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Environmental Protection
Agency
Office of Radiation Programs

Eastern Environmental
Radiation Facility
P.O. Box 3009
Montgomery, AL 36193

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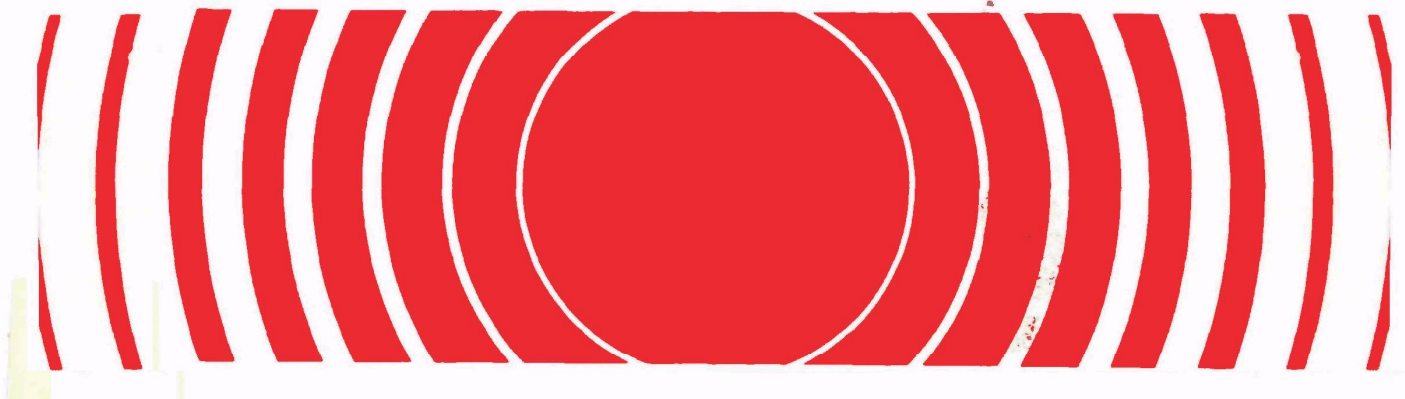
Radiation



Potential Health and Environmental Hazards of Uranium Mine Wastes

Appendixes

Report To The Congress Of The United States



Volume 3 of 3 Volumes

POTENTIAL HEALTH AND ENVIRONMENTAL
HAZARDS OF URANIUM MINE WASTES

Appendixes

A Report to the Congress of the United States
in Response to Public Law 95-604

June 10, 1983

U.S. Environmental Protection Agency
Office of Radiation Programs
Washington, D.C. 20460

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APPENDIX A

FEDERAL LAWS, REGULATIONS, AND GUIDES FOR
URANIUM MINING

Table A.1 Federal laws, regulations, and guides for uranium mining

Federal Agency	General				Mining					Health and Safety
	Water Use	Conservation-Preservation Statutes	Permits		Environmental Quality					
			Exploration Rights	Mining Rights	Air	Water Surf	UG	Solids	Land Reclam.	
Dept. of Int.	1	2,3,4,6,7	8	8						2,8
BIA ^(a)			9	9						9
BLM ^(a)		5	10	10						10
USGS ^(a)			9							9
Dept. of Energy		2	11	11						2
Dept. of Agr.	1	2,8d								2,8d
USFS ^(a)			12,13	13						12
EPA	1	2								
AIR-OAQPS ^(a)					14					
Water										
Surface OWPS ^(a)						17				
Ground OSW ^(a)							19			
Land-OSW						18	18	18		18
Radiation-ORP ^(a)					15	15	15	15		15
U.S. Army										
Corps. of Engrs.	1	2				16				2
Dept. of Labor		2								
MSHA ^(a)										22
OSHA ^(a)										21
Nuclear Reg. Comm. ^(b)		2		2	23 ^(b)	23 ^(b)	23 ^(b)	23 ^(b)	23 ^(b)	23 ^(b)

- (a) BIA-Bureau of Indian Affairs
 BLM-Bureau of Land Management
 USGS-United States Geological Survey
 USFS-United States Forest Service
 OWPS-Office of Water Planning and Standards
 OSW-Office of Solid Waste
 ORP-Office of Radiation Programs
 MSHA-Mining Safety and Health Administration
- (b) OAQPS-Office of Air Quality, Planning and Standards
 OSHA-Occupational Safety and Health Administration
 Nuclear Regulatory Commission (NRC) regulations and guides for milling do apply to in situ extraction or mining but not conventional surface or underground mining where NRC has no authority.

Table A.1 (continued)--Key to Federal laws, regulations and guides cited

1. See Appendix B and Appendix C for U.S. Constitution Citations, Federal Laws, and Interstate Compacts
2. National Environmental Policy Act of 1969 (Public Law 92-190)
3. Endangered Species Act of 1973 (Public Law 93-205) (Supplants Endangered Species Conservation Act of 1969)
4. National Historic Preservation Act of 1966 (Public Law 89-655) (Supplants Antiquities Act of 1906)
5. Federal Land Management and Policy Act of 1976
6. Reservoir Salvage Act of 1960 (16 USCA 469-469C)
7. Historic Sites Acts of 1935 (16 USCA 21-50)
8.
 - a. U.S. Mining Law of 1872 (30 USC 21-50)
 - b. Mineral Leasing Act of 1920 (30 USC 181 et seq)
 - c. Mineral Leasing Act for Acquired Lands (Amended) (30 USC 351-359)
 - d. Materials Act of 1947 (Amended) (30 USC 601-602)
 - e. Reorganization Plan of 1946 (60 Stat. 1099)
9. Indian Land - 30 CFR 231
10. Public Land - 30 USC 22 (43 CFR 3810, 3746, 3501, 3814.1)
11. Withdrawn Public Land - 42 USC 2097
12. National Forest Land - 16 USC 478 (43 CFR 3811.1 and 36 CFR 252)
13. National Forest Management Act of 1976 (16 USC 1600) - Regulations for land and resource management planning under this Act in the National Forest System are given in Federal Register Volume 44, Number 181, September 17, 1979
14. Clean Air Act as Amended (42 USC 1857 et seq)
15. Public Health Services Act (Reorganization No. 3, 1970; Section 301 - Environmental Monitoring)

Table A.1 (continued)--Key to Federal laws, regulations and guides cited

16. Marine Protection Research and Sanctuaries Act of 1972
17. Federal Water Pollution Control Act as Amended (33 USC 466 et seq)
18. Resource Recovery and Conservation Act of 1976 (Proposed 40 CFR 250.46-4)
19. Safe Drinking Water Act Amended (Public Law 95-523 and Public Law 95-190) (Could affect mining operation where injection of wastes is utilized)
20. Atomic Energy Act Amended (Public Law 86-373; 42 USC 2021(h), Federal Radiation Guidance functions from prior Federal Radiation Council)
21. Occupational Safety and Health Act of 1970
22. MSHA formed by transferring MESA from DOI to DOL pursuant to the Federal Mine Safety and Health Act of 1977, Public Law 91-173 as amended by Public Law 95-164
23. Nuclear Regulatory Commission Guides and Regulations for Benefication Processes
 - a. Regulatory Guide 3.5, Standard Format and Content of License Applications for Uranium Mills (Nov. 1977)
 - b. Regulatory Guide 3.8, Preparation of Environmental Reports for Uranium Mills (Sept. 1978)
 - c. Regulatory Guide 3.11, Design, Construction, and Inspection of Embankment Retention Systems for Uranium Mills (Dec. 1977)
 - d. Regulatory Guide 4.14, Measuring, Evaluating, and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Airborne Effluents from Uranium Mills (June 1977)
 - e. Regulatory Guide 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment (Feb. 1979)
 - f. Regulatory Guide 8.11, Applications of Bioassay for Uranium (June 1975)
 - g. Regulatory Guide 8.13, Instruction Concerning Prenatal Radiation Exposure
 - h. Standards for Protection Against Radiation (10 CFR 20)
 - i. Domestic Licensing of Source Material (10 CFR 40)
 - j. Licensing and Regulatory Policy and Procedures for Environmental Protection (10 CFR 51)
 - k. Proposed Regulations: Uranium Mill Tailings Licensing (10 CFR Parts 40,150) - 44 F.R. 50012, August 24, 1979

Table A.1 (continued)--Key to Federal laws, regulations, and guides cited

- l. Staff Technical Positions: Tailings Management - "Current U.S. Nuclear Regulatory Commission Licensing Review Process: Uranium Mill Tailings Management"; Environmental Monitoring - "Proposed Branch Position for Operational Radiological Environmental Monitoring Programs for Uranium Mills"
- m. Proposed Regulatory Guide 3.11.1, Operational Inspection and Surveillance of Imbankment Retention Systems for Uranium Mill Tailings (April 1979)

APPENDIX B
FEDERAL WATER PROGRAMS AND RIGHTS ACTIVITIES
AND THEIR LEAD ADMINISTRATIVE AGENCIES

Water use authorities and lead federal agencies

Authority

1. U.S. Constitution: Article I, Sections 8 and 10
Article II, Section 2
Article IV, Section 2
2. Rivers and Harbors Act of 1899 (33 USC 401-411)
3. Reclamation Act of 1902 (Public Law 57-161)
4. Federal Water Power Act of 1920, as amended (Public Law 66-280)
5. Fish and Wildlife Coordination Act of 1958 (Public Law 86-624)
6. Wilderness Act of 1964 (Public Law 88-577)
7. Water Resources Planning Act of 1964 (Public Law 89-90) (Council: DOI, DOA, U.S. Army, HEW, DOT, FERC, DOC, HUD, EPA)
8. Wild and Scenic Rivers Act of 1968, as amended (Public Law 90-542)
9. Colorado River Basin Act of 1968 (Public Law 90-537)
10. National Environmental Policy Act of 1969 (Public Law 91-190)
11. Federal Water Pollution Control Act of 1972 (Public Law 92-500)
12. Marine Protection, Research and Sanctuaries Act of 1972 (Public Law 92-532)
13. Coastal Zone Management Act of 1972 (Public Law 92-583)
14. Endangered Species Act of 1973 (Public Law 93-205)
15. Mexican Water Treaty of 1944
16. Colorado River Basin Salinity Control Act (Public Law 93-320)
17. Treaty of 1909 with Canada
18. Columbia River Treaty with Canada

Lead or Responsible Agencies (Authorities)

Army Corps of Engineers (2, 7, 10, 12)
 Department of Interior (3, 5, 6, 7, 8, 10, 14, 16)
 Department of Agriculture (7,10)
 Department of HEW (7, 10)
 Department of Transportation (7, 10)
 Department of Commerce (7, 10, 13)
 Department of HUD (7, 10)
 Federal Energy Regulatory Commission (4, 7, 10, 16)
 Environmental Protection Agency, (7, 10, 11, 12)
 Department of State (1, 15, 17, 18)

APPENDIX C
CONGRESSIONALLY APPROVED INTERSTATE WATER COMPACTS

Interstate water compacts

Name	Year
Arkansas River Compact	1948
Arkansas River Basin Compact	1965
Bear River Compact	1955
Belle Fourche River Compact	1943
Canadian River Compact	1950
Colorado River Compact	1922
Connecticut River Flood Control Compact	1951
Costilla Creek Compact	1963
Delaware River Basin Compact	1961
Great Lakes Basin Compact	1955
Klamath River Basin Compact	1957
La Plata River Compact	1922
Merrimack River Flood Control Compact	1956
New England Interstate Water Pollution Control Compact	1947
New York Harbor (Tri-State) Interstate Sanitation Compact	1935
Ohio River Valley Water Sanitation Compact	1939
Pecos River Compact	1948
Potomac River Basin Compact	1939
Red River of the North Compact	1937
Republican River Compact	1942
Rio Grande Compact	1938
Sabine River Compact	1953
Snake River Compact	1949
South Platte River Compact	1923
Susquehanna River Basin Compact	1970
Tennessee River Basin Water Pollution Control Compact	1955
Thames River Flood Control Compact	1957
Upper Colorado River Basin Compact	1948
Wheeling Creek Watershed Protection and Flood Prevention District Compact	1967
Yellowstone River Compact	1950

Source: Environmental Study on Uranium Mills, TRW, Inc., USEPA Contract
No. 68-03-2560, February 1979.

APPENDIX D

STATE LAWS, REGULATIONS, AND GUIDES
FOR URANIUM MINING

Table D.1 State laws, regulations, and guides for uranium mining

State	General		Mining								
	NRC Agreement State	NPDES Permit State	Water Use	Permits		Environmental Quality					
				Exploration Rights	Mining Rights	Air	Water			Land Reclam.	
							Surf	UG	Solids		
Safety											
COLORADO	Yes	Yes	-	-	-	-	-	-	-	-	-
Department of Health											
Water Quality Control Div.	-	-	-	-	-	-	6,7,8,10	8,9,10	-	-	-
Air Quality Control Div.	-	-	-	-	-	4,5	-	-	-	-	-
Department of Natural Resources											
Div. of Water Reserves (State	-	-	15	-	-	-	-	-	-	-	-
Board of Land Commissioners	-	-	-	1	1	-	-	-	-	1	-
Mined Land Reclam. Bd.	-	-	-	2,3	2,3	-	2,3	2,3	-	2,3	-
Division of Mines	-	-	-	-	-	-	-	-	-	-	14
NEW MEXICO	Yes	No	-	-	-	-	-	-	-	-	-
State Land Commission	-	-	-	1	1	-	-	-	-	-	-
Dept. of Energy and Minerals	-	-	-	-	-	-	-	-	-	2	9
Dept. of Natural Resources	-	-	3	-	-	-	-	-	-	-	-
Env. Improvement Div.	-	-	-	-	-	5,6,7,8,9	10,12,13,14	11	14	-	16
TEXAS	Yes	No	-	-	-	-	-	-	-	-	-
Dept. of Water Resources	-	-	13	-	3	-	8,9	-	4,11	4	-
R.R. Commission of Texas	-	-	-	1	1	5	5	2,7	-	2	-
General Land Office	-	-	-	14	14	-	-	-	-	15	-
Dept. of Health	-	-	-	-	-	-	6,10	-	-	-	10
Air Control Board	-	-	-	-	-	12	-	-	-	-	-
UTAH	No	No	-	-	-	-	-	-	-	-	-
State Engineer	-	-	3,4	-	-	-	-	-	-	-	-
Dept. of Social Services	-	-	-	-	-	-	-	-	-	-	-
Division of Health	-	-	-	-	-	6	1	1	-	-	5
Water Pollution Control Bd.	-	-	-	-	-	-	1	1	-	-	-
Dept. of Natural Resources	-	-	-	2	2	-	-	-	-	2	-

Table D.1 (continued)

State	GENERAL		Mining								
	NRC Agreement State	NPDES Permit State	Water Use	Permits		Air	Environmental Quality			Safety	
				Exploration Rights	Mining Rights		Water	Land			
						Surt	UG	Solids	Reclam.		
WASHINGTON	Yes	Yes	-	-	-	-	-	-	-	-	-
Dept. of Natural Resources	-	-	-	1,2	1,2	-	-	-	2	2	-
Dept. of Ecology	-	-	9	-	-	-	-	-	-	-	-
Office of Water Programs	-	-	-	-	-	-	8	(No)	-	-	-
Dept. of Social Services & Health	-	-	-	-	-	-	-	-	-	-	-
Health Services Division	-	-	-	-	-	-	-	-	-	-	3
Air Quality Division	-	-	-	-	-	7	-	-	-	-	-
WYOMING	No	Yes	-	-	-	-	-	-	-	-	-
State Inspector of Mines	-	-	-	8a	8a	-	-	-	-	8d	8c
State Engineers Office	-	-	1	-	-	-	-	-	-	-	-
Dept. of Env. Quality	-	-	-	-	-	-	-	-	-	-	-
Air Quality Div.	-	-	-	-	-	3a,4	-	-	-	-	-
Water Quality Div.	-	-	-	-	-	-	2,5	5,6	-	-	-
Land Quality Div.	-	-	-	3c	3c	-	-	-	3c,7	3c,7	-
Solid Waste Management	-	-	-	-	-	-	-	-	3d	-	-

Table D.1 (continued)--Key to State laws, regulations, and guides cited

Colorado

1. Mining Rules and Regulations, 1973, 1976; Uranium Mining Lease and Prospecting Permit; State Board of Land Commissioners.
2. Colorado Mined Land Reclamation Act, July 1, 1976; Mined Land Reclamation Board (Act. 32, Title 34, C.R.S. 1973, as amended).
3. Rules and Regulations, Colorado Mined Land Reclamation Board; effective July 1978.
4. Colorado Air Quality Control Act of 1979, adopted June 20, 1979. Replaces Colorado Air Pollution Control Act of 1970. Radioactive materials included in list of air pollutants.
5. Colorado Air Quality Control Regulations and Ambient Air Quality Standards, Colorado Air Pollution Control Commission. Specifically, Regulation No. 1, Emission Control Regulations for Particulates, Smokes, and Sulfur Oxides for the State of Colorado; and Regulation No. 3, Regulation Governing Air Contaminant Emission Notice, Emission Permit, and Fees for Direct Sources.
6. Regulations Establishing Basic Standards and an Antidegradation Standard and Establishing a System for Classifying State Waters, for Assigning Standards, and for Granting Temporary Modifications, Colorado Water Quality Control Commission, May 22, 1979; effective July 10, 1979.
7. Regulations for Effluent Limitations, Colorado Department of Health, Water Quality Control Commission; adopted March 18, 1975 effective August 21, 1975.
8. Regulations for the State Discharge Permit System, Colorado Department of Health, Water Quality Control Commission; adopted November 19, 1974 effective January 31, 1975, amended February 7, 1978.
9. Rules for Subsurface Disposal Systems, Colorado Department of Health, Water Quality Control Commission; revised July 6, 1976, effective October 1, 1977.
10. Guidelines for Control of Water Pollution from Mine Drainage, November 10, 1979; Water Pollution Control Commission (Ch 66, Act. 28, C.R.S. 1963 as amended 1970).
11. Colorado Rules and Regulations Pertaining to Radiation Control, April 1, 1978, Uranium Mill Licensing Guide, May 1978; Radioactive Materials License; Radiation and Hazardous Wastes Control Division (Title 25, Act. II, C.R.S. 1973, Radiation Control).

Table D.1 (continued)--Key to State laws, regulations, and guides cited.

12. Guidelines for the Design, Operation, and Maintenance of Mill Tailings Ponds to Prevent Water Pollution, March 13, 1968; Water Pollution Control Commission (Colorado Water Pollution Control Act of 1966, Ch. 44, Session Laws 1966 as amended by Ch. 217).
13. Publication of a Regulation Providing Tailings Piles from Uranium and Thorium Mills be Adequately Stabilized or Removed, Colorado Department of Public Health; effective June 10, 1966.
14. Colorado Division of Mines responsible for health and safety standards for uranium mines and mills. Regulations contained in Bulletin 20: Section 108 - "Missed Holes--Misfires," Section 110 - "Mucking," Section 12.2 "Radiation Control," Section 130 - "Safeguards," Section 140 - "Shafts and Raises."
15. Office of State Engineer, Division of Water Resources (Article 16, Section 5 - Colorado Constitution and Title 37, Article 90, Section 137 - Colorado Revised Statutes, 1973).

Table D.1 (continued)--Key to State laws, regulations, and guides cited

New Mexico

1. State Land. Leased by State Land Commission, 19-8-14 NMSA 1978.
2. State and Private Land. Mine plan filed and approved by State Mining Inspector, 67-5-1 et seq. NMSA 1978.
3. Water Permit issued by State Engineer; 72-5-1 et seq. NMSA 1978 and 72-12-1 NMSA 1978 and Desert Lands Act of 1866 as amended and 43 USC 383.
4. NRC agreement State Under 42 USC 2021. License required for source material: unrefined and unprocessed ore is not included. Specific License required for Mills, 10 CFR 40.20 - 40.31. Administered by Environmental Improvement Division (EID).
5. New Mexico delegated responsibilities and powers under Clean Air Act (40 CFR 52.1620). Ambient Air Quality Standards and Air Quality Control Regulations, State of New Mexico Health Department, Environmental Improvement Division; reissued November 1976.
6. Application for Permit and Certificate of Registration General Form for Sources Located Within the State of New Mexico, New Source Review Section, Air Quality Section, Environmental Improvement Division, revised February 1976.
7. Application for Permit to Construct or Modify and Certificate of Registration for Mineral Processing Plants Located within the State of New Mexico, New Source Review Section, Air Quality Section, Environmental Improvement Division, revised February 1976.
8. Supplementary Information and Notes for Use with Application for Permit and Certificate of Registration for Mineral Processing Plants, State of New Mexico - Environmental Improvement Division, Air Quality Section, New Source Review Section.
9. Monitoring Air Quality in Mines and Mills Underground: State Mine Inspector 69-5-7 NMSA 1978 also MSHA (30 CFR 57.5-37) Restricted Areas: Mills, EID, 74-2-13 NMSA 1978 Unrestricted Areas: EID per Clean Air Act (42 USC 7410) and State Radiation Protection Act (74-2-1 et seq. NMSA 1978).
10. New Mexico Water Quality: Not NPDES approved by EPA. State does not require permit per 74-6-5 NMSA 1978 and parts 2-100 of N.M. Water Quality Regulations if EPA issues NPDES permit.
11. Underground Water. State EID regulates pollution of underground water per 74-6-1 et seq. NMSA 1978.

Table D.1 (continued)--Key to State laws, regulations, and guides cited

12. Water Quality - Radioactivity: Mines by EID according to Sec. 2-101(b) of N.M. Water Quality Regulations; Mills by EID per NRC 10 CFR 20.106 and Appendix B.
13. Water Quality Standards on Enforcement: EPA enforces under NPDES system for effluent streams entering surface water of United States; EID enforces N.M. groundwater standards under N.M. Water Quality Control Act, 74-6-1 et seq. NMSA 1978.
14. Amended Water Quality Control Commission Regulation, Parts 1,2,3, and 4, Water Quality Control Commission; January 11, 1977, as amended June 14, 1977 and November 8, 1977. Water Quality Standards for Interstate and Intrastate Streams in New Mexico, Water Quality Control Commission under the authority of Paragraph C, Section 74-6-4 of the New Mexico Water Quality Act (Chapter 326, Laws of 1973, as amended); adopted August 22, 1973, revised September 29, 1975, January 13, 1976, February 8, 1977 and March 14, 1978.
15. New Mexico Environmental Improvement Agency Uranium Mill License Application Guidelines, Radiation Protection Section; September 1977.
16. (a) Radiation Protection Act, Chapter 185 Laws of 1959 (as amended by Chapter 284 Laws of 1971 and by Chapter 343 Laws of 1977).

(b) New Mexico Environmental Improvement Agency Regulations for Governing the Health and Environmental Aspects of Radiation, Environmental Improvement Board, June 16, 1973.

Table D.1 (continued)--Key to State laws, regulations, and guides cited

Texas

1. Texas Uranium Surface Mining and Reclamation Act (May 1978), Rules of the Surface Mining and Reclamation Division. The Railroad Commission of Texas, July 1, 1979.
2. Surface Mining Permit Rule 102 - Elements of Permit Application, Rule 250 Reclamation Plan; Rules of the Surface Mining and Reclamation Division.
3. Application for Permit to Conduct In Situ Uranium Mining, Instructions and Procedural Information for Filing an Application for a Permit to Conduct In Situ Mining of Uranium, Texas Department of Water Resources.
4. Technical Report for In Situ Uranium Mining, Texas Department of Water Resources.
5. Surface Mining Permit, Rule 108 - Permit Approval (Rules of the Surface Mining and Reclamation Division). Permit shall be granted if application complies with Permit rules and all applicable Federal and State laws. Permit may be approved conditioned upon approval of all other required State permits or licenses.
6. Texas Department of Health (TDH) issues licenses for surface mining, in situ mining, milling and processing of uranium ores and leachates in accordance with NRC Agreement.
7. TDH implements U.S. Safe Drinking Water Act regarding public water supplies. The underground injection portion of SDWA is regulated by the Railroad Commission (Oil and Gas), Department of Water Resources (in situ mining of uranium, salt, and sulfur).
8. Texas Regulations for Control of Radiation and Texas Water Quality Standards apply to surface water throughout state.
9. Texas Department of Water Resources issues "no discharge" permits to all uranium in situ extraction processes.
10. Texas Radiation Control Act, 1971. Texas Regulations for Control of Radiation (TDH).
11. Texas Solid Waste Disposal Act, 1969 (Texas Department of Water Resources). Rules pertaining to Industrial Solid Waste Management, March 3, 1978.
12. Texas Air Control Board. Air Control Board H-76 bill introduced February 1, 1979 to include radioactive material in the definition of air contaminant and allow Board to charge fees for permits and variances.

Table D.1 (continued)--Key to State laws, regulations, and guides cited

13. Texas Water Code, Chapter 2 - "Water Use" - Texas Department of Water Resources.
14. Rules and Regulations for Prospecting and Mining State-owned minerals. General Land Office Rules 12.6.18.03.001-.006 (Feb. 17, 1976).
15. Texas Uranium Surface Mining and Reclamation, General Land Office Rules 135.18.05.001-.005.

Table D.1 (continued)--Key to State laws, regulations, and guides cited

Utah

1. Utah Water Pollution Control Act, Utah State Division of Health.
 - (a) Wastewater Disposal Regulations, Part I, Definitions and General Requirements, State of Utah, Department of Social Services, Division of Health; adopted by Utah Water Pollution Control Board, May 18, 1965, Utah State Board of Health, May 19, 1965, (Revised by Utah Water Pollution Control Committee, Nov. 2, 1978) under authority of 26-15-4 to 5 and 73-14-1 to 13, Utah Code annotated, 1953, as amended.
 - (b) Wastewater Disposal Regulations, Part II, Standards of Quality for Waters of the State, State of Utah Department of Social Services, Division of Health; adopted by Utah Water Pollution Control Board May 18, 1965, Utah State Board of Health May 19, 1965, revised by action of the Boards June 2, 1967 and June 21, 1967, further revised by action of the Utah Water Pollution Committee September 13, 1973, and by action of the Utah State Board of Health October 23, 1978.
 - (c) Wastewater Disposal Regulations, Part III, Sewers and Wastewater Treatment works. Consideration of Waste stabilization Ponds (Lagoons) for Industrial Wastes is subject to requirements determined from analysis of the engineers report and other available pertinent information in addition to sections 83-91.
 - (d) Wastewater Disposal Regulations, Part IV, Individual Wastewater Disposal Systems.
 - (e) Wastewater Disposal Regulations, Part V, Small Underground Wastewater Disposal Systems.
2. Changes and Additions to the General Rules and Regulations, adopted by the Board of Oil, Gas and Mining; March 22, 1978, effective June 1, 1978.
 - (a) Rule M-3 -- Notice of Intention to Commence Mining Operations.
 - (b) Rule M-10 -- Reclamation Standards.
3. Water Laws of Utah and Interstate Compacts and Treaties (Second Edition, 1964).
4. State Engineer, H.B. No. 167 - "Temporary Applications to Appropriate Water" - introduced in the 1979 General Session, an act enacting Section 73-3-5.5, Utah Code Annotated 1953.

Table D.1 (continued)--Key to State laws, regulations, and guides cited

5. Utah Radiation Protection Act; Utah Code Annotated, 1953; Title 26, Chapter 25 - Radiation Control.
6. Utah Air Conservation Regulations, State of Utah, Department of Social Services, Division of Health; adopted by the Utah Air Conservation Committee and the Utah State Board of Health September 26, 1971; revised January 23, 1972; July 9, 1975; May 22, 1977; February 1979; under authority of 26-15-5 and 26-24-5 Utah Code annotated, 1953, as amended.

Table D.1 (continued)--Key to State laws, regulations, and guides cited

Washington

1. Mineral Leasing Laws, Revised 1965. (Laws cover surface and underground but not in situ and heap leaching).
2. Rules and Regulations Relating to Protection and Restoration of Lands disturbed through Surface Mining, October 20, 1970 (Surface - Mined Land Reclamation Act, Ch 64, 1970, Sec. 5 RCW 78.44--only applies to surface mining on private and state-owned lands).
3. Rules and Regulations for Radiation Protection, Chapter-402-22 WAC, Specific Licenses.
4. Rules and Regulations for Radiation Protection, Sec. 402-24-220 WAC, Concentrations in Air and Water for Release to Restricted and Unrestricted Areas.
5. Rules and Regulations for Radiation Protection, Chapter 402-24 WAC, Standards For Protection Against Radiation.
6. Rules and Regulations for Radiation Protection, Chapter 402-52 WAC, Uranium and/or Thorium Mill Operation and Stabilization of Mill Tailings Piles.
7. Clean Air Act, Revised Washington Administrative Code, Rev., Chapter 70.94, RCW.
8. Water Quality Standards, State of Washington, Department of Ecology; June 19, 1973. (Revised Dec. 19, 1977). Water Pollution Control Act of 1970 (as amended).
9. Department of Ecology - Water Use -
 - (a) Water Pollution Control: Chapter 90.48 RCW
 - (b) Water Code - 1917 Act: Chapter 90.03 RCW
 - (c) Regulations of Public Groundwaters: Chapter 90.44 RCW.

Table D.1 (continued)--Key to State laws, regulations, and guides cited

Wyoming

1. Regulations and Instructions, Part I, Surface Water, Wyoming State Engineer's Office, revised January 1974.
2. Condensed Detailed Instructions for Preparation of Surface Water Applications and Accompanying Maps for Facilities (pollution control and others) for Mining and Other Industrial Operations, revised 4-28-78. Effluent Limitations and Monitoring Requirements: Wyoming's BPT for Uranium Mine Waters.
3. Wyoming Environmental Quality Act, as amended, Department of Environmental Quality: 1973 Cumulative Supplement, 1974 Session Laws, 1975 Session Laws, 1976 Session Laws, 1977 Session Laws.
 - (a) Article 2 - Air quality Regulations.
 - (b) Article 3 - Water quality.
 - (c) Article 4 - Land Quality. Guidelines No. 1-6 and 8.
 - (d) Article 5 - Solid Waste Management.
4. Wyoming Air Quality Standards and Regulations, Department Environmental Quality, filed January 25, 1979.
5. Water Quality Rules and Regulations, Department of Environmental Quality: Chapter I, Quality Standards for Wyoming Surface Waters, filed July 17, 1979; Chapter II, Discharges/Permit Regulations for Wyoming 1974; Chapter IV, Regulations for Discharge of Oil and Hazardous Substances into Water of the State of Wyoming, June 13, 1978.
6. Proposed Groundwater Regulations: WQD Chapter VIII, Quality Standards for Groundwater of Wyoming (1979); WQD Chapter IX, Wyoming Groundwater Pollution Control Permit (1979).
7. Wyoming Land Quality Rules and Regulations, Department of Environmental Quality, filed October 6, 1978, amended September 13, 1979.
8. State of Wyoming Non-Coal Mining Laws, Safety Rules and Regulations, Title 30--Mines and Minerals.
 - (a) Chapter 1 - General Provisions
 - (b) Chapter 2 - Bureau of Mining Statistics
 - (c) Chapter 3 - Mining Operations Generally (Article 4 - Safety Regulations)
 - (d) Chapter 3 - Mining Operations Generally (Article 5 - Open Cut Land Reclamation)

APPENDIX E
ACTIVE URANIUM MINES IN
THE UNITED STATES

ACTIVE URANIUM MINES IN THE UNITED STATES
SOURCE: DOE, GRAND JUNCTION, COLORADO

PAGE 1

MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** ARIZONA *****									
RUTH 1 + 4	SILVER CREEK IND	NAVAJO	2	17 N	23.0 E	14	SURFACE	1,000 - 100,000	150
BLUE ROCK	UOCO	PIMA			0		UNDERGRO	100 - 1,000	50
***** COLOPADO *****									
SCHWARTZWALDER M	COTTER CORP	JEFFERSON	25	2 S	71.0 W	06	UNDERGRO	>100,000	850
BLACK MAMA	INCE MNG CO	MESA	20	51 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
BONANZA	ATLAS MINERALS	MESA	26	51 N	20.0 W	22	UNDERGRO	>100,000	400
CEDAR PT,3-L,CHI	W S DAWSON	MESA	23	51 N	19.0 W	22	UNDERGRO	1,000 - 100,000	200
ELIZABETH 17+18	GULF STATES ENER	MESA	29	50 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
HUBBARD HMSTD PA	HUBBARD MNG,	MESA	35	51 N	20.0 W	22	UNDERGRO	1,000 - 100,000	250
JULY	V. C. MOORES	MESA	12	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
LA SAL 4.	PIONEER URAY INC	MESA	36	51 N	20.0 W	22	UNDERGRO	1,000 - 100,000	450
LIBERTY BELL	MARION BIRCH	MESA	36	51 N	19.0 W	22	UNDERGRO	1,000 - 100,000	150
LUMSDEN 1	UNION CARBIDE CP	MESA	36	51 N	20.0 W	22	UNDERGRO	1,000 - 100,000	100
MINERAL CHAN 10+	ATLAS-AMAX	MESA	7	50 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
MLB-C-G-26A	RALPH FOSTER	MESA			0		UNKNOWN	100 - 1,000	100
MLB-C-G-27	FOSTER H-GOVTLSE	MESA			0		UNDERGRO	>100,000	400
NEW VERDE	UNION CARBIDE CP	MESA	15	50 N	18.0 W	22	UNDERGRO	>100,000	300
OCTOBER ADIT	ATLAS-AMAX	MESA	9	50 N	19.0 W	22	UNDERGRO	1,000 - 100,000	450
PACK RAT 1 + 2	UNION CARBIDE	MESA	36	51 N	20.0 W	22	UNDERGRO	1,000 - 100,000	200
RAJAH 30 SHAFT	UNION CARBIDE	MESA	1	50 N	20.0 W	22	UNDERGRO	>100,000	650
RAJAH 67 + 68	UNION CARBIDE CP	MESA	36	51 N	20.0 W	22	UNDERGRO	>100,000	550
ROSEBUD	GRAHAM MNG.	MESA	36	51 N	19.0 W	22	UNDERGRO	100 - 1,000	50
THORNTON	C V WOODWARD	MESA	31	51 N	19.0 W	22	UNDERGRO	1,000 - 100,000	300
ZEE LSE,-RAJAH 4	UNION CARRIDE	MESA	6	51 N	19.0 W	22	UNDERGRO	>100,000	450
BESSIE 2 + 3	UNION CARRIDE CP	MOFFAT	18	7 N	94.0 W	06	SURFACE	1,000 - 100,000	100
MARGE GROUP	UNION CARBIDE CP	MOFFAT	13	7 N	95.0 W	06	SURFACE	>100,000	300
SAGE-BUELLA	UNION CARRIDE CP	MOFFAT	7	7 N	94.0 W	06	SURFACE	>100,000	50
BROKEN BOW	JOHN DUFUR	MONTEZUMA			0		SURFACE	<100	50
VCA NATURITA TAI	DURITA CORP.	MONTEZUMA			0		TAIL,DMP	100 - 1,000	0
ADAK	CLEGHORN+WASHBUR	MONTROSE	12	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	250
APRIL	ATLAS MINERALS	MONTROSE	10	45 N	18.0 W	22	UNDERGRO	100 - 1,000	50
BLACK POINT	UNION CARRIDE CP	MONTROSE	13	46 N	18.0 W	22	UNDERGRO	100 - 1,000	0
BLACKBURN	UNION CARRIDE	MONTROSE	21	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	200
BLUE CAP	GEO-ENERGY RES	MONTROSE	28	28 S	26.0 E	24	UNDERGRO	1,000 - 100,000	200
BOON DOCK	EARL HOTZ	MONTROSE			0		SURFACE	100 - 1,000	0
BREEZY	UNION CARRIDE CP	MONTROSE	25	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
BUCKHORN-UREKA	C + H MINING	MONTROSE	10	48 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
CANON 4,5 + 7	E M COOPER	MONTROSE	21	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
CLIFFDWELLER	UNION CARRIDE	MONTROSE	24	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	200
COLGRADIUM	UNION CARRIDE CP	MONTROSE	21	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
CRIPPLE CREEK 2	UNION CARRIDE CP	MONTROSE	21	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
DONALD L	UNION CARRIDE	MONTROSE	21	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
ECHO 2 + 3	MICHAEL GREAGOR	MONTROSE	3	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
ECHO 6	GLEN GREAGOR	MONTROSE	3	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
EQUINOX	CLEGHORN+WASHBUR	MONTROSE	12	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	350

ACTIVE URANIUM MINES IN THE UNITED STATES
SOURCE: DOE, GRAND JUNCTION, COLORADO

PAGE 2

MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
EULA BELLE CRAIG	UNION CARBIDE	MONTROSE	32	49 N	17.0 W	22	UNDERGRO	>100,000	750
FARMER GIRL	MONOGRAM MNG.	MONTROSE	22	48 N	18.0 W	22	UNDERGRO	1,000 = 100,000	0
FAWN SPRINGS 9	UNION CARBIDE CP	MONTROSE	31	46 N	17.0 W	22	UNDERGRO	1,000 = 100,000	100
GREAGOR GROUP	ATLAS-AMAX	MONTROSE	33	46 N	18.0 W	22	UNDERGRO	1,000 = 100,000	150
GREASY SPOON	PIONEER URAV INC	MONTROSE			0		UNDERGRO	1,000 = 100,000	300
GUADALCANAL	UNION CARBIDE CP	MONTROSE	27	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	250
J M	UNION CARBIDE	MONTROSE			0		UNDERGRO	100 = 1,000	200
JACK KNIFE	WILLIAMS INC	MONTROSE	21	45 N	18.0 W	22	UNDERGRO	1,000 = 100,000	50
LONG PARK 13	UNION CARBIDE CP	MONTROSE	27	4 N	1.7 W	22	UNDERGRO	1,000 = 100,000	200
LONG PARK 15	UNION CARBIDE	MONTROSE			0		UNDERGRO	1,000 = 100,000	200
LONG PARK 16	UNION CARBIDE CP	MONTROSE	27	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	200
LUCKY GROUP	ENERGY FUELS NUC	MONTROSE	30	47 N	19.0 W	22	UNDERGRO	100 = 1,000	50
MAYBE 5 + 6	UNION CARBIDE CP	MONTROSE	26	46 N	17.0 W	22	UNDERGRO	1,000 = 100,000	400
MILL 2	UNION CARBIDE CP	MONTROSE	32	48 N	17.0 W	22	UNDERGRO	1,000 = 100,000	200
MINERAL JOE GROU	ATLAS MINERALS	MONTROSE	26	46 N	17.0 W	22	UNDERGRO	>100,000	300
MINERAL PARK 4,5	ATLAS MINERALS	MONTROSE	35	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	150
MLB-C-AM-19	UCC-GOV'T LEASE	MONTROSE			0		UNDERGRO	>100,000	600
MLB-C-BL-23	INCE MNG-GOVTLSE	MONTROSE			0		UNDERGRO	1,000 = 100,000	400
MLB-C-JD-5	GATESFOX-GOVTLSE	MONTROSE			0		UNDERGRO	1,000 = 100,000	250
MLB-C-LP-22	INCE MNG-GOVTLSE	MONTROSE			0		UNDERGRO	1,000 = 100,000	250
MLB-C-SR-11	DAWSON W-GOVTLSE	MONTROSE			0		UNDERGRO	1,000 = 100,000	150
MLB-C-SR-12	SHABAKER-GOVTLSE	MONTROSE			0		UNDERGRO	1,000 = 100,000	250
MLB-C-SR-13	FLANGANP-GOVTLSE	MONTROSE			0		UNDERGRO	1,000 = 100,000	450
MLB-C-SR-16	ALEASE DAWSON	MONTROSE			0		UNDERGRO	1,000 = 100,000	100
MLB-C-SR-16A	DYNOVE LTD	MONTROSE			0		UNDERGRO	1,000 = 100,000	100
MONOGRAM CLAIM	UNION CARBIDE	MONTROSE	18	46 N	17.0 W	22	UNDERGRO	1,000 = 100,000	100
NIL-TRACE	UNION CARBIDE CP	MONTROSE			0		UNDERGRO	>100,000	400
PEANUT MINES	ATLAS-AMAX	MONTROSE		45 N	17.0 W	22	UNDERGRO	1,000 = 100,000	150
PEGGY	NEESHAM, GLEN	MONTROSE	6	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	50
PICKET CORPAL	DON ANDREWS	MONTROSE	34	46 N	18.0 W	22	UNDERGRO	1,000 = 100,000	100
PRINCESS	D K ANDREWS	MONTROSE	27	48 N	18.0 W	22	UNDERGRO	100 = 1,000	150
RAVEN	FOOTE MINERALS	MONTROSE			0		UNDERGRO	1,000 = 100,000	100
REX MINE	CLEGHORN + WAS	MONTROSE	3	47 N	7.0 W	22	UNDERGRO	1,000 = 100,000	400
RIMROCK 5	UNION CARBIDE CP	MONTROSE			0		UNDERGRO	1,000 = 100,000	150
RIMROCK BLUES 2	UNION CARBIDE CP	MONTROSE	2	45 N	18.0 W	22	UNDERGRO	1,000 = 100,000	50
RIMROCK GROUP	UNION CARBIDE CP	MONTROSE	16	45 N	18.0 W	22	UNDERGRO	1,000 = 100,000	150
RYE 8	NATIVE RESERVE	MONTROSE			0		UNDERGRO	1,000 = 100,000	50
SEPTEMBER MORN	UNION CARBIDE	MONTROSE	10	45 N	18.0 W	22	UNDERGRO	1,000 = 100,000	100
SEMO	ATLAS MINERALS	MONTROSE	24	47 N	18.0 W	22	UNDERGRO	1,000 = 100,000	50
SILVER DOLLAR	C + D EXPLORATIO	MONTROSE			0		UNDERGRO	<100	100
ST.PATRICK 9	C W BUNKER	MONTROSE	11	47 N	20.0 W	22	UNDERGRO	1,000 = 100,000	200
SUNBEAM GROUP	UNION CARBIDE	MONTROSE	10	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	250
URA	UNION CARBIDE C	MONTROSE	29	46 N	17.0 W	22	UNDERGRO	>100,000	450
WANDA 3	PATTERSON, JAMES	MONTROSE	28	47 N	17.0 W	22	UNDERGRO	100 = 1,000	50
WHITE FACE	UNION CARBIDE CP	MONTROSE	34	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	150
YELLOW BIRD 1	R K DIETZ	MONTROSE	33	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	0
YELLOW SPOT GROU	REED MINING	MONTROSE			0		UNKNOWN	<100	0
PITCH	HOMESTAKE MNG CO	SAGUACHE		48 N	6.0 E	22	UNDERGRO	>100,000	250

ACTIVE URANIUM MINES IN THE UNITED STATES
SOURCE: DOE, GRAND JUNCTION, COLORADO

MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID,	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
BURRO	UNION CARBIDE	SAN MIGUEL	31	44 N	18,0 W	22	UNDERGRO	>100,000	500
CARNATION	PIONEER URAY INC	SAN MIGUEL	13	44 N	18,0 W	22	UNDERGRO	>100,000	200
CIVET CAT GROUP	EAGLE PEAK MNG C	SAN MIGUEL			0		UNDERGRO	1,000 - 100,000	50
DEREMO-BIGLER SH	UNION CARBIDE	SAN MIGUEL	2	42 N	20,0 W	22	UNDERGRO	>100,000	650
FALCON-BOB-OYLA	ATLAS-FOOTE	SAN MIGUEL			0		UNDERGRO	1,000 - 100,000	100
GMG	UNION CARBIDE CO	SAN MIGUEL	18	44 N	17,0 W	22	UNDERGRO	1,000 - 100,000	500
HANGOVER (SLRCK)	LOWELL E ROCKWEL	SAN MIGUEL	21	43 N	19,0 W	22	UNDERGRO	1,000 - 100,000	150
HAPPY JACK (SLKPC)	MARION BIRCH	SAN MIGUEL	36	44 N	20,0 W	22	UNDERGRO	1,000 - 100,000	0
LUCKY STRIKE	HANNERT MNG,	SAN MIGUEL	19	43 N	19,0 W	22	UNDERGRO	1,000 - 100,000	150
MAGPIE 2	PIONEER URAY INC	SAN MIGUEL	25	45 N	18,0 W	22	UNDERGRO	1,000 - 100,000	250
MURIETTA	SHIPROCK,LTD	SAN MIGUEL	25	45 N	18,0 W	22	UNDERGRO	1,000 - 100,000	250
NORTH BURRO	UNION CARBIDE CP	SAN MIGUEL			0		UNDERGRO	1,000 - 100,000	300
POND	UNION CARBIDE CP	SAN MIGUEL	23	44 N	17,0 W	22	UNDERGRO	1,000 - 100,000	100
RADIUM 9,10,+ 11	ATLAS-FOOTE	SAN MIGUEL	4	43 N	19,0 W	22	UNDERGRO	1,000 - 100,000	100
RADIUM GP-BLACKB	ATLAS-FOOTE	SAN MIGUEL	32	44 N	19,0 W	22	UNDERGRO	1,000 - 100,000	0
SEARS GROUP	JOHN BERES	SAN MIGUEL			0		UNDERGRO	100 - 1,000	0
SILVER BELL	UNION CARBIDE CP	SAN MIGUEL	22	32 S	26,0 E	24	UNKNOWN	1,000 - 100,000	650
SNYDER + PETERSO	UNION CARBIDE	SAN MIGUEL	18	43 N	18,0 W	22	UNDERGRO	>100,000	750
STRAWBERRY ROAN	ATLAS MINERALS	SAN MIGUEL	32	43 N	19,0 W	22	UNDERGRO	1,000 - 100,000	100
SUMMIT INCLINE 1	ATLAS-AMAX	SAN MIGUEL	28	43 N	19,0 W	22	UNDERGRO	1,000 - 100,000	300
SUN CUP (PUCKETT	DOLORES BENCH LT	SAN MIGUEL	31	4 N	1,7 W	22	UNDERGRO	1,000 - 100,000	300
SUNDAY GROUP	UNION CARBIDE CP	SAN MIGUEL	13	44 N	18,0 W	22	UNDERGRO	>100,000	300
UINTAH	W. D. TRIPP	SAN MIGUEL	28	43 N	19,0 W	22	UNDERGRO	1,000 - 100,000	250
WILMARTH	UNION CARBIDE CP	SAN MIGUEL	24	44 N	17,0 W	22	UNDERGRO	1,000 - 100,000	0
WINDSWEPT	UNION CARBIDE CP	SAN MIGUEL	15	44 N	17,0 W	22	UNDERGRO	1,000 - 100,000	100
***** NEW MEXICO *****									
ANN LEE(28,14-9)	UNITED NUCLEAR	MCKINLEY	28	14 N	9,0 W	22	UNDERGRO	>100,000	650
BUCKY (14-14-10)	COBB NUCLEAR INC	MCKINLEY	14	14 N	10,0 W	22	UNDERGRO	>100,000	200
CLIFFSIDE 36 14N	KERR-MCGEE CORP	MCKINLEY	36	14 N	9,0 W	22	UNDERGRO	>100,000	1400
DOG-FLEA (20-13-	M + M MINING CO	MCKINLEY	20	13 N	9,0 W	22	UNDERGRO	>100,000	200
IX CIRCUIT GRANT	KERR MCGEE	MCKINLEY			0		MWATPROD	<100	0
MAC 1 12,15-14,S	UN - HOMESTAKE	MCKINLEY	12	15 N	14,0 W	22	UNDERGRO	1,000 - 100,000	400
MINE WATER	UNITED NUC HOM	MCKINLEY			0		MWATPROD	<100	0
MLB-NH-B-1	WARNOCK-GOVT LSE	MCKINLEY			0		SURFACE	>100,000	50
N E CHURCHROCK	UNITED NUCLEAR	MCKINLEY	34	17 N	16,0 W	22	UNDERGRO	>100,000	1600
NAVAJO RES, NW	KERR-MCGEE CORP,	MCKINLEY	34	17 N	17,0 W	22	UNDERGRO	1,000 - 100,000	2250
SANDSTONE(27-14-	UNITED NUCLEAR	MCKINLEY	34	13 N	9,0 W	22	UNDERGRO	>100,000	750
SEC 1 13 9	KERR MCGEE	MCKINLEY	1	13 N	9,0 W	22	UNDERGRO	>100,000	1400
SEC 12 14 10 SWQ	COBB NUCL IND	MCKINLEY	12	14 N	10,0 W	22	UNDERGRO	>100,000	650
SEC 12-15-14W2,N	GULF MINERAL RES	MCKINLEY	12	15 N	14,0 W	22	UNDERGRO	1,000 - 100,000	450
SEC 18+20-14-9	KERR MCGEE	MCKINLEY	20	14 N	9,0 W	22	UNDERGRO	>100,000	800
SEC 19 14N 9W	KERR-MCGEE CORP,	MCKINLEY	19	14 N	9,0 W	22	UNDERGRO	>100,000	650
SEC 19-13-09(HOP	RANCHERS EXPL,	MCKINLEY	19	13 N	9,0 W	22	UNDERGRO	1,000 - 100,000	500
SEC 21-15N-13W	WESTERN NUCLEAR	MCKINLEY	21	15 N	13,0 W	22	UNDERGRO	>100,000	400
SEC 25-14N-10W	UNITED NUC HOM	MCKINLEY	25	14 N	10,0 W	22	UNDERGRO	>100,000	700

ACTIVE URANIUM MINES IN THE UNITED STATES
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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** NEW MEXICO (CONT'D) *****									
SEC 30,14-9(E +	KERR MCGEE	MCKINLEY	30	14 N	9,0 W	22	UNDERGRO	>100,000	550
SEC 32 15N 11W	COBB NUCLEAR INC	MCKINLEY	32	15 N	11,0 W	22	UNDERGRO	1,000 - 100,000	250
SEC 35,14N-9W	KERR MCGEE	MCKINLEY	35	14 N	9,0 W	22	UNDERGRO	>100,000	1200
SEC 35,17N-16W N	KERR MCGEE CORP.	MCKINLEY	34	17 N	16,0 W	22	UNDERGRO	1,000 - 100,000	1650
SEC 7-13N-8W	RANCHERS EXP.DEV	MCKINLEY	7	13 N	8,0 W	22	UNDERGRO	>100,000	1350
SEC 8 13N 9W	KOPPEN	MCKINLEY	8	13 N	9,0 W	22	UNDERGRO	1,000 - 100,000	300
SEC. 13-13-11 S	TODILTO EXPL,+D	MCKINLEY	13	13 N	11,0 W	22	UNDERGRO	1,000 - 100,000	50
SEC. 15-14-10	UNITED NUCLEAR	MCKINLEY	15	14 N	10,0 W	22	UNDERGRO	>100,000	500
SEC.13-14N-10W	UNTD,NUC,HMSTKE	MCKINLEY	13	14 N	10,0 W	22	UNDERGRO	>100,000	500
SEC.17,14N-9W,82	KERR MCGEE	MCKINLEY	17	14 N	9,0 W	22	UNDERGRO	>100,000	850
SEC.19-13-10 NWQ	TODILTO EXPL + D	MCKINLEY	19	13 N	10,0 W	22	SURFACE	>100,000	50
SEC.19-13-9 SEQ	RESERVE OIL+MNRL	MCKINLEY	19	13 N	9,0 W	22	UNDERGRO	>100,000	200
SEC.21,13-9 DORI	RANCHERS EXPL.	MCKINLEY	21	13 N	9,0 W	22	UNDERGRO	1,000 - 100,000	250
SEC.23-14N-10W	UNKNOWN	MCKINLEY	23	14 N	10,0 W	22	UNDERGRO	>100,000	700
SEC.24+26-14N-10	KERR-MCGEE CORP.	MCKINLEY	24	14 N	10,0 W	22	UNDERGRO	>100,000	650
SEC.26,14N-9W,82	KERR-MCGEE CORP.	MCKINLEY	26	14 N	9,0 W	22	UNDERGRO	1,000 - 100,000	1150
SEC.29-14-9 (MU-	KERR-MCGEE CORP.	MCKINLEY	29	14 N	9,0 W	22	UNDERGRO	>100,000	600
SEC.32,14N-09W	UNITED NUCLEAR	MCKINLEY	32	14 N	9,0 W	22	UNDERGRO	>100,000	600
ENOS JOHNSON DUM	RAY WILLIAMS	SAN JUAN			0		DUMPS	1,000 - 100,000	0
L-BAR	SOHIO-RESERVE	VALENCIA	24	11 N	5,0 W	22	UNDERGRO	>100,000	600
PAGUATE-JACKPIL	ANACONDA CO.	VALENCIA		11 N	5,0 W		SURFACE	>100,000	150
PAGUATE-JACKPIL	ANACONDA CO	VALENCIA			0		UNDERGRO	>100,000	450
ST,ANTHONY MINE	UNITED NUCLEAR	VALENCIA	19	11 N	4,0 W	22	SURFACE	>100,000	250
***** TEXAS *****									
HURT LEASE	CONOCO PIONEER	ATASCOSA			0		SURFACE	>100,000	100
BOONE-ANDERSON L	INTRCNTAL ENERGY	BEE			0		IN-SITU	1,000 - 100,000	250
BENAVIDES	WYO MINERAL CORP	DUVAL			0		IN-SITU	1,000 - 100,000	200
PALANGANA DOME	UNION CARBIDE CP	DUVAL			0		IN-SITU	<100	300
REICKER-ZAMZOH	CONOCO PIONEER	KARNES			0		SURFACE	1,000 - 100,000	100
BUTLER LEASE	CONOCO-PIONEER	KARNES			0		SURFACE	>100,000	100
CARMODY-ROSEN17	CONOCO- PIONEER	KARNES			0		SURFACE	1,000 - 100,000	300
DICKSON (UL 764)	CONOCO PIONEER	KARNES			0		SURFACE	1,000 - 100,000	200
FALLS CITY TAILI	SOLUTION ENGINRG	KARNES			0		TAIL,DMP	>100,000	0
FRANKLIN (UL1754	CONOCO PIONEER	KARNES			0		SURFACE	1,000 - 100,000	200
KOTZUR-2260	CONOCO-PIONEER	KARNES		09	17,0		SURFACE	>100,000	100
PAWELEK D.B. 7	CONOCO-PIONEER	KARNES			0		SURFACE	>100,000	200
PAWELEK-LYSSA 7	CONOCO- PIONEER	KARNES			0		SURFACE	>100,000	100
THOMAS-KNANDEL-D	CONOCO-PIONEER	KARNES			0		SURFACE	>100,000	150
WINERICH C.D. 4	CONOCO- PIONEER	KARNES			0		SURFACE	>100,000	100
BURNS MNG,PROSPE	U. S. STEEL	LIVE OAK			0		IN-SITU	>100,000	500
CHAPMAN	CONOCO-PIONEER	LIVE OAK			0		SURFACE	>100,000	100
CLAY WEST PROPER	U. S. STEEL	LIVE OAK			0		IN-SITU	>100,000	350
FELDER TRACT	EXXON CO., USA	LIVE OAK			0		SURFACE	>100,000	100
HOUSE-1734	CONOCO-PIONEER	LIVE OAK		11	15,0		SURFACE	>100,000	200
LAMPRECHT,A,H,-2	WYOMING MINERALS	LIVE OAK			0		IN-SITU	>100,000	250

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** TEXAS (CONT'D) *****									
MC LEAN-BOWMAN	EXXON CO., USA	LIVE OAK			0		SURFACE	1,000 - 100,000	100
SMITH, W.A. 2-670	CONOCO-PIONEER	LIVE OAK			0		SURFACE	1,000 - 100,000	100
ZAMZOW	INTRNTNL ENERGY	LIVE OAK			0		IN-SITU	>100,000	150
O'HERN LEASE-75	MOBIL OIL CO	WEBB			0		IN-SITU	>100,000	500
***** UTAH *****									
MONARCH	HOLLINGSHEAD MNG	BEAVER	36	29 S	16.0 W	24	UNDERGRO	1,000 - 100,000	100
ALLEN	WATTERSON MINING	EMERY			0		UNDERGRO	1,000 - 100,000	100
COMETOITE	INDUSTRIAL MININ	EMERY			0		UNDERGRO	1,000 - 100,000	50
DEDE 6,7+8	ATLAS MINERALS	EMERY			0		UNDERGRO	1,000 - 100,000	500
DELTA MINE	UTAH WEST INC.	EMERY			0		UNDERGRO	>100,000	400
DESERT MOON 3	WATTERSON MINING	EMERY			0		UNDERGRO	1,000 - 100,000	50
DEXTER GROUP	JOHN ADAMS	EMERY			0		UNDERGRO	1,000 - 100,000	100
DIRTY DEVIL 2	INDUSTRIAL NUCL	EMERY			0		UNDERGRO	1,000 - 100,000	100
DOG 3	JOHN ADAMS	EMERY			0		SURFACE	1,000 - 100,000	50
FLAT TOP LODGE	MINERALS FVAL+IN	EMERY			0		SURFACE	1,000 - 100,000	50
INCLINE 1,2,+7	ATLAS MINERALS	EMERY			0		UNDERGRO	>100,000	200
INCLINE 6	ATLAS MINERALS	EMERY			0		UNDERGRO	>100,000	200
JACK RAB-ACE-N-H	ATLAS MINERALS	EMERY			0		UNDERGRO	1,000 - 100,000	500
JOSHUA 1	TROJAN MINING CO	EMERY			0		UNDERGRO	<100	0
TEMPLE MOUNTAIN	RON CROSS	EMERY			0		UNDERGRO	1,000 - 100,000	0
THUNDERBIRD	INDUSTRIAL MININ	EMERY			0		UNDERGRO	1,000 - 100,000	50
VANADIUM KING 1	TEMPLE ROCK MNG.	EMERY			0		UNDERGRO	1,000 - 100,000	100
YELLOW DAISY	DAN L POWELL	EMERY			0		UNDERGRO	100 - 1,000	200
YELLOW QUEEN	AUGUST PRIEBE, JR	EMERY			0		UNDERGRO	1,000 - 100,000	50
CONGRESS 29+40	TED EKKER	GARFIELD			0		SURFACE	1,000 - 100,000	100
CONGRESS-DAISY J	ENERGY FUELS NUC	GARFIELD			0		UNDERGRO	100 - 1,000	100
CONGRESS-EAGLE	DONALD D HANNI	GARFIELD			0		UNDERGRO	1,000 - 100,000	50
DAISY JUNE GROUP	TED EKKER	GARFIELD			0		UNDERGRO	1,000 - 100,000	50
DELMONTE GROUP	DENNIS EKKER	GARFIELD			0		UNDERGRO	1,000 - 100,000	50
DONALD DUCK 2	DEE RAEY	GARFIELD			0		UNDERGRO	100 - 1,000	50
ELENORA 1	ENERGY FUELS NUC	GARFIELD			0		SURFACE	<100	100
LUCKY STRIKE	PLATEAU RESOU LT	GARFIELD			0		UNDERGRO	100 - 1,000	0
MIDAS-CENTIPEDE	SHUMWAY ASSOC.	GARFIELD			0		UNDERGRO	1,000 - 100,000	150
MINNIE PEAPL	LEO D JACKSON	GARFIELD			0		UNDERGRO	1,000 - 100,000	50
MOCKINGBIRD CLAI	J + R MNG	GARFIELD			0		UNDERGRO	1,000 - 100,000	100
P+P	J + R MNG.	GARFIELD			0		UNDERGRO	1,000 - 100,000	0
POISON SPRING 2	HUNT, A + SONS	GARFIELD			0		SURFACE	<100	50
SEC 36-31-11 8LM	MINERALS RECVRY	GARFIELD			0		UNDERGRO	1,000 - 100,000	50
TRACKYTE GROUP	ENERGY FUELS NUC	GARFIELD			0		UNDERGRO	1,000 - 100,000	100
BLACK JACK	LYNN ZUFELT	GRAND	34	22 S	21.0 E	24	UNDERGRO	100 - 1,000	50
BLACKSTONE 5 + 6	ALFRED FROST	GRAND	31	22 S	22.0 E	24	UNDERGRO	1,000 - 100,000	150
CACTUS RAT	ATLAS-AMAX	GRAND	33	22 S	22.0 E	24	UNDERGRO	1,000 - 100,000	50
COBALT	L + D SHUMWAY	GRAND			0		SURFACE	<100	50
CORRAL 1 + 2	COTTER CORP.	GRAND	27	24 S	20.0 E	24	UNDERGRO	>100,000	150
CORVUSITE	SHIPROCK LTD	GRAND	19	25 S	26.0 E	24	UNDERGRO	1,000 - 100,000	150

