86 ± 0.1 mg/kg

Result	Uncer.	Date
0.41	0.12	5/04

CV = 1.4 ± 0.1 mg/kg

Result	Uncer.	Date
0.49	0.15	5/13
< 0.33		8/19

CV = 1.7 ± 0.2 mg/kg

Result	Uncer.	Date
0.93	0.28	4/15

2,4-Dimethylphenol (cont)

CV = 2 ± 0.2 mg/kg

Result	Uncer.	Date
0.48	0.14	8/19

CV = 2.3 ± 0.2 mg/kg

Result	Uncer.	Date
1	0.3	7/21

CV = 3.7 ± 0.4 mg/kg

Result	Uncer.	Date
2.1	0.6	6/09
1.8	0.5	7/06

CV = 4 ± 0.4 mg/kg

Result	Uncer.	Date
1.6	0.5	6/24

CV = 4.6 ± 0.5 mg/kg

Result	Uncer.	Date
1.9	0.6	4/28

CV = 5.4 ± 0.5 mg/kg

Result	Uncer.	Date
2.8	0.8	1/06

2,4-Dinitrophenol 89GAU 01 GCMS

CV = 0.9 ± 0.09 mg/kg

Result	Uncer.	Date
0.49	0.15	10/13

CV = 1.6 ± 0.2 mg/kg

Result	Uncer.	Date
< 0.33		8/31
< 0.33		9/29

CV = 1.9 ± 0.2 mg/kg

Result	Uncer.	Date
0.64	0.19	9/10

CV = 2 ± 0.2 mg/kg

Result	Uncer.	Date
< 0.33		10/20

CV = 3.2 ± 0.3 mg/kg

Result	Uncer.	Date
< 0.33		6/19
0.99	0.3	9/30

CV = 3.5 ± 0.3 mg/kg

Result	Uncer.	Date
2.2	0.7	10/20

2,4-Dinitrophenol (cont)

CV = 4 ± 0.4 mg/kg

Result	Uncer.	Date
4.2	1.3	11/20

CV = 5.4 ± 0.5 mg/kg

Result	Uncer.	Date
2.6	0.8	10/05

CV = 6.2 ± 0.6 mg/kg

Result	Uncer.	Date
2.5	0.8	11/01

2,4-Dinitrotoluene 89GAU 01 GCMS

CV = 1.3 ± 0.1 mg/kg

Result	Uncer.	Date
0.59	0.18	12/16

CV = 1.8 ± 0.2 mg/kg

Result	Uncer.	Date
1.1	0.3	12/15

CV = 1.9 ± 0.2 mg/kg

Result	Uncer.	Date
1.2	0.4	12/01

CV = 2.9 ± 0.3 mg/kg

Result	Uncer.	Date
1.7	0.5	11/04

CV = 3.5 ± 0.3 mg/kg

Result	Uncer.	Date
1.6	0.5	12/10

CV = 3.7 ± 0.4 mg/kg

Result	Uncer.	Date
2	0.6	12/03

CV = 4.4 ± 0.4 mg/kg

Result	Uncer.	Date
3	0.9	11/16

CV = 4.8 ± 0.5 mg/kg

Result	Uncer.	Date
3.4	1	12/01

CV = 5.2 ± 0.5 mg/kg

Result	Uncer.	Date
3.6	1.1	11/18

2,4-Dinitrotoluene (cont)

CV = 5.7 ± 0.6 mg/kg

Result	Uncer.	Date
3.7	1.1	11/16

CV = 6.1 ± 0.6 mg/kg

Result	Uncer.	Date
4.4	1.3	12/01

CV = 6.5 ± 0.7 mg/kg

Result	Uncer.	Date
3.8	1.1	12/01

CV = 7 ± 0.7 mg/kg

Result	Uncer.	Date
3.8	1.1	12/02

Ethylbenzene 89GAU 01 PTGC

CV = 104 ± 10 ug/kg

Result	Uncer.	Date
110	30	10/29

CV = 106 ± 11 ug/kg

Result	Uncer.	Date
< 5		11/03
120	40	11/30

CV = 108 ± 11 ug/kg

Result	Uncer.	Date
86	26	6/17
110	30	10/06

CV = 109 ± 11 ug/kg

Result	Uncer.	Date
130	40	9/21

CV = 110 ± 11 ug/kg

Result	Uncer.	Date
130	40	11/24

CV = 122 ± 12 ug/kg

Result	Uncer.	Date
84	25	6/10

CV = 139 ± 14 ug/kg

Result	Uncer.	Date
120	40	9/18

CV = 148 ± 15 ug/kg

Result	Uncer.	Date
120	40	8/18
160	50	11/03

Ethylbenzene (cont)

CV = 160 ± 16 ug/kg

Result	Uncer.	Date
140	40	6/09

Ethylene dibromide 89GAU 01 PTGC

CV = 174 ± 17 ug/kg

Result	Uncer.	Date
340	100	11/25

Fluorene 89GAU 01 GCMS

CV = 1.3 ± 0.1 mg/kg

Result	Uncer.	Date
1.2	0.4	10/13

CV = 1.4 ± 0.1 mg/kg

Result	Uncer.	Date
1.1	0.3	10/23

CV = 1.7 ± 0.2 mg/kg

Result	Uncer.	Date
1.6	0.5	10/20

CV = 2.1 ± 0.2 mg/kg

Result	Uncer.	Date
1.7	0.5	8/17

CV = 2.3 ± 0.2 mg/kg

Result	Uncer.	Date
2	0.6	9/23

CV = 2.7 ± 0.3 mg/kg

Result	Uncer.	Date
2.1	0.6	9/10

CV = 3.6 ± 0.4 mg/kg

Result	Uncer.	Date
2.6	0.8	9/03

CV = 3.9 ± 0.4 mg/kg

Result	Uncer.	Date
2.7	0.8	8/31

CV = 4.2 ± 0.4 mg/kg

Result	Uncer.	Date
3.4	1	10/05

TABLE E-IV (cont)

****

EM-9 Organics on Soil
(cont)

****

Fluorene (cont)

CV = 4.8 ± 0.5 mg/kg

Result	Uncer.	Date
3.9	1.2	9/16

CV = 5.4 ± 0.5 mg/kg

Result	Uncer.	Date
3.7	1.1	8/31

Hexachlorobenzene 89GAU 01 GCMS

CV = 1.3 ± 0.1 mg/kg

Result	Uncer.	Date
1.2	0.4	10/13

CV = 1.4 ± 0.1 mg/kg

Result	Uncer.	Date
1.1	0.3	10/23

CV = 1.8 ± 0.2 mg/kg

Result	Uncer.	Date
1.6	0.5	10/20

CV = 2.1 ± 0.2 mg/kg

Result	Uncer.	Date
1.7	0.5	8/17

CV = 2.4 ± 0.2 mg/kg

Result	Uncer.	Date
2.3	0.7	9/23

CV = 2.8 ± 0.3 mg/kg

Result	Uncer.	Date
2.1	0.6	9/10

CV = 3.7 ± 0.4 mg/kg

Result	Uncer.	Date
2.8	0.8	9/03

CV = 4 ± 0.4 mg/kg

Result	Uncer.	Date
2.7	0.8	8/31

CV = 4.3 ± 0.4 mg/kg

Result	Uncer.	Date
3.5	1.1	10/05

Hexachlorobenzene (cont)

CV = 4.9 ± 0.5 mg/kg

Result	Uncer.	Date
4.6	1.4	9/16

CV = 5.5 ± 0.6 mg/kg

Result	Uncer.	Date
4.7	1.4	8/31

Hexachlorobutadiene 89GAU 01 GCMS

CV = 1.5 ± 0.2 mg/kg

Result	Uncer.	Date
1.1	0.3	10/13

CV = 1.7 ± 0.2 mg/kg

Result	Uncer.	Date
0.89	0.27	10/23

CV = 2.1 ± 0.2 mg/kg

Result	Uncer.	Date
1.2	0.4	10/20

CV = 2.5 ± 0.3 mg/kg

Result	Uncer.	Date
1.4	0.4	8/17

CV = 2.8 ± 0.3 mg/kg

Result	Uncer.	Date
1.9	0.6	9/23

CV = 3.3 ± 0.3 mg/kg

Result	Uncer.	Date
2.1	0.6	9/10

CV = 4.4 ± 0.4 mg/kg

Result	Uncer.	Date
3	0.9	9/03

CV = 4.7 ± 0.5 mg/kg

Result	Uncer.	Date
2.1	0.6	8/31

CV = 5.1 ± 0.5 mg/kg

Result	Uncer.	Date
2.5	0.8	10/05

CV = 5.8 ± 0.6 mg/kg

Result	Uncer.	Date
4	1.2	9/16

Hexachlorobutadiene (cont)

CV = 6.5 ± 0.7 mg/kg

Result	Uncer.	Date
3.2	1	8/31

Hexachloroethane 89GAU 01 GCMS

CV = 1 ± 0.1 mg/kg

Result	Uncer.	Date
0.37	0.11	2/21
0.34	0.1	3/24

CV = 1.11 ± 0.1 mg/kg

Result	Uncer.	Date
0.44	0.13	5/04

CV = 1.8 ± 0.2 mg/kg

Result	Uncer.	Date
< 0.33		5/13
0.72	0.22	8/19

CV = 2.2 ± 0.2 mg/kg

Result	Uncer.	Date
0.88	0.26	4/15

CV = 2.6 ± 0.3 mg/kg

Result	Uncer.	Date
1.4	0.4	8/19

CV = 3 ± 0.3 mg/kg

Result	Uncer.	Date
1.8	0.5	7/21

CV = 3.3 ± 0.3 mg/kg

Result	Uncer.	Date
1.3	0.4	2/14

CV = 4.3 ± 0.4 mg/kg

Result	Uncer.	Date
1.5	0.5	3/25

CV = 4.8 ± 0.5 mg/kg

Result	Uncer.	Date
2.3	0.7	6/09
1.7	0.5	7/06

CV = 5.2 ± 0.5 mg/kg

Result	Uncer.	Date
2.9	0.9	6/24

CV = 5.7 ± 0.6 mg/kg

Result	Uncer.	Date
1.7	0.5	2/14

Hexachloroethane (cont)

CV = 5.9 ± 0.6 mg/kg

Result	Uncer.	Date
2.4	0.7	4/28

CV = 6 ± 0.6 mg/kg

Result	Uncer.	Date
1.7	0.5	3/24

2-Hexanone 89GAU 01 PTGC

CV = 80 ± 8 ug/kg

Result	Uncer.	Date
55	17	10/30

CV = 83 ± 8 ug/kg

Result	Uncer.	Date
58	17	11/03

CV = 86 ± 9 ug/kg

Result	Uncer.	Date
66	20	10/06

CV = 106 ± 11 ug/kg

Result	Uncer.	Date
66	20	4/15
100	30	8/18

CV = 110 ± 11 ug/kg

Result	Uncer.	Date
49	15	9/03
40	12	10/29
79	24	11/03

CV = 116 ± 12 ug/kg

Result	Uncer.	Date
90	27	2/06
61	18	9/21
98	29	10/23
75	23	11/24

CV = 118 ± 12 ug/kg

Result	Uncer.	Date
120	40	6/10
100	30	8/18
200	60	9/11
< 20		10/21

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
97	29	2/06

CV = 121 ± 12 ug/kg

Result	Uncer.	Date
66	20	8/24

2-Hexanone (cont)

CV = 122 ± 12 ug/kg

Result	Uncer.	Date
95	29	11/25

CV = 123 ± 12 ug/kg

Result	Uncer.	Date
120	40	9/18

CV = 124 ± 12 ug/kg

Result	Uncer.	Date
72	22	9/11

CV = 127 ± 13 ug/kg

Result	Uncer.	Date
81	24	9/21

CV = 130 ± 13 ug/kg

Result	Uncer.	Date
67	20	1/31
72	22	6/09

CV = 131 ± 13 ug/kg

Result	Uncer.	Date
49	15	10/27

CV = 135 ± 14 ug/kg

Result	Uncer.	Date
100	30	2/06

CV = 140 ± 14 ug/kg

Result	Uncer.	Date
86	26	6/09

CV = 141 ± 14 ug/kg

Result	Uncer.	Date
99	30	9/11

CV = 144 ± 14 ug/kg

Result	Uncer.	Date
89	27	6/10
120	40	11/03

CV = 145 ± 14 ug/kg

Result	Uncer.	Date
140	40	6/17

CV = 146 ± 15 ug/kg

Result	Uncer.	Date
79	24	10/27
91	27	10/27
110	30	11/04

2-Hexanone (cont)

CV = 149 ± 15 ug/kg

Result	Uncer.	Date
130	40	2/06

CV = 150 ± 15 ug/kg

Result	Uncer.	Date
66	20	6/10

CV = 151 ± 15 ug/kg

Result	Uncer.	Date
130	40	9/21

CV = 153 ± 15 ug/kg

Result	Uncer.	Date
140	40	2/11
110	30	11/30

CV = 163 ± 16 ug/kg

Result	Uncer.	Date
110	30	9/14

CV = 169 ± 17 ug/kg

Result	Uncer.	Date
100	30	10/26
92	28	11/03

CV = 170 ± 17 ug/kg

Result	Uncer.	Date
180	50	10/23

Isophorone 89GAU 01 GCMS

CV = 2.04 ± 0.2 mg/kg

Result	Uncer.	Date
2.3	0.7	12/16

CV = 2.6 ± 0.3 mg/kg

Result	Uncer.	Date
1.7	0.5	12/03

CV = 3 ± 0.3 mg/kg

Result	Uncer.	Date
2.8	0.8	11/16

CV = 3.5 ± 0.3 mg/kg

Result	Uncer.	Date
2.8	0.8	11/04

TABLE E-IV (cont)

****

EM-9 Organics on Soil
(cont)

****

Isophorone (cont)

CV = 4.1 ± 0.4 mg/kg

Result	Uncer.	Date
3.2	1	11/16
3.5	1.1	12/01
2.5	0.8	12/02

CV = 4.4 ± 0.4 mg/kg

Result	Uncer.	Date
3.7	1.1	11/16

Isopropylbenzene
89GAU 01 PTGC

CV = 149 ± 15 ug/kg

Result	Uncer.	Date
110	30	11/25

4-Methyl-2-pentanone
89GAU 01 PTGC

CV = 81 ± 8 ug/kg

Result	Uncer.	Date
100	30	10/30

CV = 84 ± 8 ug/kg

Result	Uncer.	Date
99	30	11/03

CV = 87 ± 9 ug/kg

Result	Uncer.	Date
120	40	10/06

CV = 106 ± 11 ug/kg

Result	Uncer.	Date
140	40	10/23

CV = 107 ± 11 ug/kg

Result	Uncer.	Date
160	50	9/11
71	21	10/21

CV = 111 ± 11 ug/kg

Result	Uncer.	Date
73	22	10/29

CV = 112 ± 11 ug/kg

Result	Uncer.	Date
82	25	9/03
140	40	11/03

4-Methyl-2-pentanone (cont)

CV = 113 ± 11 ug/kg

Result	Uncer.	Date
94	28	9/11

CV = 116 ± 12 ug/kg

Result	Uncer.	Date
110	30	4/15
120	40	8/18

CV = 117 ± 12 ug/kg

Result	Uncer.	Date
130	40	2/06

CV = 118 ± 12 ug/kg

Result	Uncer.	Date
120	40	9/21
160	50	11/24
180	50	11/25

CV = 119 ± 12 ug/kg

Result	Uncer.	Date
84	25	10/27

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
160	50	2/06

CV = 123 ± 12 ug/kg

Result	Uncer.	Date
120	40	8/24

CV = 125 ± 12 ug/kg

Result	Uncer.	Date
150	50	9/18

CV = 128 ± 13 ug/kg

Result	Uncer.	Date
94	28	9/11
140	40	9/21

CV = 129 ± 13 ug/kg

Result	Uncer.	Date
110	30	8/18

CV = 130 ± 13 ug/kg

Result	Uncer.	Date
100	30	1/31
130	40	6/10

CV = 133 ± 13 ug/kg

Result	Uncer.	Date
130	40	10/27
140	40	10/27

4-Methyl-2-pentanone (cont)

CV = 136 ± 14 ug/kg

Result	Uncer.	Date
78	23	6/10

CV = 137 ± 14 ug/kg

Result	Uncer.	Date
170	50	2/06

CV = 140 ± 14 ug/kg

Result	Uncer.	Date
100	30	6/09

CV = 146 ± 15 ug/kg

Result	Uncer.	Date
210	60	11/03

CV = 148 ± 15 ug/kg

Result	Uncer.	Date
170	50	9/14
200	60	11/04

CV = 150 ± 15 ug/kg

Result	Uncer.	Date
190	60	2/06

CV = 153 ± 15 ug/kg

Result	Uncer.	Date
230	70	9/21

CV = 154 ± 15 ug/kg

Result	Uncer.	Date
190	60	2/11

CV = 155 ± 15 ug/kg

Result	Uncer.	Date
250	80	10/23
210	60	11/30

CV = 158 ± 16 ug/kg

Result	Uncer.	Date
100	30	6/10

CV = 159 ± 16 ug/kg

Result	Uncer.	Date
130	40	6/17

CV = 160 ± 16 ug/kg

Result	Uncer.	Date
130	40	6/09

4-Methyl-2-pentanone (cont)

CV = 172 ± 17 ug/kg

Result	Uncer.	Date
160	50	10/26
190	60	11/03

2-Methyl-4,6-dinitrophenol
89GAU 01 GCMS

CV = 0.96 ± 0.1 mg/kg

Result	Uncer.	Date
< 0.33		12/16

CV = 1.3 ± 0.1 mg/kg

Result	Uncer.	Date
0.66	0.2	12/15

CV = 1.4 ± 0.1 mg/kg

Result	Uncer.	Date
0.75	0.23	12/01

CV = 2.1 ± 0.2 mg/kg

Result	Uncer.	Date
1.1	0.3	11/04

CV = 2.6 ± 0.3 mg/kg

Result	Uncer.	Date
1	0.3	12/10

CV = 2.7 ± 0.3 mg/kg

Result	Uncer.	Date
0.64	0.19	12/03

CV = 3.2 ± 0.3 mg/kg

Result	Uncer.	Date
1.8	0.5	11/16

CV = 3.5 ± 0.4 mg/kg

Result	Uncer.	Date
2.3	0.7	12/01

CV = 3.8 ± 0.4 mg/kg

Result	Uncer.	Date
2.2	0.7	11/18

CV = 4.2 ± 0.4 mg/kg

Result	Uncer.	Date
3.1	0.9	11/16

CV = 4.5 ± 0.4 mg/kg

Result	Uncer.	Date
2.9	0.9	12/01

2-Methyl-4,6-dinitrophenol
(cont)

CV = 4.8 ± 0.5 mg/kg

Result	Uncer.	Date
3.4	1	12/01

CV = 5.1 ± 0.5 mg/kg

Result	Uncer.	Date
2.4	0.7	12/02

Methylene chloride
89GAU 01 PTGC

CV = 82 ± 8 ug/kg

Result	Uncer.	Date
100	30	10/30

CV = 86 ± 9 ug/kg

Result	Uncer.	Date
140	40	11/03

CV = 89 ± 9 ug/kg

Result	Uncer.	Date
110	30	10/06

CV = 99 ± 10 ug/kg

Result	Uncer.	Date
97	29	10/23

CV = 101 ± 10 ug/kg

Result	Uncer.	Date
130	40	9/11
52	16	10/21

CV = 106 ± 11 ug/kg

Result	Uncer.	Date
96	29	9/11

CV = 112 ± 11 ug/kg

Result	Uncer.	Date
93	28	10/27

CV = 113 ± 11 ug/kg

Result	Uncer.	Date
110	30	9/03
170	50	10/29
130	40	11/03

CV = 117 ± 12 ug/kg

Result	Uncer.	Date
220	70	11/25

Methylene chloride (cont)

CV = 119 ± 12 ug/kg

Result	Uncer.	Date
130	40	4/15
110	30	8/18
170	50	11/24

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
34	10	9/11
150	50	9/21

CV = 122 ± 12 ug/kg

Result	Uncer.	Date
95	29	2/06

CV = 125 ± 12 ug/kg

Result	Uncer.	Date
140	40	8/24
94	28	10/27
100	30	10/27

CV = 127 ± 13 ug/kg

Result	Uncer.	Date
140	40	9/18

CV = 128 ± 13 ug/kg

Result	Uncer.	Date
94	28	6/10

CV = 130 ± 13 ug/kg

Result	Uncer.	Date
120	40	2/06
130	40	9/21

CV = 133 ± 13 ug/kg

Result	Uncer.	Date
120	40	6/10
140	40	8/18

CV = 139 ± 14 ug/kg

Result	Uncer.	Date
130	40	9/14

CV = 140 ± 14 ug/kg

Result	Uncer.	Date
88	26	1/31

CV = 143 ± 14 ug/kg

Result	Uncer.	Date
140	40	2/06

CV = 145 ± 15 ug/kg

Result	Uncer.	Date
160	50	10/23

TABLE E-IV (cont)

****

EM-9 Organics on Soil
(cont)

****

Methylene chloride (cont)

CV = 148 ± 15 ug/kg

Result	Uncer.	Date
160	50	11/03

CV = 150 ± 15 ug/kg

Result	Uncer.	Date
110	30	6/09
220	70	11/04

CV = 155 ± 15 ug/kg

Result	Uncer.	Date
220	70	9/21

CV = 157 ± 16 ug/kg

Result	Uncer.	Date
150	50	2/06

CV = 158 ± 16 ug/kg

Result	Uncer.	Date
150	50	11/30

CV = 160 ± 16 ug/kg

Result	Uncer.	Date
130	40	6/09

CV = 161 ± 16 ug/kg

Result	Uncer.	Date
140	40	2/11

CV = 162 ± 16 ug/kg

Result	Uncer.	Date
130	40	6/10

CV = 163 ± 16 ug/kg

Result	Uncer.	Date
110	30	6/17

CV = 174 ± 17 ug/kg

Result	Uncer.	Date
170	50	10/26
74	22	11/03

2-Methylphenol 89GAU 01 GCMS

CV = 1.4 ± 0.1 mg/kg

Result	Uncer.	Date
1.3	0.4	10/13

2-Methylphenol (cont)

CV = 1.5 ± 0.2 mg/kg

Result	Uncer.	Date
0.83	0.25	10/23

CV = 2 ± 0.2 mg/kg

Result	Uncer.	Date
1.3	0.4	10/20

CV = 2.4 ± 0.2 mg/kg

Result	Uncer.	Date
1.5	0.5	8/17

CV = 2.6 ± 0.3 mg/kg

Result	Uncer.	Date
1.6	0.5	9/23

CV = 3 ± 0.3 mg/kg

Result	Uncer.	Date
2.2	0.7	9/10

CV = 4 ± 0.4 mg/kg

Result	Uncer.	Date
2.7	0.8	9/03

CV = 4.4 ± 0.4 mg/kg

Result	Uncer.	Date
2.4	0.7	8/31

CV = 4.7 ± 0.5 mg/kg

Result	Uncer.	Date
2.5	0.8	10/05

CV = 5.4 ± 0.5 mg/kg

Result	Uncer.	Date
4.3	1.3	9/16

CV = 6.1 ± 0.6 mg/kg

Result	Uncer.	Date
3.1	0.9	8/31

Naphthalene 89GAU 01 GCMS

CV = 1.08 ± 0.1 mg/kg

Result	Uncer.	Date
0.62	0.19	5/04

CV = 1.8 ± 0.2 mg/kg

Result	Uncer.	Date
0.87	0.26	5/13
0.91	0.27	8/19

Naphthalene (cont)

CV = 2.2 ± 0.2 mg/kg

Result	Uncer.	Date
1.2	0.4	4/15

CV = 2.5 ± 0.3 mg/kg

Result	Uncer.	Date
1.6	0.5	8/19

CV = 2.9 ± 0.3 mg/kg

Result	Uncer.	Date
2	0.6	7/21

CV = 4.7 ± 0.5 mg/kg

Result	Uncer.	Date
2.7	0.8	6/09
2.1	0.6	7/06

CV = 5 ± 0.5 mg/kg

Result	Uncer.	Date
3.4	1	6/24

CV = 5.8 ± 0.6 mg/kg

Result	Uncer.	Date
2.3	0.7	4/28

2-Nitroaniline 89GAU 01 GCMS

CV = 0.99 ± 0.1 mg/kg

Result	Uncer.	Date
0.48	0.14	4/28

CV = 1.3 ± 0.1 mg/kg

Result	Uncer.	Date
0.87	0.26	6/09

CV = 1.4 ± 0.1 mg/kg

Result	Uncer.	Date
0.97	0.29	7/02

CV = 2.72 ± 0.3 mg/kg

Result	Uncer.	Date
1.6	0.5	5/05

CV = 3.32 ± 0.3 mg/kg

Result	Uncer.	Date
2.6	0.8	7/21

CV = 4.3 ± 0.4 mg/kg

Result	Uncer.	Date
2.1	0.6	5/13
< 0.33		8/19

2-Nitroaniline (cont)

CV = 5 ± 0.5 mg/kg

Result	Uncer.	Date
3.4	1	7/21

CV = 5.3 ± 0.5 mg/kg

Result	Uncer.	Date
3.5	1.1	4/15

3-Nitroaniline 89GAU 01 GCMS

CV = 1.3 ± 0.1 mg/kg

Result	Uncer.	Date
< 0.33		10/13

CV = 1.5 ± 0.1 mg/kg

Result	Uncer.	Date
< 0.33		10/23

CV = 1.8 ± 0.2 mg/kg

Result	Uncer.	Date
0.41	0.12	10/20

CV = 2.2 ± 0.2 mg/kg

Result	Uncer.	Date
< 0.33		2/14
0.61	0.18	8/17

CV = 2.5 ± 0.2 mg/kg

Result	Uncer.	Date
1.4	0.4	9/23

CV = 2.7 ± 0.3 mg/kg

Result	Uncer.	Date
1.2	0.4	1/03

CV = 2.8 ± 0.3 mg/kg

Result	Uncer.	Date
1.1	0.3	9/10

CV = 3.8 ± 0.4 mg/kg

Result	Uncer.	Date
< 0.33		9/03

CV = 3.9 ± 0.4 mg/kg

Result	Uncer.	Date
2.1	0.6	3/25

CV = 4.1 ± 0.4 mg/kg

Result	Uncer.	Date
1.5	0.5	8/31

3-Nitroaniline (cont)

CV = 4.4 ± 0.4 mg/kg

Result	Uncer.	Date
1.8	0.5	10/05

CV = 5.1 ± 0.5 mg/kg

Result	Uncer.	Date
< 0.33		9/16

CV = 5.7 ± 0.6 mg/kg

Result	Uncer.	Date
3	0.9	8/31

2-Nitrophenol 89GAU 01 GCMS

CV = 1.4 ± 0.1 mg/kg

Result	Uncer.	Date
0.95	0.29	10/13

CV = 1.5 ± 0.2 mg/kg

Result	Uncer.	Date
0.51	0.15	10/23

CV = 1.9 ± 0.2 mg/kg

Result	Uncer.	Date
0.82	0.25	10/20

CV = 2.3 ± 0.2 mg/kg

Result	Uncer.	Date
1	0.3	8/17

CV = 2.6 ± 0.3 mg/kg

Result	Uncer.	Date
1.2	0.4	9/23

CV = 3 ± 0.3 mg/kg

Result	Uncer.	Date
1.7	0.5	9/10

CV = 4 ± 0.4 mg/kg

Result	Uncer.	Date
2.5	0.8	9/03

CV = 4.3 ± 0.4 mg/kg

Result	Uncer.	Date
2	0.6	8/31

CV = 4.6 ± 0.5 mg/kg

Result	Uncer.	Date
1.9	0.6	10/05

2-Nitrophenol (cont)

CV = 5.3 ± 0.5 mg/kg

Result	Uncer.	Date
3.7	1.1	9/16

CV = 5.9 ± 0.6 mg/kg

Result	Uncer.	Date
2.5	0.8	8/31

4-Nitrophenol 89GAU 01 GCMS

CV = 1.1 ± 0.1 mg/kg

Result	Uncer.	Date
0.62	0.19	2/21
0.55	0.17	3/24

CV = 2.05 ± 0.2 mg/kg

Result	Uncer.	Date
1.8	0.5	12/16

CV = 2.6 ± 0.3 mg/kg

Result	Uncer.	Date
0.85	0.26	12/03

CV = 3.1 ± 0.3 mg/kg

Result	Uncer.	Date
1.9	0.6	11/16

CV = 3.5 ± 0.4 mg/kg

Result	Uncer.	Date
2.1	0.6	2/14
1.8	0.5	11/04

CV = 4.1 ± 0.4 mg/kg

Result	Uncer.	Date
2.4	0.7	11/16
2.5	0.8	12/01
2	0.6	12/02

CV = 4.4 ± 0.4 mg/kg

Result	Uncer.	Date
2.7	0.8	11/16

CV = 4.6 ± 0.5 mg/kg

Result	Uncer.	Date
3.7	1.1	3/25

CV = 6 ± 0.6 mg/kg

Result	Uncer.	Date
3.4	1	2/14

TABLE E-IV (cont)

****

EM-9 Organics on Soil
(cont)

****

4-Nitrophenol (cont)

CV = 6.36 ± 0.6 mg/kg

Result	Uncer.	Date
3.7	1.1	3/24

N-Nitrosodiphenylamine 89GAU 01 GCMS

CV = 2.43 ± 0.2 mg/kg

Result	Uncer.	Date
1.5	0.5	12/16

CV = 3 ± 0.3 mg/kg

Result	Uncer.	Date
2.1	0.6	12/03

CV = 3.6 ± 0.4 mg/kg

Result	Uncer.	Date
3	0.9	11/16

CV = 4.2 ± 0.4 mg/kg

Result	Uncer.	Date
3.2	1	11/04

CV = 4.9 ± 0.5 mg/kg

Result	Uncer.	Date
3.2	1	11/16
4.3	1.3	12/01
2.6	0.8	12/02

CV = 5.2 ± 0.5 mg/kg

Result	Uncer.	Date
3.5	1.1	11/16

Phenol 89GAU 01 GCMS

CV = 2.29 ± 0.2 mg/kg

Result	Uncer.	Date
1.4	0.4	12/16

CV = 2.9 ± 0.3 mg/kg

Result	Uncer.	Date
1.3	0.4	12/03

CV = 3.4 ± 0.3 mg/kg

Result	Uncer.	Date
2.3	0.7	11/16

Phenol (cont)

CV = 3.9 ± 0.4 mg/kg

Result	Uncer.	Date
2.2	0.7	11/04

CV = 4.6 ± 0.5 mg/kg

Result	Uncer.	Date
2.4	0.7	11/16
2.7	0.8	12/01
1.8	0.5	12/02

CV = 4.9 ± 0.5 mg/kg

Result	Uncer.	Date
2.9	0.9	11/16

Propylbenzene 89GAU 01 PTGC

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
160	50	9/11

CV = 132 ± 13 ug/kg

Result	Uncer.	Date
22	7	10/21

CV = 144 ± 14 ug/kg

Result	Uncer.	Date
110	30	10/27

CV = 162 ± 16 ug/kg

Result	Uncer.	Date
120	40	2/06

CV = 170 ± 17 ug/kg

Result	Uncer.	Date
110	30	1/31

Pyrene 89GAU 01 GCMS

CV = 2.15 ± 0.2 mg/kg

Result	Uncer.	Date
1.6	0.5	12/16

CV = 2.7 ± 0.3 mg/kg

Result	Uncer.	Date
1.8	0.5	12/03

CV = 3.2 ± 0.3 mg/kg

Result	Uncer.	Date
2.5	0.8	11/16

Pyrene (cont)

CV = 3.7 ± 0.4 mg/kg

Result	Uncer.	Date
2.1	0.6	11/04

CV = 4.3 ± 0.4 mg/kg

Result	Uncer.	Date
2.8	0.8	11/16
3.3	1	12/01
2.6	0.8	12/02

CV = 4.6 ± 0.5 mg/kg

Result	Uncer.	Date
3.1	0.9	11/16

Styrene 89GAU 01 PTGC

CV = 119 ± 12 ug/kg

Result	Uncer.	Date
91	27	8/18

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
98	29	6/09

CV = 131 ± 13 ug/kg

Result	Uncer.	Date
140	40	4/15

CV = 144 ± 14 ug/kg

Result	Uncer.	Date
110	30	6/10

CV = 150 ± 15 ug/kg

Result	Uncer.	Date
130	40	11/25

Tetrachloroethylene 89GAU 01 PTGC

CV = 105 ± 10 ug/kg

Result	Uncer.	Date
83	25	6/10

CV = 125 ± 13 ug/kg

Result	Uncer.	Date
110	30	9/14

CV = 136 ± 14 ug/kg

Result	Uncer.	Date
93	28	10/27

Tetrachloroethylene (cont)

CV = 164 ± 16 ug/kg

Result	Uncer.	Date
220	70	9/11
39	12	10/21

CV = 182 ± 18 ug/kg

Result	Uncer.	Date
200	60	10/23

Toluene 89GAU 01 PTGC

CV = 92 ± 9 ug/kg

Result	Uncer.	Date
98	29	10/06

CV = 114 ± 11 ug/kg

Result	Uncer.	Date
99	30	8/18

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
100	30	6/09

CV = 125 ± 12 ug/kg

Result	Uncer.	Date
140	40	4/15

CV = 129 ± 13 ug/kg

Result	Uncer.	Date
100	30	9/03

CV = 131 ± 13 ug/kg

Result	Uncer.	Date
140	40	10/29

CV = 134 ± 13 ug/kg

Result	Uncer.	Date
160	50	11/03

CV = 137 ± 14 ug/kg

Result	Uncer.	Date
120	40	9/18

CV = 138 ± 14 ug/kg

Result	Uncer.	Date
120	40	6/10

CV = 150 ± 15 ug/kg

Result	Uncer.	Date
160	50	11/03

Toluene (cont)

CV = 165 ± 17 ug/kg

Result	Uncer.	Date
270	80	11/04

CV = 169 ± 17 ug/kg

Result	Uncer.	Date
200	60	9/21

1,2,4-Trichlorobenzene 89GAU 01 GCMS

CV = 1 ± 0.1 mg/kg

Result	Uncer.	Date
0.61	0.18	2/21
0.57	0.17	3/24

CV = 1.2 ± 0.1 mg/kg

Result	Uncer.	Date
0.63	0.19	4/28

CV = 1.5 ± 0.2 mg/kg

Result	Uncer.	Date
1.1	0.3	6/09

CV = 1.6 ± 0.2 mg/kg

Result	Uncer.	Date
0.83	0.25	7/02

CV = 3.17 ± 0.3 mg/kg

Result	Uncer.	Date
1.9	0.6	5/05

CV = 3.4 ± 0.3 mg/kg

Result	Uncer.	Date
2.1	0.6	2/14

CV = 3.87 ± 0.4 mg/kg

Result	Uncer.	Date
3.2	1	7/21

CV = 4.5 ± 0.4 mg/kg

Result	Uncer.	Date
2.9	0.9	3/25

CV = 5 ± 0.5 mg/kg

Result	Uncer.	Date
1.9	0.6	5/13
3	0.9	8/19

CV = 5.8 ± 0.6 mg/kg

Result	Uncer.	Date
3.7	1.1	7/21

1,2,4-Trichlorobenzene (cont)

CV = 5.9 ± 0.6 mg/kg

Result	Uncer.	Date
3.1	0.9	2/14

CV = 6.2 ± 0.6 mg/kg

Result	Uncer.	Date
2.8	0.8	3/24
2.7	0.8	4/15

Trichloroethene 89GAU 01 PTGC

CV = 130 ± 13 ug/kg

Result	Uncer.	Date
180	50	9/11

CV = 143 ± 14 ug/kg

Result	Uncer.	Date
32	10	10/21

CV = 155 ± 16 ug/kg

Result	Uncer.	Date
120	40	10/27

2,4,6-Trichlorophenol 89GAU 01 GCMS

CV = 1.06 ± 0.1 mg/kg

Result	Uncer.	Date
0.86	0.26	5/04

CV = 1.8 ± 0.2 mg/kg

Result	Uncer.	Date
1.3	0.4	5/13
< 0.33		8/19

CV = 2.1 ± 0.2 mg/kg

Result	Uncer.	Date
1.7	0.5	4/15

CV = 2.5 ± 0.2 mg/kg

Result	Uncer.	Date
< 0.33		8/19

CV = 2.8 ± 0.3 mg/kg

Result	Uncer.	Date
2.1	0.6	7/21

CV = 4.6 ± 0.5 mg/kg

Result	Uncer.	Date
< 0.33		6/09
2.6	0.8	7/06

TABLE E-IV (cont)

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EM-9 Organics on Soil (cont)

****

2,4,6-Trichlorophenol (cont)

CV = 5 ± 0.5 mg/kg

Result	Uncer.	Date
3.8	1.1	6/24

CV = 5.7 ± 0.6 mg/kg

Result	Uncer.	Date
3.1	0.9	4/28

1,2,3-Trichloropropane 89GAU 01 PTGC

CV = 99 ± 10 ug/kg

Result	Uncer.	Date
180	50	10/06

CV = 117 ± 12 ug/kg

Result	Uncer.	Date
93	28	6/17

CV = 132 ± 13 ug/kg

Result	Uncer.	Date
110	30	6/10

CV = 139 ± 14 ug/kg

Result	Uncer.	Date
82	25	9/03

CV = 141 ± 14 ug/kg

Result	Uncer.	Date
130	40	10/29

CV = 145 ± 14 ug/kg

Result	Uncer.	Date
250	80	11/03

CV = 147 ± 15 ug/kg

Result	Uncer.	Date
160	50	9/18

CV = 161 ± 16 ug/kg

Result	Uncer.	Date
170	50	8/18

CV = 162 ± 16 ug/kg

Result	Uncer.	Date
320	100	11/03

1,2,3-Trichloropropane (cont)

CV = 170 ± 17 ug/kg

Result	Uncer.	Date
140	40	6/09

CV = 178 ± 18 ug/kg

Result	Uncer.	Date
320	100	11/04

CV = 182 ± 18 ug/kg

Result	Uncer.	Date
200	60	9/21

Vinyl acetate 89GAU 01 PTGC

CV = 87 ± 9 ug/kg

Result	Uncer.	Date
120	40	10/30

CV = 90 ± 9 ug/kg

Result	Uncer.	Date
170	50	11/03

CV = 94 ± 9 ug/kg

Result	Uncer.	Date
190	60	10/06

CV = 117 ± 12 ug/kg

Result	Uncer.	Date
97	29	4/15
58	17	8/18

CV = 119 ± 12 ug/kg

Result	Uncer.	Date
140	40	10/29

CV = 120 ± 12 ug/kg

Result	Uncer.	Date
140	40	9/03
170	50	11/03

CV = 125 ± 12 ug/kg

Result	Uncer.	Date
140	40	10/23

CV = 126 ± 13 ug/kg

Result	Uncer.	Date
95	29	10/21
230	70	11/24
270	80	11/25

Vinyl acetate (cont)

CV = 127 ± 13 ug/kg

Result	Uncer.	Date
190	60	9/11
140	40	9/21

CV = 130 ± 13 ug/kg

Result	Uncer.	Date
110	30	8/18

CV = 131 ± 13 ug/kg

Result	Uncer.	Date
67	20	6/10

CV = 132 ± 13 ug/kg

Result	Uncer.	Date
190	60	8/24

CV = 133 ± 13 ug/kg

Result	Uncer.	Date
130	40	9/11

CV = 134 ± 13 ug/kg

Result	Uncer.	Date
150	50	9/18

CV = 138 ± 14 ug/kg

Result	Uncer.	Date
150	50	9/21

CV = 140 ± 14 ug/kg

Result	Uncer.	Date
< 10		6/09
91	27	10/27

CV = 151 ± 15 ug/kg

Result	Uncer.	Date
< 10		9/11

CV = 156 ± 16 ug/kg

Result	Uncer.	Date
220	70	11/03

CV = 157 ± 16 ug/kg

Result	Uncer.	Date
140	40	10/27
160	50	10/27

CV = 159 ± 16 ug/kg

Result	Uncer.	Date
210	60	11/04

Vinyl acetate (cont)

CV = 160 ± 16 ug/kg

Result	Uncer.	Date
< 10		6/09
49	15	6/10
140	40	6/17

CV = 161 ± 16 ug/kg

Result	Uncer.	Date
100	30	6/10

CV = 164 ± 16 ug/kg

Result	Uncer.	Date
260	80	9/21

CV = 167 ± 17 ug/kg

Result	Uncer.	Date
200	60	11/30

CV = 175 ± 17 ug/kg

Result	Uncer.	Date
190	60	9/14

CV = 183 ± 18 ug/kg

Result	Uncer.	Date
250	80	10/23

CV = 184 ± 18 ug/kg

Result	Uncer.	Date
210	60	10/26
150	50	11/03

****

EM-9 Organics on Vapor Badge

****

Methylene chloride 92GAU 01 GCMS

CV = 86 ± 9 ug/sample

Result	Uncer.	Date
73	15	4/08

1,1,1-Trichloroethane 92GAU 01 GCMS

CV = 62 ± 6 ug/sample

Result	Uncer.	Date
59	12	1/23

CV = 85 ± 8 ug/sample

Result	Uncer.	Date
71	14	5/12

1,1,1-Trichloroethane (cont)

CV = 88 ± 9 ug/sample

Result	Uncer.	Date
88	18	1/23

****

EM-9 PCB in Oil

****

Mixed-Aroclor 87GAU 04 GCEC

CV = 7.9 ± 0.8 ug/g

Result	Uncer.	Date
11	3	2/21
11	3	2/21
43	13	2/28
10	3	3/16
10	3	3/20
15	5	5/12
6.3	1.9	5/18
13	4	8/11
9.5	3	9/03

CV = 9.9 ± 1 ug/g

Result	Uncer.	Date
7	2	2/21
10	3	4/16
120	40	5/20
10	3	6/19

CV = 10.1 ± 1 ug/g

Result	Uncer.	Date
8.5	2.5	3/20
9.4	2.8	3/20
13	4	4/25
8.6	2.6	5/14
22	7	6/30
23	7	7/29
15	5	9/03
12	4	12/17

CV = 21.4 ± 2.1 ug/g

Result	Uncer.	Date
16	5	1/03
19	6	1/28
13	4	3/17
15	5	4/30
13	4	5/15
17	5	6/15
29	9	7/22
34	10	7/29
19	4	11/23
16	5	12/02

CV = 24.6 ± 2.5 ug/g

Result	Uncer.	Date
20	6	2/21
17	5	6/16
22	4	9/24
11	2	11/19

Mixed-Aroclor (cont)

CV = 25 ± 2 ug/g

Result	Uncer.	Date
17	5	1/03
16	5	2/24
20	6	3/04
17	5	3/04
17	4	3/05
16	5	3/17
15	5	4/16
19	6	4/25
22	7	4/26
23	7	4/27
18	6	5/13
15	5	5/14
19	6	5/21
18	5	6/17
52	16	6/19
30	9	7/22
26	8	8/07
18	5	10/22
26	7	11/10
22	7	12/02

CV = 34 ± 3.4 ug/g

Result	Uncer.	Date
37	11	2/28
45	14	3/20
42	13	4/16
77	22	11/15
51	10	11/16

CV = 34.1 ± 3.4 ug/g

Result	Uncer.	Date
32	10	5/14
33	10	6/04

CV = 36.2 ± 3.6 ug/g

Result	Uncer.	Date
21	6	3/12
32	10	4/08
24	7	5/20
32	10	6/08
27	8	6/17

CV = 36.4 ± 3.6 ug/g

Result	Uncer.	Date
47	14	2/21
38	12	2/24
41	12	3/20
74	14	11/16
46	14	11/19

CV = 44.5 ± 4.4 ug/g

Result	Uncer.	Date
34	10	2/21
9	2.7	2/28
37	11	4/26
28	9	5/14
42	13	6/15
69	21	8/04

TABLE E-IV (cont)

****

EM-9 PCB in Oil
(cont)

****

Mixed-Aroclor (cont)

CV = 53.3 ± 5.3 ug/g

Result	Uncer.	Date
89	27	4/25
110	30	5/12
60	18	10/06
9.5	3	12/14

CV = 56.6 ± 5.7 ug/g

Result	Uncer.	Date
42	13	5/29
61	18	6/04

CV = 56.7 ± 5.7 ug/g

Result	Uncer.	Date
67	20	3/16
75	23	4/25
71	21	7/29
82	25	8/06

CV = 57 ± 6 ug/g

Result	Uncer.	Date
48	14	1/28
47	14	2/21
45	14	2/21
37	11	3/05
51	15	4/25
49	15	5/14
43	13	6/08
55	13	6/16
56	17	6/19
58	17	7/29
69	21	8/04
51	15	9/08
130	40	9/10
55	11	9/24
46	14	11/20

CV = 57.2 ± 5.7 ug/g

Result	Uncer.	Date
46	14	2/21
31	9	2/28
49	15	4/27
47	14	6/15

CV = 59.6 ± 6 ug/g

Result	Uncer.	Date
37	11	2/28
50	15	4/16
44	13	5/13
67	20	6/19
92	28	7/29

Mixed-Aroclor (cont)

CV = 300 ± 30 ug/g

Result	Uncer.	Date
370	110	3/03
370	110	3/16
240	70	5/26
290	12	6/05
200	60	6/05
260	80	11/19

CV = 304.8 ± 30 ug/g

Result	Uncer.	Date
320	100	2/21
410	120	3/03
320	100	3/16
360	110	3/16
330	100	3/20
370	110	3/20
300	90	4/25
270	80	5/18
220	70	5/26
200	60	6/25
390	120	8/07
390	120	8/21
220	70	9/03
360	70	11/16
290	90	11/19

CV = 443.4 ± 44.3 ug/g

Result	Uncer.	Date
330	100	2/21
320	100	2/21
330	100	2/21
320	100	3/12
410	120	4/08
480	140	6/19
410	120	7/29
520	160	8/07

CV = 448.8 ± 44.9 ug/g

Result	Uncer.	Date
610	180	2/21
570	170	2/21
540	160	2/28
550	170	3/16
410	120	6/05
370	110	7/29
490	100	11/15

CV = 449.9 ± 45 ug/g

Result	Uncer.	Date
320	100	2/21
420	130	2/21
500	150	6/04
350	110	6/30

Aroclor 1242 86GAU 01 GCEC

CV = 7.9 ± 0.8 ug/g

Result	Uncer.	Date
11	3	2/21
11	3	2/21
< 0.5		2/28
10	3	3/16
10	3	3/20

Aroclor 1242 (cont)

15	5	5/12
6.3	1.9	5/18
13	4	8/11
9.5	3	9/03

CV = 10.1 ± 1 ug/g

Result	Uncer.	Date
8.5	2.5	3/20
9.4	2.8	3/20
13	4	4/25
23	7	7/29
15	5	9/03
12	4	12/17

CV = 34 ± 3.4 ug/g

Result	Uncer.	Date
37	11	2/28
45	14	3/20
42	13	4/16
77	22	11/15
51	10	11/16

CV = 36.4 ± 3.6 ug/g

Result	Uncer.	Date
47	14	2/21
38	12	2/24
41	12	3/20
74	14	11/16
46	14	11/19

CV = 53.3 ± 5.3 ug/g

Result	Uncer.	Date
89	27	4/25
110	30	5/12
60	18	10/06
9.5	3	12/14

CV = 56.7 ± 5.7 ug/g

Result	Uncer.	Date
67	20	3/16
75	23	4/25
71	21	7/29
82	25	8/06

CV = 300 ± 30 ug/g

Result	Uncer.	Date
370	110	3/03
370	110	3/16
240	70	5/26
290	12	6/05
200	60	6/05
260	80	11/19

CV = 304.8 ± 30 ug/g

Result	Uncer.	Date
320	100	2/21
410	120	3/03
320	100	3/16
360	110	3/16
330	100	3/20
370	110	3/20
300	90	4/25
270	80	5/18
220	70	5/26

Aroclor 1242 (cont)

200	60	6/25
390	120	8/07
390	120	8/21
220	70	9/03
360	70	11/16
290	90	11/19

CV = 448.8 ± 44.9 ug/g

Result	Uncer.	Date
570	170	2/21
610	180	2/21
540	160	2/28
550	170	3/16
410	120	6/05
370	110	7/29
490	100	11/15

Aroclor 1254 86GAU 01 GCEC

CV = 10.1 ± 1 ug/g

Result	Uncer.	Date
8.6	2.6	5/14
22	7	6/30

CV = 34.1 ± 3.4 ug/g

Result	Uncer.	Date
32	10	5/14
33	10	6/04

CV = 56.6 ± 5.7 ug/g

Result	Uncer.	Date
42	13	5/29
61	18	6/04

CV = 449.9 ± 45 ug/g

Result	Uncer.	Date
320	100	2/21
420	130	2/21
500	150	6/04
350	110	6/30

Aroclor 1260 91GAU 01 GCEC

CV = 9.9 ± 1 ug/g

Result	Uncer.	Date
7	2	2/21
10	3	4/16
< 5		5/20
10	3	6/19

CV = 21.4 ± 2.1 ug/g

Result	Uncer.	Date
16	5	1/03
19	6	1/28
13	4	3/17
15	5	4/30
13	4	5/15
17	5	6/15
29	9	7/22

Aroclor 1260 (cont)

34	10	7/29
19	4	11/23
16	5	12/02

CV = 24.6 ± 2.5 ug/g

Result	Uncer.	Date
20	6	2/21
17	5	6/16
22	4	9/24
11	2	11/19

CV = 25 ± 2 ug/g

Result	Uncer.	Date
17	5	1/03
16	5	2/24
20	6	3/04
17	5	3/04
17	4	3/05
16	5	3/17
15	5	4/16
19	6	4/25
22	7	4/26
23	7	4/27
18	6	5/13
15	5	5/14
19	6	5/21
18	5	6/17
52	16	6/19
30	9	7/22
26	8	8/07
18	5	10/22
26	7	11/10
22	7	12/02

CV = 36.2 ± 3.6 ug/g

Result	Uncer.	Date
21	6	3/12
32	10	4/08
24	7	5/20
32	10	6/08
27	8	6/17

CV = 44.5 ± 4.4 ug/g

Result	Uncer.	Date
34	10	2/21
< 0.5		2/28
37	11	4/26
28	9	5/14
42	13	6/15
69	21	8/04

CV = 57 ± 6 ug/g

Result	Uncer.	Date
48	14	1/28
45	14	2/21
47	14	2/21
37	11	3/05
51	15	4/25
49	15	5/14
43	13	6/08
20	6	6/16
56	17	6/19
58	17	7/29
69	21	8/04
51	15	9/08
130	40	9/10
55	11	9/24
46	14	11/20

Aroclor 1260 (cont)

CV = 57.2 ± 5.7 ug/g

Result	Uncer.	Date
46	14	2/21
31	9	2/28
49	15	4/27
47	14	6/15

CV = 59.6 ± 6 ug/g

Result	Uncer.	Date
37	11	2/28
50	15	4/16
44	13	5/13
67	20	6/19
92	28	7/29

CV = 443.4 ± 44.3 ug/g

Result	Uncer.	Date
320	100	2/21
330	100	2/21
330	100	2/21
320	100	3/12
410	120	4/08
480	140	6/19
410	120	7/29
520	160	8/07

****

EM-9 PCB in Organic Solvent

****

Mixed-Aroclor 92GAU 04 GCEC

CV = 2.5 ± 0.2 ug/mL

Result	Uncer.	Date
1.9	0.6	6/09
2.1	0.4	10/15

CV = 5 ± 0.5 ug/mL

Result	Uncer.	Date
3.5	1.1	6/09
36	11	6/09
4.2	2.1	8/11

CV = 7.5 ± 0.8 ug/mL

Result	Uncer.	Date
6.8	2	6/09

CV = 8 ± 0.8 ug/mL

Result	Uncer.	Date
1.9	0.6	6/05

Aroclor 1254 92GAU 04 GCEC

CV = 2.5 ± 0.2 ug/mL

Result	Uncer.	Date
1.9	0.6	6/09

TABLE E-IV (cont)

****

EM-9 PCB in Organic Solvent (cont)

****

Aroclor 1254 (cont)

CV = 5 ± 0.5 ug/mL

Result	Uncer.	Date
36	11	6/09

CV = 8 ± 0.8 ug/mL

Result	Uncer.	Date
1.9	0.6	6/05

Aroclor 1260 92GAU 04 GCEC

CV = 2.5 ± 0.2 ug/mL

Result	Uncer.	Date
2.1	0.4	10/15

CV = 5 ± 0.5 ug/mL

Result	Uncer.	Date
3.5	1.1	6/09
4.2	2.1	8/11

CV = 7.5 ± 0.8 ug/mL

Result	Uncer.	Date
6.8	2	6/09

****

EM-9 PCB in Water

****

Mixed-Aroclor 91GAU 04 GCEC

CV = 5 ± 0.5 ug/L

Result	Uncer.	Date
3.3	2	3/03
2.4	1.2	6/10

CV = 8 ± 0.8 ug/L

Result	Uncer.	Date
4.9	2.4	5/18

CV = 9 ± 0.9 ug/L

Result	Uncer.	Date
0.7	0.35	4/16

CV = 10 ± 1 ug/L

Result	Uncer.	Date
6.4	3.2	2/19

Mixed-Aroclor (cont)

CV = 11 ± 1 ug/L

Result	Uncer.	Date
7	3.5	10/26

CV = 13.5 ± 1.4 ug/L

Result	Uncer.	Date
0.62	0.31	4/16

CV = 16 ± 1.6 ug/L

Result	Uncer.	Date
11	6	4/26

CV = 24 ± 2 ug/L

Result	Uncer.	Date
12	2	9/25

CV = 25 ± 2 ug/L

Result	Uncer.	Date
22	7	6/03

Aroclor 1242 92GAU 04 GCEC

CV = 9 ± 0.9 ug/L

Result	Uncer.	Date
< 0.1		4/16

CV = 11 ± 1 ug/L

Result	Uncer.	Date
7	3.5	10/26

CV = 13.5 ± 1.4 ug/L

Result	Uncer.	Date
< 0.1		4/16

CV = 24 ± 2 ug/L

Result	Uncer.	Date
12	2	9/25

Aroclor 1254 92GAU 01 GCEC

CV = 5 ± 0.5 ug/L

Result	Uncer.	Date
3.3	2	3/03
2.4	1.2	6/10

CV = 8 ± 0.8 ug/L

Result	Uncer.	Date
4.9	2.4	5/18

Aroclor 1254 (cont)

CV = 10 ± 1 ug/L

Result	Uncer.	Date
6.4	3.2	2/19

CV = 16 ± 1.6 ug/L

Result	Uncer.	Date
11	6	4/26

CV = 25 ± 2 ug/L

Result	Uncer.	Date
22	7	6/03

****

EM-9 PCB on Filter Media

****

Mixed-Aroclor 89GAU 04 GCEC

CV = 5 ± 0.5 ug/sample

Result	Uncer.	Date
4.3	1.3	2/27
4.3	1.3	4/27
7.7	2.3	5/08
4.3	1.3	5/20
4.4	1.3	5/26
5.6	1.7	6/03
5	3	7/30
4.5	0.9	9/24

CV = 6 ± 0.6 ug/sample

Result	Uncer.	Date
5.2	1.5	2/05
5.3	1.6	5/27

CV = 7.5 ± 0.8 ug/sample

Result	Uncer.	Date
11	3	1/28
11	3	4/26
7.4	2.2	5/13
4.5	1.4	5/20
8.3	2.5	6/03
7.6	2.3	6/15
7.5	2.3	7/21

CV = 8.5 ± 0.8 ug/sample

Result	Uncer.	Date
7.4	2.2	2/05
7.5	2.2	5/13
6.1	1.8	5/27
16	5	7/28

CV = 9.5 ± 1 ug/sample

Result	Uncer.	Date
11	3	1/28
8.6	2.5	2/27
15	4	2/28
10	3	4/25

Mixed-Aroclor (cont)

CV = 10 ± 1 ug/sample

Result	Uncer.	Date
64	16	3/12
5.3	1.6	5/20
7.7	2	9/24

CV = 10.5 ± 1 ug/sample

Result	Uncer.	Date
8.7	2.6	2/05

CV = 11.5 ± 1 ug/sample

Result	Uncer.	Date
16	5	1/28
10	5	7/30
14	4	8/03
15	4	10/09

CV = 12.5 ± 1 ug/sample

Result	Uncer.	Date
13	4	2/05
10	3	2/28
9.2	2.8	3/20

CV = 13 ± 1 ug/sample

Result	Uncer.	Date
14	4	5/12
14	4	5/13
8	2.4	5/20
9.9	3	11/19

CV = 14.5 ± 1 ug/sample

Result	Uncer.	Date
14	4	2/05
17	5	5/08
12	4	5/27

CV = 15 ± 2 ug/sample

Result	Uncer.	Date
14	4	2/20
14	4	3/12
14	4	3/20
11	3	5/27
14	4	8/21

CV = 16 ± 2 ug/sample

Result	Uncer.	Date
14	4	2/27
19	6	5/12

CV = 17.5 ± 2 ug/sample

Result	Uncer.	Date
17	5	2/05
15	5	5/26
14	4	5/26
29	9	6/15

Mixed-Aroclor (cont)

CV = 19 ± 2 ug/sample

Result	Uncer.	Date
19	6	2/05
14	4	5/27

CV = 20 ± 2 ug/sample

Result	Uncer.	Date
19	6	2/20
17	5	2/27
13	4	2/28
31	9	2/28
19	6	4/25
22	7	5/13
20	6	6/15
22	7	8/03
18	15	9/24

Aroclor 1242 89GAU 04 GCEC

CV = 5 ± 0.5 ug/sample

Result	Uncer.	Date
4.3	1.3	5/20

CV = 7.5 ± 0.8 ug/sample

Result	Uncer.	Date
4.5	1.4	5/20
7.5	2.3	7/21

CV = 8.5 ± 0.8 ug/sample

Result	Uncer.	Date
6.1	1.8	5/27
16	5	7/28

CV = 10 ± 1 ug/sample

Result	Uncer.	Date
9.9	3	3/12
5.3	1.6	5/20

CV = 12.5 ± 1 ug/sample

Result	Uncer.	Date
9.2	2.8	3/20

CV = 13 ± 1 ug/sample

Result	Uncer.	Date
8	2.4	5/20
9.9	3	11/19

CV = 15 ± 2 ug/sample

Result	Uncer.	Date
14	4	2/20
14	4	3/12
14	4	3/20
11	3	5/27

Aroclor 1242 (cont)

CV = 17.5 ± 2 ug/sample

Result	Uncer.	Date
14	4	5/26

CV = 19 ± 2 ug/sample

Result	Uncer.	Date
14	4	5/27

CV = 20 ± 2 ug/sample

Result	Uncer.	Date
19	6	2/20

Aroclor 1254 89GAU 04 GCEC

CV = 5 ± 0.5 ug/sample

Result	Uncer.	Date
4.3	1.3	2/27
4.3	1.3	4/27
7.7	2.3	5/08
4.4	1.3	5/26
5.6	1.7	6/03
5	3	7/30

CV = 6 ± 0.6 ug/sample

Result	Uncer.	Date
5.3	1.6	5/27

CV = 7.5 ± 0.8 ug/sample

Result	Uncer.	Date
11	3	1/28
11	3	4/26
7.4	2.2	5/13
8.3	2.5	6/03
7.6	2.3	6/15

CV = 9.5 ± 1 ug/sample

Result	Uncer.	Date
11	3	1/28
8.6	2.5	2/27
15	4	2/28
10	3	4/25

CV = 11.5 ± 1 ug/sample

Result	Uncer.	Date
16	5	1/28
10	5	7/30
14	4	8/03
15	4	10/09

CV = 13 ± 1 ug/sample

Result	Uncer.	Date
14	4	5/12
14	4	5/13

TABLE E-IV (cont)

****

EM-9 PCB on Filter Media (cont)

****

Aroclor 1254 (cont)

CV = 14.5 ± 2 ug/sample

Result	Uncer.	Date
17	5	5/08
12	4	5/27

CV = 16 ± 2 ug/sample

Result	Uncer.	Date
14	4	2/27
19	6	5/12

CV = 17.5 ± 2 ug/sample

Result	Uncer.	Date
15	5	5/26
29	9	6/15

CV = 20 ± 2 ug/sample

Result	Uncer.	Date
17	5	2/27
31	9	2/28
19	6	4/25
20	6	6/15
22	7	8/03
18	15	9/24

Aroclor 1260 91GAU 04 GCEC

CV = 5 ± 0.5 ug/sample

Result	Uncer.	Date
4.5	0.9	9/24

CV = 6 ± 0.6 ug/sample

Result	Uncer.	Date
5.2	1.5	2/05

CV = 8.5 ± 0.8 ug/sample

Result	Uncer.	Date
7.4	2.2	2/05
7.5	2.2	5/13

CV = 10 ± 1 ug/sample

Result	Uncer.	Date
7.7	2	9/24

CV = 10.5 ± 1 ug/sample

Result	Uncer.	Date
8.7	2.6	2/05

Aroclor 1260 (cont)

CV = 12.5 ± 1 ug/sample

Result	Uncer.	Date
13	4	2/05
10	3	2/28

CV = 14.5 ± 1 ug/sample

Result	Uncer.	Date
14	4	2/05

CV = 15 ± 2 ug/sample

Result	Uncer.	Date
14	4	8/21

CV = 17.5 ± 2 ug/sample

Result	Uncer.	Date
17	5	2/05

CV = 19 ± 2 ug/sample

Result	Uncer.	Date
19	6	2/05

CV = 20 ± 2 ug/sample

Result	Uncer.	Date
13	4	2/28
22	7	5/13

****

EM-9 PCB on Fluorsil

****

Mixed-Aroclor 91GAU 04 GCEC

CV = 18 ± 2 ug/tube

Result	Uncer.	Date
16	5	3/02

CV = 24 ± 2 ug/tube

Result	Uncer.	Date
20	6	3/02

Aroclor 1254 91GAU 04 GCEC

CV = 18 ± 2 ug/tube

Result	Uncer.	Date
16	5	3/02

CV = 24 ± 2 ug/tube

Result	Uncer.	Date
20	6	3/02

****

EM-9 PCB on Soil

****

Mixed-Aroclor 91GAU 04 GCEC

CV = 11 ± 1 ug/g

Result	Uncer.	Date
9.2	4.6	1/27
8.6	4.3	3/16
8.2	4.1	3/18
9.5	4.8	3/20
8.1	4.1	4/27
10	5	5/29
16	8	8/20
15	7	9/04

CV = 12 ± 1 ug/g

Result	Uncer.	Date
17	8	10/22

CV = 13 ± 1 ug/g

Result	Uncer.	Date
11	5	10/27
4.3	2.4	11/03

CV = 14 ± 1 ug/g

Result	Uncer.	Date
3.6	1.1	5/21

CV = 15 ± 1 ug/g

Result	Uncer.	Date
12	6	3/16
11	6	3/18
11	6	3/24
9.4	4.7	6/05
15	7	9/02
7.7	4	11/04

CV = 17 ± 2 ug/g

Result	Uncer.	Date
15	8	3/20
11	5	9/02
31	16	10/26
2.5	1	12/15

CV = 19 ± 2 ug/g

Result	Uncer.	Date
7	3.5	2/20
23	11	2/27
12	6	3/16
12	6	3/18
12	4	5/20
22	11	9/04

CV = 21 ± 2 ug/g

Result	Uncer.	Date
17	4	10/02

Mixed-Aroclor (cont)

CV = 22 ± 2 ug/g

Result	Uncer.	Date
18	9	2/19
18	9	3/16
16	8	4/27
19	10	4/27
11	6	5/20
24	12	5/26
27	14	6/05
17	9	6/09

CV = 23 ± 2 ug/g

Result	Uncer.	Date
21	11	4/27

CV = 24 ± 2 ug/g

Result	Uncer.	Date
13	7	7/30
14	7	12/16

CV = 25 ± 2 ug/g

Result	Uncer.	Date
22	11	2/19
18	4	10/02
30	15	12/03

CV = 26 ± 3 ug/g

Result	Uncer.	Date
28	14	2/20
26	13	3/20
21	6	6/05
16	8	6/05
23	12	7/30

CV = 27 ± 3 ug/g

Result	Uncer.	Date
20	10	3/16

CV = 28 ± 3 ug/g

Result	Uncer.	Date
26	13	3/20
21	11	3/24
17	9	7/30
26	5	10/02

CV = 30 ± 3 ug/g

Result	Uncer.	Date
29	14	2/19
3.5	1.1	5/20

Aroclor 1242 91GAU 04 GCEC

CV = 11 ± 1 ug/g

Result	Uncer.	Date
8.2	4.1	3/18
9.5	4.8	3/20
10	5	5/29
15	7	9/04

Aroclor 1242 (cont)

CV = 12 ± 1 ug/g

Result	Uncer.	Date
17	8	10/22

CV = 15 ± 2 ug/g

Result	Uncer.	Date
11	6	3/18
15	7	9/02
7.7	4	11/04

CV = 17 ± 2 ug/g

Result	Uncer.	Date
15	8	3/20
11	5	9/02

CV = 19 ± 2 ug/g

Result	Uncer.	Date
23	11	2/27
22	11	9/04

CV = 22 ± 2 ug/g

Result	Uncer.	Date
18	9	2/19
24	12	5/26
17	9	6/09

CV = 25 ± 3 ug/g

Result	Uncer.	Date
18	4	10/02

CV = 26 ± 3 ug/g

Result	Uncer.	Date
26	13	3/20
21	6	6/05

CV = 28 ± 3 ug/g

Result	Uncer.	Date
26	13	3/20

CV = 30 ± 3 ug/g

Result	Uncer.	Date
3.5	1.1	5/20

Aroclor 1254 91GAU 04 GCEC

CV = 13 ± 1 ug/g

Result	Uncer.	Date
4.3	2.4	11/03

CV = 14 ± 1 ug/g

Result	Uncer.	Date
3.6	1.1	5/21

Aroclor 1254 (cont)

CV = 15 ± 2 ug/g

Result	Uncer.	Date
9.4	4.7	6/05

CV = 19 ± 2 ug/g

Result	Uncer.	Date
12	4	5/20

CV = 22 ± 2 ug/g

Result	Uncer.	Date
19	10	4/27
11	6	5/20

CV = 23 ± 2 ug/g

Result	Uncer.	Date
21	11	4/27

CV = 24 ± 2 ug/g

Result	Uncer.	Date
14	7	12/16

CV = 26 ± 3 ug/g

Result	Uncer.	Date
16	8	6/05

CV = 28 ± 3 ug/g

Result	Uncer.	Date
26	5	10/02

Aroclor 1260 91GAU 04 GCEC

CV = 11 ± 1 ug/g

Result	Uncer.	Date
9.2	4.6	1/27
8.6	4.3	3/16
8.1	4.1	4/27
16	8	8/20

CV = 13 ± 1 ug/g

Result	Uncer.	Date
11	5	10/27

CV = 15 ± 1 ug/g

Result	Uncer.	Date
12	6	3/16
11	6	3/24

CV = 17 ± 2 ug/g

Result	Uncer.	Date
31	16	10/26
2.5	1	12/15

TABLE E-IV (cont)

****

EM-9 PCB on Soil
(cont)

****

Aroclor 1260 (cont)

CV = 19 ± 2 ug/g

Result	Uncer.	Date
7	3.5	2/20
12	6	3/16
12	6	3/18

CV = 21 ± 2 ug/g

Result	Uncer.	Date
17	4	10/02

CV = 22 ± 2 ug/g

Result	Uncer.	Date
18	9	3/16
16	8	4/27
27	14	6/05

CV = 24 ± 2 ug/g

Result	Uncer.	Date
13	7	7/30

CV = 25 ± 2 ug/g

Result	Uncer.	Date
22	11	2/19
30	15	12/03

CV = 26 ± 3 ug/g

Result	Uncer.	Date
28	14	2/20
23	12	7/30

CV = 27 ± 3 ug/g

Result	Uncer.	Date
20	10	3/16

CV = 28 ± 3 ug/g

Result	Uncer.	Date
21	11	3/24
17	9	7/30

CV = 30 ± 3 ug/g

Result	Uncer.	Date
29	14	2/19

****

EPA Drinking Water Study 30

****

Benzene 92EPA 04 PTGC

CV = 9.51 ± 1.26 ug/L

Result	Uncer.	Date
8.5	2.6	11/19

Benzo[a]pyrene 92EPA 04 GCMS

CV = 0.485 ± 0.119 ug/L

Result	Uncer.	Date
< 10		11/20

Benzo[k]fluoranthene 92EPA 04 GCMS

CV = 2.3 ± 0.42 ug/L

Result	Uncer.	Date
< 10		11/20

Bis(2-ethylhexyl)phthalate 92EPA 04 GCMS

CV = 6.4 ± 2.97 ug/L

Result	Uncer.	Date
< 10		11/20

Bromobenzene 92EPA 04 PTGC

CV = 16.8 ± 1.14 ug/L

Result	Uncer.	Date
20	6	11/19

Bromochloromethane 92EPA 04 PTGC

CV = 13.5 ± 0.9 ug/L

Result	Uncer.	Date
14	4	11/19

Bromodichloromethane 92EPA 04 PTGC

CV = 9.88 ± 0.66 ug/L

Result	Uncer.	Date
10	3	11/19

Bromoform 92EPA 04 PTGC

CV = 24.9 ± 1.67 ug/L

Result	Uncer.	Date
26	8	11/19

Carbon tetrachloride 92EPA 04 PTGC

CV = 6.46 ± 0.86 ug/L

Result	Uncer.	Date
7.7	2.3	11/19

Chlorobenzene 92EPA 04 PTGC

CV = 12.4 ± 2.33 ug/L

Result	Uncer.	Date
12	4	11/19

Chlorodibromomethane 92EPA 04 PTGC

CV = 36.2 ± 2.4 ug/L

Result	Uncer.	Date
38	11	11/19

Chloroform 92EPA 04 PTGC

CV = 8.74 ± 0.58 ug/L

Result	Uncer.	Date
8.4	2.5	11/19

Chrysene 92EPA 04 GCMS

CV = 0.72 ± 0.104 ug/L

Result	Uncer.	Date
< 10		11/20

Di-n-butyl phthalate 92EPA 04 GCMS

CV = 22.6 ± 5.05 ug/L

Result	Uncer.	Date
< 10		11/20

Dibenzo[a,h]anthracene 92EPA 04 GCMS

CV = 0.446 ± 0.11 ug/L

Result	Uncer.	Date
< 10		11/20

1,2-Dibromo-3-chloropropane 92EPA 04 PTGC

CV = 0.98 ± 0.13 ug/L

Result	Uncer.	Date
0.854	0.02	11/19

Dibromomethane 92EPA 04 PTGC

CV = 18.6 ± 1.23 ug/L

Result	Uncer.	Date
19	6	11/19

o-Dichlorobenzene (1,2) 92EPA 04 PTGC

CV = 7.94 ± 1.06 ug/L

Result	Uncer.	Date
9.4	2.8	11/19

p-Dichlorobenzene (1,4) 92EPA 04 PTGC

CV = 16.1 ± 1.07 ug/L

Result	Uncer.	Date
16	5	11/19

1,2-Dichloroethane 92EPA 04 PTGC

CV = 7.69 ± 1.03 ug/L

Result	Uncer.	Date
9.4	2.8	11/19

1,1-Dichloroethene 92EPA 04 PTGC

CV = 14.2 ± 0.94 ug/L

Result	Uncer.	Date
19	6	11/19

trans-1,2-Dichloroethene 92EPA 04 PTGC

CV = 6.62 ± 0.88 ug/L

Result	Uncer.	Date
7.3	2.2	11/19

cis-1,2-Dichloroethylene 92EPA 04 PTGC

CV = 8.57 ± 1.14 ug/L

Result	Uncer.	Date
7.8	2.3	11/19

1,2-Dichloropropane 92EPA 04 PTGC

CV = 10.9 ± 0.73 ug/L

Result	Uncer.	Date
9.5	2.9	11/19

Dimethyl phthalate 92EPA 04 GCMS

CV = 7.31 ± 2 ug/L

Result	Uncer.	Date
< 10		11/20

Ethylbenzene 92EPA 04 PTGC

CV = 13.9 ± 0.94 ug/L

Result	Uncer.	Date
13	4	11/19

Ethylene dibromide 92EPA 04 PTGC

CV = 1.39 ± 0.19 ug/L

Result	Uncer.	Date
1.2	0.2	11/19

Fluoranthene 92EPA 04 GCMS

CV = 0.32 ± 0.066 ug/L

Result	Uncer.	Date
< 10		11/20

Pyrene 92EPA 04 GCMS

CV = 0.727 ± 0.168 ug/L

Result	Uncer.	Date
< 10		11/20

Styrene 92EPA 04 PTGC

CV = 17 ± 1.14 ug/L

Result	Uncer.	Date
16	5	11/19

1,1,1,2-Tetrachloroethane 92EPA 04 PTGC

CV = 14.3 ± 0.96 ug/L

Result	Uncer.	Date
16	5	11/19

Tetrachloroethylene 92EPA 04 PTGC

CV = 9 ± 1.2 ug/L

Result	Uncer.	Date
8.5	2.6	11/19

Toluene 92EPA 04 PTGC

CV = 8.02 ± 1.06 ug/L

Result	Uncer.	Date
7.2	2.2	11/19

1,2,4-Trichlorobenzene 92EPA 04 PTGC

CV = 13.5 ± 0.9 ug/L

Result	Uncer.	Date
13		11/19

1,1,1-Trichloroethane 92EPA 04 PTGC

CV = 7.13 ± 0.95 ug/L

Result	Uncer.	Date
7.7	2.3	11/19

1,1,2-Trichloroethane 92EPA 04 PTGC

CV = 11.5 ± 0.76 ug/L

Result	Uncer.	Date
11	3	11/19

Trichloroethene 92EPA 04 PTGC

CV = 9.45 ± 1.26 ug/L

Result	Uncer.	Date
8.4	2.5	11/19

Mixed-Xylenes (o + m + p) 92EPA 04 PTGC

CV = 15 ± 1 ug/L

Result	Uncer.	Date
14	4	11/19

TABLE E-IV (cont)

****

EPA Drinking Water Study 31

****

Benzene 92EPA 04 PTGC

CV = 12.6 ± 1.67 ug/L

Result	Uncer.	Date
11	3	11/19

Bromodichloromethane 92EPA 04 PTGC

CV = 36.9 ± 4.93 ug/L

Result	Uncer.	Date
37	11	11/19

Bromoform 92EPA 04 PTGC

CV = 43.7 ± 5.8 ug/L

Result	Uncer.	Date
43	13	11/19

Carbon tetrachloride 92EPA 04 PTGC

CV = 8.69 ± 2.33 ug/L

Result	Uncer.	Date
9.6	2.9	11/19

Chlorobenzene 92EPA 04 PTGC

CV = 7.68 ± 2.06 ug/L

Result	Uncer.	Date
7.1	2.1	11/19

Chlorodibromomethane 92EPA 04 PTGC

CV = 31.8 ± 4.3 ug/L

Result	Uncer.	Date
31	9	11/19

Chloroform 92EPA 04 PTGC

CV = 48.4 ± 6.5 ug/L

Result	Uncer.	Date
48	14	11/19

1,2-Dibromo-3-chloropropane 92EPA 04 GCEC

CV = 2.65 ± 0.71 ug/L

Result	Uncer.	Date
2.052	0.01	11/19

o-Dichlorobenzene (1,2) 92EPA 04 PTGC

CV = 16.3 ± 2.2 ug/L

Result	Uncer.	Date
15	5	11/19

p-Dichlorobenzene (1,4) 92EPA 04 PTGC

Result	Uncer.	Date
9.9	3	11/19

1,2-Dichloroethane 92EPA 04 PTGC

CV = 9.25 ± 2.45 ug/L

Result	Uncer.	Date
11	3	11/19

1,1-Dichloroethene 92EPA 04 PTGC

CV = 7.02 ± 1.87 ug/L

Result	Uncer.	Date
9.2	2.8	11/19

trans-1,2-Dichloroethene 92EPA 04 PTGC

CV = 10.1 ± 1.34 ug/L

Result	Uncer.	Date
9.6	2.9	11/19

cis-1,2-Dichloroethylene 92EPA 04 PTGC

CV = 14.5 ± 1.93 ug/L

Result	Uncer.	Date
8.6	2.6	11/19

1,2-Dichloropropane 92EPA 04 PTGC

CV = 12.7 ± 1.7 ug/L

Result	Uncer.	Date
8.8	2.6	11/19

2,2-Dichloropropane 92EPA 04 PTGC

CV = 15.7 ± 2.1 ug/L

Result	Uncer.	Date
13	4	11/19

1,1-Dichloropropene 92EPA 04 PTGC

CV = 7.31 ± 1.9 ug/L

Result	Uncer.	Date
6.6	2	11/19

Ethylbenzene 92EPA 04 PTGC

CV = 9.27 ± 2.48 ug/L

Result	Uncer.	Date
10	3	11/19

Ethylene dibromide 92EPA 04 PTGC

CV = 0.637 ± 0.17 ug/L

Result	Uncer.	Date
0.556	0.01	11/19

Fluorene 92EPA 04 GCMS

CV = 1.93 ± 0.63 ug/L

Result	Uncer.	Date
< 10		11/20

Naphthalene 92EPA 04 GCMS

CV = 11.7 ± 6 ug/L

Result	Uncer.	Date
< 10		11/20

Phenanthrene 92EPA 04 GCMS

CV = 1.4 ± 0.57 ug/L

Result	Uncer.	Date
< 10		11/20

Propylbenzene 92EPA 04 PTGC

CV = 11.7 ± 1.5 ug/L

Result	Uncer.	Date
7.6	2.3	11/19

Styrene 92EPA 04 PTGC

CV = 11.4 ± 1.5 ug/L

Result	Uncer.	Date
8.8	2.6	11/19

Tetrachloroethylene 92EPA 04 PTGC

CV = 11.6 ± 1.5 ug/L

Result	Uncer.	Date
15	5	11/19

Toluene 92EPA 04 PTGC

CV = 15.3 ± 2.1 ug/L

Result	Uncer.	Date
17	5	11/19

1,1,1-Trichloroethane 92EPA 04 PTGC

CV = 13 ± 1.7 ug/L

Result	Uncer.	Date
14	4	11/19

Trichloroethene 92EPA 04 PTGC

CV = 7.46 ± 1.97 ug/L

Result	Uncer.	Date
6.3	1.9	11/19

Trichlorofluoromethane 92EPA 04 PTGC

CV = 12.6 ± 1.7 ug/L

Result	Uncer.	Date
13	4	11/19

1,3,5-Trimethylbenzene 92EPA 04 PTGC

CV = 8.6 ± 2.28 ug/L

Result	Uncer.	Date
< 5		11/19

Vinyl chloride 92EPA 04 PTGC

CV = 11.9 ± 3.2 ug/L

Result	Uncer.	Date
12	4	11/19

Mixed-Xylenes (o + m + p) 92EPA 04 PTGC

CV = 13.2 ± 1.7 ug/L

Result	Uncer.	Date
12	4	11/19

****

EPA Water Pollution Study 27

****

Mixed-Aroclor 91EPA 02 GCEC

CV = 7.53 ± 1.2 ug/L

Result	Uncer.	Date
5.9	2.9	10/16

CV = 19.5 ± 6 mg/kg

Result	Uncer.	Date
18	6	10/16

Aroclor 1248 91EPA 02 GCEC

CV = 7.53 ± 1.2 ug/L

Result	Uncer.	Date
5.9	2.9	10/16

Aroclor 1254 91EPA 02 GCEC

CV = 19.5 ± 6 mg/kg

Result	Uncer.	Date
18	6	10/16

Benzene 91EPA 02 PTGC

CV = 8.98 ± 1 ug/L

Result	Uncer.	Date
< 5		10/20

Bromodichloromethane 91EPA 02 PTGC

CV = 14.9 ± 1.6 ug/L

Result	Uncer.	Date
< 5		10/20

Bromoform 91EPA 02 PTGC

CV = 15.5 ± 2.4 ug/L

Result	Uncer.	Date
< 5		10/20

Carbon tetrachloride 91EPA 02 PTGC

CV = 13.5 ± 1.8 ug/L

Result	Uncer.	Date
< 5		10/20

Chlorobenzene 91EPA 02 PTGC

CV = 14.4 ± 1.5 ug/L

Result	Uncer.	Date
11	3	10/20

Chlorodibromomethane 91EPA 02 PTGC

CV = 11.1 ± 1.3 ug/L

Result	Uncer.	Date
< 5		10/20

Chloroform 91EPA 02 PTGC

CV = 16.2 ± 1.7 ug/L

Result	Uncer.	Date
22	7	10/20

o-Dichlorobenzene (1,2) 91EPA 02 PTGC

CV = 14.2 ± 1.7 ug/L

Result	Uncer.	Date
7.8	2.3	10/20

m-Dichlorobenzene (1,3) 91EPA 02 PTGC

CV = 12.7 ± 1.6 ug/L

Result	Uncer.	Date
8.1	2.4	10/20

p-Dichlorobenzene (1,4) NDA PTGC

CV = 9.74 ± 1.27 ug/L

Result	Uncer.	Date
5.7	1.7	10/20

1,2-Dichloroethane 91EPA 02 PTGC

CV = 15.8 ± 1.8 ug/L

Result	Uncer.	Date
15	5	10/20

TABLE E-IV (cont)

****

EPA Water Pollution Study 27 (cont)

****

Ethylbenzene
91EPA 02 PTGC

CV = 11.9 ± 1.5 ug/L

Result	Uncer.	Date
9.4	2.8	10/20

Methylene chloride
91EPA 02 PTGC

CV = 14.8 ± 2.4 ug/L

Result	Uncer.	Date
20	6	10/20

Tetrachloroethylene
91EPA 02 PTGC

CV = 12.7 ± 1.5 ug/L

Result	Uncer.	Date
7	2.1	10/20

Toluene
91EPA 02 PTGC

CV = 10.6 ± 1.2 ug/L

Result	Uncer.	Date
9.3	2.8	10/20

1,1,1-Trichloroethane
91EPA 02 PTGC

CV = 11.5 ± 1.6 ug/L

Result	Uncer.	Date
9.5	2.9	10/20

Trichloroethene
91EPA 02 PTGC

CV = 16.8 ± 1.8 ug/L

Result	Uncer.	Date
11	3	10/20

****

EPA Water Pollution Study 28

****

Mixed-Aroclor
92EPA 04 GCEC

CV = 5.77 ± 1.42 ug/L

Result	Uncer.	Date
4.2	2.1	4/16

Mixed-Aroclor (cont)

CV = 17.6 ± 8.3 ug/g

Result	Uncer.	Date
13	4	4/16

Aroclor 1260
92EPA 04 GCEC

CV = 5.77 ± 1.42 ug/L

Result	Uncer.	Date
4.2	2.1	4/16

CV = 17.6 ± 8.3 ug/g

Result	Uncer.	Date
13	4	4/16

Benzene
92EPA 04 PTGC

CV = 16.7 ± 3.5 ug/L

Result	Uncer.	Date
14	4	4/01

CV = 67.3 ± 13.97 ug/L

Result	Uncer.	Date
57	17	4/01

Bromodichloromethane
92EPA 04 PTGC

CV = 10.9 ± 3.3 ug/L

Result	Uncer.	Date
12	4	4/01

CV = 56.7 ± 14.4 ug/L

Result	Uncer.	Date
54	16	4/01

Bromoform
92EPA 04 PTGC

CV = 13.4 ± 3.9 ug/L

Result	Uncer.	Date
16	5	4/01

CV = 61.2 ± 17.5 ug/L

Result	Uncer.	Date
63	19	4/01

Carbon tetrachloride
92EPA 04 PTGC

CV = 18.4 ± 4.6 ug/L

Result	Uncer.	Date
16	5	4/01

CV = 39.1 ± 11.2 ug/L

Result	Uncer.	Date
34	10	4/01

Chlorobenzene
92EPA 04 PTGC

CV = 17.8 ± 3.8 ug/L

Result	Uncer.	Date
19	6	4/01

CV = 38.2 ± 3.9 ug/L

Result	Uncer.	Date
36	11	4/01

Chlorodibromomethane
92EPA 04 PTGC

CV = 14.9 ± 3.3 ug/L

Result	Uncer.	Date
16	5	4/01

CV = 37.8 ± 7.9 ug/L

Result	Uncer.	Date
35	11	4/01

Chloroform
92EPA 04 PTGC

CV = 15.4 ± 3.3 ug/L

Result	Uncer.	Date
14	4	4/01

CV = 57.8 ± 12.8 ug/L

Result	Uncer.	Date
51	15	4/01

o-Dichlorobenzene (1,2)
92EPA 04 PTGC

CV = 13.9 ± 2.7 ug/L

Result	Uncer.	Date
17	5	4/01

CV = 48.2 ± 9.8 ug/L

Result	Uncer.	Date
53	16	4/01

m-Dichlorobenzene (1,3)
92EPA 04 PTGC

CV = 14 ± 2.8 ug/L

Result	Uncer.	Date
15	5	4/01

CV = 53.9 ± 13.2 ug/L

Result	Uncer.	Date
53	16	4/01

p-Dichlorobenzene (1,4)
92EPA 04 PTGC

CV = 15.7 ± 3.3 ug/L

Result	Uncer.	Date
17	5	4/01

CV = 42.5 ± 9.3 ug/L

Result	Uncer.	Date
41	12	4/01

1,2-Dichloroethane
92EPA 04 PTGC

CV = 12.2 ± 2.8 ug/L

Result	Uncer.	Date
12	4	4/01

CV = 51.5 ± 11.4 ug/L

Result	Uncer.	Date
46	14	4/01

Ethylbenzene
92EPA 04 PTGC

CV = 14.2 ± 3.3 ug/L

Result	Uncer.	Date
14	4	4/01

CV = 36.8 ± 8.6 ug/L

Result	Uncer.	Date
35	11	4/01

Methylene chloride
92EPA 04 PTGC

CV = 9.37 ± 3.37 ug/L

Result	Uncer.	Date
9.5	2.9	4/01

CV = 48.4 ± 15.1 ug/L

Result	Uncer.	Date
43	13	4/01

Tetrachloroethylene
92EPA 04 PTGC

CV = 9.73 ± 2.43 ug/L

Result	Uncer.	Date
11	3	4/01

CV = 53.5 ± 13.2 ug/L

Result	Uncer.	Date
50	15	4/01

Toluene
92EPA 04 PTGC

CV = 11.5 ± 2.5 ug/L

Result	Uncer.	Date
11	3	4/01

CV = 45.2 ± 8.4 ug/L

Result	Uncer.	Date
42	13	4/01

1,1,1-Trichloroethane
92EPA 04 PTGC

CV = 16.4 ± 4 ug/L

Result	Uncer.	Date
14	4	4/01

CV = 43.6 ± 12.2 ug/L

Result	Uncer.	Date
35	11	4/01

Trichloroethene
92EPA 04 PTGC

CV = 12.1 ± 2.5 ug/L

Result	Uncer.	Date
13	4	4/01

CV = 45.4 ± 10.6 ug/L

Result	Uncer.	Date
40	12	4/01

****

EPA Water Pollution Study 29

****

Mixed-Aroclor
92EPA 04 GCEC

CV = 1.76 ± 0.55 ug/L

Result	Uncer.	Date
1.2	0.9	10/16

Mixed-Aroclor (cont)

CV = 2.37 ± 0.39 ug/L

Result	Uncer.	Date
2.4	1.2	10/16

CV = 35.2 ± 9.7 mg/kg

Result	Uncer.	Date
37	11	10/16

CV = 42.6 ± 13 mg/kg

Result	Uncer.	Date
35	10	10/16

Aroclor 1242
92EPA 04 GCEC

CV = 42.6 ± 13 mg/kg

Result	Uncer.	Date
35	10	10/16

Aroclor 1248
92EPA 04 GCEC

CV = 1.76 ± 0.55 ug/L

Result	Uncer.	Date
1.2	0.9	10/16

Aroclor 1254
92EPA 04 GCEC

CV = 2.37 ± 0.39 ug/L

Result	Uncer.	Date
2.4	1.2	10/16

CV = 35.2 ± 9.7 mg/kg

Result	Uncer.	Date
37	11	10/16

Benzene
92EPA 04 PTGC

CV = 12.7 ± 2 ug/L

Result	Uncer.	Date
11	3	10/20

CV = 43.9 ± 7.3 ug/L

Result	Uncer.	Date
38	11	10/20

TABLE E-IV (cont)

****

EPA Water Pollution Study 29
(cont)

****

Bromodichloromethane
92EPA 04 PTGC

CV = 16.4 ± 2.5 ug/L

Result	Uncer.	Date
13	4	10/20

CV = 62.9 ± 9.8 ug/L

Result	Uncer.	Date
55	17	10/20

Bromoform
92EPA 04 PTGC

CV = 16.3 ± 4.1 ug/L

Result	Uncer.	Date
12	4	10/20

CV = 37.7 ± 7.4 ug/L

Result	Uncer.	Date
30	9	10/20

Carbon tetrachloride
92EPA 04 PTGC

CV = 10.7 ± 2 ug/L

Result	Uncer.	Date
8.9	2.7	10/20

CV = 54.5 ± 10.8 ug/L

Result	Uncer.	Date
50	15	10/20

Chlorobenzene
92EPA 04 PTGC

CV = 10.3 ± 1.6 ug/L

Result	Uncer.	Date
7.1	2.1	10/20

CV = 57.2 ± 8.5 ug/L

Result	Uncer.	Date
42	13	10/20

Chlorodibromomethane
92EPA 04 PTGC

CV = 12.5 ± 2.1 ug/L

Result	Uncer.	Date
8.8	2.6	10/20

Chlorodibromomethane (cont)

CV = 45.4 ± 8.1 ug/L

Result	Uncer.	Date
35	11	10/20

Chloroform
92EPA 04 PTGC

CV = 8.4 ± 1.39 ug/L

Result	Uncer.	Date
8.1	2.4	10/20

CV = 38.3 ± 6.2 ug/L

Result	Uncer.	Date
36	11	10/20

o-Dichlorobenzene (1,2)
92EPA 04 PTGC

CV = 15.4 ± 2.2 ug/L

Result	Uncer.	Date
13	4	10/20

CV = 57.1 ± 9.3 ug/L

Result	Uncer.	Date
44	13	10/20

m-Dichlorobenzene (1,3)
92EPA 04 PTGC

CV = 16.5 ± 2.4 ug/L

Result	Uncer.	Date
12	4	10/20

CV = 47 ± 6.9 ug/L

Result	Uncer.	Date
36	11	10/20

p-Dichlorobenzene (1,4)
92EPA 04 PTGC

CV = 13.3 ± 2 ug/L

Result	Uncer.	Date
9.9	3	10/20

CV = 50 ± 9.3 ug/L

Result	Uncer.	Date
36	11	10/20

1,2-Dichloroethane
92EPA 04 PTGC

CV = 13.8 ± 2.2 ug/L

Result	Uncer.	Date
13	4	10/20

CV = 58.5 ± 8.8 ug/L

Result	Uncer.	Date
56	17	10/20

Ethylbenzene
92EPA 04 PTGC

CV = 9.71 ± 1.71 ug/L

Result	Uncer.	Date
7	2.1	10/20

CV = 47.7 ± 8.2 ug/L

Result	Uncer.	Date
38	11	10/20

Methylene chloride
92EPA 04 PTGC

CV = 12.8 ± 3.1 ug/L

Result	Uncer.	Date
14	4	10/20

CV = 65.6 ± 11.8 ug/L

Result	Uncer.	Date
74	22	10/20

Tetrachloroethylene
92EPA 04 PTGC

CV = 14.9 ± 2.4 ug/L

Result	Uncer.	Date
11	3	10/20

CV = 46.2 ± 7.4 ug/L

Result	Uncer.	Date
31	9	10/20

Toluene
92EPA 04 PTGC

CV = 17.2 ± 2.5 ug/L

Result	Uncer.	Date
13	4	10/20

CV = 59.7 ± 8.6 ug/L

Result	Uncer.	Date
50	15	10/20

1,1,1-Trichloroethane
92EPA 04 PTGC

CV = 12.6 ± 2.3 ug/L

Result	Uncer.	Date
11	3	10/20

CV = 63.8 ± 10.4 ug/L

Result	Uncer.	Date
57	17	10/20

Trichloroethene
92EPA 04 PTGC

CV = 15.5 ± 2.4 ug/L

Result	Uncer.	Date
14	4	10/20

CV = 53.3 ± 7.7 ug/L

Result	Uncer.	Date
43	13	10/20

****

NIOSH PAT Round 108
Organics on Charcoal

****

Tetrachloroethylene
92PAT 01 GCMS

CV = 0.5089 ± 0.041 mg/tube

Result	Uncer.	Date
0.49	0.1	1/10

CV = 0.6936 ± 0.0566 mg/tube

Result	Uncer.	Date
0.7	0.14	1/10

CV = 1.0194 ± 0.0615 mg/tube

Result	Uncer.	Date
1	0.2	1/10

CV = 1.1944 ± 0.0901 ug/tube

Result	Uncer.	Date
1200	200	1/10

1,1,1-Trichloroethane
92PAT 01 GCMS

CV = 0.5531 ± 0.0514 mg/tube

Result	Uncer.	Date
0.52	0.1	1/10

CV = 0.741 ± 0.0826 mg/tube

Result	Uncer.	Date
0.77	0.15	1/10

1,1,1-Trichloroethane (cont)

CV = 1.0383 ± 0.0889 mg/tube

Result	Uncer.	Date
1.1	0.2	1/10

CV = 1.204 ± 0.1073 mg/tube

Result	Uncer.	Date
1.2	0.2	1/10

Trichloroethene
92PAT 01 GCMS

CV = 0.564 ± 0.0384 mg/tube

Result	Uncer.	Date
0.55	0.11	1/10

CV = 0.8223 ± 0.0523 mg/tube

Result	Uncer.	Date
0.8	0.16	1/10

CV = 0.8668 ± 0.0554 mg/tube

Result	Uncer.	Date
0.92	0.18	1/10

CV = 1.0966 ± 0.0743 mg/tube

Result	Uncer.	Date
1.1	0.2	1/10

****

NIOSH PAT Round 109
Organics on Charcoal

****

Carbon tetrachloride
92PAT 01 GCMS

CV = 0.5328 ± 0.0423 mg/tube

Result	Uncer.	Date
0.52	0.1	4/20

CV = 0.9414 ± 0.0793 mg/tube

Result	Uncer.	Date
0.93	0.19	4/20

CV = 1.1665 ± 0.0823 mg/tube

Result	Uncer.	Date
1.3	0.3	4/20

CV = 1.4562 ± 0.1223 mg/tube

Result	Uncer.	Date
1.5	0.3	4/20

Chloroform
92PAT 01 GCMS

CV = 0.5675 ± 0.0458 mg/tube

Result	Uncer.	Date
0.53	0.11	4/20

CV = 0.8733 ± 0.0674 mg/tube

Result	Uncer.	Date
0.92	0.18	4/20

CV = 1.081 ± 0.0802 mg/tube

Result	Uncer.	Date
1.3	0.3	4/20

CV = 1.3012 ± 0.0982 mg/tube

Result	Uncer.	Date
1.5	0.3	4/20

1,2-Dichloroethane
92PAT 01 GCMS

CV = 0.6677 ± 0.0555 mg/tube

Result	Uncer.	Date
0.67	0.14	4/20

CV = 0.8177 ± 0.0651 mg/tube

Result	Uncer.	Date
0.84	0.17	4/20

CV = 0.9456 ± 0.0822 mg/tube

Result	Uncer.	Date
1.1	0.2	4/20

CV = 1.3341 ± 0.1078 mg/tube

Result	Uncer.	Date
1.5	0.3	4/20

****

NIOSH PAT Round 110
Organics on Charcoal

****

Benzene
92PAT 01 GCMS

CV = 0.0712 ± 0.0096 mg/tube

Result	Uncer.	Date
0.065	0.013	7/14

CV = 0.1218 ± 0.015 mg/tube

Result	Uncer.	Date
0.12	0.02	7/14

TABLE E-IV (cont)

****

NIOSH PAT Round 110
Organics on Charcoal
(cont)

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Benzene (cont)

CV = 0.2833 ± 0.0237 mg/tube

Result	Uncer.	Date
0.26	0.05	7/14

CV = 0.3492 ± 0.0314 mg/tube

Result	Uncer.	Date
0.31	0.06	7/14

Toluene
92PAT 01 GCMS

CV = 0.4901 ± 0.0398 mg/tube

Result	Uncer.	Date
0.45	0.09	7/14

Toluene (cont)

CV = 0.8681 ± 0.0805 mg/tube

Result	Uncer.	Date
0.77	0.16	7/14

CV = 1.1285 ± 0.1022 mg/tube

Result	Uncer.	Date
1	0.2	7/14

CV = 1.3345 ± 0.1012 mg/tube

Result	Uncer.	Date
1.2	0.2	7/14

o-Xylene
92PAT 01 GCMS

CV = 0.66 ± 0.0628 mg/tube

Result	Uncer.	Date
0.66	0.13	7/14

o-Xylene (cont)

CV = 0.9121 ± 0.0926 mg/tube

Result	Uncer.	Date
1	0.2	7/14

CV = 1.2442 ± 0.1259 mg/tube

Result	Uncer.	Date
0.97	0.19	7/14

CV = 1.5174 ± 0.1384 mg/tube

Result	Uncer.	Date
1.4	0.3	7/14

****

NIOSH PAT Round 111
Organics on Charcoal

****

Carbon tetrachloride
92PAT 01 GCMS

CV = 0.5043 ± 0.0599 mg/tube

Result	Uncer.	Date
0.52	0.1	10/15

Carbon tetrachloride (cont)

CV = 0.8184 ± 0.0764 mg/tube

Result	Uncer.	Date
0.79	0.16	10/15

CV = 1.1169 ± 0.1057 mg/tube

Result	Uncer.	Date
1.1	0.2	10/15

CV = 1.4787 ± 0.103 mg/tube

Result	Uncer.	Date
1.5	0.3	10/15

1,2-Dichloroethane
92PAT 01 GCMS

CV = 0.545 ± 0.0396 mg/tube

Result	Uncer.	Date
0.54	0.11	10/15

1,2-Dichloroethane (cont)

CV = 0.7604 ± 0.0564 mg/tube

Result	Uncer.	Date
0.76	0.15	10/15

CV = 0.9175 ± 0.1011 mg/tube

Result	Uncer.	Date
0.89	0.18	10/15

CV = 1.2509 ± 0.1011 mg/tube

Result	Uncer.	Date
1.2	0.2	10/15

Trichloroethene
92PAT 01 GCMS

CV = 0.4651 ± 0.0365 mg/tube

Result	Uncer.	Date
0.46	0.09	10/15

Trichloroethene (cont)

CV = 0.7089 ± 0.058 mg/tube

Result	Uncer.	Date
0.69	0.14	10/15

CV = 1.2642 ± 0.0969 mg/tube

Result	Uncer.	Date
1.4	0.3	10/15

CV = 1.3639 ± 0.0982 mg/tube

Result	Uncer.	Date
1.4	0.3	10/15

TABLE E-IV (cont)

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EM-9 Poregas Surrogate
on Charcoal Tubes

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4-Bromofluorobenzene PTGC

EPA SW-846 Limits: none

Result	Uncer.	Date
6.67		1/13
0		1/13
65.33		2/03
68.67		2/03
60.67		2/03
73		2/03
106.67		2/03
64.67		2/03
62.67		2/03
54.67		2/03
54		2/03
57.33		2/03
67.33		2/03
63.33		2/03
99.5		2/03
66		2/03
69		2/03
74		2/03
111.33		2/03
77		2/03
64		2/03
60.67		2/03
66		2/03
93.5		2/03
67.33		2/03
57.33		2/03
112.5		2/03
65.33		2/03
62		2/03
62		2/04
67.33		2/04
61.33		2/07
71.33		2/07
56		2/07
62.67		2/07
57.33		2/07
52.67		2/07
58		2/07
72.67		2/07
65.33		2/07
75.33		2/07
80		2/07
58		2/12
65.33		2/12
79		2/12
84		2/12
46		2/12
54		2/12
49.33		2/12
50.67		2/12
48.67		2/12
44		2/12
274		2/13
161.33		2/13
277.33		2/13
7.33		2/13
139.33		2/13
120		2/13
74		2/13
78.67		2/13
129		2/13
68		2/13
115.5		2/13
135		2/13
62.67		2/13
97.33		2/13

4-Bromofluorobenzene (cont)

42	2/13
88	2/13
0	2/13
0	2/13
55.33	2/13
58	2/13
12	2/13
54	2/13
1.33	2/13
9.33	2/13
66	2/13
56.67	2/13
63.33	2/13
66	2/13
0	2/13
63.33	2/13
97.33	2/28
63.33	2/28
67.33	2/28
125.33	2/28
71.33	2/28
60.67	2/28
76.67	2/28
67.33	2/28
64.67	2/28
58.67	2/28
107.33	2/28
153.33	4/07
45.33	4/07
44	4/07
46.67	4/07
38	4/07
50	4/07
58	4/07
39.33	4/07
0	4/07
46	4/07
54.67	4/07
38	4/07
67.33	4/07
114	4/07
110.67	4/07
88.67	4/07
84.67	4/07
100.67	4/23
94	5/07
96	5/07
97.33	5/07
92	5/07
105.33	5/07
98	5/07
110	5/07
93	5/07
108	5/07
100	5/07
102.67	5/07
108	5/07
100.67	5/15
68.67	5/15
89.33	5/15
88.67	5/15
54.67	5/15
58.67	5/15
54.67	5/15
60	5/15
50.67	5/15
58	5/15
48	5/15
94	5/15
98.67	5/15
42.67	5/15
50	5/15
52.67	5/15
85.33	5/15
56	5/15
42	5/15
54	5/15

4-Bromofluorobenzene (cont)

54.67	5/15
46.67	5/15
47.33	5/15
93.33	5/18
80.67	5/18
96	5/18
80	5/18
86	5/18
84	5/18
92.67	5/18
92	5/18
96.67	5/18
97.33	5/18
94.67	5/18
95.33	5/18
86.67	5/18
98.67	5/18
106.67	5/18
79.33	5/18
80	5/18
85.33	5/18
91.33	5/26
87.33	5/26
92.67	5/26
87.33	5/26
92	5/26
98.67	5/26
74.67	5/28
83.33	5/28
75.33	5/28
72	5/28
88	5/28
84.67	5/28
106	5/28
126	5/28
100	6/03
104.67	6/03
82.67	6/03
83.33	6/03
82	6/03
83.33	6/03
102	6/08
85.33	6/16
82	6/16
82.67	6/16
73.33	6/16
81.33	6/16
90	6/16
86	6/16
75.33	6/16
82.67	6/16
81.33	6/16
83.33	6/16
88	6/16
96	6/16
89.33	6/16
98	6/16
98	6/16
85.33	6/16
80.67	6/17
90	6/17
76	6/17
78	6/17
75.33	6/17
94	6/23
76.67	6/23
86.67	6/23
83.33	6/23
87.33	6/23
85	6/23
100	6/25
80	6/25
101.33	6/25
89.33	6/29
95.33	6/29
100.67	7/14
112	7/14

4-Bromofluorobenzene (cont)

86.67	7/14
86.67	7/14
84.67	7/14
77.33	7/14
78.67	7/22
78	7/22
77.33	7/22
94	7/22
72.67	7/22
83.33	7/22
85.33	8/04
96.67	8/04
90	8/04
96	8/04
81.33	8/04
88	8/04
99.33	8/07
94.67	8/07
84	8/07
90	8/07
89.33	8/07
85.33	8/07
71.93	9/30
96.45	9/30
68.76	9/30
100.03	9/30
67.25	9/30
68.91	9/30
81.44	9/30
67.59	9/30
79.83	9/30
81.99	9/30
96.25	9/30
87.09	9/30
89.88	9/30
122.88	9/30
84.83	9/30
86.86	9/30
85.86	9/30
120.57	9/30
119.87	9/30
117.43	9/30
95.39	9/30
65.71	9/30
69.01	9/30
69.97	9/30
127.75	9/30
97.19	9/30
73.13	9/30
69.46	9/30
113.01	9/30
102.81	9/30
105.62	9/30
71.2	9/30
55.54	9/30
40.07	9/30
133.95	9/30
116.91	9/30
83.23	9/30
82.3	9/30
96.52	9/30
128.57	9/30
101.71	9/30
95.71	9/30
98.99	9/30
94.44	9/30
98.37	9/30
63.99	9/30
69.61	9/30
85.47	9/30
78.44	9/30
0	9/30
0	9/30
0	9/30
0	9/30
0	9/30
0	9/30
90.2	9/30

4-Bromofluorobenzene (cont)

119.4	9/30
0	9/30
63.27	9/30
89.4	9/30
0	9/30
118	9/30
66.72	9/30
59.5	9/30
66.43	9/30
97.63	9/30
62.81	9/30
100.57	9/30
122.51	9/30
109.85	9/30
98.01	9/30
70.07	9/30
67.73	9/30
96.9	9/30
100.33	9/30
100.91	9/30
102.2	10/07
119.13	10/07
134.07	10/07
96	10/07
129.33	10/07
109.53	10/07
105.87	10/07
129.93	10/07
145.6	10/07
136.27	10/07
142	10/07
143.27	10/07
137.87	10/07
136.8	10/07
100.6	10/07
108.27	10/07
100.27	10/07
104.13	10/07
103.47	10/07
123.13	10/07
116.53	10/07
103.07	10/07
96.67	10/07
134.53	10/07
130.67	10/07
131.33	10/07
141.2	10/07
141.6	10/07
133.8	10/07
124.6	10/07
125.33	10/07
125.4	10/07
145.8	10/07
140.2	10/07
130.8	10/07
126.19	10/07
123.09	10/07
113.99	10/07
122.47	10/07
124.67	10/07
121.33	10/07
129.67	10/07
120.93	10/07
126.4	10/07
140.06	10/17
124.93	10/17
114.77	10/17
129.13	10/17
129.87	10/17
85.01	10/17
119.15	10/17
107.32	10/17
119.8	10/17
117.9	10/17
120.49	10/17
119.4	10/17
121.7	10/17
138.03	10/17

4-Bromofluorobenzene (cont)

79.37	10/17
78.99	10/17
120.29	10/17
81.87	10/17
87.35	10/17
115.4	10/17
117.3	10/17
83.83	10/17
85.46	10/17
90.51	10/17
75.26	10/17
115.85	10/17
99.84	10/17
76.19	10/17
80.84	10/17
111.87	10/17
137.29	10/17
112.28	10/17
103.97	10/17
0	10/17
106.59	10/17
120.6	10/17
135	10/17
106.25	10/17
104.19	10/17
90.73	10/17
90.43	10/17
107.39	10/17
0	10/17
105.58	10/17
106.73	10/17
129.35	10/17
130.57	10/17
109.18	10/17
82.73	10/17
102.45	10/17
120.02	10/17
99.19	10/17
108.15	10/17
74.92	10/17
87.59	10/17
79.62	10/17
83.23	10/17
85.11	10/17
83.99	10/17
124.61	10/17
120.91	10/17
118.98	10/17
97.4	10/17
132.18	10/17
106.74	10/17
124.23	10/17
129	10/17
120.85	10/17
118.96	10/17
129.36	10/17
100.79	10/17
127.34	10/17
134.27	10/17
107.11	10/17
98.54	10/17
104.52	10/17
115.71	10/17
128.41	10/17
109.69	10/17
91.01	10/19
91.53	10/19
93.56	10/19
89.57	10/19
90.58	10/19
72.74	10/19
94.24	10/19
89.56	10/19
118.39	12/17
106.2	12/17
89.81	12/17
84.37	12/17
90.77	12/17

TABLE E-IV (cont)

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EM-9 Poregas Surrogate
on Charcoal Tubes
(cont)

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4-Bromofluorobenzene (cont)

83.85	12/17
81.28	12/17
89.45	12/17
84.51	12/17
92.69	12/17
96.69	12/17
99.07	12/17
95.93	12/17
92.91	12/17
94.9	12/17
96.92	12/17
92.53	12/17
93.35	12/17
93.34	12/17
92.75	12/17
96.46	12/17
100.64	12/17
94.37	12/17
97.05	12/17
99.32	12/17
102.71	12/17
102.78	12/17
97.36	12/17
93.23	12/17
95.05	12/17
93.75	12/17
92.36	12/17
169.49	12/17
93.33	12/17
94.77	12/17
96.67	12/17
94	12/17
92.83	12/17
92.85	12/17
89.92	12/17
93.01	12/17
87.01	12/17
89.83	12/17
91.15	12/17
88.2	12/17
94.75	12/17
143.09	12/17
125.54	12/17
92.59	12/17
82.63	12/17
91.29	12/17
90.27	12/17
90.04	12/17
91	12/17
92.03	12/17
103.39	12/17
91.65	12/17
91.52	12/17
96.59	12/17
92.39	12/17
90.25	12/17
92.77	12/17
97.49	12/17
95.78	12/17
94.61	12/17
92.91	12/17
95.2	12/17
94.12	12/17
93.58	12/17
91.11	12/17
106.27	12/17
115.11	12/17
91.74	12/17
106.22	12/17
94.15	12/17

4-Bromofluorobenzene (cont)

165.49	12/17
89.19	12/17
88.73	12/17
91.65	12/17
96.78	12/17
109.78	12/17
104.93	12/17
106.57	12/17
92.86	12/17
90.91	12/17
91.15	12/17
95.25	12/17

****

EM-9 Semivolatile Surrogate
in Bulk Materials

****

2-Fluorobiphenyl GCMS

EPA SW-846 Limits: none

Result	Uncer.	Date
99.66		3/24
0		3/24
0		3/24
78.72		3/24
0		3/24
242.2		5/18

2-Fluorophenol GCMS

EPA SW-846 Limits: none

Result	Uncer.	Date
51.16		3/24
0		3/24
0		3/24
0		3/24
66.7		3/24
0		5/18

Nitrobenzene d5 GCMS

EPA SW-846 Limits: none

Result	Uncer.	Date
95.76		3/24
0		3/24
0		3/24
0		3/24
72		3/24
99.4		5/18

Phenol d6 GCMS

EPA SW-846 Limits: none

Result	Uncer.	Date
52.79		3/24
66.34		3/24
0		3/24
0		3/24
0		3/24
0		5/18

Terphenyl d14 GCMS

EPA SW-846 Limits: none

Result	Uncer.	Date
0		3/24
119.94		3/24
0		3/24
0		3/24
110.94		3/24
0		5/18

2,4,6-Tribromophenol GCMS

EPA SW-846 Limits: none

Result	Uncer.	Date
69.41		3/24
0		3/24
81.76		3/24
0		3/24
0		3/24
0		5/18

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EM-9 Semivolatile Surrogate
in Sludge

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2-Fluorobiphenyl GCMS

EPA SW-846 Limits: none

Result	Uncer.	Date
85.42		6/24
66.5		6/24
59.6		6/24
63.76		6/24
61.16		6/24
65.4		6/24
76.24		6/24
102.28		6/24
73.24		6/24
64.44		6/24
71.96		6/24
58.18		6/24
77.62		6/24
61.48		6/24
73.5		6/24
96.88		6/24
58.26		6/24
59.76		6/26
65.28		6/26
78.2		8/19
78.8		8/19
66.24		8/19
54.5		8/19
47.54		8/19
60.1		8/19
59.24		8/19
70.62		8/19
57.82		8/19
60.78		8/19
66.2		8/19
62.6		8/19
70.32		8/19
62.68		8/19
69.04		8/19
51.46		8/19
57.24		8/19
65.3		8/19
64.86		8/19
122.4		8/31
83.8		9/03

2-Fluorobiphenyl (cont)

80.46	9/03
77.82	10/14
69.88	10/26
87.6	11/16
83.8	11/16
79.88	11/16
85.28	11/16
75.96	11/16
80.92	11/16
77.64	11/16
80.44	11/16
76.88	11/20
78.14	11/20
80.44	11/20
75.88	12/16
81.84	12/16
81.52	12/16

2-Fluorophenol GCMS

EPA SW-846 Limits: none

Result	Uncer.	Date
37.87		6/24
32.58		6/24
43.18		6/24
61.04		6/24
28.26		6/24
50.66		6/24
20.68		6/24
27.57		6/24
45.1		6/24
39.07		6/24
31.53		6/24
41.04		6/24
30.86		6/24
38.36		6/24
63.16		6/24
23.82		6/24
29.06		6/24
37.84		6/26
32.84		6/26
25.32		8/19
43.97		8/19
45.8		8/19
50		8/19
36.3		8/19
32.17		8/19
26.33		8/19
44.4		8/19
39.39		8/19
41.22		8/19
33		8/19
42.11		8/19
22.47		8/19
29.64		8/19
39.89		8/19
34.7		8/19
27.96		8/19
25.21		8/19
33.99		8/19
39.69		8/31
72.05		9/03
36.04		9/03
56.73		10/14
63.95		10/26
57.9		11/16
65.54		11/16
60.4		11/16
65.52		11/16
54.7		11/16
47.64		11/16
48.98		11/16
53.12		11/16
71.54		11/20
74.44		11/20

2-Fluorophenol (cont)

72.99	11/20
61.99	12/16
43.06	12/16
61.53	12/16

Nitrobenzene d5 GCMS

EPA SW-846 Limits: none

Result	Uncer.	Date
81.6		6/24
44.48		6/24
52.7		6/24
50.26		6/24
58.5		6/24
74.18		6/24
44.28		6/24
60.74		6/24
77.76		6/24
46.52		6/24
55.9		6/24
45.32		6/24
59.32		6/24
60.46		6/24
49.06		6/24
35.3		6/24
58.6		6/24
48.98		6/26
47.12		6/26
56.36		8/19
53		8/19
35.74		8/19
51.66		8/19
40.94		8/19
54.64		8/19
55.52		8/19
50.72		8/19
51.5		8/19
43.44		8/19
41.22		8/19
41.76		8/19
51.26		8/19
40.78		8/19
45.2		8/19
54.4		8/19
53.4		8/19
44.68		8/19
35.36		8/19
77.46		8/31
80.66		9/03
82.72		9/03
72.14		10/14
57.74		10/26
71.32		11/16
58.88		11/16
64.08		11/16
64.28		11/16
70		11/16
51.68		11/16
59.48		11/16
64.12		11/16
86.84		11/20
80.22		11/20
88.62		11/20
63.2		12/16
74.94		12/16
74.18		12/16

Phenol d6 GCMS

EPA SW-846 Limits: none

Result	Uncer.	Date
47.86		6/24
61.66		6/24
48.5		6/24
52.46		6/24
82.9		6/24
58.37		6/24
47.22		6/24
41.14		6/24
61.25		6/24
79.5		6/24
59.26		6/24
63.4		6/24
43.96		6/24
55.58		6/24
56.9		6/24
50.3		6/24
77.48		6/24
56.29		6/26
49.48		6/26
39.63		8/19
43.89		8/19
38.68		8/19
42.57		8/19
47.6		8/19
54.5		8/19
58.8		8/19
45.56		8/19
54.47		8/19
38.45		8/19
42.89		8/19
53.44		8/19
51.96		8/19
51.73		8/19
52.36		8/19
48.76		8/19
51.79		8/19
48.15		8/19
42.59		8/19
60.21		8/31
80.2		9/03
59.22		9/03
66.89		10/14
70.23		10/26
74.24		11/16
79.6		11/16
68.92		11/16
75.86		11/16
62.98		11/16
69.6		11/16
71.2		11/16
63.92		11/16
79.18		11/20
80.36		11/20
87.54		11/20
75.89		12/16
75.54		12/16
62.18		12/16

Terphenyl d14 GCMS

EPA SW-846 Limits: none

Result	Uncer.	Date
90.38		6/24
87.84		6/24
85.64		6/24
67.32		6/24
70.58		6/24
106.36		6/24
63.32		6/24
99.74		6/24
78.68		6/24

TABLE E-IV (cont)

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EM-9 Semivolatile Surrogate
in Sludge
(cont)

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Terphenyl d14 (cont)

77.12	6/24
96.4	6/24
74.12	6/24
79.44	6/24
69.16	6/24
75.06	6/24
80.56	6/24
68.92	6/24
78.32	6/26
83.1	6/26
84.04	8/19
83.46	8/19
79.2	8/19
81.1	8/19
83.36	8/19
77.28	8/19
73.32	8/19
69.18	8/19
76.9	8/19
81.56	8/19
76.68	8/19
83.2	8/19
93.2	8/19
87.6	8/19
85.48	8/19
93.4	8/19
69.88	8/19
75.42	8/19
77.18	8/19
94.52	8/31
95.96	9/03
92.1	9/03
100.96	10/14
102.32	10/26
110.04	11/16
121.96	11/16
134.16	11/16
108.24	11/16
106.08	11/16
135.56	11/16
128.96	11/16
145.96	11/16
86.32	11/20
81.36	11/20
82.84	11/20
73.04	12/16
78.46	12/16
78.84	12/16

2,4,6-Tribromophenol GCMS

EPA SW-846 Limits: none

Result	Uncer.	Date
106.7		6/24
61.77		6/24
79.77		6/24
64.7		6/24
79.97		6/24
93.01		6/24
70.62		6/24
83.03		6/24
72.32		6/24
80.96		6/24
87.37		6/24
109.88		6/24
73.38		6/24
107.68		6/24

2,4,6-Tribromophenol (cont)

87.94	6/24
74.44	6/24
88.31	6/24
83.86	6/26
84.24	6/26
89.84	8/19
71.58	8/19
71.17	8/19
84.29	8/19
77.72	8/19
92.33	8/19
82.22	8/19
77.97	8/19
86.66	8/19
80.79	8/19
92.2	8/19
95.51	8/19
75.05	8/19
86.29	8/19
80.07	8/19
85.28	8/19
80.2	8/19
89.3	8/19
84.89	8/19
16.64	8/31
22.08	9/03
95.91	9/03
40.4	10/14
117	10/26
103.18	11/16
103.94	11/16
108.5	11/16
106.16	11/16
102.76	11/16
113.34	11/16
102.62	11/16
114.12	11/16
52.08	11/20
74.01	11/20
100.32	11/20
131.62	12/16
91.38	12/16
111.59	12/16

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EM-9 Semivolatile Surrogate
in Soil

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2-Fluorobiphenyl GCMS

EPA SW-846 Limits: 30 - 115 %

Result	Uncer.	Date
87.54		1/03
90.26		1/03
149.2		1/03
80.78		1/03
81.76		1/03
113.6		1/03
111.04		1/03
119.92		1/03
92.3		1/03
109.52		1/06
23.56		1/06
93.2		1/06
114.88		1/06
96.16		1/06
87.62		1/06
84		2/14
72.3		2/14
84.7		2/14
69.4		2/14
84.84		2/14
80.44		2/14

2-Fluorobiphenyl (cont)

68.12	2/14
82.2	2/14
70.48	2/14
71.02	2/14
59.24	2/14
68.72	2/14
95.3	2/14
87.7	2/14
75.4	2/14
119.84	2/14
91.44	2/14
75.38	2/14
64.54	2/14
72.36	2/14
77.34	2/14
100.44	2/14
108.52	2/14
88.92	2/14
63.48	2/14
88.12	2/14
84.02	2/14
82.42	2/14
100	2/14
79.6	2/14
119.4	2/14
67.62	2/14
70.34	2/14
68.66	2/21
69.76	2/21
68.94	2/21
74.32	2/21
73.72	2/21
73.22	2/21
65.96	2/21
67.86	2/21
69.76	2/21
69.4	2/21
71.72	3/24
111.9	3/24
72.5	3/24
76.54	3/24
139	3/24
66.86	3/24
111.56	3/24
74.78	3/24
104.94	3/24
65.98	3/24
118.96	3/24
105.26	3/24
99.88	3/25
108.94	3/25
110.02	3/25
104.56	3/25
111.26	3/25
102.2	3/25
101.88	3/25
113.24	3/25
70	4/15
71.74	4/15
76.7	4/15
79.3	4/15
73.8	4/15
70.24	4/15
69.9	4/15
75.34	4/15
75.56	4/15
90.86	4/28
94.54	4/28
86.32	4/28
58.72	4/28
65.06	4/28
106.8	4/28
86.42	4/28
76.64	4/28
71.5	4/28
69.36	4/28
82.08	4/28
70.3	4/28

2-Fluorobiphenyl (cont)

72.26	4/28
81.1	5/01
85.64	5/01
81.18	5/01
91.84	5/01
77.7	5/01
77.12	5/01
89.26	5/01
84.32	5/01
85.24	5/01
81.2	5/04
80.3	5/04
82.32	5/04
84.22	5/04
79.48	5/04
88.72	5/04
125	5/04
94.16	5/04
66.78	5/04
73.6	5/04
84.64	5/05
77.72	5/05
78.12	5/05
76.66	5/05
90.5	5/05
84.5	5/05
70.06	5/05
75.62	5/05
77.26	5/05
74.92	5/05
70.68	5/05
71.04	5/05
77.62	5/05
57.36	5/13
51.54	5/13
81.8	5/13
110.32	5/13
69.84	5/13
60.66	5/13
72.12	5/13
63.94	5/13
74.54	5/13
64.38	5/13
59.9	5/13
69.62	6/09
69.12	6/09
77.1	6/09
65.8	6/09
78.9	6/09
70.42	6/09
65.06	6/09
80.66	6/09
66.92	6/09
74.48	6/09
69.04	6/09
70.98	6/09
81	6/09
66.08	6/09
67.06	6/09
67.6	6/09
83.74	6/09
69.28	6/09
82.76	6/09
86.6	6/09
43.58	6/19
46.6	6/19
61.56	6/19
53.08	6/19
0	6/19
89.98	6/24
61.2	6/24
51.9	6/24
68.64	7/02
65.24	7/02
76.22	7/02
70.26	7/02
75.52	7/02
58.86	7/06

2-Fluorobiphenyl (cont)

53.06	7/06
69.54	7/06
72.04	7/06
59.58	7/06
53.18	7/06
55.52	7/06
78.4	7/06
61.64	7/06
63.24	7/06
57.36	7/06
52.7	7/06
72.86	7/06
104.1	7/08
87.34	7/21
87.82	7/21
63.98	7/21
68.12	7/21
83.92	7/21
82.66	7/21
75.9	7/21
91.9	7/21
82.68	7/21
66.98	7/21
73.4	7/21
97.18	7/21
95.78	7/21
74.9	7/21
78	7/21
81.24	7/21
81.74	7/21
97.02	7/21
83.14	7/21
96.08	7/21
85.62	7/21
79.02	7/21
85.52	7/21
70.32	7/21
80.64	7/21
82.2	7/21
85.62	7/21
82.24	8/17
109.36	8/17
88.88	8/17
76.38	8/17
69.28	8/17
76.82	8/17
74.5	8/17
89.06	8/17
72.36	8/17
71.28	8/17
70.52	8/17
84.06	8/17
81.62	8/17
29.02	8/17
71.96	8/17
82.96	8/17
76.26	8/17
76.8	8/17
85.94	8/17
70.86	8/17
68.04	8/17
75.9	8/17
75.32	8/17
54.54	8/19
20.08	8/19
78.26	8/19
57.78	8/19
93.84	8/31
81.96	8/31
97.74	8/31
91.78	8/31
46.56	8/31
89.98	8/31
87.76	8/31
80.94	8/31
71.6	8/31
70.98	8/31
66.94	8/31

2-Fluorobiphenyl (cont)

61.82	9/03
72.04	9/08
0	9/08
15.48	9/08
33.64	9/08
82.52	9/08
73.44	9/08
78.88	9/08
69.72	9/08
62.96	9/08
67.84	9/08
75.44	9/08
52.32	9/08
73.7	9/08
61.68	9/08
33.64	9/08
63.8	9/08
63.86	9/08
77.7	9/08
69.22	9/08
48.2	9/08
66.26	9/08
73.72	9/08
75.22	9/10
57.52	9/10
44.44	9/10
61.8	9/10
74.64	9/10
44.5	9/10
90.06	9/10
94.34	9/10
60.4	9/10
97.86	9/10
100.28	9/10
87.3	9/10
89.06	9/11
86.8	9/16
59.82	9/16
80.2	9/16
64.46	9/16
85.28	9/16
79.8	9/18
71.68	9/18
62.28	9/23
83.1	9/23
64.02	9/23
87.4	9/23
66.58	9/23
81.76	9/23
70.84	9/23
46.82	9/23
67.1	9/23
82.04	9/29
77.22	9/29
71.4	9/29
47.24	9/29
82.2	9/29
87.94	9/29
57.8	9/29
88.78	9/29
79.62	9/29
85.3	9/29
64.24	9/29
76.34	9/29
76.42	9/29
78.3	9/29
69.88	9/29
76.2	9/30
70.98	9/30
94.12	9/30
76.76	9/30
56.66	9/30
64.28	9/30
80.04	9/30
65.34	9/30
70.34	9/30
90.64	9/30
62.42	9/30

TABLE E-IV (cont)

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EM-9 Semivolatile Surrogate
in Soil
(cont)

****

2-Fluorobiphenyl (cont)

85.22	9/30
85.86	9/30
88.74	9/30
81.48	9/30
80.6	9/30
68.08	9/30
62.6	9/30
53	10/05
99.6	10/05
96.7	10/05
66.76	10/05
70.38	10/05
72.48	10/05
85.46	10/05
62.1	10/05
81.32	10/05
91.52	10/05
81.66	10/05
57.02	10/05
77.44	10/05
83.74	10/05
89.86	10/05
79.72	10/05
74.56	10/05
74.32	10/05
81.52	10/05
63.02	10/05
64.74	10/05
57.34	10/05
68.52	10/13
65.04	10/13
69.74	10/13
78.72	10/13
80.34	10/13
83.9	10/13
79.8	10/13
68.94	10/13
70.14	10/13
68.16	10/13
57.4	10/13
61.06	10/13
69.36	10/13
72.86	10/13
59.64	10/13
65.78	10/13
53.7	10/20
61.42	10/20
80.12	10/20
72.4	10/20
84.34	10/20
68.38	10/20
73.94	10/20
71.9	10/20
70.14	10/20
76.58	10/20
66.2	10/20
63.74	10/20
70.56	10/20
69.7	10/20
72.44	10/20
81.86	10/20
71.74	10/20
45.26	10/20
60.34	10/20
67.18	10/20
63.72	10/20
69.9	10/20
70.4	10/20
75.2	10/20
70.86	10/20

2-Fluorobiphenyl (cont)

61.56	10/20
79.56	10/20
75.18	10/20
68.18	10/20
71.86	10/20
76.34	10/20
60.94	10/20
57.74	10/23
45.44	10/23
28.3	10/23
71.88	10/23
58.3	10/23
62.74	10/23
53.4	10/23
68.28	10/23
65.58	10/23
59.44	10/23
64.86	10/23
77.08	10/23
73.82	10/23
82.8	10/23
61.32	10/23
64.1	10/23
0	10/23
69.36	10/23
42.6	10/23
51.7	10/23
51.16	10/23
44.56	10/23
64.16	10/23
62.24	10/23
0	10/23
68.68	11/01
64.16	11/01
84.96	11/01
106.24	11/01
67.8	11/01
110.52	11/01
64.76	11/01
104.72	11/01
71.96	11/01
99.72	11/01
99.64	11/01
86.52	11/01
92.76	11/01
82.86	11/01
98.4	11/01
81.16	11/01
83.2	11/01
88.16	11/01
70.68	11/01
84.76	11/01
51.34	11/02
67.4	11/02
79.08	11/02
75.9	11/02
66	11/02
84.32	11/04
71.9	11/04
75.7	11/04
74.36	11/04
76.16	11/04
70.64	11/04
74	11/04
75.36	11/04
60.52	11/04
51.18	11/04
75.76	11/04
77.82	11/04
86.3	11/04
72.32	11/04
64.36	11/04
62.9	11/04
64.38	11/04
66.64	11/04
74	11/04
63.64	11/04
86.96	11/04

2-Fluorobiphenyl (cont)

64.88	11/04
72.92	11/04
66.56	11/04
73.06	11/04
133.6	11/04
71.58	11/04
73.32	11/04
72.96	11/04
63.2	11/04
77.64	11/04
75.3	11/04
58.02	11/16
94.6	11/16
61.64	11/16
44.9	11/16
53.32	11/16
61.64	11/16
49.54	11/16
67.5	11/16
63.16	11/16
65.48	11/16
52.72	11/16
81.74	11/16
86.84	11/16
91.42	11/16
74.32	11/16
57.86	11/16
43.6	11/16
69.62	11/16
71.52	11/16
45.92	11/16
66.64	11/16
65.38	11/16
68.66	11/16
43.16	11/16
41.68	11/16
67.66	11/16
58.42	11/16
68.54	11/16
46.52	11/16
81.92	11/16
63.76	11/16
56.36	11/16
60.54	11/16
85.88	11/16
58.74	11/16
59.4	11/16
70.4	11/17
65.4	11/17
83.12	11/17
63.5	11/17
77.5	11/17
39.18	11/17
34.72	11/17
78.5	11/17
39.34	11/17
80.34	11/17
56.74	11/17
73.68	11/18
79.8	11/18
76.12	11/18
75.04	11/18
72.84	11/18
80.2	11/18
79.64	11/18
80.88	11/18
86.84	11/18
87.68	11/18
78.42	11/18
72.22	11/18
78.8	11/18
62.76	11/18
73.52	11/18
71.82	11/20
71.12	11/20
71.46	12/01
72.38	12/01
60.84	12/01

2-Fluorobiphenyl (cont)

65.14	12/01
54.62	12/01
58.72	12/01
67.14	12/01
77.1	12/01
63.62	12/01
62.04	12/01
59.8	12/01
52.4	12/01
88.6	12/01
75.36	12/01
80.66	12/01
82.44	12/01
113.68	12/01
77.52	12/01
80.32	12/01
84.72	12/01
76.18	12/01
70.02	12/01
83.58	12/01
76.66	12/01
81.6	12/01
90.22	12/01
74.02	12/01
71.46	12/01
76.36	12/01
68.46	12/01
83.6	12/01
84.56	12/01
64.7	12/01
61.32	12/01
66.82	12/01
85.8	12/01
61.42	12/01
58.96	12/01
58.24	12/01
45.74	12/01
65.68	12/01
74.5	12/01
76.1	12/01
90.92	12/01
78.5	12/01
86.6	12/01
91.28	12/01
56.64	12/02
59.02	12/02
56.86	12/02
51.92	12/02
37.84	12/02
38.9	12/02
38.34	12/02
61.92	12/02
41.74	12/02
63.32	12/02
10.44	12/02
55.06	12/02
83.46	12/02
68.28	12/02
71.68	12/02
49.7	12/02
41.6	12/02
39.38	12/02
60.2	12/02
52.76	12/02
46.86	12/02
43.98	12/02
73.44	12/02
78.8	12/02
74.92	12/02
39.04	12/02
45.3	12/02
45.2	12/02
58.72	12/02
33.76	12/02
86.52	12/03
77.2	12/03
70.34	12/03
61.6	12/03

2-Fluorobiphenyl (cont)

62.04	12/03
59.26	12/03
61.12	12/03
100.26	12/03
64.56	12/03
56.62	12/03
83.76	12/03
75.9	12/03
51.2	12/03
55.16	12/03
56.26	12/03
70.88	12/07
60.34	12/07
86.54	12/07
47.78	12/10
45.8	12/10
81.48	12/10
66.48	12/10
80.5	12/10
75.52	12/10
47.82	12/10
78.78	12/10
81.88	12/10
42.72	12/10
54.1	12/10
62	12/15
66.62	12/15
55.86	12/15
71.38	12/15
71.8	12/15
70.04	12/15
70.64	12/15
69.88	12/15
75.02	12/15
69.5	12/15
61.52	12/15
65.22	12/15
69.44	12/15
92.7	12/16
81.92	12/16
76.58	12/16
69.44	12/16
75.24	12/16
75.98	12/16
66.8	12/16
78.92	12/16
76.6	12/16
80.44	12/16
79.78	12/16
60.06	12/16
59.06	12/16
81.52	12/16

2-Fluorophenol GCMS

EPA SW-846 Limits: 25 - 121 %

Result	Uncer.	Date
72.12		1/03
38.01		1/03
55.06		1/03
60.14		1/03
62.72		1/03
81.4		1/03
48.52		1/03
61.84		1/03
66.88		1/03
59.44		1/06
55.07		1/06
68		1/06
4.6		1/06
39.84		1/06
65.24		1/06
52.89		2/14
46.75		2/14
46.41		2/14

2-Fluorophenol (cont)

42.66	2/14
37.58	2/14
55.34	2/14
35.18	2/14
50.56	2/14
39.88	2/14
41.84	2/14
33.42	2/14
55.3	2/14
49.06	2/14
51.66	2/14
41.85	2/14
46.06	2/14
38.97	2/14
43.18	2/14
49.84	2/14
26.16	2/14
7.12	2/14
37.12	2/14
48.09	2/14
43.95	2/14
42.96	2/14
39.92	2/14
42.98	2/14
23.76	2/14
41.31	2/14
52.2	2/14
37.83	2/14
60.99	2/14
71.24	2/14
36.8	2/21
43.96	2/21
39.64	2/21
34.79	2/21
37.6	2/21
41.49	2/21
30.63	2/21
40.26	2/21
33.13	2/21
43.88	2/21
58.29	3/24
67.49	3/24
39.3	3/24
59.14	3/24
42.5	3/24
39.36	3/24
39.08	3/24
55.37	3/24
47	3/24
38.44	3/24
77.2	3/24
55.58	3/24
56.79	3/25
59.44	3/25
62.65	3/25
45.69	3/25
48.69	3/25
50.14	3/25
62.11	3/25
65.64	3/25
49.04	4/15
39.26	4/15
47.73	4/15
48.18	4/15
42.44	4/15
45.89	4/15
36.38	4/15
45.87	4/15
46.35	4/15
61.71	4/28
78.64	4/28
73.5	4/28
49.66	4/28
31.57	4/28
66.94	4/28
72.77	4/28
39.41	4/28
62.15	4/28

TABLE E-IV (cont)

****

EM-9 Semivolatile Surrogate in Soil (cont)

****

2-Fluorophenol (cont)

48.56	4/28
50	4/28
48.15	4/28
51.13	4/28
64.95	5/01
64.15	5/01
57.04	5/01
57.66	5/01
48.7	5/01
54.98	5/01
60.9	5/01
64.9	5/01
69.86	5/01
61.44	5/04
60.14	5/04
57.39	5/04
62.46	5/04
61.17	5/04
70.94	5/04
81.3	5/04
60.33	5/04
46.01	5/04
48.05	5/04
54.65	5/05
49.8	5/05
59.68	5/05
58.85	5/05
55.68	5/05
54.32	5/05
54.71	5/05
53.59	5/05
53.34	5/05
51.79	5/05
51.92	5/05
52.64	5/05
48.76	5/05
44.37	5/13
46.05	5/13
39.73	5/13
40.21	5/13
34.4	5/13
32.55	5/13
34.59	5/13
36.91	5/13
73.4	5/13
40.32	5/13
59.25	5/13
56.22	6/09
59.06	6/09
54.88	6/09
48.48	6/09
47.8	6/09
53.98	6/09
49.92	6/09
44.46	6/09
42.47	6/09
59.8	6/09
52	6/09
62.35	6/09
51.29	6/09
45.63	6/09
35.6	6/09
53.68	6/09
47.61	6/09
53.74	6/09
55.55	6/09
51.68	6/09
48.3	6/19
39.9	6/19
36.72	6/19

2-Fluorophenol (cont)

0	6/19
34.07	6/19
26.4	6/24
67.5	6/24
18.78	6/24
55.23	7/02
60.56	7/02
57.56	7/02
49.34	7/02
56.83	7/02
42.18	7/06
37.7	7/06
55.13	7/06
49.93	7/06
36.78	7/06
43.8	7/06
43.19	7/06
39.93	7/06
52.1	7/06
49.98	7/06
50.93	7/06
43.9	7/06
45.16	7/06
66.25	7/08
66.61	7/21
66.47	7/21
62.99	7/21
65.85	7/21
67.95	7/21
72.84	7/21
55.51	7/21
52.05	7/21
75.04	7/21
72.52	7/21
73.65	7/21
73.22	7/21
62.85	7/21
42.61	7/21
57.04	7/21
70.63	7/21
77.83	7/21
49.32	7/21
49.01	7/21
52.2	7/21
54.03	7/21
49.15	7/21
48.7	7/21
52.58	7/21
57.65	7/21
55.6	7/21
56.75	7/21
72.48	8/17
61.27	8/17
58.78	8/17
53.99	8/17
59.13	8/17
48.69	8/17
55.17	8/17
52.08	8/17
60.58	8/17
76.23	8/17
77.84	8/17
60.77	8/17
18.06	8/17
46.61	8/17
64.48	8/17
50.39	8/17
34.23	8/17
50.78	8/17
46.41	8/17
53.41	8/17
56.89	8/17
48.74	8/17
63.23	8/17
38.19	8/19
50.4	8/19
34.53	8/19
7.86	8/19

2-Fluorophenol (cont)

74.22	8/31
58.88	8/31
53.87	8/31
67.84	8/31
58.26	8/31
37.5	8/31
54.64	8/31
50.74	8/31
48.65	8/31
62.02	8/31
46.86	8/31
36.25	9/03
56.1	9/08
0	9/08
31.66	9/08
73.78	9/08
64.92	9/08
58.9	9/08
61.34	9/08
5.84	9/08
22.26	9/08
22.26	9/08
27.34	9/08
48.89	9/08
59.29	9/08
46.55	9/08
43.91	9/08
40.92	9/08
61.15	9/08
57.28	9/08
36.01	9/08
66.18	9/08
61.64	9/08
53.61	9/08
63.56	9/10
30.38	9/10
50.4	9/10
55.86	9/10
38.38	9/10
75.38	9/10
74.55	9/10
36.3	9/10
31.95	9/10
62.85	9/10
75.57	9/10
63.5	9/10
52.67	9/11
26.46	9/16
50.56	9/16
52.83	9/16
76	9/16
40.32	9/16
56.26	9/18
65.1	9/18
53.9	9/23
52.74	9/23
39.93	9/23
32.26	9/23
62.59	9/23
45.23	9/23
58.01	9/23
46.07	9/23
64.46	9/23
5.09	9/29
46.64	9/29
58.84	9/29
65.6	9/29
33.82	9/29
57.65	9/29
57.98	9/29
60.74	9/29
48.5	9/29
17.18	9/29
53.76	9/29
60.64	9/29
64.12	9/29
54.94	9/29
44.31	9/29

2-Fluorophenol (cont)

54.18	9/30
48.12	9/30
43.16	9/30
42.86	9/30
54.57	9/30
58.8	9/30
62.76	9/30
50.75	9/30
43.93	9/30
49.21	9/30
39.31	9/30
44.38	9/30
40.81	9/30
58.39	9/30
44.6	9/30
58.32	9/30
61.28	9/30
58.01	9/30
26.31	10/05
59.05	10/05
56.13	10/05
39.71	10/05
45.19	10/05
50.94	10/05
67.8	10/05
56.75	10/05
39.85	10/05
14.45	10/05
42.21	10/05
26.3	10/05
48.02	10/05
47.52	10/05
59.05	10/05
44.48	10/05
70.85	10/05
41.72	10/05
41.62	10/05
46.48	10/05
52.15	10/05
26.56	10/05
56.16	10/13
51.84	10/13
47.83	10/13
53.26	10/13
60.65	10/13
54.93	10/13
56.43	10/13
46.46	10/13
58.01	10/13
60.99	10/13
59.15	10/13
55.53	10/13
59.73	10/13
53.43	10/13
69.55	10/13
65.49	10/20
39.21	10/20
55.67	10/20
30.78	10/20
66.41	10/20
23.85	10/20
51.36	10/20
62.88	10/20
56.62	10/20
66.72	10/20
53.61	10/20
53.22	10/20
50.74	10/20
64.74	10/20
55.15	10/20
63.78	10/20
58.05	10/20
41.94	10/20
42.94	10/20
54.52	10/20
65.21	10/20
45.55	10/20

2-Fluorophenol (cont)

34.2	10/20
56.12	10/20
48.48	10/20
55.12	10/20
55.42	10/20
47.68	10/20
52.27	10/20
54.76	10/20
56.03	10/20
63.3	10/20
42.93	10/23
63.82	10/23
38.01	10/23
0	10/23
48.26	10/23
25.63	10/23
68.4	10/23
58.57	10/23
42.57	10/23
48.29	10/23
49.96	10/23
35.72	10/23
41.92	10/23
50.38	10/23
37.1	10/23
50.04	10/23
27.68	10/23
53.29	10/23
45.93	10/23
44.28	10/23
41.97	10/23
27.82	10/23
37.28	10/23
43.99	10/23
0	10/23
86.2	11/01
48.44	11/01
87.86	11/01
61.86	11/01
24.22	11/01
59.62	11/01
53.71	11/01
63.76	11/01
36.44	11/01
92.42	11/01
78.82	11/01
70.83	11/01
78.8	11/01
75.66	11/01
61.14	11/01
66.9	11/01
86.1	11/01
71.12	11/01
84.26	11/01
65.4	11/02
66.57	11/02
39.36	11/02
34.93	11/02
40.55	11/02
48.88	11/04
63.94	11/04
53.93	11/04
68.75	11/04
60.43	11/04
52.49	11/04
57.35	11/04
47.29	11/04
44.99	11/04
55.78	11/04
61.09	11/04
67.05	11/04
59.32	11/04
51.53	11/04
106.15	11/04
54.64	11/04
54.95	11/04
50.84	11/04

