

United States  
Environmental Protection  
Agency

Environmental Monitoring  
and Support Laboratory  
P.O. Box 15027  
Las Vegas NV 89114

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Research and Development

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# Research Reports

Environmental  
Monitoring and Support  
Laboratory-Las Vegas  
January-December  
1977



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Reports of work performed for the U.S. Department of Energy (DOE), formerly the U.S. Energy Research and Development Administration. Available from NTIS, or for DOE contractors, from the Oak Ridge Technical Information Center, Oak Ridge, Tennessee 37830.

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LAS VEGAS, NEVADA 89114

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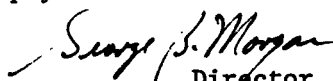
## FOREWORD

Protection of the environment requires effective regulatory actions which are based on sound technical and scientific information. This information must include the quantitative description and linking of pollutant sources, transport mechanisms, interactions, and resulting effects on man and his environment. Because of the complexities involved, assessment of specific pollutants in the environment requires a total systems approach which transcends the media of air, water, and land. The Environmental Monitoring and Support Laboratory-Las Vegas (EMSL-Las Vegas) contributes to the formation and enhancement of a sound monitoring data base for exposure assessment through programs designed to:

- develop and optimize systems and strategies for monitoring pollutants and their impact on the environment
- demonstrate new monitoring systems and technologies by applying them to full-fill special monitoring needs of the Agency's operating programs

The EMSL-Las Vegas also conducts research and monitoring programs for the U.S. Department of Energy\* (DOE), Nevada Operations Office. These programs concern environmental radiation associated with the DOE's testing of nuclear explosives conducted at the Nevada Test Site and other sites.

"Research Reports" lists scientific and technical reports published or presented by EMSL-Las Vegas personnel. We hope this listing will prove useful to persons interested in environmental monitoring and the work of our Laboratory. We welcome any suggestions for improving the utility of future issues of this annual bibliography.



Director  
Environmental Monitoring and Support  
Laboratory-Las Vegas

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\*From January 19, 1975 to October 1, 1977, the U.S. Energy Research and Development Administration; prior to January 19, 1975, the U.S. Atomic Energy Commission.

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## I. PUBLICATIONS IN THE EPA SERIES

### ECOLOGICAL RESEARCH

#### PULMONARY CELL POPULATIONS IN HAMSTERS MAINTAINED UNDER EGYPTIAN LABORATORY CONDITIONS

El-Sheikh, A. S., G. A. Abdel-Kader, S. O. Amin, Al-Azhar University, Cairo, Egypt, and R. E. Stanley, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada. Contract No. 03-546-1. R. E. Stanley, Project Officer. EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/3-77-006, January 1977 8 pp.

**ABSTRACT:** This study was conducted to obtain baseline values for pulmonary cells in golden hamsters (*Mesocricetus auratus*) bred and maintained under the laboratory conditions of Al-Azhar University in Egypt. An improvised technique is presented for measuring pulmonary cells obtained by lung lavage in golden hamsters. The results of using this technique revealed a positive correlation between the total count of pulmonary cells and the body weight of the hamsters. Cell differential counts showed that more than 99 percent of the pulmonary cells were macrophages, with lymphocytes as the remainder. The findings are discussed and compared to those reported in the available literature. (This study was supported by the Special Foreign Currency Program, P.L. 480.)

Order from: NTIS, No. PB263909/AS  
Price: Paper copy \$4.00 (A02)  
Microfiche \$3.00 (A01)

#### ABIOLOGICAL METHYLATION OF MERCURY IN SOIL

Rogers, R. D., EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/3-77-007, January 1977 16 pp.

**ABSTRACT:** This work defines several factors influencing the methylation of mercuric ion in soil. Two of the most important findings were that it is possible to extract the mercury methylating factor

from soil with a solution of 0.5N sodium hydroxide and that this factor is responsible for the abiological methylation of mercury in the soils under investigation.

The ability of the soil extract to methylate mercury is influenced by temperature, mercuric ion concentration, and solution pH. The methylating ability of the soil extract was stable at high temperatures (121° C), but was lost after exposure to ultraviolet radiation.

When the 0.5N sodium hydroxide extract of soil was separated into a soluble and insoluble fraction, the ability to methylate mercuric ion remained with the soluble fraction. It was found that the methylating factor was lost when the 0.5N sodium hydroxide extract showed that the methylating factor passes through dialysis tubing into the distilled water.

Order from: NTIS, No. PB263902/AS  
Price: Paper copy \$4.00 (A02)  
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(Also published in J. Environ. Qual. 6:4, October-December 1977, pp. 463-467)

#### PLUTONIUM UPTAKE BY PLANTS FROM SOIL CONTAINING PLUTONIUM-238 DIOXIDE PARTICLES

Brown, K. W., and J. C. McFarlane, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/3-77-052, May 1977 20 pp.

Abstract: Three plant species--alfalfa, lettuce, and radishes--were grown in soils contaminated with plutonium-238 dioxide ( $^{238}\text{PuO}_2$ ) at concentrations of 23, 69, 92, and 342 nanocuries per gram. The length of exposure varied from 60 days for the lettuce and radishes to 358 days for the alfalfa. The magnitude of plutonium incorporation as indicated by the discrimination ratios for these species, after being exposed to the relatively insoluble  $\text{PuO}_2$ , was similar to previously reported data using different chemical forms of plutonium.

Evidence indicates that the predominant factor in plutonium uptake by plants may involve the chelation of plutonium contained in the soils by the action of compounds such as citric acid and/or other similar chelating agents released from the plant roots.

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## PLAN AND CONCEPTS FOR MULTI-USE MANAGEMENT OF THE ATCHAFALAYA BASIN

van Beek, J. L., W. G. Smith, J. W. Smith, P. Light,  
Coastal Environments, Inc., Baton Rouge, Louisiana.  
Contract No. 68-01-2299. V. W. Lambou, Project  
Officer. EMSL-Las Vegas, Office of Research and  
Development, EPA, Las Vegas, Nevada  
EPA-600/3-77-062, May 1977 218 pp.

**ABSTRACT:** The report determines surface water requirements of the natural resource complex, including fishes, wildlife, and forests, and the socio-economic resource uses, including flood control, urban and industrial development, mineral extraction, transportation, agriculture, and recreation. Requirements are expressed in terms of desirable annual water-level variation, and resulting hydrographs are compared with those for present and proposed conditions associated with channelization. Minimum volumetric inflow requirements were calculated on the basis of storage characteristics and water levels as attained at present. Hydraulic geometry of the present main river channel is analyzed, and those channel dimensions that are in equilibrium with bankfull discharge suggest that channel enlargement through dredging should not go beyond a cross-sectional area of 7,400 square meters.

A surface-water management plan is presented that is believed to provide for maximum longevity of the remaining swamp ecosystem, to minimize the conflict arising from flood-control needs, and to make possible compatible derivation of benefits from both renewable and non-renewable resources.

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Price: Paper copy \$9.25 (A10)  
Microfiche \$3.00 (A01)

## MERCURY DISTRIBUTION IN SOIL AROUND A LARGE COAL- FIRED POWER PLANT

Crockett, A. B., and R. R. Kinnison, EMSL-Las Vegas,  
Office of Research and Development, EPA, Las Vegas,  
Nevada  
EPA-600/3-77-063, May 1977 16 pp.

**ABSTRACT:** Seventy soil samples were collected on a radial grid employing 16 evenly spaced radii and 5 logarithmically spaced circles, concentric around the Four Corners power plant in New Mexico. The soil samples were analyzed for total mercury using

a Zeeman Atomic Absorption spectrophotometer. Residue levels were quite low compared to average soil residues and no statistically valid differences in mercury residue levels were detected between circles or radii using two-way analysis of variance techniques. F-ratios indicated: significant differences between circles, significant differences between radii, and significant complex interaction which could not be eliminated. Contours of iso-mercury concentrations show a relative high west of the plant near the ash ponds and another just east of the plant. The fate of the 510 kilograms of mercury emitted per year is not known, but it is not accumulating near the plant. Mercury emissions by United States coal-fired power plants amount to only 4 percent of the natural degassing loss in the United States, and levels near power plants appear low. The significance of mercury emissions by power plants should be evaluated on a regional basis since the evidence shows no significant local elevation of mercury in soils or air.

Order from: NTIS, No. PB269289/AS  
Price: Paper copy \$4.00 (A02)  
Microfiche \$3.00 (A01)

129  
I IN ANIMAL THYROIDS FROM NEVADA AND OTHER WESTERN STATES

Smith, D. D., EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/3-77-067, June 1977 24 pp.

ABSTRACT: The data from over 80 thyroids collected during 1973, 1974, and 1975 from animals residing on the Nevada Test Site indicate that iodine-129 levels in these thyroids are near background levels. However, the median levels in the thyroids of animals living on the Nevada Test Site are slightly elevated from those found in northern Nevada, but are similar to those found near Denver, Colorado, and Rawlins, Wyoming. Statistical analyses of the iodine-129/iodine-127 ratios in cattle thyroids suggest that three populations were sampled. These populations are: (1) northern Nevada cattle which were considered as a baseline population, (2) corralled Nevada Test Site cattle with intermediate ratios, and (3) free-grazing cattle from Nevada Test Site and Rocky Flats, Colorado, which had the highest ratios reported.

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Price: Paper copy \$4.00 (A02)  
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## TRITIUM RETENTION BY COWS AND STEERS AND TRANSFER TO MILK

Mullen, A. L., A. A. Moghissi, J. C. Wawerna, B. A. Mitchell, E. W. Bretthauer, and R. E. Stanley, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/3-77-076, June 1977 28 pp.

**ABSTRACT:** The objective of this study was to evaluate the short- and long-term behavior of tritium in beef animals and dairy cows with emphasis on the resultant hazard to humans consuming meat and dairy products.

Eight lactating dairy cows and three steers received a single oral administration of tritiated water. Milk and blood from the lactating cows and blood from the steers were periodically collected and analyzed for tritium content. The tritium content of whole milk decreased with time giving a curve expressed as three-component exponential which yielded half-times of  $3.04 \pm 0.09$ ,  $11.1 \pm 2.58$ , and  $>120$  days. Tritium in the blood serum of steers decreased with half-lives of  $4.05 \pm 0.21$  and  $40.4 \pm 9.82$  days. Additional study of the milk to assess tritium incorporation in the various fractions showed half-times of  $2.93 \pm 0.14$  and  $43.7 \pm 4.28$  days for milk serum;  $2.08 \pm 0.56$  and  $>50$  days for milk protein; and  $3.28 \pm 0.35$  and  $60.7 \pm 43$  days for butterfat.

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Price: Paper copy \$4.50 (A03)  
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## DISTRIBUTION OF PHYTOPLANKTON IN ALABAMA LAKES

Taylor, W. D., F. A. Hiatt, S. C. Hern, J. W. Hilgert, V. W. Lambou, F. A. Morris, R. W. Thomas, M. K. Morris, and L. R. Williams, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/3-77-082, July 1977 60 pp.

**ABSTRACT:** This is a data report presenting the species and abundance of phytoplankton in the 11 lakes sampled by the National Eutrophication Survey in the State of Alabama. Results from the calculation of several water quality indices are also included (Nygaard's Trophic-State Index, Palmer's Organic Pollution Index, and species diversity and abundance indices).

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(Previously released in limited distribution as No. 677 in the Working Paper Series for the National Eutrophication Survey.)

## **SURVEY OF CROSS-BASIN BOAT TRAFFIC, ATCHAFALAYA BASIN, LOUISIANA**

van Beek, J. L., and B. Small, Coastal Environments, Inc., Baton Rouge, Louisiana. Contract No. 68-01-2299. V. W. Lambou, Project Officer. EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada EPA-600/3-77-090, August 1977 40 pp.