ACTIVE URANIUM MINES IN THE UNITED STATES
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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
LAST DOLLAR	JOE GOMEZ	GRAND			0		UNDERGRO	100 - 1,000	0
MC GROUP	PIONEER URAPAN	GRAND			0		UNDERGRO	<100	500
MINERAL POLAR 22	ATLAS-AMAX	GRAND	26	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	50
PINTO	ZIAK, PAUL	GRAND	33	22 S	20.0 E	24	SURFACE	<100	0
POLAR GROUP	UNION CARBIDE CP	GRAND	10	25 S	25.0 E	24	UNDERGRO	1,000 - 100,000	100
POLAR MESA	UNION CARBIDE CP	GRAND		25 S	25.0 E	24	UNDERGRO	1,000 - 100,000	0
RED HEAD	JERRY STOCKS	GRAND	22	24 S	23.0 E	24	UNDERGRO	100 - 1,000	150
SEC.32-CANE CREE	ATLAS-AMAX	GRAND	32	26 S	21.0 E	24	UNDERGRO	1,000 - 100,000	150
SHINARUMP 2	GENERAL ELECTRIC	GRAND	34	24 S	20.0 E	24	UNDERGRO	1,000 - 100,000	50
SLICK ROCK 1,2+3	JIM C BUTT	GRAND	28	23 S	20.0 E	24	UNDERGRO	100 - 1,000	0
UTAH ALLOY GROUP	SILLMAN, KENNETH	GRAND	6	23 S	22.0 E	24	UNDERGRO	1,000 - 100,000	50
BINGHAM	WYOMING MNPL CP	SALT LAKE			0		SURFACE	1,000 - 100,000	0
ABE 4	RICHARD V ENSLE	SAN JUAN			0		UNDERGRO	1,000 - 100,000	200
ATOMIC KING GROU	URANIUM PROD CO	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
BEAVER (DEER CK)	UNION CARBIDE	SAN JUAN	31	28 S	25.0 E	24	UNKNOWN	1,000 - 100,000	450
BIG BUCK 11A + 1	BOB SHUMWAY	SAN JUAN	14	30 S	24.0 E	24	UNDERGRO	>100,000	400
BLUE 1	EAST STANDARD UR	SAN JUAN	14	33 S	21.0 E	24	UNDERGRO	1,000 - 100,000	150
BLUE BIRD	DALE DILLON	SAN JUAN	4	37 S	21.0 E	24	UNDERGRO	1,000 - 100,000	150
RUGS 1-4	MERWIN SHUMWAY	SAN JUAN	4	37 S	21.0 E	24	UNDERGRO	1,000 - 100,000	100
CAMEL (HIDEOUT)	JIM C. BUTT	SAN JUAN			0		UNDERGRO	100 - 1,000	150
CANARY MINE	JEPPI STOCKS	SAN JUAN			0		UNDERGRO	100 - 1,000	50
CLIFF HOUSE	GLEN J SHUMWAY	SAN JUAN	4	37 S	21.0 E	24	UNDERGRO	1,000 - 100,000	50
COLUMBIA SHAFT G	ATLAS MINERALS	SAN JUAN	27	29 S	24.0 E	24	UNDERGRO	>100,000	500
COLUMBUS-RIM	ATLAS-AMAX	SAN JUAN			0		UNDERGRO	>100,000	400
COTTONWOOD GROUP	DAN SHUMWAY	SAN JUAN			0		UNDERGRO	100 - 1,000	100
COTTONWOOD GROUP	MERWIN SHUMWAY	SAN JUAN	4	37 S	21.0 E	24	UNDERGRO	1,000 - 100,000	50
DUSTY	CLYDE R. SANCHEZ	SAN JUAN	26	36 S	25.0 E	24	UNDERGRO	1,000 - 100,000	0
EASTER	GLEN J SHUMWAY	SAN JUAN			0		UNDERGRO	100 - 1,000	0
FAR WEST MINE	ATLAS MINERALS	SAN JUAN	28	29 S	24.0 E	24	UNDERGRO	>100,000	550
FRY 4	JIM C. BUTT	SAN JUAN		37 S	16.0 E	24	UNDERGRO	1,000 - 100,000	150
GENEVA	CLAYTON STOCKS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
GLADE GROUP	ENERGY FUELS NUC	SAN JUAN			0		SURFACE	1,000 - 100,000	100
HAPPY JACK (WHCA	ATLAS MINERALS	SAN JUAN	8	35 S	15.0 E	24	UNDERGRO	>100,000	200
HILLSIDE	ENERGY FUELS NUC	SAN JUAN			0		UNDERGRO	1,000 - 100,000	200
HOLE IN THE ROCK	BLACK + SHUMWAY	SAN JUAN	16	40 S	22.0 E	24	UNDERGRO	1,000 - 100,000	50
HUMBUG	ATLAS-AMAX	SAN JUAN	30	31 S	25.0 E	24	UNDERGRO	1,000 - 100,000	100
JEAN 1	JIM C BUTT	SAN JUAN	15	31 S	21.0 E	24	UNDERGRO	1,000 - 100,000	50
JIMBO BOB	SHUMWAY ASSOC.	SAN JUAN	6	32 S	25.0 E	24	UNDERGRO	1,000 - 100,000	250
KING EDWARD	EUGENE SHUMWAY	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
LAST CHANCE	W. R. WILLIAMS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	50
LAURA GROUP	LAURA MNG. CO.	SAN JUAN			0		UNDERGRO	1,000 - 100,000	200
LEF GROUP	ENERGY FUELS NUC	SAN JUAN			0		UNDERGRO	1,000 - 100,000	50
LISBON MINE	RIO ALGOM CORP	SAN JUAN	27	29 S	24.0 E	24	UNDERGRO	>100,000	2600
LOCUST	LFIGHTON-GRANT	SAN JUAN	4	3 S	2.5 E	24	UNDERGRO	100 - 1,000	100
LONG SHOT	DAN SHUMWAY	SAN JUAN			0		SURFACE	100 - 1,000	0
MARKEY	CALVIN BLACK EN	SAN JUAN	19	37 S	15.0 E	24	UNDERGRO	>100,000	1000
MI VIDA	MINERALS WEST	SAN JUAN	11	30 S	24.0 E	24	UNDERGRO	>100,000	80
NORTH ALICE	JRJ MINING CO	SAN JUAN	21	29 S	24.0 E	24	UNDERGRO	>100,000	400

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
NOTCH 1 + 4	JUNCTION BIT+TOO	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
OLD RATTLER	ENERGY FUELS NUC	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
PANDORA	ATLAS-AMAX	SAN JUAN	5	29 S	25.0 E	24	UNDERGRO	>100,000	450
PATS PROPERTY	M + M MINING CO	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
POSEY GROUP	ENERGY FUELS NUC	SAN JUAN		37 S	15.0 E	24	UNDERGRO	1,000 - 100,000	200
PRETTY GIRL	DERYL SHUMWAY	SAN JUAN			0		UNKNOWN	100 - 1,000	0
RADIUM KING MINE	LEEEO GAS + OIL	SAN JUAN			0		UNDERGRO	1,000 - 100,000	500
RAINBOW 41	DONALD V BLAKE	SAN JUAN			0		SURFACE	100 - 1,000	50
RAINBOW LEDGE	JIM C BUTT	SAN JUAN			0		UNDERGRO	100 - 1,000	0
RED + BLACK LIZA	LOWELL E ROCKWEL	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
RED ARROW	MNRLS WEST INC	SAN JUAN			0		SURFACE	100 - 1,000	50
RED DEVIL	SUNRAY MINING CO	SAN JUAN	21	27 S	24.0 E	24	UNDERGRO	100 - 1,000	0
ROANOKE	CLAYTON STOCKS	SAN JUAN	6	31 S	25.0 E	24	UNDERGRO	1,000 - 100,000	50
SAGE	ATLAS MINERALS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	700
SALLY JO 1 + 2	DERYL SHUMWAY	SAN JUAN	15	37 S	21.0 E	24	UNDERGRO	1,000 - 100,000	50
SAN JUAN	HOWARD BALSLEY	SAN JUAN	4	29 S	23.0 E	24	UNDERGRO	1,000 - 100,000	150
SANDY GROUP	RICHARD KIPP	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
SCH SEC 2 CHINLE		SAN JUAN	2	30 S	24.0 E	24	UNDERGRO	>100,000	700
SEC 2 + 31 REDD	UNION CARRIDE	SAN JUAN	02	29 S	24.0 E	24	UNDERGRO	>100,000	450
SEC 28 CALLIHAM	ATLAS MINERALS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	700
SEC.2-28S-22E	BIRCH + STOCKS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	0
SMOKEY	BLAKE MNG CO	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
SNOW FLAKE	LYLE DAVIS	SAN JUAN	28	27 S	23.0 E	24	UNDERGRO	1,000 - 100,000	0
SNOWBALL	UNION CARRIDE CP	SAN JUAN	36	29 S	24.0 E	24	UNDERGRO	1,000 - 100,000	450
STRAWBERRY	DELAY SHUMWAY	SAN JUAN	35	35 S	24.0 E	24	UNDERGRO	1,000 - 100,000	100
V-8 AND GOLD BUT	GLEN J SHUMWAY	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
VANADIUM QUEEN1-	ROBERT YOUNG	SAN JUAN	29	28 S	26.0 E	24	UNDERGRO	1,000 - 100,000	150
WATERFALL	MURPHY MNG CO	SAN JUAN	6	31 S	25.0 E	24	UNDERGRO	1,000 - 100,000	0
WEE HOPE	JIM C BUTT	SAN JUAN			0		UNDERGRO	1,000 - 100,000	250
WHITE CAN, 1-CAM	JIM C. BUTT	SAN JUAN	25	36 S	16.0 E	24	UNDERGRO	1,000 - 100,000	150
WILSON LEASE	UNION CARBIDE CO	SAN JUAN	15	32 S	26.0 E	24	UNDERGRO	>100,000	650
WOOD LEASE	ATLAS MINERALS	SAN JUAN	6	31 S	25.0 E	24	UNDERGRO	1,000 - 100,000	700
WOODENSHOE 1+2	EAGLE PEAK MININ	SAN JUAN			0		UNKNOWN	100 - 1,000	0
YANKEE GIRL	ENERGY FUELS NUC	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
YELLOW CAKE	REX POWELL	SAN JUAN	12	36 S	24.0 E	24	SURFACE	<100	250
YELLOW CIRCLE GR	LAMMERT + SHUMWA	SAN JUAN	34	27 S	23.0 E	24	UNDERGRO	1,000 - 100,000	100
***** WASHINGTON *****									
MIDNITE-ROYD	DAWN MNG CO	STEVENS	6	28 N	38.0 E	33	SURFACE	>100,000	100
PETERS L&E-SHRWD	WESTERN NUCLEAR	STEVENS	35	28 N	37.0 E	33	SURFACE	>100,000	250
***** WYOMING *****									
F GRP SEC28 ARE	PATHFINDER	CARBON	28	28 N	78.0 W	06	SURFACE	>100,000	350
JENKINS STATE LE	URAN,SUPPLY SRVC	CARBON	11	27 N	78.0 W	06	SURFACE	1,000 - 100,000	250

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** WYOMING (CONT'D) *****									
SEC.33+4,28N-78W	GETTY OIL	CARBON	3	27 N	78.0 W	05	SURFACE	>100,000	350
BEAR CREEK B-4,5	ROCKY MT ENERGY	CONVERSE	35	38 N	73.0 W	6	SURFACE	>100,000	150
HIGHLAND PROJ D.	EXXON CO USA	CONVERSE	29	36 N	73.0 W	06	SURFACE	>100,000	300
HIGHLAND PROJ,U.	EXXON CO., USA	CONVERSE	20	36 N	73.0 W	06	UNDERGRO	>100,000	550
SEC.33,37N-73W	KERR-MCGEE CORP.	CONVERSE	33	37 N	73.0 W	06	SURFACE	1,000 - 100,000	200
SEC,36,36N-74W	KERR-MCGEE CORP.	CONVERSE	36	36 N	74.0 W	06	UNDERGRO	1,000 - 100,000	650
BIG EAGLE	PATHFINDER MINES	FREMONT	27		2.9		SURFACE	>100,000	300
CAP 1,2+3	FEDERAL AMERICAN	FREMONT	27	33 N	89.0 W	6	SURFACE	100 - 1,000	200
CLYDE, BRET, LOC	FEDERAL AMERICA	FREMONT	23	32 N	91.0 W	06	SURFACE	>100,000	200
DICK GROUP	UNION CARBIDE CP	FREMONT	30	33 N	90.0 W	06	SURFACE	>100,000	250
GOLDEN GOOSE	WESTERN NUCLEAR	FREMONT	21	28 N	92.0 W	06	SURFACE	>100,000	350
HAL-BART-EGL GRI	PATHFINDER	FREMONT	6	32 N	90.0 W	06	SURFACE	>100,000	200
LUCKY MC GROUP	PATHFINDER	FREMONT	2	33 N	90.0 W	6	SURFACE	>100,000	300
MC INTOSH E+W 8N	WESTERN NUCLEAR	FREMONT			0		SURFACE	>100,000	200
OLA GROUP	UNION CARRIDE CP	FREMONT	32	33 N	90.0 W	06	SURFACE	>100,000	250
PAY DIRT	WESTERN NUCLEAR	FREMONT	20	28 N	92.0 W	06	UNDERGRO	>100,000	150
RAVINE	WESTERN NUCLEAR	FREMONT			0		IN-SITU	1,000 - 100,000	0
SEC 16 MINE WATE	WESTERN NUCLEAR	FREMONT			0		IN-SITU	<100	0
SEISMIC RES,SEC	WESTERN NUCLEAR	FREMONT	17	28 N	92.0 W	06	UNDERGRO	>100,000	350
SHEEP MOUNTAIN 1	WESTERN NUCLEAR	FREMONT	22	28	92.0	22	UNDERGRO	>100,000	1550
SUNSET GROUP	FEDERAL AMERICA	FREMONT	6	32 N	90.0 W	6	SURFACE	>100,000	200
IRIGARAY	WYOMING MINERALS	JOHNSON	18	46	77.0	6	IN-SITU	1,000 - 100,000	250
PAY ALJOB-HEAP L	UNION CARBIDE	NATRONA			0		HL-DUMPS	>100,000	0
PAY ALJOB-PROTOR	UNION CARBIDE	NATRONA			0		LOWGRADE	1,000 - 100,000	0
STAR 1-7	UNION CARRIDE CP	NATRONA	14	33 N	89.0 W	06	SURFACE	>100,000	50
SUSIE	UNION CARBIDE CP	NATRONA	14	33 N	89.0 W	06	UNDERGRO	1,000 - 100,000	150
ARE/CRE(SWEETWAT	MINERALS EXPLTN	SWEETWATER		24 N	93.0 W	06	SURFACE	<100	200
CRE	MINERALS EXPL,CO	SWEETWATER	16	24 N	93.0 W	06	SURFACE	<100	100

APPENDIX F
INACTIVE URANIUM MINES IN
THE UNITED STATES

INACTIVE URANIUM MINES IN THE UNITED STATES
SOURCE: DOE, GRAND JUNCTION, COLORADO

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** ALASKA *****									
CUB (ALASKA)	STANDARD METALS	SOUTHEAST			0		UNDERGRO	1,000 - 100,000	300
***** ARIZONA *****									
APACHE MINE	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	200
ARROWHEAD 1	NAVAJO TRIBE	APACHE			0		SURFACE	<100	50
BAPTON 3	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	50
BETTIE 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	100
BLACK 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	1,000 - 100,000	0
BLACK 2	NAVAJO TRIBE	APACHE	29	36 N	29.0 E	14	UNDERGRO	1,000 - 100,000	0
BLACK MUSTACHE	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	200
BLACK ROCK	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	100
BLACK ROCK POINT	NAVAJO TRIBE	APACHE	7	40 N	29.0 F	14	UNDERGRO	1,000 - 100,000	50
BLOCK K MIKE BRO	NAVAJO TRIBE	APACHE	31	41 N	29.0 E	14	UNDERGRO	1,000 - 100,000	100
BLUESTONE 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	100
CAPITAN BENALLY	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	100
CARSON	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	200
CATO 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	1,000 - 100,000	100
CATO 2	NAVAJO TRIBE	APACHE	8	36 N	29.0 E	14	UNDERGRO	<100	0
CHEE KEZ 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	50
CHESTER GROUP	COOLEY, CECIL J.	APACHE	26	15 N	25.0 E	14	UNDERGRO	100 - 1,000	100
CHESTER MUD 1	NAVAJO TRIBE	APACHE	13	46 N	18.0 W	22	UNDERGRO	100 - 1,000	0
CHIMNEY MINE 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	0
CISCO 1 CAMP MES	NAVAJO TRIBE	APACHE	29	36 N	29.0 E	14	UNDERGRO	1,000 - 100,000	150
CLAIM 28	NAVAJO TRIBE	APACHE	20	33 N	23.0 E	14	SURFACE	1,000 - 100,000	50
CLAIM 31	NAVAJO TRIBE	APACHE	29	33 N	23.0 E	14	SURFACE	<100	0
CLAIM 7 + 10	NAVAJO TRIBE	APACHE	3	32 N	23.0 E	14	UNDERGRO	1,000 - 100,000	50
CLEVELAND 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	0
COVE 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	150
COVE 2	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	200
COVE 4	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	250
COVE MESA	NAVAJO TRIBE	APACHE			0		UNDERGRO	1,000 - 100,000	0
COVE MESA 1	NAVAJO TRIBE	APACHE	31	38 N	29.0 F	14	UNDERGRO	1,000 - 100,000	100
COVE MESA 10	NAVAJO TRIBE	APACHE			0		UNDERGRO	1,000 - 100,000	200
COVE MESA 2	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	300
COVE MESA VCA	NAVAJO TRIBE	APACHE	1	10 N	8.0 W	21	UNDERGRO	1,000 - 100,000	100
COVE MINE	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	0
DAN TAYLOR 1	NAVAJO TRIBE	APACHE	1	34 N	23.0 E	14	UNDERGRO	100 - 1,000	250
DENNY LEE 3	NAVAJO TRIBE	APACHE	2	32 N	23.0 E	14	UNDERGRO	100 - 1,000	0
EAST MESA	NAVAJO TRIBE	APACHE	10	37 N	28.0 E	14	UNDERGRO	100 - 1,000	150
EAST MESA 1 + 2	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	50
ETBITTY 1	NAVAJO TRIBE	APACHE	2	33 N	23.0 F	14	UNDERGRO	100 - 1,000	50
EURIDA	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	200
FALL DOWN MESA	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	100
FLAG MESA 1	NAVAJO TRIBE	APACHE		9 N	7.0 W	21	UNDERGRO	1,000 - 100,000	50
FRANK JR.	NAVAJO TRIBE	APACHE	9	36 N	29.0 E	14	UNDERGRO	1,000 - 100,000	250
FRANK NO.1	NAVAJO TRIBE	APACHE	8	36 N	29.0 E	14	UNDERGRO	1,000 - 100,000	150

INACTIVE URANIUM MINES IN THE UNITED STATES
SOURCE: DOE, GRAND JUNCTION, COLORADO

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** ARIZONA (CONT'D) *****									
G + G	FOSTER, GEORGE	APACHE	18	12 N	29.0 E	14	SURFACE	<100	50
HANLEY 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	250
HARVEY BEGAY 3	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	50
HARVEY BLACKWATE	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	100
HARVEY BLACKWATE	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	50
HAZEL	NAVAJO TRIBE	APACHE			0		SURFACE	<100	0
HOWARD NEZ 1	NAVAJO TRIBE	APACHE			0		SURFACE	<100	0
JAUNITA 3	PAULSELL, PAT D.	APACHE	14	18 N	25.0 E	14	SURFACE	<100	50
JIM LEE 1	NAVAJO TRIBE	APACHE			0		SURFACE	100 - 1,000	100
JIM LEE SMILEY	NAVAJO TRIBE	APACHE	3	32 N	23.0 E	14	SURFACE	<100	0
JIMMIE BILEEN 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	50
JIMMIE KING	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	0
JOHN KEE TRACT 4	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	50
JOHN LEE BENALLY	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	150
JOHN M. YAZZIE 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	1,000 - 100,000	50
JOHNNY MC COY 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	0
KASEWOOD RAHE 1	NAVAJO TRIBE	APACHE	36	33 N	24.0 E	14	UNDERGRO	<100	50
KNIFE EDGE	NAVAJO TRIBE	APACHE	29	36 N	29.0 E	14	UNDERGRO	1,000 - 100,000	100
LAST CHANCE	NAVAJO TRIBE	APACHE	12	40 N	26.0 E	14	UNDERGRO	1,000 - 100,000	100
LEASE 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	100
LOOKOUT POINT	NAVAJO TRIBE	APACHE			0		UNDERGRO	1,000 - 100,000	300
MC KENZIE 3	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	0
MELVIN BEVALLY 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	50
MESA 1	NAVAJO TRIBE	APACHE	22	9 N	7.0 W	14	UNDERGRO	1,000 - 100,000	100
MESA 1 1-2	NAVAJO TRIBE	APACHE	22	36 N	29.0 E	14	UNDERGRO	1,000 - 100,000	250
MESA 1 1-4	NAVAJO TRIBE	APACHE	22	36 N	29.0 E	14	UNDERGRO	100 - 1,000	200
MESA 1 3-4 MINE	NAVAJO TRIBE	APACHE	28	36 N	29.0 E	14	UNDERGRO	1,000 - 100,000	350
MESA 1 MINE 14A	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	250
MESA 1 MINE 16	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	250
MESA 1 MINE 22	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	250
MESA 1 MINE 24	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	200
MESA 2	NAVAJO TRIBE	APACHE	21	36 N	29.0 E	14	UNDERGRO	>100,000	300
MESA 2 1-2 MINE	NAVAJO TRIBE	APACHE	21	36 N	29.0 E	14	UNDERGRO	1,000 - 100,000	150
MESA 2 MINE 4	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	0
MESA 3 MINE 1	NAVAJO TRIBE	APACHE	20	36 N	29.0 E	14	UNDERGRO	1,000 - 100,000	200
MESA 4	NAVAJO TRIBE	APACHE	16	36 N	29.0 E	14	UNDERGRO	1,000 - 100,000	50
MESA 4 1-2	NAVAJO TRIBE	APACHE	8	36 N	29.0 E	14	UNDERGRO	1,000 - 100,000	100
MESA 4 1-4	NAVAJO TRIBE	APACHE	17	36 N	29.0 E	14	UNDERGRO	100 - 1,000	250
MESA 4 MINE 19	NAVAJO TRIBE	APACHE			0		SURFACE	<100	150
MESA 5	NAVAJO TRIBE	APACHE	8	36 N	29.0 E	14	UNDERGRO	1,000 - 100,000	200
MESA 6	NAVAJO TRIBE	APACHE	8	36 N	29.0 E	14	UNDERGRO	1,000 - 100,000	200
MIKE BRODIE 1	NAVAJO TRIBE	APACHE			0		SURFACE	<100	200
MILDRED 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	0
MONUMENT 2	NAVAJO TRIBE	APACHE			0		SURFACE	>100,000	50
MONUMENT 3	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	250
MONUMENT HEAP LE	NAVAJO TRIBE	APACHE			0		HL-DUMPS	100 - 1,000	50
MONUMENT VALLEY	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	50
N S M 2	HILL, ADAIR	APACHE	34	15 N	26.0 E	14	UNDERGRO	<100	0

INACTIVE URANIUM MINES IN THE UNITED STATES
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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** ARIZONA (CONT'D) *****									
NAKAI CHEE BEGAY	NAVAJO TRIBE	APACHE	12	36 N	28.0 E	14	UNDERGRO	100 - 1,000	150
OAK SPGS GRAVEL	NAVAJO TRIBE	APACHE	32	39 N	31.0 E	14	UNDERGRO	1,000 - 100,000	100
PETTIGREW PERMIT	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	0
PLOT 1+2-AFC PLO	NAVAJO TRIBE	APACHE	12	40 N	28.0 E	14	UNDERGRO	1,000 - 100,000	300
PLOT 10	NAVAJO TRIBE	APACHE	31	39 N	31.0 E	14	UNDERGRO	1,000 - 100,000	50
PLOT 12 SYRACUSE	NAVAJO TRIBE	APACHE	30	39 N	31.0 E	14	UNDERGRO	100 - 1,000	300
PLOT 4(WILLIAM F	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	100
PLOT 6 RATTLESAN	NAVAJO TRIBE	APACHE		12 N	7.0 W	21	UNDERGRO	1,000 - 100,000	50
PLOT12 RATTLESNA	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	150
POPE 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	50
R F + R	NAVAJO TRIBE	APACHE	19	39 N	31.0 E	14	UNDERGRO	1,000 - 100,000	100
RATTLESNAKE	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	150
RICHARD KING 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	100
ROCK HAT	NAVAJO TRIBE	APACHE			0		SURFACE	<100	350
ROCKY SPRING	NAVAJO TRIBE	APACHE			0		SURFACE	<100	300
ROUGH ROCK SLOPE	NAVAJO TRIBE	APACHE	1	34 N	23.0 E	14	UNDERGRO	<100	50
RUBEN 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	100
SAM POINT	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	0
SANDY K	NAVAJO TRIBE	APACHE			0		SURFACE	<100	0
SCHOOL BOY CLAIM	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	50
SHEEPSKIN MESA	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	100
SHIPROCK	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	200
SHORTY 1 RATTLES	NAVAJO TRIBE	APACHE			0		UNDERGRO	1,000 - 100,000	150
SILENTMAN 1	NAVAJO TRIBE	APACHE			0		SURFACE	<100	100
SIMPSON 181	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	300
STEP MESA	NAVAJO TRIBE	APACHE	30	36 N	29.0 W	22	UNDERGRO	1,000 - 100,000	350
THOMAS BEGAY 1	NAVAJO TRIBE	APACHE	36	34 N	23.0 E	14	SURFACE	<100	0
TODAKONZIE 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	250
TODECHEENIE 1	NAVAJO TRIBE	APACHE	35	34 N	23.0 E	14	SURFACE	1,000 - 100,000	50
TODICHINEL	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	350
TOHE THLANY BEGA	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	100
TOM JOE 7	NAVAJO TRIBE	APACHE	12	36 N	28.0 E	14	UNDERGRO	<100	150
TOM KLEE CLAIM	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	0
TOM MORGAN 1	NAVAJO TRIBE	APACHE			0		SURFACE	<100	0
TOM NAKAI CHEE 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	100
TOM NAKAI CHEE6	NAVAJO TRIBE	APACHE			0		UNDERGRO	1,000 - 100,000	100
TOM WILSON	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	0
TONECHLIE	NAVAJO TRIBE	APACHE			0		SURFACE	<100	150
TONY 1	NAVAJO TRIBE	APACHE			0		SURFACE	<100	200
TOPAHA	NAVAJO TRIBE	APACHE	27	36 N	29.0 E	14	UNDERGRO	100 - 1,000	0
TREE MESA	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	100
TSOSIE 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	100
UPPER RED WASH	NAVAJO TRIBE	APACHE			0		UNDERGRO	100 - 1,000	200
VCA RATTLESNAKE	NAVAJO TRIBE	APACHE			0		SURFACE	<100	0
WARHOOP GROUP	APACHE MINING CO	APACHE	30	13 N	29.0 E	14	SURFACE	100 - 1,000	50
WEST MESA	NAVAJO TRIBE	APACHE			0		UNDERGRO	<100	100
WEST RESERVATION	NAVAJO TRIBE	APACHE			0		UNDERGRO	1,000 - 100,000	100
WILLY WATERS	NAVAJO TRIBE	APACHE			0		UNDERGRO	1,000 - 100,000	100

INACTIVE URANIUM MINES IN THE UNITED STATES
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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** ARIZONA (CONT'D) *****									
ZONA 1	NAVAJO TRIBE	APACHE			0		UNDERGRO	1,000 - 100,000	250
STAR 1	UOCO	COCHISE			0		UNDERGRO	<100	100
WINDMILL 1	SMITH + ROYSTON	COCHISE			0		SURFACE	<100	50
A + B 13	NAVAJO TRIBE	COCONINO	14	31 N	9.0 E	14	SURFACE	<100	50
A + B 2	NAVAJO TRIBE	COCONINO	5	28 N	9.0 E	14	SURFACE	100 - 1,000	50
A + B 3	NAVAJO TRIBE	COCONINO	21	28 N	9.0 E	14	SURFACE	100 - 1,000	50
A + B 5	NAVAJO TRIBE	COCONINO	3	31 N	9.0 E	14	SURFACE	100 - 1,000	50
A + B 7	NAVAJO TRIBE	COCONINO	20	31 N	9.0 E	14	SURFACE	<100	50
A MALONEY 2	NAVAJO TRIBE	COCONINO			0		SURFACE	<100	50
ALYCE TOLENO	NAVAJO TRIBE	COCONINO			0		SURFACE	1,000 - 100,000	50
AMOS CHEE 3	NAVAJO TRIBE	COCONINO	13	25 N	11.0 E	14	UNDERGRO	<100	100
AMOS CHEE R	NAVAJO TRIBE	COCONINO	34	27 N	10.0 E	14	UNDERGRO	100 - 1,000	50
B,+B, 11A	PARIA URAN,+ OIL	COCONINO			0		SURFACE	<100	100
BAKER	UNKNOWN CONTROLR	COCONINO			0		SURFACE	<100	0
BIG BLUE	ALPINE URANIUM C	COCONINO			0		UNDERGRO	<100	150
BOYD TISI 1	NAVAJO TRIBE	COCONINO	31	28 N	10.0 E	14	SURFACE	<100	50
BOYD TISI 2	NAVAJO TRIBE	COCONINO	25	29 N	9.0 E	14	SURFACE	100 - 1,000	50
CASEY 3	NAVAJO TRIBE	COCONINO	3	29 N	9.0 E	14	SURFACE	<100	50
CHARLES HUSKON 1	NAVAJO TRIBE	COCONINO	12	26 N	10.0 E	14	SURFACE	100 - 1,000	50
CHARLES HUSKON 1	NAVAJO TRIBE	COCONINO			0		SURFACE	100 - 1,000	50
CHARLES HUSKON 2	NAVAJO TRIBE	COCONINO	8	29 N	10.0 E	14	SURFACE	1,000 - 100,000	50
CHARLES HUSKON 4	NAVAJO TRIBE	COCONINO	11	26 N	10.0 E	14	SURFACE	1,000 - 100,000	50
CHARLES HUSKON 5	NAVAJO TRIBE	COCONINO	1	30 N	9.0 E	14	SURFACE	100 - 1,000	50
CHARLES HUSKON 9	NAVAJO TRIBE	COCONINO	2	26 N	10.0 E	14	SURFACE	100 - 1,000	50
CLIFF CANYON	BAKER, RILEY	COCONINO			0		UNDERGRO	<100	0
COPPER 1 + WILLA	KENNEDY+FOLSON+	COCONINO			0		UNDERGRO	<100	50
E HUSKON 34	NAVAJO TRIBE	COCONINO	8	29 N	10.0 E	14	SURFACE	1,000 - 100,000	50
E HUSKON 35	NAVAJO TRIBE	COCONINO	25	28 N	10.0 E	14	SURFACE	<100	100
EARL HUSKON 1	NAVAJO TRIBE	COCONINO	27	32 N	9.0 E	14	SURFACE	100 - 1,000	50
EARL HUSKON 3	NAVAJO TRIBE	COCONINO	26	32 N	9.0 E	14	SURFACE	1,000 - 100,000	50
EL PEQUITO	EL PEQUITO MNG C	COCONINO	11	40 N	7.0 W	14	SURFACE	100 - 1,000	50
ELWOOD CANYON 2	NAVAJO TRIBE	COCONINO	18	29 N	10.0 E	14	UNDERGRO	100 - 1,000	100
ELWOOD THOMPSON	NAVAJO TRIBE	COCONINO	1	26 N	10.0 E	14	UNDERGRO	1,000 - 100,000	100
EMMETT LEE 1	NAVAJO TRIBE	COCONINO	2	26 N	10.0 E	14	SURFACE	100 - 1,000	50
EMMETT LEE 3	NAVAJO TRIBE	COCONINO	12	26 N	10.0 E	14	SURFACE	100 - 1,000	100
FOLEY 5(YAZZIE)31	NAVAJO TRIBE	COCONINO	24	29 N	10.0 E	14	UNDERGRO	100 - 1,000	100
GRUB CLAIM 14 W2	FILLMORE, ROBERT	COCONINO	16	27 N	10.0 E	14	SURFACE	<100	50
HENRY SLOAN 1	NAVAJO TRIBE	COCONINO	35	32 N	9.0 E	14	SURFACE	100 - 1,000	50
HOSTEEN NEZ	NAVAJO TRIBE	COCONINO	5	27 N	12.0 E	14	UNDERGRO	<100	50
HOWARD 1	LAUDERDALE MNG +	COCONINO	7	27 N	10.0 E	14	SURFACE	<100	50
HUSKON 1	NAVAJO TRIBE	COCONINO	23	29 N	9.0 E	14	SURFACE	1,000 - 100,000	50
HUSKON 10	NAVAJO TRIBE	COCONINO	28	28 N	10.0 E	14	SURFACE	1,000 - 100,000	50
HUSKON 11	NAVAJO TRIBE	COCONINO	33	28 N	10.0 E	14	SURFACE	1,000 - 100,000	50
HUSKON 12	NAVAJO TRIBE	COCONINO	15	29 N	9.0 E	14	SURFACE	1,000 - 100,000	50
HUSKON 14	NAVAJO TRIBE	COCONINO	35	29 N	9.0 E	14	SURFACE	<100	50
HUSKON 17	NAVAJO TRIBE	COCONINO	15	29 N	9.0 E	14	SURFACE	1,000 - 100,000	50
HUSKON 2	NAVAJO TRIBE	COCONINO	24	29 N	9.0 E	14	SURFACE	1,000 - 100,000	50
HUSKON 3	NAVAJO TRIBE	COCONINO	12	28 N	9.0 E	14	SURFACE	1,000 - 100,000	50

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** ARIZONA (CONT'D) *****									
HUSKON 6	NAVAJO TRIBE	COCONINO	27	30 N	9.0 E	14	SURFACE	100 - 1,000	50
HUSKON 7	NAVAJO TRIBE	COCONINO	19	28 N	10.0 E	14	SURFACE	1,000 - 100,000	50
HUSKON 8	NAVAJO TRIBE	COCONINO	30	28 N	9.0 E	14	SURFACE	100 - 1,000	50
J BEMALLIE	NAVAJO TRIBE	COCONINO	12	26 N	10.0 E	14	UNDERGRO	1,000 - 100,000	50
JACK DANIELS 1	NAVAJO TRIBE	COCONINO	11	29 N	9.0 E	14	SURFACE	1,000 - 100,000	50
JACK DANIELS 3	NAVAJO TRIBE	COCONINO		N	0 E	14	SURFACE	<100	50
JACK DANIELS 4	NAVAJO TRIBE	COCONINO	11	29 N	9.0 E	14	SURFACE	<100	50
JACK DANIELS 5	NAVAJO TRIBE	COCONINO	11	29 N	9.0 E	14	SURFACE	100 - 1,000	50
JACK HUSKON 3	NAVAJO TRIBE	COCONINO	3	28 N	10.0 E	14	SURFACE	1,000 - 100,000	150
JACKPOT 1	NAVAJO TRIBE	COCONINO	14	27 N	10.0 E	14	SURFACE	100 - 1,000	50
JACKPOT 40	NAVAJO TRIBE	COCONINO	14	27 N	10.0 E	14	SURFACE	100 - 1,000	50
JACKPOT 5	NAVAJO TRIBE	COCONINO	14	27 N	10.0 E	14	SURFACE	<100	50
JEESTER 1	NAVAJO TRIBE	COCONINO	26	30 N	9.0 E	14	SURFACE	1,000 - 100,000	50
JIMMY BOONE	NAVAJO TRIBE	COCONINO	1	39 N	7.0 E	14	SURFACE	<100	0
JUAN HORSE 3	NAVAJO TRIBE	COCONINO	30	24 N	10.0 E	14	SURFACE	1,000 - 100,000	50
JUAN HORSE 4	NAVAJO TRIBE	COCONINO	31	29 N	10.0 E	14	SURFACE	1,000 - 100,000	100
JULIUS CHEE 2	NAVAJO TRIBE	COCONINO	3	26 N	10.0 E	14	SURFACE	100 - 1,000	50
JULIUS CHEE 3	NAVAJO TRIBE	COCONINO	10	26 N	10.0 E	14	UNDERGRO	100 - 1,000	50
JULIUS CHEE 4	NAVAJO TRIBE	COCONINO	2	26 N	10.0 E	14	SURFACE	1,000 - 100,000	50
JUNE	NAVAJO TRIBE	COCONINO	26	39 N	7.0 E	14	SURFACE	<100	50
KACHINA 6	NAVAJO TRIBE	COCONINO	2	29 N	9.0 E	14	SURFACE	1,000 - 100,000	100
L.LITTLEMAN 1+7	NAVAJO TRIBE	COCONINO	30	9 N	6.0 E	14	SURFACE	<100	50
L.LITTLEMAN 2	NAVAJO TRIBE	COCONINO	24	29 N	9.0 E	14	SURFACE	1,000 - 100,000	50
L.LITTLEMAN 3	NAVAJO TRIBE	COCONINO	35	29 N	9.0 E	14	SURFACE	<100	50
LIBA GROUP	BLACK, C.S.	COCONINO	4	27 N	10.0 E	14	UNDERGRO	1,000 - 100,000	50
LUSTER 1	LAUDERDALE MNG +	COCONINO	17	27 N	10.0 E	14	UNDERGRO	100 - 1,000	50
M JOHNSON 4	NAVAJO TRIBE	COCONINO	11	32 N	9.0 E	14	UNDERGRO	<100	50
MANUEL DENETSONE	NAVAJO TRIBE	COCONINO	2	28 N	10.0 E	14	UNDERGRO	100 - 1,000	50
MAX HUSKON 1 7	NAVAJO TRIBE	COCONINO	23	32 N	9.0 E	14	SURFACE	<100	50
MAX JOHNSON 1	NAVAJO TRIBE	COCONINO	23	29 N	9.0 E	14	SURFACE	1,000 - 100,000	50
MAX JOHNSON 10	NAVAJO TRIBE	COCONINO	20	29 N	9.0 E	14	SURFACE	100 - 1,000	50
MAX JOHNSON 7	NAVAJO TRIBE	COCONINO	34	27 N	10.0 E	14	SURFACE	100 - 1,000	50
MAX JOHNSON 9	NAVAJO TRIBE	COCONINO	24	29 N	9.0 E	14	SURFACE	1,000 - 100,000	50
MONTEZUMA 1	NAVAJO TRIBE	COCONINO	1	28 N	9.0 E	14	SURFACE	<100	50
MONTEZUMA 2	NAVAJO TRIBE	COCONINO	4	29 N	9.0 E	14	SURFACE	100 - 1,000	50
MONTEZUMA 7A	NAVAJO TRIBE	COCONINO	3	29 N	9.0 E	14	SURFACE	<100	0
MONTEZUMA 7B	NAVAJO TRIBE	COCONINO	5	29 N	9.0 E	14	SURFACE	<100	50
MONTEZUMA 7C	NAVAJO TRIBE	COCONINO	33	30 N	9.0 E	14	SURFACE	<100	50
MURPHY 1,7,10,16	GLASSCOCK, HOWELL	COCONINO	22	27 N	10.0 E	14	UNDERGRO	1,000 - 100,000	50
NAVAJO 26	UNKNOWN	COCONINO	18	26 N	10.0 E	14	UNDERGRO	<100	50
ORPHAN LODE (GCA	COTTER CORPORATN	COCONINO	14	31 N	2.0 E	14	UNDERGRO	>100,000	1600
PAUL HUSKIE 20	NAVAJO TRIBE	COCONINO	22	28 N	9.0 E	14	SURFACE	<100	50
PAUL HUSKIE 21	NAVAJO TRIBE	COCONINO		N	0 E	14	SURFACE	<100	50
RAINBOW	ALPINE URANIUM C	COCONINO			0		SURFACE	<100	150
RAMCO 20	NAVAJO TRIBE	COCONINO	11	27 N	10.0 E	14	SURFACE	1,000 - 100,000	50
RAMCO 21	NAVAJO TRIBE	COCONINO	11	27 N	10.0 E	14	SURFACE	1,000 - 100,000	50
RAMCO 22	NAVAJO TRIBE	COCONINO	2	27 N	10.0 E	14	SURFACE	1,000 - 100,000	50
RAMCO 24	NAVAJO TRIBE	COCONINO	12	26 N	10.0 E	14	UNDERGRO	1,000 - 100,000	100

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** ARIZONA (CONT'D) *****									
REDWING	MARBLE CANYON MG	COCONINO	34	41 N	7,0 E	14	UNDERGRO	<100	50
RIDENOUR	HUALAPAI TRIBE	COCONINO	6	31 N	8,0 W	14	UNDERGRO	<100	50
RIVERVIEW	UNKNOWN CONTROLR	COCONINO	8	26 N	10,0 E	14	UNDERGRO	100 - 1,000	50
RYAN 1	NAVAJO TRIBE	COCONINO	34	28 N	10,0 E	14	SURFACE	100 - 1,000	0
RYAN 2	NAVAJO TRIBE	COCONINO	11	27 N	10,0 E	14	SURFACE	1,000 - 100,000	100
S4,9,16,21CAMERO	WESTERN NUCLEAR	COCONINO	4	27 T	10,0 E	14	SURFACE	100 - 1,000	50
SAM 7	CONSUMERS AGENCY	COCONINO			0		SURFACE	<100	0
SEC 1 EH SWQ	NORDELL, A.C.	COCONINO	1	27 N	9,0 E	14	UNDERGRO	<100	50
SHARON LYNN	URANIUM MNG.CO.	COCONINO	33	18 N	23,0 E	14	SURFACE	<100	50
SUN VALLEY MINE	GRAND CANYON URA	COCONINO			0		UNDERGRO	100 - 1,000	50
THOMAS 1	NAVAJO TRIBE	COCONINO	21	38 N	7,0 E	14	SURFACE	100 - 1,000	50
TOMMY	NAVAJO TRIBE	COCONINO	23	39 N	7,0 E	14	SURFACE	<100	50
VERMILLION	UNITED DEVEL.CO.	COCONINO			0		UNDERGRO	<100	50
WARD TERRACE TRA	NAVAJO TRIBE	COCONINO			0		UNDERGRO	<100	0
YAZZIE 1	NAVAJO TRIBE	COCONINO	14	27 N	10,0 E	14	SURFACE	100 - 1,000	50
YAZZIE 101	NAVAJO TRIBE	COCONINO	19	29 N	10,0 E	14	SURFACE	1,000 - 100,000	50
YAZZIE 102	NAVAJO TRIBE	COCONINO	19	28 N	10,0 E	14	UNDERGRO	1,000 - 100,000	50
YAZZIE 2	NAVAJO TRIBE	COCONINO	14	29 N	10,0 E	14	SURFACE	1,000 - 100,000	50
YAZZIE 312	NAVAJO TRIBE	COCONINO	25	29 N	9,0 E	14	SURFACE	1,000 - 100,000	50
YELLOW JEEP 7 A+	NAVAJO TRIBE	COCONINO	25	29 N	11,0 E	14	UNDERGRO	100 - 1,000	100
BEE CAVE	BURKE, ROSS	GILA			0		SURFACE	<100	50
BIG BUCK GROUP	METBEL MNG+ EXPI.	GILA			0		UNDERGRO	100 - 1,000	50
BLACK BRUSH	WESTERN MINING +	GILA			0		UNDERGRO	<100	100
DONNA LEE	SMITH, H.C.	GILA			0		UNDERGRO	<100	50
FIRST CHANCE(GLO	BAKER + CLINE	GILA			0		UNDERGRO	<100	50
HOPE CLAIM	WYOMING MINERALS	GILA			0		UNDERGRO	1,000 - 100,000	150
HORSESHOE	HAUGHT, ALFRED	GILA			0		SURFACE	<100	0
JON	WYOMING MINERALS	GILA			0		UNDERGRO	1,000 - 100,000	50
LITTLE JOE	NICOLS+HILBANKS+	GILA			0		UNDERGRO	1,000 - 100,000	100
LUCKY BOY	STACY + EPPINGER	GILA			0		UNDERGRO	1,000 - 100,000	50
LUCKY STOP	WYOMING MINERALS	GILA			0		UNDERGRO	1,000 - 100,000	100
MELINDA GROUP	MORGAN+SHAW+WILB	GILA			0		UNDERGRO	1,000 - 100,000	50
RED BLUFF	WYOMING MINERALS	GILA			0		UNDERGRO	1,000 - 100,000	50
RED CLIFF 1	PATTERSON, ROY	GILA			0		SURFACE	<100	50
SUCKERITE	TULSA MINERALS C	GILA			0		UNDERGRO	1,000 - 100,000	100
SUE	ARIZONA GLOBE UP	GILA			0		UNDERGRO	100 - 1,000	50
TOMATO JUICE	LEWIS,FRANK ETAL	GILA			0		UNDERGRO	100 - 1,000	100
WORKMAN CLAIM	NICHOLS, CHARLES	GILA			0		UNDERGRO	100 - 1,000	100
FLAT TIRE	KARALSON,A.H.JR.	GRAHAM			0		SURFACE	<100	50
B + M	BICKLE + MANLEY	MARICOPA			0		UNDERGRO	<100	50
HORSESHOE GROUP	JOHNSON + YOUNG	MARICOPA			0		UNDERGRO	<100	50
MALAPAI	TONTO NATL FORRE	MARICOPA			0		SURFACE	<100	100
CHAPEL	KNIGHT,ANDRINE G	MOHAVE	25	33 N	10,0 W	14	UNDERGRO	<100	50
CHERYL M 1	THOMSON, L.A.	MOHAVE			0		UNDERGRO	<100	0
DEMO GROUP 24	SPARTAN MINING C	MOHAVE			0		UNDERGRO	<100	50
HACKS CANYON	WESTERN NUCLEAR	MOHAVE	26	37 N	5,0 W	14	UNDERGRO	1,000 - 100,000	150
RADON 1	ANNESLY GRIFFITH	MOHAVE			0		UNDERGRO	<100	50
ALMA-SEEGIN	NAVAJO TRIBE	NAVAJO		41 N	19,0 E	14	UNDERGRO	1,000 - 100,000	200

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** ARIZONA (CONT'D) *****									
BIG CHIEF	NAVAJO TRIBE	NAVAJO	23	41 N	19,0 E	14	UNDERGRO	1,000 - 100,000	150
BIG FOUR 2	NAVAJO TRIBE	NAVAJO		41 N	19,0 E	14	UNDERGRO	1,000 - 100,000	150
BOOTJACK	NAVAJO TRIBE	NAVAJO	33	41 N	19,0 E	14	UNDERGRO	1,000 - 100,000	400
CARNOTITE CANYON	NAVAJO TRIBE	NAVAJO			0		SURFACE	<100	300
FERN	NAVAJO TRIBE	NAVAJO	34	41 N	19,0 E	14	UNDERGRO	1,000 - 100,000	100
FIRELIGHT 6-NASC	NAVAJO TRIBE	NAVAJO	36	41 N	19,0 E	14	UNDERGRO	1,000 - 100,000	200
GOOF 6	BERRY + HATFIELD	NAVAJO			0		SURFACE	<100	0
GOTHE	NAVAJO TRIBE	NAVAJO			0		UNDERGRO	<100	200
HANSEN	COSTON + BARTON	NAVAJO	1	18 N	19,0 E	14	UNDERGRO	100 - 1,000	50
J CITY 1	F.+ M. MINING	NAVAJO	33	19 N	19,0 E	14	UNDERGRO	<100	0
KAY GROUP	DAVIS + HATCH	NAVAJO	28	18 N	23,0 E	14	SURFACE	100 - 1,000	100
LITTLE JOHN 1,2+	YOUNG, MERRILL	NAVAJO	2	17 N	23,0 E	14	SURFACE	<100	0
MAC 3	MAC MAHON, JOHN	NAVAJO	4	17 N	23,0 E	14	SURFACE	<100	0
MITCHELL BUTTE	NAVAJO TRIBE	NAVAJO			0		UNDERGRO	1,000 - 100,000	150
MITTEN 2	NAVAJO TRIBE	NAVAJO			0		SURFACE	1,000 - 100,000	50
MONUMENT 1	NAVAJO TRIBE	NAVAJO	17	41 N	20,0 E	14	UNDERGRO	1,000 - 100,000	50
MOONLIGHT	NAVAJO TRIBE	NAVAJO	14	41 N	19,0 E	14	UNDERGRO	>100,000	150
MORALE	NAVAJO TRIBE	NAVAJO	19	24 N	22,0 E	14	SURFACE	100 - 1,000	50
NAVAJO	HALL, JOE	NAVAJO	26	20 N	23,0 E	14	UNDERGRO	<100	0
NEW MEX + ARIZ L	BAY SHORE MINING	NAVAJO			0 E	14	SURFACE	<100	0
RAINBOW SMITH 1+	RAINBOW URANIUM	NAVAJO	36	16 N	22,0 E	14	SURFACE	<100	0
RESERVATION	NAVAJO TRIBE	NAVAJO			0		SURFACE	<100	50
ROCK GARDEN 25	BAY SHORE MINING	NAVAJO	22	19 N	23,0 E	14	SURFACE	<100	50
SAIN R20E T19N W	POWELL, L.W.	NAVAJO			0		SURFACE	<100	50
SALLY	NAVAJO TRIBE	NAVAJO			0		UNDERGRO	<100	50
BAM CHARLEE 1	NAVAJO TRIBE	NAVAJO			0		SURFACE	<100	150
SEC. 33-18N-23E	N. MEX + ARIZ. LND C	NAVAJO	24	19 N	20,0 E	14	SURFACE	<100	50
SM 68-TRACT 11	NAVAJO TRIBE	NAVAJO			0		UNKNOWN	1,000 - 100,000	0
SPENCER 1 MINE	NAVAJO TRIBE	NAVAJO			0		UNDERGRO	100 - 1,000	200
STARLIGHT (EAST)	NAVAJO TRIBE	NAVAJO	16	41 N	19,0 E	14	UNDERGRO	1,000 - 100,000	150
SUNLIGHT	NAVAJO TRIBE	NAVAJO	22	41 N	19,0 E	14	UNDERGRO	1,000 - 100,000	400
SUNLIGHT SOUTH	NAVAJO TRIBE	NAVAJO	22	41 N	19,0 E	14	UNDERGRO	1,000 - 100,000	200
SUNRISE	BONER + PETTIT	NAVAJO	4	17 N	23,0 E	14	SURFACE	<100	0
WINSLOW 6 + 7	TWIN STATES URAN	NAVAJO	32	20 N	17,0 E	14	UNDERGRO	<100	50
BLACK DYKE	HOLLER, J.	PIMA			0		UNDERGRO	<100	100
LINDA LEE 2	RUBERSON+PAYTAIN	PIMA			0		UNDERGRO	<100	50
DURANIUM 1	SANTA CRUZ URA. C	SANTA CRUZ			0		UNDERGRO	100 - 1,000	50
MONTANA GROUP	MILLER, HUGO W.	SANTA CRUZ			0		SURFACE	<100	50
WHITE OAK	CLARKE, W.H.	SANTA CRUZ			0		SURFACE	<100	0
MOON BEAM	DAY + ADAMS	YAVAPAI			0		SURFACE	<100	0
SEVEN STARS	DUNNING, CHARLES	YAVAPAI			0		SURFACE	<100	0
UR-AIR(ANDERSON	MINERALS EXPL CO	YAVAPAI	9	11 N	10,0 W	14	SURFACE	1,000 - 100,000	300
F H BARNEY	HOUSLEY, GLEN	UNKNOW			0		SURFACE	<100	0
***** CALIFORNIA *****									
CROWN MINES	CROWN MINING CO	IMPERIAL			0		UNDERGRO	<100	50

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** CALIFORNIA (CONT'D) *****									
GYP	ROBBINS, HARRIET	IMPERIAL			0		SURFACE	<100	50
COSO CLAIM	FED. RES-PNI-UP	INYO	25	20 S	37,0 E	20	SURFACE	100 - 1,000	100
BUCKEYE GROUP	MIRACLE MINING C	KERN	17	27 S	32,0 E	20	SURFACE	<100	150
KERGON 1	GREAT LAKES OIL	KERN	20	27 S	32,0 E	20	UNDERGRO	<100	100
LITTLE SPARKLER	KERN URANIUM CO	KERN	17	27 S	32,0 E	20	UNDERGRO	100 - 1,000	100
NOB HILL	CASTLE BUTTE URA	KERN	23	32 S	38,0 E	20	UNDERGRO	<100	50
OWEN 5	OWEN MINING CO.	KERN	33	31 S	22,0 E	20	SURFACE	<100	0
PIONEER 1	GREAT SALT LAKE	KERN	26	27 S	35,0 E	20	SURFACE	<100	0
CORNELIA C 2	BAKER + SONS	LASSEN	7	23 N	18,0 E	20	SURFACE	100 - 1,000	50
LOLA G	BAKER + MILLER	LASSEN			0		SURFACE	<100	50
PATSY GROUP	WAGNON, EARL M.	MADERA	33	6 S	24,0 E	20	UNDERGRO	<100	50
EMERALD 1	NEVADA GOLDFIELD	MONO			0		SURFACE	<100	50
GROUP 102	UNITED MNG+DEVEL	RIVERSIDE	13	6 S	20,0 E	25	UNDERGRO	<100	50
LUCKY 3	HARDING J.L.	RIVERSIDE			0		SURFACE	<100	0
MELODY GROUP	MINERAL EXPLOIT.	RIVERSIDE	7	6 S	21,0 E	25	UNDERGRO	<100	50
NORTHEAST GROUP	SAFRANEK, C.+J.	RIVERSIDE	19	6 S	21,0 E	25	UNDERGRO	1,000 - 100,000	50
WHITE DOME	DAY + ADAMS	RIVERSIDE			0		SURFACE	<100	0
BIG HUNCH 1	BIG HUNCH URAN I	SAN BERNARDINO			0		UNDERGRO	<100	50
MINOTE	MINOTE, R.A.	SAN BERNARDINO	29	2 N	2,0 E	25	SURFACE	<100	50
ROSE OF SHARON	DALLESSANDRO, B+G	SAN BERNARDINO			0		SURFACE	<100	100
PINE CONE+SL STR	DOG VALLEY URAN.	SIERRA			0		UNDERGRO	<100	50
JUNIPER(SHRA PS)	PATHFINDER	TUOLUMNE	8	5 N	20,0 E	20	SURFACE	1,000 - 100,000	100
***** COLORADO *****									
BLUE HOPSE + NAN	DUNCAN WALTER	BOULDER	15	44 N	19,0 W	22	SURFACE	<100	0
FAIR DAY MINE	BUSRY, P.I.	BOULDER	23	2 N	72,0 W	06	UNDERGRO	1,000 - 100,000	250
KIPP LEASE	MTN STATES OIL +	BOULDER			0		SURFACE	<100	50
MILL TAILINGS	MAHONEY OZARK	BOULDER			0		MISC.-PB	<100	0
MILLET LEASE	MTN STATES OIL +	BOULDER			0		SURFACE	<100	50
MOUNTAIN GOAT	FRONTIER MINING	BOULDER			0		SURFACE	<100	50
SISK	ENIBETA CORP	BOULDER			0		UNDERGRO	<100	50
VICTORY GROUP	JIMTOWN URANIUM	BOULDER			0		UNDERGRO	100 - 1,000	50
HIGHLANDER	UNCOMPAGRE URAN	CLEAR CREEK			0		SURFACE	<100	100
LITTLE WARRIOR 1	SEACOL COPP	CLEAR CREEK			0		UNDERGRO	<100	50
MARTHA E.	MTN STATES URAN.	CLEAR CREEK			0		SURFACE	<100	150
SPANISH BAR GROU	SPANISH BAR URAN	CLEAR CREEK			0		UNDERGRO	<100	100
BECK MOUNTAIN LO	WEST, GEORGE A	CUSTER			0		SURFACE	<100	0
KING MIDAS	KLINE, BILL+ASSOC	CUSTER			0		SURFACE	<100	50
WALTERS RANCH	MUNDY, LEWIS C.	CUSTER			0		SURFACE	<100	0
ARROWHEAD GROUP	ARROWHEAD MINING	DOLORES			0		SURFACE	<100	50
BARLOW CREEK	FOOTE MINERALS	DOLORES	15	40 N	10,0 W	22	UNDERGRO	<100	50
BROKEN THUMB 2	PETTIGREW, WARLEY	DOLORES			0		SURFACE	<100	100
GOOD HOPE-NEVADA	FM PINKERTON	DOLORES			0		UNDERGRO	100 - 1,000	0
RAINEY DAY	WILLIFORD, BEN J	DOLORES			0		UNDERGRO	<100	0
SOUTH BARLOW	FOOTE MINERALS	DOLORES			0		UNDERGRO	100 - 1,000	0
ARROWHEAD 1	SKYLAND ENGR.CO.	EAGLE			0		SURFACE	<100	100