2-Fluorophenol (cont)

48.13	11/04
45.33	11/04
58.43	11/04
66.45	11/04
56.59	11/04
59.51	11/04
47.06	11/04
57.95	11/04
58.4	11/04
45.76	11/04
10.59	11/04
60.98	11/04
57.44	11/04
44.1	11/04
71.15	11/16
44.39	11/16
50.59	11/16
42.38	11/16
59.94	11/16
48.73	11/16
26.07	11/16
29.28	11/16
31.12	11/16
51.93	11/16
58.82	11/16
31.32	11/16
29.46	11/16
59.82	11/16
58.92	11/16
29.96	11/16
39.23	11/16
37.71	11/16
38.5	11/16
50.41	11/16
35.97	11/16
38.97	11/16
27.99	11/16
53.33	11/16
46.2	11/16
28.45	11/16
24.52	11/16
54.55	11/16
67.96	11/16
63.3	11/16
49.29	11/16
56.41	11/16
25.17	11/16
56.77	11/16
29.31	11/16
48.79	11/16
53.83	11/17
53.55	11/17
51.79	11/17
67.97	11/17
46.99	11/17
22.71	11/17
27.94	11/17
37.93	11/17
68.47	11/17
28.47	11/17
55.77	11/18
64	11/18
63.72	11/18
52.84	11/18
60.14	11/18
33.28	11/18
52.98	11/18
60.64	11/18
69.9	11/18
61.47	11/18
52.07	11/18
62.16	11/18
58.53	11/18
61.04	11/18
48.41	11/18
53.52	11/20
55.27	11/20

TABLE E-IV (cont)

****

EM-9 Semivolatile Surrogate in Soil (cont)

****

2-Fluorophenol (cont)

61.66	12/01
53.51	12/01
62.95	12/01
56.04	12/01
48.76	12/01
41.34	12/01
48.89	12/01
57.63	12/01
56.34	12/01
59.12	12/01
46.32	12/01
72.22	12/01
34.4	12/01
48.59	12/01
45.45	12/01
64.59	12/01
64.82	12/01
36.57	12/01
44.5	12/01
64.85	12/01
38.74	12/01
59.34	12/01
45.79	12/01
40.59	12/01
42	12/01
40.75	12/01
63.36	12/01
38.15	12/01
75.8	12/01
53.48	12/01
53.26	12/01
39.79	12/01
52.33	12/01
51.86	12/01
69.94	12/01
71.2	12/01
68.89	12/01
52.41	12/01
67.18	12/01
48.66	12/01
105.51	12/01
65.91	12/01
70.09	12/01
38.8	12/01
58.85	12/01
68.75	12/01
53.58	12/01
28.8	12/02
26.81	12/02
33.48	12/02
52.26	12/02
25.32	12/02
25.36	12/02
40.33	12/02
30.54	12/02
58.15	12/02
21.89	12/02
23.82	12/02
47.48	12/02
27.5	12/02
29.2	12/02
45	12/02
34.6	12/02
24	12/02
7.75	12/02
36.39	12/02
25.64	12/02
50.51	12/02
21.63	12/02
0	12/02

2-Fluorophenol (cont)

33.47	12/02
42.18	12/02
48.1	12/02
32.05	12/02
29.31	12/02
43.19	12/02
53.59	12/02
42.2	12/03
39.58	12/03
53.11	12/03
62.98	12/03
48.08	12/03
62.59	12/03
48.32	12/03
52.27	12/03
50.49	12/03
53.4	12/03
51.53	12/03
41.48	12/03
61.19	12/03
75.37	12/03
38.86	12/03
44.94	12/07
54.24	12/07
67.91	12/07
61.23	12/10
63.37	12/10
47.53	12/10
43.73	12/10
63.21	12/10
49.32	12/10
48.98	12/10
68.69	12/10
53.36	12/10
50.86	12/10
47.88	12/10
54.09	12/15
62.47	12/15
63.13	12/15
42.02	12/15
55.48	12/15
60.71	12/15
58.91	12/15
46.3	12/15
62.5	12/15
54.34	12/15
59.89	12/15
65.62	12/15
49.54	12/15
59.35	12/16
59.4	12/16
58.5	12/16
51.9	12/16
51.42	12/16
49	12/16
57.62	12/16
52.77	12/16
56.65	12/16
55.27	12/16
58.84	12/16
63.36	12/16
49.03	12/16
51.46	12/16

Nitrobenzene d5 GCMS

EPA SW-846 Limits: 23 - 120 %

Result	Uncer.	Date
80.52		1/03
82.68		1/03
75.46		1/03
53.4		1/03
104.4		1/03
62.84		1/03
79.52		1/03

Nitrobenzene d5 (cont)

90.24	1/03
79.6	1/03
92.3	1/06
55.6	1/06
2.88	1/06
78.04	1/06
72.96	1/06
78.32	1/06
88.96	2/14
60.98	2/14
53.6	2/14
66.54	2/14
67.22	2/14
64.52	2/14
70.34	2/14
70.46	2/14
69.62	2/14
56.84	2/14
77.8	2/14
57.46	2/14
69.04	2/14
64.8	2/14
57.42	2/14
55.8	2/14
67.76	2/14
63.52	2/14
20.22	2/14
57.66	2/14
73.32	2/14
63.2	2/14
84.2	2/14
56.8	2/14
63.44	2/14
57.86	2/14
45.88	2/14
58.54	2/14
64.88	2/14
83.76	2/14
52.7	2/14
77.24	2/14
91.06	2/14
50.76	2/21
46.84	2/21
54.58	2/21
58.72	2/21
52.78	2/21
58.4	2/21
55.88	2/21
50.18	2/21
48.62	2/21
54.4	2/21
86.14	3/24
105.2	3/24
58.9	3/24
55	3/24
54.92	3/24
76.1	3/24
86.08	3/24
95.94	3/24
77.02	3/24
56.48	3/24
56.72	3/24
69.3	3/24
80.88	3/25
82.58	3/25
79.7	3/25
78.76	3/25
89.84	3/25
89.6	3/25
87.68	3/25
94.46	3/25
59.18	4/15
51.8	4/15
63.08	4/15
54.36	4/15
56.46	4/15
56.52	4/15
53.18	4/15

Nitrobenzene d5 (cont)

58.18	4/15
59.34	4/15
61.38	4/28
58.26	4/28
58.24	4/28
60.88	4/28
70.7	4/28
85.4	4/28
48.2	4/28
82.92	4/28
48.38	4/28
56.94	4/28
74.7	4/28
85.64	4/28
82.56	4/28
76.08	5/01
75.7	5/01
56.36	5/01
71.58	5/01
72.24	5/01
65.58	5/01
73.56	5/01
65.32	5/01
73.34	5/01
74.22	5/04
69	5/04
90.4	5/04
77.2	5/04
69.9	5/04
57.84	5/04
56.66	5/04
70.92	5/04
70.06	5/04
73.76	5/04
63.98	5/05
62.5	5/05
60.1	5/05
70.7	5/05
67.58	5/05
68.44	5/05
58.56	5/05
63.78	5/05
65.12	5/05
61.44	5/05
58.2	5/05
57.8	5/05
60.9	5/05
47.18	5/13
57.56	5/13
54.6	5/13
54.02	5/13
50.2	5/13
63.2	5/13
102.24	5/13
46.54	5/13
49.64	5/13
42.94	5/13
42.32	5/13
61.04	6/09
54.72	6/09
45.06	6/09
65.94	6/09
61.08	6/09
66.92	6/09
63.52	6/09
55.58	6/09
54.46	6/09
59.14	6/09
58.26	6/09
63.3	6/09
72.66	6/09
65.8	6/09
55.72	6/09
69.12	6/09
60.34	6/09
61.58	6/09
53.54	6/09
60.08	6/09

Nitrobenzene d5 (cont)

0	6/19
36.16	6/19
34.16	6/19
50.04	6/19
45.76	6/19
80.22	6/24
42.98	6/24
37.08	6/24
65.12	7/02
73.88	7/02
66.42	7/02
63.48	7/02
70.9	7/02
41.74	7/06
51.08	7/06
50.14	7/06
56.22	7/06
55	7/06
39.2	7/06
53.3	7/06
49.9	7/06
63.6	7/06
64.46	7/06
63.58	7/06
49.5	7/06
52.7	7/06
74.8	7/08
76.2	7/21
77.86	7/21
61.9	7/21
57.04	7/21
68.86	7/21
79.96	7/21
71.54	7/21
61.9	7/21
63.68	7/21
50.16	7/21
64.28	7/21
60.88	7/21
68.62	7/21
66.64	7/21
60.2	7/21
68.34	7/21
80.58	7/21
61.7	7/21
69.98	7/21
67.42	7/21
79.48	7/21
71.2	7/21
63.52	7/21
70.7	7/21
71.92	7/21
60.82	7/21
55.9	7/21
72.4	8/17
75.92	8/17
73.06	8/17
85.7	8/17
78.84	8/17
61.54	8/17
66.38	8/17
61.74	8/17
73.22	8/17
75.98	8/17
68.6	8/17
61.76	8/17
73.8	8/17
63.96	8/17
59.48	8/17
64.74	8/17
78.84	8/17
64.6	8/17
21.5	8/17
65.7	8/17
67.1	8/17
72.42	8/17
51.8	8/17
61.8	8/19

Nitrobenzene d5 (cont)

12.08	8/19
44.24	8/19
43.46	8/19
78.06	8/31
58.46	8/31
76.42	8/31
37.8	8/31
82.2	8/31
67.74	8/31
57.32	8/31
70.94	8/31
86.34	8/31
71.44	8/31
70	8/31
60.12	9/03
66.22	9/08
68.74	9/08
10.2	9/08
71.32	9/08
50.96	9/08
81.06	9/08
72.28	9/08
56.8	9/08
59.1	9/08
73.52	9/08
66.44	9/08
78	9/08
76.38	9/08
0	9/08
25.76	9/08
25.76	9/08
51.48	9/08
39.84	9/08
65.5	9/08
69.68	9/08
34.64	9/08
55.84	9/08
82.08	9/10
77.9	9/10
73.24	9/10
43.8	9/10
95.52	9/10
87.04	9/10
54.32	9/10
74.98	9/10
0	9/10
53.5	9/10
70.94	9/10
38.8	9/10
70.38	9/11
73.46	9/16
78.32	9/16
53.46	9/16
71.66	9/16
45.62	9/16
70.38	9/18
65.7	9/18
59.26	9/23
70.02	9/23
55.94	9/23
69.32	9/23
72.06	9/23
45.52	9/23
57.84	9/23
38.92	9/23
52.58	9/23
34.38	9/29
68.2	9/29
50.9	9/29
65.48	9/29
68.54	9/29
63.88	9/29
65.54	9/29
74.96	9/29
40.48	9/29
63.96	9/29
71.22	9/29
60.2	9/29

TABLE E-IV (cont)

****

EM-9 Semivolatile Surrogate
in Soil
(cont)

****

Nitrobenzene d5 (cont)

40.52	9/29
61.4	9/29
70.14	9/29
50.6	9/30
53.1	9/30
56.04	9/30
73.18	9/30
72.32	9/30
76.24	9/30
68.2	9/30
66.44	9/30
50.6	9/30
63.54	9/30
61.04	9/30
55.68	9/30
76.92	9/30
45.98	9/30
68.96	9/30
93.9	9/30
55.72	9/30
67.84	9/30
46.34	10/05
51.66	10/05
66.2	10/05
69.5	10/05
62.1	10/05
72.2	10/05
62.48	10/05
17.66	10/05
33.3	10/05
69.6	10/05
53.82	10/05
58.5	10/05
50.92	10/05
64.92	10/05
79.2	10/05
32.8	10/05
53.48	10/05
56.62	10/05
79.6	10/05
50.98	10/05
81.7	10/05
44.52	10/05
76.32	10/13
68.04	10/13
53.76	10/13
73.4	10/13
73.92	10/13
78.7	10/13
67.86	10/13
66.72	10/13
67.68	10/13
55.56	10/13
70.28	10/13
67.44	10/13
86.2	10/13
67.8	10/13
74.74	10/13
71.78	10/13
50.44	10/20
66.3	10/20
61.6	10/20
42.3	10/20
56.64	10/20
67.44	10/20
61.5	10/20
60.44	10/20
56.5	10/20
36.64	10/20
68	10/20

Nitrobenzene d5 (cont)

71.18	10/20
72.36	10/20
59.88	10/20
71.44	10/20
68.3	10/20
62.92	10/20
73.78	10/20
67.2	10/20
61.4	10/20
73.08	10/20
62.04	10/20
32.72	10/20
72.8	10/20
50.08	10/20
73.3	10/20
65.76	10/20
69.04	10/20
58.86	10/20
61.1	10/20
61.74	10/20
68.22	10/20
45.08	10/23
43.08	10/23
27.2	10/23
57.28	10/23
61.52	10/23
43.76	10/23
38.26	10/23
47.84	10/23
42.48	10/23
29.7	10/23
47.54	10/23
57.12	10/23
53.74	10/23
54.06	10/23
62.86	10/23
52.2	10/23
54.04	10/23
36.4	10/23
0	10/23
62.08	10/23
51.7	10/23
56.64	10/23
69.4	10/23
41.64	10/23
0	10/23
96.88	11/01
50.44	11/01
87.28	11/01
82.76	11/01
76.98	11/01
67.4	11/01
77.2	11/01
68.16	11/01
66.48	11/01
74.36	11/01
85.28	11/01
69.24	11/01
48.2	11/01
81.08	11/01
82.48	11/01
63.52	11/01
79.12	11/01
39.36	11/01
63.32	11/01
64.26	11/01
43.1	11/02
48.32	11/02
42.82	11/02
70.64	11/02
74	11/02
70.52	11/04
60.78	11/04
56.16	11/04
52.46	11/04
67.88	11/04
72.66	11/04
68.58	11/04

Nitrobenzene d5 (cont)

62.46	11/04
54.62	11/04
65.1	11/04
55.64	11/04
65.14	11/04
51.3	11/04
64.72	11/04
68.94	11/04
16.76	11/04
57.54	11/04
68.06	11/04
53.3	11/04
121.5	11/04
63.4	11/04
61.2	11/04
81.7	11/04
68.4	11/04
64.72	11/04
66.18	11/04
63.06	11/04
58.14	11/04
64.26	11/04
57.62	11/04
61.38	11/04
65	11/04
45.92	11/16
61.14	11/16
33.64	11/16
33.48	11/16
81	11/16
37.1	11/16
54.38	11/16
33	11/16
46.94	11/16
64.26	11/16
48.84	11/16
56.56	11/16
63.12	11/16
44.68	11/16
73.98	11/16
44.84	11/16
64.08	11/16
53.96	11/16
45.96	11/16
49.32	11/16
67.36	11/16
34.48	11/16
36.82	11/16
44.44	11/16
63.84	11/16
36.04	11/16
72.26	11/16
58.6	11/16
62.96	11/16
60.8	11/16
54.36	11/16
65.1	11/16
38.44	11/16
76.9	11/16
37.92	11/16
51.08	11/16
61.46	11/17
58.6	11/17
69.52	11/17
58.54	11/17
73.58	11/17
31.22	11/17
26.5	11/17
59.78	11/17
33.18	11/17
74.32	11/17
45.22	11/17
63.04	11/18
55.96	11/18
57.6	11/18
64.26	11/18
64.52	11/18
40.92	11/18

Nitrobenzene d5 (cont)

58.48	11/18
56.92	11/18
67.36	11/18
67.26	11/18
65.68	11/18
54.08	11/18
62.92	11/18
67.08	11/18
69.6	11/18
63.16	11/20
62.64	11/20
72.78	12/01
51.66	12/01
67.54	12/01
80.6	12/01
74.88	12/01
42.98	12/01
48.24	12/01
54.66	12/01
55.96	12/01
68.08	12/01
59.08	12/01
71	12/01
77.04	12/01
67.02	12/01
69.46	12/01
72.36	12/01
109.42	12/01
70.72	12/01
76.1	12/01
69.88	12/01
62.78	12/01
56.46	12/01
72.8	12/01
67.76	12/01
77.48	12/01
87.72	12/01
66.16	12/01
63.48	12/01
72.32	12/01
63.7	12/01
65.08	12/01
66.28	12/01
65.52	12/01
71.9	12/01
63.8	12/01
61.76	12/01
54.58	12/01
55.04	12/01
62.72	12/01
39.54	12/01
56	12/01
51.36	12/01
56.24	12/01
59.1	12/01
57.9	12/01
60	12/01
53.7	12/01
60.66	12/02
49.96	12/02
42.12	12/02
32.16	12/02
35.92	12/02
53.48	12/02
0	12/02
26.44	12/02
46.82	12/02
45.64	12/02
29.96	12/02
32.16	12/02
29.14	12/02
31.42	12/02
27.42	12/02
40.68	12/02
25.92	12/02
48.66	12/02
30.62	12/02
56.34	12/02

Nitrobenzene d5 (cont)

41.4	12/02
35.38	12/02
37.44	12/02
54.48	12/02
65	12/02
27.74	12/02
41.32	12/02
23.18	12/02
66.82	12/02
15.3	12/02
57.2	12/03
55.5	12/03
50.2	12/03
66.32	12/03
62.12	12/03
55.38	12/03
40.42	12/03
65.68	12/03
65.6	12/03
83.32	12/03
44.46	12/03
55.44	12/03
55.78	12/03
49.24	12/03
45.76	12/03
49.68	12/07
71.94	12/07
60.36	12/07
50.22	12/10
49.04	12/10
51.24	12/10
60.44	12/10
67.8	12/10
69.96	12/10
72.56	12/10
66.88	12/10
44.44	12/10
75.6	12/10
53.7	12/10
57.9	12/15
60.12	12/15
48.08	12/15
66.58	12/15
68.02	12/15
66.04	12/15
59.64	12/15
68.46	12/15
63.46	12/15
63.66	12/15
54.2	12/15
58.34	12/15
64.5	12/15
66.14	12/16
58.9	12/16
56.68	12/16
61	12/16
54.32	12/16
67.82	12/16
62.08	12/16
59.26	12/16
59.08	12/16
52.08	12/16
67.98	12/16
67.08	12/16
69.18	12/16
67.1	12/16

Phenol d6 GCMS

EPA SW-846 Limits: 24 - 113 %

Result	Uncer.	Date
72.12		1/03
71.6		1/03
58.16		1/03
75.28		1/03

Phenol d6 (cont)

48.09	1/03
85.2	1/03
52.95	1/03
52.02	1/03
60.46	1/03
72.6	1/06
9.37	1/06
54.28	1/06
66.16	1/06
67.17	1/06
30.33	1/06
68.5	2/14
46.42	2/14
34.04	2/14
45.03	2/14
49.08	2/14
39.23	2/14
61.8	2/14
41.48	2/14
40.03	2/14
59.32	2/14
42.46	2/14
65.48	2/14
54.52	2/14
50.87	2/14
37.7	2/14
50.94	2/14
47.1	2/14
50.09	2/14
41.54	2/14
49	2/14
64.2	2/14
40.09	2/14
59.22	2/14
39.69	2/14
49.3	2/14
44.34	2/14
45.11	2/14
48.78	2/14
41.07	2/14
42.44	2/14
31.21	2/14
17.8	2/14
39.85	2/14
39.25	2/21
43.37	2/21
38.16	2/21
46.53	2/21
42.93	2/21
43.13	2/21
38.72	2/21
41.57	2/21
44.24	2/21
30.73	2/21
81.6	3/24
42.59	3/24
43.77	3/24
37.92	3/24
40.81	3/24
42.86	3/24
54.42	3/24
68.92	3/24
70.63	3/24
62.75	3/24
43.39	3/24
61.1	3/24
53.22	3/25
57.69	3/25
64.07	3/25
62.74	3/25
70.74	3/25
66.56	3/25
68.65	3/25
67.14	3/25
50.25	4/15
58.53	4/15
57.71	4/15
56.5	4/15

TABLE E-IV (cont)

****

EM-9 Semivolatile Surrogate
in Soil
(cont)

****

Phenol d6 (cont)

54.51	4/15
55.82	4/15
53.57	4/15
53.92	4/15
53.02	4/15
62.47	4/28
65.61	4/28
63.04	4/28
63.34	4/28
69.88	4/28
60.96	4/28
44.13	4/28
53.79	4/28
77.22	4/28
93.46	4/28
71.15	4/28
74.21	4/28
76.78	4/28
78.12	5/01
66.09	5/01
68.14	5/01
64.91	5/01
56.94	5/01
72.39	5/01
72.03	5/01
77.92	5/01
64.49	5/01
54.69	5/04
69.28	5/04
69.33	5/04
66.42	5/04
65.82	5/04
71.48	5/04
99.8	5/04
77.56	5/04
70.63	5/04
55.72	5/04
57.17	5/05
59.08	5/05
56.19	5/05
58.98	5/05
59.84	5/05
54.38	5/05
59.43	5/05
62.67	5/05
61.45	5/05
66.19	5/05
57.76	5/05
59.06	5/05
57.86	5/05
35.28	5/13
41.3	5/13
68.55	5/13
82.75	5/13
48.45	5/13
51.76	5/13
51.35	5/13
56.35	5/13
50.45	5/13
44.74	5/13
54.73	5/13
64.07	6/09
68.6	6/09
62.06	6/09
59.25	6/09
38.58	6/09
53.04	6/09
49.6	6/09
60.15	6/09
62.75	6/09

Phenol d6 (cont)

55.05	6/09
46.15	6/09
62.18	6/09
60.16	6/09
64.88	6/09
61.21	6/09
60.45	6/09
67.36	6/09
55.5	6/09
67.05	6/09
64.01	6/09
48.1	6/19
68.6	6/19
41.51	6/19
55.64	6/19
37.71	6/19
38.82	6/24
35.71	6/24
79.23	6/24
72.94	7/02
77.44	7/02
66.96	7/02
65.41	7/02
69.17	7/02
54.04	7/06
65.86	7/06
39.83	7/06
56.44	7/06
47.92	7/06
55.97	7/06
46.34	7/06
44.61	7/06
52.34	7/06
47.13	7/06
60.64	7/06
59.89	7/06
64.25	7/06
79.1	7/08
77.08	7/21
52.9	7/21
63.57	7/21
67.95	7/21
60.64	7/21
78.07	7/21
67.13	7/21
57.21	7/21
53.68	7/21
56.82	7/21
82.07	7/21
75.15	7/21
67.66	7/21
77.47	7/21
83.88	7/21
65.54	7/21
70.37	7/21
74.6	7/21
66.43	7/21
83.3	7/21
64.57	7/21
58.35	7/21
61.18	7/21
55.85	7/21
59.66	7/21
72.78	7/21
69.61	7/21
54.63	8/17
89.7	8/17
67.61	8/17
53.89	8/17
65.97	8/17
70.6	8/17
64.79	8/17
88.42	8/17
70.1	8/17
23.49	8/17
63.02	8/17
65.03	8/17
67.11	8/17

Phenol d6 (cont)

61.41	8/17
60.27	8/17
71.47	8/17
83	8/17
69.18	8/17
81.9	8/17
60.76	8/17
68.08	8/17
82.74	8/17
54.52	8/17
63	8/19
41.94	8/19
13.9	8/19
47.05	8/19
76.12	8/31
57.28	8/31
58.37	8/31
85.56	8/31
72.91	8/31
71	8/31
42.33	8/31
68.23	8/31
68.38	8/31
68.8	8/31
63.93	8/31
50.83	9/03
67.99	9/08
69.65	9/08
72.84	9/08
65.2	9/08
90.36	9/08
67.46	9/08
26.05	9/08
9.42	9/08
26.62	9/08
71.9	9/08
70.16	9/08
51.73	9/08
26.62	9/08
61.14	9/08
70.8	9/08
48.92	9/08
55.27	9/08
55.09	9/08
33.56	9/08
63.73	9/08
83.67	9/08
36.64	9/08
84.22	9/10
70.93	9/10
44.75	9/10
59.08	9/10
35.6	9/10
82.02	9/10
68.99	9/10
38.3	9/10
52.41	9/10
73.71	9/10
69.55	9/10
80.97	9/10
61.59	9/11
88.14	9/16
57.29	9/16
70.99	9/16
65.74	9/16
51.84	9/16
70.37	9/18
76.1	9/18
72.38	9/23
56.27	9/23
64.87	9/23
53.97	9/23
69.08	9/23
47.62	9/23
39.37	9/23
59.25	9/23
56.31	9/23
48.89	9/29

Phenol d6 (cont)

72.94	9/29
64.52	9/29
60.24	9/29
64.1	9/29
61.62	9/29
67.1	9/29
66.29	9/29
41.72	9/29
62.75	9/29
52.19	9/29
26.13	9/29
57.63	9/29
70.09	9/29
75.65	9/29
56.74	9/30
46.78	9/30
46.49	9/30
49.56	9/30
67.48	9/30
66.67	9/30
67.38	9/30
54.39	9/30
66.79	9/30
59.5	9/30
70.38	9/30
64.09	9/30
51.08	9/30
57.66	9/30
77.84	9/30
58.92	9/30
63.24	9/30
61.08	9/30
43.44	10/05
47.13	10/05
57.51	10/05
41.11	10/05
74.15	10/05
68.7	10/05
66.86	10/05
62.15	10/05
48.72	10/05
31.77	10/05
63.71	10/05
63.82	10/05
63.96	10/05
51.38	10/05
50.23	10/05
59.72	10/05
34.14	10/05
70.91	10/05
53.22	10/05
65.89	10/05
54.55	10/05
65.3	10/05
70.41	10/13
91.6	10/13
70.3	10/13
79.95	10/13
78.93	10/13
74.58	10/13
75.6	10/13
73.08	10/13
78.41	10/13
70.35	10/13
58.24	10/13
76.41	10/13
74.1	10/13
74.87	10/13
68.97	10/13
57.51	10/13
66.23	10/20
68.17	10/20
74.62	10/20
52.09	10/20
37.12	10/20
62.41	10/20
61.3	10/20
62.33	10/20

Phenol d6 (cont)

59.39	10/20
68.38	10/20
63.45	10/20
54.83	10/20
56.8	10/20
66.97	10/20
70.46	10/20
74.18	10/20
61.3	10/20
64.82	10/20
69.74	10/20
60.64	10/20
65.11	10/20
66.07	10/20
61.14	10/20
71.03	10/20
62.54	10/20
59.72	10/20
66.17	10/20
70.69	10/20
38.05	10/20
61.9	10/20
48.89	10/20
59.5	10/20
60.5	10/23
46.22	10/23
53.2	10/23
36.78	10/23
48.48	10/23
53.1	10/23
0	10/23
60.07	10/23
43.89	10/23
53.19	10/23
49.17	10/23
42.98	10/23
52.61	10/23
55.06	10/23
57.38	10/23
77.2	10/23
49.57	10/23
49.85	10/23
59.14	10/23
55.76	10/23
48.68	10/23
53.2	10/23
64.15	10/23
29.38	10/23
0	10/23
68.98	11/01
45.2	11/01
86.18	11/01
54.94	11/01
84.92	11/01
81.26	11/01
82	11/01
54.74	11/01
99.48	11/01
88.7	11/01
66.7	11/01
86.48	11/01
62.89	11/01
70.3	11/01
85.4	11/01
72.14	11/01
65.56	11/01
73.9	11/01
83	11/01
71.5	11/01
71.81	11/02
69.7	11/02
47.7	11/02
44.12	11/02
49.5	11/02
59.06	11/04
73.44	11/04
55.4	11/04
61.08	11/04

Phenol d6 (cont)

67.98	11/04
69.53	11/04
74.65	11/04
75.59	11/04
67.41	11/04
67.44	11/04
54.68	11/04
64.68	11/04
32.65	11/04
79.3	11/04
64.8	11/04
63.38	11/04
63.8	11/04
57.94	11/04
66.34	11/04
64.27	11/04
51.76	11/04
62.72	11/04
63.24	11/04
72.23	11/04
66.63	11/04
60.88	11/04
63.12	11/04
61.15	11/04
122.05	11/04
72.57	11/04
58.25	11/04
66.58	11/04
38.7	11/16
75.45	11/16
41.18	11/16
53.07	11/16
35.18	11/16
34.24	11/16
44.91	11/16
63.65	11/16
54.97	11/16
60.35	11/16
43.81	11/16
54.29	11/16
68.72	11/16
55.73	11/16
64.33	11/16
67.26	11/16
71.96	11/16
41.87	11/16
37.32	11/16
61.03	11/16
36.8	11/16
58.11	11/16
56.94	11/16
61.88	11/16
57.48	11/16
48.34	11/16
46.47	11/16
54.54	11/16
34.25	11/16
39.16	11/16
40.92	11/16
61.07	11/16
72.77	11/16
75.03	11/16
42.74	11/16
49.45	11/16
57.36	11/17
59.2	11/17
66.78	11/17
58.22	11/17
70.8	11/17
34.2	11/17
28.66	11/17
64.53	11/17
33.66	11/17
70.16	11/17
47.72	11/17
61.71	11/18
51.12	11/18
68.66	11/18

TABLE E-IV (cont)

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EM-9 Semivolatile Surrogate
in Soil
(cont)

****

Phenol d6 (cont)

53.61	11/18
66.65	11/18
61.4	11/18
62.69	11/18
68.44	11/18
74.12	11/18
67.37	11/18
58.62	11/18
67.67	11/18
69.05	11/18
80.78	11/18
73.08	11/18
67.01	11/20
72.38	11/20
45.15	12/01
57.18	12/01
66.99	12/01
51.72	12/01
71.44	12/01
56.44	12/01
56.97	12/01
27.52	12/01
80.56	12/01
70	12/01
86.65	12/01
66.78	12/01
63.03	12/01
56.62	12/01
71.85	12/01
21.46	12/01
64.3	12/01
68.19	12/01
76.21	12/01
70.8	12/01
73.67	12/01
119.01	12/01
69.61	12/01
77.14	12/01
77.58	12/01
66.9	12/01
61.17	12/01
77.75	12/01
68.55	12/01
77.11	12/01
82.98	12/01
67.81	12/01
64.3	12/01
72.88	12/01
62.53	12/01
63.74	12/01
64.8	12/01
69.41	12/01
63.44	12/01
65.6	12/01
61.78	12/01
60.45	12/01
0	12/01
61.66	12/01
38.81	12/01
51.4	12/01
59.7	12/01
64.71	12/02
0	12/02
46.4	12/02
28.52	12/02
21.94	12/02
36.76	12/02
41.02	12/02
47.05	12/02
33.9	12/02

Phenol d6 (cont)

43.69	12/02
33.58	12/02
33.96	12/02
53.65	12/02
38.16	12/02
48.29	12/02
45.46	12/02
50.87	12/02
32.76	12/02
33.19	12/02
30.79	12/02
33.08	12/02
26.75	12/02
26.25	12/02
65.95	12/02
29.26	12/02
65.01	12/02
54.52	12/02
57.57	12/02
43.71	12/02
42.84	12/02
55.4	12/03
65.81	12/03
67.93	12/03
83.62	12/03
58.8	12/03
50.87	12/03
68.32	12/03
49.84	12/03
65.03	12/03
58.52	12/03
53.83	12/03
44.74	12/03
57.65	12/03
46.1	12/03
47.05	12/03
87.63	12/07
49.07	12/07
60.04	12/07
59.82	12/10
58.74	12/10
60.09	12/10
56.22	12/10
72.98	12/10
74.53	12/10
67.63	12/10
67.62	12/10
57.73	12/10
52.2	12/10
76.41	12/10
70.23	12/15
49.92	12/15
68.11	12/15
58.63	12/15
56.51	12/15
66.23	12/15
68.21	12/15
62.81	12/15
70.51	12/15
65.51	12/15
59.95	12/15
54.53	12/15
67.5	12/15
58.48	12/16
66.9	12/16
55.17	12/16
67.97	12/16
52.53	12/16
61.86	12/16
67.05	12/16
63.19	12/16
57.68	12/16
62.35	12/16
66.16	12/16
65.7	12/16
67.46	12/16
72	12/16

Terphenyl d14 GCMS

EPA SW-846 Limits: 18 - 137 %

Result	Uncer.	Date
140.88		1/03
132.64		1/03
139.04		1/03
110.12		1/03
116.32		1/03
102.6		1/03
0		1/03
111.24		1/03
109.38		1/03
133.84		1/06
156.32		1/06
112.08		1/06
111.18		1/06
145.84		1/06
121.92		1/06
113.84		2/14
99.82		2/14
115.48		2/14
88.82		2/14
95.46		2/14
100.94		2/14
92.88		2/14
127.04		2/14
139.68		2/14
107.46		2/14
112.54		2/14
112.06		2/14
106.88		2/14
77.88		2/14
112.44		2/14
118.3		2/14
83.98		2/14
117.58		2/14
117.62		2/14
97.2		2/14
85.68		2/14
111.12		2/14
134.2		2/14
95.08		2/14
121.78		2/14
103.36		2/14
113.16		2/14
123.06		2/14
103.34		2/14
109.98		2/14
114.34		2/14
109.18		2/14
89.84		2/14
114.62		2/21
118.06		2/21
92.1		2/21
89.18		2/21
92.78		2/21
91.6		2/21
84.7		2/21
85.96		2/21
95.94		2/21
88.14		2/21
167		3/24
104.26		3/24
85.24		3/24
90.04		3/24
85.2		3/24
114.3		3/24
102.66		3/24
103.38		3/24
116.48		3/24
150.16		3/24
118.28		3/24
116.74		3/24
147.2		3/25
138.22		3/25
165.5		3/25
135.9		3/25

Terphenyl d14 (cont)

135.58	3/25
155.98	3/25
129.36	3/25
122.08	3/25
79.22	4/15
76.4	4/15
84.14	4/15
78.04	4/15
97.42	4/15
82.62	4/15
73.24	4/15
81.38	4/15
78.54	4/15
75.96	4/28
78.6	4/28
77.16	4/28
112.88	4/28
108.12	4/28
95.4	4/28
113.76	4/28
96.68	4/28
93.52	4/28
67.72	4/28
95.82	4/28
81.56	4/28
69.16	4/28
98.74	5/01
83.7	5/01
84.78	5/01
106	5/01
81.76	5/01
79.36	5/01
111.3	5/01
90.96	5/01
80.84	5/01
85.04	5/04
74.52	5/04
86.52	5/04
117.6	5/04
95.96	5/04
95.74	5/04
83.14	5/04
92.64	5/04
76.48	5/04
81.1	5/04
79.76	5/05
78.2	5/05
110.6	5/05
90.88	5/05
97.32	5/05
77.82	5/05
111	5/05
96.02	5/05
64.88	5/05
77.84	5/05
78.42	5/05
82.48	5/05
93.68	5/05
87.88	5/13
71.82	5/13
73.4	5/13
111.76	5/13
87.6	5/13
56.2	5/13
82.78	5/13
67	5/13
67.76	5/13
68.22	5/13
56.96	5/13
76.5	6/09
63.44	6/09
64.2	6/09
91.24	6/09
68.62	6/09
74.14	6/09
54.44	6/09
74.36	6/09
66.12	6/09

Terphenyl d14 (cont)

54.42	6/09
74.68	6/09
91.4	6/09
67.36	6/09
64.72	6/09
84.8	6/09
68.82	6/09
64.98	6/09
61.2	6/09
66.34	6/09
75.08	6/09
45.98	6/19
50.6	6/19
52.24	6/19
0	6/19
53.62	6/19
75.36	6/24
65.86	6/24
99.54	6/24
81.5	7/02
78.18	7/02
90.82	7/02
80.54	7/02
82.28	7/02
56.36	7/06
56.86	7/06
87.9	7/06
79.3	7/06
73.88	7/06
49.44	7/06
49.52	7/06
64.1	7/06
101.32	7/06
51.14	7/06
67.78	7/06
74.14	7/06
73.84	7/06
104.1	7/08
119.52	7/21
130.18	7/21
124.52	7/21
105.1	7/21
121.3	7/21
120.44	7/21
111.3	7/21
96.88	7/21
105.78	7/21
102.78	7/21
122.32	7/21
144.76	7/21
117.78	7/21
95.9	7/21
112.12	7/21
133.98	7/21
135.8	7/21
96.4	7/21
112.8	7/21
97.32	7/21
97.88	7/21
101.4	7/21
98.18	7/21
81.34	7/21
107	7/21
98.06	7/21
94.24	7/21
80.98	8/17
63.56	8/17
100.36	8/17
79.2	8/17
67.44	8/17
72.64	8/17
89.86	8/17
106.24	8/17
71.86	8/17
111.98	8/17
84.82	8/17
62.14	8/17
81.42	8/17

Terphenyl d14 (cont)

35.24	8/17
85.78	8/17
86.12	8/17
107.8	8/17
63.18	8/17
110.4	8/17
76.1	8/17
99.26	8/17
98.78	8/17
93.94	8/17
99.86	8/19
77.36	8/19
80.44	8/19
82.94	8/19
98.74	8/31
59.96	8/31
73.4	8/31
78.9	8/31
90.6	8/31
88.46	8/31
93.16	8/31
35.94	8/31
68.44	8/31
86.62	8/31
63.88	8/31
87.22	9/03
89.34	9/08
70.54	9/08
83.68	9/08
79.88	9/08
66.66	9/08
75.8	9/08
64.2	9/08
68.14	9/08
0	9/08
74.06	9/08
18.44	9/08
52.48	9/08
52.48	9/08
66.34	9/08
75.82	9/08
83.5	9/08
82.78	9/08
63.68	9/08
60.44	9/08
103.12	9/08
75.18	9/08
66.4	9/08
95.82	9/10
96.78	9/10
86.96	9/10
91.5	9/10
83.98	9/10
0	9/10
49	9/10
69.52	9/10
67.96	9/10
53.34	9/10
74.62	9/10
60.3	9/10
103.3	9/11
143.6	9/16
112.1	9/16
85.44	9/16
95.78	9/16
89.88	9/16
87.1	9/18
106.8	9/18
62.82	9/23
97.24	9/23
110.74	9/23
66	9/23
65.74	9/23
134.08	9/23
99.52	9/23
77.98	9/23
58.5	9/23
73.4	9/29

TABLE E-IV (cont)

****

EM-9 Semivolatile Surrogate
in Soil
(cont)

****

Terphenyl d14 (cont)

80.38	9/29
79.78	9/29
73.58	9/29
126.04	9/29
66.64	9/29
76.82	9/29
101.96	9/29
75.9	9/29
80.76	9/29
90.38	9/29
95.5	9/29
61.2	9/29
64.14	9/29
126.72	9/29
55.96	9/30
75.34	9/30
123.02	9/30
117.64	9/30
107.48	9/30
78.18	9/30
0	9/30
110.26	9/30
66.44	9/30
64.62	9/30
60.86	9/30
76.82	9/30
71.98	9/30
66.24	9/30
50.68	9/30
85.94	9/30
89.58	9/30
72.54	9/30
114.78	10/05
69.02	10/05
88.68	10/05
82.36	10/05
84.04	10/05
107.4	10/05
86.72	10/05
66.26	10/05
88.7	10/05
52.8	10/05
67.52	10/05
65.86	10/05
79.62	10/05
72.42	10/05
92.78	10/05
123.78	10/05
146	10/05
69.64	10/05
115.24	10/05
107.1	10/05
92.76	10/05
86.32	10/05
74.76	10/13
68.7	10/13
90.2	10/13
87.3	10/13
84.12	10/13
67.88	10/13
73.06	10/13
78.66	10/13
96.66	10/13
69.92	10/13
75.82	10/13
74.72	10/13
78.9	10/13
75.72	10/13
90.84	10/13
101.1	10/13

Terphenyl d14 (cont)

89.52	10/20
95.82	10/20
70.1	10/20
85.2	10/20
68.96	10/20
79.92	10/20
64.24	10/20
78.02	10/20
82.06	10/20
75	10/20
73.8	10/20
81.72	10/20
85.64	10/20
67.64	10/20
81.66	10/20
95.66	10/20
88.54	10/20
85.72	10/20
84.44	10/20
85.28	10/20
80.72	10/20
77.1	10/20
83.68	10/20
78.34	10/20
79.32	10/20
86.3	10/20
81.54	10/20
74.82	10/20
87.36	10/20
82.74	10/20
89.72	10/20
73.38	10/20
0	10/23
60.08	10/23
90.6	10/23
96.54	10/23
69.6	10/23
85.18	10/23
65.64	10/23
43.56	10/23
82.2	10/23
65.62	10/23
63.44	10/23
71.76	10/23
120.88	10/23
71.86	10/23
69.44	10/23
0	10/23
46.02	10/23
103.36	10/23
81.38	10/23
71.82	10/23
56.74	10/23
53.18	10/23
79.22	10/23
82.96	10/23
85.46	10/23
153.32	11/01
91.4	11/01
183.4	11/01
118.6	11/01
150.68	11/01
111.68	11/01
87.06	11/01
90.16	11/01
127.88	11/01
153.28	11/01
171.24	11/01
107.24	11/01
119	11/01
122.56	11/01
107.68	11/01
85.36	11/01
175	11/01
145.6	11/01
133.8	11/01
104.92	11/01
100	11/02

Terphenyl d14 (cont)

86.34	11/02
68.26	11/02
98.98	11/02
86.06	11/02
97.46	11/04
94.96	11/04
90.76	11/04
82.34	11/04
87.38	11/04
90	11/04
97.48	11/04
61.58	11/04
178.9	11/04
85.18	11/04
67.98	11/04
104.04	11/04
100.28	11/04
101.16	11/04
106.54	11/04
73.62	11/04
89.82	11/04
176.16	11/04
131	11/04
86.44	11/04
64.44	11/04
86.98	11/04
103.44	11/04
71.62	11/04
57.04	11/04
132.3	11/04
122.72	11/04
119.38	11/04
72.24	11/04
164.1	11/04
97.6	11/04
125.42	11/04
52.4	11/16
103.2	11/16
82.48	11/16
80.6	11/16
118.5	11/16
82.26	11/16
157.96	11/16
109.56	11/16
95.42	11/16
101.2	11/16
83.9	11/16
92.22	11/16
67.66	11/16
65.82	11/16
58.18	11/16
70.98	11/16
82.74	11/16
81.44	11/16
94.1	11/16
70.56	11/16
72.58	11/16
78.54	11/16
80.24	11/16
83.04	11/16
86.22	11/16
86.28	11/16
47.68	11/16
44.52	11/16
83.88	11/16
50.4	11/16
95.2	11/16
140.2	11/16
66.34	11/16
50.4	11/16
75.4	11/16
94.64	11/16
131.72	11/17
69.74	11/17
54.82	11/17
94.28	11/17
91.36	11/17
110.9	11/17

Terphenyl d14 (cont)

85.24	11/17
147.56	11/17
60.62	11/17
65.7	11/17
129.04	11/17
114.08	11/18
86.46	11/18
97.16	11/18
116.68	11/18
103.8	11/18
133.2	11/18
141.04	11/18
149.72	11/18
114.8	11/18
88.26	11/18
102.68	11/18
98.84	11/18
92.96	11/18
117.16	11/18
93.06	11/18
93.64	11/20
84.9	11/20
93.06	12/01
76	12/01
65.6	12/01
40.16	12/01
48.78	12/01
86.64	12/01
100.24	12/01
79.56	12/01
67.36	12/01
78.56	12/01
74.74	12/01
91.38	12/01
91.24	12/01
94.2	12/01
61.98	12/01
15.28	12/01
93.74	12/01
123.68	12/01
44.58	12/01
64.56	12/01
63.82	12/01
31.7	12/01
12.36	12/01
144.7	12/01
122.14	12/01
113.04	12/01
73.44	12/01
68.6	12/01
74.6	12/01
79.4	12/01
115.56	12/01
93.42	12/01
56.5	12/01
75	12/01
117.22	12/01
12.44	12/01
98.82	12/01
99.52	12/01
121.64	12/01
123.08	12/01
112.42	12/01
99.92	12/01
172.28	12/01
158.7	12/01
87.42	12/01
86.22	12/01
86.9	12/01
82.74	12/02
76.24	12/02
86.3	12/02
74.38	12/02
66.68	12/02
49.28	12/02
82.24	12/02
72.36	12/02
102.82	12/02

Terphenyl d14 (cont)

69.46	12/02
88.96	12/02
111	12/02
58.38	12/02
68.58	12/02
77.22	12/02
75.86	12/02
97.68	12/02
66.76	12/02
47.74	12/02
70.96	12/02
59.52	12/02
63.16	12/02
49.4	12/02
63.74	12/02
90.96	12/02
80.16	12/02
75.9	12/02
98.48	12/02
81.52	12/02
36.34	12/02
81.2	12/03
63.94	12/03
38.32	12/03
117.32	12/03
120.26	12/03
101.52	12/03
60.84	12/03
62.8	12/03
84.22	12/03
83.66	12/03
131.86	12/03
140.88	12/03
135.42	12/03
75.94	12/03
63.88	12/03
87	12/07
81.16	12/07
95.26	12/07
92.16	12/10
54.54	12/10
54.98	12/10
54.28	12/10
46.32	12/10
83.1	12/10
104.16	12/10
123.6	12/10
90.82	12/10
109.6	12/10
54.8	12/10
91.14	12/15
82.78	12/15
91.36	12/15
81.6	12/15
81	12/15
83	12/15
82.26	12/15
71.2	12/15
81.02	12/15
87.76	12/15
88.32	12/15
86.2	12/15
83.76	12/15
163.4	12/16
145.3	12/16
181.26	12/16
157.72	12/16
147.4	12/16
149.48	12/16
94.46	12/16
108	12/16
74.88	12/16
77.46	12/16
106.22	12/16
98.42	12/16
73.02	12/16
74.28	12/16

2,4,6-Tribromophenol GCMS

EPA SW-846 Limits: 19 - 122 %

Result	Uncer.	Date
81.78		1/03
53.23		1/03
222		1/03
89.27		1/03
67.2		1/03
79		1/03
85.81		1/03
86.84		1/03
81.2		1/03
93.38		1/06
77.89		1/06
111.24		1/06
97.64		1/06
81.82		1/06
91.56		1/06
83.24		2/14
69.6		2/14
80.63		2/14
92.62		2/14
68.42		2/14
86.71		2/14
74.44		2/14
78.07		2/14
90.46		2/14
70.95		2/14
91.12		2/14
71.14		2/14
66.69		2/14
70.56		2/14
82.98		2/14
79.57		2/14
67.42		2/14
73.97		2/14
72.45		2/14
69.51		2/14
74.48		2/14
69.49		2/14
75.31		2/14
79.49		2/14
70.54		2/14
72.52		2/14
80.05		2/14
69.84		2/14
79.18		2/14
77.71		2/14
77.14		2/14
79.64		2/14
44.12		2/14
73.46		2/21
70.24		2/21
87.29		2/21
86.03		2/21
80.27		2/21
70.32		2/21
69.8		2/21
69.85		2/21
64.59		2/21
67.22		2/21
105.59		3/24
85.94		3/24
95.04		3/24
59.89		3/24
73.5		3/24
66.59		3/24
62.6		3/24
58.79		3/24
64.12		3/24
56.53		3/24
84.32		3/24
86.11		3/24
73.53		3/25
80.76		3/25
90.66		3/25
85.73		3/25

TABLE E-IV (cont)

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EM-9 Semivolatile Surrogate
in Soil
(cont)

****

2,4,6-Tribromophenol (cont)

81.37	3/25
93.83	3/25
90.36	3/25
101.37	3/25
83.16	4/15
69.71	4/15
79.95	4/15
75.53	4/15
81.82	4/15
75.3	4/15
75.43	4/15
57.43	4/15
78.47	4/15
82.59	4/28
88.74	4/28
95.18	4/28
89.91	4/28
83.78	4/28
88.7	4/28
99.63	4/28
98.43	4/28
96.5	4/28
94.43	4/28
104.36	4/28
67.39	4/28
71.18	4/28
92.88	5/01
92.75	5/01
90.51	5/01
94.7	5/01
73.28	5/01
96.97	5/01
86.9	5/01
102.28	5/01
90.18	5/01
90.92	5/04
91.7	5/04
88.22	5/04
85.33	5/04
96	5/04
98.6	5/04
86.07	5/04
76.97	5/04
97.86	5/04
86.39	5/04
64.32	5/05
71.96	5/05
79.12	5/05
84.96	5/05
58.49	5/05
74.28	5/05
77.32	5/05
90.25	5/05
75.6	5/05
82.62	5/05
74.87	5/05
76.28	5/05
70.5	5/05
76.49	5/13
69.22	5/13
75.48	5/13
92.86	5/13
67.39	5/13
69.52	5/13
118.19	5/13
94.7	5/13
192	5/13
72.09	5/13
0	5/13
79.46	6/09

2,4,6-Tribromophenol (cont)

90.75	6/09
88.94	6/09
98.76	6/09
60.1	6/09
83.44	6/09
63.52	6/09
50.85	6/09
53.36	6/09
71.46	6/09
72.01	6/09
117.84	6/09
102.21	6/09
64.24	6/09
78.36	6/09
0	6/09
123.6	6/09
72.42	6/09
68.04	6/09
94.22	6/09
0	6/19
65.89	6/19
58.3	6/19
54.89	6/19
49.31	6/19
51.38	6/24
62.27	6/24
81.18	6/24
101.12	7/02
86.92	7/02
103.23	7/02
90.7	7/02
99.08	7/02
68.01	7/06
63.67	7/06
99.84	7/06
48.9	7/06
46.66	7/06
66.6	7/06
79.47	7/06
79.31	7/06
76.99	7/06
70.43	7/06
71.48	7/06
85.86	7/06
78.59	7/06
69.5	7/08
91.54	7/21
111.6	7/21
111.41	7/21
116.02	7/21
82.01	7/21
106.57	7/21
89.66	7/21
89.22	7/21
83.12	7/21
79.29	7/21
115.43	7/21
121.74	7/21
114.01	7/21
70.99	7/21
130.7	7/21
85.29	7/21
117.61	7/21
111.65	7/21
115.98	7/21
120.74	7/21
110.79	7/21
77.89	7/21
97.11	7/21
80.62	7/21
85.4	7/21
124.28	7/21
84.02	7/21
88.39	8/17
110.82	8/17
68.75	8/17
81.43	8/17
90.15	8/17

2,4,6-Tribromophenol (cont)

82.04	8/17
87.69	8/17
76.16	8/17
83.62	8/17
89.58	8/17
87.55	8/17
79.27	8/17
96.74	8/17
105.12	8/17
87.68	8/17
86.11	8/17
34.03	8/17
154.85	8/17
84.36	8/17
99.33	8/17
95.38	8/17
88.44	8/17
65.99	8/17
90.05	8/19
79.04	8/19
69.77	8/19
71.65	8/19
74.91	8/31
61.48	8/31
63.95	8/31
63.87	8/31
72.45	8/31
38.63	8/31
71.35	8/31
78.47	8/31
96.92	8/31
92.36	8/31
76.1	8/31
78.5	9/03
49.9	9/08
66.78	9/08
60.05	9/08
71.75	9/08
79.31	9/08
75.12	9/08
54.04	9/08
56.74	9/08
9.9	9/08
42.38	9/08
42.38	9/08
62.3	9/08
76.93	9/08
66.28	9/08
60.17	9/08
72.06	9/08
72.82	9/08
0	9/08
71.22	9/08
63.8	9/08
89.81	9/08
68.49	9/08
76.7	9/10
60.98	9/10
0	9/10
87.95	9/10
45.82	9/10
46.06	9/10
72.22	9/10
0	9/10
90.51	9/10
87.22	9/10
90.33	9/10
102.99	9/10
64.66	9/11
81.89	9/16
63.32	9/16
85.59	9/16
76.78	9/16
82.28	9/16
68	9/18
69.26	9/18
98.1	9/23
72.26	9/23

2,4,6-Tribromophenol (cont)

94.24	9/23
91.47	9/23
62.98	9/23
114.33	9/23
98.59	9/23
113.27	9/23
115.12	9/23
94.7	9/29
103.28	9/29
111.58	9/29
98.49	9/29
113.76	9/29
95.14	9/29
165.72	9/29
175.67	9/29
61.03	9/29
79.65	9/29
139.1	9/29
138.51	9/29
71.29	9/29
81.7	9/29
99.62	9/29
59.86	9/30
67.36	9/30
81.43	9/30
0	9/30
96.08	9/30
108.13	9/30
100.37	9/30
71.8	9/30
103.05	9/30
90.62	9/30
80.72	9/30
106.58	9/30
109.01	9/30
97.94	9/30
97.35	9/30
163.53	9/30
98.92	9/30
82.26	9/30
67.9	10/05
0	10/05
70.53	10/05
81.28	10/05
87.56	10/05
69.9	10/05
86.9	10/05
63.15	10/05
73.83	10/05
74.9	10/05
86.51	10/05
79.87	10/05
66.39	10/05
59.68	10/05
88.9	10/05
78.02	10/05
91.49	10/05
90.22	10/05
82.24	10/05
54.64	10/05
59.15	10/05
64.85	10/05
29.07	10/13
33.21	10/13
64.7	10/13
64.1	10/13
38.64	10/13
65.49	10/13
67.08	10/13
69.3	10/13
83.52	10/13
80.49	10/13
58.5	10/13
66.85	10/13
54	10/13
74.93	10/13
70.51	10/13
39.95	10/13

2,4,6-Tribromophenol (cont)

91.7	10/20
92.38	10/20
92.41	10/20
80.84	10/20
74.37	10/20
87.08	10/20
62.56	10/20
74.88	10/20
71.68	10/20
81.63	10/20
74.63	10/20
81.11	10/20
94.19	10/20
94.47	10/20
87.93	10/20
83.28	10/20
83.99	10/20
80.17	10/20
79.69	10/20
87.5	10/20
92.24	10/20
90.22	10/20
91.04	10/20
87.82	10/20
84.76	10/20
86.96	10/20
93.05	10/20
92.91	10/20
83.03	10/20
78.2	10/20
82.22	10/20
81.6	10/20
121.12	10/23
0	10/23
93.86	10/23
107.72	10/23
98.87	10/23
67.37	10/23
50.26	10/23
64.74	10/23
0	10/23
80.52	10/23
80.58	10/23
96.16	10/23
75.1	10/23
62.18	10/23
103.58	10/23
94.76	10/23
79.02	10/23
104.36	10/23
80.74	10/23
91.07	10/23
111.61	10/23
54.52	10/23
96.83	10/23
84.21	10/23
58.03	10/23
119.1	11/01
141.52	11/01
82.78	11/01
143.44	11/01
141.8	11/01
80.3	11/01
113.2	11/01
103.7	11/01
117.6	11/01
160.9	11/01
137.76	11/01
100.3	11/01
128.34	11/01
102.92	11/01
95.88	11/01
102.8	11/01
91.36	11/01
89.28	11/01
87.64	11/01
119.6	11/01
83.29	11/02

2,4,6-Tribromophenol (cont)

55.61	11/02
65.1	11/02
78.24	11/02
82.33	11/02
96.89	11/04
82.38	11/04
93.7	11/04
101.02	11/04
98.77	11/04
92.42	11/04
99.46	11/04
75.45	11/04
97.6	11/04
78.61	11/04
93.32	11/04
107.15	11/04
112.49	11/04
99.99	11/04
90.99	11/04
132.18	11/04
114.13	11/04
81.31	11/04
85.35	11/04
93.9	11/04
66.2	11/04
78.49	11/04
100.51	11/04
93.96	11/04
114.32	11/04
81.4	11/04
86.46	11/04
113.7	11/04
153.75	11/04
92.49	11/04
103.26	11/04
103.71	11/04
84.03	11/16
34.18	11/16
44.9	11/16
79.98	11/16
41	11/16
77.16	11/16
53.34	11/16
69.2	11/16
65.05	11/16
92.49	11/16
78.12	11/16
82.45	11/16
105.59	11/16
108.97	11/16
81.4	11/16
117.4	11/16
63.32	11/16
110.9	11/16
67.18	11/16
87.21	11/16
85.55	11/16
102.2	11/16
80.76	11/16
40.85	11/16
103.24	11/16
79.62	11/16
83.08	11/16
85.01	11/16
48.08	11/16
88.3	11/16
93.61	11/16
61.8	11/16
66.1	11/16
76.34	11/16
102.29	11/16
96.12	11/16
79.76	11/17
84.6	11/17
95.68	11/17
100.5	11/17
76.19	11/17
106.17	11/17

TABLE E-IV (cont)

****

EM-9 Semivolatile Surrogate
in Soil
(cont)

****

2,4,6-Tribromophenol (cont)

65.47	11/17
51.07	11/17
40.86	11/17
109.59	11/17
48.06	11/17
67.52	11/18
89.76	11/18
86.1	11/18
91.98	11/18
85.2	11/18
75.35	11/18
77.34	11/18
96.86	11/18
59.58	11/18
84.52	11/18
74.55	11/18
90.62	11/18
93	11/18
63.59	11/18
94.77	11/18
95.29	11/20
89.72	11/20
77.5	12/01
63.26	12/01
105.69	12/01
74.51	12/01
105.17	12/01
54.95	12/01
74.24	12/01
53.49	12/01
56.02	12/01
97.06	12/01
100.72	12/01
104.29	12/01
53.73	12/01
58.53	12/01
93.8	12/01
90.43	12/01
92.7	12/01
94.17	12/01
64.72	12/01
66.35	12/01
52.35	12/01
85.14	12/01
70.05	12/01
34.75	12/01
85.67	12/01
96.52	12/01
150.35	12/01
63.09	12/01
60	12/01
176.7	12/01
128.28	12/01
90.39	12/01
91.74	12/01
98.7	12/01
54.48	12/01
90.81	12/01
91.85	12/01
99.19	12/01
63.93	12/01
55.46	12/01
63.17	12/01
69.44	12/01
80.21	12/01
63.53	12/01
77.24	12/01
72.44	12/01
62.94	12/01
69.91	12/02

2,4,6-Tribromophenol (cont)

78.17	12/02
70.49	12/02
46.75	12/02
71.45	12/02
38.76	12/02
40.94	12/02
72.64	12/02
63.53	12/02
63.34	12/02
83.47	12/02
36.71	12/02
57.48	12/02
77.52	12/02
61.47	12/02
58.5	12/02
71.1	12/02
64.68	12/02
60.18	12/02
51.49	12/02
57.31	12/02
41.32	12/02
58.58	12/02
41.41	12/02
51.62	12/02
64.36	12/02
67.84	12/02
43.75	12/02
74.16	12/02
70.17	12/02
96.82	12/03
129.35	12/03
60.22	12/03
100.12	12/03
100.82	12/03
86.86	12/03
61.71	12/03
104.49	12/03
55.17	12/03
66.98	12/03
71.77	12/03
61.37	12/03
51.94	12/03
69.65	12/03
64.42	12/03
83.36	12/07
95.72	12/07
102.84	12/07
91.28	12/10
90.26	12/10
73.14	12/10
46.84	12/10
50.16	12/10
49.46	12/10
89.39	12/10
85.27	12/10
84.81	12/10
48.2	12/10
57.34	12/10
74.15	12/15
72.37	12/15
67.45	12/15
67.2	12/15
61.02	12/15
78.25	12/15
78.99	12/15
86.94	12/15
90.39	12/15
84.58	12/15
82.41	12/15
78.78	12/15
72.92	12/15
72.23	12/16
82.01	12/16
81.26	12/16
81.24	12/16
79.81	12/16
92.05	12/16
75.38	12/16

2,4,6-Tribromophenol (cont)

69.57	12/16
84.39	12/16
83.86	12/16
99.62	12/16
97.04	12/16
89.15	12/16
87.47	12/16

****

EM-9 Semivolatile Surrogate
in Water

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2-Fluorobiphenyl GCMS

EPA SW-846 Limits: 43 - 116 %

Result	Uncer.	Date
86.1		1/02
92.3		1/02
99.22		1/02
76.86		1/06
87.98		1/06
76.42		1/06
90.72		1/06
86.54		1/06
0		1/07
79.94		1/07
79.62		1/07
77.94		1/07
79.36		1/07
85.8		1/07
74.14		1/07
69.9		1/07
85.56		1/07
68.96		1/07
70.32		1/07
2.12		1/09
79.66		1/09
8.54		1/09
73.76		1/09
67.48		1/09
7.64		1/09
12.18		1/09
19.28		1/09
5.62		1/09
73		1/09
23.98		1/09
87.1		1/09
0		2/24
0		2/24
8.24		2/24
0		2/24
0		2/24
56.92		3/24
96.36		3/24
76.54		4/22
11.44		4/22
102.26		4/23
85.84		4/23
86.08		4/23
68.76		4/23
101.78		4/23
90.96		4/23
65.78		4/23
64.82		4/28
55.24		4/28
20.98		4/28
64.96		4/28
81.46		4/28
90.68		4/28
89.04		4/28
111.24		4/28
72.98		5/07
67.44		5/07

2-Fluorobiphenyl (cont)

80.06	5/08
71.08	5/08
71	5/08
67.44	5/08
76.36	5/14
80.8	5/14
50.5	5/18
63.8	5/18
58.2	5/19
79.78	6/02
50.36	6/02
51.28	6/02
53.88	6/03
115	6/03
37.9	6/03
50.46	6/03
26.98	6/03
50.76	6/03
50.71	6/18
60.76	6/18
63.78	6/18
51.94	6/18
51.63	6/18
51.82	6/18
62.36	6/18
62.83	6/18
57.18	6/18
44.66	6/18
56.83	6/18
60.9	6/18
50.14	6/18
63.1	6/18
71.62	6/22
74.14	6/22
53.74	6/22
56.46	6/22
57	6/22
74.06	6/24
75.92	6/24
75.82	6/24
55.24	6/24
48.36	6/24
43.58	6/24
69.4	6/24
45.68	7/14
43.36	7/14
60.7	7/14
46.66	7/14
53.54	7/14
70.16	7/14
65.98	7/28
71	7/28
62.4	7/28
61.02	7/28
65.38	7/28
56.68	7/28
61.34	7/28
69.58	7/28
77.66	7/28
80.48	7/28
63.04	7/28
57.5	8/10
63.16	8/10
84.3	8/12
62.46	8/12
70.56	8/12
65.5	8/12
71.46	8/17
89.48	8/17
68.86	8/17
84.54	8/17
61.68	8/17
37.02	8/18
64.76	8/18
62	8/19
61.28	8/19
52.32	8/19
65.76	8/19

2-Fluorobiphenyl (cont)

56.54	8/19
24.82	8/19
75.08	8/24
59.46	8/24
80.28	8/24
70.84	8/24
83.7	8/24
70.76	8/24
66	8/24
77.76	8/24
71.36	8/24
26.42	8/24
78.12	8/24
49.34	8/24
59.22	8/24
72.74	8/24
76.44	9/10
67.24	9/10
58.36	9/10
75.24	9/10
74.74	9/10
47.82	9/10
70.68	9/10
69.44	9/10
57.16	9/11
73.32	9/11
65.38	9/11
63.12	9/11
59.94	9/11
62.42	9/11
114.84	9/11
61.12	10/06
55.86	10/06
57.96	10/06
64.14	10/06
70.4	10/06
49.02	10/06
54.3	10/06
66.18	10/06
63.44	10/06
53.14	10/07
52.5	10/12
48.58	10/12
44.16	10/12
45.66	10/12
55.44	10/12
41.12	10/12
26.34	10/13
50.9	10/13
56.38	10/13
65.58	10/13
61.9	10/13
52.38	10/13
54.96	10/13
57.92	10/13
62.86	10/13
67.9	10/13
47.52	10/22
53.74	10/22
63.52	10/22
48.14	10/22
61.84	10/22
75.2	10/22
62.16	10/22
70.3	10/22
45.36	10/22
60.12	10/22
59.82	10/22
53.46	10/22
57.02	10/22
35.4	10/22
61.64	10/22
46.64	10/22
46.6	10/22
45.3	10/22
61.82	10/22
63.32	10/22
63.54	10/22

2-Fluorobiphenyl (cont)

14.02	10/22
55.92	10/22
56.56	10/22
68.56	10/22
74.98	10/22
68.88	10/22
76.54	10/22
66.7	10/22
46.96	10/22
64.5	10/22
41.48	10/22
63.8	10/22
62.06	10/22
66.5	10/22
61.14	10/22
59.92	10/22
58.38	10/22
57.36	10/26
54.64	10/28
55.66	10/28
59.22	10/28
55.78	10/28
46.12	10/28
50.98	10/28
59.18	10/28
52.8	10/29
42.28	10/29
50.52	10/29
48.36	10/29
55.8	10/29
55.54	10/29
49.42	10/29
55.46	11/06
57.18	11/20
57.18	11/20
64.14	11/20
78.46	11/25
80.68	11/25
63.38	11/25
47.24	11/25
52.82	11/25
67.6	11/25
54.4	11/25
74.22	12/01
76.54	12/01
59.14	12/01
36.66	12/01
19.6	12/01
52.48	12/01
48.06	12/01
41.96	12/01
39	12/01
38.56	12/01
45.88	12/01
47.04	12/01
50.96	12/01
40.82	12/01
40	12/01
54.88	12/01
51.56	12/01
40.5	12/01
52.08	12/01
48.3	12/01
50.48	12/01
27.76	12/01
40.32	12/01
51.02	12/01
49.34	12/01
56.24	12/01
50.3	12/01
67.24	12/01
62.8	12/01
64.64	12/01
65.92	12/01
57.32	12/01
65.74	12/01
62.5	12/02
64.4	12/02

TABLE E-IV (cont)

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EM-9 Semivolatile Surrogate in Water (cont)

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2-Fluorobiphenyl (cont)

46.74	12/09
50.56	12/09
48.1	12/09
70.02	12/09
51.4	12/09
48.9	12/09
47.62	12/09
51.86	12/09
41.16	12/09
49.16	12/09
46.48	12/09
46.36	12/09
63	12/09
66.48	12/09
64.04	12/09
54.92	12/09
52.96	12/09
47.3	12/09
66.58	12/09
64.28	12/09
70.76	12/09
45.94	12/10
67.78	12/10
65.68	12/10
69.3	12/10
47.22	12/10
62.88	12/10
69.86	12/10
77.08	12/10
51.68	12/10
41.14	12/10
54.08	12/10
59.66	12/10
74.98	12/10
62.8	12/10
69.76	12/10
55.48	12/10
65.68	12/10
64.3	12/10
37.06	12/10
46.32	12/10
64.94	12/10
81.56	12/10
69.62	12/10
67.22	12/10
48.62	12/10
69.38	12/10
70.5	12/10
75.36	12/16
71.32	12/16
81.36	12/16
71.88	12/16
70.48	12/16
62.46	12/16
70.48	12/16
75.86	12/16
75.16	12/16
49.44	12/16
64.36	12/16
51.16	12/16
49.24	12/16
50.94	12/16
47.7	12/16
48.98	12/16
46.86	12/16

2-Fluorophenol GCMS

EPA SW-846 Limits: 21 - 100 %

Result	Uncer.	Date
64.75		1/02
54.97		1/02
65.98		1/02
44.05		1/06
17.82		1/06
66.42		1/06
28.74		1/06
44.76		1/06
0		1/07
54.16		1/07
48.62		1/07
62.12		1/07
53.16		1/07
52.42		1/07
51.11		1/07
38.95		1/07
54.13		1/07
43.1		1/07
44.9		1/07
0		1/09
59.33		1/09
0		1/09
66.02		1/09
21.18		1/09
0		1/09
0		1/09
2.49		1/09
0		1/09
0		1/09
52.98		1/09
50.69		1/09
0		2/24
0		2/24
0		2/24
0		2/24
0		2/24
65.87		3/24
11.07		3/24
31.54		4/22
37.08		4/22
46.81		4/23
49.78		4/23
32.54		4/23
45.66		4/23
56.81		4/23
62.55		4/23
58.75		4/23
51.62		4/28
61.8		4/28
27.02		4/28
19.29		4/28
22.37		4/28
49.35		4/28
34.15		4/28
0		4/28
47.87		5/07
40.96		5/07
47.2		5/08
52.54		5/08
48.28		5/08
54.85		5/08
53.08		5/14
42.86		5/14
52.83		5/18
51.64		5/18
53.44		5/19
47.4		6/02
50.03		6/02
45.77		6/02
0		6/03
8.9		6/03
41.63		6/03
36.64		6/03
18.42		6/03

2-Fluorophenol (cont)

32.67	6/03
49.39	6/18
42.79	6/18
57.81	6/18
63.95	6/18
47.16	6/18
63.02	6/18
64.28	6/18
45.01	6/18
4.95	6/18
49.37	6/18
33.97	6/18
53.01	6/18
58.28	6/18
57.48	6/18
46.34	6/22
69.9	6/22
48.12	6/22
42.89	6/22
54.83	6/22
31.97	6/24
58.89	6/24
57.29	6/24
37.72	6/24
57.44	6/24
46.82	6/24
54.78	6/24
63.68	7/14
22	7/14
19.76	7/14
46.63	7/14
17.79	7/14
30.14	7/14
40.37	7/28
33.89	7/28
47.88	7/28
49.78	7/28
35.72	7/28
69.47	7/28
23.23	7/28
59.93	7/28
18.54	7/28
11.2	7/28
25.11	7/28
42.14	8/10
33.2	8/10
1.27	8/12
1.18	8/12
53.39	8/12
72.02	8/12
67.67	8/17
71.55	8/17
46.38	8/17
60.16	8/17
43.16	8/17
42.56	8/18
14.84	8/18
37.97	8/19
60.02	8/19
58.8	8/19
55.41	8/19
56.15	8/19
2.47	8/19
61.33	8/24
47.79	8/24
53.14	8/24
55.96	8/24
64.01	8/24
63.21	8/24
50.42	8/24
90.18	8/24
32.31	8/24
2.17	8/24
39.2	8/24
71.46	8/24
39.44	8/24
20.91	8/24
11.12	9/10

2-Fluorophenol (cont)

48.16	9/10
69.08	9/10
56.17	9/10
50.5	9/10
23.98	9/10
50.08	9/10
10.07	9/10
51.71	9/11
0	9/11
65.77	9/11
42.57	9/11
58.27	9/11
56.14	9/11
41.75	9/11
48.95	10/06
52.4	10/06
59.07	10/06
47.3	10/06
56.37	10/06
48.39	10/06
41.8	10/06
41.09	10/06
53	10/06
38.52	10/07
35.6	10/12
33.76	10/12
31.22	10/12
38.93	10/12
36.46	10/12
39.14	10/12
0	10/13
37.42	10/13
0	10/13
31.49	10/13
0	10/13
0	10/13
33.57	10/13
29.26	10/13
2.96	10/13
0	10/13
41.64	10/22
5.58	10/22
54.85	10/22
48.36	10/22
50.83	10/22
47.93	10/22
35.93	10/22
60.41	10/22
44.36	10/22
62.58	10/22
55.24	10/22
41.92	10/22
68.49	10/22
35.31	10/22
50.07	10/22
36.24	10/22
24.66	10/22
37.28	10/22
43.91	10/22
28.16	10/22
34.85	10/22
27.85	10/22
30.87	10/22
5.94	10/22
25.46	10/22
44.95	10/22
34.05	10/22
37.16	10/22
14.04	10/22
11.1	10/22
28.43	10/22
64.09	10/22
24.61	10/22
4.65	10/22
63.77	10/22
41.03	10/22
28.86	10/22
18.48	10/22

2-Fluorophenol (cont)

33.54	10/26
45.97	10/28
32.37	10/28
29.23	10/28
48.83	10/28
32.69	10/28
40.92	10/28
47.9	10/28
40.71	10/29
12.5	10/29
51.25	10/29
39.72	10/29
35.51	10/29
40.23	10/29
42.73	10/29
43.2	11/06
57.47	11/20
50.77	11/20
50.77	11/20
75.58	11/25
3.55	11/25
52.4	11/25
40.49	11/25
61.77	11/25
33.86	11/25
30.52	11/25
26.09	12/01
42.52	12/01
24.3	12/01
53.29	12/01
45.52	12/01
0	12/01
18.13	12/01
47.52	12/01
30.13	12/01
39.53	12/01
65.11	12/01
26.02	12/01
20.61	12/01
43.66	12/01
52.01	12/01
37.75	12/01
66.7	12/01
54.08	12/01
37.16	12/01
60.09	12/01
28.07	12/01
13.97	12/01
46.66	12/01
39.94	12/01
47.9	12/01
49.13	12/01
41.84	12/01
34.93	12/01
20.44	12/01
62.39	12/01
36.13	12/01
49.04	12/01
43.99	12/01
47.84	12/02
41.61	12/02
32.47	12/09
36.55	12/09
45.49	12/09
29.7	12/09
43.73	12/09
38.37	12/09
47.92	12/09
43.82	12/09
40.36	12/09
39.95	12/09
40.07	12/09
52.05	12/09
67.22	12/09
29.67	12/09
48.93	12/09
112.04	12/09
62.69	12/09

2-Fluorophenol (cont)

48.35	12/09
55.02	12/09
55.94	12/09
51.49	12/09
54.53	12/10
59.51	12/10
48.56	12/10
33.86	12/10
44.79	12/10
64.09	12/10
50.85	12/10
33.39	12/10
59.49	12/10
47.98	12/10
55.75	12/10
38.71	12/10
28.63	12/10
67.9	12/10
37.2	12/10
33.82	12/10
42.17	12/10
6.33	12/10
37	12/10
51.99	12/10
42.7	12/10
51.48	12/10
60.02	12/10
49.43	12/10
52.86	12/10
37.6	12/10
66.94	12/10
47.97	12/16
73.25	12/16
49.14	12/16
63.15	12/16
68.9	12/16
41.04	12/16
73.25	12/16
61.08	12/16
67.94	12/16
63.3	12/16
36.96	12/16
55.34	12/16
81.96	12/16
44.27	12/16
41.88	12/16
68.74	12/16
42.16	12/16

Nitrobenzene d5 GCMS

EPA SW-846 Limits: 35 - 114 %

Result	Uncer.	Date
91.58		1/02
90.88		1/02
78.24		1/02
84.86		1/06
79.96		1/06
76.54		1/06
74.58		1/06
85.2		1/06
0		1/07
81.18		1/07
85.24		1/07
69.12		1/07
76.44		1/07
80.72		1/07
87.94		1/07
69.02		1/07
68.2		1/07
67.4		1/07
72		1/07
0		1/09
79.52		1/09
0		1/09

TABLE E-IV (cont)

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EM-9 Semivolatile Surrogate
in Water
(cont)

****

Nitrobenzene d5 (cont)

71.86	1/09
57.32	1/09
0	1/09
0	1/09
0	1/09
0	1/09
67.88	1/09
0	1/09
50.98	1/09
0	2/24
0	2/24
0	2/24
0	2/24
0	2/24
32.76	3/24
92.48	3/24
78.2	4/22
59.16	4/22
73.98	4/23
85.94	4/23
69.04	4/23
58.18	4/23
60.3	4/23
74.74	4/23
64.54	4/23
42.84	4/28
57.42	4/28
89	4/28
92.4	4/28
85.18	4/28
49.78	4/28
6.9	4/28
58.94	4/28
47.9	5/07
58	5/07
64.88	5/08
60	5/08
72.98	5/08
60.64	5/08
59.84	5/14
60.98	5/14
63.78	5/18
61.66	5/18
60.84	5/19
56.42	6/02
60	6/02
65.04	6/02
36.94	6/03
131.32	6/03
0	6/03
17.9	6/03
45.06	6/03
20.72	6/03
65.08	6/18
40.04	6/18
59.03	6/18
60.08	6/18
56.02	6/18
67.52	6/18
38.08	6/18
64.92	6/18
65.58	6/18
59.29	6/18
61.78	6/18
58.21	6/18
67.58	6/18
54.03	6/18
64.12	6/22
84	6/22
81.94	6/22

Nitrobenzene d5 (cont)

64.14	6/22
61.98	6/22
44.08	6/24
46.62	6/24
54.62	6/24
73.88	6/24
69.94	6/24
79.92	6/24
71.66	6/24
66.88	7/14
35.14	7/14
22.52	7/14
35.2	7/14
31.6	7/14
48.68	7/14
84.18	7/28
67.34	7/28
91.32	7/28
62.6	7/28
43.72	7/28
63.02	7/28
92.66	7/28
67.68	7/28
85.04	7/28
59.68	7/28
57.74	7/28
54.54	8/10
51.64	8/10
83.78	8/12
64.58	8/12
28.92	8/12
61.12	8/12
78.2	8/17
89.34	8/17
112.6	8/17
60.58	8/17
100.34	8/17
56.28	8/18
18.72	8/18
77.86	8/19
77.76	8/19
89.94	8/19
71.02	8/19
8.9	8/19
73.92	8/19
74.64	8/24
63.42	8/24
75.14	8/24
52.16	8/24
42.5	8/24
39.9	8/24
96.28	8/24
82.2	8/24
113.1	8/24
76.76	8/24
50.7	8/24
72.12	8/24
4.62	8/24
93.86	8/24
30.54	9/10
61.28	9/10
52.26	9/10
21.62	9/10
53.48	9/10
49	9/10
59.88	9/10
64.52	9/10
76.88	9/11
64.98	9/11
61.88	9/11
88.3	9/11
101.94	9/11
89.54	9/11
82.66	9/11
77.9	10/06
55.14	10/06
66.72	10/06
50.32	10/06

Nitrobenzene d5 (cont)

64.06	10/06
73.44	10/06
61.9	10/06
54.02	10/06
57.94	10/06
48.14	10/07
43.68	10/12
40.86	10/12
37.14	10/12
36.32	10/12
43.16	10/12
39.12	10/12
9	10/13
56.1	10/13
58.48	10/13
44.24	10/13
50.5	10/13
65.02	10/13
56.18	10/13
48.78	10/13
51.32	10/13
52.2	10/13
57.28	10/22
42.6	10/22
60.42	10/22
69.02	10/22
63.94	10/22
83.86	10/22
92.58	10/22
95.74	10/22
34.1	10/22
52.66	10/22
39.34	10/22
45.16	10/22
49.88	10/22
45.12	10/22
49.46	10/22
49.52	10/22
57.72	10/22
6.46	10/22
48.46	10/22
44.14	10/22
55.04	10/22
40.74	10/22
63.98	10/22
76.96	10/22
40.9	10/22
86.42	10/22
70.54	10/22
81.4	10/22
88.98	10/22
50.06	10/22
61.02	10/22
13.58	10/22
59.68	10/22
52.68	10/22
60.92	10/22
56.72	10/22
53.78	10/22
69.94	10/22
54.56	10/26
59.28	10/28
54.26	10/28
67.1	10/28
59.64	10/28
76.54	10/28
46.84	10/28
55.68	10/28
52.5	10/29
52.6	10/29
45.32	10/29
47.92	10/29
41.18	10/29
50.16	10/29
44.12	10/29
47.92	11/06
55.28	11/20
46.68	11/20

Nitrobenzene d5 (cont)

46.68	11/20
61.34	11/25
44.98	11/25
83.22	11/25
96.3	11/25
36.28	11/25
69.18	11/25
28	11/25
49.6	12/01
48.62	12/01
55.84	12/01
56.58	12/01
32.26	12/01
37.02	12/01
44.64	12/01
57.48	12/01
34.04	12/01
69.86	12/01
36.76	12/01
51.78	12/01
37	12/01
48.04	12/01
56.44	12/01
55.26	12/01
3.18	12/01
60.16	12/01
39	12/01
44.08	12/01
50.6	12/01
50.26	12/01
45.16	12/01
51.14	12/01
71.22	12/01
37.92	12/01
72.38	12/01
41.36	12/01
31.56	12/01
59.72	12/01
39.42	12/01
65.56	12/01
62.62	12/01
58.66	12/02
61.66	12/02
54.64	12/09
47.04	12/09
60.2	12/09
50.4	12/09
57.36	12/09
64.58	12/09
56.76	12/09
70.96	12/09
70.26	12/09
70.8	12/09
44.26	12/09
49.96	12/09
48.16	12/09
51.34	12/09
92.28	12/09
49.38	12/09
43.76	12/09
34.78	12/09
45.84	12/09
55.52	12/09
55.42	12/09
88.44	12/10
54.04	12/10
84.44	12/10
60.14	12/10
65.52	12/10
41.84	12/10
48.24	12/10
48.86	12/10
41.28	12/10
51.1	12/10
39.68	12/10
42.28	12/10
54.4	12/10
59.3	12/10

Nitrobenzene d5 (cont)

62.8	12/10
80.32	12/10
46.22	12/10
61.28	12/10
46.8	12/10
68.22	12/10
61.46	12/10
58.48	12/10
73.06	12/10
44.88	12/10
53.28	12/10
66.08	12/10
72.04	12/10
45.64	12/16
44.88	12/16
42.36	12/16
43.82	12/16
50.6	12/16
64.44	12/16
112.64	12/16
112.64	12/16
89.38	12/16
53.6	12/16
56.9	12/16
71.56	12/16
68.48	12/16
72.4	12/16
63.7	12/16
85.26	12/16
68.88	12/16

Phenol d6 GCMS

EPA SW-846 Limits: 10 - 94 %

Result	Uncer.	Date
61.4		1/02
36.16		1/02
50.08		1/02
25.23		1/06
67.37		1/06
41.04		1/06
46.82		1/06
14.06		1/06
0		1/07
53.32		1/07
43.63		1/07
59.57		1/07
52.07		1/07
44.55		1/07
42.56		1/07
54.65		1/07
52.73		1/07
48.6		1/07
48.78		1/07
0		1/09
56.52		1/09
58.46		1/09
5.35		1/09
3.65		1/09
0		1/09
55.42		1/09
2.03		1/09
43.67		1/09
69.01		1/09
6.55		1/09
11.49		1/09
0		2/24
0		2/24
0		2/24
0		2/24
0		2/24
25.49		3/24
63.7		3/24
63.3		4/22
80.1		4/22

Phenol d6 (cont)

68.34	4/23
57.04	4/23
69.07	4/23
73.28	4/23
71.43	4/23
39.69	4/23
61.68	4/23
41.64	4/28
55.71	4/28
7.96	4/28
52.74	4/28
40.75	4/28
43.14	4/28
70.78	4/28
120.57	4/28
43.77	5/07
29.19	5/07
60.43	5/08
53.87	5/08
55	5/08
53.97	5/08
55.9	5/14
56.49	5/14
62.37	5/18
60.65	5/18
66.57	5/19
54.89	6/02
50.02	6/02
59.2	6/02
45.1	6/03
33.96	6/03
36.38	6/03
20.59	6/03
14.35	6/03
50	6/03
66.72	6/18
67.8	6/18
46.72	6/18
59.85	6/18
59.76	6/18
58.92	6/18
43.64	6/18
55.55	6/18
52.73	6/18
69.76	6/18
56.98	6/18
55.29	6/18
23.6	6/18
30.81	6/18
78.39	6/22
45.18	6/22
52.19	6/22
47.7	6/22
60.89	6/22
75.02	6/24
61.64	6/24
78.59	6/24
72.93	6/24
38.62	6/24
44.77	6/24
72.41	6/24
43.04	7/14
34.96	7/14
32.77	7/14
38.11	7/14
69.7	7/14
53.41	7/14
80.05	7/28
68.04	7/28
62.37	7/28
71.56	7/28
67.83	7/28
89.99	7/28
75.85	7/28
46.43	7/28
14.61	7/28
70.4	7/28
64.45	7/28

TABLE E-IV (cont)

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EM-9 Semivolatile Surrogate
in Water
(cont)

****

Phenol d6 (cont)

51.43	8/10
40.6	8/10
59.44	8/12
78	8/12
2.23	8/12
3.72	8/12
98.38	8/17
87.91	8/17
58.62	8/17
90.17	8/17
72.91	8/17
24.09	8/18
53.41	8/18
72.82	8/19
73.65	8/19
67.8	8/19
51.16	8/19
12.11	8/19
71.55	8/19
110.78	8/24
8.16	8/24
86.37	8/24
55.23	8/24
47.68	8/24
28.08	8/24
51.25	8/24
65.32	8/24
60.58	8/24
79.58	8/24
76.67	8/24
93.76	8/24
78.35	8/24
71.74	8/24
58.89	9/10
75.98	9/10
49.55	9/10
55.66	9/10
58.63	9/10
46.83	9/10
35.92	9/10
61.24	9/10
59.49	9/11
55.69	9/11
53.01	9/11
59.21	9/11
53.82	9/11
88.14	9/11
3.47	9/11
54.93	10/06
40.16	10/06
31.84	10/06
70.39	10/06
52.92	10/06
59.24	10/06
62.11	10/06
59.81	10/06
48.1	10/06
47.65	10/07
51.94	10/12
45.25	10/12
43.1	10/12
47.3	10/12
44.27	10/12
42.64	10/12
7.01	10/13
0	10/13
0	10/13
30.16	10/13
10.15	10/13
8.89	10/13

Phenol d6 (cont)

25.59	10/13
23.78	10/13
28.38	10/13
0	10/13
85.6	10/22
86.79	10/22
26.72	10/22
79.64	10/22
4.66	10/22
69.26	10/22
24.74	10/22
31.21	10/22
23.11	10/22
28.16	10/22
77.24	10/22
20.32	10/22
44.6	10/22
72.2	10/22
65.63	10/22
70.15	10/22
28.39	10/22
30.2	10/22
89.35	10/22
77.91	10/22
44.99	10/22
25.6	10/22
27.67	10/22
19.29	10/22
41.55	10/22
27.8	10/22
13.64	10/22
58.68	10/22
19.53	10/22
85.75	10/22
46.4	10/22
54.48	10/22
22.59	10/22
53.56	10/22
59.08	10/22
59.3	10/22
61.48	10/22
55.36	10/22
48.86	10/26
53.12	10/28
43.87	10/28
63.3	10/28
60.47	10/28
5.79	10/28
21.06	10/28
61.91	10/28
26.5	10/29
49.9	10/29
53.81	10/29
46.83	10/29
49.03	10/29
29.81	10/29
29.55	10/29
52.95	11/06
54.44	11/20
54.44	11/20
61.18	11/20
39.97	11/25
52.53	11/25
75.03	11/25
84.79	11/25
60.84	11/25
51.05	11/25
78.59	11/25
47.3	12/01
60.06	12/01
54.3	12/01
30.3	12/01
64.36	12/01
62.59	12/01
43.76	12/01
59.43	12/01
53.93	12/01
54.76	12/01

Phenol d6 (cont)

58.4	12/01
42.06	12/01
55	12/01
47	12/01
25.27	12/01
2.66	12/01
65.7	12/01
34.08	12/01
54.4	12/01
63.6	12/01
45.67	12/01
56.45	12/01
51.59	12/01
47.22	12/01
43.08	12/01
71.7	12/01
72.28	12/01
34.79	12/01
44.85	12/01
4.29	12/01
55.42	12/01
60.77	12/01
45.9	12/01
52.19	12/02
43.28	12/02
59.64	12/09
97.77	12/09
75.28	12/09
58.17	12/09
50.39	12/09
45.48	12/09
47.81	12/09
32.33	12/09
66.82	12/09
67.42	12/09
57.43	12/09
43.92	12/09
49.77	12/09
25.84	12/09
35.06	12/09
52.12	12/09
54.74	12/09
47.89	12/09
49.62	12/09
53.51	12/09
57.34	12/09
48.94	12/10
38.2	12/10
59.35	12/10
13.68	12/10
59.55	12/10
58.92	12/10
64.67	12/10
57.75	12/10
57.35	12/10
43.54	12/10
59.14	12/10
41.34	12/10
62.13	12/10
50.41	12/10
31.11	12/10
38.3	12/10
79.28	12/10
56.14	12/10
42.25	12/10
43.25	12/10
71.31	12/10
57.74	12/10
75.2	12/10
45.41	12/10
92.21	12/10
61.84	12/10
72.13	12/10
50.38	12/16
67.28	12/16
52.26	12/16
56.63	12/16
71.63	12/16

Phenol d6 (cont)

77.61	12/16
72.85	12/16
53.01	12/16
20.84	12/16
79.69	12/16
20.84	12/16
55.33	12/16
72.68	12/16
57.47	12/16
94.21	12/16
63.9	12/16
38.15	12/16

Terphenyl d14 GCMS

EPA SW-846 Limits: 33 - 141 %

Result	Uncer.	Date
113.88		1/02
109.48		1/02
108.64		1/02
98.06		1/06
91.48		1/06
91.44		1/06
93.24		1/06
37.44		1/06
84.64		1/07
95.06		1/07
0		1/07
90.62		1/07
72.46		1/07
102.24		1/07
98.14		1/07
84.92		1/07
81.64		1/07
82.42		1/07
93.28		1/07
108.42		1/09
107.78		1/09
118.84		1/09
51.48		1/09
76.4		1/09
84.82		1/09
118.38		1/09
72.78		1/09
68.82		1/09
78.62		1/09
85.88		1/09
74.8		1/09
58.36		2/24
85.08		2/24
75.4		2/24
29.14		2/24
44.06		2/24
119.62		3/24
106.16		3/24
81.6		4/22
0		4/22
84.64		4/23
87.84		4/23
92.5		4/23
27.44		4/23
42.6		4/23
82.34		4/23
95.88		4/23
98.68		4/28
65.16		4/28
48.92		4/28
67.16		4/28
73.08		4/28
79.04		4/28
77.04		4/28
77.74		4/28
63.38		5/07
57.14		5/07
70.96		5/08

Terphenyl d14 (cont)

64.56	5/08
69.06	5/08
59.2	5/08
65.48	5/14
69.26	5/14
0	5/18
64.78	5/18
75.62	5/19
60.18	6/02
70.86	6/02
74.08	6/02
45.9	6/03
58.16	6/03
59.5	6/03
20.94	6/03
52	6/03
55.7	6/03
11.48	6/18
12.58	6/18
75.08	6/18
65.84	6/18
80.37	6/18
17.45	6/18
15.95	6/18
83.6	6/18
76.49	6/18
42.02	6/18
45.08	6/18
73.88	6/18
86.18	6/18
88.53	6/18
41.2	6/22
79.36	6/22
80.64	6/22
47.44	6/22
92.42	6/22
81.5	6/24
77.28	6/24
81.56	6/24
87.46	6/24
40.98	6/24
81.16	6/24
83.26	6/24
76.4	7/14
73.9	7/14
73.1	7/14
93.56	7/14
86.54	7/14
72.72	7/14
60.3	7/28
52.4	7/28
75.34	7/28
73.84	7/28
77.24	7/28
81.84	7/28
55.46	7/28
71.42	7/28
22.44	7/28
57.62	7/28
70.02	7/28
74.48	8/10
72.32	8/10
108.36	8/12
74	8/12
87.76	8/12
97.78	8/12
91.26	8/17
90.56	8/17
74.96	8/17
90.82	8/17
73.44	8/17
75.72	8/18
86.96	8/18
76.84	8/19
94.8	8/19
64.4	8/19
75.28	8/19
73.36	8/19

Terphenyl d14 (cont)

78.74	8/19
83.04	8/24
89.9	8/24
68.7	8/24
74.08	8/24
75.78	8/24
94.48	8/24
74.86	8/24
78.68	8/24
74.44	8/24
94.58	8/24
78.22	8/24
69.98	8/24
101.48	8/24
98.74	8/24
79.1	9/10
53.1	9/10
69.08	9/10
81.08	9/10
74.4	9/10
73.56	9/10
86.52	9/10
60.82	9/10
66.04	9/11
48.74	9/11
67.4	9/11
57.9	9/11
56.14	9/11
59	9/11
53.24	9/11
65.88	10/06
71.9	10/06
70.36	10/06
80.42	10/06
57.98	10/06
46.52	10/06
40.54	10/06
56.18	10/06
57.24	10/06
30.24	10/07
71	10/12
63.54	10/12
54.52	10/12
63.88	10/12
58.66	10/12
58.24	10/12
82.02	10/13
67.08	10/13
91.78	10/13
76.54	10/13
65.92	10/13
60.96	10/13
84.98	10/13
87.84	10/13
94.96	10/13
76.44	10/13
70.64	10/22
60.42	10/22
74.54	10/22
50.64	10/22
65.88	10/22
57.72	10/22
69.02	10/22
73.48	10/22
47.38	10/22
69.24	10/22
88.52	10/22
52.76	10/22
87.9	10/22
83.54	10/22
92.82	10/22
75.06	10/22
60.54	10/22
93.6	10/22
91.38	10/22
66.94	10/22
69.82	10/22
87.5	10/22

TABLE E-IV (cont)

****

EM-9 Semivolatile Surrogate
in Water
(cont)

****

Terphenyl d14 (cont)

91.42	10/22
97.4	10/22
77.14	10/22
75.38	10/22
105.2	10/22
89.98	10/22
55.04	10/22
104.02	10/22
99.88	10/22
88.72	10/22
68.3	10/22
76.02	10/22
67.3	10/22
66.4	10/22
77.62	10/22
77.5	10/22
19.06	10/26
76.84	10/28
71.92	10/28
47.1	10/28
61.2	10/28
60.84	10/28
65.98	10/28
61.26	10/28
76.08	10/29
62.1	10/29
75.12	10/29
94.16	10/29
83.12	10/29
78.16	10/29
37.74	10/29
66.24	11/06
78.44	11/20
78.44	11/20
77.52	11/20
54.48	11/25
76.42	11/25
80.64	11/25
63.98	11/25
86.44	11/25
81	11/25
60.68	11/25
70.24	12/01
68.92	12/01
55.74	12/01
52.9	12/01
73.28	12/01
53.52	12/01
65.84	12/01
42.62	12/01
58.16	12/01
39.02	12/01
35.62	12/01
40.4	12/01
48.46	12/01
53.88	12/01
15.56	12/01
71.58	12/01
42.18	12/01
18.56	12/01
23.06	12/01
69.64	12/01
19.62	12/01
19.96	12/01
23.86	12/01
79.14	12/01
79.8	12/01
44.3	12/01
44.56	12/01
43.6	12/01

Terphenyl d14 (cont)

47.04	12/01
33.38	12/01
33.44	12/01
58.66	12/01
51.92	12/01
53.78	12/02
28.5	12/02
64.92	12/09
53.52	12/09
55.28	12/09
43.4	12/09
78.22	12/09
53.32	12/09
75.9	12/09
68.78	12/09
75.6	12/09
64.72	12/09
64.7	12/09
65.7	12/09
57.94	12/09
60.26	12/09
51.38	12/09
44.5	12/09
41.7	12/09
42.18	12/09
38.56	12/09
76.1	12/09
53.16	12/09
80.4	12/10
63.86	12/10
76.12	12/10
45.52	12/10
33.74	12/10
69.76	12/10
72.1	12/10
75.06	12/10
83.02	12/10
78.94	12/10
39.98	12/10
42.82	12/10
61.52	12/10
49.46	12/10
80.42	12/10
73.3	12/10
39.66	12/10
71.78	12/10
84.88	12/10
63.74	12/10
64.24	12/10
67.02	12/10
77.26	12/10
55.84	12/10
79.9	12/10
75.66	12/10
78.98	12/10
73.54	12/16
65.06	12/16
76.16	12/16
73.38	12/16
80.82	12/16
49.66	12/16
56.46	12/16
48.4	12/16
48.4	12/16
52.08	12/16
50.56	12/16
54.94	12/16
55.04	12/16
71.36	12/16
64.68	12/16
53.36	12/16
59.34	12/16

2,4,6-Tribromophenol GCMS

EPA SW-846 Limits: 10 - 123 %

Result	Uncer.	Date
82.55		1/02
99.28		1/02
86.63		1/02
74.13		1/06
63.54		1/06
71.01		1/06
59.32		1/06
93.49		1/06
0		1/07
63.49		1/07
56.83		1/07
60.98		1/07
66.09		1/07
61.79		1/07
83.51		1/07
49.63		1/07
67.71		1/07
52.73		1/07
40.51		1/07
62.92		1/09
74.62		1/09
72.02		1/09
74.47		1/09
75.15		1/09
77.74		1/09
59.97		1/09
66.58		1/09
60.14		1/09
89.38		1/09
59.45		1/09
80.38		1/09
19.11		2/24
61.91		2/24
43.87		2/24
13.93		2/24
22.29		2/24
78.38		3/24
56.46		3/24
117.05		4/22
70.68		4/22
72.87		4/23
99.97		4/23
88.48		4/23
82.25		4/23
83.16		4/23
81.13		4/23
101.53		4/23
56.77		4/28
51.18		4/28
62.97		4/28
52.33		4/28
53.2		4/28
85.69		4/28
106.98		4/28
91.61		4/28
56.26		5/07
64.18		5/07
74.04		5/08
89.69		5/08
86.84		5/08
67.81		5/08
59.14		5/14
71.04		5/14
69.26		5/18
88.82		5/18
92.41		5/19
16.95		6/02
78.03		6/02
73.59		6/02
27.52		6/03
44.66		6/03
55.43		6/03
53.17		6/03
0		6/03

2,4,6-Tribromophenol (cont)

56.15	6/03
81.92	6/18
83.83	6/18
103.21	6/18
38.18	6/18
88.56	6/18
84.74	6/18
47.92	6/18
54.31	6/18
96.37	6/18
85.67	6/18
77.38	6/18
82.85	6/18
70.99	6/18
73	6/18
77.32	6/22
96.95	6/22
77.34	6/22
115.48	6/22
89.55	6/22
135.07	6/24
110.28	6/24
79.84	6/24
74.47	6/24
122.08	6/24
123.1	6/24
113.56	6/24
75.76	7/14
84.57	7/14
90.75	7/14
76.26	7/14
83.94	7/14
89.54	7/14
77.99	7/28
79.64	7/28
65.36	7/28
56.06	7/28
65.48	7/28
84.86	7/28
71.09	7/28
53.5	7/28
15.97	7/28
64.17	7/28
67.04	7/28
53.43	8/10
66.1	8/10
88.94	8/12
74.54	8/12
0.03	8/12
0.46	8/12
66.12	8/17
62.57	8/17
46.37	8/17
59.37	8/17
70.52	8/17
73.74	8/18
79.46	8/18
67.73	8/19
57.39	8/19
73.21	8/19
86.36	8/19
71.25	8/19
57.28	8/19
71.22	8/24
61.43	8/24
83.64	8/24
69.33	8/24
77.73	8/24
79.8	8/24
82.13	8/24
58.06	8/24
57.15	8/24
31.64	8/24
74.06	8/24
55.75	8/24
68.95	8/24
67.74	8/24
76.7	9/10

2,4,6-Tribromophenol (cont)

57.71	9/10
54.35	9/10
53.49	9/10
56.54	9/10
54.08	9/10
60.8	9/10
74.26	9/10
0	9/11
68.18	9/11
75.75	9/11
57.19	9/11
69.12	9/11
67.75	9/11
53.04	9/11
46.2	10/06
65.03	10/06
56.54	10/06
56.23	10/06
48.81	10/06
58.85	10/06
42.86	10/06
60.69	10/06
52.56	10/06
74.23	10/07
46.56	10/12
62.12	10/12
46.63	10/12
56.23	10/12
46.23	10/12
49.24	10/12
0	10/13
101.09	10/13
0	10/13
0	10/13
0	10/13
102.07	10/13
112.14	10/13
108.3	10/13
0	10/13
113.25	10/13
60.42	10/22
50.38	10/22
79.97	10/22
82.72	10/22
64.6	10/22
74.12	10/22
63.87	10/22
55.13	10/22
81.01	10/22
74.84	10/22
72.05	10/22
54.6	10/22
52.59	10/22
52.79	10/22
45.19	10/22
70.68	10/22
99.51	10/22
61.55	10/22
93.02	10/22
56.7	10/22
62.9	10/22
68.05	10/22
70.45	10/22
59.22	10/22
53.77	10/22
52.45	10/22
172.6	10/22
72.06	10/22
84.43	10/22
15.35	10/22
79.28	10/22
68.82	10/22
87.13	10/22
80.67	10/22
53.24	10/22
74.39	10/22
89.98	10/22
68.48	10/22

2,4,6-Tribromophenol (cont)

67.4	10/26
84.17	10/28
57.88	10/28
0	10/28
56.87	10/28
56.69	10/28
59.23	10/28
58.78	10/28
84.14	10/29
76.22	10/29
89.49	10/29
38.84	10/29
112.62	10/29
72.96	10/29
67.11	10/29
70.6	11/06
65.16	11/20
65.16	11/20
63.67	11/20
78.76	11/25
68.29	11/25
63.87	11/25
74.75	11/25
125.51	11/25
77.99	11/25
59.95	11/25
44.54	12/01
51.53	12/01
66.05	12/01
63.73	12/01
67.05	12/01
64.47	12/01
69.43	12/01
94.33	12/01
59.91	12/01
59.14	12/01
75.35	12/01
50.62	12/01
54.62	12/01
61.05	12/01
51.75	12/01
35	12/01
74.81	12/01
44.66	12/01
42.84	12/01
50.19	12/01
49.59	12/01
59.63	12/01
43.97	12/01
42.84	12/01
51.37	12/01
51.93	12/01
60.75	12/01
61.74	12/01
53.9	12/01
53.52	12/01
30.51	12/01
46.46	12/01
147.68	12/01
71.05	12/02
61.94	12/02
0	12/09
73.59	12/09
118.59	12/09
78.3	12/09
69.71	12/09
60.87	12/09
69.35	12/09
60.11	12/09
52.15	12/09
49.46	12/09
58.86	12/09
66.1	12/09
62.95	12/09
84.67	12/09
60.43	12/09
57.24	12/09
55.79	12/09

TABLE E-IV (cont)

****

EM-9 Semivolatile Surrogate in Water (cont)

****

2,4,6-Tribromophenol (cont)

63.21	12/09
60.87	12/09
61.87	12/09
55.05	12/09
73.7	12/10
80.66	12/10
43.13	12/10
69.98	12/10
79.27	12/10
83.32	12/10
69.52	12/10
69.84	12/10
16.37	12/10
73.19	12/10
66.73	12/10
83.38	12/10
72.6	12/10
59.38	12/10
67.24	12/10
38.78	12/10
70.5	12/10
61.03	12/10
55.37	12/10
82.83	12/10
61.57	12/10
71.42	12/10
75.27	12/10
86.78	12/10
63.18	12/10
71.13	12/10
69.46	12/10
69.32	12/16
57.51	12/16
69.32	12/16
53.74	12/16
66.42	12/16
42.86	12/16
57.52	12/16
104.28	12/16
73.56	12/16
49.58	12/16
71.41	12/16
70.68	12/16
70.84	12/16
67.94	12/16
64.97	12/16
63.7	12/16
59.88	12/16

****

EM-9 Volatile Surrogate in Bulk Materials

****

4-Bromofluorobenzene PTGC

EPA SW-846 Limits: none

Result	Uncer.	Date
140.68		2/12
108.78		2/12
187.34		2/12
192.4		2/12
157.32		2/12
191.8		2/12
126.96		3/23
104.46		3/23

4-Bromofluorobenzene (cont)

102.22	3/23
100.72	3/23
101.88	3/23
110	3/23
167.36	3/23
126.92	6/09

1,2-Dichloroethane d4 PTGC

EPA SW-846 Limits: none

Result	Uncer.	Date
92.42		2/12
94.78		2/12
103.02		2/12
104		2/12
104.52		2/12
93.14		2/12
114.98		3/23
94.84		3/23
92.42		3/23
92.9		3/23
101.04		3/23
83.04		3/23
80.52		3/23
106.64		6/09

Toluene d8 PTGC

EPA SW-846 Limits: none

Result	Uncer.	Date
96.84		2/12
80.88		2/12
92.7		2/12
85.24		2/12
79.84		2/12
79.66		2/12
87.88		3/23
88.66		3/23
87.34		3/23
89.18		3/23
92.78		3/23
102.94		3/23
92.88		3/23
92.08		6/09

****

EM-9 Volatile Surrogate in Sludge

****

4-Bromofluorobenzene PTGC

EPA SW-846 Limits: none

Result	Uncer.	Date
114.14		6/09
119.84		6/09
115.2		6/09
109.32		6/09
119.44		6/09
144.86		6/09
96.62		6/09
149.86		6/09
103.56		6/09
114.26		6/09
117.2		6/09
129.6		6/09
129.7		6/09
124.54		6/09

4-Bromofluorobenzene (cont)

108.52	6/09
135.54	6/09
124.6	6/09
118.18	6/09
119.52	6/09
103.28	6/09
111.34	6/09
103.5	6/09
97.3	6/09
110.28	6/09
110.8	6/09
165.12	6/09
92.2	6/10
108.18	6/10
114.46	6/10
114.4	6/10
98.76	6/10
104.16	6/10
117.38	6/10
114.48	6/10
103.68	6/10
108.66	6/10
108.84	6/10
107.04	6/10
172.6	6/10
169.2	6/10
164.4	6/10
119	8/18
126.2	8/18
133.8	8/18
114.6	8/18
108.8	8/18
96.8	8/18
116.6	8/18
145	8/18
143	8/18
130	8/18
130	8/18
149.4	8/18
125.6	8/18
125.8	8/18
120.4	8/18
133	8/18
130.6	8/18
123.4	8/18
173.7	9/11
167.48	9/11
116.76	9/11
126.72	9/18
127.78	9/18
104.54	11/03
115.24	11/03
117.58	11/03
116.64	11/03
103.68	11/03
118.02	11/03
116.42	11/03
113.48	11/03

1,2-Dichloroethane d4 PTGC

EPA SW-846 Limits: none

Result	Uncer.	Date
101.12		6/09
107.46		6/09
99.16		6/09
100.42		6/09
96.78		6/09
95.82		6/09
110.6		6/09
98.78		6/09
107.18		6/09
100.02		6/09
93.82		6/09
108.68		6/09

1,2-Dichloroethane d4 (cont)

99.72	6/09
108.62	6/09
95.58	6/09
103.7	6/09
92.74	6/09
100.22	6/09
100.36	6/09
97.74	6/09
101.48	6/09
105.26	6/09
105.9	6/09
99.16	6/09
82.56	6/09
106.8	6/09
90.6	6/10
90.4	6/10
106.4	6/10
93.4	6/10
98.56	6/10
111.18	6/10
104.52	6/10
110.88	6/10
97.2	6/10
98.48	6/10
97.44	6/10
111.46	6/10
101.3	6/10
108.82	6/10
102.88	6/10
96.8	8/18
103.2	8/18
95.2	8/18
82.4	8/18
89.2	8/18
80.2	8/18
103.2	8/18
102.6	8/18
92.6	8/18
94.4	8/18
85.2	8/18
71.8	8/18
68.4	8/18
83.4	8/18
84.2	8/18
90.8	8/18
66.6	8/18
63.6	8/18
53.26	9/11
67.06	9/11
62.26	9/11
100.48	9/18
104.88	9/18
98.4	11/03
80.44	11/03
142.1	11/03
140.9	11/03
142.76	11/03
151.96	11/03
132.74	11/03
116.4	11/03

Toluene d8 PTGC

EPA SW-846 Limits: none

Result	Uncer.	Date
101.98		6/09
95.08		6/09
105.84		6/09
99.6		6/09
102.18		6/09
97.66		6/09
101.04		6/09
103.7		6/09
106.62		6/09
102.82		6/09

Toluene d8 (cont)

91.94	6/09
98.08	6/09
98.84	6/09
98.2	6/09
101.34	6/09
95.4	6/09
99.42	6/09
102.4	6/09
93.66	6/09
98.68	6/09
103.94	6/09
105.14	6/09
101.26	6/09
100	6/09
103.32	6/09
97.34	6/09
105.76	6/10
98.08	6/10
84.2	6/10
101.4	6/10
83.6	6/10
87	6/10
106.24	6/10
102.88	6/10
103.02	6/10
100.1	6/10
102.44	6/10
99.18	6/10
102.12	6/10
99.42	6/10
97.06	6/10
99.2	8/18
100.6	8/18
95.8	8/18
99.8	8/18
89.4	8/18
96.4	8/18
102.4	8/18
99	8/18
97.6	8/18
100.8	8/18
100.4	8/18
101.8	8/18
97.6	8/18
104.2	8/18
95.2	8/18
94.4	8/18
101.4	8/18
100.4	8/18
86.68	9/11
102.94	9/11
99.8	9/11
109.36	9/18
105.58	9/18
86.88	11/03
80.64	11/03
92.66	11/03
79.7	11/03
77.64	11/03
79.62	11/03
79.66	11/03
80.16	11/03

****

EM-9 Volatile Surrogate in Soil

****

4-Bromofluorobenzene PTGC

EPA SW-846 Limits: 74 - 121 %

Result	Uncer.	Date
113.8		1/31
115.54		1/31

4-Bromofluorobenzene (cont)

117.12	1/31
115.28	1/31
85.64	1/31
85.06	1/31
99.56	1/31
89.62	1/31
95	1/31
98.8	1/31
88.52	2/06
105.98	2/06
98.46	2/06
98.2	2/06
102.1	2/06
105.6	2/06
93.44	2/06
110.08	2/06
120.3	2/06
96.88	2/06
96.26	2/06
102.2	2/06
107.84	2/06
102.1	2/06
88.72	2/06
119.46	2/06
116.14	2/06
108.62	2/06
121.8	2/06
110.58	2/06
109.02	2/06
96.42	2/06
119.36	2/06
82.36	2/06
78.46	2/06
268.62	2/06
101.58	2/06
94.06	2/06
102.88	2/06
105.68	2/06
92.78	2/06
100.76	2/06
128.4	2/06
98.12	2/06
99.64	2/06
92.6	2/06
100.76	2/06
94.14	2/06
108.8	2/06
94.24	2/06
101.56	2/06
102.18	2/06
87.4	2/06
104.96	2/06
104.22	2/06
105.72	2/06
98.46	2/06
81.04	2/06
88.68	2/06
100.44	2/06
79.6	2/06
106.36	2/06
116.86	2/06
109.62	2/06
118.24	2/06
109.44	2/06
101.48	2/06
87.86	2/06
96.76	2/06
146.88	2/06
184.06	2/06
108.88	2/06
107.8	2/06
124.96	2/06
122.34	2/06
113.26	2/06
101.2	2/06
109	2/06
110.08	2/06
109.76	2/06

TABLE E-IV (cont)

****

EM-9 Volatile Surrogate
in Soil
(cont)

****

4-Bromofluorobenzene (cont)

117.64	2/06
124.26	2/06
107.98	2/06
147.86	2/06
99	2/11
81.72	2/11
96.6	2/11
106.96	2/11
107.04	2/11
108.12	2/11
92.8	4/15
105.2	4/15
77	4/15
98.2	4/15
99.2	4/15
97.4	4/15
97.2	4/15
96	4/15
96	4/15
94.7	5/01
107.76	5/01
92.02	5/01
98.8	6/09
96.78	6/09
101.86	6/09
97.52	6/09
107.56	6/09
97.88	6/09
97.52	6/09
102.66	6/09
99.08	6/09
103.16	6/09
102.66	6/09
101.4	6/10
96.6	6/10
101.7	6/10
97.88	6/10
105.74	6/17
106.56	6/17
103.54	6/17
104.34	6/17
94.18	6/17
102.88	6/17
108.12	6/17
109.56	6/17
107.38	6/17
108.12	6/17
103.58	6/17
102.5	6/17
108.28	6/17
105.2	6/17
101.26	6/17
109.04	6/17
103.3	6/17
101.6	8/18
100.2	8/18
86.2	8/18
97.8	8/18
102.8	8/18
106.2	8/18
96	8/18
76.8	8/24
74.4	8/24
103.42	8/24
78.4	8/24
82.92	8/24
81.68	8/24
107.18	8/24
78.96	8/24
110.7	8/24

4-Bromofluorobenzene (cont)

117.44	8/31
109.58	9/03
91.04	9/03
175.44	9/03
184.58	9/11
137	9/11
123.56	9/11
122.42	9/11
152.36	9/11
122.56	9/11
138.36	9/11
115.86	9/11
117.44	9/11
138.62	9/11
109.68	9/11
110.18	9/11
108.58	9/11
144.12	9/11
149.88	9/11
96.62	9/11
140.46	9/11
135.06	9/11
92.02	9/11
139.88	9/11
117.44	9/11
143	9/11
154.42	9/11
137.3	9/11
117.18	9/11
85.94	9/11
139.42	9/11
108.6	9/11
130.04	9/11
126.2	9/11
130.08	9/11
123.18	9/11
138.86	9/11
136.58	9/11
85.1	9/14
117.8	9/14
106.12	9/14
87.06	9/14
88.58	9/14
111.18	9/14
75.84	9/14
75.14	9/14
93.6	9/14
102.06	9/14
94.12	9/14
100.52	9/14
89.28	9/14
97.32	9/14
102.24	9/14
102.24	9/14
109.72	9/14
97.32	9/14
99.4	9/14
81.06	9/18
118.96	9/18
79.12	9/21
75.72	9/21
74.08	9/21
90.68	9/21
81.54	9/21
77.26	9/21
81.34	9/21
83.54	9/21
86.1	9/21
85.36	9/21
76.88	9/21
78.52	9/21
86.3	9/21
84.46	9/21
76.8	9/21
78.4	9/21
83.96	9/21
77.54	9/21
82.24	9/25

4-Bromofluorobenzene (cont)

84.32	9/25
106.3	9/25
108.74	9/25
100.06	9/25
98.54	9/25
87.78	9/25
94.42	9/25
89.32	9/25
81.86	9/25
86.94	9/25
88.6	9/25
87.38	9/25
86.22	9/25
90.44	9/25
85.48	9/25
88.58	9/25
81.7	9/25
79.84	9/25
87.18	9/25
101.48	9/25
87.02	9/25
90.7	10/06
96.48	10/06
118.46	10/06
112.76	10/06
112.18	10/06
91.72	10/06
117.14	10/06
103.92	10/06
96.56	10/20
116.06	10/20
111.24	10/20
87.08	10/20
79.6	10/20
96.64	10/20
85.48	10/20
82.1	10/20
91.38	10/20
92.58	10/20
98.42	10/20
99.76	10/20
128.2	10/20
108.62	10/21
91.62	10/21
112.82	10/21
118.86	10/21
124.8	10/21
142.72	10/21
85.4	10/21
117.76	10/21
98.74	10/21
84.22	10/21
92.5	10/21
85.94	10/21
110.02	10/21
97.1	10/21
133.02	10/21
85.1	10/21
53.52	10/21
92.06	10/21
149.46	10/23
131.44	10/23
128.2	10/23
101.68	10/23
105.3	10/23
134.86	10/23
140.42	10/23
102.6	10/23
120.18	10/23
151.74	10/23
151.74	10/23
131.7	10/23
111.46	10/23
103.38	10/23
106.4	10/23
116.4	10/23
101.9	10/23
122.32	10/23

4-Bromofluorobenzene (cont)

109.66	10/23
125.42	10/23
70.44	10/26
121.32	10/26
103.18	10/26
116.8	10/26
102.04	10/26
79.78	10/27
92.88	10/27
92.06	10/27
86.82	10/27
78.74	10/27
85.04	10/27
96.44	10/27
108.58	10/27
102.62	10/27
74.64	10/27
85.78	10/27
85.1	10/27
92.56	10/27
93.2	10/27
100.12	10/27
100.12	10/27
101.22	10/27
100.26	10/27
224.22	10/27
68.06	10/27
116.98	10/27
126.4	10/27
100.06	10/27
103.8	10/27
105.08	10/27
84.3	10/28
84.44	10/28
89.9	10/28
136.78	10/28
82.4	10/28
194.76	10/28
85.06	10/28
177.8	10/28
80.76	10/28
104	10/28
100.92	10/28
86.3	10/28
84.9	10/28
84.4	10/28
72.62	10/29
99.86	10/29
108.42	10/29
107.08	10/29
113.66	10/29
94.24	10/30
90.7	10/30
83.42	10/30
133.72	10/30
91.24	10/30
99.72	10/30
93.4	10/30
113.32	10/30
90.7	11/03
104.5	11/03
92.66	11/03
109.74	11/03
131.6	11/03
120.88	11/03
121.04	11/03
99.32	11/03
105.82	11/03
102.5	11/03
112.36	11/03
112.08	11/03
107.88	11/03
106.8	11/03
103.1	11/03
82.24	11/03
98.18	11/03
77.88	11/03
100.92	11/03

4-Bromofluorobenzene (cont)

73.92	11/03
98.32	11/03
90.12	11/03
99.56	11/03
67.3	11/03
66.48	11/03
61.08	11/03
106.1	11/03
117.94	11/03
100	11/03
75.32	11/03
106.38	11/03
105.92	11/03
105.72	11/03
106.62	11/03
82.74	11/03
102.38	11/03
61.48	11/03
63.92	11/03
91.5	11/03
104.58	11/04
93.46	11/04
99.6	11/04
116.22	11/04
88.7	11/04
89.5	11/04
103.12	11/04
91.08	11/04
92.84	11/04
102.48	11/24
142.1	11/24
93.36	11/24
83.08	11/24
90.94	11/24
181.22	11/24
171.76	11/24
115	11/24
82.32	11/24
110.26	11/24
72.14	11/24
80.92	11/25
90.22	11/25
90.86	11/25
85.68	11/25
124	11/25
82.18	11/25
139.92	11/25
91.42	11/25
106.18	11/25
121.8	11/25
86.46	11/25
114.92	11/30
103.1	11/30
93.02	11/30
82.42	11/30
100.82	11/30
107.52	11/30
104.48	11/30
102.74	11/30
103.14	11/30
100.76	11/30
110.04	11/30
110.3	11/30
115.4	11/30
113.4	11/30
98.66	11/30
158.62	12/01
51.72	12/01
166.52	12/01
159.7	12/01
145.62	12/01
153.16	12/01
154.4	12/01
169.02	12/01
111.4	12/16

1,2-Dichloroethane d4 PTGC

EPA SW-846 Limits: 70 - 121 %

Result	Uncer.	Date
100.56		1/31
101.72		1/31
97.54		1/31
83.2		1/31
97.28		1/31
89.46		1/31
87.76		1/31
83.4		1/31
81.44		1/31
89.16		1/31
81.28		2/06
82.26		2/06
98		2/06
83.62		2/06
92.84		2/06
93.28		2/06
76.6		2/06
108.02		2/06
76.92		2/06
78.88		2/06
83.16		2/06
91.68		2/06
81.54		2/06
84.62		2/06
95.68		2/06
101.4		2/06
80.28		2/06
84.74		2/06
86.04		2/06
95.04		2/06
90.62		2/06
98.04		2/06
82.84		2/06
88.4		2/06
95.48		2/06
76.58		2/06
85.64		2/06
86.04		2/06
68.92		2/06
81.02		2/06
77.48		2/06
100.94		2/06
95.48		2/06
97.88		2/06
83.92		2/06
90		2/06
84.08		2/06
84.8		2/06
89.54		2/06
90.12		2/06
90.46		2/06
91.48		2/06
103.54		2/06
87.1		2/06
79.62		2/06
81.12		2/06
88.56		2/06
81.16		2/06
88		2/06
82.28		2/06
83.82		2/06
81.16		2/06
81.44		2/06
87.94		2/06
90.66		2/06
92.34		2/06
87.14		2/06
88.84		2/06
75.82		2/06
87.72		2/06
87.78		2/06
90.46		2/06
83.22		2/06
89.76		2/06

TABLE E-IV (cont)

****

EM-9 Volatile Surrogate
in Soil
(cont)

****

1,2-Dichloroethane d4 (cont)

79.48	2/06
81.44	2/06
93.38	2/06
84.1	2/06
87.98	2/06
91.42	2/06
85.24	2/06
86.04	2/06
81.38	2/06
86.12	2/06
97.46	2/11
100	2/11
107.98	2/11
110.78	2/11
107.34	2/11
102.02	2/11
87.2	4/15
86	4/15
87.6	4/15
87.6	4/15
86	4/15
88.2	4/15
94.2	4/15
90	4/15
109.6	4/15
36.14	5/01
75.3	5/01
70.58	5/01
95.02	6/09
86.14	6/09
90.88	6/09
95.28	6/09
88.74	6/09
96.58	6/09
87.98	6/09
97.24	6/09
95.02	6/09
90.88	6/09
100.88	6/09
96.58	6/10
95.86	6/10
105.6	6/10
92.64	6/10
105.8	6/17
99.56	6/17
85.54	6/17
85.16	6/17
94.3	6/17
97.2	6/17
95.28	6/17
104.6	6/17
102.68	6/17
91.94	6/17
95.74	6/17
97.86	6/17
95	6/17
97.2	6/17
99.28	6/17
102.48	6/17
118.3	6/17
102.4	8/18
98.8	8/18
97.6	8/18
96.6	8/18
100.8	8/18
94.4	8/18
88.2	8/18
139.8	8/24
126.8	8/24
109.2	8/24

1,2-Dichloroethane d4 (cont)

134.86	8/24
142.74	8/24
107.08	8/24
128.48	8/24
94.6	8/24
107.38	8/24
105.42	8/31
82.5	9/03
105.56	9/03
82.94	9/03
101.46	9/11
104.28	9/11
97.6	9/11
111.58	9/11
83.3	9/11
92.1	9/11
105.42	9/11
96.8	9/11
95.86	9/11
96.2	9/11
91.52	9/11
97.94	9/11
96.22	9/11
103.38	9/11
97.28	9/11
90.78	9/11
105.42	9/11
99.74	9/11
105.48	9/11
111.36	9/11
108.82	9/11
110.7	9/11
107.84	9/11
116.02	9/11
114.7	9/11
108.94	9/11
101.74	9/11
101.06	9/11
98	9/11
108.26	9/11
104.52	9/11
105.4	9/11
111.3	9/11
108.58	9/11
120.46	9/14
131.4	9/14
154.42	9/14
133.56	9/14
132.14	9/14
129.56	9/14
141.46	9/14
135.9	9/14
129.56	9/14
119.18	9/14
116.32	9/14
99.16	9/14
101.54	9/14
104.82	9/14
95.4	9/14
107.16	9/14
103.84	9/14
102.72	9/14
133.56	9/14
97.68	9/18
107.32	9/18
105.58	9/21
102.74	9/21
172.56	9/21
171.46	9/21
163.36	9/21
168.3	9/21
155.36	9/21
124.56	9/21
132.98	9/21
163.58	9/21
138.98	9/21
231.4	9/21
108.42	9/21

1,2-Dichloroethane d4 (cont)

140.62	9/21
195.2	9/21
180.48	9/21
182.44	9/21
175.9	9/21
101.42	9/25
100.98	9/25
128.34	9/25
105.86	9/25
124.58	9/25
135.06	9/25
131.3	9/25
143.1	9/25
145.98	9/25
174.26	9/25
147.68	9/25
144.82	9/25
143.54	9/25
136	9/25
136.76	9/25
139.78	9/25
155.98	9/25
136.86	9/25
151.38	9/25
144.06	9/25
149.74	9/25
135.74	9/25
267.96	10/06
133.68	10/06
124.66	10/06
135.52	10/06
136.76	10/06
93.52	10/06
102.1	10/06
131.2	10/06
185.18	10/20
81.22	10/20
92.36	10/20
112.48	10/20
112.8	10/20
181.08	10/20
171.14	10/20
205.48	10/20
105.88	10/20
94.88	10/20
111.7	10/20
116.1	10/20
113.46	10/20
122.36	10/21
95.4	10/21
105.6	10/21
120.04	10/21
126.3	10/21
134.9	10/21
135	10/21
136.04	10/21
138.66	10/21
120.16	10/21
125.56	10/21
125.66	10/21
119.54	10/21
113.18	10/21
111.16	10/21
126.8	10/21
124.14	10/21
139.12	10/21
105.42	10/23
105.66	10/23
109.26	10/23
116.92	10/23
106.78	10/23
106.78	10/23
100.48	10/23
95.4	10/23
108.66	10/23
127.3	10/23
107.26	10/23
126.22	10/23

1,2-Dichloroethane d4 (cont)

134.1	10/23
124	10/23
115.64	10/23
130.96	10/23
167.5	10/23
137.86	10/23
177	10/23
124.38	10/23
99.02	10/26
111.24	10/26
100.94	10/26
102.16	10/26
113.52	10/26
87.86	10/27
180.26	10/27
89.86	10/27
106.96	10/27
148.86	10/27
135.64	10/27
148.32	10/27
116.16	10/27
120.7	10/27
81.78	10/27
119.14	10/27
121.58	10/27
128.26	10/27
111.16	10/27
93.98	10/27
113.2	10/27
112.2	10/27
95.4	10/27
119.14	10/27
102.8	10/27
88.3	10/27
76	10/27
114.96	10/27
104.9	10/27
87.54	10/27
75.76	10/28
113.8	10/28
106.92	10/28
168.16	10/28
103.08	10/28
105.72	10/28
105	10/28
124.56	10/28
96	10/28
130.82	10/28
216.22	10/28
114.2	10/28
65.32	10/28
79.28	10/28
125.38	10/29
106.78	10/29
112.76	10/29
126.96	10/29
103.62	10/29
135.5	10/30
112.2	10/30
110.14	10/30
117.62	10/30
140.84	10/30
108.2	10/30
93.52	10/30
112.66	10/30
148.12	11/03
153.38	11/03
156.36	11/03
144.6	11/03
158.18	11/03
133.86	11/03
115.52	11/03
141.68	11/03
107.12	11/03
128.04	11/03
101.46	11/03
162.5	11/03
115.3	11/03

1,2-Dichloroethane d4 (cont)

167.36	11/03
114.24	11/03
179.72	11/03
107.72	11/03
161.72	11/03
105.32	11/03
110.9	11/03
103.1	11/03
106.86	11/03
249.2	11/03
104.34	11/03
132.14	11/03
140.36	11/03
117.72	11/03
160.9	11/03
153.38	11/03
133.08	11/03
128.2	11/03
146.7	11/03
125.94	11/03
145.34	11/03
135.54	11/03
132.98	11/03
125.68	11/03
93.52	11/03
103.5	11/03
115.34	11/04
114.8	11/04
196.92	11/04
112.78	11/04
103.22	11/04
188.74	11/04
169.58	11/04
121.82	11/04
134.08	11/04
88.68	11/24
101.68	11/24
102.56	11/24
110.74	11/24
105.5	11/24
111.34	11/24
116.56	11/24
108.34	11/24
100.1	11/24
143.48	11/24
128.98	11/24
103.2	11/25
106.84	11/25
152.84	11/25
154.76	11/25
190.14	11/25
154.34	11/25
166.72	11/25
181.82	11/25
181.04	11/25
228.96	11/25
170.16	11/25
122.92	11/30
125.28	11/30
124.38	11/30
124.64	11/30
123.92	11/30
167.68	11/30
96.9	11/30
82.12	11/30
154.32	11/30
106.86	11/30
113.1	11/30
150.9	11/30
121.16	11/30
138.28	11/30
155.78	11/30
123.14	12/01
117.42	12/01
107.24	12/01
108.06	12/01
110.58	12/01
115.02	12/01

1,2-Dichloroethane d4 (cont)

115.98	12/01
109.94	12/01
124.18	12/16

Toluene d8 PTGC

EPA SW-846 Limits: 81 - 117 %

Result	Uncer.	Date
86.94		1/31
79.54		1/31
80.42		1/31
87.84		1/31
88.02		1/31
84.8		1/31
88.58		1/31
89.46		1/31
89.16		1/31
89		1/31
92.18		2/06
87.06		2/06
82.5		2/06
89.9		2/06
84.26		2/06
91.82		2/06
83.82		2/06
90.4		2/06
84.36		2/06
84.24		2/06
84.34		2/06
83.74		2/06
84.58		2/06
83.44		2/06
86.54		2/06
96.84		2/06
96.38		2/06
93.9		2/06
88.06		2/06
87.58		2/06
96.46		2/06
91.28		2/06
92.94		2/06
85.38		2/06
96.7		2/06
90.36		2/06
89.72		2/06
87.9		2/06
89.6		2/06
93.62		2/06
81.78		2/06
80.12		2/06
85.08		2/06
91.3		2/06
98.16		2/06
97.68		2/06
91.84		2/06
91.98		2/06
85.42		2/06
85.02		2/06
93.2		2/06
92.12		2/06
89.42		2/06
97.68		2/06
83.38		2/06
87.44		2/06
92.12		2/06
86.28		2/06
88.34		2/06
86.7		2/06
96.66		2/06
90.84		2/06
75.8		2/06
88.16		2/06
83.04		2/06
86.54		2/06
81.26		2/06

TABLE E-IV (cont)

****

EM-9 Volatile Surrogate
in Soil
(cont)

****

Toluene d8 (cont)

85.42	2/06
88	2/06
87.24	2/06
90.1	2/06
93	2/06
83.02	2/06
81.76	2/06
82.12	2/06
90.4	2/06
78.58	2/06
86.28	2/06
92.34	2/06
81.68	2/06
81.96	2/06
91.42	2/06
81.3	2/06
82.02	2/06
95.36	2/11
100.12	2/11
98.26	2/11
92.12	2/11
94.76	2/11
94.46	2/11
91.8	4/15
92.4	4/15
90	4/15
94	4/15
93.8	4/15
93.2	4/15
92	4/15
91.6	4/15
95.6	4/15
86.42	5/01
89.12	5/01
95.74	5/01
98.44	6/09
102.64	6/09
99.44	6/09
100.84	6/09
97.6	6/09
95.2	6/09
98.86	6/09
100.84	6/09
100.3	6/09
98.14	6/09
100.3	6/09
101.2	6/10
102.18	6/10
100.94	6/10
102.64	6/10
98.02	6/17
100.6	6/17
94.58	6/17
100.52	6/17
95.16	6/17
94.76	6/17
97.34	6/17
93.9	6/17
94.94	6/17
101.56	6/17
101	6/17
100.24	6/17
98.06	6/17
94.8	6/17
100.46	6/17
101.16	6/17
99.5	6/17
104.6	8/18
102.6	8/18
100.6	8/18

Toluene d8 (cont)

106.4	8/18
100	8/18
107	8/18
99	8/18
101.62	8/24
87.56	8/24
93.6	8/24
90.72	8/24
89.24	8/24
81.92	8/24
79.8	8/24
86.52	8/24
98.04	8/24
93.82	8/31
72.92	9/03
100.74	9/03
101.82	9/03
92.08	9/11
100.22	9/11
101.66	9/11
104.72	9/11
91.32	9/11
93.82	9/11
99.32	9/11
105.3	9/11
101.92	9/11
102.34	9/11
104.54	9/11
93.9	9/11
115.96	9/11
114.02	9/11
101	9/11
93.82	9/11
101.34	9/11
104.96	9/11
100.9	9/11
93.52	9/11
96.1	9/11
96.02	9/11
95.14	9/11
99.52	9/11
98.88	9/11
106.1	9/11
100.9	9/11
100.4	9/11
101.9	9/11
105.3	9/11
103	9/11
92.02	9/11
99.46	9/11
99.38	9/11
81.94	9/14
102.2	9/14
99.08	9/14
87.66	9/14
87.7	9/14
86.52	9/14
98.88	9/14
84.42	9/14
87.66	9/14
102.3	9/14
86.52	9/14
98.82	9/14
95.22	9/14
95.96	9/14
93.54	9/14
84.12	9/14
87	9/14
91.22	9/14
93.2	9/14
110.22	9/18
111.14	9/18
95.32	9/21
83.52	9/21
100.12	9/21
81.76	9/21
94.76	9/21
82.24	9/21

Toluene d8 (cont)

83.76	9/21
80.06	9/21
84.52	9/21
86.74	9/21
81.4	9/21
85.14	9/21
82.6	9/21
87.98	9/21
83.36	9/21
98.72	9/21
84.66	9/21
91.34	9/21
96	9/25
89.52	9/25
88.08	9/25
85.8	9/25
87.02	9/25
87.82	9/25
89.36	9/25
87.18	9/25
86.5	9/25
83.3	9/25
86.58	9/25
84.6	9/25
88.9	9/25
87.96	9/25
85.32	9/25
87.66	9/25
84.12	9/25
85.74	9/25
91.66	9/25
89.92	9/25
90.26	9/25
96.72	9/25
76.94	10/06
73.86	10/06
78.64	10/06
76.3	10/06
75.96	10/06
75.22	10/06
93.86	10/06
91.9	10/06
95.98	10/20
107.36	10/20
102.08	10/20
82.84	10/20
81.4	10/20
97.6	10/20
82.2	10/20
95.92	10/20
81.12	10/20
97.56	10/20
92.76	10/20
100.72	10/20
95.68	10/20
99.08	10/21
71.02	10/21
90.14	10/21
93.6	10/21
86.24	10/21
99	10/21
81.4	10/21
86.2	10/21
88.02	10/21
91.92	10/21
89.44	10/21
95.84	10/21
91.74	10/21
88.92	10/21
92.54	10/21
91.74	10/21
97.22	10/21
92.8	10/21
82.7	10/23
95.26	10/23
85.34	10/23
98.6	10/23
98.6	10/23

Toluene d8 (cont)

100.64	10/23
97.76	10/23
93	10/23
94.14	10/23
94.7	10/23
76.74	10/23
80.86	10/23
86.76	10/23
93.12	10/23
90.06	10/23
83.98	10/23
91.98	10/23
89.38	10/23
73.58	10/23
96.72	10/23
100.72	10/26
93.78	10/26
94.48	10/26
103.96	10/26
101.3	10/26
91.8	10/27
99.08	10/27
93.74	10/27
92.8	10/27
90.76	10/27
97.18	10/27
101.1	10/27
77.26	10/27
85.16	10/27
106.54	10/27
105.24	10/27
98.56	10/27
82.22	10/27
86.32	10/27
100.7	10/27
89.94	10/27
88.92	10/27
67.82	10/27
96.5	10/27
91.96	10/27
98.42	10/27
82.58	10/27
88.38	10/27
82.58	10/27
92.78	10/27
98.4	10/28
93.36	10/28
93.24	10/28
84.62	10/28
87.48	10/28
74.56	10/28
95.16	10/28
98.3	10/28
99.74	10/28
68.78	10/28
99.04	10/28
72.3	10/28
95.64	10/28
101.18	10/28
76.74	10/29
77.92	10/29
80.92	10/29
75.82	10/29
81.28	10/29
93.86	10/30
82.76	10/30
87.98	10/30
86.18	10/30
78.14	10/30
82.02	10/30
84.82	10/30
85.9	10/30
90.18	11/03
93.86	11/03
87.68	11/03
86.2	11/03
84.18	11/03
75.56	11/03

Toluene d8 (cont)

83.58	11/03
88.12	11/03
82.08	11/03
88.34	11/03
90.24	11/03
88.92	11/03
80.92	11/03
79.28	11/03
85.86	11/03
93.56	11/03
85.9	11/03
82.02	11/03
88.82	11/03
91.86	11/03
79.64	11/03
79.5	11/03
81.46	11/03
87.32	11/03
94.32	11/03
86.42	11/03
88.64	11/03
92.88	11/03
85.32	11/03
79.56	11/03
74.18	11/03
78.44	11/03
86.9	11/03
79.74	11/03
78.58	11/03
83.58	11/03
88.96	11/03
90.68	11/03
81.28	11/03
83.54	11/04
82.6	11/04
80.54	11/04
82.5	11/04
80.56	11/04
90.12	11/04
90.48	11/04
79.42	11/04
76.1	11/04
86.08	11/24
86.44	11/24
97.36	11/24
68.54	11/24
89.24	11/24
89.76	11/24
93.34	11/24
96.04	11/24
98.44	11/24
97.64	11/24
101.5	11/24
82.36	11/25
80.28	11/25
80.04	11/25
99.8	11/25
83.52	11/25
81.98	11/25
75.36	11/25
99.06	11/25
112.84	11/25
99.84	11/25
87.24	11/25
95.96	11/30
115.32	11/30
88.96	11/30
92.36	11/30
96.44	11/30
88.98	11/30
89.42	11/30
96.02	11/30
94.4	11/30
91.6	11/30
90.38	11/30
95.04	11/30
95.74	11/30
98.4	11/30

Toluene d8 (cont)

97.24	11/30
97.74	12/01
92.38	12/01
97.54	12/01
96.94	12/01
125.02	12/01
96.74	12/01
95.94	12/01
91.24	12/01
83.38	12/16

****

EM-9 Volatile Surrogate
in Water

****

4-Bromofluorobenzene PTGC

EPA SW-846 Limits: 86 - 115 %

Result	Uncer.	Date
98.2		1/27
99.38		1/30
97.62		1/30
101.68		1/30
106.36		1/30
100.96		1/30
88.42		1/30
103.26		2/12
113.6		2/12
84.78		2/19
90.5		2/19
91.28		2/19
84.08		2/19
88.52		2/19
89.06		2/19
90.68		2/19
92.02		2/19
94.7		3/23
103.22		3/23
109.2		3/30
105.2		3/30
106.6		3/30
97.2		3/30
104.4		3/31
90.8		3/31
94.8		3/31
91.2		3/31
95.8		3/31
96.48		4/01
98.2		4/01
105.26		4/01
90.14		4/01
107		5/04
114.4		5/04
101.4		5/04
101.8		5/04
108.2		5/04
100.6		5/19
104.6		5/19
93		5/19
141.2		5/20
102		5/20
98		5/20
101.2		5/20
98		5/29
98		5/29
96		5/29
96.2		5/29
100.8		5/29
96.8		5/29
100.4		5/29
102.8		5/29
101.6		5/29
141.2		5/29

TABLE E-IV (cont)

****

EM-9 Volatile Surrogate
in Water
(cont)

****

4-Bromofluorobenzene (cont)

102	5/29
98.4	5/29
97.6	5/29
95.2	5/29
98	5/29
96.8	5/29
107.16	5/29
99.4	6/01
100.6	6/01
101.4	6/01
101	6/01
99.6	6/01
100.6	6/01
98.8	6/01
99	6/01
100.2	6/01
104.6	6/01
95.4	6/01
100.4	6/01
124.42	6/09
113.58	6/09
109.44	6/09
124.54	6/09
128.64	6/09
98	6/09
107.48	6/16
107.56	6/16
100.94	6/16
93.02	6/16
103.86	6/16
96.22	6/16
92.72	6/16
94.12	6/16
94.82	6/16
100.62	6/16
100.44	6/16
98.72	6/16
90.66	6/16
89.72	6/16
90.4	6/16
92.34	6/16
94.54	6/16
95.02	6/16
95.92	6/16
101.04	6/19
100.14	6/19
110.4	8/06
107.8	8/06
110	8/06
94.3	8/06
108.4	8/06
112.4	8/06
111.6	8/06
115.2	8/11
91	8/11
111.6	8/11
114.6	8/11
107.6	8/11
110.4	8/11
108.2	8/11
108.6	8/11
111.6	8/11
110.8	8/11
111.2	8/11
98.6	8/11
107.4	8/11
108.2	8/11
106.6	8/11
103.8	8/12
78.66	8/27

4-Bromofluorobenzene (cont)

72.14	8/27
72.98	8/27
63.66	8/27
68.18	8/27
69.84	8/27
76.8	8/27
69.78	8/27
76.66	8/27
81.02	8/27
66.6	8/27
77.58	8/27
76.18	8/27
77.1	8/27
75	8/27
80.24	8/27
69.5	8/27
73.96	8/27
105.62	8/31
99.88	8/31
111.4	8/31
106.3	8/31
105.74	8/31
93.48	8/31
105.2	8/31
112.04	8/31
111.4	8/31
116.04	8/31
117.4	8/31
106.1	8/31
108.24	8/31
107.2	9/01
111.6	9/01
108.8	9/01
108.8	9/01
100.6	9/01
102.8	9/01
107.4	9/01
123.22	9/03
124.36	9/03
119.76	9/03
124.04	9/03
103.2	9/03
118.14	9/03
124.72	9/03
128.66	9/03
126.38	9/03
117.86	9/03
118.46	9/10
99.78	9/10
118.18	9/10
119.3	9/10
119.24	9/10
116.4	9/10
112.04	9/10
120.34	9/10
119.16	9/10
109.34	9/11
105.18	9/11
112.38	9/11
107.94	9/11
111.46	9/11
91.58	9/11
111.38	9/11
109.68	9/11
113.8	9/11
109.32	9/14
104.52	9/14
105.24	9/14
99.52	9/14
107.74	9/14
88.68	9/14
108.8	9/14
97.26	9/14
123.3	9/14
126.04	9/14
107.14	9/14
122.9	9/14
125.3	9/14

4-Bromofluorobenzene (cont)

