

WYMAN HARRISON

Senior Scientist (1976)

Argonne National Laboratory, Argonne, IL 60439

Educational Background

Ph.D. 1956, University of Chicago, Geology
M.S. 1954, University of Chicago, Geology
B.S. 1953, University of Chicago, Physical Science
Undergraduate 1949-1952, Stanford University, Geology major

Professional Experience

6/93 - 7/94 Special Term Appointee, Engineering Physics Division

Functioning as member of review panel for classified U. S. Department of Energy activities related to underground test measurements technologies for detection and discrimination of nuclear weapons explosions.

2/91 - 5/93 (retired) Senior Geologist, Energy Systems Division, Argonne National Laboratory

Responsible for conceiving, marketing, and managing projects in various areas of basic and applied research, with emphasis on geophysical and geochemical studies of contaminated natural environments. Managed a five-year, \$15-million program of technical assistance to the Baltimore District, U.S. Army Corps of Engineers, in the areas of Superfund and DOD/IRP studies. Served as Arbitrator for disputes between DOE Weapons Laboratories staffs on the DOE Review Panel for (classified) Underground Test Measurements Technologies.

7/89 - 1/91 Senior Geologist, Special Projects Group, Energy Systems Division, Argonne National Laboratory

Managed 1) the three-year performance review of major facility systems to support semiconductor and circuit-board manufacturing at the National Security Agency's Special Process Laboratories, Ft. Meade, Maryland, and 2) the site-characterization study, human-health risk assessment, and foundation-excavation design for the \$100-million Walter Reed Army Institute of Research building, Forest Glen, Maryland.

1/87-6/89 Senior Geologist and Program Manager, Energy and Environmental Systems Division, Argonne National Laboratory

Conceived, developed, and managed research and assessment programs in areas of science and engineering that related to the evaluation and exploitation of energy resources and to the development and use of energy technologies. Managed the five-year,

75-person peer review of major contractor documents submitted to DOE in support of construction of a high-level nuclear waste repository in salt rock and granitic rock environments.

1/78-12/86 Associate Director for Geoscience and Engineering, Energy and Environmental Systems Division, Argonne National Laboratory

Supervised a multimillion dollar research program involving field measurements, laboratory experiments, mathematical modeling, and assessment studies conducted by the Geology and Geophysics, Hydrologic and Geologic Engineering, and Geotechnology and Applied Research Sections. Major projects were concerned with ocean thermal energy conversion, petroleum resources of the USSR and China, site characterization strategies for waste management, studies of crystalline rocks in the north central and northeastern regions of the U.S., and development of advanced chemical and electronic sensors for detection of environmental contaminants.

1/76-12/77 Senior Geologist and Manager, Water Resources Research Program, Energy and Environmental Systems Division, Argonne National Laboratory

Directed studies of energy-related pollution of the Great Lakes basin's water environment, including field measurements, laboratory analytical work, and computer modeling.

1/75-12/76 Environmental Scientist, Argonne National Laboratory, Manager, Great Lakes Research Program

Conducted and managed studies of nearshore thermal and chemical pollution of coastal waters of Lake Michigan.

9/71-12/74 Professor of Geography, University of Toronto.

Developed the Environmental Studies Program at Erindale College and was Associate Chairman of the Geography Department. Major research was devoted to field and theoretical studies of the physical and chemical fate of crude oil spills as related to the siting of supertanker ports in Canada and the Bahamas. Other research was devoted to assessing slope-hazard lands in Ontario and remote sensing of lake processes.

1/69-8/71 Chairman of the Department of Physical, Chemical, and Geological Oceanography at the Virginia Institute of Marine Science (also was Associate Professor of Marine Science at the University of Virginia and Professor of Marine Science at the College of William and Mary)

Planned and supervised an extensive program of research and education related to Virginia's beaches, estuaries, shorelines, wetlands, and continental shelf.