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
DORADO	UNKNOWN CONTRLR	EAGLE			0		SURFACE	<100	0
LUCKY BEN LEASE	YOUNG, CLAYBORNE	EL PASO			0		SURFACE	100 - 1,000	50
BILL + RUD 2 + 4	HARVEY, W.P.,JR.	FREMONT			0		UNDERGRO	<100	50
CAP ROCK 40	JOHNSON C.B.,INC	FREMONT	30	17 S	72.0 W	06	SURFACE	<100	50
CLAIM 2	BEN RIVER MNG	FREMONT	16	19 S	71.0 W	06	SURFACE	<100	0
DICKSON-SNOOPER	JUNIPER OIL+MNG	FREMONT	26	17 S	73.0 W	06	SURFACE	1,000 - 100,000	50
DILLEY RANCH	BEATON, JOHN	FREMONT			0		UNDERGRO	100 - 1,000	50
FIRST CHANCE(TAL	HURD + ASSOC.	FREMONT			0		UNDERGRO	100 - 1,000	50
HIGH PARK	COTTER CORPORATN	FREMONT			0		SURFACE	<100	0
HONEST JOHN 1-15	STURBAUM,STANLEY	FREMONT			0		UNDERGRO	100 - 1,000	0
JOAN 2	SEACOL INC	FREMONT	14	17 S	73.0 W	22	SURFACE	1,000 - 100,000	150
KNOB HILL ORE 80	HEISEN, EARL	FREMONT	22	17 S	73.0 W	06	UNDERGRO	1,000 - 100,000	50
LAST CHANCE	HEISEN, CHARLES	FREMONT	31	17 S	72.0 W	06	UNDERGRO	1,000 - 100,000	100
LIGHTNING 2	BENTON + BRADY	FREMONT			0		UNDERGRO	100 - 1,000	150
LITTLE ABNER 1	MNRUS RECOVERY	FREMONT	14	17 S	73.0 W	06	SURFACE	1,000 - 100,000	100
MARY L. 1	SMALLER, F.J.	FREMONT	13	17 S	73.0 W	06	UNDERGRO	1,000 - 100,000	50
MISERY MINE 7	MC CORMACK,ROBT.	FREMONT			0		UNDERGRO	<100	50
MOOSE RAINBOW	JUNIPER OIL+MNG	FREMONT			0		SURFACE	100 - 1,000	50
PICNIC TREE	CYPRUS MINES	FREMONT	26	17 S	73.0 W	06	SURFACE	1,000 - 100,000	100
RAINBOW ORE BODY	JUNIPER OIL+MNG	FREMONT			0		SURFACE	100 - 1,000	50
RED CLIFF 30	UNKNOWN CONTROLR	FREMONT			0		UNDERGRO	1,000 - 100,000	50
SAND CREEK 4	CURTIS + THOPPE	FREMONT	1	16 S	71.0 W	06	SURFACE	<100	50
SEC.36,17S-73W N	US BANK-GRND JCT	FREMONT	36	17 S	73.0 W	06	UNDERGRO	1,000 - 100,000	150
SEC.36,17S-73W N	US BANK-GRND JCT	FREMONT	36	17 S	73.0 W	06	UNDERGRO	1,000 - 100,000	100
SPRING VALLEY	JONES + TAYLOR	FREMONT			0		SURFACE	<100	0
BUNSHINE GROUP	OLIVER GFM +WED	FREMONT	30	17 S	72.0 W	06	SURFACE	1,000 - 100,000	100
THORNE 9+10	ATLAS MINERALS	FREMONT	26	17 S	73.0 W	06	UNDERGRO	1,000 - 100,000	100
ELK VAN TUNNEL	MASCON BROS+ OLS	GARFIELD			0		SURFACE	<100	0
END OF TRAIL 1	DOBBS F.C.	GARFIELD			0		UNDERGRO	100 - 1,000	50
ENTERPRISE 1,2+3	ENTERPRISE MNG.	GARFIELD			0		SURFACE	<100	0
GARFIELD MINE	UNION CARBIDE CP	GARFIELD			0		UNDERGRO	1,000 - 100,000	300
HOMESTAKE	HAYES ERNST URAN	GARFIELD			0		UNDERGRO	<100	0
INCORPORATED 1	BENDETTIS +ASSOC	GARFIELD			0		SURFACE	<100	0
LOTTI B	NEW CASTLE URAN.	GARFIELD			0		SURFACE	<100	50
MARNOLA LODE 1-1	JEPSON + HOLT	GARFIELD			0		UNDERGRO	<100	0
RIFLE MINE	UNION CARBIDE CP	GARFIELD			0		UNDERGRO	>100,000	300
WARD GULCH	LEHR, VERNON L.	GARFIELD			0		SURFACE	<100	0
BONANZA	RUTTER, ROBERT L	GILPIN			0		SURFACE	<100	50
ROOT RANCH LEASE	ROOT RANCH	GILPIN			0		SURFACE	<100	50
TWO SISTERS	UNITED MNG.+ L.	GILPIN			0		SURFACE	<100	200
WOOD MINE	LYMAN, BOB	GILPIN			0		UNDERGRO	<100	600
ALASKA HUMES	HUMES, FRED	GRAND	21	5 S	82.0 W	06	UNDERGRO	100 - 1,000	50
HUME	PIONEER EXPL.CO.	GRAND			0		SURFACE	<100	0
LUCKY JACK	SCHEIFELE, H.J.	GRAND			0		SURFACE	<100	50
UNDECIDED 4	U S DEPT WILDLIF	GRAND			0		UNDERGRO	100 - 1,000	50
BIG RED 22	TURNER +HACKNEY	GUNNISON	11	49 N	5.0 E	06	UNDERGRO	100 - 1,000	50
BETH 1-10	MULLINS+BEAUCHMP	HINSDALE		44	5.0	22	UNDERGRO	<100	50
ANAL 1	SECURITY EXPL CO	HUERFANO	17	25 S	70.0 W	06	SURFACE	<100	50

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
STUMBLING STUD	BRISCOE, G.E.+ASSO	HUERFANO			0		UNDERGRO	100 - 1,000	50
ASCENSION MINE	KERR MCGEE	JEFFERSON	24	3 S	71.0 W	06	UNDERGRO	1,000 - 100,000	200
AUBREY LADWIG LS	RESERVE OIL+MINS	JEFFERSON			0		UNDERGRO	1,000 - 100,000	50
FORK PROSPECT	ROCKY MTN.ENERGY	JEFFERSON			0		UNDERGRO	<100	50
GRAPE VINE 1	E.E.Lewis, INC.	JEFFERSON	29	4 S	79.0 W	06	SURFACE	1,000 - 100,000	100
LADWIG 2 PPOSPEC	ENERGY FUELS NUC	JEFFERSON	19	3 S	70.0 W	06	UNDERGRO	1,000 - 100,000	100
LEYDFN MINE	MORENO URAN.CORP	JEFFERSON			0		UNDERGRO	100 - 1,000	50
MANN RANCH	J L MANN URANIUM	JEFFERSON	12	5 S	70.0 W	06	UNDERGRO	1,000 - 100,000	100
MENA 1	UNKNOWN CONTROLR	JEFFERSON	26	2 S	71.0 W	06	UNDERGRO	1,000 - 100,000	50
OHMAN MINE	OHMAN, LEIGH D.	JEFFERSON			0		UNDERGRO	<100	50
PALLAORO LEASE	FOUR CORNERS OIL	JEFFERSON			0		UNDERGRO	100 - 1,000	150
QUATMAN LEASE	UNKNOWN CONTROLR	JEFFERSON			0		SURFACE	<100	50
STONE PLACER 7	CONTIN.URAN.WYO.	JEFFERSON			0		SURFACE	1,000 - 100,000	100
WRIGHT LEASE	COTTIE COPPORATH	JEFFERSON			0		UNDERGRO	1,000 - 100,000	400
BLACKHAWK	BARNETT MINING C	LA PLATA			0		UNDERGRO	<100	0
LUCKY LEPRACON	SUNSET URAN,INC.	LA PLATA			0		SURFACE	<100	0
SHORTY LODGE	STEARNS, I.G.	LA PLATA	5	36 N	11.0 W	22	UNDERGRO	<100	50
BLACK HAWK MINE	CHEROKEE MINES C	LARIMER			0		UNDERGRO	100 - 1,000	150
BOULDER ROCK	MC LAUGHLIN, E.	LARIMER			0		SURFACE	<100	0
EUREKA	NEW WAR URANIUM	LARIMER			0		SURFACE	<100	50
RED HILL 1	ROBINSON, E.C.	LARIMER			0		UNDERGRO	100 - 1,000	50
WAHKETA LEASE	NORTON, ELBERT	LARIMER			0		UNDERGRO	<100	50
AJAX 1	AJAX MINING +OIL	MESA	19	51 N	19.0 W	22	UNDERGRO	100 - 1,000	0
ARROWHEAD 4	ATLAS-AMAX	MESA	2	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
ARROWHEAD 4	ATLAS-AMAX	MESA	2	50 N	18.0 W	22	UNDERGRO	<100	50
ARROWHEAD 1 + 7	ATLAS-AMAX	MESA	10	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
ARROWHEAD 10	ATLAS-AMAX	MESA	11	50 N	18.0 W	22	UNDERGRO	100 - 1,000	50
ARROWHEAD 11	ATLAS-AMAX	MESA	10	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
ARROWHEAD 13	ATLAS-AMAX	MESA	10	50 N	18.0 W	22	UNDERGRO	<100	100
ARROWHEAD 14	ATLAS-AMAX	MESA	11	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
ARROWHEAD 17	ATLAS-AMAX	MESA	2	50 N	18.0 W	22	UNDERGRO	100 - 1,000	50
ARROWHEAD 18	ATLAS-AMAX	MESA	2	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
ARROWHEAD 19	ATLAS-AMAX	MESA	2	50 N	18.0 W	22	UNDERGRO	100 - 1,000	50
ARROWHEAD 20	ATLAS-AMAX	MESA	2	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
ARROWHEAD 25	ATLAS-AMAX	MESA	3	50 N	18.0 W	22	UNDERGRO	100 - 1,000	100
ARROWHEAD 27	ATLAS-AMAX	MESA	10	50 N	18.0 W	22	UNDERGRO	100 - 1,000	0
ARROWHEAD 28	ATLAS-AMAX	MESA	10	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
ARROWHEAD 29	ATLAS-AMAX	MESA	10	50 N	18.0 W	22	UNDERGRO	100 - 1,000	150
ARROWHEAD INC 1+	ATLAS-AMAX	MESA	2	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
ARROWHEAD INC 12	ATLAS-AMAX	MESA	3	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
ARROWHEAD INC 24	ATLAS-AMAX	MESA	11	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
ARROWHEAD INC 6	ATLAS-AMAX	MESA			0		UNDERGRO	1,000 - 100,000	50
AT-05-1-36	UNION CARBIDE CP	MESA	4	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
ATLAS-LONE MESA	DUNKLE, DALE	MESA	6	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
AUSTIN + AUSTIN	WOODARD, CHARLES	MESA			0		UNDERGRO	100 - 1,000	250
BANCO 1	DAVIS, RALPH M.	MESA	17	51 N	18.0 W	22	SURFACE	<100	50
BELMONT 1 + 2	CARRICO, A.M.	MESA	3	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
BESSIE GROUP	MC MANUS, JOHN U	MESA	36	50 N	18.0 W	22	SURFACE	<100	0

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
BIG INDIAN LEASE	ARROWHEAD URAN.	MESA	19	50 N	18.0 W	22	SURFACE	<100	0
BIG MAVERICK	KELLEY, DAN E.	MESA	20	50 N	18.0 W	22	UNDERGRO	<100	0
BIG SEVEN	ATLAS-AMAX	MESA	32	50 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
BLACK MESA	WILLIAMS, GROVER	MESA			0		UNDERGRO	100 - 1,000	0
BLACK ROCK 2	BENDER, E.E.	MESA	27	50 N	19.0 W	22	UNDERGRO	<100	0
BLACK STREAK	UNION CARBIDE	MESA	31	50 N	17.0 W	22	UNDERGRO	1,000 - 100,000	0
BLUE CRFEK	BLUE CREEK MNG.	MESA	19	50 N	17.0 W	22	SURFACE	<100	0
BLUE MESA VIEW	BLUE CREEK MININ	MESA	30	50 N	17.0 W	22	SURFACE	<100	0
BLUE RIBBON 1	ATLAS-AMAX	MESA	3	50 N	18.0 W	22	UNDERGRO	100 - 1,000	100
BLUE RIBBON 3	ATLAS-AMAX	MESA	10	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
BLUE RIBBON 17	ATLAS-AMAX	MESA	17	50 N	18.0 W	22	UNDERGRO	<100	0
BLUE RIBBON 32	ATLAS-AMAX	MESA	16	50 N	18.0 W	22	UNDERGRO	<100	0
BLUE RIBBON GROU	ATLAS-AMAX	MESA	3	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
BLUEBIRD	ATLAS-AMAX	MESA	19	50 N	17.0 W	22	UNDERGRO	100 - 1,000	0
BLUEBIRD DUMP	ATLAS-CLIMAX	MESA	19	50 N	17.0 W	22	DUMPS	100 - 1,000	0
BONNIE	STEWART, WESLEY	MESA			0		SURFACE	<100	0
BUD 1	WADE, RAY	MESA			0		SURFACE	<100	0
BUICK	SCHUMACHER, J.I.	MESA	31	51 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
C-G-27 (PONNIE 1	U.S.GOV'T.	MESA	13	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
CALAMITY HOMESTE	HENDRICKSON, MB+H	MESA	35	50 N	18.0 W	22	UNDERGRO	<100	0
CALAMITY MESA DU	ATLAS MINERALS	MESA	10	50 N	18.0 W	22	DUMPS	100 - 1,000	50
CALCO	HARRICK+OPTMAYER	MESA	23	50 N	18.0 W	22	UNDERGRO	100 - 1,000	100
CAT TRACK	SHIPROCK LTD.	MESA			0		UNKNOWN	100 - 1,000	100
CAVE CANYON	AJAX MINING +OIL	MESA	9	50 N	19.0 W	22	UNDERGRO	100 - 1,000	0
CHICO + C FRACTI	GRAHAM F.R.	MESA	36	51 N	19.0 W	22	UNDERGRO	100 - 1,000	0
CLIFF DWELLER	ZANETT, FRED	MESA	22	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
CLIMAX	UNKNOWN CONTROLR	MESA			0		UNDERGRO	<100	0
CLIMAX RESIDUE	UNION CARBIDE CP	MESA			0		MISC.-PB	1,000 - 100,000	0
CLIMAX YD CLEANU	KEOGH+SHUMWAY	MESA			0		MISC.-PB	1,000 - 100,000	0
COAL TOWN-CITATI	VAN URANIUM	MESA	6	50 N	18.0 W	22	SURFACE	<100	0
COTTONWOOD 3+5	UNION CARBIDE	MESA	22	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
COVE 1 ADIT	UNKNOWN	MESA	4	50 N	19.0 W	22	UNDERGRO	<100	0
CRESCENT	GRIPE + BAILEY	MESA	25	50 N	18.0 W	22	UNDERGRO	<100	0
CROWS NEST	ATLAS-AMAX	MESA	11	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
CUB (GATEWAY)	NICKEPSON ALBERT	MESA	5	50 N	18.0 W	22	UNDERGRO	<100	50
DALLIU-YELLOWBIR	BURNSIDE, GEORGE	MESA	4	25 S	26.0 E	24	UNDERGRO	100 - 1,000	50
DEAL GROUP	DEAL MNG CO, INC.	MESA	4	49 N	17.0 W	22	SURFACE	<100	0
DEPRESSION 2+3	AMERICAN WST MTL	MESA	18	50 N	18.0 W	22	UNDERGRO	100 - 1,000	100
DEPRESSION 4 + 5	NUCLEAR FUELS IN	MESA	18	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
DEPRESSION 6	CONTINENTAL MATL	MESA	17	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
DEPRESSION GROUP	MATTERHORN MNG.	MESA	18	50 N	18.0 W	22	UNDERGRO	100 - 1,000	0
DRUM DUST	LAWTON BROS, DRUM	MESA			0		MISC.-PB	100 - 1,000	0
DURANGO 2	BENHAM + TUNNEL	MESA	34	51 N	19.0 W	22	UNDERGRO	<100	50
ELIZABETH 7-10	ATLAS-AMAX	MESA	4	49 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
EMERSON	ATLAS-AMAX	MESA	19	50 N	17.0 W	22	UNDERGRO	100 - 1,000	0
FLAT TOP	BURNETT, WILLIAM	MESA	17	50 N	18.0 W	22	UNDERGRO	<100	0
FOUNTAIN OF YOUT	MAYOUTH MINING	MESA	31	51 N	18.0 W	22	UNDERGRO	100 - 1,000	0
FRACTION	BEAVER MESA	MESA	12	50 N	18.0 W	22	UNDERGRO	100 - 1,000	0

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
GATEWAY TAILINGS	ALABASTER PRODUC	MESA	10	51 N	19.0 W	22	MISC.-PB	1,000 - 100,000	0
GILMORE LODE	GATEWAY MNG+DEV	MESA	36	51 N	20.0 W	22	UNDERGRO	100 - 1,000	0
GLADYS 1	RIGGLE+HARTOUGH	MESA	19	51 N	18.0 W	22	UNDERGRO	<100	50
HANSON-NEGUS	ATLAS-AMAX	MESA	17	50 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
HARVEY 1	FOSTER + FOSTER	MESA	28	51 N	18.0 W	22	UNDERGRO	<100	50
HARVEY-PICK+SHOV	BROWN, RAY	MESA	28	51 N	18.0 W	22	UNDERGRO	100 - 1,000	0
HOLE 24	UNKNOWN CONTRLR	MESA			0		SURFACE	<100	0
HOPE 1 TO 4	ATLAS-FOOTE	MESA	29	50 N	17.0 W	22	UNDERGRO	100 - 1,000	50
HUMDINGER	BROWN, RAY	MESA	5	50 N	18.0 W	22	UNDERGRO	<100	0
J.W. LEWIS	J.W. LEWIS	MESA			0		UNKNOWN	<100	300
J.W.L.FRACTION	UNION CARBIDE CP	MESA	36	51 N	20.0 W	22	UNDERGRO	1,000 - 100,000	350
JEAN 1 + 2	AMERICAN LEDUC II	MESA			0		UNDERGRO	<100	0
JODY GROUP	BOND, JACK	MESA			0		UNDERGRO	1,000 - 100,000	50
JOE	E.E.LEWIS, INC.	MESA	31	51 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
JOHN BROWN	GATEWAY MNG+DEV	MESA	1	50 N	20.0 W	22	SURFACE	<100	0
JOHN BROWN 14 +	UNION CARBIDE CP	MESA			0		UNDERGRO	1,000 - 100,000	300
JOHNNY MAE 3	NEW IDRIA MNG+CH	MESA	36	51 N	20.0 W	22	UNDERGRO	1,000 - 100,000	250
JU DEE 1	IP-IN, WAYNE A.	MESA			0		SURFACE	<100	0
JUMBO 1	ATLAS-AMAX	MESA	19	50 N	17.0 W	22	UNDERGRO	100 - 1,000	0
KANARADO 3	WARREN, B.V.	MESA	33	50 N	18.0 W	22	SURFACE	<100	0
KARNS INCLINE	UNION CARBIDE CP	MESA	12	50 N	20.0 W	22	UNDERGRO	1,000 - 100,000	300
KING SOLOMON	CANYON URAN CO I	MESA	24	48 N	18.0 W	22	UNDERGRO	100 - 1,000	50
KLONDIKE	BLUE CREEK MININ	MESA	25	50 N	18.0 W	22	UNDERGRO	<100	0
LA PLAZA 1	CARNOTITE EXPL C	MESA	22	50 N	19.0 W	22	UNDERGRO	100 - 1,000	0
LA SAL	CEN PAC MNG CO	MESA			0		UNDERGRO	1,000 - 100,000	150
LA SAL 1 + 2	WOODARD, CHARLES	MESA	36	51 N	20.0 W	22	UNDERGRO	1,000 - 100,000	300
LA SAL 2,4,6+25	ATLAS-AMAX	MESA			0		UNKNOWN	100 - 1,000	0
LA SAL 5 + 7	SHIPMAN MNG+EXPL	MESA	36	51 N	20.0 W	22	UNDERGRO	1,000 - 100,000	300
LA SAL GROUP	SHIPMAN MNG+EXPL	MESA	36	51 N	20.0 W	22	UNDERGRO	1,000 - 100,000	450
LA SALLE GROUP	FLANDERS MINING	MESA	36	51 N	20.0 W	22	UNDERGRO	1,000 - 100,000	150
LEE 1-6	HARRICK +LINSOT	MESA	21	50 N	18.0 W	22	UNDERGRO	<100	0
LEGAL + LUCKY DA	NARDINE, PAUL	MESA	7	50 N	19.0 W	22	SURFACE	<100	0
LEVADA	MONTGOMERY, JACK	MESA	23	50 N	18.0 W	22	UNDERGRO	<100	0
LIBERTY BELL 2	HALL, RIO B.	MESA			0		UNDERGRO	<100	0
LINCOLN	SHIPROCK, LTD	MESA	31	51 N	18.0 W	22	UNDERGRO	1,000 - 100,000	200
LITTLE JOHNNY	SHIPROCK LTD	MESA	31	51 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
LITTLE MAVERICK	WARREN, B.V.	MESA	21	50 N	18.0 W	22	UNDERGRO	<100	0
LOCUS 1,2+3	MITCHELL, C.E.	MESA	28	50 N	18.0 W	22	SURFACE	<100	0
LODE CLAIM	BUCAR MINES	MESA	33		0		UNDERGRO	<100	0
LOG CABIN	ZUFELT, LYNN	MESA	35	46 N	18.0 W	22	UNDERGRO	100 - 1,000	0
LONE PEAK	STRODE, EMORY	MESA	27	51 N	19.0 W	22	SURFACE	<100	0
LOOK OUT	KEELINE OIL+URAN	MESA	19	50 N	18.0 W	22	SURFACE	<100	50
LOST DUTCHMAN	PIONEER URAN INC	MESA	26	51 N	20.0 W	22	SURFACE	1,000 - 100,000	250
LUCKY BOY	UNION CARBIDE CP	MESA			0		UNDERGRO	1,000 - 100,000	50
LUCKY DAY	AJAX MINING +OIL	MESA	7	50 N	19.0 W	22	UNDERGRO	100 - 1,000	0
LUCKY HOLE	GULLETT, ORA R.	MESA			0		SURFACE	<100	0
LUCKY PINE 2	CORDREY+O,CONNOR	MESA	28	24 S	26.0 E	24	UNDERGRO	<100	0
LUCKY STRIKE	BUTLER, DEAN K.	MESA	32	50 N	18.0 W	22	UNDERGRO	<100	450

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SOURCE: DOE, GRAND JUNCTION, COLORADO

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
LUCKY STRIKE 7	BARONE + EDGEMAN	MESA	32	50 N	18.0 W	22	SURFACE	<100	0
LUMSDEN 2 + 6	UNION CARBIDE CP	MESA	36	51 N	20.0 W	22	UNDERGRO	1,000 - 100,000	200
MAMMOTH	SEYMOUR+MYERS	MESA	31	51 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
MAMMOTH-LINCOLN	MAMOUTH MINING.	MESA	31	51 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
MARK 2	UNION CARBIDE CP	MESA	1	50 N	20.0 W	22	UNDERGRO	1,000 - 100,000	200
MARY 3	UNION CARBIDE CP	MESA	27	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	200
MAVERICK	JONES + BOWLES	MESA	3	50 N	18.0 W	22	SURFACE	<100	0
MAVERICK 6	ATLAS-AMAX	MESA	3	50 N	18.0 W	22	UNDERGRO	<100	100
MESA 5 (BEVR MSA	RALPH FOSTER+S	MESA			0		UNDERGRO	1,000 - 100,000	100
MESA 8	FOSTER + SONS	MESA	12	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
MESA CREEK	CHRISTMAS, M. MNG	MESA			0		UNDERGRO	<100	0
MILL CLEAN UP	ATLAS MINERALS	MESA			0		MISC.-PB	1,000 - 100,000	50
MILL SITE LODE	PALMER, JACK	MESA			0		UNDERGRO	<100	0
MINERAL CHANNEL	ATLAS-AMAX	MESA	12	50 N	18.0 W	22	UNDERGRO	100 - 1,000	0
MINERAL CHANNEL	ATLAS-AMAX	MESA	12	50 N	18.0 W	22	UNDERGRO	<100	50
MINING LEASE 34	BOSMA + PUBY F	MESA	31	44 N	18.0 W	22	SURFACE	<100	0
MLB-C-G-26	RAJAH VNTR-GOVTL	MESA			0		UNDERGRO	100 - 1,000	100
MLB-C-G-27A	PIONR URAV GVTL	MESA			0		UNKNOW	1,000 - 100,000	400
MONROE 18	AMERICAN LEDUC U	MESA	36	50 N	18.0 W	22	UNDERGRO	100 - 1,000	50
MONTUZUMA	NIELSON, HAROLD I.	MESA	10	50 N	19.0 W	22	UNDERGRO	<100	0
NEILSON	DULANEY MINING C	MESA	10	50 N	19.0 W	22	SURFACE	<100	0
NEILSON MOTHER D	DULANEY MINING C	MESA	10	50 N	19.0 W	22	UNDERGRO	<100	0
NEWHEISEL	WOODARD, CHARLES	MESA	31	51 N	19.0 W	22	UNDERGRO	1,000 - 100,000	250
OUTLAW ECONOMY	FOSTER + SONS	MESA	12	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
PAY LODE	KELLEY, DAN E.	MESA	19	51 N	18.0 W	22	UNDERGRO	100 - 1,000	0
PAYDAY 1 THRU 7	BLACK CAT EXPL,C	MESA	2	50 N	19.0 W	22	SURFACE	<100	0
PAYROCK GROUP	DOYLE M K	MESA	17	51 N	18.0 W	22	UNDERGRO	100 - 1,000	50
PEACH 10 INC.1+2	AMERICAN LEDUC U	MESA	25	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
PIF FACE 1	CHAPIN, LOUIS	MESA	2	46 N	17.0 W	22	UNDERGRO	100 - 1,000	0
PPT.CONCENTRATE	ALABASTER PRODUC	MESA	10	51 N	19.0 W	22	MISC.-PB	<100	0
PROTECTOR	SCHUMACHER, J.I.	MESA	31	51 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
PURPLE HEART	PETITTI, JOHN J.	MESA			0		SURFACE	<100	0
RADIUM 7	ATLAS-AMAX	MESA	9	50 N	18.0 W	22	UNDERGRO	<100	50
RAE MARIE 3	LEECO GAS + OIL	MESA			0		UNDERGRO	100 - 1,000	200
RAE MARIE GROUP	W. S. DAWSON	MESA	33	24 S	26.0 E	24	UNDERGRO	1,000 - 100,000	200
RAINBOW	BROWN + WILLIAMS	MESA	18	50 N	18.0 W	22	UNDERGRO	100 - 1,000	0
RAINY DAY	FOSTER + SONS	MESA	35	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
RAJAH 1	UNION CARBIDE CP	MESA	36	51 N	20.0 W	22	UNDERGRO	100 - 1,000	550
RAJAH 11+ 63	UNION CARBIDE	MESA	35	51 N	20.0 W	22	UNDERGRO	1,000 - 100,000	550
RAJAH 72	UNION CARBIDE CP	MESA	36	51 N	20.0 W	22	UNDERGRO	100 - 1,000	450
RANCH VIEW	BLUE CREEK MININ	MESA	30	50 N	17.0 W	22	SURFACE	<100	0
RAVEN 3	UNION CARBIDE	MESA	32	50 N	17.0 W	22	UNDERGRO	100 - 1,000	100
RENA	DEL RIO MNG CO.	MESA	19	51 N	18.0 W	22	UNDERGRO	100 - 1,000	150
RONNIE 2	BARNETT, GRANT T	MESA	12	50 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
RUDDOT 1	BENHAM + TUNNEL	MESA	34	51 N	19.0 W	22	UNDERGRO	100 - 1,000	50
SALUTE 3	AMERICAN LEDUC U	MESA	25	50 N	18.0 W	22	UNDERGRO	<100	0
SAMPLE REJECT	SMITH, J. EARL	MESA			0		MISC.-PB	<100	0
SCOTT 2	HARRICK +LINSOT	MESA	27	50 N	18.0 W	22	SURFACE	<100	0

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
SHELBY DEAN 2	STULLER + BOWEN	MESA	34	51 N	19,0 W	22	SURFACE	<100	0
SILVER MOON	BECK, L.C.	MESA	10	1 N	3,0 W	22	MISC,-PB	<100	0
SMALL SPOT	ZIMMERMAN, BEN	MESA	9	50 N	18,0 W	22	UNDERGRO	1,000 - 100,000	0
SNOW SHOE	FOSTER + SONS	MESA	12	50 N	18,0 W	22	UNDERGRO	1,000 - 100,000	50
SOLDIER BOY	PETRO NUCLEAR	MESA	11	47 N	20,0 W	22	UNDERGRO	100 - 1,000	0
SPRING	ATLAS-AMAX	MESA	12	50 N	18,0 W	22	UNDERGRO	1,000 - 100,000	100
STORMY TREASURE	CHESAPEAKE+ COLO	MESA	35	50 N	18,0 W	22	SURFACE	<100	100
STRODE 1	STRODE, EMORY	MESA			0		SURFACE	<100	0
SUN	FOSTER + SONS	MESA	12	50 N	18,0 W	22	UNDERGRO	100 - 1,000	50
SUN SPOT-CLOUD 1	UNION CARBIDE CP	MESA	32	51 N	19,0 W	22	UNDERGRO	1,000 - 100,000	150
SUPPLY 11	MONTGOMERY, JACK	MESA	35	50 N	18,0 W	22	SURFACE	<100	0
SUPPLY 14	AMERICAN LEUC U	MESA	35	50 N	18,0 W	22	SURFACE	<100	50
SURPRISE	MUVOKIV MNG.CO.	MESA			0		UNDERGRO	100 - 1,000	0
TENDERFOOT GROUP	GRAHAM, FRED	MESA	19	51 N	18,0 W	22	SURFACE	<100	0
THE DUKE	UNION CARBIDE CP	MESA	32	51 N	19,0 W	22	UNDERGRO	100 - 1,000	0
TODITLO	ERDA	MESA			0		MISC,-PB	<100	0
TROJAN 18 + 20	UNION CARBIDE CP	MESA	23	50 N	18,0 W	22	UNDERGRO	100 - 1,000	0
VANADIUM KING 1	WRIGHT, WARREN E.	MESA	19	51 N	18,0 W	22	SURFACE	<100	0
VANADIUM KING 2	WRIGHT, WARREN E.	MESA	19	51 N	18,0 W	22	UNDERGRO	<100	0
VIRGEN	CLEGHORN, DOUGLAS	MESA			0		UNDERGRO	<100	250
WASP	CONTINENTAL MAIL	MESA	18	50 N	18,0 W	22	UNDERGRO	100 - 1,000	100
WRAY MESA	UTIDA URAN.CO.	MESA	30	47 N	19,0 W	22	UNDERGRO	<100	0
YELLOW CAT	WRIGHT, WARREN E.	MESA	21	24 S	26,0 E	24	SURFACE	<100	0
YELLOW JACKET 15	ATLAS-AMAX	MESA	3	50 N	18,0 W	22	UNDERGRO	1,000 - 100,000	0
YELLOW JACKET 9	ATLAS-AMAX	MESA	3	50 N	18,0 W	22	UNDERGRO	100 - 1,000	0
YELLOW JACKET 14	ATLAS-AMAX	MESA	3	50 N	18,0 W	22	UNDERGRO	1,000 - 100,000	100
BESSIE 9 + 10	UNION CARBIDE CP	MOFFAT			0		SURFACE	100 - 1,000	100
BLUE MOUNTAINS 4	SKULL CREEK COAL	MOFFAT			0		UNDERGRO	100 - 1,000	50
BREADLINE	JONES, R.R.	MOFFAT			0		SURFACE	<100	0
BUFFALO HEAD	BUFFALO HEAD MNG	MOFFAT			0		SURFACE	<100	50
BUTLER LEASE 1	CONOCO-PIONEER	MOFFAT	30	8 N	91,0 W	06	SURFACE	1,000 - 100,000	50
CEDARS 1	HENDERSON, COUNTS	MOFFAT			0		SURFACE	<100	0
CLAIM 1	BASHAW + ULSH	MOFFAT			0		SURFACE	<100	0
CLETA GROUP	BESSELL + KAYE	MOFFAT			0		SURFACE	<100	0
DOC ARMOUR MINE	UNION CARBIDE CP	MOFFAT			0		SURFACE	100 - 1,000	50
GERTPUDE	UNION CARBIDE CP	MOFFAT	8	7 N	94,0 W	06	SURFACE	>100,000	50
GLORY BEE	ELLER + CALDWELL	MOFFAT			0		SURFACE	<100	0
JOHNSON M.C.S.	UNION CARBIDE CP	MOFFAT	9	7 N	94,0 W	06	SURFACE	1,000 - 100,000	50
LITTLE STAR	POWERS, LLOYD	MOFFAT	33	5 N	00,0 W	06	UNDERGRO	1,000 - 100,000	50
LUCKY BOY	RANGEP UPAN.CO.	MOFFAT			0		UNDERGRO	<100	0
ROB-ROLLO	UNION CARBIDE CP	MOFFAT			0		SURFACE	>100,000	200
SEC.16, 6N-94W	TONY WILLJAMS CO	MOFFAT	16	6 N	94,0 W	06	SURFACE	100 - 1,000	50
SUGARLOAF	MRS.G.I.TOWER	MOFFAT			0		SURFACE	100 - 1,000	50
THREE SISTERS	LEVKULICH, BILL	MOFFAT			0		SURFACE	100 - 1,000	50
BLUE EAGLE 1	YOUNG, ELPEE	MONTEZUMA			0		UNDERGRO	<100	100
KARLE KAY	FOUR CORNERS OIL	MONTEZUMA			0		SURFACE	<100	0
ROBERTA JEAN	HOTZ, EARL	MONTEZUMA			0		UNDERGRO	100 - 1,000	50
SWALLOW 1	BLIGAR, GENE	MONTEZUMA			0		SURFACE	<100	50

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
VEACH	BRITTAIN + HALL	MONTEZUMA			0		SURFACE	<100	0
VIRGINIA ANN	BUCKEYE MINING C	MONTEZUMA			0		UNDERGRO	<100	0
1ST NATIONAL BAN	UNION CARBIDE CP	MONTROSE	21	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
2ND NATIONAL BAN	UNION CARBIDE CP	MONTROSE	28	47 N	17.0 W	22	UNDERGRO	100 - 1,000	0
30-30	HADDEN, T.A.	MONTROSE			0		UNDERGRO	1,000 - 100,000	0
45-90	UNION CARBIDE CP	MONTROSE	10	47 N	17.0 W	22	UNDERGRO	100 - 1,000	0
ABAJO 1-5	UNION CARBIDE CP	MONTROSE	19	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	300
ALL STAPS EVENIN	UNION CARBIDE CP	MONTROSE	28	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
ALTA	MONOGRAM MINING	MONTROSE	23	48 N	18.0 W	22	UNDERGRO	100 - 1,000	50
ALTAIR, CAPELLA, V	UNION CARBIDE CP	MONTROSE	13	46 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
AMERICAN EAGLE 4	WEBB RESOURCES	MONTROSE	3	45 N	19.0 W	22	UNDERGRO	1,000 - 100,000	50
AMERICAN EAGLE G	MAYFIELD, JEPHY	MONTROSE	10	45 N	19.0 W	22	UNDERGRO	1,000 - 100,000	150
ANCHOR	UNION CARBIDE CP	MONTROSE	3	48 N	18.0 W	22	UNDERGRO	100 - 1,000	0
ANGLE	GRAMLICH SAM V	MONTROSE	1	47 N	20.0 W	22	UNDERGRO	<100	0
ANNA MAY 1	UNION CARBIDE CP	MONTROSE	18	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
ANNA MAY 1 DUMPS	UNION CARBIDE CP	MONTROSE	18	46 N	17.0 W	22	DUMPS	1,000 - 100,000	50
ANNEX	NEESHAM, GLEN	MONTROSE	7	47 N	17.0 W	22	SURFACE	<100	0
ARCTURUS	UNION CARBIDE CP	MONTROSE	18	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
ARROWHEAD (URAVAN	UNION CARBIDE CP	MONTROSE	28	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
AUSTIN (DOLORES)	UNION CARBIDE CP	MONTROSE	20	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
AZTEC	FOOTE MINERALS	MONTROSE	33	46 N	19.0 W	22	UNDERGRO	100 - 1,000	50
AZTEC	UNION CARBIDE CP	MONTROSE	20	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	200
B P 1	DAVIS, RAY	MONTROSE			0		SURFACE	<100	50
BABE RUTH	FOOTE MINERALS	MONTROSE	14	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
BABY FAWN	FOOTE MINERALS	MONTROSE	6	45 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
BADGER	UNION CARBIDE CP	MONTROSE	19	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
BADGER 1	UNION CARBIDE CP	MONTROSE	19	47 N	17.0 W	22	UNDERGRO	100 - 1,000	0
BADGER 2	UNION CARBIDE CP	MONTROSE	26	48 N	18.0 W	22	UNDERGRO	100 - 1,000	0
BADGER DUMP	UNION CARBIDE CP	MONTROSE	19	47 N	17.0 W	22	DUMPS	100 - 1,000	50
BADGER-CROWN PRN	MICRO COPPER	MONTROSE	26	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
BAGGER	UNION CARBIDE CO	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
BALL POINT	MONTGOMERY, JACK	MONTROSE	11	46 N	18.0 W	22	UNDERGRO	<100	0
BANNER	UNION CARBIDE CP	MONTROSE	12	46 N	18.0 W	22	UNDERGRO	<100	0
BEAVER	UNION CARBIDE CP	MONTROSE	32	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	200
BED ROCK	UNKNOWN CONTROLR	MONTROSE			0		SURFACE	<100	0
BENCH	LYLE FRANCIS	MONTROSE			0		SURFACE	<100	0
BERNARD	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
BERTIE'S BEAUTY C	KRESS + PISCHEL	MONTROSE	8	46 N	16.0 W	22	UNDERGRO	<100	0
BETTER B 7	MATTERHORN MNG.	MONTROSE	31	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	200
BETTY JEAN	MONOGRAM MINING	MONTROSE	22	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
BIG BULL	FOOTE MINERALS	MONTROSE	12	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
BIG DICK	UNION CARBIDE CP	MONTROSE	19	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
BIG MITT	UNION CARBIDE CP	MONTROSE	21	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
BIG ROCK	SIMPLON, J.R. CO	MONTROSE	33	46 N	18.0 W	22	UNDERGRO	100 - 1,000	0
BIG SHOT	MOSLANDER, GEORGE	MONTROSE	6	47 N	17.0 W	22	SURFACE	<100	0
BILL BADDY-LUCKYR	UNION CARBIDE CP	MONTROSE	18	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
BIRTHDAY 1	GREEN, ARTHUR	MONTROSE	2	46 N	17.0 W	22	SURFACE	<100	0
BISMARCK	UNION CARBIDE CP	MONTROSE	29	47 N	17.0 W	22	UNDERGRO	<100	0

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
BITTER CREEK	UNION CARBIDE	MONTROSE	12	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
BLACK DINAH	UNION CARBIDE CP	MONTROSE	28	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
BLACK DINAH DUMP	UNION CARBIDE CP	MONTROSE	28	47 N	17.0 W	22	DUMPS	100 - 1,000	150
BLACK EAGLE	COCKRUM, F.V.	MONTROSE	4	45 N	16.0 W	22	SURFACE	<100	0
BLACK GNAT	MALEY MINING CO.	MONTROSE			0		SURFACE	<100	0
BLACK HAWK	WRIGHT, GEORGIA T	MONTROSE	27	49 N	18.0 W	22	SURFACE	<100	0
BLACK JACK	MAGIC URANIUM CO	MONTROSE	2	45 N	18.0 W	22	UNDERGRO	<100	50
BLACK PRINCE	BINDER, F. V.	MONTROSE	33	46 N	19.0 W	22	UNDERGRO	100 - 1,000	100
BLACK ROCK	UNION CARBIDE	MONTROSE	23	48 N	18.0 W	22	UNDERGRO	100 - 1,000	100
BLACK TOM	UNION CARBIDE CP	MONTROSE	20	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
BLACKFOOT RATTLE	SANDRA MARIE MIN	MONTROSE	10	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
BLISS	UNION CARBIDE C	MONTROSE			0		UNDERGRO	1,000 - 100,000	350
BLONDA	AYEKS, EVERETT	MONTROSE			0		SURFACE	<100	0
BLONDY	GRIPE W.F.	MONTROSE	26	48 N	18.0 W	22	UNDERGRO	<100	50
BLUE BELL	UNION CARBIDE CP	MONTROSE	35	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
BLUE BIRD	UNION CARBIDE CP	MONTROSE	25	48 N	18.0 W	22	UNDERGRO	100 - 1,000	100
BLUE BIRD DUMP	UNION CARBIDE CP	MONTROSE	25	48 N	18.0 W	22	DUMPS	100 - 1,000	50
BOB 6,7,8	UNION CARBIDE CP	MONTROSE			0		UNDERGRO	1,000 - 100,000	600
BOB 9	BELL, A.L. + B.L.	MONTROSE	5	45 N	17.0 W	22	SURFACE	<100	0
BOB CAT	UNION CARBIDE CP	MONTROSE	19	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
BOB CAT	GRAMLICH SAM V	MONTROSE	1	47 N	20.0 W	22	SURFACE	<100	0
BONANZA	SECURITY URANIUM	MONTROSE			0		UNDERGRO	<100	0
BONITA 1	BONITA URANIUM C	MONTROSE	32	49 N	17.0 W	22	UNDERGRO	<100	0
BOUNCIN BETTY	JONES + THOMPSON	MONTROSE			0		SURFACE	<100	0
BROOKE 1	MAYFIELD, JERRY	MONTROSE	10	45 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
BROOMSTICK	FOOTE MINERALS	MONTROSE	11	45 N	18.0 W	22	UNDERGRO	<100	0
BROWN DERBY	EARLEY, EMERY	MONTROSE			0		SURFACE	<100	0
BRUSHY BASIN	SCHUMACHER J. I.	MONTROSE	28	28 S	26.0 E	24	UNDERGRO	100 - 1,000	0
BUBBLES	COCHRAN URANIUM	MONTROSE			0		UNDERGRO	<100	0
BUCKEYE 4	SMITH+JENSEN+DAV	MONTROSE			0		SURFACE	<100	0
BUCKHORN 1	CURTIS, CLYDE	MONTROSE	21	48 N	18.0 W	22	SURFACE	<100	0
BUCKSHOT	UNION CARBIDE CP	MONTROSE	31	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
BUCKSKIN	JARMAN + HADDEN	MONTROSE	35	46 N	18.0 W	22	UNDERGRO	<100	250
BUCKSKIN GROUP	F V BINDER	MONTROSE	35	46 N	18.0 W	22	UNDERGRO	<100	100
BUTTERFLY	UNION CARBIDE	MONTROSE	10	47 N	17.0 W	22	UNDERGRO	100 - 1,000	0
BUTTERFLY	UNION CARBIDE	MONTROSE	14	47 N	20.0 W	22	UNDERGRO	1,000 - 100,000	100
C F C	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	100 - 1,000	150
CABIN VIEW	CAMOOSE URANIUM	MONTROSE	33	46 N	18.0 W	22	UNDERGRO	<100	0
CALVERT 2	UNION CARBIDE CP	MONTROSE	10	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
CAMEL (LEIGHTON)	FOOTE MINERALS	MONTROSE	11	45 N	18.0 W	22	UNDERGRO	100 - 1,000	200
CANOPUS	UNION CARBIDE CP	MONTROSE	18	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
CANYON 2	PATTERSON, PAT	MONTROSE			0		UNDERGRO	<100	0
CANYON VIEW	YACKEL, CAPL	MONTROSE	4	45 N	19.0 W	22	UNDERGRO	100 - 1,000	0
CARPATHIA	UNION CARBIDE CP	MONTROSE	18	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
CARPENTER RIDGE	UNKNOWN CONTROLP	MONTROSE			0		SURFACE	<100	0
CASHIN MILL	HARRISON D.E.	MONTROSE	22	47 N	19.0 W	22	SURFACE	<100	0
CEDAR RIDGE	AYERS, EVERETT	MONTROSE	4	45 N	19.0 W	22	UNDERGRO	100 - 1,000	0
CHECKER	PATTERSON+ NEILS	MONTROSE	30	47 N	17.0 W	22	SURFACE	<100	100

INACTIVE URANIUM MINES IN THE UNITED STATES
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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD.	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
CHESTERFIELD TPE	UNION CARBIDE CP	MONTROSE			0		UNDERGRO	1,000 - 100,000	0
CHILLI 5	UNION CARBIDE CP	MONTROSE	25	45 N	18,0 W	22	UNDERGRO	1,000 - 100,000	100
CHIPMONK 1	AYERS, EVERETT	MONTROSE	4	43 N	19,0 W	22	UNDERGRO	<100	0
CHRISTIE	STOCKS, R.M., +SISK	MONTROSE			0		SURFACE	<100	0
CLIFDWELLER DUMP	UNION CARBIDE CP	MONTROSE			0		DUMPS	100 - 1,000	0
CLUB 2	UNION CARBIDE CP	MONTROSE	20	48 N	17,0 W	22	UNDERGRO	1,000 - 100,000	100
CLUB GROUP	RLOSSER, RAYMOND	MONTROSE	32	48 N	17,0 W	22	UNDERGRO	1,000 - 100,000	100
CLUB GROUP	UNION CARBIDE	MONTROSE	29	48 N	17,0 W	22	UNDERGRO	1,000 - 100,000	0
COLUMBUS	FOOTE MINERALS	MONTROSE	2	46 N	17,0 W	22	UNDERGRO	<100	0
CONFUSION	SAM V. GRAMLICH	MONTROSE	12	47 N	20,0 W	22	UNDERGRO	100 - 1,000	0
COPPEE JACK	MARVEL MNG CO	MONTROSE	19	48 N	18,0 W	22	UNDERGRO	100 - 1,000	0
CORPORATION	UNION CARBIDE	MONTROSE	16	47 N	17,0 W	22	UNDERGRO	100 - 1,000	250
CORRECT	UNION CARBIDE CP	MONTROSE			0		UNDERGRO	<100	0
COTTONWOOD 1,2+3	PATTERSON, PAT	MONTROSE	33	46 N	19,0 W	22	UNDERGRO	100 - 1,000	0
COUGAR	DOOLEY T.T.	MONTROSE			0		SURFACE	<100	0
CRIPPLE CREEK	UNION CARBIDE CP	MONTROSE	28	47 N	17,0 W	22	UNDERGRO	1,000 - 100,000	100
CRIPPLE CREEK DU	UNION CARBIDE CP	MONTROSE	21	47 N	17,0 W	22	DUMPS	1,000 - 100,000	100
CRIPPLE CRK 2 DU	UNION CARBIDE CP	MONTROSE	21	47 N	17,0 W	22	DUMPS	1,000 - 100,000	100
CUE BALL	UNION CARBIDE CP	MONTROSE	3	47 N	17,0 W	22	UNDERGRO	<100	0
D + D 3	ROGERS + HUNT	MONTROSE			0		UNDERGRO	<100	0
D + D 5	DOWELL H.L.	MONTROSE			0		UNDERGRO	<100	0
DADS	MICRO COPPER CO	MONTROSE	14	48 N	18,0 W	22	UNDERGRO	1,000 - 100,000	0
DAN PATCH	UNION CARBIDE CP	MONTROSE	35	47 N	17,0 W	22	UNDERGRO	1,000 - 100,000	200
DAWN	STORY, OREN	MONTROSE			0		SURFACE	<100	0
DEER, JULY, SLIM	UNION CARBIDE CP	MONTROSE	28	46 N	17,0 W	22	UNDERGRO	>100,000	650
DIANA	FOOTE MINERALS	MONTROSE	14	45 N	18,0 W	22	UNDERGRO	1,000 - 100,000	200
DOAGY 2-LAST DOL	UNION CARBIDE CP	MONTROSE	20	46 N	17,0 W	22	UNDERGRO	1,000 - 100,000	100
DOLORES 2	BAIRD+SNYDER MNG	MONTROSE	30	44 N	18,0 W	22	UNDERGRO	1,000 - 100,000	0
DOLORES MINE	UNION CARBIDE CP	MONTROSE	19	48 N	17,0 W	22	UNDERGRO	1,000 - 100,000	150
DONALD L DUMP	UNION CARBIDE CP	MONTROSE			0		DUMPS	100 - 1,000	0
DONNA K	FOOTE MINERALS	MONTROSE	31	47 N	16,0 W	22	UNDERGRO	1,000 - 100,000	200
DOROTHY	UNION CARBIDE CP	MONTROSE	20	47 N	17,0 W	22	UNDERGRO	1,000 - 100,000	200
DOROTHY E.	ST REGIS URANIUM	MONTROSE	18	48 N	18,0 W	22	UNDERGRO	<100	0
DOUBLE JACK	KYLE, JAMES A.	MONTROSE	30	47 N	16,0 W	22	UNDERGRO	100 - 1,000	0
DUCHESS 2 + 3	GRIFE W.E.	MONTROSE	34	48 N	18,0 W	22	UNDERGRO	1,000 - 100,000	150
DUSTY DUMP	UNION CARBIDE CP	MONTROSE			0		DUMPS	100 - 1,000	0
EAGLE ROCK 1	DOWELL H.L.	MONTROSE			0		UNDERGRO	<100	0
EDITH IRENE	STEWART, JAMES	MONTROSE	11	45 N	19,0 W	22	UNDERGRO	<100	50
EDNA MAE	JOHANSEN E.J.	MONTROSE	21	45 N	18,0 W	22	UNDERGRO	100 - 1,000	0
EIGHT BALL	UNION CARBIDE CP	MONTROSE	3	47 N	17,0 W	22	UNDERGRO	100 - 1,000	0
EIGHT O CLOCK	FINCH, TOM	MONTROSE	33	46 N	18,0 W	22	SURFACE	<100	0
ELIZABETH ANN 1	HARDWICK +LOVESS	MONTROSE			0		UNDERGRO	<100	0
EVENING STAR	PETRO NUCLEAR	MONTROSE	11	47 N	20,0 W	22	UNDERGRO	1,000 - 100,000	50
EXPECTANT 1	LONDON, ROBERT	MONTROSE	3	45 N	19,0 W	22	SURFACE	<100	0
FABRY QUEEN	UNION CARBIDE	MONTROSE	10	47 N	17,0 W	22	UNDERGRO	100 - 1,000	50
FARMER BOY	KINSEY + MALICH	MONTROSE			0		SURFACE	<100	0
FAULTLESS	MAYFIELD+WICKERS	MONTROSE	24	45 N	19,0 W	22	UNDERGRO	<100	0
FAWN SPRINGS 11	UNION CARBIDE CP	MONTROSE	6	45 N	17,0 W	22	UNDERGRO	1,000 - 100,000	100

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
FAWN SPRINGS 12	UNION CARBIDE CP	MONTROSE	31	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
FAWN SPRINGS 13	UNION CARBIDE CP	MONTROSE	6	45 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
FAWN SPRINGS 15	UNION CARBIDE CP	MONTROSE	6	45 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
FAWN SPRINGS 1R	UNION CARBIDE CP	MONTROSE	6	45 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
FAWN SPRINGS 21	UNION CARBIDE CP	MONTROSE	31	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
FAWN SPRINGS 29	FOOTE MINERALS	MONTROSE	7	45 N	17.0 W	22	UNDERGRO	100 - 1,000	100
FAWN SPRINGS 3	UNION CARBIDE CP	MONTROSE	31	46 N	17.0 W	22	UNDERGRO	100 - 1,000	300
FAWN SPRINGS 30	UNION CARBIDE CP	MONTROSE	6	45 N	17.0 W	22	UNDERGRO	100 - 1,000	350
FAWN SPRINGS 4+1	UNION CARBIDE CP	MONTROSE	6	45 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
FAWN SPRINGS 5 T	UNION CARBIDE CP	MONTROSE	6	45 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
FIFTH NATIONAL B	UNION CARBIDE CP	MONTROSE	28	47 N	17.0 W	22	UNDERGRO	100 - 1,000	150
FIREBIRD	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
PIPECRACKER	UNION CARBIDE CP	MONTROSE	35	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	300
FLAT TOP	SAN MIGUEL MINES	MONTROSE			0		SURFACE	<100	0
FLORENCE NELLIE	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
FOSSIL	FOOTE MINERALS	MONTROSE	7	45 N	17.0 W	22	UNDERGRO	100 - 1,000	50
FOURTH JULY + K	UNION CARBIDE CP	MONTROSE	24	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
FOURTH NAIL BANK	UNION CARBIDE CP	MONTROSE	28	47 N	17.0 W	22	UNDERGRO	100 - 1,000	100
FOX	UNION CARBIDE CP	MONTROSE	30	48 N	17.0 W	22	UNDERGRO	100 - 1,000	150
FOX CISTERN	UNION CARBIDE CP	MONTROSE	19	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
FRACTION + FRAC	UNION CARBIDE CP	MONTROSE	19	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	250
GILBERT	UNION CARBIDE CP	MONTROSE	32	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
GNOME	UNION CARBIDE CP	MONTROSE	17	47 N	17.0 W	22	UNDERGRO	<100	0
GOLDEN EAGLE 14+	ALBANO, CLAIR	MONTROSE	9	45 N	19.0 W	22	UNDERGRO	100 - 1,000	150
GOOD HOPE RED FD	FAGEN + FAGEN	MONTROSE	10	47 N	17.0 W	22	SURFACE	<100	0
GRAND DAD	MAL PAIS MNG.	MONTROSE			0		SURFACE	<100	50
GRANDVIEW	H.D.+JIM BUTT	MONTROSE			0		UNDERGRO	1,000 - 100,000	0
GRASS ROOTS	UNION CARBIDE CP	MONTROSE	34	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
GRASS ROOTS DUMP	UNION CARBIDE CP	MONTROSE	27	48 N	17.0 W	22	DUMPS	100 - 1,000	100
GRAY	UNION CARBIDE CP	MONTROSE	13	46 N	18.0 W	22	SURFACE	1,000 - 100,000	50
GRAY DUMP	UNION CARBIDE CP	MONTROSE	13	46 N	18.0 W	22	DUMPS	<100	0
GRAY FOX	BELL, PIRL W.	MONTROSE	11	47 N	17.0 W	22	UNDERGRO	100 - 1,000	0
GREAT WESTERN	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
GREAT WESTERN DU	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	DUMPS	100 - 1,000	50
GREENBACK	UNION CARBIDE CP	MONTROSE	18	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
GROUNDHOG	UNION CARBIDE CP	MONTROSE	17	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
GROUNDHOG	OLIVER + RUSS	MONTROSE	9	48 N	19.0 W	22	UNDERGRO	100 - 1,000	0
GYP LEASE	FOOTE MINERALS	MONTROSE	10	45 N	19.0 W	22	UNDERGRO	1,000 - 100,000	50
HAPPY	UNION CARBIDE CP	MONTROSE	21	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
HAPPY JOE	MILLER+BLACKBURN	MONTROSE	2	45 N	19.0 W	22	UNDERGRO	<100	0
HAPPY THOUGHT	UNION CARBIDE CP	MONTROSE	18	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
HARD LUCK	LONG, ARTHUR	MONTROSE			0		UNDERGRO	<100	0
HARDROCK	FOOTE MINERALS	MONTROSE	18	46 N	16.0 W	22	UNDERGRO	100 - 1,000	150
HAROLD	UNION CARBIDE CP	MONTROSE	32	46 N	17.0 W	22	UNDERGRO	100 - 1,000	150
HENRY CLAY	UNION CARBIDE CP	MONTROSE	29	4 N	1.7 W	22	UNDERGRO	1,000 - 100,000	50
HENRY CLAY DUMPS	UNION CARBIDE CP	MONTROSE	29	47 N	17.0 W	22	DUMPS	1,000 - 100,000	250
HIDDEN BASIN	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	250
HIGH BALL 5	SHUMWAY+ DADE	MONTROSE	26	46 N	18.0 W	22	UNDERGRO	100 - 1,000	100

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
HOMESTEAD	BALL, ALBERT	MONTROSE			0		SURFACE	<100	0
HONEYMOON	UNION CARRIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
HONEYMOON DUMPS	UNION CARRIDE CP	MONTROSE	20	47 N	17.0 W	22	DUMPS	1,000 - 100,000	50
HORSEHAIR 1	URRALURU-HOLZ	MONTROSE	1	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
HORSEHAIR GROUP	GUIRE, HELEN M.	MONTROSE	2	45 N	18.0 W	22	UNDERGRO	100 - 1,000	0
HOT ROCK	MEYER, KARL	MONTROSE	12	46 N	17.0 W	22	SURFACE	<100	0
HOT SPOT	PRICE + LEDLOW	MONTROSE			0		UNDERGRO	<100	0
HOWLING COYOTE	DANVERS, DON	MONTROSE	33	47 N	19.0 W	22	UNDERGRO	<100	0
HUMMER	UNION CARRIDE CP	MONTROSE	21	46 N	17.0 W	22	UNDERGRO	>100,000	200
HUMMER DUMPS	UNION CARRIDE CP	MONTROSE	21	46 N	17.0 W	22	DUMPS	100 - 1,000	150
ILENA	SCHUMACHER, J I	MONTROSE			0		UNDERGRO	<100	50
INDEX	LA RUE, O.C.	MONTROSE	2	48 N	18.0 W	22	UNDERGRO	100 - 1,000	0
IOLA	UNION CARRIDE CP	MONTROSE			0		UNDERGRO	100 - 1,000	0
IRENE	UNION CARRIDE CP	MONTROSE	29	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
ISLAND VIEW 1-7	CHAPMAN + FRANKS	MONTROSE	11	45 N	19.0 W	22	SURFACE	<100	100
J.B.GROUP	UNION CARRIDE CP	MONTROSE	3	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
J.J.	UNION CARRIDE CP	MONTROSE	26	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
JACK RABBIT	UNKNOWN CONTROLR	MONTROSE	11	45 N	18.0 W	22	UNDERGRO	<100	0
JACKPOT GROUP	BEE HIVE MINING	MONTROSE	2	48 N	20.0 W	22	SURFACE	<100	0
JEOP	PETERSON, FREDDIE	MONTROSE	18	47 N	17.0 W	22	SURFACE	<100	0
JITTERBUG	MARVEL MNG.CO.	MONTROSE	21	48 N	18.0 W	22	UNDERGRO	100 - 1,000	0
JO ANNE GROUP	CHERIGOS, HARRY P	MONTROSE	25	48 N	18.0 W	22	UNDERGRO	100 - 1,000	100
JOE	UNION CARRIDE CP	MONTROSE			0		UNDERGRO	1,000 - 100,000	200
JOE DANDY	UNION CARRIDE CP	MONTROSE	21	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	250
JOE DANDY DUMPS	UNION CARRIDE CP	MONTROSE	21	46 N	17.0 W	22	UNDERGRO	<100	150
JOE RIVERSIDE	UNION CARRIDE CP	MONTROSE	29	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	200
JOHN Z.	SMART, O.E.	MONTROSE	10	46 N	18.0 W	22	UNDERGRO	100 - 1,000	50
JOKER	PLATEAU URANIUM	MONTROSE	24	48 N	19.0 W	22	UNDERGRO	100 - 1,000	50
JOKER	BLACK HAWK URAN.	MONTROSE	10	45 N	19.0 W	22	UNDERGRO	100 - 1,000	50
JOKER	ELDER, FRANK	MONTROSE	34	46 N	18.0 W	22	UNDERGRO	100 - 1,000	0
JUDY ANN	ST REGIS URANIUM	MONTROSE	16	48 N	18.0 W	22	UNDERGRO	<100	50
JUMBO	BRINK, AL	MONTROSE	11	45 N	19.0 W	22	UNDERGRO	<100	0
JUNE BUG	AYERS, EVERETT	MONTROSE	30	28 E	26.0 E	24	UNDERGRO	<100	0
JUNGLE BASIN	FOOTE MINERALS	MONTROSE	35	45 N	17.0 W	22	SURFACE	<100	0
JUST RIGHT	MENDISCO, FELIX	MONTROSE	31	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
KING	E.E.LEWIS, INC.	MONTROSE			0		UNDERGRO	<100	50
KING OF LODES	UNION CARRIDE CP	MONTROSE	19	47 N	17.0 W	22	UNDERGRO	100 - 1,000	0
LARK 7 + 8	UNION CARRIDE CP	MONTROSE	11	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	250
LAST CHANCE 1	UNION CARRIDE CP	MONTROSE	9	48 N	19.0 W	22	UNDERGRO	1,000 - 100,000	50
LAST HOPE	DYNATEK ENTERPRIS	MONTROSE	22	48 N	18.0 W	22	UNDERGRO	<100	0
LAST LOAD	SNYDER, FRED JR.	MONTROSE	8	48 N	19.0 W	22	SURFACE	<100	0
LAZY THREE	D.+ D.URAN +EXPI.	MONTROSE	25	48 N	18.0 W	22	UNDERGRO	100 - 1,000	50
LEVI	UNION CARRIDE CP	MONTROSE	9	45 N	18.0 W	22	UNDERGRO	100 - 1,000	0
LITTLE BASIN	UNION CARRIDE CP	MONTROSE	27	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	0
LITTLE BUCKHORN	ATLAS-AMAX	MONTROSE	10	48 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
LITTLE CHIEF	MALEY, LEP	MONTROSE	13	47 N	18.0 W	22	SURFACE	<100	0
LITTLE DICK	UNION CARRIDE CP	MONTROSE	30	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
LITTLE DICK DUMP	UNION CARRIDE CP	MONTROSE	30	48 N	17.0 W	22	DUMPS	<100	100