106.1	9/14
124.72	9/14
125.32	9/14
118.26	9/15
124.36	9/15
123.66	9/15
114.68	9/15
103.3	9/15
116.28	9/15
121.64	9/15
111.56	9/15
102.98	9/15
126.18	9/16
128.14	9/16
122.08	9/16
129.64	9/16
115.22	9/16
124.24	9/16
105.28	9/16
114.26	9/16
119.04	9/16
110.14	9/18
104	9/18
87.62	9/18
118.96	9/18
107.54	9/18
101.68	9/18
121.2	9/18
123.66	9/18
117.06	9/18
122.16	9/18
120.18	9/18
101.46	9/18
121.92	9/18
123.06	9/18
124.62	9/18
88.06	9/18
119.7	9/18
104	9/18
102.36	9/18
103.86	9/18
103.3	9/18
126.38	9/18
121.52	9/18
121.86	9/18
122.08	9/18
118.68	9/18
121.72	9/18
124.2	9/18
102.92	10/14
104.62	10/14
101.72	10/14
104.32	10/14
100.16	10/14
103.88	10/14
104.8	10/14
97.14	10/14
96.42	10/14
118.32	10/14
109.86	10/14
114.08	10/14
104.14	10/14
104.62	10/14
108.38	10/14
111.06	10/14
114.16	10/14
107.3	10/15
99.38	10/15
98.28	10/15
100.74	10/15
119.52	10/15
94.62	10/19
102.04	10/19
98.04	10/19
100.5	10/19
101.4	10/19
104.66	10/19
84.6	10/19

4-Bromofluorobenzene (cont)

101.2	10/19
98.58	10/19
100.5	10/19
103.44	10/19
100.38	10/19
104.04	10/19
107.02	10/19
105.46	10/19
98.74	10/19
103.14	10/19
109.22	10/20
126.48	10/20
124.6	10/20
114.96	10/20
134.54	10/20
131.44	10/20
116.16	10/20
114.44	10/20
103.56	10/21
96.06	10/21
87.38	10/21
92.04	10/21
72.88	10/21
92.24	10/21
96.04	10/21
116.92	10/21
91.94	10/21
96.58	10/21
88.9	10/21
118.22	10/21
89.64	10/21
94.48	10/21
108.18	10/21
80.74	10/21
84.36	10/21
84.42	10/21
86.38	10/21
97.66	10/21
98.3	10/21
96.1	10/21
97.28	10/21
103.66	10/22
98.64	10/22
91.94	10/22
98.64	10/22
100.12	10/22
88.1	10/28
96.48	10/28
91.34	10/28
96.3	10/28
106.24	10/28
98.28	10/28
93.32	10/28
74.8	10/28
94	10/28
87.06	10/28
87.98	10/28
77.74	10/28
97.98	10/30
103.12	10/30
98.72	10/30
97.4	10/30
91.22	11/04
105.32	11/04
91.14	11/04
78.44	11/16
92.5	11/16
80.74	11/16
81.94	11/16
80.08	11/16
89.24	11/16
79.26	11/16
88.36	11/16
82.42	11/16
88.34	11/16
115.14	11/18
106.88	11/18
111.5	11/18

4-Bromofluorobenzene (cont)

113.72	11/18
109.18	11/18
86.28	11/18
113.74	11/18
104.92	11/18
107.46	11/18
117.52	11/18
114.54	11/18
117.18	11/18
110.18	11/18
112.1	11/18
116.26	11/18
108.84	11/18
113.38	11/18
78.48	11/18
110.36	11/18
114.44	11/18
112.7	11/18
114.34	11/18
108.44	11/18
116.02	11/18
112.58	11/18
109.82	11/18
93.96	11/18
113.4	11/18
106.36	11/18
88.82	11/19
106.02	11/19
106.48	11/19
107.86	11/19
111.38	11/19
109.28	11/19
108.44	11/19
106.6	11/19
113.04	11/19
111.48	11/19
25.5	11/19
33.08	11/19
20.5	11/19
22.02	11/19
24.08	11/19
19.38	11/19
23.74	11/19
23.5	11/19
103.52	11/24
114.6	11/24
103.46	11/24
106.54	11/24
100.9	11/24
105.32	11/24
100.92	11/24
105.04	11/24
103.92	11/24
119.22	12/01
119.54	12/01
119.32	12/01
122.3	12/01
121.28	12/01
99.28	12/01
126.76	12/01
109.84	12/07
109.24	12/07
99.98	12/07
110.14	12/07
111.78	12/07
110.14	12/07
107.26	12/07
90.5	12/07
111.74	12/07
112.04	12/07
112.86	12/07
91.42	12/09
89.92	12/09
78.92	12/09

1,2-Dichloroethane d4 PTGC

EPA SW-846 Limits: 76 - 114 %

Result	Uncer.	Date
81.64		1/27
80.5		1/30
83.62		1/30
89.32		1/30
80.66		1/30
80.82		1/30
86.12		1/30
104.44		2/12
96.82		2/12
85.74		2/19
78.62		2/19
78.84		2/19
82.56		2/19
78.94		2/19
80.46		2/19
90.3		2/19
82.86		2/19
108.26		3/23
75.6		3/23
98.2		3/30
94.8		3/30
92.8		3/30
97.8		3/30
109.4		3/31
102.2		3/31
98.2		3/31
109.6		3/31
108.6		3/31
90.38		4/01
92.48		4/01
85.36		4/01
85.96		4/01
157.2		5/04
99		5/04
130.4		5/04
111.6		5/04
138.2		5/04
104.4		5/19
97.8		5/19
104.2		5/19
99.2		5/20
101		5/20
98.8		5/20
98.6		5/20
103.4		5/29
101.64		5/29
104.2		5/29
101.4		5/29
101		5/29
102.32		5/29
99.2		5/29
102.8		5/29
101		5/29
99		5/29
105.8		5/29
107.6		5/29
101.2		5/29
106.8		5/29
94.4		5/29
102		5/29
101.6		5/29
105.6		6/01
104.8		6/01
100		6/01
101.4		6/01
100		6/01
102		6/01
97.8		6/01
102.2		6/01
103		6/01
104.6		6/01
105.8		6/01
102.2		6/01
84.36		6/09

TABLE E-IV (cont)

****

EM-9 Volatile Surrogate
in Water
(cont)

****

1,2-Dichloroethane d4 (cont)

106.34	6/09
105.68	6/09
100.68	6/09
112.68	6/09
102.72	6/09
94.04	6/16
91.48	6/16
94.54	6/16
105.62	6/16
94.02	6/16
94.02	6/16
102.7	6/16
100.32	6/16
97.14	6/16
88.98	6/16
106.88	6/16
100.82	6/16
85.22	6/16
93.36	6/16
100.94	6/16
85.64	6/16
106.08	6/16
89.66	6/16
94.64	6/16
100.46	6/19
98.38	6/19
108	8/06
108	8/06
103	8/06
106.8	8/06
96.6	8/06
79.8	8/06
104.8	8/06
102.2	8/11
104	8/11
100.8	8/11
102.6	8/11
104	8/11
107.8	8/11
105.4	8/11
101	8/11
112.8	8/11
116.8	8/11
98.6	8/11
94	8/11
99.6	8/11
111.4	8/11
109.8	8/11
98.2	8/12
148.68	8/27
138.6	8/27
130.92	8/27
129.44	8/27
143.98	8/27
141.88	8/27
124.78	8/27
149.04	8/27
107.38	8/27
145.42	8/27
157.12	8/27
168.3	8/27
165.2	8/27
144.34	8/27
133.8	8/27
148.36	8/27
129.46	8/27
152.88	8/27
95.12	8/31
98.52	8/31
92.78	8/31

1,2-Dichloroethane d4 (cont)

96.56	8/31
100.24	8/31
98.98	8/31
95.2	8/31
99.76	8/31
87.18	8/31
90.42	8/31
97.4	8/31
99.62	8/31
97.82	8/31
93.2	9/01
105.8	9/01
91	9/01
96.4	9/01
94.4	9/01
94	9/01
96.4	9/01
105.14	9/03
106.3	9/03
106.18	9/03
105.88	9/03
109.68	9/03
107.98	9/03
110.18	9/03
111.08	9/03
100.28	9/03
102.26	9/03
102.24	9/10
104.56	9/10
99.8	9/10
95.98	9/10
103.42	9/10
104.52	9/10
101.94	9/10
101.1	9/10
97.5	9/10
92.96	9/11
83.58	9/11
84.54	9/11
92.1	9/11
87.8	9/11
90.6	9/11
85.72	9/11
89.98	9/11
89.02	9/11
96.74	9/14
95.54	9/14
105.7	9/14
97.36	9/14
101.28	9/14
100.28	9/14
101.32	9/14
109.52	9/14
107.24	9/14
110.02	9/14
107.92	9/14
100.88	9/14
98.94	9/14
101.16	9/14
103.66	9/14
103.4	9/14
113.56	9/15
108.18	9/15
113.2	9/15
108.04	9/15
115.2	9/15
112.1	9/15
109.74	9/15
101.62	9/15
110.54	9/15
89.34	9/16
102.26	9/16
109.02	9/16
107.46	9/16
102.06	9/16
108.9	9/16
106.64	9/16
108.76	9/16

1,2-Dichloroethane d4 (cont)

102.14	9/16
100.36	9/18
99.08	9/18
97.68	9/18
103.12	9/18
105.7	9/18
108.04	9/18
106	9/18
101.26	9/18
104.28	9/18
103.26	9/18
97.46	9/18
95.94	9/18
101.6	9/18
98.28	9/18
94.72	9/18
97.32	9/18
98.14	9/18
100.62	9/18
96.9	9/18
95.46	9/18
91.3	9/18
94.54	9/18
92.32	9/18
93.96	9/18
95.48	9/18
93.7	9/18
90.56	9/18
94.28	9/18
95.74	10/14
94.84	10/14
97.82	10/14
98.36	10/14
100.6	10/14
105.7	10/14
95.3	10/14
98.72	10/14
100.08	10/14
100.86	10/14
100.22	10/14
98.16	10/14
93.86	10/14
98.86	10/14
97.66	10/14
98.24	10/14
98.92	10/14
148.48	10/15
107.14	10/15
106.46	10/15
184.32	10/15
141.94	10/15
98.22	10/19
104.86	10/19
106.84	10/19
102.24	10/19
108.42	10/19
106.94	10/19
107.48	10/19
99.02	10/19
101.88	10/19
96.8	10/19
99.96	10/19
98.26	10/19
97.34	10/19
99.16	10/19
99.86	10/19
97.02	10/19
98.44	10/19
102.36	10/20
95.82	10/20
116.08	10/20
111.5	10/20
115.06	10/20
70.22	10/20
116.4	10/20
122.5	10/20
154.68	10/21
146.68	10/21

1,2-Dichloroethane d4 (cont)

129.56	10/21
132.08	10/21
148.18	10/21
135.9	10/21
133.32	10/21
138.5	10/21
92.2	10/21
126.46	10/21
128.32	10/21
144.94	10/21
133.54	10/21
136.56	10/21
151.32	10/21
130.72	10/21
131.06	10/21
105.44	10/21
148	10/21
115.14	10/21
139.58	10/21
137.34	10/21
163.12	10/21
122.32	10/22
125.88	10/22
122.32	10/22
106	10/22
116.16	10/22
109.92	10/28
139.48	10/28
118.3	10/28
108.38	10/28
80.16	10/28
115.34	10/28
110.24	10/28
103.04	10/28
104.2	10/28
102.1	10/28
121.32	10/28
123.8	10/28
227.1	10/30
115.34	10/30
180.32	10/30
209.56	10/30
137.36	11/04
117.82	11/04
138.52	11/04
96.9	11/16
112.96	11/16
116.1	11/16
152.56	11/16
126.66	11/16
131.48	11/16
126.96	11/16
122.64	11/16
147.34	11/16
151.76	11/16
101.9	11/18
107.64	11/18
107.24	11/18
104.14	11/18
101.82	11/18
112.08	11/18
109.2	11/18
104.4	11/18
103.08	11/18
108.84	11/18
102.82	11/18
109.3	11/18
106.52	11/18
109.9	11/18
108.4	11/18
107.42	11/18
98.88	11/18
100.42	11/18
112.68	11/18
105.64	11/18
106.86	11/18
122.52	11/18
107.74	11/18

1,2-Dichloroethane d4 (cont)

107.42	11/18
114.46	11/18
104.04	11/18
99.02	11/18
92.32	11/18
100.38	11/18
21.34	11/19
22.98	11/19
19.16	11/19
22.3	11/19
21.52	11/19
10.46	11/19
20.46	11/19
21.86	11/19
104.02	11/19
100.02	11/19
100.6	11/19
101.86	11/19
101.94	11/19
106.48	11/19
99	11/19
102.08	11/19
99.16	11/19
103.58	11/19
97.08	11/24
99.2	11/24
92.78	11/24
93.1	11/24
109.94	11/24
97.16	11/24
100.34	11/24
108.18	11/24
113.46	11/24
101.06	12/01
95.32	12/01
100.04	12/01
90.54	12/01
95.4	12/01
97.58	12/01
98.96	12/01
81.02	12/07
100.9	12/07
101.66	12/07
104.68	12/07
98.92	12/07
103.06	12/07
101.4	12/07
104.72	12/07
98.92	12/07
112.26	12/07
105.6	12/07
179.58	12/09
103.2	12/09
134.72	12/09

Toluene d8 PTGC

EPA SW-846 Limits: 88 - 110 %

Result	Uncer.	Date
87.32		1/27
94.44		1/30
90.98		1/30
92.58		1/30
93.12		1/30
92.28		1/30
92.92		1/30
105.54		2/12
98.46		2/12
90.24		2/19
88.32		2/19
89.28		2/19
88.48		2/19
90.74		2/19
83.22		2/19
87.24		2/19

Toluene d8 (cont)

87.92	2/19
90.66	3/23
93.62	3/23
95.2	3/30
97	3/30
98	3/30
101.2	3/30
97.6	3/31
100.6	3/31
102.8	3/31
98.8	3/31
98.2	3/31
95.74	4/01
95.42	4/01
98.86	4/01
98.44	4/01
109.2	5/04
103.4	5/04
104.2	5/04
107.6	5/04
105.8	5/04
100	5/19
100.2	5/19
99	5/19
101.4	5/20
98.4	5/20
102	5/20
100	5/20
102.8	5/29
101	5/29
107	5/29
100.4	5/29
103.2	5/29
99.2	5/29
103.8	5/29
99.02	5/29
100.8	5/29
98.4	5/29
102	5/29
103.8	5/29
103.6	5/29
107	5/29
101.72	5/29
107.8	5/29
106.4	5/29
99.2	6/01
99.2	6/01
101.2	6/01
99.2	6/01
104	6/01
104.4	6/01
100.2	6/01
101.2	6/01
99.8	6/01
102.8	6/01
100.6	6/01
102.4	6/01
99.98	6/09
87.18	6/09
84.62	6/09
87.34	6/09
85.88	6/09
89.76	6/09
102.9	6/16
92	6/16
101.06	6/16
104.16	6/16
104.64	6/16
103.98	6/16
104.66	6/16
103.86	6/16
104.68	6/16
105.26	6/16
103.34	6/16
105.44	6/16
103.7	6/16
101.66	6/16
98.72	6/16

TABLE E-IV (cont)

****

EN-9 Volatile Surrogate
in Water
(cont)

****

Toluene d8 (cont)

100.86	6/16
101.44	6/16
103.14	6/16
106.52	6/16
105.28	6/19
102.42	6/19
102	8/06
101.8	8/06
100	8/06
97.8	8/06
99.6	8/06
99.8	8/06
98.8	8/06
96.2	8/11
98.4	8/11
104	8/11
98.6	8/11
101.4	8/11
99.2	8/11
104.8	8/11
105.2	8/11
104.8	8/11
99.6	8/11
104.2	8/11
99.8	8/11
100.2	8/11
102.4	8/11
104	8/11
96.6	8/12
86.96	8/27
87.04	8/27
83.56	8/27
90.42	8/27
91.26	8/27
84.36	8/27
87.96	8/27
86.78	8/27
86.58	8/27
86.46	8/27
89.02	8/27
86	8/27
86.7	8/27
86.86	8/27
88.58	8/27
98.04	8/27
85.56	8/27
84.72	8/27
108	8/31
101.16	8/31
100.54	8/31

Toluene d8 (cont)

103.1	8/31
95.8	8/31
97.08	8/31
99.5	8/31
92.62	8/31
99.92	8/31
98.8	8/31
98.74	8/31
102.28	8/31
96.62	8/31
100.6	9/01
93.4	9/01
103	9/01
99.6	9/01
98.8	9/01
95.8	9/01
99.4	9/01
99.42	9/03
107.86	9/03
97.78	9/03
100.52	9/03
102	9/03
100.48	9/03
95.42	9/03
104.28	9/03
98.94	9/03
95.6	9/03
95.24	9/10
94.76	9/10
95.32	9/10
92.92	9/10
96.7	9/10
93.94	9/10
94.62	9/10
97.86	9/10
95.34	9/10
98.88	9/11
97.3	9/11
101.6	9/11
99.28	9/11
100.1	9/11
97.76	9/11
100.7	9/11
99.42	9/11
94.96	9/11
103.1	9/14
101.84	9/14
102.92	9/14
104.52	9/14
99.52	9/14
98.54	9/14
100.78	9/14
102.42	9/14
98.74	9/14
103.42	9/14
101.98	9/14
99.34	9/14
100.66	9/14

Toluene d8 (cont)

100.66	9/14
102.36	9/14
103.7	9/14
104.56	9/15
105.36	9/15
104.78	9/15
105.86	9/15
102.68	9/15
103.3	9/15
105.08	9/15
100.78	9/15
103.16	9/15
95.36	9/16
97.66	9/16
97.74	9/16
101.68	9/16
101.52	9/16
95.14	9/16
101.6	9/16
100.16	9/16
99.14	9/16
93.76	9/18
95.26	9/18
92.32	9/18
96.4	9/18
104.14	9/18
93.96	9/18
99.32	9/18
96.52	9/18
102.94	9/18
96.24	9/18
101.22	9/18
102.08	9/18
101.42	9/18
103.8	9/18
99.26	9/18
105.14	9/18
100.56	9/18
102.58	9/18
110.22	9/18
97.48	9/18
96.66	9/18
99.88	9/18
98.74	9/18
98.02	9/18
97.6	9/18
98.74	9/18
99.28	9/18
97.9	9/18
98.32	10/14
103.76	10/14
105.02	10/14
102.68	10/14
99.38	10/14
98.18	10/14
98.96	10/14
101.92	10/14
100.4	10/14
98.9	10/14

Toluene d8 (cont)

104.06	10/14
100.42	10/14
100.88	10/14
99.48	10/14
98.14	10/14
98.24	10/14
96.18	10/14
70.7	10/15
92	10/15
90.8	10/15
82.06	10/15
80.66	10/15
102.04	10/19
100.72	10/19
103.96	10/19
99.68	10/19
99.12	10/19
98.2	10/19
98.44	10/19
99.44	10/19
99.78	10/19
101.72	10/19
94.86	10/19
100.56	10/19
100.22	10/19
99.52	10/19
94.9	10/19
106.72	10/19
99.66	10/19
99.1	10/20
100.08	10/20
100.9	10/20
99.06	10/20
104.7	10/20
93.16	10/20
97.32	10/20
97.66	10/20
95.48	10/21
83.92	10/21
92.12	10/21
82.26	10/21
88.26	10/21
87.32	10/21
89.46	10/21
94.58	10/21
79.84	10/21
90.02	10/21
78.32	10/21
96.26	10/21
82.22	10/21
86.18	10/21
88.18	10/21
84.26	10/21
88.74	10/21
86.2	10/21
78.54	10/21
80.16	10/21
83.5	10/21
93.14	10/21

Toluene d8 (cont)

83.82	10/21
85.36	10/22
90.54	10/22
85.36	10/22
92.4	10/22
86.96	10/22
77.12	10/28
91.9	10/28
85.18	10/28
83.32	10/28
59.16	10/28
88.46	10/28
77.06	10/28
66.86	10/28
85.28	10/28
100.58	10/28
86.06	10/28
89.04	10/28
79.56	10/30
78.6	10/30
78.1	10/30
90.48	10/30
89.72	11/04
85.84	11/04
87.92	11/04
92.82	11/16
82.04	11/16
88.82	11/16
86	11/16
93.8	11/16
83.4	11/16
90.04	11/16
88.62	11/16
93.7	11/16
95.96	11/16
97.24	11/18
98.62	11/18
100.88	11/18
101.8	11/18
101.8	11/18
100.06	11/18
99.72	11/18
99.2	11/18
98.58	11/18
96.8	11/18
100.28	11/18
98.18	11/18
100.14	11/18
100.2	11/18
98.82	11/18
98.28	11/18
103.54	11/18
104.94	11/18
94.64	11/18
100.62	11/18
96.44	11/18
98.58	11/18
98.76	11/18

Toluene d8 (cont)

95.02	11/18
99.54	11/18
98.2	11/18
100.38	11/18
97.08	11/18
97.48	11/18
98.38	11/19
98.38	11/19
98.68	11/19
97.76	11/19
97.12	11/19
98.96	11/19
100.62	11/19
98.22	11/19
100.34	11/19
97.54	11/19
20.26	11/19
20.02	11/19
19.46	11/19
19.42	11/19
19.8	11/19
19.66	11/19
19.66	11/19
20.48	11/19
105.78	11/24
96.38	11/24
97.82	11/24
102.46	11/24
95.78	11/24
97.5	11/24
104.1	11/24
98.64	11/24
98.52	11/24
98.5	12/01
99.74	12/01
100.24	12/01
102.64	12/01
99.84	12/01
99.38	12/01
98.3	12/01
103.14	12/07
103.3	12/07
102.06	12/07
104.58	12/07
100.02	12/07
102.34	12/07
100.9	12/07
99.5	12/07
99.5	12/07
104.38	12/07
93.32	12/07
87.24	12/09
80.48	12/09
80.78	12/09

TABLE E-V

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Quality Assurance Material	Page
CCRMP CLV-1 Vegetative Radionuclide	E-17
CCRMP SO-1 Regosolic Soil	E-17
CCRMP SO-2 Podzolic Soil	E-20
CCRMP SO-3 Calcareous C Horizon Soil	E-22
CCRMP SO-4 Chernozemic A Horizon Soil	E-26
DOE Be Intercomparison Study, Round 1	E-26
DOE Be Intercomparison Study, Round 2	E-26
DOE Be Intercomparison Study, Round 3	E-26
DOE Be Intercomparison Study, Round 4	E-26
EM-9 Flash Point of 1-Hexanol	E-26
EM-9 Gross Alpha/Beta in Water	E-26
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EM-9 Organics in Water	E-98
EM-9 Organics on Charcoal	E-109
EM-9 Organics on Formaldehyde Tube	E-117
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EM-9 Organics on Vapor Badge	E-129
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EM-9 Radionuclides in Urine	E-27
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EM-9 Radionuclides on Vegetation	E-40
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EM-9 Semivolatile Surrogate in Bulk Materials	E-139
EM-9 Semivolatile Surrogate in Sludge	E-139
EM-9 Semivolatile Surrogate in Soil	E-140
EM-9 Semivolatile Surrogate in Water	E-149

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EM-9 Trace Elements in Urine	E-41
EM-9 Trace Elements in Water	E-41
EM-9 Trace Elements on Filter Media	E-70
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EM-9 Volatile Surrogate in Sludge	E-154
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EML Radionuclides in Soil, May 1984	E-75
EML Radionuclides in Soil, March 1992	E-75
EML Radionuclides in Soil, Sept 1992	E-75
EML Radionuclides in Vegetation, March 1992	E-75
EML Radionuclides in Vegetation, Sept 1992	E-75
EML Radionuclides in Water, April 1980	E-75
EML Radionuclides in Water, March 1992	E-76
EML Radionuclides in Water, Sept 1992	E-76
EML Radionuclides on Air Filter, March 1992	E-76
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EPA Air Filter Intercomparison, March 1989	E-77
EPA Air Filter Intercomparison, April 1992	E-77
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EPA Alpha Performance Evaluation in Water, April 1992	E-77
EPA Alpha Performance Evaluation in Water, October 1992	E-77
EPA Beta Performance Evaluation in Water, April 1992	E-78
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EPA Corrosivity and Sodium in Water	E-78
EPA Cyanide in Water	E-78
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EPA Gross Alpha/Beta in Water, May 1988	E-79
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EPA Gross Alpha/Beta in Water, May 1992	E-80
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EPA Plutonium-239 in Water, January 1992	E-82
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EPA Radionuclides in Milk, May 1992	E-82
EPA Radionuclides in Milk, October 1992	E-82
EPA Radionuclides in Water, February 1992	E-82
EPA Radionuclides in Water, June 1992	E-82
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EPA Strontium in Water, January 1992	E-83
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NBS 1633a Trace Elements in Coal Fly Ash	E-88
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USGS GXR-6 Soil	E-96

TABLE E-VI

REFERENCES FOR INDIVIDUAL CERTIFIED VALUES IN QUALITY ASSURANCE MATERIALS MEASURED BY EM-9 IN 1992

Code	N	Reference
75NBS	03	National Bureau of Standards, Certificate of Analysis, SRM 4350, Environmental Radioactivity Standard: River Sediment (1975).
78NBS	08	National Bureau of Standards, Report of Investigation, Research Material 45b, Homogeneous River Sediment for Radioactivity Measurements (1978).
79PAC	01	Packard Instrument Company, Tritium standard certified against NBS reference material, Downer's Grove, Illinois, (1979).
80EML	01	Environmental Measurements Laboratory, Private Communication (1980).
81EPA	01	Environmental Protection Agency, EPA Water Pollution Quality Control Samples, EMSL, Cincinnati (1981).
81H-8	03	IBID., Assumption of Natural Isotopic Abundance for Uranium (1981).
81NBS	01	National Bureau of Standards, Certificate of Analysis, SRM 4353, Environmental Radioactivity, Rocky Flats Soil No. 1 (1981).
81NBS	02	National Bureau of Standards, Certificate of Analysis, SRM 4350B, Environmental Radioactivity, River Sediment (1981).
81NBS	03	National Bureau of Standards, Certificate of Analysis, SRM 278, Obsidian Rock (1981).
82EPA	01	Environmental Protection Agency, Quality Control Samples for Water Pollution, EMSL, Cincinnati (1982).
82NBS	11	National Bureau of Standards, Certificate of Analysis, SRM 1645, River Sediment (Revised) (1982).
83NBS	02	National Bureau of Standards, Certificate of Analysis, SRM 1566, Oyster Tissue (1983).
84ADA	01	W. H. Adams, HSE-9 In-House Quality Control Standard for pH, TDS, and Conductivity, Standard Methods, 15th Edition, p. 29 (1984).
84EML	01	Environmental Measurements Laboratory, Quality Assessment Program, Department of Energy, New York (1984).
84EPA	02	Environmental Protection Agency, Quality Assurance Check Samples, EMSL, Cincinnati (1984).
84NBS	05	National Bureau of Standards, Certificate, SRM 1643B, Trace Elements in Water (1984).
85CAN	01	Canadian Certified Reference Materials Project, Revised Certificates of Analysis, DL-1a, DH-1a, BL-4a, BL-5, and SO-1 thru SO-4 (1985).
85GAU	01	M. A. Gautier, HSE-9 In-House Quality Assurance Samples, Miscellaneous Samples (1985).
85NBS	11	National Bureau of Standards, Certficate of Analysis SRM 1633a, Trace Elements in Coal Fly Ash (1985).
86DAL	01	J. L. Dalton and W. S. Bowman, "Vegetative Radionuclide Reference Materials," National Uranium Tailings Program report NUTP-4E, CANMET (1986).
86EPA	01	Environmental Protection Agency, Quality Assurance Check Samples, EMSL, Las Vegas (1986).
86EPA	02	Environmental Protection Agency, Quality Assurance Check Samples, EMSL, Cincinnati (1986).
86GAU	01	M. A. Gautier, HSE-9 In-House Quality Assurance Samples, Miscellaneous Samples (1986).
86NBS	07	National Bureau of Standards, Certificate of Analysis, SRM 2689, 2690, and 2691, Coal Fly Ashes (1986).
86WIL	01	M. C. Williams, HSE-9 In-House Quality Assurance Samples Prepared at TA-50 (1986).
87EPA	02	Environmental Protection Agency, Quality Assurance Check Samples, EMSL, Cincinnati (1987).

TABLE E-VI (cont)

Code	N	Reference
87GAU	03	M.A. Gautier, HSE-9 In-House Quality Assurance Samples, Prepared from NBS Traceable Materials (1987).
87GAU	04	M.A. Gautier, HSE-9 In-House Quality Assurance Samples, Prepared from EPA Traceable Materials (1987).
87GLA	01	E. S. Gladney, B. O'Malley, I. Roelandts, and T. E. Gills, Compilation of Elemental Concentration Data for NBS Clinical, Biological, Geological and Environmental Standard Reference Materials, NBS Special Publication 260-111 (1987).
88EPA	01	Environmental Protection Agency, Quality Assurance Check Samples, EMSL, Las Vegas (1988).
88EPA	02	Environmental Protection Agency, Quality Assurance Check Samples, EMSL, Cincinnati (1988).
88GAU	01	M. A. Gautier, HSE-9 In-House Quality Assurance Samples, Miscellaneous Samples (1988).
88GAU	02	M. A. Gautier, HSE-9 In-House Quality Assurance Samples, Prepared from Fisher, Spex, and Alfa Products Certified Reference Solutions (1988).
88GAU	03	M.A. Gautier, HSE-9 In-House Quality Assurance Samples, Prepared from NBS Traceable Materials (1988).
88NBS	01	National Bureau of Standards, Certificate of Analysis, SRM 2704, Buffalo River Sediment (1988).
89EPA	01	Environmental Protection Agency, Quality Assurance Check Samples, EMSL, Las Vegas (1989).
89EPA	02	Environmental Protection Agency, Quality Assurance Check Samples, EMSL, Cincinnati (1989).
89GAU	01	M. A. Gautier, HSE-9 In-House Quality Assurance Samples, Miscellaneous Samples (1989).
89GAU	02	M. A. Gautier, HSE-9 In-House Quality Assurance Samples, Prepared from Fisher, Spex, and Alfa Products Certified Reference Solutions (1989).
89GAU	04	M.A. Gautier, HSE-9 In-House Quality Assurance Samples, Prepared from EPA Traceable Materials (1989).
89GLA	02	E. S. Gladney and I. Roelandts, 1988 Compilation of Elemental Concentration Data for USGS Geochemical Exploration Reference Materials GXR-1 to GXR-6, Geostandards Newsletter, in press (1989).
89GLA	03	E. S. Gladney and I. Roelandts, 1988 Compilation of Elemental Concentration Data for CCRMP Soils SO-1 to SO-4, Geostandards Newsletter, 13: 217-268.
89GLA	04	E. S. Gladney, Interim Calculations of Compiled Value from SRMS Literature Database (1989).
89MON	01	J. D. Montoya, HSE-9 In-House Quality Assurance Samples Prepared at TA-50 (1989).
90EPA	02	Environmental Protection Agency, Quality Assurance Check Samples, EMSL, Cincinnati (1990).
90FIL	01	T.D. Filer, HSE-9 In-house Quality Assurance Sample Prepared at TA-50 (1990).
90GAU	01	M. A. Gautier, HSE-9 In-House Quality Assurance Samples, Miscellaneous Samples (1990).
90GAU	02	M. A. Gautier, HSE-9 In-House Quality Assurance Samples, Prepared from Fisher, Spex, MCB, and Alfa Products Certified Reference Solutions (1990).
90GAU	03	M.A. Gautier, HSE-9 In-House Quality Assurance Samples, Prepared from NBS Traceable Materials (1990).
90GAU	04	M.A. Gautier, HSE-9 In-House Quality Assurance Samples, Prepared from EPA Traceable Materials (1990).
90GLA	01	E. S. Gladney and I. Roelandts, 1988 Compilation of Elemental Concentration Data for CCRMP Reference Rock Samples SY-2, SY-3, and MRG-1, Geostandards Newsletter, in press (1990).
91EPA	02	Environmental Protection Agency, Quality Assurance Check Samples, EMSL, Cincinnati (1991).
91GAU	01	M. A. Gautier, HSE-9 In-House Quality Assurance Samples, Miscellaneous Samples (1991).
91GAU	02	M. A. Gautier, HSE-9 In-House Quality Assurance Samples, Prepared from Fisher, Spex, and Alfa Products Certified Reference Solutions (1991).
91GAU	03	M.A. Gautier, HSE-9 In-House Quality Assurance Samples, Prepared from NIST Traceable Materials (1991).
91GAU	04	M.A. Gautier, HSE-9 In-House Quality Assurance Samples, Prepared from EPA Traceable Materials (1991).

TABLE E-VI (cont)

Code	N	Reference
91GAU	05	M.A. Gautier, HSE-9 In-House Quality Assurance Samples, Prepared from CCRMP Traceable Materials (1991).
91GLA	01	E. S. Gladney, Interim Calculations of Compiled Value from SRMS Literature Database (1991).
91MGB	01	M. G. Bell, HSE-9 ICPMS In-House Quality Assurance Sample Prepared at TA-50 (1991).
91NBS	04	National Institute of Standards and Technology, Certificate of Analysis, SRM 1643c, Trace Elements in Water (1991).
92DOE	01	Department of Energy Beryllium Round Robin, Quality Assurance Samples (1992).
92EML	01	Environmental Measurements Laboratory, DOE-QAP Quality Assurance Program (1992).
92EPA	01	Environmental Protection Agency, Quality Assurance Check Samples, EMSL, Las Vegas (1992).
92GAU	01	M.A. Gautier, EM-9 In-House Quality Assuarance Samples, Miscellaneous Samples (1992).
92GAU	02	M.A. Gautier, EM-9 In-House Quality Assurance Samples, Fisher, Spex, Alfa Products, and Inorganic Ventures Certified Reference Solutions (1992).
92GAU	03	M.A. Gautier, EM-9 In-House Quality Assurance Samples, Prepared from NIST Traceable Materials (1992).
92GAU	04	M.A. Gautier, EM-9 In-House Quality Assurance Samples, Prepared from EPA Traceable Materials (1992).
92GAU	05	M.A. Gautier, EM-9 In-House Quality Assurance Samples, Prepared from CCRMP Traceable Materials (1992).
92PAT	01	Proficiency Analytical Testing Program, National Institute for Occupational Safety and Health (1992).
93GAU	02	M.A. Gautier, EM-9 In-House Quality Assurance Samples, Fisher, Spex, Alfa Products, and Inorganic Ventures Certified Reference Solutions (1993).
93GAU	03	M.A. Gautier, EM-9 In-House Quality Assurance Samples, Prepared from NIST Traceable Materials (1993).

APPENDIX F

PLOTS OF FIVE-YEAR TRENDS

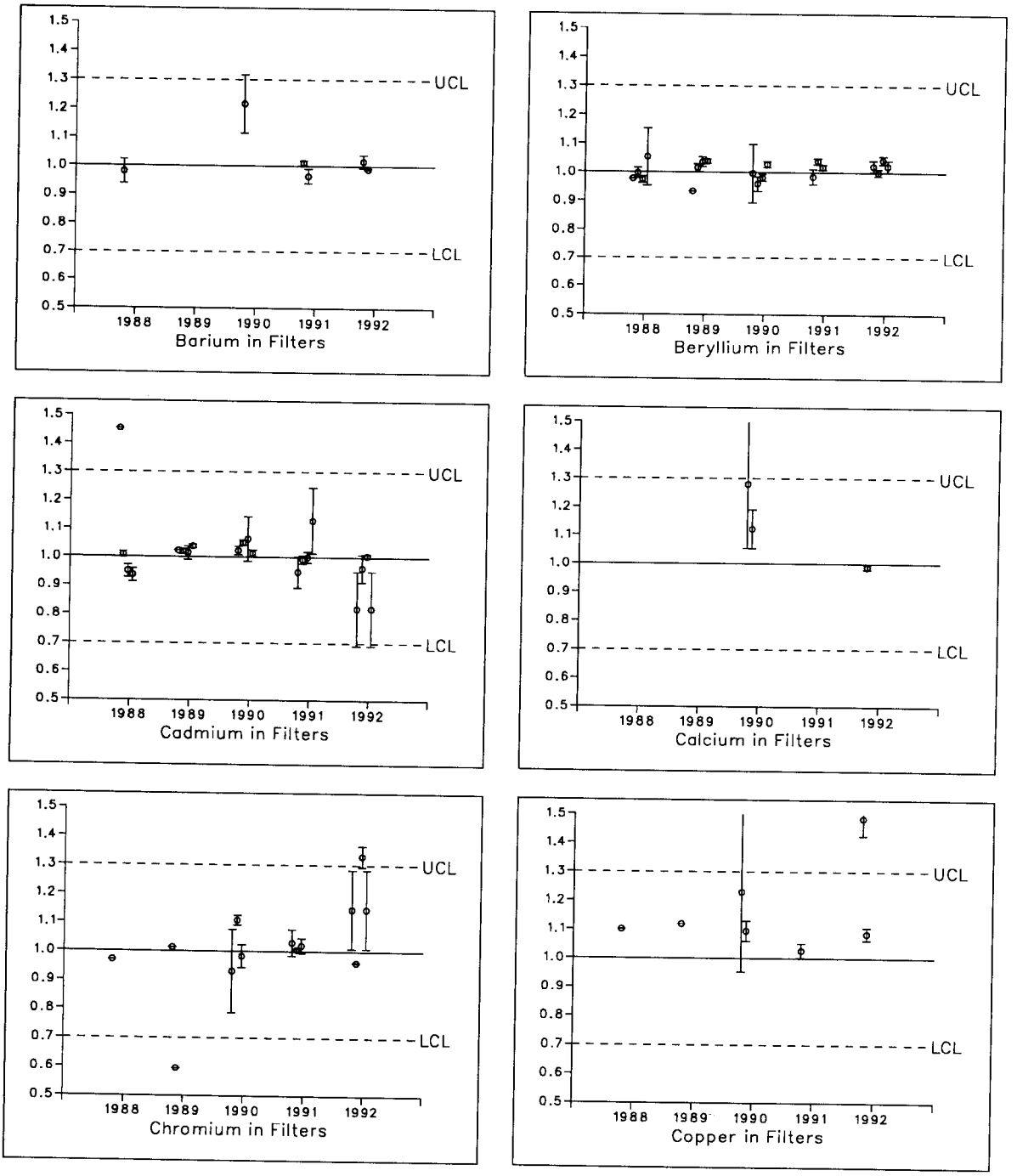
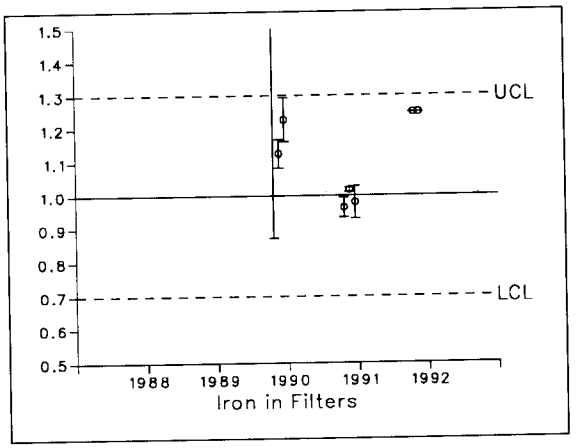


Fig. F-1. Five-year trends in quality assurance data for inorganic analyses.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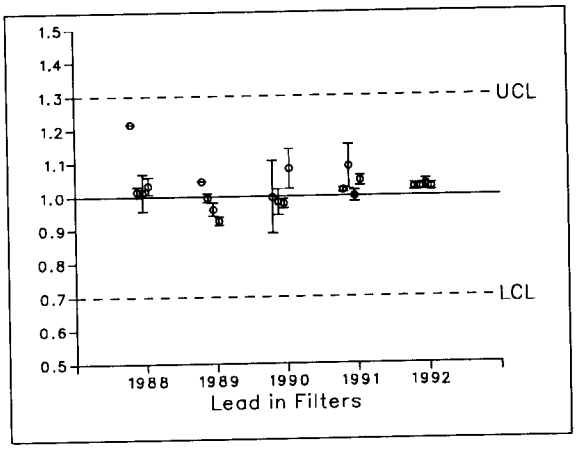
LCL
1988
1989
1990
1991
1992
Iron in Filters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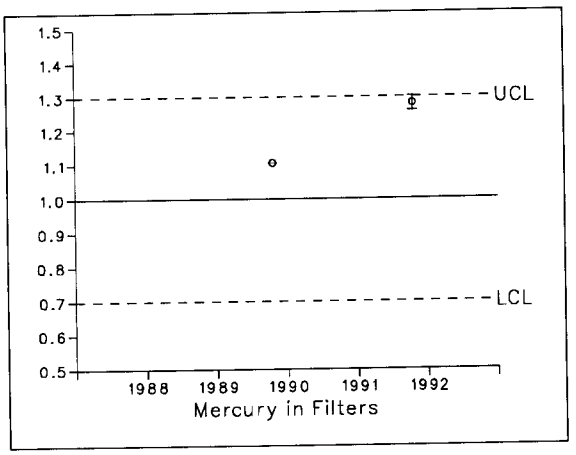
1989
1990
1991
1992
Lead in Filters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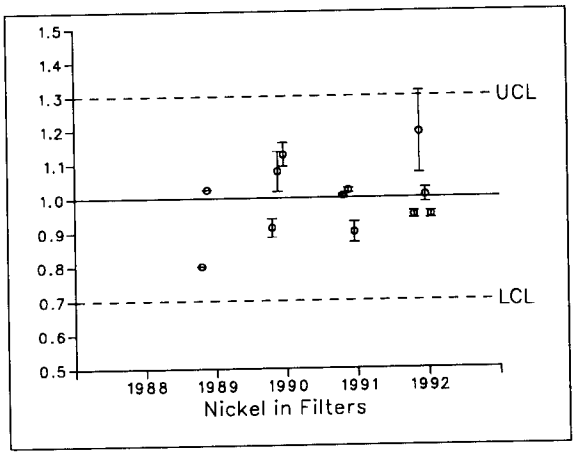
1988
1989
1990
1991
1992
Mercury in Filters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1991
1992
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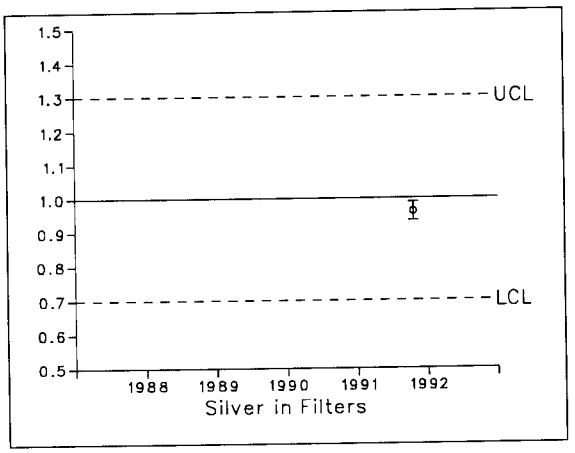
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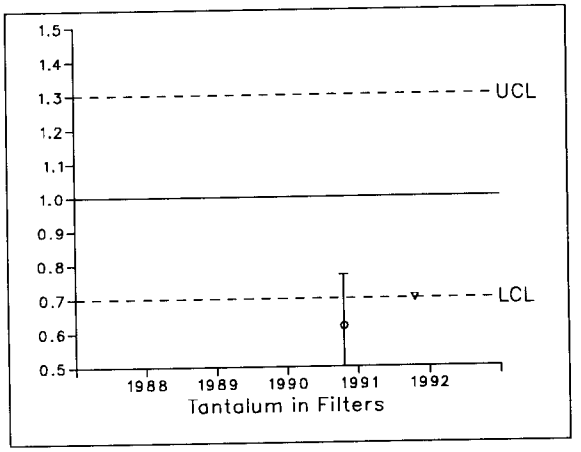
Silver in Filters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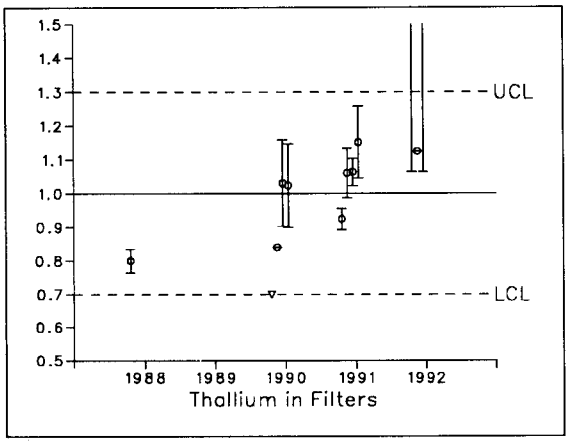
1988
1989
1990
1991
1992
Tantalum in Filters

Fig. F-1. (cont)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1992
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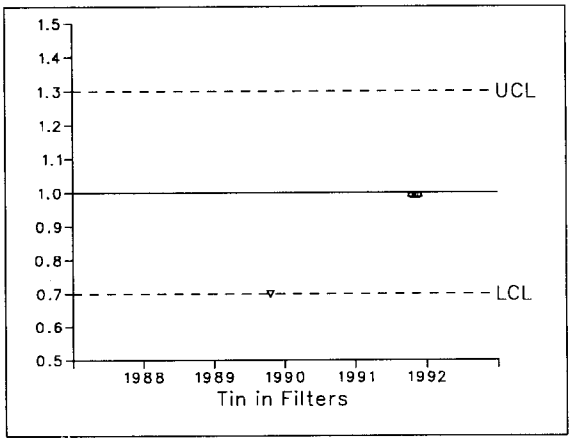
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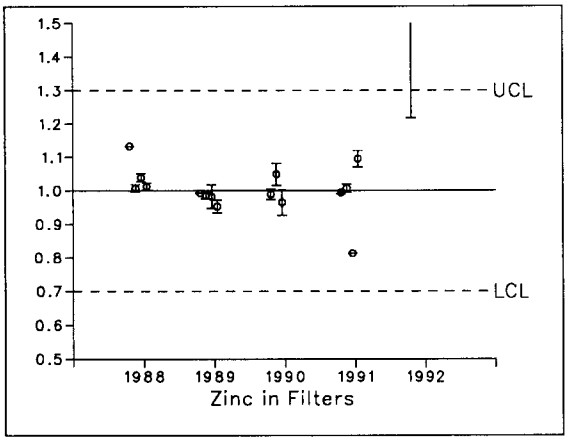
1989
1990
1991
1992
Tin in Filters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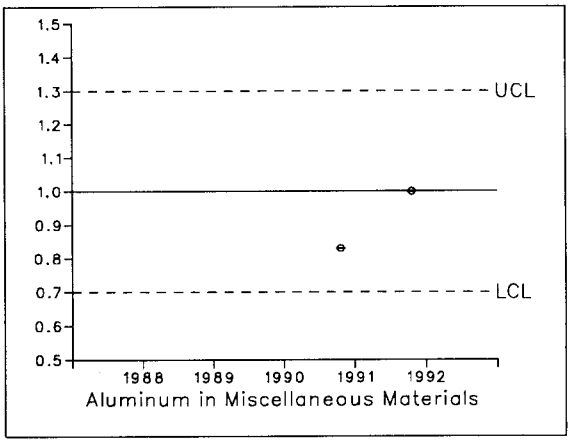
1989
1990
1991
1992
Zinc in Filters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1991
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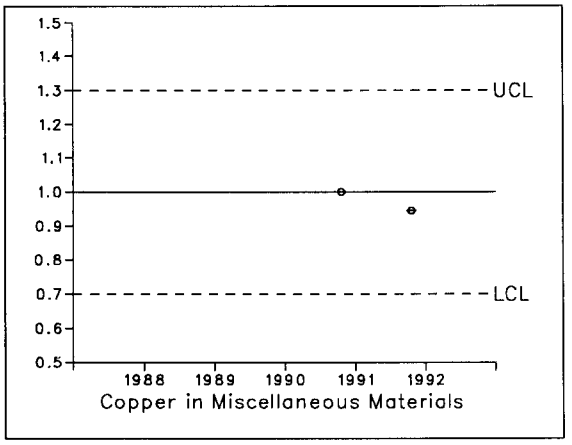
Aluminum in Miscellaneous Materials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1991
1992
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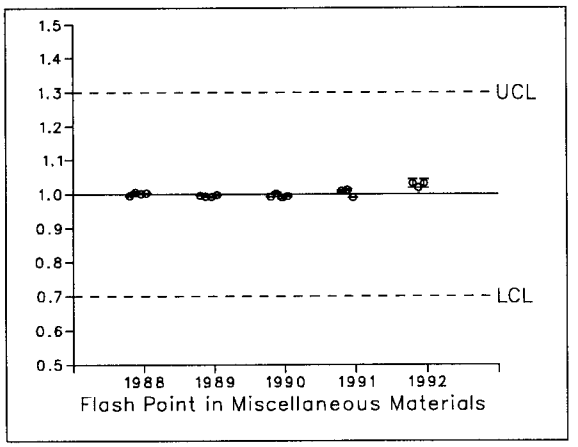
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LCL
1988
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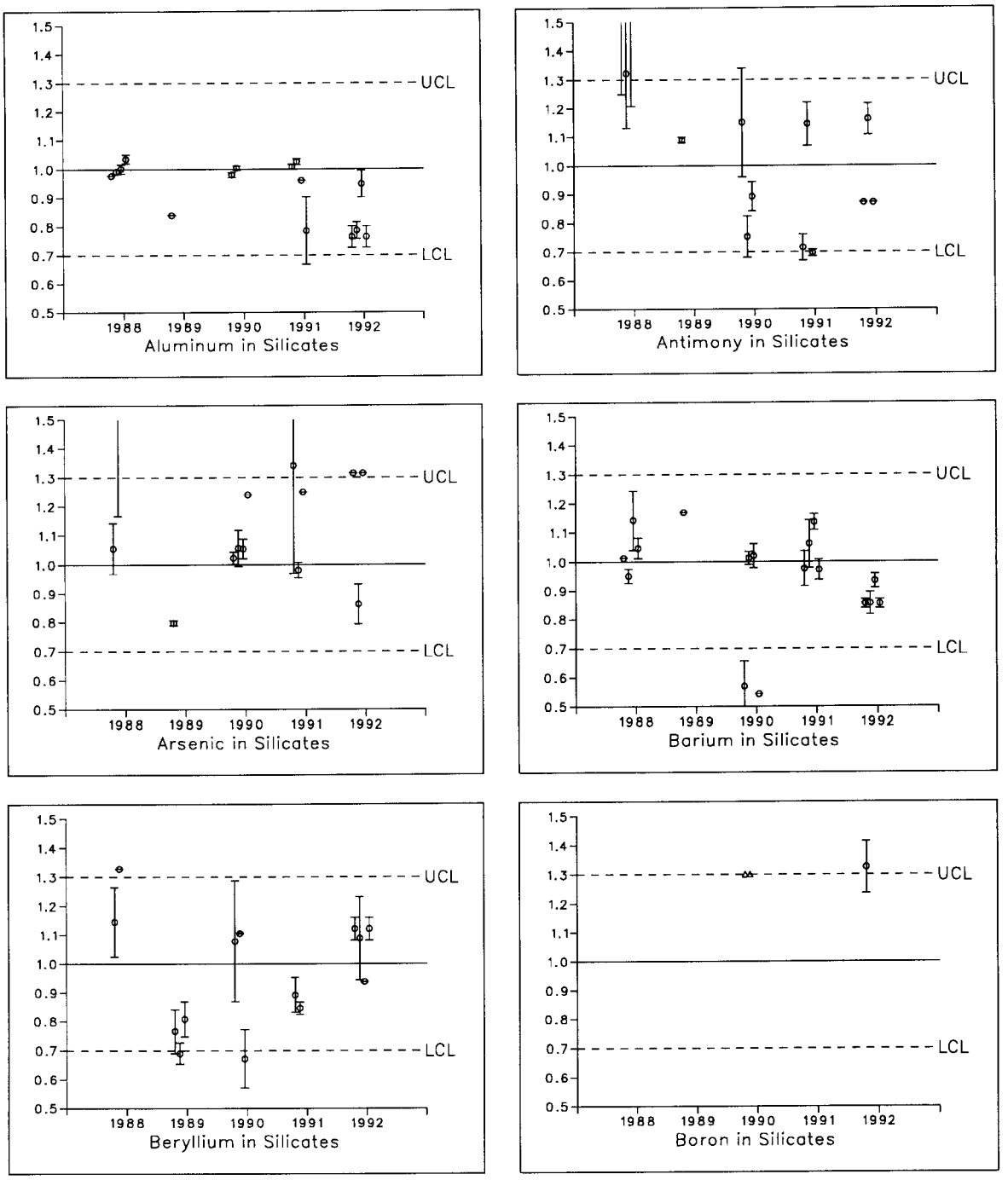
1992
Flash Point in Miscellaneous Materials

Fig. F-1. (cont)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1988
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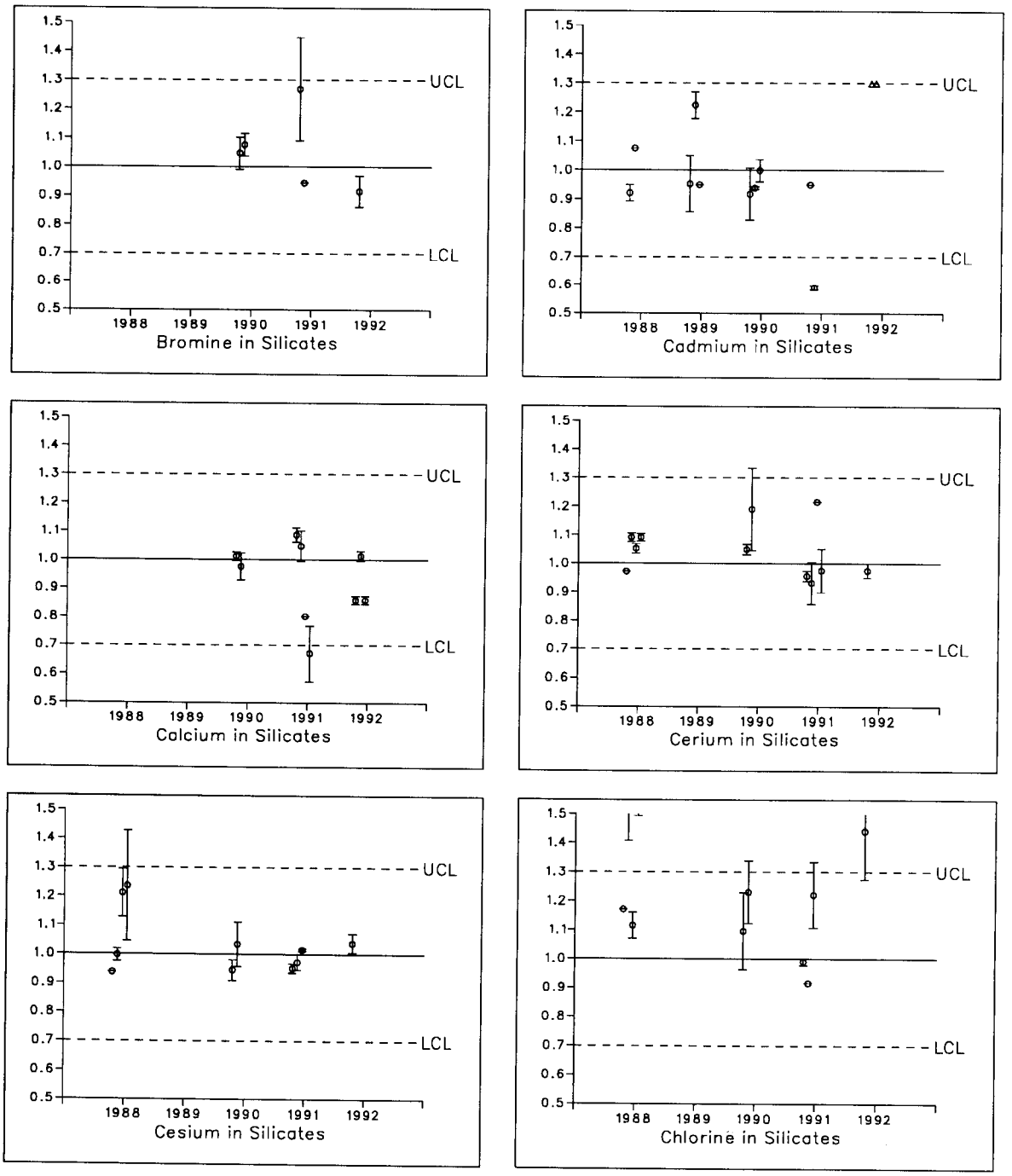
1990
1991
1992
Aluminum in Silicates
Antimony in Silicates
Arsenic in Silicates
Barium in Silicates
Beryllium in Silicates
Boron in Silicates

Fig. F-1. (cont)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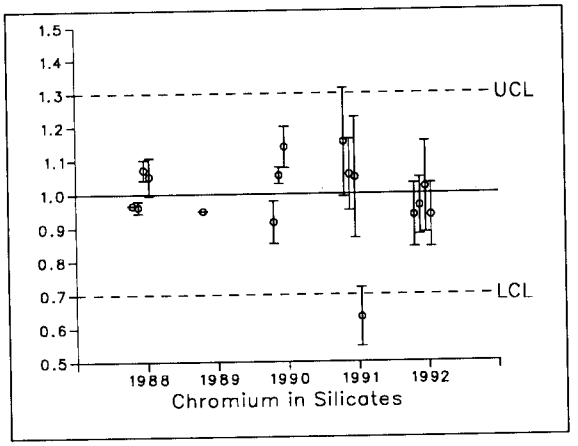
Bromine in Silicates
Cadmium in Silicates
Calcium in Silicates
Cerium in Silicates
Cesium in Silicates
Chlorine in Silicates

Fig. F-1. (cont)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LCL
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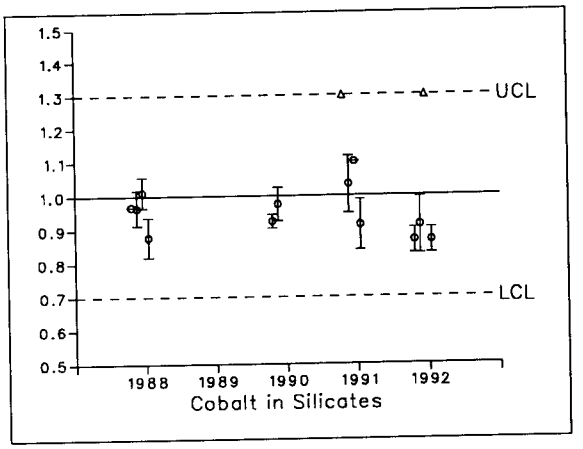
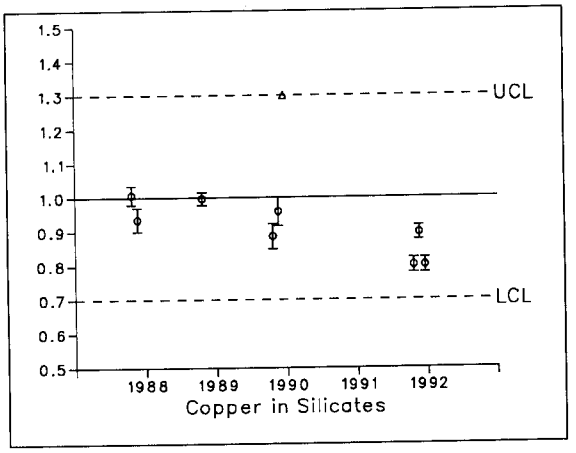
1989
1990
1991
1992
Chromium in Silicates


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Cobalt in Silicates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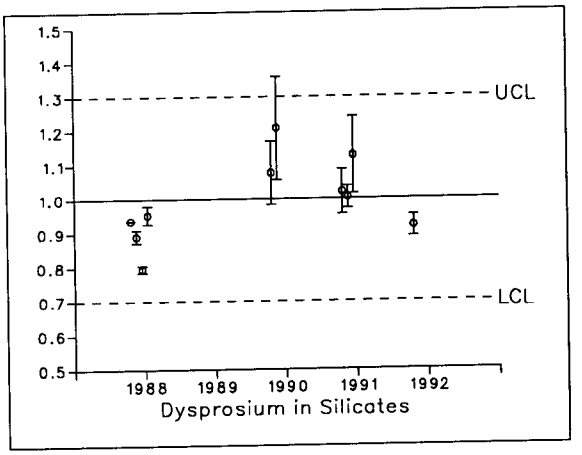
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Copper in Silicates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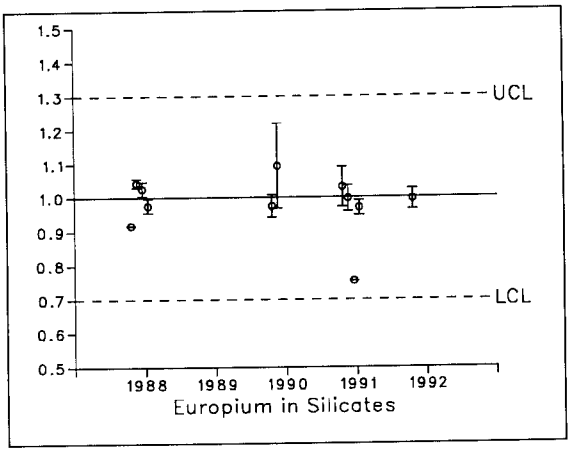
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Dysprosium in Silicates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1.4
1.3
1.2
1.1
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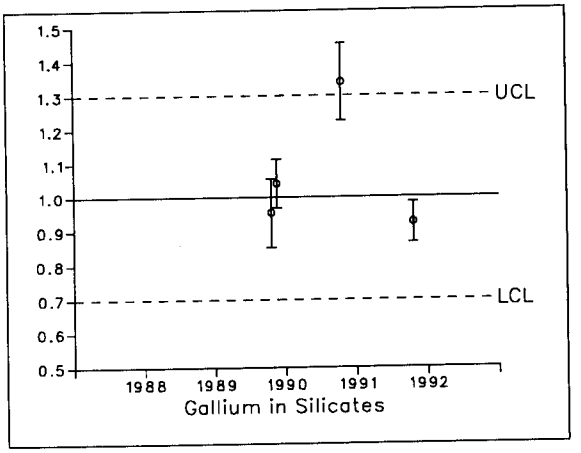
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Europium in Silicates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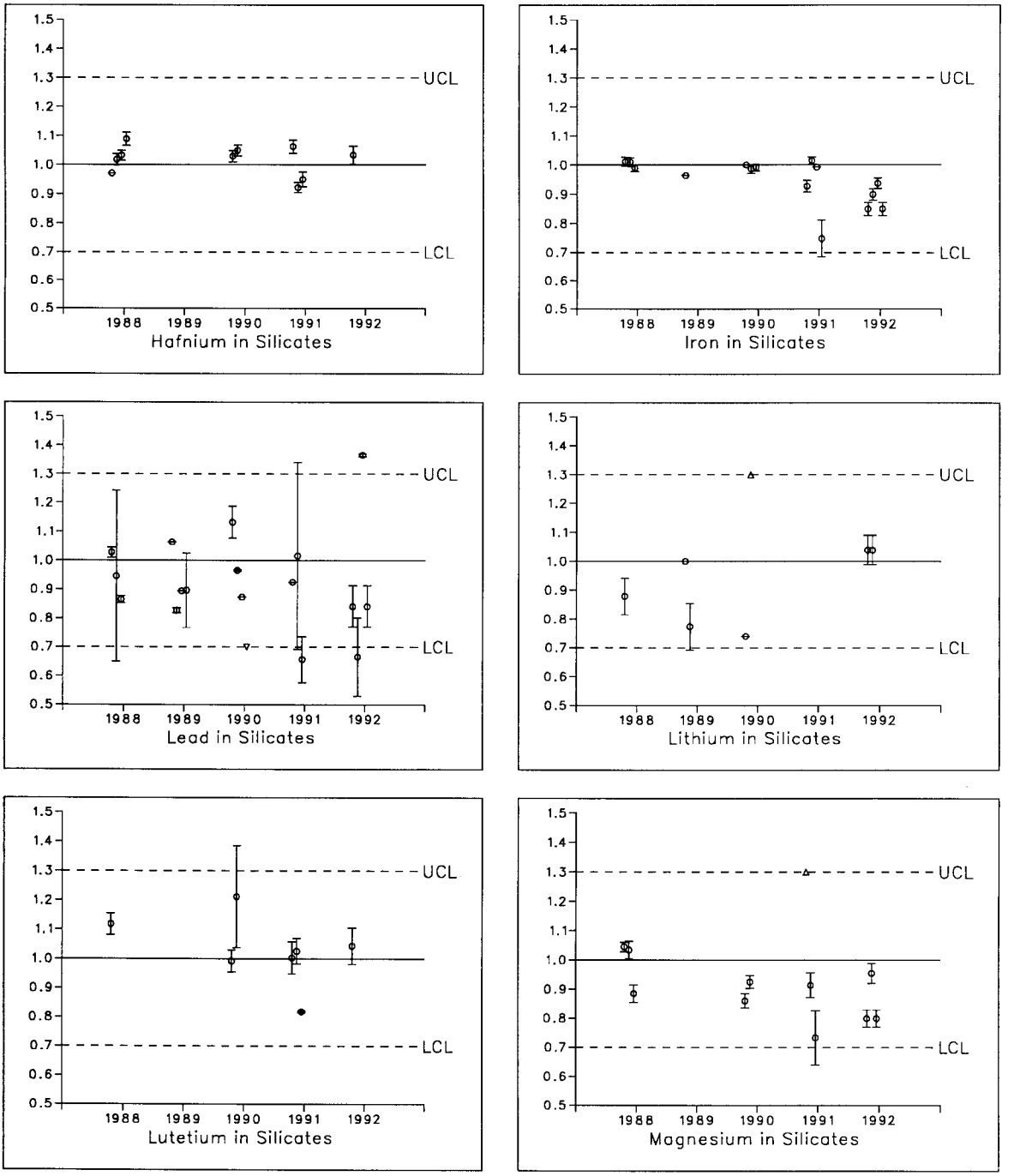
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Gallium in Silicates

Fig. F-1. (cont)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1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Hafnium in Silicates
Iron in Silicates
Lead in Silicates
Lithium in Silicates
Lutetium in Silicates
Magnesium in Silicates

Fig. F-1. (cont)

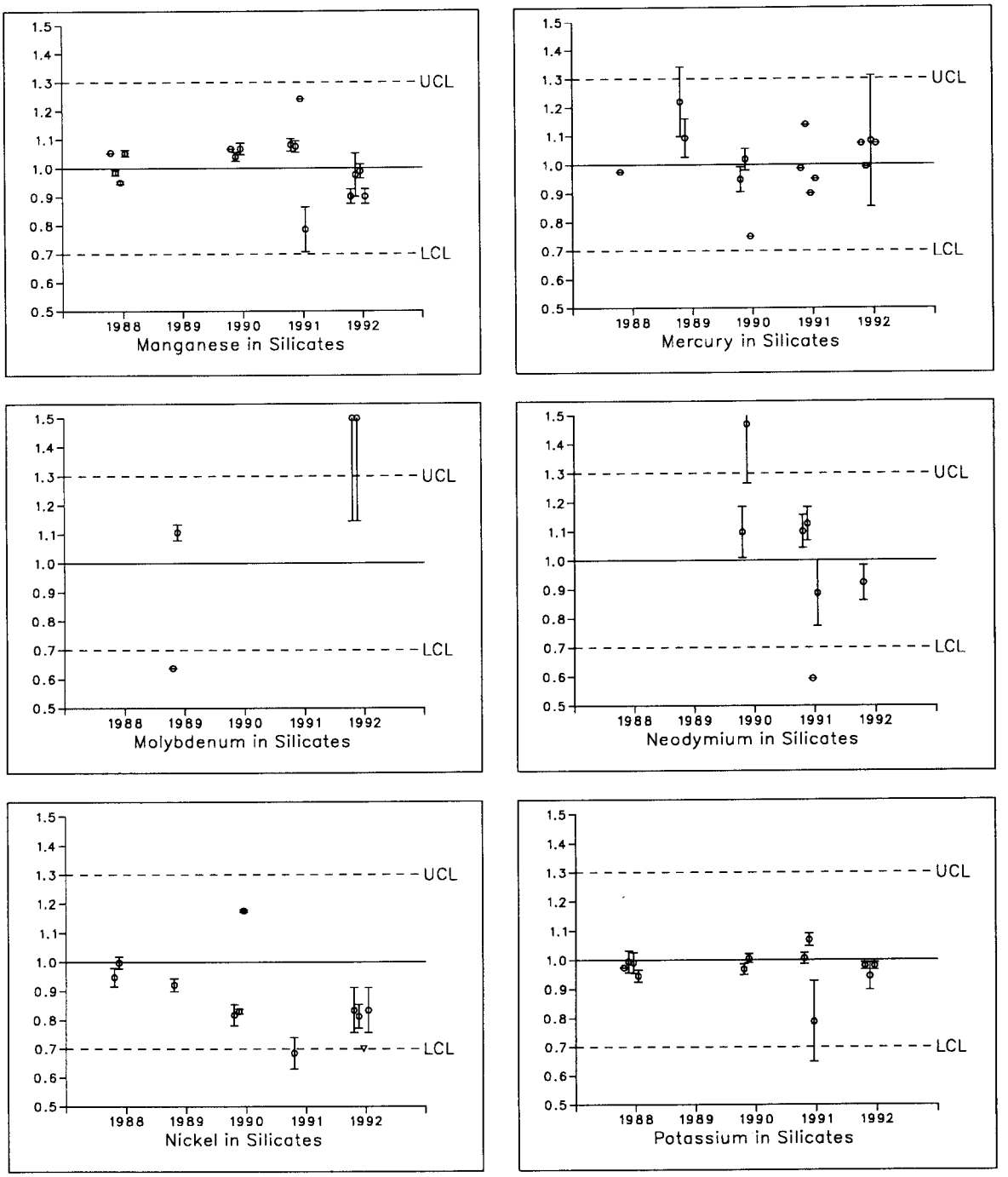

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
Manganese in Silicates
Mercury in Silicates
Molybdenum in Silicates
Neodymium in Silicates
Nickel in Silicates
Potassium in Silicates

Fig. F-1. (cont)

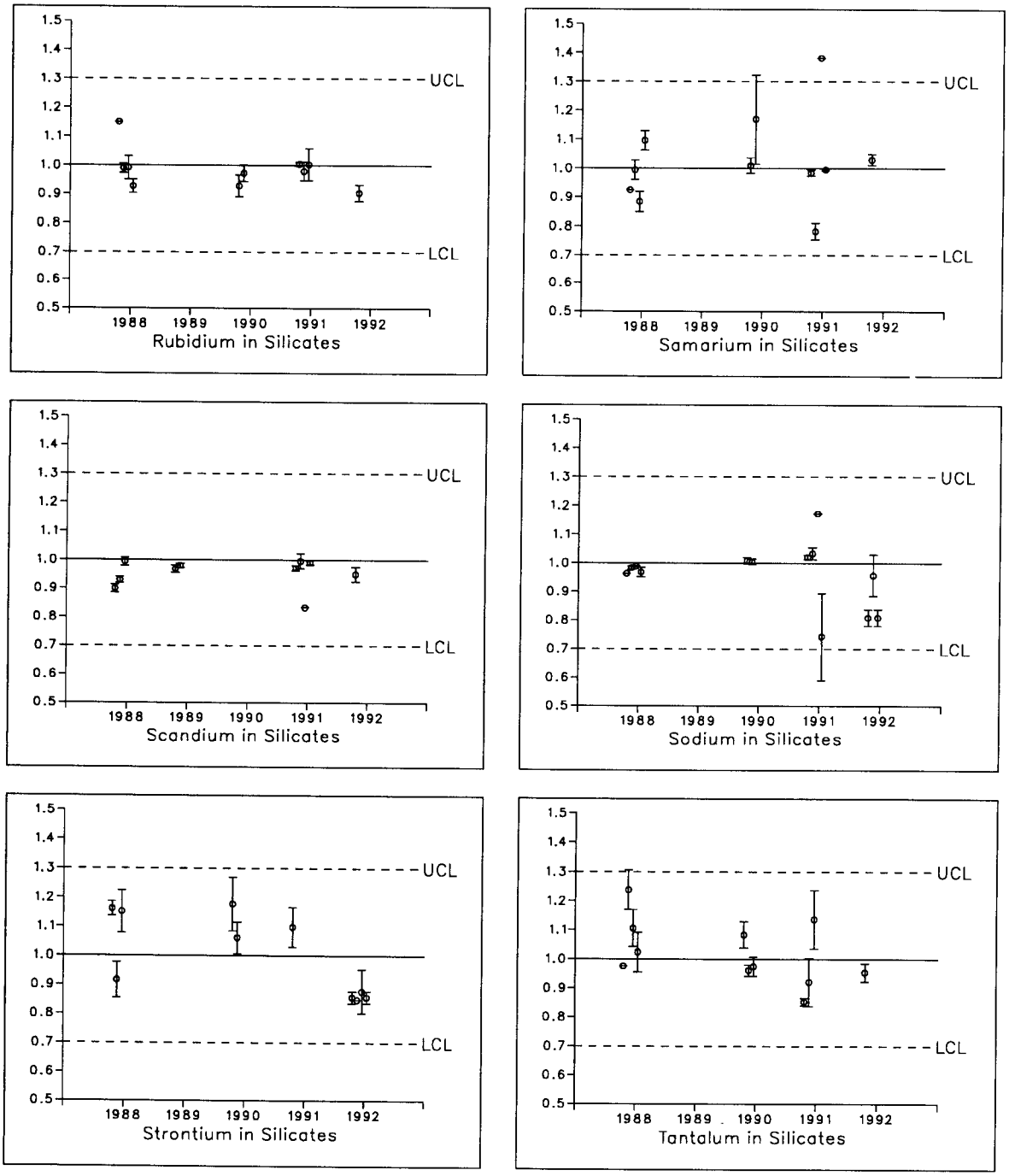

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Rubidium in Silicates
Samarium in Silicates
Scandium in Silicates
Sodium in Silicates
Strontium in Silicates
Tantalum in Silicates

Fig. F-1. (cont)

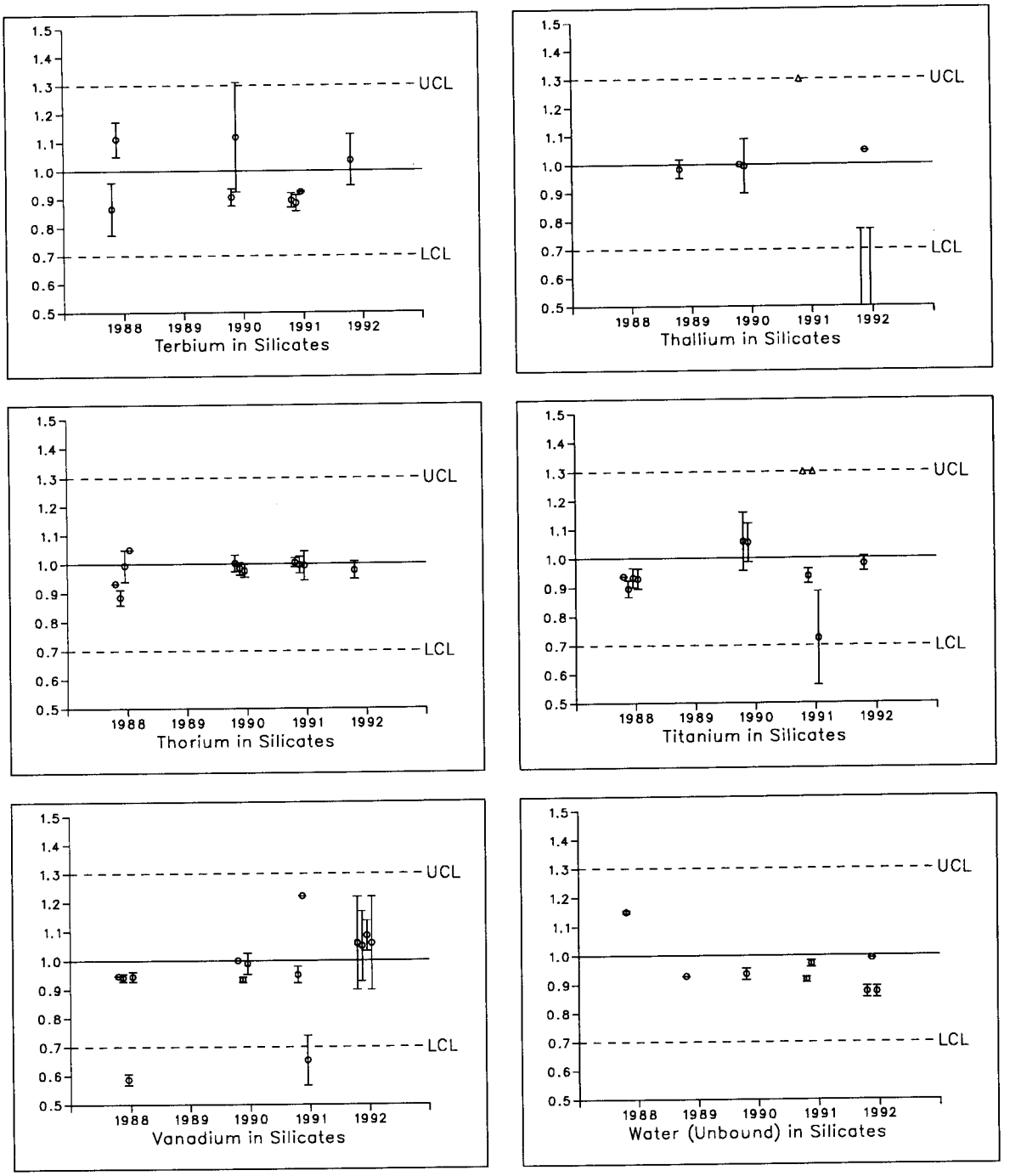

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
Terbium in Silicates
Thallium in Silicates
Thorium in Silicates
Titanium in Silicates
Vanadium in Silicates
Water (Unbound) in Silicates

Fig. F-1. (cont)

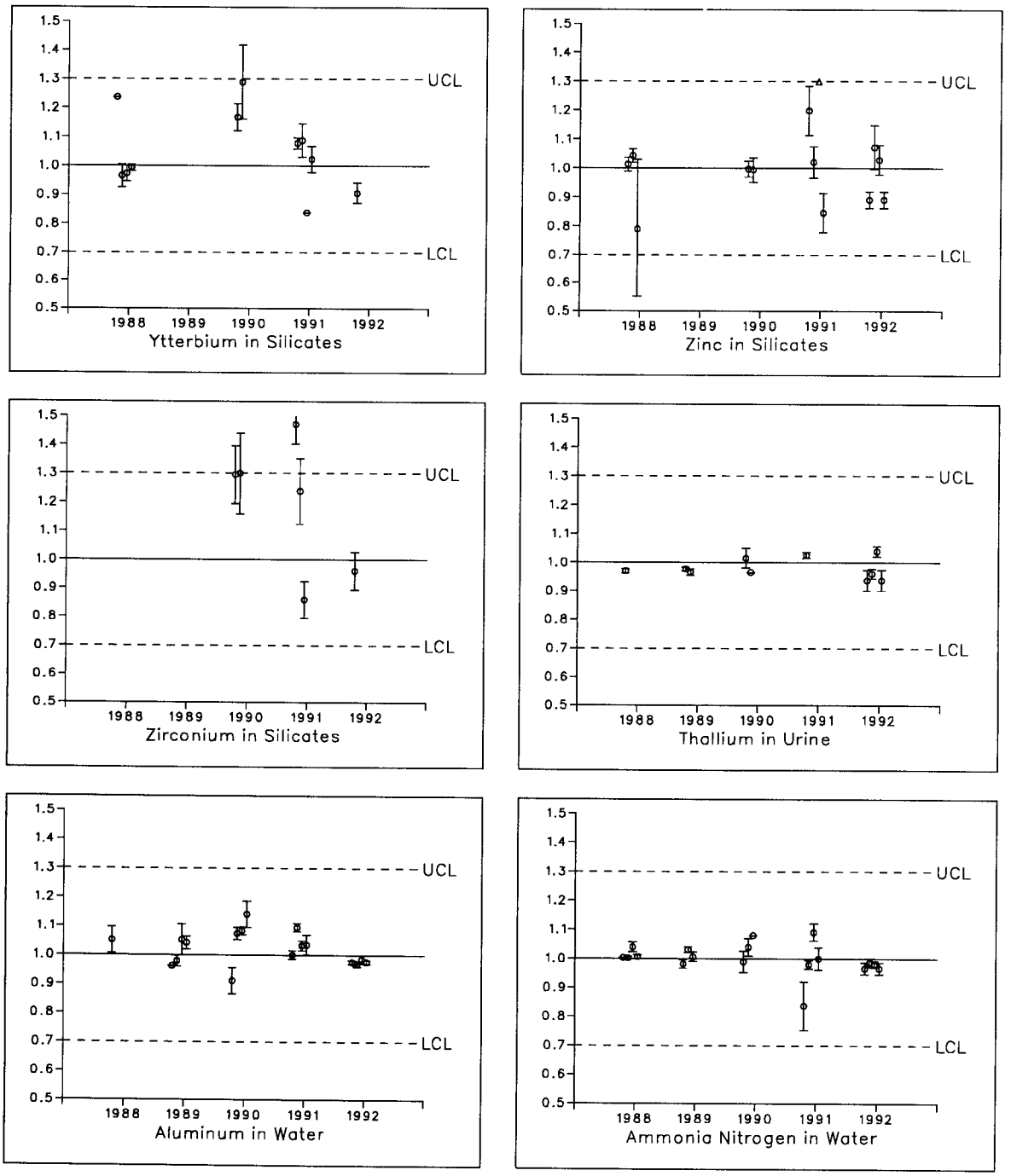

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
Ytterbium in Silicates
Zinc in Silicates
Zirconium in Silicates
Thallium in Urine
Aluminum in Water
Ammonia Nitrogen in Water

Fig. F-1. (cont)

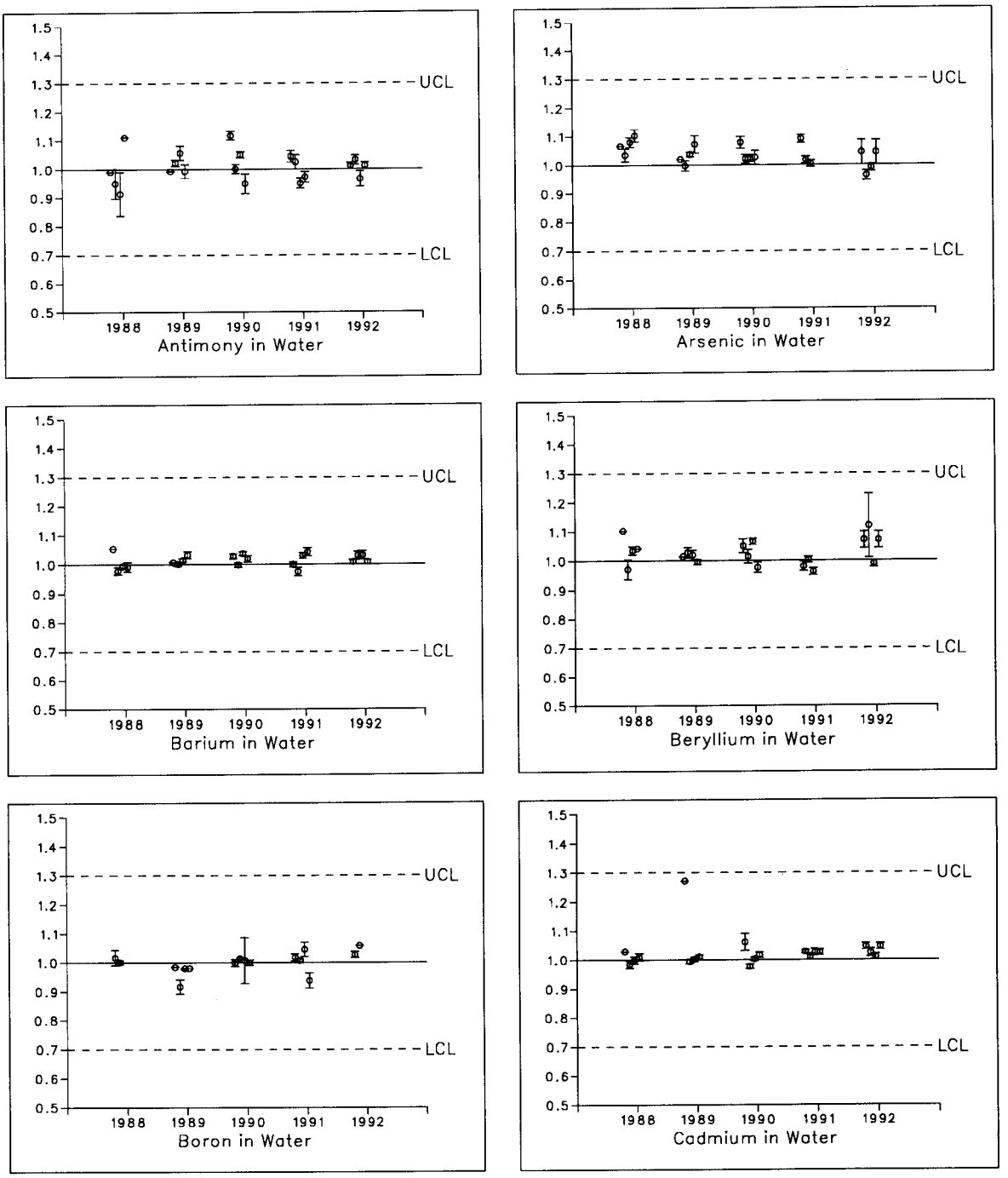

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
Antimony in Water
Arsenic in Water
Barium in Water
Beryllium in Water
Boron in Water
Cadmium in Water

Fig. F-1. (cont)

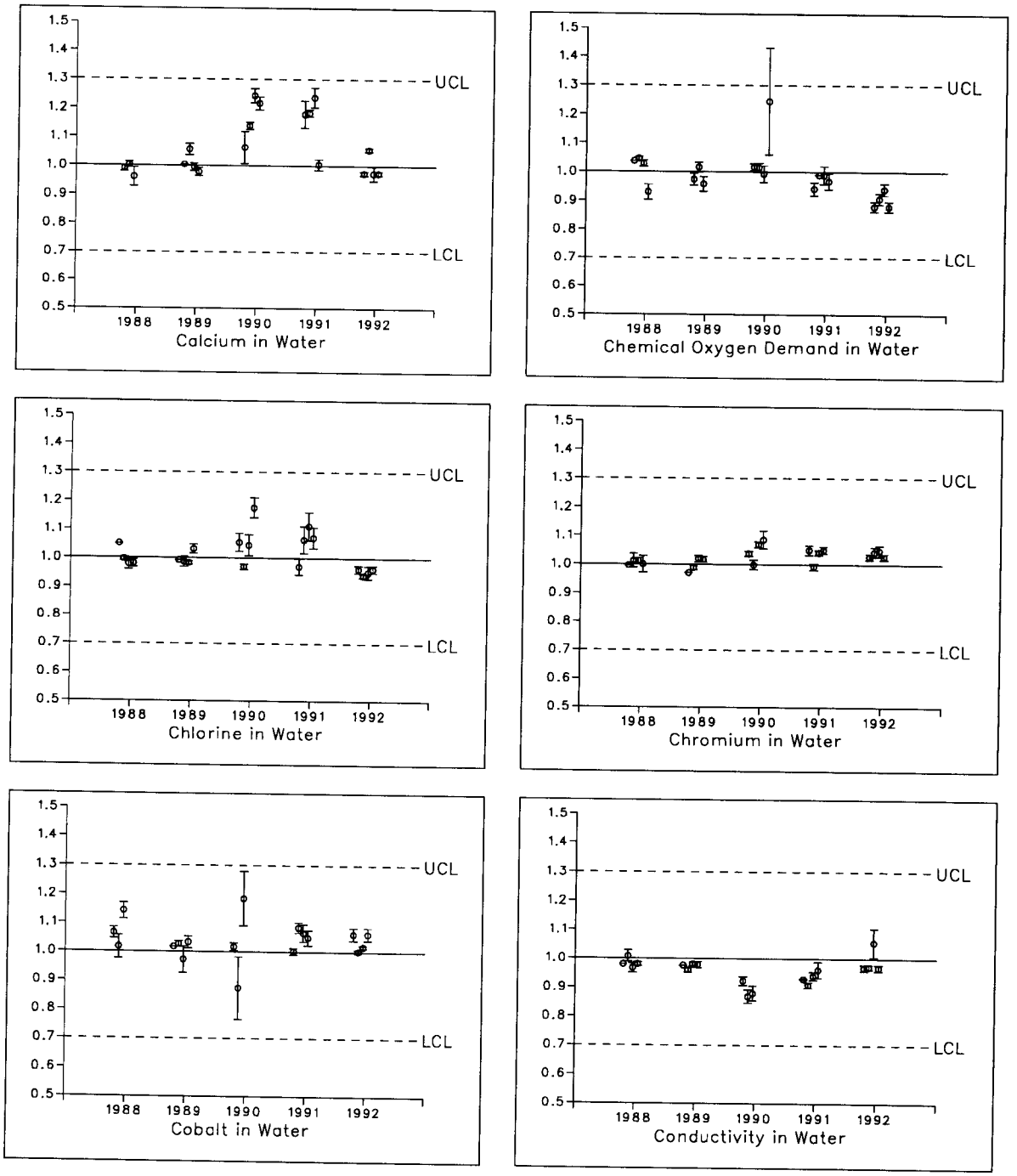

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Calcium in Water
Chemical Oxygen Demand in Water
Chlorine in Water
Chromium in Water
Cobalt in Water
Conductivity in Water

Fig. F-1. (cont)

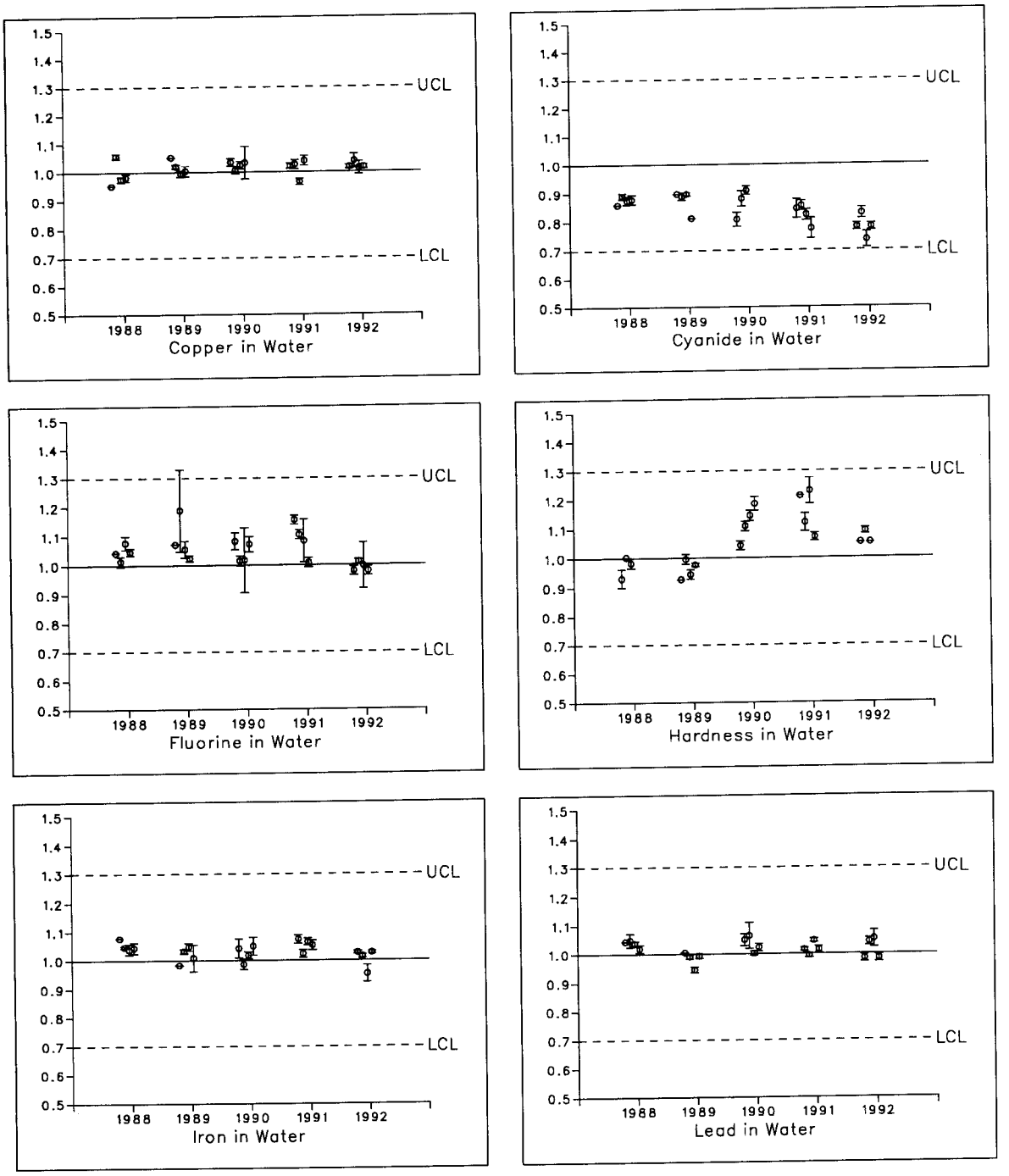

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Copper in Water
Cyanide in Water
Fluorine in Water
Hardness in Water
Iron in Water
Lead in Water

Fig. F-1. (cont)

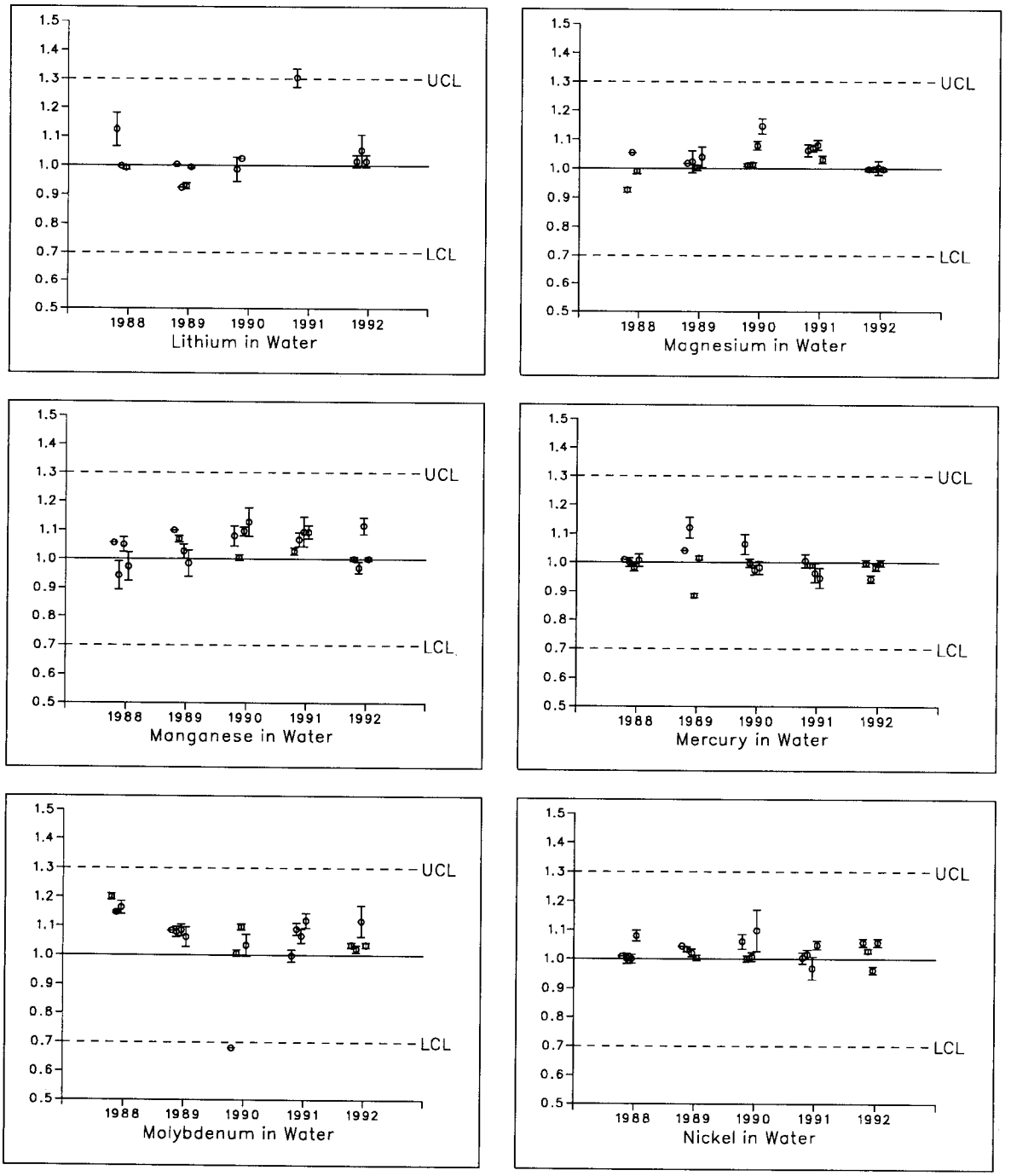
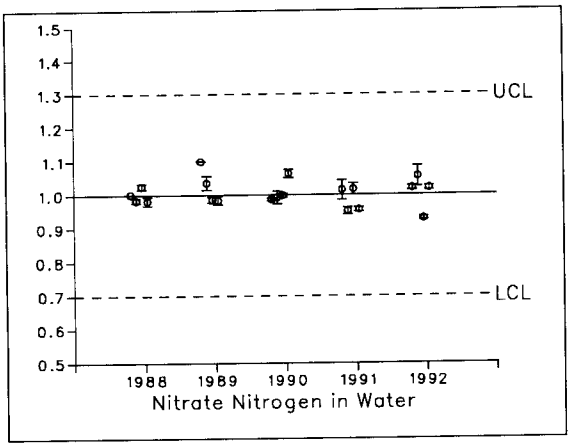
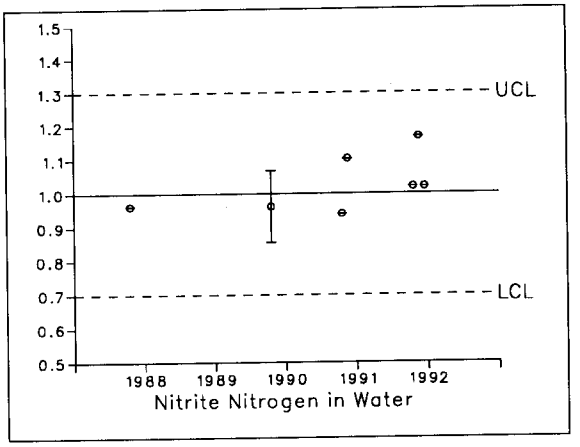
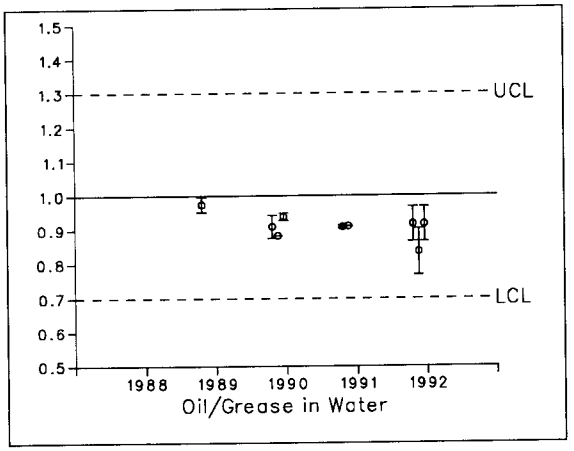
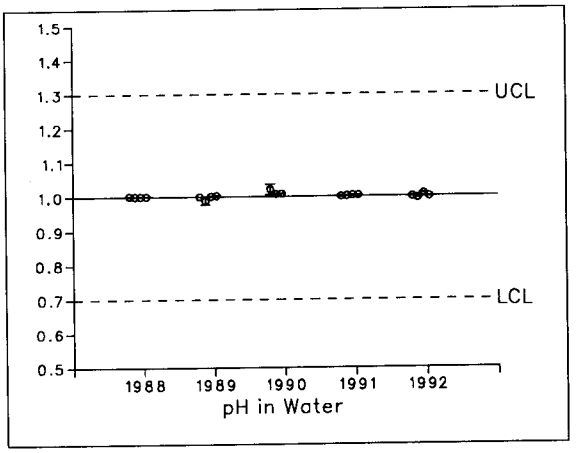

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Lithium in Water
Magnesium in Water
Manganese in Water
Mercury in Water
Molybdenum in Water
Nickel in Water

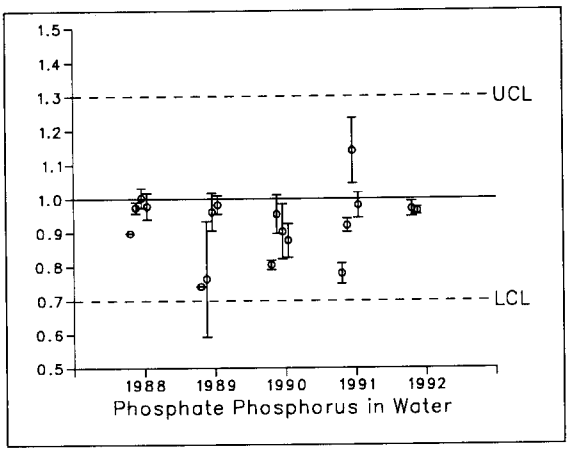
Fig. F-1. (cont)


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Nitrate Nitrogen in Water


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Nitrite Nitrogen in Water


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Oil/Grease in Water


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
pH in Water


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Phosphate Phosphorus in Water

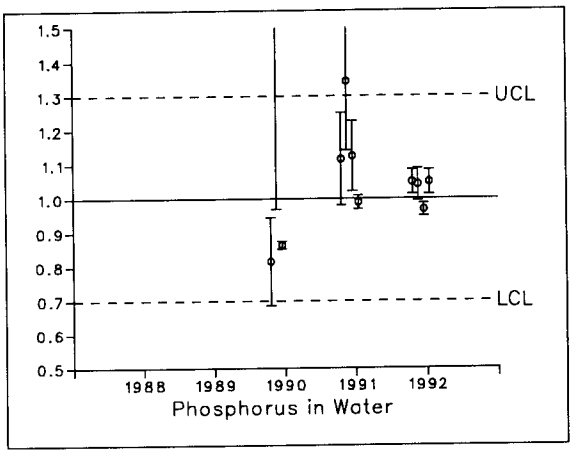

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Phosphorus in Water

Fig. F-1. (cont)

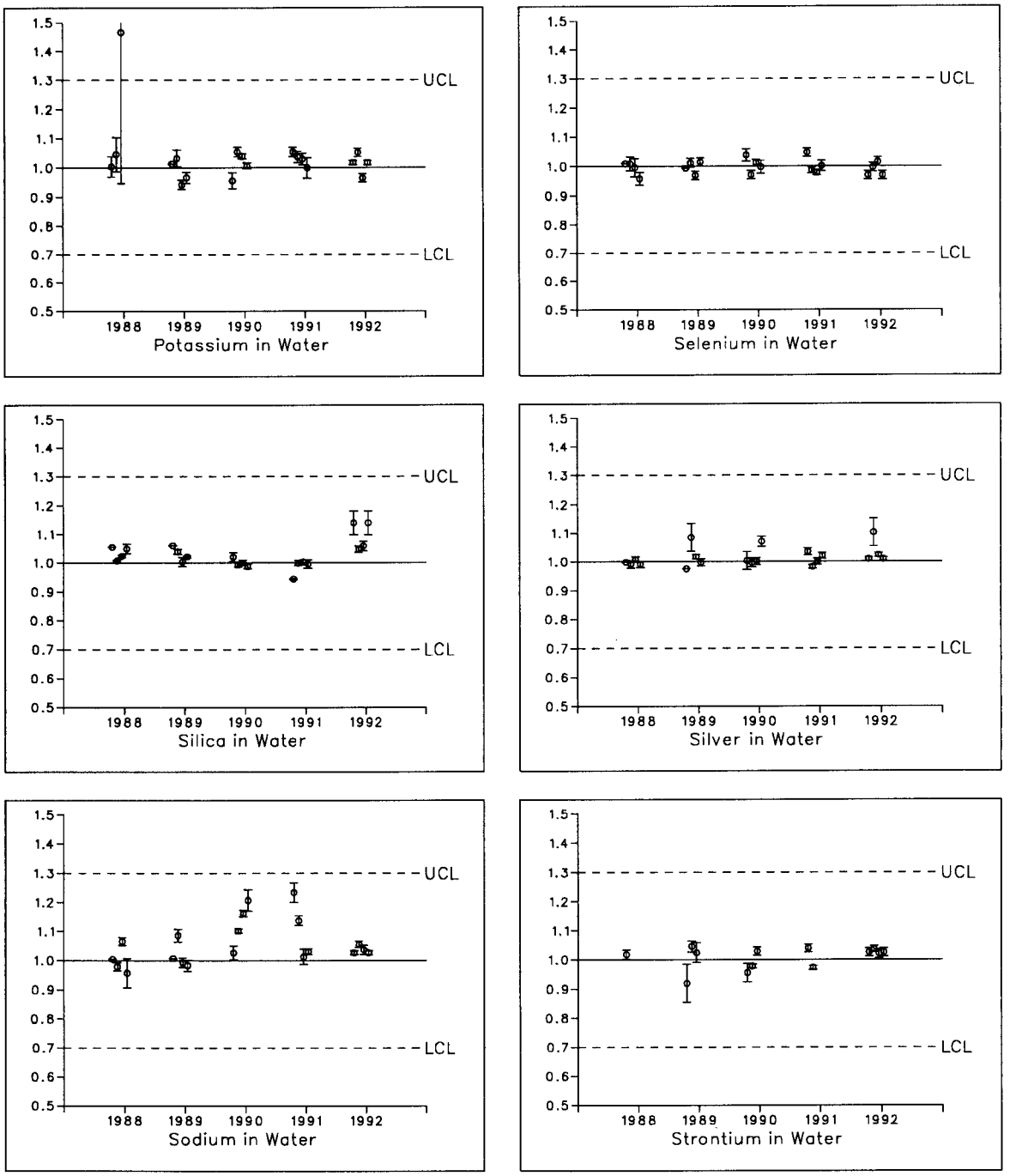

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Potassium in Water
Selenium in Water
Silica in Water
Silver in Water
Sodium in Water
Strontium in Water

Fig. F-1. (cont)

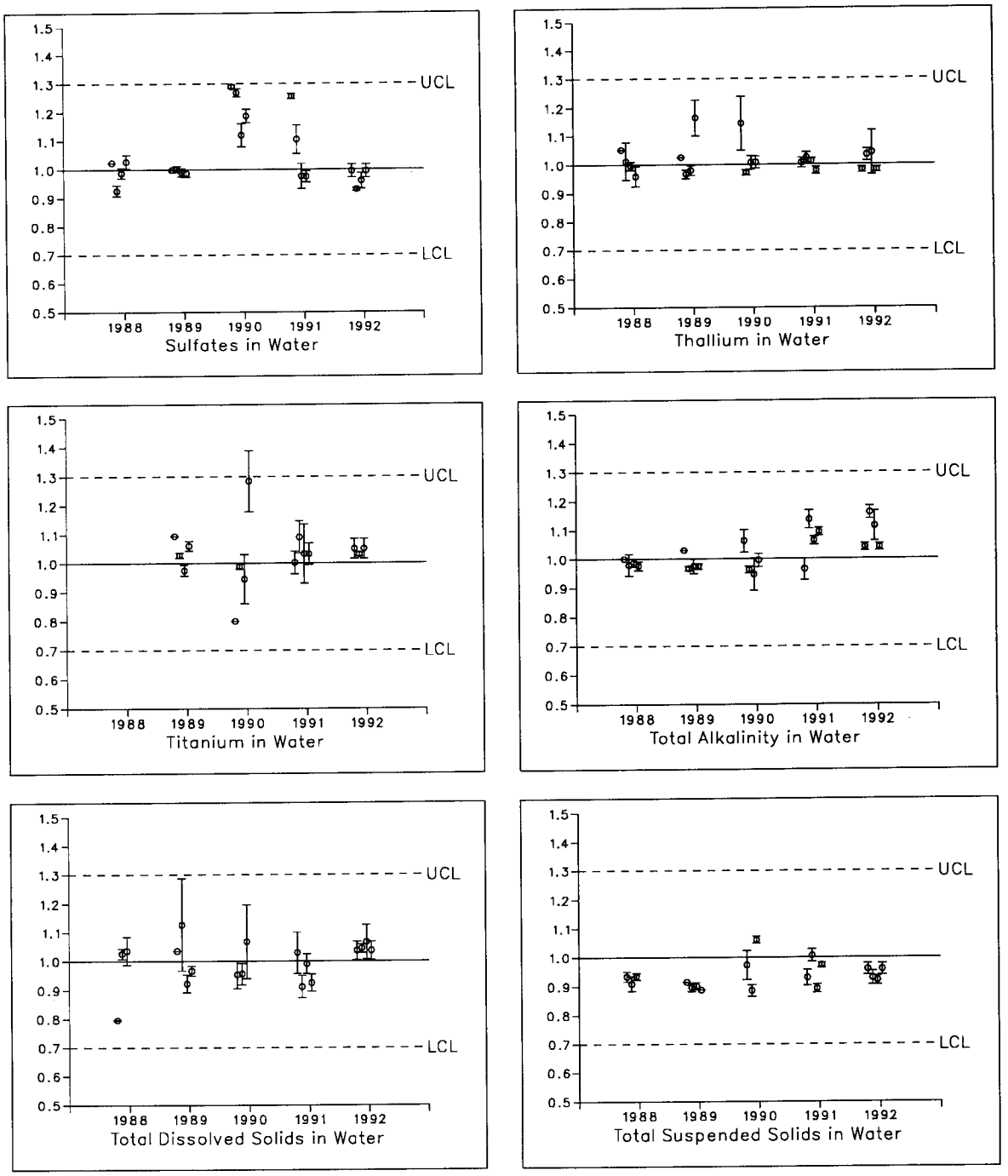
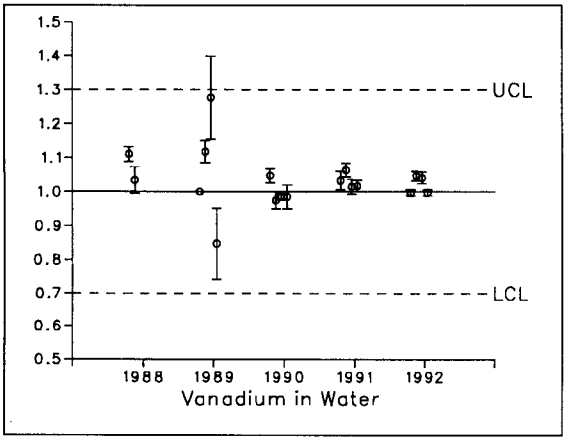

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
Sulfates in Water
Thallium in Water
Titanium in Water
Total Alkalinity in Water
Total Dissolved Solids in Water
Total Suspended Solids in Water

Fig. F-1. (cont)



NOTE: △ ▽ indicates data points beyond the ± 3 σ control limits.

Fig. F-1. (cont)

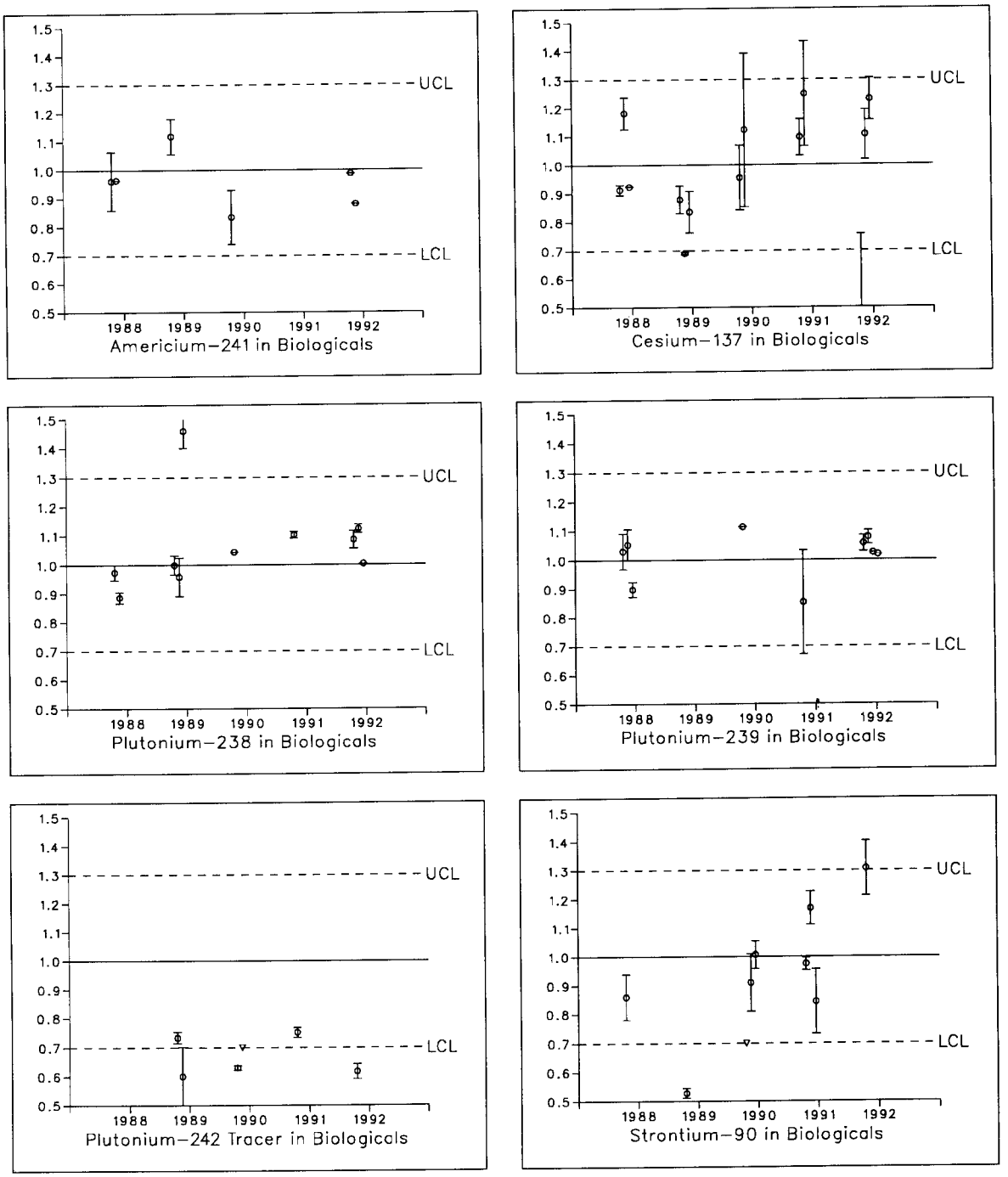


Fig. F-2. Five-year trends in quality assurance data for radiochemical analyses.

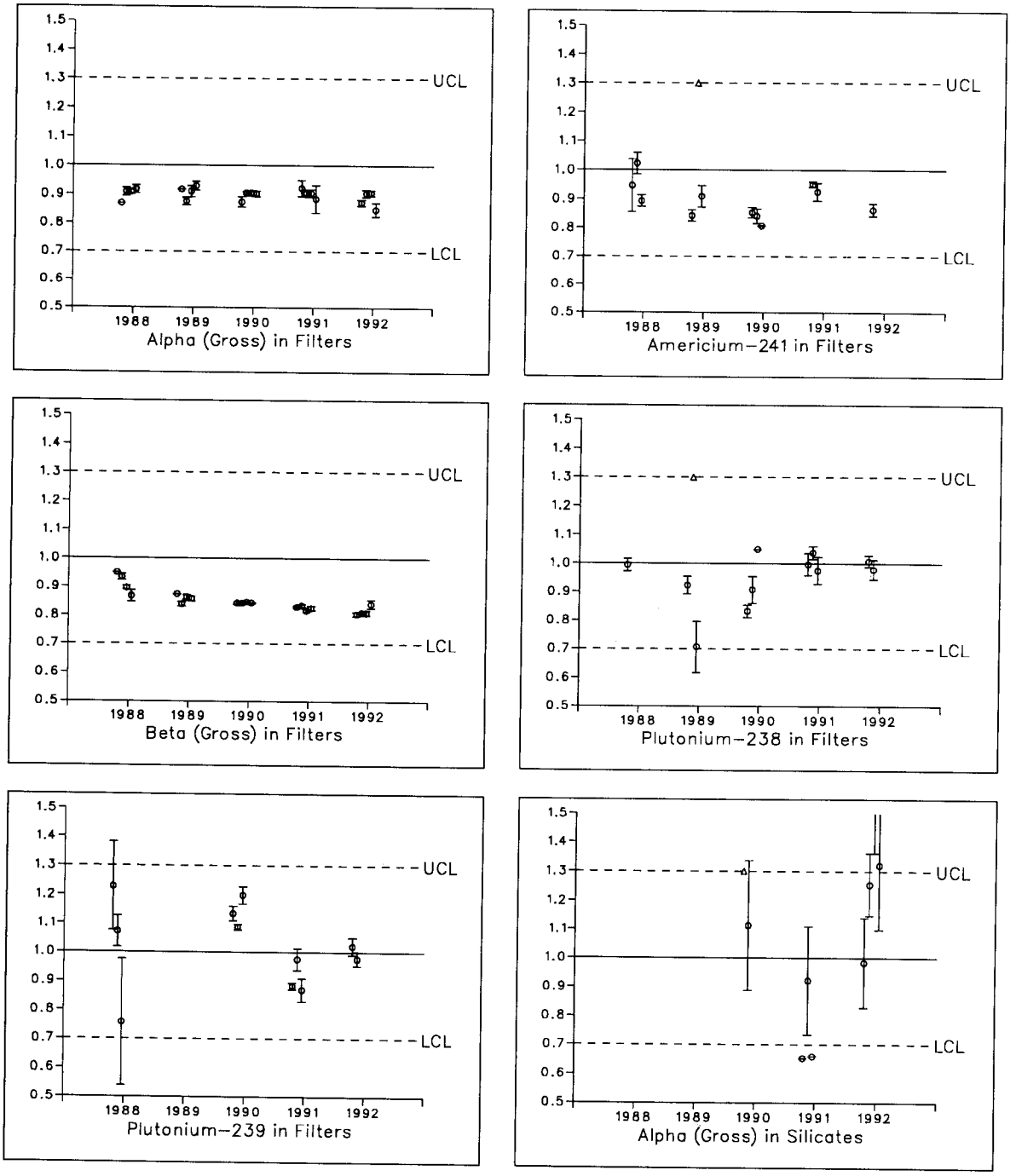

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Alpha (Gross) in Filters
Americium–241 in Filters
Beta (Gross) in Filters
Plutonium–238 in Filters
Plutonium–239 in Filters
Alpha (Gross) in Silicates

Fig. F-2. (cont)

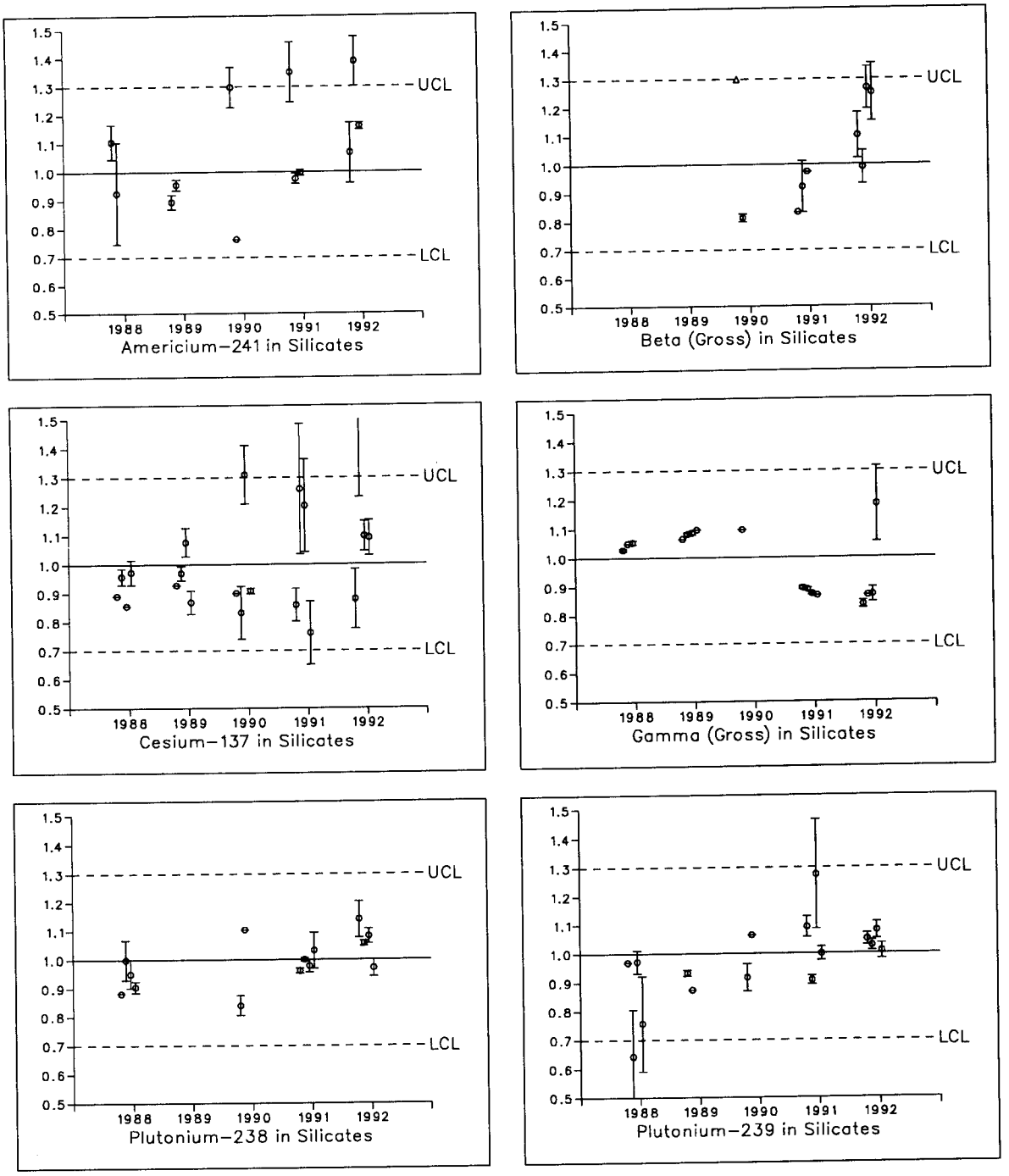
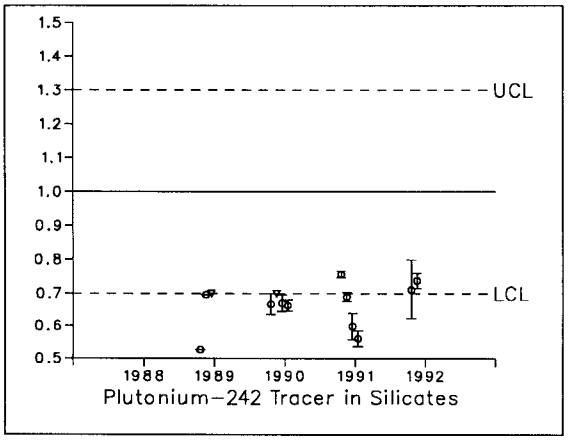
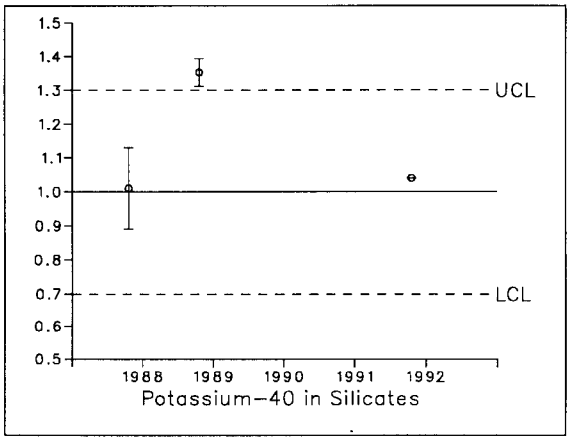
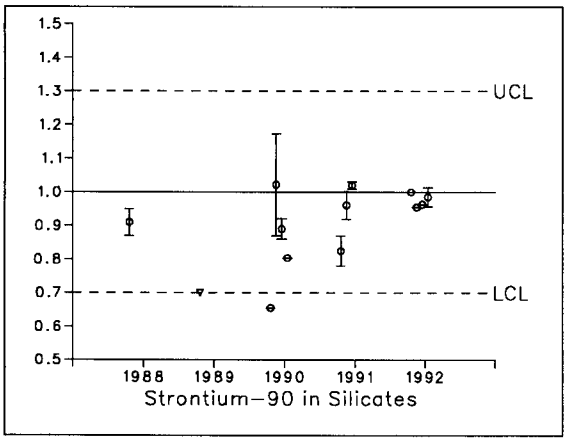
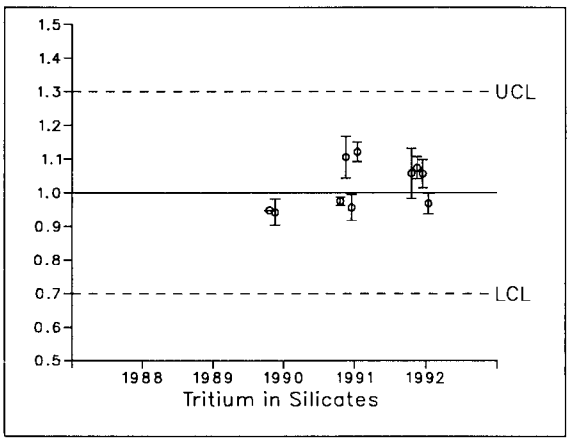

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
Americium-241 in Silicates
Beta (Gross) in Silicates
Cesium-137 in Silicates
Gamma (Gross) in Silicates
Plutonium-238 in Silicates
Plutonium-239 in Silicates

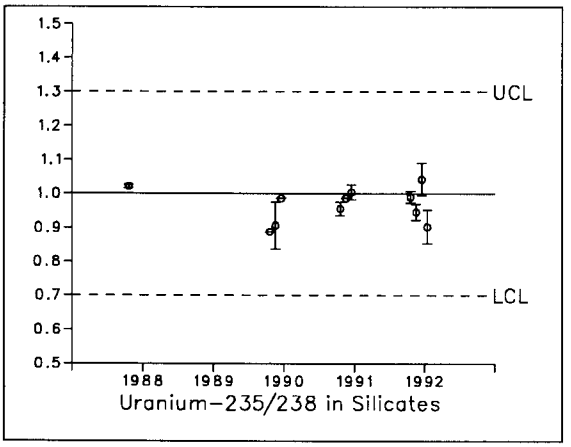
Fig. F-2. (cont)


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Plutonium-242 Tracer in Silicates


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Potassium-40 in Silicates


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Strontium-90 in Silicates


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Tritium in Silicates


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Uranium-235/238 in Silicates

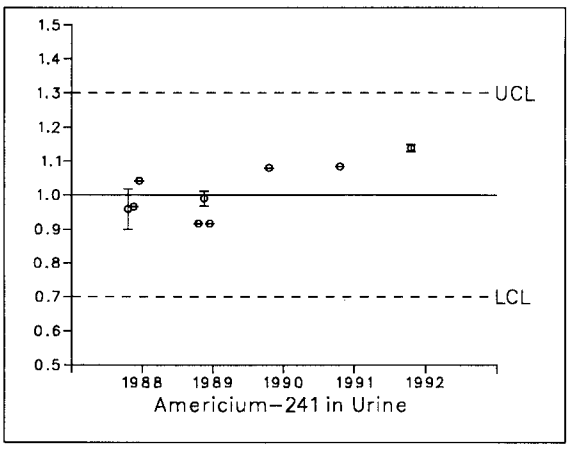

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Americium-241 in Urine

Fig. F-2. (cont)

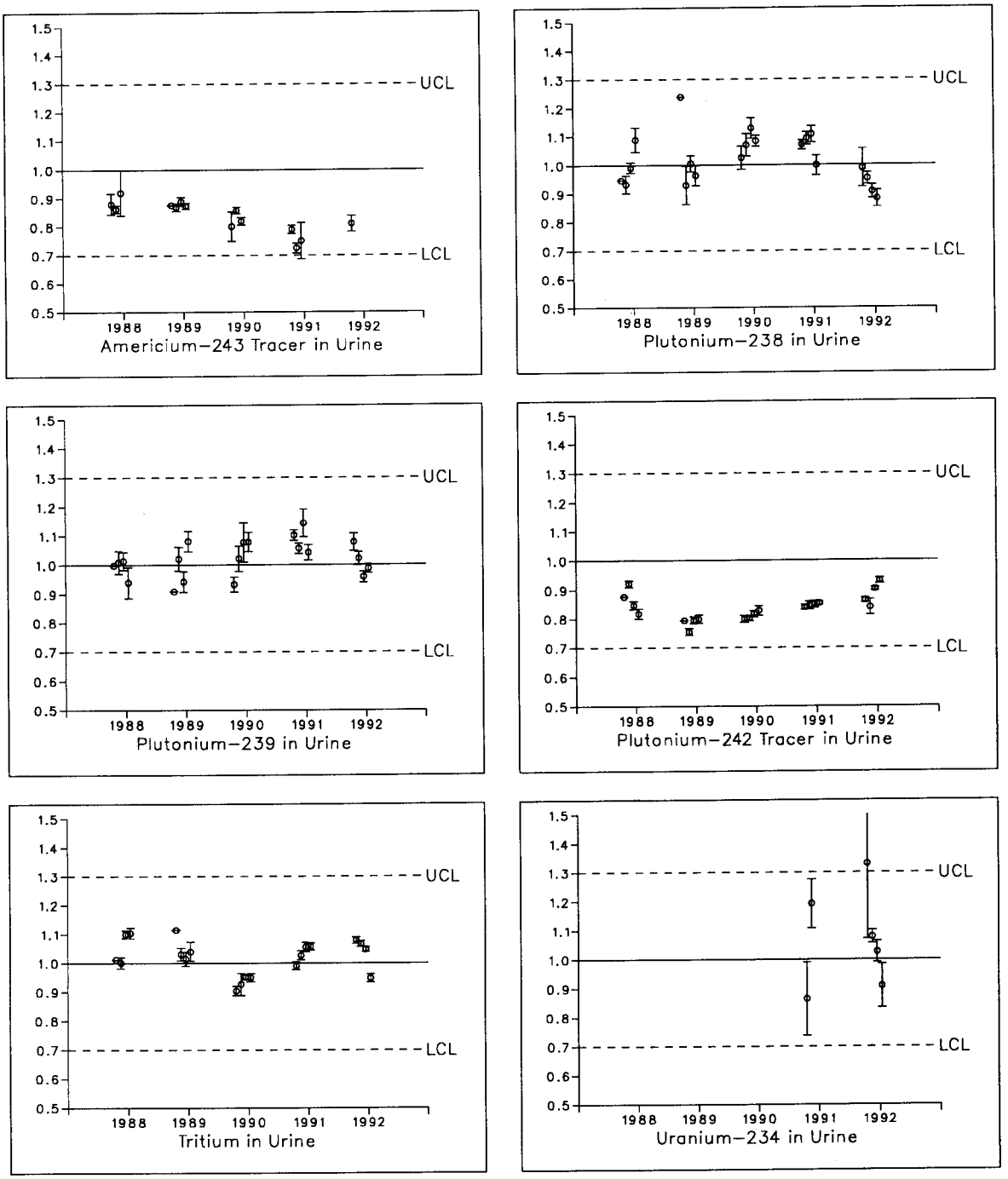

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
Americium-243 Tracer in Urine
Plutonium-238 in Urine
Plutonium-239 in Urine
Plutonium-242 Tracer in Urine
Tritium in Urine
Uranium-234 in Urine

Fig. F-2. (cont)

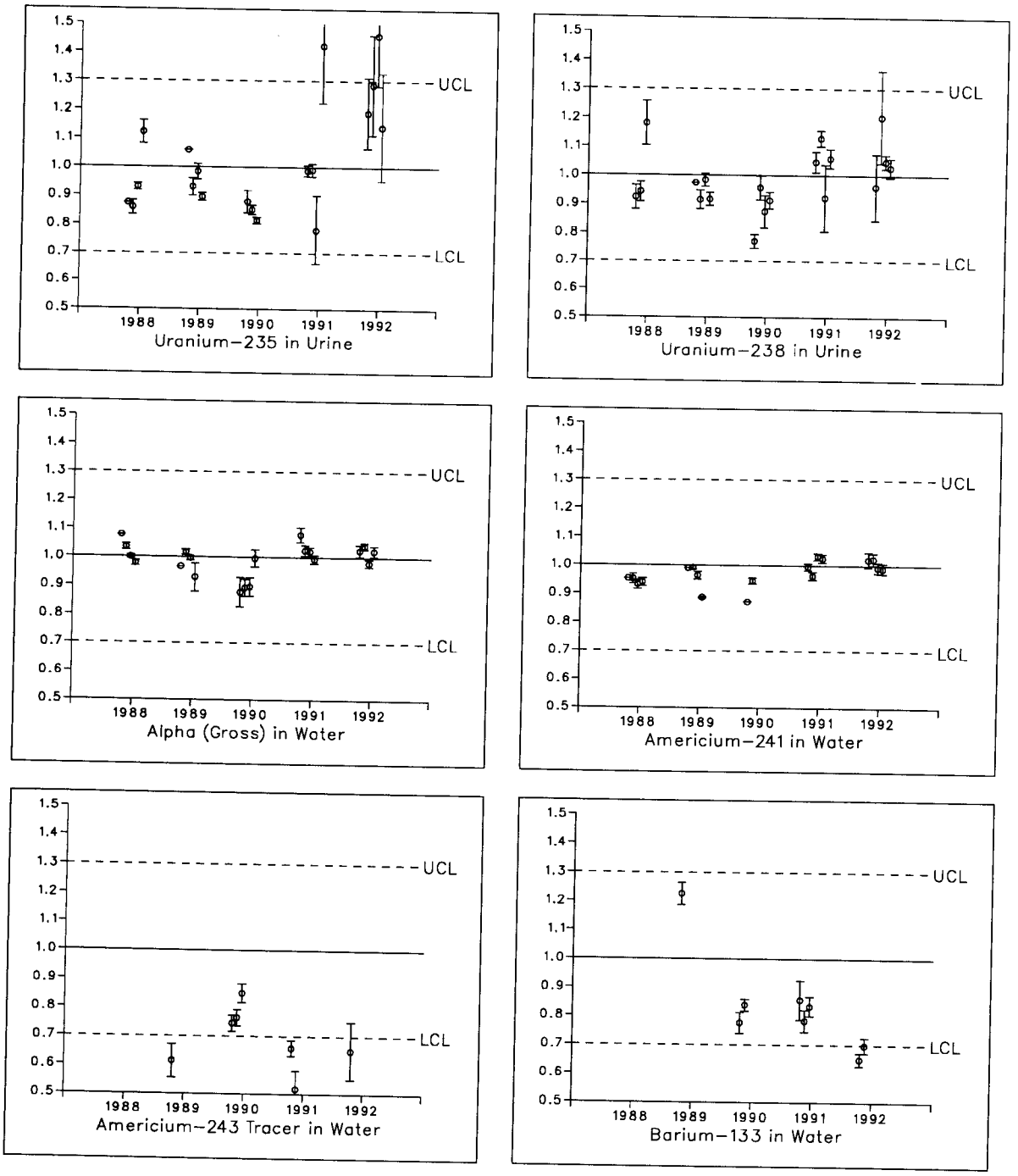

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
Uranium-235 in Urine
Uranium-238 in Urine
Alpha (Gross) in Water
Americium-241 in Water
Americium-243 Tracer in Water
Barium-133 in Water

Fig. F-2. (cont)

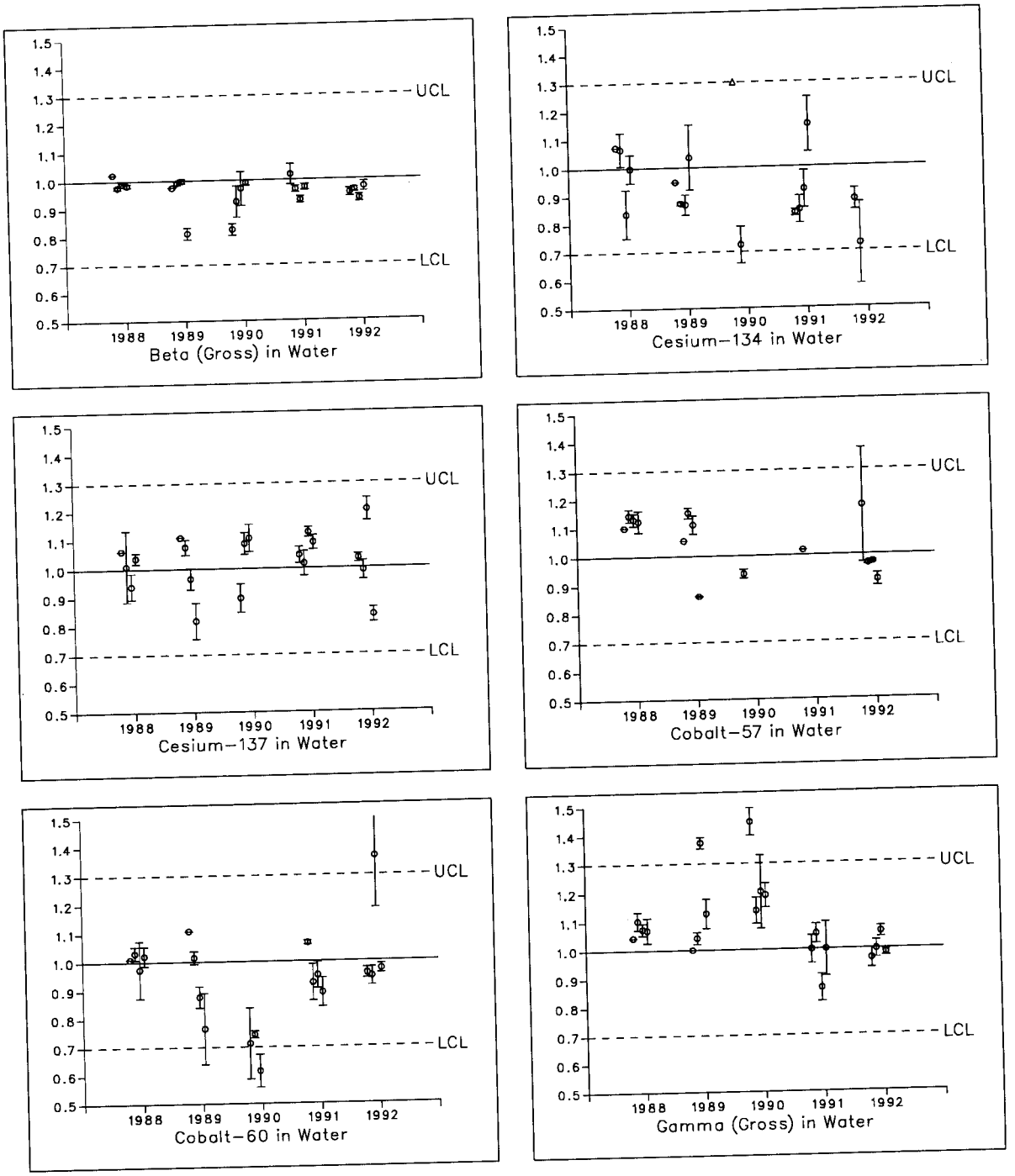

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
Beta (Gross) in Water
Cesium-134 in Water
Cesium-137 in Water
Cobalt-57 in Water
Cobalt-60 in Water
Gamma (Gross) in Water

Fig. F-2. (cont)

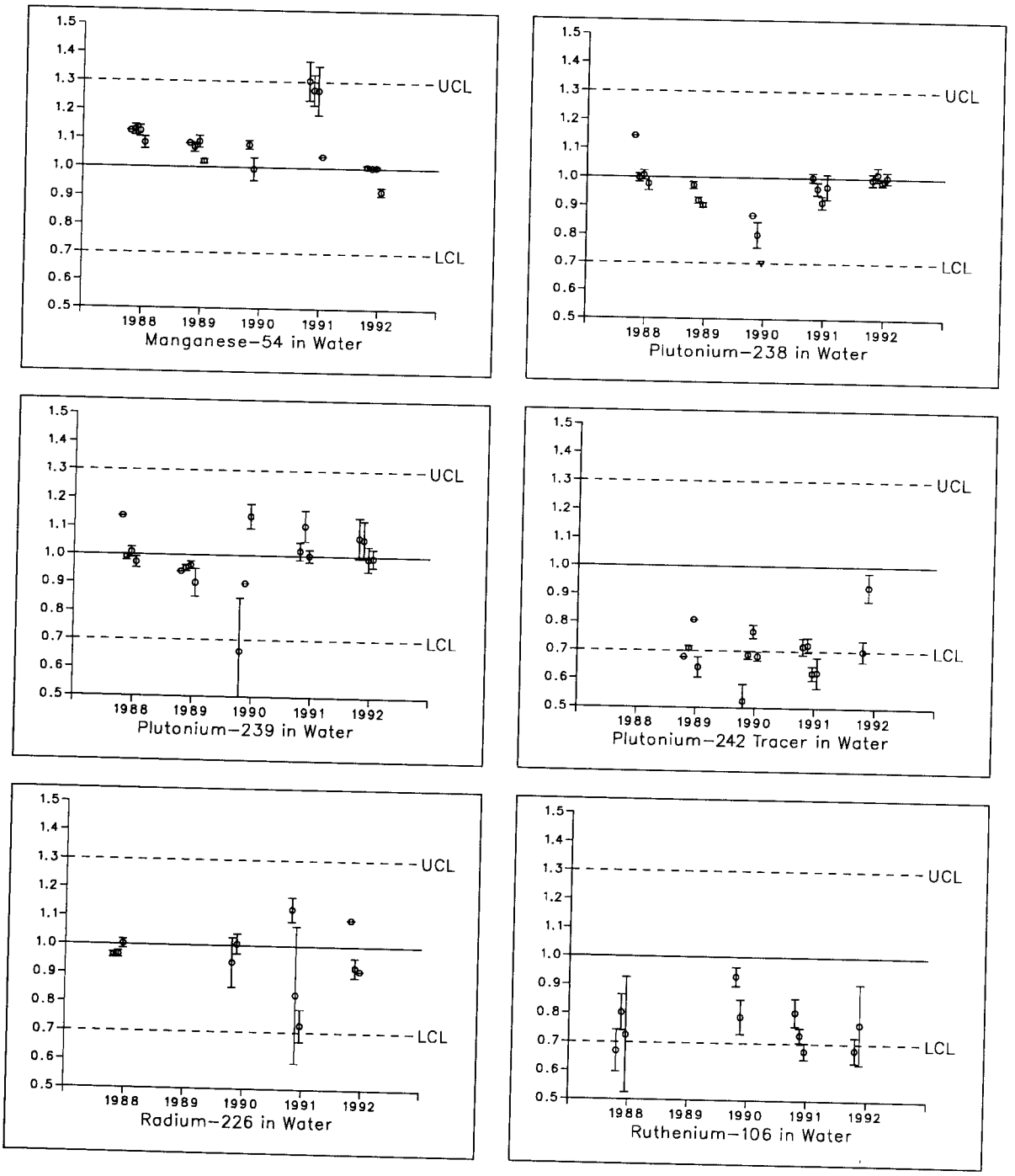
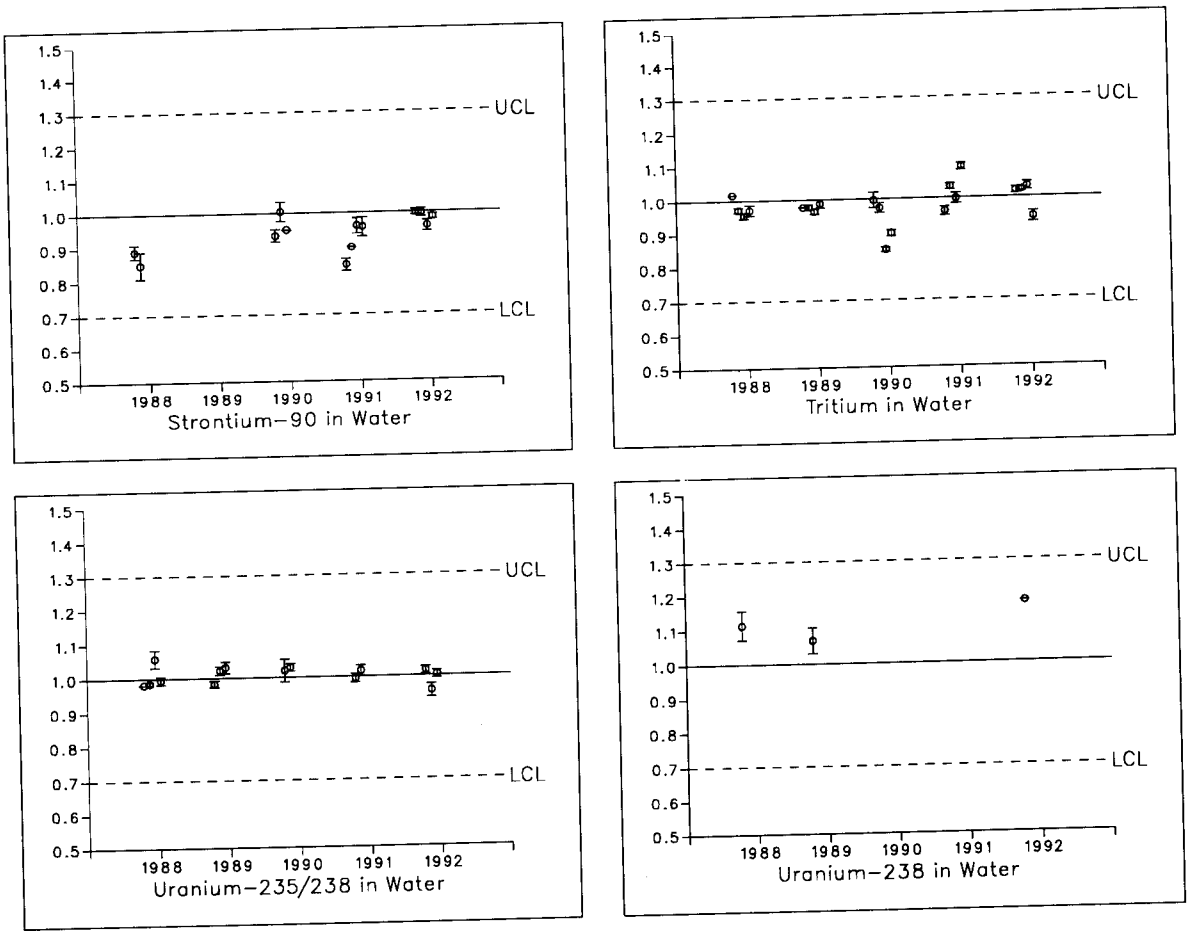

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
Manganese-54 in Water
Plutonium-238 in Water
Plutonium-239 in Water
Plutonium-242 Tracer in Water
Radium-226 in Water
Ruthenium-106 in Water

Fig. F-2. (cont)



NOTE: △ ▽ indicates data points beyond the ± 3σ control limits.