1/65-12/68 Director, U.S. Department of Commerce's (ESSA's) Land and Sea Interaction Laboratory, Norfolk, Virginia

Managed an intensive basic research program on Atlantic-coast inlet and shelf-water hydrodynamics, sediment transport, and beach-ocean-atmosphere interactions.

9/63-12/64 Supervisory Oceanographer, Oceanographic Analysis Branch, U.S. Coast and Geodetic Survey, Washington, D.C.

Was in charge of reduction of geophysical/marine geological data from ocean cruises. Conducted study of subbottom stratigraphy of Chesapeake Bay.

3/62-8/63 Marine Scientist, Virginia Institute of Marine Science

Conducted extensive investigations of sediments of Chesapeake Bay and studies of coastal and estuary dynamics.

9/60-2/62 Associate Professor of Geology (Chemistry Department), Norfolk College of William and Mary, Virginia

Founded what is now Old Dominion University's Department of Geophysical Sciences.

9/59-8/60 Assistant Professor of Geology, Dartmouth College

Taught sedimentology, sedimentary petrography, and glacial geology.

6/56-8/59 Geologist, Indiana Geological Survey

Mapped Marion County (Indianapolis area) and conducted fundamental studies of petrologic and soil-mechanical properties of glacial sediments.

Professional Affiliations

American Geophysical Union
American Institute of Professional Geologists
Association of Engineering Geologists

Registration

Geologist No. 2476, California (registration now defunct)

Security Clearance

DOE "Q" Clearance (1990-1995)

Certifications

Professional Geologist No. 487 (Virginia)
American Institute of Professional Geologists (Charter Member #134)

Short Courses

- 1963, Estuarine and Coastal Hydrodynamics, M.I.T.
- 1979, Oil Reservoir Engineering, George Washington University
- 1989, Practical Integrated Circuit Fabrication, Ft. Meade, MD

Special Activities

- 1984-1986 — Member, Scientific Personnel Committee A, Argonne National Laboratory
- 1979-1980 — Vice President, American Institute of Professional Geologists, Illinois/Indiana Section
- 1974 — Member, President's Select Committee on Tenure Appeal, University of Toronto
- 1973 — Co-organizer, "National Conference on Oil and the Canadian Environment," held at the University of Toronto
- 1968 Autumn — Exchange Scientist, National Science Foundation's U.S.-India Exchange Program (Coastal Oceanography)
- 1965 — Co-organizer, "First International Conference on Marine Geotechnique," held at the University of Illinois/Urbana
- 1955 Summer — Invited Scientist, U.S. Army Corps of Engineers, Ice Tunnel Project, Thule, Greenland

Award

- 1969 — Environmental Science Services Administration (ESSA) Research Laboratories' Distinguished Authorship Award for ESSA Professional Paper No. III, "Circulation of Continental Shelf Waters Off the Chesapeake Bight."

Publications: Books

- MacKay, D., and W. Harrison, Oil and the Canadian Environment, University of Toronto Press (1973).
- Harrison, W., The Geology of Marion County, Indiana, Indiana Geological Survey Bulletin 28 (1963).