**ABSTRACT:** For flood control and for the preservation and enhancement of environmental quality of overflow swamp habitats, introduction of sediment from the Atchafalaya Basin Main Channel into backwater areas of the Atchafalaya Basin Floodway should be minimized. This introduction occurs mainly through diversion of Main Channel discharge into the old Atchafalaya River Channel and the four dredged and maintained cross-basin channels that function as distributaries. Therefore, reduction of sedimentation required structural control over the volume of flow diverted.

A boat-traffic survey was conducted to evaluate the need for control structures with regard to navigational use of the West and East Freshwater Distribution Channels and the West and East Access Channels. The survey shows that the highest number of traffic occurrences relates to recreation and involves only small boats. The second most frequent usage is for commercial fishing with use of the East Access Channel being heaviest. Usage by the oil and gas extraction industry ranks third. Survey data suggest that only oil- and gas-related traffic requires, at low river stage, the channel dimensions presently maintained. In order of importance to navigation, the East and West Access Channels rank highest. The East Freshwater Distribution Channel has by far the least number of traffic occurrences.

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## DISTRIBUTION OF PHYTOPLANKTON IN VIRGINIA LAKES

Hilgert, J. W., V. W. Lambou, F. A. Morris, R. W. Thomas, M. K. Morris, L. R. Williams, W. D. Taylor, F. A. Hiatt, and S. C. Hern, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/3-77-100, September 1977 48 pp.

**ABSTRACT:** This is a data report presenting the species and abundance of phytoplankton in the eight lakes sampled by the National Eutrophication Survey in the State of Virginia. Results from the calculation of several water quality indices are also included (Nygaard's Trophic State Index, Palmer's Organic Pollution Index, and species diversity and abundance indices).

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Previously released in limited distribution as No. 692 in the Working Paper Series for the National Eutrophication Survey.)

## DISTRIBUTION OF PHYTOPLANKTON IN MISSISSIPPI LAKES

Williams, L. R., W. D. Taylor, F. A. Hiatt, S. C. Hern, J. W. Hilgert, V. W. Lambou, F. A. Morris, R. W. Thomas, and M. K. Morris, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/3-77-101, September 1977 36 pp.

**ABSTRACT:** This is a data report presenting the species and abundance of phytoplankton in the five lakes sampled by the National Eutrophication Survey in the State of Mississippi. Results from the calculation of several water quality indices are also included (Nygaard's Trophic State Index, Palmer's Organic Pollution Index, and species diversity and abundance indices).

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(Previously released in limited distribution as No. 685 in the Working Paper Series for the National Eutrophication Survey.)

## DISTRIBUTION OF PHYTOPLANKTON IN SOUTH CAROLINA LAKES

Hern, S. C., J. W. Hilgert, V. W. Lambou, F. A. Morris  
M. K. Morris, L. R. Williams, W. D. Taylor, and F. A.  
Hiatt, EMSL-Las Vegas, Office of Research and Develop-  
ment, EPA, Las Vegas, Nevada  
EPA-600/3-77-102, September 1977 72 pp.

ABSTRACT: This is a data report presenting the species  
and abundance of phytoplankton in the 13  
lakes sampled by the National Eutrophication Survey in  
the State of South Carolina. Results from the calcu-  
lation of several water quality indices are also in-  
cluded (Nygaard's Trophic State Index, Palmer's  
Organic Pollution Index, and species diversity and  
abundance indices).

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## DISTRIBUTION OF PHYTOPLANKTON IN WEST VIRGINIA LAKES

Lambou, V. W., F. A. Morris, M. K. Morris, L. R.  
Williams, W. D. Taylor, F. A. Hiatt, S. C. Hern, and  
J. W. Hilgert, EMSL-Las Vegas, Office of Research and  
Development, EPA, Las Vegas, Nevada  
EPA-600/3-77-103, September 1977 28 pp.

ABSTRACT: This is a data report presenting the species  
and abundance of phytoplankton in four lakes  
sampled by the National Eutrophication Survey in the  
State of West Virginia. Results from the calculation  
of several water quality indices are also included  
(Nygaard's Trophic State Index, Palmer's Organic  
Pollution Index, and species diversity and abundance  
indices).

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(Previously issued in limited distribution as No. 693 in the  
Working Paper Series for the National Eutrophication Survey.)

## MOVEMENT OF MERCURY-203 IN PLANTS

Gay, D. D., and G. P. Butler, EMSL-Las Vegas, Office  
of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/3-77-122, October 1977 20 pp.

**ABSTRACT:** Seeds of *Pisum sativum*, varieties Little Marvel and Alaska, were planted in soils contaminated with radioactive ionic mercury, methylmercury or phenylmercury compounds. After maturation, stems, leaves, and pods were harvested and analyzed by gamma spectroscopy. Utilizing a least squares three-way analysis of covariance coupled with a Studentized Range Test, significant differences were noted among the levels of the three mercury compounds in the plants, between mercury levels in the two pea varieties and among mercury levels in the different pea tissues examined.

Phenylmercury levels differed consistently from levels of ionic mercury and methylmercury suggesting a separate pathway for it in peas.

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#### DISTRIBUTION OF PHYTOPLANKTON IN MARYLAND LAKES

Lambou, V. W., F. A. Morris, R. W. Thomas, M. K. Morris, L. R. Williams, W. D. Taylor, F. A. Hiatt, S. C. Hern, and J. W. Hilgert, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada EPA-600/3-77-124, October 1977 32 pp.

**ABSTRACT:** This is a data report presenting the species and abundance of phytoplankton in the four lakes sampled by the National Eutrophication Survey in the State of Maryland. Results from the calculation of several water quality indices are also included (Nygaard's Trophic State Index, Palmer's Organic Pollution Index, and species diversity and abundance indices).

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(Previously released in limited distribution as No. 684 in the Working Paper Series for the National Eutrophication Survey.)

## ENVIRONMENTAL MONITORING

### ENVIRONMENTAL RADIOACTIVITY LABORATORY INTERCOMPARISON STUDIES PROGRAM FY 1977

Quality Assurance Branch, Monitoring Systems Research and Development Division, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/4-77-001, January 1977 28 pp.

ABSTRACT: EPA's intercomparison studies program for laboratories involved in environmental radiation measurements is described. The type of environmental samples distributed, the analysis required for each sample, the distribution schedule, and the statistical analysis and reporting of results are discussed. Instructions and application forms are included for laboratories desiring to participate in the program.

This is not a research report. It is designed for use by laboratories participating or desiring to participate in this quality assurance program.

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Price: Paper copy \$4.50 (A03)

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### DEVELOPMENT OF A METHODOLOGY FOR DESIGNING CARBON MONOXIDE MONITORING NETWORKS

Liu, M. K., J. Meyer, R. Pollack, P. M. Roth, J. H. Seinfeld, Systems Applications, Incorporated, San Rafael, California, Contract No. 63-03-2399; and J. V. Behar, L. M. Dunn, J. L. McElroy, P. N. Lem, A. M. Pitchford, and N. T. Fisher, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada.  
E. A. Schuck, Project Officer. EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/4-77-019, March 1977 64 pp.

ABSTRACT: A methodology is presented for designing a carbon monoxide monitoring network based on the objective of identifying concentrations that exceed the national ambient air quality standards (NAAQS). The basis for identifying concentrations in excess of NAAQS is the Concentration Area Time-Product, where the concentrations are integrated over an area (i.e., a grid square in a gridded system) and integrated over a time interval for averaging the concentrations. These are computed with a mesoscale air quality simulation



model formulated as a 4-dimensional (x,y,z,t), partial differential equation of mass balance for the pollutant species which yields space-time average concentration distributions. A frequency-weighted average of concentrations called Figure of Merit is determined from these projected concentration distributions, prevailing meteorological patterns, and the frequency of occurrence associated with each of the meteorological patterns. A mapping of these Figure of Merit values provides the basis of selection of the locations and number of sites in the network.

The methodology was applied in a design of an ambient air monitoring network for carbon monoxide. The establishment of a field measurement program is described which would provide air quality and meteorological data for model validation and simulation as required in development of the specifications for the number and location of sites in the network design. Discussions are limited to the design methodology. Actual field data, simulation exercises, pollution concentration isopleths, and mappings are presented in a separate report.

Order from: NTIS, No. PB268642/AS  
Price: Paper copy \$5.25 (A04)  
Microfiche \$3.00 (A01)

#### AIR QUALITY DATA FOR THE NORTHEAST OXIDANT TRANSPORT STUDY, 1975: FINAL DATA REPORT

Siple, G. W., C. K. Fitzsimmons, J. J. van Ee, and K. F. Zeller, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/4-77-020, March 1977 104 pp.

ABSTRACT: During the summer of 1975, a survey was conducted in the northeastern region of the United States to assess the transport of oxidant and oxidant precursors through the area. This report documents the scope of participants of the Laboratory's Long-Range Air Monitoring Aircraft in the study. The report includes a description of the monitoring system, considerations involved in the operation of the system, and a presentation of the data collected by the system.

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Price: Paper copy \$6.50 (A06)  
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## RESUSPENSION OF PLUTONIUM FROM CONTAMINATED LAND SURFACES: METEOROLOGICAL FACTORS

Lem, P. N., J. V. Behar, and F. N. Buck, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada

EPA-600/4-77-037, July 1977 36 pp.

**Abstract:** A literature review is presented in a discussion of the relevance of meteorological factors on the resuspension of plutonium from contaminated land surfaces. The physical processes of resuspension based on soil erosion work are described. Some of the models developed to simulate the resuspension of materials for predicting airborne concentrations are reviewed. The significance of some of the parameters used in the different models is also discussed. The interplay of meteorological factors measured, discussed, or implied in the literature reviewed as related to the resuspension process is discussed in the final section.

Order from: NTIS, No. PB271645/AS  
Price: Paper copy \$4.50 (A03)  
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## THE STATUS AND QUALITY OF RADIATION MEASUREMENTS FOR AIR

Easterly, D. G., R. R. Kinnison, A. N. Jarvis, and R. F. Smiecinski, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/4-77-043, October 1977 44 pp.

**ABSTRACT:** As part of the radiation quality assurance program conducted by EPA, calibrated radionuclide solutions are distributed to participating laboratories for instrument calibration and yield determinations. Laboratory performance studies involving the analysis of radionuclides in environmental media are also conducted.

A summary is given of the results of the air filter cross-check program for 1973-1975. Examination of these results indicates that gross alpha is the least difficult (86 percent within the control limits for accuracy) and gross beta is the most difficult (39 percent within the control limits for accuracy) for the laboratories to analyze.

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## STATUS AND QUALITY OF RADIATION MEASUREMENTS: FOOD AND HUMAN URINE

Easterly, D. G., R. R. Kinnison, A. N. Jarvis, and R. F. Smiecinski, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/4-77-047, October 1977 44 pp.

**ABSTRACT:** As part of the radiation quality assurance program conducted by EPA, calibrated radionuclide solutions are distributed to participating laboratories for instrument calibration and yield determinations. Laboratory performance studies involving the analysis of radionuclides in environmental media are also conducted.

A summary is given of the results for the food and human urine cross-check programs for 1972-1975. For tritium, which was the least difficult to analyze, 82 percent of the laboratories were within the control limits for accuracy and 99 percent within the control limits for precision over the 3-year period. For strontium-89, the most difficult to analyze, 33 percent were within the accuracy control limits and 77 percent within the precision control limits.

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## INTERAGENCY ENERGY-ENVIRONMENT RESEARCH AND DEVELOPMENT

### MONITORING ENVIRONMENTAL IMPACTS OF THE COAL AND OIL SHALE INDUSTRIES: RESEARCH AND DEVELOPMENT NEEDS

Jones, D. C., W. S. Clark, W. F. Holland, J. C. Lacy, and E. D. Sethness, Radian Corporation, Austin, Texas. Contract No. 68-02-1319. R. K. Oser, Project Officer. EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/7-77-015, February 1977 204 pp.

ABSTRACT: Recommendations are presented for monitoring and predictive technology for the coal conversion and oil shale industries. The recommendations are based upon a literature survey of the emissions and potential impacts of these industries. Descriptions of the technologies are included.