Fig. F-2. (cont)

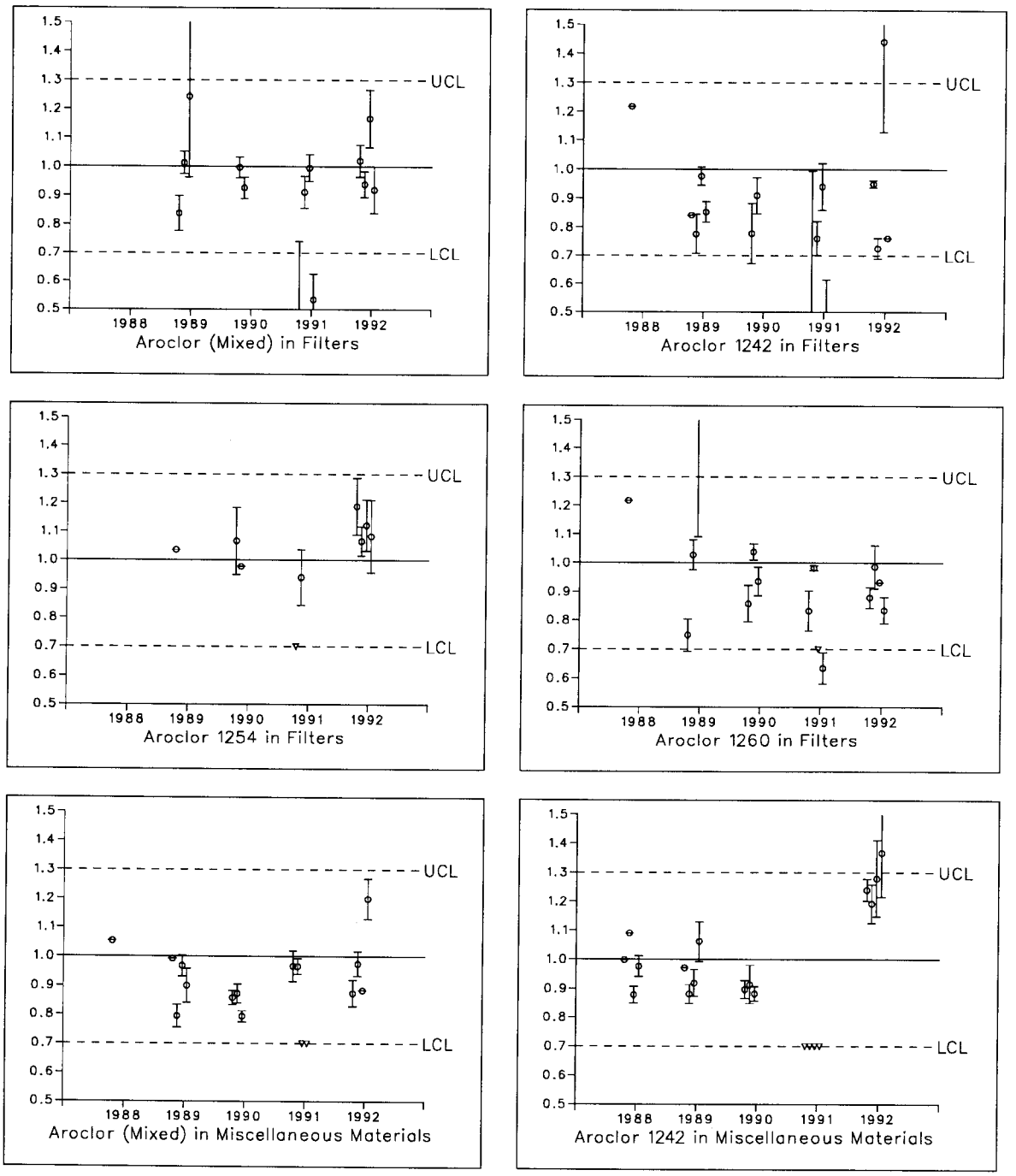
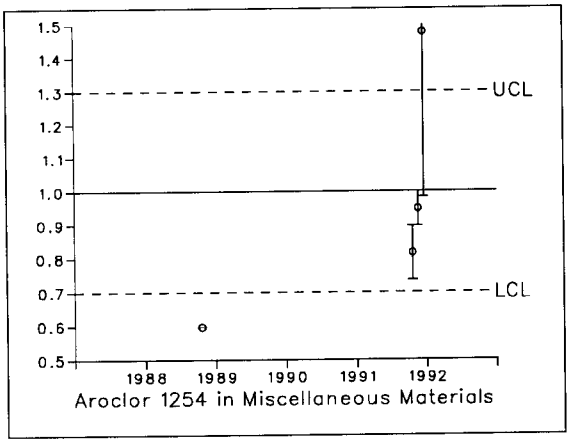
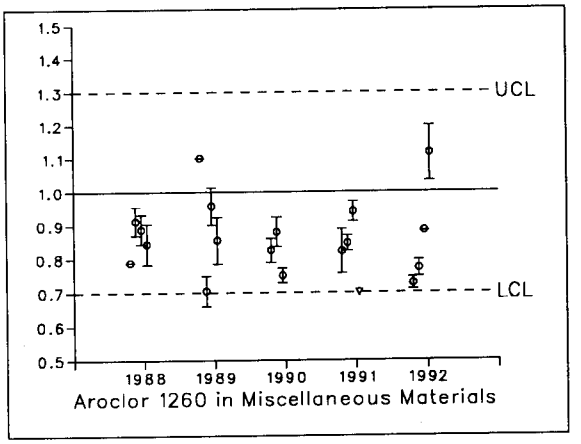
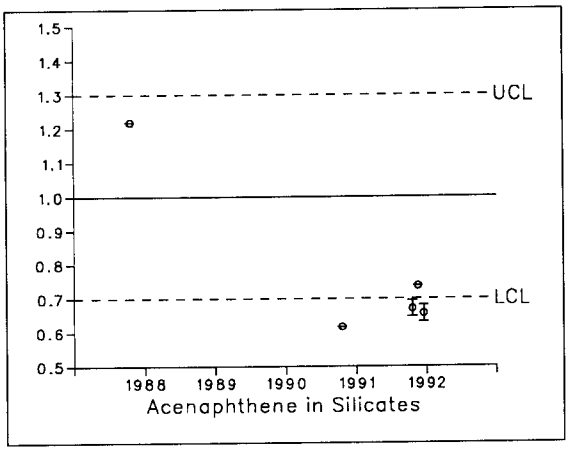
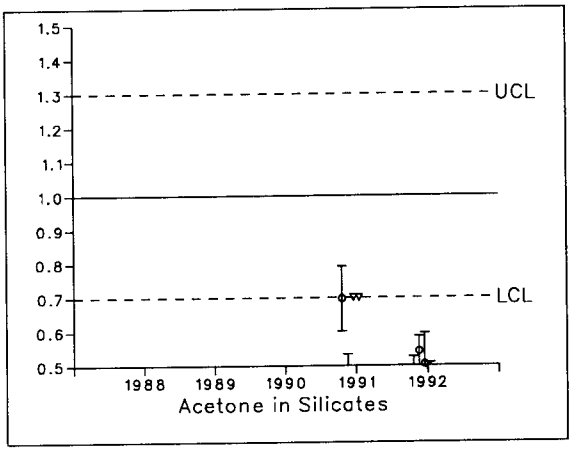


Fig. F-3. Five-year trends in quality assurance for organic analyses.


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Aroclor 1254 in Miscellaneous Materials


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Aroclor 1260 in Miscellaneous Materials


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Acenaphthene in Silicates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1.4
1.3
1.2
1.1
1.0
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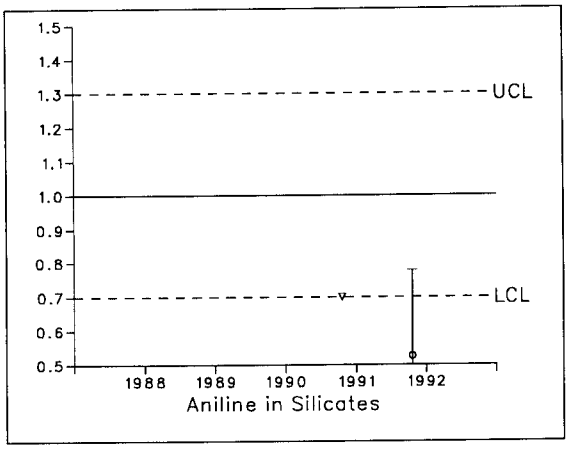
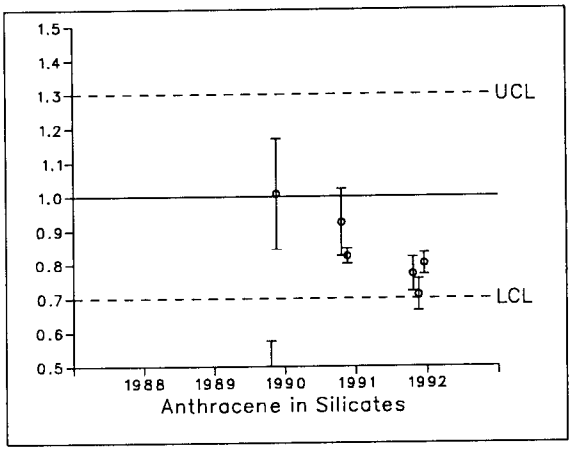
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Acetone in Silicates


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Aniline in Silicates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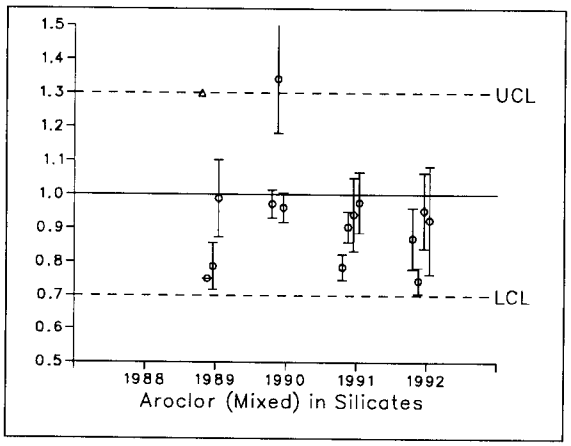
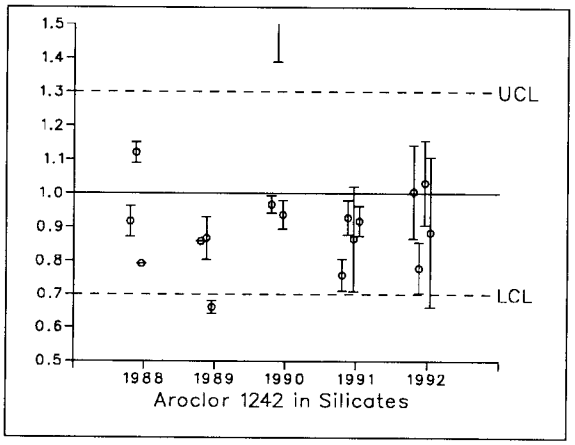
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Anthracene in Silicates

Fig. F-3. (cont)


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Aroclor (Mixed) in Silicates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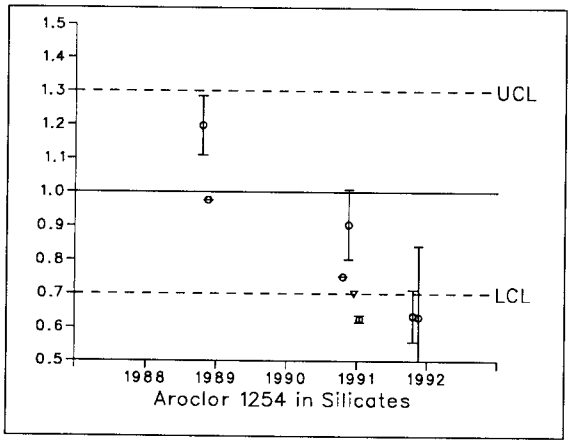
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Aroclor 1242 in Silicates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1.4
1.3
1.2
1.1
1.0
0.9
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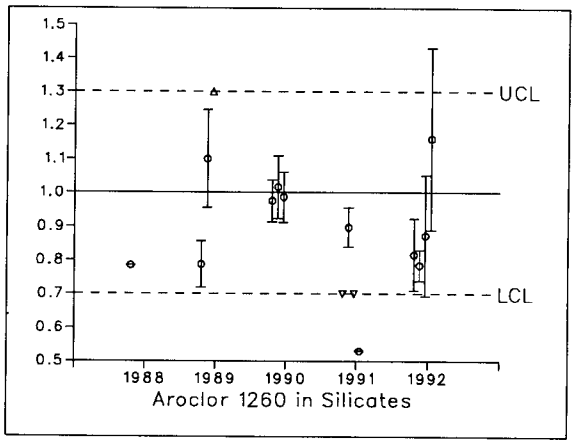
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Aroclor 1254 in Silicates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1.3
1.2
1.1
1.0
0.9
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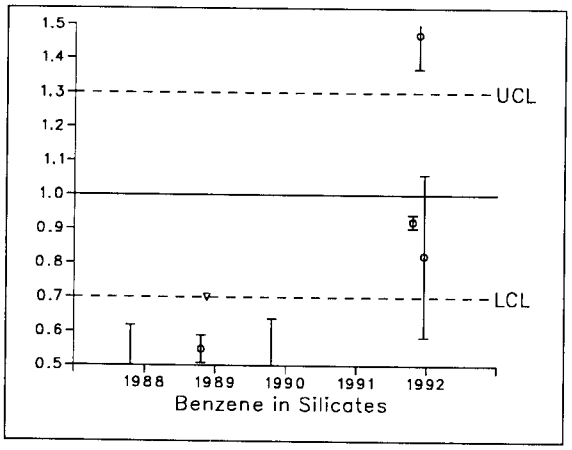
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Aroclor 1260 in Silicates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1.2
1.1
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0.9
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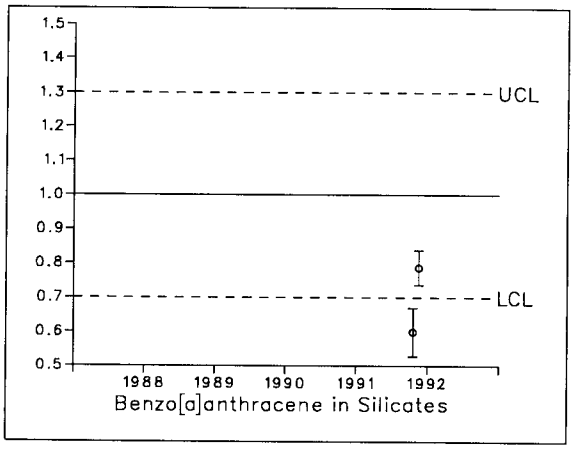
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Benzene in Silicates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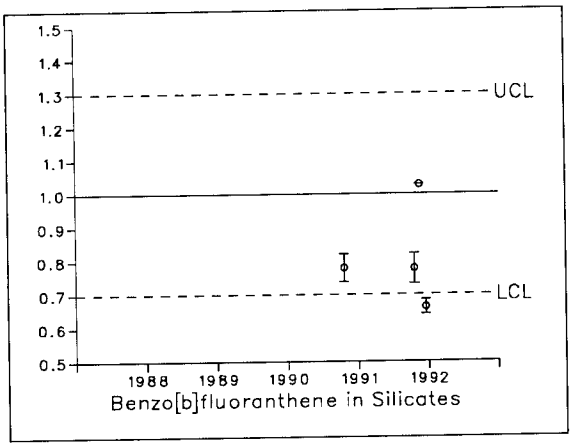
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Benzo[a]anthracene in Silicates

Fig. F-3. (cont)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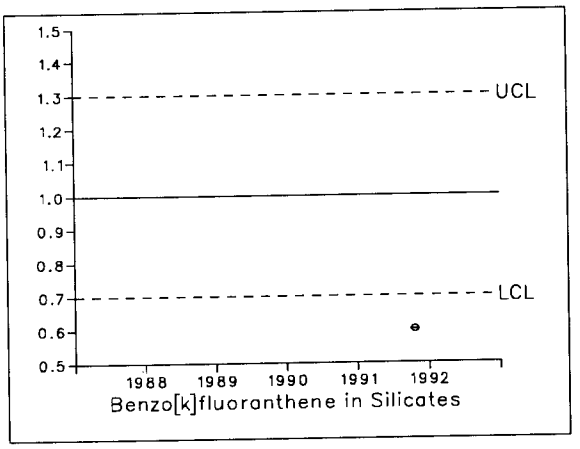
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Benzo[b]fluoranthene in Silicates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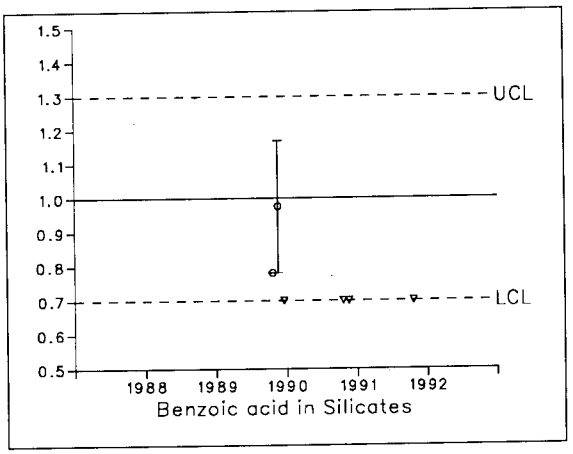
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Benzo[k]fluoranthene in Silicates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1.4
1.3
1.2
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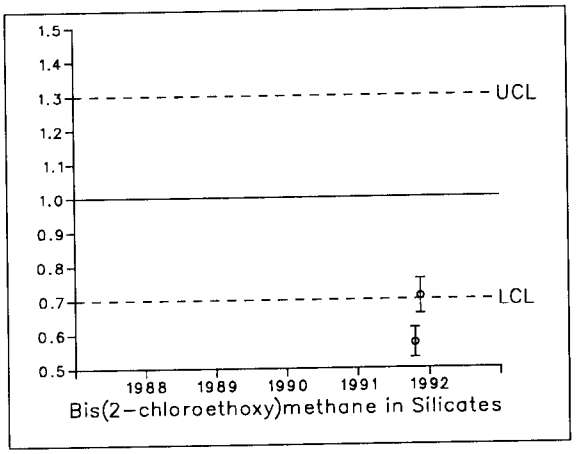
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Benzoic acid in Silicates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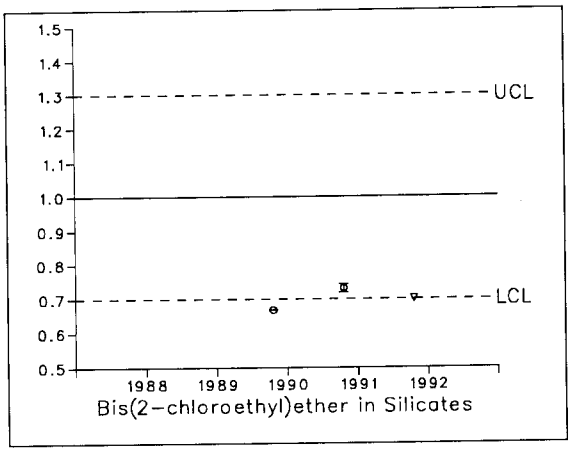
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Bis(2-chloroethoxy)methane in Silicates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1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Bis(2-chloroethyl)ether in Silicates

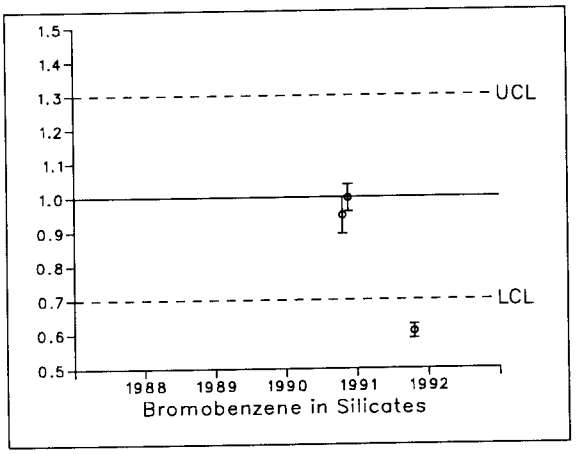

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Bromobenzene in Silicates

Fig. F-3. (cont)

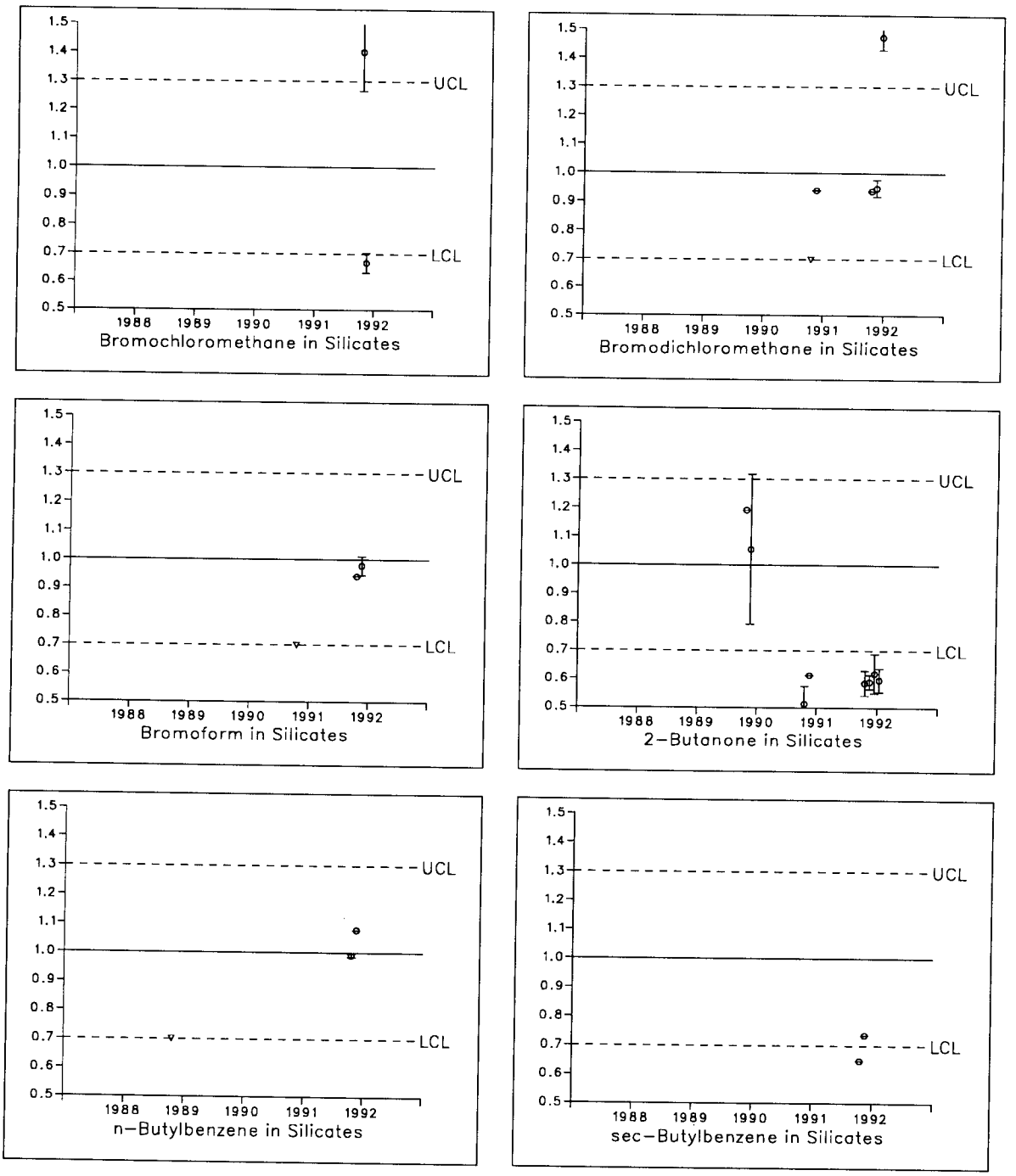
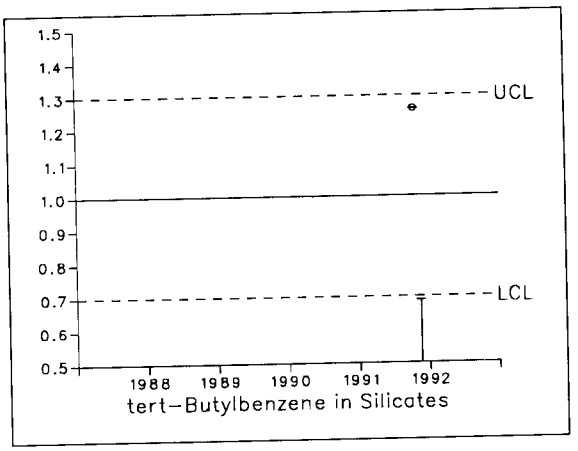
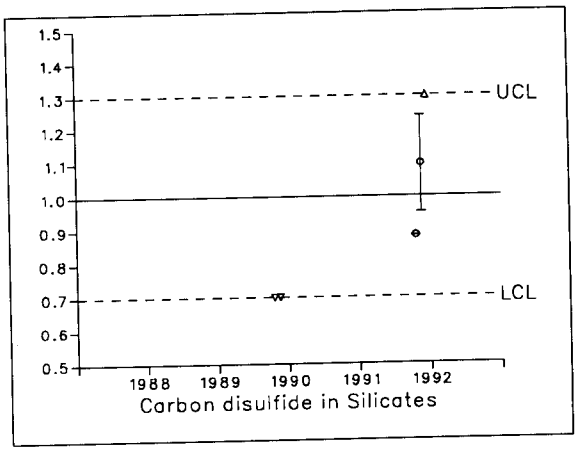
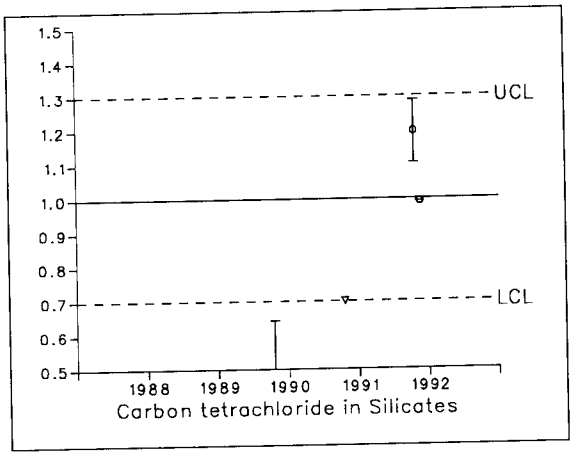

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
Bromochloromethane in Silicates
Bromodichloromethane in Silicates
Bromoform in Silicates
2-Butanone in Silicates
n-Butylbenzene in Silicates
sec-Butylbenzene in Silicates

Fig. F-3. (cont)


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
tert-Butylbenzene in Silicates


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
Carbon disulfide in Silicates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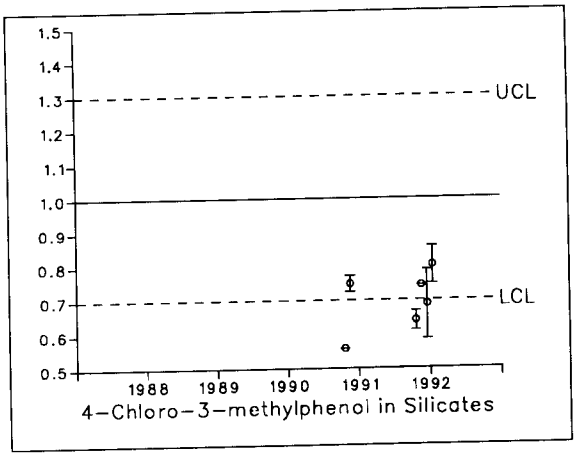
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
Carbon tetrachloride in Silicates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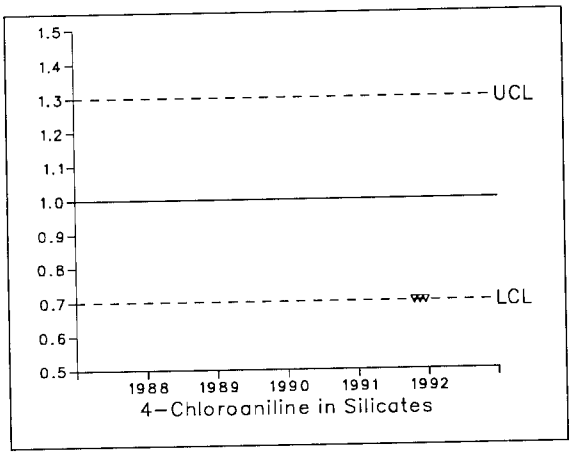
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
4-Chloro-3-methylphenol in Silicates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1.4
1.3
1.2
1.1
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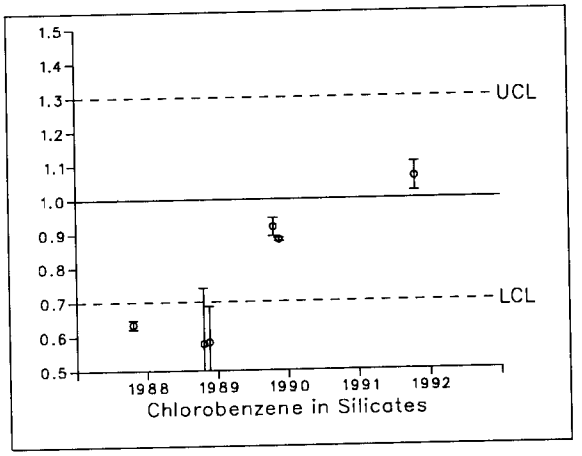
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
4-Chloroaniline in Silicates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1.2
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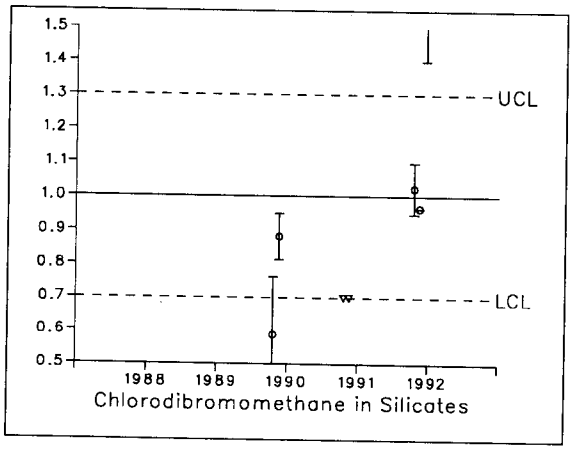
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
Chlorobenzene in Silicates

Fig. F-3. (cont)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1.3
1.2
1.1
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0.9
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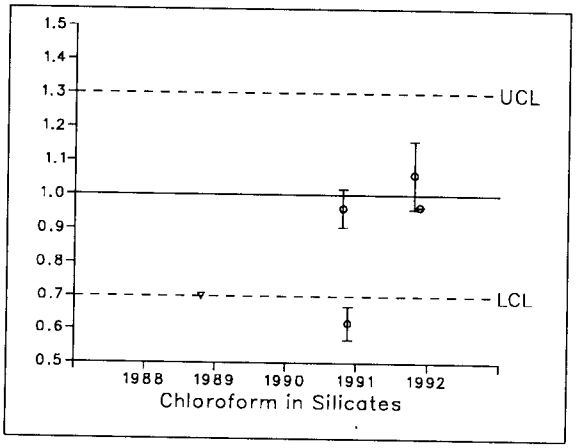
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Chlorodibromomethane in Silicates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1.3
1.2
1.1
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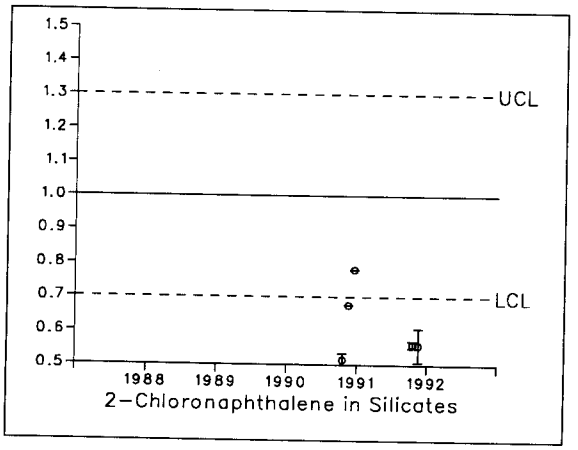
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Chloroform in Silicates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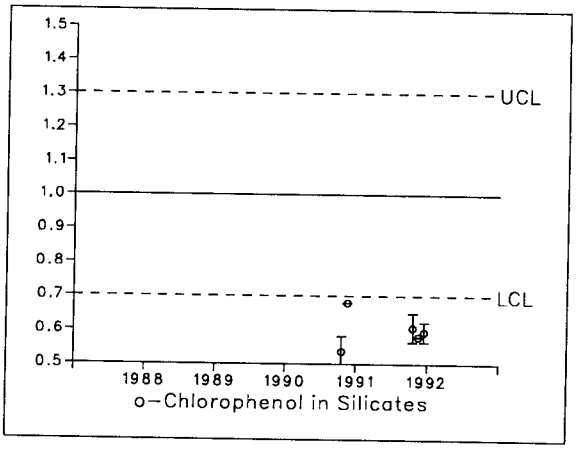
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
2-Chloronaphthalene in Silicates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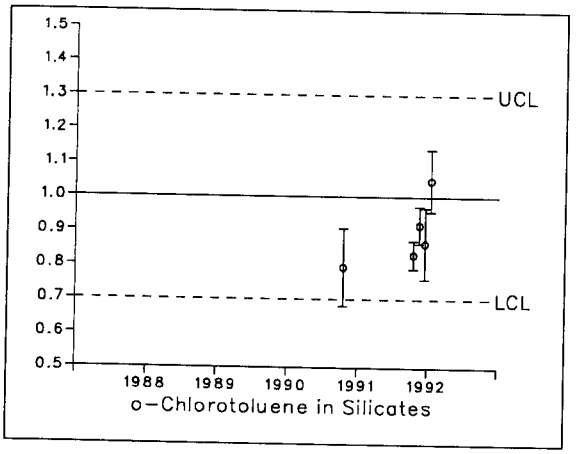
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
o-Chlorophenol in Silicates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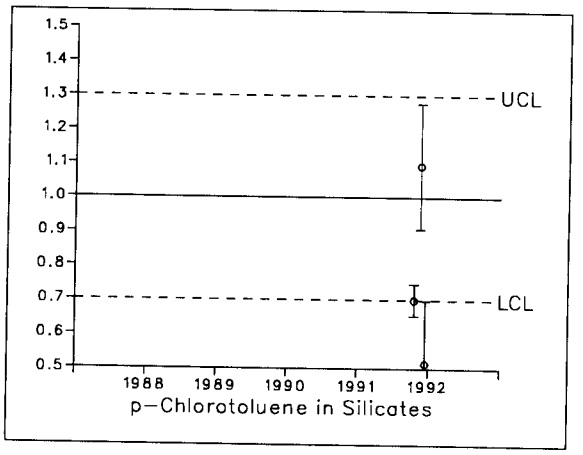
0.5
UCL
LCL
1988
1989
1990
1991
1992
o-Chlorotoluene in Silicates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1.3
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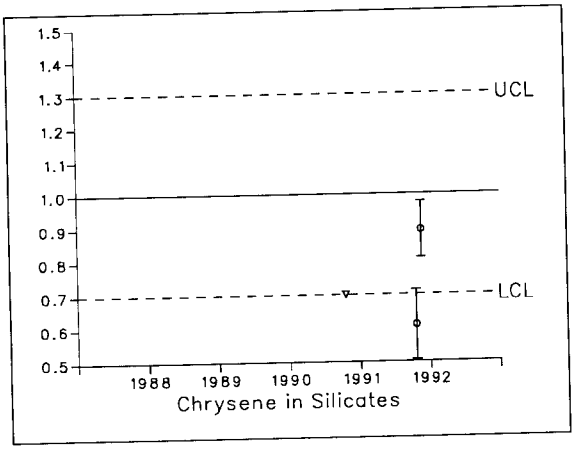
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
p-Chlorotoluene in Silicates

Fig. F-3. (cont)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1.4
1.3
1.2
1.1
1.0
0.9
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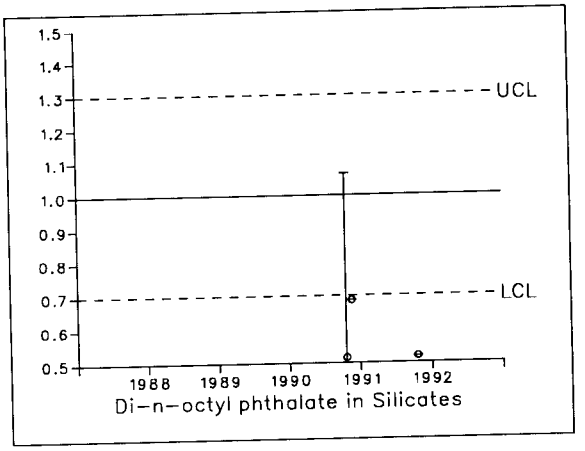
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Chrysene in Silicates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1.4
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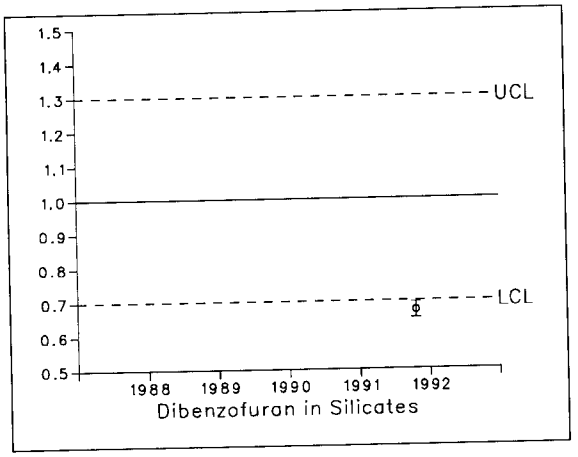
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Di-n-octyl phthalate in Silicates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1.2
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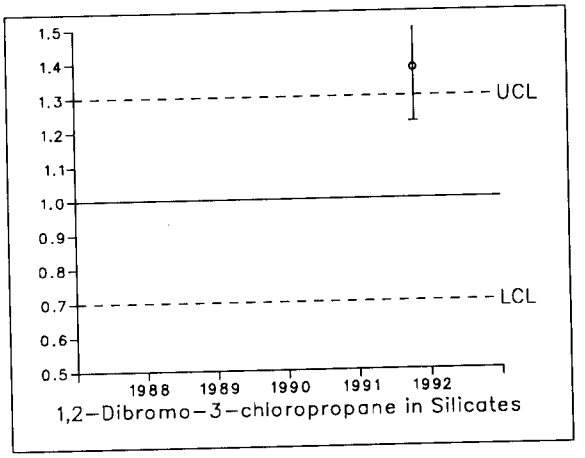
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Dibenzofuran in Silicates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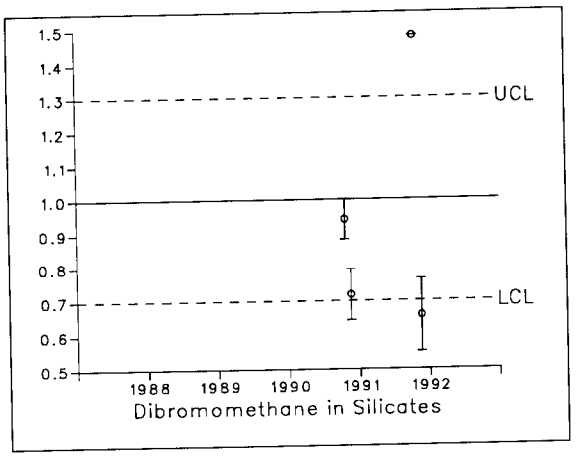
UCL
LCL
1988
1989
1990
1991
1992
1,2-Dibromo-3-chloropropane in Silicates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LCL
1988
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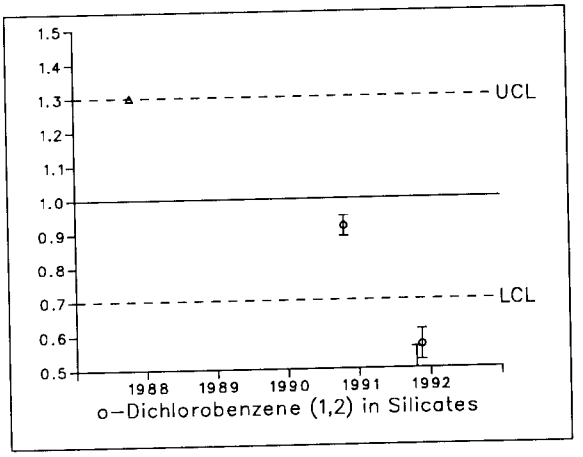
1990
1991
1992
Dibromomethane in Silicates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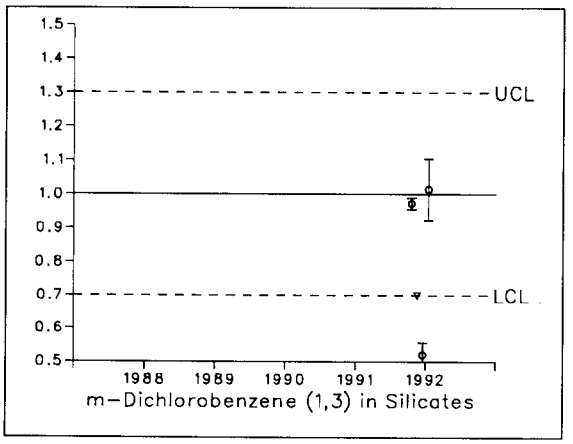
LCL
1988
1989
1990
1991
1992
o-Dichlorobenzene (1,2) in Silicates

Fig. F-3. (cont)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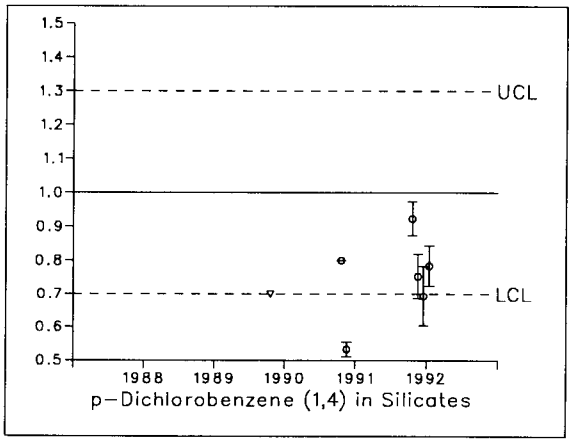
UCL
LCL
1988 1989 1990 1991 1992
m-Dichlorobenzene (1,3) in Silicates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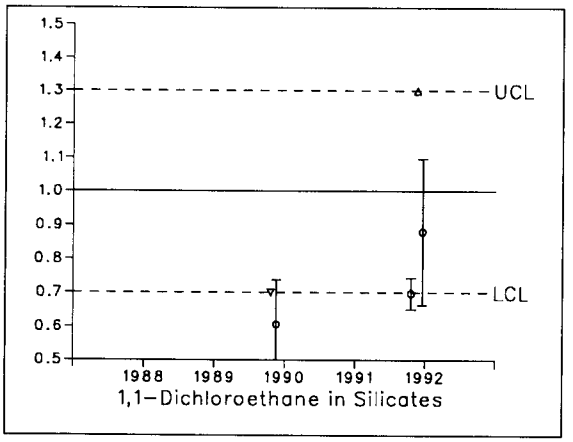
UCL
LCL
1988 1989 1990 1991 1992
p-Dichlorobenzene (1,4) in Silicates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UCL
LCL
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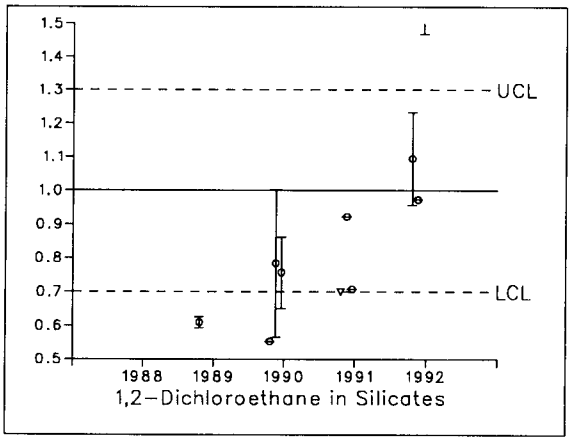
1,1-Dichloroethane in Silicates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LCL
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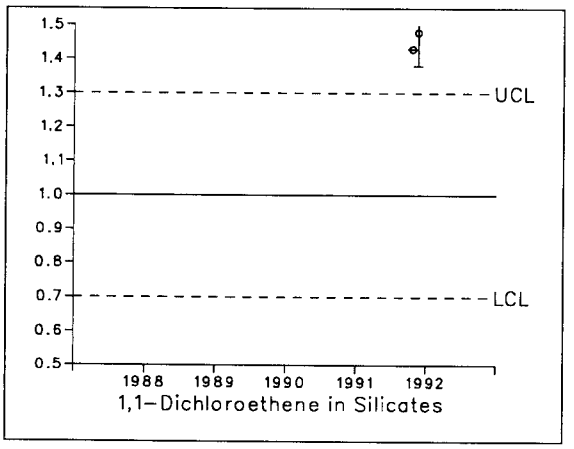
1,2-Dichloroethane in Silicates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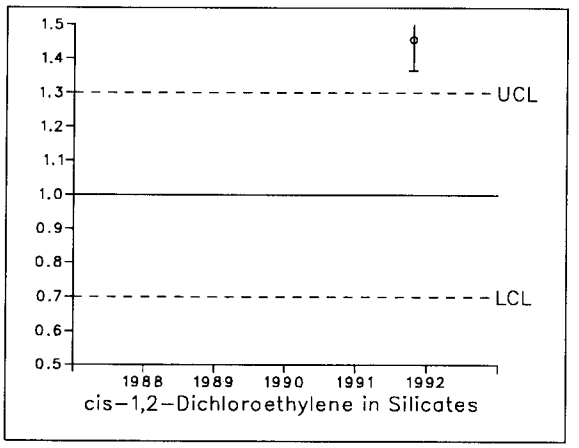
LCL
1988 1989 1990 1991 1992
1,1-Dichloroethene in Silicates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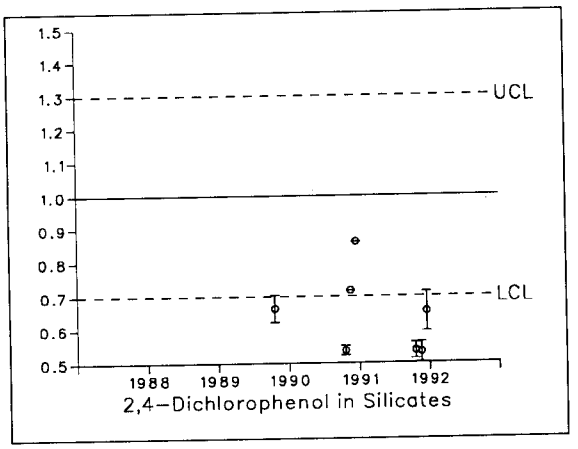
UCL
LCL
1988 1989 1990 1991 1992
cis-1,2-Dichloroethylene in Silicates

Fig. F-3. (cont)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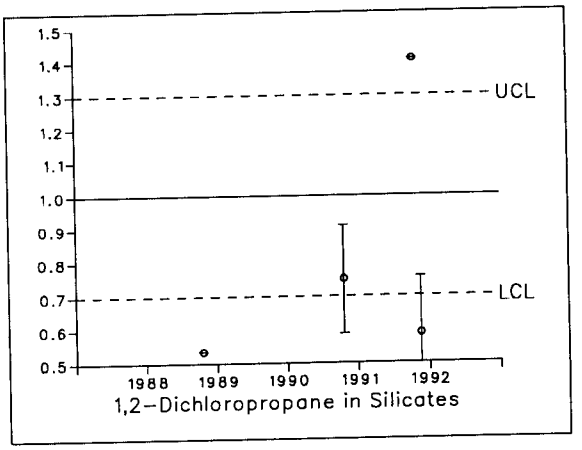
0.5
UCL
LCL
1988
1989
1990
1991
1992
2,4–Dichlorophenol in Silicates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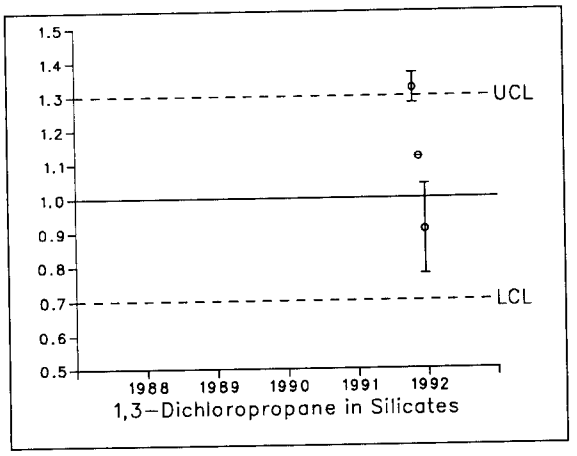
UCL
LCL
1988
1989
1990
1991
1992
1,2–Dichloropropane in Silicates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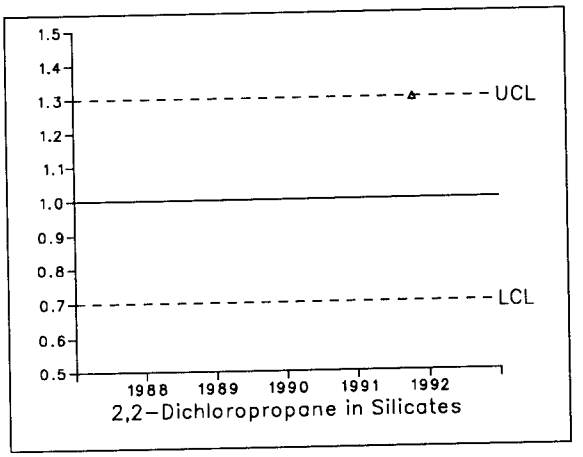
UCL
LCL
1988
1989
1990
1991
1992
1,3–Dichloropropane in Silicates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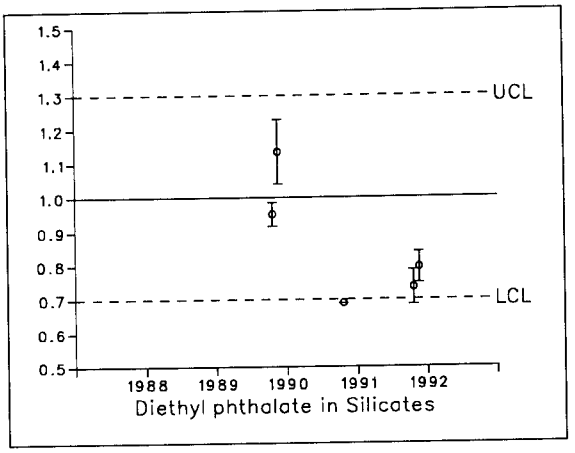
LCL
1988
1989
1990
1991
1992
2,2–Dichloropropane in Silicates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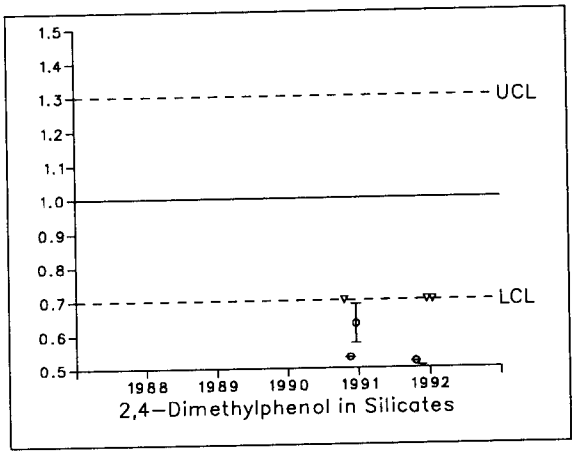
LCL
1988
1989
1990
1991
1992
Diethyl phthalate in Silicates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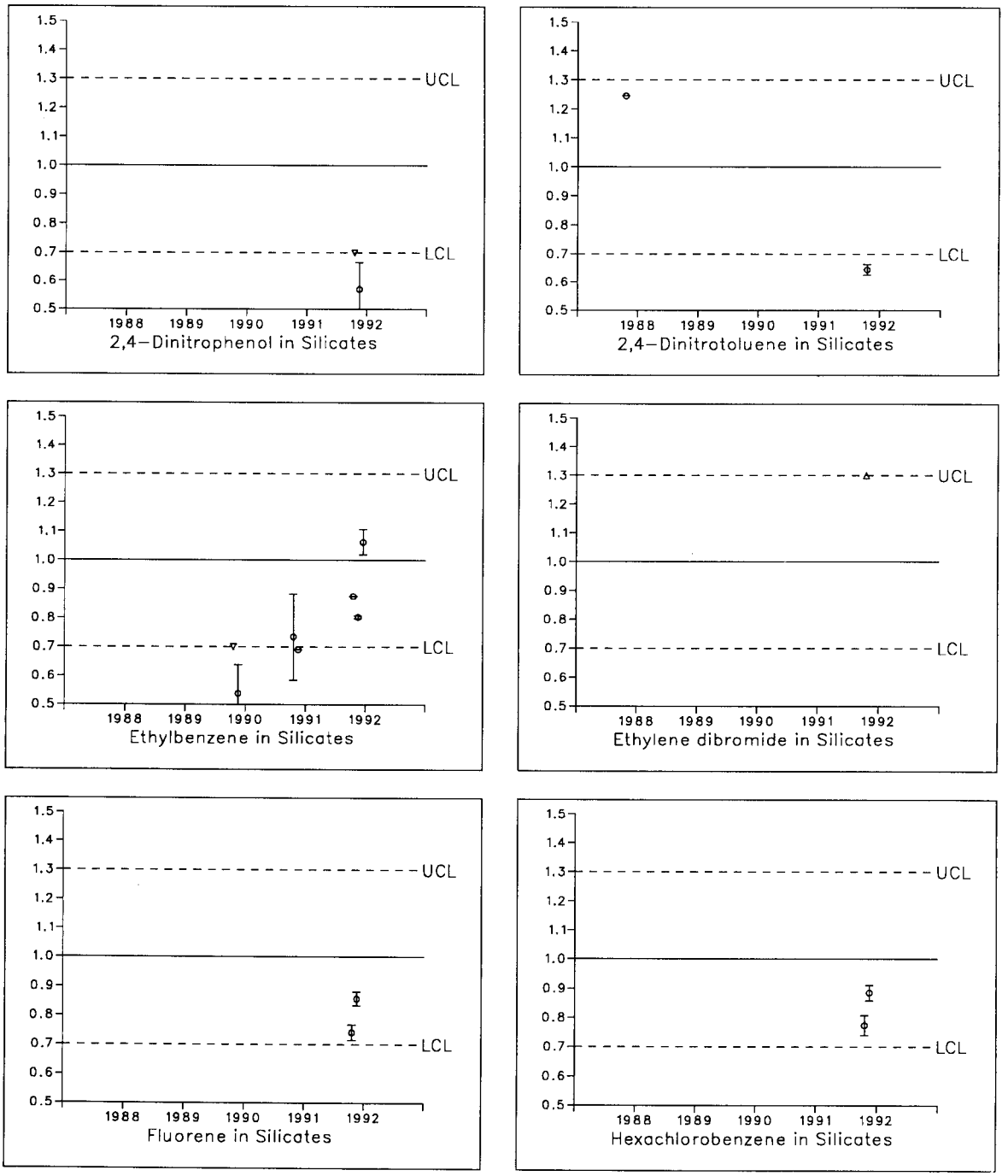
UCL
LCL
1988
1989
1990
1991
1992
2,4–Dimethylphenol in Silicates

Fig. F-3. (cont)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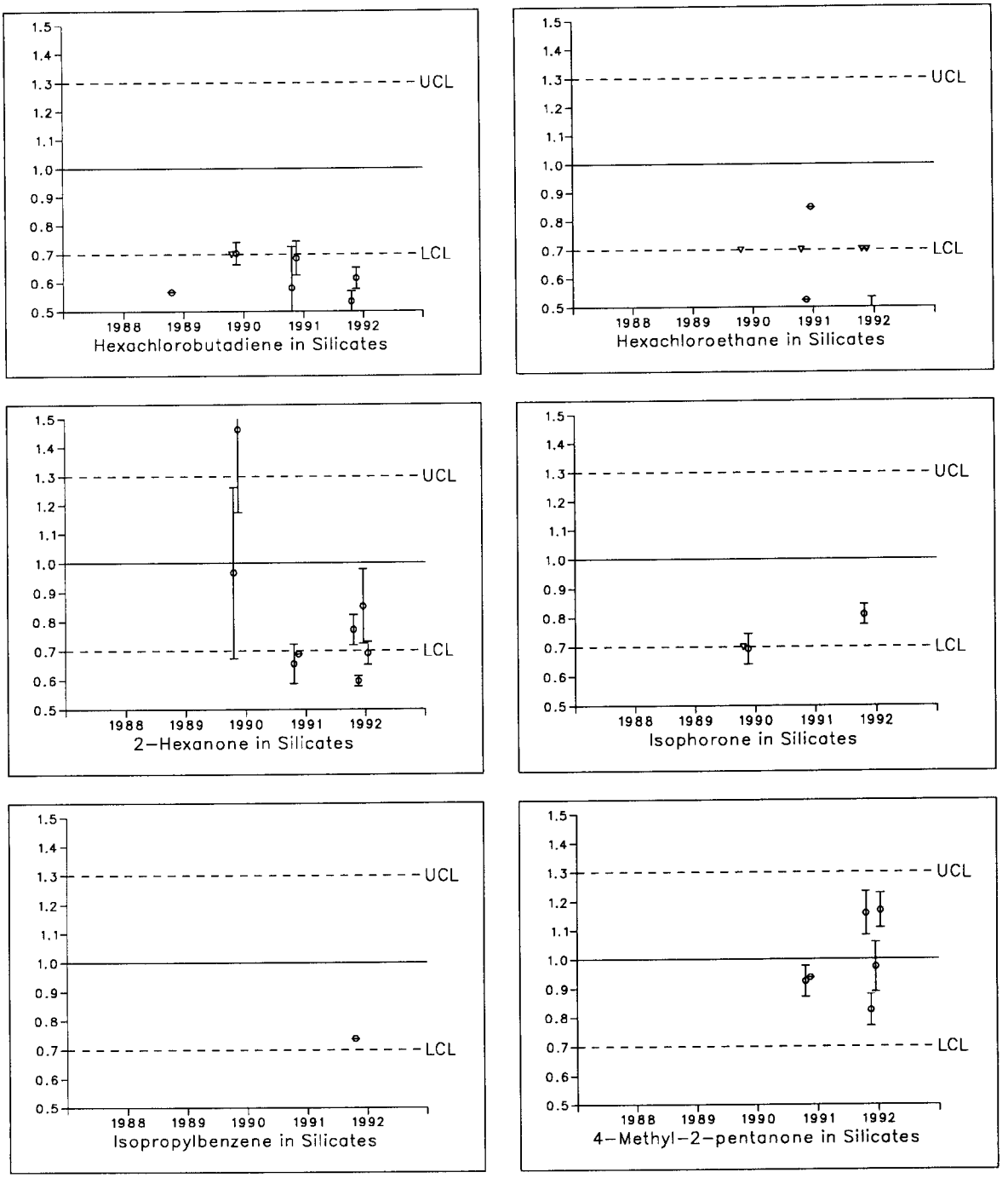
UCL
LCL
1988 1989 1990 1991 1992
2,4-Dinitrophenol in Silicates
2,4-Dinitrotoluene in Silicates
Ethylbenzene in Silicates
Ethylene dibromide in Silicates
Fluorene in Silicates
Hexachlorobenzene in Silicates

Fig. F-3. (cont)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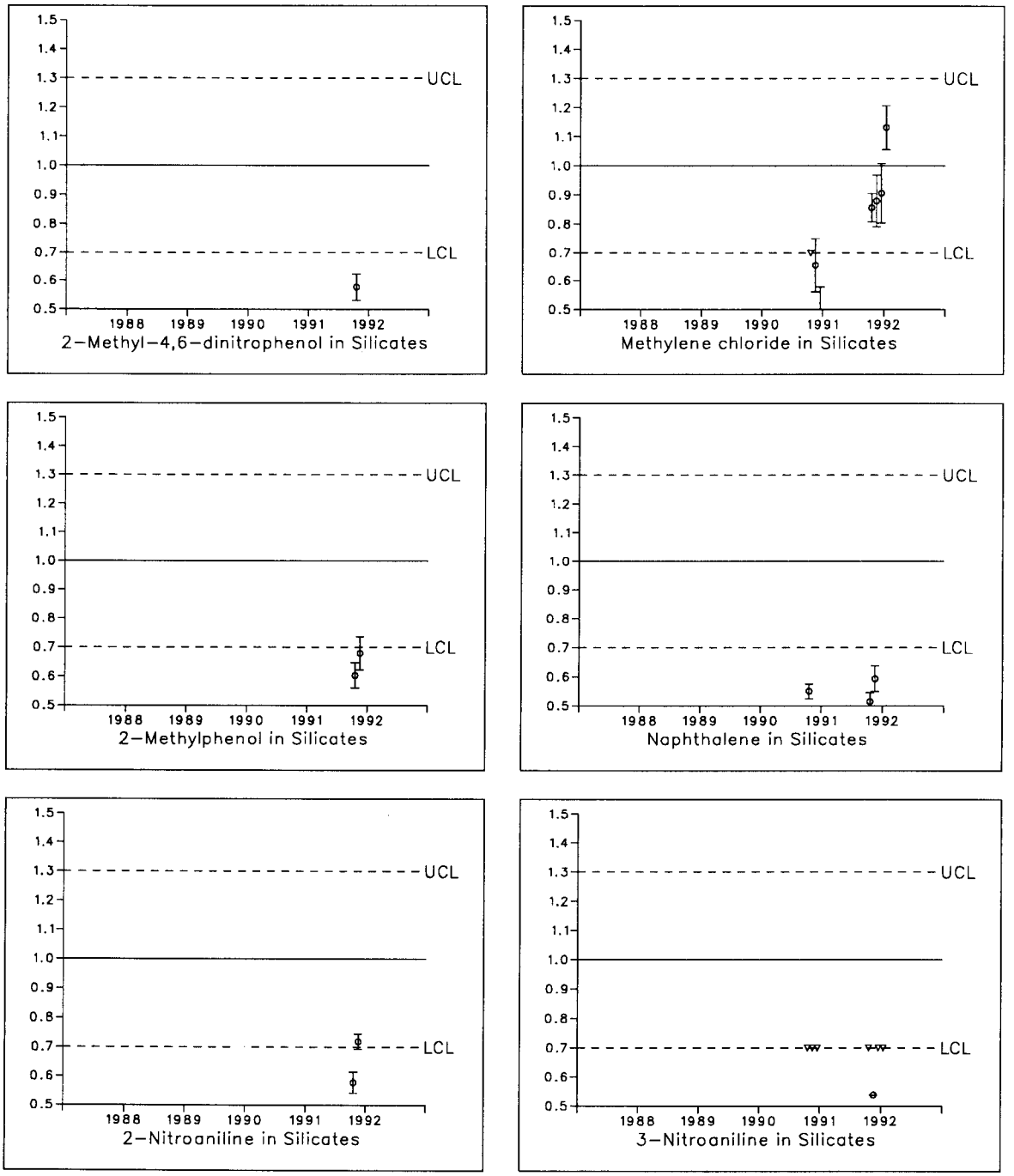
UCL
LCL
1988 1989 1990 1991 1992
Hexachlorobutadiene in Silicates
Hexachloroethane in Silicates
2-Hexanone in Silicates
Isophorone in Silicates
Isopropylbenzene in Silicates
4-Methyl-2-pentanone in Silicates

Fig. F-3. (cont)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0.8
0.7
0.6
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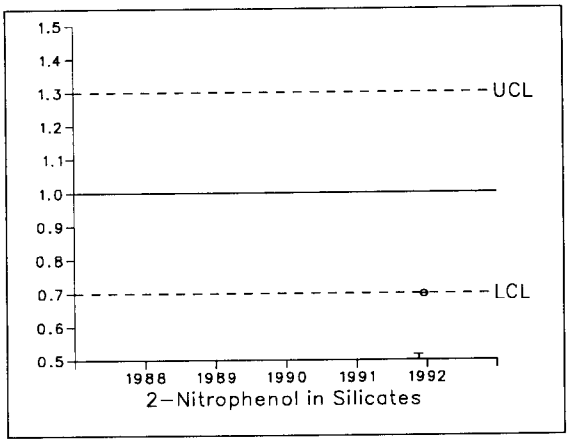
UCL
LCL
1988 1989 1990 1991 1992
2-Methyl-4,6-dinitrophenol in Silicates
Methylene chloride in Silicates
2-Methylphenol in Silicates
Naphthalene in Silicates
2-Nitroaniline in Silicates
3-Nitroaniline in Silicates

Fig. F-3. (cont)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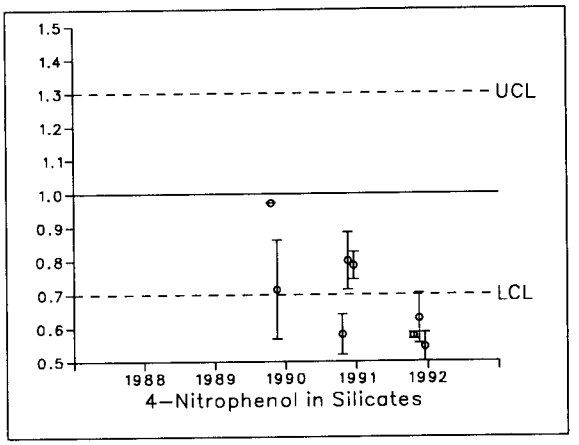
UCL
LCL
1988
1989
1990
1991
1992
2–Nitrophenol in Silicates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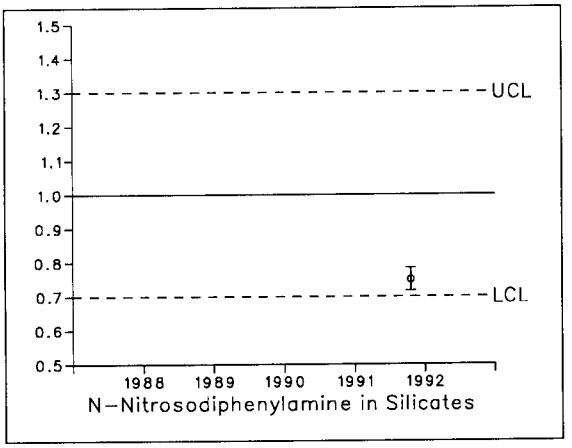
UCL
LCL
1988
1989
1990
1991
1992
4–Nitrophenol in Silicates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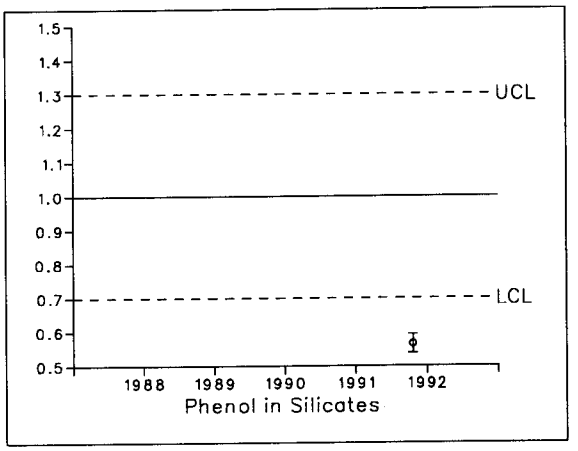
UCL
LCL
1988
1989
1990
1991
1992
N–Nitrosodiphenylamine in Silicates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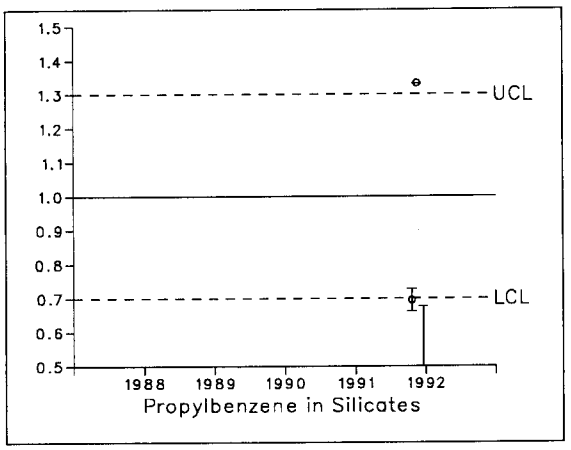
UCL
LCL
1988
1989
1990
1991
1992
Phenol in Silicates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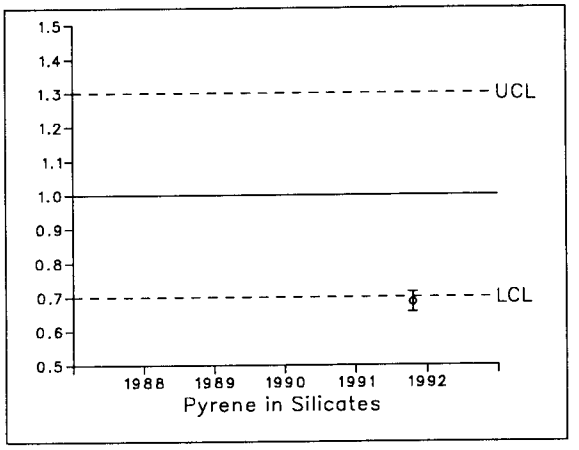
LCL
1988
1989
1990
1991
1992
Propylbenzene in Silicates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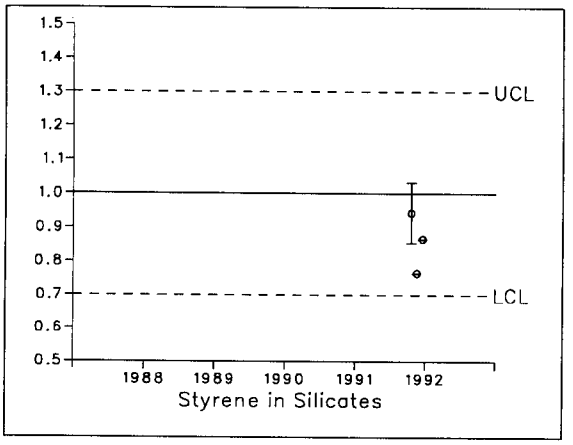
UCL
LCL
1988
1989
1990
1991
1992
Pyrene in Silicates

Fig. F-3. (cont)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LCL
1988
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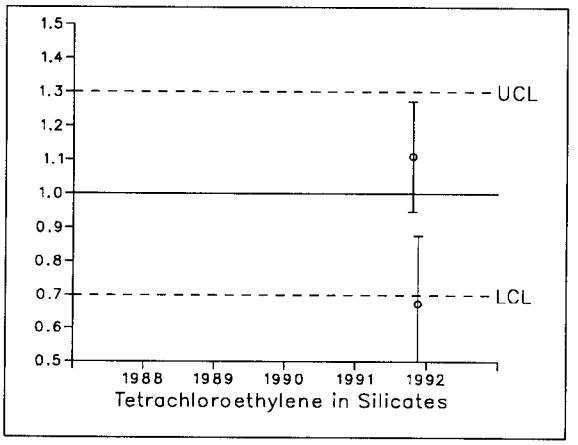
1990
1991
1992
Styrene in Silicates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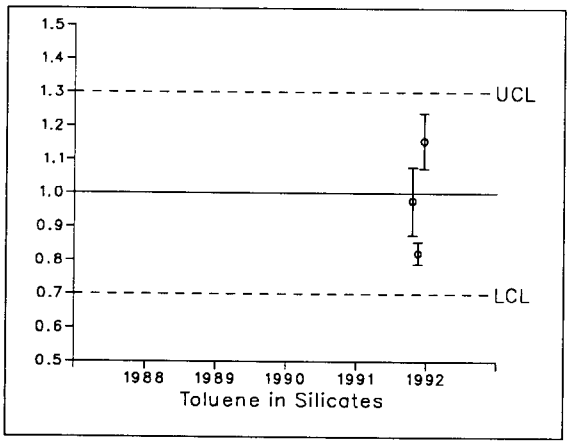
UCL
LCL
1988
1989
1990
1991
1992
Tetrachloroethylene in Silicates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LCL
1988
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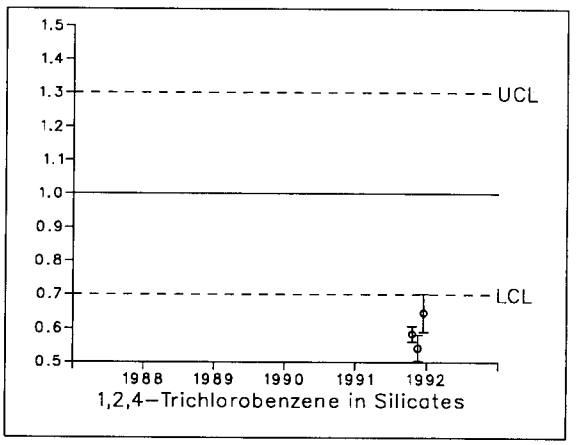
1990
1991
1992
Toluene in Silicates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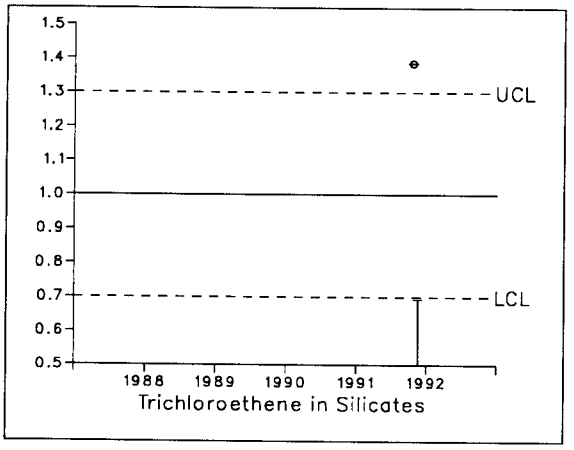
UCL
LCL
1988
1989
1990
1991
1992
1,2,4–Trichlorobenzene in Silicates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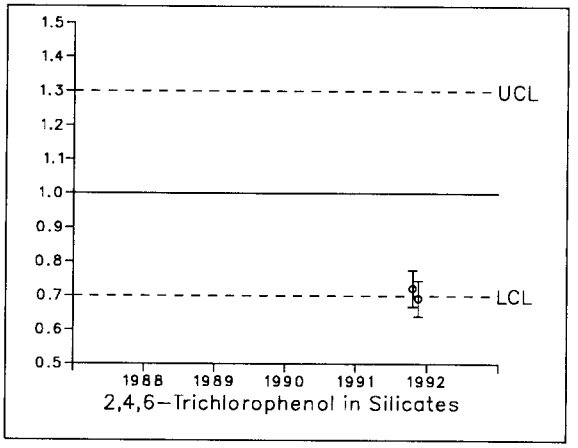
LCL
1988
1989
1990
1991
1992
Trichloroethene in Silicates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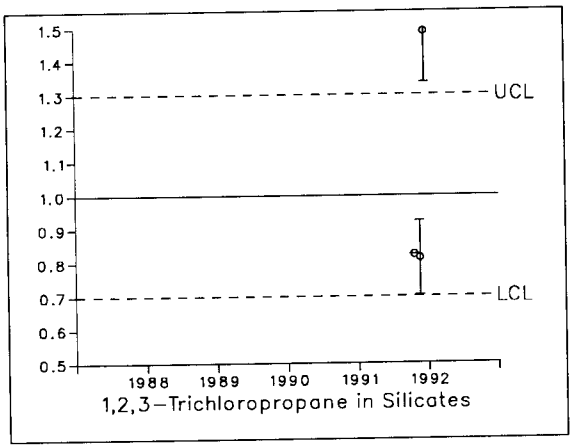
UCL
LCL
1988
1989
1990
1991
1992
2,4,6–Trichlorophenol in Silicates

Fig. F-3. (cont)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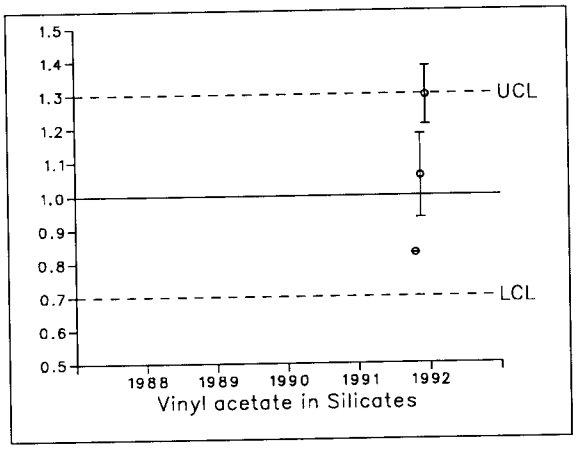
1988
1989
1990
1991
1992
1,2,3–Trichloropropane in Silicates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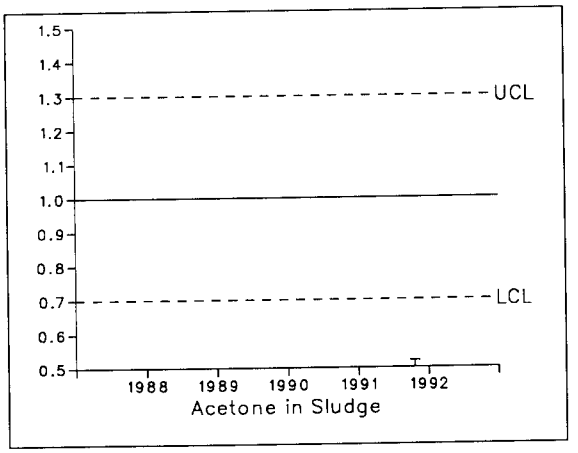
UCL
LCL
1988
1989
1990
1991
1992
Vinyl acetate in Silicates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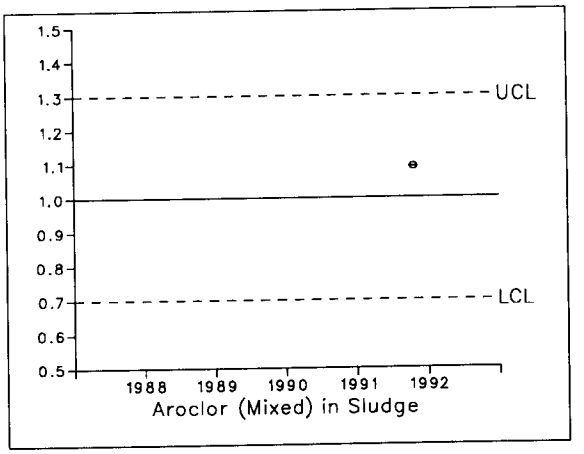
UCL
LCL
1988
1989
1990
1991
1992
Acetone in Sludge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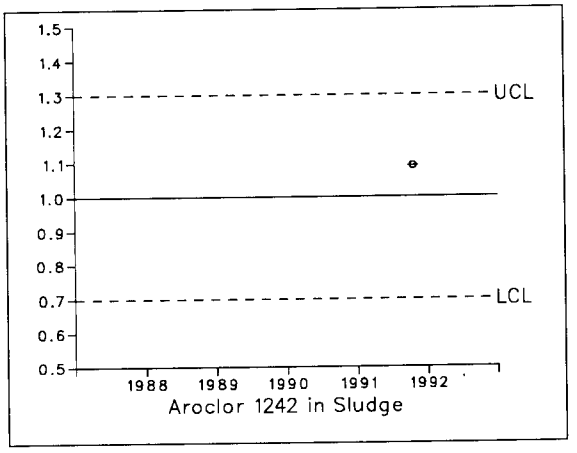
UCL
LCL
1988
1989
1990
1991
1992
Aroclor (Mixed) in Sludge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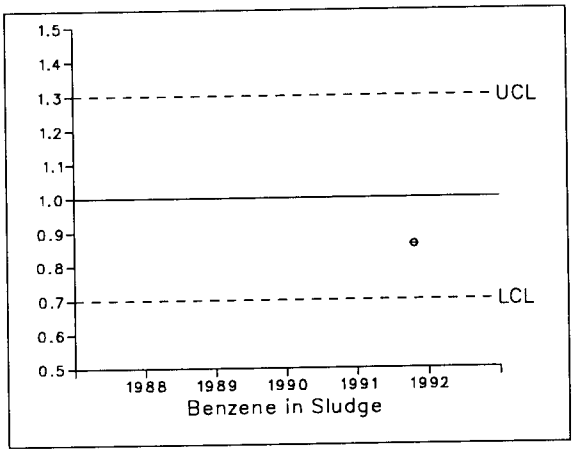
1989
1990
1991
1992
Aroclor 1242 in Sludge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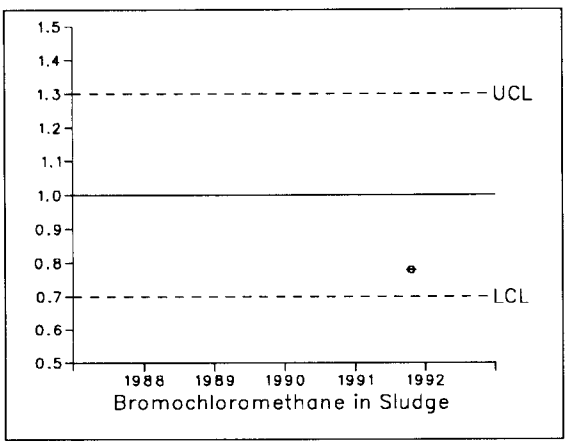
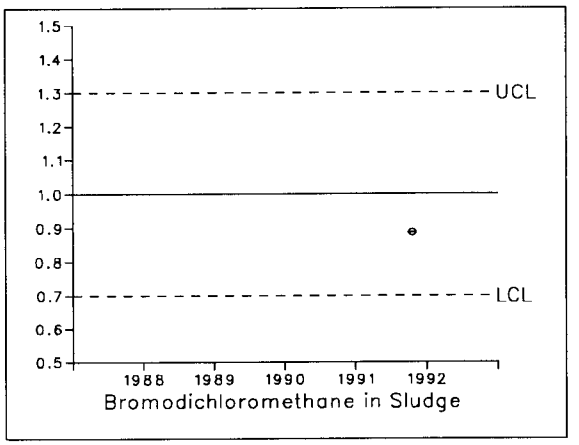
UCL
LCL
1988
1989
1990
1991
1992
Benzene in Sludge

Fig. F-3. (cont)


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
Bromochloromethane in Sludge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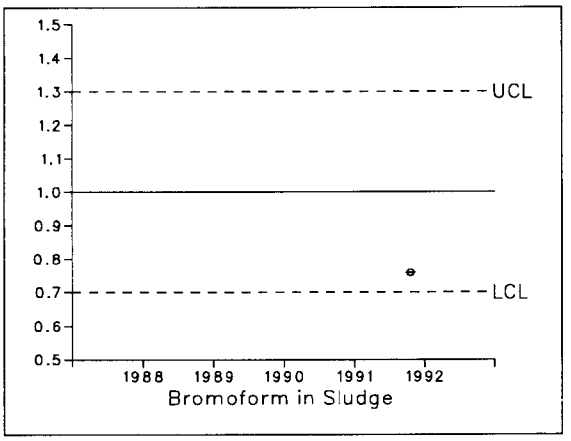
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
Bromodichloromethane in Sludge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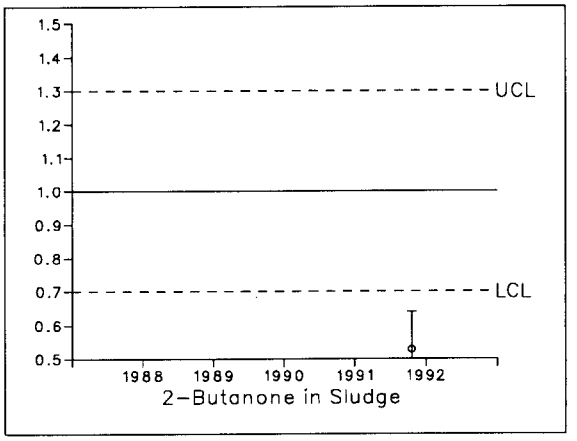
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
Bromoform in Sludge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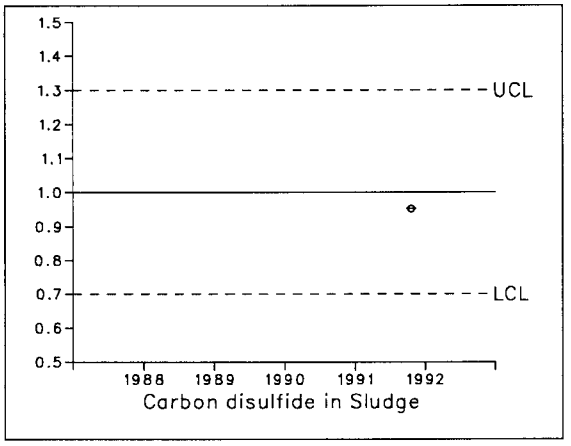
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
2-Butanone in Sludge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1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
Carbon disulfide in Sludge

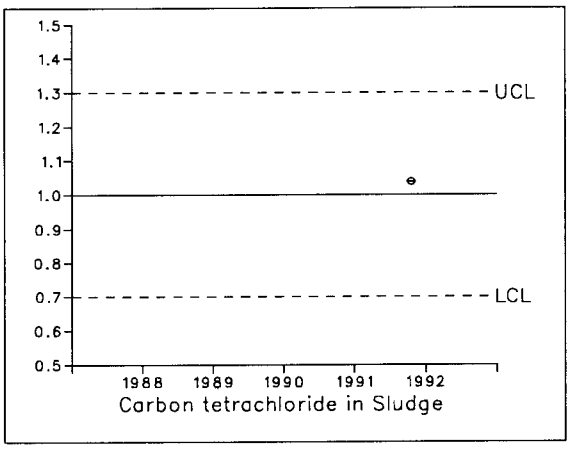

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
Carbon tetrachloride in Sludge

Fig. F-3. (cont)

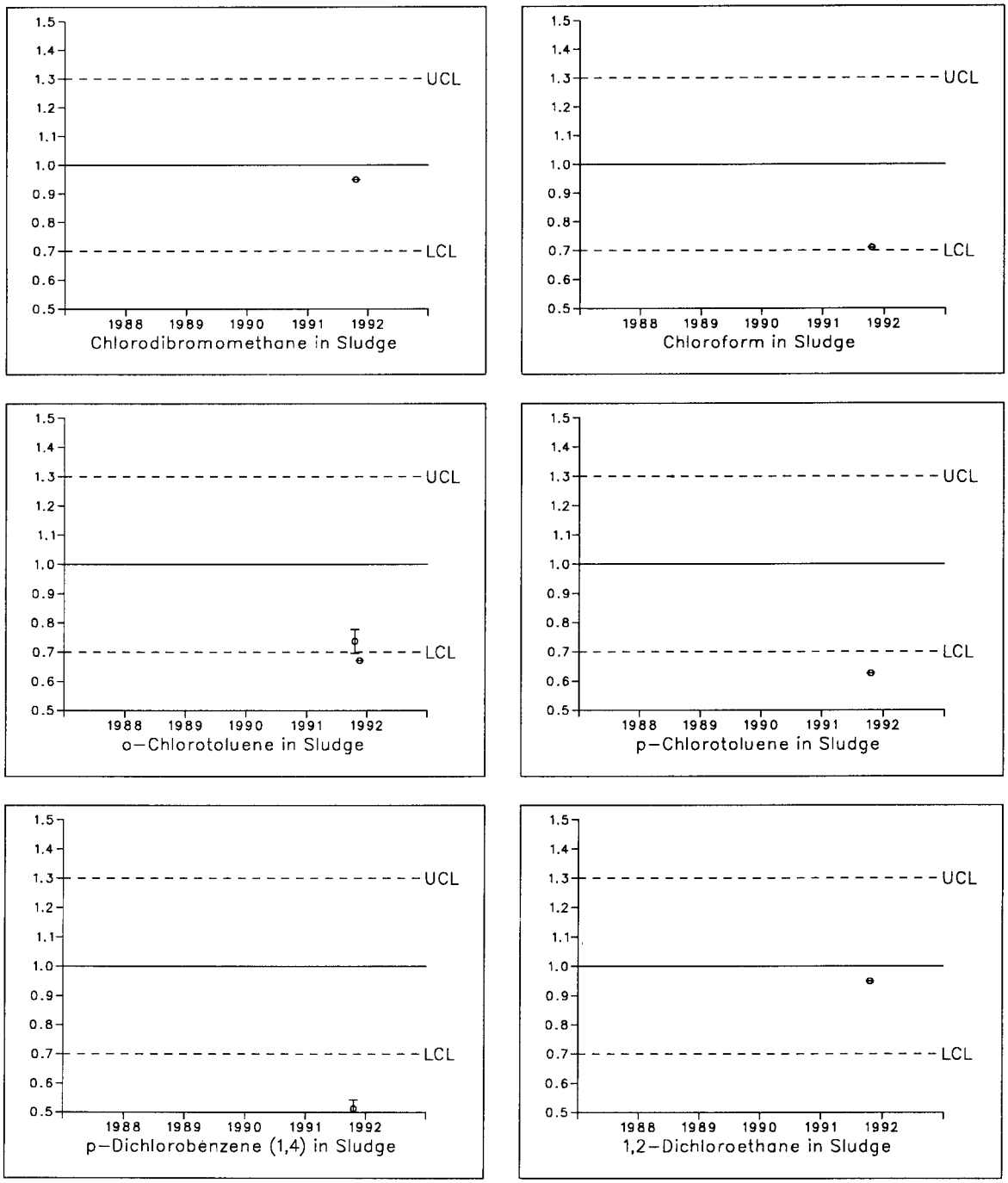

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
Chlorodibromomethane in Sludge
Chloroform in Sludge
o-Chlorotoluene in Sludge
p-Chlorotoluene in Sludge
p-Dichlorobenzene (1,4) in Sludge
1,2-Dichloroethane in Sludge

Fig. F-3. (cont)

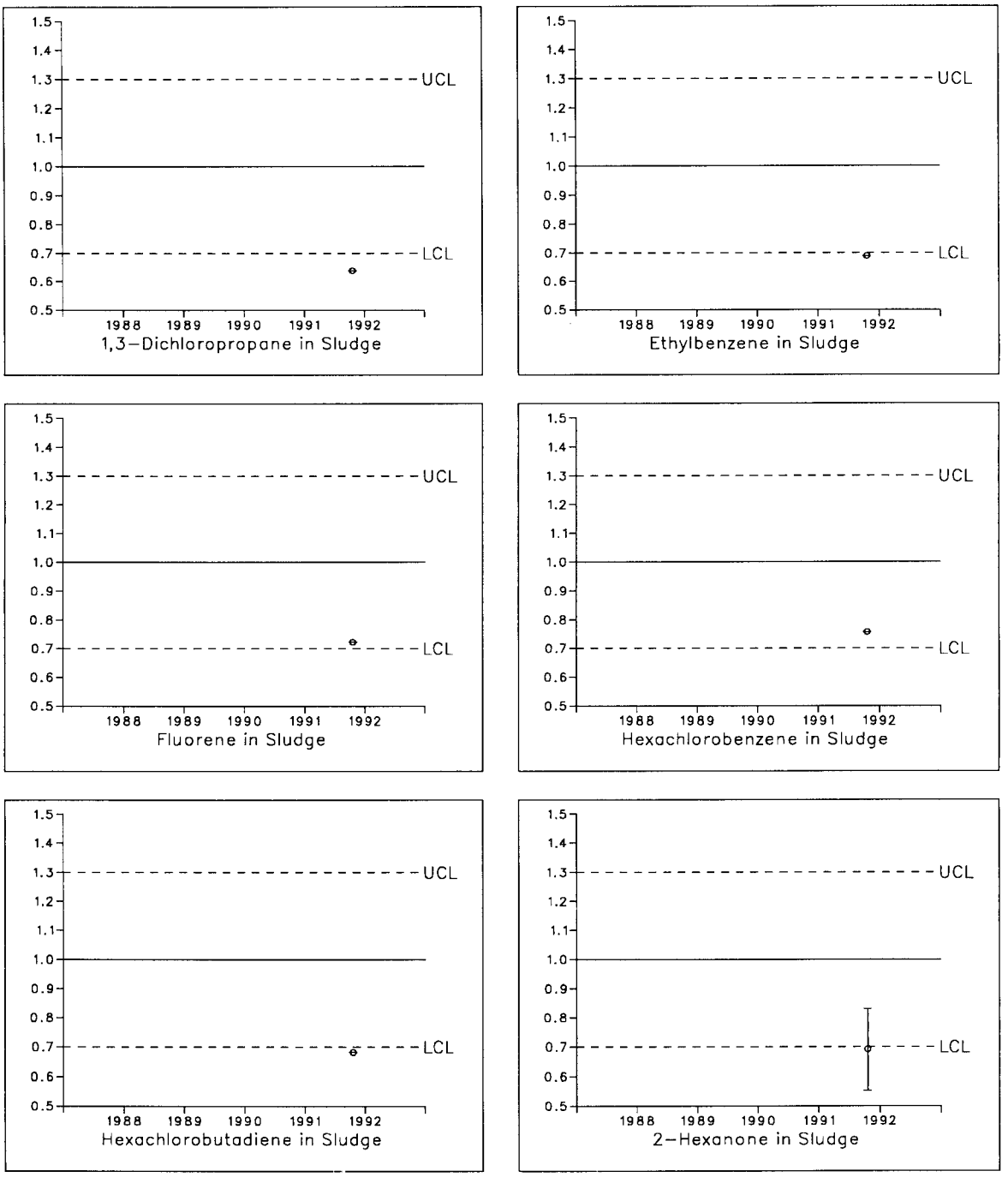

1,3-Dichloropropane in Sludge
Ethylbenzene in Sludge
Fluorene in Sludge
Hexachlorobenzene in Sludge
Hexachlorobutadiene in Sludge
2-Hexanone in Sludge
UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992

Fig. F-3. (cont)

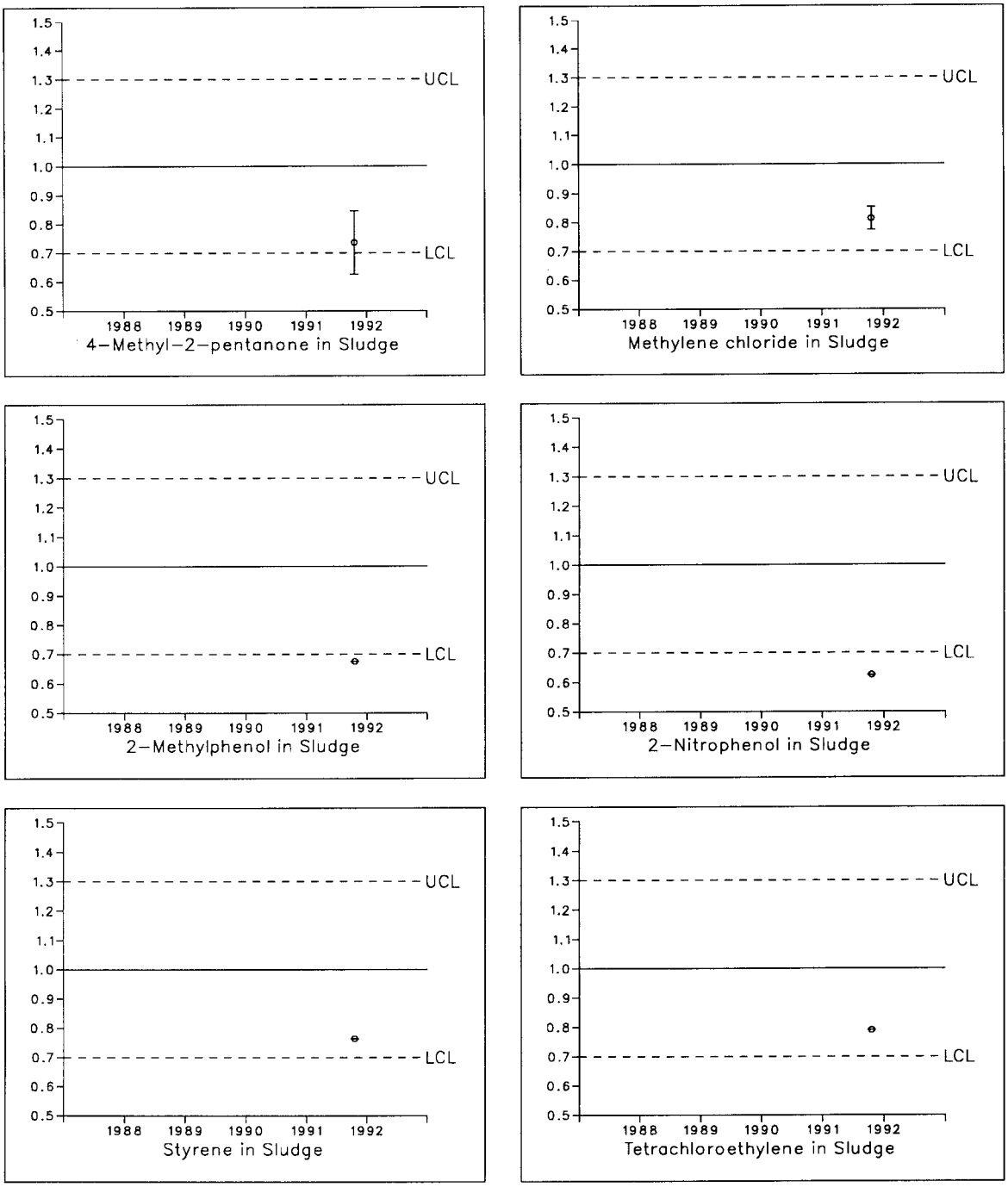
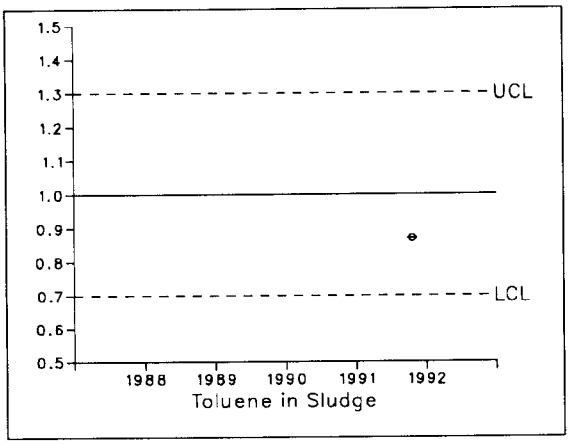
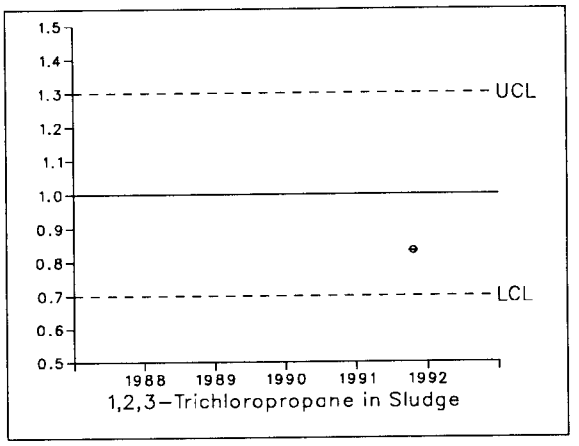
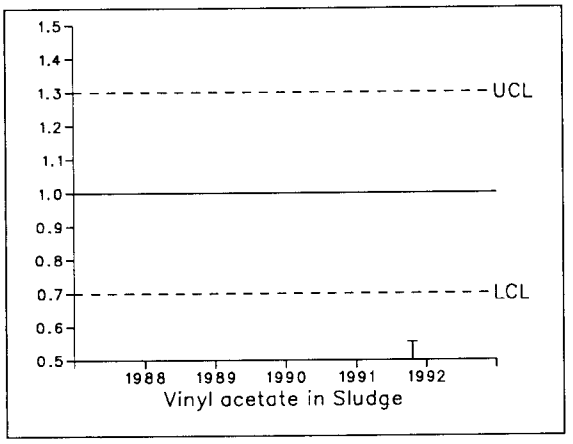
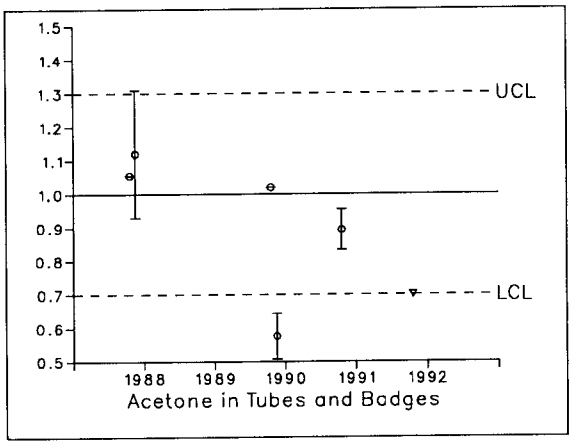

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
4-Methyl-2-pentanone in Sludge
Methylene chloride in Sludge
2-Methylphenol in Sludge
2-Nitrophenol in Sludge
Styrene in Sludge
Tetrachloroethylene in Sludge

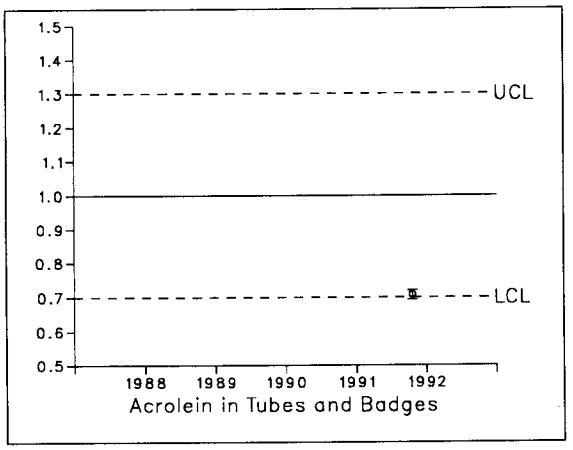
Fig. F-3. (cont)


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Toluene in Sludge


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
1,2,3–Trichloropropane in Sludge


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Vinyl acetate in Sludge


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Acetone in Tubes and Badges


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Acrolein in Tubes and Badges

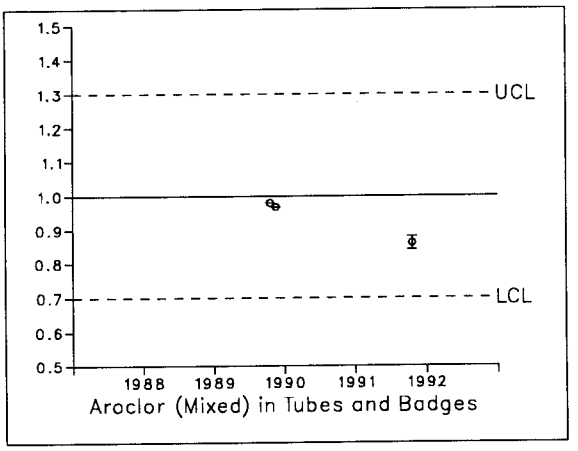

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Aroclor (Mixed) in Tubes and Badges

Fig. F-3. (cont)

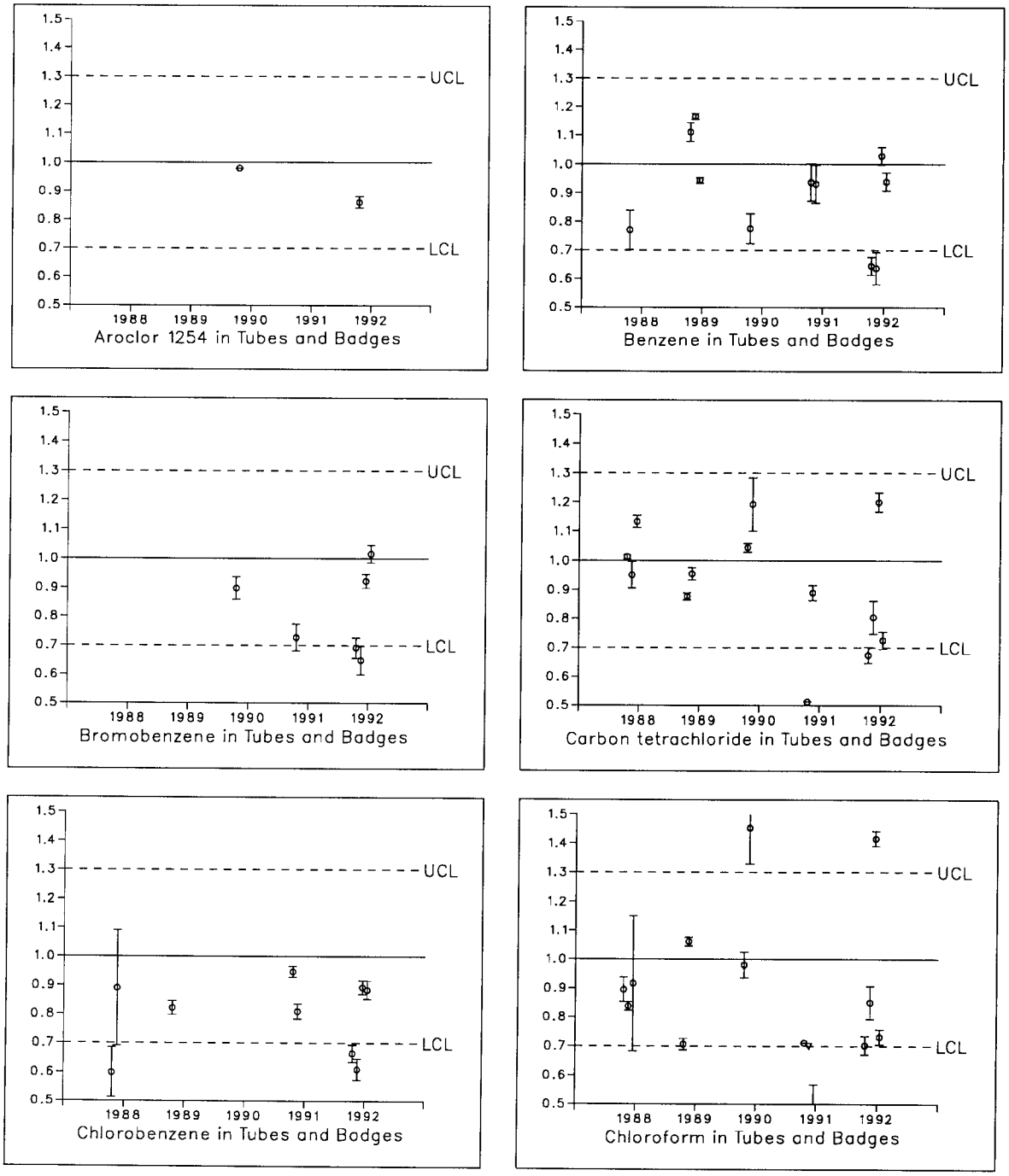

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
Aroclor 1254 in Tubes and Badges
Benzene in Tubes and Badges
Bromobenzene in Tubes and Badges
Carbon tetrachloride in Tubes and Badges
Chlorobenzene in Tubes and Badges
Chloroform in Tubes and Badges

Fig. F-3. (cont)

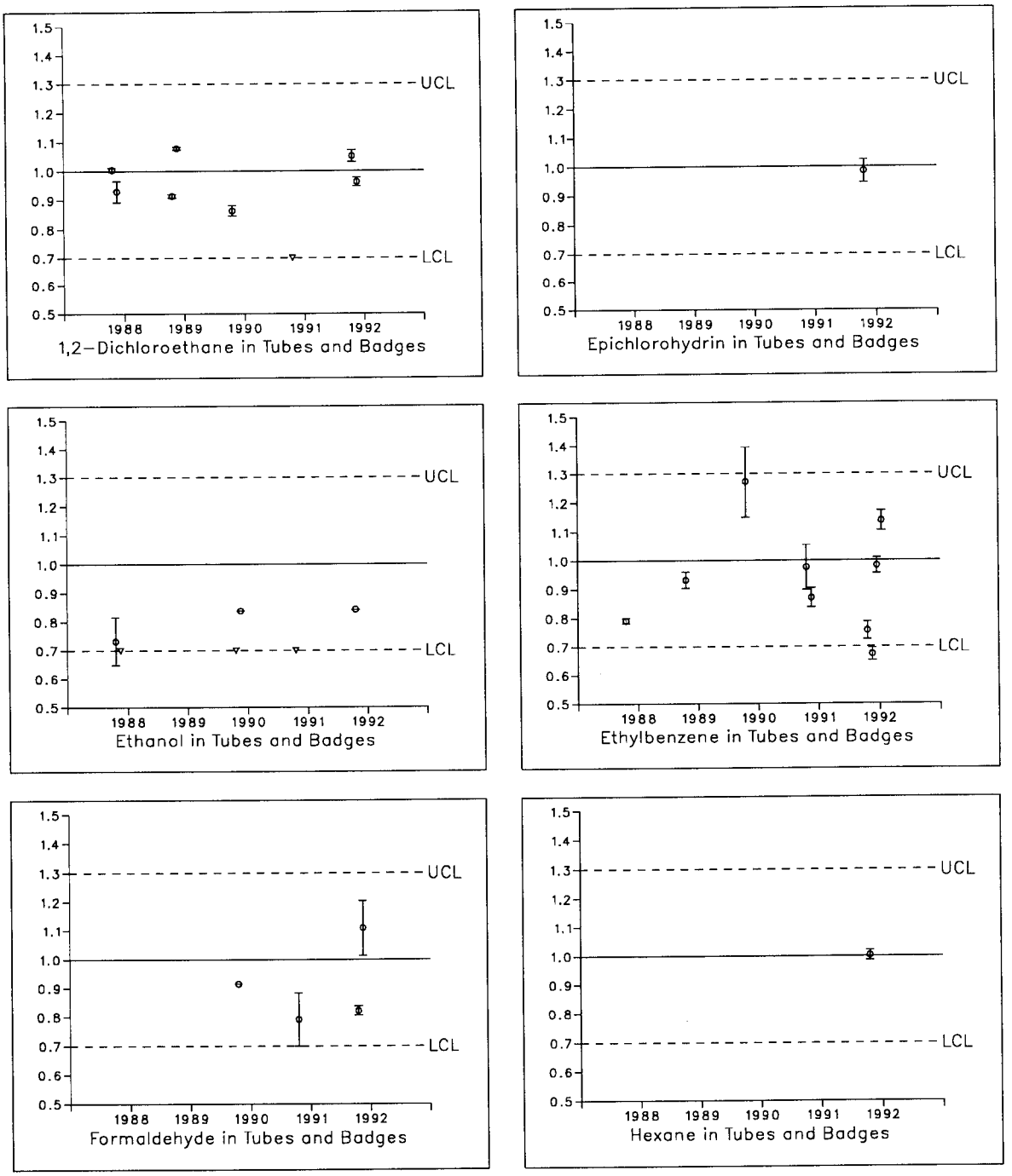

1,2–Dichloroethane in Tubes and Badges
Epichlorohydrin in Tubes and Badges
Ethanol in Tubes and Badges
Ethylbenzene in Tubes and Badges
Formaldehyde in Tubes and Badges
Hexane in Tubes and Badges
UCL
LCL
1988
1989
1990
1991
1992

Fig. F-3. (cont)

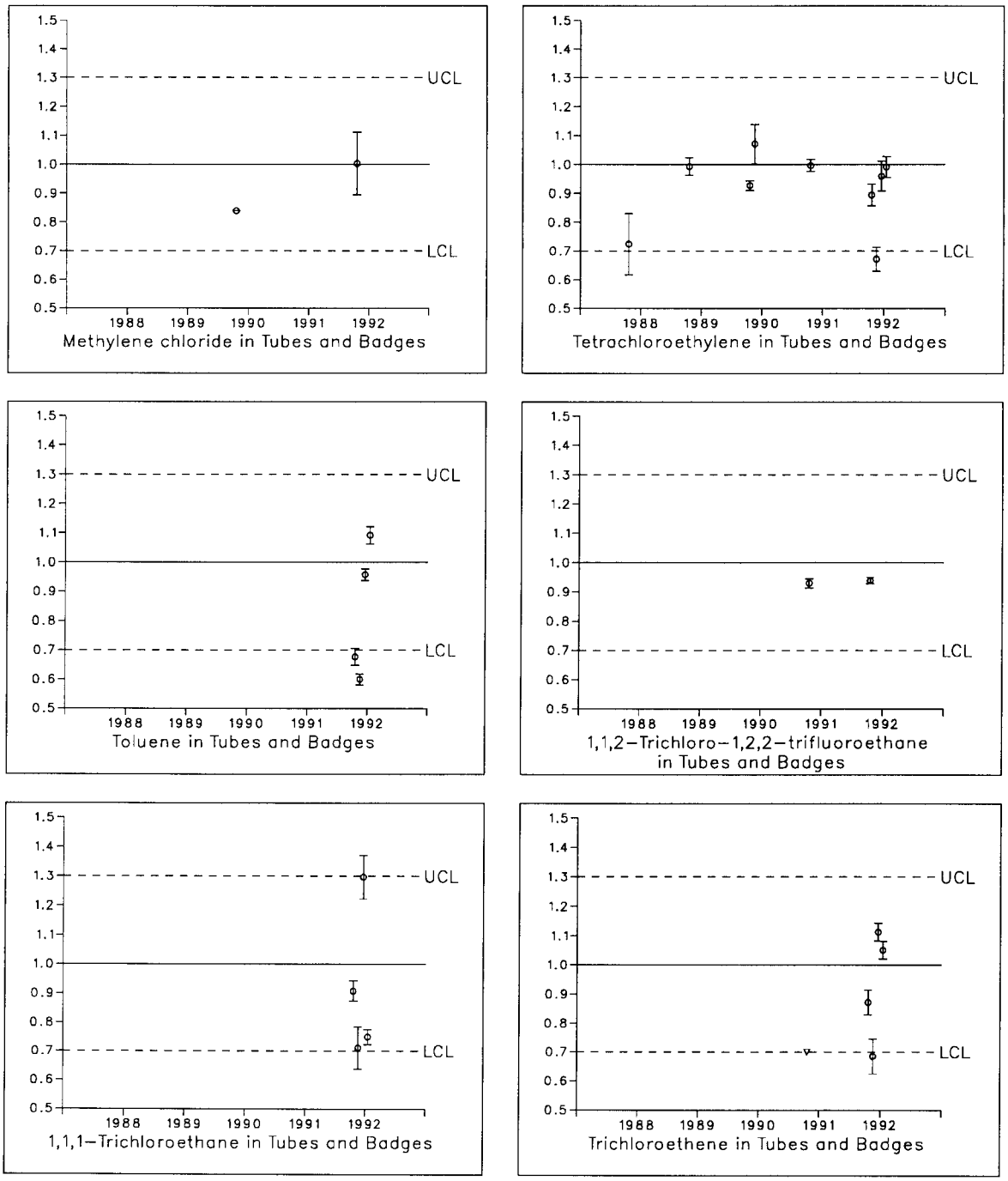
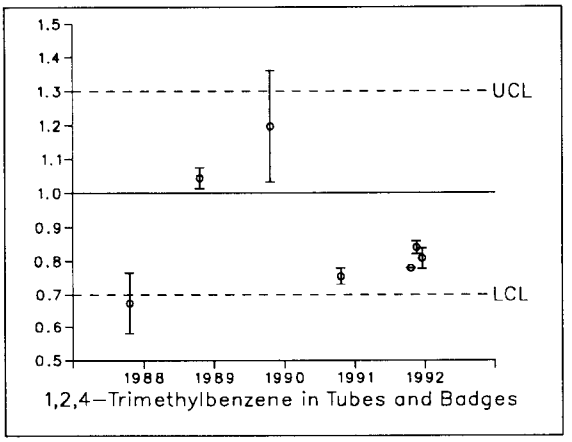
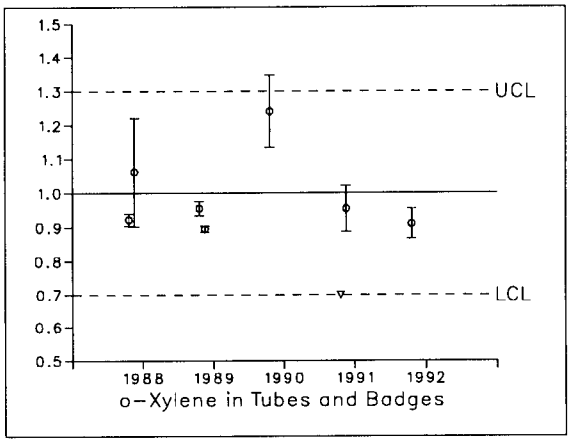
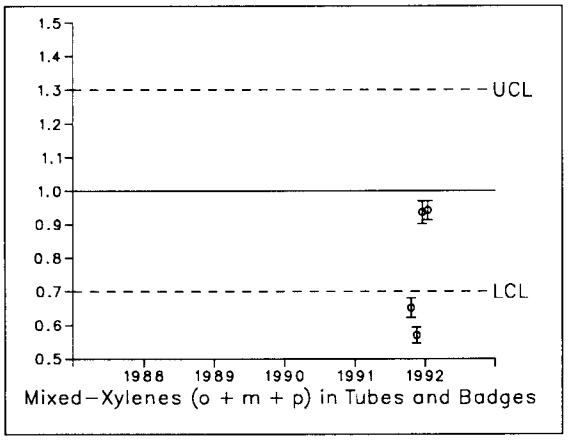
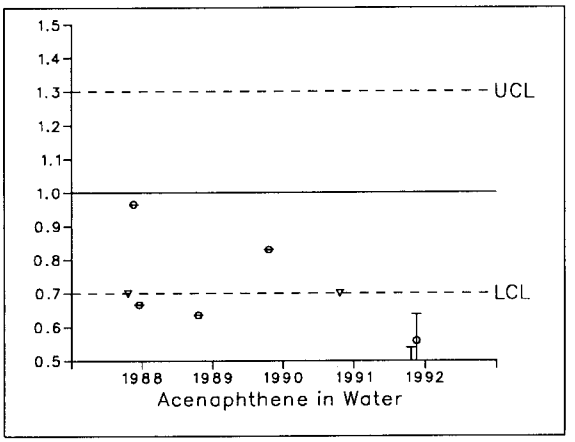

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Methylene chloride in Tubes and Badges
Tetrachloroethylene in Tubes and Badges
Toluene in Tubes and Badges
1,1,2–Trichloro–1,2,2–trifluoroethane in Tubes and Badges
1,1,1–Trichloroethane in Tubes and Badges
Trichloroethene in Tubes and Badges

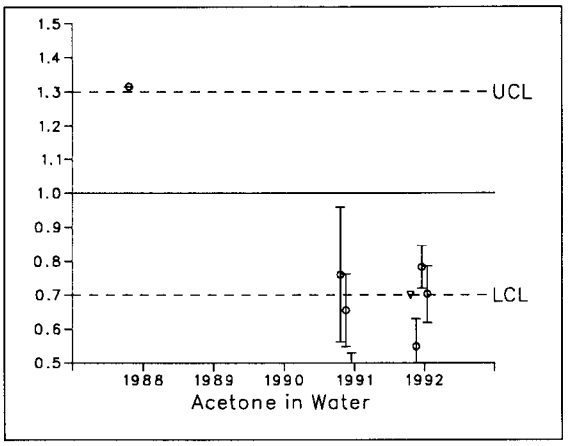
Fig. F-3. (cont)


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
1,2,4–Trimethylbenzene in Tubes and Badges


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
o–Xylene in Tubes and Badges


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Mixed–Xylenes (o + m + p) in Tubes and Badges


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Acenaphthene in Water


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Acetone in Water

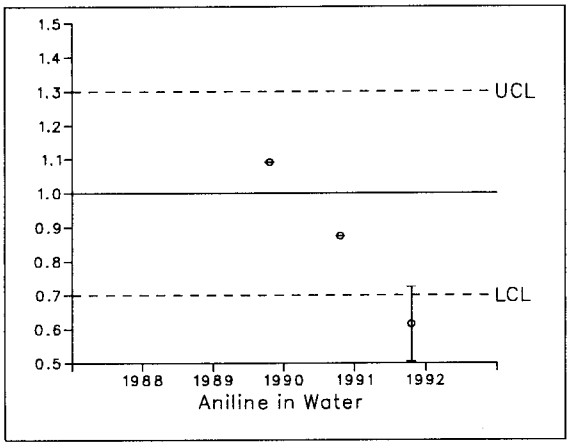
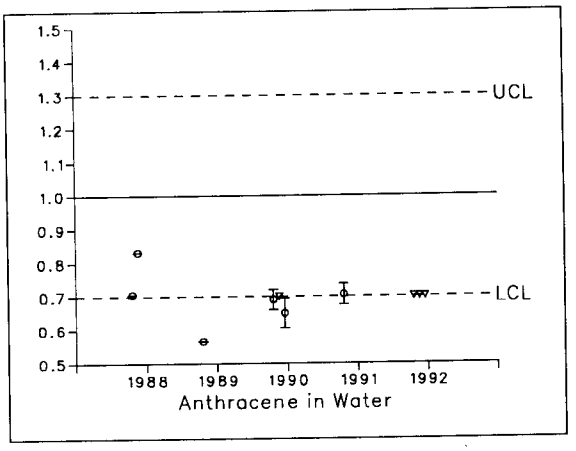
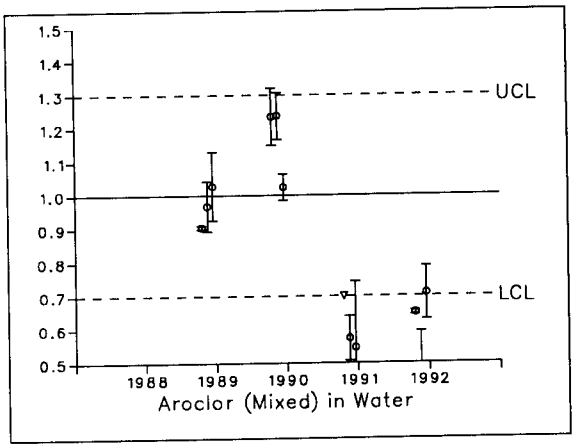
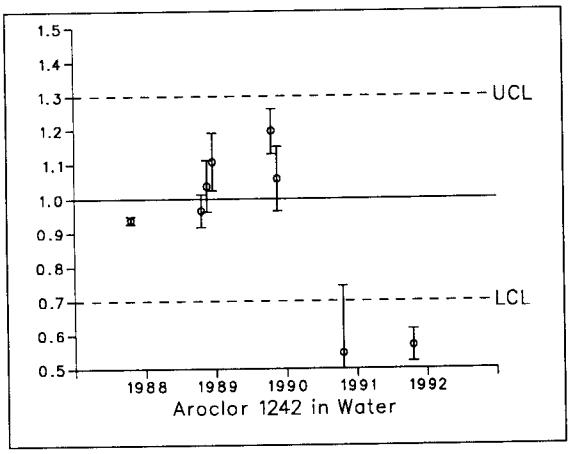
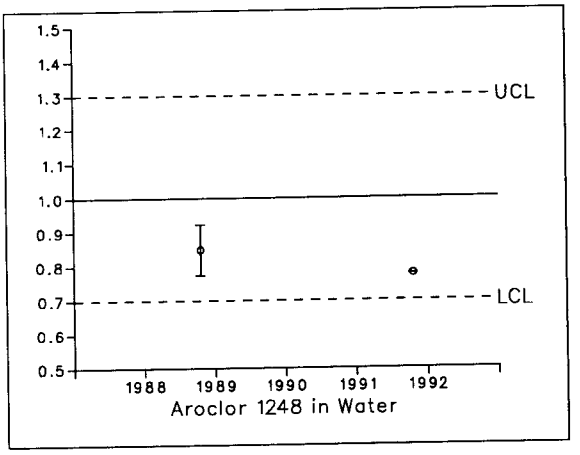

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Aniline in Water

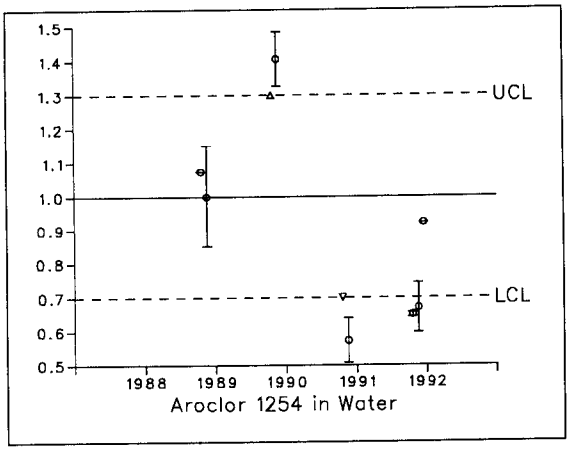
Fig. F-3. (cont)


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Anthracene in Water


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Aroclor (Mixed) in Water


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Aroclor 1242 in Water


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Aroclor 1248 in Water


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Aroclor 1254 in Water

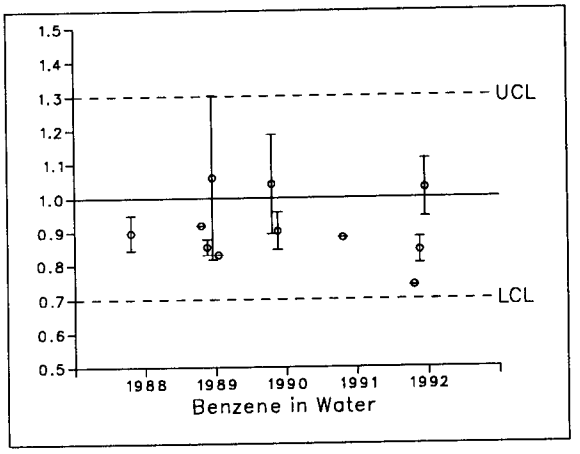

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Benzene in Water

Fig. F-3. (cont)

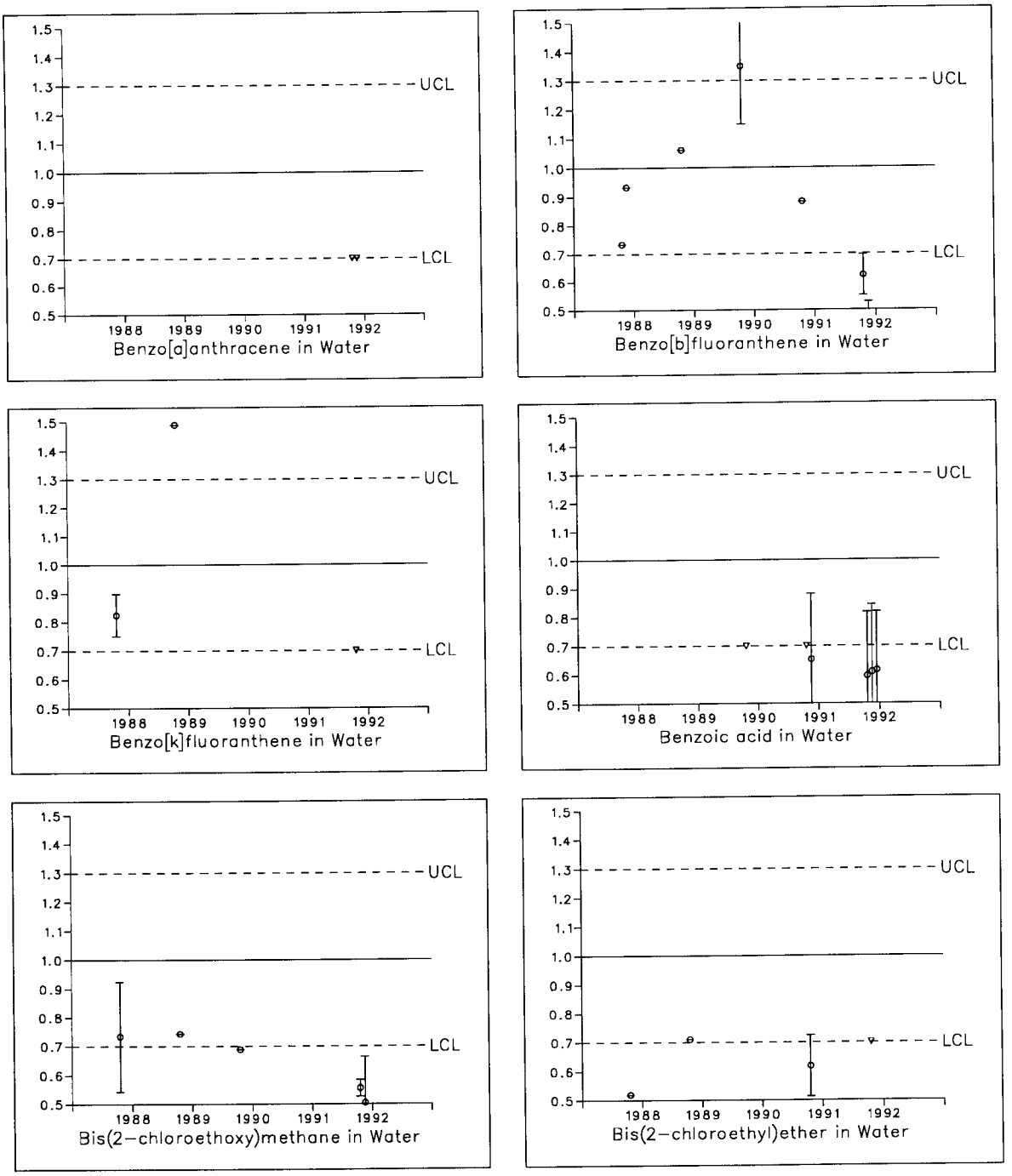

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
Benzo[a]anthracene in Water
Benzo[b]fluoranthene in Water
Benzo[k]fluoranthene in Water
Benzoic acid in Water
Bis(2-chloroethoxy)methane in Water
Bis(2-chloroethyl)ether in Water

Fig. F-3. (cont)

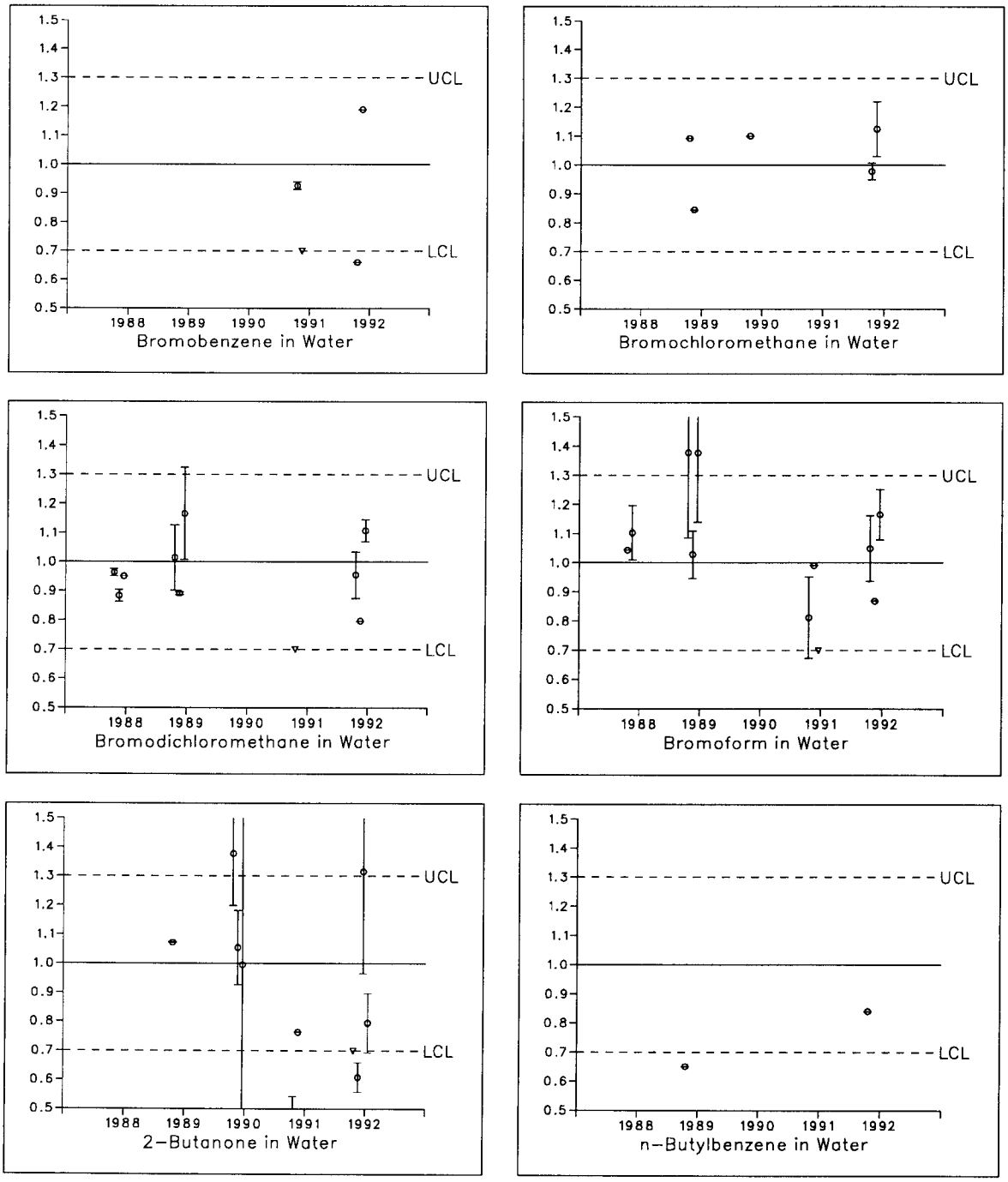

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Bromobenzene in Water
Bromochloromethane in Water
Bromodichloromethane in Water
Bromoform in Water
2-Butanone in Water
n-Butylbenzene in Water

Fig. F-3. (cont)