Journal Articles and Book Contributions

- Harrison, W., and D.J. Santini and D.G. Aubrey, Assessing Impacts of Potential Accelerating Sea-Level Rise on Coastal Energy Facilities, U.S.A., *Internat. Jour. Energy, Environ., Economics*, v. 1, no. 1 (March) pp. 63-69 (1991).
- Lewan, M.D., and G.F. Ulmishek, W. Harrison, and F. Schreiner, Gamma 60Co - Irradiation of Organic Matter in the Phosphoria Retort Shale, *Geochimica et Cosmo Chimica Acta*, v. 55:4, pp. 1051-1063, (April, 1991).
- Ulmishek, G., and W. Harrison, Oil and Gas Developments in USSR in 1983-1985, *American Association of Petroleum Geologists Bulletin*, 70(10):1566-1577 (1986).
- Van Luik, A.E., and W. Harrison, Mined-Land Reclamation Using Polluted Urban Navigable Waterway Sediments: III. Experience at a Demonstration Site, *J. Environmental Quality*, 13(3):423-431 (July-Sept. 1984).
- Luthy, R.G., V.C. Stamoudis, J.R. Campbell, and W. Harrison, Removal of Contaminants from Coal-Conversion Condensates, *J. Water Pollution Control Federation*, 55(2):196-207 (1983).
- Ulmishek, G., and W. Harrison, Oil and Gas Developments in USSR in 1982, *American Association of Petroleum Geologists Bulletin*, 67(10):1717-1722 (1983).
- Ulmishek, G., and W. Harrison, Peculiarities of Petroleum Formation in Highly Bituminous, Siliceous, Shaly, Carbonaceous Facies, Timan-Pechora Basin, USSR (abs.), *American Association of Petroleum Geologists Bulletin*, 67:561 (1983).
- Ulmishek, G., and W. Harrison, Uzen Development Gives New Insight into Projecting Future Soviet Oil Output, *Oil and Gas J.*, 79(134):148-154 (1981).
- Harrison, W., D.L. McCown, K.D. Saunders, and J.D. Ditmars, Wintertime Raw-Water Contamination at Chicago's South Water Filtration Plant, *J. Water Pollution Control Federation*, 51(10):2432-2446 (1979).
- Karrow, P.F., W. Harrison, and H.C. Saunderson, Reworked Middle Wisconsinan(?) Plant Fossils from the Brampton Esker, Southern Ontario, *Canadian J. of Earth Science*, 14(3):426-430 (1977).
- Gillis, W., R. Byrne, and W. Harrison, Bibliography of the Bahama Islands, *Atoll Research Bulletin No. 191*, pp. 1-123 (1975).
- Harrison, W., M. Winnik, P.T.Y. Kwong, and D. MacKay, Crude Oil Spills: Disappearance of Aromatic and Aliphatic Components from Small Sea-Surface Slicks, *J. Environmental Science and Technology*, 9:231-234 (1975).

- Harrison, W., Fate of Oil Spills and the Siting of Four Supertanker Ports, *Canadian Geographer*, 18(3):211-231 (1974).
- Fang, C.S., S.N. Wang, and W. Harrison, Groundwater Flow in a Sandy, Tidal Beach: 2. Two Dimensional Finite-Element Analysis, *Water Resources Research*, 8:121-128 (1972).
- Harrison, W., and J.D. Boon, III, Beach-Water-Table and Beach-Profile Measuring Equipment, *Shore and Beach*, 40:26-33 (1972).
- Harrison, W., Atlantis Undiscovered -- Bimini, Bahamas, *Nature*, 230:287-289 (1971).
- Harrison, W., C.S. Fang, and S.N. Wang, Groundwater Flow in a Sandy Tidal Beach: 1. One-Dimensional Finite-Element Analysis, *Water Resources Research*, 7:1313-1322 (1971).
- Harrison, W., Prediction of Beach Changes, in *Progress in Geography, International Reviews of Current Research*, Vol. 2, Edward Arnold, London, pp. 207-235 (1970).
- Lynch, M.P., and W. Harrison, Sedimentation Caused by a Tube-Building Amphipod, *J. Sedimentary Petrology*, March 30:434-436 (1970).
- Munday, J.C., W. Harrison, and W.G. MacIntyre, Oil Slick Motion near Chesapeake Bay Entrance, *Water Resources Bulletin*, 6(6):879-884 (1970).
- Harrison, W., Empirical Equations for Foreshore Changes over a Tidal Cycle, *Marine Geology*, 7:529-551 (1969).
- Harrison, W., Empirical Equation for Longshore Current Velocity, *J. Geophysical Research*, 72:6929-6936 (1968).
- Harrison, W., and N.A. Pore, An Approach to Correlation and Prediction in the Wind-Runoff-Drift System, in *Circulation of Shelf Waters off the Chesapeake Bight*, Environmental Science Services Administration Professional Paper No. 3 (1967).
- Harrison, W., and A. Richardson, Plate-Load Tests on Sandy Marine Sediments, Lower Chesapeake Bay, in *Marine Geotechnique*, Univ. of Illinois Press, Urbana, pp. 274-290 (1967).
- Norcross, J.J., and W. Harrison, Introduction to Surface and Bottom Drift of Continental Shelf Waters between Cape Henlopen, Delaware, and Cape Hatteras, North Carolina, June 1963 -- October 1964, in *Circulation of Shelf Waters off the Chesapeake Bight*, Environmental Science Services Administration Professional Paper No. 3, pp. 3-9 (1967).
- Harrison, W., R.G. Malloy, G.A. Rusnak, and J. Terasmae, Possible Late-Pleistocene Uplift, Chesapeake Bay Entrance, *J. of Geology*, 73:201-229 (1965).