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### WESTERN ENERGY/ENVIRONMENT MONITORING ATLAS

Remote Sensing Division and Monitoring Operations Division, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada. Prepared by Lockheed Electronics Co., Inc., Las Vegas, Nevada. Contract No. 68-03-2153.  
EPA-600/7-77-047a, May 1977

ABSTRACT: The Atlas will give policy makers at various levels a regional perspective of the impacts on media quality (air, land and water) (level and extent) resulting from the pattern of energy dedicated land use. The purpose of the Atlas is to synthesize monitoring information into an integrated format wherein both the geographical pattern of sources and the geographical extent of media quality can be displayed. Appendices covering detailed air, water and land use data will be published separately.

NOT AVAILABLE: Printed for limited distribution only.

## WESTERN ENERGY/ENVIRONMENT MONITORING ATLAS: OVER- HEAD MONITORING APPENDIX

Remote Sensing Division, EMSL-Las Vegas, Office of  
Research and Development, EPA, Las Vegas, Nevada.  
Prepared by Lockheed Electronics Co., Inc., Las Vegas,  
Nevada. Contract No. 68-03-2153.  
EPA-600/7-77-047b, April 1977

**ABSTRACT:** Appendix to Western Energy/Environment  
Monitoring Atlas. The purpose is to demon-  
strate current remote sensing techniques utilized in  
monitoring mining activities and reclamation efforts  
on surface-mined areas located in the western part of  
the United States. An overview of the analysis per-  
formed on eight mines located in five of the western  
States and actual interpreted frames of photography  
with corresponding overlays are included. The classi-  
fication hierarchy, which was specifically developed  
for the Western Energy Project, is also included.

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## FUSION METHOD FOR THE MEASUREMENT OF PLUTONIUM IN SOIL: SINGLE-LABORATORY EVALUATION AND INTERLABORA- TORY COLLABORATIVE TEST

Hahn, P. B., E. W. Bretthauer, P. B. Altringer, and  
N. F. Mathews, EMSL-Las Vegas, Office of Research and  
Development, EPA, Las Vegas, Nevada  
EPA-600/7-77-078, July 1977 76 pp.

**ABSTRACT:** This report presents the results of a  
single-laboratory evaluation and an inter-  
laboratory collaborative test of a method for measuring  
plutonium in soil. The method employs potassium  
fluoride and potassium pyrosulfate fusions to decom-  
pose a 10-gram sample, barium sulfate precipitations,  
solvent extraction and electrodeposition to isolate  
the plutonium, and alpha spectrometry to measure the  
plutonium. The method is appended to the report.

The single-laboratory evaluation demonstrated that the  
overall within-laboratory precision of the method can  
approach the precision of nuclear counting statistics  
alone. The interlaboratory collaborative test showed  
the coefficient variation representing differences  
between laboratories to be approximately 10 percent  
for concentration levels exceeding 1 disintegration  
per minute per gram.

Also discussed are several problem areas associated with environmental actinide analyses. These include the difficulties which may be anticipated in requiring monitoring laboratories to adopt a specific complex method of this type. Suggestions are presented for improving agreement between laboratories by establishing criteria for analytical results rather than requiring specific methodology.

This report covers a period from January 1, 1974, to September 30, 1976, and work was completed as of December 31, 1976.

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Microfiche \$3.00 (A01)

#### CHARACTERIZATION OF EMISSIONS FROM PLUTONIUM-URANIUM OXIDE FUEL FABRICATION

Bretthauer, E. W., A. J. Cummings, and S. C. Black,  
EMSL-Las Vegas, Office of Research and Development,  
EPA, Las Vegas, Nevada  
EPA-600/7-77-079, July 1977 76 pp.

ABSTRACT: To develop accurate monitoring techniques for the radioactive emissions from new types of nuclear facilities, it is necessary to characterize those emissions as completely as possible. The first facility selected was a mixed-oxide fuel fabrication plant. In-stack, standard hi-vol, and special ultra-high volume air samplers were used to collect particulate samples at the Babcock and Wilcox plant in Parks Township, Pennsylvania.

The number of radioactive particles emitted, the particle sizes, plutonium and uranium isotopic content, and the concentration of other materials were determined. These characteristics are used to propose an appropriate air-monitoring technique for facilities of this type.

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Microfiche \$3.00 (A01)

## POTENTIAL RADIOACTIVE POLLUTANTS RESULTING FROM EXPANDED ENERGY PROGRAMS

Lee, H., T. O. Peyton, R. V. Steele, and R. K. White,  
Center for Resource and Environmental Systems Studies,  
Stanford Research Institute, Menlo Park, California.  
Contract No. 68-03-2375. A. N. Jarvis, Project Officer.  
EMSL-Las Vegas, Office of Research and Development, EPA,  
Las Vegas, Nevada  
EPA-600/7-77-082, August 1977 142 pp.

**ABSTRACT:** An effective environmental monitoring program must have a quality assurance component to assure the production of valid data. Quality assurance has many components: calibration standards, standard reference materials, standard reference methods, interlaboratory comparison studies, and data validation. The purpose of this document is to identify and document the potential radioactive pollutants that could result from the expanded energy program and for which quality assurance programs must be provided.

The radionuclide releases and the resulting population exposure doses from several energy systems for four projected energy utilization scenarios were calculated and compared. The energy system components examined were: coal mining, processing, combustion, and ash disposal; coal gasification and liquefaction; oil shale mining, processing, residue disposal and product utilization; geothermal development and operations; uranium mining, milling, conversion, enrichment and fabrication; nuclear reactor operations; and fuel reprocessing and waste disposal.

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Price: Paper copy \$7.25 (A07)  
Microfiche \$3.00 (A01)

## GUIDE TO PRESELECTION OF TRAINING SAMPLES AND GROUND TRUTH COLLECTION

Tanner, C. E., Lockheed Electronics Co., Inc., Las Vegas, Nevada. Contract No. 68-03-2153. R. W. Landers, Project Officer. EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada.  
EPA-600/7-77-100, September 1977 32 pp.

**ABSTRACT:** The purpose is to provide the novice data processing analyst and field personnel with the tools and basic concepts used in the processing of multispectral scanner data via an interactive or

conventional processing system. The need for collecting accurate, inexpensive "ground truth" is explained. Brief descriptions of the ecosystems that will be encountered in this study are given. Also provided is a list of the actual parameters that should be included in a well designed ground truth form. Sampling schemes from Landsat and aircraft multispectral scanner data are discussed along with procedures and recommendations for selecting training samples from photography for use in automatic data processing.

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Microfiche \$3.00 (A01)

#### QUALITY CONTROL FOR ENVIRONMENTAL MEASUREMENTS USING GAMMA-RAY SPECTROMETRY

Ziegler, L. H., and H. M. Hunt, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada  
EPA-600/7-77-144, December 1977 158 pp.

ABSTRACT: This report describes the quality control procedures, calibration, collection, analysis, and interpretation of data in measuring the activity of gamma ray-emitting radionuclides in environmental samples. Included in the appendices are basic data for selected gamma ray-emitting radionuclides, the uranium-235 series, the uranium-238 series, and the thorium-232 series. Typical pulse height spectra of selected gamma ray-emitting radionuclides measured with a thallium-activated sodium iodide detector are included in an appendix.

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Microfiche \$3.00 (A01)



## MISCELLANEOUS

### **CAPABILITIES OF THE ENVIRONMENTAL MONITORING AND SUPPORT LABORATORY-LAS VEGAS**

**Black, S. C., and G. S. Douglas, EMSL-Las Vegas,  
Office of Research and Development, EPA, Las Vegas,  
Nevada**

**EPA-600/9-77-004, March 1977 39 pp.**

**ABSTRACT:** This report describes the present and developing capabilities of EPA's Environmental Monitoring and Support Laboratory in Las Vegas, Nevada. Its purpose is to present comprehensive information in concise form to enable users of the Laboratory's services to more readily determine the types of technical support available.

The Laboratory's present capabilities were developed through performance of research and monitoring projects involving large and small animal studies; studies of vegetation and soil; development and application of techniques for monitoring of air, water, and land; analytical studies, and quality assurance activities. The data show a 5-fold increase in budget from 1971 to 1976. Whereas 77 percent of its resources were spent in radiation projects in FY 1971, only 31 percent of its FY 1976 funds were devoted to radiation studies.

Indexed tables list the present capabilities by environmental medium and by pollutant. These are referenced to scientific and technical reports published or presented by Laboratory personnel.

**Order from: NTIS, No. PB266651/AS**

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Microfiche \$3.00 (A01)**

## II. PUBLICATIONS IN THE EMSL-LV SERIES\*

### ANIMAL INVESTIGATION PROGRAM 1973 ANNUAL REPORT: NEVADA TEST SITE AND VICINITY

Smith, D. D., K. R. Giles, and D. E. Bernhardt,  
EMSL-Las Vegas, EPA, Las Vegas, Nevada  
EMSL-LV-0539-3, May 1977 105 pp.

ABSTRACT: Activities conducted by the Animal Investigation Program to meet its objectives are discussed. Data collected are presented. Basic objectives are: 1) to conduct surveillance of domestic and wild animals on and around the Nevada Test Site to assess the radionuclide burden present in their tissue and to detect any pathological effects from the burdens; 2) to investigate alleged damage to domestic animals and wildlife resulting from the activities of the Nevada Operations Office of the U.S. Energy Research and Development Administration; 3) to maintain public relations through education and veterinary advice to the off-site population; 4) to conduct special ad hoc investigations.

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Microfiche \$3.00 (A01)

### NOBLE GAS SAMPLING SYSTEM

Monitoring Operations Division, EMSL-Las Vegas, EPA,  
Las Vegas, Nevada  
EMSL-LV-0539-7, March 1977 18 pp.

ABSTRACT: A system to provide continuous monitoring for atmospheric concentrations of noble gases and tritium has been operated in the Nevada Test Site vicinity since 1972. The field sampling system

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\*Work reported in this series was performed under Memorandum of Understanding No. AT(26-1)-539 and No. EY-76-A-08-0539 for the U.S. Department of Energy (formerly the U.S. Energy Research and Development Administration, formerly the U.S. Atomic Energy Commission).

was designed to utilize the analytical capabilities at the EMSL-Las Vegas. This report describes the noble gas system which provides sample collection and analysis for radiokrypton, radioxenon, and tritium in the form of methane, with detection capabilities, at the time of count, of about 2 picocuries per cubic meter.

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Microfiche \$3.00 (A01)

#### FIVE-YEAR SUMMARY REPORT OF AN EXPERIMENTAL DAIRY HERD MAINTAINED ON THE NEVADA TEST SITE 1971 THROUGH 1975

Daley, E. M., EMSL-Las Vegas, EPA, Las Vegas, Nevada  
EMSL-LV-0539-9, June 1977 52 pp.

ABSTRACT: The EMSL-Las Vegas maintains an experimental dairy herd in Area 15 of the U.S. Energy Research and Development Administration's Nevada Test Site. This report covers the period January 1, 1971, through December 31, 1975, giving the status of the herd for this period of time. Improvements, changes, and additions made on the facilities, the production and reproduction statistics of individual cows and the herd, and summaries of metabolism studies that involved the dairy herd are discussed.

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Microfiche \$3.00 (A01)

#### ANIMAL INVESTIGATION PROGRAM 1974 ANNUAL REPORT

Smith, D. D., K. R. Giles, D. E. Bernhardt, and K. W. Brown, EMSL-Las Vegas, EPA, Las Vegas, Nevada  
EMSL-LV-0539-10, June 1977 115 pp.

ABSTRACT: Activities conducted by the Animal Investigation Program to meet its objectives are discussed. Data collected are presented. Basic objectives are: 1) to conduct surveillance of domestic and wild animals on and around the Nevada Test Site to assess the radionuclide burden present in their tissue and to detect any pathological effects from the burdens; 2) to investigate alleged damage to domestic animals and wildlife resulting from the activities of the Nevada Operations Office of the U.S. Energy Research and Development Administration; 3) to maintain public relations through education and veterinary advice to the

off-site population; 4) to conduct special ad hoc investigations.