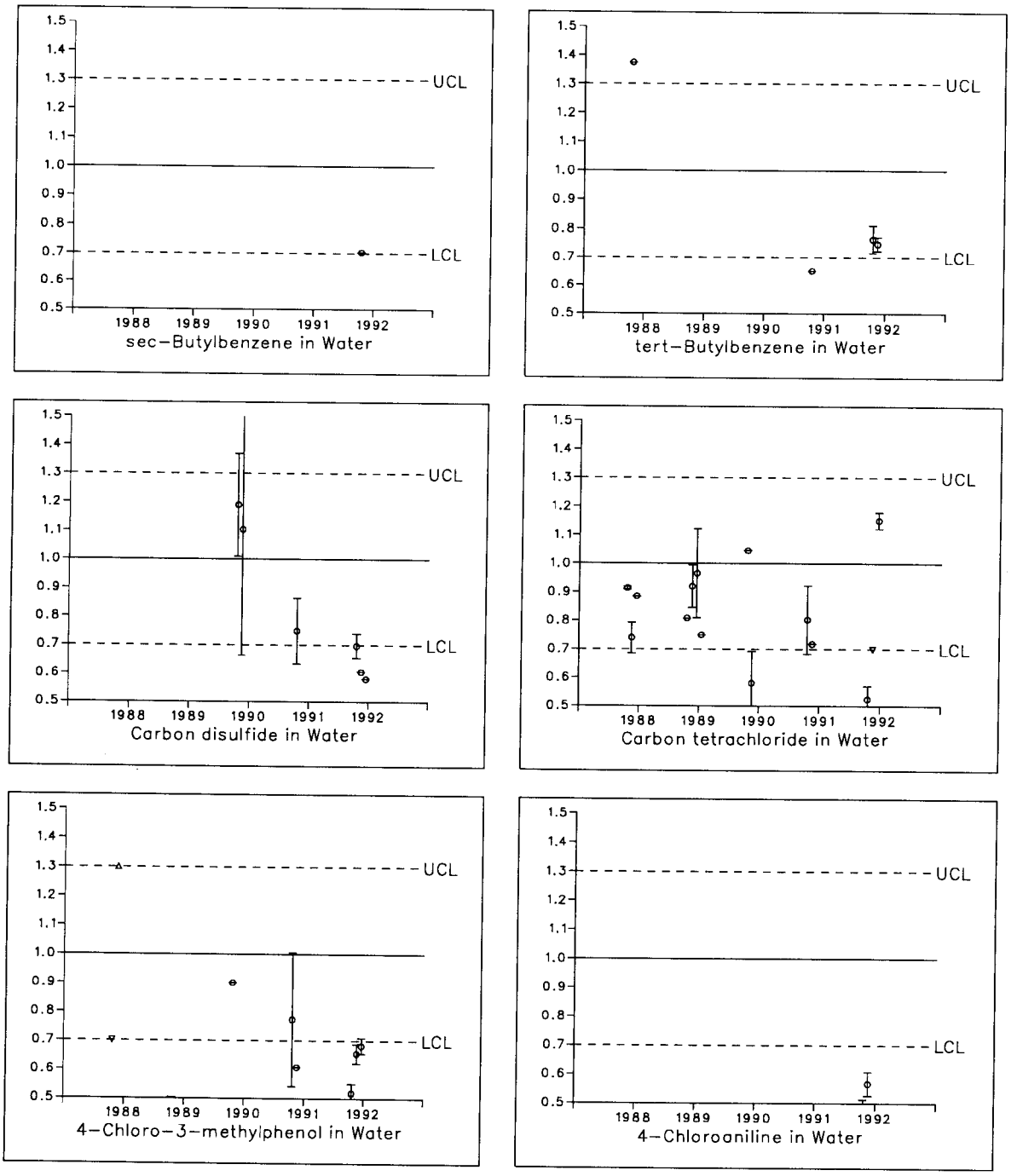

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
sec-Butylbenzene in Water
tert-Butylbenzene in Water
Carbon disulfide in Water
Carbon tetrachloride in Water
4-Chloro-3-methylphenol in Water
4-Chloroaniline in Water

Fig. F-3. (cont)

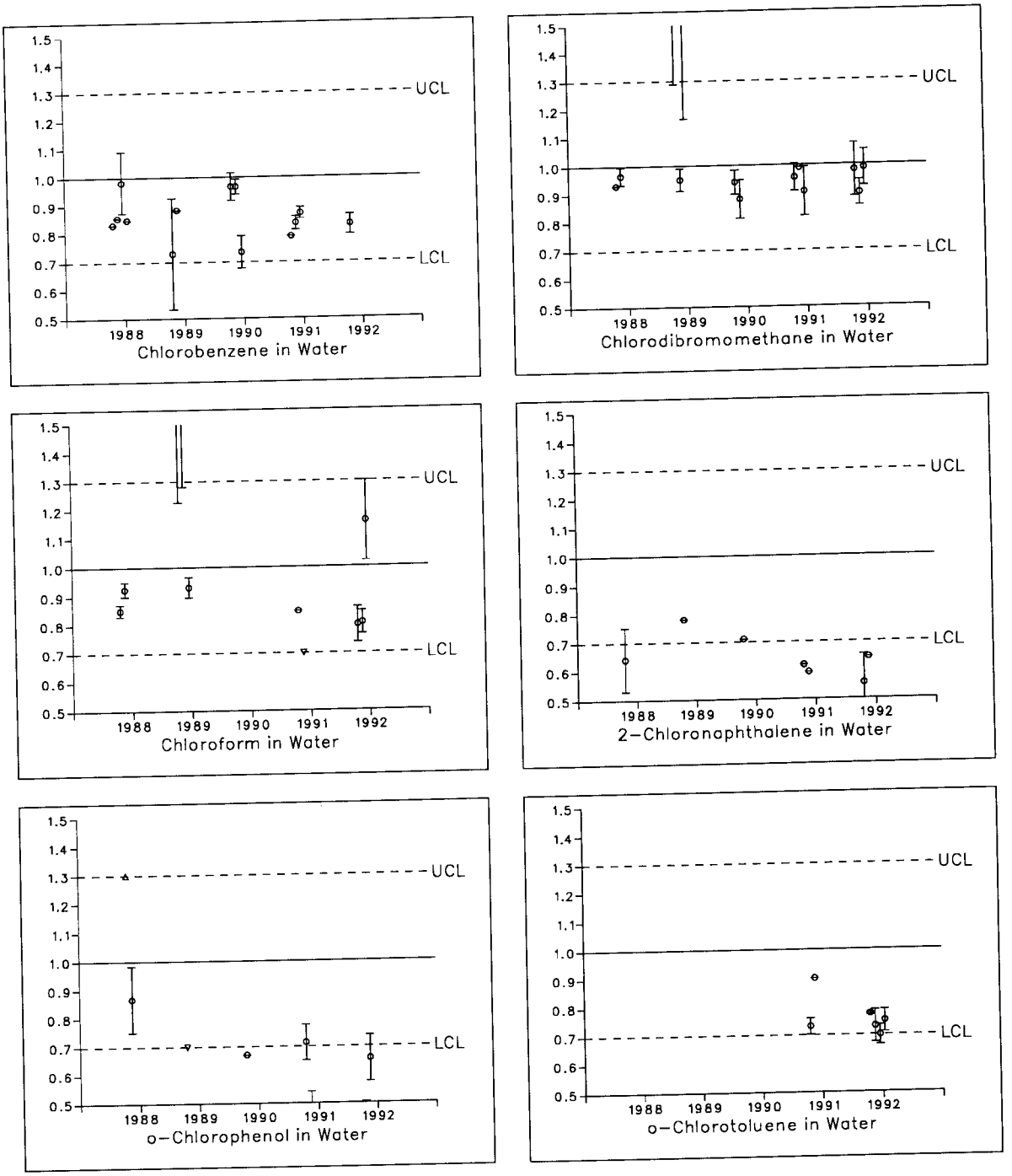

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
Chlorobenzene in Water
Chlorodibromomethane in Water
Chloroform in Water
2-Chloronaphthalene in Water
o-Chlorophenol in Water
o-Chlorotoluene in Water

Fig. F-3. (cont)

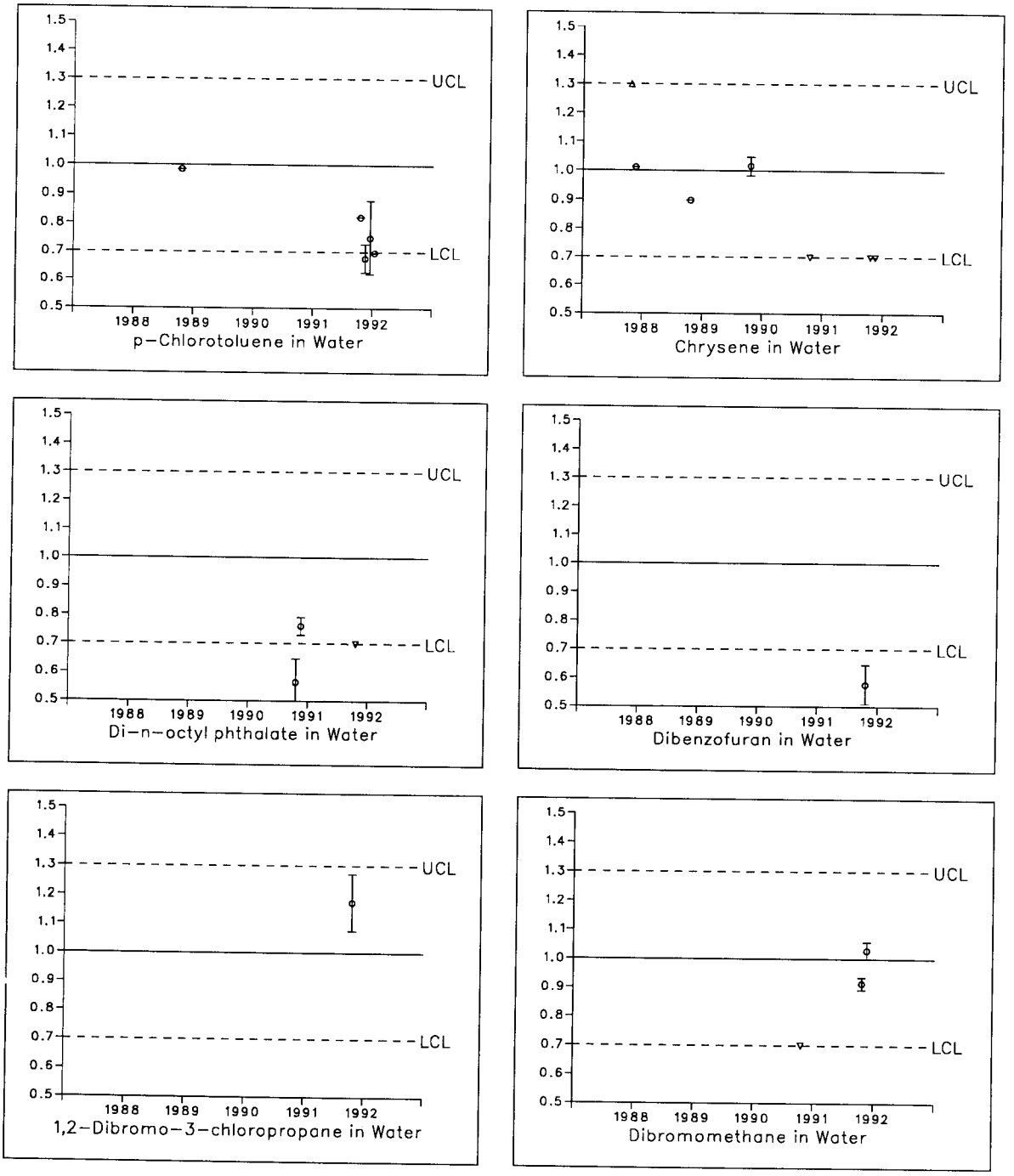

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
p-Chlorotoluene in Water
Chrysene in Water
Di-n-octyl phthalate in Water
Dibenzofuran in Water
1,2-Dibromo-3-chloropropane in Water
Dibromomethane in Water

Fig. F-3. (cont)

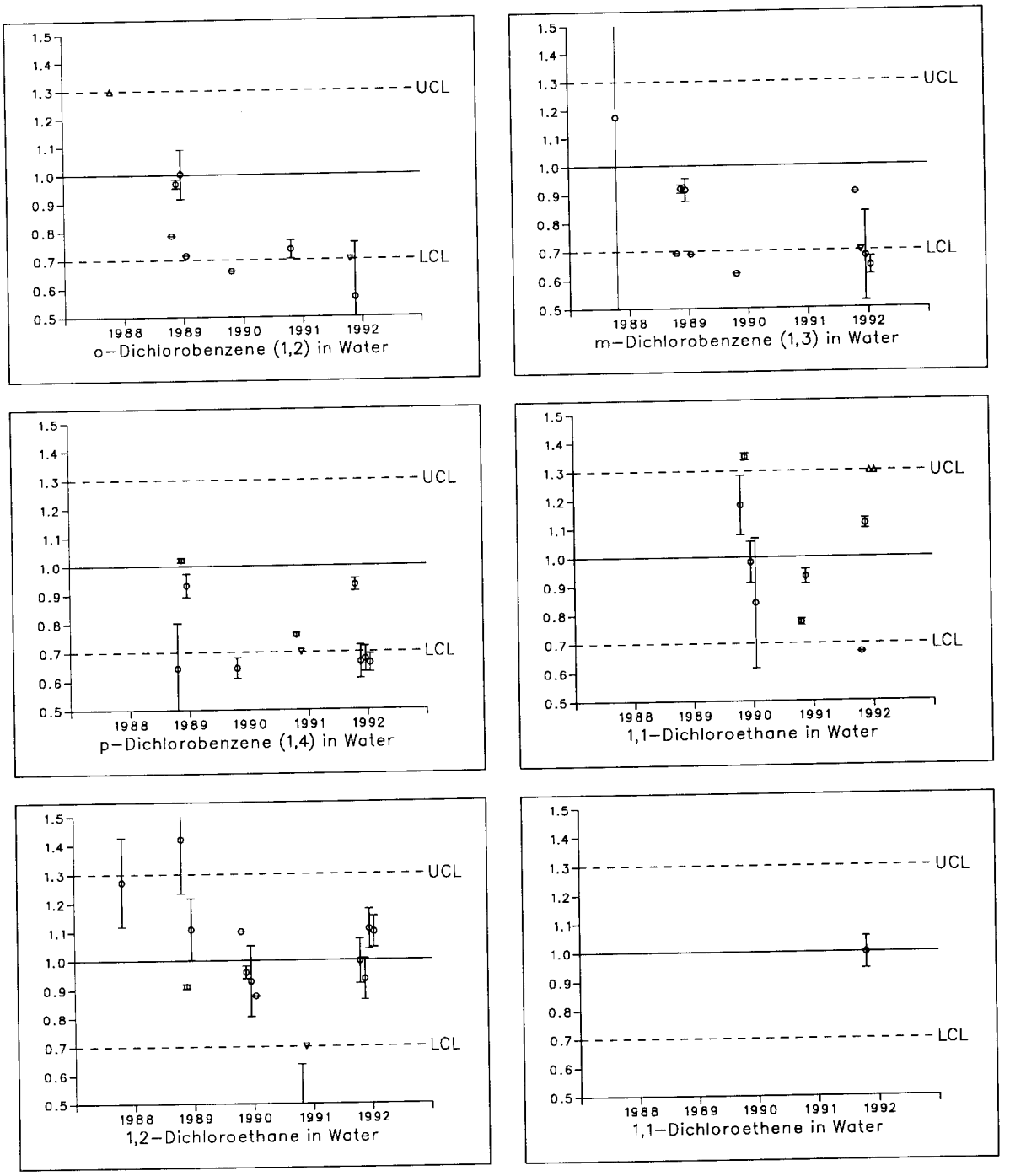

UCL
LCL
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
1988
1989
1990
1991
1992
o-Dichlorobenzene (1,2) in Water
m-Dichlorobenzene (1,3) in Water
p-Dichlorobenzene (1,4) in Water
1,1-Dichloroethane in Water
1,2-Dichloroethane in Water
1,1-Dichloroethene in Water

Fig. F-3. (cont)

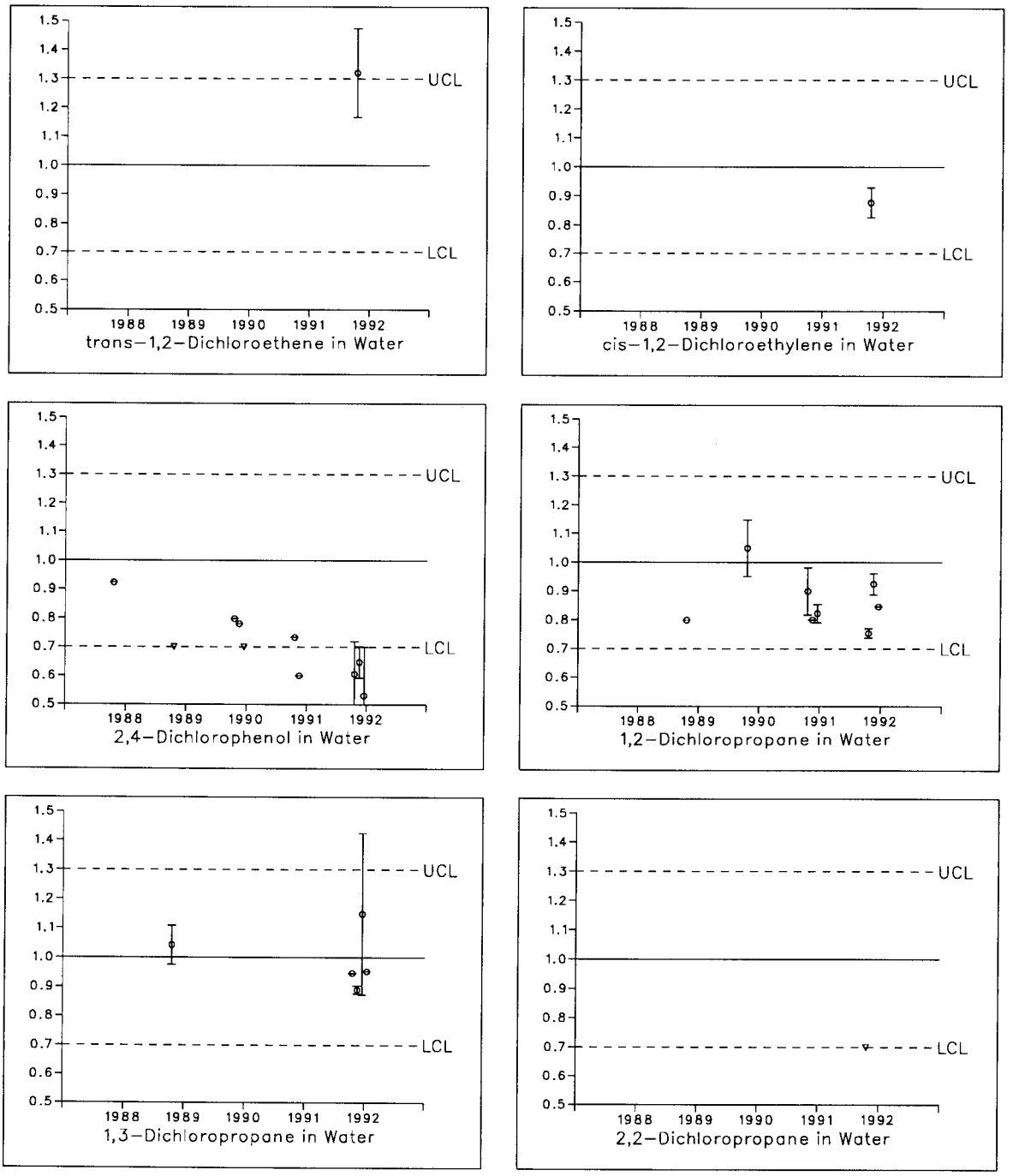
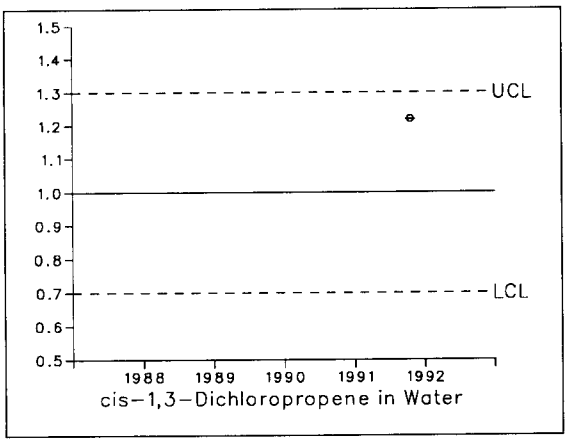
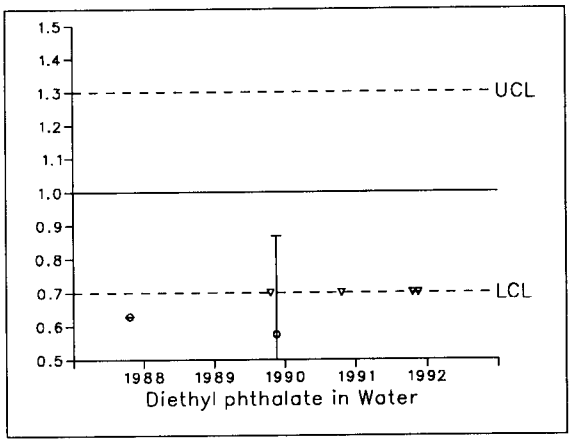
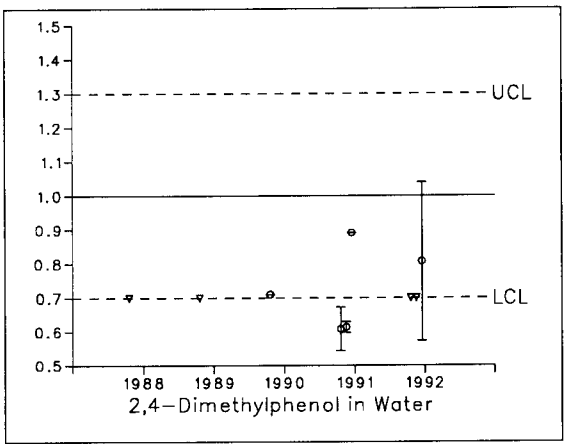
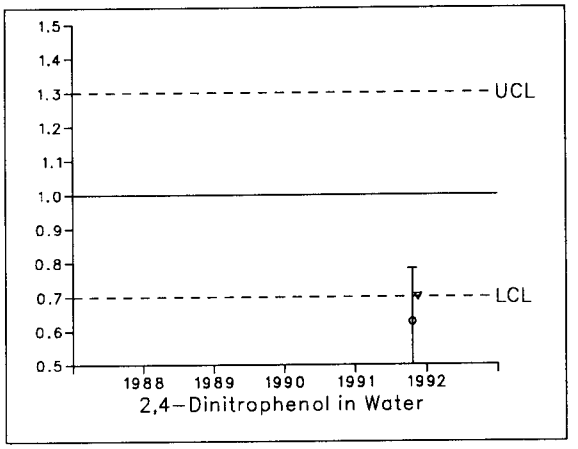

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
trans−1,2−Dichloroethene in Water
cis−1,2−Dichloroethylene in Water
2,4−Dichlorophenol in Water
1,2−Dichloropropane in Water
1,3−Dichloropropane in Water
2,2−Dichloropropane in Water

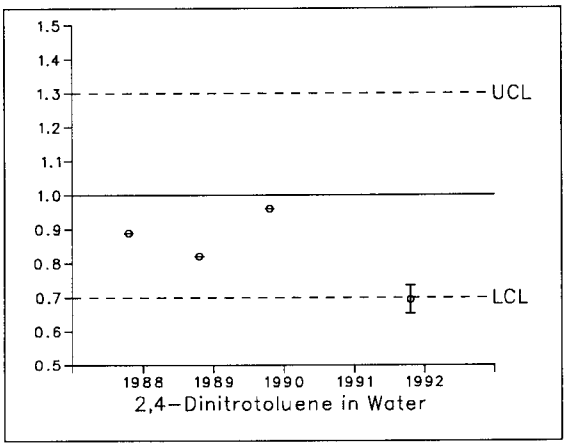
Fig. F-3. (cont)


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
cis-1,3-Dichloropropene in Water


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Diethyl phthalate in Water


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
2,4-Dimethylphenol in Water


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
2,4-Dinitrophenol in Water


1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
2,4-Dinitrotoluene in Water

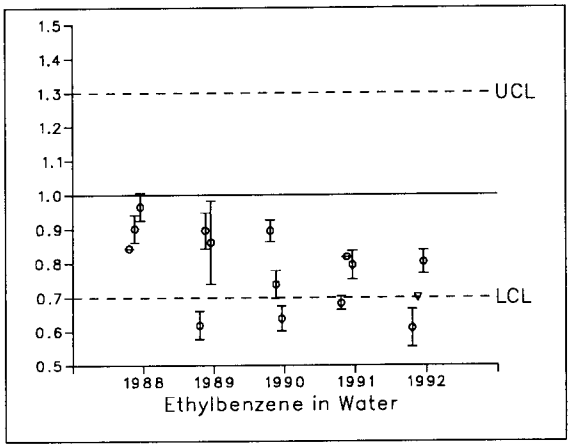

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Ethylbenzene in Water

Fig. F-3. (cont)

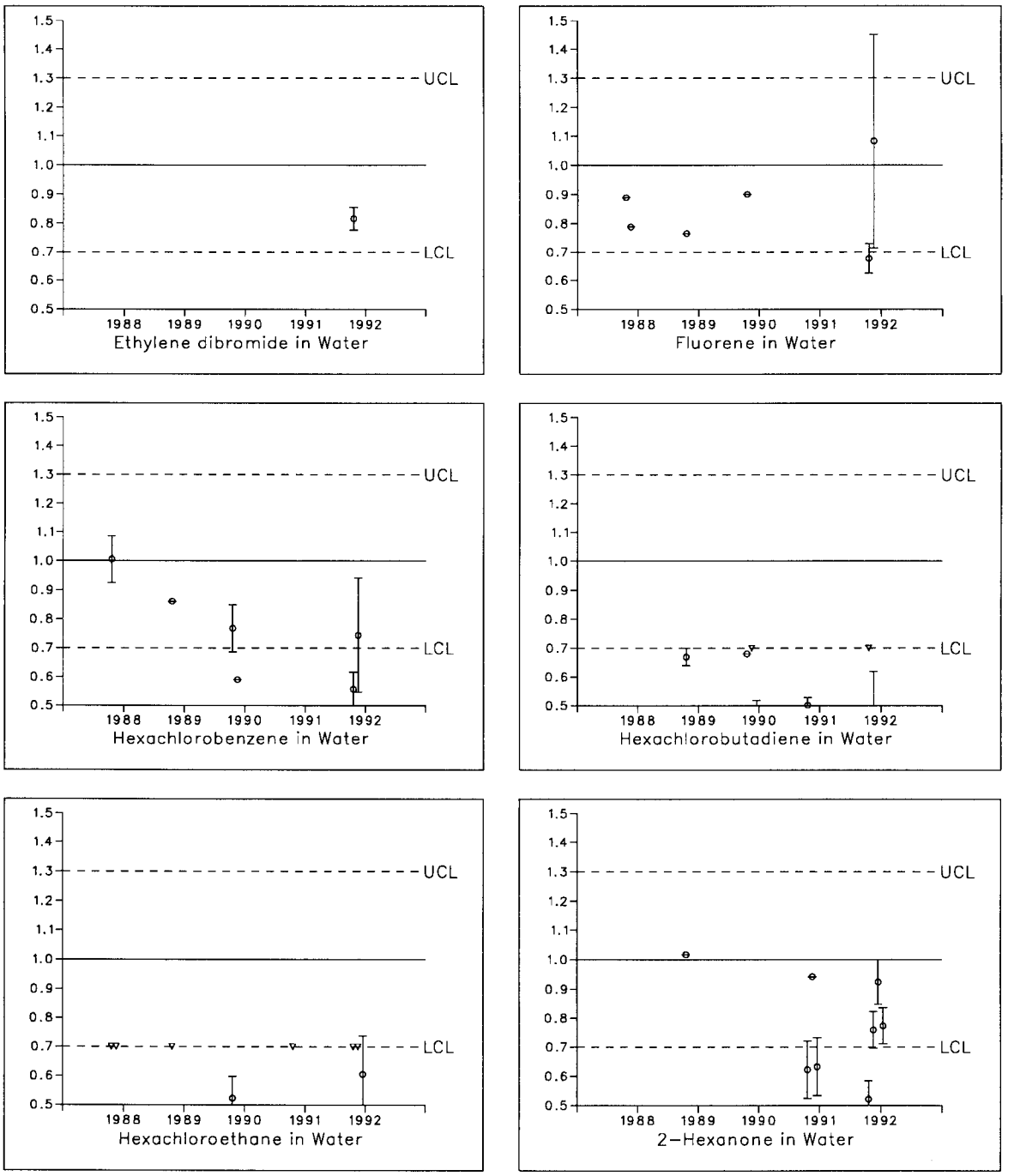

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Ethylene dibromide in Water
Fluorene in Water
Hexachlorobenzene in Water
Hexachlorobutadiene in Water
Hexachloroethane in Water
2-Hexanone in Water

Fig. F-3. (cont)

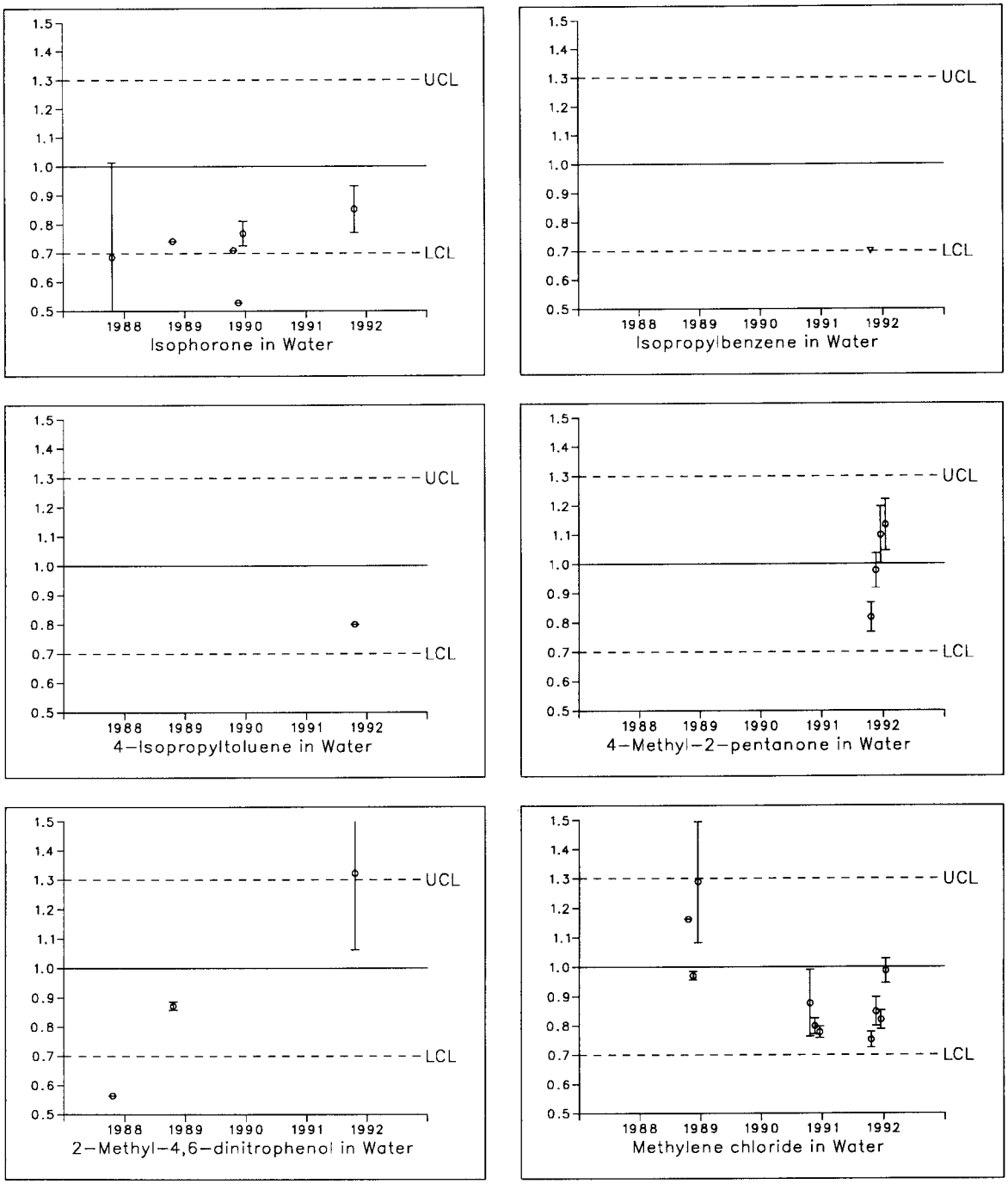

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
Isophorone in Water
Isopropylbenzene in Water
4-Isopropyltoluene in Water
4-Methyl-2-pentanone in Water
2-Methyl-4,6-dinitrophenol in Water
Methylene chloride in Water

Fig. F-3. (cont)

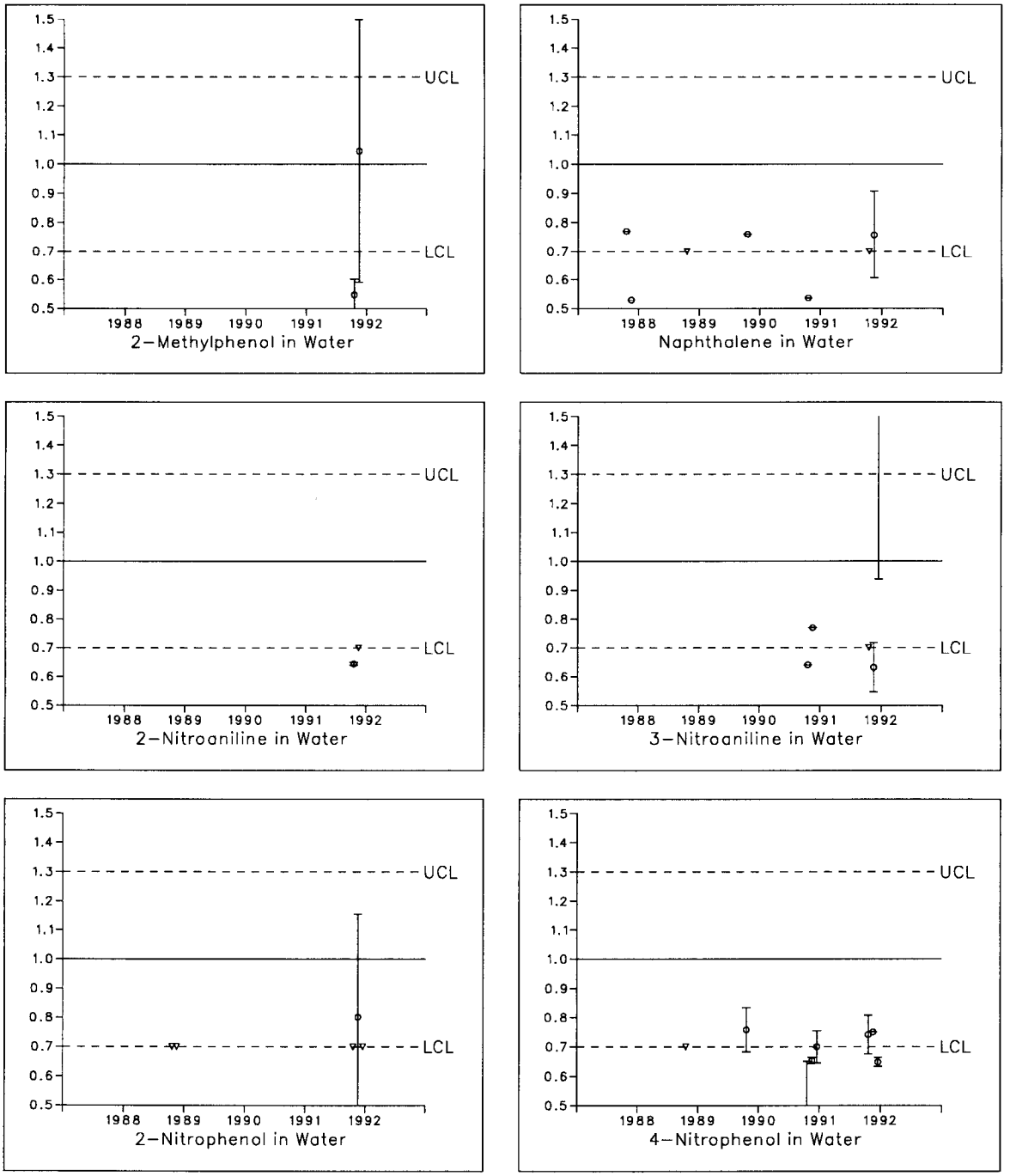

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
2-Methylphenol in Water
Naphthalene in Water
2-Nitroaniline in Water
3-Nitroaniline in Water
2-Nitrophenol in Water
4-Nitrophenol in Water

Fig. F-3. (cont)

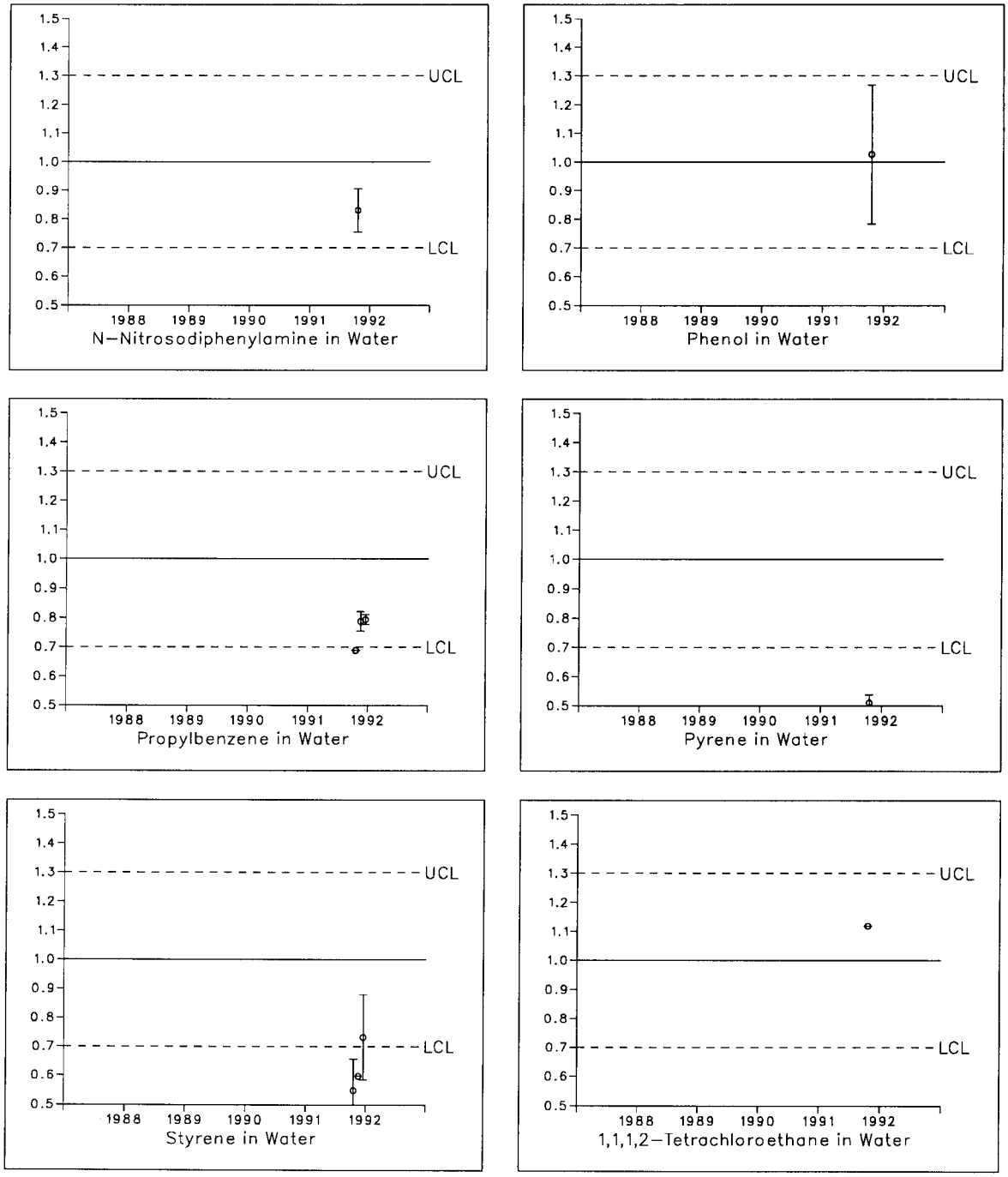

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988
1989
1990
1991
1992
N–Nitrosodiphenylamine in Water
Phenol in Water
Propylbenzene in Water
Pyrene in Water
Styrene in Water
1,1,1,2–Tetrachloroethane in Water

Fig. F-3. (cont)

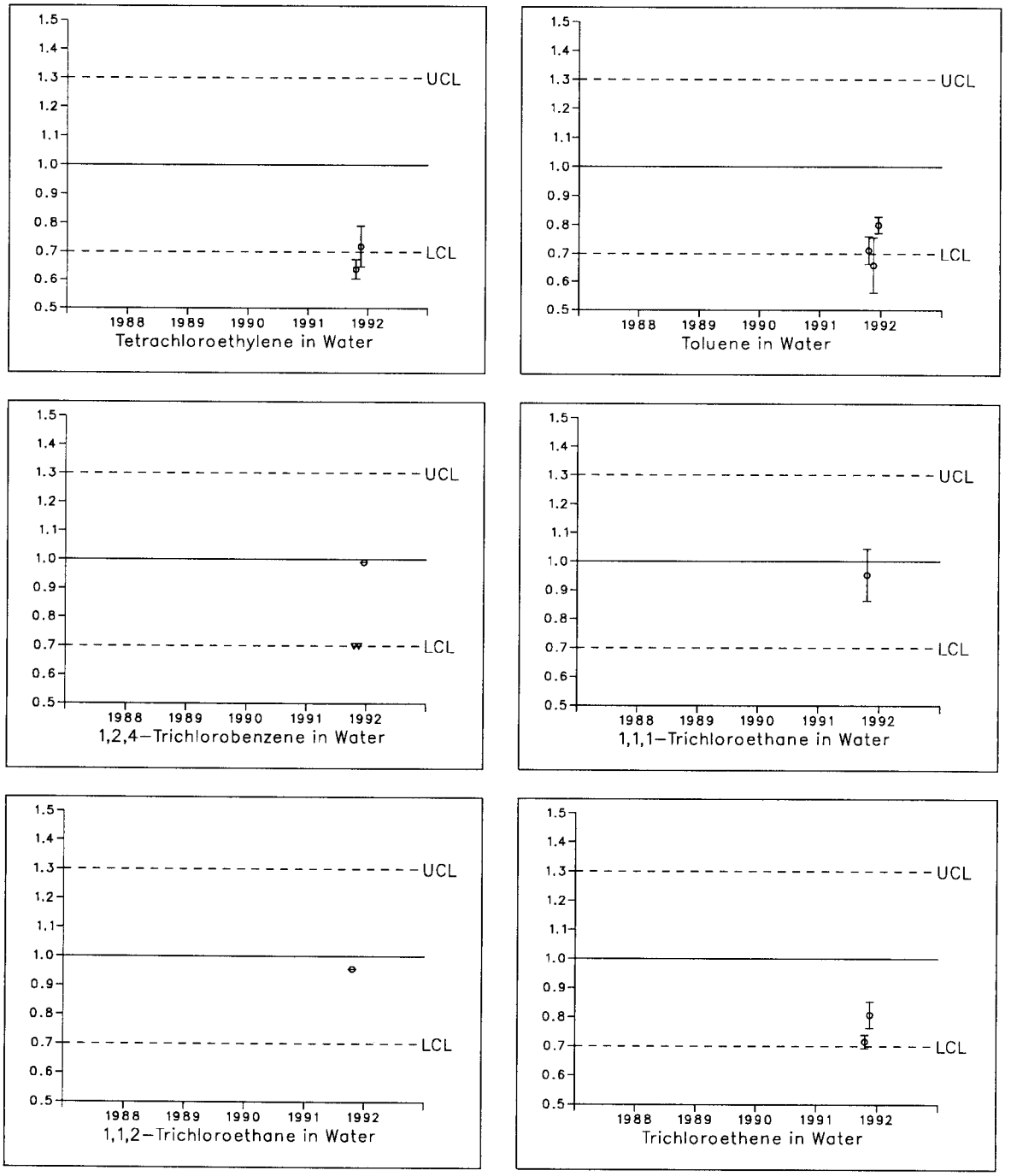
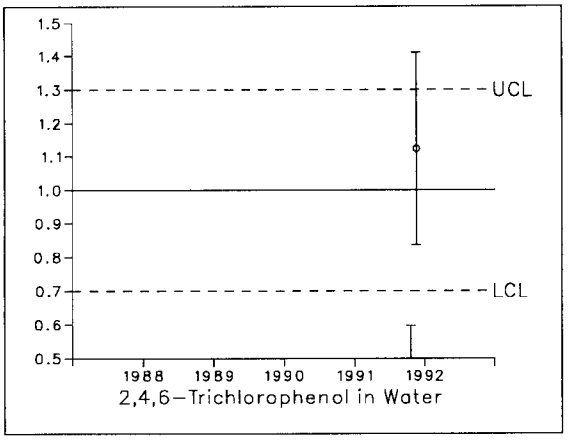
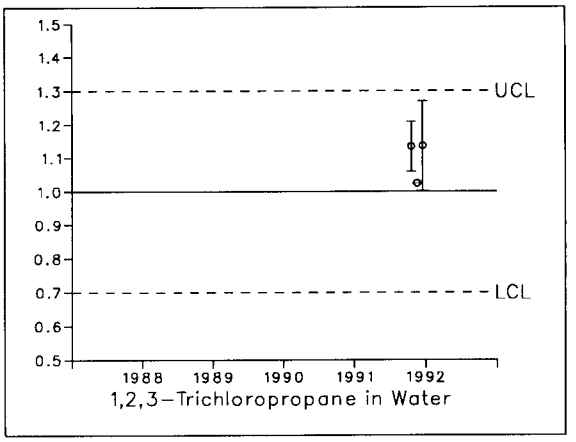
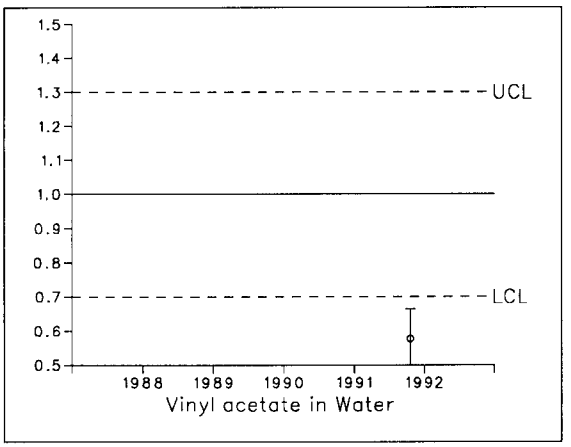

1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
UCL
LCL
1988 1989 1990 1991 1992
Tetrachloroethylene in Water
Toluene in Water
1,2,4–Trichlorobenzene in Water
1,1,1–Trichloroethane in Water
1,1,2–Trichloroethane in Water
Trichloroethene in Water

Fig. F-3. (cont)







NOTE: △ ▽ indicates data points beyond the ± 3 σ control limits.

Fig. F-3. (cont)

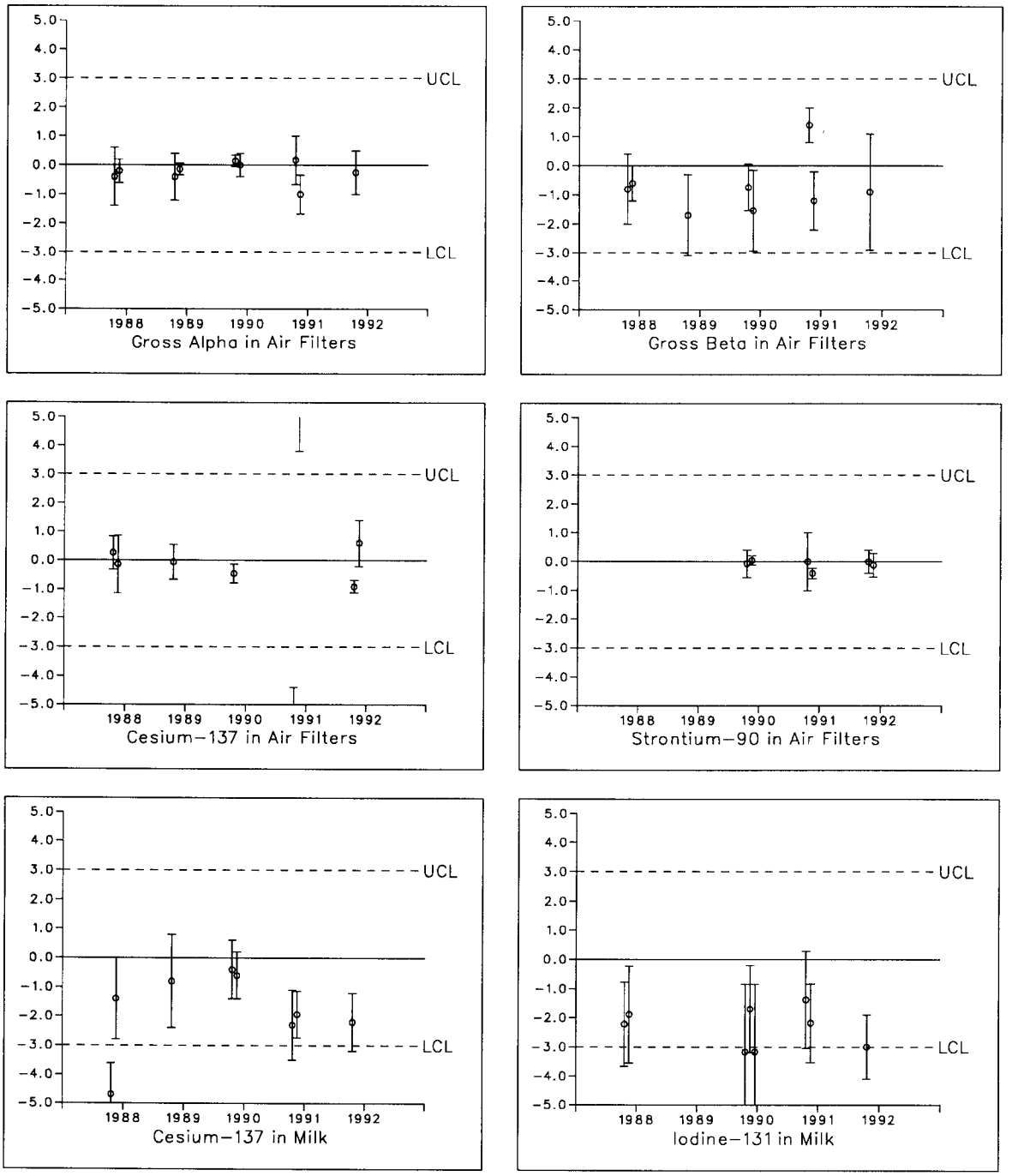


Fig. F-4. Five-year trends in EPA radiochemical quality assurance program for air filters, milk, and water.

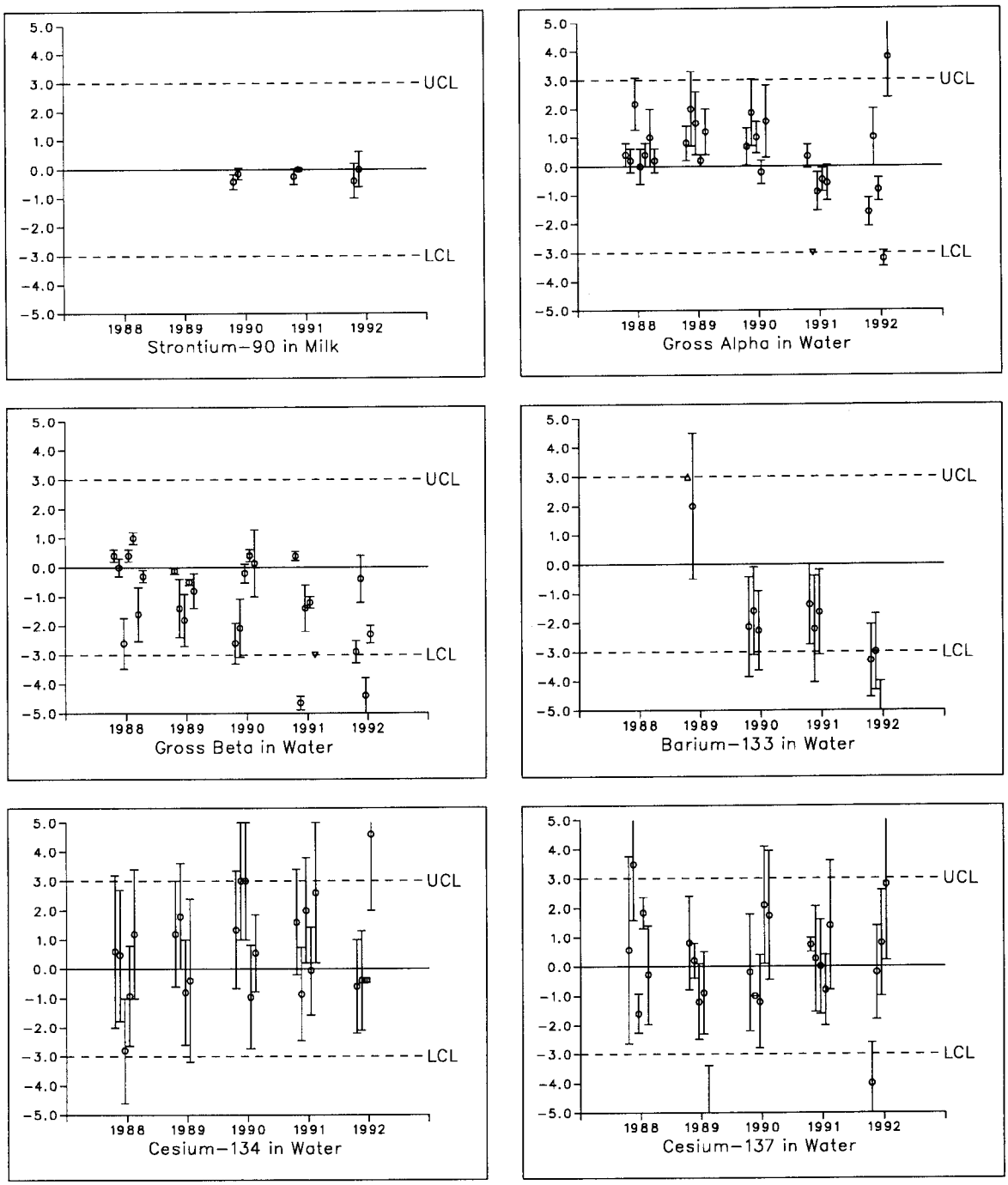

UCL
LCL
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
1988
1989
1990
1991
1992
Strontium-90 in Milk
Gross Alpha in Water
Gross Beta in Water
Barium-133 in Water
Cesium-134 in Water
Cesium-137 in Water

Fig. F-4. (cont)

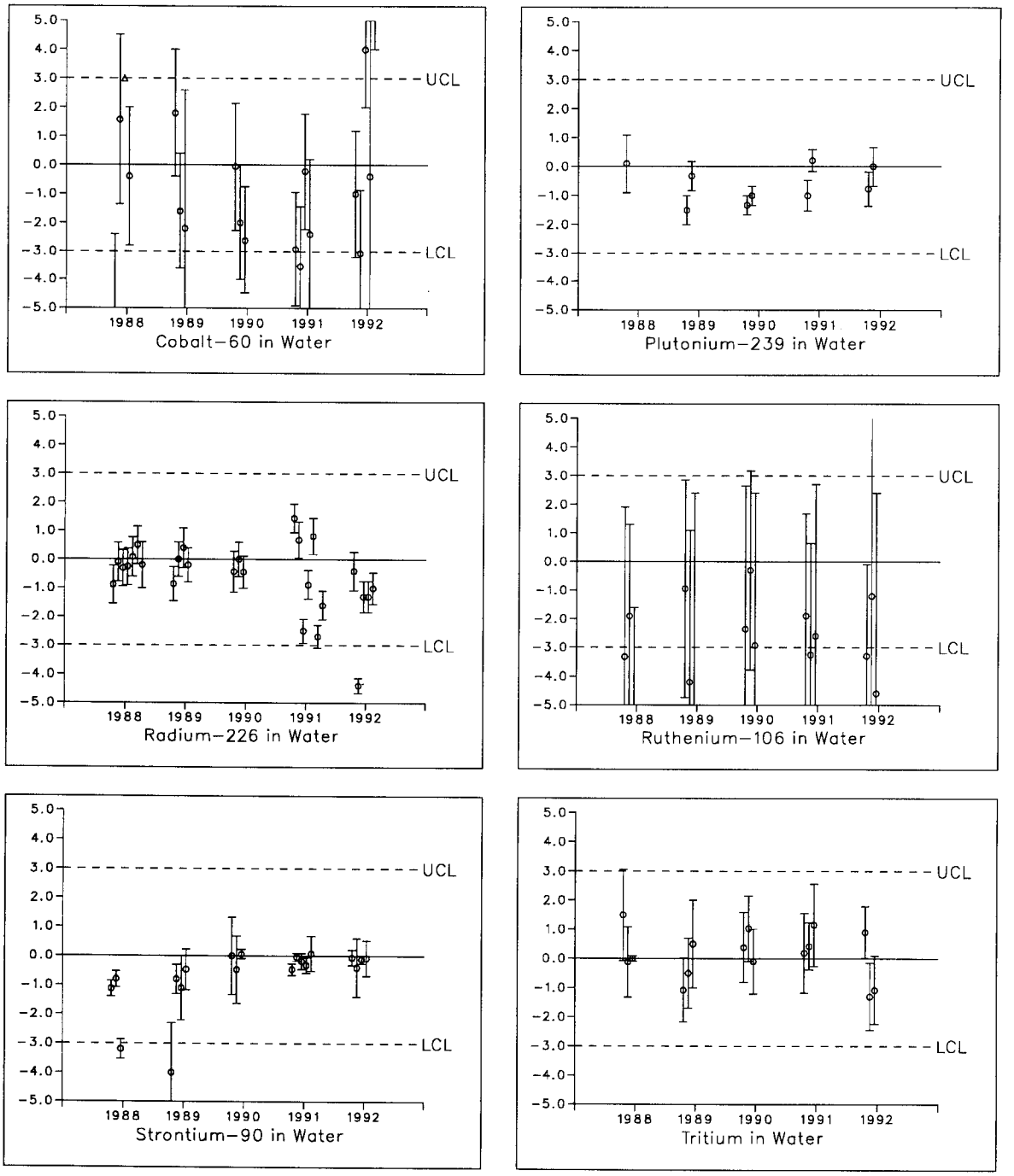
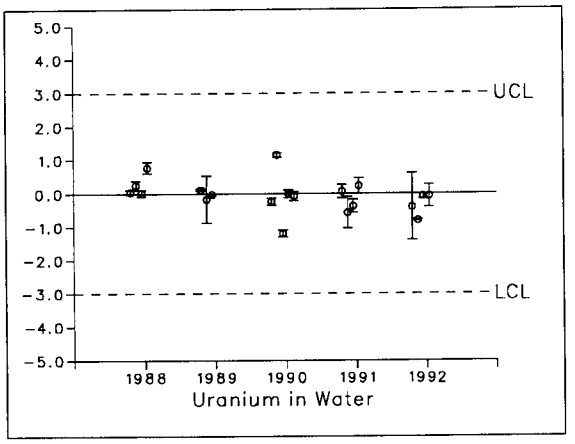
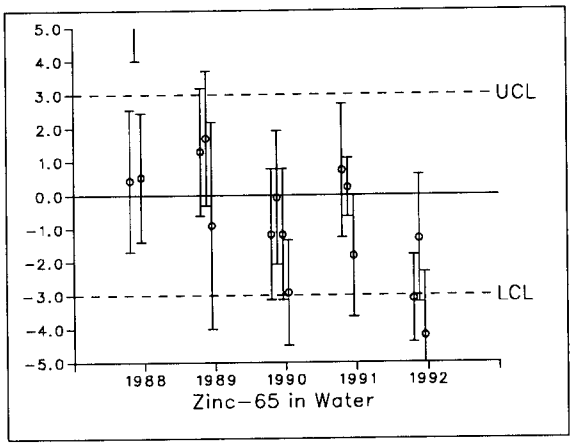

5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Cobalt-60 in Water
Plutonium-239 in Water
Radium-226 in Water
Ruthenium-106 in Water
Strontium-90 in Water
Tritium in Water

Fig. F-4. (cont)





NOTE: The position of each data point is determined by dividing the difference between the EM-9 and agency values by the expected standard deviation given by the agency. The size of the error bar is determined by dividing the EM-9 standard deviation by the agency standard deviation. In most cases, the EM-9 mean is within one standard deviation of the agency value and our error bars overlap the agency mean value. For environmental levels of radioactivity, this record is good.

△ ▽ indicates data points beyond the ± 3 σ control limits.

Fig. F-4. (cont)

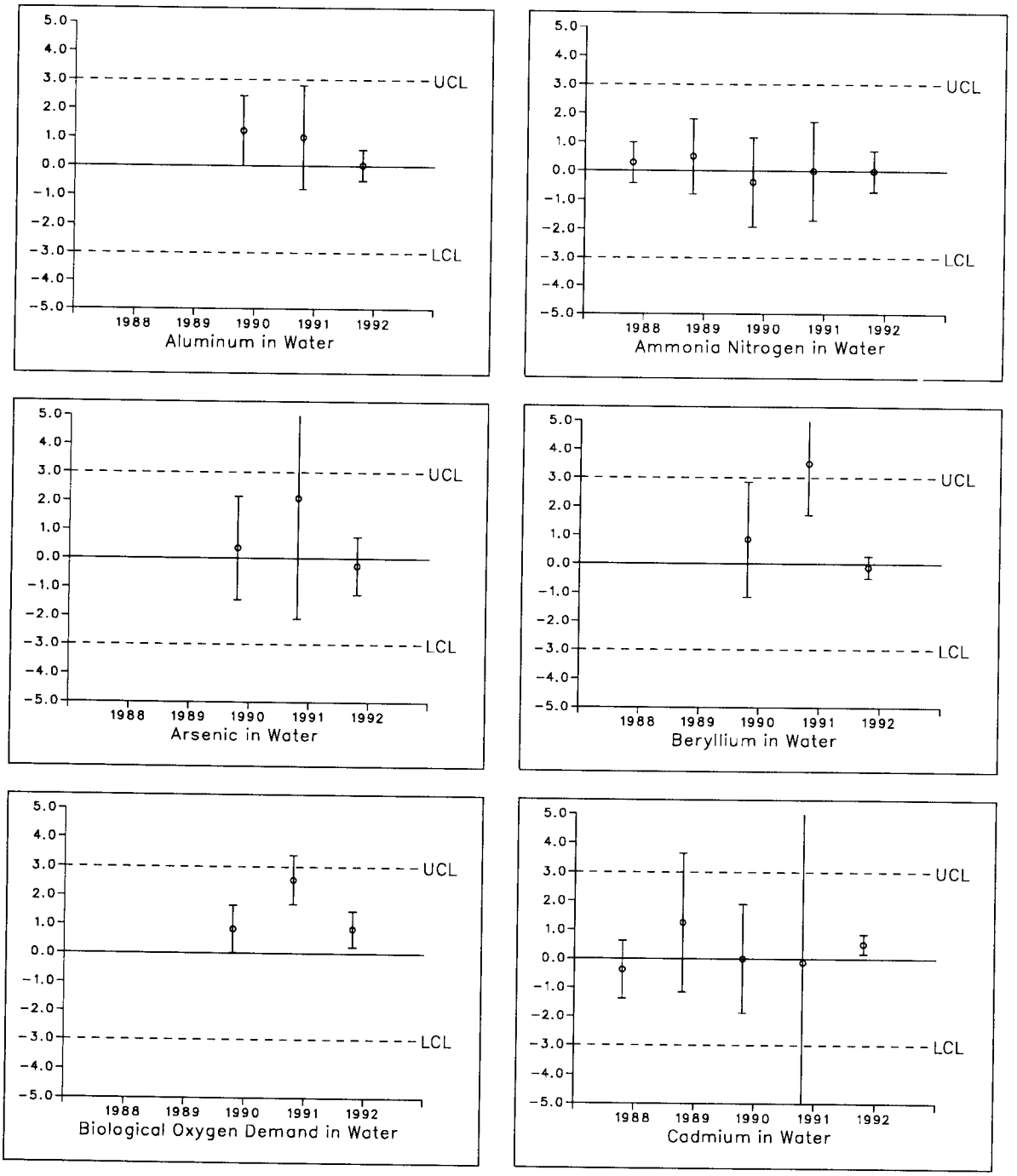


Fig. F-5. Five-year trends in National Pollutant Discharge Elimination System quality assurance program for industrial and municipal waste waters.

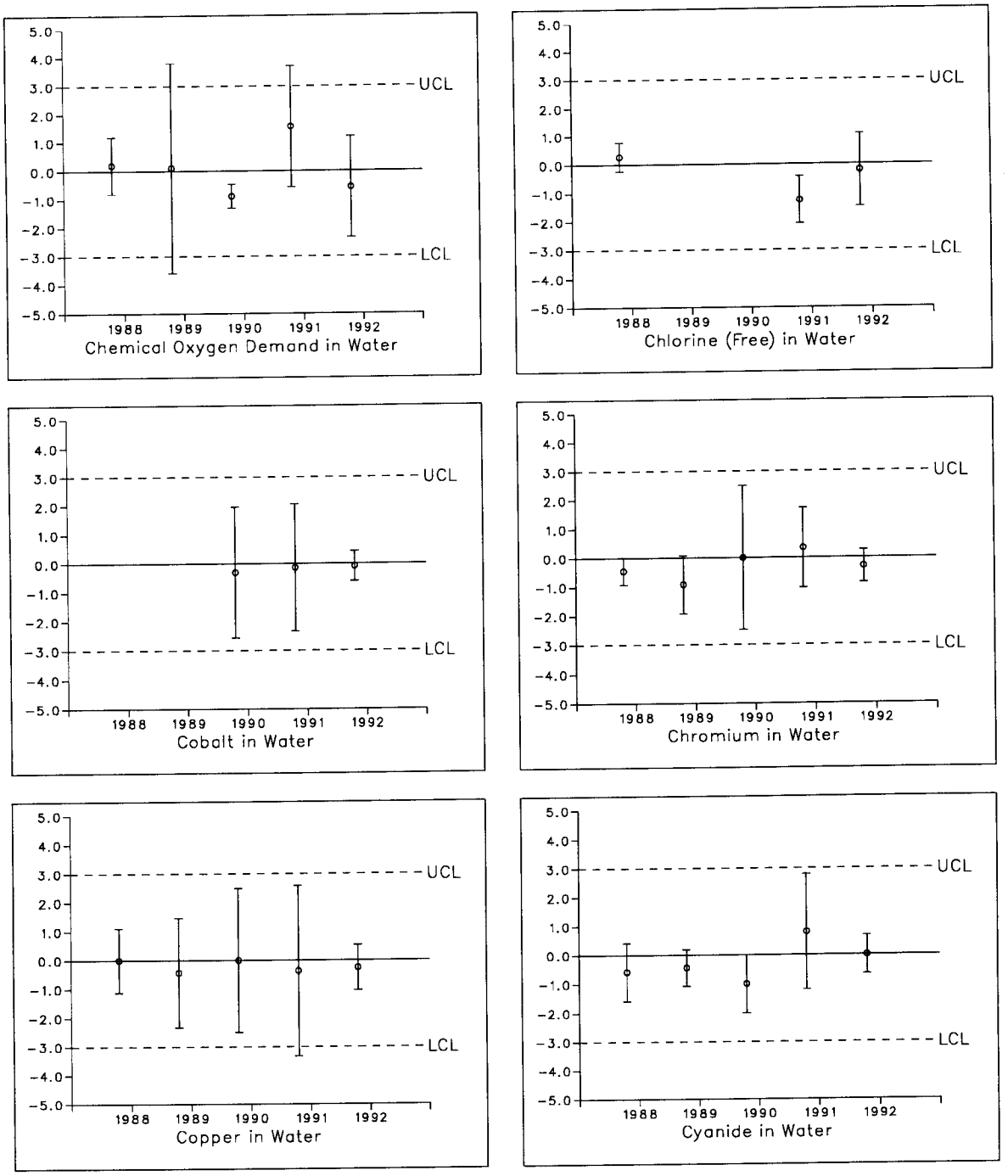
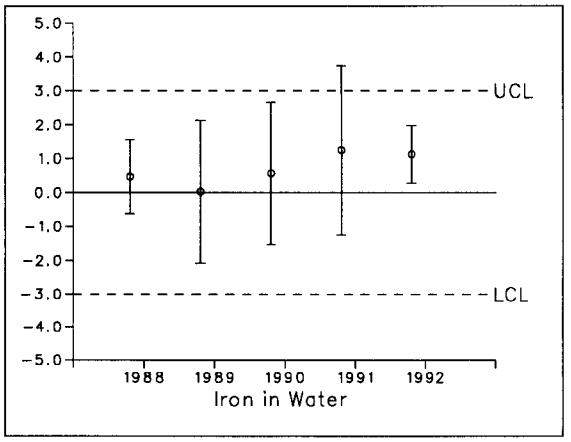
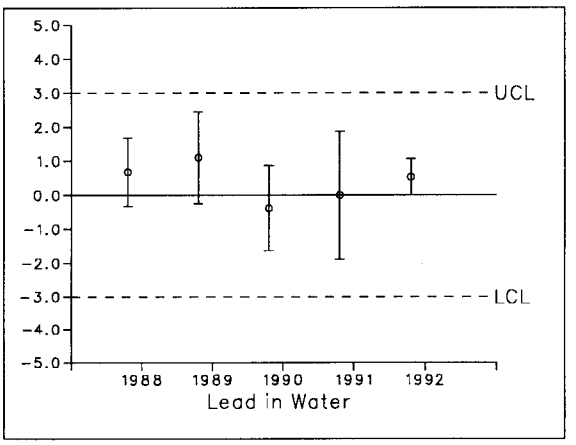
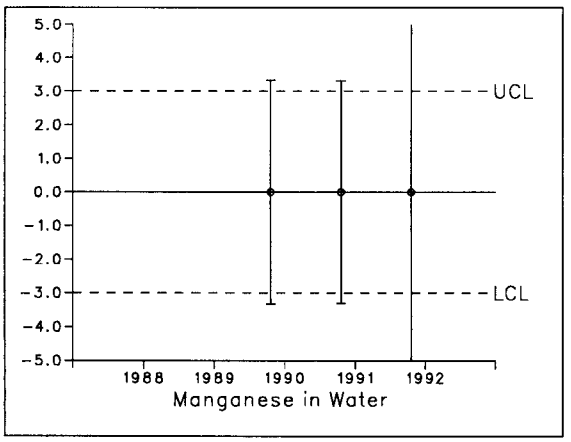
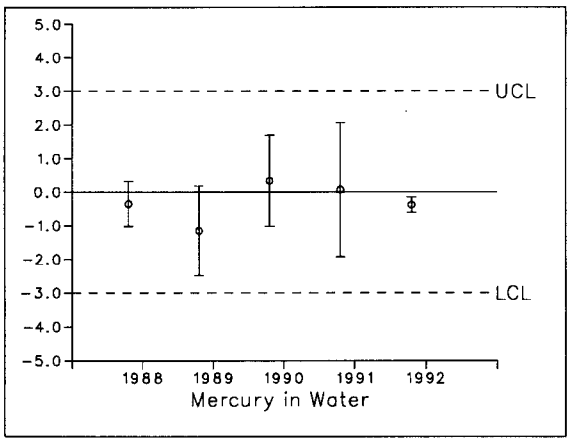

5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Chemical Oxygen Demand in Water
Chlorine (Free) in Water
Cobalt in Water
Chromium in Water
Copper in Water
Cyanide in Water

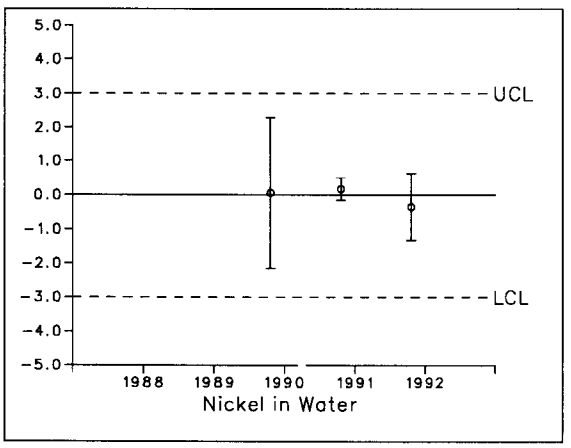
Fig. F-5. (cont)


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Iron in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Lead in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Manganese in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Mercury in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Nickel in Water

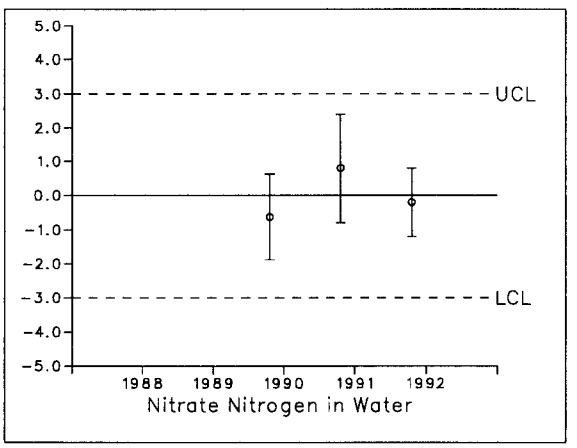

5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Nitrate Nitrogen in Water

Fig. F-5. (cont)

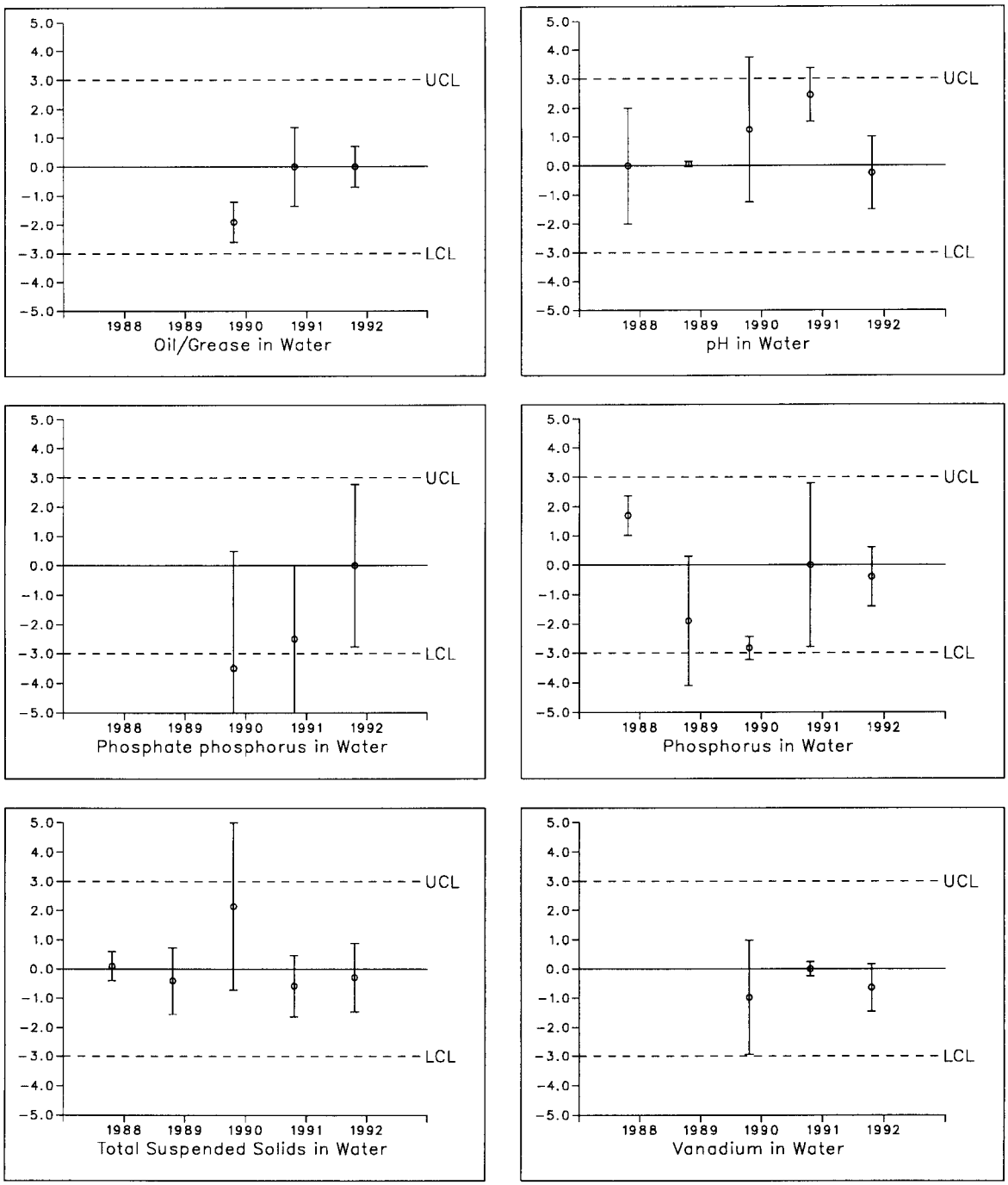
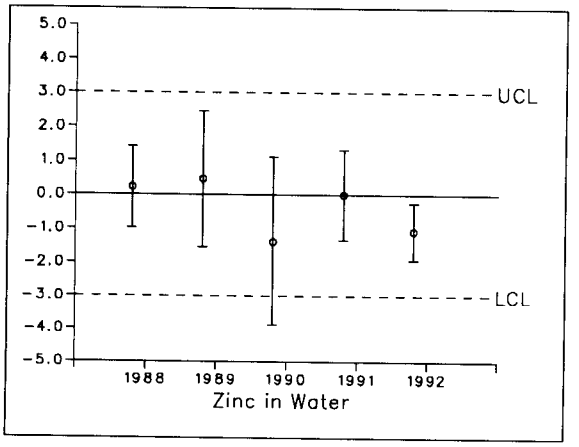

5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Oil/Grease in Water
pH in Water
Phosphate phosphorus in Water
Phosphorus in Water
Total Suspended Solids in Water
Vanadium in Water

Fig. F-5. (cont)



NOTE: The position of each data point is determined by dividing the difference between the EM-9 and agency values by the expected standard deviation given by the agency. The size of the error bar is determined by dividing the EM-9 standard deviation by the agency standard deviation. In most cases, the EM-9 mean is within one standard deviation of the agency value and our error bars overlap the agency mean value.

△ ▽ indicates data points beyond the ± 3 σ control limits.

Fig. F-5. (cont)

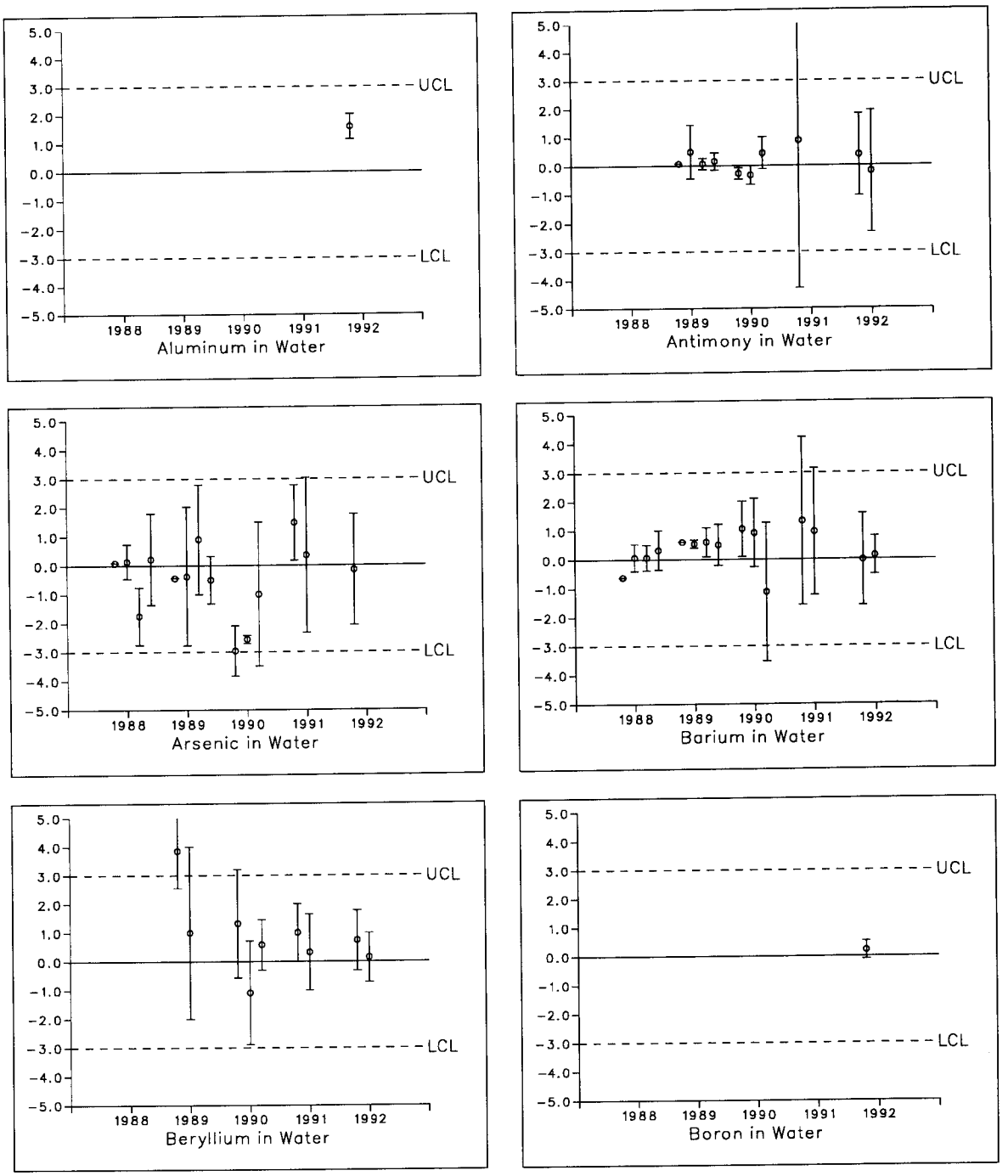
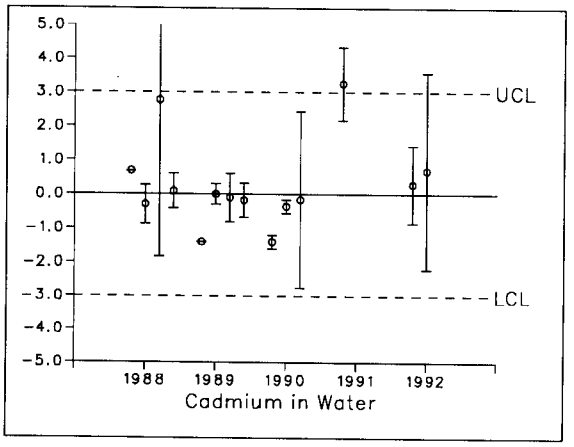
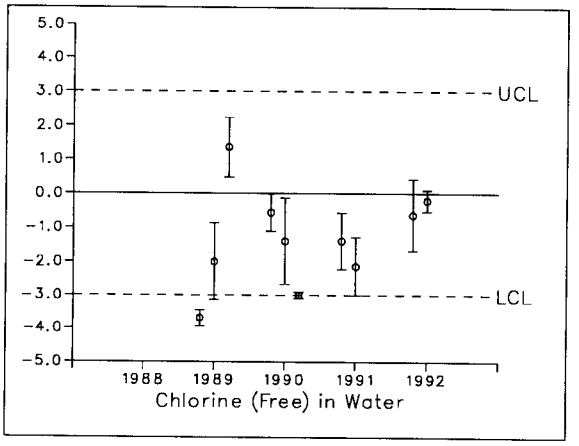
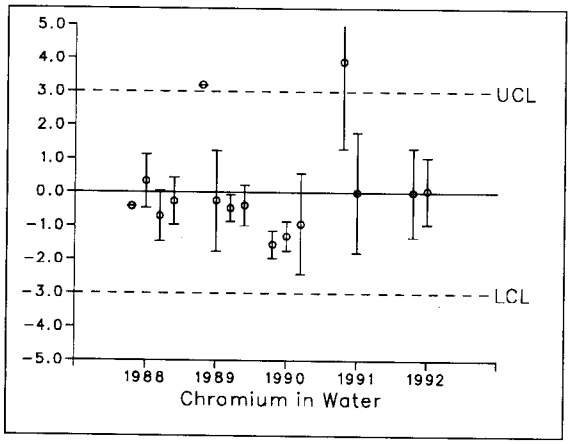
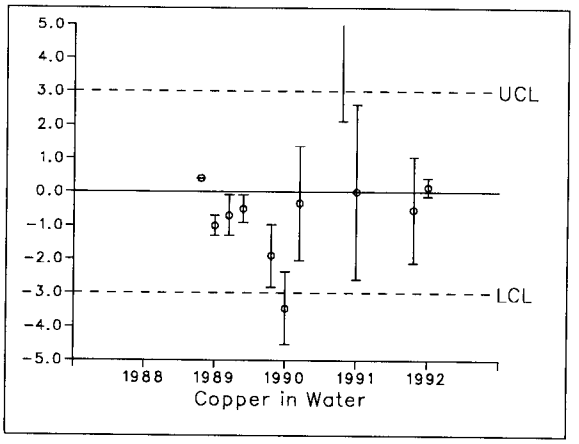


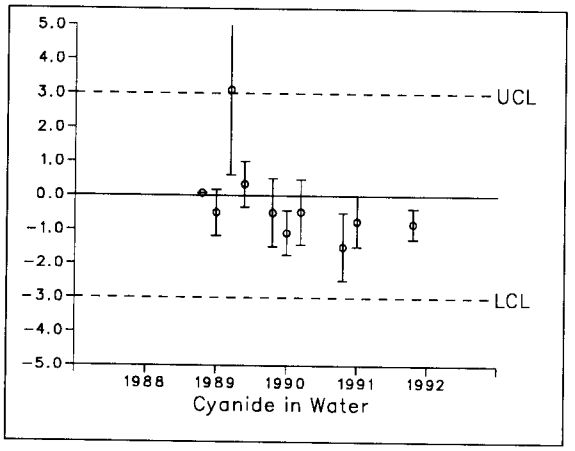
Fig. F-6. Five-year trends in EPA Water Supply Performance Evaluation Studies.


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Cadmium in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Chlorine (Free) in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Chromium in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Copper in Water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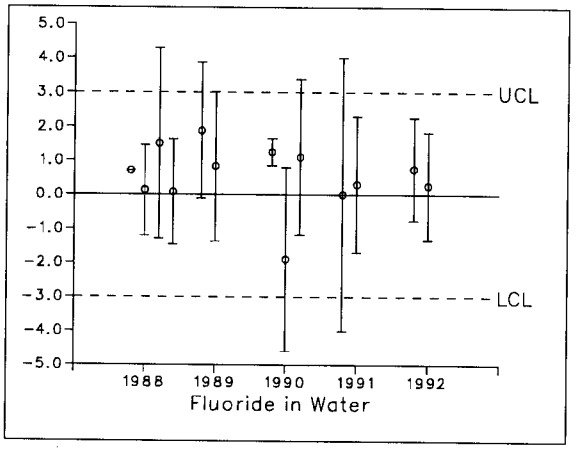
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Cyanide in Water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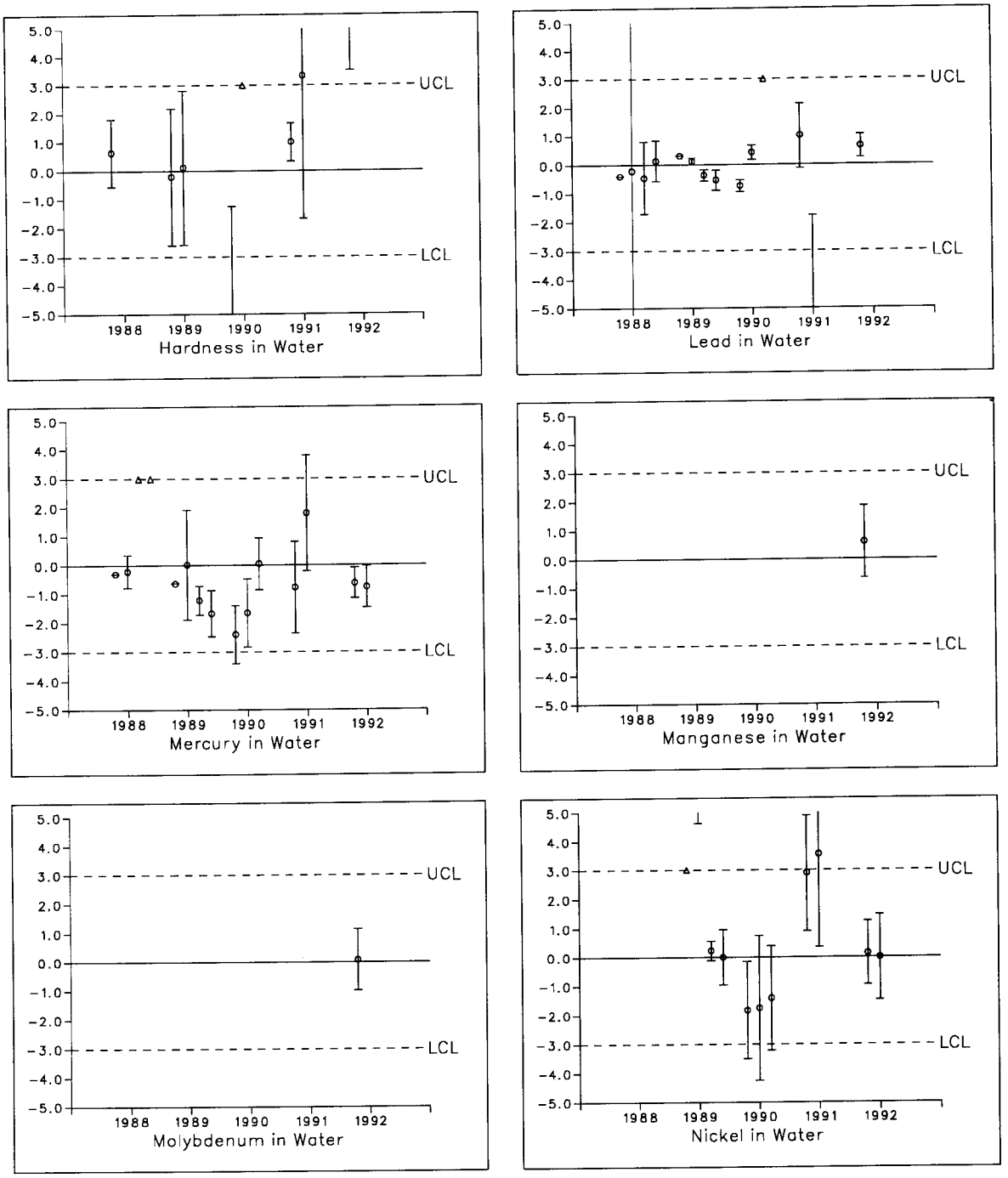
UCL
LCL
1988
1989
1990
1991
1992
Fluoride in Water

Fig. F-6. (cont)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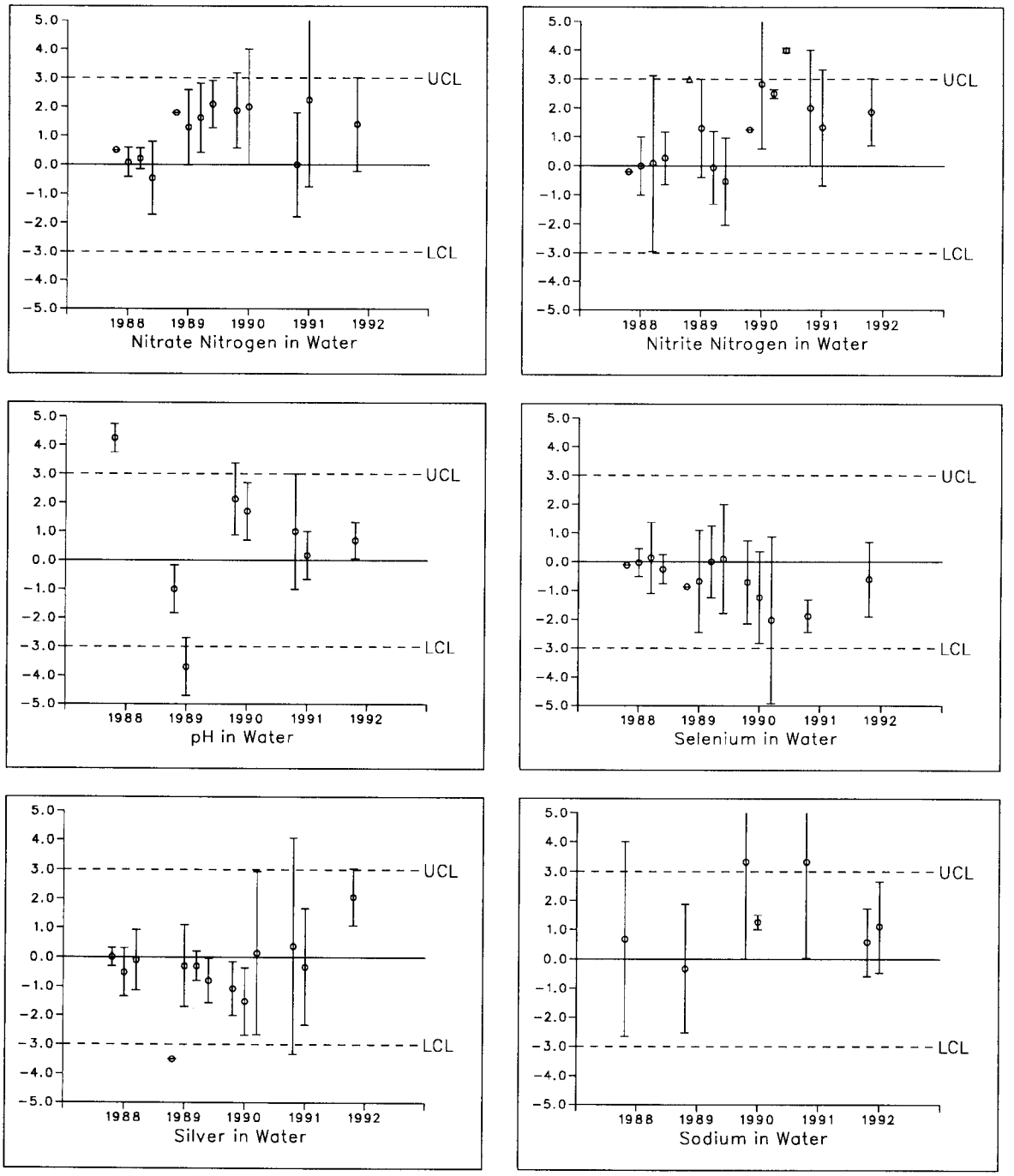
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Hardness in Water
Lead in Water
Mercury in Water
Manganese in Water
Molybdenum in Water
Nickel in Water

Fig. F-6. (cont)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1.0
0.0
-1.0
-2.0
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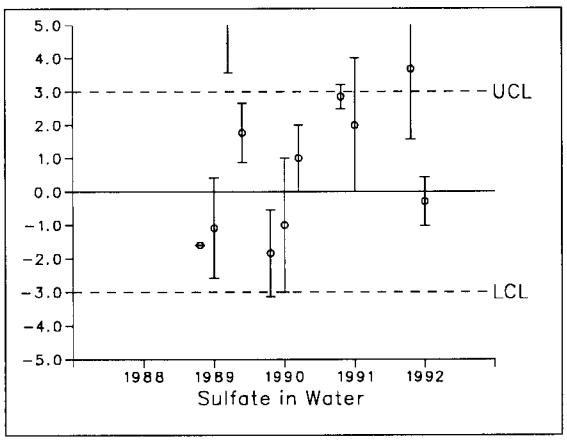
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Nitrate Nitrogen in Water
Nitrite Nitrogen in Water
pH in Water
Selenium in Water
Silver in Water
Sodium in Water

Fig. F-6. (cont)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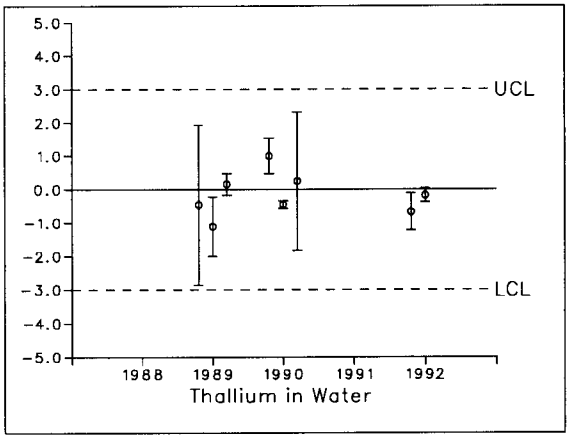
UCL
LCL
1988
1989
1990
1991
1992
Sulfate in Water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-3.0
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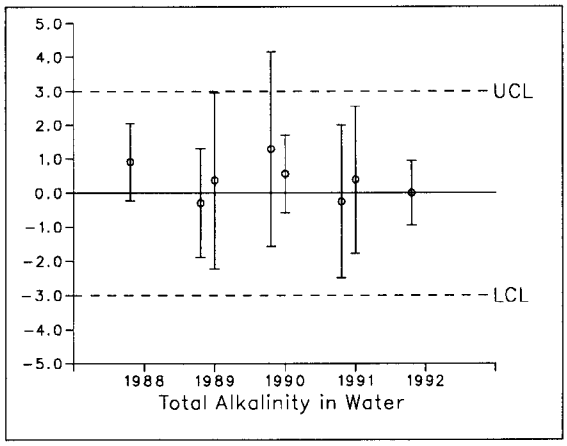
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Thallium in Water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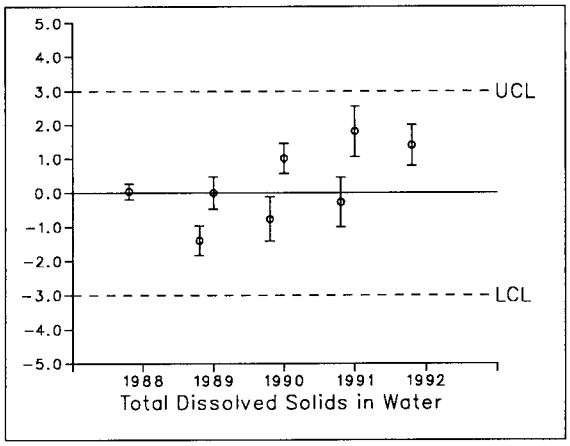
UCL
LCL
1988
1989
1990
1991
1992
Total Alkalinity in Water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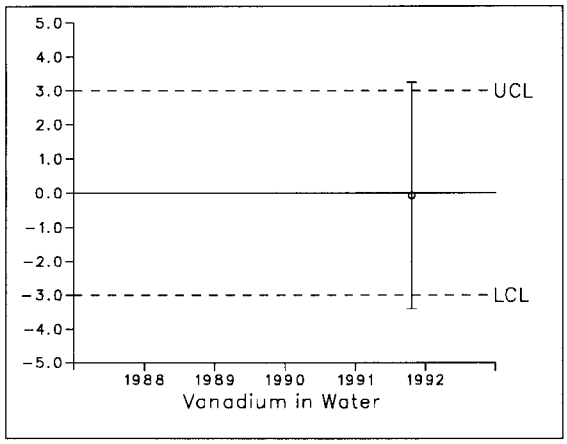
UCL
LCL
1988
1989
1990
1991
1992
Total Dissolved Solids in Water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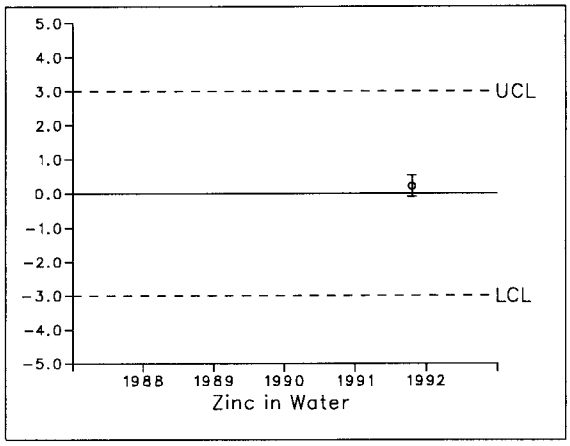
UCL
LCL
1988
1989
1990
1991
1992
Vanadium in Water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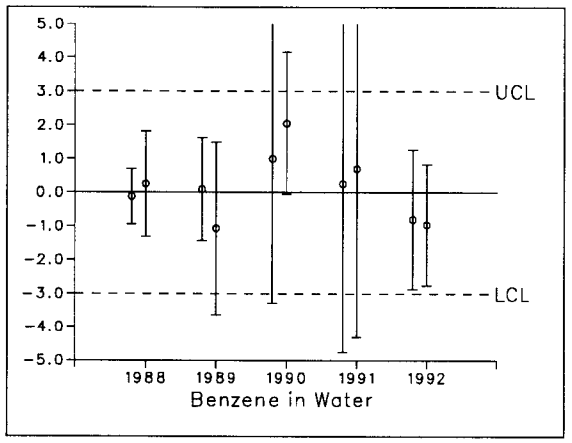
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Zinc in Water

Fig. F-6. (cont)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2.0
1.0
0.0
-1.0
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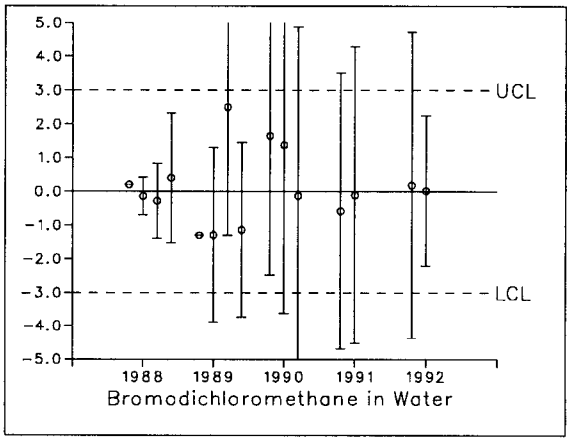
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Benzene in Water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1.0
0.0
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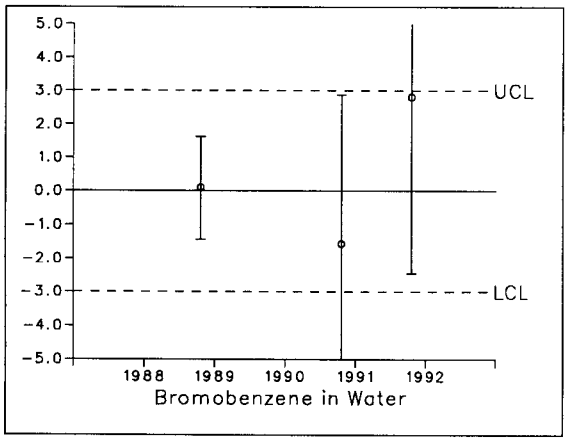
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Bromodichloromethane in Water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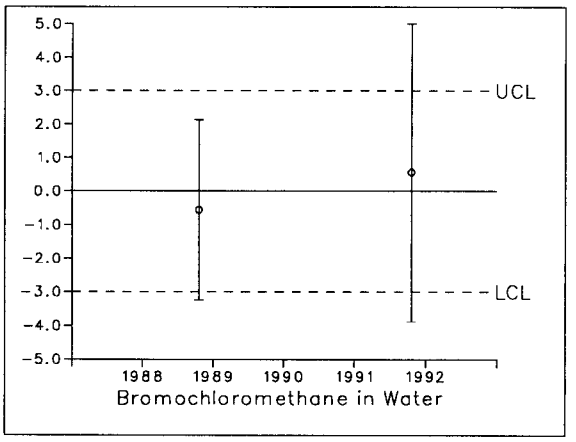
UCL
LCL
1988
1989
1990
1991
1992
Bromobenzene in Water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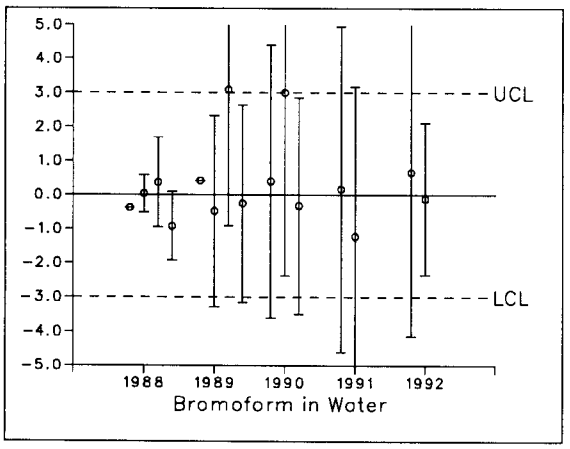
UCL
LCL
1988
1989
1990
1991
1992
Bromochloromethane in Water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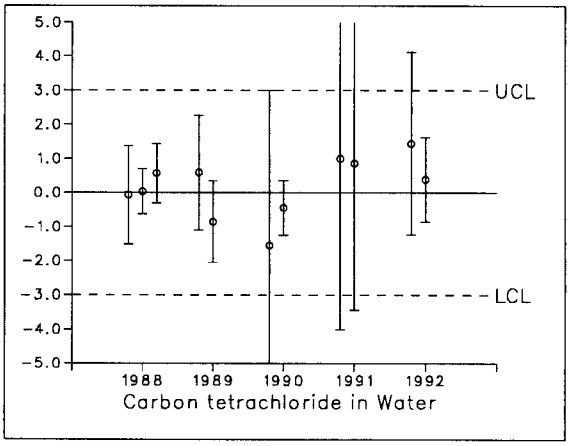
UCL
LCL
1988
1989
1990
1991
1992
Bromoform in Water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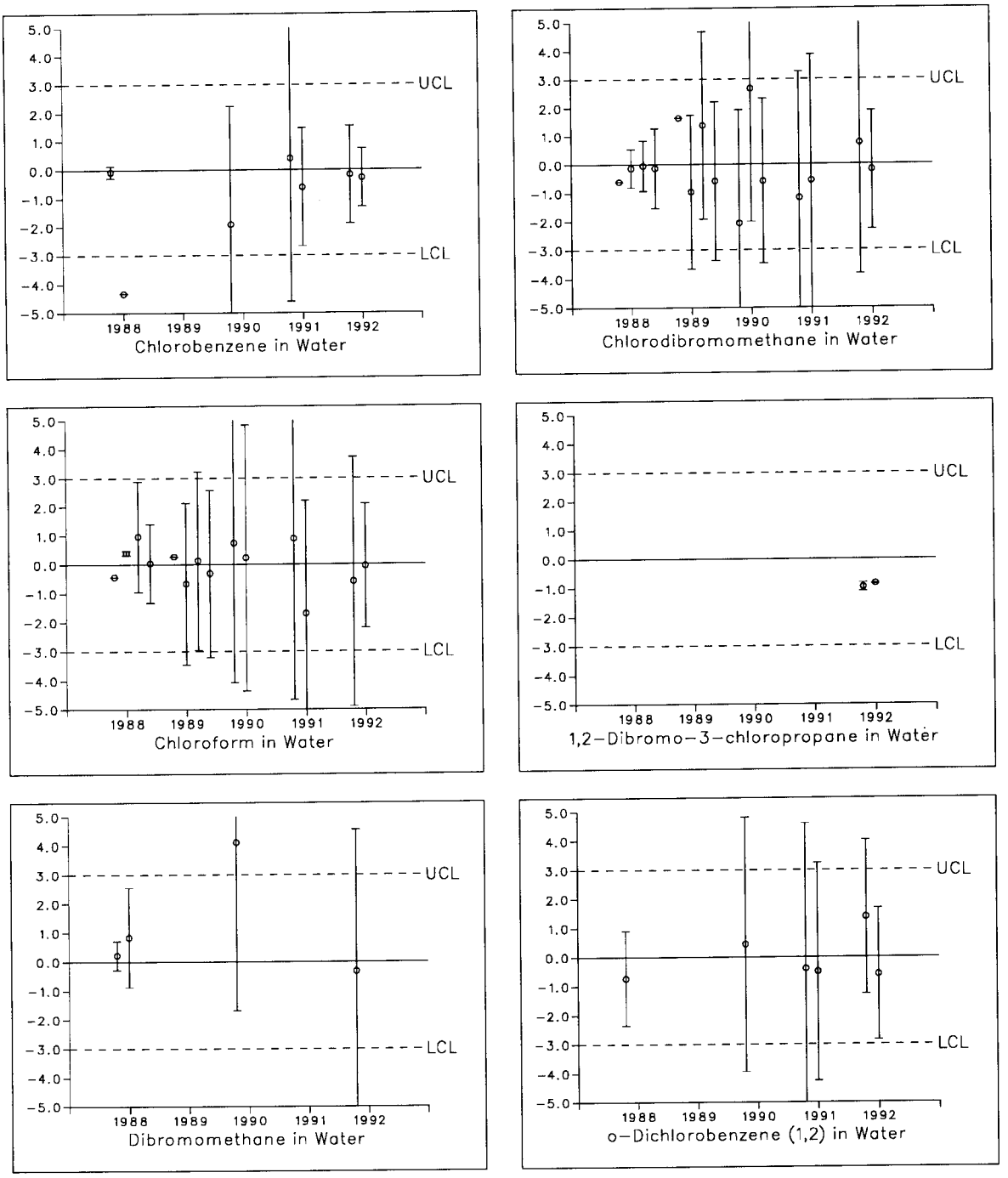
UCL
LCL
1988
1989
1990
1991
1992
Carbon tetrachloride in Water

Fig. F-6. (cont)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-1.0
-2.0
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-4.0
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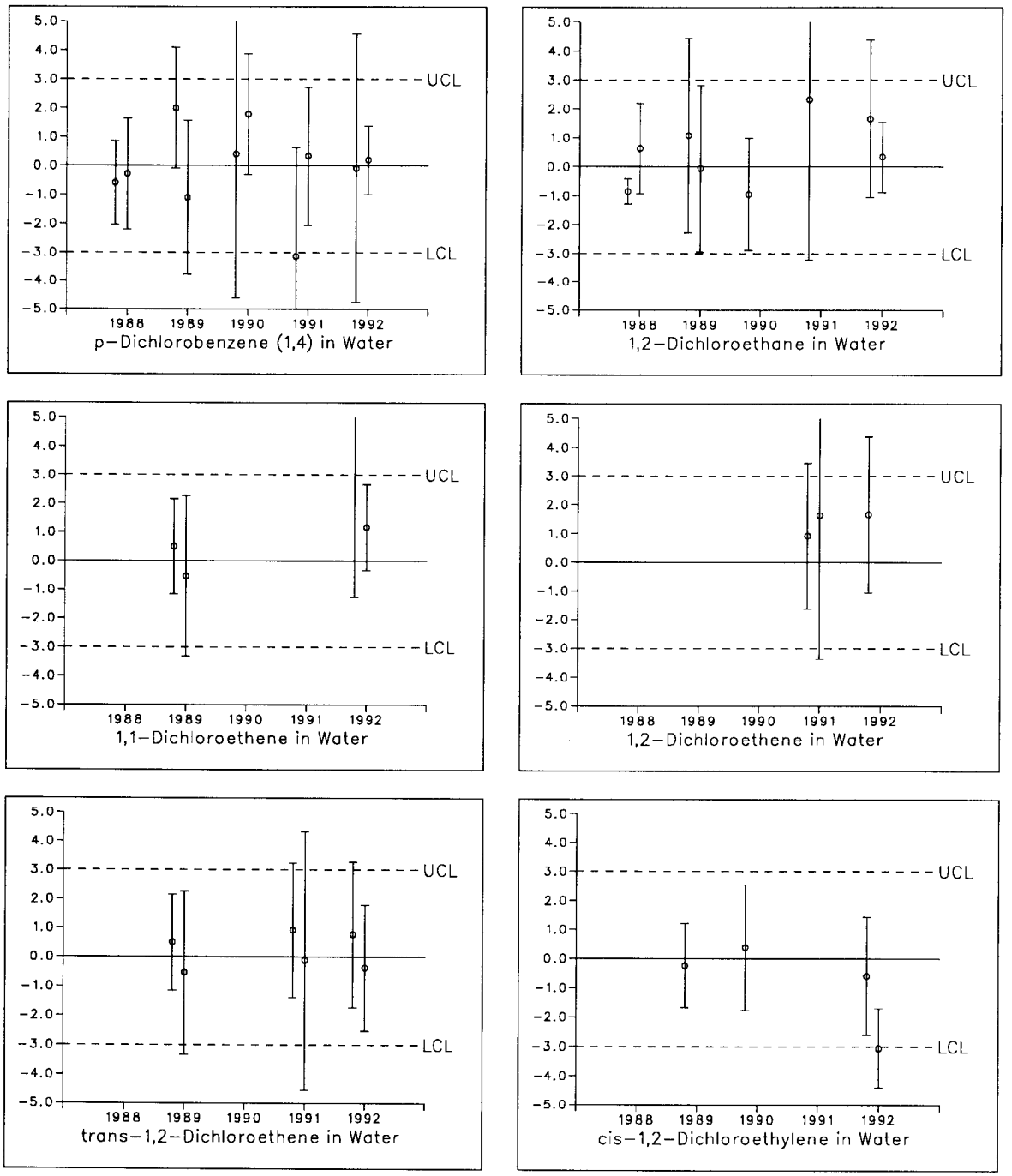
UCL
LCL
1988
1989
1990
1991
1992
Chlorobenzene in Water
Chlorodibromomethane in Water
Chloroform in Water
1,2-Dibromo-3-chloropropane in Water
Dibromomethane in Water
o-Dichlorobenzene (1,2) in Water

Fig. F-6. (cont)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1.0
0.0
-1.0
-2.0
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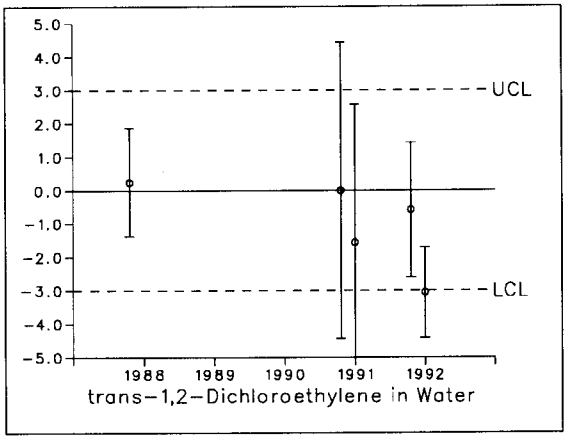
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
p-Dichlorobenzene (1,4) in Water
1,2-Dichloroethane in Water
1,1-Dichloroethene in Water
1,2-Dichloroethene in Water
trans-1,2-Dichloroethene in Water
cis-1,2-Dichloroethylene in Water

Fig. F-6. (cont)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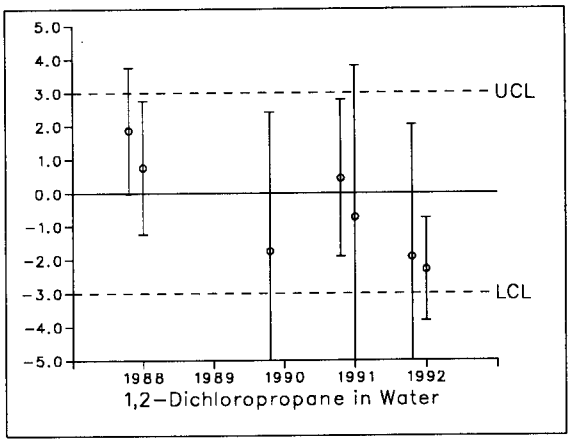
UCL
LCL
1988
1989
1990
1991
1992
trans-1,2-Dichloroethylene in Water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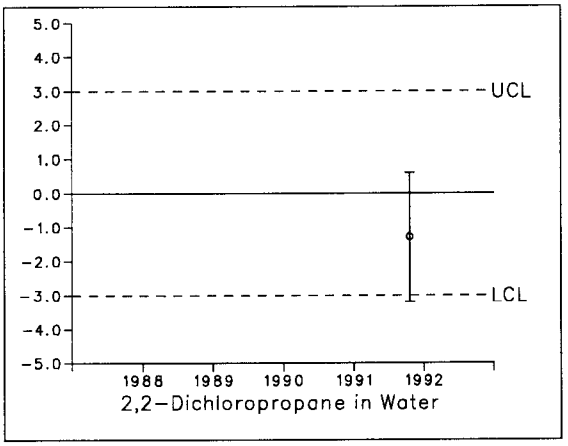
UCL
LCL
1988
1989
1990
1991
1992
1,2-Dichloropropane in Water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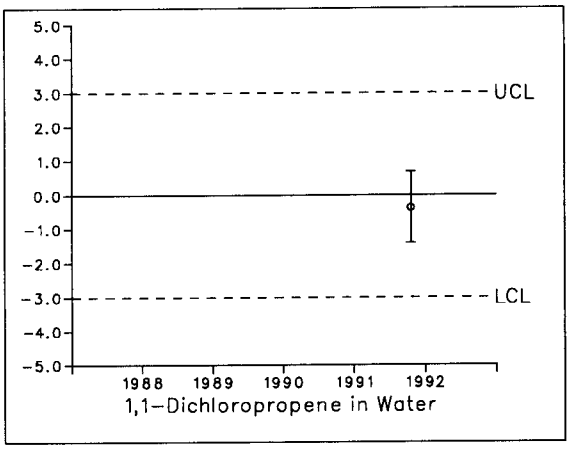
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
2,2-Dichloropropane in Water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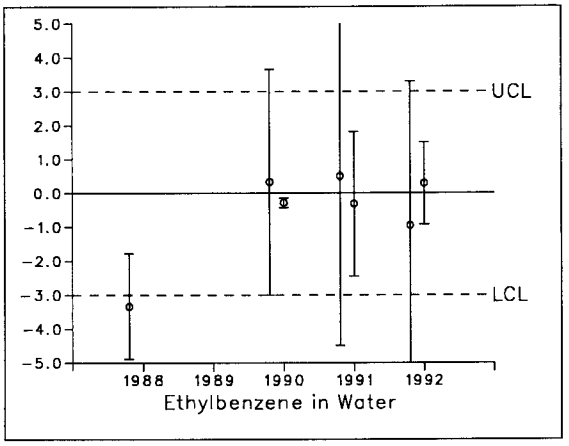
UCL
LCL
1988
1989
1990
1991
1992
1,1-Dichloropropene in Water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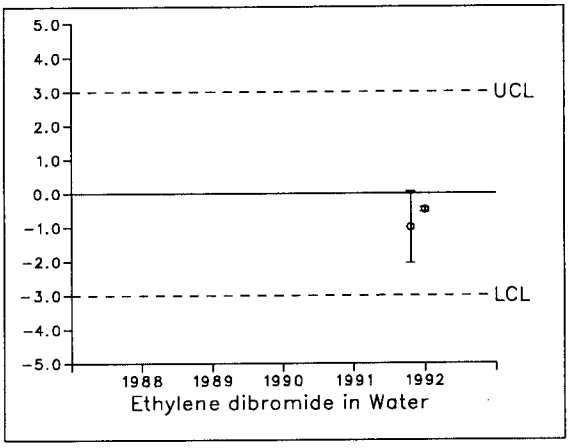
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Ethylbenzene in Water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-1.0
-2.0
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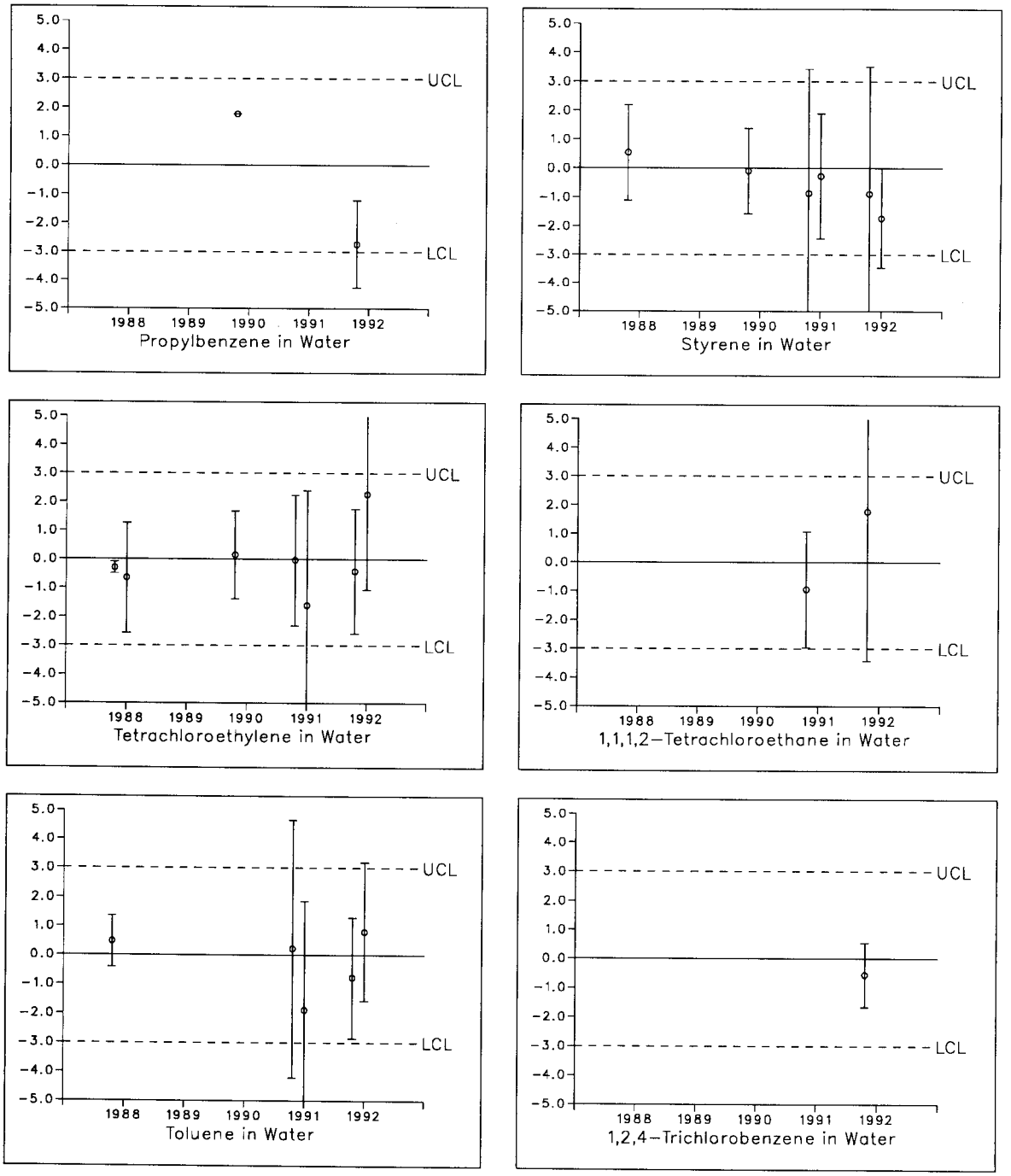
UCL
LCL
1988
1989
1990
1991
1992
Ethylene dibromide in Water

Fig. F-6. (cont)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-1.0
-2.0
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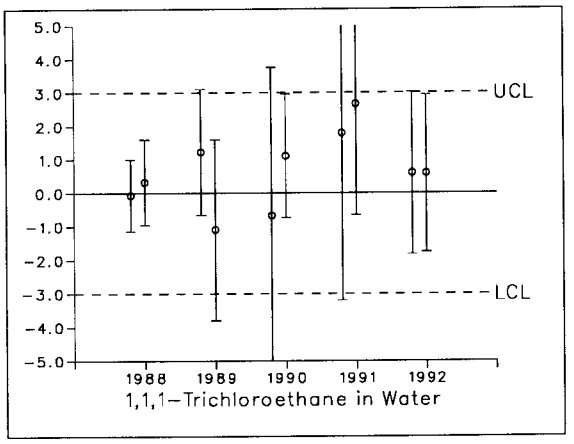
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Propylbenzene in Water
Styrene in Water
Tetrachloroethylene in Water
1,1,1,2-Tetrachloroethane in Water
Toluene in Water
1,2,4-Trichlorobenzene in Water

Fig. F-6. (cont)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1.0
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-1.0
-2.0
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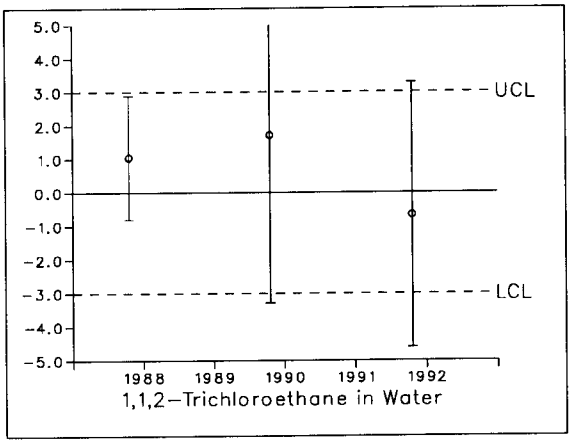
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
1,1,1-Trichloroethane in Water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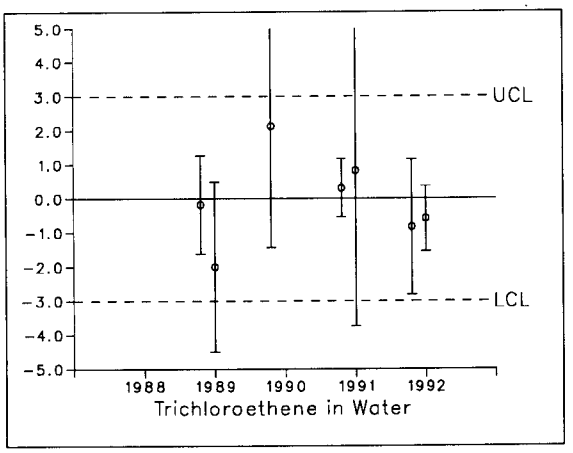
UCL
LCL
1988
1989
1990
1991
1992
1,1,2-Trichloroethane in Water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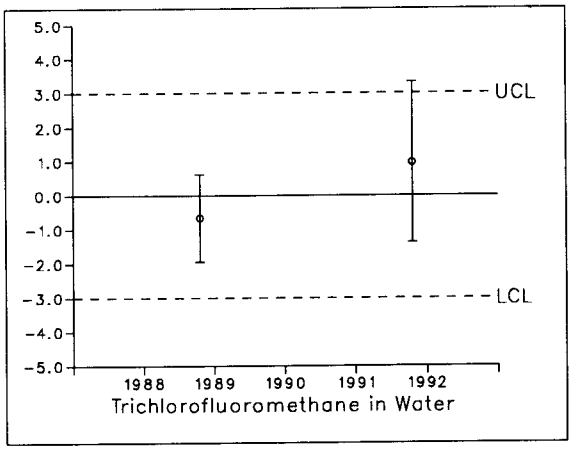
UCL
LCL
1988
1989
1990
1991
1992
Trichloroethene in Water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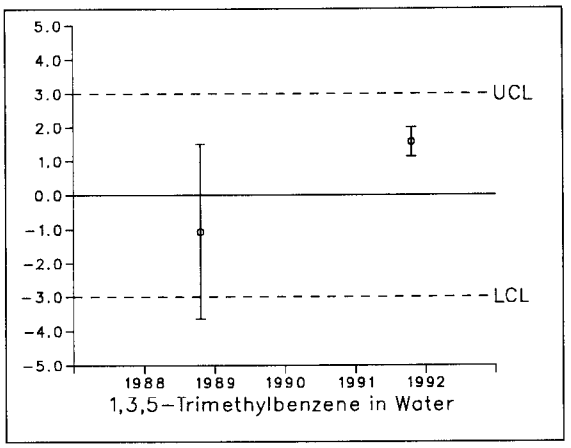
UCL
LCL
1988
1989
1990
1991
1992
Trichlorofluoromethane in Water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3.0
2.0
1.0
0.0
-1.0
-2.0
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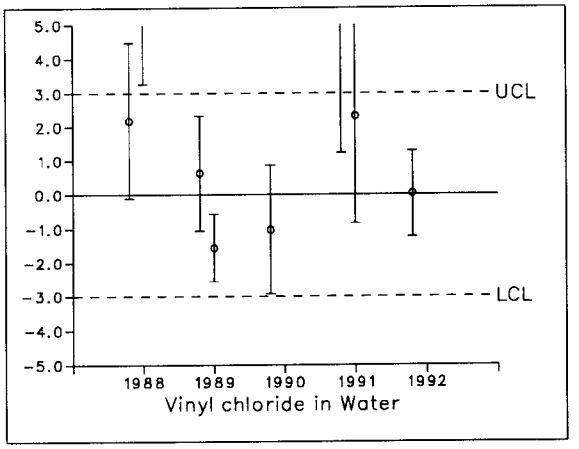
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
1,3,5-Trimethylbenzene in Water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-2.0
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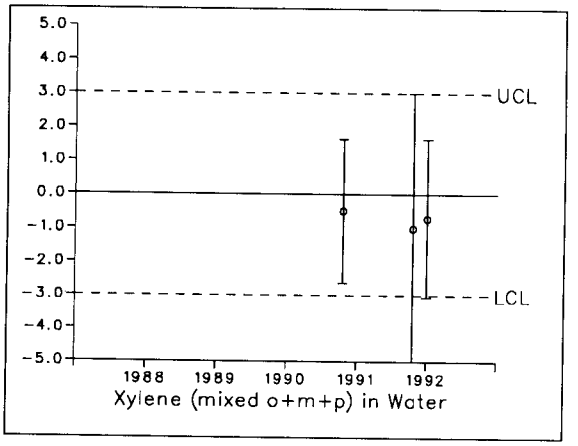
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Vinyl chloride in Water

Fig. F-6. (cont)



NOTE: The position of each data point is determined by dividing the difference between the EM-9 and agency values by the expected standard deviation given by the agency. The size of the error bar is determined by dividing the EM-9 standard deviation by the agency standard deviation. In most cases, the EM-9 mean is within one standard deviation of the agency value and our error bars overlap the agency mean value.

△ ▽ indicates data points beyond the ± 3 σ control limits.