- Harrison, W., N.A. Pore, and R.D. Tuck, Predictor Equations for Beach Processes and Responses, *J. Geophysical Research*, 70:6103-6109 (1965).
- Harrison, W., and M.L. Wass, Frequencies of Infaunal Invertebrates Related to Water Content of Chesapeake Bay Sediments, *Southeastern Geology*, 6(4):177-187 (1965).
- Harrison, W., M.P. Lynch, and A.G. Altschaeffl, Sediments of Lower Chesapeake Bay, with Emphasis on Mass Properties, *J. Sedimentary Petrology*, 34:727-755 (1964).
- Harrison, W., and C.J. Lyon, Sea-Level and Coastal Movements along the New England-Acadian Shore: 4500-3000 B.P., *J. of Geology*, 71:96-108 (1963).
- Harrison, W., Pleistocene Record in the Subsurface of the Norfolk Area, Virginia, in *Guidebook for Field Trips -- Norfolk Meeting*, Virginia Academy of Science, General Publication Series, Norfolk College of William and Mary, pp. 35-62 (1962).
- Harrison, W., and J. Terasmae, Remanent Magnetism in Silts of Pleistocene Age from North America, *J. Sedimentary Petrology*, 31:448-452 (1961).
- Harrison, W., Original Bedrock Composition of Wisconsin Till in Central Indiana, *J. Sedimentary Petrology*, 20:432-445 (1960).
- Lyon, C.J., and W. Harrison, Rate of Submergence of Coastal New England and Acadia, *Science*, 132:295-296 (1960).
- Altschaeffl, A.G., and W. Harrison, Estimation of a Minimum Depth of Burial for a Pennsylvanian Underclay, *J. Sedimentary Petrology*, 29(2):178-185 (1959).
- Harrison, W., Marginal Zones of Vanished Glaciers Reconstructed from the Preconsolidation-Pressure Values of Overridden Silts, *J. of Geology*, 66(1):72-95 (1958).
- Harrison, P.W., A Clay-Till Fabric: Its Character and Origin, *J. of Geology*, 65:275-308 (1957).
- Harrison, P.W., New Technique for Three-Dimensional Fabric Analysis of Till and Englacial Debris Containing Particles from 30 to 40 mm in Size, *J. of Geology*, 65:98-105 (1957).

Publications: Reports

- Harrison, W., and G. Miller, Argonne's Performance Assessment of Major Systems to Support Semiconductor Manufacturing by the National Security Agency/R Group, Ft. Meade, Maryland: Document Index, Argonne National Laboratory Report, ANL/ESD/TM-11, 136 p.(Dec. 1990).
- Hambley, D. F., W. Harrison, S. A. Foster, and M. J. Schweighauser, Site Remediation Considerations and Foundation Excavation Plan for the Walter Reed Army Institute of Research Building, Forest Glen, Maryland, Argonne National Laboratory Report ANL/ES-TM-17 (April, 1991), 292 pp.