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**OFF-SITE ENVIRONMENTAL MONITORING REPORT FOR THE  
NEVADA TEST SITE AND OTHER TEST AREAS USED FOR UNDER-  
GROUND NUCLEAR DETONATIONS, JANUARY THROUGH DECEMBER  
1976**

Monitoring Operations Division, EMSL-Las Vegas, EPA,  
Las Vegas, Nevada  
EMSL-LV-0539-12, May 1977 142 pp.

**ABSTRACT:** This report contains summaries of EMSL-Las Vegas sampling methods, analytical procedures, and the analytical results of environmental samples collected in support of U.S. Energy Research and Development Administration nuclear testing activities. Where applicable, sampling data are compared to appropriate guides for external and internal exposures to ionizing radiation. In addition, a brief summary of pertinent and demographical features of the Nevada Test Site and the Nevada Test Site environs is presented for background information.

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(Also published in Environmental Monitoring at Major U.S. Energy Research and Development Administration Contractor Sites, 1976. U.S. Energy Research and Development Administration, Washington, D.C. ERDA 77-104/2, Vol. 2, August 1977, pp. 878-1017)

**REPORT OF PUBLIC HEALTH SERVICE ACTIVITIES IN THE  
OFF-SITE MONITORING PROGRAM: NEVADA PROVING GROUND-  
SPRING 1953**

Radiological Health Branch, Bureau of State Service,  
Public Health Service, U.S. Department of Health,  
Education and Welfare, Las Vegas, Nevada (1953)  
EMSL-LV-0539-15, November 1977 76 pp.

**ABSTRACT:** Report of Public Health Service activities in the off-site monitoring program incidental to the atomic tests at the Nevada Proving Grounds in the spring of 1953. It is based upon operations reports.

Order from: Oak Ridge National Laboratory  
Oak Ridge, Tennessee 37830

### III. OTHER PUBLICATIONS

#### JOURNAL ARTICLES

##### METALS IN BIOENVIRONMENTAL SYSTEMS

Morgan, G. B., and E. W. Bretthauer  
Anal. Chem. 49:14, December 1977. pp. 1210A-1213A

ABSTRACT: Exposure of man to increasing amounts of trace and ultratrace metals and metalloid pollutants is a problem of immediate concern. An integrated multimedia monitoring system is necessary to determine accurately the sources and pathways of these pollutants as well as total exposure to the receptor. The analytical chemist's input into such a system includes recommendations on sampling procedures and methods of analysis. Sensitivity, accuracy, selectivity, and cost-effectiveness of the various available methods must be considered. Interpretation of the data and adequate quality assurance are prime responsibilities of the analytical chemist.

##### TRACKING POLLUTANTS FROM A DISTANCE

Melfi, S. H., J. D. Koutsandreas, J. Moran  
Environ. Sci. Technol. 11:1, January 1977. pp. 36-38  
EPA-600/J-77-007

ABSTRACT: EPA is investigating and selectively applying remote sensing to track environmental pollutants. The remote sensing program in the Agency's Office of Research and Development is described. It is divided into two major activities: first, it provides operational remote sensing support to the rest of the Agency, and second, it is developing advanced remote sensing techniques to meet the critical monitoring needs of the Agency.

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## MONITORING THE QUALITY OF AMBIENT AIR

Morgan, G. B.

Environ. Sci. Technol. 11:4, April 1977. pp. 352-357  
EPA-600/J-77-036

**ABSTRACT:** The monitoring of ambient air quality is of paramount importance for determining ambient levels of pollutants so that they can be related to adverse effects on man and his environment. The considerations and objectives for designing and implementing an air quality monitoring network are reviewed.

The types of air monitoring activities are discussed covering permanent fixed-site (trend) monitoring, ambient source-linked monitoring, exposure monitoring, and biological monitoring. The components of an ambient air quality monitoring network are reviewed and evaluated along with the quality control program necessary to assure that the data and supporting information are legally and scientifically defensible.

## OBSERVATIONS ON THE DISTRIBUTION OF MICROORGANISMS IN DESERT SOIL

Vollmer, A. T., F. Au, and S. A. Bamberg

Great Basin Natur. 37:1, March 31, 1977. pp. 81-86

**ABSTRACT:** Population estimates of fungi, bacteria, and actinomycetes in desert soil were determined with respect to soil depth and distance from shrubs. In general the highest numbers of microbes were found at the shrub base; the lowest numbers were found in the interspaces. While the total number of organisms usually declined in deeper soil, the relative importance of the actinomycetes increased. These population trends are attributed to substrate availability and utilization and interspecific interactions.

As the soils became drier and warmer the total number of microorganisms decreased. Mold populations remained at about the same level during the study. While the numbers of both bacteria and actinomycetes declined, the relative importance of actinomycetes increased.

## REVISED GUIDELINES FOR REPORTING STUDIES IN CONTROLLED ENVIRONMENTAL CHAMBERS

American Society for Horticultural Science (ASHA)  
Special Committee on Growth Chamber Environments.  
(J. C. McFarlane, EMSL-Las Vegas, is a member of the  
ASHA Special Committee.)  
HortScience 12:4, August 1977. pp. 309-310

ABSTRACT: The guidelines proposed for reporting research conducted in plant growth chambers will allow comparison of the results with similar experiments, or repetition of the studies in other laboratories. The revisions in the guidelines reflect changes in measurement techniques or instrumentation based on research experience and improvements in measuring devices. The revised guidelines and sample text are given.

## CONTAMINANTS IN PLANT GROWTH CHAMBERS

Tibbitts, T. W., J. C. McFarlane, D. T. Krizek, W. L. Berry, P. A. Hammer, R. W. Hodgson, and R. W. Langhans  
HortScience 12:4, August 1977. pp. 310-311

ABSTRACT: Observations and comments presented at the discussion of the Growth Chamber Committee of the American Society for Horticultural Science workshop are summarized. Workshop was held August 13, 1976, at Louisiana State University in Baton Rouge, Louisiana, at the annual meeting on Contaminants in Growth Chambers.

## FUTURE TRENDS IN ENVIRONMENTAL MONITORING AND INSTRUMENTATION

Morgan, G. B.  
Instrum. Technol. 24:2, February 1977. pp. 33-40  
EPA-600/J-77-006

ABSTRACT: Future trends in environmental monitoring and instrumentation will reflect the growing need to measure total exposure of critical receptors to specific pollutants. This paper describes the major monitoring objectives expected and the design criteria for developing and implementing monitoring systems to meet these objectives. It deals with requirements for air and water monitoring systems as well as those for integrated monitoring, biological monitoring, personnel exposure monitoring, and remote monitoring systems



which will be needed in the immediate future. It describes the analytical laboratory support that will be required for measuring such pollutants as respiratory irritants, organic compounds, and inorganic compounds as well as for the routine elemental analysis now commonly provided. Finally, it discusses the need for a well-designed quality assurance program and the role of such a program in providing data that are legally and scientifically defensible.

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## ABIOLGICAL METHYLATION OF MERCURY IN SOIL

Rogers, R. D.  
J. Environ. Qual. 6:4, October-December 1977. pp. 463-467

**ABSTRACT:** The results from this work define several factors influencing the methylation of mercuric ion in soil. Two of the most important findings were that it is possible to extract the mercury methylating factor from soil with a solution of 0.5N sodium hydroxide and that this factor is responsible for the abiological methylation of mercury in the soils under investigation.

The ability of the soil extract to methylate mercury is influenced by temperature, mercuric ion concentrations, and solution pH. In addition, it was found that the methylating ability of the soil extract was stable at high temperatures (121° C), but was lost after exposure to ultraviolet radiation.

When the 0.5N sodium hydroxide extract of soil was separated into a soluble fraction and an insoluble precipitate, the ability to methylate mercuric ion remained with the soluble fraction. It was found that the methylating factor was lost when the 0.5N sodium hydroxide extract was dialyzed against distilled water. Other work showed that the methylating factor passes through dialysis tubing into the distilled water.

(Also published as EPA-600/3-77-007, January 1977.)

## MESOSCALE ANALYSIS OF OZONE MEASUREMENTS IN THE BOSTON ENVIRONS

Zeller, K. F., R. B. Evans, C. F. Fitzsimmons, and G. W. Siple

J. Geophys. Res. 82:37, December 20, 1977. pp. 5879-5888

**ABSTRACT:** The mesoscale analysis of ozone concentrations measured at ground level and aloft in the Boston metropolitan area has provided some insight into the origin and fate of urban ozone. A period of intensive airborne ambient monitoring, conducted by EPA's EMSL-Las Vegas long-range air-monitoring aircraft from August 9-14, 1975, shows areas of semipersistent high and low ozone concentrations. In addition, data presented identify an urban ozone plume at extended distances downwind of Boston on several days within this sampling period. The importance of the daily synoptic meteorological situation upon the observed ozone distribution is emphasized.

On August 9, ozone concentrations ranging as high as 103 ppb were measured aloft 35 km downwind of Boston. On this same day, immediately upwind of Boston, a surface ozone ridge was evident. Data collected on August 10-12 show that with persistent wind directions aloft an urban plume is discernible at distances of 50-100 km downwind. Ozone values as high as 148 ppb were measured within the urban plume; in fact, ozone concentrations exceeded 80 ppb as far as 200 km over the ocean, downwind of Boston, on August 12. On August 11 and 13 the local weather situation apparently caused a sea breeze related surface ozone ridge pattern to recirculate high ozone levels over the Boston area late in the evening. August 14, a non-sea breeze day, featured a cold front passage through the Boston area. The ozone distribution pattern at the surface differed from surface patterns for other days studied. The ozone distribution pattern aloft was also less complicated than patterns aloft on other days studied.

(Also presented at The Non-Urban Troposphere Composition Conference, Hollywood, Florida, November 10-12, 1976.)

## MONITORING GROUNDWATER QUALITY

Morgan, G. B., E. A. Schuck, and L. G. McMillion  
Water Qual. Bull. 2:1, January 1977. pp. 11-14  
EPA-600/J-77-008

ABSTRACT: Recently the U.S. Congress enacted laws that provide for protection and monitoring of groundwater quality. Many attempts to monitor groundwater quality have shown that such monitoring is usually costly and difficult because groundwater is relatively inaccessible and the chemical behavior of pollutants in the subsurface is very complex. In response, a monitoring methodology has been developed under sponsorship of the EPA. This methodology has excellent potential for application at State and local levels of government. The methodology is briefly discussed and the published reports that contain details on it are summarized and referenced.