Fig. F-6. (cont)

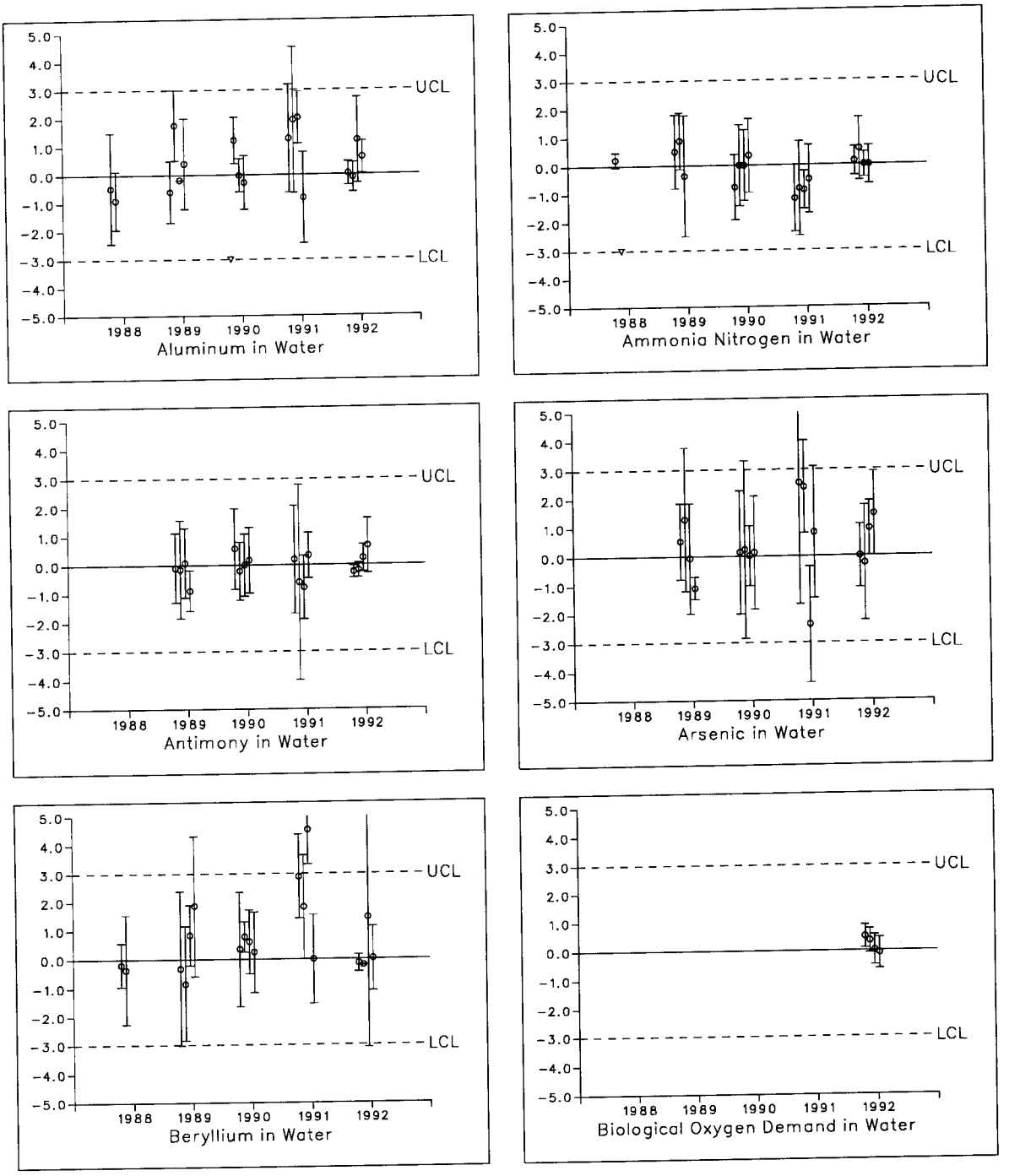
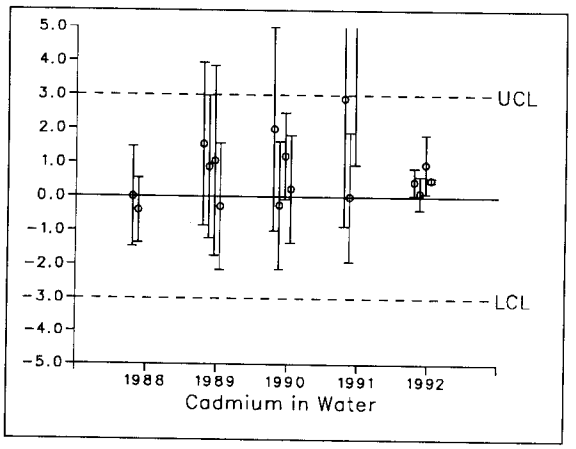


Fig. F-7. Five-year trends in EPA Water Pollution Performance Evaluation Studies.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1.0
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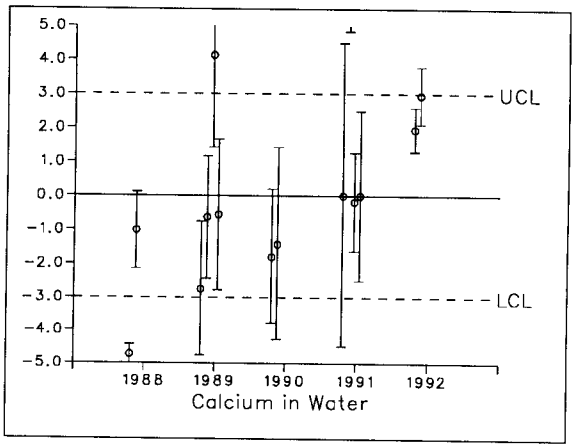
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Cadmium in Water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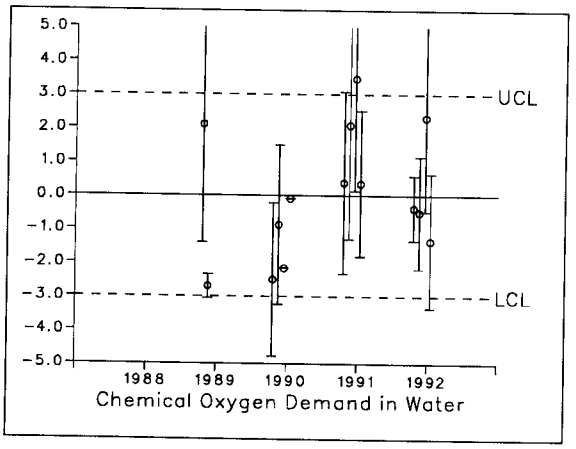
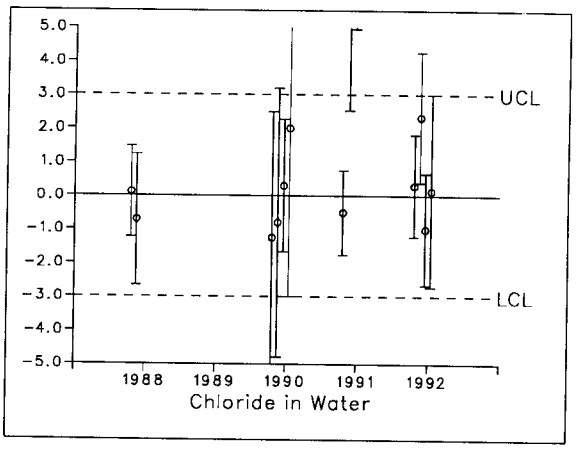
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Calcium in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Chemical Oxygen Demand in Water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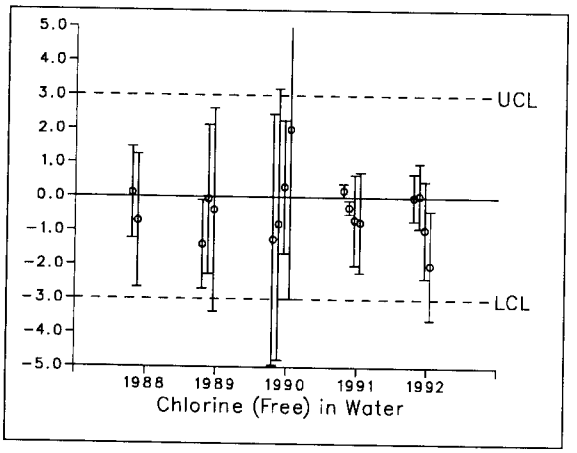
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Chloride in Water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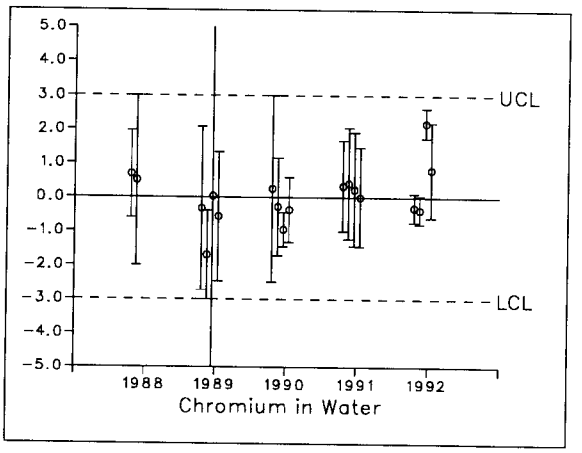
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Chlorine (Free) in Water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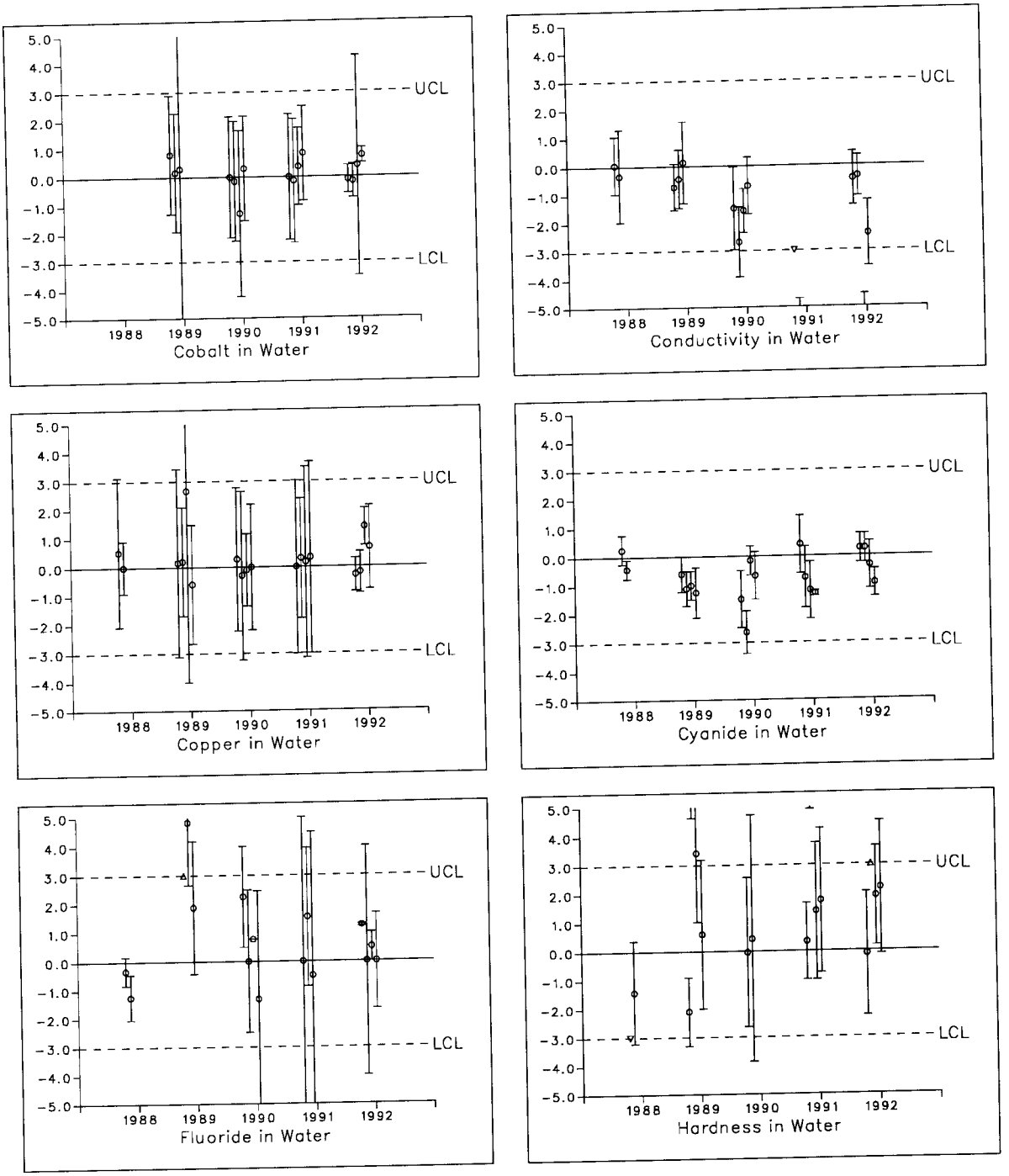
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Chromium in Water

Fig. F-7. (cont)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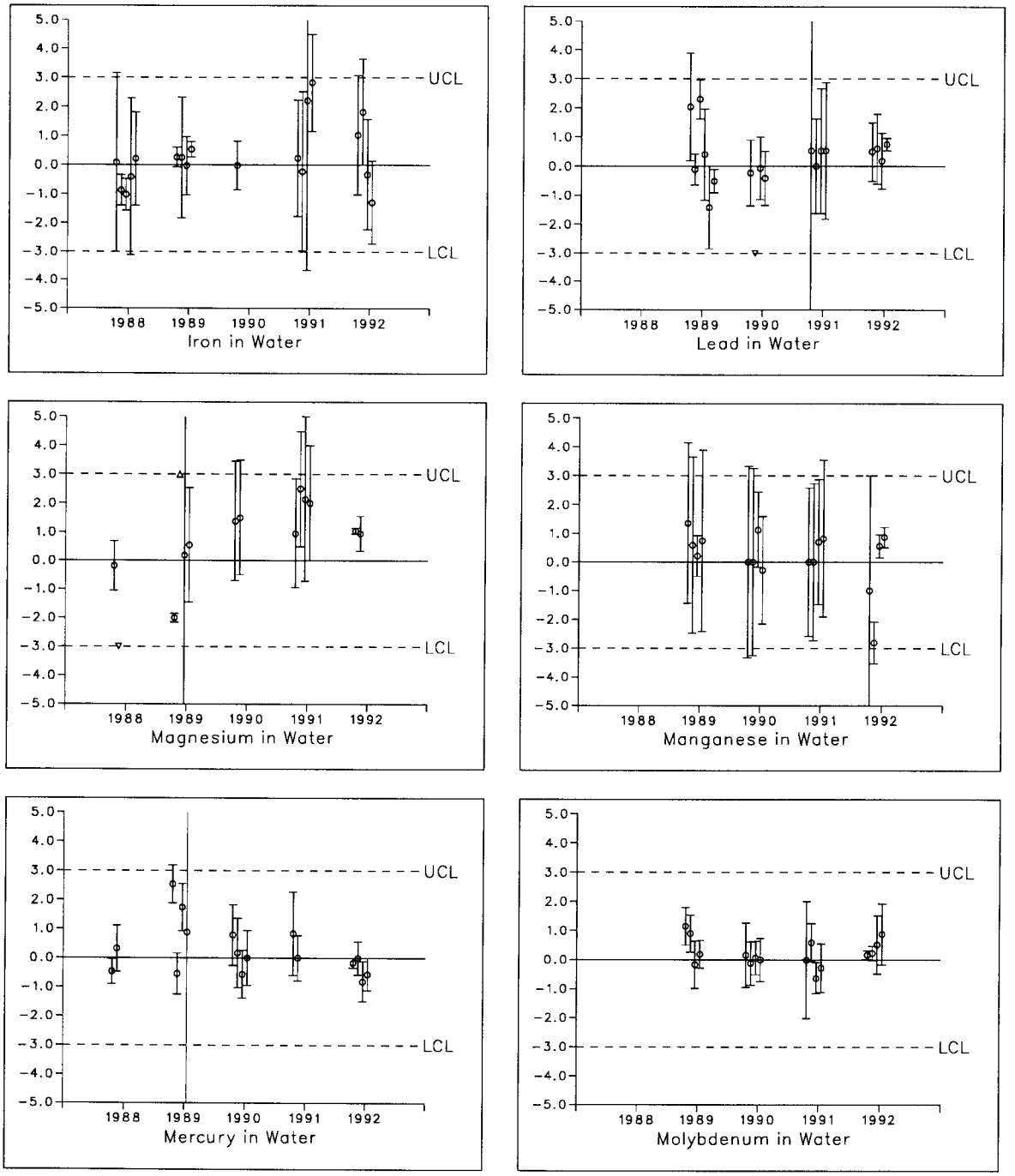
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Cobalt in Water
Conductivity in Water
Copper in Water
Cyanide in Water
Fluoride in Water
Hardness in Water

Fig. F-7. (cont)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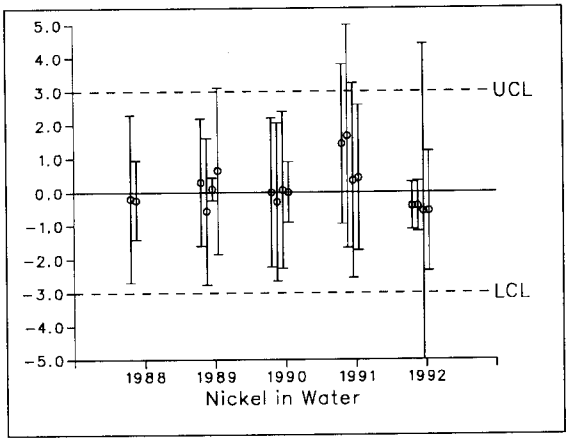
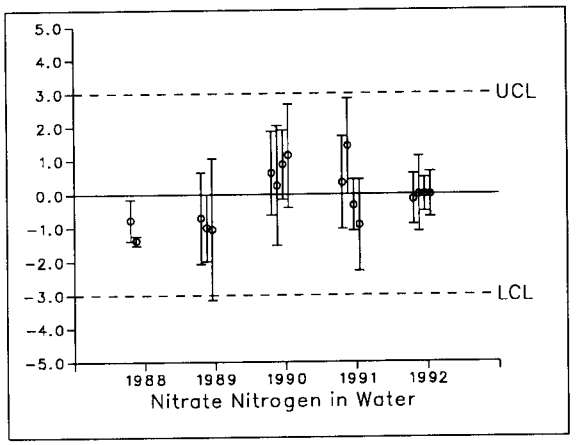
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Iron in Water
Lead in Water
Magnesium in Water
Manganese in Water
Mercury in Water
Molybdenum in Water

Fig. F-7. (cont)


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Nickel in Water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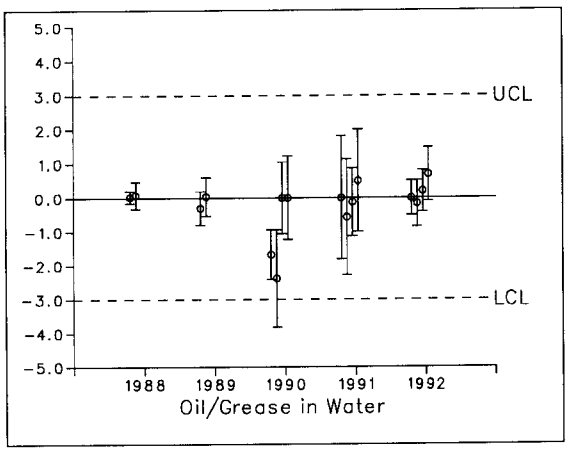
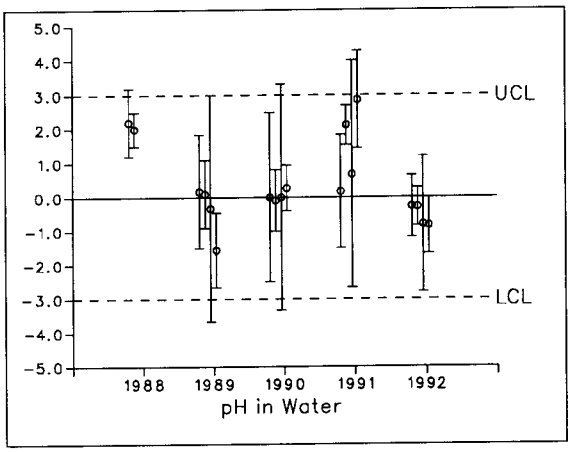
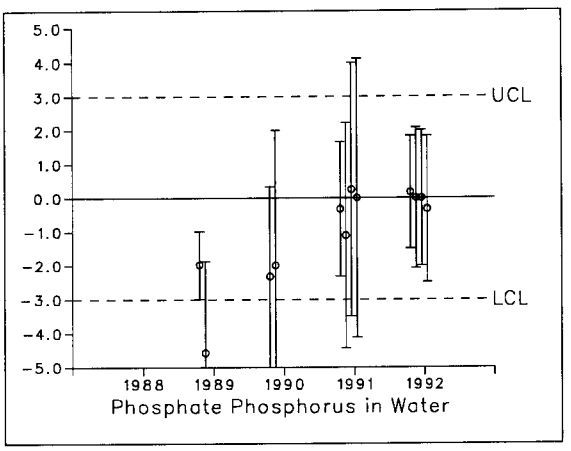
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Nitrate Nitrogen in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Oil/Grease in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
pH in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Phosphate Phosphorus in Water

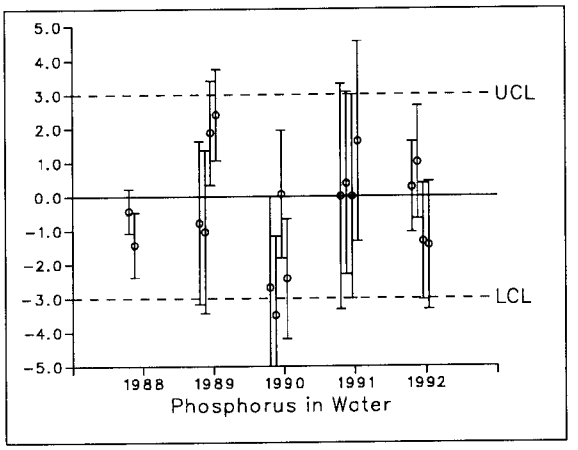

5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Phosphorus in Water

Fig. F-7. (cont)

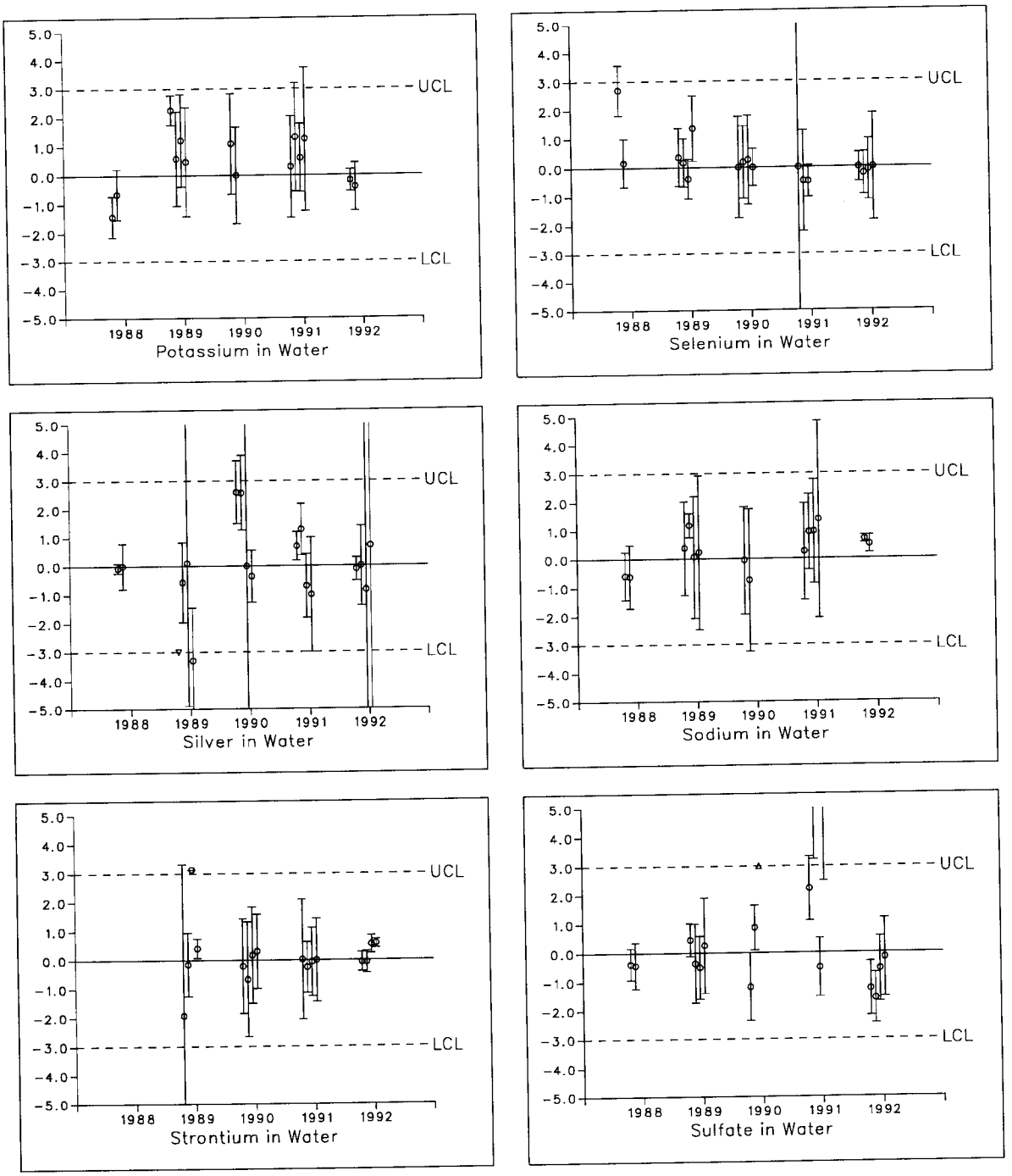
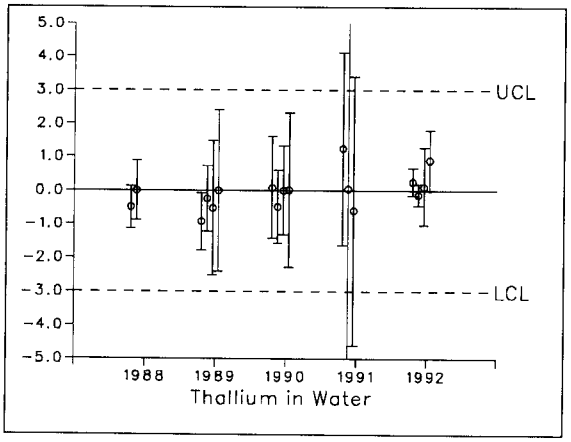
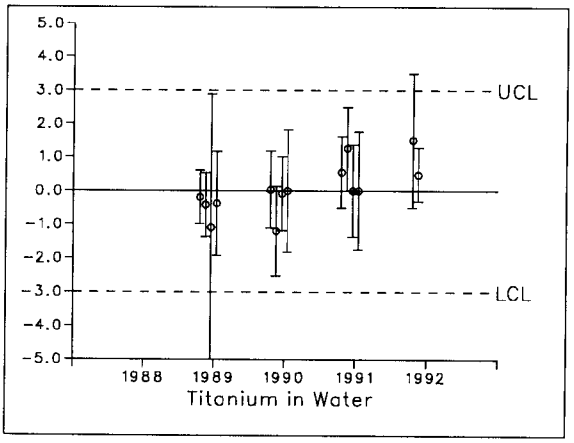
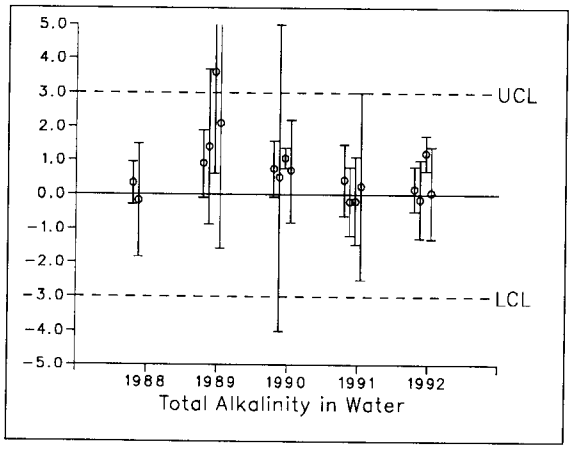
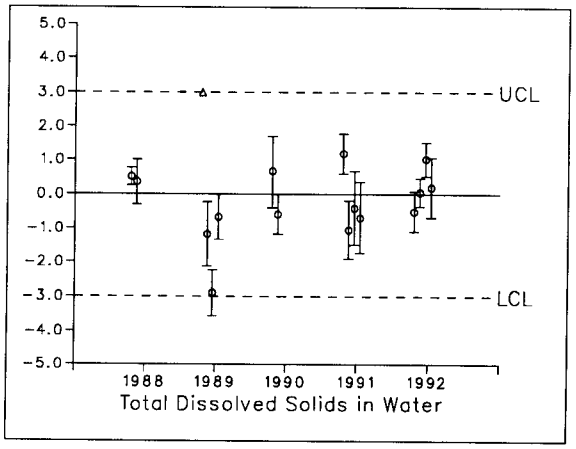

5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Potassium in Water
Selenium in Water
Silver in Water
Sodium in Water
Strontium in Water
Sulfate in Water

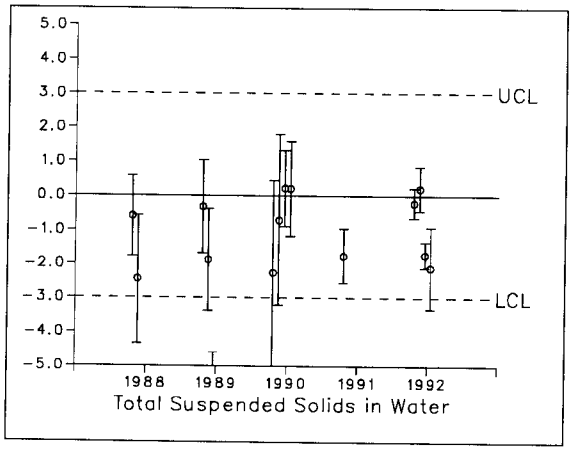
Fig. F-7. (cont)


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Thallium in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Titanium in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Total Alkalinity in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Total Dissolved Solids in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Total Suspended Solids in Water

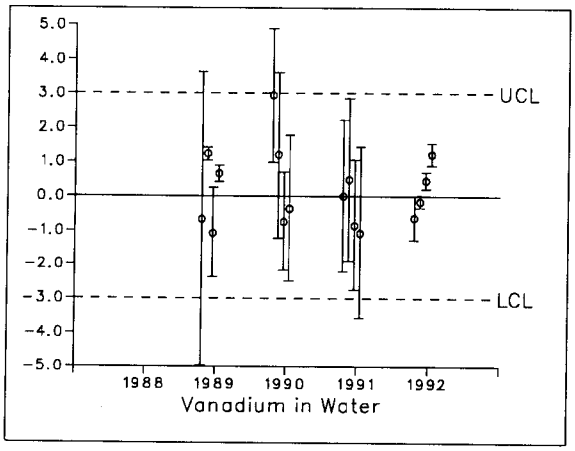
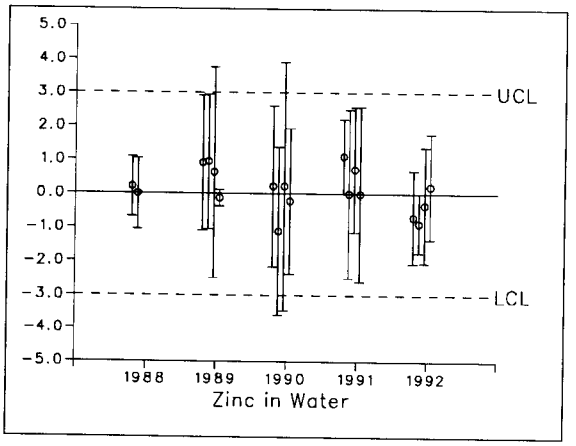
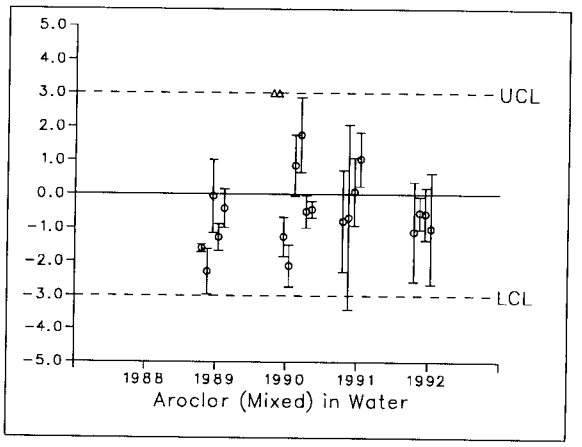
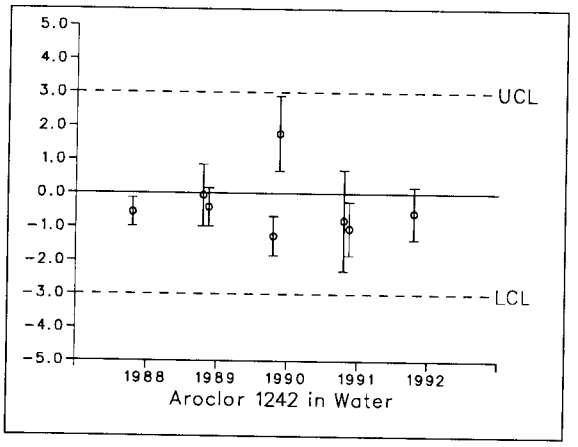
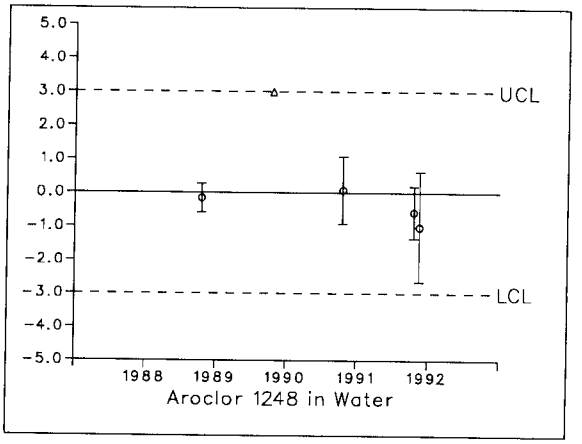

5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Vanadium in Water

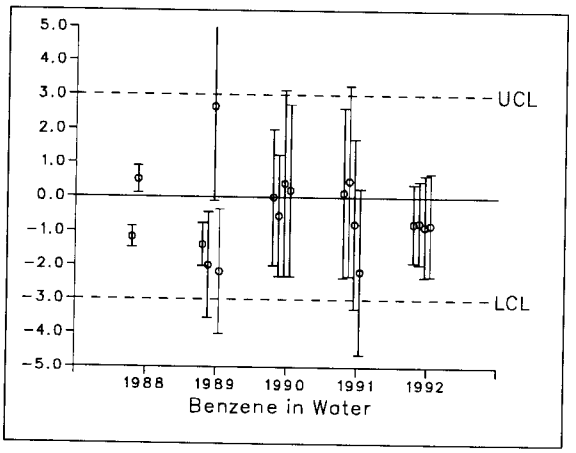
Fig. F-7. (cont)


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Zinc in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Aroclor (Mixed) in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Aroclor 1242 in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Aroclor 1248 in Water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4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Benzene in Water

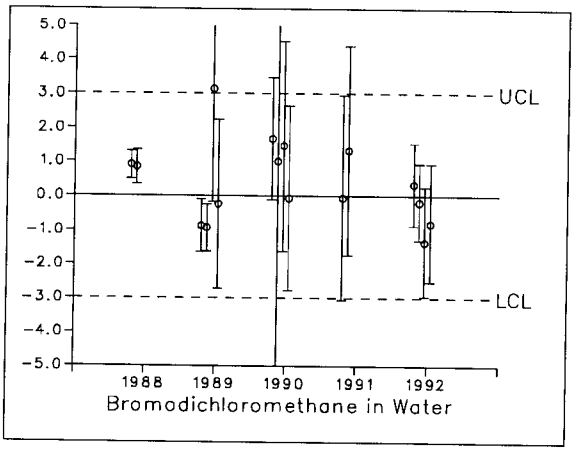
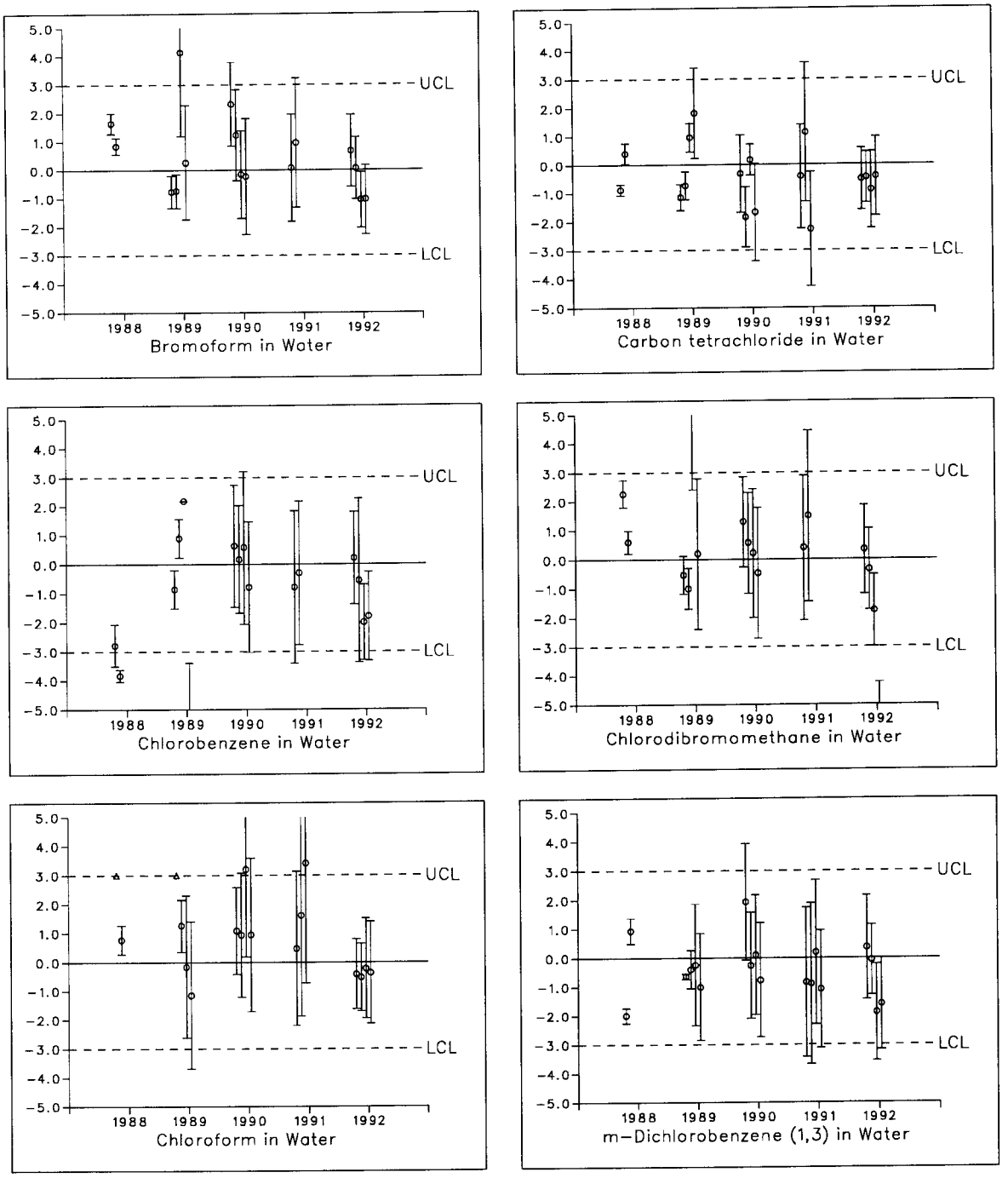

5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Bromodichloromethane in Water

Fig. F-7. (cont)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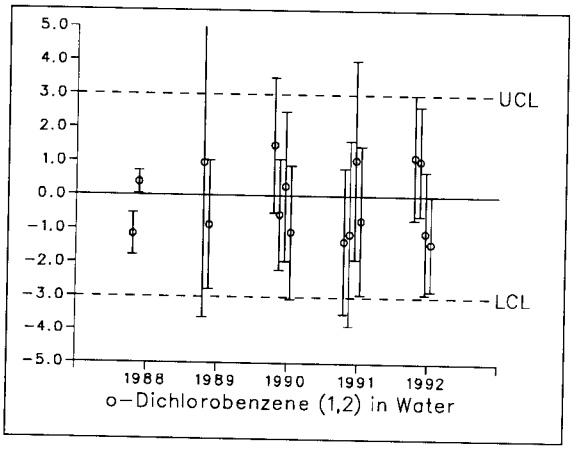
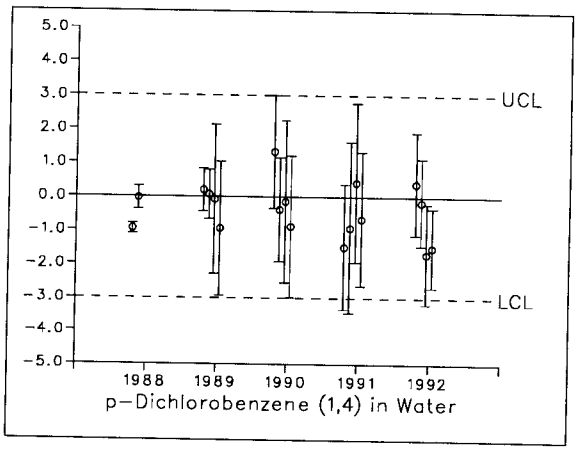
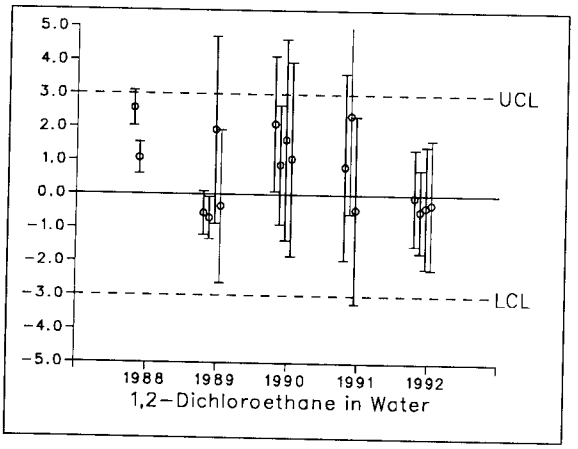
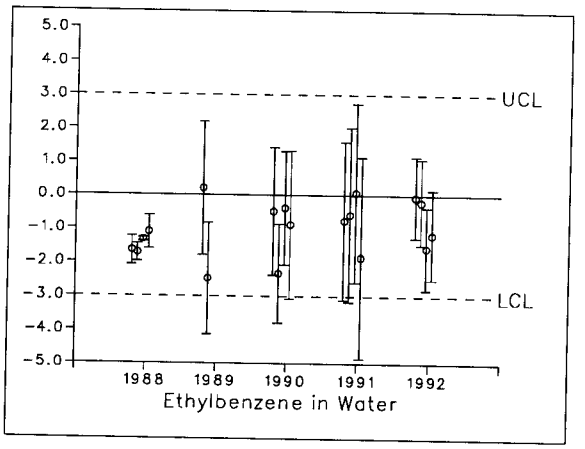
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Bromoform in Water
Carbon tetrachloride in Water
Chlorobenzene in Water
Chlorodibromomethane in Water
Chloroform in Water
m-Dichlorobenzene (1,3) in Water

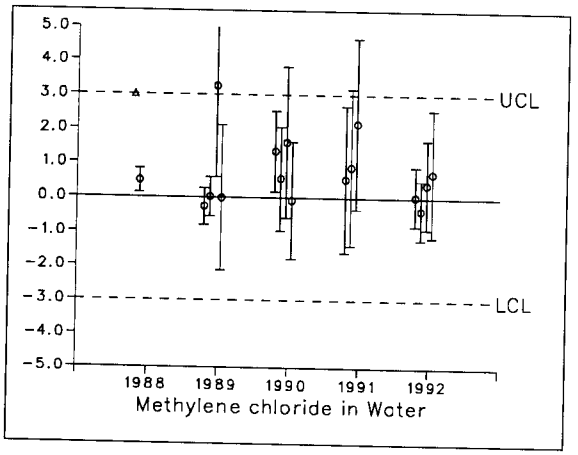
Fig. F-7. (cont)


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
o-Dichlorobenzene (1,2) in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
p-Dichlorobenzene (1,4) in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
1,2-Dichloroethane in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Ethylbenzene in Water


5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Methylene chloride in Water

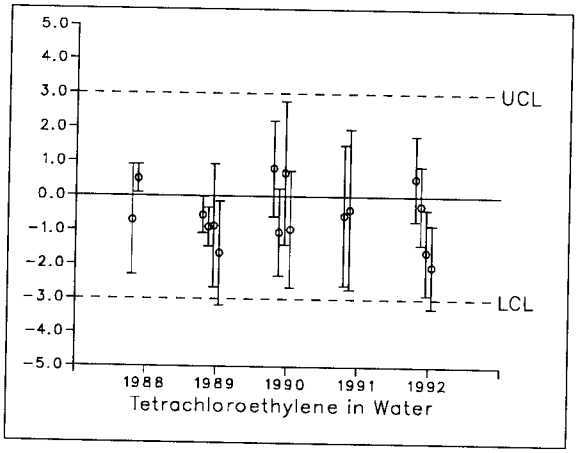
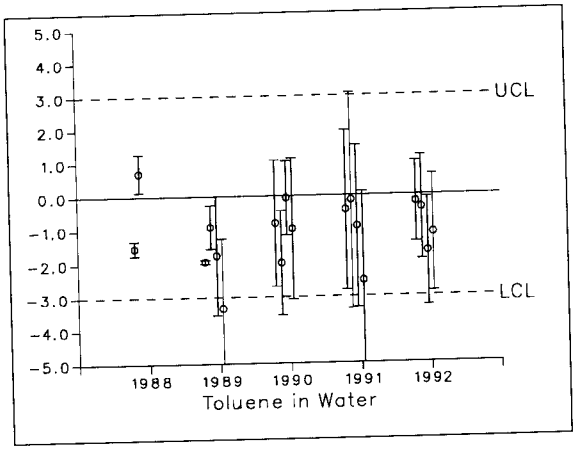
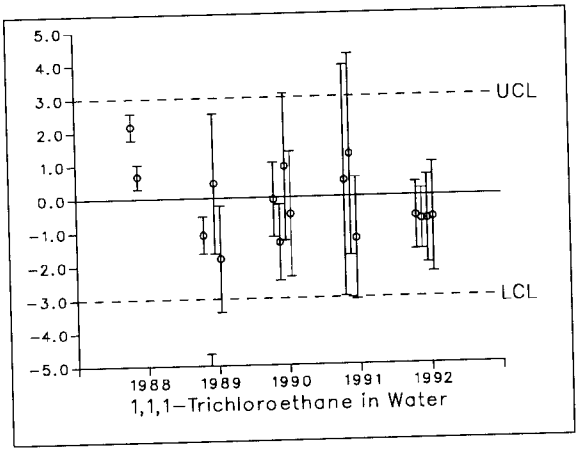
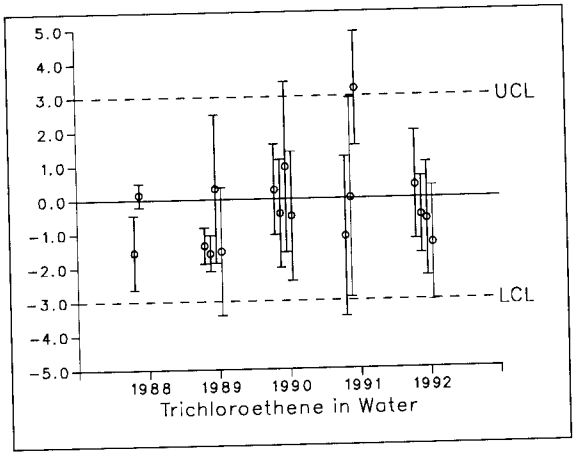

5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
UCL
LCL
1988
1989
1990
1991
1992
Tetrachloroethylene in Water

Fig. F-7. (cont)







NOTE: The position of each data point is determined by dividing the difference between the EM-9 and agency values by the expected standard deviation given by the agency. The size of the error bar is determined by dividing the EM-9 standard deviation by the agency standard deviation. In most cases, the EM-9 mean is within one standard deviation of the agency value and our error bars overlap the agency mean value.

△ ▽ indicates data points beyond the ± 3 σ control limits.

Fig. F-7. (cont)

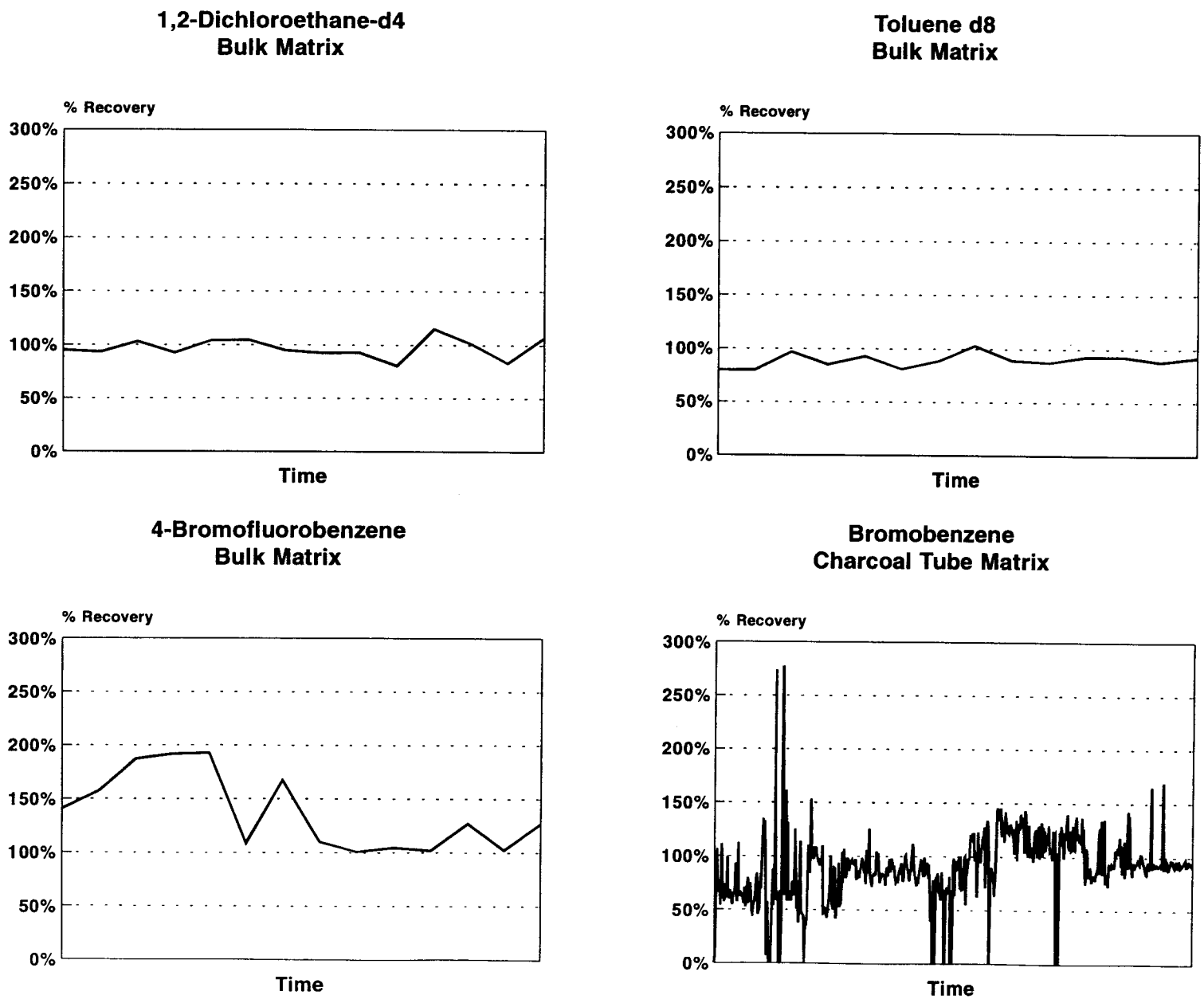


Fig. F-8. Organic surrogate data for bulk, charcoal tube, sludge, soil, and water matrices for 1992.

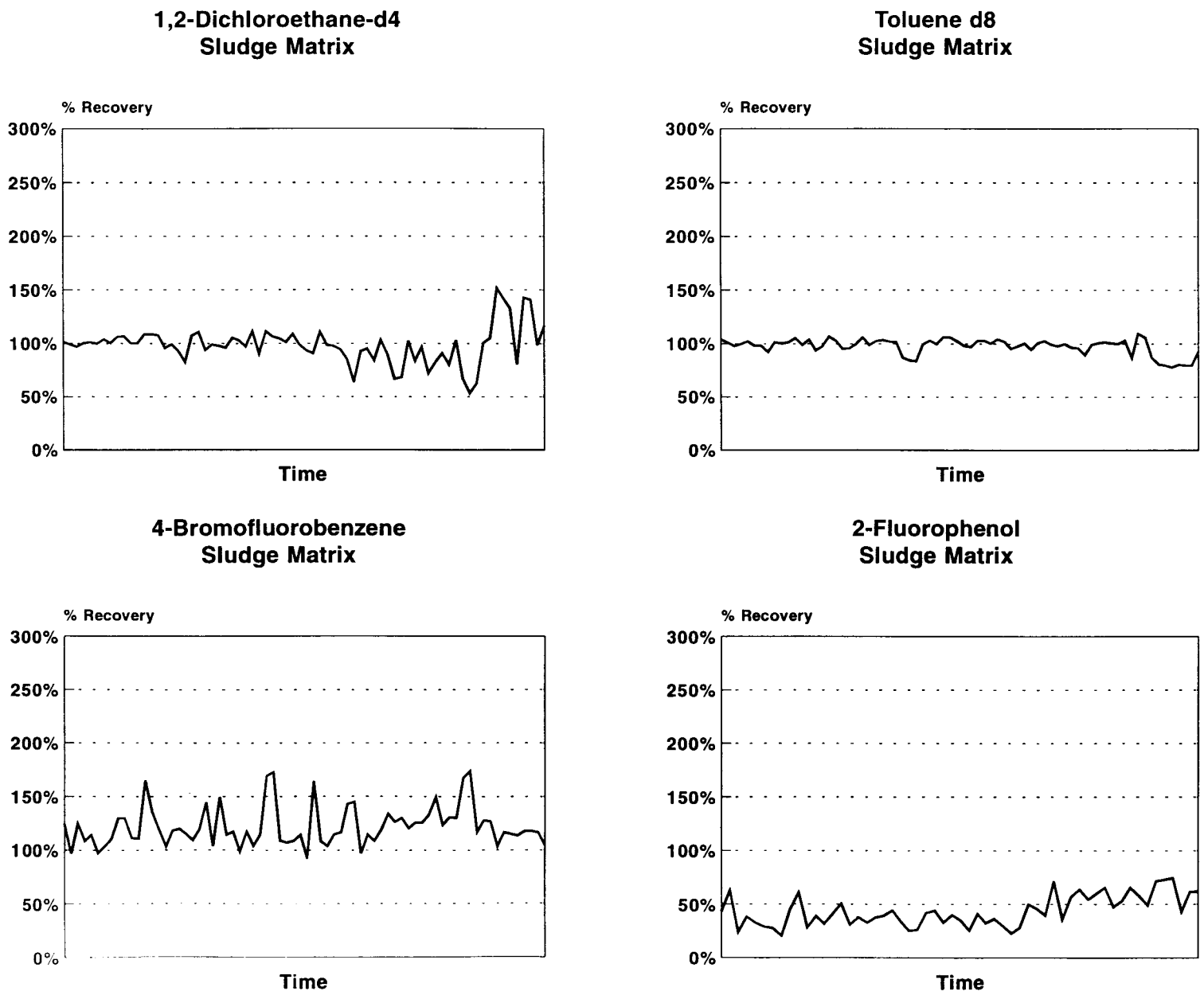
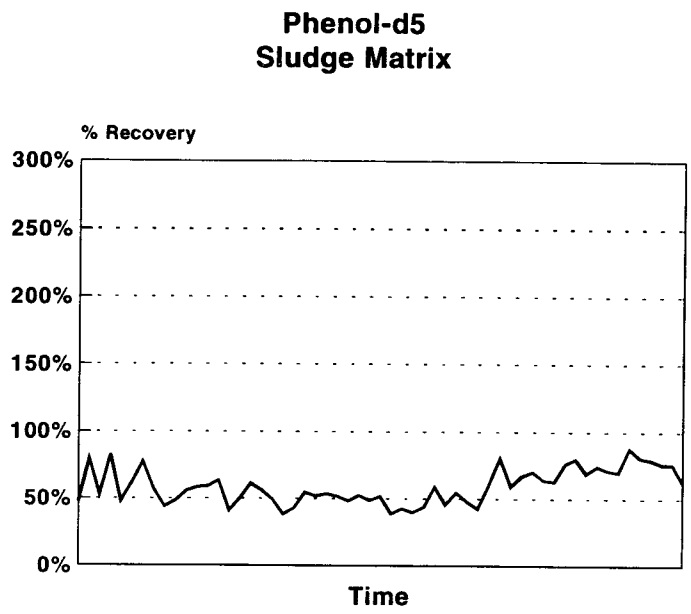
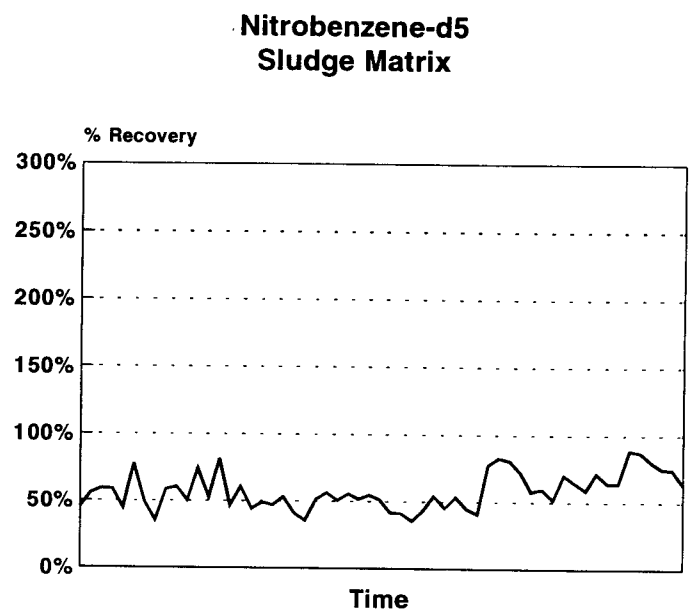
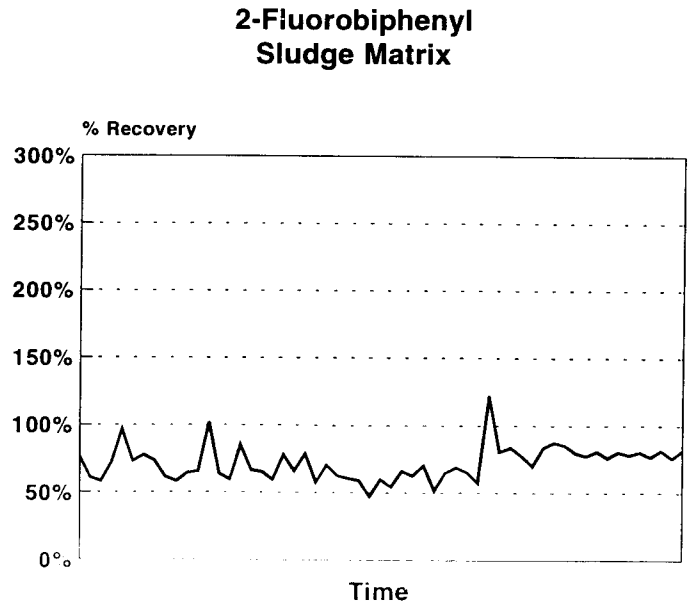

1,2-Dichloroethane-d4
Sludge Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time
Toluene d8
Sludge Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time
4-Bromofluorobenzene
Sludge Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time
2-Fluorophenol
Sludge Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time

Fig. F-8. (cont)


Phenol-d5
Sludge Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time


Nitrobenzene-d5
Sludge Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time


2-Fluorobiphenyl
Sludge Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time

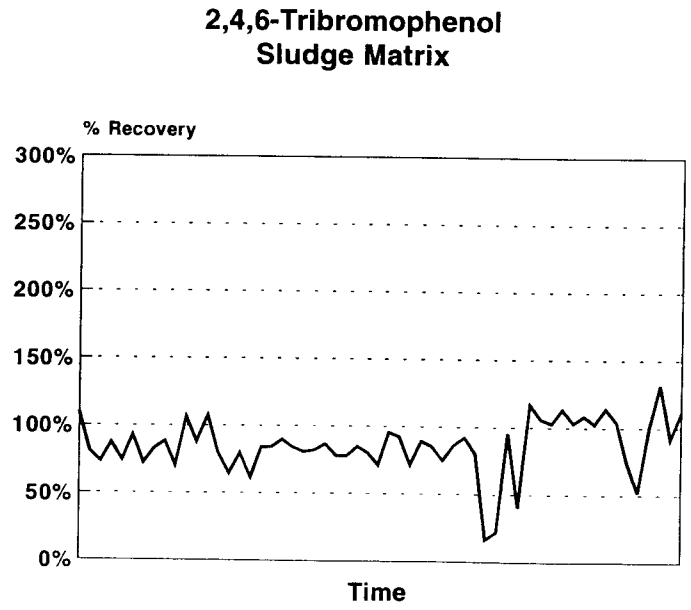

2,4,6-Tribromophenol
Sludge Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time

Fig. F-8. (cont)

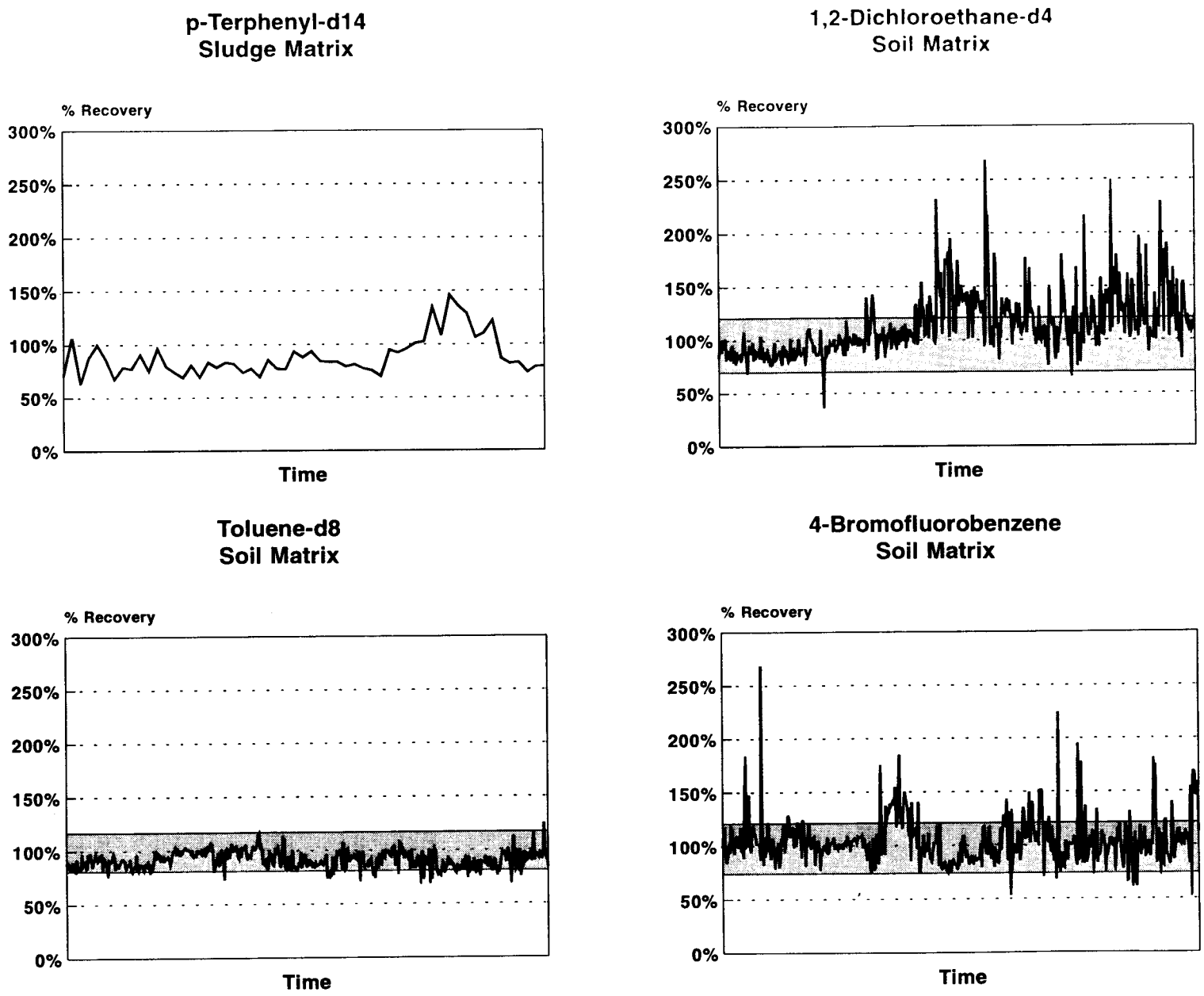
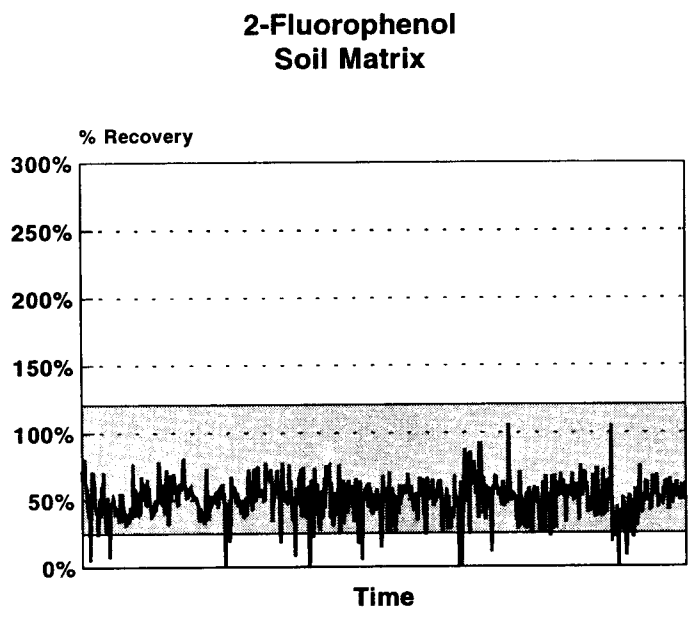
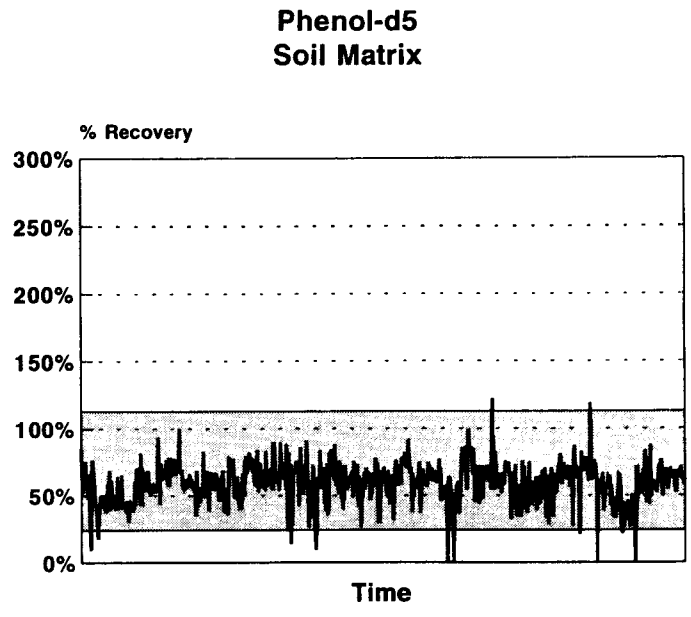
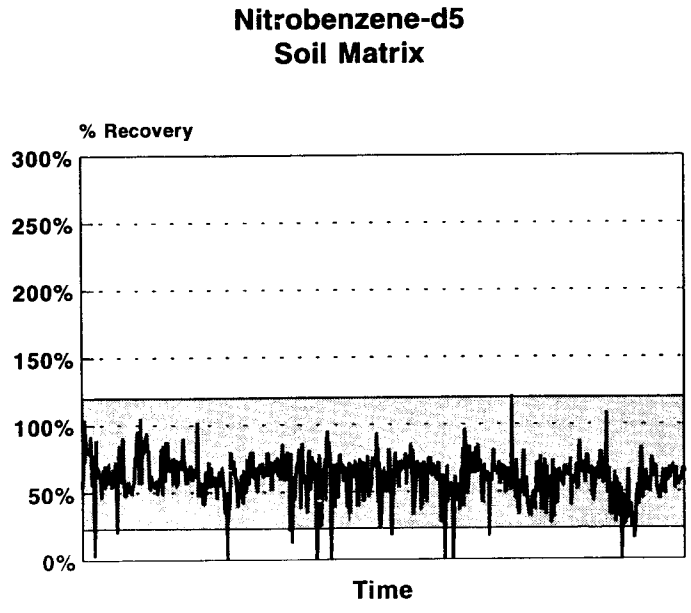

p-Terphenyl-d14
Sludge Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time
1,2-Dichloroethane-d4
Soil Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time
Toluene-d8
Soil Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time
4-Bromofluorobenzene
Soil Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time

Fig. F-8. (cont)


2-Fluorophenol
Soil Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time


Phenol-d5
Soil Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time


Nitrobenzene-d5
Soil Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time

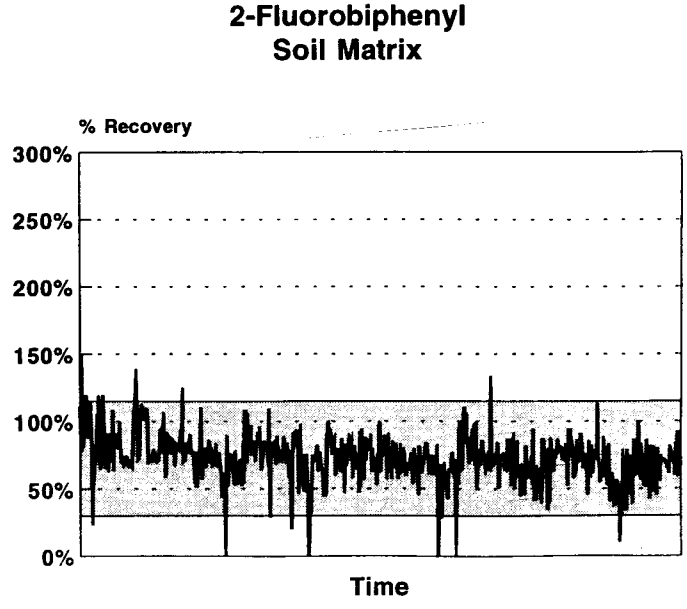

2-Fluorobiphenyl
Soil Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time

Fig. F-8. (cont)

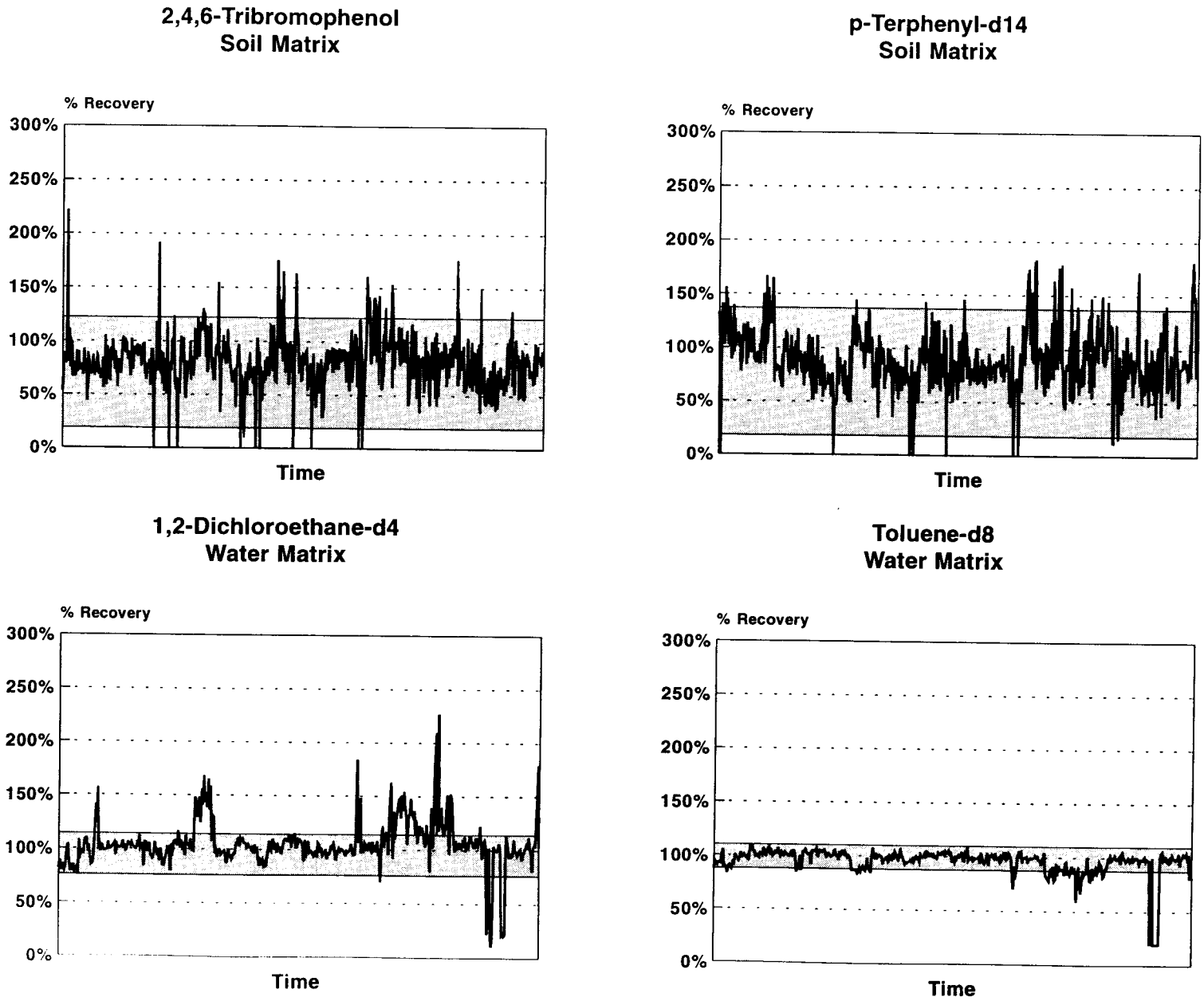

2,4,6-Tribromophenol
Soil Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time
p-Terphenyl-d14
Soil Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time
1,2-Dichloroethane-d4
Water Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time
Toluene-d8
Water Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time

Fig. F-8. (cont)

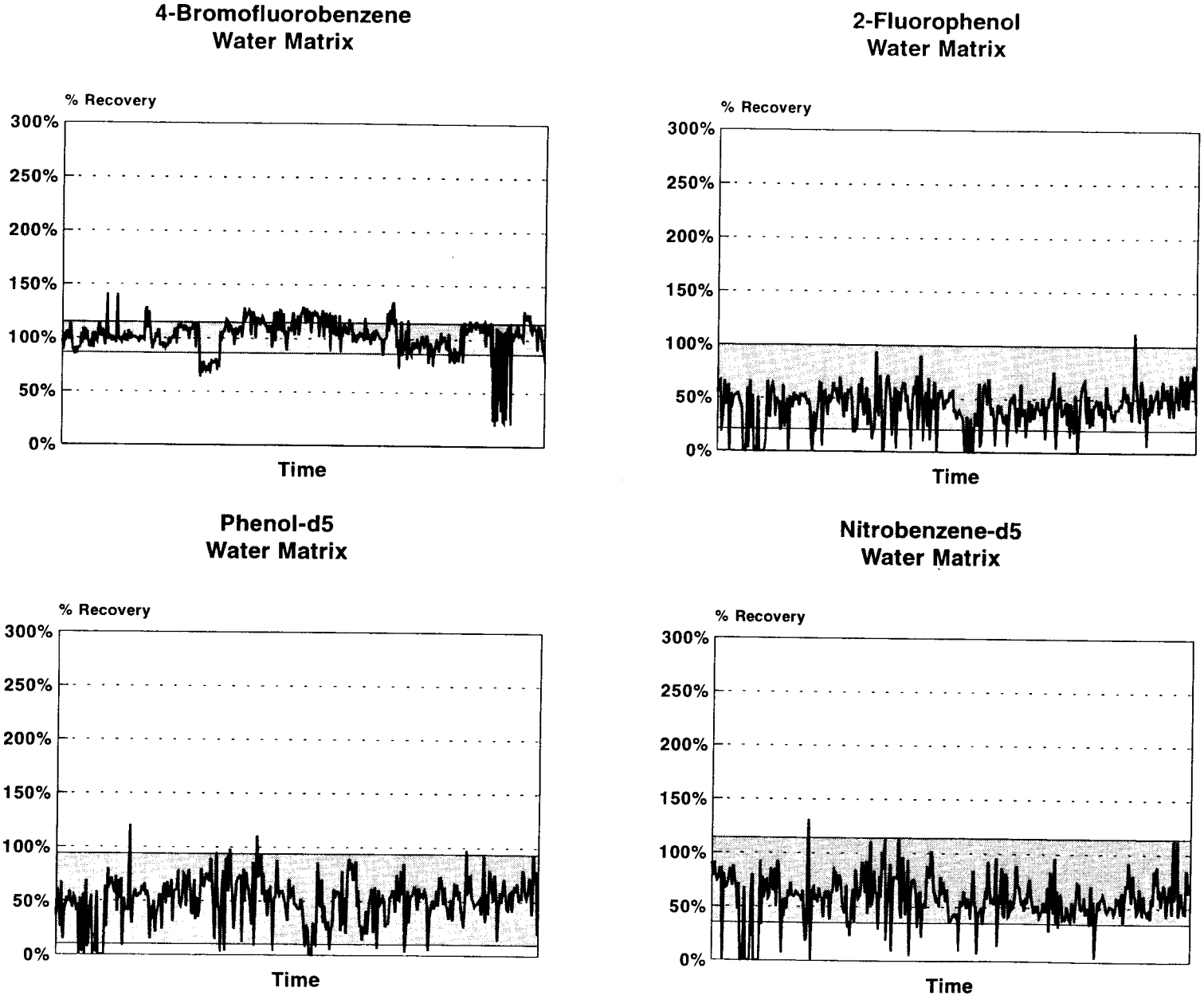
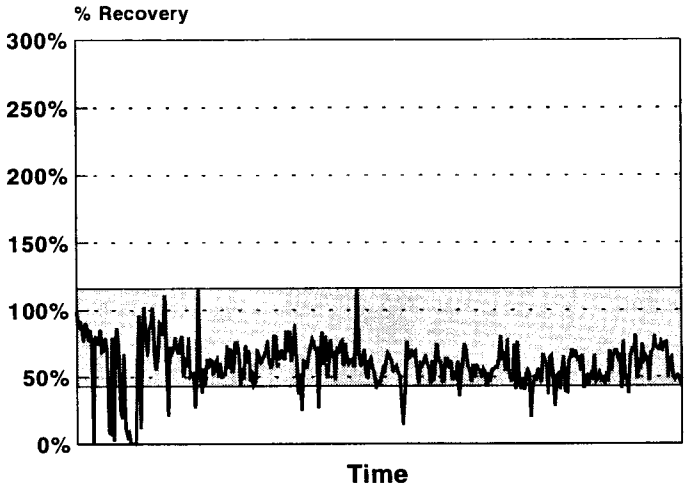
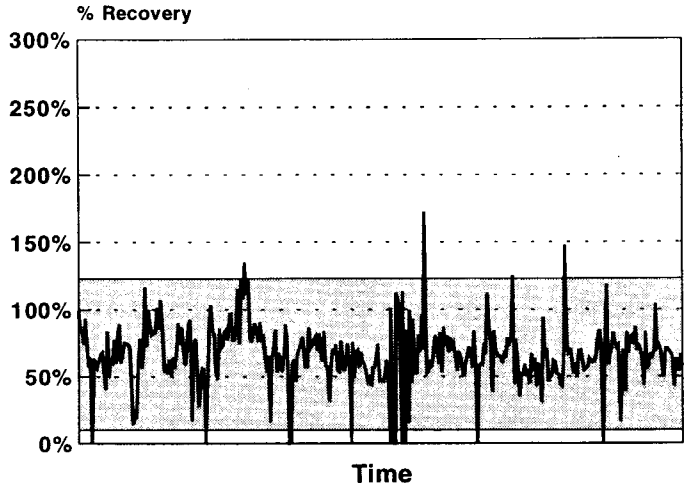

4-Bromofluorobenzene
Water Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time
2-Fluorophenol
Water Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time
Phenol-d5
Water Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time
Nitrobenzene-d5
Water Matrix
% Recovery
300%
250%
200%
150%
100%
50%
0%
Time

Fig. F-8. (cont)

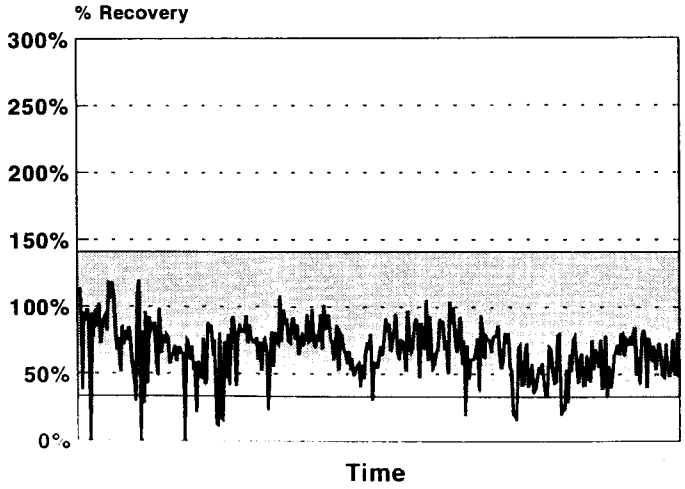
2-Fluorobiphenyl
Water Matrix



2,4,6-Tribromophenol
Water Matrix



p-Terphenyl-d14
Water Matrix



The shaded areas of the plots represent established EPA recovery limits.

—— Results

- - - EPA control limits

Fig. F-8. (cont)

APPENDIX G

SUMMARY TABLES OF SPIKE RECOVERY DATA

TABLE G-I

PLUTONIUM-238 SPIKE RECOVERY IN URINE
AFTER CORRECTION FOR PLUTONIUM-242 TRACER RECOVERY

Spike Level pCi/Sample	Mean ± Std Dev	No. of Samples	RSD (%)
0.07	104 ± 10	21	10
0.14	91 ± 10	23	11
0.25	88 ± 11	21	13
0.50	86 ± 8	24	9

TABLE G-II

PLUTONIUM-239 SPIKE RECOVERY IN URINE
AFTER CORRECTION FOR PLUTONIUM-242 TRACER RECOVERY

Spike Level pCi/Sample	Mean ± Std Dev	No. of Samples	RSD (%)
0.06	99 ± 11	20	11
0.15	95 ± 12	21	13
0.22	101 ± 8	24	8
0.44	101 ± 6	20	6

TABLE G-III

TRITIUM SPIKE RECOVERY IN URINE

Spike Level uCi/L	Mean ± Std Dev	No. of Samples	RSD (%)
0.40	103 ± 11	51	11
0.70	100 ± 10	46	10
4.09	105 ± 6	29	6
8.17	101 ± 8	43	8

TABLE G-IV

URANIUM-234 SPIKE RECOVERY IN URINE
AFTER CORRECTION FOR URANIUM-232 TRACER RECOVERY

Spike Level pCi/Sample	Mean ± Std Dev	No. of Samples	RSD (%)
0.07	84 ± 26	6	31
0.12	108 ± 22	13	20
0.35	100 ± 15	8	15
0.82	109 ± 10	9	9
5.79	99 ± 5	7	5
28.94	99 ± 3	6	3
57.89	99 ± 1	5	1

TABLE G-V

URANIUM-235 SPIKE RECOVERY IN URINE
AFTER CORRECTION FOR URANIUM-232 TRACER RECOVERY

Spike Level pCi/L	Mean ± Std Dev	No. of Samples	RSD (%)
0.06	84 ± 27	9	32
0.08	96 ± 67	4	70
0.12	121 ± 41	7	34
0.36	97 ± 22	6	23
0.60	102 ± 8	6	8
0.85	105 ± 12	5	11
1.21	106 ± 2	5	2

TABLE G-VI

URANIUM-238 SPIKE RECOVERY IN URINE
AFTER CORRECTION FOR URANIUM-232 TRACER RECOVERY

Spike Level ug/L	Mean ± Std Dev	No. of Samples	RSD (%)
0.13	101 ± 12	3	12
0.17	108 ± 23	6	21
0.37	105 ± 11	6	11
0.62	102 ± 10	8	10
0.87	104 ± 7	7	7
1.25	105 ± 9	7	9
1.65	99 ± 11	4	11

TABLE G-VII

COMPARISON OF EM-9 QC SAMPLE RECOVERY WITH NIOSH PAT SAMPLE RECOVERY

ROUND 108 - FIRST QUARTER

METALS

	Lead		Cadmium		Chromium	
	EM-9	PAT	EM-9	PAT	EM-9	PAT
	103	107	97	104	137	149
	104	107	101	103	134	127
	102	104	100	101	123	143
	108	103	99	100	144	134
$\bar{X}$	104 ± 3	105 ± 2	99 ± 2	102 ± 2	132 ± 13	138 ± 10

SOLVENTS

	1,2-Dichloroethane		Carbon tetrachloride		Trichloroethylene	
	EM-9	PAT	EM-9	PAT	EM-9	PAT
	103	101	109	98	108	97
	99	97	102	105	102	106
	94	98	96	104	94	104
	102	97	101	94	88	97
$\bar{X}$	99 ± 4	98 ± 2	102 ± 10	100 ± 5	98 ± 9	101 ± 5

ROUND 109 - SECOND QUARTER

METALS

	Lead		Cadmium		Zinc	
	EM-9	PAT	EM-9	PAT	EM-9	PAT
	104	103	104	103	104	101
	103	105	101	110	99	106
	103	105	104	108	100	103
	104	103	103	107	101	101
$\bar{X}$	104 ± 1	104 ± 1	103 ± 1	107 ± 3	101 ± 2	103 ± 2

SOLVENTS

	Chloroform		Carbon tetrachloride		1,2-Dichloroethane	
	EM-9	PAT	EM-9	PAT	EM-9	PAT
	81	121	103	107	--	101
	99	117	94	99	101	113
	95	105	94	98	101	115
	110	93	103	104	103	103
$\bar{X}$	96 ± 12	109 ± 13	99 ± 5	102 ± 4	102 ± 1	108 ± 7

TABLE G-VII (cont)

ROUND 110 - THIRD QUARTER

METALS

	Lead		Cadmium		Chromium	
	EM-9	PAT	EM-9	PAT	EM-9	PAT
	104	109	102	104	106	105
	103	108	103	103	105	105
	100	105	104	100	90	107
	116	106	102	103	--	108
$\bar{X}$	104 ± 3	107 ± 2	103 ± 1	103 ± 2	100 ± 9	106 ± 2

SOLVENTS

	Benzene		o-Xylene		Toluene	
	EM-9	PAT	EM-9	PAT	EM-9	PAT
	92	91	87	78	83	89
	84	99	81	91	85	89
	93	92	76	114	89	90
	96	87	102	100	101	92
$\bar{X}$	91 ± 5	92 ± 5	87 ± 11	96 ± 15	90 ± 8	90 ± 1

ROUND 111 - FOURTH QUARTER

METALS

	Lead		Cadmium		Zinc	
	EM-9	PAT	EM-9	PAT	EM-9	PAT
	99	105	97	99	94	106
	104	102	99	102	103	100
	95	103	117	105	102	101
	105	107	100	104	100	101
$\bar{X}$	101 ± 5	104 ± 2	103 ± 9	103 ± 3	100 ± 4	101 ± 1

SOLVENTS

	1,2-Dichloroethane		Carbon tetrachloride		Trichloroetylene	
	EM-9	PAT	EM-9	PAT	EM-9	PAT
	95	97	94	96	94	100
	93	99	95	101	98	97
	95	100	94	103	99	107
	101	102	98	103	98	98
$\bar{X}$	96 ± 3	100 ± 2	95 ± 2	101 ± 3	97 ± 2	101 ± 5

APPENDIX H

NUCLEAR SPECTROMETRY

Alpha Spectrometer Calibration

and Background Data

TABLE H-I

ALPHA SPECTROMETER CALIBRATION AND BACKGROUND DATA
FIRST QUARTER 1992

16 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (70 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	30.30 ± 1.82	1	2	4
2	30.59 ± 1.84	1	1	2
3	36.52 ± 2.19	2	1	2
4	31.95 ± 1.92	3	1	4
5	36.74 ± 2.20	2	1	4
6	34.59 ± 2.08	3	1	6
7	37.02 ± 2.22	2	2	6
8	35.13 ± 2.11	1	1	1
9	33.55 ± 2.01	3	2	5
10	32.91 ± 1.97	1	0	1
11	35.14 ± 2.11	1	1	2
12	36.03 ± 2.16	3	1	3
13	35.86 ± 2.15	2	1	4
14	33.31 ± 2.00	1	1	2
15	34.31 ± 2.06	2	2	2
16	33.13 ± 1.99	2	1	3

48 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (70 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	30.09 ± 1.81	2	1	4
2	31.17 ± 1.87	1	1	2
3	36.98 ± 2.22	4	2	3
4	31.44 ± 1.89	2	1	2
5	33.98 ± 2.04	1	1	2
6	32.81 ± 1.97	1	1	2
7	35.43 ± 2.13	1	1	3
8	31.30 ± 1.88	2	2	3
9	33.45 ± 2.01	1	2	3
10	35.69 ± 2.14	2	1	2
11	34.96 ± 2.10	1	1	4
12	34.70 ± 2.08	3	1	3
13	34.85 ± 2.09	0	0	1
14	35.88 ± 2.15	1	1	0
15	31.84 ± 1.91	1	1	2
16	32.68 ± 1.96	4	2	4

32 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (70 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	31.55 ± 1.89	2	1	3
2	29.01 ± 1.74	1	0	5
3	30.86 ± 1.85	1	1	1
4	30.71 ± 1.84	2	0	1
5	32.75 ± 1.96	2	2	2
6	32.50 ± 1.95	2	1	3
7	31.23 ± 1.87	1	1	3
8	32.80 ± 1.97	1	2	3
9	34.86 ± 2.09	1	1	3
10	34.69 ± 2.08	2	2	5
11	32.12 ± 1.93	1	0	3
12	34.40 ± 2.06	2	2	4
13	35.12 ± 2.11	2	2	4
14	35.41 ± 2.12	2	1	3
15	34.98 ± 2.10	3	1	4
16	28.06 ± 1.68	1	1	2

64 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	17.34 ± 1.04	2	1	4
2	16.52 ± .99	1	1	2
3	20.84 ± 1.25	1	1	2
4	20.00 ± 1.20	1	0	2
5	20.88 ± 1.25	0	0	1
6	20.13 ± 1.21	1	1	1
7	19.56 ± 1.17	0	1	0
8	20.36 ± 1.22	0	0	1
9	23.20 ± 1.39	2	2	4
10	23.21 ± 1.39	2	1	2
11	23.82 ± 1.43	2	3	4
12	22.28 ± 1.34	0	1	2
13	23.90 ± 1.43	1	1	1
14	21.86 ± 1.31	0	2	2
15	23.23 ± 1.39	2	0	1
16	22.49 ± 1.35	0	0	0

TABLE H-I (cont)

80 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	20.03 ± 1.20	1	2	4
2	19.27 ± 1.16	1	0	2
3	21.15 ± 1.27	1	1	4
4	20.18 ± 1.21	1	1	6
5	20.94 ± 1.26	2	2	2
6	20.74 ± 1.24	4	2	5
7	21.05 ± 1.26	2	4	3
8	20.94 ± 1.26	2	2	7
9	22.13 ± 1.33	3	2	6
10	21.00 ± 1.26	2	3	4
11	23.15 ± 1.39	0	1	1
12	21.41 ± 1.28	1	1	1
13	21.40 ± 1.28	0	1	1
14	21.86 ± 1.31	1	0	0
15	22.91 ± 1.37	1	0	5
16	20.39 ± 1.22	0	0	0

96 ALPHA SPECTROMETER

Uranium and Thorium Background (70 000 s) N=10								
Detector	U-238	U-235	U-234	U232	Th-232	Th-230	Th-229	Th-228
1	0	0	0	5	-	-	-	-
2	0	1	0	1	-	-	-	-
3	0	0	1	1	-	-	-	-
4	0	0	0	1	-	-	-	-
5	0	0	0	1	-	-	-	-
6	0	0	0	1	-	-	-	-
7	0	1	1	1	-	-	-	-
8	0	0	0	1	-	-	-	-
9	1	1	0	1	-	-	-	-
10	0	0	0	1	-	-	-	-
11	0	2	1	4	-	-	-	-
12	0	0	0	0	-	-	-	-
13	0	1	1	2	-	-	-	-
14	0	0	0	1	-	-	-	-
15	0	0	0	0	-	-	-	-
16	0	0	0	1	-	-	-	-

96 ALPHA SPECTROMETER

Plutonium, Uranium and Thorium Calibration (17 min) N=10		Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	18.71 ± 1.12	1	3	3
2	17.44 ± 1.05	2	2	5
3	20.37 ± 1.22	3	3	5
4	20.47 ± 1.23	1	0	5
5	19.77 ± 1.19	2	1	3
6	18.07 ± 1.06	1	1	3
7	19.16 ± 1.15	3	1	4
8	18.44 ± 1.11	1	1	2
9	20.32 ± 1.22	1	1	5
10	18.51 ± 1.11	1	0	4
11	20.08 ± 1.21	2	5	2
12	18.56 ± 1.11	1	1	5
13	19.80 ± 1.19	2	1	6
14	19.56 ± 1.17	1	1	3
15	19.36 ± 1.16	2	1	3
16	17.48 ± 1.05	1	1	3

96 ALPHA SPECTROMETER

Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Am-243	Am-241
1	1	3
2	0	3
3	1	4
4	0	1
5	0	2
6	0	2
7	0	2
8	0	2
9	0	2
10	0	2
11	2	3
12	0	2
13	0	3
14	1	2
15	0	1
16	1	2

DETECTOR REPLACEMENT

System	Detector	Date
No detectors replaced.		

TABLE H-II

ALPHA SPECTROMETER CALIBRATION AND BACKGROUND DATA
SECOND QUARTER 1992

16 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (70 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	30.46 ± 1.83	1	1	3
2	30.41 ± 1.82	0	1	2
3	36.52 ± 2.19	1	1	2
4	31.87 ± 1.91	1	1	4
5	36.50 ± 2.19	2	1	4
6	34.69 ± 2.08	4	2	5
7	36.73 ± 2.20	2	1	3
8	35.37 ± 2.12	1	1	1
9	32.75 ± 1.97	2	2	4
10	32.88 ± 1.97	1	0	1
11	35.02 ± 2.10	1	1	2
12	36.13 ± 2.17	2	1	2
13	35.75 ± 2.14	1	1	3
14	33.00 ± 1.98	1	1	2
15	34.06 ± 2.04	1	1	2
16	33.13 ± 1.99	1	1	3

48 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (70 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	29.80 ± 1.79	2	2	4
2	31.08 ± 1.86	2	1	3
3	36.54 ± 2.19	6	2	4
4	31.41 ± 1.88	3	3	2
5	33.67 ± 2.02	1	1	4
6	32.56 ± 1.95	2	1	4
7	35.44 ± 2.13	2	1	2
8	31.34 ± 1.88	2	1	3
9	32.29 ± 1.94	2	2	2
10	35.40 ± 2.12	2	1	2
11	34.79 ± 2.09	2	1	4
12	34.39 ± 2.06	2	1	2
13	34.58 ± 2.07	1	1	2
14	35.38 ± 2.12	1	1	1
15	31.25 ± 1.87	1	1	3
16	32.52 ± 1.95	4	2	4

32 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (70 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	30.93 ± 1.86	2	1	3
2	28.96 ± 1.74	0	1	5
3	31.52 ± 1.89	2	1	2
4	30.61 ± 1.84	1	1	2
5	32.69 ± 1.96	2	1	3
6	32.24 ± 1.93	1	1	2
7	31.83 ± 1.91	2	1	5
8	32.61 ± 1.96	1	1	4
9	33.84 ± 2.03	3	1	3
10	34.40 ± 2.06	3	2	5
11	32.50 ± 1.95	3	2	4
12	34.47 ± 2.07	3	2	4
13	34.74 ± 2.08	2	3	3
14	35.23 ± 2.11	2	1	3
15	34.36 ± 2.06	2	2	5
16	28.71 ± 1.72	1	1	3

64 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	17.31 ± 1.04	2	2	6
2	16.92 ± 1.02	1	1	3
3	20.77 ± 1.25	2	1	4
4	19.80 ± 1.19	1	1	1
5	20.76 ± 1.25	1	1	3
6	20.27 ± 1.22	1	1	1
7	19.53 ± 1.17	2	0	3
8	20.59 ± 1.24	1	0	2
9	22.85 ± 1.37	2	3	5
10	23.16 ± 1.39	2	1	1
11	23.95 ± 1.44	2	4	3
12	22.61 ± 1.36	1	1	1
13	23.93 ± 1.44	0	1	2
14	22.01 ± 1.32	0	2	1
15	23.04 ± 1.38	1	1	2
16	22.26 ± 1.34	0	0	1

TABLE H-II (cont)

80 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	19.92 ± 1.20	2	1	4
2	19.47 ± 1.17	2	1	2
3	21.40 ± 1.28	1	0	2
4	20.15 ± 1.21	0	1	5
5	20.41 ± 1.22	1	1	2
6	20.53 ± 1.23	4	1	4
7	20.54 ± 1.23	3	4	3
8	21.48 ± 1.29	2	2	6
9	21.67 ± 1.30	2	3	7
10	21.12 ± 1.27	2	3	4
11	23.42 ± 1.41	1	1	1
12	21.47 ± 1.29	0	1	0
13	21.39 ± 1.28	1	1	2
14	21.65 ± 1.30	1	1	1
15	22.70 ± 1.36	1	1	6
16	20.41 ± 1.22	1	0	0

96 ALPHA SPECTROMETER

Uranium and Thorium
Background (70 000 s) N=10

Detector	U-238	U-235	U-234	U232	Th-232	Th-230	Th-229	Th-228
1	0	1	0	4	-	-	-	-
2	1	0	0	1	-	-	-	-
3	0	0	0	1	-	-	-	-
4	0	0	0	0	-	-	-	-
5	0	0	1	1	-	-	-	-
6	0	0	0	0	-	-	-	-
7	1	1	1	0	-	-	-	-
8	0	0	0	0	-	-	-	-
9	0	0	0	1	-	-	-	-
10	0	0	0	1	-	-	-	-
11	0	1	1	5	-	-	-	-
12	0	0	0	0	-	-	-	-
13	1	0	0	2	-	-	-	-
14	1	1	0	1	-	-	-	-
15	1	1	0	1	-	-	-	-
16	0	0	0	1	-	-	-	-

96 ALPHA SPECTROMETER

Plutonium, Uranium and Thorium Calibration (17 min) N=10		Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	18.00 ± 1.08	2	6	3
2	17.06 ± 1.02	2	1	4
3	19.18 ± 1.15	1	1	3
4	19.79 ± 1.19	1	0	5
5	19.25 ± 1.16	1	1	3
6	16.87 ± 1.01	2	1	4
7	18.38 ± 1.10	1	1	4
8	18.23 ± 1.09	1	0	3
9	18.97 ± 1.14	1	0	5
10	17.89 ± 1.07	2	0	2
11	18.65 ± 1.12	2	4	2
12	18.24 ± 1.09	2	1	4
13	18.84 ± 1.13	2	2	6
14	19.19 ± 1.15	2	1	4
15	18.66 ± 1.12	1	0	3
16	17.05 ± 1.02	1	1	3

96 ALPHA SPECTROMETER

Background (80 000 s) N=10
Mean Counts Per 20 Channels

Detector	Am-243	Am-241
1	1	6
2	0	2
3	0	2
4	0	2
5	0	1
6	0	1
7	0	2
8	0	0
9	0	2
10	0	2
11	1	3
12	0	1
13	1	3
14	0	3
15	0	1
16	0	2

Detector Replacement

System	Detector	Date
Alpha 96	3	03-26-92

TABLE H-III

ALPHA SPECTROMETER CALIBRATION AND BACKGROUND DATA
THIRD QUARTER 1992

16 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (70 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	30.62 ± 1.84	1	1	2
2	30.25 ± 1.81	1	1	3
3	35.52 ± 2.13	2	1	2
4	31.86 ± 1.91	2	2	5
5	36.15 ± 2.17	0	0	2
6	34.45 ± 2.07	4	3	6
7	36.75 ± 2.21	3	2	4
8	35.23 ± 2.11	2	1	1
9	32.29 ± 1.94	2	2	3
10	32.74 ± 1.96	1	0	1
11	34.82 ± 2.09	1	0	4
12	35.77 ± 2.15	2	2	2
13	35.08 ± 2.10	2	2	4
14	33.08 ± 1.98	1	1	3
15	32.75 ± 1.96	2	1	2
16	32.81 ± 1.97	1	1	4

48 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (70 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	29.83 ± 1.79	2	1	2
2	30.80 ± 1.85	2	1	3
3	35.86 ± 2.15	4	1	3
4	31.26 ± 1.88	3	2	3
5	33.63 ± 2.02	3	2	6
6	32.51 ± 1.95	1	1	3
7	34.94 ± 2.10	2	1	3
8	31.50 ± 1.89	2	1	3
9	32.09 ± 1.93	2	2	2
10	35.20 ± 2.11	1	2	4
11	34.00 ± 2.04	1	1	4
12	34.23 ± 2.05	2	1	3
13	34.13 ± 2.05	1	0	2
14	35.00 ± 2.10	1	1	2
15	30.91 ± 1.85	1	1	2
16	31.58 ± 1.89	4	2	3

32 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (70 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	31.04 ± 1.86	2	1	4
2	28.76 ± 1.73	1	1	4
3	30.86 ± 1.85	2	1	3
4	30.55 ± 1.83	1	1	3
5	32.51 ± 1.95	2	2	3
6	32.07 ± 1.92	1	1	4
7	31.29 ± 1.88	2	0	4
8	33.00 ± 1.98	2	2	4
9	33.47 ± 2.01	2	1	3
10	34.20 ± 2.05	5	4	7
11	31.85 ± 1.91	4	3	6
12	34.43 ± 2.07	2	2	3
13	34.71 ± 2.08	2	2	4
14	34.47 ± 2.07	1	1	3
15	33.85 ± 2.03	2	1	5
16	27.92 ± 1.68	2	1	2

64 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	17.30 ± 1.04	2	2	6
2	16.37 ± .98	1	1	5
3	20.65 ± 1.24	2	2	2
4	19.74 ± 1.18	1	0	2
5	21.14 ± 1.27	1	1	3
6	20.20 ± 1.21	2	1	3
7	19.68 ± 1.18	2	2	2
8	20.31 ± 1.22	1	1	2
9	22.54 ± 1.35	3	3	6
10	23.00 ± 1.38	1	1	3
11	23.37 ± 1.40	3	3	6
12	22.96 ± 1.38	2	3	3
13	23.82 ± 1.43	2	1	2
14	21.53 ± 1.29	1	2	3
15	22.21 ± 1.33	2	1	3
16	22.21 ± 1.33	0	0	1

TABLE H-III (cont)

80 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	19.76 ± 1.19	2	1	4
2	19.42 ± 1.17	2	1	3
3	21.45 ± 1.29	1	1	4
4	20.10 ± 1.21	1	1	7
5	20.44 ± 1.23	1	2	3
6	20.89 ± 1.25	4	1	5
7	20.49 ± 1.23	2	3	4
8	21.41 ± 1.28	2	2	6
9	21.51 ± 1.29	2	3	7
10	21.87 ± 1.25	1	3	4
11	23.14 ± 1.39	1	1	1
12	21.37 ± 1.28	0	1	1
13	21.25 ± 1.28	1	1	2
14	21.68 ± 1.30	0	0	1
15	21.87 ± 1.31	1	1	5
16	20.08 ± 1.20	1	0	0

96 ALPHA SPECTROMETER

Uranium and Thorium
Background (70 000 s) N=10

Detector	U-238	U-235	U-234	U232	Th-232	Th-230	Th-229	Th-228
1	0	1	0	4	-	-	-	-
2	0	1	0	1	-	-	-	-
3	0	0	0	1	-	-	-	-
4	0	0	0	1	-	-	-	-
5	0	0	0	0	-	-	-	-
6	0	0	0	1	-	-	-	-
7	1	1	1	0	-	-	-	-
8	0	0	0	0	-	-	-	-
9	0	0	0	1	-	-	-	-
10	0	0	0	1	-	-	-	-
11	1	1	1	4	-	-	-	-
12	0	0	0	0	-	-	-	-
13	0	1	1	2	-	-	-	-
14	0	0	0	1	-	-	-	-
15	1	1	0	1	-	-	-	-
16	1	0	0	1	-	-	-	-

96 ALPHA SPECTROMETER

Plutonium, Uranium and Thorium Calibration (17 min) N=10		Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	18.76 ± 1.13	2	5	3
2	17.45 ± 1.05	2	2	3
3	19.78 ± 1.19	2	1	3
4	20.34 ± 1.22	1	2	5
5	19.80 ± 1.19	2	2	4
6	17.96 ± 1.08	1	1	5
7	19.04 ± 1.14	2	0	4
8	18.44 ± 1.11	1	0	3
9	19.07 ± 1.14	1	2	4
10	18.69 ± 1.12	1	1	3
11	19.68 ± 1.18	3	4	2
12	18.46 ± 1.11	2	1	4
13	19.06 ± 1.14	2	1	4
14	19.84 ± 1.19	1	1	4
15	18.60 ± 1.12	1	1	3
16	16.83 ± 1.01	1	1	3

96 ALPHA SPECTROMETER

Background (80 000 s) N=10
Mean Counts Per 20 Channels

Detector	Am-243	Am-241
1	1	4
2	1	3
3	0	4
4	0	3
5	1	3
6	0	2
7	0	2
8	0	1
9	0	2
10	0	2
11	2	3
12	0	2
13	1	3
14	0	3
15	1	3
16	0	3

Detector Replacement

System	Detector	Date
Alpha 16	3	07-13-92
Alpha 32	14	08-05-92
Alpha 64	12	07-13-92
Alpha 80	8	08-31-92

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TABLE H-IV

ALPHA SPECTROMETER CALIBRATION AND BACKGROUND DATA
FOURTH QUARTER 1992

16 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (70 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	30.90 ± 1.85	1	2	1
2	30.17 ± 1.81	1	1	2
3	34.77 ± 2.09	2	1	2
4	31.56 ± 1.89	2	2	5
5	35.61 ± 2.14	1	0	3
6	36.07 ± 2.16	3	3	7
7	36.31 ± 2.18	2	2	3
8	34.89 ± 2.09	1	1	2
9	33.09 ± 1.99	2	1	3
10	32.86 ± 1.97	0	0	1
11	34.67 ± 2.08	1	1	3
12	35.76 ± 2.15	3	2	2
13	34.77 ± 2.09	2	2	3
14	33.06 ± 1.98	1	1	2
15	33.79 ± 2.03	1	1	4
16	32.29 ± 1.94	1	1	3

48 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (70 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	29.98 ± 1.80	2	2	3
2	30.65 ± 1.85	2	1	3
3	36.36 ± 2.18	4	1	3
4	31.18 ± 1.87	2	2	3
5	33.79 ± 2.03	4	3	5
6	32.43 ± 1.95	1	1	3
7	35.30 ± 2.12	2	2	3
8	31.05 ± 1.86	2	1	2
9	32.59 ± 1.96	2	2	2
10	35.57 ± 2.13	2	1	3
11	34.30 ± 2.06	1	1	4
12	34.26 ± 2.06	2	1	3
13	33.98 ± 2.04	1	0	1
14	35.48 ± 2.13	2	1	2
15	31.14 ± 1.87	1	0	2
16	31.77 ± 1.91	2	1	3

32 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (70 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	31.05 ± 1.86	1	1	3
2	28.81 ± 1.73	1	1	3
3	30.75 ± 1.85	1	1	4
4	30.26 ± 1.82	1	0	2
5	32.39 ± 1.94	2	2	3
6	31.99 ± 1.92	2	1	3
7	31.24 ± 1.87	2	1	3
8	32.65 ± 1.96	2	1	5
9	34.58 ± 2.08	2	1	3
10	34.56 ± 2.07	4	2	5
11	31.56 ± 1.89	4	3	6
12	33.98 ± 2.04	2	2	3
13	34.34 ± 2.06	2	2	4
14	33.65 ± 2.02	1	1	3
15	34.00 ± 2.04	2	2	5
16	27.54 ± 1.65	1	1	3

64 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	17.63 ± 1.06	2	2	5
2	16.88 ± 1.01	0	0	2
3	20.71 ± 1.24	1	2	4
4	19.95 ± 1.20	1	1	2
5	21.10 ± 1.27	0	0	2
6	20.13 ± 1.21	1	0	0
7	19.68 ± 1.18	1	1	2
8	20.22 ± 1.21	0	0	1
9	23.11 ± 1.39	2	2	2
10	23.03 ± 1.38	2	0	1
11	23.50 ± 1.41	2	5	4
12	23.00 ± 1.38	1	0	1
13	23.43 ± 1.41	1	1	0
14	22.21 ± 1.33	0	3	1
15	22.55 ± 1.35	0	0	0
16	21.95 ± 1.32	0	0	0

TABLE H-IV (cont)

80 ALPHA SPECTROMETER

Calibration (17 min) N=10		Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	19.97 ± 1.20	1	0	4
2	19.25 ± 1.16	1	0	1
3	21.32 ± 1.28	1	1	4
4	20.14 ± 1.21	1	1	4
5	20.55 ± 1.23	1	1	2
6	20.65 ± 1.24	3	2	5
7	20.44 ± 1.23	1	3	3
8	21.02 ± 1.26	1	1	1
9	21.82 ± 1.31	2	2	6
10	21.05 ± 1.26	1	3	4
11	22.82 ± 1.37	1	2	1
12	21.09 ± 1.27	0	0	1
13	20.95 ± 1.26	1	1	1
14	21.75 ± 1.31	0	0	0
15	22.16 ± 1.33	1	1	3
16	19.84 ± 1.29	0	1	0

96 ALPHA SPECTROMETER

Uranium and Thorium
Background (70 000 s) N=10

Detector	U-238	U-235	U-234	U232	Th-232	Th-230	Th-229	Th-228
1	0	1	0	4	-	-	-	-
2	0	1	0	1	-	-	-	-
3	0	0	0	1	-	-	-	-
4	0	0	0	1	-	-	-	-
5	0	0	0	1	-	-	-	-
6	0	0	0	1	-	-	-	-
7	1	0	1	1	-	-	-	-
8	0	0	0	1	-	-	-	-
9	0	0	0	1	-	-	-	-
10	0	0	0	1	-	-	-	-
11	1	1	1	5	-	-	-	-
12	0	0	0	0	-	-	-	-
13	0	1	0	2	-	-	-	-
14	0	0	0	1	-	-	-	-
15	1	0	0	1	-	-	-	-
16	1	0	0	1	-	-	-	-

96 ALPHA SPECTROMETER

Plutonium, Uranium and Thorium Calibration (17 min) N=10		Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Mean Eff. ± 3 Std Dev	Pu-242	Pu-239	Pu-238
1	18.75 ± 1.12	2	5	3
2	17.68 ± 1.06	2	2	4
3	19.46 ± 1.17	2	2	4
4	20.00 ± 1.20	1	2	5
5	19.83 ± 1.19	2	2	3
6	18.42 ± 1.10	1	2	5
7	18.81 ± 1.13	2	1	4
8	18.48 ± 1.11	1	0	2
9	20.00 ± 1.20	2	0	5
10	18.75 ± 1.12	1	2	3
11	18.88 ± 1.13	3	3	2
12	18.31 ± 1.10	1	1	4
13	19.65 ± 1.18	2	1	3
14	19.92 ± 1.20	2	1	4
15	19.36 ± 1.16	1	1	3
16	16.67 ± 1.00	1	1	4

96 ALPHA SPECTROMETER

Background (80 000 s) N=10 Mean Counts Per 20 Channels		
Detector	Am-243	Am-241
1	1	3
2	1	3
3	1	4
4	0	3
5	1	4
6	0	2
7	0	2
8	0	2
9	0	2
10	0	2
11	2	3
12	0	2
13	1	3
14	0	2
15	1	3
16	0	3

Detector Replacement

System	Detector	Date
Alpha 16	5	11-10-92

TABLE H-V

CALIBRATION DATA FOR THE 16 ROUTINE CALIBRATION PLATES

Plate No.	D/M/30 min Mean ± Std Dev[a]	D/M/30 min Mean ± Std Dev[b]	D/M/30 min Mean ± Std Dev[c]	D/M/30 min Mean ± Std Dev[d]
1	1959 ± 10	1957 ± 10	1961 ± 13	1935 ± 14
2	1988 ± 14	1981 ± 17	1993 ± 21	1925 ± 55
3	1994 ± 11	1986 ± 12	1999 ± 27	1939 ± 29
4	1993 ± 11	1983 ± 22	1996 ± 17	1939 ± 36
5	2008 ± 12	2001 ± 15	2018 ± 23	2068 ± 48
6	2018 ± 11	2003 ± 14	2015 ± 17	1956 ± 32
7	2024 ± 14	2028 ± 17	2043 ± 18	1999 ± 49
8	2042 ± 11	2028 ± 12	2036 ± 18	1999 ± 39
9	2002 ± 14	2030 ± 20	2033 ± 12	1980 ± 5
10	2066 ± 13	2059 ± 16	2072 ± 9	2023 ± 5
11	2169 ± 11	2159 ± 14	2151 ± 50	2128 ± 42
12	2102 ± 13	2091 ± 14	2096 ± 27	2071 ± 30
13	2149 ± 14	2138 ± 14	2155 ± 10	2124 ± 25
14	2107 ± 16	2104 ± 10	2108 ± 18	2068 ± 32
15	2154 ± 14	2144 ± 9	2364 ± 49	2048 ± 46
16	1990 ± 12	1982 ± 17	1989 ± 20	1943 ± 53

$$\text{D/M of std plate} = \frac{\text{counts}}{\text{time x eff}} = \frac{\text{counts}}{30 \times 0.5074}$$

[a]First quarter 1992. Twelve calibrations included in the mean.
[b]Second quarter 1992. Ten calibrations included in the mean.
[c]Third quarter 1992. Ten calibrations included in the mean.
[d]Fourth quarter 1992. Ten calibrations included in the mean.

Note: The calibration plates were prepared in 1989 and are electropolished/electroplated plates that approximate the routine samples submitted for counting. The standard plates contain 706 D/M Pu-242, 327 D/M Pu-239, and 1012 D/M Am-241 and Pu-238, and are being routinely counted on the gas-flow proportional counter, which is calibrated with NBS SRM 4906-B33. Because these plates contain a trace amount (< 1%) of Pu-238, they are reevaluated each year for Pu-238 decay. The 1992 data are recorded on pages 144 to 145 of Notebook A8184 and pages 140-141 of Notebook A11284. Plate No. 9 and 15 were noted to be coated with vacuum grease on 8-18-92. They were replaced with two spare plates having similar alpha concentrations.

TABLE H-VI

CALIBRATION DATA FOR THE 16 PLATES AS A SET

Date	No. of Calibrations	Eff. (%)	D/M/30 min Mean ± Std Dev[a]
4-15-92	12	50.69	2052 ± 66
5-20-92	14	50.79	2039 ± 64
6-30-92	10	50.57	2028 ± 66
8-24-92	10	49.96	2050 ± 61
12-08-92	10	50.49	2003 ± 67

[a]All 16 plates.

TABLE H-VII

ESTIMATES OF ALPHA ACTIVITY FOR EM-9 STANDARD NO. 2B

Calibration Date	Calibration Group	Units C/M	Units D/M
11-30-53	CMB-Div.	9730	19460[a]
11-30-53	J-Div.	9889	19778[a]
11-30-53	H-Div.	9768	19536[a]
6-02-61	CMB-Div.	9799	19598[a]
9-20-73	INC-Div.	9858	19716[a]
9-20-73	INC-Div.	9885	19770[a]
9-20-73	INC-Div.	9688	19376[a]
5-13-86	INC-Div.	10119	19764[b]
5-19-86	HSE-9	10097	19667[c]
5-11-88	HSE-9	10057	19743[d]
4-02-90	HSE-9	9863	19450[e]
3-21-91	EM-9	9884	19533[f]
8-05-92	EM-9	9734	19507[g]

[a]50% counting efficiency used to calculate D/M.
[b]51.2% counting efficiency used to calculate D/M.
[c]51.34% counting efficiency used to calculate D/M.
[d]50.94% counting efficiency used to calculate D/M.
[e]50.71% counting efficiency used to calculate D/M.
[f]50.60% counting efficiency used to calculate D/M.
[g]49.90% counting efficiency used to calculate D/M.

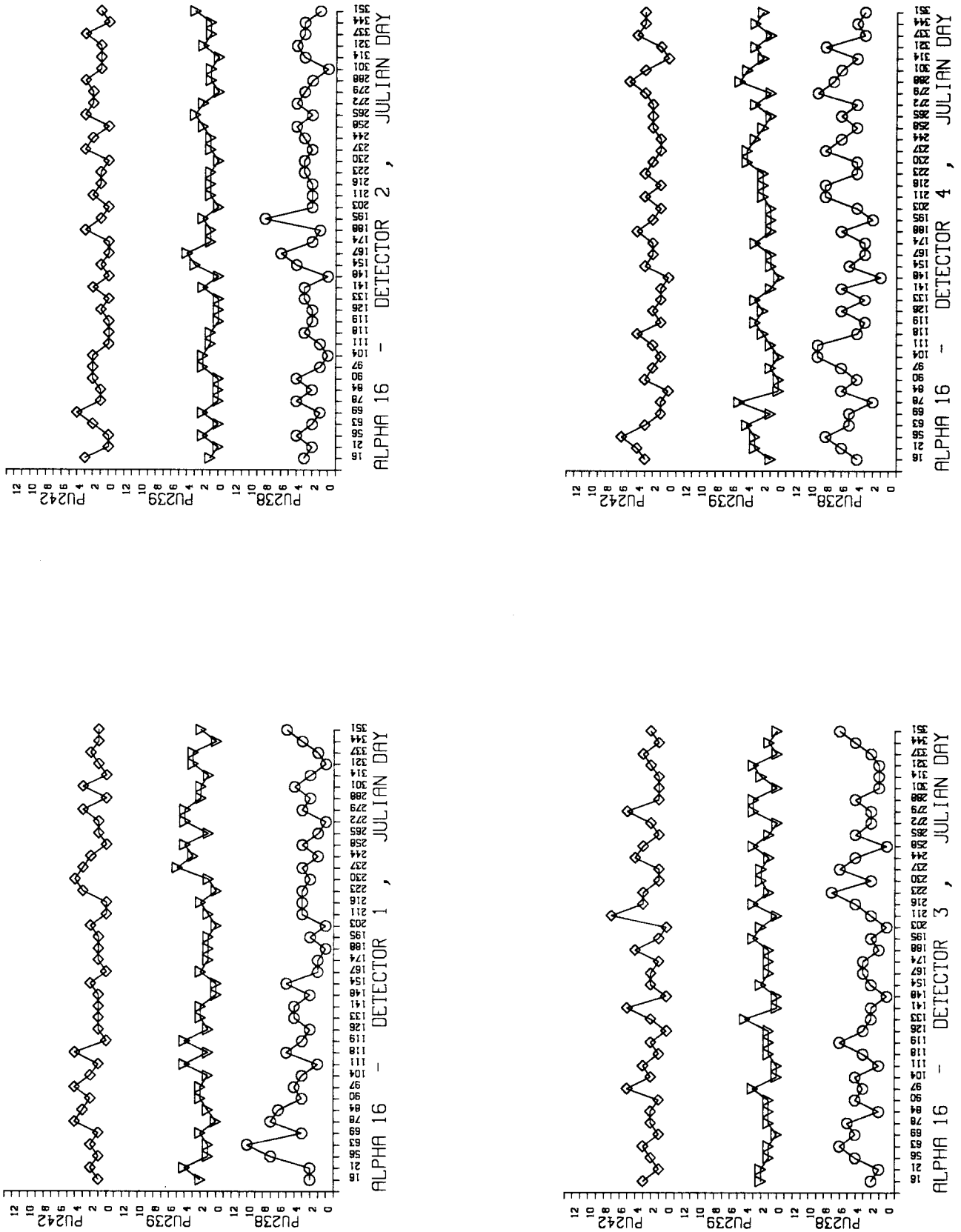
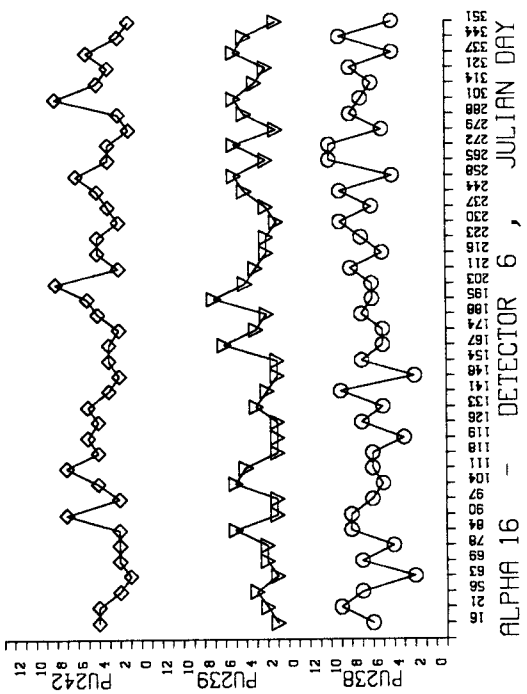
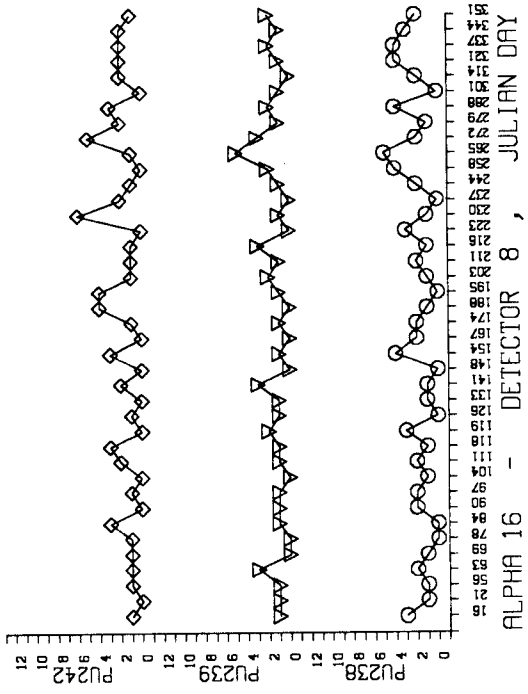


Fig. H-1. Plots of alpha spectrometer background data.


ALPHA 16 - DETECTOR 6 , JULIAN DAY
PU238
PU239
PU242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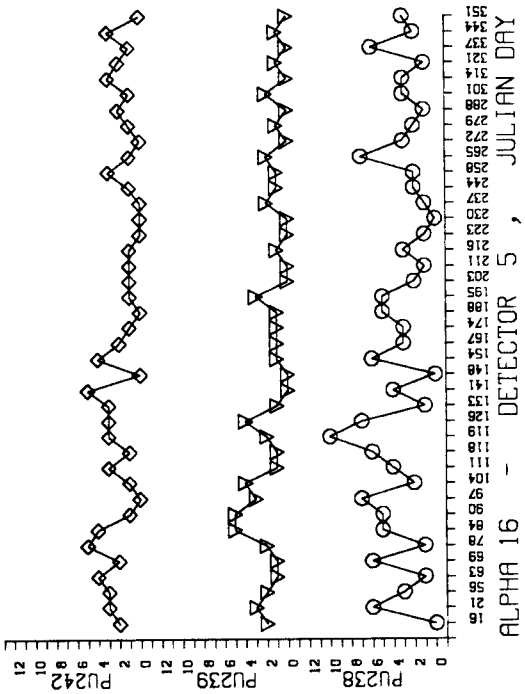
ALPHA 16 - DETECTOR 5 , JULIAN DAY
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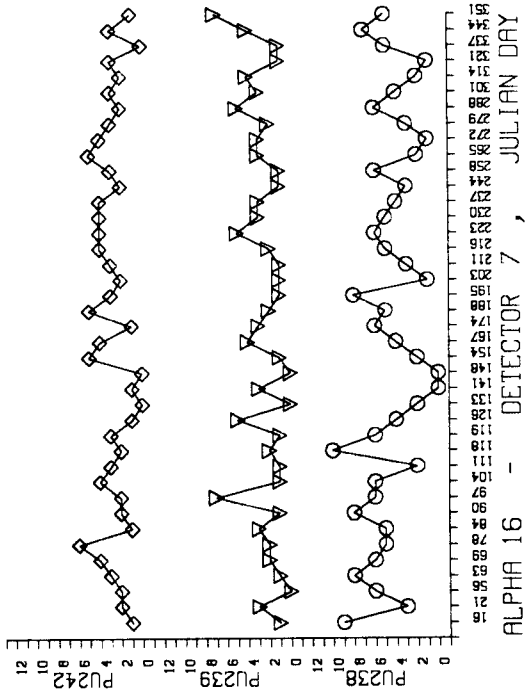
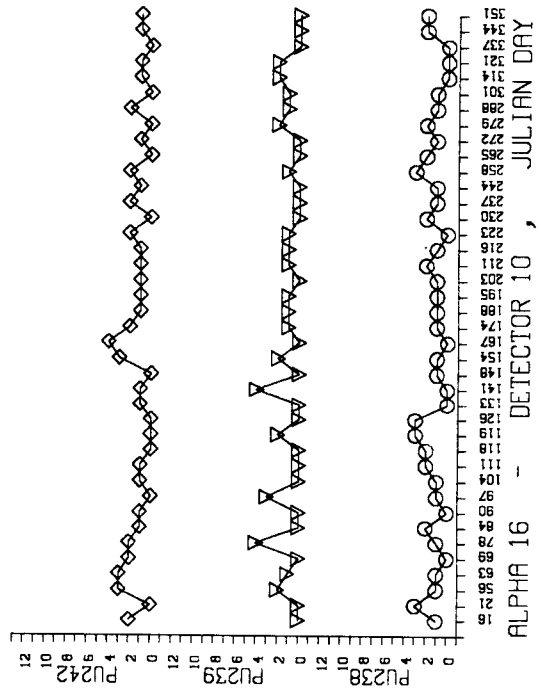

ALPHA 16 - DETECTOR 7 , JULIAN DAY
PU238
PU239
PU242

Fig. H-1. (cont)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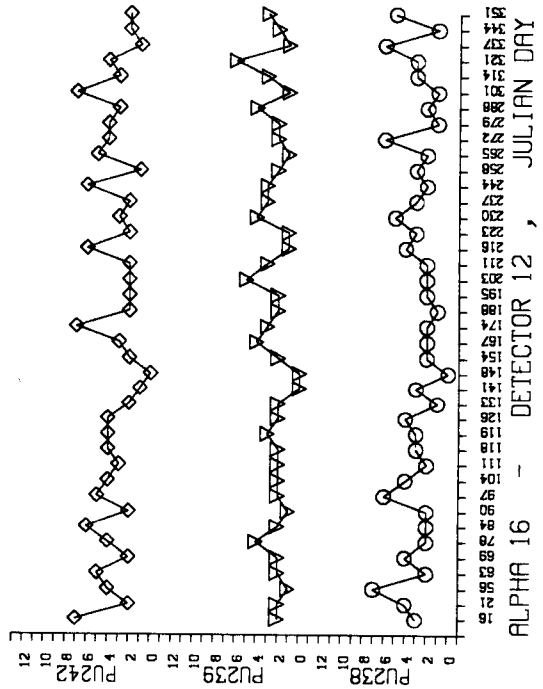
ALPHA 16 - DETECTOR 12 , JULIAN DAY
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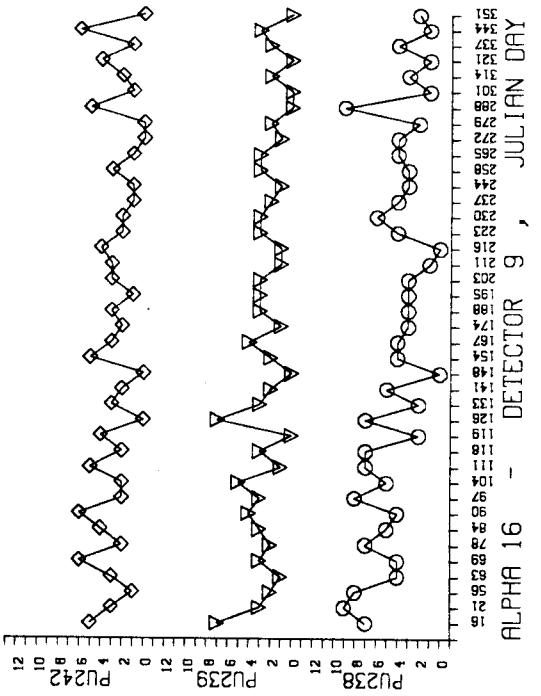
ALPHA 16 - DETECTOR 9 , JULIAN DAY
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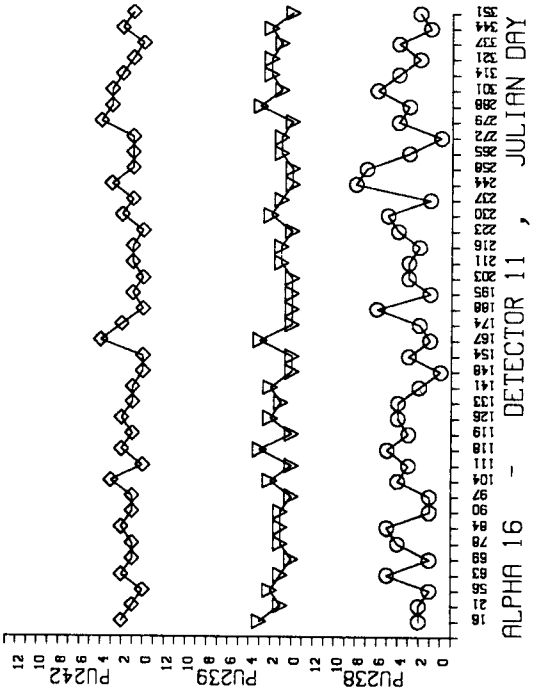
ALPHA 16 - DETECTOR 11 , JULIAN DAY
PU238
PU239
PU242

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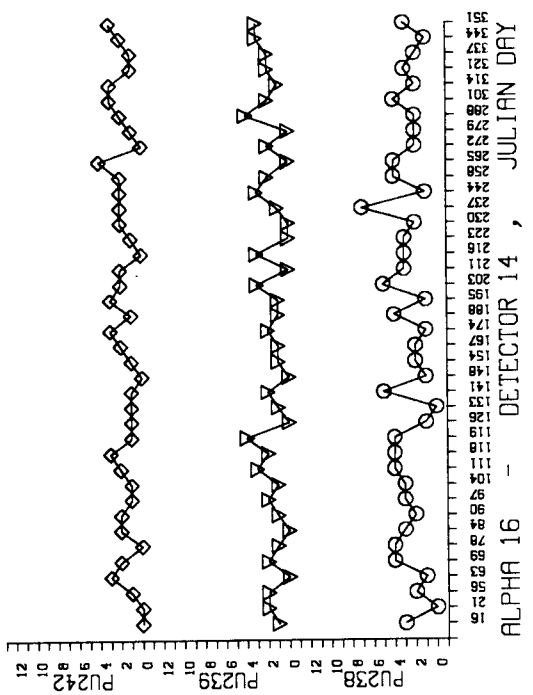
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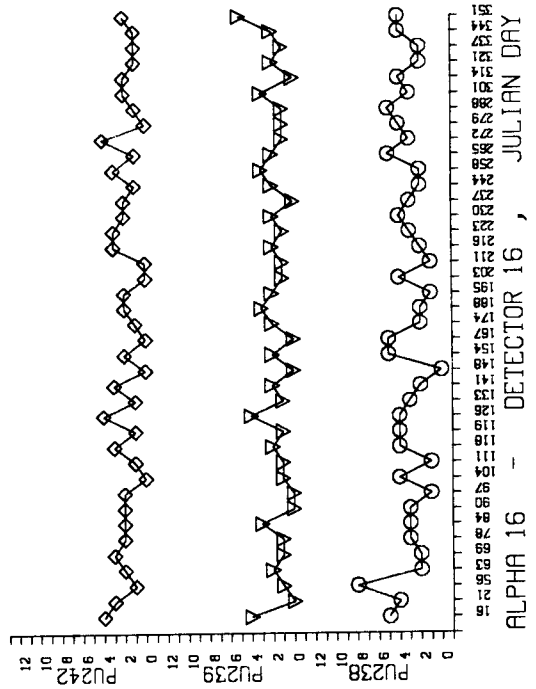
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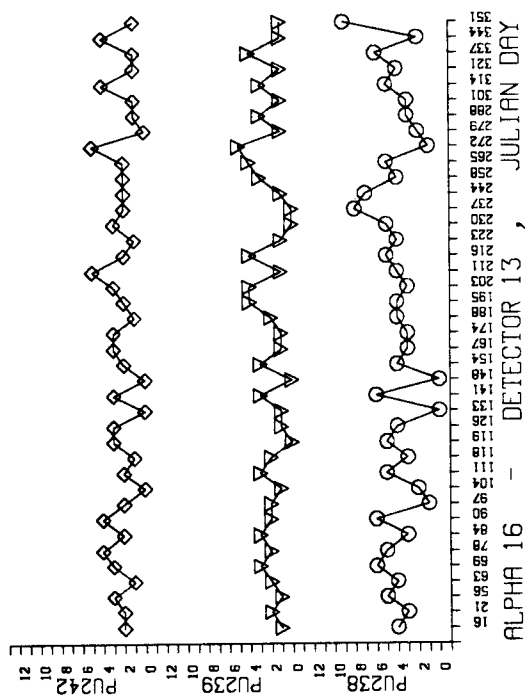
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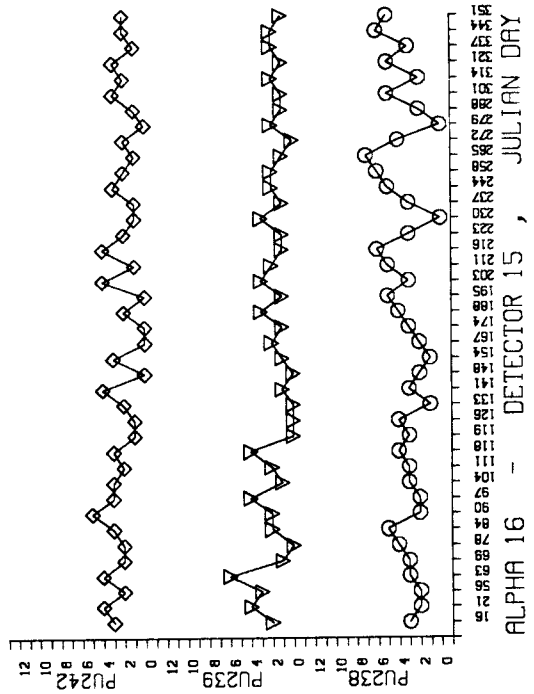
PU239
PU242


ALPHA 16 - DETECTOR 15 , JULIAN DAY
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PU242

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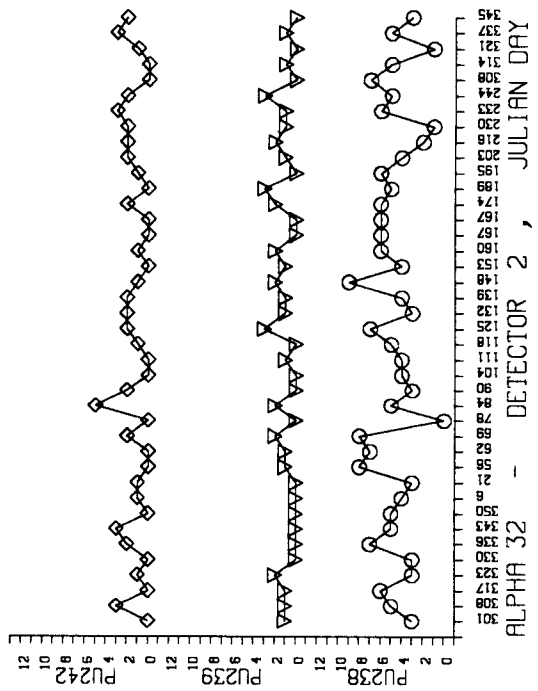
ALPHA 32 - DETECTOR 2 , JULIAN DAY
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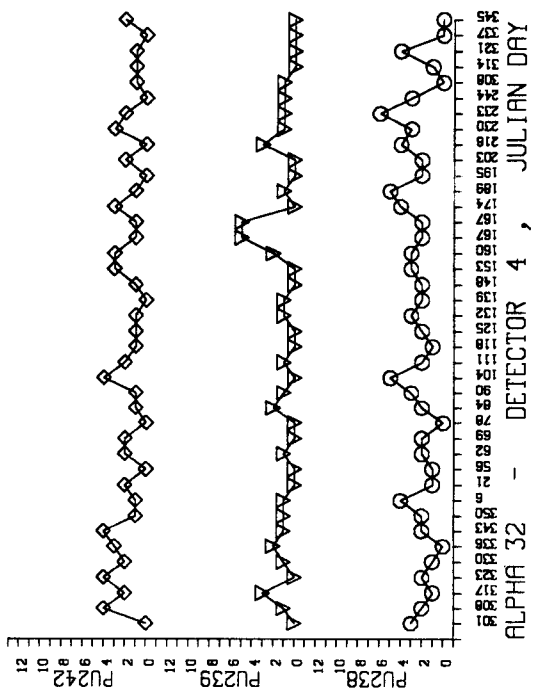
ALPHA 32 - DETECTOR 4 , JULIAN DAY
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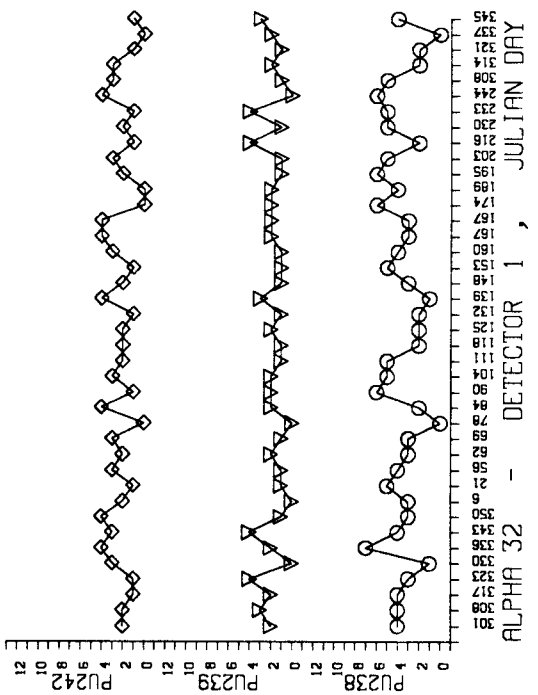
ALPHA 32 - DETECTOR 1 , JULIAN DAY
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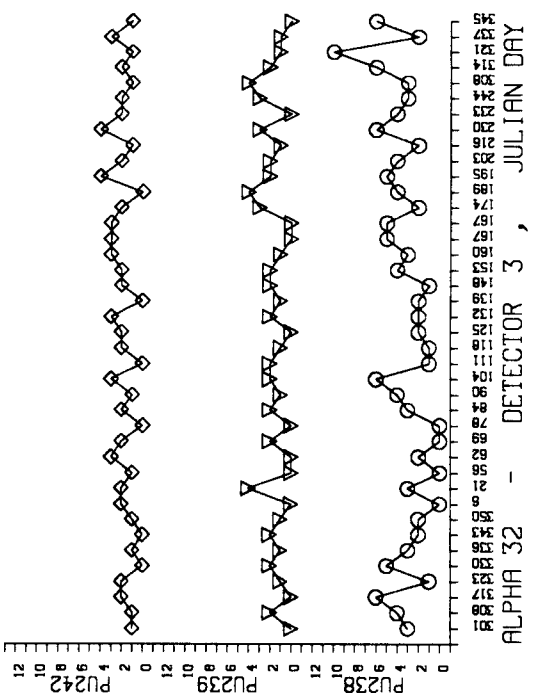
ALPHA 32 - DETECTOR 3 , JULIAN DAY
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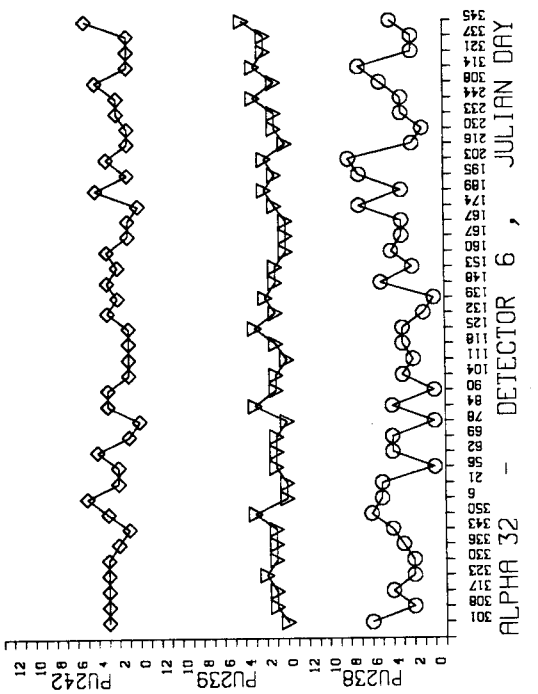
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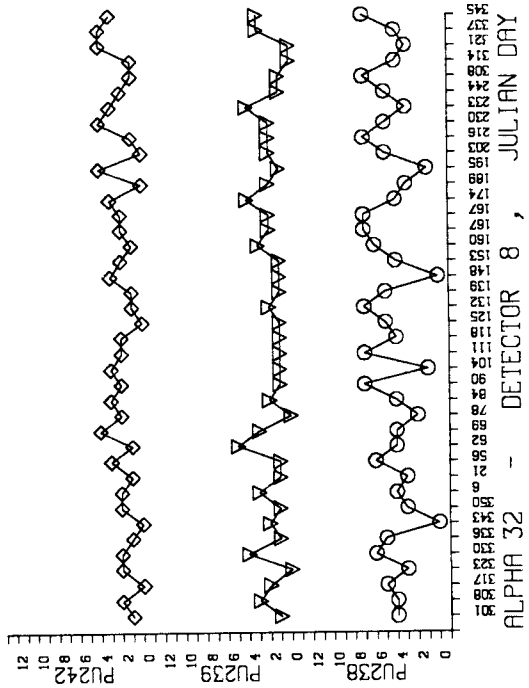
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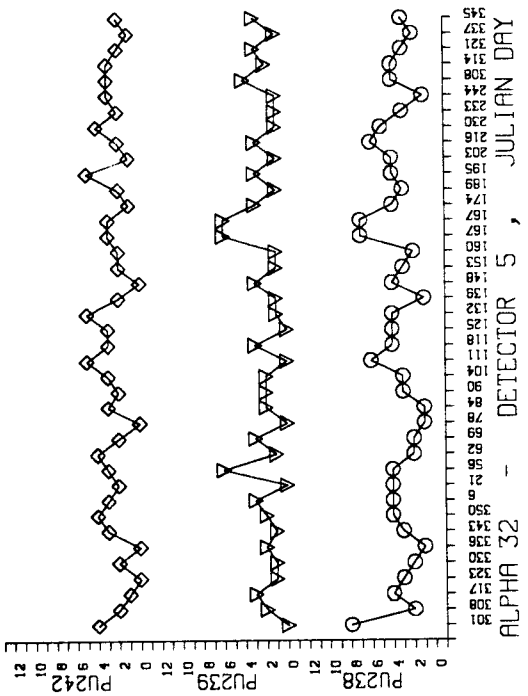
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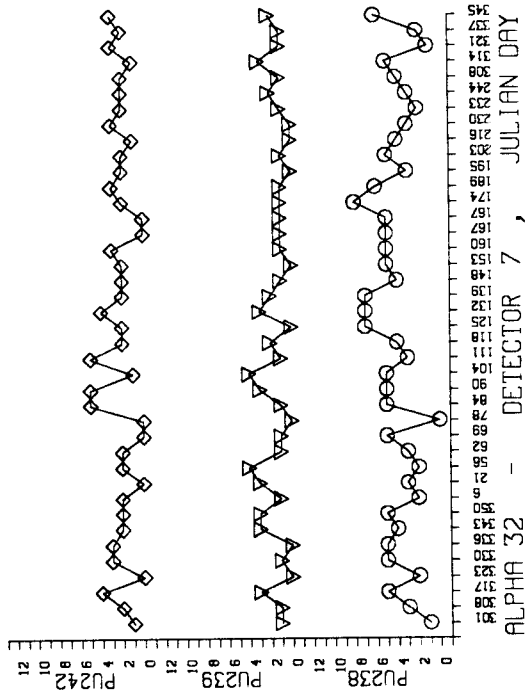
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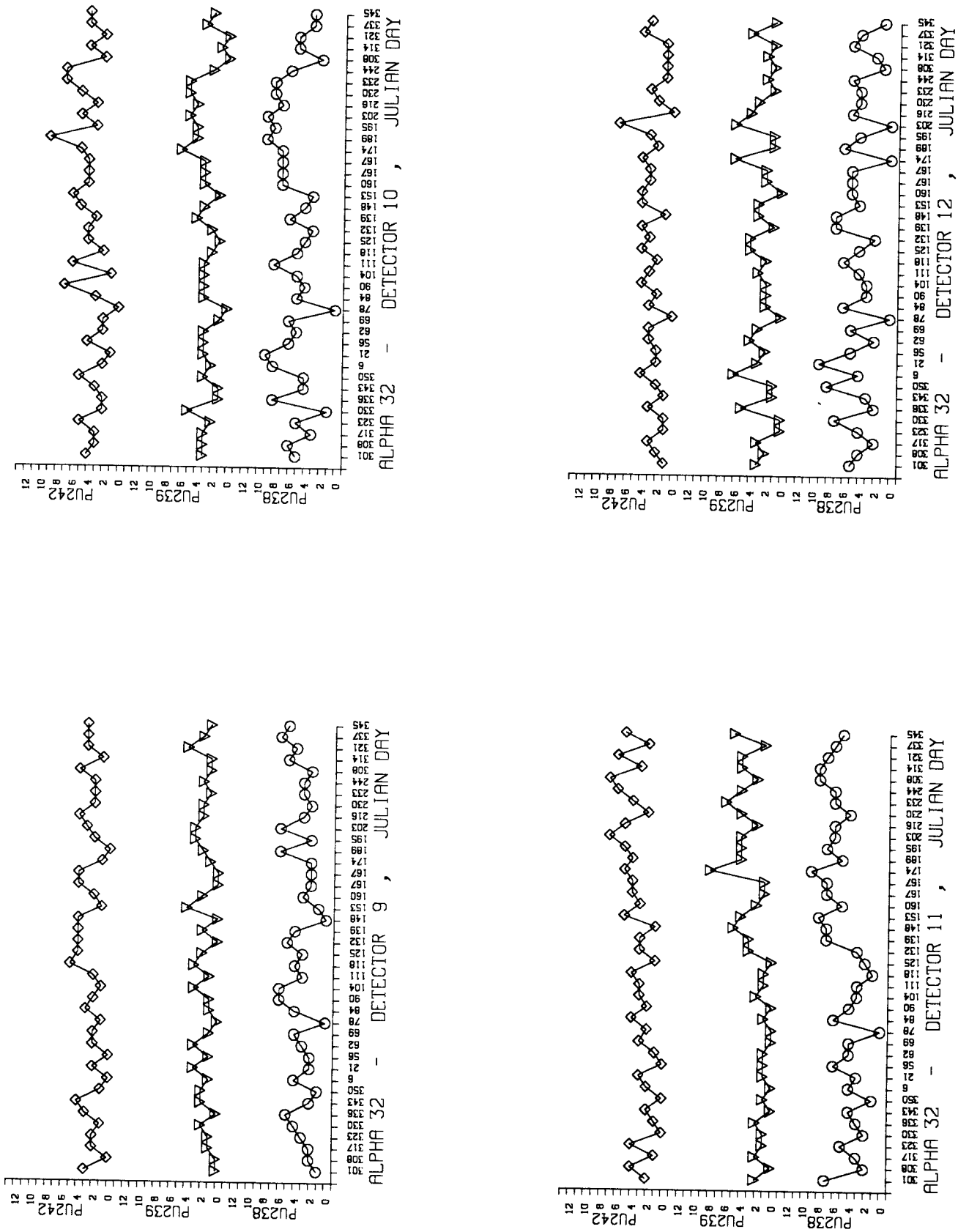
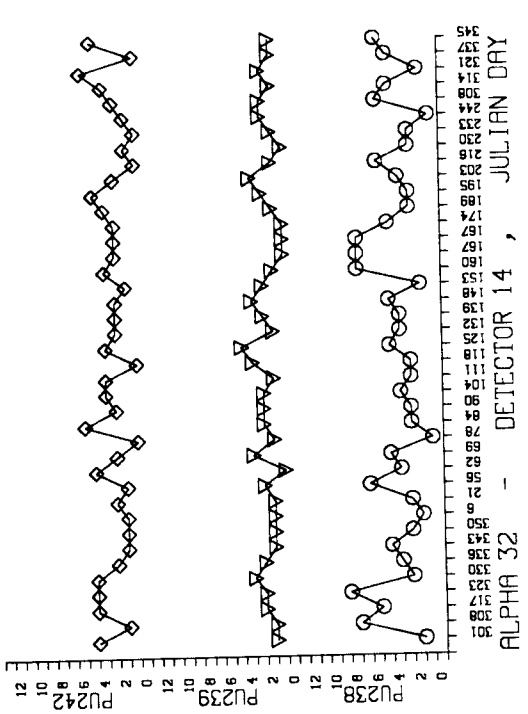