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
LITTLE JEWEL	FOOTE MINERALS	MONTROSE	3	45 N	19.0 W	22	UNDERGRO	100 = 1,000	0
LITTLE JOE	MALEY LEO C	MONTROSE	14	48 N	18.0 W	22	SURFACE	<100	0
LITTLE SLIP 1	HIETT, MARION J.	MONTROSE			0		SURFACE	<100	0
LO HIGH	SULLIVAN+MOORE+	MONTROSE			0		UNDERGRO	<100	0
LOG CABIN	MICRO COPPER CO	MONTROSE	35	46 N	18.0 W	22	UNDERGRO	1,000 = 100,000	50
LOHI	JOHANNSEN E.J.	MONTROSE	17	46 N	17.0 W	22	UNDERGRO	<100	0
LONE CEDAR	GALYEAN, JAMES F	MONTROSE	34	46 N	17.0 W	22	UNDERGRO	<100	0
LONE PINE	CECIL BUNKER	MONTROSE	5	48 N	19.0 W	22	UNDERGRO	1,000 = 100,000	100
LONG PARK 1	UNION CARBIDE CP	MONTROSE	27	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	200
LONG PARK 10	UNION CARBIDE	MONTROSE	27	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	100
LONG PARK 10 DUM	UNION CARBIDE CP	MONTROSE			0		DUMPS	<100	0
LONG PARK 11	UNION CARBIDE CP	MONTROSE	27	47 N	17.0 W	22	UNDERGRO	100 = 1,000	0
LONG PARK 12	UNION CARBIDE CP	MONTROSE	27	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	150
LONG PARK 2	UNION CARBIDE CP	MONTROSE	28	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	50
LONG PARK 3	UNION CARBIDE CP	MONTROSE	28	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	50
LONG PARK 4	UNION CARBIDE CP	MONTROSE	28	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	50
LONG PARK 5	UNION CARBIDE CP	MONTROSE	28	47 N	17.0 W	22	UNDERGRO	100 = 1,000	100
LONG PARK 6	UNION CARBIDE CP	MONTROSE	27	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	150
LONG PARK 6 DUM	UNION CARBIDE CP	MONTROSE	27	47 N	17.0 W	22	DUMPS	1,000 = 100,000	50
LONG PARK 9	UNION CARBIDE CP	MONTROSE	27	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	650
LONG PARK GROUP	SUTHERLAND MNG.	MONTROSE			0		UNDERGRO	100 = 1,000	0
LUCK DAY	COUCH + TRONE	MONTROSE	2	45 N	18.0 W	22	UNDERGRO	<100	0
LUCKY BLUNDER	UNION CARBIDE CP	MONTROSE	18	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	50
LUCKY DOG	UNION CARBIDE CP	MONTROSE	29	48 N	17.0 W	22	UNDERGRO	1,000 = 100,000	50
LUCKY MARK	RIDENOUR + ROSS	MONTROSE			0		UNDERGRO	<100	0
LUCKY STRIKE	HETZEL, LFE	MONTROSE	29	48 N	17.0 W	22	SURFACE	<100	50
LUCKY STRIKE 4	WRIGHT, BILL	MONTROSE			0		SURFACE	<100	0
LYNX	UNION CARBIDE CP	MONTROSE	29	48 N	17.0 W	22	UNDERGRO	1,000 = 100,000	450
MAGGIE C	UNION CARBIDE	MONTROSE	21	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	50
MAGGIE C DUMP	UNION CARBIDE CP	MONTROSE			0		DUMPS	100 = 1,000	0
MARGIE 2	FLANDERS MINING	MONTROSE	30	48 N	17.0 W	22	SURFACE	<100	0
MARGIE GROUP	FOOTE MINFRALS	MONTROSE	30	48 N	17.0 W	22	UNDERGRO	1,000 = 100,000	50
MARJORIE ANN	PETRO NUCLEAR	MONTROSE	11	47 N	20.0 W	22	UNDERGRO	1,000 = 100,000	100
MARTHA BELLE	UNION CARBIDE CP	MONTROSE	6	48 N	17.0 W	22	UNDERGRO	1,000 = 100,000	300
MARY ANN 4-DOROT	UNION CARBIDE CP	MONTROSE	18	46 N	17.0 W	22	UNDERGRO	1,000 = 100,000	150
MARY JANE	E. JOHANNSEN	MONTROSE			0		UNKNOWN	100 = 1,000	0
MAUDE	UNION CARBIDE	MONTROSE	14	47 N	20.0 W	22	UNDERGRO	100 = 1,000	50
MAYBE DUMPS	UNION CARBIDE CP	MONTROSE	35	46 N	17.0 W	22	DUMPS	100 = 1,000	400
MEDIA	UNION CARBIDE	MONTROSE	34	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	50
MERRY CHRISTMAS	CHRISTMAS, M. MNG	MONTROSE	2	48 N	18.0 W	22	SURFACE	<100	0
MERRY WIDOW	UNION CARBIDE	MONTROSE	10	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	100
MESA	CARE, ORVAL	MONTROSE	33	46 N	19.0 W	22	UNDERGRO	1,000 = 100,000	50
MESA 2	PATTERSON, PAT	MONTROSE	34	46 N	19.0 W	22	UNDERGRO	1,000 = 100,000	0
MESA 3	HOPKINS + SMITH	MONTROSE	21	36 N	29.0 E	14	SURFACE	<100	0
MIDAS	SMITH, ED	MONTROSE			0		SURFACE	<100	0
MIKE 1	LAMMERT, JAMES R	MONTROSE	36	44 N	17.0 W	22	SURFACE	<100	0
MILL 4	UNION CARBIDE CP	MONTROSE	4	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	200
MINERAL PARK 2	ATLAS-AMAX	MONTROSE	27	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	150

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
MINERAL PARK 3	ATLAS-AMAX	MONTROSE	27	47 N	17.0 W	22	UNDERGRO	<100	200
MINING LEASE 10	LA SALLE MINING	MONTROSE	5	47 N	17.0 W	22	UNDERGRO	>100,000	250
MINING LEASE 11	UNION CARBIDE CP	MONTROSE	5	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	250
MINING LEASE 13	BUNKER + CO	MONTROSE	31	48 N	17.0 W	22	UNDERGRO	1,000 = 100,000	100
MINING LEASE 14	UNION CARBIDE CP	MONTROSE	22	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	400
MINING LEASE 15	BRITO, BEN	MONTROSE	21	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	150
MINING LEASE 23	ALBANO, CLAIR	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	100
MINING LEASE 24	BARKLEY + CO	MONTROSE	5	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	250
MINING LEASE 37	SHATTUCK DENN HG	MONTROSE	6	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	500
MINING LEASE 47	WORCESTER MINES	MONTROSE	24	48 N	18.0 W	22	UNDERGRO	>100,000	600
MLB-C-JD-7	COTTER-GOVTLEASE	MONTROSE			0		UNDERGRO	100 = 1,000	250
MLB-C-SR-10	TRIO IND GOVTLEASE	MONTROSE			0		UNDERGRO	1,000 = 100,000	150
MLB-C-SR-15	COUGAR VENTURES	MONTROSE			0		UNDERGRO	1,000 = 100,000	400
MODEEN	SEARS, RALPH	MONTROSE	33	46 N	19.0 W	22	UNDERGRO	1,000 = 100,000	0
MONOGRAM 12	MONOGRAM MINING	MONTROSE	27	48 N	18.0 W	22	UNDERGRO	1,000 = 100,000	100
MONOGRAM 5-FRM G	MONOGRAM MNG C	MONTROSE	22	48 N	18.0 W	22	UNDERGRO	1,000 = 100,000	200
MOONBEAM	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	50
MORN STAR-MOONLI	E.E. LEWIS, INC.	MONTROSE	28	46 N	19.0 W	22	UNDERGRO	1,000 = 100,000	50
MORNING GLORY 2	TINTIC URANIUM	MONTROSE	28	47 N	19.0 W	22	UNDERGRO	<100	0
MOVIE STAR	UNION CARBIDE CP	MONTROSE	22	48 N	17.0 W	22	UNDERGRO	100 = 1,000	300
MUCKER	UNION CARBIDE CP	MONTROSE	28	47 N	17.0 W	22	UNDERGRO	1,000 = 100,000	100
MUM	PIONEER UPAY INC	MONTROSE	36	47 N	17.0 W	24	UNDERGRO	100 = 1,000	200
MUSTARD	UNION CARBIDE CP	MONTROSE	30	46 N	17.0 W	22	UNDERGRO	1,000 = 100,000	150
NAT GROUP	TRANS MOHID URAN	MONTROSE			0		SURFACE	<100	100
NATURITA 24	GRIPE W.F.	MONTROSE	29	47 N	16.0 W	22	UNDERGRO	<100	50
NATURITA 4	GRIPE, ALLEN L.	MONTROSE	33	47 N	16.0 W	22	SURFACE	<100	50
NAVAJO	TEMPLETON, CLIFF.	MONTROSE	19	45 N	18.0 W	22	UNDERGRO	<100	0
NAVAJO	SCHUMACHER, J I	MONTROSE	11	45 N	18.0 W	22	UNDERGRO	100 = 1,000	200
NEW CAMP BIRD	MONTGOMERY, JACK	MONTROSE	33	46 N	18.0 W	22	SURFACE	<100	0
NIL 2 DUMP	UNION CARBIDE CP	MONTROSE	26	46 N	17.0 W	22	DUMPS	100 = 1,000	400
NORTH STAR DUMP	UNION CARBIDE CP	MONTROSE	14	48 N	18.0 W	22	DUMPS	100 = 1,000	200
NORTH STAR UNAME	UNION CARBIDE	MONTROSE	14	48 N	18.0 W	22	UNDERGRO	1,000 = 100,000	200
NUCLA	UNION CARBIDE	MONTROSE	24	48 N	18.0 W	22	UNDERGRO	1,000 = 100,000	100
NUCLA	UNION CARBIDE CP	MONTROSE	24	48 N	18.0 W	22	UNDERGRO	100 = 1,000	50
OLD CROW	CAMOOSE URANIUM	MONTROSE	4	45 N	18.0 W	22	UNDERGRO	<100	0
OLD GRANDAD	FOOTE MINERALS	MONTROSE	6	45 N	17.0 W	22	UNDERGRO	1,000 = 100,000	250
OLD QUAKER	UNION CARBIDE CP	MONTROSE	18	45 N	17.0 W	22	UNDERGRO	100 = 1,000	0
OLD SALT LICK	UNION CARBIDE CP	MONTROSE	29	48 N	17.0 W	22	UNDERGRO	1,000 = 100,000	50
OLD STAG 1	ENSLEY+OSTROWSKI	MONTROSE			0		SURFACE	<100	0
OPERA BOX	UNION CARBIDE CP	MONTROSE	20	46 N	17.0 W	22	UNDERGRO	>100,000	250
OPHIR BLUEBIRD	UNION CARBIDE CP	MONTROSE	24	48 N	18.0 W	22	UNDERGRO	1,000 = 100,000	50
OPHIR DUMP	UNION CARBIDE CP	MONTROSE	24	48 N	18.0 W	22	DUMPS	1,000 = 100,000	50
OREGON	UNION CARBIDE CP	MONTROSE	11	48 N	18.0 W	22	UNDERGRO	1,000 = 100,000	100
OVERSIGHT	UNION CARBIDE CP	MONTROSE	21	46 N	17.0 W	22	UNDERGRO	1,000 = 100,000	200
PABLO 4 + 5	CLEGHORN+WASHBRN	MONTROSE			0		UNDERGRO	100 = 1,000	200
PAIN-OBNOXIOUS	UNION CARBIDE CP	MONTROSE	32	46 N	17.0 W	22	UNDERGRO	1,000 = 100,000	150
PARADOX 4,5+6	UNION CARBIDE CP	MONTROSE	15	46 N	17.0 W	22	UNDERGRO	>100,000	350
PARADOX BELLE	UNION CARBIDE CP	MONTROSE	30	47 N	17.0 W	22	UNDERGRO	<100	100

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
PARADOX C	UNION CARBIDE CP	MONTROSE	22	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	350
PARADOX D	UNION CARBIDE CP	MONTROSE	21	46 N	17.0 W	22	UNDERGRO	>100,000	250
PARADOX VIEW	BELL, GEORGE L.	MONTROSE	2	46 N	17.0 W	22	UNDERGRO	100 - 1,000	0
PATTERSON GROUP	HOLMAN, CLAY	MONTROSE	18	48 N	18.0 W	22	SURFACE	<100	0
PATTERSON SEEP	WRIGHT, BILL	MONTROSE	18	48 N	18.0 W	22	SURFACE	<100	0
PATTY 4	MICRO COPPER CO	MONTROSE	34	46 N	18.0 W	22	UNDERGRO	100 - 1,000	0
PATTY 5	MICRO COPPER CO	MONTROSE	3	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
PAYDAY	MONOGRAM MINING	MONTROSE	23	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
PAYDAY	BLUEBIRD MINING	MONTROSE	34	45 N	18.0 W	22	UNDERGRO	<100	0
PEG LEG 2	UNION CARBIDE CP	MONTROSE	19	47 N	17.0 W	22	UNDERGRO	100 - 1,000	150
PINION-CEDAR GRO	UNKNOWN CONTROLP	MONTROSE	24	18 N	19.0 W	22	SURFACE	<100	0
PLUTO-SATURN	UNION CARBIDE CP	MONTROSE	12	46 N	18.0 W	22	UNDERGRO	1,000 - 100,000	250
POINT-EMPIPE	MONOGRAM MINING	MONTROSE	23	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
POOCH + POOCH 1	BLUE BIRD MINING	MONTROSE	9	45 N	19.0 W	22	UNDERGRO	<100	0
POOR BOY	STROEF, EMORY	MONTROSE	3	48 N	18.0 W	22	SURFACE	<100	0
PRAYER 8 + 9	UNION CARBIDE CP	MONTROSE	14	47 N	20.0 W	22	UNDERGRO	1,000 - 100,000	350
PRINCESS PAT	UNION CARBIDE CP	MONTROSE			0		UNDERGRO	<100	0
PROBABLE	ROBINSON, CLAUDE	MONTROSE	4	45 N	19.0 W	22	UNDERGRO	<100	50
PRODUCTION	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
PRODUCTION DUMPS	UNION CARBIDE CP	MONTROSE			0		DUMPS	<100	100
PROHIBITION	AYERS + AYERS	MONTROSE	8	48 N	18.0 W	22	UNDERGRO	100 - 1,000	0
QUARREL	MICRO COPPER	MONTROSE	12	45 N	18.0 W	22	UNDERGRO	100 - 1,000	0
QUO VADIS	DOWELL + ASSOC.	MONTROSE	3	48 N	18.0 W	22	SURFACE	<100	0
R.A.L. 1	GREAT WESTERN UR	MONTROSE	23	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
R.A.M.	UNION CARBIDE CP	MONTROSE	33	48 N	17.0 W	22	UNDERGRO	>100,000	150
R.A.M. DUMP	UNION CARBIDE CP	MONTROSE	33	48 N	17.0 W	22	DUMPS	1,000 - 100,000	50
RABBIT FOOT 2	UNION CARBIDE CP	MONTROSE	2	45 N	18.0 W	22	UNDERGRO	<100	0
RADAR-EARLY MORN	KRAUSE + MILLER	MONTROSE	24	45 N	19.0 W	22	SURFACE	<100	50
RADIUM CYCLE	BEE HIVE MINING	MONTROSE	8	48 N	19.0 W	22	UNDERGRO	1,000 - 100,000	0
RADIUM HILL 10	UNION CARBIDE	MONTROSE	10	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	350
RADIUM HILL 31	FOOTE MINERALS	MONTROSE	10	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
RADIUM HILL 50	UNION CARBIDE	MONTROSE			0		UNDERGRO	100 - 1,000	150
RADIUM HILL 7	FOOTE MINERALS	MONTROSE	16	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	400
RADIUM KING(URAV	UNION CARBIDE CP	MONTROSE	1	46 N	17.0 W	22	UNDERGRO	<100	0
RADIUM QUEEN 13	MARVEL ENG CO	MONTROSE	20	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
RAINBOW	TOWRES, DAVID	MONTROSE	27	47 N	19.0 W	22	SURFACE	<100	0
RAJAH DUMP ORE	COL COL DRILLING	MONTROSE	7	48 N	19.0 W	22	UNDERGRO	<100	100
RAJAH-BIG CHIEF	FOOTE MINERALS	MONTROSE	6	48 N	19.0 W	22	UNDERGRO	1,000 - 100,000	0
RAMBLER	UNION CARBIDE CP	MONTROSE	33	48 N	17.0 W	22	UNDERGRO	100 - 1,000	350
RAMBLER DUMPS	UNION CARBIDE CP	MONTROSE	33	48 N	17.0 W	22	DUMPS	1,000 - 100,000	50
RATEX	HIDDEN SPLENDOR	MONTROSE	7	47 N	17.0 W	22	SURFACE	<100	0
RATTLER 1	BRUCE, FERRIS	MONTROSE			0		UNDERGRO	<100	0
RATTLESNAKE 2	CRANDELL, MARION	MONTROSE	33	45 N	18.0 W	22	SURFACE	<100	0
RATTLESNAKE-DAVI	B + L MNG.	MONTROSE	2	47 N	20.0 W	22	UNDERGRO	1,000 - 100,000	100
RATTLESNAKETURNO	YEADON + KEMPF	MONTROSE	3	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
RAVEN	UNION CARBIDE CP	MONTROSE	30	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
RED BEDS	RADIUM HILL URAN	MONTROSE	23	48 N	19.0 W	22	UNDERGRO	<100	0
RED BIRD 1 + 2	OLIVER + BUSS	MONTROSE	9	48 N	19.0 W	22	UNDERGRO	1,000 - 100,000	150

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
RED BIRD 20	MCGEEHEE, L.	MONTROSE	5	48 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
RED COW	UNION CARBIDE CP	MONTROSE	2	48 N	18.0 W	22	UNDERGRO	<100	0
RED HEAD 1	DOYLE M.K.	MONTROSE			0		SURFACE	<100	0
RED ROCK 2	MICRO COPPER	MONTROSE	28	48 N	18.0 W	22	UNDERGRO	100 - 1,000	150
RED ROCK 5	MICRO COPPER	MONTROSE	28	48 N	18.0 W	22	UNDERGRO	100 - 1,000	250
RED SOX-YANKEES	UNION CARBIDE	MONTROSE	23	48 N	16.0 W	22	UNDERGRO	1,000 - 100,000	250
REDBIRD-YELLOWBI	CLAXTON, W.O., +ASO	MONTROSE	33	46 N	19.0 W	22	UNDERGRO	1,000 - 100,000	0
REMANENT 1	SOUTHWESTERN OIL	MONTROSE	7	48 N	18.0 W	22	SURFACE	<100	150
RENEGADE GROUP	CLEGHORN+WASHBRN	MONTROSE	12	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
REPUBLICAN DUMP	UNION CARBIDE CP	MONTROSE			0		DUMPS	1,000 - 100,000	0
REPUBLICAN-DUSTY	UNION CARBIDE	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
RES. BLOCK 2 ML. 4	GARDNER + BROWN	MONTROSE	33	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	0
RIGEL	UNION CARBIDE CP	MONTROSE	13	46 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
RIM CLAIMS	GRIPE W.E.	MONTROSE	23	48 N	18.0 W	22	UNDERGRO	<100	0
RIMROCK BLUES 15+1	UNION CARBIDE CP	MONTROSE	36	46 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
RIMROCK	MICRO COPPER CO	MONTROSE	15	48 N	18.0 W	22	UNDERGRO	100 - 1,000	0
RIMROCK BLUES 20	UNION CARBIDE CP	MONTROSE			0		UNDERGRO	100 - 1,000	100
RIMROCK BLUES 5	UNION CARBIDE CP	MONTROSE	9	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
RIMROCK BLUES 6+	UNION CARBIDE CP	MONTROSE	1	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
RIMROCK BLUES 6E	UNION CARBIDE CP	MONTROSE	1	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
RIMROCK BLUES 9	UNION CARBIDE CP	MONTROSE	1	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
ROCK RAVEN	UNION CARBIDE CP	MONTROSE	35	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
RODDY 1	ALBERT BELL	MONTROSE			0		UNDERGRO	<100	0
ROSEBUD	FOOTE MINERALS	MONTROSE	13	48 N	18.0 W	22	UNDERGRO	<100	0
ROYAL OAK	UNION CARBIDE CP	MONTROSE	10	45 N	18.0 W	22	UNDERGRO	<100	0
RUBADALE	AMARILLO MNG	MONTROSE	28	47 N	17.0 W	22	UNDERGRO	100 - 1,000	50
RUSTY 5	BEERS, SIDNEY J.	MONTROSE	6	47 N	17.0 W	22	SURFACE	<100	0
SAM	UNION CARBIDE CP	MONTROSE	36	46 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
SANDY	UNION CARBIDE CP	MONTROSE	20	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
SAUCER BASIN GPO	NEESHAM, GLEN	MONTROSE	6	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	0
SCHOOL HARM	FOOTE MINERALS	MONTROSE	2	45 N	18.0 W	22	UNDERGRO	100 - 1,000	50
SEC. 20, 46N-17E N	ATOMIC ENERGY CO	MONTROSE	20	46 N	17.0 W	22	UNDERGRO	<100	250
SEGO LILY 1	DANVERS, DON	MONTROSE	32	47 N	19.0 W	22	UNDERGRO	<100	0
SHADOK	MONTGOMERY, N.W.	MONTROSE	20	48 N	18.0 W	22	SURFACE	<100	0
SHADOW ROCK	BLEAK, CHARLES	MONTROSE	1	48 N	19.0 W	22	UNDERGRO	100 - 1,000	0
SHAMROCK	UNION CARBIDE CP	MONTROSE	29	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
SHAMROCK	FOOTE MINERALS	MONTROSE	35	46 N	18.0 W	22	UNDERGRO	<100	50
SHARKEY	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
SHOOTING STAR	DOWELL+ MC ILVIR	MONTROSE	25	48 N	18.0 W	22	SURFACE	<100	50
SHRIVER	UNION CARBIDE CP	MONTROSE			0		UNDERGRO	100 - 1,000	0
SLIM CHANCE	SCHARF, T.J.	MONTROSE			0		UNDERGRO	<100	0
SMOKY	CLYDE URAN. CORP.	MONTROSE	8	47 N	17.0 W	22	SURFACE	<100	150
SOCKET	MONTGOMERY, N.W.	MONTROSE	1	48 N	19.0 W	22	SURFACE	<100	0
SOONER OR LATER	NICHOLS, CARL L.	MONTROSE			0		UNDERGRO	100 - 1,000	0
SPHINX	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
SPHINX DUMP	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	DUMPS	100 - 1,000	50
ST PATRICK	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	200
STAR 13 + 14	UNION CARBIDE C	MONTROSE			0		UNDERGRO	1,000 - 100,000	250

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***** COLORADO (CONT'D) *****									
STAP 3 + 4	UNION CARBIDE CP	MONTROSE	28	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
STAR 3 DUMP	UNION CARBIDE CP	MONTROSE	28	48 N	17.0 W	22	DUMPS	<100	150
STAR 5 + 6	UNION CARBIDE CP	MONTROSE	28	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	250
STARLIGHT	SIMPLOT, J.R. CO	MONTROSE	33	46 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
STARLIGHT 1	F A SITTON	MONTROSE	33	46 N	18.0 W	22	UNDERGRO	100 - 1,000	0
STARLIGHT 2	SIMPLOT, J.R. CO	MONTROSE	33	46 N	18.0 W	22	UNDERGRO	<100	0
STARLIGHT 4	SIMPLOT, J.R. CO	MONTROSE	32	46 N	18.0 W	22	SURFACE	<100	0
STARLIGHT 8	SIMPLOT, J.R. CO	MONTROSE	33	46 N	18.0 W	22	UNDERGRO	100 - 1,000	0
STEER 1-8	FOOTE MINERALS	MONTROSE	14	4 N	1.8 W	22	UNDERGRO	1,000 - 100,000	100
STRAIGHT ARROW	GRINA, RUSSELL O	MONTROSE	3	46 N	17.0 W	22	UNDERGRO	<100	0
SUMMER	UNION CARBIDE CP	MONTROSE	2	47 N	20.0 W	22	SURFACE	<100	0
SUNFLOWER 2	UNION CARBIDE CP	MONTROSE	16	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	200
SUNNYSIDE	UNION CARBIDE CP	MONTROSE	24	46 N	18.0 W	22	UNDERGRO	<100	0
SUNRISE GROUP	MICRO COPPER	MONTROSE	34	46 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
SUNSET	CONSOLIDATED URA	MONTROSE	32	46 N	18.0 W	22	UNDERGRO	100 - 1,000	0
SURPRISE	FOOTE MINERALS	MONTROSE	4	47 N	17.0 W	22	UNDERGRO	<100	0
SWINDLER DUMP	UNION CARBIDE CP	MONTROSE			0		DUMPS	<100	0
SYLVEYS POCKET	PATTERSON, PAT	MONTROSE			0		SURFACE	<100	0
TANGO	UNION CARBIDE CO	MONTROSE			0		UNDERGRO	1,000 - 100,000	100
TEAPOT DOME 2 +	UNION CARBIDE CP	MONTROSE			0		UNDERGRO	1,000 - 100,000	100
TEEPEE POLE	BLUE CREEK MININ	MONTROSE	36	50 N	18.0 W	22	SURFACE	<100	0
THREE JACKS	UNION CARBIDE	MONTROSE	14	47 N	20.0 W	22	UNDERGRO	1,000 - 100,000	100
THREE MUSKETEERS	HOIZ, EARL	MONTROSE	8	48 N	18.0 W	22	UNDERGRO	<100	50
THUNDERBOLT	UNION CARBIDE CP	MONTROSE	23	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
TNT 2	UNION CARBIDE	MONTROSE	21	47 N	17.0 W	22	UNDERGRO	100 - 1,000	100
TNT 3	UNION CARBIDE	MONTROSE	21	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	100
TOO HIGH	PIONEER UPAY INC	MONTROSE	36	47 N	20.0 W	22	UNDERGRO	1,000 - 100,000	100
TOP NOTCH	COX, MARION	MONTROSE			0		SURFACE	<100	0
TOWN HOUSE	UNION CARBIDE CP	MONTROSE	20	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	4950
TOWNSITE(E)	UNION CARBIDE	MONTROSE			0		UNDERGRO	1,000 - 100,000	100
TRAMP 2	UNION CARBIDE CP	MONTROSE	6	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	250
TRAMP DUMPS	UNION CARBIDE CP	MONTROSE	6	47 N	17.0 W	22	DUMPS	1,000 - 100,000	50
TRIANGULATION	UNION CARBIDE CP	MONTROSE	34	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	300
TRIPOD	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	250
TRIPOD LOW GRADE	UNION CARBIDE CP	MONTROSE			0		LOWGRADE	1,000 - 100,000	50
TRUSCOTT	UNION CARBIDE CP	MONTROSE	28	48 N	17.0 W	22	UNDERGRO	100 - 1,000	50
TWILIGHT	UNION CARBIDE CP	MONTROSE	2	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
TWIN SISTERS	MARVEL MNG CO	MONTROSE	19	48 N	18.0 W	22	UNDERGRO	100 - 1,000	0
TWO BITS	MAUPIN, ED	MONTROSE	34	46 N	18.0 W	22	UNDERGRO	<100	150
TWO SHOVEL	UNION CARBIDE CP	MONTROSE	18	47 N	17.0 W	22	UNDERGRO	<100	0
U.S. GRANT	UNION CARBIDE CP	MONTROSE	8	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
UNCLE SAM(URAVAN)	UNION CARBIDE CP	MONTROSE	13	48 N	18.0 W	22	UNDERGRO	100 - 1,000	350
URANIUM GIRL	URANIUM GIRL INC	MONTROSE	14	47 N	20.0 W	22	UNDERGRO	1,000 - 100,000	250
URANUS-DOROTHY J	UNION CARBIDE CP	MONTROSE	18	46 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
URAVAN 2	SCHUMACHER, J.I.	MONTROSE	4	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
UREKA	MC GEHEE, J.P. + L	MONTROSE	10	48 N	19.0 W	22	UNDERGRO	100 - 1,000	0
VADEN VIEW	FOOTE MINERALS	MONTROSE	13	46 N	18.0 W	22	UNDERGRO	1,000 - 100,000	200
VALENTINE(MS-202)	UNION CARBIDE CP	MONTROSE	24	47 N	18.0 W	22	UNDERGRO	<100	0

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
VALLEY VIEW	E E LEWIS, INC	MONTROSE	8	48 N	19.0 W	22	UNDERGRO	1,000 - 100,000	0
VALLEY VIEW-N, ST	UNION CARBIDE CP	MONTROSE	20	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	50
VAN	UNION CARBIDE	MONTROSE	12	46 N	17.0 W	22	UNDERGRO	100 - 1,000	0
VANABLEND 47	SILVER STATE URA	MONTROSE	29	48 N	16.0 W	22	SURFACE	<100	100
VANADITE	UNION CARBIDE	MONTROSE	29	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	0
VANADIUM KING	UNION CARBIDE	MONTROSE	22	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	350
VENTURE LODE	RICE + WILLIAMS	MONTROSE	31	46 N	17.0 W	22	SURFACE	<100	0
VICTORY 2	KELLY, MARK	MONTROSE			0		SURFACE	<100	50
VIRGIN 3	CLEGHORN, DOUGLAS	MONTROSE	22	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	350
VISTA GPANDE	SAM V GRAMLICH	MONTROSE	2	47 N	20.0 W	22	UNDERGRO	<100	0
VONNIE 5	SCOOTER UPANIUM	MONTROSE			0		SURFACE	<100	0
WATCHMAN	FOOTE MINERALS	MONTROSE	34	46 N	19.0 W	22	UNDERGRO	<100	100
WATERLOO	MARVEL MNG CO	MONTROSE	20	48 N	18.0 W	22	SURFACE	<100	0
WEDGE 1	UNION CARBIDE	MONTROSE	10	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	250
WEDGE-PI WARREN	UNION CARBIDE	MONTROSE	2	47 N	20.0 W	22	UNDERGRO	1,000 - 100,000	100
WEDNESDAY + THUR	UNION CARBIDE CP	MONTROSE	22	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	600
WEST	MAGIC UPANIUM CO	MONTROSE	35	46 N	18.0 W	22	UNDERGRO	<100	250
WEST LODE	WILLIAMS, D.L.	MONTROSE			0		UNDERGRO	100 - 1,000	150
WEST MARTHA BELL	UNION CARBIDE CP	MONTROSE	31	49 N	17.0 W	22	UNDERGRO	1,000 - 100,000	200
WHITE COX	COLE+MITCHELL+WH	MONTROSE	1	45 N	20.0 W	22	UNDERGRO	<100	0
WHITE CROW	FOSTER, LYMAN	MONTROSE	3	45 N	19.0 W	22	SURFACE	<100	50
WHITNEY	UNION CARBIDE CP	MONTROSE	35	47 N	17.0 W	22	UNDERGRO	1,000 - 100,000	400
WILD CAT 2	BURNETT, WILLIAM	MONTROSE	28	48 N	18.0 W	22	SURFACE	<100	0
WILD CAT 8	MICRO COPPER	MONTROSE	27	48 N	18.0 W	22	UNDERGRO	100 - 1,000	0
WILD HORSE-COLOR	UNION CARBIDE CP	MONTROSE	11	48 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
WILDCAT 3	MICRO COPPER	MONTROSE	28	48 N	18.0 W	22	UNDERGRO	100 - 1,000	0
WINDY DAY	UNION CARBIDE	MONTROSE	3	47 N	17.0 W	22	UNDERGRO	100 - 1,000	50
WOODCHUCK	MORRIS TREASURE UP	MONTROSE	23	48 N	19.0 W	22	SURFACE	<100	0
WOODWARD	WELLS ENGLISH+ST	MONTROSE	1	45 N	18.0 W	22	SURFACE	<100	0
WRIGHT	UNION CARBIDE CP	MONTROSE	27	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	150
YELLOW JACKET	UNION CARBIDE CP	MONTROSE	33	48 N	17.0 W	22	UNDERGRO	1,000 - 100,000	0
ZEBRA	UNION CARBIDE CP	MONTROSE	31	46 N	17.0 W	22	UNDERGRO	100 - 1,000	0
ZELLA GROUP	JOHNSON, HUGO W.	MONTROSE	16	48 N	18.0 W	22	UNDERGRO	100 - 1,000	100
GEM DANDY 3	MARTIN QUAYLE BR	PARK			0		UNDERGRO	100 - 1,000	50
LADY ELK 1	ARMINE, JOHN	PARK			0		UNDERGRO	<100	50
LAST CHANCE	WARD + FEELEY	PARK			0		SURFACE	<100	50
LUCKY JIM 1,2+3	FOUR STAR EXPL, C	PARK	26	10 S	75.0 W	06	UNDERGRO	100 - 1,000	50
MAC GEORGE 4	YELLOW QUEEN URA	PARK			0		UNDERGRO	100 - 1,000	50
REDSKIN MINES	REDSKIN MINES IN	PARK			0		UNDERGRO	<100	50
SHIRLEY MAE	GADDIS MINING	PARK	16	11 S	76.0 W	06	SURFACE	100 - 1,000	0
FRYING PAN GROUP	ASPEN MINING CO,	PITKIN			0		UNDERGRO	<100	100
AVERY RANCH	CLIFF + CREEK UP	PUEBLO	6	18 S	66.0 W	06	UNDERGRO	1,000 - 100,000	100
ALLEN	E. + H. LEASING CO	RIO BLANCO			0		SURFACE	<100	0
BROWN 2	DEVEREAUX BROS.	RIO BLANCO			0		UNDERGRO	100 - 1,000	200
BROWN 5	DEVEREAUX BROS.	RIO BLANCO			0		SURFACE	<100	200
BURRELL 1,2+3	LYLE FRANCIS	RIO BLANCO			0		SURFACE	1,000 - 100,000	150
BURRELL 5	MINIER, DOROTHY	RIO BLANCO			0		SURFACE	100 - 1,000	100
BUTTERFLY GROUP	JRJ MNG.	RIO BLANCO			0		UNDERGRO	1,000 - 100,000	100

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
CHRIS	PHILLIPS,CLAYTON	RIO BLANCO			0		SURFACE	<100	0
COAL CREEK 1	DEVEREAUX BROS.	RIO BLANCO			0		UNDERGRO	1,000 - 100,000	100
COLUMBINE 1	DEVEREAUX BROS.	RIO BLANCO			0		UNDERGRO	100 - 1,000	50
EVENING STAR	DEER TRAIL MINES	RIO BLANCO			0		UNDERGRO	<100	100
FRYING PAN 1	PAYTON, NORMAN	RIO BLANCO			0		SURFACE	<100	0
LAST DAY	MC ALESTER FUELS	RIO BLANCO			0		UNDERGRO	1,000 - 100,000	0
LUCIL 106	JONES W.S.	RIO BLANCO			0		SURFACE	<100	0
M.+G.	IONIA URANIUM CO	RIO BLANCO			0		SURFACE	<100	0
MARVINE VIEW 10	DEVEREAUX BROS.	RIO BLANCO			0		UNDERGRO	100 - 1,000	0
MIDNIGHT GROUP	HAPP, HARRY H,JR	RIO BLANCO			0		UNDERGRO	1,000 - 100,000	100
MIDNIGHT NH	HARP, HARPY H,JR	RIO BLANCO			0		UNDERGRO	1,000 - 100,000	550
NAOMI ANN	MC ALESTER FUEL	RIO BLANCO			0		UNDERGRO	100 - 1,000	50
RIO BLANCO	RIO BLANCO CORP	RIO BLANCO			0		UNDERGRO	<100	150
S.+G. 4	MARCY EXPL.+ MNG	RIO BLANCO			0		UNDERGRO	<100	100
SHYLO GROUP	DEVEREAUX BROS.	RIO BLANCO			0		UNDERGRO	1,000 - 100,000	100
ST. LUE	SMITH, LOUISE	RIO BLANCO			0		SURFACE	<100	0
T.B.	TUNGSTEN URANIUM	RIO BLANCO			0		UNDERGRO	<100	0
TWIN STAR 500	TWIN STAR MINING	RIO BLANCO			0		SURFACE	<100	0
UTE GROUP	MINIER,DOROTHY	RIO BLANCO			0		UNDERGRO	<100	50
WINDY POINT 1	GENTRY W.W.	RIO BLANCO			0		UNDERGRO	100 - 1,000	0
BEGINNERS LUCK 3	MIKE MIZOKAMI	SAGUACHE			0		UNDERGRO	<100	50
BOBCAT LODGE	PHIPPS, D.F.	SAGUACHE			0		UNDERGRO	<100	50
BONITA GROUP	D + J URANIUM	SAGUACHE			0		UNDERGRO	100 - 1,000	100
LA RUE 2	CANADIAN MOLLY	SAGUACHE	30	47 N	2,0 E	22	UNDERGRO	<100	50
LITTLE INDIAN 36	HOMESTAKE MNG C/	SAGUACHE		48 N	6,0 E	22	UNDERGRO	1,000 - 100,000	100
LOOKOUT 22	MONARCH EXPL.CO.	SAGUACHE	27	48 N	6,0 E	22	UNDERGRO	100 - 1,000	50
LOS OCHOS	HOMESTAKE MNG CO	SAGUACHE	33	48 N	2,0 E	22	UNDERGRO	>100,000	350
MARSHALL PASS 5	UNCOMPANGPE EXPL	SAGUACHE		48 N	6,0 E	22	SURFACE	<100	0
MERCURY 1	COL TEX URANIUM	SAGUACHE			0		UNDERGRO	<100	50
MOCKING BIRD	GARDNER, JOE	SAGUACHE			0		UNDERGRO	<100	50
PAM LODGE	CALIF,UTAH PETRO	SAGUACHE			0		SURFACE	<100	0
RAM + RAM 1	PIKE MINING CO.	SAGUACHE			0		SURFACE	<100	50
SEC. 3 NH NEQ T-	GUNNISON MINING	SAGUACHE	3	47 N	2,0 E	22	SURFACE	1,000 - 100,000	100
ELK PARK MINE	GADDIS MINING	SAN JUAN	18	40 N	7,0 W	22	UNDERGRO	<100	50
GRAYSILL	FOOTE MINEPALS	SAN JUAN	28	40 N	9,0 W	22	UNDERGRO	1,000 - 100,000	0
ADA BELL	HARMON A.J.	SAN MIGUEL	16	45 N	19,0 W	22	UNDERGRO	<100	0
ALCHEMIST	FUJII K + HALL B	SAN MIGUEL	4	43 N	10,0 W	22	UNDERGRO	100 - 1,000	0
APRIL	B + M MINING CO	SAN MIGUEL			0		UNDERGRO	1,000 - 100,000	0
AVA JAY	FRITZ ERICKSON M	SAN MIGUEL	25	44 N	20,0 W	22	UNDERGRO	1,000 - 100,000	100
BABE 1-4	WILLIAMS, RAY L.	SAN MIGUEL			0		UNDERGRO	<100	50
BACHELOR	HERRING, JAMES	SAN MIGUEL	11	45 N	18,0 W	22	UNDERGRO	1,000 - 100,000	300
BALD EAGLE	SPENCER MINING C	SAN MIGUEL	30	44 N	16,0 W	22	UNDERGRO	1,000 - 100,000	50
BAY MULE	UNKNOWN CONTROLR	SAN MIGUEL			0		SURFACE	<100	0
BEAN 10	ATLAS-FOOTE	SAN MIGUEL	32	44 N	19,0 W	22	UNDERGRO	1,000 - 100,000	100
BEAN 15,16,+ 17	ATLAS-FOOTE	SAN MIGUEL	31	44 N	19,0 W	22	UNDERGRO	<100	100
BEAN 2 + 3	ATLAS-FOOTE	SAN MIGUEL	5	43 N	19,0 W	22	UNDERGRO	1,000 - 100,000	100
BEAN 4 + 5	ATLAS-FOOTE	SAN MIGUEL	5	43 N	19,0 W	22	UNDERGRO	1,000 - 100,000	100
BEAN 6	ATLAS-FOOTE	SAN MIGUEL	5	43 N	19,0 W	22	UNDERGRO	100 - 1,000	50

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***** COLORADO (CONT'D) *****									
BEAN PATCH	ATLAS-FOOTE	SAN MIGUEL	5	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
BEAR CREEK	FOOTE MINERALS	SAN MIGUEL	4	42 N	10.0 W	22	UNDERGRO	1,000 - 100,000	0
BETTY JANE 2	UNKNOWN CONTROLR	SAN MIGUEL			0		SURFACE	<100	0
BIG BUCK 1	CLOSSON, DANIEL S	SAN MIGUEL	26	44 N	20.0 W	22	SURFACE	<100	0
BIG CHIEF	UNION CARBIDE CP	SAN MIGUEL	29	43 N	18.0 W	22	UNDERGRO	100 - 1,000	0
BIG MEDICINE	EMTESS OIL + URA	SAN MIGUEL	23	45 N	19.0 W	22	UNDERGRO	100 - 1,000	0
BIG S	DUNCAN + SANCHEZ	SAN MIGUEL	32	44 N	18.0 W	22	SURFACE	<100	0
BLACK BIRD	ATLAS-FOOTE	SAN MIGUEL	8	43 N	19.0 W	22	UNDERGRO	<100	50
BLACK FOX	DUNCAN R L MININ	SAN MIGUEL	5	43 N	18.0 W	22	UNDERGRO	100 - 1,000	0
BLACK JACK	ATLAS-FOOTE	SAN MIGUEL	28	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
BLACK KING 5	BACHELOR CORP.	SAN MIGUEL			0		SURFACE	<100	0
BLK, SPID.-RED AN	C.L. STEWART	SAN MIGUEL	30	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	150
BLUE MOON	DAVIS + GOFORTH	SAN MIGUEL	16	45 N	18.0 W	22	UNDERGRO	100 - 1,000	0
BLUEBIRD	DULANEY MNG.	SAN MIGUEL	24	43 N	20.0 W	22	SURFACE	<100	0
BLUFF	UNION CARBIDE CP	SAN MIGUEL	35	45 N	18.0 W	22	UNDERGRO	100 - 1,000	0
BRETTON + NORCOT	BRETTON + NORCOTT	SAN MIGUEL			0		SURFACE	<100	150
BROWN MULE	BLAIR, FLOYD	SAN MIGUEL	7	43 N	16.0 W	22	UNDERGRO	<100	0
BUCKHORN	BROWN, E.R.	SAN MIGUEL	34	43 N	18.0 W	22	UNDERGRO	100 - 1,000	0
BUGWINE	BALORA, HEKMAN M.	SAN MIGUEL	31	45 N	19.0 W	22	UNDERGRO	100 - 1,000	0
BULL MOOSE	THOMPSON, T.E.	SAN MIGUEL	32	43 N	19.0 W	22	UNDERGRO	<100	0
BULL SNAKE GROUP	URANIUM PPOCESSE	SAN MIGUEL	12	42 N	18.0 W	22	UNDERGRO	100 - 1,000	850
BURRO POINT	SCHUMACHER, J I	SAN MIGUEL	16	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
CANYON	KEOGH + SHUMWAY	SAN MIGUEL			0		UNKNOWN	1,000 - 100,000	0
CANYON VIEW	DUNCAN R L MININ	SAN MIGUEL	5	43 N	18.0 W	22	UNDERGRO	100 - 1,000	100
CAPE MAIRS	BARRETT + BROWN	SAN MIGUEL			0		SURFACE	<100	0
CEDAR RIDGE GROU	BILL MINING CO	SAN MIGUEL			0		SURFACE	<100	0
CHARLES T. 1	CANFIELD, ARTHUR	SAN MIGUEL	10	43 N	19.0 W	22	UNDERGRO	100 - 1,000	0
CHARLES T. 2A	CANFIELD, ARTHUR	SAN MIGUEL			0		UNDERGRO	1,000 - 100,000	0
CHARLOTTE 1	LLOYD, MERLE D.	SAN MIGUEL			0		UNDERGRO	<100	50
CHESTA	NEW DEAL MNG CO	SAN MIGUEL	26	45 N	18.0 W	22	UNDERGRO	100 - 1,000	0
CHIEF 1-3	FRITZ ERICKSON M	SAN MIGUEL			0		UNDERGRO	1,000 - 100,000	200
CHINNESE	WILLIAMS+MC GEHE	SAN MIGUEL			0		SURFACE	<100	0
CHIPMUNK	PETRO NUCLEAR	SAN MIGUEL	16	45 N	18.0 W	22	UNDERGRO	100 - 1,000	0
CHIPMUNK 1	AZTEC MINING CO.	SAN MIGUEL	35	44 N	19.0 W	22	UNDERGRO	100 - 1,000	200
CLEAR CREEK	UNKNOWN CONTROLR	SAN MIGUEL			0		SURFACE	<100	0
CLEAR VIEW	LYENS, W.E.	SAN MIGUEL	6	42 N	17.0 W	22	UNDERGRO	<100	0
CLIFF DWELLER	SKALLA, A.F.	SAN MIGUEL	9	44 N	17.0 W	22	UNDERGRO	100 - 1,000	0
COLORADO CAT	SNYDER, LEE	SAN MIGUEL	15	44 N	19.0 W	22	SURFACE	<100	0
CONE 1-6	ATLAS-FOOTE	SAN MIGUEL	30	44 N	19.0 W	22	UNDERGRO	1,000 - 100,000	150
COWHAND 2	BOLDRA, HEKMAN M.	SAN MIGUEL	31	45 N	19.0 W	22	UNDERGRO	<100	0
CRUCIBLE	NIELSON, ELMER	SAN MIGUEL	7	43 N	10.0 W	22	UNDERGRO	<100	0
CUR 1	RISENHOOVER, NATH	SAN MIGUEL			0		UNDERGRO	<100	0
CURTIS	SAN JUAN LEASING	SAN MIGUEL	28	43 N	18.0 W	22	UNDERGRO	100 - 1,000	0
CUSCO	LUBBOCK MNG.CO.	SAN MIGUEL			0		SURFACE	<100	0
CYCLE 3	SEARS, RALPH	SAN MIGUEL			0		SURFACE	<100	0
DELUXE + MASTER	BITTON + BITTON	SAN MIGUEL			0		UNDERGRO	1,000 - 100,000	250
DEREMO DUMPS	UNION CARBIDE CP	SAN MIGUEL			0		DUMPS	1,000 - 100,000	50
DICKIE 1 + 3	B.E.K. CORPORATIO	SAN MIGUEL			0		UNDERGRO	<100	0

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
DOLORES RIVER	FOOTE MINERALS	SAN MIGUEL			0		UNDERGRO	<100	0
DOLORES RIVER	DOLORES RIVER BN	SAN MIGUEL			0		UNDERGRO	1,000 - 100,000	250
DONALD HILL	UNION CARBIDE CP	SAN MIGUEL	15	44 N	18.0 W	22	UNDERGRO	<100	0
DONEGAN LEASE	NELSON +LANGTON	SAN MIGUEL	8	43 N	10.0 W	22	UNDERGRO	<100	0
DRAGON	ALMONT MINES INC	SAN MIGUEL			0		UNDERGRO	100 - 1,000	0
DUNCAN	UNION CARBIDE CP	SAN MIGUEL	26	45 N	18.0 W	22	UNDERGRO	<100	0
DURANGO + L ANIM	OLIVER BROS	SAN MIGUEL	33	44 N	19.0 W	22	UNDERGRO	<100	0
EARLY MORN GROUP	D.C. BUNKER MINE	SAN MIGUEL	24	44 N	17.0 W	22	UNDERGRO	1,000 - 100,000	0
ECLIPSE	UNION CARBIDE CP	SAN MIGUEL	10	44 N	18.0 W	22	UNDERGRO	<100	0
EMPIRE GROUP	ORTHEYER MINING	SAN MIGUEL			0		SURFACE	<100	0
FAIR VIEW	UNKNOWN CONTROLP	SAN MIGUEL			0		SURFACE	<100	0
FALL CREEK GROUP	FOOTE MINERALS	SAN MIGUEL	7	43 N	10.0 W	22	UNDERGRO	1,000 - 100,000	200
FIREFLY 3	E.E. LEWIS, INC.	SAN MIGUEL			0		UNDERGRO	1,000 - 100,000	100
FIVE POINTS	FIVE POINTS URAN	SAN MIGUEL			0		UNDERGRO	<100	50
FLORENCE	HAMILTON, VERL	SAN MIGUEL			0		UNDERGRO	100 - 1,000	0
FOX GROUP	BURWELL MINING	SAN MIGUEL			0		UNDERGRO	<100	100
FOX GROUP	MILLING JACK	SAN MIGUEL			0		UNDERGRO	100 - 1,000	100
FRACTION	DULANEY MINING C	SAN MIGUEL	8	43 N	19.0 W	22	UNDERGRO	100 - 1,000	0
FRACTION 1	DULANEY MNG	SAN MIGUEL	10	43 N	19.0 W	22	UNDERGRO	100 - 1,000	0
FRANCE	FRITZ ERICKSON M	SAN MIGUEL	20	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	50
FRANCES	UNION CARBIDE	SAN MIGUEL			0		UNDERGRO	<100	50
FRANKLIN 1 + 2	TORRES, DAVID	SAN MIGUEL	33	46 N	19.0 W	22	UNDERGRO	100 - 1,000	0
FRAZIER	BEHNETT + ROSE	SAN MIGUEL	24	43 N	11.0 W	22	UNDERGRO	100 - 1,000	0
FRENCHY 2	ORTHAYEP MINING	SAN MIGUEL	29	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	50
FULL MOON GROUP	UNION CARBIDE C	SAN MIGUEL	15	43 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
G.M.D. 1	DOWELL H.L.	SAN MIGUEL			0		SURFACE	<100	0
GAP	REED, EDGAR J.	SAN MIGUEL	16	43 N	16.0 W	22	SURFACE	<100	0
GERALD T.	MATTERHORN MNG.	SAN MIGUEL	19	44 N	18.0 W	22	UNDERGRO	100 - 1,000	100
GIANT	UNION CARBIDE CP	SAN MIGUEL	24	45 N	19.0 W	22	UNDERGRO	100 - 1,000	0
GLEN 27	BOSKY, HENRY	SAN MIGUEL	28	44 N	18.0 W	22	UNDERGRO	100 - 1,000	0
GOPFORTH HOMESTEAD	DAVIS MINING CO	SAN MIGUEL	15	43 N	19.0 W	22	SURFACE	<100	0
GOLDEN ROD 1	FAHRION +SAGRILL	SAN MIGUEL	11	43 N	19.0 W	22	UNDERGRO	100 - 1,000	0
GOLDEN ROD 2	ATOMIC ENFRGY CO	SAN MIGUEL	14	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	50
GOLDEN ROD 4	JOHNSON+HARGRAVE	SAN MIGUEL	14	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
GOPHER	SCHUMACHER, J I	SAN MIGUEL	21	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	350
GOVERNOR MINE	CAPITOL SEABOARD	SAN MIGUEL	29	43 N	19.0 W	22	UNDERGRO	100 - 1,000	150
GRASS FLAT	SHUMWAY+ DADE	SAN MIGUEL	32	44 N	18.0 W	22	UNDERGRO	1,000 - 100,000	200
GRASSY HILL	COPDER OIL + MNG	SAN MIGUEL	24	45 N	19.0 W	22	UNDERGRO	<100	0
GREEN ARROW	UNKNOWN CONTROLP	SAN MIGUEL			0		SURFACE	<100	0
GROUND HOG	PICKENS, CHARLES	SAN MIGUEL	21	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	300
GROUND HOG DUMP	FOUR CORNERS OIL	SAN MIGUEL	21	45 N	18.0 W	22	DUMPS	1,000 - 100,000	50
GRUB STAKE	SVYDER, C.F. +SONS	SAN MIGUEL	23	44 N	19.0 W	22	SURFACE	<100	0
GYPSSUM HOMESTEAD	BELL, PIPL W.	SAN MIGUEL	33	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
HALLOWEEN	NICHOLS+CRECELI	SAN MIGUEL			0		UNDERGRO	<100	0
HAPPY JACK	FOOTE MINERALS	SAN MIGUEL	4	45 N	19.0 W	22	UNDERGRO	100 - 1,000	150
HANK-FRANKIE	ATLAS-FOOTE	SAN MIGUEL	16	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
HAYMAKER-SUNSET	UNION CARBIDE CP	SAN MIGUEL	29	45 N	18.0 W	22	UNDERGRO	100 - 1,000	0
HAZEL	DAVIS, TRENTON	SAN MIGUEL			0		UNDERGRO	100 - 1,000	0

INACTIVE URANIUM MINES IN THE UNITED STATES
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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
HOGBACK	DAVIS, TRENTON	SAN MIGUEL	19	43 N	19.0 W	22	UNDERGRO	100 - 1,000	50
HORSESHOE 1	BROOKS MINERALS	SAN MIGUEL	6	42 N	17.0 W	22	UNDERGRO	100 - 1,000	0
HORSESHOE 2	BROOKS MINERALS	SAN MIGUEL	6	42 N	17.0 W	22	UNDERGRO	100 - 1,000	150
HORSESHOE 3	BROOKS MINERALS	SAN MIGUEL	6	42 N	17.0 W	22	UNDERGRO	100 - 1,000	150
HORSESHOE 4	BROOKS MINERALS	SAN MIGUEL	6	42 N	17.0 W	22	SURFACE	<100	0
HORSESHOE 5	BROOKS MINERALS	SAN MIGUEL	6	42 N	17.0 W	22	UNDERGRO	1,000 - 100,000	0
HORSESHOE 6	BROOKS MINERALS	SAN MIGUEL	6	42 N	17.0 W	22	UNDERGRO	100 - 1,000	150
HORSESHOE 7	CENTURY MNG+DEVE	SAN MIGUEL	6	42 N	17.0 W	22	UNDERGRO	100 - 1,000	150
HORSESHOE BEND 1	CENTURY MNG+DEVE	SAN MIGUEL			0		UNDERGRO	1,000 - 100,000	150
HOT DRILL 11	UNITED URAN CORP	SAN MIGUEL	11	42 N	18.0 W	22	UNDERGRO	<100	850
HOT SHOT	SCHUMACHER, J I	SAN MIGUEL	16	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
HOT SPOT	AYERS, EVERETT	SAN MIGUEL			0		UNDERGRO	<100	0
HOYMAN LEASE	DAWSON, W.S.	SAN MIGUEL			0		UNDERGRO	1,000 - 100,000	800
I, V.	DULANEY MINING C	SAN MIGUEL	15	43 N	19.0 W	22	UNDERGRO	<100	0
INDEPENDENCE	GOMEZ + GUPWELL	SAN MIGUEL	17	43 N	19.0 W	22	SURFACE	<100	0
INSPIRATION 1	LECCO GAS + OIL	SAN MIGUEL	33	45 N	18.0 W	22	UNDERGRO	100 - 1,000	0
INSPIRATION 15	SITTON F A	SAN MIGUEL	33	45 N	18.0 W	22	SURFACE	<100	0
J, J, 2	SMITH + PETERS	SAN MIGUEL			0		SURFACE	<100	0
J. V. EAVENSON LSE	ALARADO MNG. CO.	SAN MIGUEL	27	43 N	19.0 W	22	UNDERGRO	<100	0
JACK KNIFE 3	SCHUMACHER, J I	SAN MIGUEL	16	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
JACK-O-LANTERN	DALE DILLON	SAN MIGUEL	32	44 N	18.0 W	22	SURFACE	<100	0
JACKIE L.	DULANEY MINING C	SAN MIGUEL	8	43 N	19.0 W	22	UNDERGRO	<100	0
JACKIE WALLS 3	FRITZ EPICKSON M	SAN MIGUEL	36	44 N	20.0 W	22	UNDERGRO	1,000 - 100,000	50
JACKKNIFE 3 W	SCHUMACHER J I	SAN MIGUEL	16	45 N	18.0 W	22	UNDERGRO	100 - 1,000	100
JACKPOT GROUP	BROWN + WRIGHT	SAN MIGUEL	16	44 N	17.0 W	22	UNDERGRO	100 - 1,000	0
JIM 2	DAVIS + GOFORTH	SAN MIGUEL	11	42 N	18.0 W	22	UNDERGRO	100 - 1,000	0
JOE BUSH GROUP	THOMPSON, E.	SAN MIGUEL	26	43 N	19.0 W	22	UNDERGRO	100 - 1,000	0
JOE DANDY	NEILSON, C.	SAN MIGUEL	8	43 N	10.0 W	22	UNDERGRO	100 - 1,000	0
JUPITER	DUNCAN WALTER	SAN MIGUEL	32	43 N	18.0 W	22	UNDERGRO	100 - 1,000	150
KATE MEYERS	BLIXT, ALFRD	SAN MIGUEL			0		UNDERGRO	<100	0
KATIE	DALPEZ, MARIO	SAN MIGUEL	24	43 N	19.0 W	22	UNDERGRO	<100	50
KEYSTONE	FAHRION +SAGRILL	SAN MIGUEL	14	43 N	19.0 W	22	UNDERGRO	100 - 1,000	0
KLONDIKE	LAKALUCRE MINES	SAN MIGUEL	1	43 N	17.0 W	22	SURFACE	<100	50
LA SALLE	ATLAS-FOOTE	SAN MIGUEL	30	44 N	19.0 W	22	UNDERGRO	1,000 - 100,000	0
LAST CHANCE	GREENRIVER OIL +	SAN MIGUEL	23	44 N	19.0 W	22	UNDERGRO	<100	100
LAST HOPE	JIM BUTT	SAN MIGUEL	24	43 N	20.0 W	22	UNDERGRO	100 - 1,000	0
LATRICIA	DOYLE M A	SAN MIGUEL	20	43 N	19.0 W	22	UNDERGRO	100 - 1,000	200
LEE MOCK	KAMHOLZ, ROY	SAN MIGUEL	1	43 N	19.0 W	22	SURFACE	<100	0
LEOPARD VANADIUM	BENNETT +CORNETT	SAN MIGUEL	26	44 N	11.0 W	22	UNDERGRO	100 - 1,000	0
LIBERTY BELL	MALICK, ELI	SAN MIGUEL			0		SURFACE	<100	0
LITTLE CHIEF	BALDRA, HERMAN M.	SAN MIGUEL			0		SURFACE	<100	0
LITTLE HELEN	GOFORTH, WM.	SAN MIGUEL	18	43 N	18.0 W	22	UNDERGRO	<100	0
LITTLE MARIE	THOMPSON+GRIBBLE	SAN MIGUEL	23	44 N	19.0 W	22	SURFACE	<100	0
LITTLE MAX	UNION CARBIDE CP	SAN MIGUEL	28	43 N	18.0 W	22	UNDERGRO	100 - 1,000	0
LITTLE ROY	SNYDER, C.F.+SONS	SAN MIGUEL	28	43 N	18.0 W	22	UNDERGRO	<100	0
LIZZIE G	C NEILSON	SAN MIGUEL	8	43 N	10.0 W	22	UNDERGRO	100 - 1,000	0
LONE PEAK 1-3	PIONEER URAY INC	SAN MIGUEL	32	43 N	18.0 W	22	UNDERGRO	100 - 1,000	100
LONE STAR GROUP	J + J MNG.	SAN MIGUEL	4	43 N	19.0 W	22	UNDERGRO	100 - 1,000	50