- Harrison, W., and A.S. Boparai, B. Nashold, S.A. Sandberg, S.A. Foster, J.J. Russell, M.J. Schweighauser, R.R. Heinrich, D.G. Graczyk, N.K. Meshkov, and C. Tome, Site Characterization and Qualitative Human Risk Assessment for the Walter Reed Army Institute of Research Building Site, Forest Glen, Maryland, Argonne National Laboratory Report ANL/ES-TM-9,612 pp. (July, 1990).
- Harrison, W., and D. Hambley, R. Paddock, D. Kullen, and C. Tome, Beach Profiles and Sediment Size Properties for Willoughby Spit, Norfolk, Virginia, Argonne National Laboratory Report ANL/EES-TM-367, 52 pp. (Feb. 1989).
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- Harrison, W., D. Edgar, C. Baker, W. Buehring, R. Whitfield, A. VanLuik, M. Sood, M. Flower, M. Warren, M. Jusko, J. Peerenboom, and J. Bogner, Using Geologic Conditions and Multiattribute Decision Analysis to Determine the Relative Favorability of Selected Areas For Siting a High-Level Radioactive Waste Repository, Argonne National Laboratory Report ANL/ES-151, 106 pp. (1988).
- Hambley, D.F., D.Z. Mraz, R.R. Unterberger, J.C. Stormont, S.P. Neuman, J.E. Russell, C.H. Jacoby, A.B. Hull, B.H.G. Brady, J.D. Ditmars, D.M. Rote, R.M. Bateman, J.B. Farr, D.I. Leap, T.R. Harper, W. Harrison, G.B. Baecher, M.G. Seitz, C.H. Dowding, D.F. Fenster, R.A. Paddock, L.W. Braile, G.R. Keller, J.S. Busch, and A.W. Hatheway, Radioactive Waste Isolation in Salt: Peer Review of the Golder Associates Draft Test Plan for In Situ Testing in an Exploratory Shaft in Salt, ANL/EES-TM-320 (1987).
- Harrison, W., D.F. Fenster, J.D. Ditmars, R.A. Paddock, D.M. Rote, D.F. Hambley, M.G. Seitz, A.B. Hull, and Off-Site Panelists, Radioactive Waste Isolation in Salt: Peer Review of the Office of Nuclear Waste Isolation's Draft Report on an Issues Hierarchy and Data Needs for Site Characterization, Argonne National Laboratory draft technical memorandum ANL/EES-TM-316 (1986).
- Hambley, D.F., J.E. Russell, R.G. Whitfield, L.D. McGinnis, W. Harrison, C.H. Jacoby, T.R. Bump, D.Z. Mraz, J.S. Busch, and L.E. Fischer, Radioactive Waste Isolation in Salt: Peer Review of the Fluor Technology, Inc., Report and Position Paper Concerning Waste Emplacement Mode and Its Effect on Repository Conceptual Design, ANL/EES-TM-322 (1987).
- Paddock, R.A., A. Lerman, J.D. Ditmars, D.D. Macdonald, J.P. Peerenboom, G.S. Was, and W. Harrison, Radioactive Waste Isolation in Salt: Peer Review of the Office of Nuclear Waste Isolation's Draft Report on a Multifactor Test Design to Investigate Uniform Corrosion of Low-Carbon Steel, ANL/EES-TM-319 (1987).