ALPHA 32 - DETECTOR 10 , JULIAN DAY
ALPHA 32 - DETECTOR 12 , JULIAN DAY
ALPHA 32 - DETECTOR 9 , JULIAN DAY
ALPHA 32 - DETECTOR 11 , JULIAN DAY
PU238
PU239
PU242

Fig. H-1. (cont)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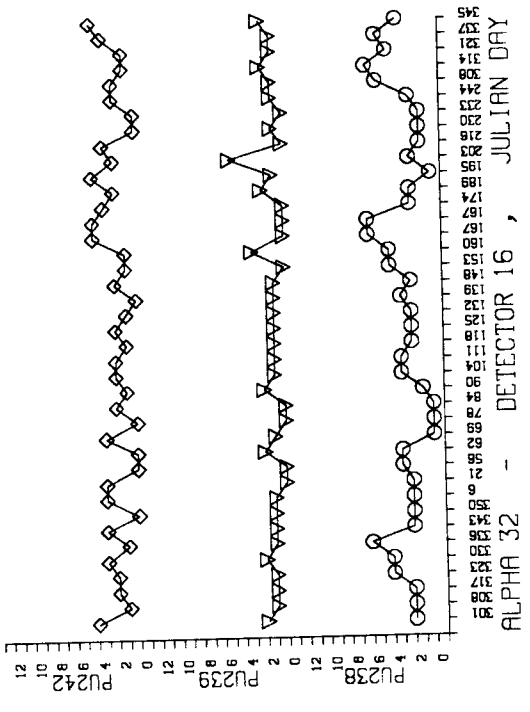
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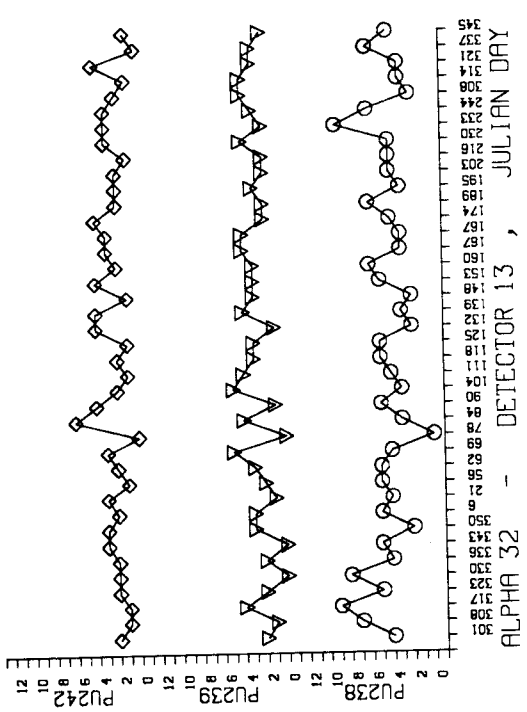
ALPHA 32 - DETECTOR 13 , JULIAN DAY
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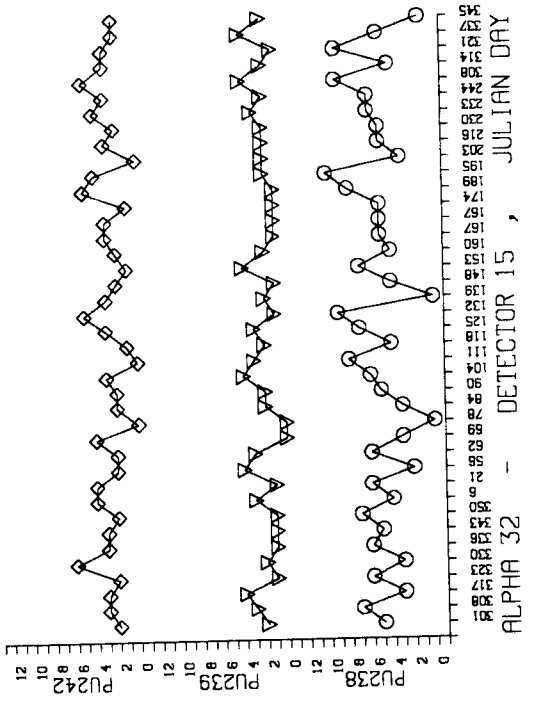
PU239
PU242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PU238
PU239
PU242

Fig. H-1. (cont)

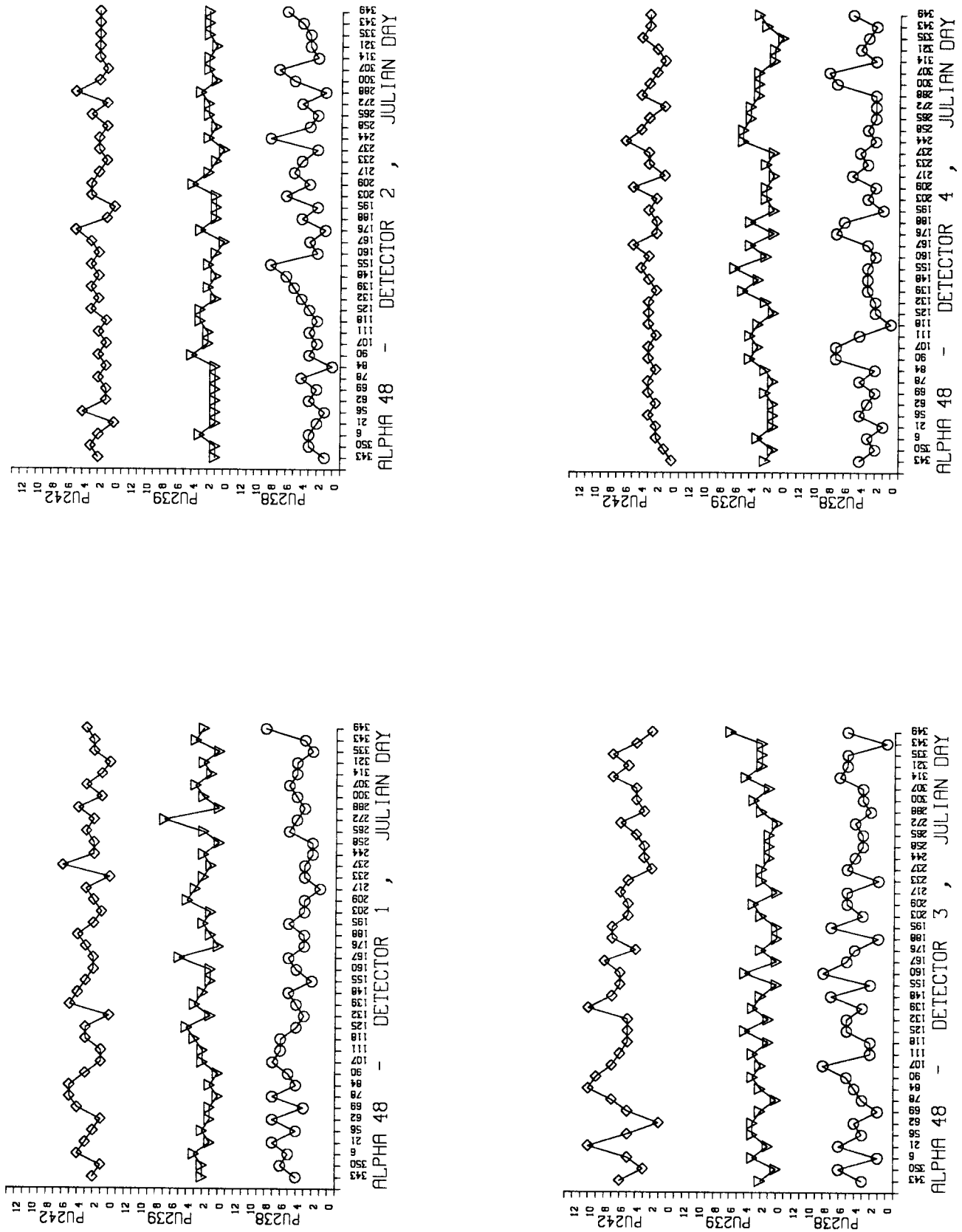
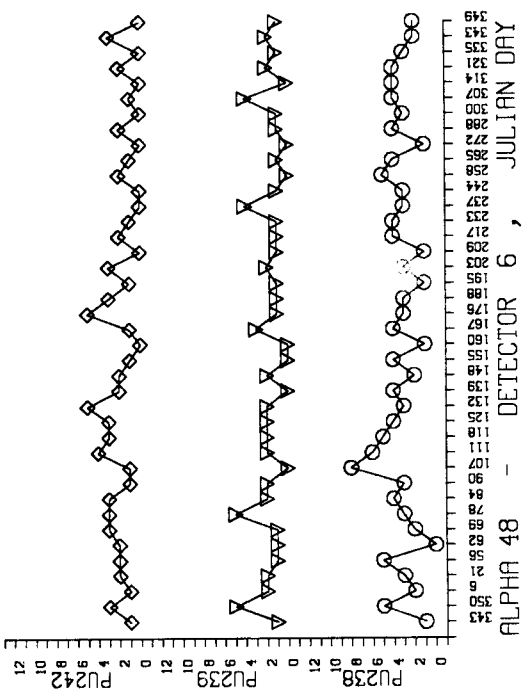
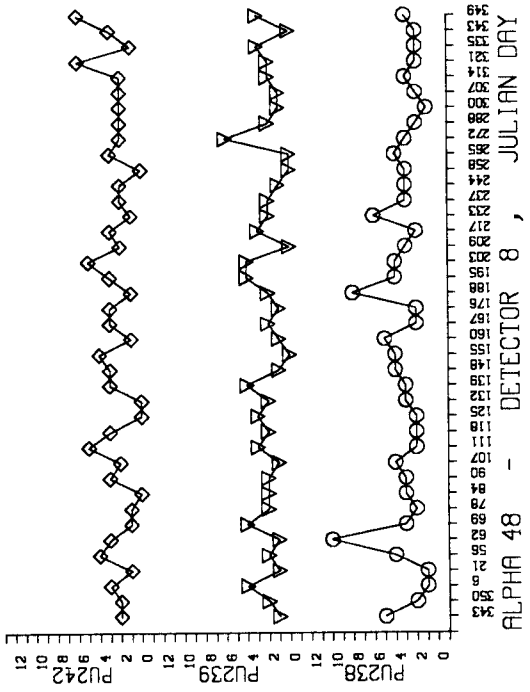

ALPHA 48 - DETECTOR 1 , JULIAN DAY
ALPHA 48 - DETECTOR 2 , JULIAN DAY
ALPHA 48 - DETECTOR 3 , JULIAN DAY
ALPHA 48 - DETECTOR 4 , JULIAN DAY
PU238
PU239
PU242

Fig. H-1. (cont)


ALPHA 48 - DETECTOR 6 , JULIAN DAY
PU238
PU239
PU242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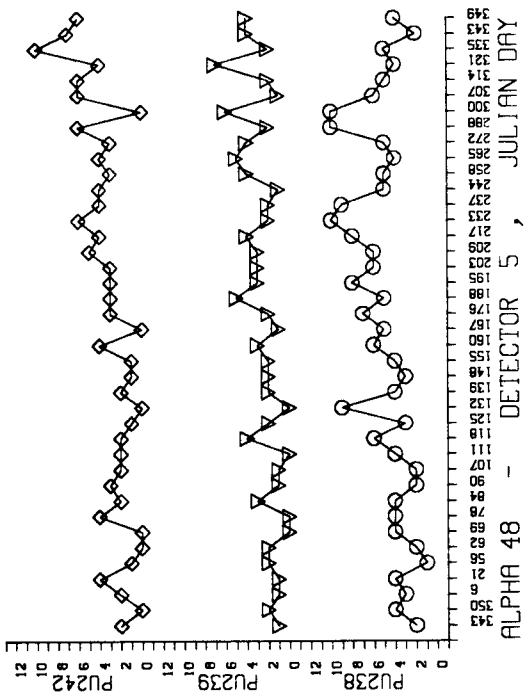
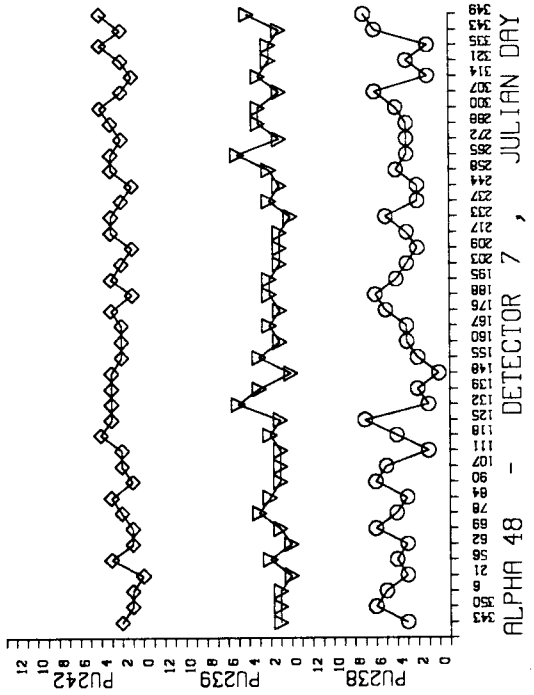
PU238
PU239
PU242


ALPHA 48 - DETECTOR 5 , JULIAN DAY
PU238
PU239
PU242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PU238
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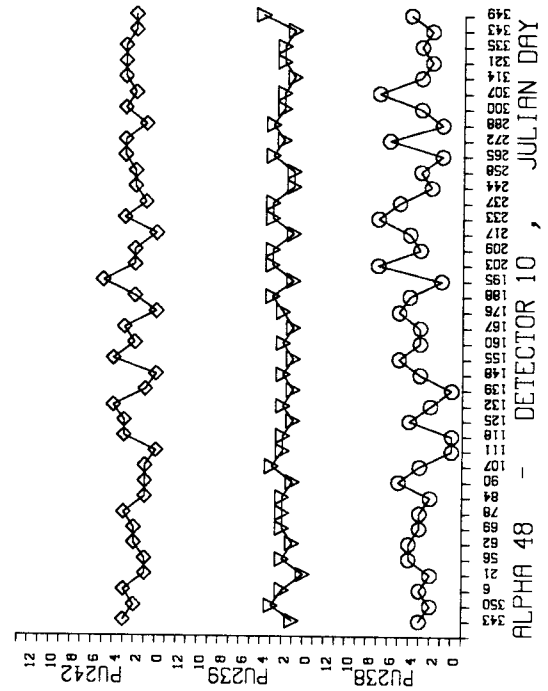
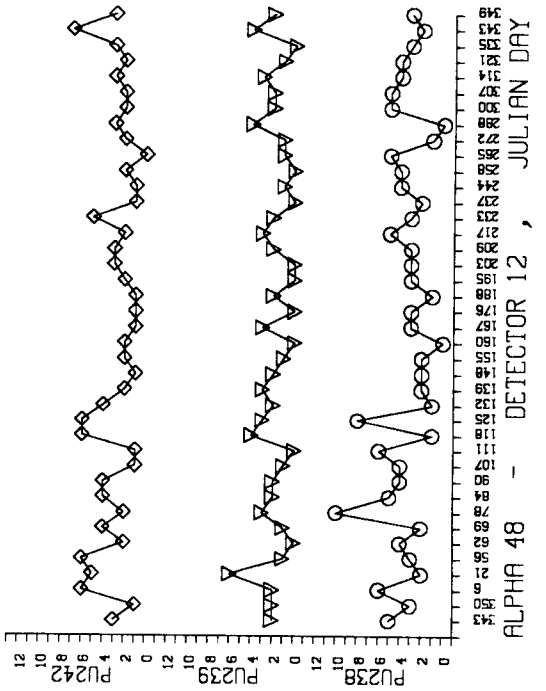
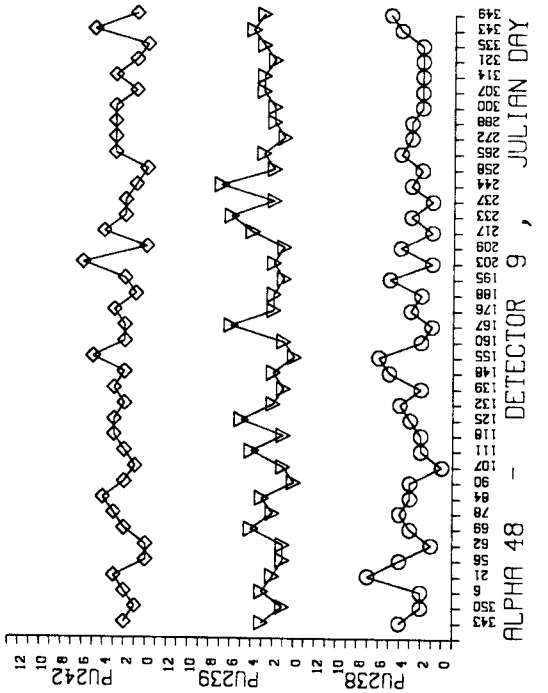
PU242

Fig. H-1. (cont)


ALPHA 48 - DETECTOR 10 , JULIAN DAY
PU238
PU239
PU242


ALPHA 48 - DETECTOR 12 , JULIAN DAY
PU238
PU239
PU242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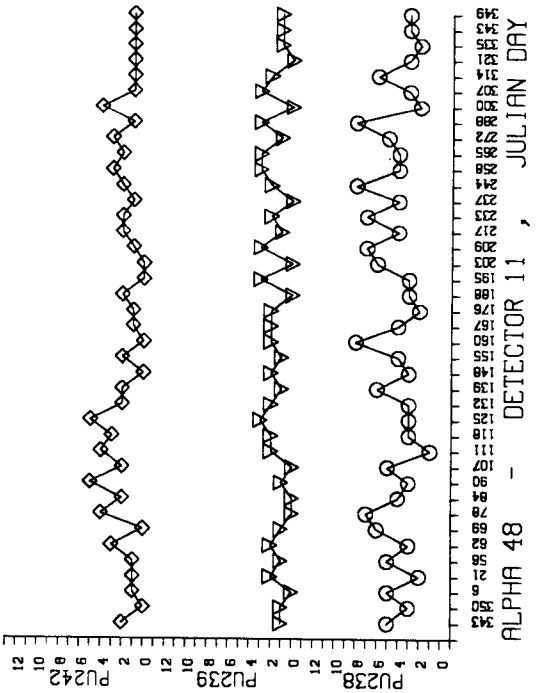
PU242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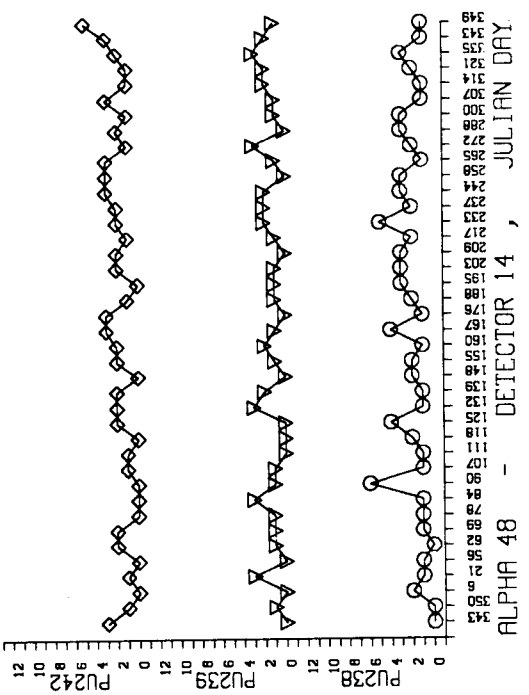
PU238
PU239
PU242

Fig. H-1. (cont)


ALPHA 48 - DETECTOR 14 , JULIAN DAY
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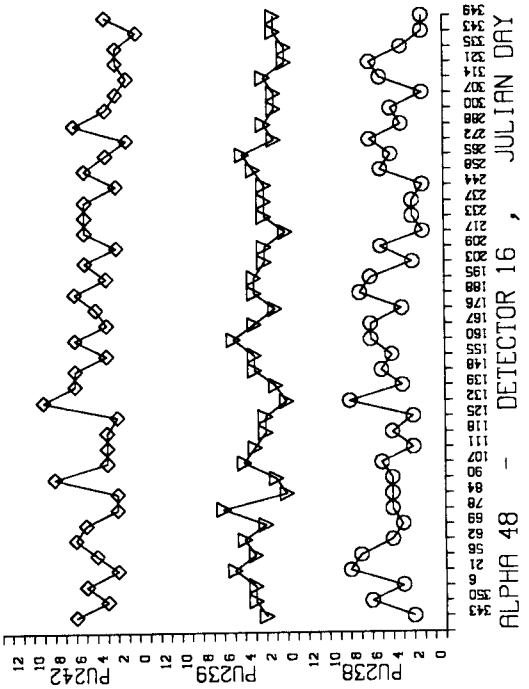
PU239
PU242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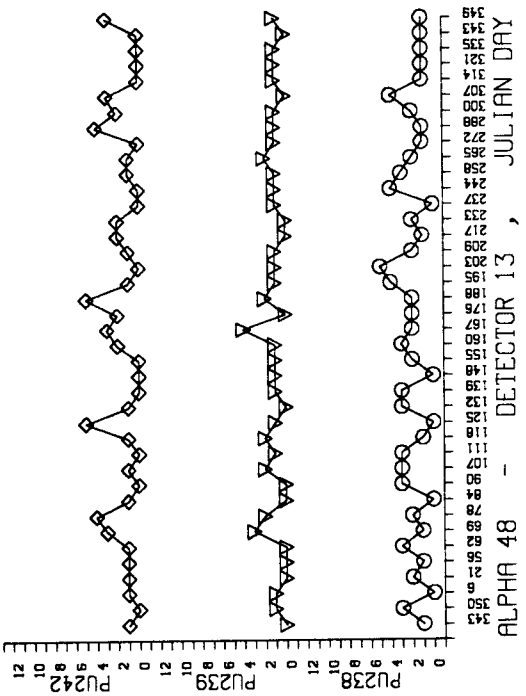
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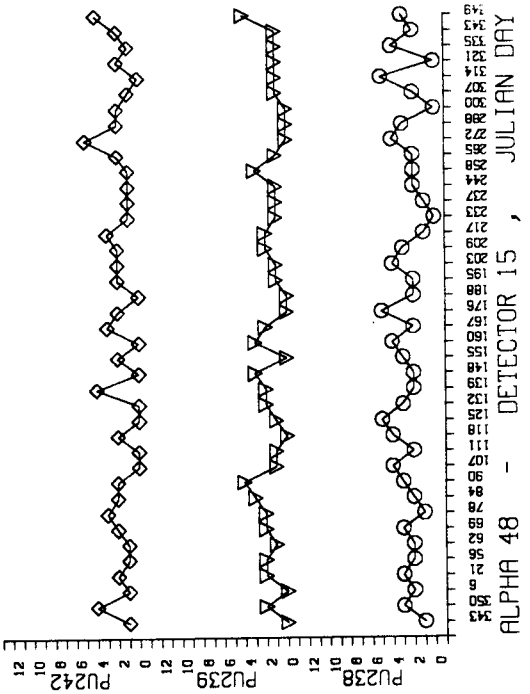
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Fig. H-1. (cont)

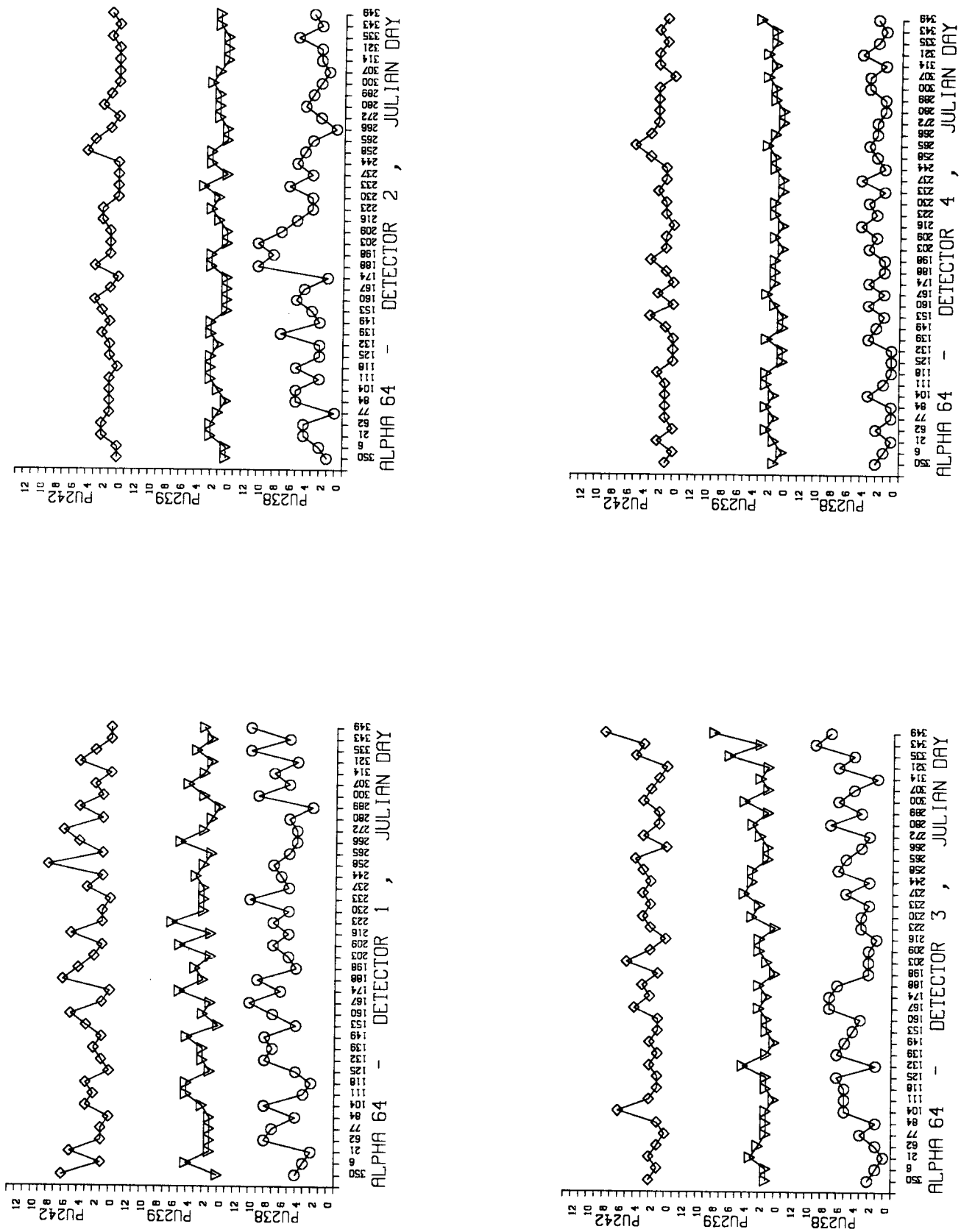
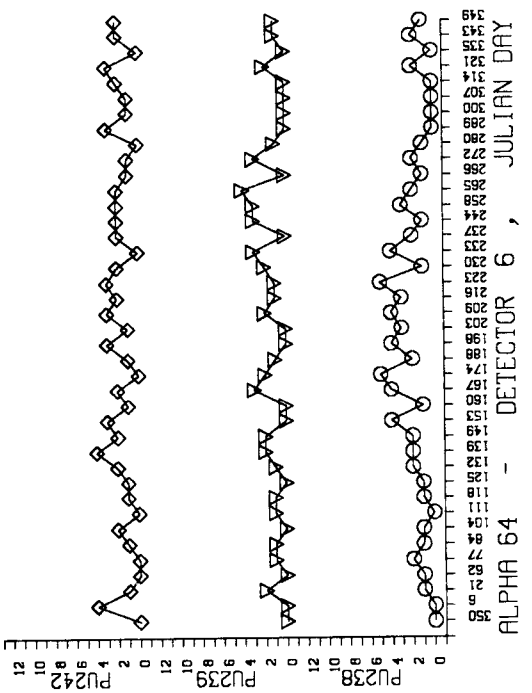

ALPHA 64 - DETECTOR 2 , JULIAN DAY
ALPHA 64 - DETECTOR 4 , JULIAN DAY
ALPHA 64 - DETECTOR 1 , JULIAN DAY
ALPHA 64 - DETECTOR 3 , JULIAN DAY
PU238
PU239
PU242

Fig. H-1. (cont)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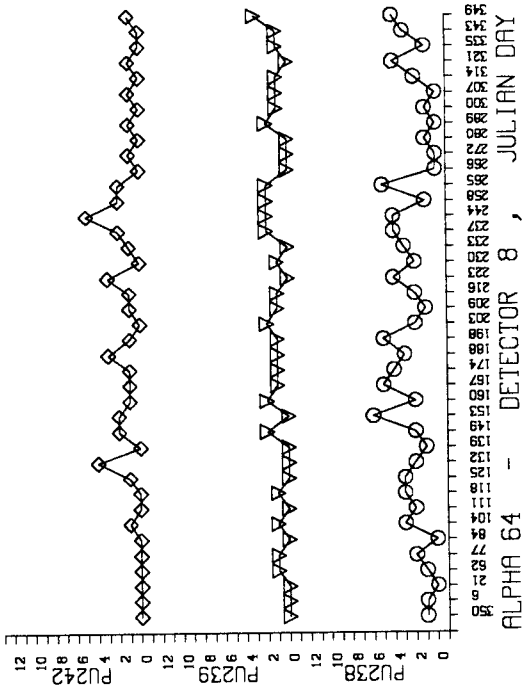
PU238
PU239
PU242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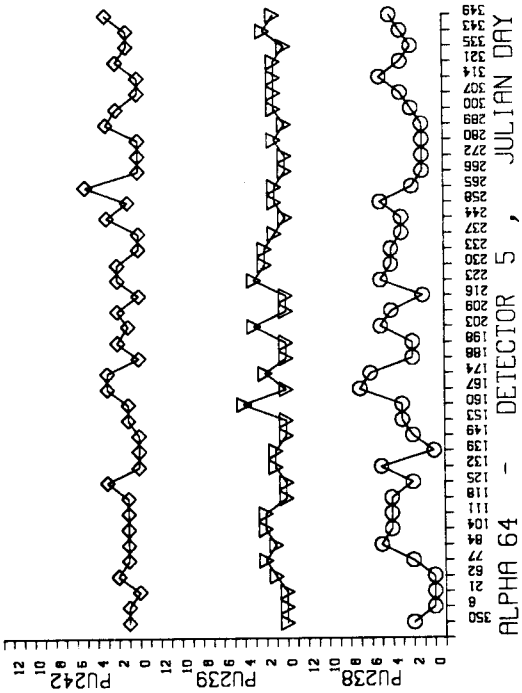
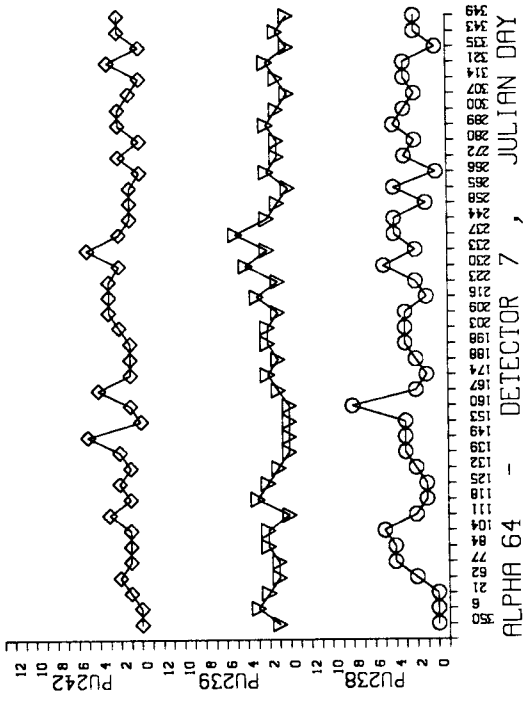
PU238
PU239
PU242


ALPHA 64 - DETECTOR 5 , JULIAN DAY
PU238
PU239
PU242


ALPHA 64 - DETECTOR 7 , JULIAN DAY
PU238
PU239
PU242

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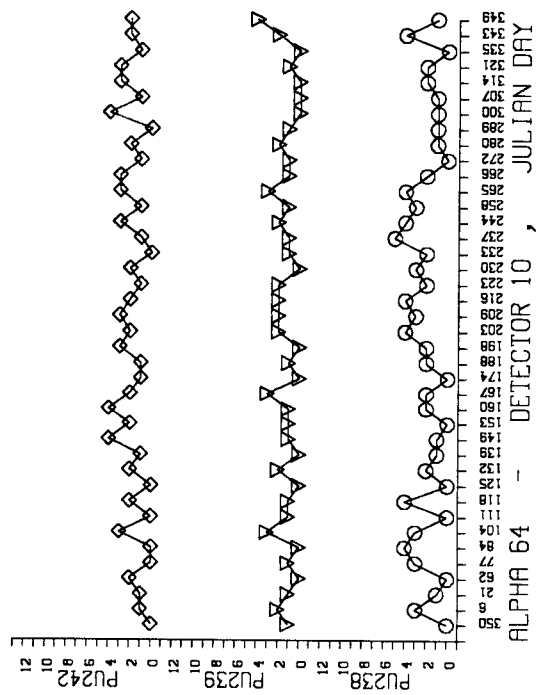
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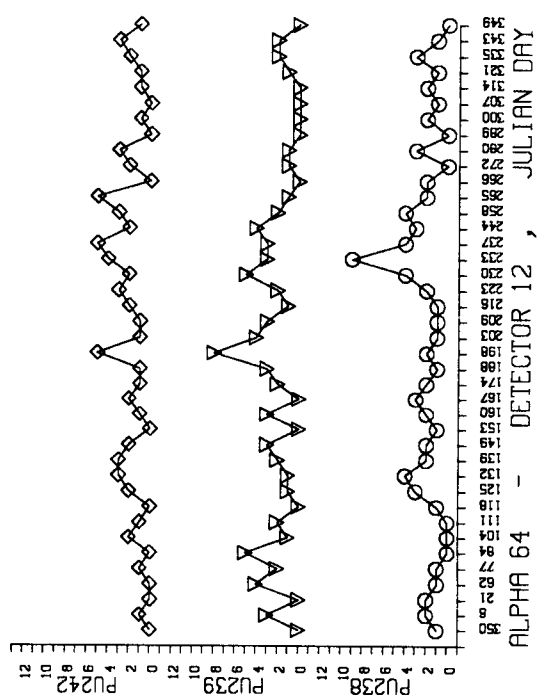
PU238
PU239
PU242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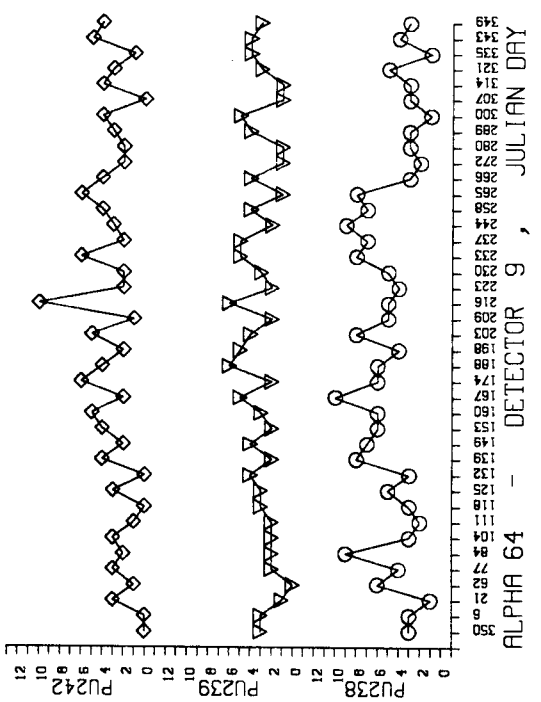
PU238
PU239
PU242


ALPHA 64 - DETECTOR 9 , JULIAN DAY
PU238
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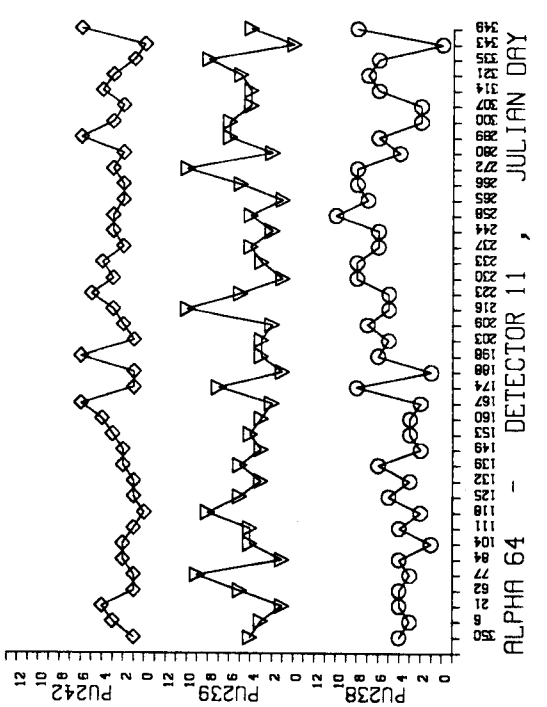
ALPHA 64 - DETECTOR 11 , JULIAN DAY
PU238
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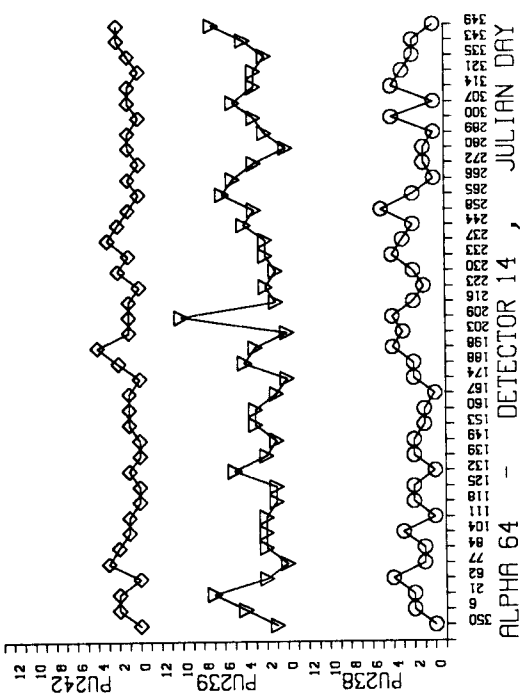
Fig. H-1. (cont)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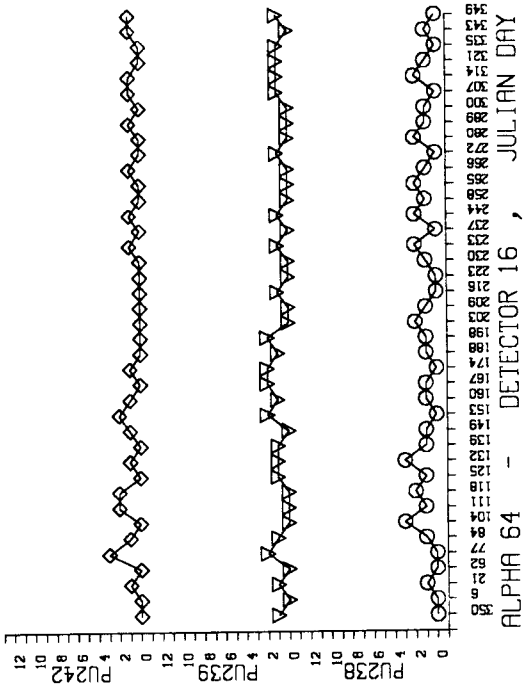
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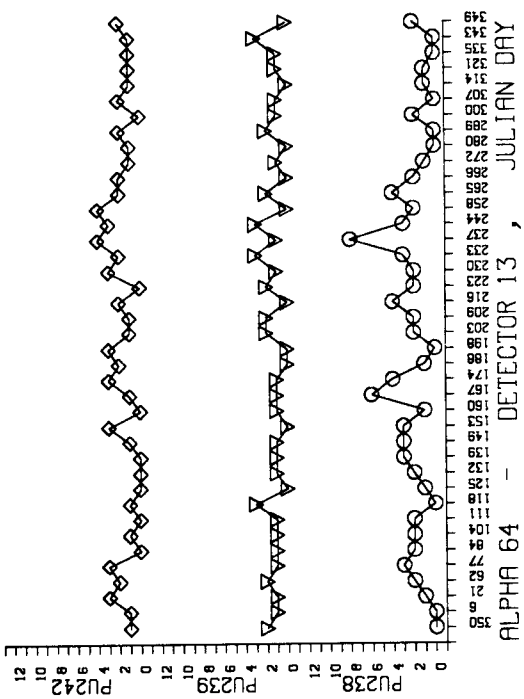
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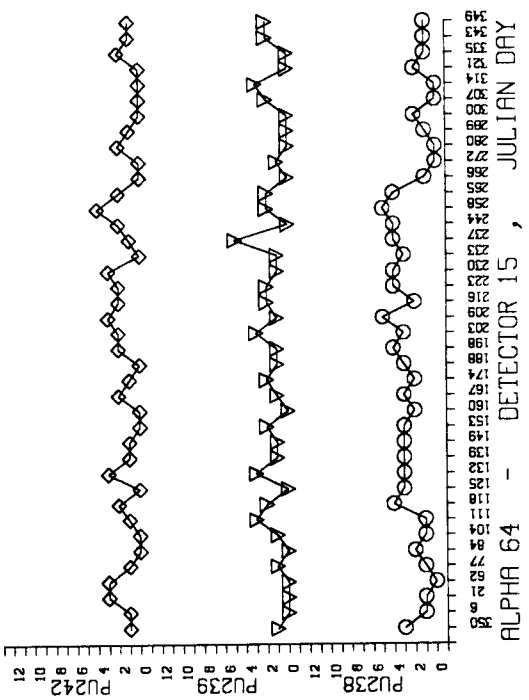
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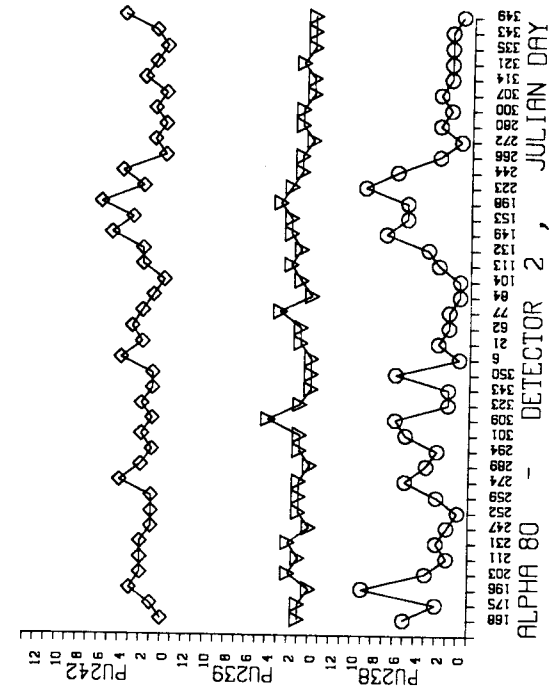
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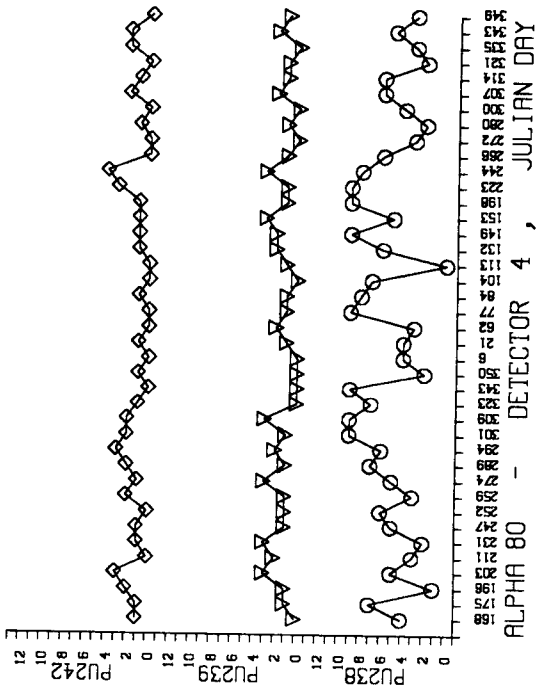
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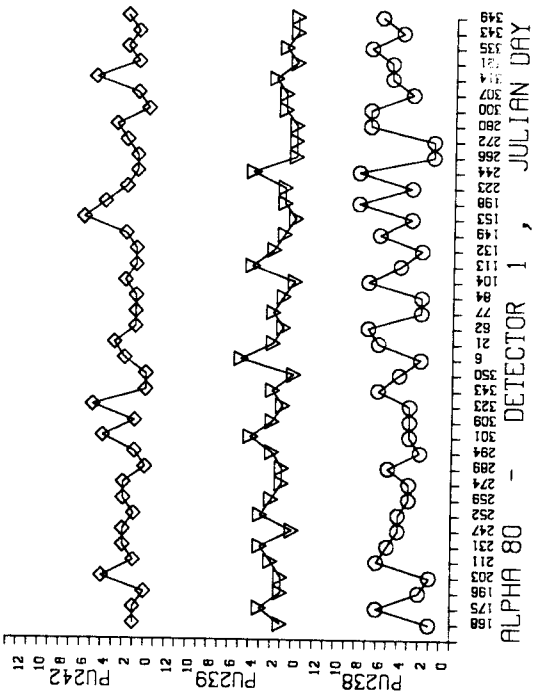
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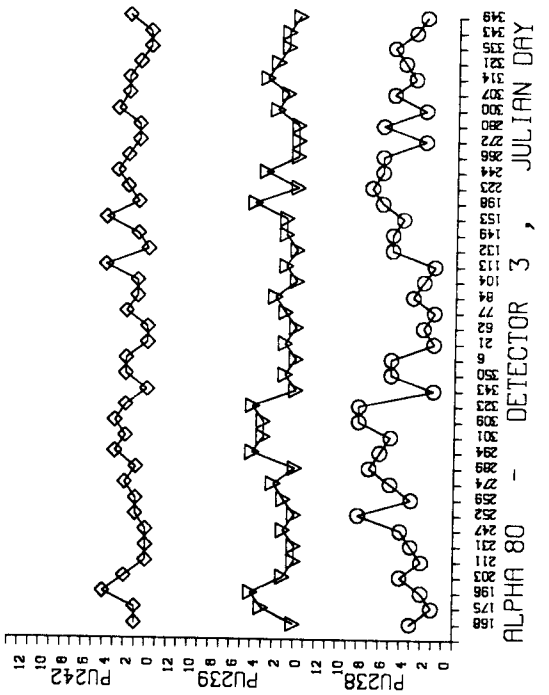
ALPHA 80 - DETECTOR 3 , JULIAN DAY
PU238
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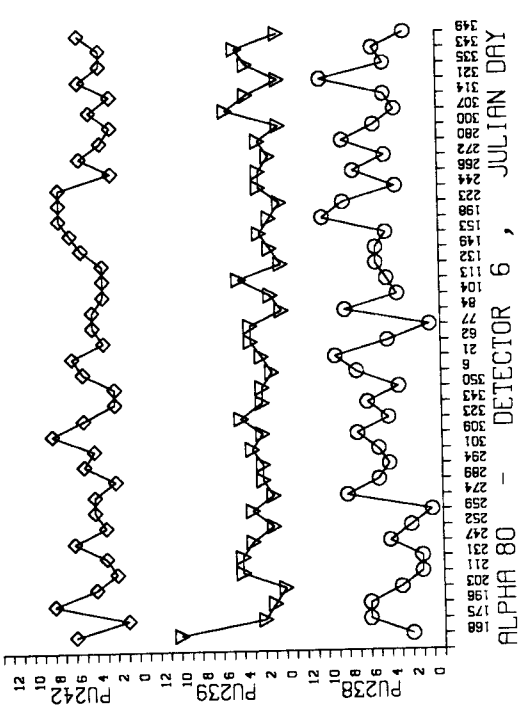
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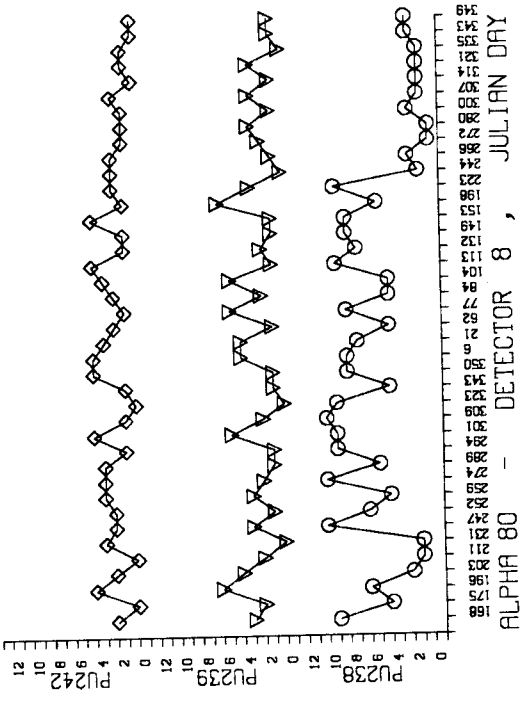
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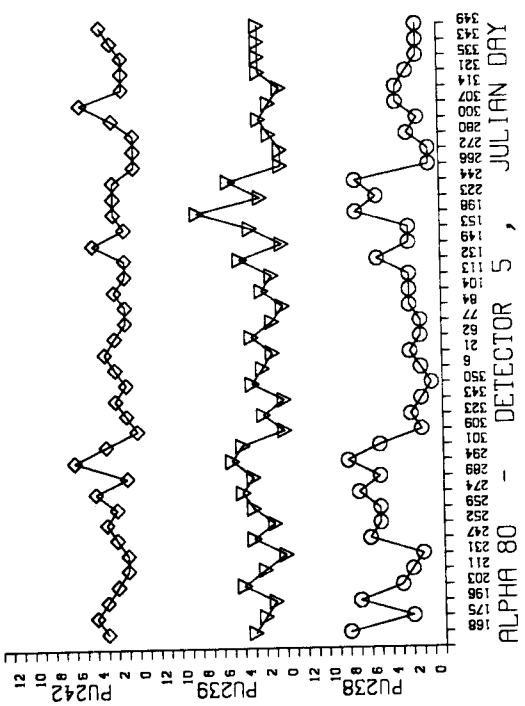
ALPHA 80 - DETECTOR 5 , JULIAN DAY
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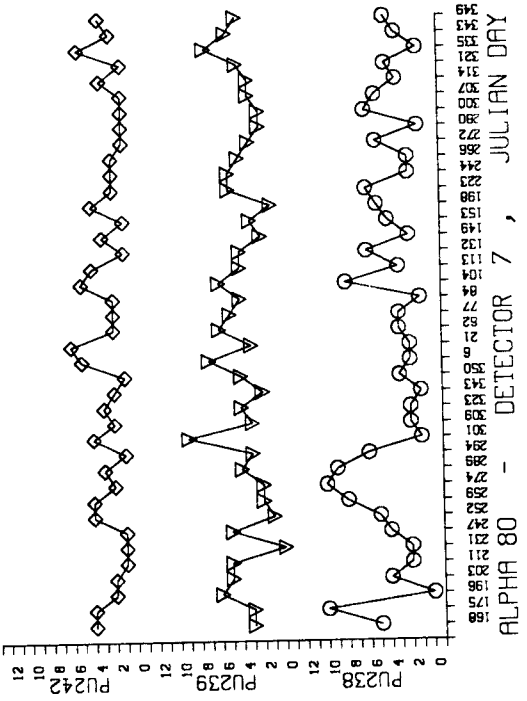
ALPHA 80 - DETECTOR 7 , JULIAN DAY
PU238
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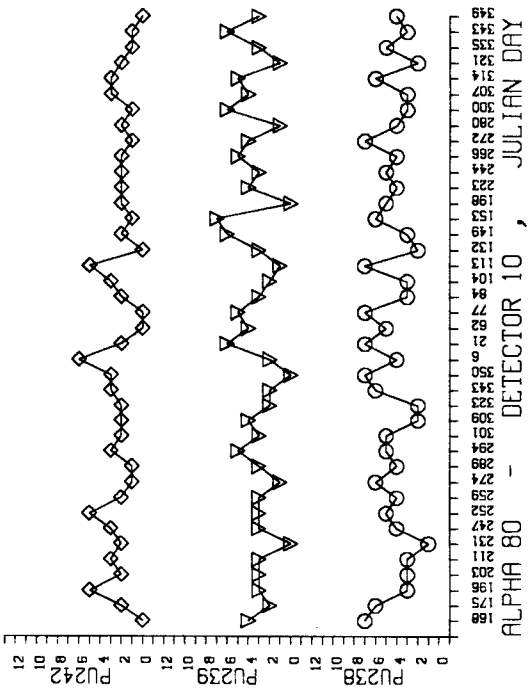
ALPHA 80 - DETECTOR 10 , JULIAN DAY
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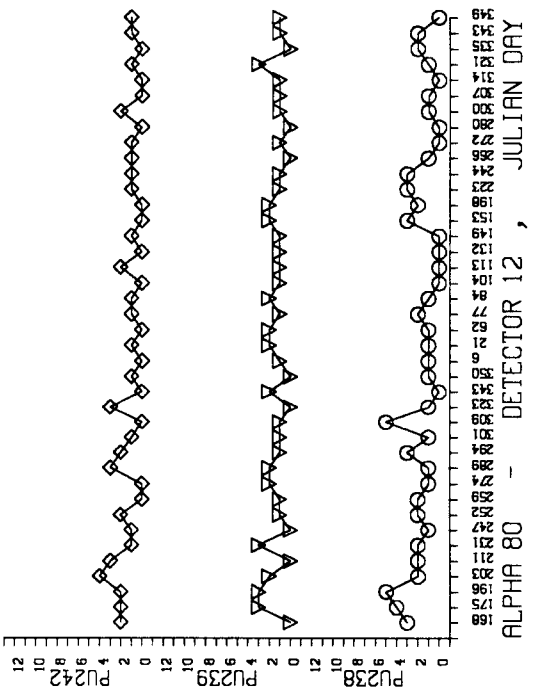
ALPHA 80 - DETECTOR 12 , JULIAN DAY
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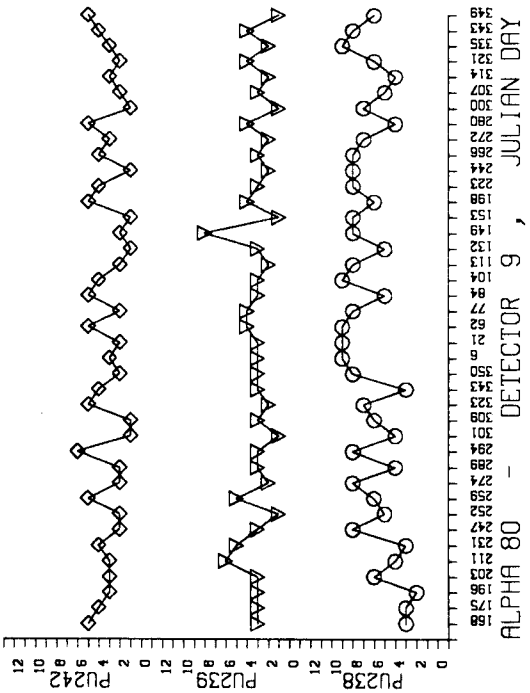
ALPHA 80 - DETECTOR 9 , JULIAN DAY
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PU239
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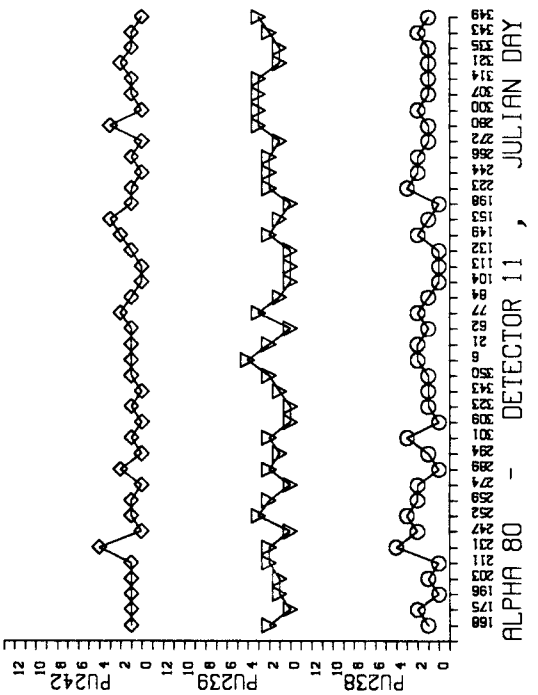
ALPHA 80 - DETECTOR 11 , JULIAN DAY
PU238
PU239
PU242

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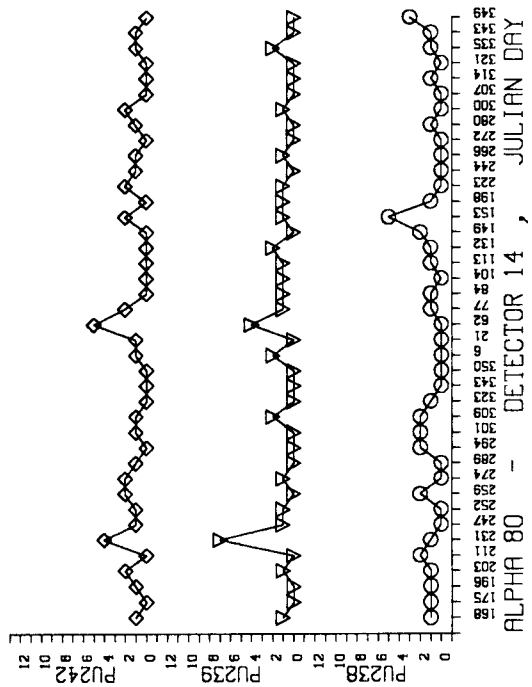
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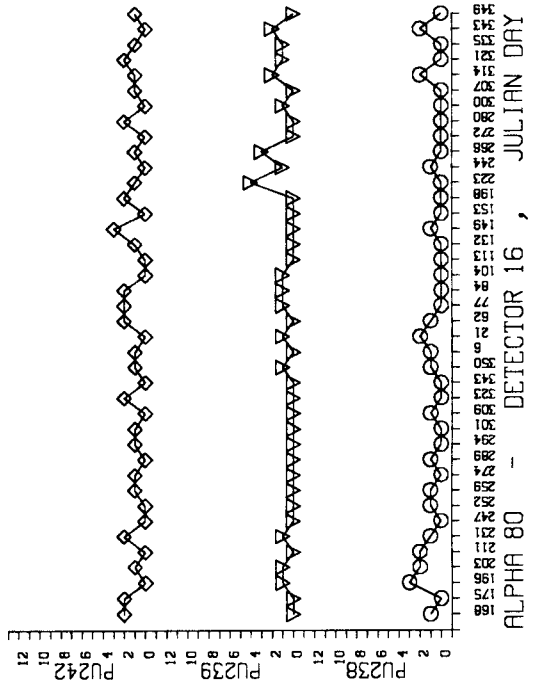
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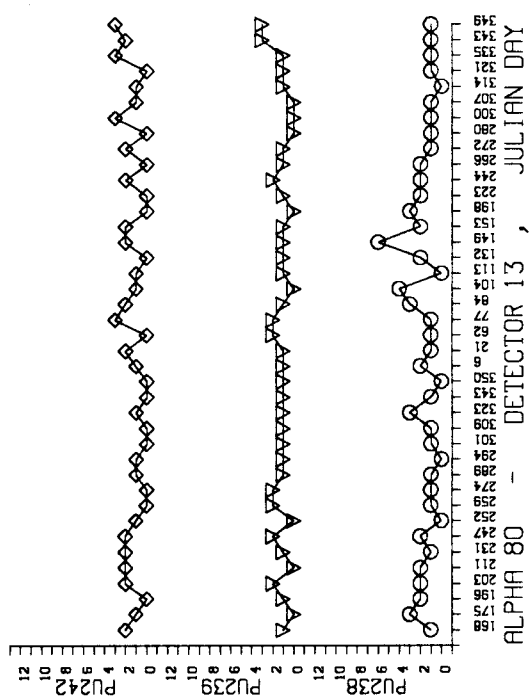
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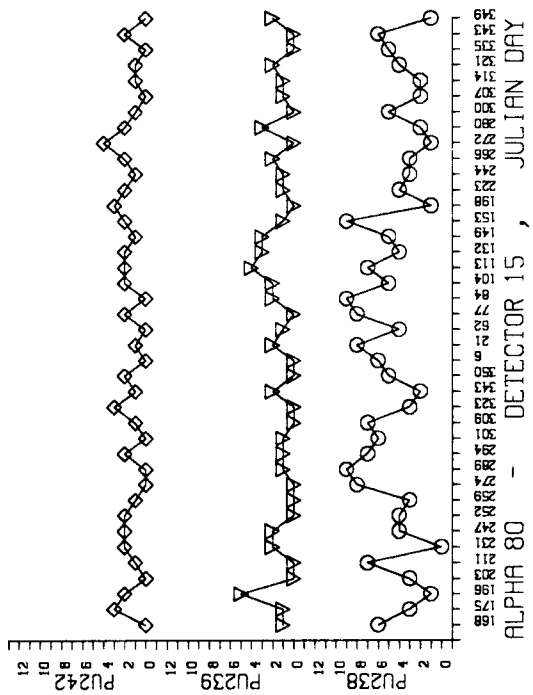
ALPHA 80 - DETECTOR 15 , JULIAN DAY
PU238
PU239
PU242

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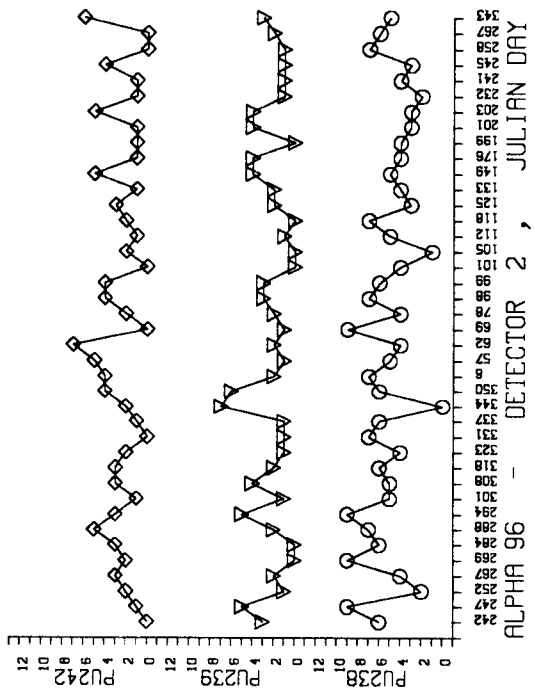
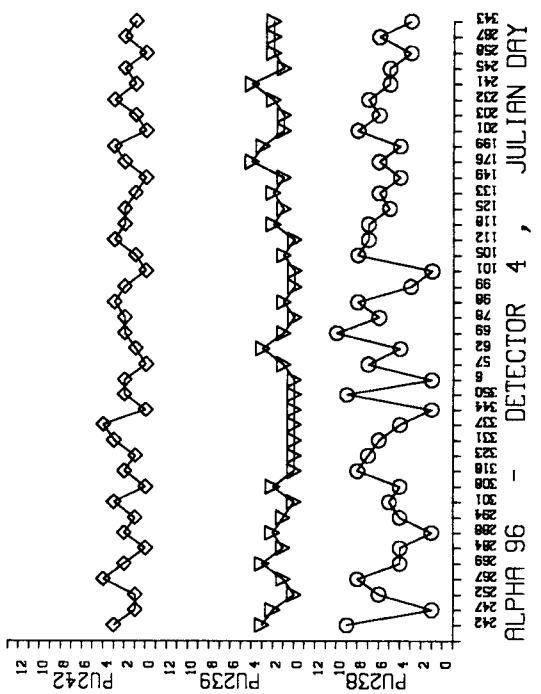

ALPHA 96 - DETECTOR 2 , JULIAN DAY
PU238
PU239
PU242


ALPHA 96 - DETECTOR 4 , JULIAN DAY
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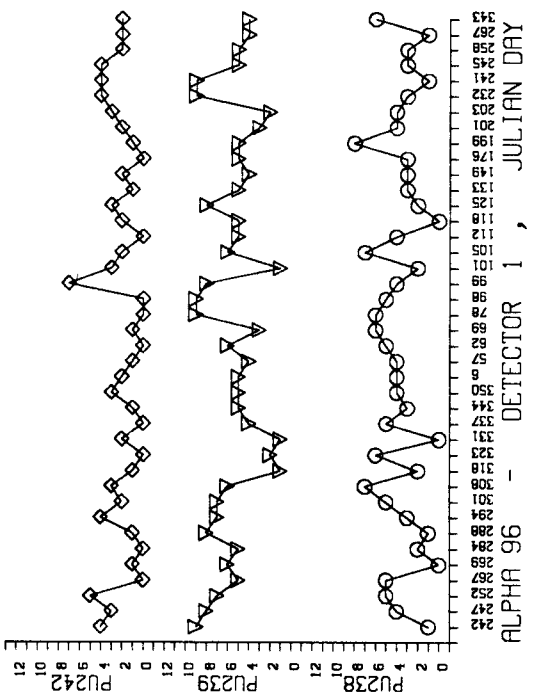
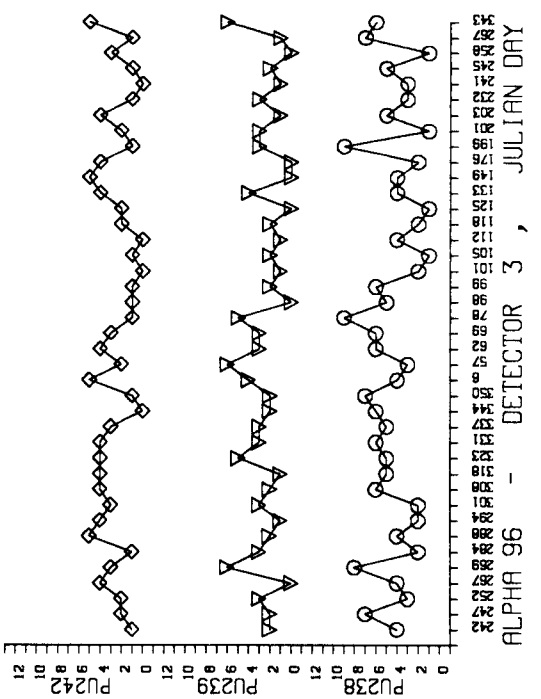
PU242


ALPHA 96 - DETECTOR 1 , JULIAN DAY
PU238
PU239
PU242


ALPHA 96 - DETECTOR 3 , JULIAN DAY
PU238
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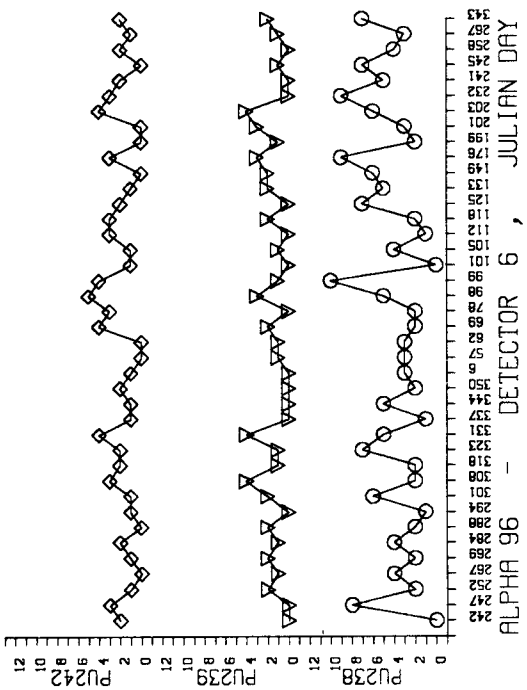
PU242

Fig. H-1. (cont)


ALPHA 96 - DETECTOR 6 , JULIAN DAY
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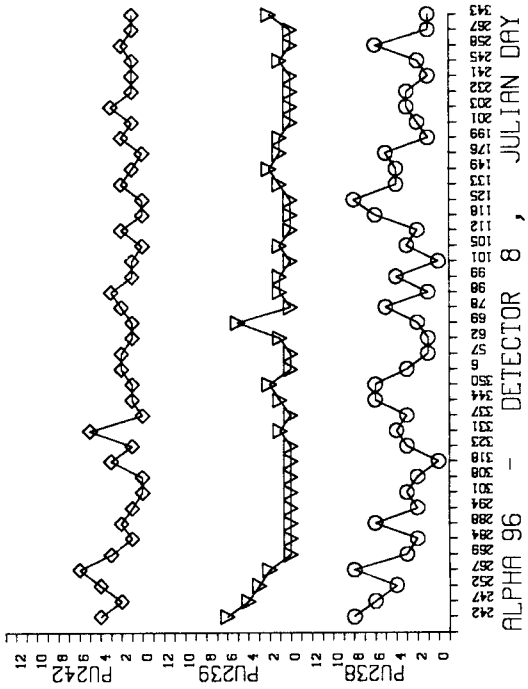
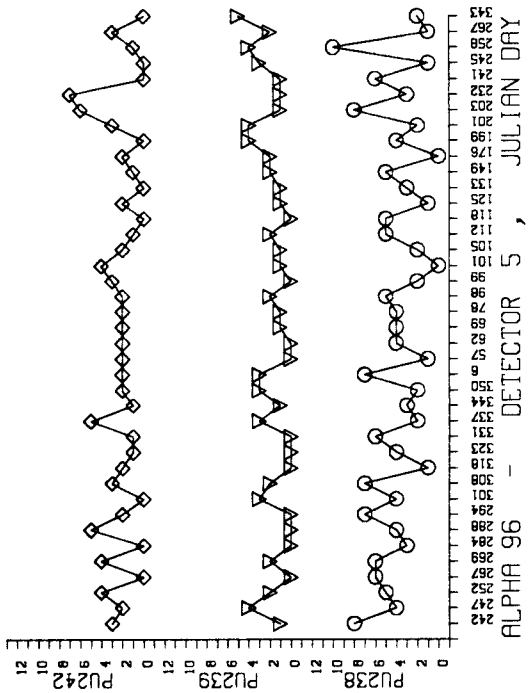
PU239
PU242


ALPHA 96 - DETECTOR 8 , JULIAN DAY
PU238
PU239
PU242


ALPHA 96 - DETECTOR 5 , JULIAN DAY
PU238
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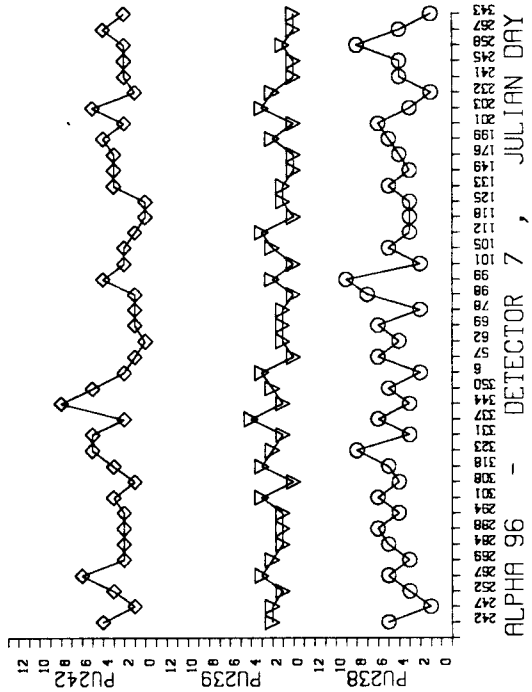
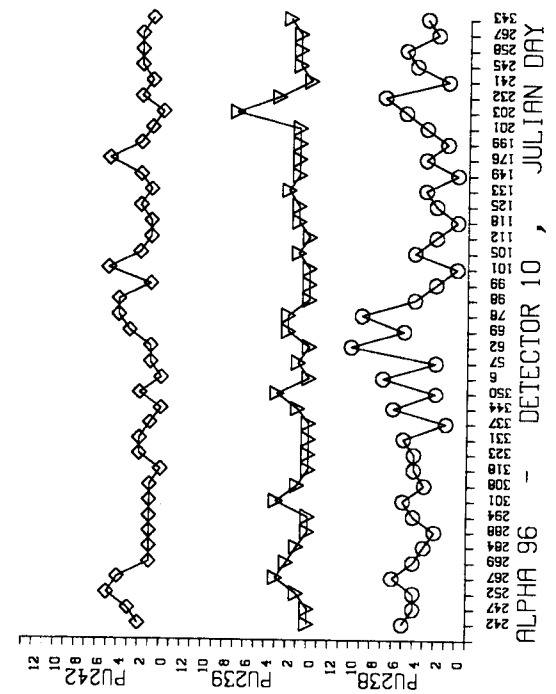

ALPHA 96 - DETECTOR 7 , JULIAN DAY
PU238
PU239
PU242

Fig. H-1. (cont)


ALPHA 96 - DETECTOR 10 , JULIAN DAY
PU238
PU239
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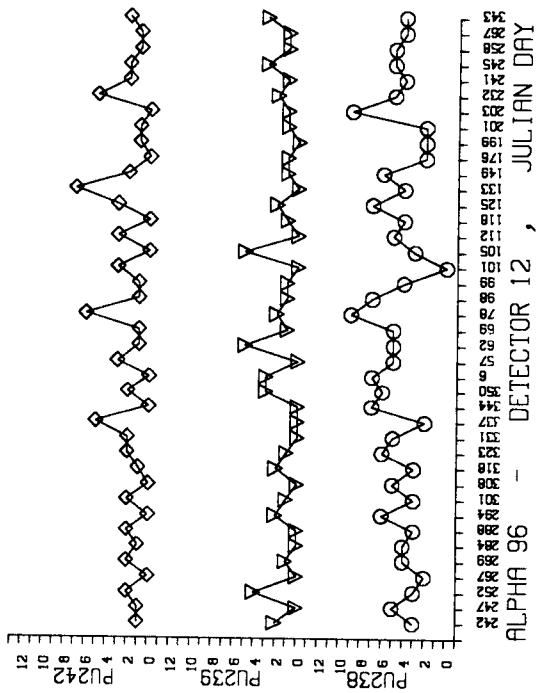
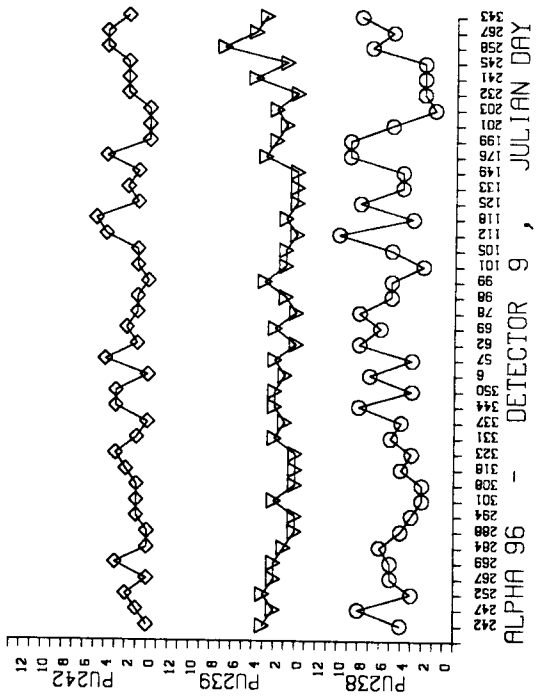

ALPHA 96 - DETECTOR 12 , JULIAN DAY
PU238
PU239
PU242


ALPHA 96 - DETECTOR 9 , JULIAN DAY
PU238
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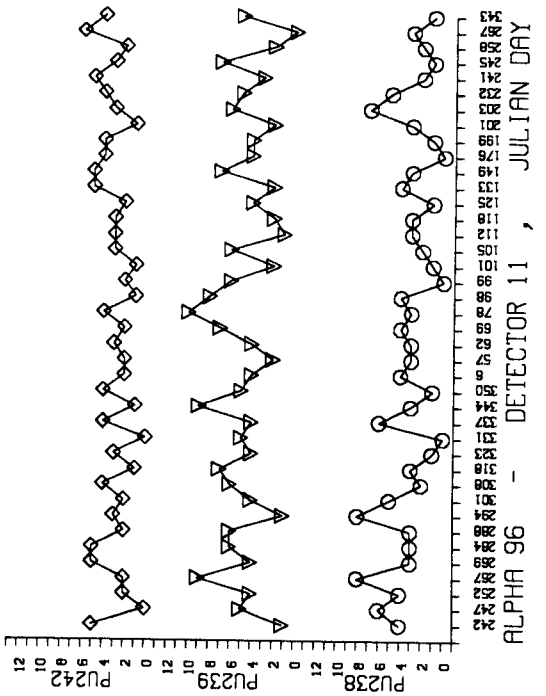
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PU238
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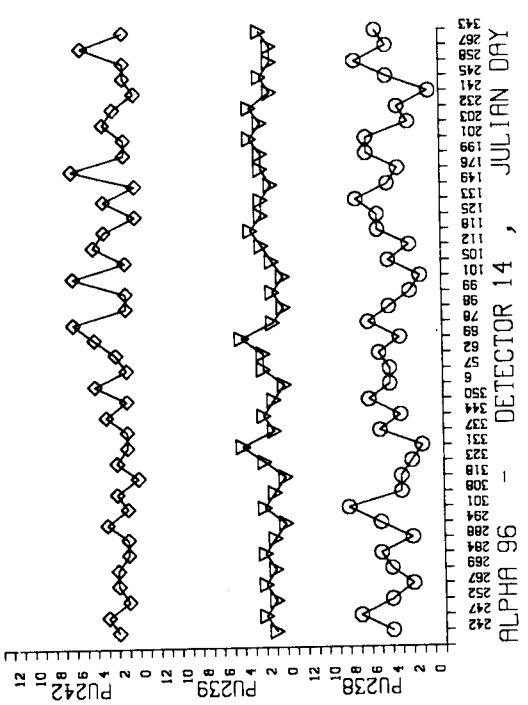
Fig. H-1. (cont)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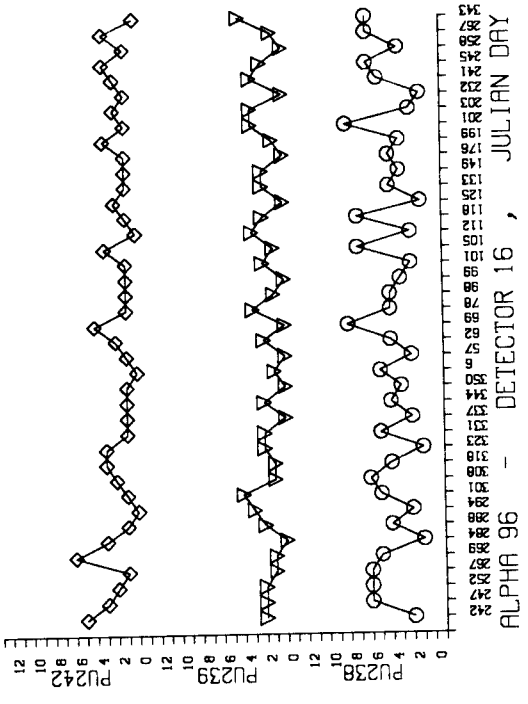
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PU238
PU239
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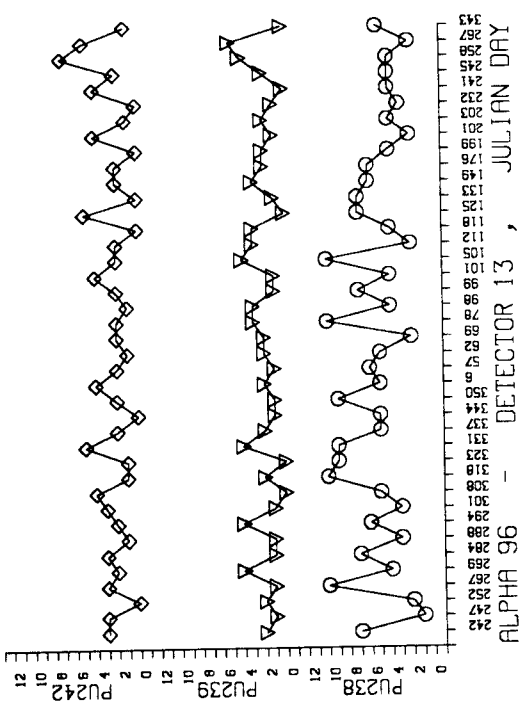
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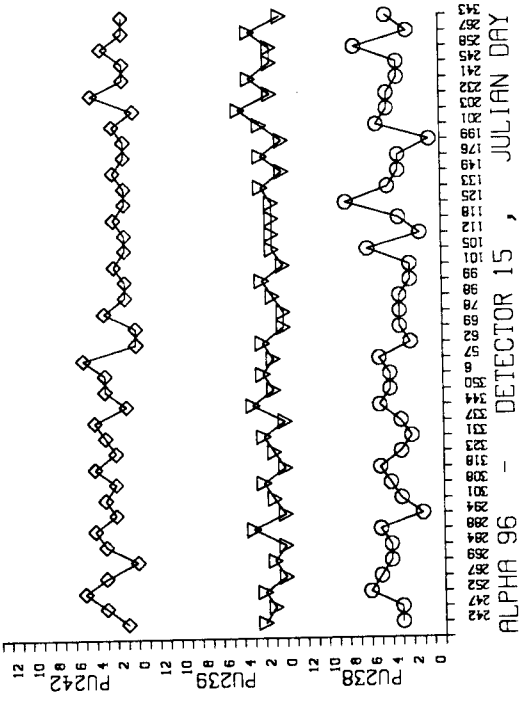
PU239
PU242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PU238
PU239
PU242

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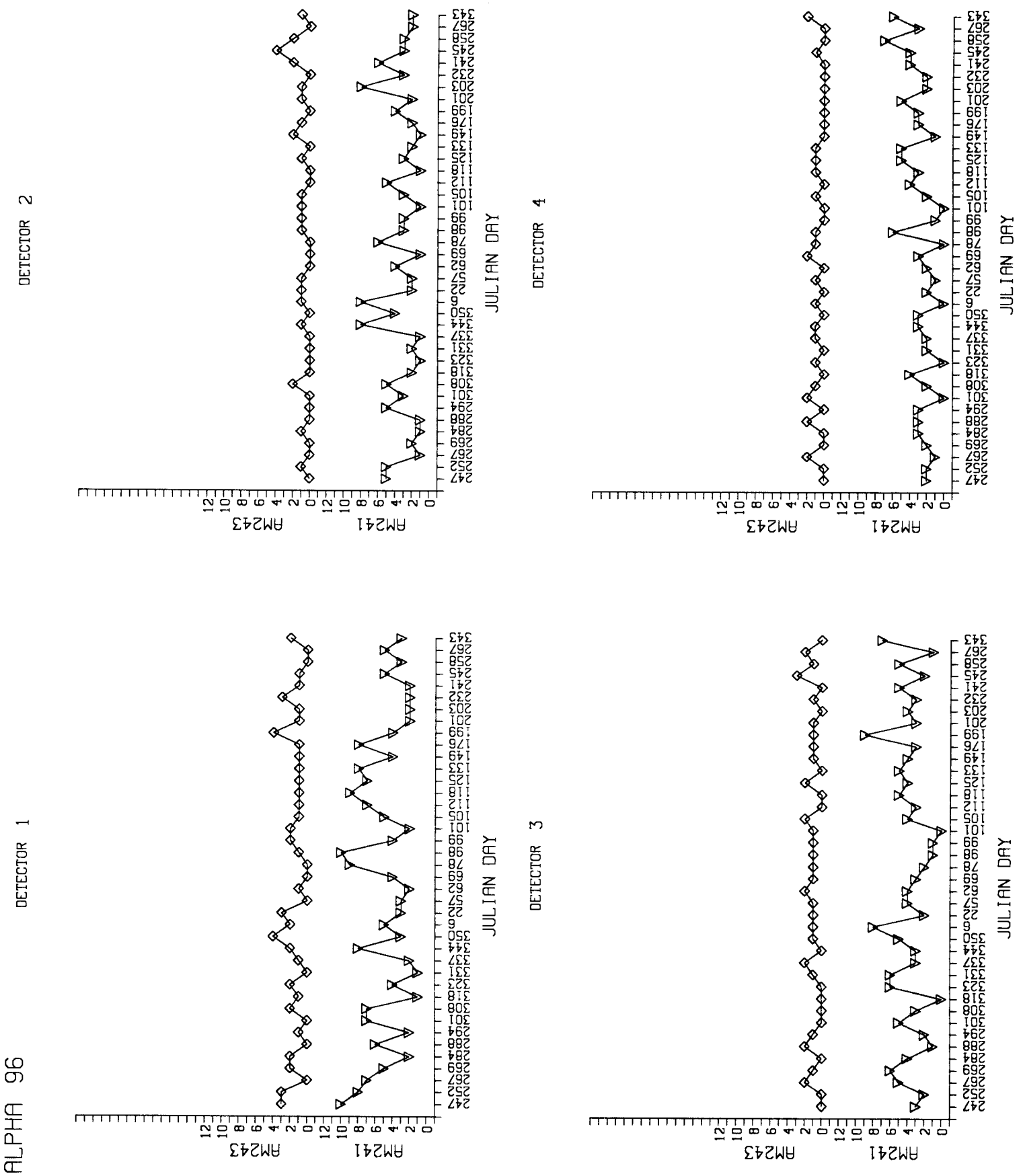
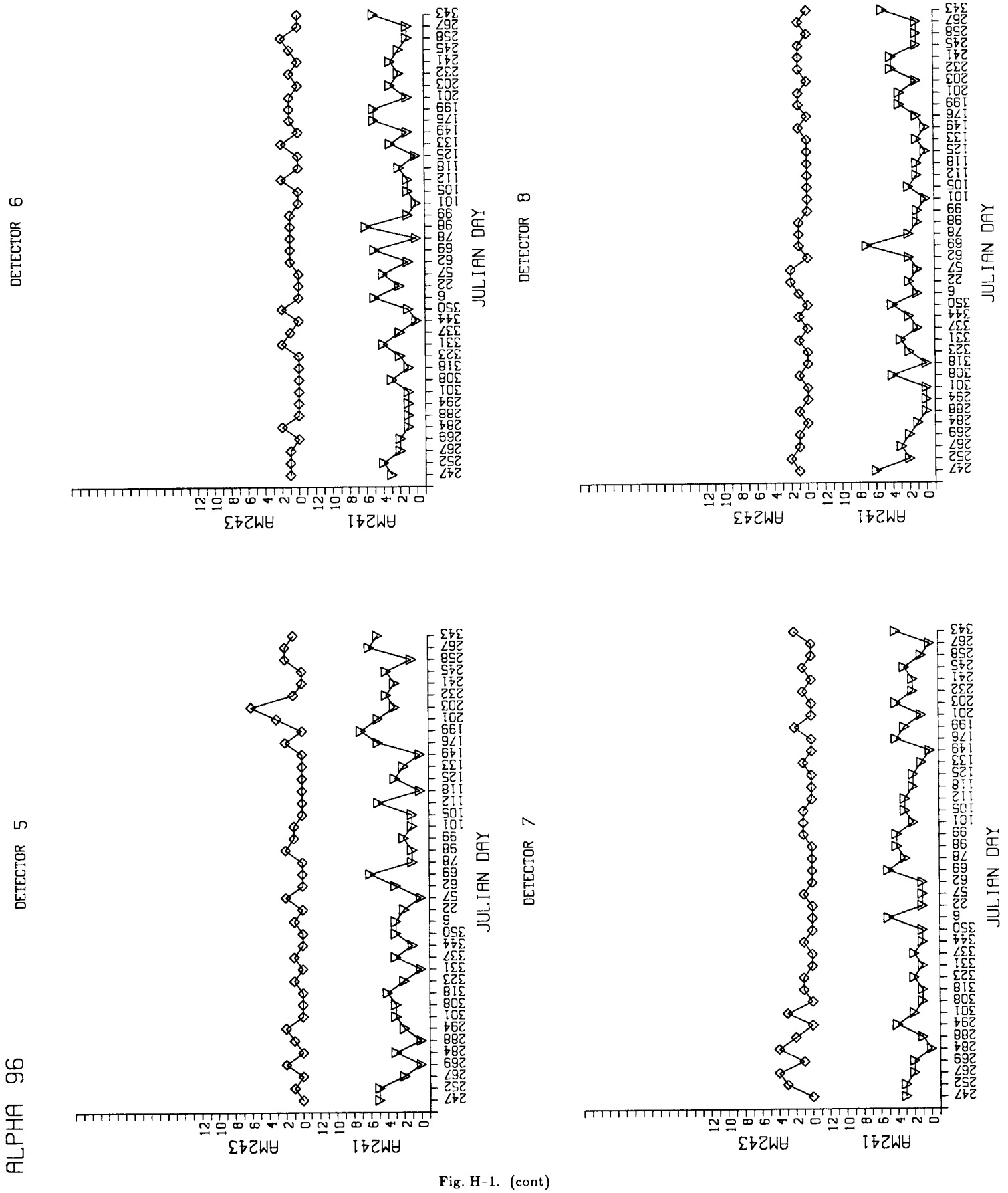

ALPHA 96
DETECTOR 1
DETECTOR 2
DETECTOR 3
DETECTOR 4
AM241
AM243
JULIAN DAY

Fig. H-1. (cont)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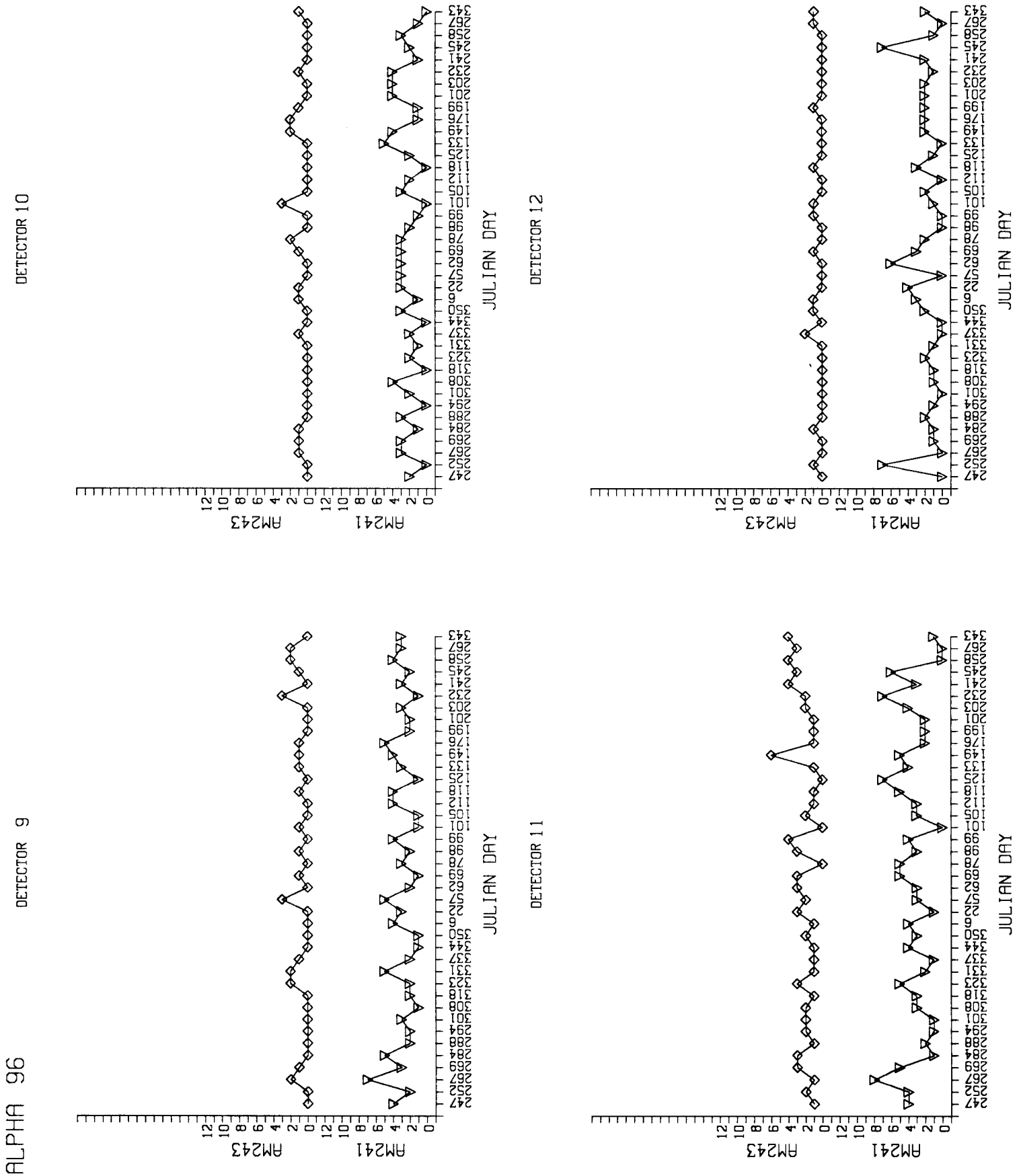
DETECTOR 5
DETECTOR 6
DETECTOR 7
DETECTOR 8
AM241
AM243
JULIAN DAY

Fig. H-1. (cont)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DETECTOR 11
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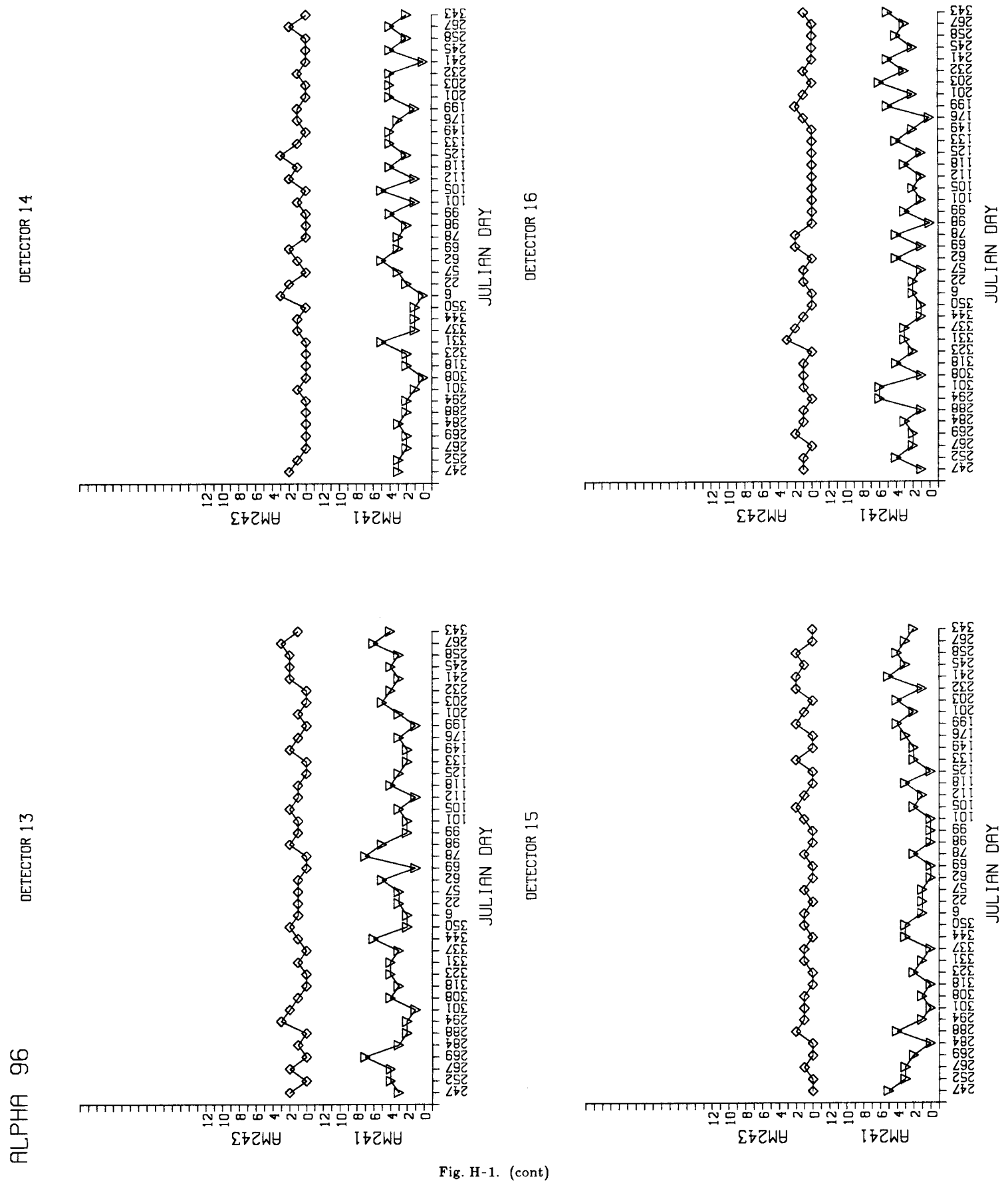
AM243
JULIAN DAY

Fig. H-1. (cont)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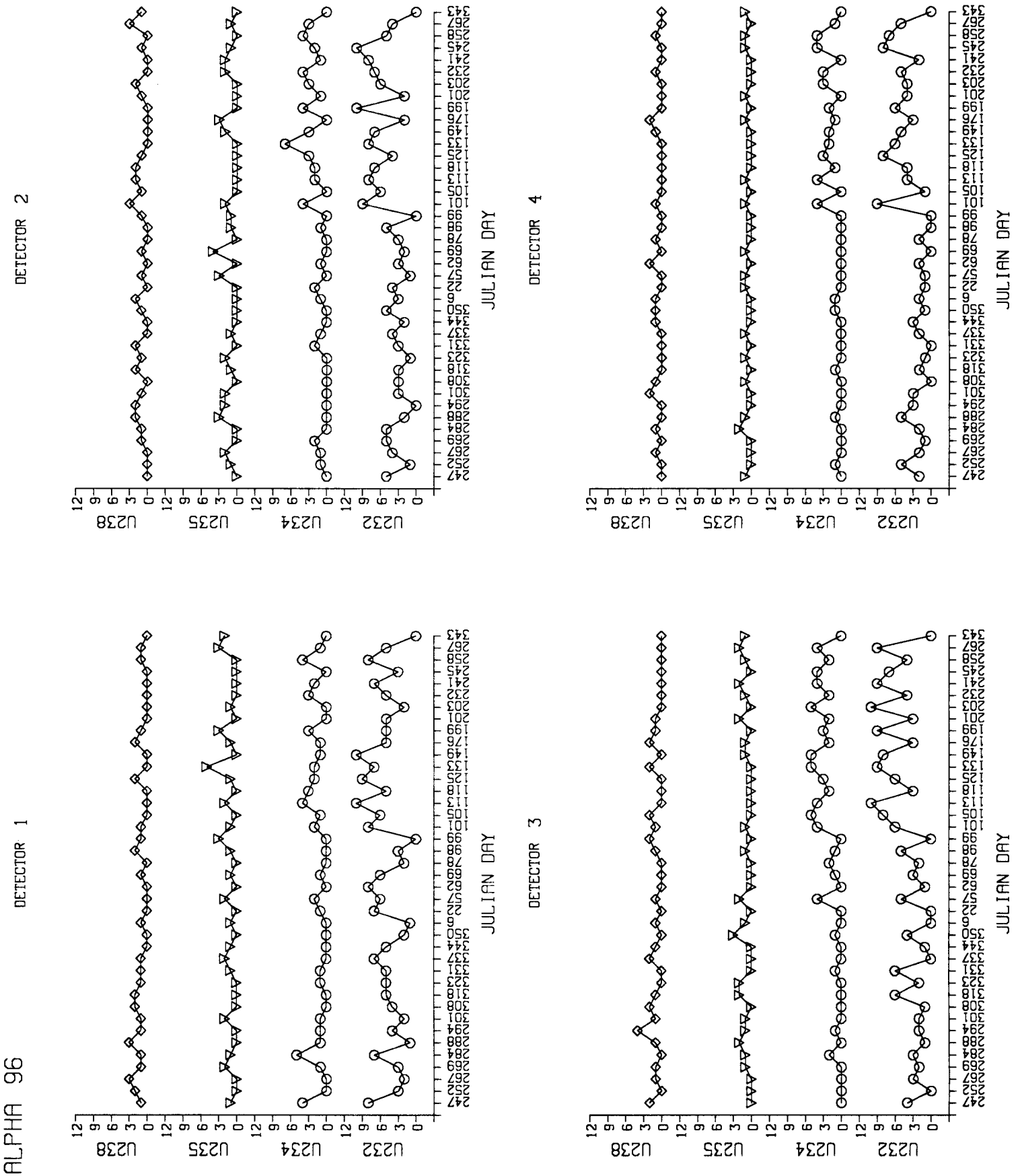
AM241
AM243
JULIAN DAY

Fig. H-1. (cont)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DETECTOR 1
DETECTOR 2
DETECTOR 3
DETECTOR 4
U238
U235
U234
U232
JULIAN DAY

Fig. H-1. (cont)

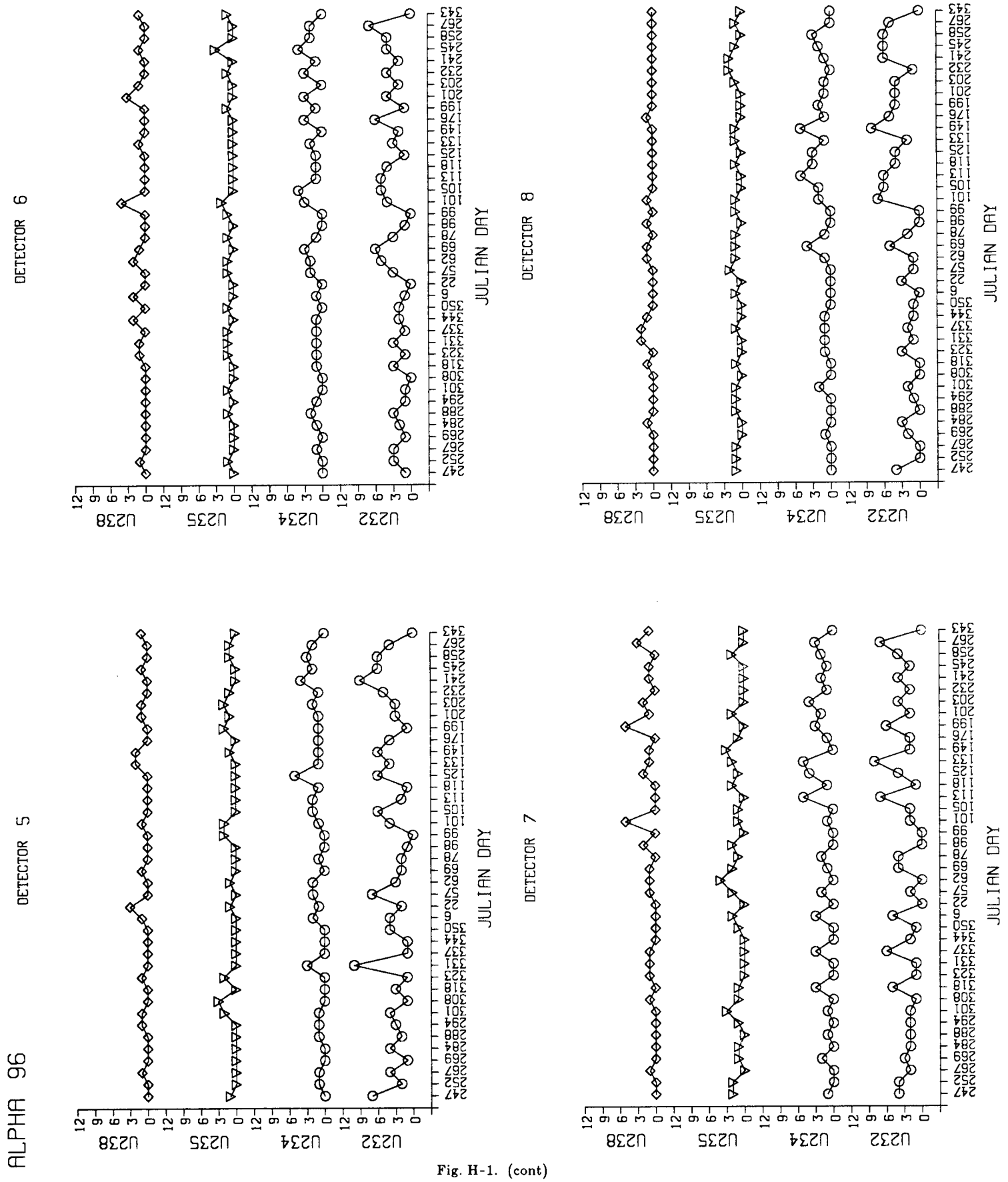
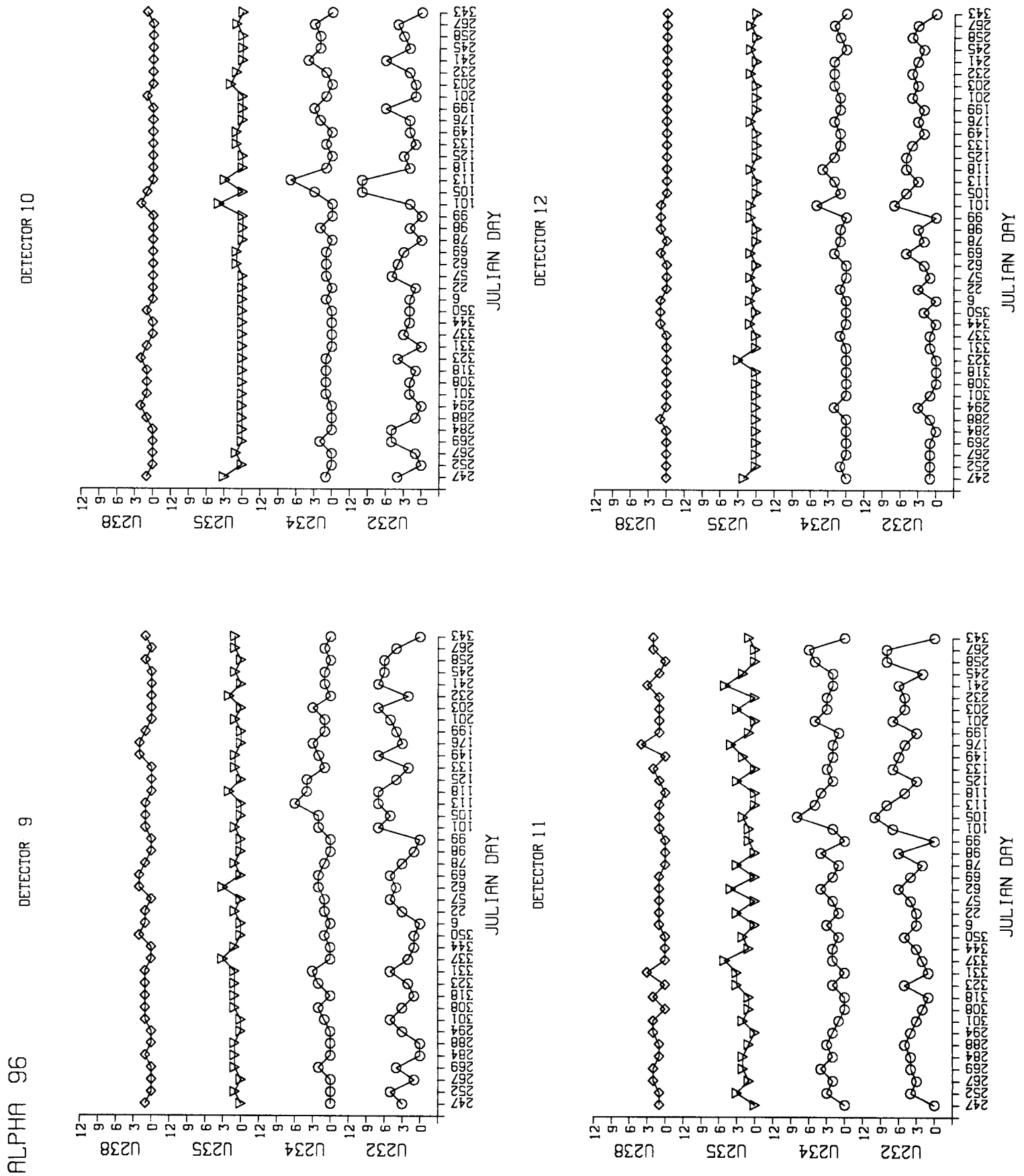

ALPHA 96
DETECTOR 5
DETECTOR 6
DETECTOR 7
DETECTOR 8
U238
U235
U234
U232
JULIAN DAY

Fig. H-1. (cont)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DETECTOR 9
DETECTOR 10
DETECTOR 11
DETECTOR 12
U238
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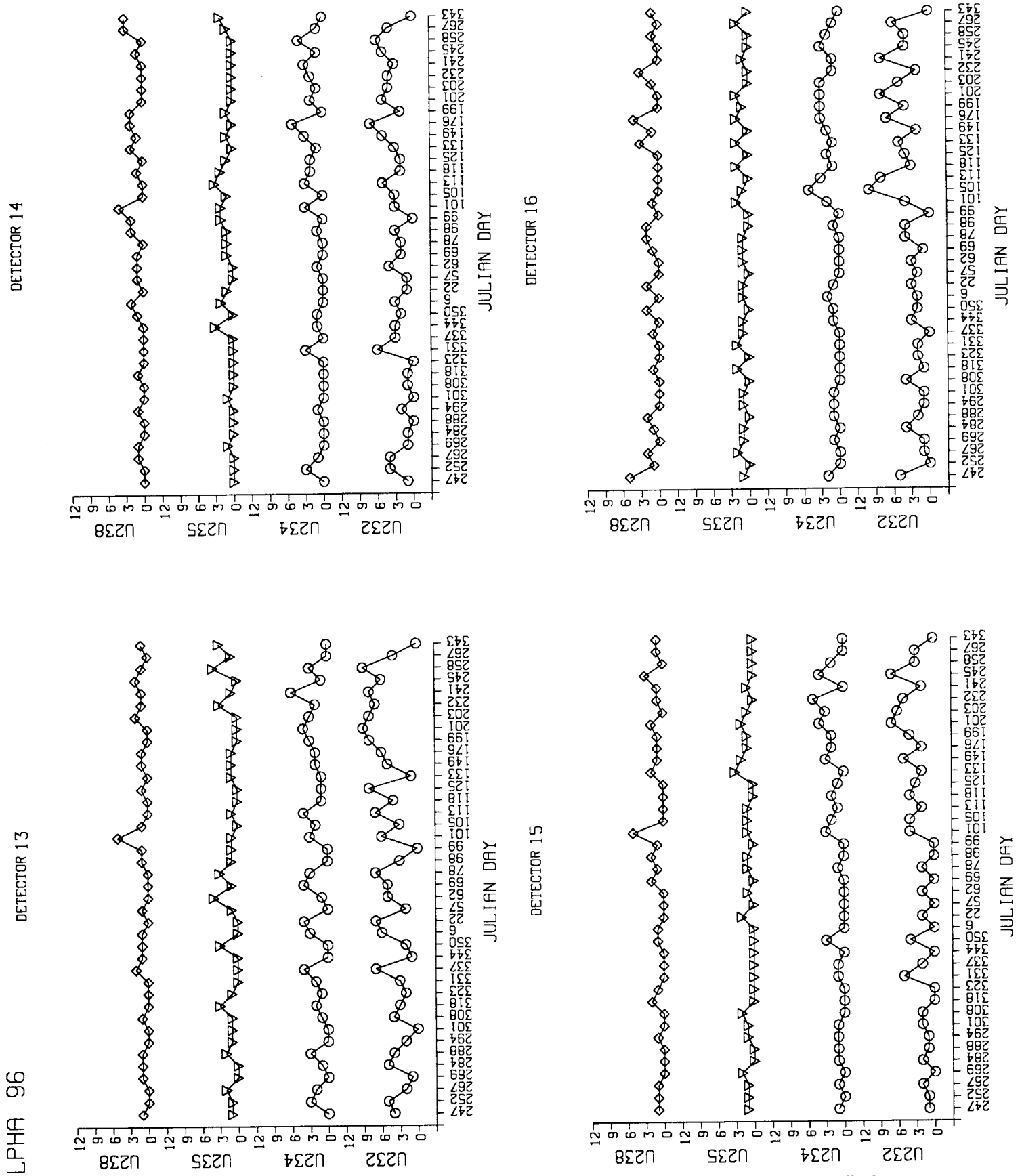
U234
U232
JULIAN DAY

Fig. H-1. (cont)



NOTE: Fluctuations in these data are documented in Laboratory notebooks A-8192 and A-10105 and are generally due to a detector being replaced or needing cleaning, electrical power surges and failures, vacuum system leaks, and electronic noise.

Fig. H-1. (cont)

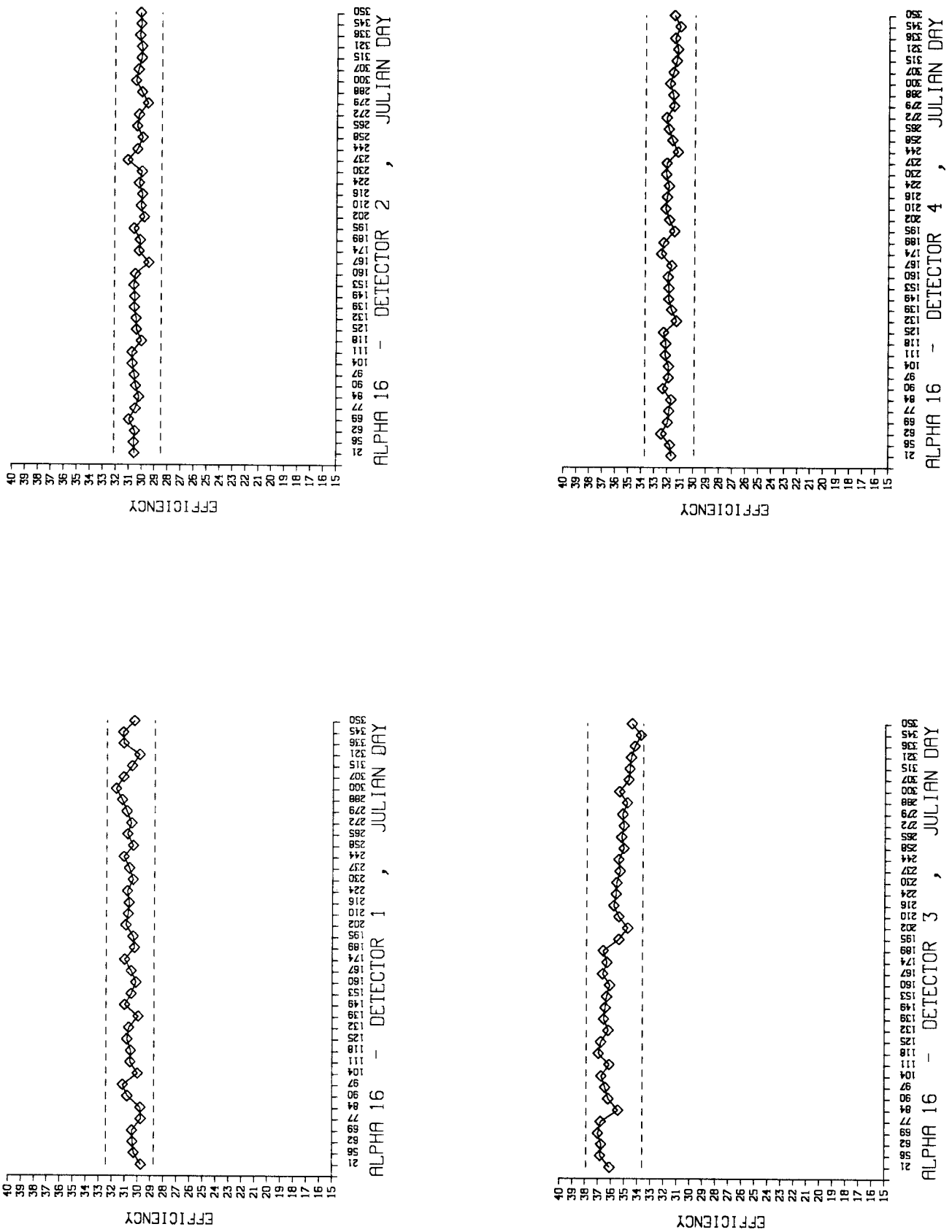
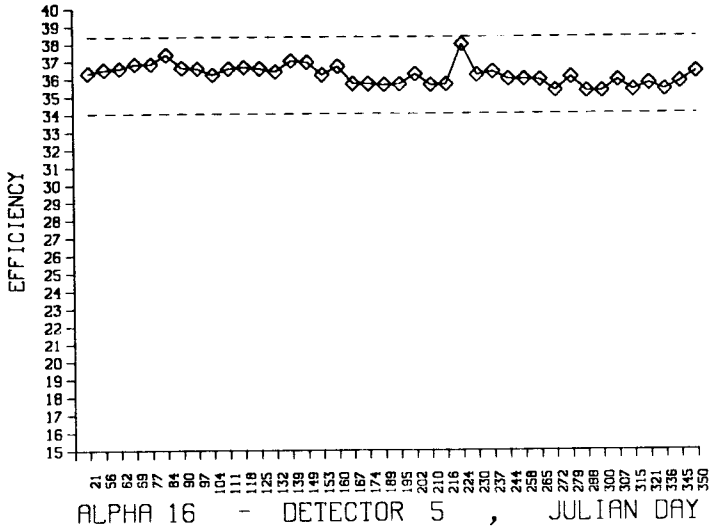
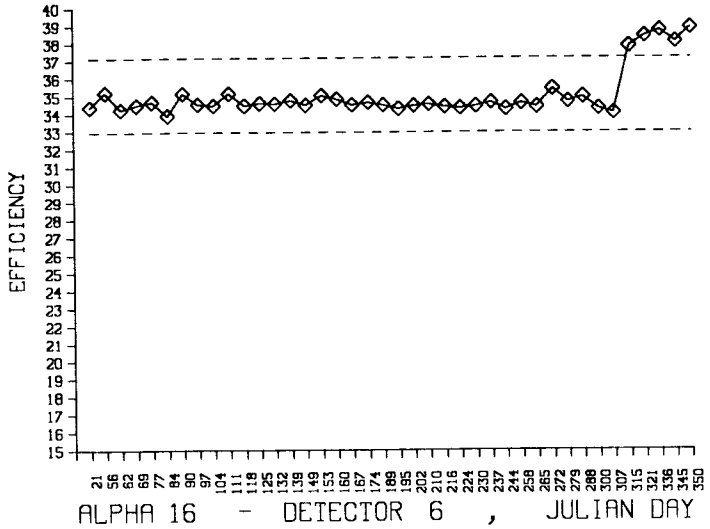
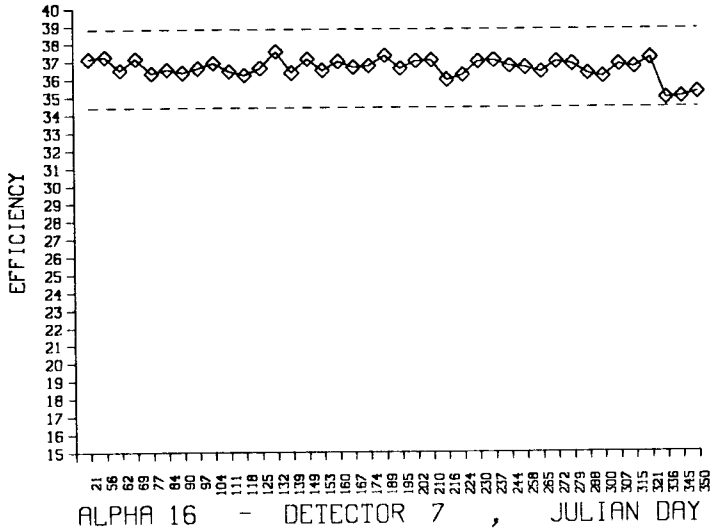


Fig. H-2. Plots of alpha spectrometer calibration data.