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
LONESOME 34	PIONEER URAN INC	SAN MIGUEL			0		UNDERGRO	1,000 - 100,000	0
LONG RIDGE+L.R.	UNION CARBIDE CP	SAN MIGUEL	23	44 N	17,0 W	22	UNDERGRO	1,000 - 100,000	0
LOOKOUT	PETRO NUCLEAR	SAN MIGUEL	23	44 N	19,0 W	22	UNDERGRO	1,000 - 100,000	0
LOST	BEARS, RALPH	SAN MIGUEL	33	45 N	18,0 W	22	UNDERGRO	100 - 1,000	0
LOST BROTHERS	CROWN URANIUM CO	SAN MIGUEL	27	45 N	18,0 W	22	UNDERGRO	100 - 1,000	50
LOST DOG	MAYFIELD, JERRY	SAN MIGUEL	16	43 N	19,0 W	22	UNDERGRO	100 - 1,000	50
L6E,875,S.16,NW4	ST. OF COLORADO	SAN MIGUEL			0		SURFACE	<100	0
LUCKY 1 + JOE RA	UNITED URAN CORP	SAN MIGUEL	8	43 N	18,0 W	22	UNDERGRO	<100	200
LUCKY 8	PIKES PEAK URAN.	SAN MIGUEL			0		UNDERGRO	<100	0
LUCKY DAY	DALPEZ, MARIO	SAN MIGUEL	24	43 N	19,0 W	22	UNDERGRO	1,000 - 100,000	100
MAC INTYRE CLAIM	ORTMEYER MNG CO	SAN MIGUEL			0		SURFACE	<100	0
MAGPIE	DOYLE M K	SAN MIGUEL	36	45 N	18,0 W	22	UNDERGRO	1,000 - 100,000	100
MAINSTREET	PETRO NUCLEAR	SAN MIGUEL	16	45 N	18,0 W	22	UNDERGRO	1,000 - 100,000	100
MARGARET C, 1-6	TORRES, DAVID	SAN MIGUEL	7	43 N	16,0 W	22	UNDERGRO	<100	0
MARIE	TRE JOINT VENTUR	SAN MIGUEL	19	43 N	19,0 W	22	UNDERGRO	100 - 1,000	0
MARIE 1	TRE JOINT VENTUR	SAN MIGUEL	29	43 N	19,0 W	22	UNDERGRO	100 - 1,000	0
MARNE GROUP	FOOTE MINERALS	SAN MIGUEL	32	43 N	18,0 W	22	UNDERGRO	1,000 - 100,000	100
MARTHA SUE	SNYDER, FRANK	SAN MIGUEL	11	43 N	19,0 W	22	SURFACE	<100	0
MARY 2	ORTMEYER MINING	SAN MIGUEL			0		SURFACE	<100	0
MARY JANE+BROADH	HOPKINS MNG CO	SAN MIGUEL	22	45 N	18,0 W	22	UNDERGRO	1,000 - 100,000	0
MARY M.	FRONTIER VAN+URA	SAN MIGUEL			0		SURFACE	<100	0
MAY DAY	BALLS, E.M.	SAN MIGUEL	32	43 N	18,0 W	22	SURFACE	<100	0
MAYRE 1 + 2	ROGERS, W.A	SAN MIGUEL	26	46 N	17,0 W	22	UNDERGRO	<100	100
MAYFLOWER	NIELSON + SONS	SAN MIGUEL	33	44 N	19,0 W	22	UNDERGRO	<100	0
MC KEE GROUP	RICE, JOE	SAN MIGUEL	22	45 N	18,0 W	22	UNDERGRO	<100	0
MC MILLAN	UNKNOWN CONTROLR	SAN MIGUEL			0		SURFACE	<100	0
MEMPHIS 1 + 2	LEE + SMALL	SAN MIGUEL	29	45 N	18,0 W	22	UNDERGRO	<100	100
MERCANTILE	DULANEY MNG CO	SAN MIGUEL	18	43 N	19,0 W	22	UNDERGRO	1,000 - 100,000	0
MERCANTILE 1	SITTON + DULANEY	SAN MIGUEL	18	43 N	19,0 W	22	UNDERGRO	100 - 1,000	0
MERCANTILE 2	SITTON + DULANEY	SAN MIGUEL	18	43 N	19,0 W	22	UNDERGRO	<100	0
MERCANTILE 3	SITTON + DULANEY	SAN MIGUEL	18	43 N	19,0 W	22	UNDERGRO	<100	0
MERCANTILE BETH	DULANEY MINING C	SAN MIGUEL	19	43 N	19,0 W	22	UNDERGRO	<100	0
MERCANTILE BRIGH	DULANEY MINING C	SAN MIGUEL	17	43 N	19,0 W	22	UNDERGRO	100 - 1,000	0
MESA 7	DEVEREAUX BRÖS.	SAN MIGUEL	31	44 N	17,0 W	22	UNDERGRO	<100	0
MESA HILL	SNYDER,C.F.+SONS	SAN MIGUEL			0		UNDERGRO	100 - 1,000	0
MICKY 3	BAIRD+SNYDER MNG	SAN MIGUEL	20	43 N	19,0 W	22	SURFACE	<100	0
MIDNIGHT	URANIUM METALS	SAN MIGUEL	27	44 N	19,0 W	22	UNDERGRO	100 - 1,000	0
MINERAL MINES	WRIGHT, L.B.	SAN MIGUEL			0		UNDERGRO	100 - 1,000	0
MINERAL MOUNTAIN	WRIGHT, L.B.	SAN MIGUEL			0		UNDERGRO	<100	0
MINERAL MOUNTAIN	WRIGHT, KEITH	SAN MIGUEL			0		UNDERGRO	100 - 1,000	0
MINERAL MOUNTAIN	WRIGHT, L.B.	SAN MIGUEL			0		UNDERGRO	<100	0
MINERAL MOUNTAIN	WRIGHT, L.B.	SAN MIGUEL			0		UNDERGRO	100 - 1,000	0
MINERAL MTN	WRIGHT L	SAN MIGUEL			0		UNDERGRO	100 - 1,000	0
MINERAL MTN 3 +	WRIGHT, CLYDE	SAN MIGUEL			0		UNDERGRO	<100	0
MINERAL MTN, 3	WRIGHT, L.B.	SAN MIGUEL			0		UNDERGRO	100 - 1,000	0
MINING LEASE 1	SKIDMORE, T.H.	SAN MIGUEL	28	43 N	19,0 W	22	UNDERGRO	1,000 - 100,000	0
MINING LEASE 17	TURNER, JACK C.	SAN MIGUEL	30	44 N	18,0 W	22	UNDERGRO	1,000 - 100,000	200
MINING LEASE 18	MC CORMICK, WM,P	SAN MIGUEL	28	43 N	19,0 W	22	UNDERGRO	1,000 - 100,000	50

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
MINING LEASE 20	SAN JUAN LEASING	SAN MIGUEL	26	44 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
MINING LEASE 21	BAIRD+ROBINETTE+	SAN MIGUEL	5	43 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
MINING LEASE 27	GAMBLIN +KNOWLES	SAN MIGUEL	36	44 N	19.0 W	22	UNDERGRO	100 - 1,000	0
MINING LEASE 28	DUNCAN + SANCHEZ	SAN MIGUEL	32	44 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
MINING LEASE 29	ORTMEYER MNG CO	SAN MIGUEL	29	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	0
MINING LEASE 30	HARGROVE J.W.	SAN MIGUEL	31	44 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
MINING LEASE 32	BLUE CREEK MININ	SAN MIGUEL			0		UNDERGRO	1,000 - 100,000	150
MINING LEASE 4	DULANEY MNG CO	SAN MIGUEL	16	43 N	19.0 W	22	UNDERGRO	>100,000	0
MINING LEASE 42	BLIXT,ALFRED +OS	SAN MIGUEL	30	44 N	18.0 W	22	SURFACE	<100	0
MINING LEASE 43	KAMHOLZ, ROY	SAN MIGUEL	10	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
MINING LEASE 44	ATOMIC ENERGY CG	SAN MIGUEL	5	43 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
MINING LEASE 45	CROWLEY J.R.	SAN MIGUEL	15	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	0
MINING LEASE 46	GAYNO MINING CO	SAN MIGUEL	30	44 N	18.0 W	22	UNDERGRO	1,000 - 100,000	450
MINING LEASE 6	HOLLING, HENRY	SAN MIGUEL	23	44 N	19.0 W	22	UNDERGRO	1,000 - 100,000	0
MITCHEL+CUCHER G	FOOTE MINERALS	SAN MIGUEL	14	45 N	18.0 W	22	UNDERGRO	100 - 1,000	0
MONTEZUMA	OWENEY, H.R.	SAN MIGUEL	19	43 N	18.0 W	22	SURFACE	<100	0
MONUMENT 4	TRISTY + BYERLY	SAN MIGUEL			0		SURFACE	<100	0
MOQUI JUG	UNION CARBIDE CP	SAN MIGUEL	29	43 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
MORTGAGE LIFTER	WILLIAMS + CONN	SAN MIGUEL	4	43 N	19.0 W	22	UNDERGRO	<100	0
MUCHO GRN(DOL.R	BROOKS MINERALS	SAN MIGUEL	1	42 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
MULE GROUP	HILL+DUNCAN+BUFF	SAN MIGUEL			0		UNDERGRO	<100	0
MULESHOE 6	HILL+DUNCAN+BUFF	SAN MIGUEL	22	43 N	18.0 W	22	UNDERGRO	<100	0
MYSTERY	BARPETT + BREWER	SAN MIGUEL	26	43 N	18.0 W	22	UNDERGRO	100 - 1,000	0
NATIONAL	CRISTEA MNG.CO.	SAN MIGUEL			0		SURFACE	<100	0
NELLIF GRAY	MADDOX,C.W.	SAN MIGUEL			0		SURFACE	<100	0
NEW DEAL	E H JOHNSSEN	SAN MIGUEL			0		UNDERGRO	100 - 1,000	0
NIGGER HEAD	MOTLEY, R.C.	SAN MIGUEL	36	44 N	20.0 W	22	SURFACE	<100	0
NORMA JEAN 1 + 2	UNION CARBIDE CP	SAN MIGUEL	28	43 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
NORTH CON MILL	TURNER, ACE	SAN MIGUEL			0		SURFACE	<100	0
NORTH SLOPE 2	ATLAS-FOOTE	SAN MIGUEL	5	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	0
NORTHER 5 + 6	UNION CARBIDE CP	SAN MIGUEL	22	44 N	19.0 W	22	UNDERGRO	1,000 - 100,000	550
NORTHERN LIGHT	HOIZ, EARL	SAN MIGUEL	19	44 N	18.0 W	22	UNDERGRO	100 - 1,000	200
OMEGA	UNKNOWN	SAN MIGUEL	35	44 N	11.0 W	22	SURFACE	<100	0
OWENSBY	UNKNOWN CONTROLR	SAN MIGUEL	16	43 N	19.0 W	22	UNDERGRO	<100	0
PAINTED ROCK	PRETTY BLUE MNG	SAN MIGUEL	31	44 N	18.0 W	22	SURFACE	<100	0
PARROT GROUP	BROOKS MINERALS	SAN MIGUEL	26	43 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
PAYSTREAK 3	UNION CARBIDE CP	SAN MIGUEL	30	43 N	18.0 W	22	UNDERGRO	100 - 1,000	0
PECAS 1	UNITED URAN CORP	SAN MIGUEL			0		SURFACE	<100	0
PENIGAL	DALPEZ, MARIO	SAN MIGUEL	24	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
PENJU	JACK THOMPSON	SAN MIGUEL	7	43 N	16.0 W	22	UNDERGRO	100 - 1,000	0
PHILLIPS 66 1	PHILLIPS, DORR	SAN MIGUEL	24	44 N	17.0 W	22	UNDERGRO	100 - 1,000	0
PINE BUG	TURNER + SMITH	SAN MIGUEL	29	43 N	19.0 W	22	SURFACE	<100	0
PITCHFORK	BOKUM CORPORATN	SAN MIGUEL	32	44 N	16.0 W	22	UNDERGRO	1,000 - 100,000	100
POLARIS 1	WAVERLY MINING C	SAN MIGUEL			0		SURFACE	<100	0
POUR OFF	UNKNOWN CONTROLR	SAN MIGUEL			0		SURFACE	<100	0
PROSPECTORS FORT	ROBERTS RUTH	SAN MIGUEL	25	45 N	19.0 W	22	UNDERGRO	1,000 - 100,000	0
QUEEN OF SPADES	THUNDERBIRD URAN	SAN MIGUEL	18	43 N	18.0 W	22	UNDERGRO	>100	0
RADIUM	ATLAS-FOOTE	SAN MIGUEL	5	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	0

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** COLORADO (CONT'D) *****									
RADIUM 1	SITTON F A	SAN MIGUEL	5	43 N	19.0 W	22	SURFACE	<100	0
RADIUM 12	ATLAS-FOOTE	SAN MIGUEL	4	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	150
RADIUM 19	ATLAS-FOOTE	SAN MIGUEL	5	43 N	19.0 W	22	UNDERGRO	100 - 1,000	100
RADIUM 22	ATLAS-FOOTE	SAN MIGUEL	32	44 N	19.0 W	22	UNDERGRO	<100	100
RADIUM 24	ATLAS-FOOTE	SAN MIGUEL	5	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
RADIUM 25	ATLAS-FOOTE	SAN MIGUEL	5	43 N	19.0 W	22	SURFACE	<100	0
RADIUM 26 + 27	ATLAS-FOOTE	SAN MIGUEL	5	43 N	19.0 W	22	UNDERGRO	100 - 1,000	100
RADIUM 29	ATLAS-FOOTE	SAN MIGUEL	5	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	150
RADIUM 3	ATLAS-FOOTE	SAN MIGUEL	4	43 N	19.0 W	22	UNDERGRO	100 - 1,000	0
RADIUM 4	ATLAS-FOOTE	SAN MIGUEL	4	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
RADIUM 5 + 6	ATLAS-FOOTE	SAN MIGUEL	8	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
RADIUM 6	ATLAS-FOOTE	SAN MIGUEL	9	43 N	19.0 W	22	UNDERGRO	<100	0
RADIUM 7	ATLAS-FOOTE	SAN MIGUEL	8	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	150
RADIUM 8	ATLAS-FOOTE	SAN MIGUEL	9	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	0
RAINY DAY	UNION CARBIDE CP	SAN MIGUEL	35	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
RAMBLER	UNION CARBIDE CP	SAN MIGUEL	9	44 N	17.0 W	22	UNDERGRO	1,000 - 100,000	0
PAT HOLE	ROGERS, JACK	SAN MIGUEL			0		SURFACE	<100	0
RATTLESNAKE	RUTHERFORD, R.F.	SAN MIGUEL			0		SURFACE	<100	0
RATTLESNAKE	KNIGHT, N.B.	SAN MIGUEL	19	43 N	18.0 W	22	SURFACE	<100	0
RATTLESNAKE 1	CARKHUFF, CAMPBEL	SAN MIGUEL	4	45 N	19.0 W	22	SURFACE	<100	100
RED ANT	KNUCKLES, W.T.	SAN MIGUEL	30	43 N	19.0 W	22	UNDERGRO	<100	100
RED HORSE	UNION CARBIDE CP	SAN MIGUEL	26	45 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
RED ROCK 4 + 5	BROOKS MINERALS	SAN MIGUEL	35	43 N	18.0 W	22	UNDERGRO	1,000 - 100,000	250
RED ROCK 5	BROOKS MINERALS	SAN MIGUEL	35	43 N	18.0 W	22	UNDERGRO	1,000 - 100,000	100
RED SNAKE	JEWELL, LOREN	SAN MIGUEL			0		SURFACE	<100	50
RED TOP	SULLIVAN, BILL	SAN MIGUEL	6	42 N	17.0 W	22	UNDERGRO	<100	0
RED TOP	JOHNSON, HUGO W.	SAN MIGUEL	9	44 N	18.0 W	22	UNDERGRO	<100	50
RED WING	SALES, BURT	SAN MIGUEL	23	44 N	17.0 W	22	SURFACE	<100	0
REX CLAIM	REED, EDGAR J.	SAN MIGUEL			0		UNDERGRO	<100	0
RIM	DRINKAPD, JOHN	SAN MIGUEL	1	42 N	18.0 W	22	SURFACE	<100	0
RIVERVIEW	UNION CARBIDE CP	SAN MIGUEL	33	45 N	18.0 W	22	UNDERGRO	100 - 1,000	50
ROBERT M	MARLANG, J.+ C.	SAN MIGUEL	16	44 N	17.0 W	22	UNDERGRO	<100	0
ROBERTA JEAN	HAMPTON R.J.	SAN MIGUEL			0		UNDERGRO	<100	0
ROSE JUNE	MARLANG, FRED	SAN MIGUEL	16	44 N	17.0 W	22	UNDERGRO	<100	0
ROY LEE	BROOKS MINERALS	SAN MIGUEL	34	43 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
S.R.GROUP	DYER, GUY B.	SAN MIGUEL	11	42 N	18.0 W	22	UNDERGRO	1,000 - 100,000	4950
SAGE 11	SHUMWAY+ DADE	SAN MIGUEL	32	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	300
SAN MIGUEL	ATLAS-FOOTE	SAN MIGUEL	8	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
SANTA MARIA	SKIDMORE, T.H.	SAN MIGUEL	14	43 N	19.0 W	22	UNDERGRO	<100	0
SARA M.	FOOTE MINERALS	SAN MIGUEL	26	43 N	18.0 W	22	UNDERGRO	100 - 1,000	0
SARAH ELLEN	GRIPE R.	SAN MIGUEL	26	43 N	18.0 W	22	UNDERGRO	100 - 1,000	0
SARAH JANE	TORRES, DAVID	SAN MIGUEL			0		SURFACE	<100	0
SCHLEE	SNYDER, ROBERT A.	SAN MIGUEL	26	43 N	19.0 W	22	SURFACE	<100	0
SIBLEY	DULANEY MINING C	SAN MIGUEL	17	43 N	19.0 W	22	UNDERGRO	100 - 1,000	0
SINGLE JACK	CRISTEA MNG.CO.	SAN MIGUEL	26	44 N	11.0 W	22	UNDERGRO	<100	0
SLICK RIM	ROSENQUIST, HOMER	SAN MIGUEL	16	45 N	18.0 W	22	UNDERGRO	<100	50
SLICK ROCK HILL	SKYLAND SALES, IN	SAN MIGUEL			0		UNDERGRO	100 - 1,000	0
SPRING	UNION CARBIDE CP	SAN MIGUEL	9	44 N	18.0 W	22	UNDERGRO	<100	0

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***** COLORADO (CONT'D) *****									
SPUD PATCH	UNION CARRIDE	SAN MIGUEL	29	43 N	18.0 W	22	UNDERGRO	1,000 - 100,000	50
STAR	OLIVER + RUSS	SAN MIGUEL	30	43 N	18.0 W	22	SURFACE	<100	0
SUNDAY	LEE H. MORRIS	SAN MIGUEL	29	43 N	18.0 W	22	UNDERGRO	100 - 1,000	0
SUNDOWN	LUBBROCK MNG.CO.	SAN MIGUEL	27	44 N	19.0 W	22	UNDERGRO	<100	0
SUNDOWN GROUP	R + B MINING CO.	SAN MIGUEL	25	45 N	19.0 W	22	UNDERGRO	<100	200
SUNNYSIDE	BURNETT + CO	SAN MIGUEL	32	44 N	18.0 W	22	UNDERGRO	100 - 1,000	0
SUNRISE	ATLAS-FOOTE	SAN MIGUEL	5	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	350
SUNRISE + PATENT	ATLAS-FOOTE	SAN MIGUEL	5	44 N	19.0 W	22	UNDERGRO	1,000 - 100,000	350
SUNRISE 1	ATLAS-FOOTE	SAN MIGUEL	8	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	200
SUNRISE 3, 4, +	ATLAS-FOOTE	SAN MIGUEL	8	43 N	19.0 W	22	UNDERGRO	100 - 1,000	100
SUNSHINE 6	AYERS, EVFRETT	SAN MIGUEL	21	44 N	17.0 W	22	UNDERGRO	<100	0
TAILHOLT	CHARLES PICKENS	SAN MIGUEL	27	44 N	19.0 W	22	UNDERGRO	1,000 - 100,000	350
TERRIBLE	MAYFIELD, JERRY	SAN MIGUEL	10	45 N	19.0 W	22	UNDERGRO	1,000 - 100,000	0
TEXAS CHIEF 1	KUYKENDALL +ELMO	SAN MIGUEL			0		UNDERGRO	<100	0
TINY	UNION CARBIDE CP	SAN MIGUEL	30	44 N	16.0 W	22	UNDERGRO	1,000 - 100,000	100
TORNADO	UNION CARBIDE CP	SAN MIGUEL	3	45 N	19.0 W	22	UNDERGRO	100 - 1,000	550
TWO BAR	UNION CARBIDE CP	SAN MIGUEL	24	44 N	17.0 W	22	UNDERGRO	1,000 - 100,000	0
UINTAH 2 LODE	TUCHSCHER, C.L.	SAN MIGUEL	28	43 N	19.0 W	22	UNDERGRO	<100	0
UNCLE SAM	ALTMAN+FELLER+JA	SAN MIGUEL	6	42 N	17.0 W	22	UNDERGRO	100 - 1,000	0
UNCLE SAM(GYP VA	UNION CARBIDE CP	SAN MIGUEL	10	44 N	18.0 W	22	UNDERGRO	1,000 - 100,000	150
UTE 4	CRANDELL, MARION	SAN MIGUEL	4	45 N	19.0 W	22	UNDERGRO	<100	0
VALLEY VIEW	FOSTER, LYMAN	SAN MIGUEL	19	45 N	18.0 W	22	UNDERGRO	<100	0
VAN	TORRES, DAVID	SAN MIGUEL	12	46 N	17.0 W	22	SURFACE	<100	0
VAN,QUEEN(SLK RK	SHIPROCK,LTD	SAN MIGUEL	12	44 N	20.0 W	22	UNDERGRO	1,000 - 100,000	1500
VANADIUM	WATTERS, M.R.	SAN MIGUEL	31	44 N	18.0 W	22	UNDERGRO	100 - 1,000	0
VANADIUM 7	UNION CARBIDE CP	SAN MIGUEL	23	44 N	17.0 W	22	UNDERGRO	<100	0
VANADIUM QUEEN G	MC DOUGALD+WRIGHT	SAN MIGUEL	12	44 N	20.0 W	22	SURFACE	<100	0
VANUVA CLAIMS	SHORT, ELPERT	SAN MIGUEL	11	44 N	18.0 W	22	UNDERGRO	<100	100
VICTOR	REED, EDGAR J.	SAN MIGUEL	7	43 N	16.0 W	22	SURFACE	<100	0
VICTOR 2	BISHOP CANYON UR	SAN MIGUEL	20	43 N	19.0 W	22	UNDERGRO	100 - 1,000	50
VIRGINIA	JOHANNSEN E.J.	SAN MIGUEL			0		SURFACE	<100	0
WALLY-DOUBLE JAC	BERTOCH, E.H.	SAN MIGUEL	14	43 N	18.0 W	22	UNDERGRO	1,000 - 100,000	200
WHIZ BANG	FOOTE MINERALS	SAN MIGUEL	3	45 N	19.0 W	22	UNDERGRO	<100	0
WINDY DAY-BELL	HUNT, V.F.	SAN MIGUEL	8	43 N	16.0 W	22	UNDERGRO	100 - 1,000	50
WYOMING	DRINKARD, JOHN	SAN MIGUEL	15	30 S	24.0 E	24	UNDERGRO	<100	0
YELLOW GIPL	LYLE FRANCIS	SAN MIGUEL			0		UNDERGRO	100 - 1,000	150
YELLOWBIRD-RADIU	ATLAS-FOOTE	SAN MIGUEL	4	43 N	19.0 W	22	UNDERGRO	1,000 - 100,000	100
YORKTON	DAWSON,W.B.	SAN MIGUEL	19	45 N	18.0 W	22	SURFACE	<100	50
ZEBRA	ROCKWELL, ALVA A	SAN MIGUEL			0		UNDERGRO	<100	0
ZEBRA 1	GARNER, MILLARD	SAN MIGUEL			0		UNDERGRO	<100	100
ABRIL 2,6+8	CURTIS + THORPE	TELLER	30	15 S	70.0 W	22	SURFACE	<100	50
GENEVIEVE LODE	TRANS MTN.URAN+G	TELLER			0		UNDERGRO	<100	100
SEC. 36 SWQ NEQ	COTTER CORPORATION	TELLER	36	15 S	70.0 W	06	SURFACE	100 - 1,000	100
***** FLORIDA *****									
W. R. GRACE	W. P. GRACE	POLK			0		MISC.-PB	<100	0

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***** IDAHO *****									
COAL CREEK GROUP	LAUB, DON	CUSTER	17	11 N	14.0 E	08	UNDERGRO	1,000 - 100,000	50
EAST BASIN CREEK	EVANS, E.K.	CUSTER			0		SURFACE	1,000 - 100,000	100
ELK 1-DEERSTRIKE	LAUB, DON	CUSTER	15	11 N	14.0 E	08	UNDERGRO	1,000 - 100,000	100
LIGHTNING GROUP	UNKNOWN CONTROLR	CUSTER			0		UNDERGRO	100 - 1,000	50
SHORTY GROUP	UNKNOWN CONTROLR	CUSTER	6	11 N	14.0 E	08	UNDERGRO	1,000 - 100,000	50
DONNA LOU 1	UNKNOWN CONTROLR	LEMHI			0		SURFACE	<100	0
***** MISSOURI *****									
ST LOU ARPT PSID	COMMERCIAL DI	ST. LOUIS			0		MISC.-PB	1,000 - 100,000	50
***** MONTANA *****									
COBBAN LEASE	UNKNOWN CONTROLR	BROADWATER	20	9 N	1.0 E	23	SURFACE	<100	50
BOB 6	HIDDEN SPLENDOR	CARBON	17	9 S	27.0 E	23	SURFACE	100 - 1,000	50
BUCKHORN 2	MIDWEST EXPLRATN	CARBON	26	9 S	28.0 E	23	UNDERGRO	<100	50
DANDY-MARIE-PERC	BICE MINING CO	CARBON	8	9 S	27.0 E	23	SURFACE	1,000 - 100,000	50
FRAN	UNKNOWN CONTROLR	CARBON			0		UNDERGRO	100 - 1,000	50
KEY	BIG HORN MNG CO.	CARBON			0		SURFACE	<100	0
OLD GLORY	PRYOR MINING CO	CARBON	32	8 S	27.0 E	23	UNDERGRO	100 - 1,000	50
PEARL	BICE MINING CO	CARBON			0		SURFACE	<100	50
PERC GROUP	MICHAUD, I.L.	CARBON	8	9 S	27.0 E	23	UNDERGRO	100 - 1,000	100
SANDRA	MIDLAND MNG. CO.	CARBON			0		UNDERGRO	<100	50
SNAIL 2	COLOTAH URANIUM	CARBON			0		UNDERGRO	100 - 1,000	50
SWAMP FROG	STOICK, JAMES J.	CARBON			0		UNDERGRO	100 - 1,000	50
WALDRON	WALDRON, R.	FALLON	19	10 N	61.0 E	05	SURFACE	<100	50
UNIT 3	TEXAS INSTRUMENT	HILL			0		SURFACE	<100	50
FREE ENTERPRISE	ELKHORN MINING	JEFFERSON			0		UNDERGRO	100 - 1,000	0
HAYNES HOMESTEAD	LENHART, PAYMOND	JEFFERSON			0		SURFACE	100 - 1,000	50
LONE EAGLE GROUP	EISELEIN, AH ETA	JEFFERSON	31	8 N	4.0 W	23	SURFACE	<100	150
RUM GROUP	POWELL, W.W.	MADISON	26	7 S	4.0 W	23	UNDERGRO	<100	50
***** NEVADA *****									
FIRST CHANCE	BUSHMAN, WILLIAM	CLARK	30	18 S	71.0 E	20	SURFACE	<100	50
GREEN MONSTER	SMITH + COMPS	CLARK			0		SURFACE	<100	0
RACETRACK	TOM WHITE +ASSOC	ELKO			0		SURFACE	1,000 - 100,000	50
RIMROCK	BOGDANICH DEVEL.	ELKO			0		SURFACE	100 - 1,000	50
SOUTH FOPK	VALLEY ENGR+DEV.	ELKO			0		UNDERGRO	1,000 - 100,000	50
MOONLIGHT	TRANS WORLD URAN	HUMBOLDT			0		UNDERGRO	100 - 1,000	100
EARLY DAY	APEX MINERALS	LANDER	2	18 N	43.0 E	20	UNDERGRO	1,000 - 100,000	100
LOW BOY	VALLEY VIEW URAN	LANDER	24	18 N	44.0 W	20	UNDERGRO	1,000 - 100,000	50
BLUE BIRD CLAIM	HULBE,PARKS+HEZZ	LINCOLN			0		UNDERGRO	100 - 1,000	50
WHITE CLOUD	LEE, LESTER E.	LINCOLN			0		SURFACE	<100	50
GLACIER KING CLA	MANCINI, FRANK	LYON			0		SURFACE	<100	50

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***** NEVADA (CONT'D) *****									
RIVER ROAD	MOUNT, LLOYD	LYON			0		SURFACE	<100	100
BROKEN ROW GROUP	HOUCK, EDWARD	MINERAL			0		UNDERGRO	<100	0
CAROL R	BIG M URANIUM CO	MINERAL			0		UNDERGRO	100 = 1,000	50
BLACK BONANZA	FLAMINGO MINING	NYE			0		UNDERGRO	<100	50
ARMSTRONG 1	ARMSTRONG, ARDEN	WASHOE			0		UNDERGRO	<100	50
BUCKHORN	DELAVEGA, T.R.	WASHOE			0		SURFACE	100 = 1,000	50
FLAGG SECTION	NORTH AMERICAN A	WASHOE			0		UNDERGRO	<100	50
LOWARY CLAIMS	LOWARY URAN CO.	WASHOE			0		SURFACE	100 = 1,000	50
RED BLUFF	DE LONGCHAMPS F.	WASHOE			0		UNDERGRO	100 = 1,000	50
TICK CANYON	COURVOISIER, CHAS	WASHOE			0		UNDERGRO	<100	50
***** NEW JERSEY *****									
CHARLOTTE	BEMCO INC	UNKNOWN			0		UNDERGRO	<100	50
***** NEW MEXICO *****									
BABY MINE	THREE ELEVEN MNG	CATRON			0		UNDERGRO	<100	0
MIDNIGHT (MCPHAU)	GULF MINERAL	CATRON	11	2 N	11.0 W	22	SURFACE	100 = 1,000	50
RED BASIN	HAYSTACK MTN, DEV	CATRON	19	2 N	10.0 W	22	SURFACE	<100	0
SEC. 21, 34-16W NE	STATE OF NEW MEX	CATRON	21	3 N	16.0 W	22	UNDERGRO	<100	0
BLUE STAR	LEACH + LEACH	DONA ANA			0		SURFACE	<100	0
FLOYD COLLINS	LEACH, A.A.	GRANT			0		UNDERGRO	100 = 1,000	50
INEZ-SEQ24-20S-1	WESTERN EXPLORAT	GRANT			0		UNDERGRO	100 = 1,000	50
SEC. 21, 1RS-15W	STATE OF NEW MEX	GRANT			0		SURFACE	<100	0
POLITA 2, 17N-29E	PACHECO, J. AND B.	HARDING	5	17 N	29.0 F	22	SURFACE	<100	50
NAPANE SEC 25 P1	BAKER WILDER SYN	HIDALGO			0		UNDERGRO	<100	0
29-14-09 MINE WA	REKERR MCGEE	MCKINLEY			0		MWATPROD	<100	0
ALTA (5+6-11-4)	CITRUS CNTY LAND	MCKINLEY	6	14 N	11.0 W	22	UNDERGRO	1,000 = 100,000	200
B HILL 18+23(SEC	CITRUS CNTY LAND	MCKINLEY	20	13 N	9.0 W	22	UNDERGRO	1,000 = 100,000	150
BARB J 2(30, 13-1	SMITH DEVELOPMNT	MCKINLEY	30	13 N	9.0 W	22	UNDERGRO	1,000 = 100,000	250
BARB J 3 (30-13-	MID-CONT MNG, COR	MCKINLEY	30	13 N	9.0 W	22	UNDERGRO	>100,000	50
BARB, J 1 (30-13-	MID-CONT MNG, COR	MCKINLEY	30	13 N	9.0 W	22	UNDERGRO	1,000 = 100,000	400
BG-GRP(20-13-9)	UNITED NUCLEAR	MCKINLEY	20	13 N	9.0 W	22	UNDERGRO	1,000 = 100,000	200
BILLY THE KID	HENRY ANDREWS	MCKINLEY	19	14 N	11.0 W	22	UNDERGRO	1,000 = 100,000	50
BLACK JACK 2	INDIAN ALLOTEE	MCKINLEY	18	15 N	13.0 W	22	UNDERGRO	>100,000	250
BLACKJACK 1	INDIAN ALLOTEE	MCKINLEY	12	15 N	13.0 W	22	UNDERGRO	>100,000	700
BLUE PEAK(24-13-	GARCIA + ANDREWS	MCKINLEY	24	13 N	10.0 W	22	UNDERGRO	1,000 = 100,000	0
BOBCAT NEQ24-13-	HYDE ESTATE	MCKINLEY	24	13 N	9.0 W	22	UNDERGRO	<100	0
C D+S (35-16-17)	SANTA FE PACIFIC	MCKINLEY	35	16 N	17.0 W	22	UNDERGRO	<100	50
CHARLOTTE(33-13-	SANTA FE PACIFIC	MCKINLEY	33	13 N	9.0 W	22	UNDERGRO	100 = 1,000	0
CHILL HILLS(PALT	MARQUEZ, NABOR	MCKINLEY	24	13 N	9.0 W	22	UNDERGRO	1,000 = 100,000	450
CHURCHROCK (8+17	UNITED NUCLEAR	MCKINLEY	17	16 N	16.0 W	22	UNDERGRO	>100,000	650
CLIFFSIDE SEC 36	KERR-MCGEE CORP.	MCKINLEY			0		LOWGRADE	1,000 = 100,000	0
DAKOTA(4-13N-10W	STATE OF NEW MEX	MCKINLEY	4	13 N	10.0 W	22	UNDERGRO	1,000 = 100,000	0
DAVENPORT(20-13-	HYDE ESTATE	MCKINLEY	20	13 N	9.0 W	22	UNDERGRO	<100	150

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***** NEW MEXICO (CONT'D) *****									
DIAMOND 2 LARGO	SHIPROCK,LTD	MCKINLEY	33	15 N	17.0 W	22	UNDERGRO	1,000 - 100,000	300
DYSART 1 SEC 11	HOMESTAKE-U,N.	MCKINLEY	11	14 N	10.0 W	22	UNDERGRO	>100,000	400
DYSART 2	UNITED N. HMSTKE	MCKINLEY			0		UNDERGRO	>100,000	450
E,MALPAIS 20-13-	FOUR CORNERS EXP	MCKINLEY	20	13 N	9.0 W	22	UNDERGRO	1,000 - 100,000	200
ELKINS (24-14-12)	ELKINS, LAWRENCE	MCKINLEY			0		UNDERGRO	<100	50
EVELYN (9-14-11)	CITRUS CNTY LAND	MCKINLEY	9	14 N	11.0 W	22	UNDERGRO	1,000 - 100,000	50
FAITH (29,13-09)	RANCHERS EXP,DEV	MCKINLEY	29	13 N	9.0 W	22	UNDERGRO	1,000 - 100,000	300
FLAT TOP 1 2 3	HYDE ESTATE	MCKINLEY	30	13 N	9.0 W	22	UNDERGRO	100 - 1,000	100
FLAT TOP VIL HYD	HYDE ESTATE	MCKINLEY	30	13 N	9.0 W	22	UNDERGRO	1,000 - 100,000	100
FOUTZ 1	FOUTZ MNG.CO.	MCKINLEY	4	15 N	16.0 W	22	UNDERGRO	100 - 1,000	50
FOUTZ 2	FOUTZ MNG.CO.	MCKINLEY			0		UNDERGRO	100 - 1,000	100
FOUTZ 3	FOUTZ MNG.CO.	MCKINLEY	31	15 N	16.0 W	22	UNDERGRO	1,000 - 100,000	50
FRANCIS	CITRUS CNTY LAND	MCKINLEY	8	14 N	11.0 W	22	UNDERGRO	100 - 1,000	0
HOGAN (14-13-9)	UNITED N. HMSTKE	MCKINLEY	14	13 N	9.0 W	22	UNDERGRO	>100,000	300
HOGBACK 3-5	HYDE ESTATE	MCKINLEY	12	15 N	18.0 W	22	UNDERGRO	1,000 - 100,000	0
ISABELLA(5+7,13-	M. P. GRACE	MCKINLEY	7	13 N	9.0 W	22	UNDERGRO	1,000 - 100,000	300
LOST MINE(35-14-	BERRYHILL,ELKINS	MCKINLEY	35	14 N	11.0 W	22	UNDERGRO	<100	100
MAC 2(17+18,15-1	INDIAN ALIOTTEE	MCKINLEY	18	15 N	13.0 W	22	UNDERGRO	1,000 - 100,000	250
MALPAIS MINE	SMITH DEVELOPMENT	MCKINLEY	20	13 N	9.0 W	22	UNDERGRO	1,000 - 100,000	200
MARQUEZ (23,13-0	SANTA FE PAIIRD	MCKINLEY	24	13 N	9.0 W	22	UNDERGRO	>100,000	250
MARY NO.1	UNITED N. HMSTKE	MCKINLEY	11	14 N	10.0 W	22	UNDERGRO	>100,000	350
MESA TOP (20-13-	HYDE ESTATE	MCKINLEY	20	13 N	9.0 W	22	UNDERGRO	>100,000	200
NAVAJO RES	KERR-MCGEE CORP	MCKINLEY			0		UNDERGRO	>100,000	0
RED CAP (T-GROUP	NAVAJO DEVELOPNT.	MCKINLEY			0		SURFACE-	100 - 1,000	50
RED POINT 16-13-	STATE OF NEW MEX	MCKINLEY	16	13 N	10.0 W	22	UNDERGRO	100 - 1,000	50
RENTOP 1+2(1P-14	RED TOP URAN,MNG	MCKINLEY	18	14 N	11.0 W	22	UNDERGRO	100 - 1,000	50
SANTA FE CHRIST	REY URANIUM CO	MCKINLEY			0		SURFACE	<100	0
SEC 16 13N 9W	STATE OF NEW MEX	MCKINLEY	16	13 N	9.0 W	22	UNDERGRO	1,000 - 100,000	200
SEC 17 13 9	SANTA FE PACIFIC	MCKINLEY	17	13 N	9.0 W	22	UNDERGRO	1,000 - 100,000	200
SEC 17 14N 9W LG	KERR-MCGEE CORP.	MCKINLEY			0		LOWGRADE	1,000 - 100,000	0
SEC 18 13N 9W	CITRUS CNTY LAND	MCKINLEY	18	13 N	9.0 W	22	UNDERGRO	1,000 - 100,000	150
SEC 20 14N 9W LO	KERR MCGEE	MCKINLEY			0		LOWGRADE	1,000 - 100,000	0
SEC 22 14N 10W L	KERR MCGEE	MCKINLEY			0		LOWGRADE	1,000 - 100,000	0
SEC 22,14-10	KERR MCGEE	MCKINLEY	22	14 N	10.0 W	22	UNDERGRO	>100,000	650
SEC 23 13N 10W	SANTA FE PACIFIC	MCKINLEY	23	10 N	13.0 W	22	UNDERGRO	1,000 - 100,000	50
SEC 24 14N 10W L	KERR MCGEE	MCKINLEY			0		LOWGRADE	>100,000	0
SEC 28 BECENTI	TUCKER, A.W.	MCKINLEY	28	15 N	17.0 W	22	UNDERGRO	100 - 1,000	50
SEC 29 14N 9W LO	KERR MCGEE	MCKINLEY			0		LOWGRADE	1,000 - 100,000	0
SEC 30 14N 9W LO	KERR MCGEE	MCKINLEY			0		LOWGRADE	>100,000	0
SEC 31 14N 9W	KERR-MCGEE CORP.	MCKINLEY	31	14 N	9.0 W	22	UNDERGRO	1,000 - 100,000	600
SEC 33,14-9(ONLY	KERR MCGEE	MCKINLEY	29	14 N	9.0 W	22	UNDERGRO	>100,000	700
SEC 33-14-09 LO	KERR-MCGEE	MCKINLEY			0		LOWGRADE	>100,000	0
SEC 36 13N 10W	STATE OF NEW MEX	MCKINLEY	36	13 N	10.0 W	22	UNDERGRO	1,000 - 100,000	50
SEC. 10-14N-10W	UNTD NUC HOMSTKE	MCKINLEY	10	14 N	10.0 W	22	UNDERGRO	>100,000	400
SEC.18,13N-10W S	VANDEVER,N.	MCKINLEY	18	13 N	10.0 W	22	UNDERGRO	1,000 - 100,000	150
SEC.24-13N-11W N	VANDEVER,	MCKINLEY	24	13 N	11.0 W	22	UNDERGRO	1,000 - 100,000	50
SEC.25-13N-10W S	CITRUS CNTY LAND	MCKINLEY	25	13 N	10.0 W	22	SURFACE	>100,000	100
SEC.26-13N-10W N	ESEDEPO, N.	MCKINLEY	26	13 N	10.0 W	22	UNDERGRO	1,000 - 100,000	50

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***** NE4 MEXICO (CONT'D) *****									
SEC.3-15-16LIGN1	STATE OF NEW MEX	MCKINLEY	3	15 N	16.0 W	22	UNDERGRO	100 - 1,000	50
SEC.30-13-9 WH 5	BAILEY + FIFF	MCKINLEY	30	13 N	9.0 W	22	UNDERGRO	1,000 - 100,000	200
SEC.31,13N-09W	SANTA FE PACIFIC	MCKINLEY	31	13 N	9.0 W	22	UNDERGRO	1,000 - 100,000	50
SEC.32,13N-9W	STATE OF N.M.	MCKINLEY	32	13 N	9.0 W	22	UNDERGRO	1,000 - 100,000	250
SEC.32-15N-11W N	HYDRO NUCLEAR	MCKINLEY	32	15 N	11.0 W	22	UNDERGRO	1,000 - 100,000	300
SEC.32-15N-11W S	HYDRO NUCLEAR	MCKINLEY	32	15 N	11.0 W	22	UNDERGRO	1,000 - 100,000	300
SEC.33-15-11 W N	RANCHERS EXP.DEV	MCKINLEY	33	15 N	11.0 W	22	UNDERGRO	1,000 - 100,000	0
SEC.5,13N-10W	SANTA FE PACIFIC	MCKINLEY			0		UNDERGRO	<100	0
SECTION 23-16N-1	GRACE NUCLEAR	MCKINLEY	23	16 N	17.0 W	22	UNKNOWN	<100	700
SILVER BIT	ELKINS, LAWRENCE	MCKINLEY	10	14 N	12.0 W	22	UNDERGRO	100 - 1,000	100
SILVERSPUR(31141	CITRUS CNTY LAND	MCKINLEY	31	14 N	10.0 W	22	UNDERGRO	1,000 - 100,000	0
U MINE (4-15-16)	CHRISTENSEN EST	MCKINLEY	4	15 N	16.0 W	22	UNDERGRO	1,000 - 100,000	100
VALLEJO (SEC. 34	FARRIS MINES	MCKINLEY	34	13 N	9.0 W	22	UNDERGRO	1,000 - 100,000	200
WESTWATER 1	STATE OF NEW MEX	MCKINLEY			0		UNDERGRO	1,000 - 100,000	150
WHITECAPS	SMITH DEVELOPMNT	MCKINLEY	30	13 N	9.0 W	22	UNDERGRO	1,000 - 100,000	200
LEDOUX RANCH	GALISTEO MINING	MORA	22	16.0 E		22	SURFACE	<100	0
GOOD LUCK	DENNIS, L.T.	QUAY	6	7 N	32.0 E	22	SURFACE	<100	100
SEC.12,11N-33E	HIGHLAND DEVEL.C	QUAY			0		SURFACE	<100	0
TWP.11N+12N-33E	LITTLE RATTLER M	QUAY			0		UNDERGRO	<100	50
BOX CANYON	BOX CANYON MNG.	RIO ARRIBA			0		UNDERGRO	100 - 1,000	250
COYOTE HILLS	IJA LAND+INVEST.	RIO ARRIBA			0		SURFACE	<100	50
J.O.L.	ARRIBA URANIUM C	RIO ARRIBA	24	26 N	7.0 F	22	SURFACE	<100	50
LUCKY STRIKE	ARROYA DE AGUA M	RIO ARRIBA			0		UNDERGRO	<100	300
PINEAPPLE + PALO	WELLS, S.M.	RIO ARRIBA	30	26 N	9.0 E	22	UNDERGRO	<100	0
RED HEAD 2	BOLIVAR URANIUM	RIO ARRIBA			0		UNDERGRO	<100	50
TUSAS EAST SLOPE	COLONIAL URANIUM	RIO ARRIBA	24	28 N	7.0 E	22	UNDERGRO	<100	50
WHITEFLO 1	WHITEFLO MNG.CO.	RIO ARRIBA	30	23 N	1.0 F	22	SURFACE	<100	50
BUTLER BROTHERS	BUTLER BROS.	SANDOVAL	23	19 N	1.0 W	22	UNDERGRO	<100	50
COLLINS	ZIA IND. RES.	SANDOVAL	25	17 N	1.0 W	22	UNDERGRO	100 - 1,000	700
CORPAL 3	SLA TEX VENTURE	SANDOVAL	25	23 N	1.0 E	22	UNDERGRO	<100	1000
14	MEADOWS MINING C	SAN JUAN			0		UNDERGRO	<100	200
ALONGO MINE	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	50
B B	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	100
R B B	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	100 - 1,000	150
RECLABITO	NAVAJO TRIBE	SAN JUAN			0		UNKNOWN	100 - 1,000	0
BEGAY 1	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
BEGAY 2	NAVAJO TRIBE	SAN JUAN	23	29 N	21.0 W	22	UNDERGRO	1,000 - 100,000	50
CANYON VIEW	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	100 - 1,000	150
CARL YAZZIE 1	NAVAJO TRIBE	SAN JUAN			0		SURFACE	<100	150
CASTLE TSOBIE	NAVAJO TRIBE	SAN JUAN			0		SURFACE	<100	100
DENEH NEZ 1	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	100 - 1,000	150
EAST NEW MEXICO	NAVAJO TRIBE	SAN JUAN			0		SURFACE	<100	200
EAST RESERVATION	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
ENOS JOHNSON 1-4	RAY WILLIAMS	SAN JUAN	5	25 N	20.0 W	22	UNDERGRO	1,000 - 100,000	300
H B ROY 2	NAVAJO TRIBE	SAN JUAN			0		SURFACE	<100	50
HOG BACK 2	DAVIDSON, WILLIE	SAN JUAN			0		SURFACE	<100	0
HORACE BEN 1	NAVAJO TRIBE	SAN JUAN			0		SURFACE	<100	250
JACK BOYD CLAIMS	BOYD, JACK	SAN JUAN			0		SURFACE	<100	0

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***** NEW MEXICO (CONT'D) *****									
JOE BEN 1	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	100 - 1,000	150
JOHN JOE 1	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	200
JOHN JOHN MP 334	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	0
JUNCTION	NAVAJO TRIBE	SAN JUAN			0		SURFACE	<100	100
KEY TOME	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	350
KING 2	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	100 - 1,000	100
KING TUTT 1	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	100 - 1,000	100
KING TUTT POINT	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	200
KINGS 6	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	50
LOWER CANYON	NAVAJO TRIBE	SAN JUAN	29	39 N	31.0 E	14	UNDERGRO	1,000 - 100,000	100
NELSON POINT	NAVAJO TRIBE	SAN JUAN	23	28 N	21.0 W	22	UNDERGRO	1,000 - 100,000	50
PLOT 1 RED WASH	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	100 - 1,000	250
PLOT 2 KING TUTT	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	100 - 1,000	200
PLOT 7 OAK SPRIN	NAVAJO TRIBE	SAN JUAN	11	29 N	21.0 W	22	UNDERGRO	1,000 - 100,000	100
PLOT 8 COTTONWOOD	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	100 - 1,000	0
PLOT 9 LONE STAR	NAVAJO TRIBE	SAN JUAN	35	30 N	21.0 W	22	UNDERGRO	100 - 1,000	0
REED HENDERSON 1	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	200
ROCKY FLATS MINE	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	100 - 1,000	250
SALT CANYON	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	100
SHADYSIDE	NAVAJO TRIBE	SAN JUAN	23	29 N	21.0 W	22	UNDERGRO	1,000 - 100,000	100
SHADYSIDE 2	NAVAJO TRIBE	SAN JUAN	23	29 N	21.0 W	22	UNDERGRO	100 - 1,000	100
SHIPROCK RESIDUE	NAVAJO TRIBE	SAN JUAN			0		MISC, -PB	100 - 1,000	50
SUNNYSIDE	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	0
TENT 1	NAVAJO TRIBE	SAN JUAN	18	24 N	20.0 W	22	UNDERGRO	1,000 - 100,000	100
UPPER SALT WASH	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	0
BIRK 2	FURMAN+FOSTER	SAN MIGUEL	31	17 N	24.0 E	22	UNDERGRO	<100	0
SPARKS=STONE 1	SPARKS STONE MNG	SAN MIGUEL	5	16 N	14.0 E	22	UNDERGRO	<100	50
WINDY NINE MINE	SAN CARLOS URAN	SAN MIGUEL	14	17 N	23.0 E	22	UNDERGRO	<100	0
LA BAJADA	LOVE STAR MNG+DV	SANTA FE	9	15 N	7.0 E	22	UNDERGRO	1,000 - 100,000	200
SAN JOSE CLAIMS	ROYBAL, J.C.	SANTA FE	29	20 N	9.0 E	22	UNDERGRO	<100	0
EMPIRE CLAIMS	THE EMPIRE PROJ.	SIERRA			0		UNDERGRO	<100	0
LAST CHANCE	ALAMO MINING CO.	SIERRA			0		UNDERGRO	<100	50
MITCHELL PRICE 1	PRICE BUELL	SIERRA			0		SURFACE	<100	50
PARAN	SAMANIEGO, BERNIE	SIERRA			0		SURFACE	<100	50
PITCHBLEND STRIK	TERRY, EARL H.	SIERRA			0		UNDERGRO	<100	50
ST MIN LEASE 61	AUGER, ROBERT	SIERRA			0		SURFACE	<100	50
AUGUA TORRES	CAMPBELL FARMING	SOCORRO			0		UNDERGRO	100 - 1,000	100
HOOKS RANCH	LUMMUS, R.H.	SOCORRO	13	1 N	6.0 W	22	UNDERGRO	100 - 1,000	50
JETER MINE	CAPITOL SEABOARD	SOCORRO			0		SURFACE	1,000 - 100,000	0
LITTLE DAVIE	SANTA FE PACIFC	SOCORRO			0		SURFACE	<100	50
LUCKY DON SEC 35	LUMMUS, R.H.	SOCORRO			0		UNDERGRO	1,000 - 100,000	50
MARY BALL 1	CAMPBELL FARMING	SOCORRO			0		UNDERGRO	<100	50
SAH LORENZO 1 NW	GRIEGO, JOE	SOCORRO			0		SURFACE	<100	50
BLACK COPPER 2 L	BLACK COPPER MIN	TAOS	26	28 N	15.0 E	22	UNDERGRO	<100	0
BLACK HAWK + BUN	GRANTS STATE BNK	VALENCIA	4	12 N	9.0 W	22	UNDERGRO	1,000 - 100,000	50
CEDAR CLAIMS 1 7	YUCCA URANIUM	VALENCIA	20	11 N	9.0 W	22	UNDERGRO	1,000 - 100,000	50
CHAVEZ (22-10-3)	CANONCITO IND,RS	VALENCIA	22	10 N	3.0 W	22	UNDERGRO	100 - 1,000	50
CHRISTMAS DAY PH	UNKNOWN CONTROLR	VALENCIA	4	12 N	9.0 W	22	UNDERGRO	1,000 - 100,000	150

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***** NEW MEXICO (CONT'D) *****									
CRACKPOT(57+8-8-	DEVILLIERS NUC.	VALENCIA			0		UNDERGRO	1,000 = 100,000	650
FALCON 1 + 2	YUCCA URANIUM	VALENCIA	21	43 N	19.0 W	22	SURFACE	<100	50
LA JARA	CIBOLA MNG. CO.	VALENCIA	15	12 N	9.0 W	22	UNDERGRO	1,000 = 100,000	50
LAST CHANCE	BROADBUSH, J. FOLEY	VALENCIA			0		SURFACE	1,000 = 100,000	100
LONE PINE 3	TYCONDA MINERALS	VALENCIA	8	11 N	9.0 W	22	SURFACE	100 = 1,000	150
PAISANO (16-8-6)	GOOD NEWS MNG. LT	VALENCIA			0		SURFACE	<100	50
RED BLUFF GAY FA	MOISES+HIPABEL	VALENCIA	4	12 N	9.0 W	22	UNDERGRO	1,000 = 100,000	50
SAN MATEO(30-13-	UNITED NUCLEAR	VALENCIA	30	13 N	8.0 W	22	UNDERGRO	>100,000	1050
SANDY (SEC.27-9-	DEVILLIERS NUC.	VALENCIA	27	9 N	5.0 W	22	SURFACE	100 = 1,000	50
SEC 33-12N-9W	HOMESTAKE MING	VALENCIA	33	12 N	9.0 W	22	UNDERGRO	>100,000	150
SEC 9 12N 9W	ELKINS, MARK	VALENCIA	9	12 N	9.0 W	22	UNDERGRO	1,000 = 100,000	50
TAFFY (SEC.11-12	NATIONAL GROWTH	VALENCIA	14	12 N	9.0 W	22	UNDERGRO	100 = 1,000	0
TOM 13(SEC.4-11-	ANACONDA CO.	VALENCIA			0		SURFACE	<100	50
UDC 5 (SEC.4-12-	COFFEY, WILLIAM	VALENCIA			0		UNDERGRO	100 = 1,000	50
WOODROW (36-11-0	ANACONDA CO.	VALENCIA			0		UNDERGRO	1,000 = 100,000	150
***** NORTH DAKOTA *****									
BARANKO LEASE	MCCANN + GETTING	BILLINGS	23	42 N	99.0 W	05	SURFACE	1,000 = 100,000	0
CHURCH 1	AMERICAN LUTH CH	BILLINGS	5	36 N	00.0 W	05	SURFACE	1,000 = 100,000	50
GEARY LEASE	GARDNER+WALSH+S	BILLINGS	8	37 N	00.0 W	05	SURFACE	<100	0
JOHNSON MINE-SEC	US REACQUIRED	BILLINGS	3	40 N	00.0 W	05	SURFACE	1,000 = 100,000	50
KLYM	KLYM, W.O.	BILLINGS	26	42 N	99.0 W	07	SURFACE	1,000 = 100,000	50
OYHUS (NP-1)	NORTHERN PACIFIC	BILLINGS	15	41 N	00.0 W	05	SURFACE	1,000 = 100,000	50
SEC.2,37N-100W,S	GEORESOURCES, INC	BILLINGS	2	37 N	00.0 W	05	SURFACE	1,000 = 100,000	50
SMITH 1 LEASE	HAYDEN, GARY	BILLINGS	6	37 N	00.0 W	05	SURFACE	100 = 1,000	50
SPIKE 1	DE SART + KELLEY	BILLINGS	10	37 N	01.0 W	05	SURFACE	<100	0
HURICK 1	HURICK, JOE	SLOPE	5	36 N	00.0 W	05	SURFACE	1,000 = 100,000	50
FRANK LEASE	MIKE FRANK	STARK	7	40 N	99.0 W	05	SURFACE	1,000 = 100,000	50
LUPTAK 1	LUPTAK, ANNA	STARK	6	40 N	99.0 W	05	SURFACE	1,000 = 100,000	50
LUPTAK STATE	LUPTAK+ST.N,DAK.	STARK	6	40 N	99.0 W	05	SURFACE	1,000 = 100,000	50
***** OKLAHOMA *****									
CEMENT	LISTER HILLS	CADDO			0		SURFACE	<100	150
SCHOOL LAND	LISTER HILLS	CADDO			0		SURFACE	<100	0
THORPE 1	PRATT, ORVILLE L	CUSTER			0		SURFACE	<100	0
***** OREGON *****									
PINE SPRINGS	UNKNOWN CONTROLR	CROOK	13	18 S	16.0 E		UNDERGRO	<100	50
LUCKY LASS	WESTERN NUCLEAR	LAKE	25	37 S	18.0 E	33	SURFACE	1,000 = 100,000	100
WHITE KING	WESTERN NUCLEAR	LAKE	30	37 S	19.0 E	33	SURFACE	>100,000	50
***** SOUTH DAKOTA *****									
APLAND 1	UNKNOWN CONTROLR	BUTTE			0		SURFACE	100 = 1,000	50