Order from: NTIS, No. PB266818/4BE  
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## PRESENTATIONS PUBLISHED IN PROCEEDINGS

### **INFLUENCE OF MICROBIAL ACTIVITIES ON AVAILABILITY AND BIOTRANSPORT OF PLUTONIUM**

**Au, F. H. F., and W. F. Beckert**

**Presented:** Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
February 12-13, 1976

**Published:** Environmental Plutonium on the Nevada  
Test Site and Environs. U.S. Energy  
Research and Development Administration,  
Las Vegas, Nevada. June 1977. Publica-  
tion No. NVO-171. pp. 219-226

### **SOLUBILITY OF PLUTONIUM AND AMERICIUM-241 FROM RUMEN CONTENTS OF CATTLE GRAZING ON PLUTONIUM-CONTAMINATED DESERT VEGETATION IN IN VITRO BOVINE GASTROINTESTINAL FLUIDS-NOVEMBER 1974 TO MAY 1975**

**Barth, J.**

**Presented:** Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
February 12-13, 1976

**Published:** Environmental Plutonium on the Nevada  
Test Site and Environs. U.S. Energy  
Research and Development Administration,  
Las Vegas, Nevada. June 1977. Publica-  
tion No. NVO-171. pp. 121-137

### **PLUTONIUM DISTRIBUTION IN THE ENVIRONS OF THE NEVADA TEST SITE**

**Bliss, W. A., and F. M. Jakubowski**

**Presented:** Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
February 12-13, 1976

**Published:** Environmental Plutonium on the Nevada  
Test Site and Environs. U.S. Energy  
Research and Development Administration,  
Las Vegas, Nevada. June 1977. Publica-  
tion No. NVO-171. pp. 227-231

## AN INITIAL SYNTHESIS OF AREA 13 $^{239}\text{Pu}$ DATA AND OTHER STATISTICAL ANALYSES

Gilbert, R. O., L. L. Eberhardt, and D. D. Smith

Presented: Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
February 12-13, 1976

Published: Environmental Plutonium on the Nevada  
Test Site and Environs. U.S. Energy  
Research and Development Administration,  
Las Vegas, Nevada. June 1977. Publica-  
tion No. NVO-171. pp. 237-274

## PASSAGE OF SAND PARTICLES THROUGH THE GASTROINTESTINAL TRACT OF DAIRY COWS

Patzer, R. G., W. W. Sutton, and G. D. Potter

Presented: Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
February 12-13, 1976

Published: Environmental Plutonium on the Nevada  
Test Site and Environs. U.S. Energy  
Research and Development Administration,  
Las Vegas, Nevada. June 1977. Publica-  
tion No. NVO-171. pp. 151-165

## GRAZING STUDIES ON A CONTAMINATED RANGE OF THE NEVADA TEST SITE

Smith, D. D.

Presented: Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
February 12-13, 1976

Published: Environmental Plutonium on the Nevada  
Test Site and Environs. U.S. Energy  
Research and Development Administration,  
Las Vegas, Nevada. June 1977. Publica-  
tion No. NVO-171. pp. 139-149

## BIOLOGICAL TRANSPORT OF CURIUM-243 IN LACTATING DAIRY GOATS

Sutton, W. W., R. G. Patzer, P. B. Hahn, and G. D. Potter

Presented: Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
February 12-13, 1976

Published: Environmental Plutonium on the Nevada  
Test Site and Environs. U.S. Energy  
Research and Development Administration,  
Las Vegas, Nevada. June 1977. Publica-  
tion No. NV0-171. pp. 167-178

## BOVINE TRANSPORT AND RETENTION OF PLUTONIUM-238 WITH SPECIAL EMPHASIS ON THE GASTROINTESTINAL UPTAKE OF IN VIVO-LABELED MILK

Sutton, W. W., R. G. Patzer, P. B. Hahn, and G. D. Potter

Presented: Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
February 12-13, 1976

Published: Environmental Plutonium on the Nevada  
Test Site and Environs. U.S. Energy  
Research and Development Administration,  
Las Vegas, Nevada. June 1977. Publica-  
tion No. NV0-171. pp. 179-192

## AMBIENT AIR QUALITY MONITORING

Morgan, G. B.

Presented: 8th Materials Research Symposium  
Gaithersburg, Maryland  
September 20-24, 1976

Published: Methods and Standards for Environmental  
Measurement. National Bureau of Standards,  
Washington, D.C. November 1977. NBS  
Publication No. 464. pp. 381-385

## DEVELOPMENT OF A TWO-FREQUENCY DOWNWARD LOOKING AIRBORNE LIDAR

Eckert, J. A., D. H. Bundy, and J. L. Peacock

Presented: 8th Materials Research Symposium  
Gaithersburg, Maryland  
September 20-24, 1976

Published: Methods and Standards for Environmental  
Measurement. National Bureau of Standards,  
Washington, D.C. November 1977. NBS  
Publication No. 464. pp. 295-300

## APPLICATION OF THE ARTIFICIAL RUMEN AND SIMULATED BOVINE GASTROINTESTINAL FLUIDS PROCEDURE IN THE STUDY OF THE BIOAVAILABILITY OF FIELD-DEPOSITED TRANSURANICS

Barth, J.

Presented: Symposium on the Dynamics of Transuranics  
in Terrestrial and Aquatic Environments  
Nevada Applied Ecology Group  
Gatlinburg, Tennessee  
October 5-7, 1976

Published: Transuranics in Natural Environments.  
U.S. Energy Research and Development  
Administration, Las Vegas, Nevada.  
June 1977. Publication No. NV0-178.  
pp. 419-433

## SOME NEW STATISTICAL CONCEPTS FOR QUALITY CONTROL

Kinnison, R. R., and A. N. Jarvis

Presented: Symposium on the Dynamics of Transuranics  
in Terrestrial and Aquatic Environments  
Nevada Applied Ecology Group  
Gatlinburg, Tennessee  
October 5-7, 1976

Published: Transuranics in Natural Environments.  
U.S. Energy Research and Development  
Administration, Las Vegas, Nevada.  
June 1977. Publication No. NV0-178.  
pp. 593-600

## **TRANSURANIC ELEMENTS IN TERRESTRIAL ANIMALS AND THE ENVIRONMENT: AN INTRODUCTION**

**Potter, G. D.**

**Presented:** Symposium on the Dynamics of Transuranics  
in Terrestrial and Aquatic Environments  
Nevada Applied Ecology Group  
Gatlinburg, Tennessee  
October 5-7, 1976

**Published:** Transuranics in Natural Environments.  
U.S. Energy Research and Development  
Administration, Las Vegas, Nevada.  
June 1977. Publication No. NVO-178.  
pp. 379-383

## **REVIEW OF GRAZING STUDIES ON PLUTONIUM-CONTAMINATED RANGELANDS**

**Smith, D. D.**

**Presented:** Symposium on the Dynamics of Transuranics  
in Terrestrial and Aquatic Environments  
Nevada Applied Ecology Group  
Gatlinburg, Tennessee  
October 5-7, 1976

**Published:** Transuranics in Natural Environments.  
U.S. Energy Research and Development  
Administration, Las Vegas, Nevada.  
June 1977. Publication No. NVO-178.  
pp. 407-417

## **TRANSPORT OF PLUTONIUM VIA FOOD PRODUCTS OF ANIMAL ORIGIN**

**Sutton, W. W., and A. A. Mullen**

**Presented:** Symposium on the Dynamics of Transuranics  
in Terrestrial and Aquatic Environments  
Nevada Applied Ecology Group  
Gatlinburg, Tennessee  
October 5-7, 1976

**Published:** Transuranics in Natural Environments.  
U.S. Energy Research and Development  
Administration, Las Vegas, Nevada.  
June 1977. Publication No. NVO-178.  
pp. 435-448



## OFF-SITE MEDICAL ACTIVITIES, NEVADA TEST SITE AND THE MEDICAL LIAISON OFFICER NETWORK: A HISTORICAL REVIEW

van der Smissen, E., and M. E. Kaye

Presented: Symposium on the Dynamics of Transuranics  
in Terrestrial and Aquatic Environments  
Nevada Applied Ecology Group  
Gatlinburg, Tennessee  
October 5-7, 1976

Published: Transuranics in Natural Environments.  
U.S. Energy Research and Development  
Administration, Las Vegas, Nevada.  
June 1977. Publication No. NV0-178.  
pp. 17-24

## THE RELATIONSHIP OF MICROBIAL PROCESSES TO THE FATE OF TRANSURANIC ELEMENTS IN SOIL

Wildung, R. E., H. Drucker, and F. H. F. Au

Presented: Symposium on the Dynamics of Transuranics  
in Terrestrial and Aquatic Environments  
Nevada Applied Ecology Group  
Gatlinburg, Tennessee  
October 5-7, 1976

Published: Transuranics in Natural Environments.  
U.S. Energy Research and Development  
Administration, Las Vegas, Nevada.  
June 1977. Publication No. NV0-178.  
pp. 127-169

## TERRESTRIAL MONITORING OF ELEMENTAL CONTAMINANTS AROUND GEOTHERMAL POWER PLANTS

Crockett, A. B.

Presented: Geothermal Environmental Symposium-1976  
Lakeport, California  
October 27-29, 1976

Published: Geothermal Environmental Symposium-1976  
Geothermal Seminar, Lakeport, California.  
pp. 205-211

## THE DETECTION AND MAPPING OF OIL ON A MARSHY AREA BY A REMOTE LUMINESCENT SENSOR

McFarlane, J. C., and R. D. Watson

Presented: 1977 Oil Spill Conference: Prevention,  
Behavior, Control, Cleanup  
New Orleans, Louisiana  
March 8-10, 1977

Published: Proceedings: 1977 Oil Spill Conference.  
American Petroleum Institute, Washington,  
D.C. API Publication No. 4284. pp. 197-201

## REMOTE SENSING OF AIR POLLUTION

Eckert, J. A., and R. B. Evans

Presented: Eleventh International Symposium on  
Remote Sensing of Environment  
Ann Arbor, Michigan  
April 25-29, 1977

Published: Proceedings of Eleventh International  
Symposium on Remote Sensing of Environ-  
ment, Vol. 1. Center for Remote Sensing  
Information and Analysis, Environmental  
Research Institute of Michigan, Ann  
Arbor, Michigan. April 1977. pp. 353-  
359

## STATUS OF BASELINE SAMPLING FOR ELEMENTS IN SOIL AND VEGETATION AT FOUR KGRA'S IN THE IMPERIAL VALLEY, CALIFORNIA

Crockett, A. B., and G. B. Wiersma

Presented: Geothermal: State of the Art  
San Diego, California  
May 9-11, 1977

Published: Geothermal: State of the Art,  
TRANSACTIONS, Vol. 1 Geothermal  
Resources Council, Davis, California.  
May 1977. pp. 65-67

## **AIRBORNE ACTIVE REMOTE SENSING OF POLLUTANTS**

**Eckert, J. A., and M. P. F. Bristow**

**Presented:** Second National Conference on the  
Interagency R&D Program  
Washington, D.C.  
June 6-7, 1977

**Published:** Energy/Environment II. U.S. Environmental Protection Agency, Washington, D.C. November 1977. Publication No. EPA-600/9-77-012. pp. 473-475

## **WESTERN COAL AND OIL SHALE--GROUNDWATER QUALITY MONITORING RESEARCH AND DEVELOPMENT**

**McMillion, L. G.**

**Presented:** Second National Conference on the  
Interagency R&D Program  
Washington, D.C.  
June 6-7, 1977

**Published:** Energy/Environment II. U.S. Environmental Protection Agency, Washington, D.C. November 1977. Publication No. EPA-600/9-77-012. pp. 411-414

## **AIR AND WATER QUALITY DATA INTEGRATION IN THE WESTERN ENERGY RESOURCE DEVELOPMENT AREA**

**McNelis, D. N.**

**Presented:** Second National Conference on the  
Interagency R&D Program  
Washington, D.C.  
June 6-7, 1977

**Published:** Energy/Environment II. U.S. Environmental Protection Agency, Washington, D.C. November 1977. Publication No. EPA-600/9-77-012. pp. 399-402

## WESTERN ENERGY-RELATED OVERHEAD MONITORING PROJECT

Tilton, E. L., III, and R. W. Landers, Jr.

Presented: Second National Conference on the  
Interagency R&D Program  
Washington, D.C.  
June 6-7, 1977

Published: Energy/Environment II. U.S. Environmental Protection Agency, Washington, D.C. November 1977. Publication No. EPA-600/9-77-012. pp. 415-416

## MISCELLANEOUS

### VERTICAL FLUXES AND EXCHANGE COEFFICIENTS IN THE AIR OVER ST. LOUIS: FIELD PROGRAM 1975

Ackerman, B., Illinois State Water Survey, Urbana, Illinois. Grant No. R803682. J. L. McElroy, Project Officer, EMSL-Las Vegas, Office of Research and Development, EPA, Las Vegas, Nevada. Environmental Sciences Research Laboratory, Office of Research and Development, EPA, Research Triangle Park, North Carolina  
EPA-600/4-77-045, November 1977 72 pp.