EFFICIENCY
ALPHA 16 - DETECTOR 5 , JULIAN DAY


EFFICIENCY
ALPHA 16 - DETECTOR 6 , JULIAN DAY


EFFICIENCY
ALPHA 16 - DETECTOR 7 , JULIAN DAY

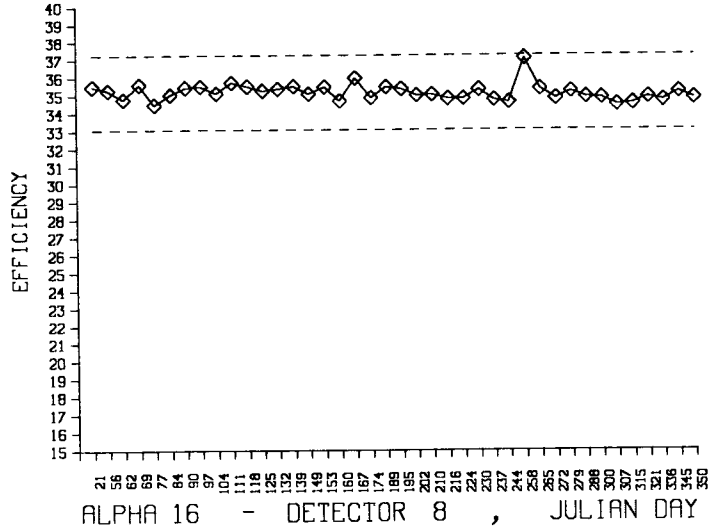
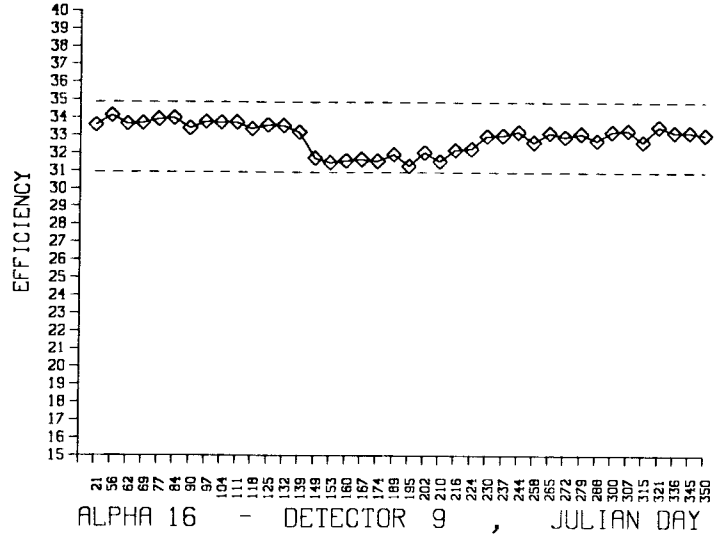
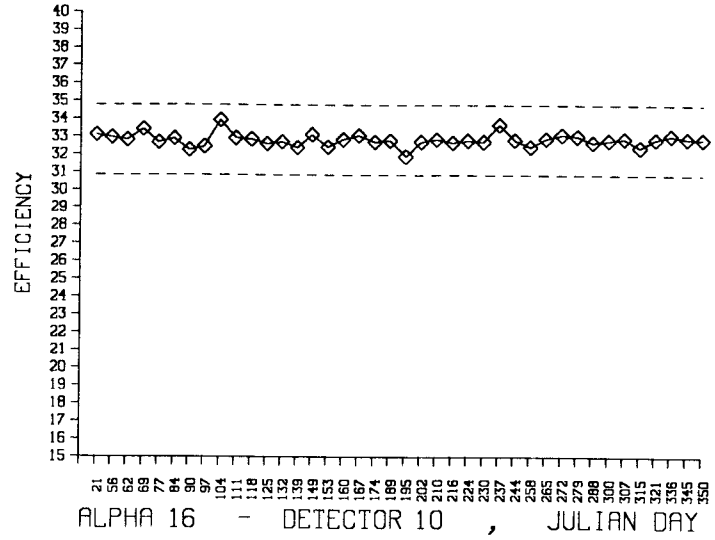
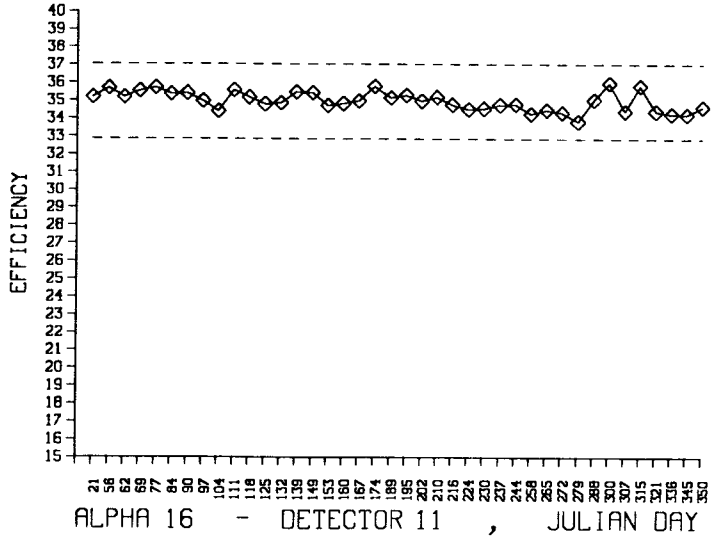

EFFICIENCY
ALPHA 16 - DETECTOR 8 , JULIAN DAY

Fig. H-2. (cont)


EFFICIENCY
ALPHA 16 - DETECTOR 9 , JULIAN DAY


EFFICIENCY
ALPHA 16 - DETECTOR 10 , JULIAN DAY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ALPHA 16 - DETECTOR 11 , JULIAN DAY

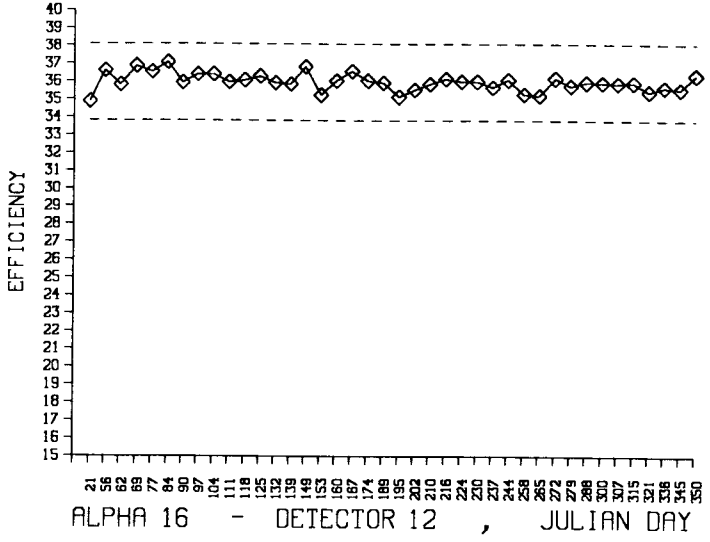
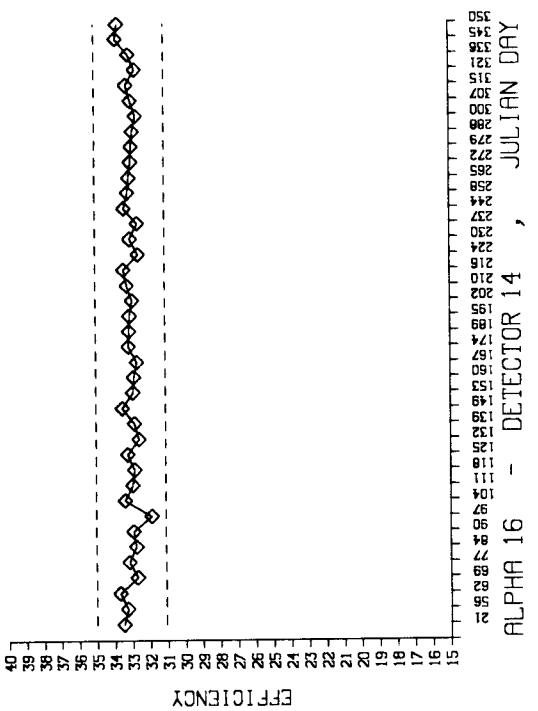
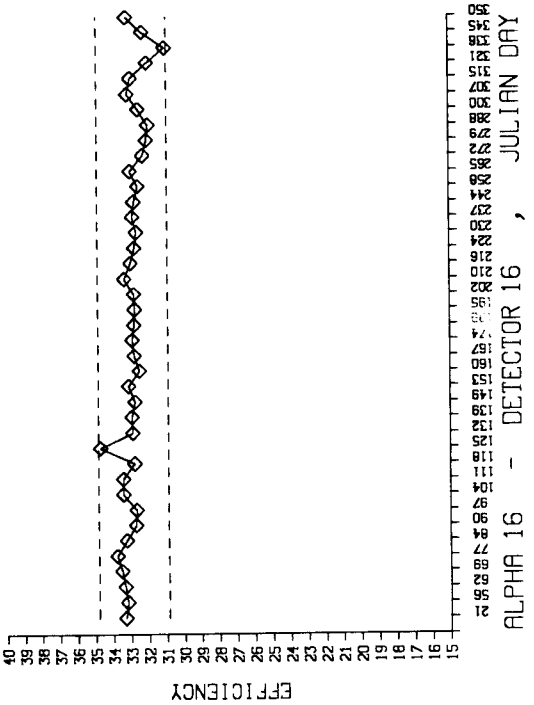

EFFICIENCY
ALPHA 16 - DETECTOR 12 , JULIAN DAY

Fig. H-2. (cont)


ALPHA 16 - DETECTOR 14 , JULIAN DAY
EFFICIENCY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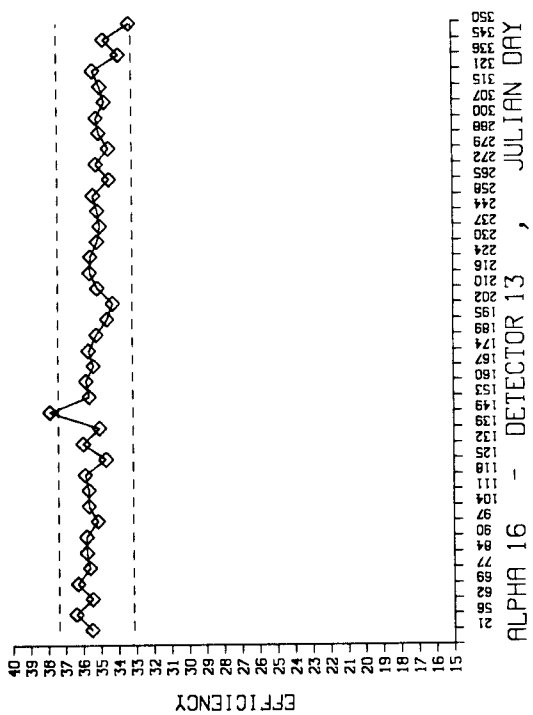

ALPHA 16 - DETECTOR 13 , JULIAN DAY
EFFICIENCY

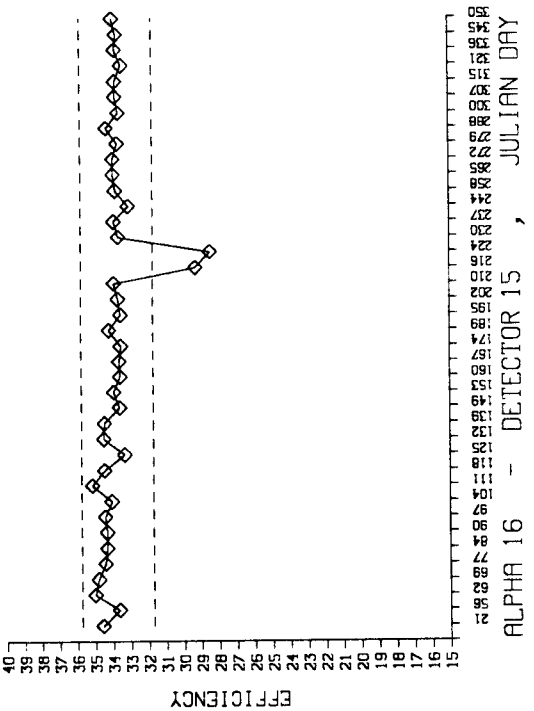
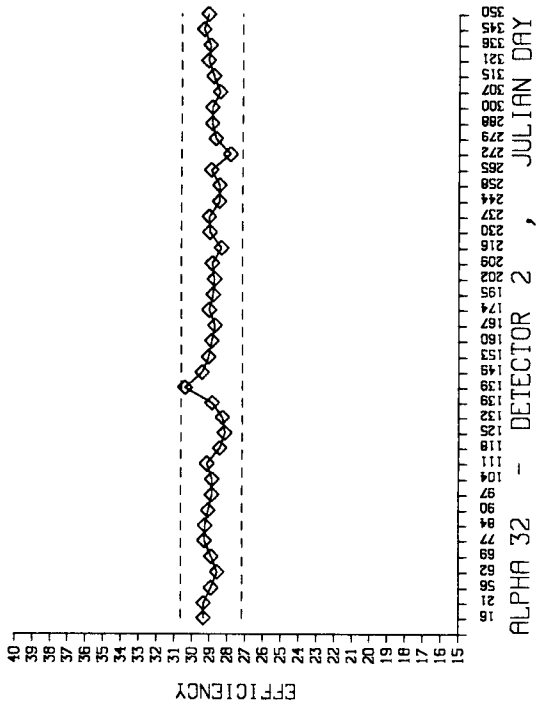
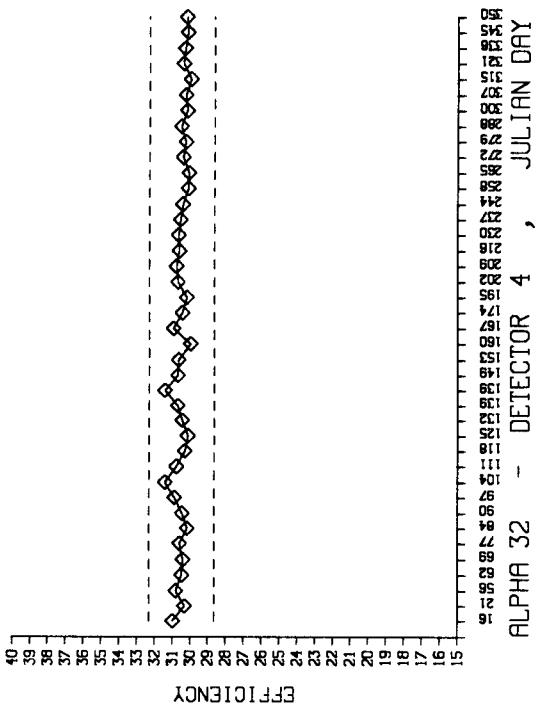

ALPHA 16 - DETECTOR 15 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)


ALPHA 32 - DETECTOR 2 , JULIAN DAY
EFFICIENCY


ALPHA 32 - DETECTOR 4 , JULIAN DAY
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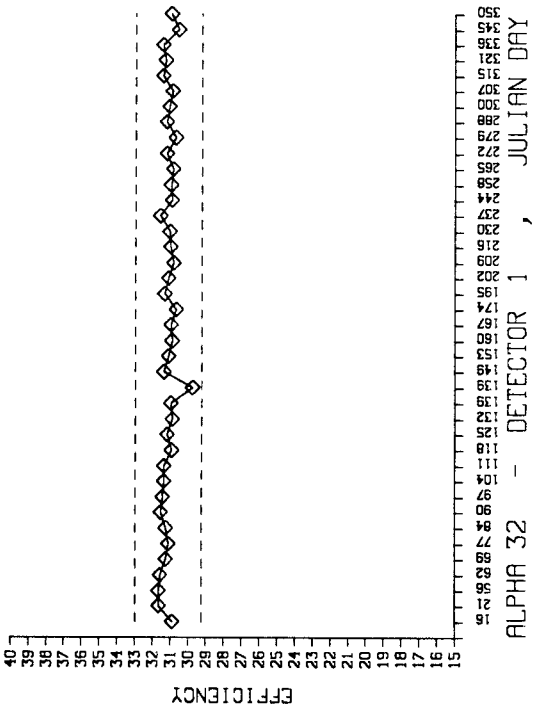
ALPHA 32 - DETECTOR 1 , JULIAN DAY
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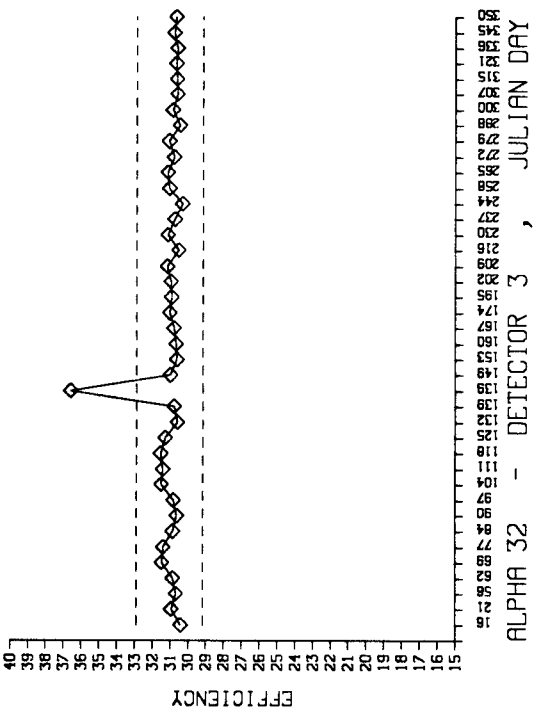

ALPHA 32 - DETECTOR 3 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)

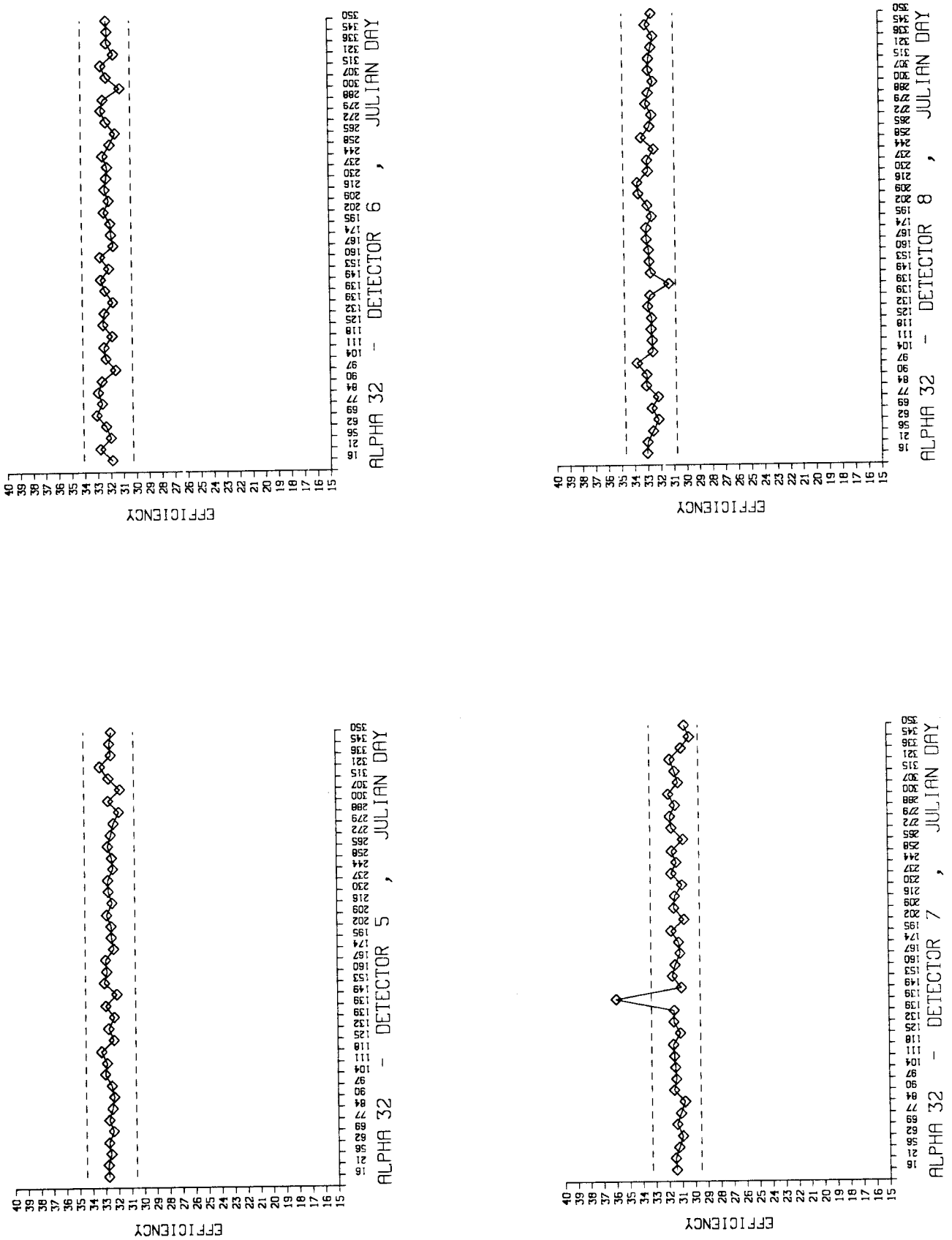

ALPHA 32 - DETECTOR 6 , JULIAN DAY
EFFICIENCY
ALPHA 32 - DETECTOR 8 , JULIAN DAY
EFFICIENCY
ALPHA 32 - DETECTOR 5 , JULIAN DAY
EFFICIENCY
ALPHA 32 - DETECTOR 7 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)

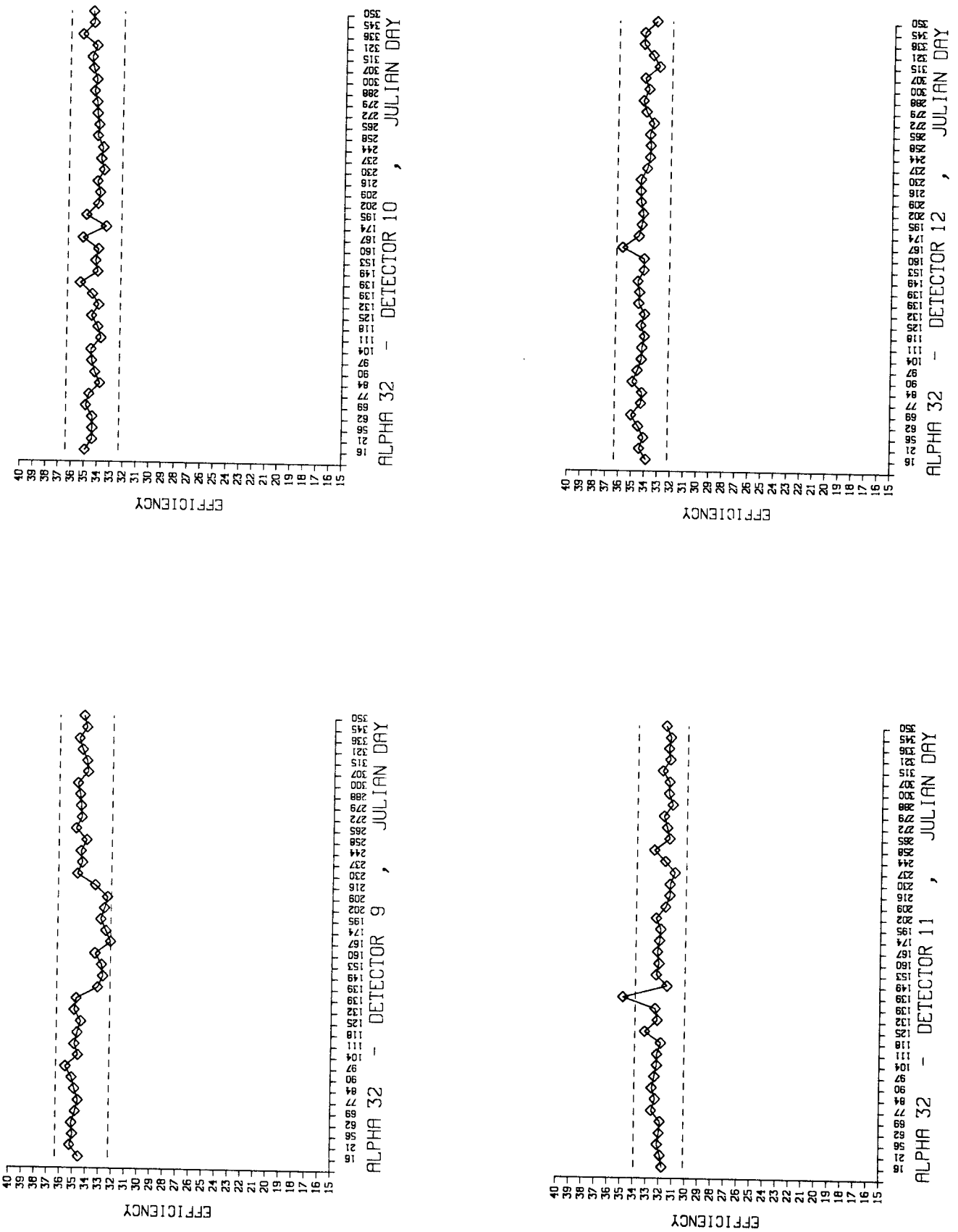

ALPHA 32 - DETECTOR 10 , JULIAN DAY
EFFICIENCY
ALPHA 32 - DETECTOR 12 , JULIAN DAY
EFFICIENCY
ALPHA 32 - DETECTOR 9 , JULIAN DAY
EFFICIENCY
ALPHA 32 - DETECTOR 11 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)

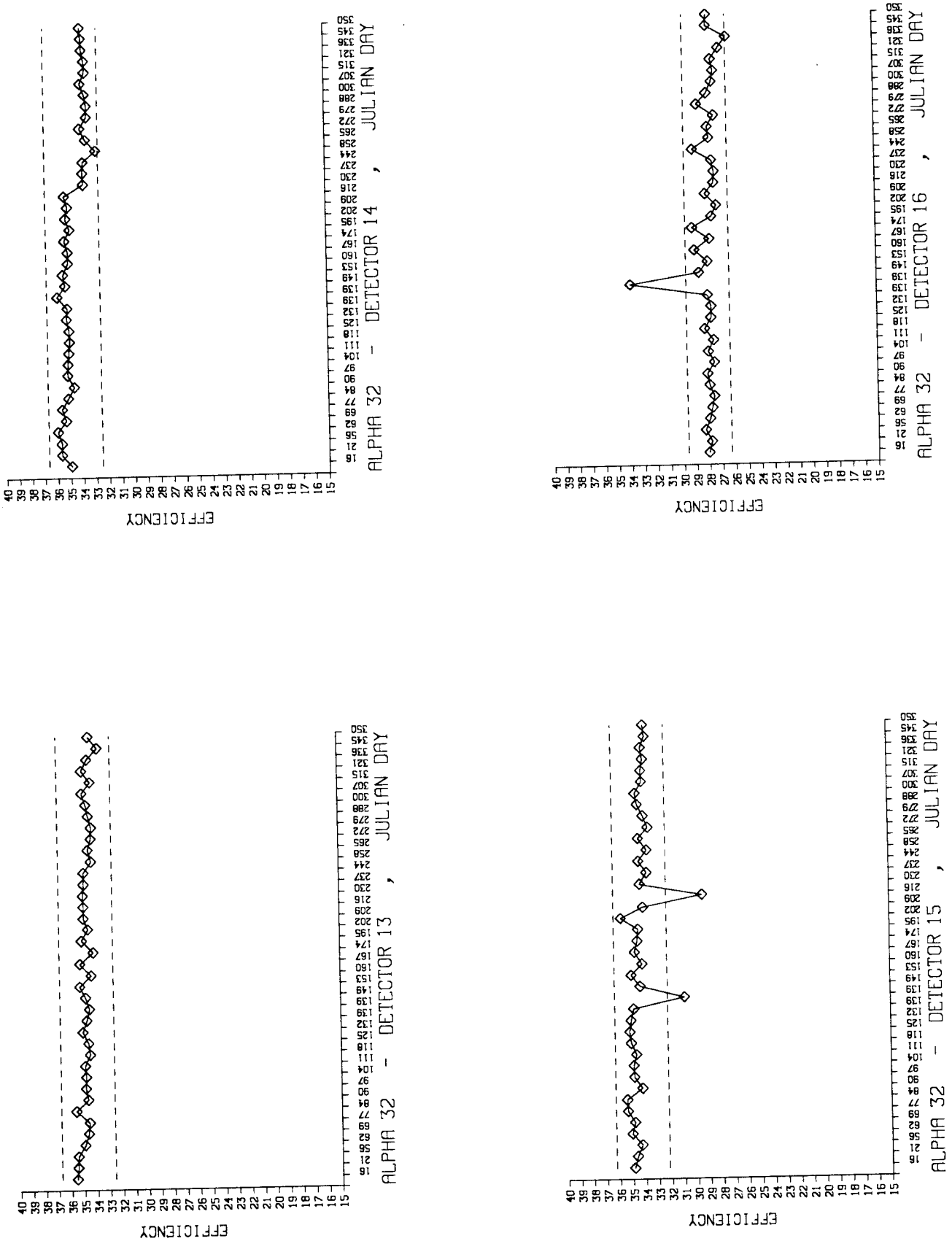
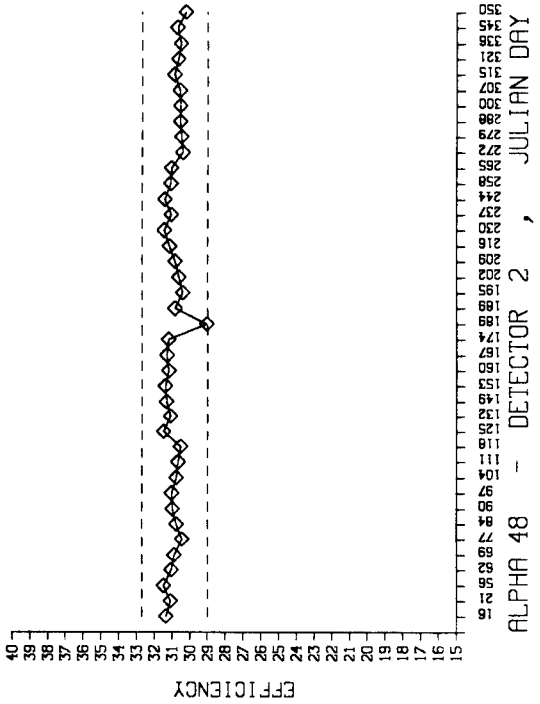
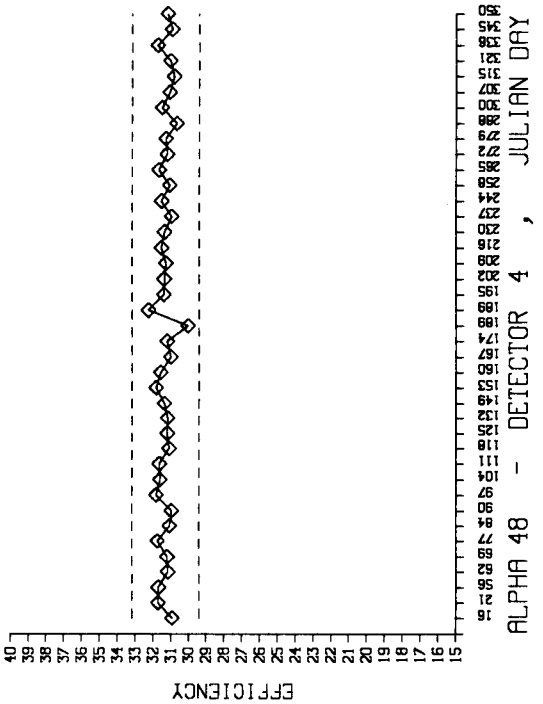

ALPHA 32 - DETECTOR 14 , JULIAN DAY
EFFICIENCY
ALPHA 32 - DETECTOR 16 , JULIAN DAY
EFFICIENCY
ALPHA 32 - DETECTOR 13 , JULIAN DAY
EFFICIENCY
ALPHA 32 - DETECTOR 15 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)


ALPHA 48 - DETECTOR 2 , JULIAN DAY
EFFICIENCY


ALPHA 48 - DETECTOR 4 , JULIAN DAY
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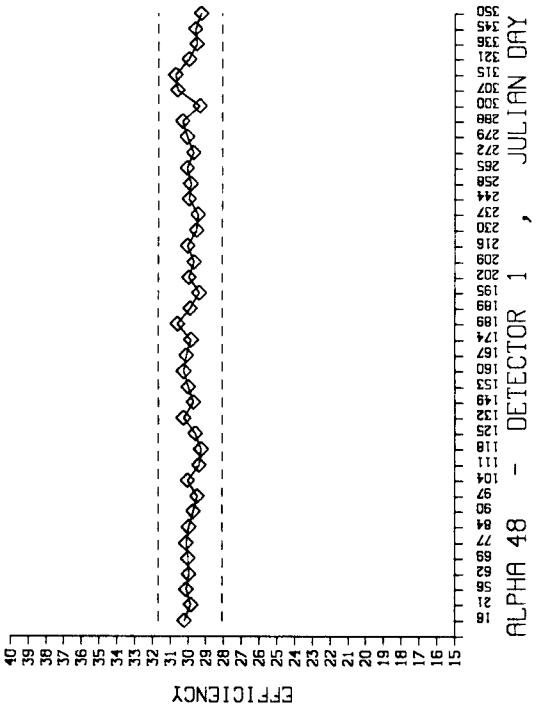
ALPHA 48 - DETECTOR 1 , JULIAN DAY
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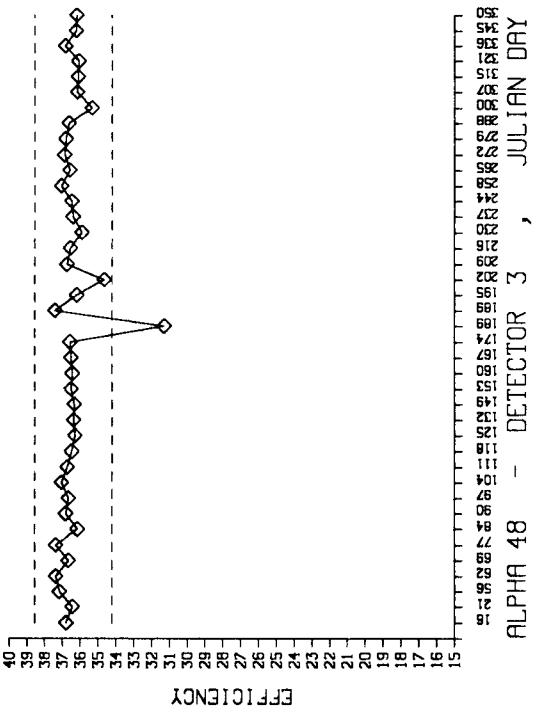
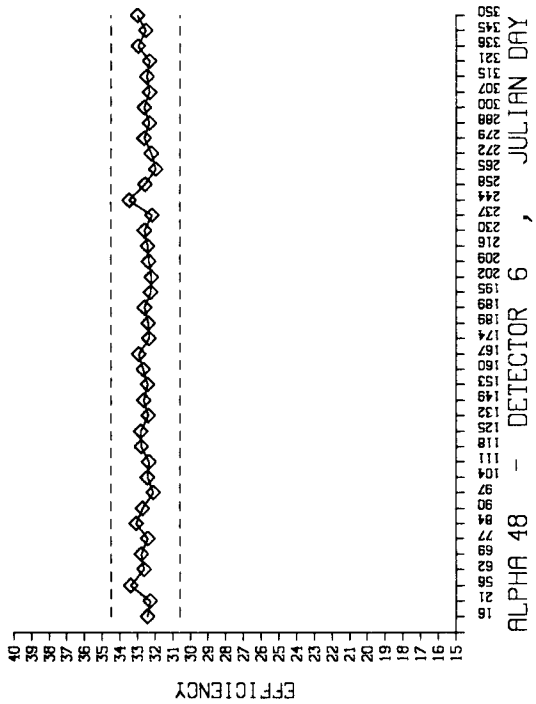

ALPHA 48 - DETECTOR 3 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)


ALPHA 48 - DETECTOR 6 , JULIAN DAY
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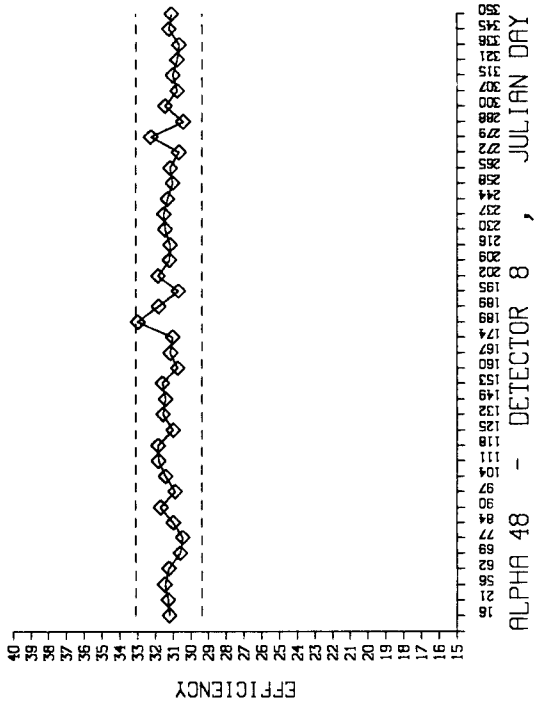
ALPHA 48 - DETECTOR 8 , JULIAN DAY
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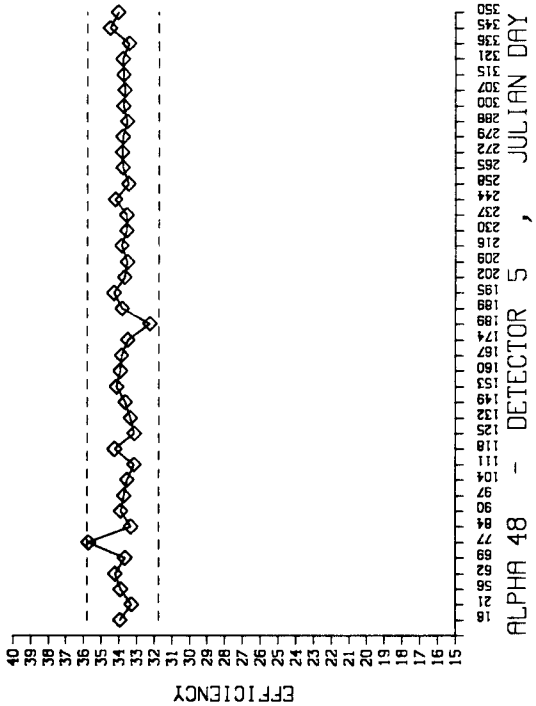
ALPHA 48 - DETECTOR 5 , JULIAN DAY
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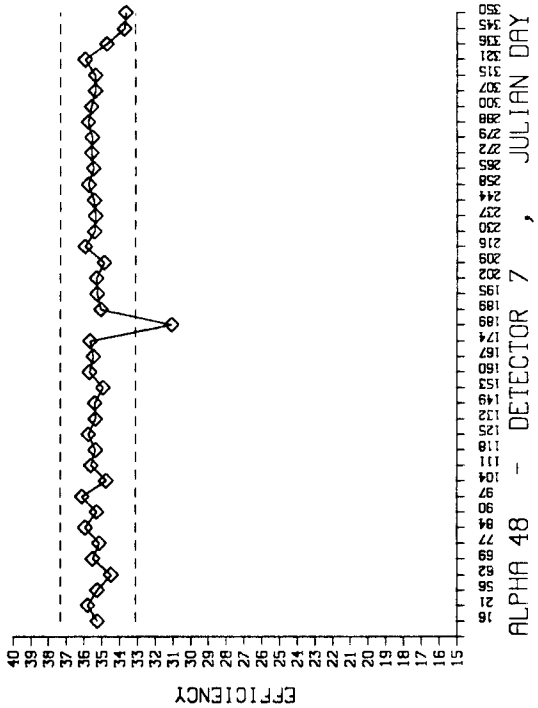
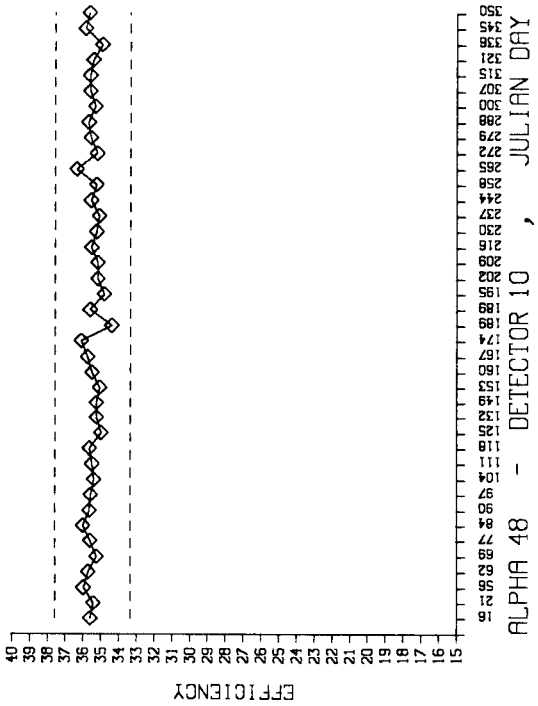

ALPHA 48 - DETECTOR 7 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)


ALPHA 48 - DETECTOR 10 , JULIAN DAY
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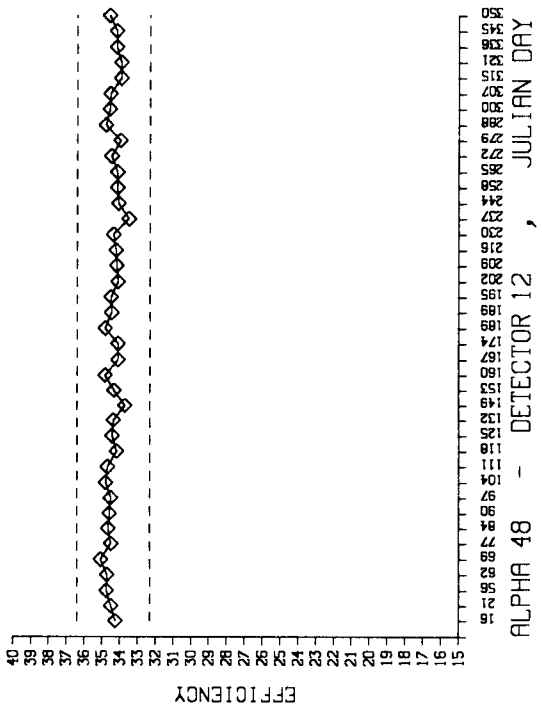
ALPHA 48 - DETECTOR 12 , JULIAN DAY
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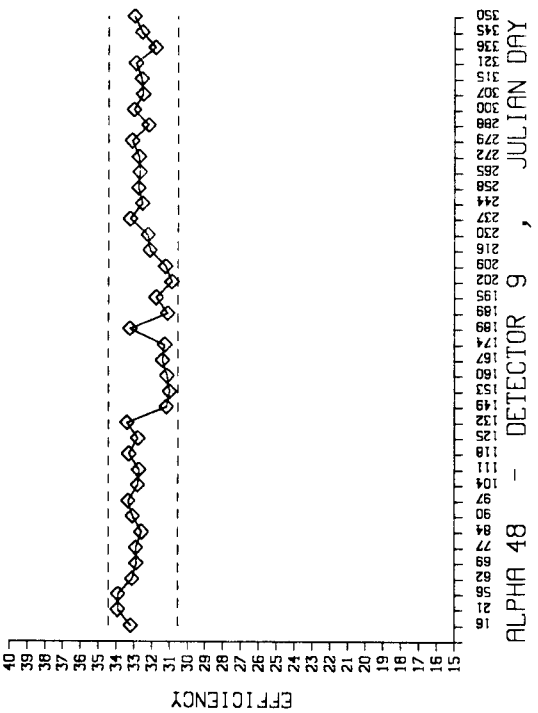
ALPHA 48 - DETECTOR 9 , JULIAN DAY
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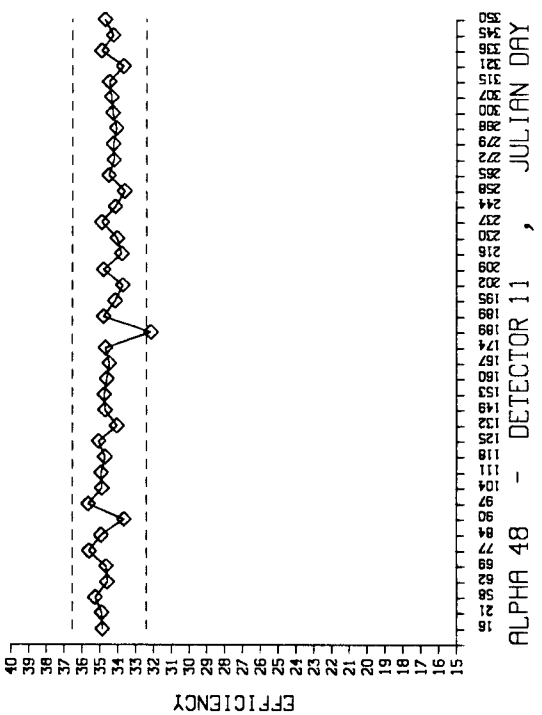
ALPHA 48 - DETECTOR 11 , JULIAN DAY
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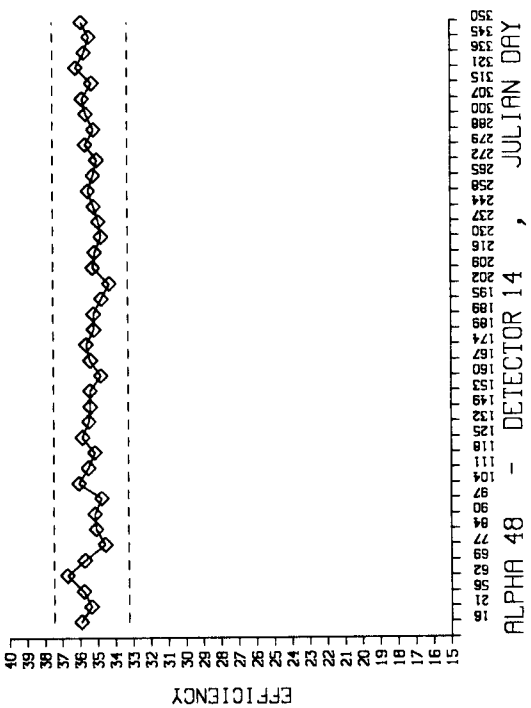
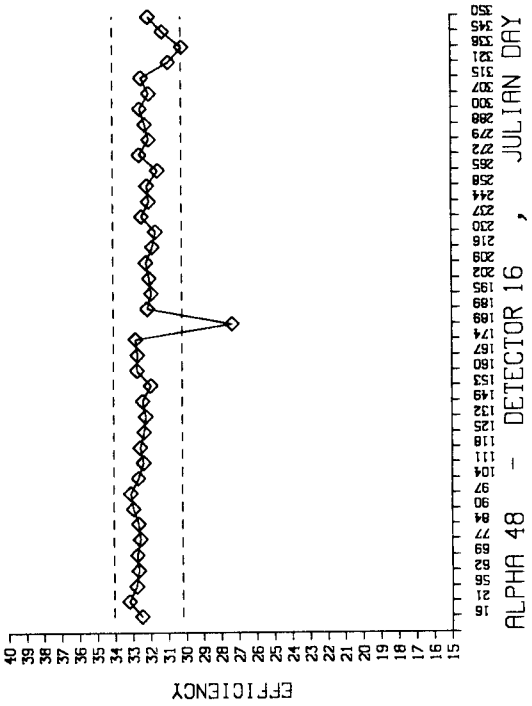
Fig. H-2. (cont)


ALPHA 48 - DETECTOR 14 , JULIAN DAY
EFFICIENCY


ALPHA 48 - DETECTOR 16 , JULIAN DAY
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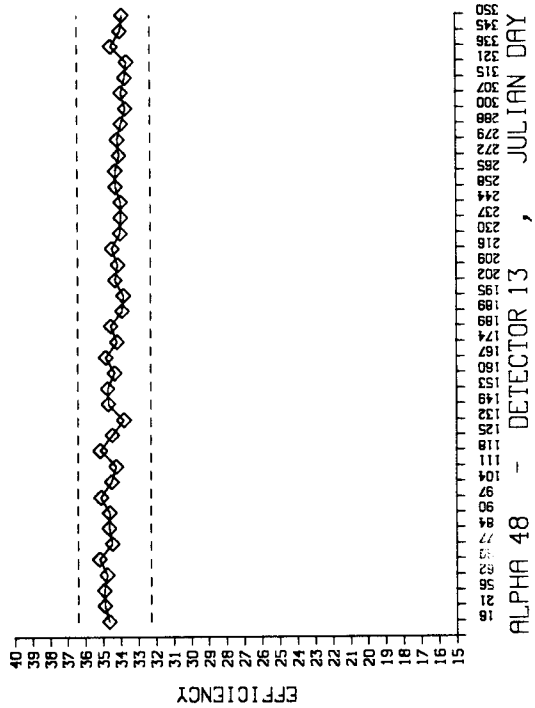
ALPHA 48 - DETECTOR 13 , JULIAN DAY
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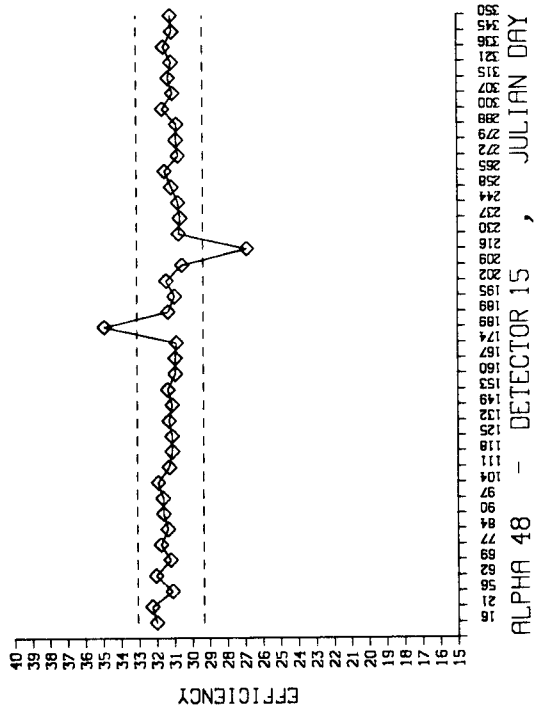
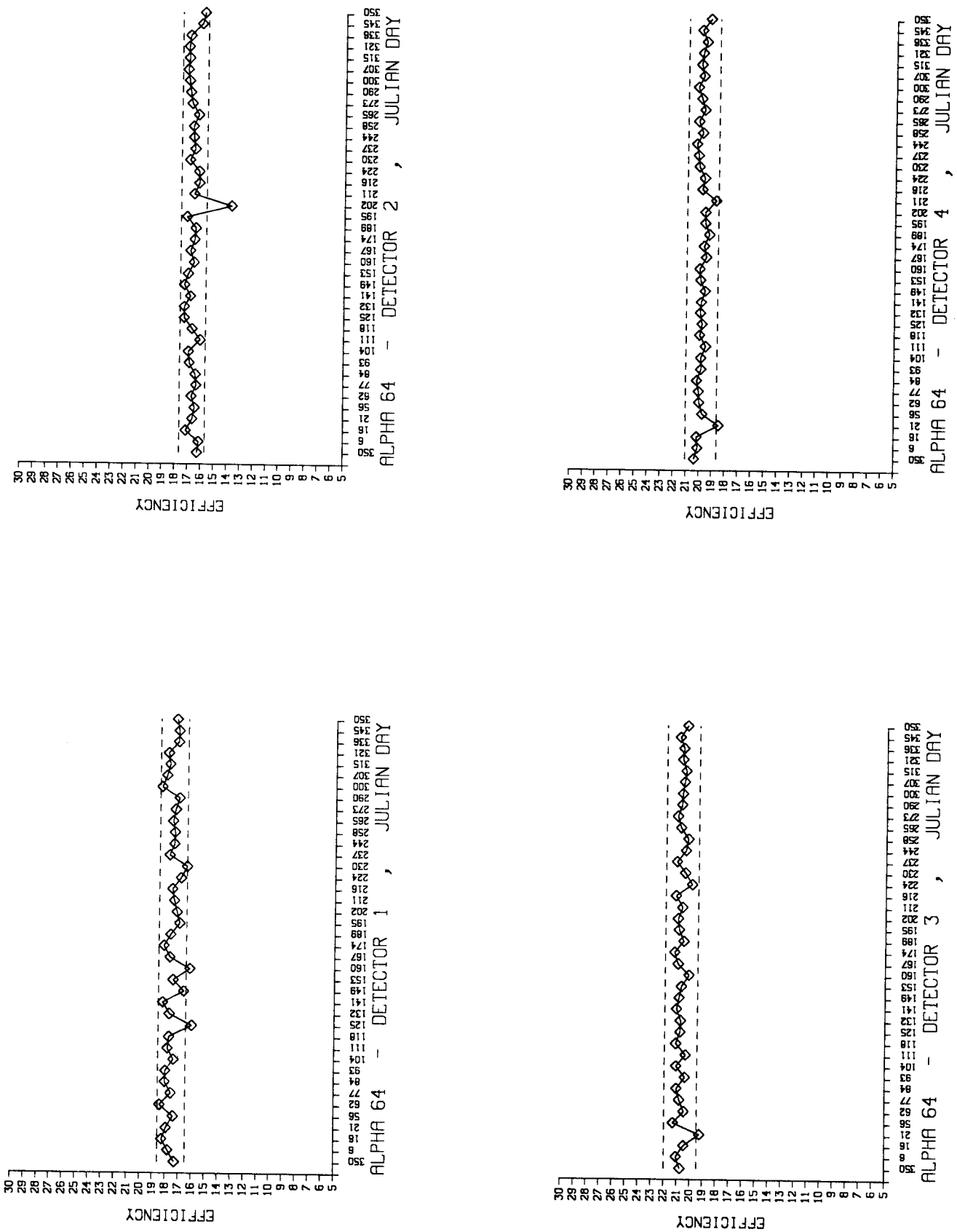

ALPHA 48 - DETECTOR 15 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)


ALPHA 64 - DETECTOR 2 , JULIAN DAY
EFFICIENCY
ALPHA 64 - DETECTOR 4 , JULIAN DAY
EFFICIENCY
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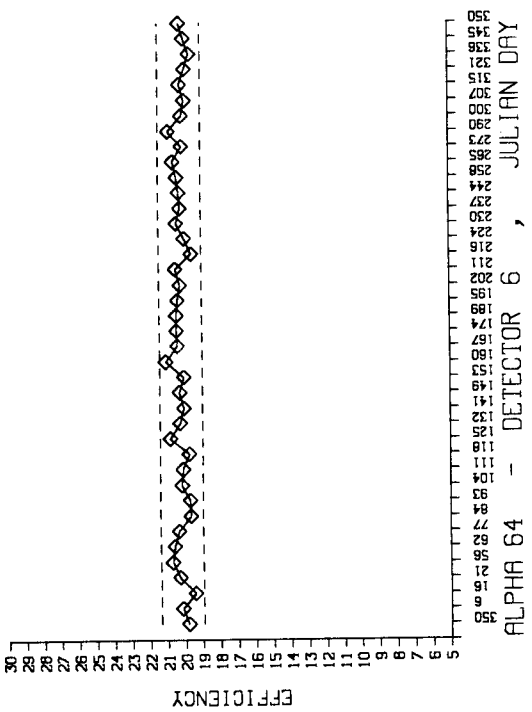
EFFICIENCY
ALPHA 64 - DETECTOR 3 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)


ALPHA 64 - DETECTOR 6 , JULIAN DAY
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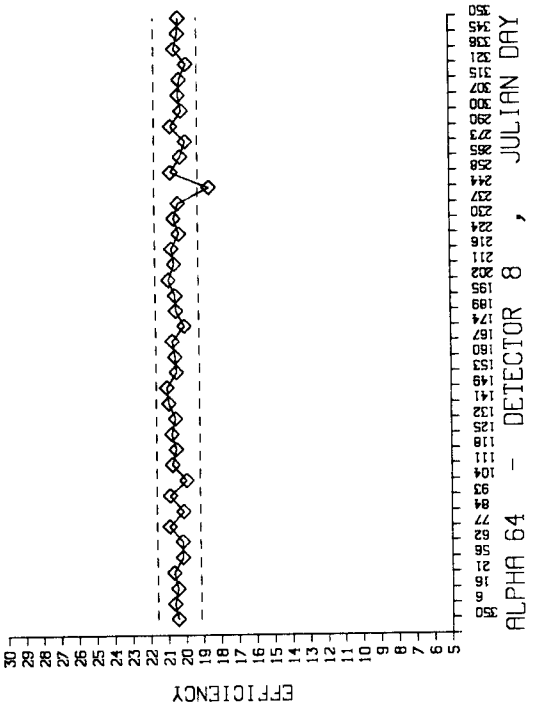
ALPHA 64 - DETECTOR 8 , JULIAN DAY
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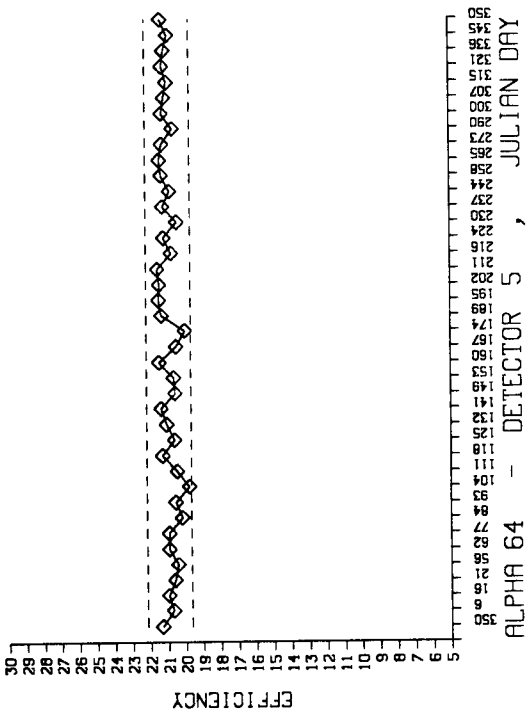
ALPHA 64 - DETECTOR 5 , JULIAN DAY
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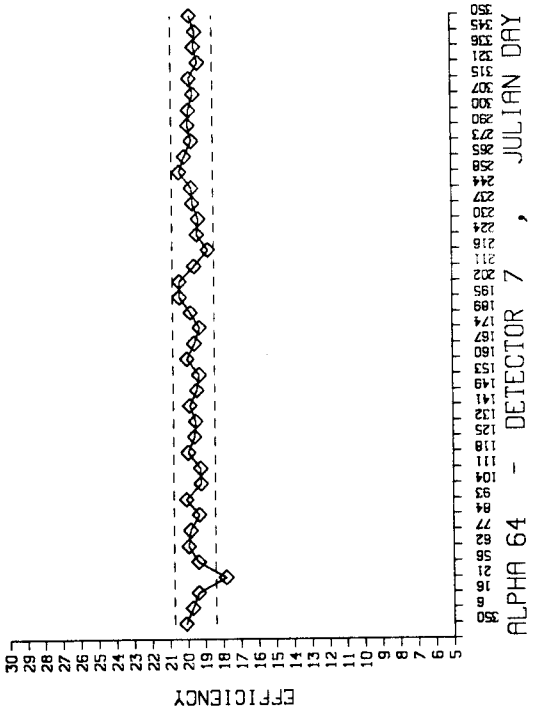
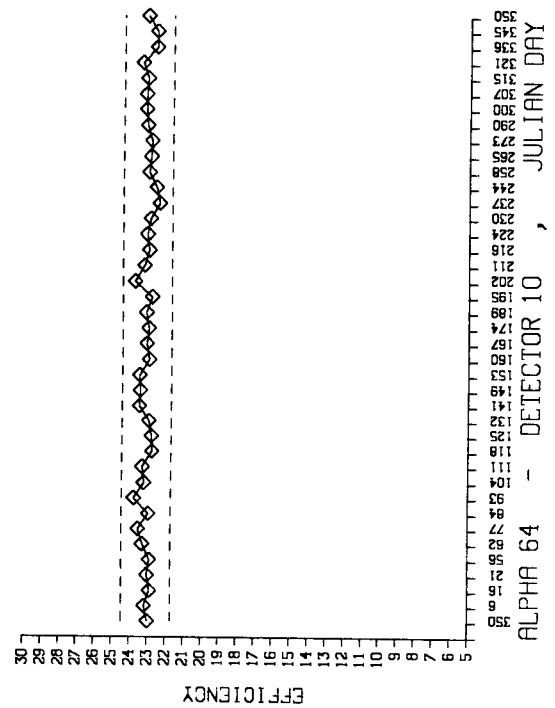

ALPHA 64 - DETECTOR 7 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)


ALPHA 64 - DETECTOR 10 , JULIAN DAY
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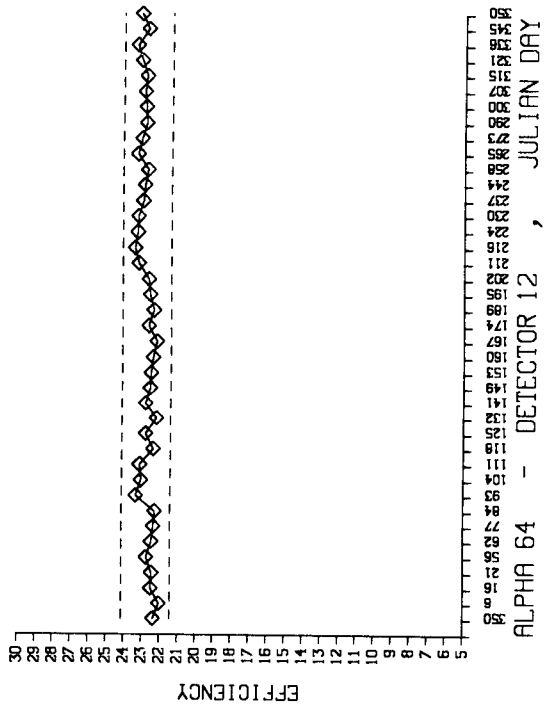
ALPHA 64 - DETECTOR 12 , JULIAN DAY
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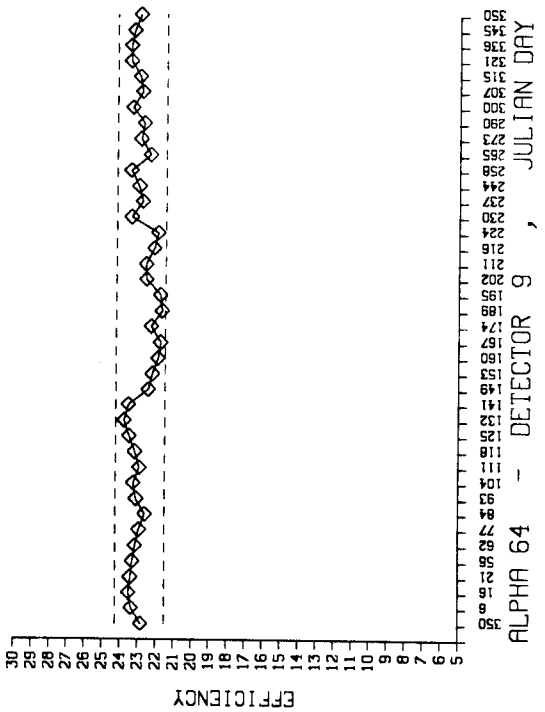
ALPHA 64 - DETECTOR 9 , JULIAN DAY
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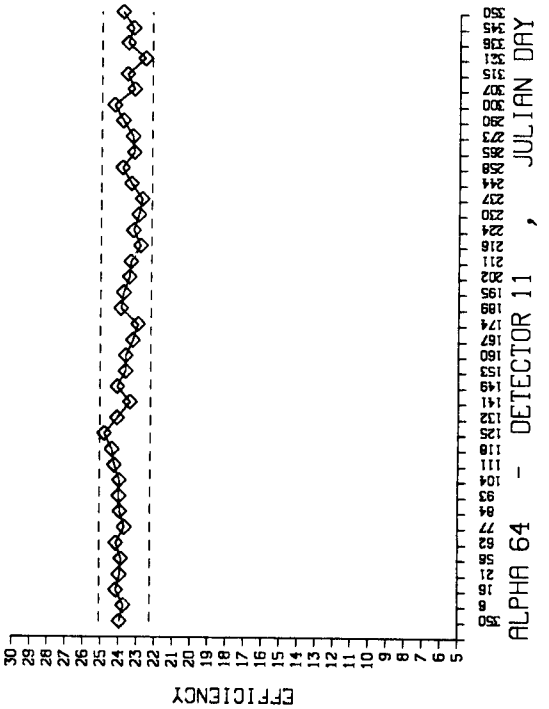
ALPHA 64 - DETECTOR 11 , JULIAN DAY
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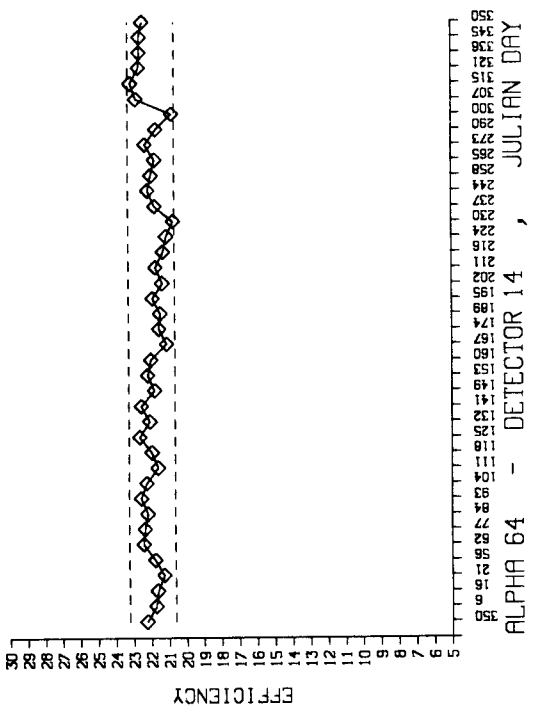
ALPHA 64 - DETECTOR 14 , JULIAN DAY
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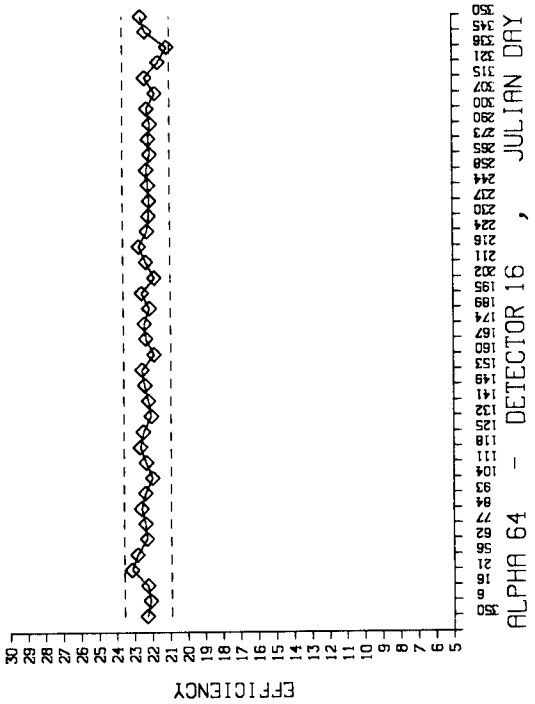
ALPHA 64 - DETECTOR 16 , JULIAN DAY
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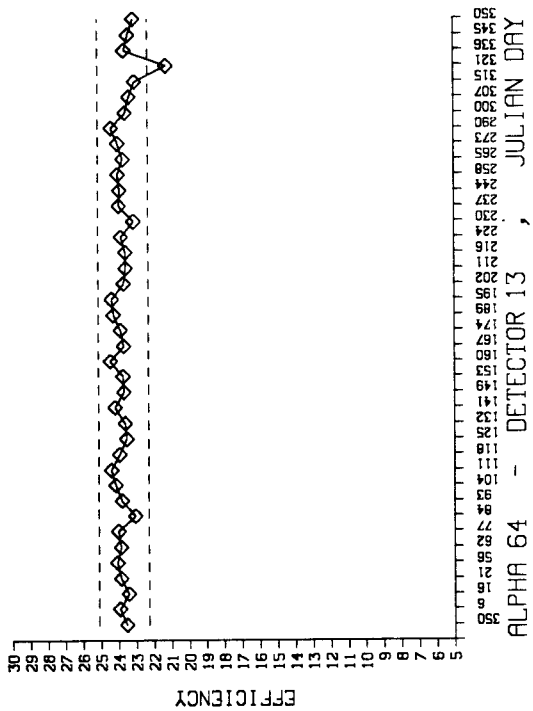
ALPHA 64 - DETECTOR 13 , JULIAN DAY
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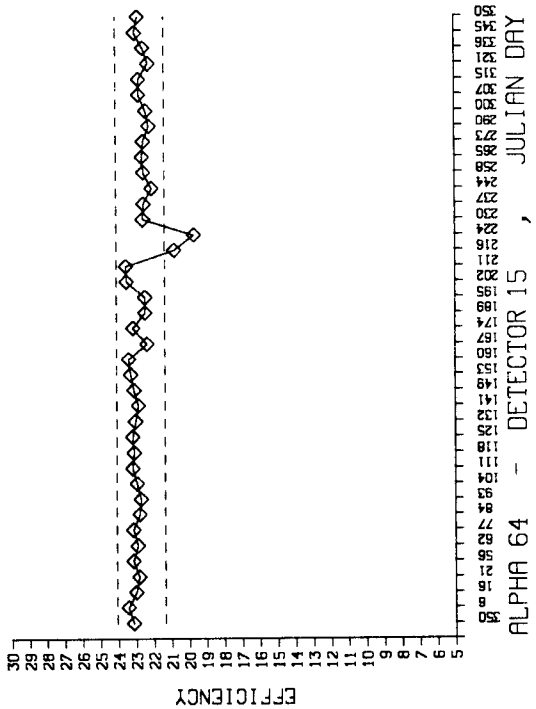

ALPHA 64 - DETECTOR 15 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)

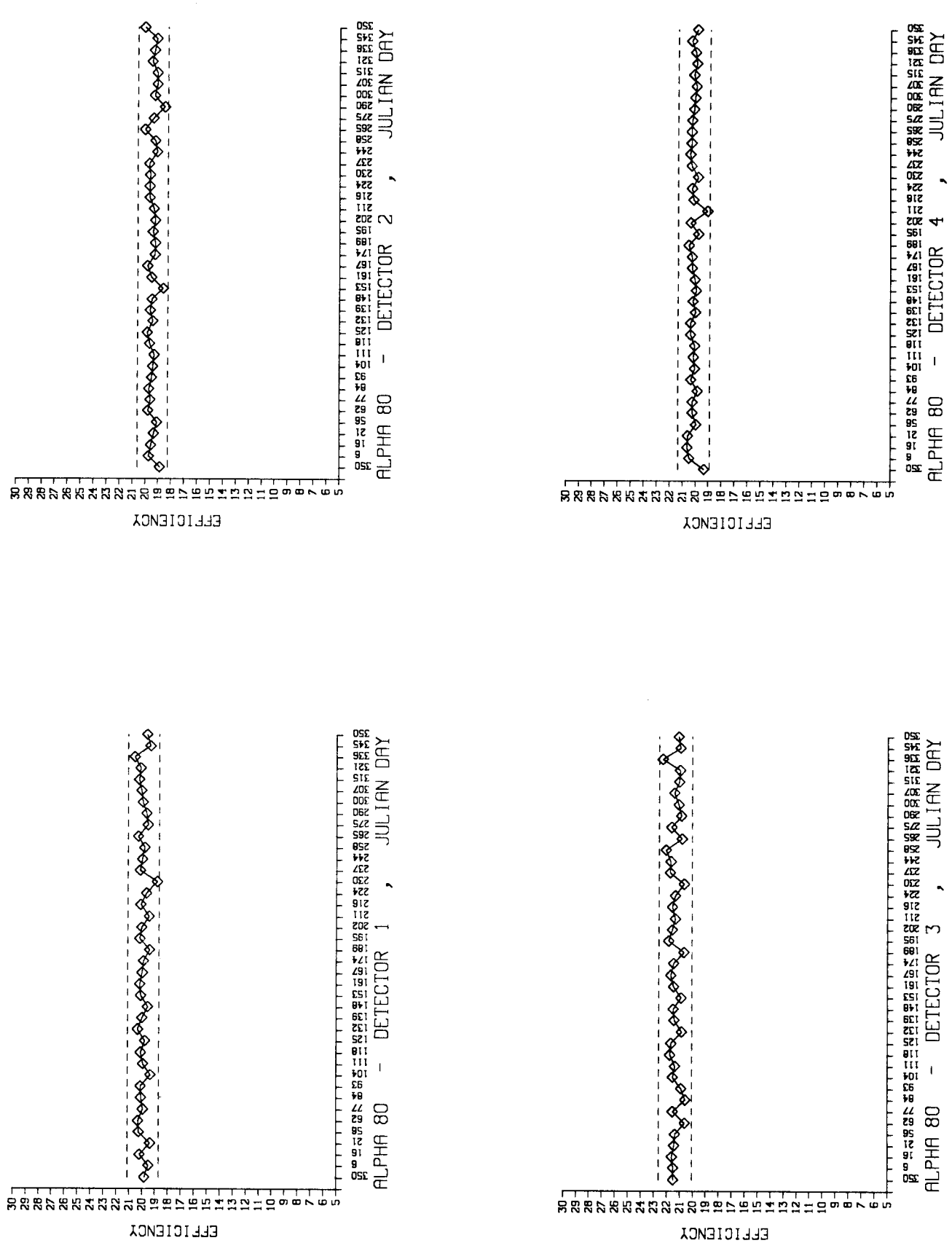
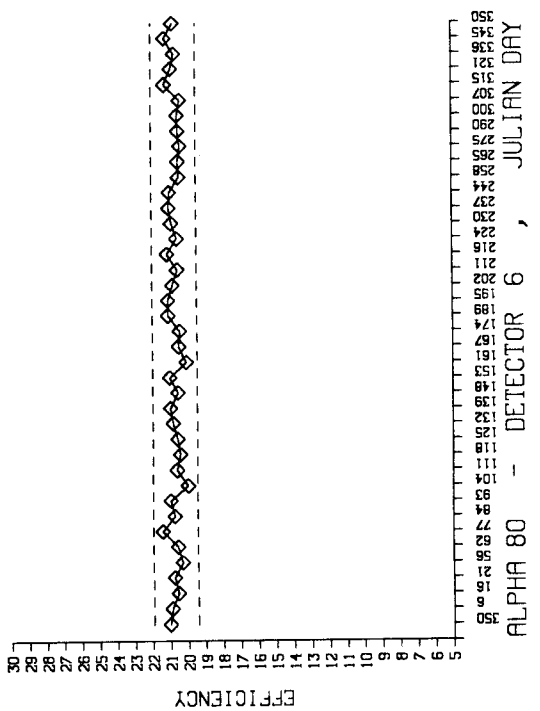

ALPHA 80 - DETECTOR 2 , JULIAN DAY
EFFICIENCY
ALPHA 80 - DETECTOR 4 , JULIAN DAY
EFFICIENCY
ALPHA 80 - DETECTOR 1 , JULIAN DAY
EFFICIENCY
ALPHA 80 - DETECTOR 3 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)


ALPHA 80 - DETECTOR 6 , JULIAN DAY
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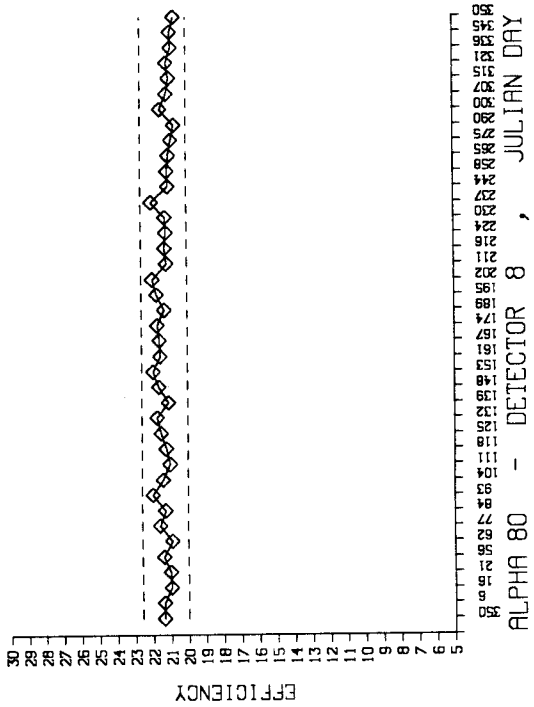
ALPHA 80 - DETECTOR 8 , JULIAN DAY
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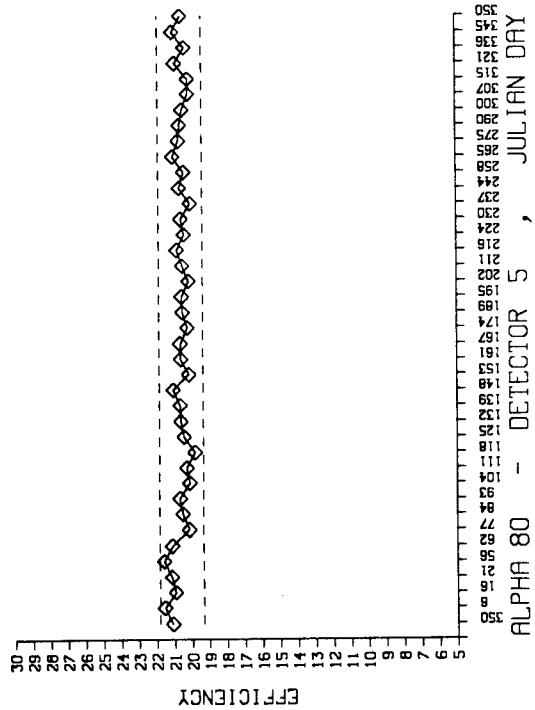
ALPHA 80 - DETECTOR 5 , JULIAN DAY
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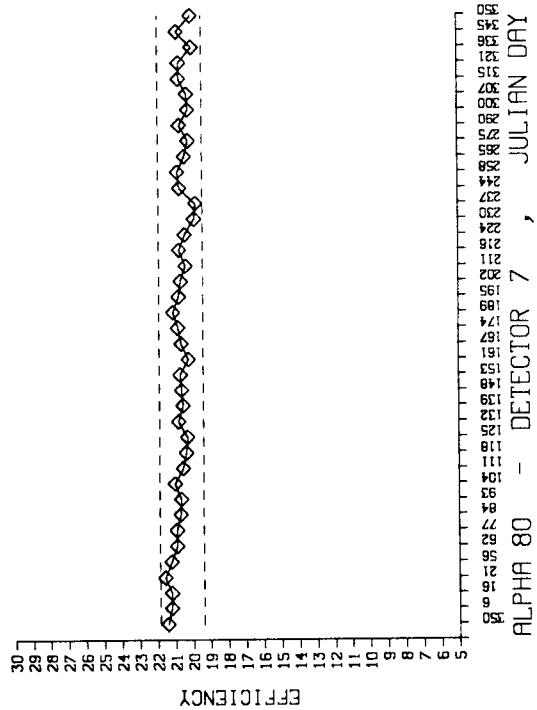
ALPHA 80 - DETECTOR 7 , JULIAN DAY
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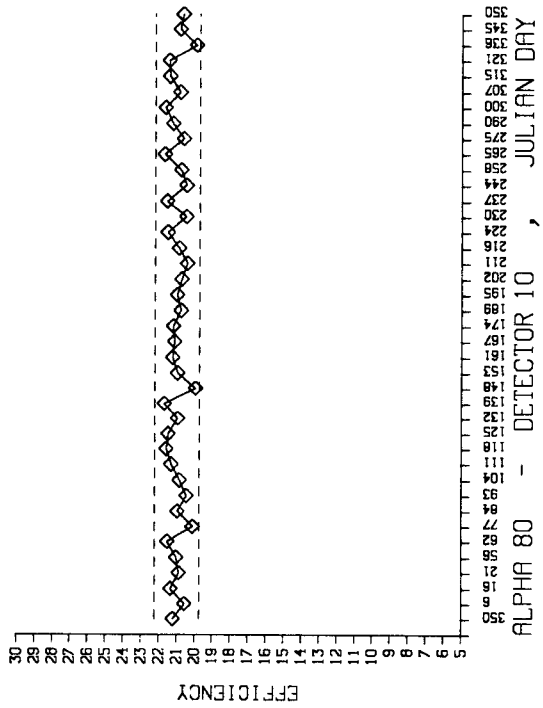
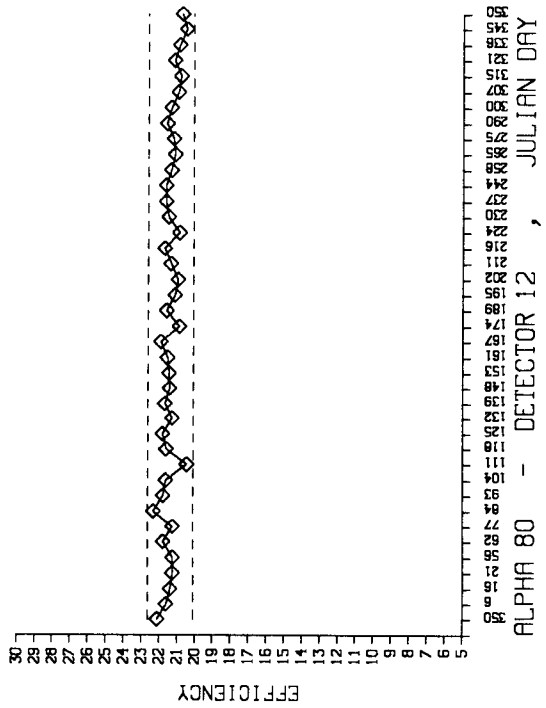
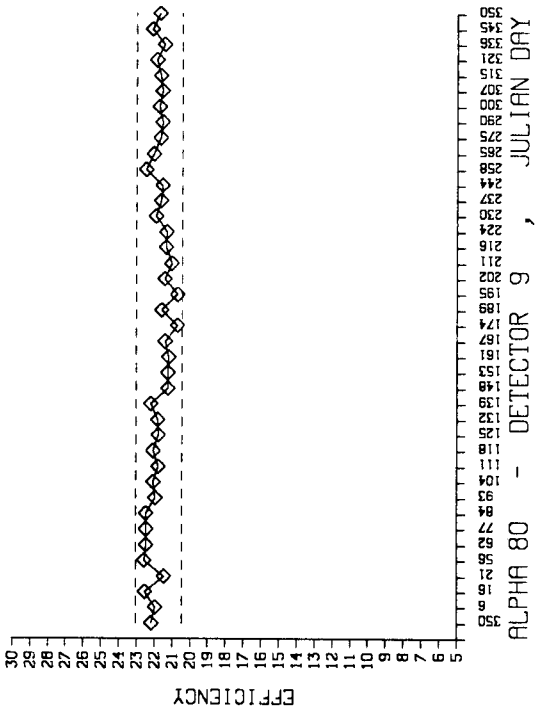
Fig. H-2. (cont)


ALPHA 80 - DETECTOR 10 , JULIAN DAY
EFFICIENCY


ALPHA 80 - DETECTOR 12 , JULIAN DAY
EFFICIENCY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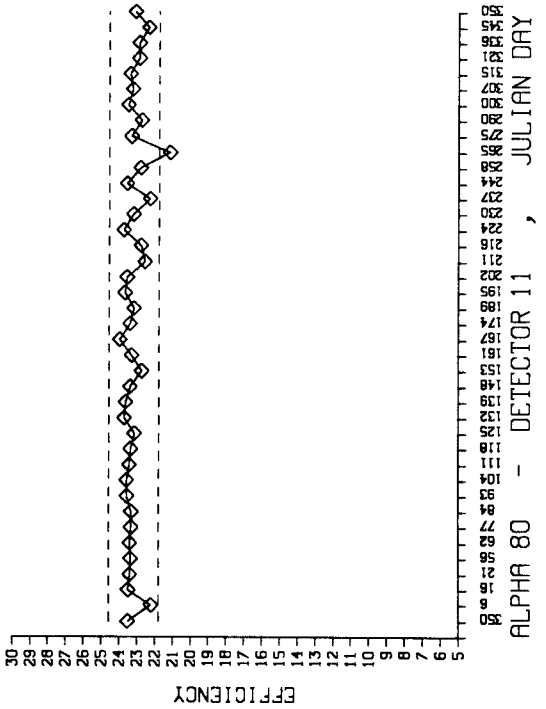
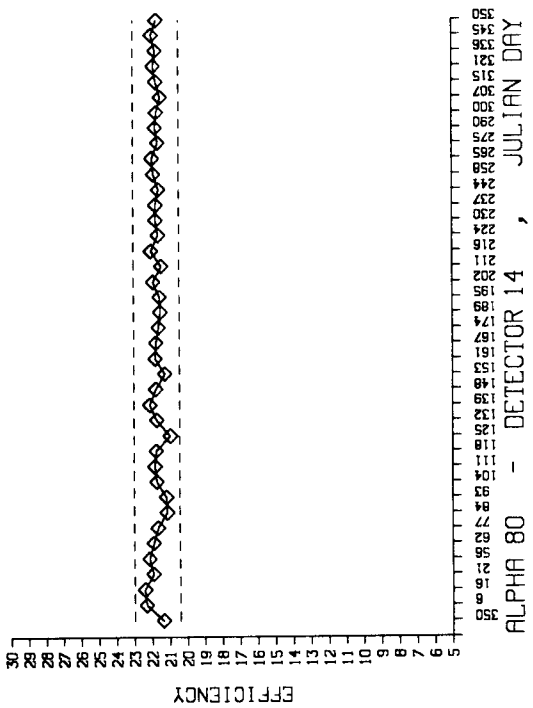
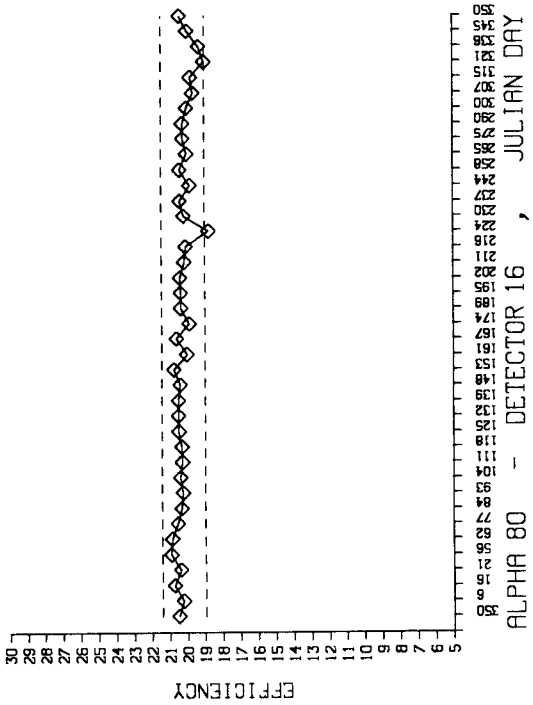
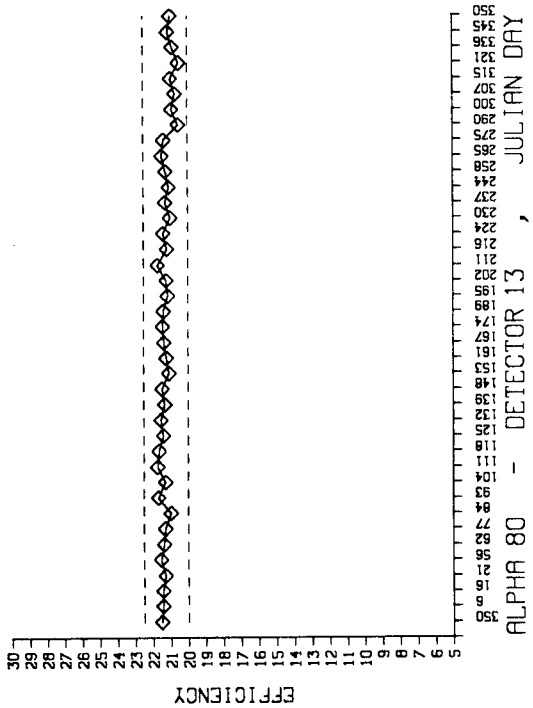

ALPHA 80 - DETECTOR 11 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)


ALPHA 80 - DETECTOR 14 , JULIAN DAY
EFFICIENCY


ALPHA 80 - DETECTOR 16 , JULIAN DAY
EFFICIENCY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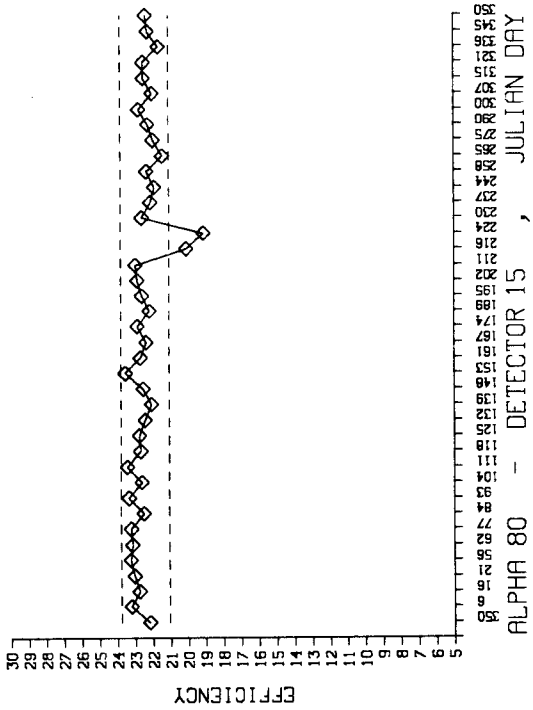
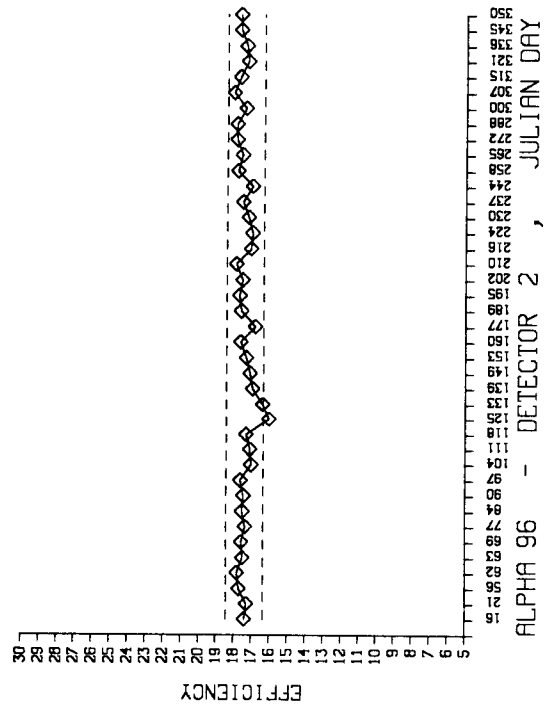
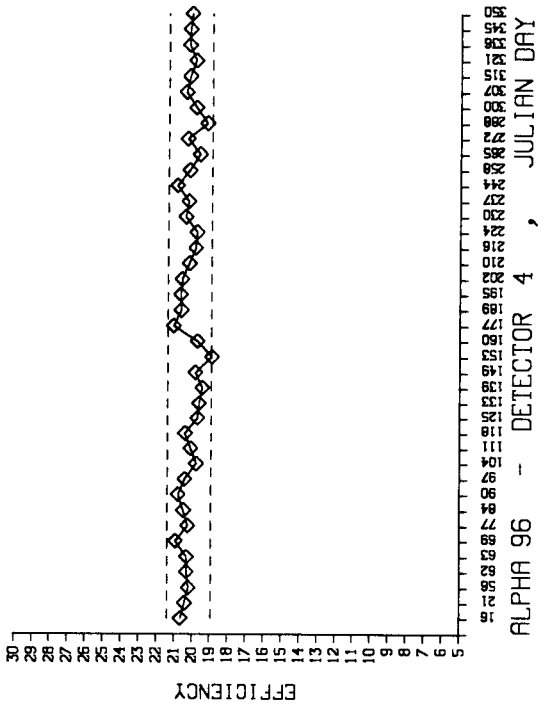

ALPHA 80 - DETECTOR 15 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)


ALPHA 96 - DETECTOR 2 , JULIAN DAY
EFFICIENCY


ALPHA 96 - DETECTOR 4 , JULIAN DAY
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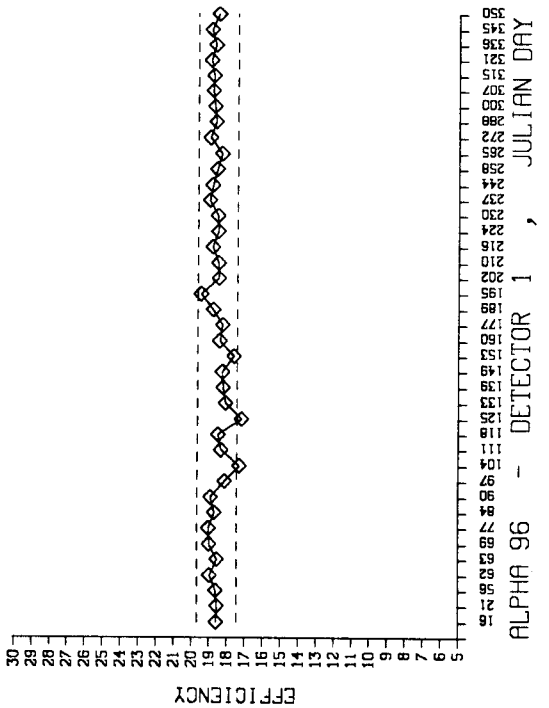
ALPHA 96 - DETECTOR 1 , JULIAN DAY
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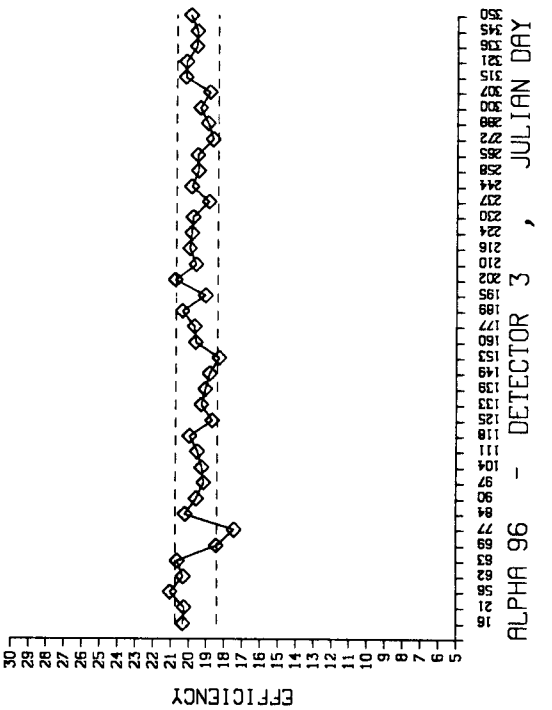
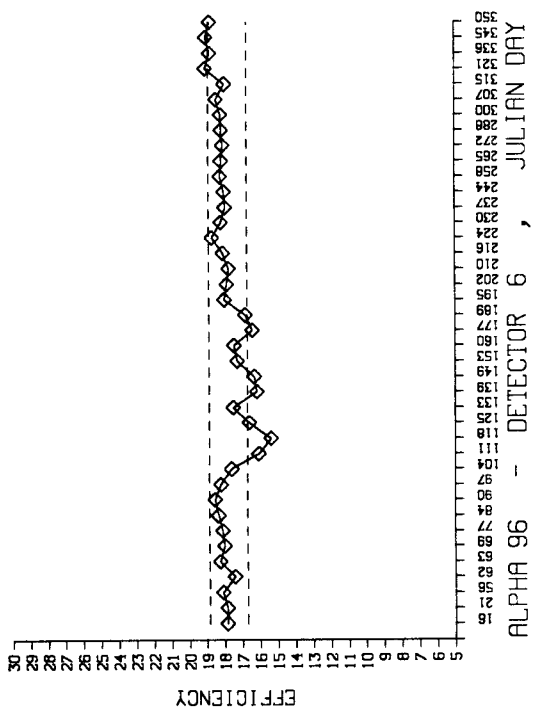

ALPHA 96 - DETECTOR 3 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)


ALPHA 96 - DETECTOR 6 , JULIAN DAY
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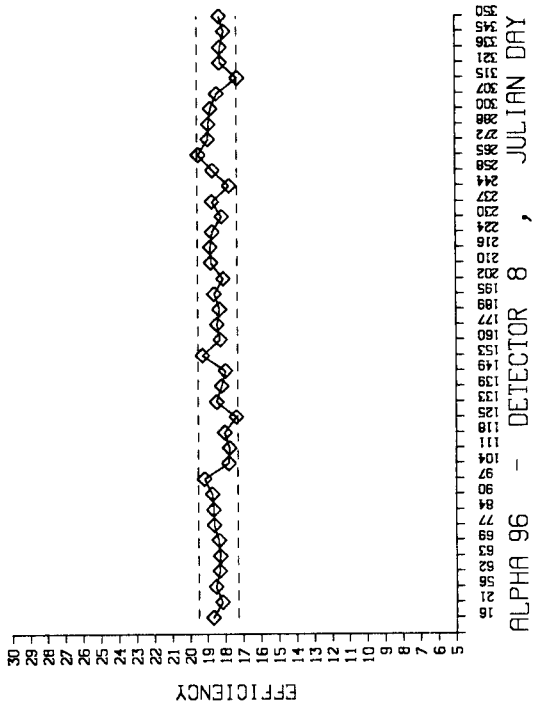
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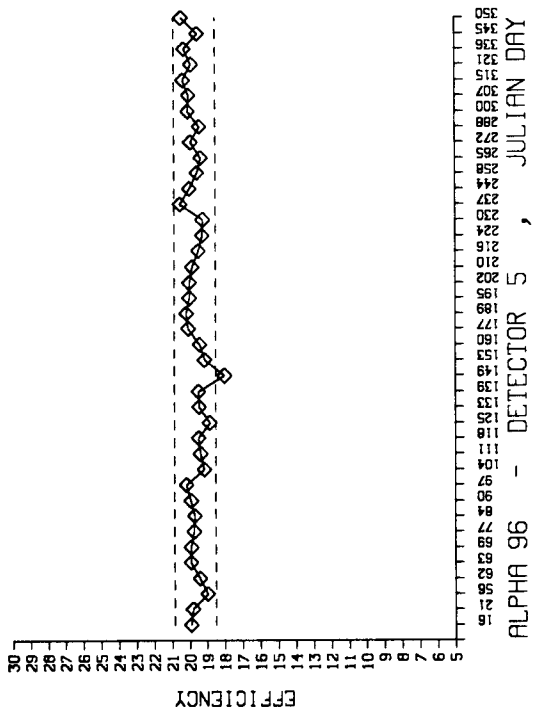
ALPHA 96 - DETECTOR 5 , JULIAN DAY
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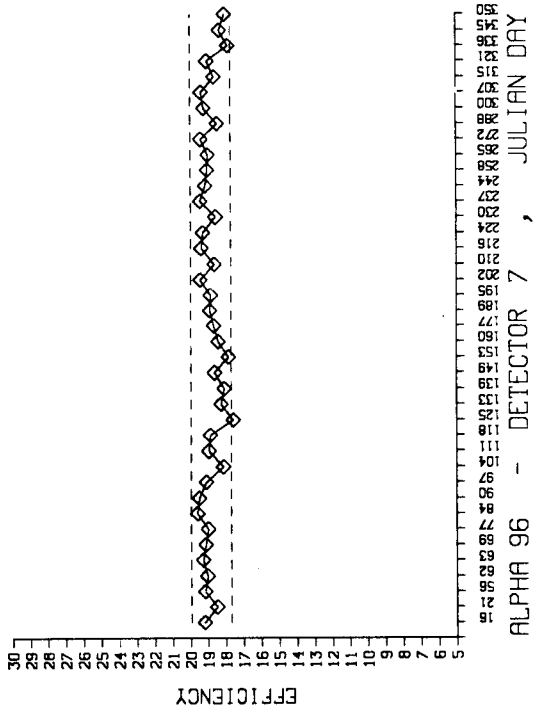
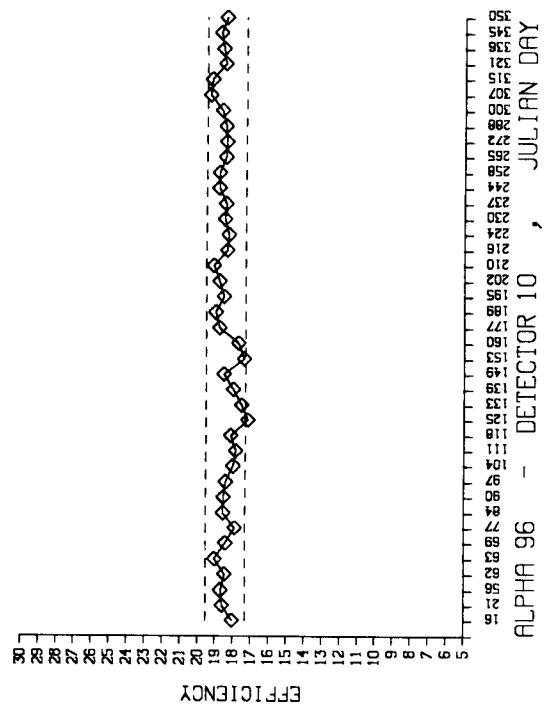

ALPHA 96 - DETECTOR 7 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)


ALPHA 96 - DETECTOR 10 , JULIAN DAY
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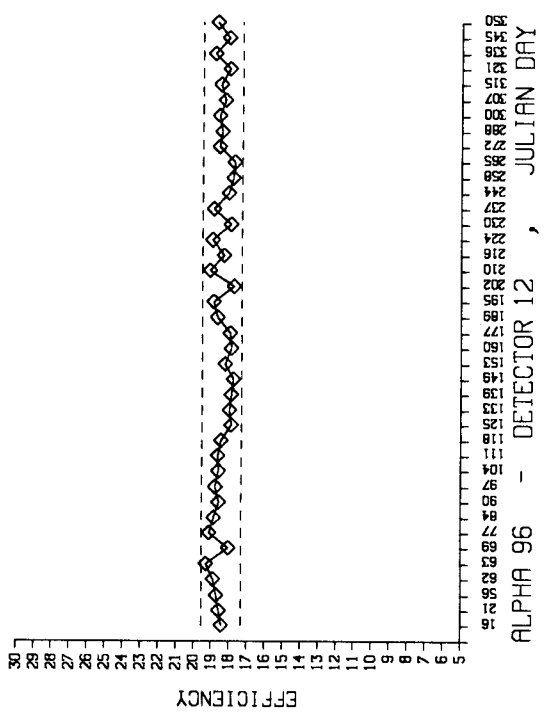
ALPHA 96 - DETECTOR 12 , JULIAN DAY
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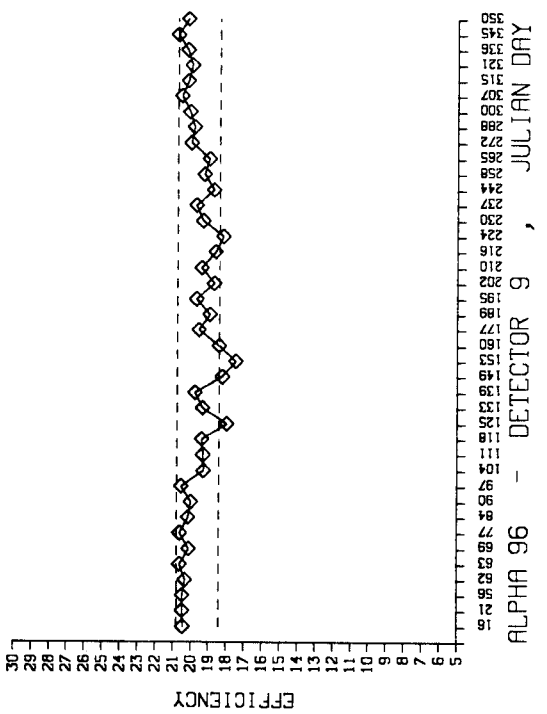

ALPHA 96 - DETECTOR 9 , JULIAN DAY
EFFICIENCY

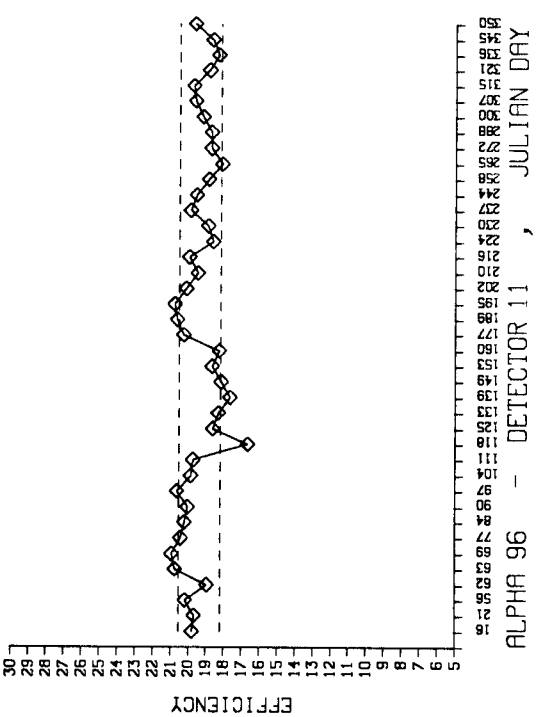
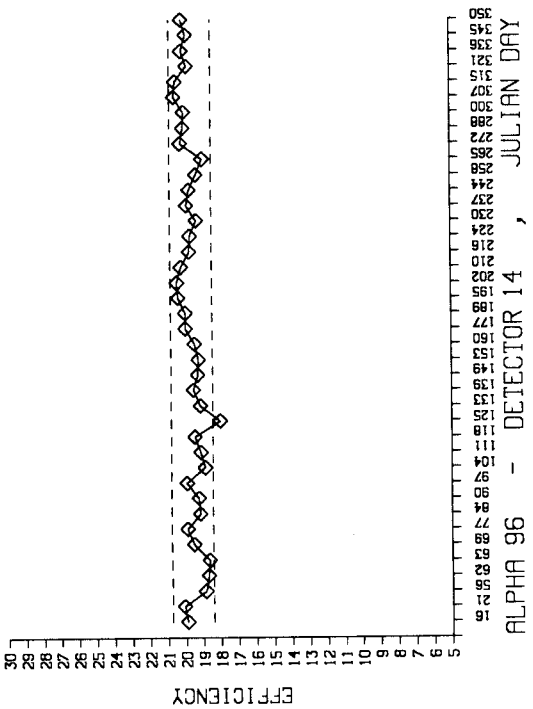
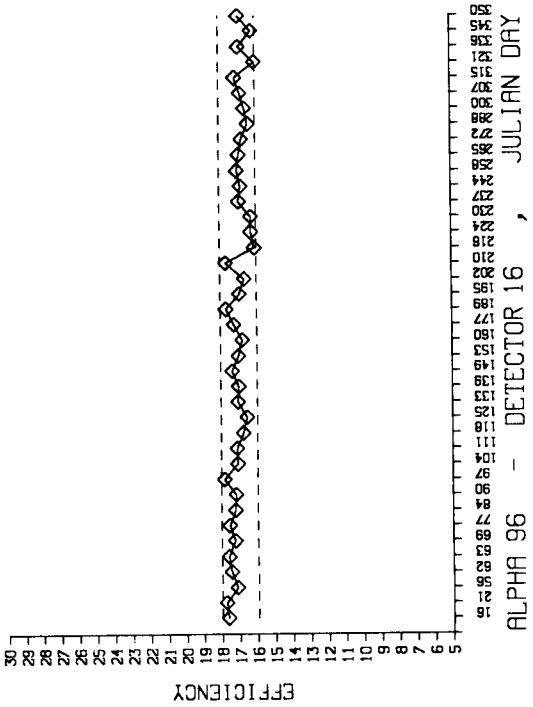
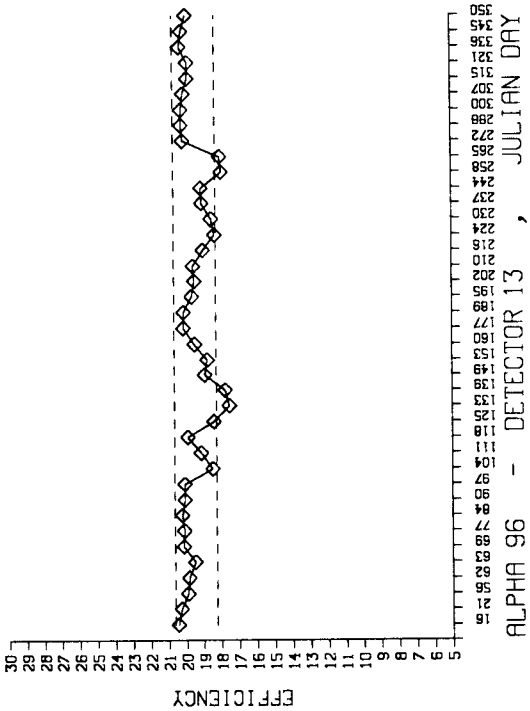
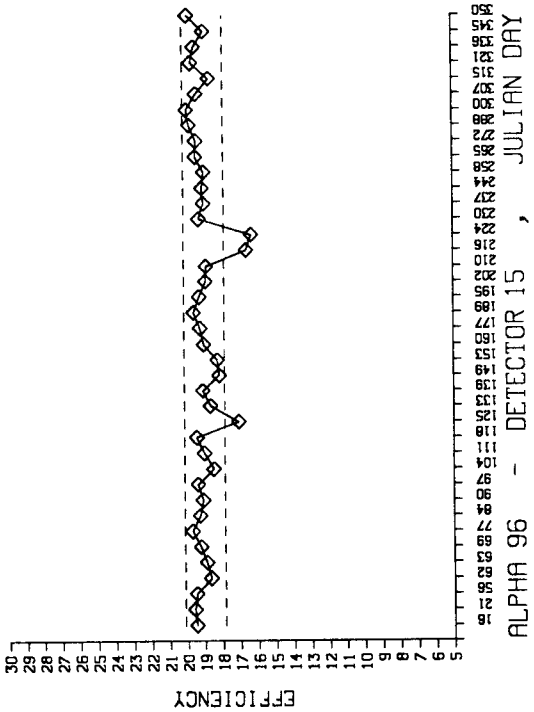

ALPHA 96 - DETECTOR 11 , JULIAN DAY
EFFICIENCY

Fig. H-2. (cont)







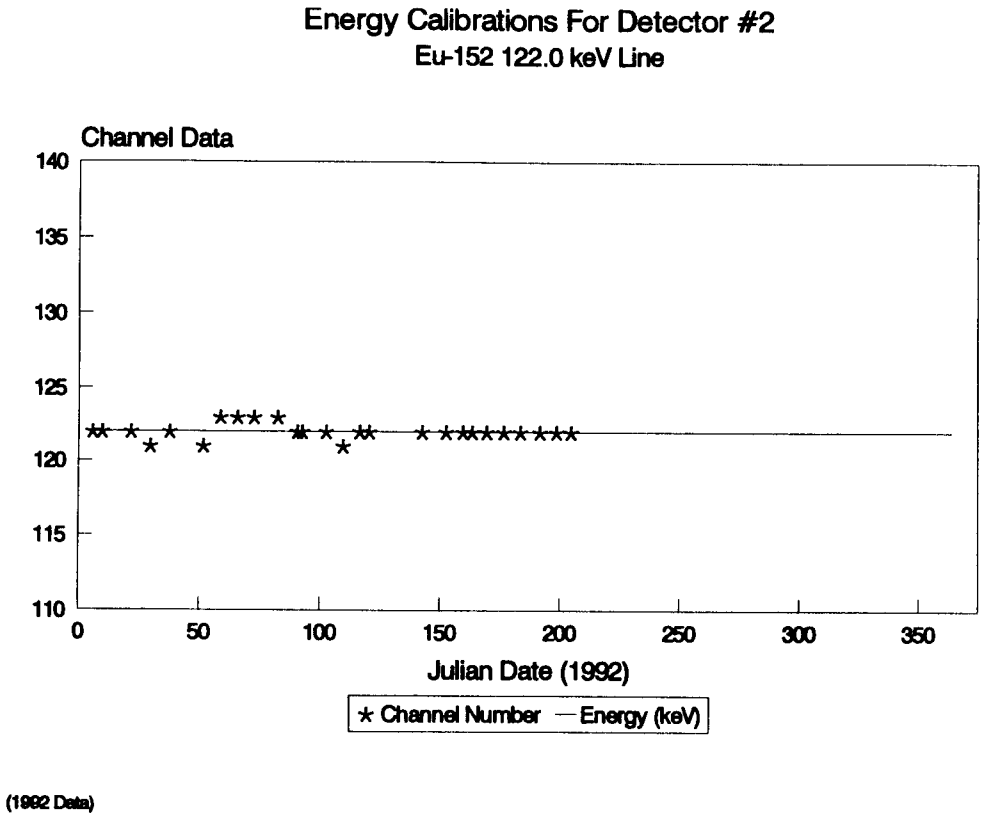


NOTE: Fluctuations in these data are documented in Laboratory notebooks A-8192 and A-10105 and are generally due to a detector being replaced or needing cleaning, electrical power surges and failures, vacuum system leaks, and electronic noise.

Fig. H-2. (cont)

Gamma Spectrometer and Liquid Scintillation

Background and Efficiency Data



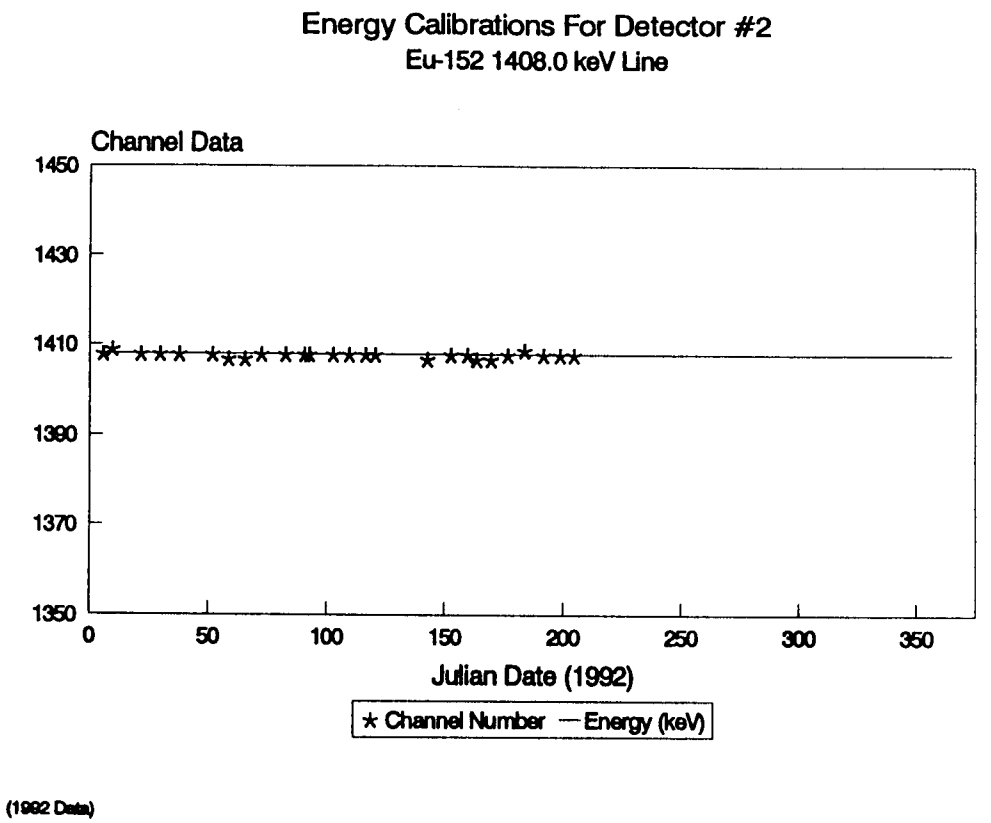
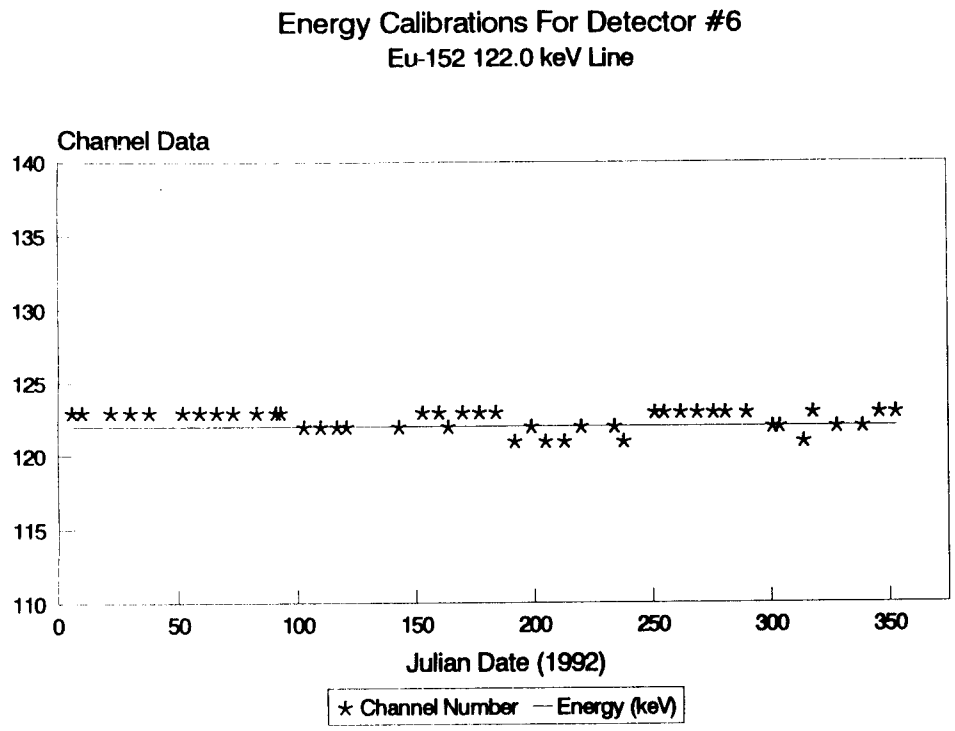
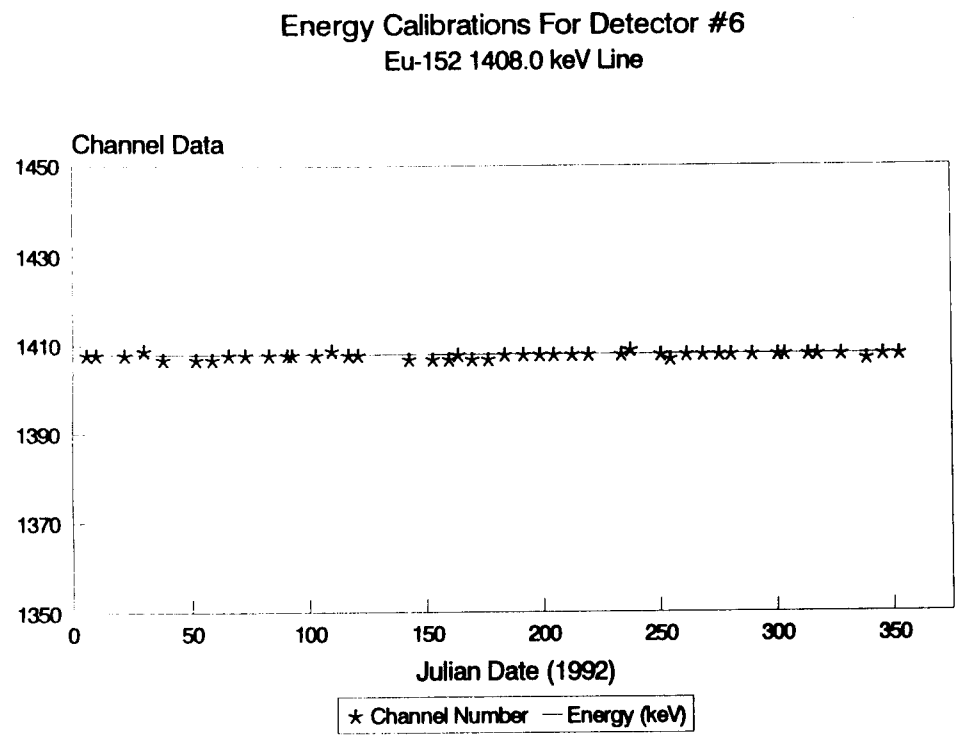


Fig. H-3. Energy calibrations for gamma detectors.

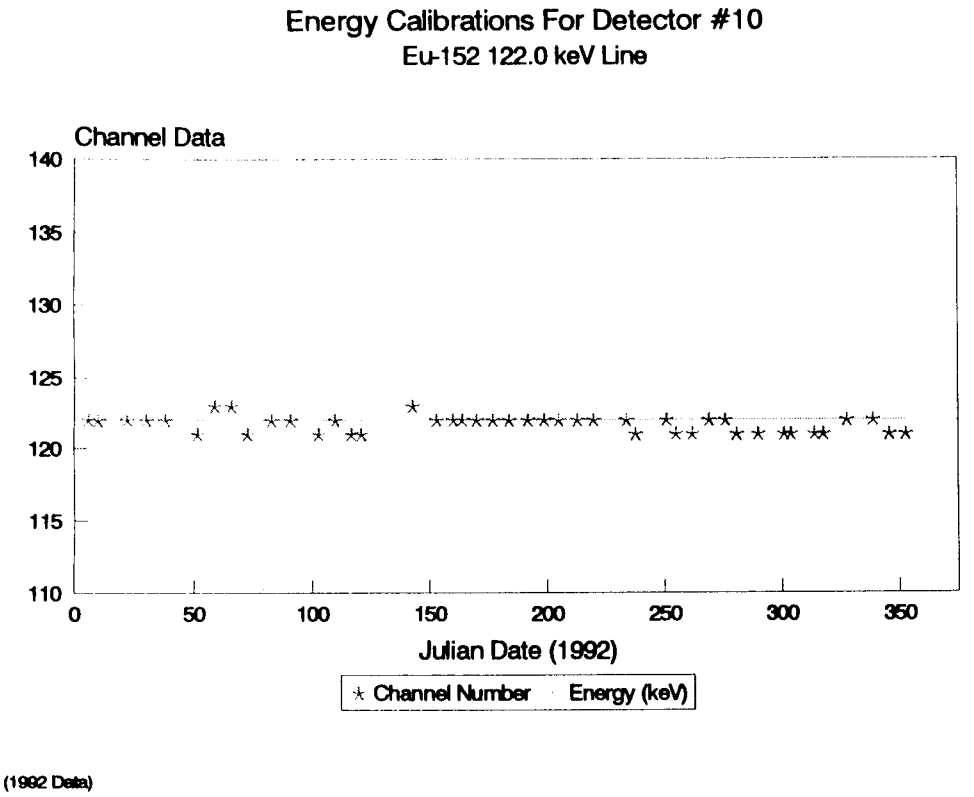


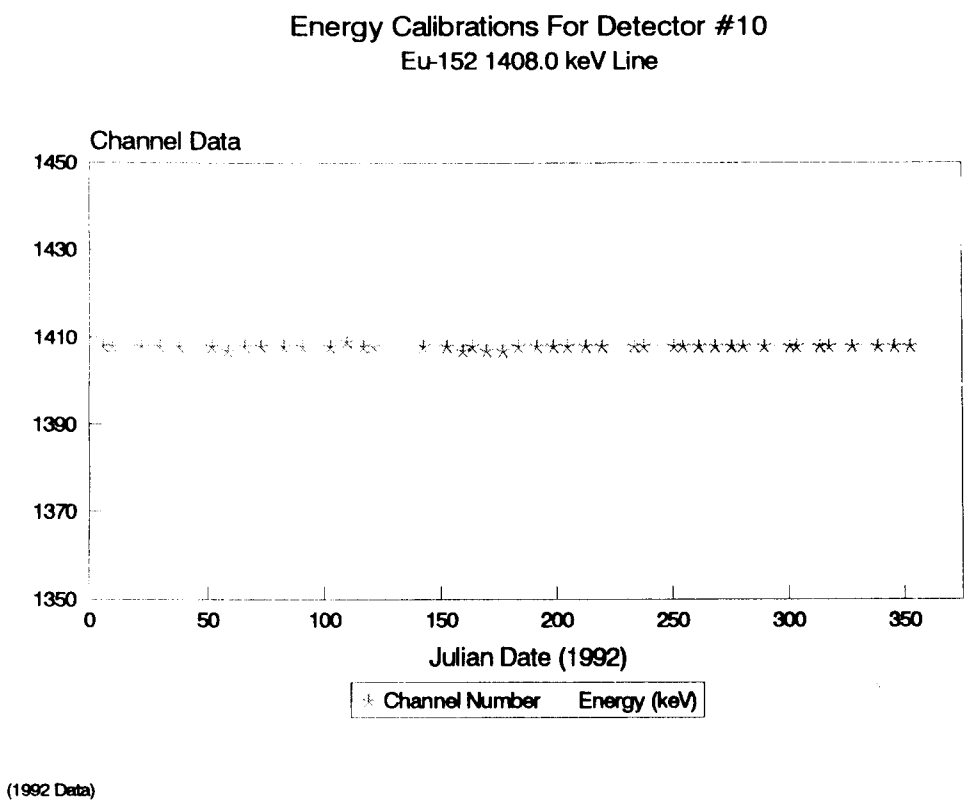
(1992 Data)



(1992 Data)

Fig. H-3. (cont)


Energy Calibrations For Detector #10
Eu-152 122.0 keV Line
Channel Data
140
135
130
125
120
115
110
0
50
100
150
200
250
300
350
Julian Date (1992)
Channel Number
Energy (keV)
(1992 Data)


Energy Calibrations For Detector #10
Eu-152 1408.0 keV Line
Channel Data
1450
1430
1410
1390
1370
1350
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150
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350
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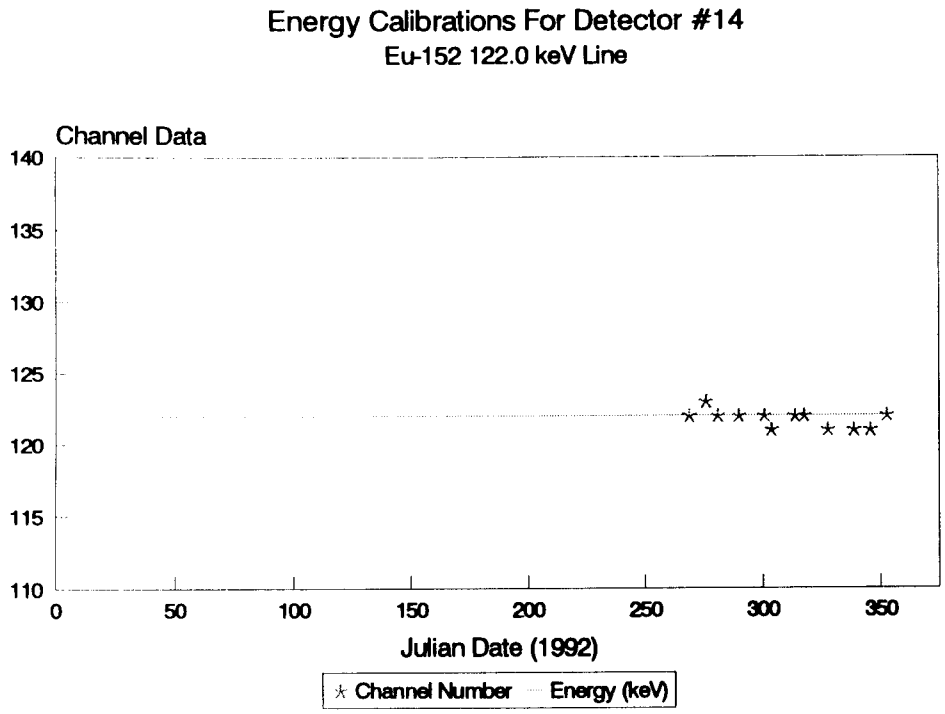
Channel Number
Energy (keV)
(1992 Data)

Fig. H-3. (cont)



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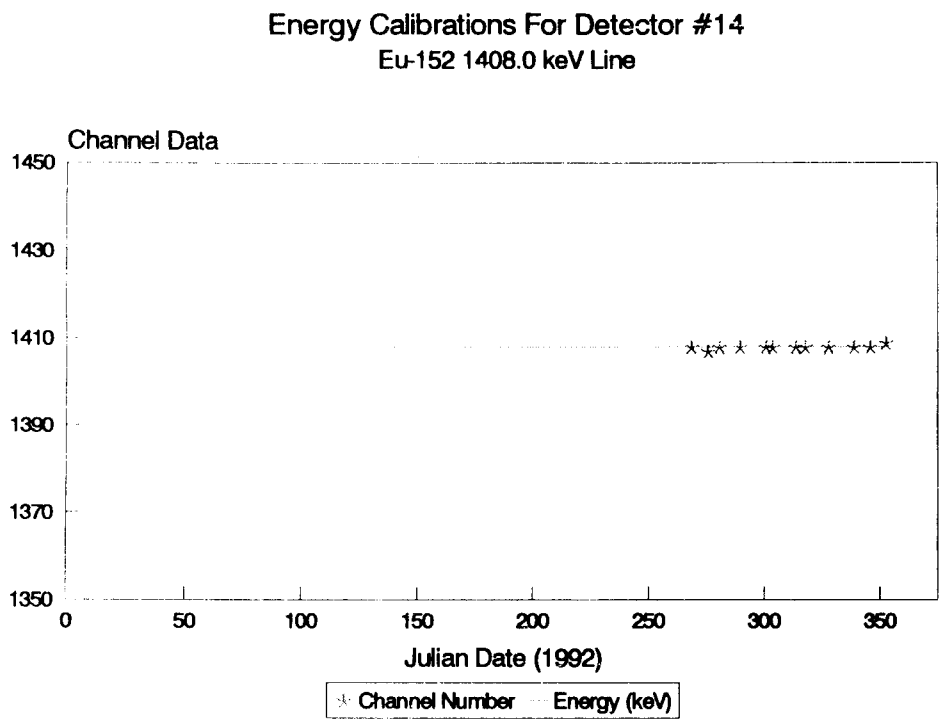
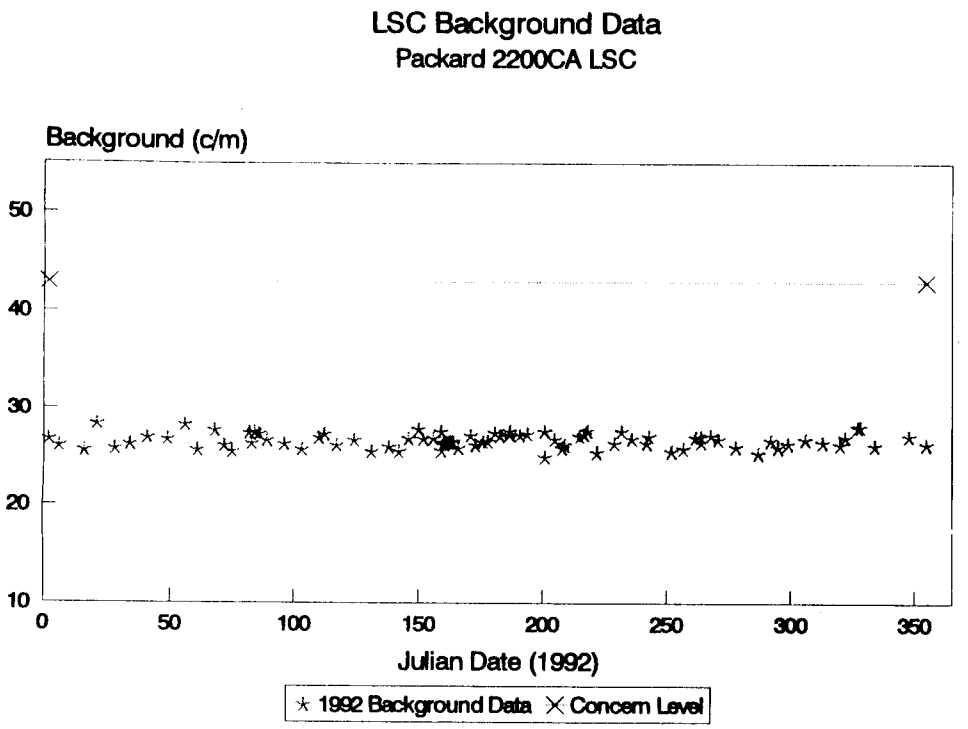


(1992 Data)

Fig. H-3. (cont)



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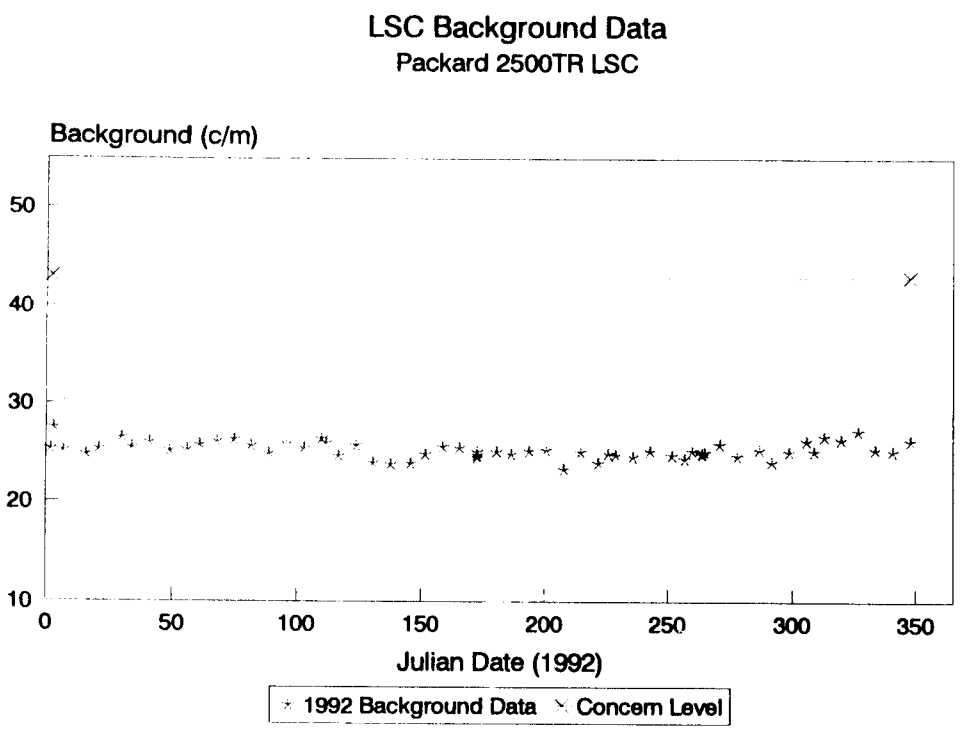
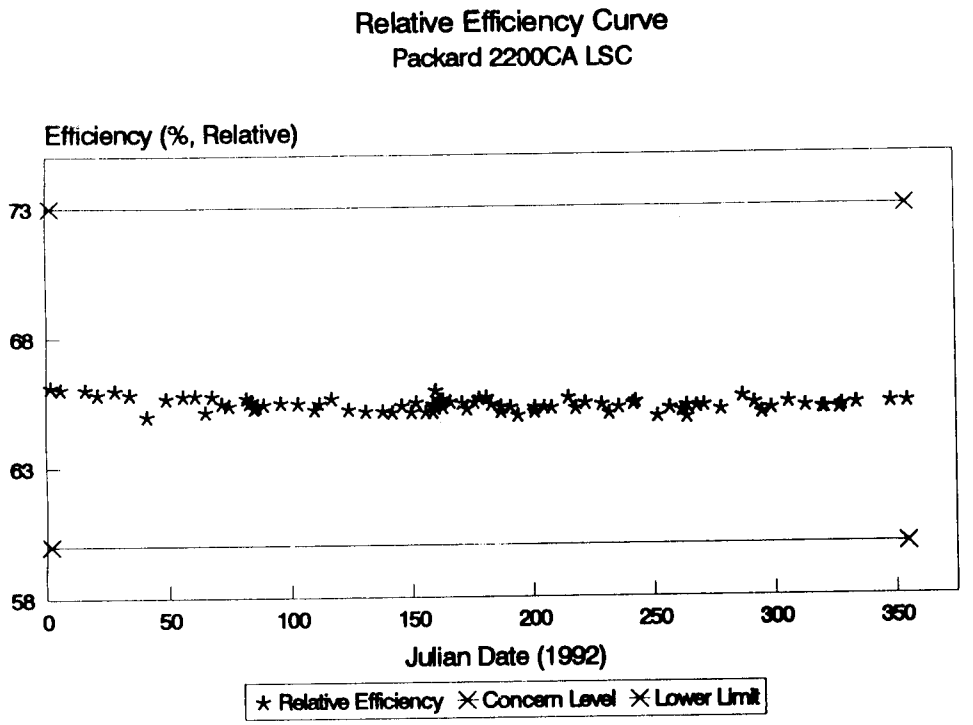


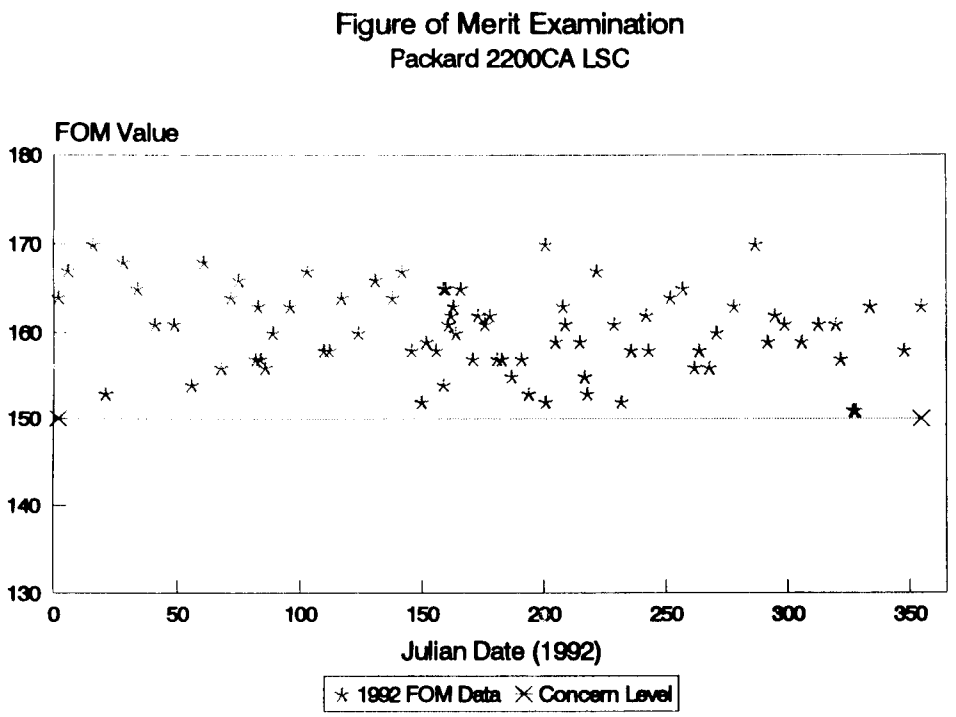
(1992 Data)

Fig. H-4. Liquid scintillation counter background data.

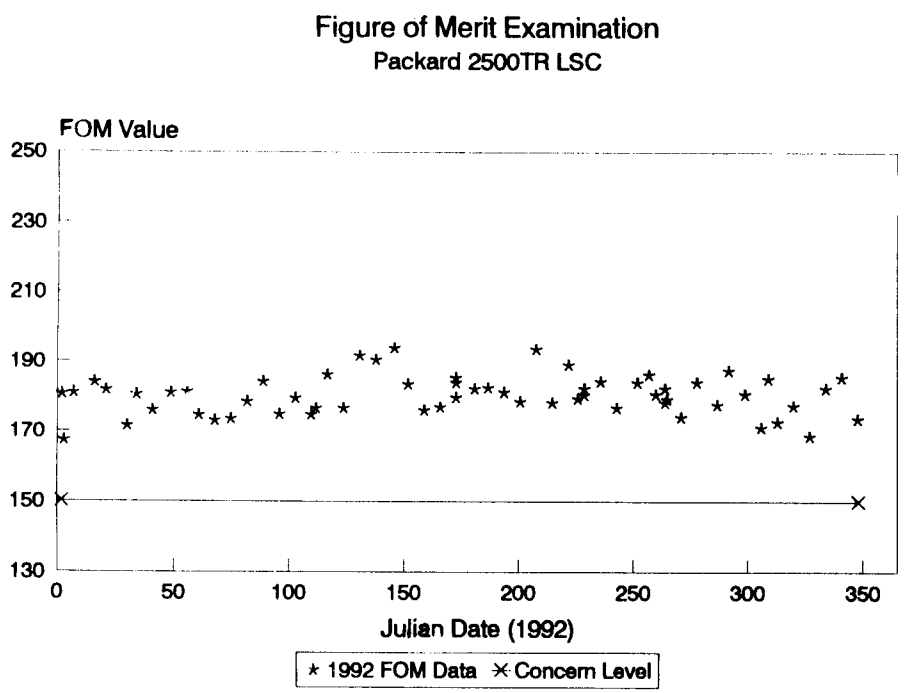


(1992 Data)

Fig. H-5. Relative efficiency curves for liquid scintillation counters.

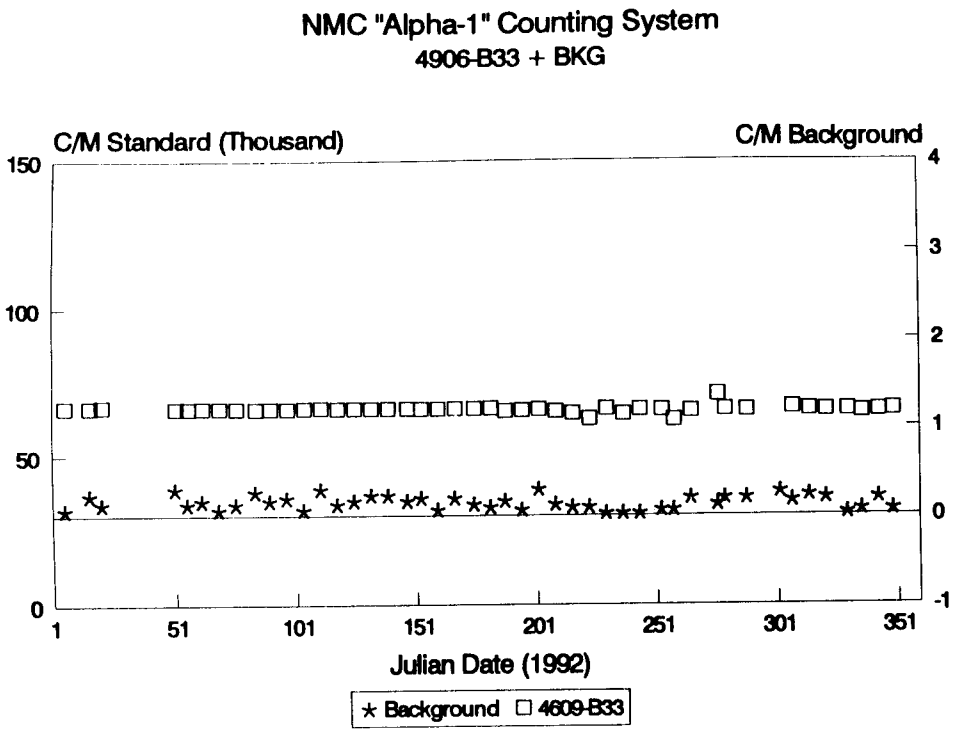


(1992 Data)

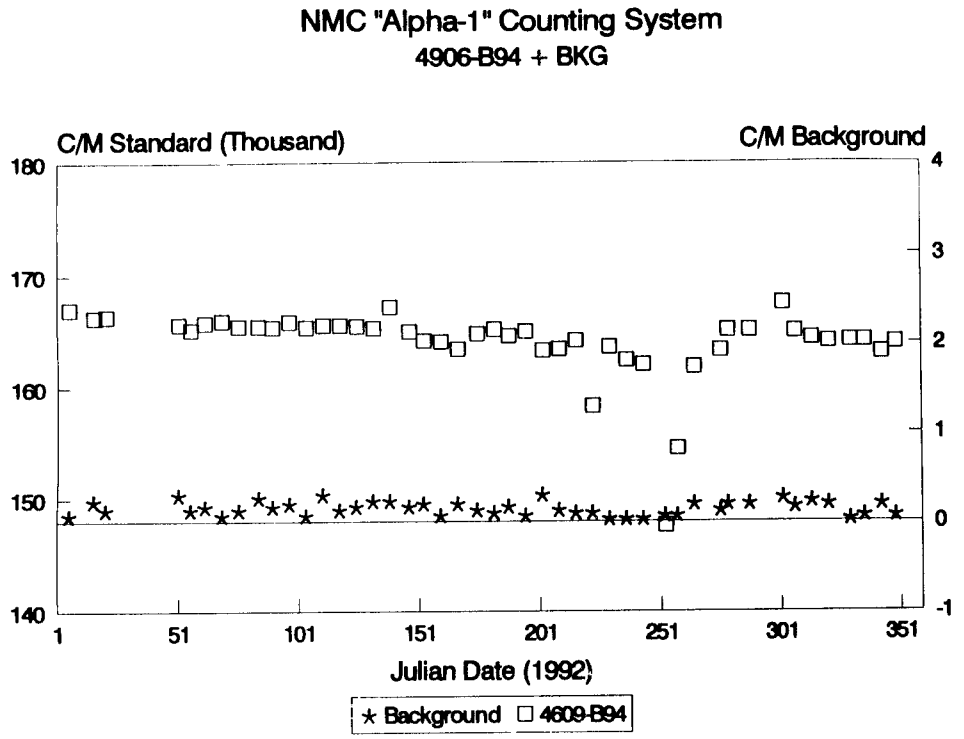


(1992 Data)

Fig. H-6. Figure of merit charts for liquid scintillation counters.

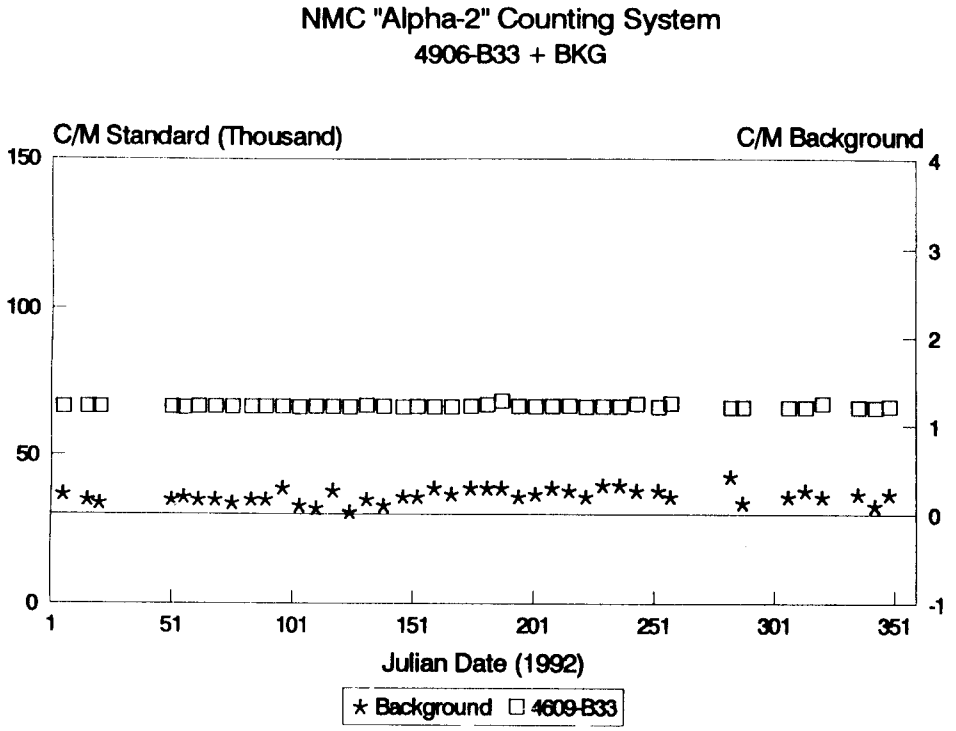


(1992 Data)



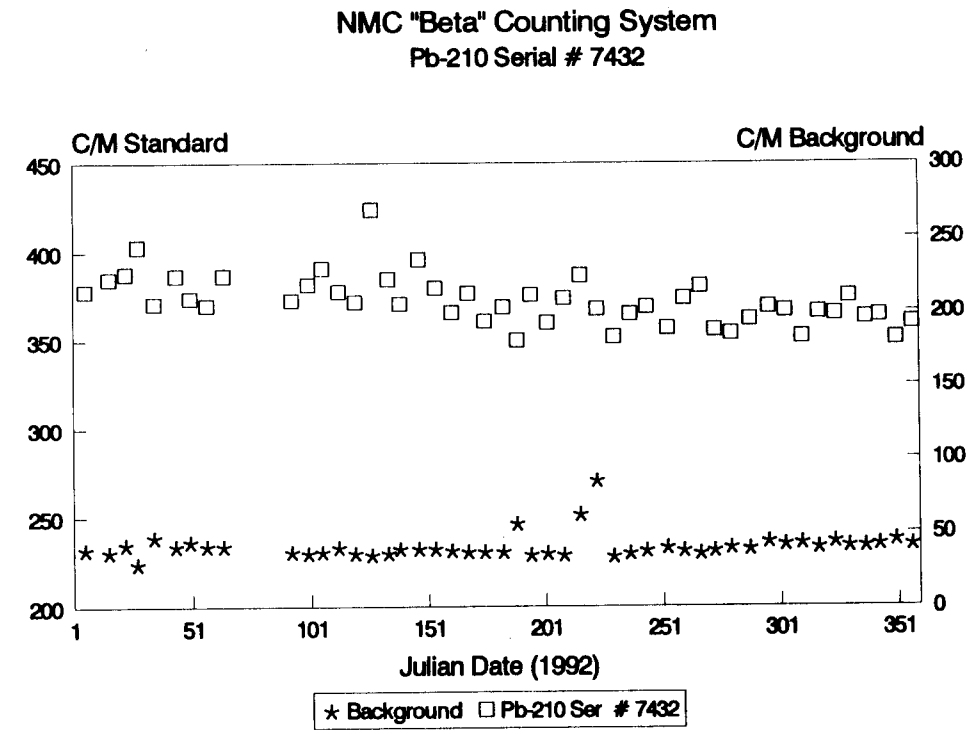
(1992 Data)

Fig. H-7. Efficiency values for alpha windowless gas-flow proportional system.

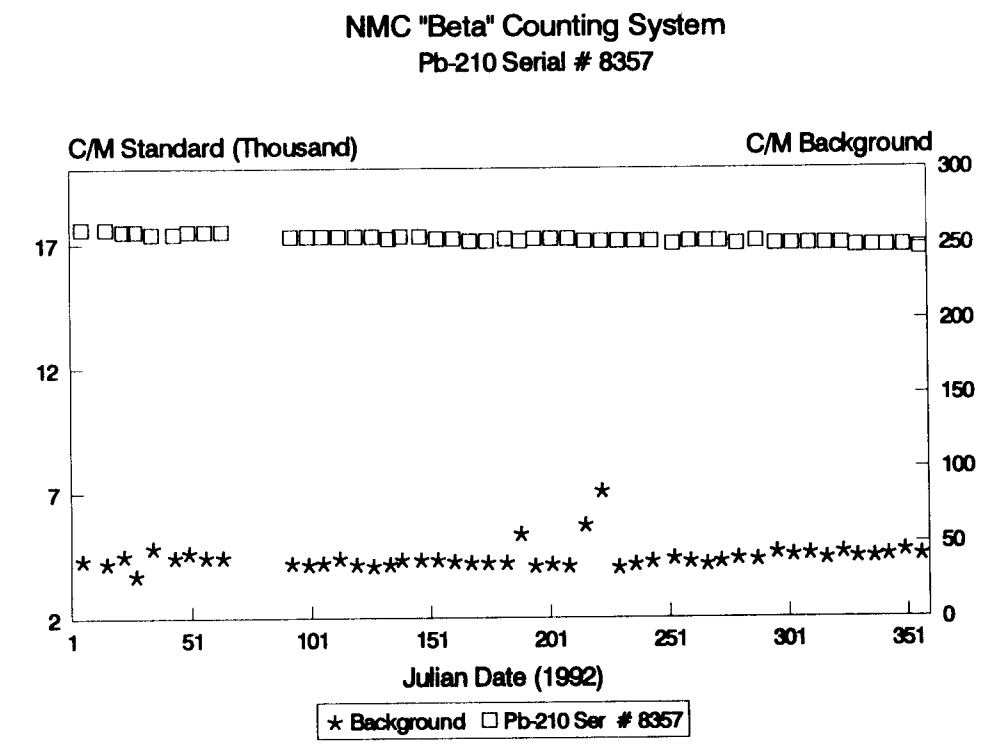


(1992 Data)

Fig. H-7. (cont)

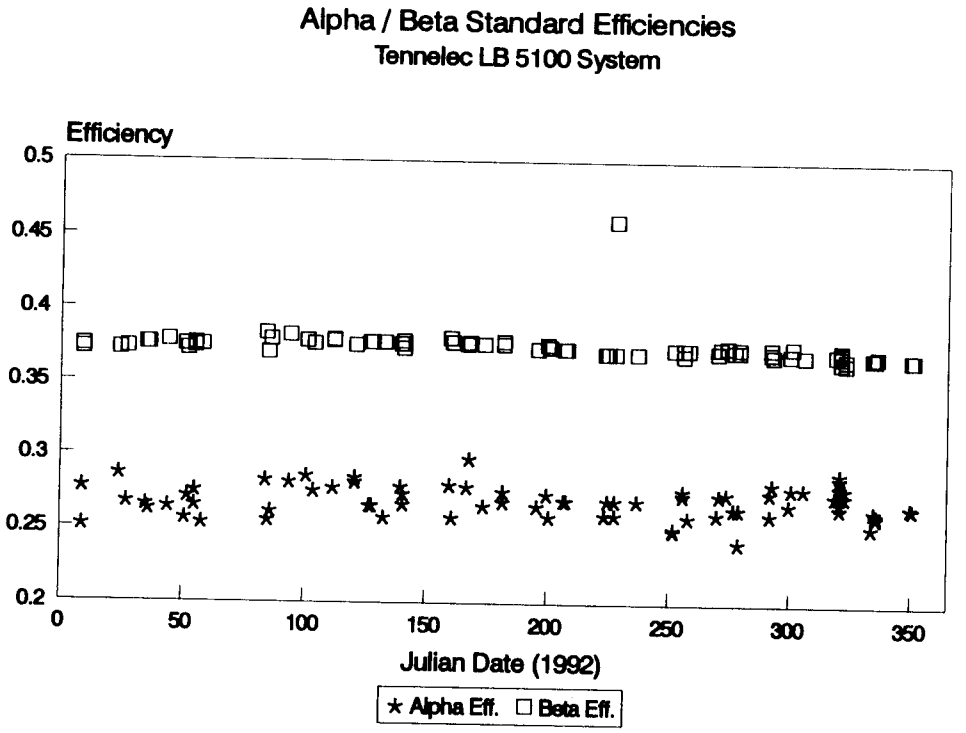


(1992 Data)



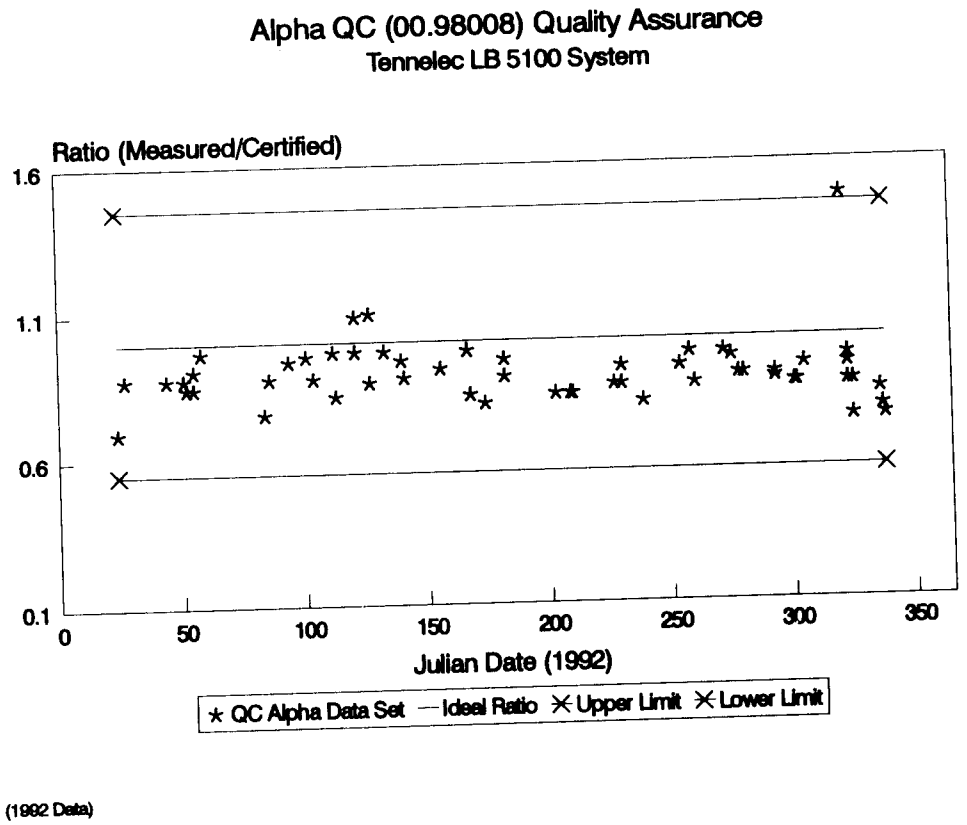
(1992 Data)

Fig. H-8. Efficiency values for beta windowless gas-flow proportional system.



(1992 Data)

Fig. H-9. Relative efficiencies for the Tennelec LB 5100 system.



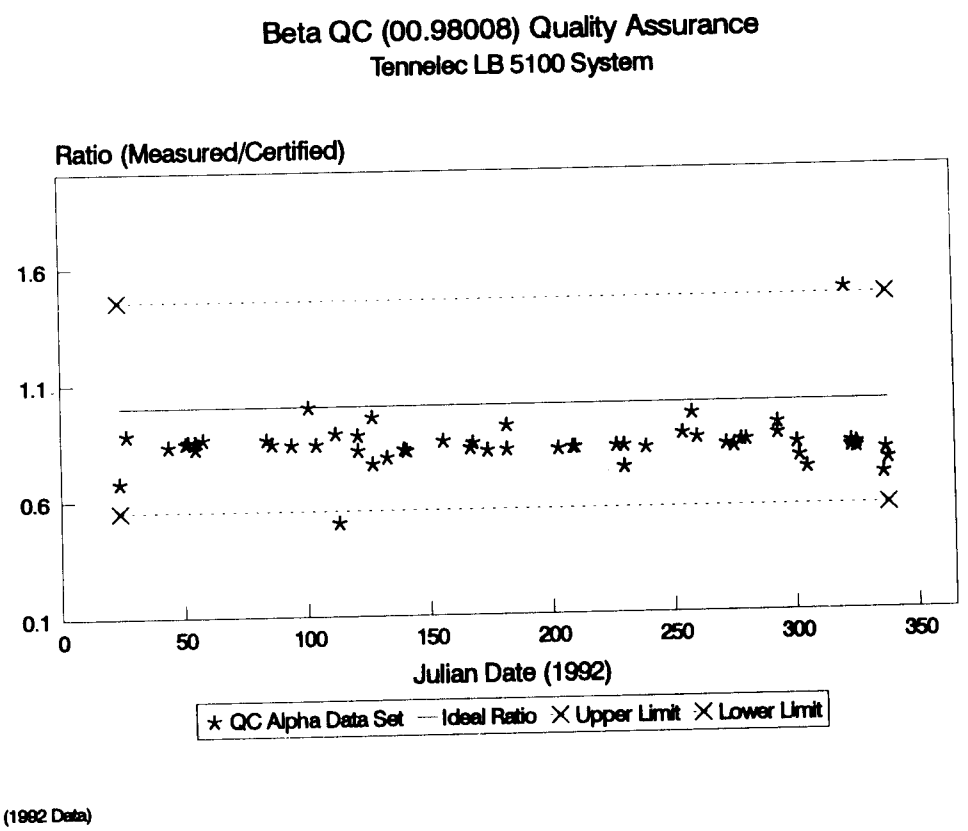


Fig. H-10. Quality control charts for alpha and beta measurements.

*U.S. GOVERNMENT PRINTING OFFICE 1994-0-573-024/7021