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***** SOUTH DAKOTA (CONT'D) *****									
BONATO RANCH	ENRICO BONATO	BUTTE	25	8 N	1.0 E	07	SURFACE	<100	0
KLING LEASE	ALEX KLING	BUTTE	23	8 N	1.0 E	07	UNDERGRO	1,000 - 100,000	50
BUD-LUCKY BHD	TENN.VALLEY AUTH	CUSTER	34	6 S	1.0 E	07	SURFACE	>100,000	100
CAYLOR LEASE	WESTERN GIANT OI	CUSTER	6	2 S	7.0 E	07	SURFACE	<100	50
DARK 1	DARROW + COOK	CUSTER			0		SURFACE	100 - 1,000	0
DEL MUERTO	GENTLEMEN MINING	CUSTER			0		SURFACE	<100	50
FREEZEOUT GROUP	TENN.VALLEY AUTH	CUSTER	36	6 S	1.0 E	07	SURFACE	1,000 - 100,000	100
JIMROB 1	ROBINSON, DELBERT	CUSTER			0		SURFACE	<100	50
LOST CANYON 1	KERCHERVAL, R.S.	CUSTER			0		SURFACE	<100	50
M.C.1	KENNEDY, MIKE C.	CUSTER			0		SURFACE	<100	50
TOD LATE	TENN.VALLEY AUTH	CUSTER	33	7 S	3.0 E	07	UNDERGRO	1,000 - 100,000	100
URANIUM 1	CRAVEN UPAL.CO.	CUSTER			0		SURFACE	<100	50
ACCIDENTAL GROUP	LORENZ BROTHERS	FALL RIVER	31	8 S	4.0 E	07	UNDERGRO	100 - 1,000	50
AMY 1	LORD, B.H.+PABY J.	FALL RIVER			0		UNDERGRO	<100	0
APPLE PIE	ALLIED EXPL.CO.	FALL RIVER			0		SURFACE	<100	0
B.+H.GROUP	TENN.VALLEY AUTH	FALL RIVER			0		SURFACE	100 - 1,000	50
BARKER + HOWELL	TENN.VALLEY AUTH	FALL RIVER	21	7 S	2.0 E	07	SURFACE	1,000 - 100,000	0
BAXTER 1	BAXTER, F.P.	FALL RIVER			0		UNDERGRO	<100	50
BEADLE GROUP	TENN.VALLEY AUTH	FALL RIVER	24	8 S	3.0 E	07	SURFACE	<100	50
BERIT 2	DAKOTA URAN+DRUG	FALL RIVER			0		SURFACE	<100	50
BITS GROUP	CHORD, ROY E.	FALL RIVER			0		SURFACE	<100	50
BLUE NOTE	CHORD, ROY E.	FALL RIVER	24	7 S	2.0 E	07	SURFACE	100 - 1,000	0
BUDA-DEXTER	TENN.VALLEY AUTH	FALL RIVER	3	8 S	3.0 E	07	UNDERGRO	1,000 - 100,000	200
CHILSON CANYON	TENN.VALLEY AUTH	FALL RIVER			0		UNDERGRO	100 - 1,000	0
CLARABELLE GROUP	CHORD, ROY E.	FALL RIVER	19	7 S	3.0 F	07	UNDERGRO	1,000 - 100,000	100
COAL CANYON	CHORD, ROY E.	FALL RIVER			0		SURFACE	1,000 - 100,000	0
COAL CANYON 1	CHORD, ROY E.	FALL RIVER	26	7 S	2.0 F	07	SURFACE	100 - 1,000	0
COAL CANYON 14	HUFF J.W.	FALL RIVER			0		SURFACE	<100	0
CRAM LEASE	TENN.VALLEY AUTH	FALL RIVER	12	8 S	3.0 F	07	SURFACE	1,000 - 100,000	50
CRANDALL GROUP	TENN.VALLEY AUTH	FALL RIVER	4	8 S	3.0 F	07	SURFACE	<100	50
CYCAD	TENN.VALLEY AUTH	FALL RIVER			0		SURFACE	100 - 1,000	50
DAKOTA FLATS	CHORD, ROY E.	FALL RIVER	25	7 S	6.0 E	07	SURFACE	100 - 1,000	50
DAMSITE	LORENZ BROTHERS	FALL RIVER	31	8 S	4.0 E	07	SURFACE	100 - 1,000	50
DARNELL LEASE	DISNEY MINING CO	FALL RIVER			0		SURFACE	<100	200
DARROW 1-5 AND W	TENN.VALLEY AUTH	FALL RIVER	2	7 S	1.0 E	07	SURFACE	>100,000	100
DIANE A	CHORD, ROY E.	FALL RIVER	25	7 S	2.0 E	07	SURFACE	1,000 - 100,000	100
DRIFTWOOD CANYON	BARKER, JAMES	FALL RIVER			0		SURFACE	1,000 - 100,000	50
EAGLE AEPIC 1	CHILDERS, M.F.	FALL RIVER			0		SURFACE	<100	50
EDGEMONT 6	CHORD, ROY E.	FALL RIVER	24	7 S	2.0 E	07	SURFACE	100 - 1,000	200
GERTRUDE + FLORA	CHORD, ROY E.	FALL RIVER	19	7 S	3.0 E	07	UNDERGRO	1,000 - 100,000	50
GET ME HIGH 1	CHORD, ROY E.	FALL RIVER	26	7 S	2.0 F	07	UNDERGRO	100 - 1,000	50
GOULD LEASES	TENN.VALLEY AUTH	FALL RIVER	11	8 S	3.0 E	07	UNDERGRO	>100,000	150
GREEN ACRES GROU	ALBRIGHT, F+J	FALL RIVER			0		UNDERGRO	1,000 - 100,000	50
GREEN SLIPPER 1	CHORD, ROY E.	FALL RIVER	19	7 S	3.0 E	07	SURFACE	1,000 - 100,000	100
GULL LEASES 1-3	TENN.VALLEY AUTH	FALL RIVER	27	8 S	3.0 E	07	SURFACE	1,000 - 100,000	150
HELEN	CHORD, ROY E.	FALL RIVER	19	7 S	3.0 E	06	UNDERGRO	100 - 1,000	50
HELLS CANYON GRO	HANSON+HAUPTMAN	FALL RIVER			0		UNDERGRO	100 - 1,000	50
HEY + FAY 5 + 6	FAY + HEY	FALL RIVER	20	7 S	3.0 E	07	SURFACE	1,000 - 100,000	50

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** SOUTH DAKOTA (CONT'D) *****									
HI POCKETS 4	CHORD, ROY E.	FALL RIVER	20	7 S	3.0 E	07	SURFACE	100 = 1,000	50
HOLDUP 15-KADOS	CHORD, ROY E.	FALL RIVER	33	7 S	3.0 E	07	UNDERGRO	1,000 = 100,000	50
HOLDUP 2	CHORD, ROY E.	FALL RIVER	33	7 S	3.0 E	07	UNDERGRO	100 = 1,000	50
HOLDUP 22	CHORD, ROY E.	FALL RIVER			0		UNDERGRO	<100	50
HOT POINT GRP	CHORD, ROY E.	FALL RIVER	28	7 S	3.0 E	07	UNDERGRO	1,000 = 100,000	100
IMOGENE	CHORD, ROY E.	FALL RIVER	19	7 S	3.0 E	07	SURFACE	<100	0
JACK PINE 2	BONER, ROY	FALL RIVER			0		SURFACE	<100	50
JOANN	CHORD, ROY E.	FALL RIVER			0		SURFACE	<100	50
KELLOGG MINE	TENN.VALLEY AUTH	FALL RIVER	19	8 S	4.0 E	07	UNDERGRO	1,000 = 100,000	100
KING	CHORD, ROY E.	FALL RIVER			0		SURFACE	1,000 = 100,000	50
LAKOTA LODE 11	LAKOTA PROSPECTI	FALL RIVER			0		SURFACE	<100	0
LAZYMANS LODE	CHORD, ROY E.	FALL RIVER	20	7 S	3.0 E	07	SURFACE	<100	50
LION 1	TENN.VALLEY AUTH	FALL RIVER			0		SURFACE	1,000 = 100,000	50
LION-MC KNIGHT	TENN.VALLEY AUTH	FALL RIVER	12	8 S	3.0 E	07	SURFACE	1,000 = 100,000	50
LITTLE ANV	TRADE DOLLAR MNG	FALL RIVER			0		SURFACE	<100	0
LODE GROUP	HILL EVERETT	FALL RIVER			0		SURFACE	<100	0
LORA 1	LORD, R.H+RARY J.	FALL RIVER			0		SURFACE	<100	50
LORD LEASE	BAXTER, F.R.	FALL RIVER			0		SURFACE	<100	50
LUCKY 1	CHORD, ROY E.	FALL RIVER	26	7 S	2.0 E	07	UNDERGRO	100 = 1,000	50
LUCKY STRIKE	EDGEMONT MINING	FALL RIVER			0		SURFACE	<100	0
LUCKY STRIKE	BETTENHAUSEN, RAY	FALL RIVER			0		SURFACE	100 = 1,000	0
LUCKY TOSS	STEVENS, EARL E.	FALL RIVER			0		SURFACE	<100	50
MARTY LEASE	TENN.VALLEY AUTH	FALL RIVER	11	8 S	3.0 E	07	SURFACE	1,000 = 100,000	50
MARYJAC 1 9	TENN.VALLEY AUTH	FALL RIVER	10	8 S	3.0 E	07	UNDERGRO	100 = 1,000	50
MATIAS PEAK	TENN.VALLEY AUTH	FALL RIVER	34	7 S	3.0 E	07	SURFACE	1,000 = 100,000	50
MC KNIGHT 1	TENN.VALLEY AUTH	FALL RIVER			0		SURFACE	1,000 = 100,000	50
NIGGER GULCH	TENN.VALLEY AUTH	FALL RIVER	25	8 S	4.0 E	07	SURFACE	<100	50
OPHELIA	CHORD, ROY E.	FALL RIVER	19	7 S	3.0 E	07	SURFACE	100 = 1,000	50
PABST 3	TENN.VALLEY AUTH	FALL RIVER	12	8 S	3.0 E	07	SURFACE	1,000 = 100,000	50
PAT 2	TENN.VALLEY AUTH	FALL RIVER			0		SURFACE	<100	50
PATSY	CHORD, ROY E.	FALL RIVER			0		UNDERGRO	100 = 1,000	0
PAY DAY 3	TENN.VALLEY AUTH	FALL RIVER			0		SURFACE	<100	50
PEE WEE	CHORD, ROY E.	FALL RIVER			0		UNDERGRO	<100	0
PENNY+ITT 1	CHORD, ROY E.	FALL RIVER			0		UNDERGRO	100 = 1,000	50
PICTOGRAPH LODE	TENN.VALLEY AUTH	FALL RIVER	30	7 S	3.0 E	07	SURFACE	1,000 = 100,000	50
RABY LEASE	BETTENHAUSEN+ MC	FALL RIVER			0		SURFACE	<100	50
RIDGE RUNNER	CHORD, ROY E.	FALL RIVER	26	7 S	3.0 E	07	SURFACE	1,000 = 100,000	100
RIPSWORTER 1	TENN.VALLEY AUTH	FALL RIVER	27	7 S	3.0 E	07	SURFACE	1,000 = 100,000	0
ROAD HOG	CHORD, ROY E.	FALL RIVER			0		SURFACE	1,000 = 100,000	0
ROWENA	CHORD, ROY E.	FALL RIVER	25	7 S	2.0 E	07	SURFACE	1,000 = 100,000	50
SEC. 11, 4H SEC	TENN.VALLEY AUTH	FALL RIVER			0		SURFACE	100 = 1,000	50
SEC. 36, 8S- 3E	BETTENHAUSEN, RAY	FALL RIVER			0		SURFACE	100 = 1,000	100
SHAMROCK	CHORD, ROY E.	FALL RIVER	19	7 S	3.0 E	07	UNDERGRO	1,000 = 100,000	100
SKINNEY SOB	SMITH, ROBERT B.	FALL RIVER			0		SURFACE	<100	50
SKIPPER 4	ALLIED EXPL.CO.	FALL RIVER			0		SURFACE	<100	0
SOTO + VERDE	BEAR LODGE MNG.	FALL RIVER	25	7 S	2.0 E	07	UNDERGRO	1,000 = 100,000	100
SOUTH VIEW GROUP	NICOLAYSEN+DAR.	FALL RIVER	25	7 S	2.0 E	07	SURFACE	100 = 1,000	50
SOUTHVIEW	WEIR + HENDERSON	FALL RIVER			0		SURFACE	<100	0

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** SOUTH DAKOTA (CONT'D) *****									
STARLIGHT 2	M.I.L.UPAN, INC.	FALL RIVER			0		SURFACE	<100	0
TESS	EYRICH, HAROLD R	FALL RIVER			0		SURFACE	<100	50
TIN SHACK 6	BIEBER + MC LEOD	FALL RIVER			0		SURFACE	<100	50
TRAIL FRACTION	CHORD, ROY E.	FALL RIVER			0		UNDERGRO	1,000 - 100,000	0
TRAIL WIND	CHORD, ROY E.	FALL RIVER			0		SURFACE	100 - 1,000	50
VIRGINIA C	SUSQUEHANNA WEST	FALL RIVER	26	7 S	2.0 E	07	SURFACE	1,000 - 100,000	100
WASHBOARD	LORENZ BROTHERS	FALL RIVER	30	8 S	4.0 E	07	UNDERGRO	1,000 - 100,000	150
WESTERN EDGE	CHORD, ROY E.	FALL RIVER			0		SURFACE	<100	50
YELLOW CAT 1	CHORD, ROY E.	FALL RIVER	19	7 S	3.0 E	07	UNDERGRO	1,000 - 100,000	50
BILLY DALE 1-4	HENDERSON+BENNET	HARDING	36	22 N	5.0 E	07	SURFACE	1,000 - 100,000	50
BLUE JAY 8	HAIVALA BROS.	HARDING	34	21 N	5.0 E	07	SURFACE	<100	100
BOBCAT GROUP	SCHULL, LESTER	HARDING	30	18 N	8.0 E	07	SURFACE	<100	50
BONE-CHOPPY	PATTERSON, A.J.	HARDING	22	22 N	5.0 E	07	SURFACE	1,000 - 100,000	100
CALAMITY JANE 2	KRAUSE, MELVIN A.	HARDING	14	19 N	7.0 E	07	SURFACE	<100	0
CARBONATE GROUP	SUNDANCE PETRO	HARDING	29	21 N	5.0 E	07	SURFACE	<100	50
CRAZY 1 + 2	HANSON LLEWELYN	HARDING	18	16 N	9.0 E	07	SURFACE	1,000 - 100,000	50
DAISY MAY 5	MTN STATES MNG.	HARDING	24	17 N	1.0 E	07	SURFACE	<100	0
ELFANOR 1	BROWN, E.G.	HARDING	5	20 N	5.0 E	07	SURFACE	<100	0
FLAT TOP GROUP	CREVIER+LUDLOW+S	HARDING	27	22 N	6.0 E	07	SURFACE	1,000 - 100,000	100
HILLTOP GROUP	HANSON LLEWELYN	HARDING	12	16 N	8.0 E	07	SURFACE	1,000 - 100,000	50
JEFFERY LYNN	MILLER, M.D.	HARDING	23	21 N	5.0 E	07	SURFACE	<100	150
JIM GROUP	LEHAR+PATTERSON	HARDING	22	22 N	5.0 E	07	SURFACE	<100	50
LAST CHANCE GROU	KALINAS BROS.	HARDING	20	22 N	5.0 E	07	SURFACE	100 - 1,000	50
LINDAHL	LINDAHL	HARDING	27	22 N	6.0 E	07	SURFACE	1,000 - 100,000	50
LONESOME PETE	HAIVALA, W.S.	HARDING	26	21 N	4.0 E	07	SURFACE	100 - 1,000	50
LUCKY STRIKE 2	LUCKY SIX MNG.	HARDING			0		SURFACE	<100	0
MC CURDY LEASE	MCCURDY+STENSETH	HARDING	21	22 N	6.0 E	07	SURFACE	<100	50
MOONSHINE	MOONSHINE URAN.	HARDING	29	16 N	9.0 E	07	SURFACE	<100	100
PICKPOCKET	MUNKRES, WM. L.	HARDING	35	22 N	5.0 E	07	SURFACE	1,000 - 100,000	50
QUAD 1 + 2	QUAD MNG CO	HARDING	13	16 N	8.0 E	07	SURFACE	<100	50
QUINN 6	QUINN, J.F. + R.N.	HARDING			0		SURFACE	<100	0
RELF GROUP	VOSS OIL CO.	HARDING	26	22 N	5.0 E	07	SURFACE	1,000 - 100,000	50
RILEY GROUP	OLSON + OAKLAND	HARDING	23	22 N	5.0 E	07	SURFACE	1,000 - 100,000	50
SNAKE EYE	STERNAD + HILL	HARDING	36	22 N	5.0 E	07	SURFACE	1,000 - 100,000	50
SNOOKS	PETERS, M.+E.	HARDING	29	22 N	5.0 E	07	SURFACE	<100	50
SUSAN BECKY	RYMROCK MINING	HARDING	23	22 N	5.0 E	07	SURFACE	1,000 - 100,000	50
TRIO LODGE	TRIO MINING CO.	HARDING	18	16 N	9.0 E	07	SURFACE	100 - 1,000	50
BAVARIA	ROCKFORD THREE S	LAWRENCE			0		SURFACE	<100	0
STANLEY	ROCKFORD THREE S	LAWRENCE			0		SURFACE	<100	300
JELD 1	DENEVAN L.R.	PENNINGTON			0		SURFACE	<100	50
KAYLOR LEASE	BALDWIN, F.V.	PENNINGTON			0		SURFACE	<100	50
KOOL 10	ARNOLD, THOMAS F.	PENNINGTON			0		SURFACE	<100	50
RUBE 1	PICTOGRAPH MNG.	PENNINGTON			0		UNDERGRO	100 - 1,000	0
TED 1	MILLER, THEODORE	PENNINGTON			0		SURFACE	<100	50

***** TEXAS *****

SAUL BROS LEASE	BRISCOE CO, URAN	BRISCOE			0		SURFACE	<100	0
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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** TEXAS (CONT'D) *****									
TULE RANCH	LOVE MINING CO.	BRISCOE			0		SURFACE	<100	0
WILD HORSE MINE	JOHNSON, JAMES	BURNET			0		SURFACE	<100	50
EUBANKS RANCH	RADIATION EXPL C	CROSBY			0		SURFACE	100 - 1,000	50
CROWN	RADIATION EXPL C	GARZA			0		SURFACE	<100	50
GARZA COUNTY EXP	ADAMS, JOHN	GARZA			0		SURFACE	<100	0
HILLSIDE	GARZA MINING CO.	GARZA			0		SURFACE	<100	50
MC ARTHUR NWQSEC	MC ARTHUR STOCK	GARZA			0		SURFACE	<100	50
TWIN RATTLER	RADIATION EXPL C	GARZA			0		SURFACE	100 - 1,000	50
YELLOW CUB-SEC.4	RADIATION EXPL C	GARZA			0		SURFACE	100 - 1,000	50
DUNDERSTADT	CITIES SERVICE	GONZALES			0		IN-SITU	100 - 1,000	0
SMITH E.F. 14	CONOCO-PIONEER	GONZALES			0		SURFACE	>100,000	100
BOSO-HACKNEY 2	SUSQUEHANNA WEST	KARNES			0		SURFACE	1,000 - 100,000	50
BRYSCH LEASE	SUSQUEHANNA WEST	KARNES			0		SURFACE	1,000 - 100,000	100
FT.WORTH NATBK4	CONOCO-PIONEER	KARNES			0		SURFACE	1,000 - 100,000	100
HAASE F.(UL1491)	CONOCO-PIONEER	KARNES			0		SURFACE	>100,000	100
HACKNEY	SUSQUEHANNA WEST	KARNES			0		SURFACE	1,000 - 100,000	50
KELLNER LEASE 7	CONOCO-PIONEER	KARNES			0		SURFACE	>100,000	150
LAUM A LEASE 12	CONOCO-PIONEER	KARNES			0		SURFACE	1,000 - 100,000	100
LYSSY NIESTORY	SUSQUEHANNA WEST	KARNES			0		SURFACE	1,000 - 100,000	200
MANKA, J.(203)	CONOCO-PIONEER	KARNES			0		SURFACE	1,000 - 100,000	150
MC CRADY LEASE	CONOCO PIONEER	KARNES			0		SURFACE	>100,000	200
MOCZYGENBA LSE12	CONOCO PIONEER	KARNES			0		SURFACE	1,000 - 100,000	200
NIESCHWITZ-725	CONOCO-PIONEER	KARNES			0		SURFACE	1,000 - 100,000	100
NUHN LEASE	CONOCO-PIONEER	KARNES			0		SURFACE	>100,000	50
PAWELEK TRACT	CONOCO-PIONEER	KARNES			0		SURFACE	>100,000	100
PFEIL-WEIG, 303-1	CONOCO-PIONEER	KARNES			0		SURFACE	>100,000	150
SEARCY-PAWELEK	CONOCO-PIONEER	KARNES			0		UNKNOWN	1,000 - 100,000	0
SICKENIUS LEASE	CONOCO-PIONEER	KARNES			0		SURFACE	>100,000	50
SOUTH BRYSCH LEA	SUSQUEHANNA WEST	KARNES			0		SURFACE	1,000 - 100,000	100
STOEL-NIES-BOD.0	CONOCO-PIONEER	KARNES			0		SURFACE	>100,000	150
WEDDINGTON-SUS	CONOCO-PIONEER	KARNES			0		SURFACE	>100,000	150
WEDDINGTON-TENNE	CONOCO-PIONEER	KARNES			0		SURFACE	>100,000	400
WRIGHT LEASE 7	CONOCO-PIONEER	KARNES			0		SURFACE	>100,000	200
WURZRACH	SUSQUEHANNA WEST	KARNES			0		SURFACE	1,000 - 100,000	50
CLAY WEST SLUPRY	DALCO-U S STEEL	LIVE OAK			0		IN-SITU	<100	0
E-S-B HEAP LEACH	CONOCO-PIONEER	LIVE OAK			0		HL-ORES	1,000 - 100,000	0
ESSE-SPOON-SCHP2	CONOCO PIONEER	LIVE OAK			0		SURFACE	>100,000	200
KOPPLIN, H. 363	WYOMING MINERALS	LIVE OAK			0		SURFACE	>100,000	150
MABEL NEW	CONOCO-PIONEER	LIVE OAK			0		SURFACE	1,000 - 100,000	100
MC LEAN 1 + 2	EXXON CO USA	LIVE OAK			0		SURFACE	>100,000	50
RYAN	CONOCO-PIONEER	LIVE OAK			0		SURFACE	1,000 - 100,000	50
***** UTAH *****									
BEEHIVE 5	ATKINSON EXPL.CO	BFAVER			0		UNDERGRO	<100	50
C D P	CARTER+DALTON+PO	BEAVER			0		UNDERGRO	<100	50
DAISY	STAATS + LONDER	BEAVER			0		UNDERGRO	100 - 1,000	100

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
GEYSER BASIN	GEYSER BASIN UPA	BEAVER			0		SURFACE	<100	0
IRON QUEEN	C + H MNG.	BEAVER			0		UNDERGRO	<100	100
LITTLE SISTERS	GRAEFF, RUSSELL	BEAVER			0		SURFACE	<100	50
MERCURY SEC 14	GARRICK, ELDRED M	BEAVER			0		SURFACE	<100	0
MYSTERY SNIFFER PRODUCER	MYSTERY SNIFFER	BEAVER	28	27 S	6.0 W	24	UNDERGRO	1,000 - 100,000	200
WILLARD GROUP	ATKINSON EXPL.CO	BEAVER			0		UNDERGRO	100 - 1,000	50
BLUE SKY 1	DREWES, VERNON	BOX ELDER			0		SURFACE	<100	150
KEG	GRAHAM, FRED H.	DUCHESNE			0		SURFACE	<100	0
OH HENRY 1	REED, G.B.	DUCHESNE			0		UNDERGRO	<100	0
RAINBOW RIDGE GR 12A	ACADEMY URANIUM	DUCHESNE			0		SURFACE	<100	0
4-CORNERS AREA D A,+G.1	PARRISH+DALGLEI	DUCHESNE			0		SURFACE	<100	0
A,E,C. INCLINE	WPIGHT, L.B.	EMERY			0		UNDERGRO	<100	0
A,E,C.13	ATLAS MINERALS	EMERY			0		DUMPS	1,000 - 100,000	0
A,E,C.6+8	ALBRECHT BROS.UR	EMERY			0		UNDERGRO	100 - 1,000	100
A,E,C.7	CONSOLIDATED URA	EMERY			0		UNDERGRO	100 - 1,000	0
ACEITE 2	CONSOLIDATED URA	EMERY			0		UNDERGRO	<100	250
ADDIT 2	UNION CARBIDE CP	EMERY			0		UNDERGRO	>100,000	100
APEX 5	CONSOLIDATED URA	EMERY			0		UNDERGRO	<100	150
BAKER INCLINE	CONSOLIDATED MON	EMERY			0		UNDERGRO	1,000 - 100,000	50
BEAR CLAW	CONSOLIDATED URA	EMERY			0		UNDERGRO	1,000 - 100,000	0
BIG CHIEF 8	WOODWARD, O.W.	EMERY			0		UNDERGRO	<100	0
BIG FLAT 1	UNION CARBIDE CP	EMERY			0		UNDERGRO	1,000 - 100,000	100
BIG ROCK	RACHIDE + CHIDES	EMERY			0		UNDERGRO	<100	0
BIRTHDAY	BRACE, REED	EMERY			0		SURFACE	<100	0
BLACK ROCK 1	HUNT, REO	EMERY			0		UNDERGRO	<100	0
BLANCO	URANIUM INC.	EMERY			0		UNDERGRO	<100	0
BLOCK C	WILCOX, BERT L.	EMERY			0		UNDERGRO	100 - 1,000	0
BLOCK G	FOOTE L.S.	EMERY			0		SURFACE	<100	50
BLUE BELL 2	STONE, E.F.	EMERY			0		SURFACE	<100	0
BLUE BUTTE	PLATEAU URANIUM	EMERY			0		UNDERGRO	<100	0
BLUE BUTTE 1	CONSOLIDATED URA	EMERY			0		UNDERGRO	<100	0
BLUE GOOSE	FARNSWORTH, EMERS	EMERY			0		SURFACE	<100	0
BLUE JAY 1	DAVIS + NIELSON	EMERY			0		SURFACE	<100	0
BLUEBIRD	ADAMS, R.D.+L.A.	EMERY			0		SURFACE	<100	0
BRIDGE 2-12	ASIMUS, C.C.	EMERY			0		UNDERGRO	100 - 1,000	0
BUCKHORN	JENSEN + KOURIS	EMERY			0		SURFACE	<100	50
BUCKSKIN 2	HUNT, KAY	EMERY			0		UNDERGRO	100 - 1,000	0
BULL 1	HAYES H.+ M.	EMERY			0		UNDERGRO	100 - 1,000	0
BUZZARDS ROOST	HANSEN, HOMER	EMERY			0		UNDERGRO	<100	0
CAMP BIRD GROUP	KAINSTEAUX, HARVE	EMERY			0		SURFACE	<100	0
CANARY GROUP	FAUCETT + JONES	EMERY			0		SURFACE	<100	0
CAT BIRD	VALLEY MINING CO	EMERY			0		UNDERGRO	<100	0
CECILIAITE 1	HAMILTON J.C.	EMERY			0		SURFACE	<100	0
CEDAR MTN SEC 36	UNION CARBIDE CP	EMERY			0		UNDERGRO	1,000 - 100,000	100
	LITTLE WILD HORS	EMERY			0		UNDERGRO	100 - 1,000	0
	WILLIAMS MINERAL	EMERY			0		UNDERGRO	100 - 1,000	0
	ACERSON, ALFRED O	EMERY			0		SURFACE	<100	0
	R HENDERSON	EMERY			0		SURFACE	100 - 1,000	50

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WINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
CEDAR RIDGE 2	CEDAR RIDGE URAN	EMERY			0		SURFACE	<100	0
CHERIE 1,2+3	KRUGER, RICHARD	EMERY			0		SURFACE	<100	100
CISTERN 1 + 2	ENERGY FUELS NUC	EMERY			0		UNDERGRO	1,000 - 100,000	100
CLIFF DWELLER 1	CHEETLE, E.V.	EMERY			0		UNDERGRO	<100	0
CONRAD	CONRAD URAN,INC	EMERY			0		UNDERGRO	1,000 - 100,000	100
CONSOLIDATED	ELLIOTT, JAMES O	EMERY			0		UNDERGRO	1,000 - 100,000	0
CONTROVERSY 1	HOWARD, BRUCE	EMERY			0		UNDERGRO	1,000 - 100,000	0
COPPER HEAD	BEHUNIN, JOANNE	EMERY			0		SURFACE	<100	0
COTTONWOOD 1	NOYES, FRED	EMERY			0		SURFACE	<100	50
COUGAR 2	RAINBOW URANIUM	EMERY			0		SURFACE	<100	150
CROSSROW	CULLUM, CARROL	EMERY			0		UNDERGRO	1,000 - 100,000	50
CROW	HAMILTON J.C.	EMERY			0		SURFACE	<100	0
D.+R. CLAIMS	CONTIN.URAN.WYO.	EMERY			0		UNDERGRO	<100	0
DALTON BROS 2	DALTON BROS,	EMERY			0		SURFACE	<100	0
DARLENE 1-20	ACERSON,ALFRED O	EMERY			0		UNDERGRO	<100	50
DELTA DUMP	PRESSREY, G. M.	EMERY			0		DUMPS	1,000 - 100,000	0
DESERT MOON	PETRO NUCLEAR	EMERY			0		UNDERGRO	100 - 1,000	50
DESOLATION	LA., GLEN A.	EMERY			0		SURFACE	<100	0
DIXIE JOYCE	LINDQUIST, JOE	EMERY			0		SURFACE	<100	0
DOLLY	ELLIOTT, JAMES O	EMERY			0		UNDERGRO	<100	0
DONITE GROUP	ACERSON,ALFRED O	EMERY			0		UNDERGRO	100 - 1,000	200
DRILL 2	INLAND RESOURCE+	EMERY			0		SURFACE	<100	0
EAGLE-BATTLESHIP	OUTWEST URAN+OIL	EMERY			0		UNDERGRO	100 - 1,000	150
EAGLES NEST	HEATH, WILFOPD	EMERY			0		SURFACE	<100	0
ELMER E CASPER	CASPER,CAPLTON P	EMERY			0		SURFACE	<100	50
FANTASTIC	JEWKES + COVEY	EMERY			0		UNDERGRO	<100	0
FISHER	HAMILTON J.C.	EMERY			0		SURFACE	<100	0
FLINTYPE 2	STEEL, L.F.	EMERY			0		UNDERGRO	<100	100
GREAT BASIN	U.S.URANIUM CORP	EMERY			0		UNDERGRO	<100	100
GREEN DRAGON	ALBRECHT PROS.UR	EMERY			0		UNDERGRO	100 - 1,000	150
GREEN VEIN	BRYON, ELDON	EMERY			0		SURFACE	<100	0
GREEN VEIN 2	JENSEN,WALTER K.	EMERY			0		UNDERGRO	100 - 1,000	0
GREEN VEIN 5	ENERGY FUELS NUC	EMERY			0		UNDERGRO	100 - 1,000	100
GREEN VIEW 4	CAPITOL REEF URA	EMERY			0		UNDERGRO	100 - 1,000	100
HARD CLIMBING 10	PETITTI, JOHN J.	EMERY			0		UNDERGRO	<100	0
HAPDLUCK	DALE DILLON	EMERY			0		SURFACE	100 - 1,000	0
HERTZ 1	DONALD HANNI	EMERY			0		UNDERGRO	1,000 - 100,000	100
HIDDEN POINT	CHIDESTER, JOE	EMERY			0		SURFACE	<100	0
INCL 6 DUMPS	PETRO NUCLEAR	EMERY			0		DUMPS	1,000 - 100,000	200
INCLINE 10	PETRO NUCLEAR	EMERY			0		UNDERGRO	100 - 1,000	50
INCLINE 11	ATLAS MINFRALS	EMERY			0		UNDERGRO	100 - 1,000	150
INCLINE 12	PETRO NUCLEAR	EMERY			0		UNDERGRO	1,000 - 100,000	50
INCLINE 13	PETRO NUCLEAR	EMERY			0		UNDERGRO	100 - 1,000	100
INCLINE 14 + 15	PETRO NUCLEAR	EMERY			0		UNDERGRO	1,000 - 100,000	50
INCLINE 16	PETRO NUCLEAP	EMERY			0		UNDERGRO	100 - 1,000	100
INCLINE 17	PETRO NUCLEAR	EMERY			0		UNDERGRO	1,000 - 100,000	50
INCLINE 18	FOUR CORNERS OIL	EMERY			0		UNDERGRO	100 - 1,000	0
INCLINE 19	FOUR CORNERS OIL	EMERY			0		UNDERGRO	100 - 1,000	100*

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
INCLINE 2-WED.BE	PETRO NUCLEAR	EMERY			0		UNDERGRO	100 - 1,000	100
INCLINE 20	FOUR CORNERS OIL	EMERY			0		UNDERGRO	<100	100
INCLINE 21	FOUR CORNERS OIL	EMERY			0		UNDERGRO	1,000 - 100,000	100
INCLINE 22	FOUR CORNERS OIL	EMERY			0		UNDERGRO	100 - 1,000	100
INCLINE 3	PETRO NUCLEAR	EMERY			0		UNDERGRO	1,000 - 100,000	250
INCLINE 4+5	PETRO NUCLEAR	EMERY			0		UNDERGRO	1,000 - 100,000	200
INCLINE 7-MINE 7	PETRO NUCLEAR	EMERY			0		UNDERGRO	100 - 1,000	100
INCLINE 8+DINOSA	ATLAS MINERALS	EMERY			0		UNDERGRO	1,000 - 100,000	200
INCLINE 9 NORTH	ATLAS MNRLS.	EMERY			0		UNDERGRO	1,000 - 100,000	150
INCLINE 9(RED 1-	ATLAS MINERALS	EMERY			0		UNDERGRO	1,000 - 100,000	150
JACK POT	CONSOLIDATED URA	EMERY			0		UNDERGRO	<100	0
JOHNNIE BOY 2	JOHNSON+JOHNSON	EMERY			0		SURFACE	<100	0
JOSHUA 1	JOSHUA MINING CO	EMERY			0		UNDERGRO	<100	0
KOH-BIRDSEYE	U NEVA UPAN,CORP	EMERY			0		UNDERGRO	<100	50
LAST CHANCE	LAST CHANCE MNG	EMERY			0		SURFACE	<100	0
LAST CHANCE 8	WRIGHT, WAYNE S.	EMERY			0		SURFACE	<100	0
LE DUC LEASE	UNION CAPRADE CP	EMERY			0		UNDERGRO	1,000 - 100,000	150
LITTLE EPMA 2	CHUTE CANYON UR.	EMERY			0		UNDERGRO	100 - 1,000	100
LITTLE JOE	CURTIS, RUSSELL	EMERY			0		UNDERGRO	<100	0
LITTLE LIL-JERRY	BLACK BULL MNG.	EMERY			0		UNDERGRO	1,000 - 100,000	300
LITTLE MIKE	GRAMLICH MINERAL	EMERY			0		UNDERGRO	100 - 1,000	0
LITTLE SUSAN	ABS MINING CO.	EMERY			0		UNDERGRO	100 - 1,000	150
LITTLE WILDCAT	JACKSON,GEORGE R	EMERY			0		SURFACE	<100	0
LOME TREE GROUP	EMERY ENTERPRISE	EMERY			0		UNDERGRO	<100	0
LOOKOUT 1	HAMILTON J.C.	EMERY			0		SURFACE	<100	0
LORETTA	WRIGHT, L.P.	EMERY			0		UNDERGRO	<100	0
LUCKY DOG 1	FOOTE L.S.	EMERY			0		SURFACE	<100	50
LUCKY SQUIRREL	GRAMLICH MINERAL	EMERY			0		UNDERGRO	<100	0
LUCKY STRIKE	NIXON URANIUM CO	EMERY			0		UNDERGRO	100 - 1,000	50
LUCKY STRIKE 1,2	ASIYUS, C.C.	EMERY			0		UNDERGRO	100 - 1,000	0
LUCKY STRIKE GRO	FERRON URAN MNG	EMERY			0		UNDERGRO	1,000 - 100,000	200
LUCKY STRIKE GRO	JACKSON,GEORGE B	EMERY	6	24 S	9,0 E	24	UNDERGRO	1,000 - 100,000	150
MAGPIE	JEWKES M.K.	EMERY			0		SURFACE	<100	0
MAJESTIC 2	RAE JEAN MINING	EMERY			0		UNDERGRO	<100	150
MANILA GROUP	BEHUVIN, JOANNE	EMERY			0		SURFACE	<100	150
MARY JO 2	PETERSON, JESS	EMERY			0		SURFACE	<100	0
MAYFLOWER	U.S.URANIUM CORP	EMERY			0		UNDERGRO	<100	100
MAYFLOWER 1	CALDERWOOD, J.M.	EMERY			0		UNDERGRO	100 - 1,000	0
MAYFLOWER 32	U.S.URANIUM CORP	EMERY			0		UNDERGRO	<100	150
MESA 1	BENTLEY, JIM	EMERY			0		UNDERGRO	1,000 - 100,000	0
MISCELLANEOUS	FOUR CORNERS OIL	EMERY			0		UNDERGRO	<100	0
MORLENE 1	STILSON, OPSON	EMERY			0		SURFACE	<100	0
MOUNTAIN KING	SKIDMORE, T.H.	EMERY			0		UNDERGRO	100 - 1,000	0
MOUNTAIN KING 1	CONSOLIDATED URA	EMERY			0		UNDERGRO	<100	0
MOUNTAIN KING 2	SKIDMORE, T.H.	EMERY			0		UNDERGRO	100 - 1,000	0
MOUNTAIN KING 3	SKIDMORE, T.H.	EMERY			0		UNDERGRO	1,000 - 100,000	0
MOUNTAIN KING GR	CONSOLIDATED URA	EMERY			0		UNDERGRO	1,000 - 100,000	0
MUCHO	ATLAS MINERALS	EMERY			0		UNDERGRO	100 - 1,000	50

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
MUDDY 7	CIMMARON MNG.	EMERY			0		UNDERGRO	100 - 1,000	100
MUDDY 8	HUNTER L.T.	EMERY			0		UNDERGRO	100 - 1,000	0
MUDDY RIVER	HUNTER L.T.	EMERY			0		SURFACE	<100	0
NQ. 2	FRANSEN, LAVERN	EMERY			0		SURFACE	<100	0
NORMA JOE	JOHNSON MELVIN C	EMERY			0		UNDERGRO	<100	0
NORTH MESA 1	UNION CARBIDE CP	EMERY			0		UNDERGRO	1,000 - 100,000	150
NORTH MESA 12	CONSOLIDATED URA	EMERY			0		UNDERGRO	<100	0
NORTH MESA 17	CONSOLIDATED URA	EMERY			0		UNDERGRO	<100	0
NORTH MESA 6	CONSOLIDATED URA	EMERY			0		SURFACE	<100	0
NORTH MESA 9	UNION CARBIDE CP	EMERY			0		UNDERGRO	1,000 - 100,000	50
NORTH MOUNTAIN 2	WILKERSON, THOMAS	EMERY			0		SURFACE	<100	300
NORTH SLOPE GROU	JACKSON, LEO D.	EMERY			0		UNDERGRO	100 - 1,000	0
NORTH STAR	HAYS, MONTY	EMERY			0		SURFACE	<100	0
PACIFIC VENTURES	BAY WEST INC.	EMERY			0		UNDERGRO	1,000 - 100,000	0
PAY DAY	AGAARD, ELMER R. A	EMERY			0		UNDERGRO	100 - 1,000	100
PEARCE + KELLEY	FOUR CORNERS OIL	EMERY			0		UNDERGRO	<100	0
POSSIBILITY 3	HEATH, WILFORD	EMERY			0		SURFACE	<100	0
PABBIT 1	GALAGER+PIECRUCC	EMERY			0		UNDERGRO	100 - 1,000	0
RAINY DAY	GREEN FORK MNG.	EMERY			0		UNDERGRO	100 - 1,000	250
RED 1,2+5	PETRO NUCLEAR	EMERY			0		UNDERGRO	1,000 - 100,000	250
RED BONE 10	VITRO MINERALS	EMERY			0		UNDERGRO	100 - 1,000	100
RED BONE 5	WELCH MINING CO	EMERY			0		UNDERGRO	<100	100
RED BONE 9	PETRO NUCLEAR	EMERY			0		UNDERGRO	1,000 - 100,000	150
RED BUTTE 1-4	ADAMS URANIUM CO	EMERY			0		SURFACE	<100	100
RED CLIFF 3	WINDER, WALLACE	EMERY			0		SURFACE	<100	0
RED FACE	KNIGHT, HYRUM	EMERY			0		SURFACE	<100	50
RED PORT	HEATH, WILFORD	EMERY			0		SURFACE	<100	0
RED SEEPS	MOAR URANIUM CO.	EMERY			0		UNDERGRO	<100	0
REX 1	UNION CARBIDE CP	EMERY			0		UNDERGRO	1,000 - 100,000	0
RYAN 11	MAYNARD + RYAN	EMERY			0		SURFACE	<100	0
SAHARA 16	ENERGY FUELS NUC	EMERY			0		UNDERGRO	1,000 - 100,000	250
SC SEC. 36-185-10	RAM MINING CO	EMERY			0		SURFACE	<100	100
SCH SEC 2	ACEPSON, ALFRED O	EMERY			0		UNDERGRO	100 - 1,000	100
SCH, SEC. 2+16	ASIMUS, C.C.	EMERY			0		UNDERGRO	<100	0
SOUTH TEMPLE	SKIDMORE, T.H.	EMERY			0		UNDERGRO	<100	0
SOUTHERN CROSS	WINN, JOHN	EMERY			0		UNDERGRO	<100	0
SQUIRREL	GRANLICH MINERAL	EMERY			0		SURFACE	<100	0
STILSON 5	STILSON, DOYLE	EMERY			0		SURFACE	<100	0
TEMPLE 1	CONSOLIDATED URA	EMERY			0		SURFACE	<100	0
TOTEM POLE 1	BABBLE, GORDON	EMERY			0		SURFACE	<100	0
TOUGH LUCK 1	CONSOLIDATED URA	EMERY			0		UNDERGRO	<100	0
TWIN PEAKS	WINN, JOHN	EMERY			0		SURFACE	<100	0
UNION GOLF 3	THOMAS, HARVEY	EMERY			0		UNDERGRO	100 - 1,000	100
UNKNOWN	NUCLEAR MINES IN	EMERY			0		UNDERGRO	<100	0
VAN BERP 2	KNIGHT, M.R.	EMERY			0		UNDERGRO	100 - 1,000	0
VANADIUM KING 4+	ROBINSON, ELWIN	EMERY			0		UNDERGRO	1,000 - 100,000	0
VARIOUS	CONSOLIDATED URA	EMERY			0		UNDERGRO	1,000 - 100,000	100
VENTURE	GREEN HORNET MNG	EMERY			0		SURFACE	<100	100

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
VIRGINIA VALLEY	LAW, GLEN A.	EMERY	0				SURFACE	100 - 1,000	100
VITRO DUMP	VITRO CHEMICAL	EMERY	0				DUMPS	100 - 1,000	0
WEDDING BELL	H.M.W. MINERALS	EMERY	0				UNDERGRO	1,000 - 100,000	150
WHITE STAR 1-10	B + B MINING CO.	EMERY	0				UNDERGRO	100 - 1,000	50
WICKIUP	ARAGON, A.B.	EMERY	0				UNDERGRO	<100	200
WILD HORSE 22,27	CISTERN MINING	EMERY	0				UNDERGRO	100 - 1,000	100
WILDCAT	JENSEN + JACKSON	EMERY	0				SURFACE	<100	0
WILLOW SPRINGS	WINTERS + JONES	EMERY	0				SURFACE	<100	0
WINDY	BLACK DRAGON URA	EMERY	0				SURFACE	<100	0
AGATE GROUP	UNITED ENERGY	GARFIELD	0				UNDERGRO	1,000 - 100,000	100
ALLEN 3	KAISER URAN.CO.	GARFIELD	0				UNDERGRO	<100	150
B + M CLAIM 1	UNKNOWN	GARFIELD	0				SURFACE	<100	50
BEAR CANYON	HEIMECKE PROS.	GARFIELD	0				UNDERGRO	<100	100
BETTY JACK	FEDERAL RESOURCE	GARFIELD	0				SURFACE	<100	100
BIG TREE	UNIVERSAL URAN.C	GARFIELD	0				SURFACE	<100	300
BLACK CAT 2	20TH CENTURY POW	GARFIELD	0				SURFACE	<100	100
BLACK MOUNTAIN	MC ELROY, JOHN	GARFIELD	0				SURFACE	<100	100
BLACK WIDOW	HOLMES, J.MARK	GARFIELD	0				UNDERGRO	100 - 1,000	150
BLITZ	ENERGY FUELS NUC	GARFIELD	0				UNDERGRO	1,000 - 100,000	50
BLUE BIRD	ACHE URANIUM MNG	GARFIELD	0				UNDERGRO	<100	50
BLUE BIRD 4	RAINBOW URANIUM	GARFIELD	0				SURFACE	<100	150
BLUE GOOSE	BLUE GOOSE MNG	GARFIELD	0				SURFACE	<100	100
BROWN TOP	DAVIDSON, EMERY L	GARFIELD	0				UNDERGRO	<100	150
BUFF	CHRISTENSEN, ARWI	GARFIELD	0				UNDERGRO	<100	200
BULL 4	WRIGHT, W.K.	GARFIELD	0				UNDERGRO	<100	150
BUST 2	HUNT, REO	GARFIELD	0				UNDERGRO	<100	50
BUTTLAR WASH 1	SMITH + STEWART	GARFIELD	0				SURFACE	<100	100
CARRON 1	EKKER, HAROLD C.	GARFIELD	0				SURFACE	<100	100
CEDAR POINT 2	SILVER BELL INDU	GARFIELD	0				UNDERGRO	100 - 1,000	100
CIRCLE CLIFFS	COOPER + BROWN	GARFIELD	0				SURFACE	<100	100
COFFEE ROYAL 1 +	BROWN, A.P. + ASSOC	GARFIELD	0				SURFACE	<100	100
CONGRESS 14	BULLDOG MINING C	GARFIELD	0				UNDERGRO	<100	250
CONGRESS 22	GUTHRIE + ASSOC.	GARFIELD	0				UNDERGRO	<100	250
CONGRESS 24	GUTHRIE + ASSOC.	GARFIELD	0				UNDERGRO	<100	300
CONGRESS 25	GUTHRIE + ASSOC.	GARFIELD	0				UNDERGRO	<100	300
CONGRESS 47	GENERAL UTILITIES	GARFIELD	0				SURFACE	<100	100
CONGRESS 47+48+5	EKKER, HAROLD C.	GARFIELD	0				SURFACE	<100	150
CONGRESS 53	INDUSTRIES+MINES	GARFIELD	0				UNDERGRO	<100	200
CROW-LUCKY SLATE	SMITH, C.C.	GARFIELD	0				UNDERGRO	<100	200
DEAN 4	GENERAL UTILITIES	GARFIELD	0				SURFACE	<100	100
DEEP CANYON 1	EKKER, HAROLD C.	GARFIELD	0				SURFACE	100 - 1,000	150
DEEP CANYON 2	EKKER, HAROLD C.	GARFIELD	0				SURFACE	<100	150
DENNEA LOU	HERCULES URANIUM	GARFIELD	0				SURFACE	<100	50
DIRTY SHAME 7	DIRTY SHAME MNG	GARFIELD	0				SURFACE	<100	200
DOMS 1	EKKER, RITTER	GARFIELD	0				SURFACE	<100	50
DREAM	BROWN + SONS CO	GARFIELD	0				UNDERGRO	<100	100
DREAM CLAIM 1	DREAM MINING CO	GARFIELD	0				SURFACE	<100	100
DUKE MINE	FRANSEN BROS.	GARFIELD	0				SURFACE	<100	100

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
EAGLE GROUF	EKKER, HORACE	GARFIELD			0		UNDERGRO	100 - 1,000	250
EAST COVE 9	HONEY POT URAN C	GARFIELD			0		SURFACE	<100	100
EDNA GROUF	EKKER, HAROLD C.	GARFIELD			0		SURFACE	<100	150
ELLEN 1	HUNT, REO	GARFIELD			0		UNDERGRO	100 - 1,000	100
ELLSWORTH 1	PROSPECTORS, INC.	GARFIELD			0		SURFACE	<100	100
ELORA 1	EKKER, RITTER	GARFIELD			0		SURFACE	100 - 1,000	50
ELSWORTH 1	EKKER, HAROLD C.	GARFIELD			0		SURFACE	<100	50
ERMA MAE 1 + 2	FAIRBANKS, NEIL	GARFIELD			0		SURFACE	<100	50
EUNICE 1	WOOD, HOWARD P.	GARFIELD			0		SURFACE	<100	50
FIVE STAP GROUP	DUNFIELD, MABLE P	GARFIELD			0		SURFACE	<100	100
FREMONT ASSOC 1	FREMONT ASSOC. D.	GARFIELD			0		SURFACE	<100	200
GARFIELD	STUD HORSE BUTTE	GARFIELD			0		UNDERGRO	<100	200
GENERAL	EKKER, HAROLD C.	GARFIELD			0		SURFACE	<100	50
H., H. 3-5+15	BAKER, JOE	GARFIELD			0		UNDERGRO	100 - 1,000	50
HANSEN 4	HANSEN, J. VEARS	GARFIELD			0		SURFACE	<100	100
HARD ROCK	HOLMES, J. MARK	GARFIELD			0		SURFACE	<100	150
HARD SCRAPBLE 1	HUNT, KAY	GARFIELD			0		SURFACE	<100	150
HENRY 12	BROWN, J. F.	GARFIELD			0		SURFACE	<100	100
HENRY MOUNTAINS	HUNT, KAY	GARFIELD			0		UNDERGRO	1,000 - 100,000	50
HOPE	HOPE MINING CO	GARFIELD			0		UNDERGRO	100 - 1,000	200
HOPE-CIRCLE CLIF	STUD HORSE BUTTE	GARFIELD			0		UNDERGRO	100 - 1,000	50
HOT SHOT+HT. SHT.	HOWARD S. K.	GARFIELD			0		UNDERGRO	100 - 1,000	100
JAKE	BUCHANE, SANDY L	GARFIELD			0		SURFACE	<100	50
JIM DANDY	HUNT, REO	GARFIELD			0		UNDERGRO	100 - 1,000	50
JUNE BELL GROUP	FOOTE MINFRALS	GARFIELD			0		UNDERGRO	100 - 1,000	50
KING GROUP	HUNT, KAY	GARFIELD			0		SURFACE	1,000 - 100,000	50
LAST CHANCE 1	UTAH FNERGY CO.	GARFIELD			0		UNDERGRO	<100	150
LITTLE SUE	ALLEN PAUL K	GARFIELD			0		SURFACE	<100	50
LODE	C+H MINING	GARFIELD			0		SURFACE	<100	50
LONE F.	MORTENSEN, NEAL J	GARFIELD			0		UNDERGRO	<100	50
LONE EAGLE 1-9	SHOOTERING CREEK	GARFIELD			0		UNDERGRO	100 - 1,000	100
LOUISE 1	JUSTENSEN, LEE	GARFIELD			0		SURFACE	<100	100
LUCKY DAY	WARDEN+TWITCHELL	GARFIELD			0		UNDERGRO	<100	100
LUCKY STRIKE 1-7	JENSEN + JACKSON	GARFIELD			0		UNDERGRO	1,000 - 100,000	100
LUCKY STRIKE 10	KLIPPEL, BEN F.	GARFIELD			0		UNDERGRO	1,000 - 100,000	300
LUCKY STRIKE 8 +	HYDRO JET SERVIC	GARFIELD			0		UNDERGRO	1,000 - 100,000	150
LUCKY STRIKE 1 9+	EKKER, HAROLD C.	GARFIELD			0		SURFACE	<100	50
MAJESTIC + MODOC	P+P ASSOCIATES	GARFIELD			0		UNDERGRO	100 - 1,000	150
MAJESTIC 1	BASTIAN, G. A.	GARFIELD			0		SURFACE	<100	50
MAUD 9	NOVELLE, F. D.	GARFIELD			0		UNDERGRO	<100	100
MERRI MAC GROUP	WOOD, HOWARD P.	GARFIELD			0		UNDERGRO	100 - 1,000	50
MIDNIGHT	TANNEP + TROUT	GARFIELD			0		SURFACE	<100	100
MIDNIGHT 1	WRIGHT, W. F.	GARFIELD			0		SURFACE	<100	50
MISFIT 1	SELF, ERROL	GARFIELD			0		SURFACE	<100	50
MODOC 2	RITER EKKER	GARFIELD			0		UNDERGRO	100 - 1,000	100
NANCY 2	S. + A. MINING CO.	GARFIELD			0		SURFACE	<100	50
NANCY JANE	BRET MINING CO	GARFIELD			0		SURFACE	<100	50
NAVAJO 1	HUNT, REO	GARFIELD			0		UNDERGRO	100 - 1,000	50

INACTIVE URANIUM MINES IN THE UNITED STATES
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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
OIL BEEP 8	EKKER, HAROLD C.	GARFIELD			0		SURFACE	<100	50
PENNEL 11	HUNT, REO	GARFIELD			0		UNDERGRO	100 - 1,000	150
PHYLLIS	EKKER, RITTER	GARFIELD			0		UNDERGRO	<100	200
QUEEN OF SHEBA	JENSEN, WESLEY	GARFIELD			0		SURFACE	<100	0
RAINY DAY	ACME URANIUM MNG	GARFIELD			0		UNDERGRO	1,000 - 100,000	350
RATS NEST	PROSPECTORS, INC.	GARFIELD			0		UNDERGRO	<100	100
RATTLESNAKE	DAVIS, RAY	GARFIELD			0		UNDERGRO	100 - 1,000	0
RED CLIFF	TANNER, RUTHERFOR	GARFIELD			0		SURFACE	<100	50
RENE BOB	SEVEY, JAMES	GARFIELD			0		SURFACE	<100	50
ROARING ATOM	JOHNSON + ROSS	GARFIELD			0		UNDERGRO	<100	100
ROBBERS ROOST	JENSEN MC MINING	GARFIELD			0		UNDERGRO	<100	0
ROSE ANN 1	APMSTRONG, LYLE C	GARFIELD			0		SURFACE	<100	100
ROSILAND 2	EKKER + SANDERS	GARFIELD			0		SURFACE	<100	50
ROY DEL GROUP	FEDERAL RESOURCE	GARFIELD			0		SURFACE	<100	50
RUBILEE 2	ARCO URANIUM CO	GARFIELD			0		UNDERGRO	<100	100
S.Y. 36	GUITHRIE + ASSOC.	GARFIELD			0		UNDERGRO	<100	100
SALINA 2	MATHIS, R.G.	GARFIELD			0		SURFACE	<100	0
SEC. 36-32S-11E	SHELCO, INC.	GARFIELD			0		UNDERGRO	100 - 1,000	0
SEC. 6-32S-11E(T-	P+P ASSOC	GARFIELD			0		UNDERGRO	100 - 1,000	0
SHOOTING 1 + 2	U NEVA URAN. CORP	GARFIELD			0		UNDERGRO	<100	50
SILVER FALLS	HINDS, FRED	GARFIELD			0		SURFACE	<100	100
SILVER LEAF	HINDS, FRED	GARFIELD			0		SURFACE	<100	100
SILVER ROCK GROU	SELF, ERROL	GARFIELD			0		SURFACE	<100	50
SPRING CANYON	EKKER, HORACE	GARFIELD			0		SURFACE	<100	50
STRAIGHT CREEK	ENERGY FUELS NUC	GARFIELD			0		UNDERGRO	100 - 1,000	50
SUNRISE 1-6	S. + A. MINING CO.	GARFIELD			0		SURFACE	<100	50
SYLVIA 2 + 14	CPEEL EM+ KING J	GARFIELD			0		UNDERGRO	<100	150
TENDERFOOT	HULLEN, BRADLEY	GARFIELD			0		UNDERGRO	<100	50
TRACKYTE 12	MILLARD GARDNER	GARFIELD			0		UNDERGRO	<100	50
TRACKYTE 17, 18+1	DENNIS EKKER	GARFIELD			0		UNDERGRO	1,000 - 100,000	100
TRACKYTE 9 10	CHESTNUT+HARTLEY	GARFIELD			0		UNDERGRO	100 - 1,000	100
TRAIL CANYON 1	EKKER, HOPACE	GARFIELD			0		SURFACE	<100	100
TRU ANN GROUP	PROSPECTORS, INC.	GARFIELD			0		UNDERGRO	100 - 1,000	50
TUNNISON	ACME URANIUM MNG	GARFIELD			0		UNDERGRO	<100	150
VA LEAR	HUNT, KAY	GARFIELD			0		SURFACE	<100	50
WALTER GROUP	DAY, ORSON	GARFIELD			0		UNDERGRO	100 - 1,000	150
WAR PAINT 1	WALLACE, LYMAN	GARFIELD			0		SURFACE	<100	50
WEST BANK	ROGERS, R.S.	GARFIELD			0		SURFACE	<100	50
WHITE BULL GROUP	TYREE, CHAS, H, EST	GARFIELD			0		UNDERGRO	100 - 1,000	150
WILLIE 1	URANIUM SERVICE	GARFIELD			0		SURFACE	<100	50
WOODPUFF GROUP	ENERGY FUELS NUC	GARFIELD			0		UNDERGRO	100 - 1,000	50
YELLOW CAT 1-3	NOVELLE, F.D.	GARFIELD			0		UNDERGRO	<100	50
YELLOW JACKET	BARNEY + HOWARD	GARFIELD			0		UNDERGRO	100 - 1,000	150
YELLOW PAINT	ATLAS-AMAX	GARFIELD			0		UNDERGRO	100 - 1,000	100
3 RS 5	BALSLEY, TOM	GRAND			0		UNDERGRO	100 - 1,000	0
A GROUP	URANIUM PROD CO	GRAND	12	26 S	17.0 E	24	UNDERGRO	1,000 - 100,000	50
AEC GROUP	SUTHEPLAND+SUTH	GRAND			0		SURFACE	<100	0
AUQUA	HARRIS MINING CO	GRAND		23 S	17.0 E	24	SURFACE	<100	150

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TO*NSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
AVIS-HORN	UNION CARRIDE CP	GRAND	1	25 S	25.0 E	24	UNDERGRO	1,000 - 100,000	100
BARE SPOT	SWARTZ, HAROLD H	GRAND	5	23 S	21.0 E	24	SURFACE	<100	50
BEAR POINT	LILE, GLEN	GRAND	29	25 S	25.0 E	24	SURFACE	100 - 1,000	0
BERTHA + FALCON	CLINE + CO.	GRAND	34	23 S	20.0 E	24	UNDERGRO	100 - 1,000	100
RIG BUCK 17	LAMMERT+BURGESS	GRAND		26 S	17.0 E	24	SURFACE	<100	150
BIG LOUIE 1	AMCAN	GRAND	21	24 S	26.0 E	24	UNDERGRO	1,000 - 100,000	0
BLACK APE 1 + 2	TERRA MARINE MNG	GRAND	7	23 S	22.0 E	24	UNDERGRO	1,000 - 100,000	50
BLUE BOY	HAMRICK, EARL	GRAND			0		SURFACE	<100	0
BLUE CHIEF	NICHOLS, CARL A.	GRAND			0		SURFACE	<100	0
BLUE CHIEF	COWGER W.R.	GRAND			0		SURFACE	<100	50
BOBBY 1	CIRCLE DOT INC.	GRAND			0		UNDERGRO	<100	0
BRUMLEY BASIN 1	STRATEGIC MNRLS	GRAND			0		UNDERGRO	<100	0
BUCKHORN 1	COLVIN +BPESNAHA	GRAND	3	23 S	25.0 E	24	SURFACE	<100	250
BULL CANYON GROU	ADAIR, IVOR	GRAND	4	26 S	20.0 E	24	UNDERGRO	100 - 1,000	0
C D WHEELER CIA1	BLACK ROCK URAN.	GRAND			0		UNDERGRO	<100	0
CAPTAIN JACK	UNION CARRIDE CP	GRAND	26	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	200
CAPTAIN JINKS	UNION CARRIDE CP	GRAND			0		UNDERGRO	<100	0
CEDAR POINT 2	FOSTER, LEONA	GRAND	33	24 S	26.0 E	24	UNDERGRO	1,000 - 100,000	200
CIE DOG	COMANCHE URAN.CO	GRAND	29	22 S	20.0 E	24	UNDERGRO	<100	0
CLEANUP MATERIAL	LANCE HARDMAN	GRAND			0		MISC.-PB	<100	0
CONSTELLATION 3	SECREST, ART O.	GRAND	12	23 S	21.0 E	24	SURFACE	<100	0
COPPER 2 B	K.+ J. MINING CO.	GRAND	11	25 S	20.0 E	24	SURFACE	<100	0
CORRAL DUMP	THORNBURG MNG.	GRAND			0		DUMPS	1,000 - 100,000	0
COTTONWOOD 6	URANIUM PPOD CO	GRAND	25	25 S	17.5 E	24	UNDERGRO	1,000 - 100,000	650
COUNTER 1	ABERNATHY, JESS	GRAND			0		SURFACE	<100	0
DANICE	UNKNOWN CONTROLR	GRAND	26	25 S	17.0 E	24	UNDERGRO	100 - 1,000	200
DILLERS 1 + 3	GOLD CLOUD URAN	GRAND			0		UNDERGRO	<100	100
DIME	MC NEIL + HUGHES	GRAND	24	24 S	20.0 E	24	SURFACE	<100	0
DIME	STOCKS, JOHN	GRAND	24	24 S	20.0 E	24	UNDERGRO	100 - 1,000	0
DISCOVERY	MERNAB CO.	GRAND			0		UNDERGRO	<100	150
DRAGON FLY 4	GREAT WESTERN UR	GRAND		26 S	18.0 E	24	UNDERGRO	<100	50
EDNA 3	COLUMBIA URAN.CO	GRAND	15	25 S	17.5 E	24	UNDERGRO	100 - 1,000	0
EFFIE F.	UNION CARRIDE CP	GRAND	34	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	200
END OF TRAIL	BLACK CAT EXPL.C	GRAND	10	5 S	91.0 W	24	SURFACE	<100	0
F.W. 3	UNION CARRIDE CP	GRAND	35	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	250
FALCON 1	HASLEY, JACK	GRAND	27	23 S	20.0 E	24	SURFACE	<100	100
FLAT TOP	WILSON, R.P.	GRAND	25	22 S	22.0 E	24	UNDERGRO	100 - 1,000	0
FOOLS LUCK	SWARTZ, HAROLD H	GRAND	10	23 S	21.0 E	24	SURFACE	<100	0
FOSTER AREA	UNION CARRIDE CP	GRAND	34	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	200
FREEDA 2	MONARCH URANIUM	GRAND	9	27 S	23.0 E	24	UNDERGRO	<100	0
FREEPORT	UNION CARRIDE CP	GRAND	1	25 S	25.0 E	24	UNDERGRO	<100	0
GAP	WOODS, DUKE B.	GRAND			0		SURFACE	<100	0
GEIGER 1	EMERSON EL +ASSO	GRAND			0		SURFACE	<100	0
GLADSTONE	UTAH ALLOY ORES	GRAND			0		UNDERGRO	<100	0
GLORY HOLE	URADO MINING	GRAND	24	23 S	24.0 E	24	SURFACE	<100	0
GREAT DANE 1	ABRAHAMSON, J.F.	GRAND			0		UNDERGRO	100 - 1,000	0
GREEN LIZARD 1	SMITH + LIKES	GRAND			0		SURFACE	<100	0
GREEN TREE	MCGEEHEE, L.	GRAND			0		UNDERGRO	<100	150