**ABSTRACT:** A field program was conducted in the greater metropolitan area of St. Louis, Missouri, during February and July 1975 as part of the Regional Air Pollution Study. The purpose was to collect atmospheric measurements needed for future studies of the planetary boundary layer over urban and industrial areas and surrounding rural areas. The overall goals of the planetary boundary layer study are to 1) describe the thermodynamic, wind and turbulence fields over the region; 2) determine the magnitude and vertical variation of the vertical fluxes of heat, moisture and momentum as a function of land use; 3) obtain estimates of the exchange coefficients of these variables; and 4) determine the dependence of turbulence intensity on land use.

Pilot-balloon stations provided simultaneous measurements of the wind profile with vertical resolution. Tethered-balloon sounding systems yielded thermodynamic and wind profiles. An airplane equipped with meteorological instruments provided measurements of the three components of wind velocity and of high frequency fluctuations in velocity, temperature and humidity.

Observational periods, or missions, were scheduled for 3- or 4-hour durations during field experiments. The objectives included (a) mapping missions to delineate the thermodynamic, wind and turbulent fields over the region, (b) flux missions to provide estimates of the true vertical fluxes of momentum, heat and moisture simultaneously with vertical profiles of these variables, and (c) nocturnal missions to provide information on the strength of the nocturnal heat island circulation.

Order from: NTIS

Price: Paper copy \$5.25 (A04)  
Microfiche \$3.00 (A01)

#### IV. UNPUBLISHED PRESENTATIONS AT SCIENTIFIC AND PROFESSIONAL MEETINGS

##### INCORPORATION OF TRANSURANICS INTO VEGETABLE AND FIELD CROPS GROWN AT THE NEVADA TEST SITE\*

Au, F. H. F., V. D. Leavitt, W. F. Beckert, and J. C.  
McFarlane

Presented: Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
March 3-4, 1977

##### THE SOLUBILITY OF NEPTUNIUM-234 IN AN ARTIFICIAL RUMEN AND SIMULATED BOVINE GASTROINTESTINAL FLUIDS\*

Barth, J.

Presented: Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
March 3-4, 1977

##### ENVIRONMENTAL PLUTONIUM LEVELS NEAR THE NEVADA TEST SITE\*

Bliss, W. A., and F. M. Jakubowski

Presented: Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
March 3-4, 1977

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\* To appear in proceedings

**ABSORPTION, DISTRIBUTION AND MILK SECRETION OF NEPTUNIUM IN THE DAIRY GOAT\***

Mullen, A. A., S. R. Lloyd, R. E. Mosley, G. D. Potter, and R. G. Patzer

Presented: Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
March 3-4, 1977

**COMPARISONS OF CURIUM-243 AND PLUTONIUM-238 BIOLOGICAL TRANSPORT TO DAIRY ANIMALS FOLLOWING INTRAVENOUS INJECTION\***

Patzer, R. G., W. W. Sutton, A. A. Mullen, P. B. Hahn, and G. D. Potter

Presented: Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
March 3-4, 1977

**ACTINIDE CONCENTRATIONS IN TISSUES FROM CATTLE GRAZING A CONTAMINATED RANGE\***

Smith, D. D., and D. E. Bernhardt

Presented: Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
March 3-4, 1977

**PLUTONIUM RETENTION IN DAIRY CALVES FOLLOWING INGESTION OF EITHER IN VIVO LABELED OR IN VITRO LABELED MILK\***

Sutton, W. W., R. G. Patzer, P. B. Hahn, and G. D. Potter

Presented: Plutonium Information Conference  
Nevada Applied Ecology Group  
Las Vegas, Nevada  
March 3-4, 1977

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\* To appear in proceedings

## REVIEW OF SURVEY SYSTEMS FOR AIR QUALITY MONITORING\*

Evans, R. B.

Presented: Aerial Techniques for Environmental  
Monitoring Topical Symposium  
American Nuclear Society  
Las Vegas, Nevada  
March 7-11, 1977

## QUALITY ASSURANCE FOR AIRBORNE CONTACT MONITORING\*

Hansen, D. A.

Presented: Aerial Techniques for Environmental  
Monitoring Topical Symposium  
American Nuclear Society  
Las Vegas, Nevada  
March 7-11, 1977

## PLUME CHARACTERIZATION FOR ENFORCEMENT PURPOSES\*

Johnson, F. G., and D. T. Mage

Presented: Aerial Techniques for Environmental  
Monitoring Topical Symposium  
American Nuclear Society  
Las Vegas, Nevada  
March 7-11, 1977

## AERIAL PHOTOGRAPHIC APPLICATIONS IN SUPPORT OF OIL SPILL CLEANUP, CONTROL, AND PREVENTION\*

Jones, D., R. W. Landers, and A. Pressman

Presented: Aerial Techniques for Environmental  
Monitoring Topical Symposium  
American Nuclear Society  
Las Vegas, Nevada  
March 7-11, 1977

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\* To appear in proceedings



**AN ACTIVE SYSTEM FOR REMOTE AIRBORNE MEASUREMENTS OF  
SULFUR DIOXIDE IN SMOKESTACK PLUMES\***

Thompson, R. T.

Presented: Aerial Techniques for Environmental  
Monitoring Topical Symposium  
American Nuclear Society  
Las Vegas, Nevada  
March 7-11, 1977

**AERIAL PHOTOGRAPHIC SURVEY OF VEGETATION DAMAGE CAUSED  
BY AN AIR POLLUTION INCIDENT\***

Williams, D. R., and J. H. Long

Presented: Aerial Techniques for Environmental  
Monitoring Topical Symposium  
American Nuclear Society  
Las Vegas, Nevada  
March 7-11, 1977

(Also presented at: Remote Sensing of Natural Resources, Utah  
State University, Logan, Utah, April 21-22, 1977.)

**THE ROLE OF REMOTE SENSING IN MONITORING POLLUTION  
ASSOCIATED WITH ENERGY DEVELOPMENT**

Eckert, J. A.

Presented: 12th Annual Meeting of the U.S. Public  
Health Service Professional Association  
San Francisco, California  
April 3-6, 1977

**FOOD HABITS OF DESERT BIGHORN SHEEP IN NEVADA, 1956-  
1966\***

Brown, K. W., D. D. Smith, and R. P. McQuivey

Presented: Desert Bighorn Council  
Las Cruces, New Mexico  
April 6-8, 1977

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\* To appear in proceedings

## MACROINVERTEBRATE SAMPLING TECHNIQUES APPLICABLE TO STREAMS OF SEMIARID REGIONS

Hornig, C. E., and J. E. Pollard

Presented: North American Benthological Society  
Roanoke, Virginia  
April 6-7, 1977

and 21st Annual Meeting of the Arizona  
Academy of Sciences  
Las Vegas, Nevada  
April 15-16, 1977

(Abstract published in Proceedings of 21st Annual Meeting, J.  
Ariz. Acad. Sci. 12, April 1977, p. 32)

## MACROBENTHIC COMMUNITIES IN LAKE MEAD, NEVADA

Melancon, S. M. S.

Presented: North American Benthological Society  
Roanoke, Virginia  
April 6-7, 1977

and 21st Annual Meeting of the Arizona  
Academy of Sciences  
Las Vegas, Nevada  
April 15-16, 1977

(Abstract published in Proceedings of 21st Annual Meeting, J.  
Ariz. Acad. Sci. 12, April 1977, p. 33)

## AERIAL PHOTOGRAPHIC SURVEY OF VEGETATION DAMAGE CAUSED BY AN AIR POLLUTION INCIDENT\*

Williams, D. R., and J. H. Long

Presented: Remote Sensing of Natural Resources  
Utah State University  
Logan, Utah  
April 21-22, 1977

(Also presented at: Aerial Techniques for Environmental Monitor-  
ing Topical Symposium, Las Vegas, Nevada, March 7-11, 1977.)

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\* To appear in proceedings

THE U.S. ENVIRONMENTAL PROTECTION AGENCY PROGRAM OF  
ENVIRONMENTAL REMOTE SENSING FROM AIRCRAFT

Melfi, S. H.

Presented: Seventh Annual Symposium on the  
Analytical Chemistry of Pollutants  
Lake Lanier Islands, Georgia  
April 25-27, 1977

RADIONUCLIDE AND HEAVY METAL TRANSPORT TO AERIAL  
FUNGAL SPORES

Au, F. H. F., and W. F. Beckert

Presented: American Society for Microbiology  
Annual Meeting  
New Orleans, Louisiana  
May 8-13, 1977

(Abstract published in Abstracts of the Annual Meeting, Abstract  
No. I 126)

ETHYLMERCURY: FORMATION IN PLANT TISSUES AND RELATION  
TO METHYLMERCURY FORMATION\*

Fortmann, L. C., D. D. Gay, and K. O. Wirtz

Presented: Eleventh Annual Conference on Trace  
Substances in Environmental Health  
Columbia, Missouri  
June 7-9, 1977

COMPARISON OF THE EFFICIENCY OF MACROINVERTEBRATE  
SAMPLERS IN THE WHITE RIVER, UTAH

Pollard, J. E., and C. E. Hornig

Presented: Annual Meeting of Western Division of  
the American Society of Limnology and  
Oceanography  
San Francisco, California  
June 12-16, 1977

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\* To appear in proceedings

## **SOME STATISTICAL CONCEPTS NEW FOR QUALITY CONTROL**

**Kinnison, R. R., and A. N. Jarvis**

**Presented:** Western Regional Meeting of the  
American Statistical Association  
Stanford University  
Stanford, California  
June 21-23, 1977

## **FUTURE ANALYTICAL REQUIREMENTS FOR THE DETERMINATION OF TRACE AND ULTRATRACE LEVELS OF METALS IN BIOENVIRONMENTAL SYSTEMS**

**Morgan, G. B., and E. W. Bretthauer**

**Presented:** Symposium on Ultratrace Analysis of  
Metals in Biological Systems and  
the Environment  
American Chemical Society  
Chicago, Illinois  
August 28 - September 2, 1977

(Published as "Metals in Bioenvironmental Systems," Anal. Chem.  
49:14, December 1977, pp. 1210A-1213A)

## **PLASMA EMISSION ANALYSIS OF GEOTHERMAL WATER**

**Bratten, G., and D. R. Scott**

**Presented:** 1977 Pacific Conference on Chemistry  
and Spectroscopy  
Anaheim, California  
October 12-14, 1977

## **ZEEMAN ATOMIC ABSORPTION SPECTROSCOPY AND ITS CAPABILITIES**

**Kelley, H. L.**

**Presented:** 1977 Pacific Conference on Chemistry  
and Spectroscopy  
Anaheim, California  
October 12-14, 1977

APPLICATION OF REMOTE SENSING FOR OIL SPILL PREVENTION,  
CONTROL AND COUNTERMEASURES COMPLIANCE MONITORING

Duggan, J. S.