- Rote, D.M., A.B. Hull, G.S. Was, D.D. Macdonald, B.E. Wilde, J.E. Russell, J. Kruger, W. Harrison, and D.F. Hambley, Radioactive Waste Isolation in Salt: Peer Review of Westinghouse Electric Corporation's Report on Reference Conceptual Designs for a Repository Waste Package, ANL/EES-TM-292 (Oct. 1985).
- Harrison, W., J.D. Ditmars, M.W. Tissue, D.F. Hambley, D.F. Fenster, and D.M. Rote, Radioactive Waste Isolation in Salt: Rationale and Methodology for Argonne-Conducted Reviews of Site Characterization Programs, ANL/ES-147 (July 1985).
- Hambley, D.F., J.C. Stormont, J.E. Russell, D.E. Edgar, D.F. Fenster, W. Harrison, and M.W. Tissue, Radioactive Waste Isolation in Salt: Peer Review of the D'Appolonia Report on Schematic Designs for Penetration Seals for a Repository in the Permian Basin, Texas, Argonne National Laboratory Report ANL/EES-TM-262 (Sept. 1984).
- McPheeters, C.C., W. Harrison, J.D. Ditmars, A. Lerman, D.M. Rote, D.E. Edgar, and D.F. Hambley, Radioactive Waste Isolation in Salt: Peer Review of the Office of Nuclear Waste Isolation's Reports on Multifactor Life Testing of Waste Package Materials, Argonne National Laboratory Report ANL/EES-TM-263 (Sept. 1984).
- Fenster, D.F., R.Y. Anderson, S. Gonzales, V.R. Baker, D.E. Edgar, and W. Harrison, Radioactive Waste Isolation in Salt: Peer Review of the Texas Bureau of Economic Geology's Report on the Petrographic, Stratigraphic, and Structural Evidence for Dissolution of Upper Permian Bedded Salt, Texas Panhandle, Argonne National Laboratory Report ANL/EES-TM-260 (Aug. 1984).
- Fenster, D.F., D.G. Brookins, W. Harrison, M.G. Seitz, A. Lerman, and V.C. Stamoudis, Radioactive Waste Isolation in Salt: Peer Review of the Office of Nuclear Waste Isolation's Report on the Organic Geochemistry of Deep Groundwaters from the Palo Duro Basin, Texas, Argonne National Laboratory Report ANL/EES-TM-259 (Aug. 1984).
- Hambley, D.F., J.E. Russell, J.S. Busch, W. Harrison, D.E. Edgar, and M.W. Tissue, Radioactive Waste Isolation in Salt: Peer Review of the Office of Nuclear Waste Isolation's Report on Functional Design Criteria for a Repository for High-Level Radioactive Waste, Argonne National Laboratory Report ANL/EES-TM-261 (Aug. 1984).
- Fenster, D.F., J.P. Schubert, S.D. Zellmer, W. Harrison, D.G. Simpson, and J.S. Busch, Radioactive Waste Isolation in Salt: Peer Review of the Office of Nuclear Waste Isolation's Plan to Decommission and Reclaim Exploratory Shafts and Related Facilities, Argonne National Laboratory Report ANL/EES-TM-258 (July 1984).
- Winter, R., D. Fenster, M. O'Hare, D. Zillman, W. Harrison, and M. Tissue, Radioactive Waste Isolation in Salt: Peer Review of the Office of Nuclear Waste Isolation's Socioeconomic Program Plan, Argonne National Laboratory Report ANL/EES-TM-243 (July 1984).