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
GREY FAULT	BALCONES EXPL.DR	GRAND	21	26 S	20.0 E	24	UNDERGRO	100 - 1,000	200
HEBER 1	ZUEFELT C.+ P.	GRAND	12	29 S	21.0 E	24	SURFACE	<100	0
HEY JOE	JIM TWITCHELL	GRAND	16	25 S	17.0 E	24	UNDERGRO	1,000 - 100,000	50
HILL TOP 1	DE ROSS, ROSE MAP	GRAND	4	22 S	14.0 E	24	UNDERGRO	100 - 1,000	50
HIROHITO	GRAMLICH MINERAL	GRAND			0		UNDERGRO	<100	0
HOPE	IRVINE, DON J.	GRAND			0		SURFACE	<100	0
HORSETHIEF 7 MIN	UNIVERSAL URAN.C	GRAND		26 S	17.0 E	24	SURFACE	<100	150
INCLINE 1,2,3,4+	ATLAS MINERALS	GRAND	22	2 S	14.0 E	24	UNDERGRO	1,000 - 100,000	0
INGERSOLL 13	SUNSET MINES INC	GRAND			0		SURFACE	<100	0
JIM	V.+ L.DEVFLPOMEN	GRAND	10	25 S	17.5 E	24	UNDERGRO	<100	0
JOHN	UNKNOWN CONTROLP	GRAND	1	23 S	21.0 E	24	UNDERGRO	1,000 - 100,000	200
JOHNNIE A.1	DAVIS, LEON L.	GRAND			0		SURFACE	<100	0
JUANITA GROUP	BARTON, C.S.	GRAND	23	23 S	21.0 E	24	SURFACE	<100	0
JUNCTION	MOAR URANIUM CO.	GRAND			0		SURFACE	<100	50
JUNIPER GROUP	PETRO NUCLEAR	GRAND	26	22 S	22.0 E	24	UNDERGRO	100 - 1,000	50
KELLY 1	ABERNATHY, JESS	GRAND			0		UNDERGRO	<100	50
KLONDIKE	KNIGHT, N.B. JR	GRAND	15	25 S	20.0 E	24	UNDERGRO	100 - 1,000	0
LAST INDIAN 1	LEWIS, J.W.	GRAND			0		UNDERGRO	<100	0
LENA 1	MINERAL HILL URA	GRAND			0		UNDERGRO	<100	0
LEWIS A	UNION CARBIDE CP	GRAND	26	24 S	24.0 E	24	UNDERGRO	100 - 1,000	0
LITTLE EVA	TONY PENE	GRAND	6	22 S	22.0 E	24	UNDERGRO	1,000 - 100,000	50
LITTLE LIZZARD	JONES, E.N.	GRAND			0		UNDERGRO	<100	0
LITTLE MEDICINE	WEAVER, CAPL	GRAND			0		UNDERGRO	<100	0
LONE PINE 2	FOSTER + WAREHAM	GRAND	28	24 S	26.0 E	24	SURFACE	<100	0
LOOKOUT 1	CATO, CHARLES	GRAND			0		SURFACE	<100	0
LOUISE GROUPS	BROWN + DARROWS	GRAND			0		UNDERGRO	100 - 1,000	0
LUCKY DAY	BUTHERLAND+SUTH	GRAND	7	23 S	22.0 E	24	SURFACE	<100	0
M GROUP	AIRBORNE PRSPCTR	GRAND	32	26 S	20.0 E	24	UNDERGRO	1,000 - 100,000	0
MATCHLESS	DEVELOPS CO.	GRAND		26 S	18.0 E	24	UNDERGRO	100 - 1,000	50
MAYBELL	PENE, ANTHONY JR	GRAND			0		SURFACE	<100	0
MERCURY 1	BEHUNIN, JOANNE	GRAND			0		SURFACE	<100	0
MILE HIGH TANK F	INDUSTRIES+MINES	GRAND	27	26 S	20.0 E	24	UNDERGRO	100 - 1,000	0
MINERAL 10-BLK J	JERRY STOCKS	GRAND			0		UNDERGRO	1,000 - 100,000	50
MINERAL 11	SHUNWAY + WESTWO	GRAND	15	26 S	18.0 E	24	SURFACE	<100	0
MINERAL POLAR 8+	ATLAS-AMAX	GRAND	35	24 S	25.0 E	24	UNDERGRO	<100	400
MINERAL-BIG BLUE	INTERMOUNTAINM	GRAND			0		UNDERGRO	100 - 1,000	100
MISTAKE	KNIGHT, N.B.	GRAND	7	26 S	24.0 E	24	SURFACE	<100	0
MORRIS CLAIMS	LEE MORRIS	GRAND			0		UNDERGRO	100 - 1,000	0
NEW ARMSTRONG	UNION CARBIDE CP	GRAND	3	25 S	25.0 E	24	UNDERGRO	100 - 1,000	0
NORTH MINE 2	THORNBURG URAN P	GRAND			0		UNDERGRO	<100	0
NORTH SLOPE 2	JENSEN + KOURIS	GRAND			0		SURFACE	<100	0
OLD MC COY	WRIGHT, L.P.	GRAND			0		SURFACE	<100	0
OLD SPOON	TURNER BROS	GRAND			0		SURFACE	<100	0
OSCAR 1	ABERNATHY, JESS	GRAND			0		SURFACE	<100	0
OXIDE 1	CATO, CHARLES	GRAND			0		SURFACE	<100	0
P.F.G.E.	UNION CARBIDE CP	GRAND	1	24 S	25.0 E	24	UNDERGRO	100 - 1,000	0
PARCO 6	UTAH ALLOY ORES	GRAND	6	23 S	22.0 E	24	UNDERGRO	100 - 1,000	50
PARIS 25	UTAH ALLOY ORES	GRAND	6	23 S	22.0 E	24	SURFACE	<100	0

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
PET.TREE 7+8	UNION CARBIDE CP	GRAND	27	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	100
PET.TREE-ELVA M.	UNION CARBIDE CP	GRAND	34	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	100
PETERSON PROPERT	UNKNOWN CONTROLR	GRAND			0		UNDERGRO	<100	0
PETRIFIED TREE 2	UNION CARBIDE CP	GRAND	27	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	150
PETRIFIED TREE 9	UNION CARBIDE CP	GRAND	35	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	250
PINE TREE 1	IRVINE, DON J.	GRAND	20	19 S	19.0 E	24	SURFACE	<100	0
PINTO JACK	UNION CARBIDE CP	GRAND	10	25 S	25.0 E	24	UNDERGRO	<100	0
PITTSBURG	UNION CARBIDE CP	GRAND	25	24 S	25.0 E	24	UNDERGRO	100 - 1,000	0
POLAR KING	UNION CARBIDE CP	GRAND	11	25 S	25.0 E	24	UNDERGRO	1,000 - 100,000	150
POND + SHUBERT	UNKNOWN	GRAND	18	25 S	26.0 E	24	UNDERGRO	1,000 - 100,000	100
PROSPECT 1	HETZEL, LFE	GRAND	18	25 S	25.0 E	24	SURFACE	<100	0
PROSPECT 2	HARBISON, JAMES L	GRAND	18	25 S	26.0 E	24	UNDERGRO	1,000 - 100,000	0
PROSPECT 4	BOOMERANG MINING	GRAND	18	25 S	26.0 E	24	SURFACE	<100	0
PROSPECT 7	WIEMAN, S.W.	GRAND	18	25 S	26.0 E	24	SURFACE	<100	0
PROSPECT 9	MC FARLAND, BOB	GRAND	18	25 S	26.0 E	24	UNDERGRO	<100	0
PROSPECTOR	MONTGOMERY, JACK	GRAND			0		SURFACE	<100	0
QUESTA 3	BUSEY, L.E.	GRAND			0		SURFACE	<100	0
RANCH VIEW	YOSEMITE URAN. CO	GRAND	24	23 S	24.0 E	24	UNDERGRO	<100	100
RED HEAD 2	SHUPE, IKE W.	GRAND	22	24 S	23.0 E	24	SURFACE	<100	0
RED OXIDE 1 + 2	CATO, CHARLES	GRAND	4	23 S	23.0 E	24	SURFACE	<100	50
RED TOP 3	CALLAHAN, JAY	GRAND			0		UNDERGRO	<100	0
PED VANADIUM GRO	UNION CARBIDE CP	GRAND	26	22 S	23.0 E	24	UNDERGRO	1,000 - 100,000	50
RIBBON RIDGE	KEELE, T.H.+DALLAS	GRAND			0		SURFACE	<100	250
RIMROCK	UNION CARBIDE CP	GRAND	26	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	50
RIVER VIEW	EVANS R.C.	GRAND			0		SURFACE	<100	200
ROCKET JR.GROUP	ADAIR, IVOR	GRAND		25 S	18.0 E	24	UNDERGRO	100 - 1,000	50
RURE	KEOGH, JOHN	GRAND	12	23 S	21.0 E	24	UNDERGRO	<100	0
RUSTY BUCKET	DETRONICS INC.	GRAND			0		SURFACE	<100	0
RUTH 1	MAY DAY URAN CO	GRAND			0		SURFACE	<100	0
S.R.FRACTION	UNION CARBIDE CP	GRAND	26	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	100
SADDLE	ZIAK, PAUL	GRAND			0		SURFACE	<100	0
SAND FLAT	MIDLAND URANIUM	GRAND	24	23 S	24.0 E	24	SURFACE	<100	0
8C, SEC. 36 (RNGT)	ATLAS MINERALS	GRAND	36	22 S	21.0 E	24	UNDERGRO	1,000 - 100,000	200
SCH SEC. 2	STATE OF UTAH	GRAND			0		SURFACE	<100	0
SEC. 2, 23S-21E	UNION CARBIDE CP	GRAND	2	23 S	21.0 E	24	UNDERGRO	1,000 - 100,000	200
SEC. 32, 22S-22E	HUFF, LILLIAN	GRAND	32	22 S	22.0 E	24	UNDERGRO	1,000 - 100,000	50
SHINARUMP 1	POWER OIL CO.	GRAND			0		UNDERGRO	1,000 - 100,000	50
SHINARUMP 1, 1A, 3	POWER OIL CO.	GRAND			0		UNDERGRO	1,000 - 100,000	50
SILVER MOON	UTAH ALLOY ORES	GRAND	11	23 S	21.0 E	24	UNDERGRO	<100	50
SLICK ROCK	LILE, GLEN	GRAND	28	23 S	20.0 E	24	SURFACE	<100	0
SNOW FLAKE 1	SUTHERLAND+SUTH	GRAND			0		SURFACE	<100	0
SOCKO 2	ATOMIC POWER URA	GRAND	11	47 N	20.0 W	22	UNDERGRO	100 - 1,000	50
SQUAW PARK GROUP	PENE + RUGGERI	GRAND	4	23 S	23.0 E	24	UNDERGRO	1,000 - 100,000	50
SUE + RUTH	SUNRAY MINING CO	GRAND			0		UNDERGRO	<100	0
SURE PIPE	MURPHY, OTTO	GRAND			0		SURFACE	<100	0
TEATON 2	MANGER + JONES	GRAND			0		SURFACE	<100	0
THOMAS B.	UNION CARBIDE CP	GRAND	34	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	50
THOMPSON C.	UNION CARBIDE CP	GRAND	34	24 S	25.0 E	24	UNDERGRO	1,000 - 100,000	200

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
THORN	GARDNER L.L.	GRAND	31	22 S	23.0 E	24	SURFACE	<100	0
THREE JAY 19	JONES, LEO W.	GRAND			0		SURFACE	<100	0
TOBY GROUP	DOYLE M.K.	GRAND			0		UNDERGRO	<100	250
TURTLE	MERIWETHER, JAMES	GRAND			0		SURFACE	<100	0
TWIN BUTTE	LEWIS, C.L.	GRAND			0		SURFACE	<100	0
UTAH ST. LSE, 573	STATE OF UTAH	GRAND	32	22 S	25.0 E	24	UNDERGRO	<100	50
VALLEY VIEW	ROWLES + WRIGHT	GRAND	18	26 S	24.0 E	24	UNDERGRO	1,000 - 100,000	50
VIRGIN MARY 1	DAVIS R.L. + BESS	GRAND	13	23 S	21.0 E	24	SURFACE	<100	0
VIVIAN + NEW VIV	UNION CARBIDE CP	GRAND	3	25 S	25.0 E	24	UNDERGRO	100 - 1,000	0
WASP	ABERNATHY, JESS	GRAND			0		SURFACE	<100	0
WEDO 1-10	JAHNKE, ROLAND	GRAND			0		SURFACE	<100	0
WINDY POINT	SMITH, CHARLES H	GRAND	35	22 S	22.0 E	24	SURFACE	<100	0
YELLOW GRASS ROO	ABERNATHY, JESS	GRAND			0		SURFACE	<100	0
YELLOW HORSE	MC COLOUGH, W.J.	GRAND			0		UNDERGRO	100 - 1,000	0
YELLOW JACK	CATO, CHAPLES	GRAND			0		UNDERGRO	<100	0
YELLOW ROAD	ABERNATHY, JESS	GRAND			0		SURFACE	<100	0
YELLOW VANADIUM	WRIGHT, WILLIAM	GRAND			0		UNDERGRO	<100	0
YIP YIP	SCHUMACHER J. I.	GRAND			0		UNDERGRO	100 - 1,000	0
DESERT VIEW	ATKINSON, W.H.	IRON			0		SURFACE	<100	50
BELL HILL	MINERALS PEPIN,	JUAB			0		UNDERGRO	100 - 1,000	150
CARNOTITE KING	GOLDEN GLOVES MG	JUAB			0		UNDERGRO	<100	50
EAGLE ROCK	CLARIDGE + WILDEN	JUAB	35	12 S	12.0 W	24	UNDERGRO	<100	50
YELLOW CHIEF	BLACK ROCK MNG.	JUAB	35	12 S	12.0 W	24	UNDERGRO	>100,000	100
LYNN GROUP	SALINA MNG. + SMC	KANE	16	40 S	9.0 W	24	UNDERGRO	100 - 1,000	50
RADIANCE	RASMUSSEN, W. + V.	KANE			0		UNDERGRO	100 - 1,000	50
YOUNG 1	BLACK MTN. URAN. C	KANE			0		SURFACE	<100	0
BUDDY	U.S. SMELT + REFG	PIUTE	4	27 N	3.0 W	24	UNDERGRO	1,000 - 100,000	500
CLOY'S MINE	SEEGMILLER, P.	PIUTE	4	27 N	3.0 W	24	UNDERGRO	1,000 - 100,000	150
EAST SLOPE	MAGNOLIA LEAD + OI	PIUTE			0		SURFACE	<100	0
FARMER JOHN	BULLION MONARCH	PIUTE	4	27 S	3.0 W	24	UNDERGRO	1,000 - 100,000	500
FREEDOM GROUP	SEEGMILLER, P.	PIUTE	4	27 S	3.0 W	24	UNDERGRO	>100,000	500
J D G	GLENNY R.A.	PIUTE			0		SURFACE	<100	0
LUCKY STRIKE ANNE	WILHELM ESTATE	PIUTE	4	27 S	3.0 W	24	UNDERGRO	<100	50
POTTS FRACTION	BLACK BEAR CONSO	PIUTE	26	26 S	4.0 W	24	UNDERGRO	1,000 - 100,000	200
PROSPECTOR	SMITH, REX	PIUTE	4	27 S	3.0 W	24	UNDERGRO	1,000 - 100,000	200
VEGA CLAIMS	ATHERLEY + SMITH	PIUTE			0		UNDERGRO	100 - 1,000	100
D+RGW RR ROOPER Y	MECHAM, V.W.	SALT LAKE			0		MISC. - PB	<100	0
A FAULT THERE WA	HUGHES C.J.	SAN JUAN			0		SURFACE	<100	0
ABE 11	INTERNATNL ENRGY	SAN JUAN			0		UNDERGRO	1,000 - 100,000	200
ABE 8	INTERNATNL ENRGY	SAN JUAN			0		UNDERGRO	1,000 - 100,000	200
ACE	CLEON SHUHWAY	SAN JUAN	15	37 S	21.0 E	24	UNDERGRO	100 - 1,000	0
AJAX	EADS, FRANK	SAN JUAN			0		SURFACE	<100	50
ANETH 1	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	100
ANN	ATLAS-AMAX	SAN JUAN			0		UNDERGRO	100 - 1,000	1150
ANN	ATLAS MINERALS	SAN JUAN	11	30 S	24.0 E	24	UNDERGRO	1,000 - 100,000	500
ASH	ATLAS MINERALS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	50
AVALANCHE 13	URADCO	SAN JUAN			0		UNDERGRO	1,000 - 100,000	350
AVALANCHE 9	URADCO	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
B + I	WHITE CANYON MNG	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
F VEE	HILL H.K.	SAN JUAN			0		UNDERGRO	<100	100
BACARDI CUTLER	ATLAS MINERALS	SAN JUAN	29	S	28.0	E 24	UNDERGRO	>100,000	550
BADGER HOLE	UNKNOWN CONTROLR	SAN JUAN			0		SURFACE	<100	0
BALSEY	UNKNOWN CONTROLR	SAN JUAN			0		SURFACE	<100	0
BASEIN GROUP	SHUMWAY BROS.MG	SAN JUAN	3	S	21.0	E 24	UNDERGRO	1,000 - 100,000	100
BEE	ATOMIC RESOURCES	SAN JUAN	8	S	25.0	F 24	UNDERGRO	100 - 1,000	50
BELL MINE	BARLOW + SITTON	SAN JUAN	8	S	17.0	E 24	UNDERGRO	100 - 1,000	100
BENCH 1,2,3 + 4	MCDONALD+PATRSON	SAN JUAN			0		UNDERGRO	1,000 - 100,000	200
BETTY GROUP	ELK RIDGE MINING	SAN JUAN			0		UNDERGRO	1,000 - 100,000	250
BIG BEN 1	FLECK, SAMUEL	SAN JUAN			0		SURFACE	<100	0
BIG BLUFF	S.+ R. MINES	SAN JUAN	9	S	25.0	F 24	SURFACE	<100	0
BIG BOUL	PITTMAN, EMIT	SAN JUAN	31	S	23.0	F 24	SURFACE	<100	0
BIG BUCK	BAILEY, WALLACE	SAN JUAN			0		UNDERGRO	1,000 - 100,000	0
BIG BUCK 11	ATLAS MINERALS	SAN JUAN			0		UNDERGRO	100 - 1,000	400
BIG BUCK 7	ATLAS MINERALS	SAN JUAN	11	S	24.0	E 24	UNDERGRO	<100	0
BIG BUCK 7,8+8A	ATLAS MINERALS	SAN JUAN	11	S	24.0	E 24	UNDERGRO	1,000 - 100,000	100
BIG BUCK 9A(BRNK)	ATLAS MINERALS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
BIG BUCK 9,9A,10,	ATLAS MINERALS	SAN JUAN	11	S	24.0	E 24	UNDERGRO	>100,000	500
BIG CREEK	BAILEY, WALLACE	SAN JUAN			0		SURFACE	<100	0
BIG INDIAN 2	UTAH COLORADO DF	SAN JUAN			0		UNDERGRO	<100	150
BIG MIKE 1	LAMMEPT, JAMES R	SAN JUAN			0		SURFACE	<100	0
BIG MONKEY	ORTSMAN, WILLIAM	SAN JUAN			0		UNDERGRO	<100	50
BIG SADDLE 1	MISSOURI EXPL.CO	SAN JUAN			0		SURFACE	<100	0
BIG TREE	AKIN BROS.	SAN JUAN			0		SURFACE	<100	0
BILL, 5	WIGHT, BILL	SAN JUAN			0		SURFACE	<100	300
BILLY JOE WHEELER	BLACK ROCK URAN.	SAN JUAN			0		SURFACE	<100	0
BIRTHDAY	FOOTE MINERALS	SAN JUAN	10	S	21.0	E 24	UNDERGRO	1,000 - 100,000	0
BLACK ACE 2	LYENS, W.F.	SAN JUAN			0		UNDERGRO	<100	0
BLACK BOTTOM	SWIPROCK,LTD	SAN JUAN	19	S	25.0	E 24	UNDERGRO	100 - 1,000	0
BLACK CATS 1-10	MAXWELL,MELVIN L.	SAN JUAN			0		UNDERGRO	<100	200
BLACK HAT	GEO-ENERGY RES	SAN JUAN	28	S	26.0	E 24	UNDERGRO	1,000 - 100,000	200
BLACK OXIDE	ABC EXPLORATION	SAN JUAN			0		UNDERGRO	100 - 1,000	200
BLACK WATER	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	1,000 - 100,000	50
BLACKSTONE DUMPS	EXCALIBUR IND.	SAN JUAN			0		DUMPS	1,000 - 100,000	100
BLO SVAKE	TIDWELL,CLAUDE E	SAN JUAN			0		SURFACE	<100	0
BLOCK 42	PLATEAU MNG.CO,	SAN JUAN			0		UNDERGRO	<100	0
BLUE BELL	MALIN, OWEN	SAN JUAN			0		UNDERGRO	<100	0
BLUE BIRD	HARRISON,JAMES L	SAN JUAN			0		UNDERGRO	<100	0
BLUE BIRD 1	UNKNOWN CONTROLR	SAN JUAN			0		UNDERGRO	100 - 1,000	0
BLUE BONNET	PRESLEY + TANNER	SAN JUAN			0		SURFACE	<100	0
BLUE BUTTE 1	UNKNOWN CONTROLR	SAN JUAN			0		SURFACE	<100	0
BLUE CLAY	PICKENS,CHARLES	SAN JUAN			0		UNDERGRO	1,000 - 100,000	0
BLUE GOOSE	BALSLEY + WRIGHT	SAN JUAN	15	S	23.0	E 24	UNDERGRO	100 - 1,000	0
BLUE HILL	JOHNSON, DUANE	SAN JUAN	36	S	22.0	F 24	SURFACE	<100	0
BLUE JAY	BALSLEY, H.W.	SAN JUAN	28	S	23.0	E 24	UNDERGRO	1,000 - 100,000	0
BLUE JAY 3	RUST+BAIRD+PIECE	SAN JUAN	20	S	25.0	F 24	UNDERGRO	<100	0
BLUE JAY DUMPS	BIERSCHIED+SWISH	SAN JUAN			0		DUMPS	1,000 - 100,000	0

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
BLUE LIZZARD	ENERGY FUELS NUC	SAN JUAN			0		UNDERGRO	1,000 - 100,000	300
BOBCAT	UNKNOWN CONTRLR	SAN JUAN	11	30 S	24.0 E	24	UNDERGRO	1,000 - 100,000	450
BOJO	BOJO URANIUM CO.	SAN JUAN			0		UNDERGRO	100 - 1,000	100
BONANZA 1 + 2	BALSLEY, H.W.	SAN JUAN	27	31 S	24.0 E	24	UNDERGRO	100 - 1,000	0
BONNIE LEE	BOJO URANIUM CO.	SAN JUAN			0		SURFACE	<100	100
BOULDER	PETERSON, FRANK	SAN JUAN			0		UNDERGRO	<100	0
BOW	INSPIRATION LEAD	SAN JUAN			0		SURFACE	<100	50
BOWLEGS	ATLAS MINERALS	SAN JUAN	33	29 S	24.0 E	24	UNDERGRO	>100,000	550
BOX CANYON	FOOTE MINERALS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	50
BRADFORD 1-5	DEVILS CANYON UR	SAN JUAN			0		UNKNOWN	100 - 1,000	0
BREEZY GROUP	STOCKS+LAMBERT	SAN JUAN			0		UNDERGRO	100 - 1,000	250
BRIGHT STAP	LEWIS, C.L.	SAN JUAN	14	36 S	24.0 E	24	UNDERGRO	<100	0
BROKEN SHOE	DANVERS, DON	SAN JUAN	33	29 S	26.0 E	24	SURFACE	<100	0
BROWNIE 1	URANIUM CENTER C	SAN JUAN			0		SURFACE	<100	200
BUB	SHUMWAY BOB	SAN JUAN			0		SURFACE	<100	0
BUCK 3	BIGHORN GOLD CLD	SAN JUAN			0		UNDERGRO	100 - 1,000	250
BUCK SKIN 1 + 2	ALBERT BALLARD	SAN JUAN			0		UNDERGRO	100 - 1,000	0
BUCKEYE NO 1	WEGNER W.J.	SAN JUAN			0		SURFACE	<100	50
BUCKHORN	UTOMIC EXP.+ MNG	SAN JUAN	23	37 S	24.0 E	24	SURFACE	<100	150
BUCKHORN 1-8	BUCKHORN MINING	SAN JUAN			0		SURFACE	<100	250
BUCKSKIN 1-2	JIM WINBOURN	SAN JUAN			0		UNKNOWN	<100	0
BUCKSKIN BOBBY	UNKNOWN CONTRLR	SAN JUAN			0		UNDERGRO	<100	0
BUCKSKIN STAIN	SHIPROCK, LTD	SAN JUAN			0		UNDERGRO	<100	100
RUD 1	BALDWIN, ROBERT D	SAN JUAN	29	51 N	18.0 W	22	UNDERGRO	<100	0
BUSTER	NICHOLS+SUTYAK+	SAN JUAN	29	27 S	23.0 E	24	UNDERGRO	<100	0
BUTLER CANYON	UNKNOWN CONTRLR	SAN JUAN			0		SURFACE	<100	0
BUTTE 1	SHUMWAY SETH	SAN JUAN			0		UNDERGRO	100 - 1,000	0
C GROUP	AIRBORNE PRSPCTR	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
C.C.C.	DELAY SHUMWAY	SAN JUAN			0		UNDERGRO	<100	0
CALICO	RANCHERS EXPL+D	SAN JUAN			0		SURFACE	<100	100
CAMEL (CIGARETTE)	BABELS UPAN, ENG	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
CANARY	BADGER UPAN, CORP	SAN JUAN	18	36 S	26.0 E	24	SURFACE	<100	0
CANARY	ABERNATHY, JESS	SAN JUAN	19	27 S	24.0 E	24	UNDERGRO	<100	50
CANDY	REDD+BASINERE ME	SAN JUAN			0		SURFACE	<100	50
CANYON 1	BARBER MINING CO	SAN JUAN			0		UNDERGRO	100 - 1,000	150
CANYON 2	COL TEX URANIUM	SAN JUAN			0		UNDERGRO	<100	100
CARL, LOCK, PAYDAY	NIELSON, FRANCIS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	200
CAROL B	OURAY URANIUM	SAN JUAN	3	28 S	23.0 E	24	UNDERGRO	100 - 1,000	0
CARTER 2	MORGAN, CHARLES G	SAN JUAN			0		UNDERGRO	<100	0
CASKIN 3	SHUMWAY + WESTWD	SAN JUAN			0		SURFACE	<100	0
CEDAP	ZIAK, PAUL	SAN JUAN			0		SURFACE	<100	0
CEDAR 37	YUBA DEVELOP. CO.	SAN JUAN			0		UNDERGRO	100 - 1,000	250
CEDAR BIRD	BRADFORD, SYLVEST	SAN JUAN	9	37 S	21.0 E	24	UNDERGRO	<100	150
CEDAR INCLINE	YUBA DEVELOP. CO.	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
CHAMP 1	CHAMP MINING CO	SAN JUAN			0		SURFACE	<100	0
CHARLES KEITH	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	150
CHARLEY 3	WHITE CANYON MNG	SAN JUAN			0		UNDERGRO	1,000 - 100,000	250
CHESS RIDGE	SHUMWAY PETE	SAN JUAN	7	27 S	24.0 E	24	UNDERGRO	<100	100

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
CHIPMONK	BROPHY + YACKEL	SAN JUAN	15	27 S	23.0 E	24	SURFACE	<100	0
CLAIM 22	DALPEZ+MORTISON	SAN JUAN			0		SURFACE	<100	100
CLAIM 4	UNKNOWN CONTROLR	SAN JUAN			0		UNDERGRO	100 - 1,000	50
CLAIM 8	STANDARD METALS	SAN JUAN			0		UNDERGRO	<100	0
CLIFF HOUSE	UNION CARBIDE CP	SAN JUAN	15	36 S	25.0 E	24	UNDERGRO	100 - 1,000	50
CLIMAX 2	ATLAS MINERALS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	50
COAL CREEK	SITTON + DULANEY	SAN JUAN			0		UNDERGRO	<100	0
COLUMBIA 1	ATLAS MINERALS	SAN JUAN	33	29 S	24.0 E	24	UNDERGRO	1,000 - 100,000	700
CONCENTRATE	C.O.G.MINERALS	SAN JUAN			0		LOWGRADE	1,000 - 100,000	0
CONGLOMERATE 2	INTERMOUNTAIN UR	SAN JUAN		31 S	21.0 E	24	SURFACE	<100	0
COPPER TOP 5	WRIGHT, L.B.	SAN JUAN			0		SURFACE	<100	300
COSTANZA	PIONEER DRUG.CO.	SAN JUAN	35	30 S	25.0 E	24	UNDERGRO	1,000 - 100,000	100
COTTONWOOD	BALSLEY, H.W.	SAN JUAN			0		UNDERGRO	100 - 1,000	0
COTTONWOOD	UNKNOWN CONTROLR	SAN JUAN			0		UNDERGRO	1,000 - 100,000	0
COTTONWOOD 1	DENTON F.J.	SAN JUAN			0		UNDERGRO	100 - 1,000	100
COTTONWOOD 2	BLACK, CALVIN	SAN JUAN	3	37 S	21.0 E	24	UNDERGRO	1,000 - 100,000	0
COTTONWOOD 2+3	SHUMWAY+HGLLIDAY	SAN JUAN	4	37 S	21.0 E	24	UNDERGRO	1,000 - 100,000	100
COTTONWOOD 3	BLACK,C.+JONES K	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
COTTONWOOD 4	HARVEY BELLUM	SAN JUAN	4	37 S	21.0 E	24	UNDERGRO	1,000 - 100,000	100
COTTONWOOD TAILI	BLANDING MINES C	SAN JUAN			0		MISC.=PB	1,000 - 100,000	50
COUGAR	INDUSTRIAL URAN.	SAN JUAN			0		UNDERGRO	<100	100
COVE GROUP	C.O.G.MINERALS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	250
COYOTE 1	BURDETT SHUMWAY	SAN JUAN	35	35 S	24.0 E	24	UNDERGRO	<100	50
CUTLER	CLIFF MINING CO.	SAN JUAN			0		UNDERGRO	100 - 1,000	50
CYS MONUMENT	ENERGY FUFLS NUC	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
DAISY 2	JIM C. BUTT	SAN JUAN			0		UNDERGRO	1,000 - 100,000	200
DARK HORSE	DAVIS, HOMER	SAN JUAN			0		SURFACE	<100	0
DELAWARE CHIEF 1	GIBRALTAR URAN.C	SAN JUAN			0		UNDERGRO	<100	250
DEVIL 3	CROSS, ODDIE V.	SAN JUAN			0		UNDERGRO	<100	250
DEVIL CANYON 1	HURST,QUINTON R.	SAN JUAN			0		UNDERGRO	<100	0
DIABLO	CRAWFORD+*RIGHT	SAN JUAN			0		SURFACE	<100	250
DIME	SHUMWAY+ DADE	SAN JUAN	7	31 S	25.0 E	24	UNDERGRO	1,000 - 100,000	50
DIP GROUP	MINERAL HILL URA	SAN JUAN			0		UNDERGRO	100 - 1,000	50
DISMONT SLIMES	ATOMIC RESOURCES	SAN JUAN			0		UNDERGRO	<100	0
DISSIPATION	HOMESTAKE MNG CO	SAN JUAN	28	29 S	24.0 E	24	UNDERGRO	1,000 - 100,000	500
DIVIDE-YELLOW JC	RED ROCK DEV C	SAN JUAN	35	30 S	25.0 E	24	UNDERGRO	1,000 - 100,000	150
DIXIE 2	SURPLUS URANIUM	SAN JUAN	19	37 S	25.0 E	24	SURFACE	<100	150
DOLLAR	C.B.S.URANIUM CO	SAN JUAN	26	36 S	24.0 E	24	UNDERGRO	<100	250
DOROTHY 2	BARRY, ROBERT	SAN JUAN			0		SURFACE	<100	100
DOROTHY MAY	ATLAS MINERALS	SAN JUAN	13	30 S	24.0 E	24	UNDERGRO	>100,000	400
DRY HOLE(4L 35)	COTTONWOOD MNG.	SAN JUAN	4	37 S	21.0 E	24	UNDERGRO	1,000 - 100,000	100
DUGWAY	FOOTE MINERALS	SAN JUAN			0		UNDERGRO	100 - 1,000	50
DUSTY	ALONGO, E.J.	SAN JUAN			0		UNDERGRO	100 - 1,000	50
E,TAYLOR CANYON	DELHI URAN + OIL	SAN JUAN			0		UNDERGRO	100 - 1,000	50
EAGLE NEST	MOAB URANIUM CO.	SAN JUAN			0		SURFACE	<100	100
EARLY DAWN	STOCKS, H.R.	SAN JUAN			0		UNDERGRO	<100	0
EARLY MORN	STOCKS, H.P.	SAN JUAN			0		SURFACE	100 - 1,000	0
EAST BANK	SHUMWAY BROS.MG	SAN JUAN	3	37 S	21.0 E	24	UNDERGRO	1,000 - 100,000	0

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
EAST RIM	BLEAK, FLOYD	SAN JUAN			0		UNDERGRO	100 - 1,000	50
EAST WOODEN SHO	SETH SHUMWAY	SAN JUAN			0		UNDERGRO	100 - 1,000	150
ELLA	WASHBURN,LARK	SAN JUAN	28	28 S	26,0 E	24	UNDERGRO	1,000 - 100,000	300
ELMORE 1	PRESLEY + TANNER	SAN JUAN			0		UNDERGRO	<100	0
EVA	UNION CARRIDE	SAN JUAN	13	47 N	20,0 W	22	UNDERGRO	1,000 - 100,000	0
EXPECTATION	ATLAS MINERALS	SAN JUAN	3	30 S	24,0 E	24	UNDERGRO	>100,000	750
F.D.R.9	NEILSON, D.J.	SAN JUAN			0		UNDERGRO	<100	250
F.I.GROUP	HILLSBOPO URAN	SAN JUAN			0		UNDERGRO	<100	100
FAIR DAY	JONES + SIMPSON	SAN JUAN			0		SURFACE	<100	0
FALL	MERIT URAN,CORP.	SAN JUAN			0		UNDERGRO	<100	100
FAULT 1	ARBOT, DAVID	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
FIREFLY	GEO-ENERGY RES	SAN JUAN	30	28 S	26,0 E	24	UNDERGRO	1,000 - 100,000	300
FIRST+LAST CHANC	WRIGHT, L.R.	SAN JUAN			0		UNDERGRO	<100	200
FORK VIEW	RANDOLPH +DILLON	SAN JUAN			0		UNDERGRO	<100	0
FOUND	FOOTE MINERALS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
FOUND	WHITE CANYON MNG	SAN JUAN			0		UNDERGRO	1,000 - 100,000	50
FOXY DAN	WINBOURN, JAMES	SAN JUAN			0		UNDERGRO	<100	0
FRACTION	OURAY URANIUM	SAN JUAN	2	28 S	23,0 E	24	UNDERGRO	100 - 1,000	100
FRACTION CLAIM	SHUMWAY + DAVIS	SAN JUAN			0		SURFACE	<100	100
FRANCE	EDGE, MAX W.	SAN JUAN			0		UNDERGRO	<100	100
FRIDAY	BROWN, ALBERT J.	SAN JUAN			0		UNDERGRO	<100	0
FRUNDELL 1	UNKNOWN CONTROLR	SAN JUAN	9	37 S	24,0 E	24	UNDERGRO	<100	0
FRY-E.COMMAND	TANNER + TANGREE	SAN JUAN			0		SURFACE	<100	100
G.D. 1	DENBY + FERRANDO	SAN JUAN			0		SURFACE	<100	50
GARY	SHUPE BROS	SAN JUAN			0		SURFACE	<100	0
GAYLENE 2	AMALGAMATED URAN	SAN JUAN			0		SURFACE	<100	50
GILMAN + GILMAN	SHUMWAY+ DADE	SAN JUAN	6	31 S	25,0 E	24	UNDERGRO	1,000 - 100,000	50
GILMAN	FOOTE MINFRALS	SAN JUAN			0		UNDERGRO	<100	50
GIVEAWAY	JIM C. BUTT	SAN JUAN			0		UNDERGRO	1,000 - 100,000	200
GIZMO GROUP	BLAKE, DONALD V.	SAN JUAN			0		UNDERGRO	1,000 - 100,000	450
GLADE 11	NUGENT, CLAUDE E	SAN JUAN			0		UNDERGRO	1,000 - 100,000	200
GOLD CROWN	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	150
GOOD HOPE	DAY, ABE	SAN JUAN	7	31 S	25,0 E	24	UNDERGRO	<100	0
GRAND VIEW	BLUE CHIEF URAN	SAN JUAN			0		SURFACE	<100	100
GRASS ROOT	HAZER, ORSON	SAN JUAN	27	28 S	23,0 E	24	SURFACE	<100	0
GREEN + GREEN	ELK MTN.URAN,COR	SAN JUAN			0		SURFACE	<100	250
GREEN FLY 1	LAUGHTER, GERALD	SAN JUAN	13	31 S	24,0 E	24	UNDERGRO	<100	0
GREEN ROCK	WEGNER+VEBELIK+H	SAN JUAN			0		SURFACE	<100	0
GREY DAWN	WASHBURN,LARK	SAN JUAN	30	28 S	26,0 E	24	UNDERGRO	1,000 - 100,000	0
H.BLACKWATER 2+3	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	100 - 1,000	50
HALF + HALF	JOHNSON, DAVE	SAN JUAN			0		SURFACE	<100	0
HANGOVER	C.SHUMWAY	SAN JUAN	15	37 S	21,0 E	24	UNDERGRO	100 - 1,000	0
HAPPY JACK	BRUNKE, W.W.	SAN JUAN	13	32 S	23,0 E	24	UNDERGRO	100 - 1,000	0
HAPPY SURPRISE 1	HAPPY SUPPRISE M	SAN JUAN			0		UNDERGRO	<100	150
HARD ROCK	GOODWIN, RAY	SAN JUAN			0		SURFACE	<100	0
HART DRAW	CLIFF MINING CO.	SAN JUAN			0		UNDERGRO	<100	100
HATCHET 3	TURNER + TIDWELL	SAN JUAN			0		UNDERGRO	<100	100
HATTIE	MURPHY, VICTOR	SAN JUAN			0		UNDERGRO	<100	0

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
HENRY L. SAMPSON	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	250
HERSEY-RADIUM KI	ATLAS MINERALS	SAN JUAN			0		UNDERGRO	>100,000	500
HESPERUS	MAYFIELD, JERRY	SAN JUAN			0		UNDERGRO	100 = 1,000	50
HIDDEN LOG	TOWN MINING CO	SAN JUAN			0		UNDERGRO	100 = 1,000	0
HIDDEN VALLEY 5	M. + M. DEVELOPMEN	SAN JUAN			0		SURFACE	<100	100
HIDEOUT MINE	UTAH MIN RESOU	SAN JUAN			0		UNDERGRO	>100,000	200
HIGH HOPES	UNKNOWN CONTROLP	SAN JUAN			0		UNDERGRO	<100	0
HIGHBALL	INDUSTRIAL URAN.	SAN JUAN			0		UNDERGRO	100 = 1,000	200
HIGHWAY	DAY, ABE	SAN JUAN			0		SURFACE	<100	0
HILLTOP	STADTER, ROBERT I.	SAN JUAN			0		SURFACE	<100	0
MONEYMOON	DOUGLAS + SEARS	SAN JUAN			0		UNDERGRO	100 = 1,000	0
HOOT	SHUMWAY BROS. MG	SAN JUAN	15	37 S	21.0 E	24	UNDERGRO	100 = 1,000	100
HOOT OWL	CROSS, ODDIE V.	SAN JUAN	3	37 S	24.0 E	24	UNDERGRO	<100	200
HOPE 1	CAMPBELL, W.B.	SAN JUAN			0		UNDERGRO	100 = 1,000	0
HOPE-SAGE, ETC.	BUTT, H.D. ET AL	SAN JUAN			0		UNDERGRO	<100	150
HOPPERS	PEARSON, T.E.	SAN JUAN			0		SURFACE	<100	0
HORSEFLY	UNKNOWN CONTROLP	SAN JUAN			0		SURFACE	<100	100
HORSESHOE 1	KNIGHT, N.B.	SAN JUAN	7	32 S	21.0 E	24	UNDERGRO	1,000 = 100,000	0
HOUSE	UNION CARBIDE CP	SAN JUAN			0		UNDERGRO	100 = 1,000	0
I DON T KNOW	BRUCE+CUNNINGHAM	SAN JUAN			0		SURFACE	<100	0
IDA	GRAMLICH EXPLOR.	SAN JUAN	25	28 S	25.0 E	24	UNDERGRO	<100	150
IKE-NIXON SHAFT	ATLAS MINERALS	SAN JUAN	34	29 S	24.0 E	24	UNDERGRO	>100,000	500
INDEPENDENT	TUSING + DEAN	SAN JUAN			0		SURFACE	<100	150
INDIAN CREEK	PARADOX MINING C	SAN JUAN			0		UNDERGRO	<100	50
INDIAN CREEK GRP	PARADOX MINING C	SAN JUAN	10	33 S	22.0 E	24	UNDERGRO	1,000 = 100,000	0
J.R.P. 16	ALADDIN EXPL, INC	SAN JUAN			0		SURFACE	<100	150
JACK	GLENNY CUTLER	SAN JUAN			0		UNDERGRO	<100	50
JACKPOT	LONE STAR MNG. CO	SAN JUAN			0		UNDERGRO	<100	50
JACKPOT	BEENTLEY + GARCIA	SAN JUAN			0		UNDERGRO	100 = 1,000	0
JACKS	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	100 = 1,000	300
JACORS CHAIR	ATOMIC EXTRACT, N	SAN JUAN			0		UNDERGRO	<100	100
JIM DANDY	ROGERS, DARREL	SAN JUAN			0		SURFACE	<100	0
JOAN	WATKINS, LYMAN M.	SAN JUAN			0		SURFACE	<100	0
JOAN	WASHBURN, LARK	SAN JUAN	28	28 S	26.0 E	24	UNDERGRO	1,000 = 100,000	0
JOE BISHOP	REDD, ELLIOTT	SAN JUAN			0		UNDERGRO	1,000 = 100,000	200
JOHN CLAIMS	SHUMWAY M + B	SAN JUAN			0		UNDERGRO	100 = 1,000	150
JOHN D 2	CLOUSE + FOSTER	SAN JUAN			0		SURFACE	<100	100
JOHNNIE	SHUMWAY BROS. MG	SAN JUAN			0		UNDERGRO	1,000 = 100,000	250
JOHNNIE MINE	VIGIL BROS	SAN JUAN	11	32 S	23.0 E	24	UNDERGRO	<100	0
JOKER	COTTONWOOD MNG.	SAN JUAN			0		UNDERGRO	100 = 1,000	0
JOKER 1	MINERALS WEST	SAN JUAN			0		UNDERGRO	1,000 = 100,000	150
JOMAC 1,2+3	CENTURY 21 MNG	SAN JUAN			0		UNDERGRO	1,000 = 100,000	100
JUDY KAY	CRAIG, EARL M.	SAN JUAN			0		SURFACE	<100	0
JUNCTION GROUP	APPLEBEE, GLEN	SAN JUAN	3	29 S	23.0 E	24	UNDERGRO	1,000 = 100,000	0
KIEV	AKIN, M.E.	SAN JUAN	10	37 S	21.0 E	24	SURFACE	<100	0
KING 3	SESAME MINING CO	SAN JUAN			0		UNDERGRO	<100	0
KING JAMES VIRGE	URADCO	SAN JUAN			0		UNDERGRO	1,000 = 100,000	200
KITTY	SHUMWAY KENNETH	SAN JUAN			0		SURFACE	<100	0

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
KNOB	REDD, PRESTON	SAN JUAN			0		UNDERGRO	100 - 1,000	150
LA LOMA 2	BAILEY, R.D.	SAN JUAN			0		UNDERGRO	100 - 1,000	100
LAST CHANCE 1	ATLAS URANIUM CO	SAN JUAN	17	28 S	23.0 E	24	UNDERGRO	100 - 1,000	150
LAST CHANCE 1	ALCO URANIUM	SAN JUAN	31	35 S	25.0 E	24	UNDERGRO	1,000 - 100,000	150
LAST CHANCE 3	SHUPE, WADE	SAN JUAN			0		UNDERGRO	<100	150
LAVENDER 5	FROST, ALFRED	SAN JUAN			0		SURFACE	<100	0
LEASE 3226	STATE OF UTAH	SAN JUAN			0		UNDERGRO	<100	100
LEASE 3919	STATE OF UTAH	SAN JUAN			0		SURFACE	<100	0
LEDGE	ELLISON W.	SAN JUAN	10	37 S	21.0 E	24	UNDERGRO	1,000 - 100,000	0
LENA 16	TURNER BROS	SAN JUAN			0		UNDERGRO	100 - 1,000	0
LENA 20	TURNER BROS	SAN JUAN			0		UNDERGRO	<100	0
LENA 4	KELLEY, JAME S.	SAN JUAN			0		UNDERGRO	<100	0
LEO J.	J.+ J.URANIUM	SAN JUAN			0		UNDERGRO	<100	150
LIBERTY	ERNST, HAROLD	SAN JUAN	28	31 S	26.0 E	24	UNDERGRO	100 - 1,000	100
LINDA MUJAR	ATLAS MINERALS	SAN JUAN	11	30 S	24.0 E	24	UNDERGRO	1,000 - 100,000	50
LITTLE DAWN	STOCKS, DONALD	SAN JUAN			0		UNDERGRO	<100	0
LITTLE DEVIL	BOWLES + HEFLIN	SAN JUAN	3	28 S	23.0 E	24	UNDERGRO	<100	0
LITTLE DIAM 3	LONE BUTTE MNG.	SAN JUAN			0		UNDERGRO	100 - 1,000	50
LITTLE DOROTHY	UNKNOWN CONTROLP	SAN JUAN			0		SURFACE	<100	0
LITTLE FAWN	NICHOLS, CARL L.	SAN JUAN	15	27 S	23.0 E	24	UNDERGRO	<100	0
LITTLE INDIAN	SITTON F A	SAN JUAN			0		SURFACE	<100	0
LITTLE JACK	QUIGLEY, FRANK	SAN JUAN			0		UNDERGRO	<100	100
LITTLE PETFP	WASHBURN, LARK	SAN JUAN			0		UNDERGRO	100 - 1,000	150
LIZARD	CLEVELAND, J.G.	SAN JUAN	16	28 S	23.0 E	24	SURFACE	<100	0
LOGAN	UNKNOWN CONTROLP	SAN JUAN	7	31 S	25.0 E	24	SURFACE	<100	0
LONE BUTTE	NOONAN RALPH	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
LONE PINE	DYER, DELBERT	SAN JUAN	6	32 S	24.0 E	24	SURFACE	<100	0
LONE STAR	BAILEY +FILSON	SAN JUAN	7	31 S	26.0 E	24	UNDERGRO	100 - 1,000	0
LONE WOLF	WARD, W.D.	SAN JUAN			0		SURFACE	<100	0
LONESOME 5 + 6	STOCKS, CLAYTON	SAN JUAN			0		UNDERGRO	100 - 1,000	150
LONG HOLE	RUST, GLEN	SAN JUAN			0		UNDERGRO	<100	0
LOST BOY+LOST RO	BARBER MINING CO	SAN JUAN			0		UNDERGRO	1,000 - 100,000	250
LOST INDIAN 1	DOBELL MNG.CO.	SAN JUAN			0		SURFACE	<100	0
LOUISF	ATLAS MINERALS	SAN JUAN	14	30 S	24.0 E	24	UNDERGRO	>100,000	550
LOYA RAY	COLORADO DRFG.+	SAN JUAN	6	32 S	24.0 E	24	UNDERGRO	100 - 1,000	50
LUCKY BOY 1	CENTURY 21 MNG.	SAN JUAN	34	35 S	24.0 E	24	UNDERGRO	100 - 1,000	300
LUCKY DAY 2	ARMSTRONG GERMAN	SAN JUAN			0		SURFACE	<100	0
LUCKY LADY	COTTONWOOD MNG.	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
LUCKY STRIKE	SHUMWAY RAY + PE	SAN JUAN			0		UNDERGRO	1,000 - 100,000	0
LUCKY STRIKE	GOFORTH, GAY	SAN JUAN			0		UNDERGRO	100 - 1,000	100
LUCKY STRIKE 1 +	CABOT CORP.	SAN JUAN			0		UNDERGRO	<100	0
LUCKY STRIKE 2	CASTER, LESTER	SAN JUAN			0		SURFACE	<100	150
LULU 1	URANIUM CORPORAT	SAN JUAN			0		UNDERGRO	<100	100
MABLE DEE	LISBON URAN. COR	SAN JUAN			0		UNDERGRO	100 - 1,000	450
MACHINE REJECTS	MARCY SHENANDOAH	SAN JUAN			0		MISC. -PB	<100	0
MAMIE	ATLAS MINERALS	SAN JUAN	27	29 S	24.0 E	24	UNDERGRO	>100,000	400
MARCY GROUP	ENERGY FUELS NUC	SAN JUAN			0		UNDERGRO	1,000 - 100,000	200
MARION	UNKNOWN	SAN JUAN			0		UNDERGRO	100 - 1,000	150

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
MARY JANE 7	SMITH, RICHARD F.	SAN JUAN			0		SURFACE	<100	0
MAXINE	HARBISON, JAMES L.	SAN JUAN			0		UNDERGRO	100 - 1,000	0
MAXINE 2	TRANS WESTERN UR	SAN JUAN			0		UNDERGRO	<100	100
MAXINE 3	TRANS WESTERN UR	SAN JUAN			0		UNDERGRO	<100	100
MAYBE MINE	NEILSON, MILTON	SAN JUAN			0		UNDERGRO	1,000 - 100,000	800
MESA	GOOD EARTH MNG.	SAN JUAN			0		SURFACE	<100	0
MEXICAN HAT STOC	NAVAJO TRIBE	SAN JUAN			0		MISC, -PB	100 - 1,000	100
MI CORAZON	ATLAS MINERALS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	750
MIDVALE	SHUMWAY+ DADE	SAN JUAN	25	31 S	24.0 E	24	UNDERGRO	1,000 - 100,000	0
MILL	R + J MINING	SAN JUAN	1	37 S	24.0 E	24	UNDERGRO	100 - 1,000	0
MINERAL 10	SHUMWAY + WESTWO	SAN JUAN			0		UNDERGRO	<100	0
MIRADOR-HORNY TO	ELAM J.D.	SAN JUAN			0		UNDERGRO	100 - 1,000	200
MITTEN 1	NAVAJO TRIBE	SAN JUAN	26	43 S	15.0 E	24	SURFACE	1,000 - 100,000	50
MOE 1	BLAKE, DONALD V.	SAN JUAN			0		UNDERGRO	100 - 1,000	50
MOKI 1	MOKI MNG CO	SAN JUAN	13	31 S	21.0 E	24	UNDERGRO	1,000 - 100,000	0
MOLLIE, UT. ST. 56	STATE OF UTAH	SAN JUAN			0		UNDERGRO	<100	50
MONTEZUMA	BLACK THUNDER 01	SAN JUAN	35	36 S	24.0 F	24	UNDERGRO	100 - 1,000	250
MONTEZUMA 1	BLACK THUNDER 01	SAN JUAN			0		UNDERGRO	100 - 1,000	250
MONUMENT 3	BUTT, H.D.	SAN JUAN	26	36 S	25.0 E	24	SURFACE	<100	0
MOONLIGHT 1,2+3	SECURITY URA+OIL	SAN JUAN			0		SURFACE	<100	0
NAP	TERRELL + BLACK	SAN JUAN			0		UNDERGRO	1,000 - 100,000	350
NEW AL ROGERS	H.T.+ G.MNG.CO.	SAN JUAN	1	27 S	23.0 E	24	SURFACE	<100	150
NIPPLES	TORRES, DAVID	SAN JUAN	18	31 S	25.0 E	24	UNDERGRO	100 - 1,000	150
NONE SUCH-PIG LE	FOOTE MINERALS	SAN JUAN	21	31 S	24.0 E	24	UNDERGRO	1,000 - 100,000	50
NORTH MESA	NICHOL-ADAIR+BR	SAN JUAN			0		UNDERGRO	<100	0
NORTH POINT 6	WHITE CANYON MNG	SAN JUAN			0		UNDERGRO	100 - 1,000	100
NORTH PT.-GONEA	YUBA DEVELOP.CO.	SAN JUAN		35 S	15.0 E	24	UNDERGRO	1,000 - 100,000	50
OKIE	A+B MINING CO	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
OLD POWDER	HELMAN, MATT+DA	SAN JUAN	2	22 S	28.0 E	24	SURFACE	<100	100
PAGODA	EAST BASIN OIL +	SAN JUAN			0		UNDERGRO	<100	50
PANDA	HURST, BOB	SAN JUAN			0		UNDERGRO	100 - 1,000	100
PASCO, JEN, JACKIE	ATLAS MINERALS	SAN JUAN	33	29 S	24.0 E	24	UNDERGRO	>100,000	650
PAY DAY	QUIGLEY, FRANK	SAN JUAN			0		UNDERGRO	<100	0
PAY OFF	WESTWOOD + SMITH	SAN JUAN	2	33 S	22.0 E	24	UNDERGRO	100 - 1,000	0
PAYDAY-CLOUDY DA	ENERGY FUELS NUC	SAN JUAN	34	36 S	24.0 E	24	UNDERGRO	1,000 - 100,000	0
PEACH A 1	RICHEY, LEE	SAN JUAN			0		UNDERGRO	100 - 1,000	150
PEARL	ATLAS MINERALS	SAN JUAN	14	30 S	24.0 E	24	UNDERGRO	>100,000	550
PEAVINE QUEEN	KIMMERLE, HOWARD	SAN JUAN	7	36 S	29.0 E	24	UNDERGRO	<100	250
PEGGY	SHUPE, WADE	SAN JUAN	28	28 S	26.0 E	24	SURFACE	<100	0
PETE GROUP	CANYONLANDS URAV	SAN JUAN			0		UNDERGRO	1,000 - 100,000	200
PETERINO	SHUMWAY PETE	SAN JUAN			0		UNDERGRO	100 - 1,000	0
PHILLIP DEE 1	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	100 - 1,000	50
PICKALO PETE	BLEAK URANIUM CO	SAN JUAN			0		SURFACE	<100	100
PIGMY	STERN + ZASTROW	SAN JUAN	30	28 S	26.0 E	24	UNDERGRO	100 - 1,000	300
PINCH	UNKNOWN CONTROLR	SAN JUAN			0		SURFACE	<100	0
PINE TREE	PETE SHUMWAY	SAN JUAN	28	28 S	23.0 E	24	UNDERGRO	<100	0
PIUTE	CONSOLIDATED URA	SAN JUAN			0		SURFACE	<100	0
POINT	FOOTE MINERALS	SAN JUAN	4	37 S	21.0 E	24	UNDERGRO	<100	100