Presented: American Society of Photogrammetry  
Fall Technical Meeting  
Little Rock, Arkansas  
October 18-21, 1977

(Abstract published in Proceedings of 1977 Fall Technical Meeting,  
American Society of Photogrammetry, Falls Church, Virginia, p. 55)

APPLICATION OF A METHODOLOGY FOR THE DESIGN OF A  
CARBON MONOXIDE MONITORING NETWORK IN THE LAS VEGAS  
VALLEY, NEVADA\*

Behar, J. V., J. L. McElroy, L. M. Dunn, P. N. Lem,  
and M. K. Liu

Presented: Fourth Joint Conference on Sensing of  
Environmental Pollutants  
New Orleans, Louisiana  
November 6-11, 1977

TROPHIC CLASSIFICATION OF COLORADO LAKES UTILIZING  
CONTACT DATA AND LANDSAT AND AIRCRAFT-ACQUIRED MULTI-  
SPECTRAL SCANNER DATA\*

Boland, D. H. P , and R. J. Blackwell

Presented: Fourth Joint Conference on Sensing of  
Environmental Pollutants  
New Orleans, Louisiana  
November 6-11, 1977

THE APPLICATION OF FLUORESCENCE SPECTROSCOPY TO REMOTE  
MONITORING OF TOTAL ORGANICS IN SURFACE WATERS\*

Bristow, M., and D. Neilsen

Presented: Fourth Joint Conference on Sensing of  
Environmental Pollutants  
New Orleans, Louisiana  
November 6-11, 1977

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\* To appear in proceedings

**DIMETHYLMERCURY: VOLATILIZATION FROM PLANTS\***

Gay, D. D., L. C. Fortmann, K. O. Wirtz, and C. W. Frank

Presented: Fourth Joint Conference on Sensing of  
Environmental Pollutants  
New Orleans, Louisiana  
November 6-11, 1977

**COMPARISON OF MACROINVERTEBRATE SAMPLERS AS THEY APPLY  
TO STREAMS OF SEMIARID REGIONS\***

Kinney, W. L., J. E. Pollard, and C. E. Hornig

Presented: Fourth Joint Conference on Sensing of  
Environmental Pollutants  
New Orleans, Louisiana  
November 6-11, 1977

**AMBIENT AIR MONITORING DESIGN: METHODOLOGY AND  
ILLUSTRATIVE EXAMPLES\***

McElroy, J. L.

Presented: Fourth Joint Conference on Sensing of  
Environmental Pollutants  
New Orleans, Louisiana  
November 6-11, 1977

**DEVELOPMENT OF A POLLUTANT MONITORING SYSTEM FOR  
BIOSPHERE RESERVES AND RESULTS OF THE GREAT SMOKY  
MOUNTAINS PILOT STUDY\***

Wiersma, G. B., K. W. Brown, and A. B. Crockett

Presented: Fourth Joint Conference on Sensing of  
Environmental Pollutants  
New Orleans, Louisiana  
November 6-11, 1977

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\* To appear in proceedings

## A PRESENT CHALLENGE -- THE SERVICE ANALYSIS

Hahn, P. B.

Presented: Fourth Annual Meeting of the  
Federation of Analytical Anachem  
Award Symposium  
Chemistry and Spectroscopy Societies  
Detroit, Michigan  
November 7-11, 1977

## BIOLOGICAL MONITORING OF AVAILABLE TOXIC MATERIALS IN SOIL

Rogers, R. D., D. V. Bradley, and J. C. McFarlane

Presented: 1977 Annual Meeting  
American Society of Agronomy  
Los Angeles, California  
November 13-18, 1977

(Abstract published in Agronomy Abstracts, 1977 Annual Meeting,  
p. 35)

## THE DEVELOPMENT OF A THREE-DIMENSIONAL WIND MODEL FOR COMPLEX TERRAIN\*

Yocke, M. A., M. K. Liu, and J. L. McElroy

Presented: Joint Conference on Application of Air  
Pollution Meteorology  
Salt Lake City, Utah  
November 28 - December 2, 1977

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\* To appear in proceedings

## V. WORKING PAPER SERIES

### EPA NATIONAL EUTROPHICATION SURVEY WORKING PAPER SERIES, 1977

The National Eutrophication Survey was initiated in 1972 to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs. The Survey was designed to develop, in conjunction with State and environmental agencies, information on nutrient sources, concentrations and impact on selected freshwater lakes. This information provides a basis for formulating comprehensive and coordinated national, regional and State management practices relating to point source discharge reduction and nonpoint source pollution abatement in lake watersheds. Lake sampling was completed in November 1975.

Reports of data on individual lakes are being prepared cooperatively by the Special Studies Section, Criteria and Assessment Division, Corvallis Environmental Research Laboratory, 200 SW 35th Street, Corvallis, Oregon 97330, and the Water and Land Quality Branch, Monitoring Operations Division, EMSL-Las Vegas, P. O. Box 15027, Las Vegas, Nevada 89114.

Working papers listed here are available from NTIS and, as long as their supplies last, from the groups which prepared the reports.

<u>Working Paper No.</u>	<u>Date in 1977</u>	<u>Title</u>
243	December	ALLIGATOR LAKE, COLUMBIA COUNTY, FLORIDA
244	December	LAKE APOPKA, ORANGE AND LAKE COUNTIES, FLORIDA
245	December	BANANA LAKE, POLK COUNTY, FLORIDA
246	December	LAKE CRESCENT, PUTNAM, FLAGLER AND VOLUSIA COUNTIES, FLORIDA
247	December	DOCTORS LAKE, CLAY COUNTY, FLORIDA
248	December	LAKE DORA, LAKE COUNTY, FLORIDA
249	December	EAST LAKE TOHOPEKALIGA, OSCEOLA COUNTY, FLORIDA



<u>Working Paper No.</u>	<u>Date in 1977</u>	<u>Title</u>
250	December	LAKE ELOISE, POLK COUNTY, FLORIDA
251	December	LAKE GEORGE, VOLUSIA COUNTY, FLORIDA
252	December	LAKE GIBSON, POLK COUNTY, FLORIDA
253	December	GLENADA LAKE, HIGHLANDS COUNTY, FLORIDA
254	December	LAKE GRIFFIN, LAKE COUNTY, FLORIDA
255	December	LAKE HAINES, POLK COUNTY, FLORIDA
256	December	LAKE HANCOCK, POLK COUNTY, FLORIDA
257	December	LAKE HOWELL, SEMINOLE AND ORANGE COUNTIES, FLORIDA
258	December	LAKE ISTOKPOGA, HIGHLANDS COUNTY, FLORIDA
259	December	LAKE JESSIE, POLK COUNTY, FLORIDA
260	December	LAKE JESSUP, SEMINOLE COUNTY, FLORIDA
261	December	LAKE KISSIMMEE, OSCEOLA COUNTY, FLORIDA
262	December	LAKE LAWNE, ORANGE COUNTY, FLORIDA
263	December	LAKE LULU, POLK COUNTY, FLORIDA
264	December	LAKE MARION, POLK COUNTY, FLORIDA
265	December	LAKE MINNEHAHA, ORANGE COUNTY, FLORIDA
266	December	LAKE MINNEOLA, LAKE COUNTY, FLORIDA
267	December	LAKE MONROE, SEMINOLE AND VOLUSIA COUNTIES, FLORIDA
268	December	LAKE MUNSON, LEON COUNTY, FLORIDA
269	December	LAKE OKEECHOBEE, OKEECHOBEE, GLADES, PALM BEACH, MARTIN AND HENDRY COUNTIES, FLORIDA
270	December	LAKE SOUTH, BREVARD COUNTY, FLORIDA

<u>Working Paper No.</u>	<u>Date in 1977</u>	<u>Title</u>
271	November	LAKE POINSETT, BREVARD, OSCEOLA AND ORANGE COUNTIES, FLORIDA
272	December	LAKE REEDY, POLK COUNTY, FLORIDA
273	December	LAKE SEMINOLE, PINELLAS COUNTY, FLORIDA
274	December	LAKE TALQUIN, GADSDEN AND LEON COUNTIES, FLORIDA
275	December	LAKE TARPON, PINELLAS COUNTY, FLORIDA
276	December	LAKE THONOTOSASSA, HILLSBOROUGH COUNTY, FLORIDA
277	December	LAKE TOHOPEKALIGA, OSCEOLA COUNTY, FLORIDA
278	December	TROUT LAKE, LAKE COUNTY, FLORIDA
279	December	LAKE WEOHYAKAPKA, POLK COUNTY, FLORIDA
280	December	LAKE YALE, LAKE COUNTY, FLORIDA
351	June	CUMBERLAND LAKE, CLINTON, PULASKI, RUSSELL AND WAYNE COUNTIES, KENTUCKY
352	June	DALE HOLLOW RESERVOIR, CLINTON AND CUMBERLAND COUNTIES, KENTUCKY, AND CLAY, OVERTON, AND PICKETT COUNTIES, TENNESSEE
353	June	HERRINGTON LAKE, BOYLE, GARRARD AND MERCER COUNTIES, KENTUCKY
446	January	FT. LOUDOUN, WATTS BAR, CHICKAMAUGA AND NICKAJACK RESERVOIRS, LOUDON, KNOX, BLOUNT, RHEA, MEIGS, ROANE, MONROE, CUMBERLAND, McMINN, MARION AND HAMILTON COUNTIES, TENNESSEE
480	February	BEAVER, TABLE ROCK, BULL SHOALS AND TANEYCOMO RESERVOIRS, BENTON, LOUDON, CARROLL, BOONE, MARION AND BAXTER COUNTIES, ARKANSAS, AND BARRY, STONE, TANEY, AND OZARK COUNTIES, MISSOURI

<u>Working Paper No.</u>	<u>Date in 1977</u>	<u>Title</u>
481	January	BLACKFISH LAKE, CRITTENDEN AND ST. FRANCIS COUNTIES, ARKANSAS
482	January	BLUE MOUNTAIN LAKE, LOGAN AND YELL COUNTIES, ARKANSAS
483	January	LAKES OUACHITA, HAMILTON AND CATHERINE, MONTGOMERY, GARLAND AND HOT SPRING COUNTIES, ARKANSAS
484	January	CHICOT LAKE, CHICOT COUNTY, ARKANSAS
485	January	DeGRAY RESERVOIR, CLARK AND HOT SPRING COUNTIES, ARKANSAS
486	January	LAKE ERLING, LAFAYETTE COUNTY, ARKANSAS
487	January	GREER'S FERRY RESERVOIR, VAN BUREN AND CLEBURNE COUNTIES, ARKANSAS
488	January	GRAND LAKE, CHICOT COUNTY, ARKANSAS
489	January	MILLWOOD RESERVOIR, HEMPSTEAD, HOWARD, LITTLE RIVER AND SEVIER COUNTIES, ARKANSAS
490	January	NIMROD LAKE, PERRY AND YELL COUNTIES, ARKANSAS
491	January	NORFORK LAKE, BAXTER AND FULTON COUNTIES, ARKANSAS, AND OZARK COUNTY, MISSOURI
511	May	CEDAR BLUFF RESERVOIR, TREGO COUNTY, KANSAS
512	April	COUNCIL GROVE RESERVOIR, MORRIS COUNTY, KANSAS
513	April	ELK CITY RESERVOIR, MONTGOMERY COUNTY, KANSAS
514	April	FALL RIVER RESERVOIR, GREENWOOD COUNTY, KANSAS
515	April	JOHN REDMOND RESERVOIR, COFFEY AND LYON COUNTIES, KANSAS

<u>Working Paper No.</u>	<u>Date in 1977</u>	<u>Title</u>
516	May	KANOPOLIS RESERVOIR, ELLSWORTH COUNTY, KANSAS
517	April	MARION RESERVOIR, MARION COUNTY, KANSAS
518	April	MELVERN RESERVOIR, OSAGE COUNTY, KANSAS
519	April	MILFORD RESERVOIR, CLAY AND GEARY COUNTIES, KANSAS
520	April	NORTON RESERVOIR, NORTON COUNTY, KANSAS
521	May	PERRY RESERVOIR, JEFFERSON COUNTY, KANSAS
522	April	POMONA RESERVOIR, OSAGE COUNTY, KANSAS
523	April	TORONTO RESERVOIR, GREENWOOD AND WOODSON COUNTIES, KANSAS
524	April	TUTTLE CREEK RESERVOIR, MARSHALL, POTTAWATOMIE AND RILEY COUNTIES, KANSAS
525	May	WILSON RESERVOIR, RUSSELL COUNTY, KANSAS
528	March	LAKES VERNON AND ANACOCO, VERNON PARISH, LOUISIANA
529	March	LAKE BISTINEAU, BIENVILLE, BOSSIER AND WEBSTER PARISHES, LOUISIANA
530	March	BLACK BAYOU RESERVOIR, CADDO PARISH, LOUISIANA
531	March	BLACK LAKE, NATCHITOCHEs AND RED RIVER PARISHES, LOUISIANA
532	March	BRUIN LAKE, TENSAS PARISH, LOUISIANA
533	March	BUNDICK LAKE, BEAUREGARD PARISH, LOUISIANA
534	March	COCODRIE LAKE, CONCORDIA PARISH, LOUISIANA