- Harrison, W., with 14 others Radioactive Waste Isolation in Salt: Peer Review of the Office of Nuclear Waste Isolation's Plans for Repository Performance Assessment, Argonne National Laboratory Report ANL/EES-TM-246 (May 1984).
- Fenster, D., D. Edgar, S. Gonzales, P. Domenico, W. Harrison, T. Engelder, and M. Tisue, Radioactive Waste Isolation in Salt: Peer Review of the Office of Nuclear Waste Isolation's Reports on Preferred Repository Sites within the Palo Duro Basin, Texas, Argonne National Laboratory Report ANL/EES-TM-254 (April 1984).
- Walbridge, E.W., J.-L. Lee, and W. Harrison, Evaluation of Zero-Dimensional Gas Reservoir Models, Argonne National Laboratory Report ANL/EES-TM-248 (April 1984).
- Harrison, W., M. Seitz, D. Fenster, A. Lerman, D. Brookins, and M. Tisue, Radioactive Waste Isolation in Salt: Peer Review of the Office of Nuclear Waste Isolation's Geochemical Program Plan, Argonne National Laboratory Report ANL/EES-TM-242 (Feb. 1984).
- Ditmars, J.D., E.W. Walbridge, D.M. Rote, W. Harrison, and C.L. Herzenberg, Radioactive Waste Isolation in Salt: Special Advisory Report on the Status of the Office of Nuclear Waste Isolation's Plans for Repository Performance Assessment, Argonne National Laboratory Report ANL/EES-TM-256 (Oct. 1983).
- Harrison, W., D. Edgar, P. Barosh, J. Ebel, G. Kuecher, M. Tisue, S. Tsai, M. Winters, M. Flower, and M. Sood, Geology, Hydrology, and Mineral Resources of Crystalline Rock Areas of the Northeastern United States, Argonne National Laboratory Report ANL/ES-136 (Oct. 1983).
- Harrison, W., D. Edgar, A. Van Luik, W. Hinze, L. Braile, J. Kalliokoski, H. Pfannkuch, H. Wright, Jr., M. Tisue, and M. Sood, Geology, Hydrology, and Mineral Resources of Crystalline Rock Areas of the Lake Superior Region, United States, Argonne National Laboratory Report ANL/ES-134 (Oct. 1983).
- Harrison, W., M. Flower, M. Sood, M. Tisue, and D. Edgar, Crystalline Rocks of the Northeastern United States, Argonne National Laboratory Report ANL/ES-137 (Oct. 1983).
- Harrison, W., M. Sood, M. Flower, and M. Tisue, Crystalline Rocks of the Lake Superior Region, United States, Argonne National Laboratory Report ANL/ES-135 (Oct. 1983).
- Van Luik, A., and W. Harrison, Reclamation of Abandoned Mined Lands along the Upper Illinois Waterway Using Dredged Material, Argonne National Laboratory Report ANL/ES-127 (Jan. 1982).
- Raphaelian, L.A., W. Harrison, and M.F. Torpy, Organic Constituents in Process Water from Tar-Sand Oil Recovery, Argonne National Laboratory Report ANL/PAG-6 (Aug. 1981).

Ulmishek, G., and W. Harrison, Petroleum Geology and Resource Assessment of the Middle Caspian Basin, USSR, with Special Emphasis on the Uzen Field, Argonne National Laboratory Report ANL/ES-116 (May 1981).

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Raphaelian, L.A., and W. Harrison, Organic Constituents in Process Water from the In-Situ Retorting of Oil from Oil-Shale Kerogen: Occidental Oil Shale Inc., Logan Wash No. 6 Retort Experiment, Argonne National Laboratory Report ANL/PAG-5 (Feb. 1981).

Wingender, R.J., W. Harrison, and L.A. Raphaelian, Organic Constituents in Sour Condensates from Shale-Oil and Petroleum-Crude Runs at Sohio's Toledo Refinery: Identification and Wastewater-Control-Technology Considerations, Argonne National Laboratory Report ANL/PAG-4 (Feb. 1981).

Lloyd, J.M., and W. Harrison, Petroleum Reservoir Data for Testing Simulation Models, Argonne National Laboratory Report ANL/ES-103 (Sept. 1980).

Harrison, W., and A. Van Luik, Suitability of Dredged Material for Reclamation of Surface-Mined Land: The Ottawa, Illinois, Demonstration Project, U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Miss., Technical Report TR-EL-80-7, Argonne National Laboratory Report ANL/ES-73 (June 1979).

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Harrison, W., R.L. Flotard, and D.L. Ford, Assessment of Activated Carbon for Environmental Control of Trace Organics in Petroleum Refinery Wastewater, Argonne National Laboratory Report ANL/WR-79-3 (March 1979).

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Book

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