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535	March	COCODRIE LAKE, RAPIDES PARISH, LOUISIANA
536	March	CONCORDIA LAKE, CONCORDIA PARISH, LOUISIANA
537	March	COTILE RESERVOIR, RAPIDES PARISH, LOUISIANA
538	March	CROSS LAKE, CADDO PARISH, LOUISIANA
539	March	BAYOU D'ARBONNE LAKE, UNION AND LINCOLN PARISHES, LOUISIANA
540	March	FALSE RIVER LAKE, POINTE COUPEE PARISH, LOUISIANA
541	March	INDIAN CREEK RESERVOIR, RAPIDES PARISH, LOUISIANA
542	March	SALINE LAKE, LaSALLE PARISH, LOUISIANA
543	March	TURKEY CREEK LAKE, FRANKLIN PARISH, LOUISIANA
544	March	LAKE VERRET, ASSUMPTION PARISH, LOUISIANA
547	February	CLEARWATER LAKE, REYNOLDS AND WAYNE COUNTIES, MISSOURI
548	February	POMME DE TERRE RESERVOIR, POLK AND HICKORY COUNTIES, MISSOURI
549	February	STOCKTON RESERVOIR, DADE, POLK AND CEDAR COUNTIES, MISSOURI
550	February	THOMAS HILL RESERVOIR, MACON AND RANDOLPH COUNTIES, MISSOURI
551	February	LAKE WAPPAPELLO, WAYNE AND BUTLER COUNTIES, MISSOURI
581	March	ALTUS RESERVOIR, GREER AND KIOWA COUNTIES, OKLAHOMA
582	March	ARBUCKLE LAKE, MURRAY COUNTY, OKLAHOMA

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583	March	ELSWORTH LAKE, CADDO AND COMANCHE COUNTIES, OKLAHOMA
584	March	LAKE EUFAULA, HASKEL, OKMULGEE, McINTOSH AND PITTSBURG COUNTIES, OKLAHOMA
585	March	FORT COBB RESERVOIR, CADDO COUNTY, OKLAHOMA
586	March	FORT SUPPLY RESERVOIR, WOODWARD COUNTY, OKLAHOMA
587	March	FOSS RESERVOIR, CUSTER COUNTY, OKLAHOMA
588	March	LAKE FRANCES, ADAIR COUNTY, OKLAHOMA
589	March	GRAND LAKE O' THE CHEROKEES, OTTAWA, MAYES, DELAWARE AND CRAIG COUNTIES, OKLAHOMA
590	March	LAKE HEFNER, OKLAHOMA COUNTY, OKLAHOMA
591	March	KEYSTONE RESERVOIR, TULSA, OSAGE, CREEK AND PAWNEE COUNTIES, OKLAHOMA
592	March	OOLOGAH RESERVOIR, NOWATA AND ROGERS COUNTIES, OKLAHOMA
593	March	TENKILLER FERRY RESERVOIR, CHEROKEE AND SEQUOYAH COUNTIES, OKLAHOMA
594	March	LAKE THUNDERBIRD, CLEVELAND COUNTY, OKLAHOMA
595	March	WISTER RESERVOIR, LeFLORE COUNTY, OKLAHOMA
598	January	LAKE ALBERT, KINGSBURY COUNTY, SOUTH DAKOTA
600	January	ANGOSTURA RESERVOIR, FALL RIVER COUNTY, SOUTH DAKOTA
602	January	LAKE BYRON, BEADLE COUNTY, SOUTH DAKOTA

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603	January	CLEAR LAKE, MARSHALL COUNTY, SOUTH DAKOTA
604	January	CLEAR LAKE, MINNEHAHA COUNTY, SOUTH DAKOTA
605	January	LAKE COCHRANE, DEUEL COUNTY, SOUTH DAKOTA
606	January	COTTONWOOD LAKE, SPINK COUNTY, SOUTH DAKOTA
607	January	DEERFIELD LAKE, PENNINGTON COUNTY, SOUTH DAKOTA
608	January	ENEMY SWIM LAKE, DAY COUNTY, SOUTH DAKOTA
609	January	LAKE HERMAN, LAKE COUNTY, SOUTH DAKOTA
610	January	LAKE ST. JOHN, HAMLIN COUNTY, SOUTH DAKOTA
611	January	LAKE KAMPESKA, CODINGTON COUNTY, SOUTH DAKOTA
612	January	LAKE MADISON, LAKE COUNTY, SOUTH DAKOTA
613	January	LAKE MITCHELL, DAVISON COUNTY, SOUTH DAKOTA
614	January	LAKE NORDEN, HAMLIN COUNTY, SOUTH DAKOTA
615	January	EAST OAKWOOD LAKE, BROOKINGS COUNTY, SOUTH DAKOTA
616	January	WEST OAKWOOD LAKE, BROOKINGS COUNTY, SOUTH DAKOTA
618	January	PICKEREL LAKE, DAY COUNTY, SOUTH DAKOTA
619	January	LAKE POINSETT, BROOKINGS AND HAMLIN COUNTIES, SOUTH DAKOTA
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622	January	ROY LAKE, MARSHALL COUNTY, SOUTH DAKOTA
624	January	SHERIDAN LAKE, PENNINGTON COUNTY, SOUTH DAKOTA
631	February	AMISTAD RESERVOIR, VAL VERDE COUNTY, TEXAS
632	October	BASTROP LAKE, BASTROP COUNTY, TEXAS
633	February	BELTON RESERVOIR, BELL AND CORYELL COUNTIES, TEXAS
634	April	BRAUNIG LAKE, BEXAR COUNTY, TEXAS
635	February	LAKE BROWNWOOD, BROWN COUNTY, TEXAS
636	February	LAKE BUCHANAN, BURNET AND LLANO COUNTIES, TEXAS
637	March	CADDO LAKE, CADDO PARISH, LOUISIANA, MARION AND HARRISON COUNTIES, TEXAS
638	February	CALAVERAS LAKE, BEXAR COUNTY, TEXAS
639	March	CANYON RESERVOIR, COMAL COUNTY, TEXAS
640	February	LAKE COLORADO CITY, MITCHELL COUNTY, TEXAS
641	February	LAKE CORPUS CHRISTI, JIM WELLS, LIVE OAK AND SAN PATRICIO COUNTIES, TEXAS
642	February	LAKE DIVERSION, ARCHER AND BAYLOR COUNTIES, TEXAS
643	February	EAGLE MOUNTAIN LAKE, TARRANT AND WISE COUNTIES, TEXAS
644	March	LAKE FORT PHANTOM HILL, JONES COUNTY, TEXAS
645	April	LAKE LYNDON B. JOHNSON, BURNET AND LLANO COUNTIES, TEXAS



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650	March	LAKE LEWISVILLE (GARZA-LITTLE ELM), DENTON COUNTY, TEXAS
651	February	LIVINGSTON RESERVOIR, POLK, SAN JACINTO, TRINITY AND WALKER COUNTIES, TEXAS
652	February	MEDINA LAKE, BANDERA AND MEDINA COUNTIES, TEXAS
653	March	LAKE MERIDETH, POTTER, MOORE AND HUTCHINSON COUNTIES, TEXAS
654	April	PALESTINE RESERVOIR, ANDERSON, CHEROKEE, HENDERSON AND SMITH COUNTIES, TEXAS
655	March	POSSUM KINGDOM RESERVOIR, PALO PINTO, STEPHENS AND YOUNG COUNTIES, TEXAS
656	March	O.C. FISHER (SAN ANGELO) RESERVOIR, TOM GREEN COUNTY, TEXAS
657	March	SAM RAYBURN RESERVOIR, ANGELINA, JASPER, NACOGDOCHES, SABINE AND SAN AUGUSTINE COUNTIES, TEXAS
658	March	E.V. SPENCE RESERVOIR, COKE COUNTY, TEXAS
659	March	SOMERVILLE LAKE, BURLESON, LEE AND WASHINGTON COUNTIES, TEXAS
660	March	LAKE STAMFORD, HASKELL COUNTY, TEXAS
661	March	STILLHOUSE HOLLOW RESERVOIR, BELL COUNTY, TEXAS
662	April	LAKE TAWAKONI, HUNT, RAINS AND VAN ZANDT COUNTIES, TEXAS

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666	March	TWIN BUTTES RESERVOIR, TOM GREEN COUNTY, TEXAS
667	March	WHITE RIVER RESERVOIR, CROSBY COUNTY, TEXAS
668	March	WHITNEY RESERVOIR, BOSQUE AND HILL COUNTIES, TEXAS
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733	August	LAKE POWELL, COCONINO COUNTY, ARIZONA, AND GARFIELD, KANE AND SAN JUAN COUNTIES, UTAH
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777	July	CASCADE RESERVOIR, VALLEY COUNTY, IDAHO
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779	July	DWORSHAK RESERVOIR, CLEARWATER COUNTY, IDAHO
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785	July	MAGIC RESERVOIR, CAMAS AND BLAINE COUNTIES, IDAHO, AND LINCOLN COUNTY, WYOMING
786	July	PALISADES RESERVOIR, BONNEVILLE COUNTY, IDAHO, AND LINCOLN COUNTY, WYOMING
787	July	UPPER AND LOWER TWIN LAKES, KOOTENAI COUNTY, IDAHO
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807	September	LAHONTAN RESERVOIR, CHURCHILL AND LYON COUNTIES, NEVADA
808	September	LAKE MEAD, CLARK COUNTY, NEVADA AND MOHAVE COUNTY, ARIZONA
809	September	RYE PATCH RESERVOIR, PERSHING COUNTY, NEVADA
810	September	LAKE TAHOE, CARSON CITY, DOUGLAS AND WASHOE COUNTIES, NEVADA, AND EL DORADO AND PLACER COUNTIES, CALIFORNIA
811	September	TOPAZ LAKE, DOUGLAS COUNTY, NEVADA, AND MONO COUNTY, CALIFORNIA
812	September	UPPER PAHRANAGAT LAKE, LINCOLN COUNTY, NEVADA
813	September	WALKER LAKE, MINERAL COUNTY, NEVADA
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815	September	WILD HORSE RESERVOIR, ELKO COUNTY, NEVADA
816	September	WILSON RESERVOIR, ELKO COUNTY, NEVADA
817	July	ALAMOGORDO RESERVOIR (SUMNER LAKE), DE BACA AND GUADALUPE COUNTIES, NEW MEXICO
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839	November	FISH LAKE, SEVIER COUNTY, UTAH
840	December	HUNTINGTON LAKE, EMERY COUNTY, UTAH
841	November	JOES VALLEY RESERVOIR, EMERY COUNTY, UTAH
842	December	LOWER BOWN'S RESERVOIR, GARFIELD COUNTY, UTAH
843	November	LYNN RESERVOIR, BOX ELDER COUNTY, UTAH
846	December	MINERSVILLE RESERVOIR, BEAVER COUNTY, UTAH
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848	November	NAVAJO LAKE, KANE COUNTY, UTAH
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858	December	STARVATION RESERVOIR, DUCHESNE COUNTY, UTAH
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865	July	BANKS LAKE, GRANT AND DOUGLAS COUNTIES, WASHINGTON
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867	December	DIAMOND LAKE, PEND OREILLE COUNTY, WASHINGTON
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875	July	LAKE WHATCOM, WHATCOM COUNTY, WASHINGTON
876	July	LOWER GRANITE RESERVOIR, GARFIELD AND WHITMAN COUNTIES, WASHINGTON
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893	August	WOODRUFF NARROWS RESERVOIR, UINTA COUNTY, WYOMING
894	November	YELLOWTAIL RESERVOIR (BIG HORN LAKE), BIG HORN COUNTY, WYOMING, AND BIG HORN AND CARBON COUNTIES, MONTANA

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