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
POINT	YUBA DEVELOP.CO.	SAN JUAN		36 S	16.0 E	24	SURFACE	<100	50
POPEYE	JARAMILLO, THOS.	SAN JUAN	4	32 S	23.0 E	24	SURFACE	<100	0
PORCUPINE	HARBISON, JAMES L	SAN JUAN	7	28 S	23.0 E	24	UNDERGRO	<100	0
PORCUPINE 1	CHATU URAN.MNG.	SAN JUAN			0		SURFACE	<100	200
PRICE=LUCK	SLAGTER EXPLORAT	SAN JUAN			0		UNDERGRO	<100	100
PRINCE ALBERT	SILVER EAGLE MNG	SAN JUAN	16	28 S	23.0 E	24	UNDERGRO	100 - 1,000	0
PRODUCTION	SKYLAND DEVEL.CO	SAN JUAN			0		UNDERGRO	100 - 1,000	0
PROFIT GROUP	ATLAS-AMAX	SAN JUAN	30	31 S	25.0 E	24	UNDERGRO	1,000 - 100,000	150
PURE LUCK	EDGAR EXPLORATIO	SAN JUAN	35	36 S	25.0 E	24	UNDERGRO	100 - 1,000	150
R.H.H.	DEGURSE, JACK	SAN JUAN			0		SURFACE	<100	0
R.O.METALS	APEX EXPLORATION	SAN JUAN			0		UNDERGRO	<100	100
RADON HIT ROCK G	ATLAS MINERALS	SAN JUAN	29	29 S	24.0 E	24	UNDERGRO	>100,000	700
RAINBOW	SMITH, W.I.	SAN JUAN			0		UNDERGRO	100 - 1,000	0
RAM 1	CIMOTA EXPLORATI	SAN JUAN			0		UNDERGRO	100 - 1,000	0
PAN GROUP	LYLE PROS	SAN JUAN			0		SURFACE	<100	0
RAM JET	WESTERN MINERALS	SAN JUAN			0		UNDERGRO	<100	500
RATTLESNAKE 4 U	ATLAS MINERALS	SAN JUAN			0		UNDERGRO	100 - 1,000	150
RATTLESNAKE PIT	WOODMONT IAC	SAN JUAN	12	29 S	23.0 E	24	UNDERGRO	>100,000	200
RAVEN 1	RADIO GEOPHYSICA	SAN JUAN			0		SURFACE	<100	50
REBEL	R J YOONAN	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
RECLAIMED ORE	BLACK, CECIL	SAN JUAN			0		MISC.-PB	<100	0
RED BOX + RED HO	ERNST + DILLON	SAN JUAN			0		UNDERGRO	<100	250
RED CANYON 1	RED CANYON MINES	SAN JUAN			0		UNDERGRO	<100	100
RED DEVIL 1 + 2	DURHAM, JASPER N.	SAN JUAN			0		SURFACE	<100	0
RED HOT 1-36	ALTURA MINING CO	SAN JUAN			0		UNDERGRO	100 - 1,000	50
RED MOTEL	UNKNOWN CONTROLR	SAN JUAN			0		SURFACE	<100	0
RED PATCH	SHUMWAY+ DADE	SAN JUAN	9	31 S	25.0 E	24	UNDERGRO	<100	50
RED ROCK	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	150
RED ROCK GROUP	DENTON F.J.	SAN JUAN			0		UNDERGRO	1,000 - 100,000	300
REDLANDS GROUP	MURPHY, VICTOR	SAN JUAN			0		SURFACE	<100	0
RENEGADE	PETERSON, FRANK	SAN JUAN	14	27 S	23.0 E	24	UNDERGRO	100 - 1,000	0
RENEGADE 1	MINERAL HILL URA	SAN JUAN	14	27 S	23.0 E	24	UNDERGRO	<100	0
REPRISE	ATLAS MINERALS	SAN JUAN	3	30 S	24.0 E	24	UNDERGRO	1,000 - 100,000	900
REX GROUP(DEER F	GRANT SHUMWAY	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
REYNOLDS 1	REYNOLDS, HORACE	SAN JUAN			0		SURFACE	<100	100
RICHARDSON	HOMESTAKE MNG CO	SAN JUAN	28	29 S	24.0 E	24	UNDERGRO	>100,000	500
RIDGE 1	SIMPSON, WOODROW	SAN JUAN	15	37 S	21.0 E	24	UNDERGRO	1,000 - 100,000	0
RIM ROCK	KASSEL URAN.ENTE	SAN JUAN			0		UNDERGRO	<100	200
ROAN CREEK	CONSOLIDATED URA	SAN JUAN			0		UNDERGRO	<100	0
ROBIN	TURNER, FRED	SAN JUAN	36	27 S	22.0 E	24	SURFACE	<100	0
ROCK 1 + 2	BURBRIDGE, DEL	SAN JUAN	34	35 S	24.0 E	24	UNDERGRO	1,000 - 100,000	0
ROCK DOOR 1	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	<100	50
ROTTEN LOG	UNKNOWN CONTROLR	SAN JUAN			0		SURFACE	<100	0
ROYAL FLUSH	SHUMWAY BROS.MG	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
RUBY	SHUPE, WADE	SAN JUAN			0		SURFACE	<100	100
RUSTY 4	TURNER URAN CORP	SAN JUAN			0		SURFACE	<100	0
RUSTY CAN 5	WRIGHT, L.B.	SAN JUAN	26	36 S	25.0 E	24	UNDERGRO	<100	250
RUSTY-LITTLE MAE	GENERAL ELECTRIC	SAN JUAN			0		UNDERGRO	1,000 - 100,000	250

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
SADDLE	WHITE CANYON MNG	SAN JUAN			0		UNDERGRO	100 - 1,000	150
SADDLE-SCENIC	YUBA DEVELOP.CO.	SAN JUAN			0		UNDERGRO	100 - 1,000	100
SALT CEDAR	BARBER MINING CO	SAN JUAN	34	29 S	20,0 E	24	UNDERPGRO	100 - 1,000	0
SALT CREEK 2	JONES BROS,MNG,	SAN JUAN			0		SURFACE	<100	100
SAN JUAN 4	LINDA GAY MNG,	SAN JUAN			0		SURFACE	<100	100
SAN JUAN SHAFT	RANCHERS EXPL+D	SAN JUAN	34	29 S	24,0 F	24	UNDERGRO	1,000 - 100,000	250
SANDY	KNAPP URAN,DEVEL	SAN JUAN	33	39 S	21,0 E	24	UNDERGRO	<100	50
SC,SEC.16,27S-23	STATE OF UTAH	SAN JUAN	16	27 S	23,0 E	24	UNDERGRO	<100	0
SCENIC	JIM BUTT	SAN JUAN			0		UNDERGRO	1,000 - 100,000	200
SCH SEC 2	STATE OF UTAH	SAN JUAN			0		SURFACE	100 - 1,000	50
SCH SEC. 36	STATE OF UTAH	SAN JUAN			0		SURFACE	<100	0
SCH SEC 36 A	STATE OF UTAH	SAN JUAN			0		UNDERGRO	<100	0
SCH. SEC. 16	LAMBERT +PALSLEY	SAN JUAN			0		SURFACE	<100	0
SCH. SEC. 32	STATE OF UTAH	SAN JUAN			0		SURFACE	<100	0
SCH. SEC. 32	STATE OF UTAH	SAN JUAN	32	37 S	23,0 E	24	SURFACE	100 - 1,000	0
SCH,SEC.16-28S-2	BALSLEY, TOM	SAN JUAN	16	28 S	23,0 E	24	UNDERGRO	100 - 1,000	100
SCH,SEC.16-39S-2	JIM BUTT	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
SCH,SEC.36,30S-2	TRIDENT MIN CO	SAN JUAN	36	30 S	25,0 E	24	UNDERGRO	1,000 - 100,000	150
SCH,SEC.36,43S-1	STATE OF UTAH	SAN JUAN	36	43 S	14,0 E	24	UNDERGRO	1,000 - 100,000	100
SCHMITZ FOLLY	BADGER URAN,CORP	SAN JUAN			0		SURFACE	<100	50
SCHOOL SECTION	AMERICAN URAN EN	SAN JUAN			0		UNDERGRO	<100	150
SEBASTPOOL	FERGUSON AV,+ CT	SAN JUAN			0		UNDERGRO	100 - 1,000	0
SEC.36,2RS-24E U	UNION CARBIDE	SAN JUAN	36	28 S	24,0 E	24	UNKNOWN	1,000 - 100,000	450
SEC.36,31S-24E	HOPKINS, ED	SAN JUAN	36	21 S	24,0 E	24	UNDERGRO	1,000 - 100,000	150
SELDOM	DELAY SHUMWAY	SAN JUAN			0		UNDERGRO	100 - 1,000	0
SERVICE	LYEN,POLLOCK+HUM	SAN JUAN			0		SURFACE	<100	0
SERVICE BERRY	LYLE FRANCIS	SAN JUAN	34	30 S	25,0 E	24	UNDERGRO	100 - 1,000	0
SHALE	SHUMWAY BROS,MG	SAN JUAN	3	37 S	21,0 E	24	UNDERGRO	1,000 - 100,000	100
SHALE BLOCK 1 +	FOOTE MINERALS	SAN JUAN			0		UNDERGRO	100 - 1,000	100
SHINE	SHUMWAY BROS,MG	SAN JUAN			0		UNDERGRO	100 - 1,000	0
SHIRLEY 1	CRAIG MINING CO,	SAN JUAN			0		UNDERGRO	<100	0
SIMPATICA 3	SHUMWAY BROS,MG	SAN JUAN			0		UNDERGRO	1,000 - 100,000	0
SIR SNAPPER	NOLAND, FRANK	SAN JUAN			0		UNDERGRO	<100	250
SKEETER	STOCKS, JOHN	SAN JUAN			0		UNDERGRO	<100	0
SKIP	BISHOP + DAVIS	SAN JUAN			0		SURFACE	<100	0
SKUNKOVICH 1	ATLAS MINERALS	SAN JUAN	11	30 S	24,0 E	24	UNDERGRO	1,000 - 100,000	550
SKUNKOVICH 2	ATLAS MINERALS	SAN JUAN	14	30 S	24,0 E	24	UNDERGRO	1,000 - 100,000	650
SKYLINE	NAVAJO TRIBE	SAN JUAN	27	43 S	15,0 E	24	UNDERGRO	1,000 - 100,000	200
SLIDE	SHUMWAY H + L	SAN JUAN			0		UNDERGRO	<100	0
SLIDE-BIG THREE	CHESS RIDGE MNG	SAN JUAN	7	25 S	24,0 F	24	UNDERGRO	<100	100
SLUM	MONTAZUMA URAN,	SAN JUAN	28	35 S	24,0 E	24	UNDERGRO	<100	150
SMALL FRY 5 + 7	RANCHERS EXPL+D	SAN JUAN	35	29 S	24,0 E	24	UNDERGRO	1,000 - 100,000	200
SOLOMAN EMMA	TATMAN+GILLESPIE	SAN JUAN			0		SURFACE	<100	500
SOUTH ALICE	HOMESTAKE MNG CO	SAN JUAN	33	29 S	24,0 E	24	UNDERGRO	1,000 - 100,000	700
SOUTH ALMAR GROU	ATLAS MINERALS	SAN JUAN	28	29 S	24,0 E	24	UNDERGRO	>100,000	750
SOUTH NOTCH	BERNSTEIN+CARTE	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
SOUTH SLOPE	BENTLEY, JIM	SAN JUAN	13	31 S	24,0 E	24	SURFACE	<100	0
SOUTH WIND 1	DAKOTA MINING CO	SAN JUAN			0		UNDERGRO	<100	0

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MINE NAME	CONTROLLEP NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
SPOOK-DEE	CBC MINING CO.	SAN JUAN			0		UNDERGRO	1,000 - 100,000	300
SPRING CREEK	FOOTE MINERALS	SAN JUAN	3	37 S	21,0 E	24	UNDERGRO	1,000 - 100,000	50
SPRING WATER GRO	SHUMWAY BROS.MG	SAN JUAN	3	37 S	21,0 E	24	UNDERGRO	1,000 - 100,000	150
SSL 2470	STATE OF UTAH	SAN JUAN			0		SURFACE	<100	0
ST.LSE. 5691 UTA	STATE OF UTAH	SAN JUAN			0		UNDERGRO	<100	150
STARLIGHT	SHUPE, IKE W.	SAN JUAN			0		SURFACE	<100	0
STATE LINE	NEILSON, PILTON	SAN JUAN	26	31 S	24,0 E	24	UNDERGRO	<100	0
STINKO	ATLAS MINERALS	SAN JUAN	3	30 S	24,0 E	24	UNDERGRO	>100,000	650
STONE LOG 1	BASHAW, FRED L.	SAN JUAN			0		UNDERGRO	<100	50
SUNDAY 4	NATURAL POWERS C	SAN JUAN			0		SURFACE	<100	50
SUNDOWN	STEWART, WESLEY	SAN JUAN	14	27 S	23,0 E	24	UNDERGRO	<100	0
SUNDOWN	NAVAJO TRIBE	SAN JUAN			0		SURFACE	<100	200
SUNNY DAY	BLAKE, DONALD V.	SAN JUAN	6	24 S	24,0 E	24	SURFACE	<100	0
SUNNYSIDE	BALSLEY, H.W.	SAN JUAN	33	28 S	23,0 E	24	UNDERGRO	100 - 1,000	0
SUNNYSIDE	WOODMONT INC.	SAN JUAN	11	31 S	24,0 E	24	UNDERGRO	1,000 - 100,000	300
SUNRISE	ATLAS MINERALS	SAN JUAN			0		UNDERGRO	1,000 - 100,000	50
SUNSET	STEWART, WESLEY	SAN JUAN	14	27 S	23,0 E	24	SURFACE	<100	0
SUNSHINE	NICK J. MIPPHY	SAN JUAN	30	31 S	25,0 E	24	UNDERGRO	1,000 - 100,000	50
SURPRISE	MAXWELL, MELVIN I.	SAN JUAN	26	35 S	24,0 F	24	UNDERGRO	1,000 - 100,000	0
TAYLOR FEID 1+2	SAYKO, CHARLIE	SAN JUAN			0		SURFACE	<100	0
TE QUIERO	NAVAJO TRIBE	SAN JUAN	15	43 S	14,0 E	24	UNDERGRO	1,000 - 100,000	200
TERGIRA	LARRY SHUMWAY	SAN JUAN			0		UNDERGRO	1,000 - 100,000	0
TEXSTAR	TERGIBA INC	SAN JUAN			0		SURFACE	<100	50
TOP	NOONAN R J	SAN JUAN			0		UNDERGRO	<100	250
TREASURE TROVE	JOHNSON, DAVE	SAN JUAN	31	27 S	23,0 E	24	SURFACE	<100	0
TREE	ASIMUS, C.C.	SAN JUAN			0		SURFACE	<100	0
UNIT 7	BLEAK, CHARLES	SAN JUAN			0		UNDERGRO	100 - 1,000	100
UNKNOWN	LEWIS, W.E	SAN JUAN			0		SURFACE	<100	150
URACOP 1-3	MOKI UPAN, SYNDIC	SAN JUAN			0		UNDERGRO	<100	50
URANIUM KING	DENTON F.J.	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
UTAH ST.LSE 2291	SUTHERLAND M C	SAN JUAN	6	37 S	16,0 E	24	UNDERGRO	1,000 - 100,000	300
UTAH ST.LSE, 235	STATE OF UTAH	SAN JUAN			0		SURFACE	<100	100
UTAH ST.LSE. 530	SHUMWAY+ CADE	SAN JUAN			0		SURFACE	<100	150
UTAH ST.LSE,1766	STATE OF UTAH	SAN JUAN			0		UNDERGRO	<100	0
UTAH ST.LSE,2333	ANDERSON BRUS,DR	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
VAL VISTA 1	COSTANZA, JOSEPH	SAN JUAN			0		UNDERGRO	100 - 1,000	150
VALLEY POINT	CONFEDERATED MET	SAN JUAN			0		UNDERGRO	<100	150
VALLEY VIEW	THOMPSON, NOEL	SAN JUAN			0		SURFACE	<100	0
VANADIUM QUEEN	ATOMIC RESOURCES	SAN JUAN	11	31 S	24,0 E	24	UNDERGRO	<100	0
VARIOUS	BRUNKE, W.W.	SAN JUAN			0		UNDERGRO	100 - 1,000	0
VARIOUS	W.C.T.ENGINEERIN	SAN JUAN			0		UNDERGRO	1,000 - 100,000	0
VEDURE	URANIUM PROCESSE	SAN JUAN			0		SURFACE	<100	0
VELDERS 1	PARAMOUNT URAN,C	SAN JUAN	34	35 S	25,0 E	24	UNDERGRO	100 - 1,000	250
VELVET	VELDERS, JOHN	SAN JUAN			0		UNDERGRO	<100	0
VICTOR	FOOTE MINERALS	SAN JUAN	19	31 S	25,0 E	24	UNDERGRO	1,000 - 100,000	0
VIEW	MURPHY, OTTO	SAN JUAN			0		SURFACE	<100	0
VIEW NORTH 1	FOOTE MINERALS	SAN JUAN			0		UNDERGRO	<100	50
	SOUTHERN CROSS U	SAN JUAN			0		UNDERGRO	<100	200

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
VISION	PLATEAU MNG.CO.	SAN JUAN			0		UNDERGRO	100 - 1,000	100
W.J.1	CASTOR + STEWART	SAN JUAN			0		UNDERGRO	100 - 1,000	200
W.N.	YUBA DEVELOP.CO.	SAN JUAN	21	3 S	1,7 E	24	UNDERGRO	1,000 - 100,000	150
WABAN MINE	RALPH J NOONAN	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
WATERLOO	MALEY MINING CO.	SAN JUAN	16	37 S	21,0 E	24	SURFACE	<100	0
WATERLOO-STEPLAD	DUNCAN WALTER JR	SAN JUAN			0 E	24	UNDERGRO	<100	250
WEST PAY DAY	DANIEL R.B.	SAN JUAN	36	24 S	19,0 E	24	UNDERGRO	100 - 1,000	250
WHEELER	OSULLIVAN+THIRKE	SAN JUAN			0		SURFACE	<100	250
WHIRLWIND	NAVAJO TRIBE	SAN JUAN			0		UNDERGRO	1,000 - 100,000	150
WHITE CANYON STK	FOOTE MINFRALS	SAN JUAN			0		UNDERGRO	<100	0
WHITE HORSE GROU	BARBY, ROBERT W.	SAN JUAN	11	36 S	25,0 E	24	UNDERGRO	<100	0
WILLIE	UNKNOWN CONTROLP	SAN JUAN			0		SURFACE	<100	0
WIND BLOWN	SAN MIGUEL MINES	SAN JUAN			0		SURFACE	<100	0
WINDFALL 27	ATLAS-FOOTE	SAN JUAN			0		UNDERGRO	1,000 - 100,000	100
WOELTER	LYMAN, BOB	SAN JUAN			0		SURFACE	<100	0
WOODROW WILSON	NEILSON, MILTON	SAN JUAN	35	30 S	24,0 E	24	UNDERGRO	1,000 - 100,000	0
WYOMING	NEILSON, MILTON	SAN JUAN			0		UNDERGRO	100 - 1,000	0
YELLOW BARY	MERZ + KNOX	SAN JUAN			0		UNDERGRO	<100	0
YELLOW GIRL	KNOX, HARRY	SAN JUAN	13	44 N	20,0 W	22	SURFACE	<100	0
YELLOW JOHN	JIM C. BUTT	SAN JUAN			0		UNDERGRO	1,000 - 100,000	50
YELLOW PAIL 1	F.+ C.WESTERN MG	SAN JUAN			0		UNDERGRO	100 - 1,000	0
ZIG ZAG	HAUGUM, CARL	SAN JUAN			0		UNDERGRO	<100	0
R.B.B.	APPIER, DAVID	SEVIER			0		SURFACE	<100	50
FLAT TIRE 2	MARYSVALE URAN,C	SEVIER	24	26 S	4,0 W	24	UNDERGRO	<100	100
BOBO	TEXAS PLUNGERS+A	UINTAH			0		UNDERGRO	<100	0
BRENDA GROUP	FERNAB CO.	UINTAH			0		SURFACE	<100	0
BUZZARD 1	HAMILTON ASSOC.	UINTAH			0		SURFACE	<100	0
CPOW 1	HAMILTON, STEVE	UINTAH			0		SURFACE	<100	50
DEVILS CAVE	MARTINSEN, M,LYNN	UINTAH			0		UNDERGRO	<100	50
EUREKA4-CANARY B	COOPER + SANDS	UINTAH			0		UNDERGRO	<100	0
GREEN ROCK	SWOYTS, DARRELL	UINTAH			0		SURFACE	<100	50
HORSE EAR	MOTT, ORSON	UINTAH			0		SURFACE	<100	0
LION 5	MORGETTS,SUMNER	UINTAH			0		SURFACE	<100	0
LONE PEAK	ERRISA L.M.	UINTAH			0		SURFACE	<100	0
RATTLESNAKE	HARRISON J.H.	UINTAH			0		SURFACE	<100	0
SANDY	ANSON, DELMER C.	UINTAH			0		SURFACE	<100	0
SATIN GROUP	COLOTAH URANIUM	UINTAH			0		SURFACE	<100	100
STEPHENS	FLUKEY + HUNT	UINTAH			0		SURFACE	<100	0
ANNAS PRIDE	LA FLOPECITA MNG	WASHINGTON			0		SURFACE	<100	0
KOLOB	STATE OF UTAH	WASHINGTON			0		UNDERGRO	100 - 1,000	50
LOCALORE 1	LA VORKIN MNG.	WASHINGTON			0		SURFACE	<100	0
SILVER POINT LOD	LA FLORECITA MNG	WASHINGTON			0		SURFACE	<100	0
SILVERMAN 2	WESTERN EQUITIES	WASHINGTON	6	41 S	13,0 W	24	UNDERGRO	1,000 - 100,000	150
VANDEBILT	EAGER, WALTER C.	WASHINGTON	17	41 S	13,0 W	24	SURFACE	<100	0
BIG JIM-LITTLE J	SMITH + HUNT	WAYNE			0		UNDERGRO	100 - 1,000	50
BLACK JACK	MC CAULEY,EUGENE	WAYNE			0		SURFACE	<100	50
BLUE RIBBON	BROWN, J.F.	WAYNE			0		SURFACE	<100	50
BLUE STONE	BLUE STONE MNG	WAYNE			0		SURFACE	<100	100

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UTAH (CONT'D) *****									
BRIDGER JACK	BRIDGER, JACK INC	WAYNE			0		UNDERGRO	100 - 1,000	0
CONGRESS 20	INDUSTRIES+MINES	WAYNE			0		UNDERGRO	<100	50
FAIRVIEW	ROBINSON, ELWIN	WAYNE			0		SURFACE	<100	50
GRAYBAR	ROCKY MTN URA	WAYNE			0		SURFACE	<100	50
GREEN HORNET	ALAMCO INC.	WAYNE			0		UNDERGRO	100 - 1,000	50
GREEN MONSTER	CAPITOL REEF URA	WAYNE			0		UNDERGRO	<100	100
GREENLIGHT + KIM	ELLETT, RUION S.	WAYNE			0		UNDERGRO	<100	150
HECLA	HECLA MINING CO.	WAYNE			0		UNDERGRO	<100	0
HELM GROUP	HATCH, DWAIN + CL	WAYNE			0		UNDERGRO	100 - 1,000	150
HILLERS 1	PEHNELL URANIUM	WAYNE			0		UNDERGRO	<100	50
ISSIANN 1	ISABEL MNG.CO.	WAYNE			0		UNDERGRO	<100	150
JANUARY	LYMAN, BOB	WAYNE			0		SURFACE	<100	100
LA VELL 1	SKINER+SKINER+B	WAYNE			0		UNDERGRO	<100	150
LAST CHANCE 2	GREAT WESTERN UR	WAYNE			0		SURFACE	<100	50
LOVELL 1	IMPERIAL URANIUM	WAYNE			0		SURFACE	<100	100
LUSCOMBE 2	PELICAN URANIUM	WAYNE			0		SURFACE	<100	50
MAMA + PAPA BEAR	P + P ASSOCIATES	WAYNE			0		SURFACE	100 - 1,000	0
NORTON	ROCKY MTN, URA	WAYNE			0		SURFACE	<100	50
OAK CREEK	LYMAN, BOB	WAYNE			0		UNDERGRO	<100	100
OAK RIDGE	UNKNOWN CONTROLR	WAYNE			0		SURFACE	<100	50
OLD CROW	WONDERLAND MNG	WAYNE			0		UNDERGRO	<100	0
ORAL 1 + 2	JENSEN + KOURIS	WAYNE			0		UNDERGRO	<100	50
POOR BOY 1	ROPER, P.L.	WAYNE			0		SURFACE	<100	100
SOUTH FORK 1	CROWN DEVEL CO	WAYNE			0		SURFACE	<100	50
THUNDERING HERD	TACONY URANIUM	WAYNE			0		SURFACE	<100	50
TURRET 1	UTAH SOUTHERN UR	WAYNE			0		UNDERGRO	<100	150
WILD HORSE MESA	US COMMON WEALTH	WAYNE			0		UNDERGRO	<100	50
YELLOW CANARY	CHRISTENSEN+MAT	WAYNE			0		UNDERGRO	100 - 1,000	50
BIG DANE	CURTIS E.P.	UNKNOWN			0		SURFACE	<100	0
BULL DOG 1	PEACOCK+NEILSON	UNKNOWN			0		SURFACE	<100	0
CAT 1	WALLACE, MELVIN J	UNKNOWN			0		UNDERGRO	<100	0
CUB 1	TUSHER MINING CO	UNKNOWN			0		UNDERGRO	<100	0
HOLE 4	PETTY MNG + EXPL	UNKNOWN			0		SURFACE	<100	0
SUSIE BELL	SADDLER, DON	UNKNOWN			0		SURFACE	<100	0
***** WASHINGTON *****									
H.P.S. CLAIMS	GREEN NUGGET MNG	PEND OREILLE			0		SURFACE	100 - 1,000	50
LOST CREEK 4	ATOMIC SILVER CP	PEND OREILLE			0		SURFACE	1,000 - 100,000	100
QUARTZ RIDGE GRO	ATOMIC SILVER CP	PEND OREILLE			0		SURFACE	100 - 1,000	0
CLINE LEASE	UNKNOWN CONTROLR	SPOKANE			0		SURFACE	100 - 1,000	50
DAHL LEASE	HAREM, OSCAR	SPOKANE	11	28 N	44.0 F	33	SURFACE	1,000 - 100,000	50
DAHL TRACT A	HAREM, MRS. LETHA	SPOKANE			0		SURFACE	100 - 1,000	100
HANSON LEASE	UNKNOWN CONTROLR	SPOKANE			0		SURFACE	100 - 1,000	50
HEREM MOORE LEAS	HAREM, OSCAR	SPOKANE			0		SURFACE	1,000 - 100,000	100
HUFFMAN LEASE	HUFFMAN, ELLA	SPOKANE			0		SURFACE	100 - 1,000	100
INGRAM LEASE	UNKNOWN CONTROLR	SPOKANE	18	28 N	45.0 E	33	SURFACE	100 - 1,000	50

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** WASHINGTON (CONT'D) *****									
LEHMBECKER LEASE	LEHMBECKER, W.E.	SPOKANE			0		SURFACE	100 - 1,000	50
MOURNING LEASE	DIMITROFF, JACK	SPOKANE			0		SURFACE	100 - 1,000	50
LOWLEY LEASE	WESTERN NUCLEAR	STEVENS			0		SURFACE	100 - 1,000	50
***** WYOMING *****									
AJAX 42	ASPEN MINING CO.	ALBANY			0		SURFACE	<100	0
ALBANY	WATERS + CUNDALL	ALBANY			0		SURFACE	<100	0
DESERT ROSE LEAS	SXTON, LINCOLN W	ALBANY	9	13 N	78.0 W	06	SURFACE	<100	50
NIGHT OWL	BATTLE AXE MNG. C	ALBANY			0		SURFACE	<100	50
BASHAWN 2	BONNEVILLE BASIN	BIG HORN	28	45 N	75.0 W	06	SURFACE	<100	50
BROKEN HEART 8	SUPER CUR MNG. CO	BIG HORN			0		SURFACE	<100	50
HIGH NOON 3	SKYWAYS EXPLORAT	BIG HORN			0		UNDERGRO	100 - 1,000	100
HORSESHOE JOHN	SANTA RITA MNG. +	BIG HORN			0		UNDERGRO	100 - 1,000	50
JET 8	MODERN MINES DEV	BIG HORN	22	58 N	94.0 W	06	UNDERGRO	1,000 - 100,000	200
LEO 1-6	FINK, HERMAN	BIG HORN	23	58 N	94.0 W	06	UNDERGRO	100 - 1,000	50
MIKE MICKEY	HANSON	BIG HORN	22	58 N	94.0 W	06	UNDERGRO	1,000 - 100,000	50
SANQUINE 12	HOLLAND, ROBERT L	BIG HORN			0		SURFACE	<100	50
TRI-PACER	TITAN MINING CO.	BIG HORN	28	58 N	94.0 W	06	UNDERGRO	1,000 - 100,000	50
ABLE, BAKER, CHARL	HIGHLAND URANIUM	CAMPBELL	23	43 N	76.0 W	06	SURFACE	<100	50
ANOMALY 261, 4-42-	KERR-MCGEE CORP.	CAMPBELL	4	42 N	76.0 W	06	SURFACE	<100	50
ANOMALY 96, 16-45-	KERR-MCGEE CORP.	CAMPBELL	16	45 N	76.0 W	06	SURFACE	<100	0
AXE 10	AXE URANIUM CO.	CAMPBELL	8	43 N	75.0 W	06	SURFACE	100 - 1,000	50
B GROUP	LOGAN CHUPCHILL	CAMPBELL	17	44 N	75.0 W	06	SURFACE	100 - 1,000	50
BAR NONE 31	UNKNOWN CONTROLR	CAMPBELL	20	45 N	75.0 W	06	SURFACE	<100	50
BIG HORN 3	BIG HILL MINING	CAMPBELL			0		SURFACE	<100	0
BILL + EARL CLAI	GARDNER, F.L.	CAMPBELL	33	44 N	75.0 W	06	SURFACE	<100	50
BLACK STAR-RLUF	ROSEN, HERLON H.	CAMPBELL	10	44 N	75.0 W	06	SURFACE	1,000 - 100,000	50
BRUCE CLAIMS	ROSENBERGER, GENE	CAMPBELL	8	43 N	76.0 W	06	SURFACE	<100	100
CAMBLIN 2	WHYNOT PROSPECTI	CAMPBELL	28	44 N	75.0 W	06	SURFACE	<100	50
CAMBLIN WEST	HURD H.P. + ASSOC	CAMPBELL	4	43 N	75.0 W	06	SURFACE	100 - 1,000	150
CHRYSOPS 1, 30-41-	KERR-MCGEE CORP.	CAMPBELL	20	41 N	73.0 W	06	SURFACE	1,000 - 100,000	50
COLO SPOT 4 + 5	GILBERT, MORSE C	CAMPBELL	25	43 N	76.0 W	06	SURFACE	1,000 - 100,000	50
COLORADO CHRISTE	ROSEN, HERLON H.	CAMPBELL	27	45 N	75.0 W	06	SURFACE	1,000 - 100,000	50
COLUMBUS GROUP	BALL, GRACE D. MRS	CAMPBELL	5	43 N	76.0 W	06	SURFACE	<100	50
CORA + BETTY	HAMLIN EXPL + MNG.	CAMPBELL	29	43 N	75.0 W	06	SURFACE	<100	50
DOE + CHRISTENSE	WESTERN URANIUM	CAMPBELL	21	45 N	76.0 W	06	SURFACE	100 - 1,000	50
DOVE BUTTE	NELSON + SPAIN	CAMPBELL	35	45 N	76.0 W	06	SURFACE	100 - 1,000	50
GAP GROUP	LITTLE PHOENIX UR	CAMPBELL	5	43 N	75.0 W	06	SURFACE	<100	50
HA + RUTH SCHLAUTM	LITTLE STAR MNG	CAMPBELL			44 N		SURFACE	<100	50
HOE CLAIMS	AMERICAN NUCL. CP	CAMPBELL	3	46 N	76.0 W	06	SURFACE	100 - 1,000	50
INNES LEASE	WESTERN URANIUM	CAMPBELL	11	45 N	75.0 W	06	SURFACE	1,000 - 100,000	50
IRA 1	BUTLER, RYBURN	CAMPBELL			43 N		SURFACE	100 - 1,000	50
JAKE CME 1920-41-	KERR-MCGEE CORP.	CAMPBELL	19	41 N	73.0 W	06	SURFACE	1,000 - 100,000	50
JEANETTE 1	ROSEN, HERLON H.	CAMPBELL	22	45 N	75.0 W	06	SURFACE	1,000 - 100,000	100
JOE 1	CORBELL, F.O.	CAMPBELL			N		SURFACE	<100	50
JOYCE	GILBERT, MORSE C	CAMPBELL	33	44 N	75.0 W	06	SURFACE	<100	50

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***** WYOMING (CONT'D) *****									
LAUBY SCHLAUTMAN	LITTLE STAR MNG	CAMPBELL	27	45 N	75.0 W	06	SURFACE	<100	50
LAUR 8, 19	WHYNOT PROSPECTI	CAMPBELL	19	43 N	74.0 W	06	SURFACE	<100	50
LUCKY EIGHT 1	BOND, JACK	CAMPBELL	10	44 N	76.0 W	06	SURFACE	<100	50
MARY 1	BOWEN, H.H.	CAMPBELL	22	45 N	75.0 W	06	SURFACE	100 - 1,000	50
MC CLAIMS	WILK, MAX	CAMPBELL	27	43 N	76.0 W	06	SURFACE	100 - 1,000	50
MIRACLE MILE	MOORE, GEORGE R.	CAMPBELL	27	45 N	75.0 W	06	SURFACE	100 - 1,000	50
MYSTERY 2	HOT SANDS URAN C	CAMPBELL	28	43 N	76.0 W	06	UNDERGRO	<100	50
NERO 5 + 17	MTN STATES MNG,	CAMPBELL	15	43 N	76.0 W	06	SURFACE	100 - 1,000	50
ORR 2	GILA URAN,CORP.	CAMPBELL	5	45 N	74.0 W	06	SURFACE	100 - 1,000	50
OSAGE LEASE	BOWEN,HERLDOH H.	CAMPBELL	32	46 N	74.0 W	06	SURFACE	100 - 1,000	150
PAT 3	MIDDLE BUTTE MNG	CAMPBELL	9	43 N	75.0 W	06	SURFACE	<100	50
PETE GROUP	WESTERN URANIUM	CAMPBELL	3	43 N	76.0 W	06	SURFACE	1,000 - 100,000	50
PRAEST LEASE	GILBERT, MORSE	CAMPBELL	11	45 N	75.0 W	06	SURFACE	<100	50
QUEEN 2	BOWEN,HERLDOH H.	CAMPBELL	22	45 N	75.0 W	06	SURFACE	<100	100
R.H.O. TERRA	WESTERN URANIUM	CAMPBELL	19	43 N	75.0 W	06	SURFACE	<100	50
RENO LEASE	GEORESOURCES,INC	CAMPBELL	34	42 N	73.0 W	06	SURFACE	100 - 1,000	50
SABLE	GILBERT, MORSE	CAMPBELL	9	42 N	75.0 W	06	SURFACE	<100	50
SCOTT 1	W.S.SCHLAUTMAN	CAMPBELL	11	44 N	75.0 W	06	SURFACE	100 - 1,000	100
SEC.36,43N-76.	GILBERT, MORSE	CAMPBELL	36	43 N	76.0 W	06	SURFACE	<100	50
SIMMONS 2	WYO ROC DEVEL	CAMPBELL	28	44 N	75.0 W	06	SURFACE	<100	50
STURLIN MINE	BOWEN, H.H.	CAMPBELL	30	43 N	75.0 W	06	SURFACE	<100	50
SUE 3	MASEK, J.I.	CAMPBELL	17	44 N	75.0 W	06	SURFACE	100 - 1,000	50
SYL DEL MINE	SYL DEL MINES	CAMPBELL	3	43 N	75.0 W	06	SURFACE	100 - 1,000	50
TRIANGLE	AMERICAN URAN,CO	CAMPBELL	28	41 N	75.0 W	06	UNDERGRO	100 - 1,000	100
TRIX GROUP	UPANIUM CORPORAT	CAMPBELL	29	43 N	75.0 W	06	SURFACE	<100	50
YAN BUGGENUM SCO	MURD H.R.+ ASSOC	CAMPBELL	34	44 N	75.0 W	06	SURFACE	<100	100
WHITE MULE 1	W.S.SCHLAUTMAN	CAMPBELL	10	44 N	75.0 W	06	SURFACE	<100	50
AJO	UNKNOWN	CARBON			0		SURFACE	<100	0
BALD KNOB	WESTERN STAN,URAN	CARBON	14	25 N	81.0 W	06	SURFACE	<100	50
CEDAR HLS-JACKRA	UNION CARRIDE CP	CARBON	32	13 N	92.0 W	06	SURFACE	1,000 - 100,000	50
DAVE LEAN ORE	KGS JOINT VENTUR	CARBON			0		LO+GRADE	>100,000	200
DAVE SEC 9+10+15	GETTY-SKELLY UJV	CARBON	10	27 N	78.0 W	06	SURFACE	>100,000	200
DEL ORO 1	PFLUG, RICHARD I	CARBON			0		SURFACE	<100	50
HELEN MAY	ARMSTRONG, H.T.	CARBON	17	28 N	92.0 W	06	SURFACE	1,000 - 100,000	50
KETTCHUM BUTTE L	UNKNOWN CONTROLR	CARBON			0		SURFACE	100 - 1,000	50
LITTLE LILL-JB D	KERR MCGEE	CARBON			0		HL-DUMPS	<100	0
LITTLE MAN 1	UNKNOWN CONTROLR	CARBON			0		UNDERGRO	<100	50
NALL LEASE	TEXAS UTILITIES	CARBON	26	28 N	78.0 W	06	SURFACE	1,000 - 100,000	250
POISON BASIN	HOMESTEAD MINRLS	CARBON	4	12 N	92.0 W	06	SURFACE	1,000 - 100,000	50
SEC 10 LEAN ORE	KGS JOINT VENTUR	CARBON			0		SURFACE	1,000 - 100,000	250
SEC.36,25N-8 W	BAILEY,ROBERT V.	CARBON			0		SURFACE	<100	50
TETON-LUCKY STRI	HOMESTEAD MINRLS	CARBON	6	12 N	92.0 W	06	SURFACE	1,000 - 100,000	100
TSG 1	KGS JOINT VENTUR	CARBON	9	27 N	78.0 W	06	SURFACE	>100,000	150
TSG HEAP LEACH	KGS JOINT VENTUP	CARBON			0		HL-DUMPS	1,000 - 100,000	250
URANIUM KING 1	PLATT,RE +NORISS	CARBON			0		SURFACE	<100	0
WALKER-SULLIVAN	KERR MCGEE	CARBON	11	27 N	78.0 W	06	SURFACE	>100,000	200
ANOMALYD7 28-37-	KERR-MCGEE CORP.	CONVERSE	28	37 N	73.0 W	06	SURFACE	1,000 - 100,000	150
BETTY	KERR-MCGEE CORP.	CONVERSE	25	41 N	74.0 W	06	SURFACE	<100	50

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***** WYOMING (CONT'D) *****									
BETZER LEASE	SMATHERS + DILTS	CONVERSE			0		SURFACE	<100	50
BOX CREEK	UNITED NUCLEAR	CONVERSE	2	35 N	72.0 W	06	SURFACE	1,000 - 100,000	50
CANON BALL 1	UNKNOWN CONTROL.	CONVERSE	1	35 N	72.0 W	06	SURFACE	100 - 1,000	50
CONVERSE MINE	MOORE-HAMBLIN	CONVERSE	14	40 N	75.0 W	06	SURFACE	1,000 - 100,000	150
CARRIER 1	SHAWNEE UPAN+MNG	CONVERSE	2	32 N	69.0 W	06	SURFACE	<100	50
HARDY LSE 27-38-	KERP-MCGEE CORP.	CONVERSE	15	38 N	73.0 W	06	SURFACE	1,000 - 100,000	100
JACKALOPE 13	JACKALOPE OIL+M.	CONVERSE	12	35 N	72.0 W	06	SURFACE	<100	50
JOE GROUP	CRABTREE, JOHN M	CONVERSE	26	38 N	73.0 W	06	SURFACE	1,000 - 100,000	50
JUDY 1-14	COWAN J.L.	CONVERSE	2	32 N	69.0 W	06	SURFACE	<100	50
LAMB	UNKNOWN CONTROL.	CONVERSE	12	35 N	72.0 W	06	SURFACE	1,000 - 100,000	50
LILA BUZZ MINES	NEOCO	CONVERSE	31	35 N	71.0 W	06	UNDERGRO	<100	50
LUCKY ANN MIKEY	STARVES, JOEL	CONVERSE			0		SURFACE	100 - 1,000	50
MINE 1 (D-R)	JARRETT ENTERPRI	CONVERSE	3	37 N	73.0 W	06	UNDERGRO	<100	50
MINE 2D-B 53-37-	KERP-MCGEE CORP.	CONVERSE	3	37 N	73.0 W	06	UNDERGRO	<100	100
NORTH POLE 1	BENSON + CAMBLIN	CONVERSE			0 W	06	SURFACE	<100	50
REYNOLDS T36N-P7	KERP-MCGEE CORP.	CONVERSE	17	36 N	73.0 W	06	SURFACE	<100	50
SEC. 3,37N-73W	KERR-MCGEE CORP.	CONVERSE	3	37 N	73.0 W	06	SURFACE	1,000 - 100,000	100
SEC. 9,37N-73W	KERR-MCGEE CORP.	CONVERSE	9	37 N	73.0 W	06	SURFACE	1,000 - 100,000	100
SEC.10,37N-73W D	KERR-MCGEE CORP.	CONVERSE	10	37 N	73.0 W	06	SURFACE	1,000 - 100,000	50
SEC.15,37N-73W	KERR-MCGEE CORP.	CONVERSE	15	37 N	73.0 W	06	SURFACE	100 - 1,000	150
SEC.16,37N-73W	KERR-MCGEE CORP.	CONVERSE	16	37 N	73.0 W	06	SURFACE	1,000 - 100,000	100
SEC.21,37N-73W N	KEPR-MCGEE CORP.	CONVERSE	21	37 N	73.0 W	06	SURFACE	1,000 - 100,000	100
SHEEPSHED GROUP	BOWEN, HERLDON H.	CONVERSE	12	35 N	72.0 W	06	SURFACE	<100	50
SPOOK	HORNBUCKLE, DICK	CONVERSE	28	38 N	73.0 W	06	SURFACE	>100,000	100
SPRING GROUP	ALLSUP, DARREL B	CONVERSE	30	40 N	74.0 W	06	SURFACE	<100	50
STROCK-ROBCAT-LE	JOHN PETERSON AS	CONVERSE	27	33 N	72.0 W	06	SURFACE	<100	50
TRAIL CREEK GROU	PHINNEY, B.D, ETAL	CONVERSE			0		UNDERGRO	<100	50
TURNERCREST	KERR-MCGEE CORP.	CONVERSE	25	41 N	74.0 W	06	SURFACE	1,000 - 100,000	50
ZEE 1 + 2	KERP-MCGEE CORP.	CONVERSE	27	38 N	73.0 W	06	SURFACE	1,000 - 100,000	100
A.+H.	UNKNOWN CONTROLR	CROOK			0		SURFACE	<100	0
A.A.SISSON	KERR MCGEE	CROOK	7	54 N	60.0 W	06	SURFACE	<100	50
ACKERMAN LEASE	FEDERAL RESOURCE	CROOK	34	56 N	66.0 W	06	SURFACE	1,000 - 100,000	50
BUSFIELD LEASE	FEDERAL RESOURCE	CROOK	26	56 N	66.0 W	06	SURFACE	1,000 - 100,000	50
CABIN CREEK 6	TRI STATE MINING	CROOK			0		SURFACE	<100	50
DENNIS 2 LEASE	MICHAUD MINING C	CROOK	3	55 N	67.0 W	06	SURFACE	1,000 - 100,000	50
GRIFFITH LEASE	GRIFFITH, LYLE	CROOK	26	52 N	66.0 W	06	UNDERGRO	1,000 - 100,000	100
HAUBER MINE UG	HOMESTAKE MNG CO	CROOK	2	55 N	67.0 W	06	UNDERGRO	>100,000	400
HELMER RANCH	CHRIS HELMER	CROOK	19	54 N	60.0 W	06	SURFACE	100 - 1,000	0
HOLMES LEASE	TENN.VALLEY AUTH	CROOK	18	54 N	65.0 W	06	SURFACE	1,000 - 100,000	100
HOMESTAKE 1-4	GEORESOURCES, INC	CROOK	26	52 N	66.0 W	06	SURFACE	1,000 - 100,000	50
K GROUP	TENN.VALLEY AUTH	CROOK	26	56 N	66.0 W	06	SURFACE	1,000 - 100,000	100
LAYMON LEASE	FEDERAL RESOURCE	CROOK	27	52 N	66.0 W	06	UNDERGRO	1,000 - 100,000	200
LEWIS DENNIS LEA	LITTLE MO MINING	CROOK			0		SURFACE	1,000 - 100,000	50
MEYERS LEASE	TENN.VALLEY AUTH	CROOK	21	52 N	65.0 W	06	UNDERGRO	100 - 1,000	50
NEW HAVEN 20-SEC	HOMESTAKE MNG CO	CROOK	10	55 N	67.0 W	06	UNDERGRO	1,000 - 100,000	50
NORTH SLOPE	UNKNOWN CONTROLR	CROOK	7	54 N	60.0 W	06	SURFACE	<100	50
POISON CREEK CLA	BAKER, IRVIN	CROOK	12	54 N	67.0 W	06	SURFACE	<100	50
SADDLE GROUP	LYNARD +KPILEAN	CROOK	22	55 N	65.0 W	06	SURFACE	<100	50

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***** WYOMING (CONT'D) *****									
STATE LEASE	STATE OF WYOMING	CROOK	17	54 N	60.0 W	06	SURFACE	100 - 1,000	50
STORM MINE	HOMESTAKE MNG CO	CROOK	6	55 N	66.0 W	06	SURFACE	1,000 - 100,000	50
T.F.WOLFSKILL LS	ROUNDS + SHPIMER	CROOK	15	54 N	66.0 W	06	SURFACE	1,000 - 100,000	50
VIRGINIA 16	ROCKY MTN.URAN.	CROOK	32	57 N	64.0 W	06	SURFACE	<100	0
ANDRIA (C PIT)	FEDERAL AMERICAN	FREMONT			0		SURFACE	1,000 - 100,000	0
ANDRIA GROUP	FEDERAL AMERICAN	FREMONT	1	32 N	91.0 W	06	SURFACE	1,000 - 100,000	50
ARROWHEAD(COP.MT B.+H. 1	ROCKY MTN.ENERGY	FREMONT	28	40 N	92.0 W	06	UNDERGRO	>100,000	100
B.H.HALL-BONANZA	HAYS, RICHARD	FREMONT	8	33 N	95.0 W	06	SURFACE	<100	50
BEATRICE 3	FORD,ROBERT+ASOC	FREMONT	33	40 N	92.0 W	06	SURFACE	1,000 - 100,000	50
BIG RED 4	ARMSTRONG, H.T.	FREMONT			0		SURFACE	<100	50
BLACKSTONE 51	BRIDGER MNG CO	FREMONT			0		SURFACE	<100	50
BLARCO	WESTERN NUCLEAR	FREMONT	22	33 N	89.0 W	06	SURFACE	<100	50
BLUE RUCK-RED. HO	J.M.WADE	FREMONT	12	32 N	91.0 W	06	SURFACE	1,000 - 100,000	0
BOUNTIFUL 1,9+10	VIPONT MINING CO	FREMONT	9	33 N	89.0 W	06	SURFACE	1,000 - 100,000	50
BULLRUSH DUMP	WESTERN NUCLEAR	FREMONT	22	33 N	89.0 W	06	SURFACE	1,000 - 100,000	150
BULLRUSH GROUP	WESTERN NUCLEAR	FREMONT			0		LOWGRADE	100 - 1,000	0
CAL 15	WESTERN NUCLEAR	FREMONT	29	33 N	90.0 W	06	SURFACE	>100,000	100
CINCH 15	FEDERAL AMERICAN	FREMONT	29	33 N	90.0 W	06	SURFACE	1,000 - 100,000	200
CLEANUP MATERIAL DAY 26	WILLIAMS, A.E.	FREMONT			0		SURFACE	<100	50
DAY-BERGER LEASE	PETERS, REX	FREMONT			0		MISC.-PB	100 - 1,000	0
DAY-LOMA	WESTERN NUCLEAR	FREMONT	24	32 N	91.0 W	06	SURFACE	>100,000	350
DISCOVERY	REEVES, H.J.	FREMONT	3	39 N	92.0 W	06	UNDERGRO	1,000 - 100,000	50
DONNA LEE	ENERGY FUELS NUC	FREMONT	24	32 N	91.0 W	06	SURFACE	>100,000	100
DUBOIS 1	WELLS, JOHN	FREMONT	29	40 N	92.0 W	06	SURFACE	<100	50
EUREKA-IMPERIAL	PETERS, REX	FREMONT	5	33 N	93.0 W	06	SURFACE	<100	50
FANNIE 1-4	KAYE MINERALS IN	FREMONT	24	41 N	08.0 W	06	SURFACE	<100	50
FEDERAL	WYOMING NUCLEAR	FREMONT	29	33 N	90.0 W	06	SURFACE	1,000 - 100,000	100
FRAZIER-LAMAC GR	STAMM, ED	FREMONT	2	39 N	92.0 W	06	SURFACE	100 - 1,000	50
GEORGE + VER GPO	FEDERAL AMERICAN	FREMONT			0		SURFACE	1,000 - 100,000	100
GEORGE 1 AND 2	WESTERN NUCLEAR	FREMONT	27	33 N	90.0 W	06	SURFACE	>100,000	300
GEORGE 12 + 14	FEDERAL AMERICAN	FREMONT	22	33 N	90.0 W	6	SURFACE	1,000 - 100,000	150
HADES 17	UNION CARBIDE CP	FREMONT	30	33 N	90.0 W	06	SURFACE	1,000 - 100,000	100
HAPPY 19	UNION CARBIDE CP	FREMONT	30	33 N	90.0 W	06	SURFACE	1,000 - 100,000	50
HAZEL GROUP	REX PETERS	FREMONT			0		SURFACE	100 - 1,000	0
HEAP LEACH (UTAH HESITATION	MACK LANG URAN.C	FREMONT			0		SURFACE	<100	50
HOPE-STAR	WESTERN NUCLEAR	FREMONT	9	28 N	92.0 W	06	SURFACE	100 - 1,000	50
HUNTER LEASE	PATHFINDER	FREMONT			0		HL-DUMPS	<100	200
IDIOTS DELIGHT	GENEVA URAN CORP	FREMONT	27	40 N	92.0 W	06	SURFACE	<100	50
JACK 2	UNKNOWN CONTROLR	FREMONT	12	32 N	90.0 W	06	SURFACE	1,000 - 100,000	150
JAY GROUP	DALE B. LEVI	FREMONT	1	32 N	91.0 W	06	SURFACE	1,000 - 100,000	100
JEM 1	PATHFINDER	FREMONT	12	32 N	91.0 W	06	SURFACE	<100	300
JOHN-GUNNEL	UNION CARBIDE CP	FREMONT	6	32 N	91.0 W	06	UNDERGRO	1,000 - 100,000	50
JOY GROUP	FEDERAL AMERICAN	FREMONT	26	33 N	90.0 W	06	SURFACE	>100,000	200
LAST CHANCE	HERRSTROM H.G.	FREMONT	15	39 N	92.0 W	06	SURFACE	<100	50
LITTLE STORY 6	FEDERAL AMERICAN	FREMONT	25	33 N	90.0 W	06	SURFACE	>100,000	100
	UNION CARBIDE CP	FREMONT	6	32 N	90.0 W	06	SURFACE	>100,000	150
	SAN JUAN URAN,EX	FREMONT			0		SURFACE	<100	50
	LITTLE STORY GRP	FREMONT			0		SURFACE	<100	0

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***** WYOMING (CONT'D) *****									
LOMA HEAP LEACH	WESTERN NUCLEAR	FREMONT			0		HL-DUMPS	<100	250
MIDNIGHT 1	BIG SKY URANIUM	FREMONT			0		SURFACE	<100	0
NELS GROUP	UNKNOWN CONTROL,	FREMONT	13	32 N	91.0 W	06	SURFACE	1,000 - 100,000	150
NEVIN GEN	JAY, G.L.	FREMONT	33	40 N	92.0 W	06	SURFACE	100 - 1,000	50
PAN-PAT	HENRY HUDSPETH	FREMONT	34	32 N	99.0 W	06	SURFACE	100 - 1,000	50
PEACH GROUP(UG)	AMERICAN NUCLEAR	FREMONT	2	32 N	90.0 W	06	UNDERGRO	1,000 - 100,000	400
PHIL (P-1)	P.JENKINS-HAND	FREMONT	12	32 N	91.0 W	06	SURFACE	1,000 - 100,000	50
PIT A-6	UNION CARBIDE CP	FREMONT	14	33 N	89.0 W	06	SURFACE	1,000 - 100,000	150
PIT M-1	UNION CARBIDE CP	FREMONT			0		SURFACE	100 - 1,000	0
QUEENS GROUP	SWANTON, K.F	FREMONT			0		SURFACE	<100	50
RAY 6	WESTERN NUCLEAR	FREMONT	4	32 N	90.0 W	06	SURFACE	<100	50
REX CLAIMS	PATHFINDER	FREMONT	11	32 N	91.0 W	06	SURFACE	1,000 - 100,000	100
RIM GROUP	PATHFINDER	FREMONT	9	33 N	89.0 W	06	SURFACE	>100,000	150
RING + SANDUSKY	WAR BONNET URAN.	FREMONT	10	30 N	97.0 W	06	SURFACE	<100	50
ROX GROUP	ENERGY FUELS NUC	FREMONT	21	33 N	89.0 W	06	UNDERGRO	1,000 - 100,000	350
ROX LEACH	ENERGY FUELS NUC	FREMONT			0		HL-DUMPS	<100	0
SAGEBRUSH-TRLSK	FEDERAL AMERICA	FREMONT	32	33 N	90.0 W	06	UNDERGRO	>100,000	200
SEC.16,33,89*	GREAT BASIN PETR	FREMONT	16	33 N	89.0 W	06	SURFACE	>100,000	50
STAN	UNION CARBIDE CP	FREMONT	28	33 N	90.0 W	06	SURFACE	1,000 - 100,000	100
STOCKPILE CLEANU	WESTERN NUCLEAR	FREMONT			0		MISC.-PB	100 - 1,000	0
SUN-SNOBALL	WESTERN NUCLEAR	FREMONT	28	28 N	92.0 W	6	SURFACE	1,000 - 100,000	250
TORCHY	WOOTEN, CHARLENF	FREMONT			0		UNDERGRO	<100	0
TWO C + BOZO	WADEN, JIN	FREMONT	17	30 N	96.0 W	06	SURFACE	<100	0
WASHAKIE	ALLIED NUCLEAR	FREMONT	10	32 N	94.0 W	06	SURFACE	1,000 - 100,000	50
WASHOUT 1	WALKER, RAYMOND	FREMONT			0		SURFACE	<100	0
YELLOW BUCK-LEDG	VIPONT MINING CO	FREMONT	4	33 N	89.0 W	06	SURFACE	100 - 1,000	50
YELLOWSTONE 1	SWANTON, K.F	FREMONT	31	33 N	89.0 W	06	SURFACE	<100	50
ANTELOPE GROUP	GEORESOURCES,INC	JOHNSON	10	43 N	77.0 W	06	SURFACE	1,000 - 100,000	50
HANNA GROUP	HAMLIN EXPL.MNG.	JOHNSON	14	42 N	77.0 W	06	SURFACE	1,000 - 100,000	50
JERRIE MARIE GRO	LITTLE GIANT URA	JOHNSON			0		SURFACE	<100	0
KELL ROY 3 + 4	YOUNKIN, POY O.	JOHNSON		42 N	78.0 W	06	SURFACE	<100	50
LUCKY SEVEN 2	TREBELCOCK + KNI	JOHNSON	20	44 N	77.0 W	06	SURFACE	<100	50
MASEK 1	ATOE MINING CO.	JOHNSON	3	44 N	83.0 W	06	SURFACE	<100	50
MISSEY GROUP	AMERICAN NUCL,CP	JOHNSON	3	42 N	78.0 W	06	SURFACE	100 - 1,000	50
MOE 14(ANOMALY 8	UNKNOWN CONTROLP	JOHNSON	19	45 N	76.0 W	06	SURFACE	100 - 1,000	50
N,STAR ISE(MOYMO	SPERBERG,JOHN J.	JOHNSON	11	43 N	80.0 W	06	SURFACE	<100	150
P CLAIM 8-45-	KERR-MCGEE CORP.	JOHNSON	8	45 N	76.0 W	06	UNDERGRO	<100	150
RED ROCK 2	SOUTH PEAK MNG.	JOHNSON		N	0 W	06	SURFACE	<100	50
SNAKERITE 1-3	GEORESOURCES,INC	JOHNSON	3	43 N	77.0 W	06	SURFACE	100 - 1,000	50
T BONE	KERR-MCGEE CORP.	JOHNSON	31	42 N	75.0 W	06	SURFACE	<100	50
VANCE 1	ROSENBERGER,DUAN	JOHNSON		N	0 W	06	SURFACE	<100	50
YANK 4	SAN JUAN URAN,EX	JOHNSON		N	0 W	06	SURFACE	<100	50
ANTELOPE 4	SPACE AGE NUCLER	NATRONA			0		SURFACE	<100	50
BAKER 3,4,5+6	JONPS +VANGILDER	NATRONA	5	39 N	77.0 W	06	SURFACE	1,000 - 100,000	50
BRIDGER TRAIL	HIGHLAND URAN,IN	NATRONA			0		SURFACE	<100	50
BUSS-RUSS	FEDERAL AMERICAN	NATRONA	27	33 N	89.0 W	06	UNDERGRO	1,000 - 100,000	350
DRY LAKE	GEORESOURCES,INC	NATRONA	33	35 N	79.0 W	06	SURFACE	<100	100
HEAP LEACH B-2	UNION CARBIDE CP	NATRONA			0		HL-DUMPS	<100	150

INACTIVE URANIUM MINES IN THE UNITED STATES
SOURCE: DOE, GRAND JUNCTION, COLORADO

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** MINING (CONT'D) *****									
MARS GROUP	FEDERAL AMERICAN	NATRONA	25	33 N	89,0 W	06	SURFACE	1,000 = 100,000	100
PAY - ALICE	UNION CARBIDE	NATRONA	15	33 N	89,0 W	06	SURFACE	>100,000	100
PINE TREE GROUP	MINERALS EXPL.CO	NATRONA			0		SURFACE	<100	50
PIT A-2	UNION CARBIDE CP	NATRONA			0		SURFACE	1,000 = 100,000	50
PIT B-1	UNION CARBIDE CP	NATRONA			0		SURFACE	1,000 = 100,000	150
PIT K-2	UNION CARBIDE CP	NATRONA	15	33 N	89,0 W	06	SURFACE	>100,000	200
RIDGE 1 + 1ETON	WENTZ, JOE	NATRONA	25	34 N	89,0 W	06	SURFACE	1,000 = 100,000	50
SHOT #	TWIN ARROW PETRO	NATRONA			0		UNDERGRU	100 = 1,000	50
SPA SAGE	CUNNINGHAM MIN	NATRONA	34	37 N	88,0 W	06	SURFACE	1,000 = 100,000	50
THE GROUP	FEDERAL AMERICA	NATRONA	22	33 N	89,0 W	06	SURFACE	>100,000	150
VECA PITS	FEDERAL AMERICAN	NATRONA	21	33 N	89,0 W	6	SURFACE	>100,000	100
APEX 1	HOLFF, OTTO	NIOBRARA			0		SURFACE	<100	50
90-EP 3	ASSOCIATED DEVEL	NIOBRARA			0		SURFACE	<100	0
CLAIM 1	WESTERN URANIUM	NIOBRARA			0		SURFACE	<100	50
MENG 1	MENG, J.M.	NIOBRARA			0		SURFACE	<100	50
MILLER LEASE 7	WALKER, BERT	NIOBRARA			0		SURFACE	<100	0
MOORE 1	RUPP, MURRISON W.	NIOBRARA	23	36 N	65,0 W	06	SURFACE	<100	50
NEVADA 1-	JOHNSON + WALKER	NIOBRARA			0		SURFACE	100 = 1,000	50
NEW HOPE	BARHAUGH PAGMAR	NIOBRARA	24	34 N	67,0 W	06	SURFACE	<100	50
POITFR LEASE	PELIUS+FITZHENRY	NIOBRARA	23	31 N	64,0 W	06	UNDERGRU	<100	50
PEED LEASE	SMITH, W.M.H.	NIOBRARA			0		SURFACE	<100	50
SILVER CLIFF PAL	LEMEN, MATTHEW H	NIOBRARA			0		UNDERGRU	100 = 1,000	50
WALT CLAIMS	HARTNET+POSENRE	NIOBRARA			0		SURFACE	100 = 1,000	50
WEIGAND LEASE	ROCKY Mtn.MILL.+	NIOBRARA			0		SURFACE	100 = 1,000	50
PARD 4	UNKNOWN CONTROL.	SURLETTE			0		SURFACE	100 = 1,000	50
GOLDEN ARCHA	LUCKY JUNE MFG.C	SWEETWATER	30	26 N	94,0 W	06	SURFACE	<100	50
LONE WOLF 1	BLACK SHEEP URAN	SWEETWATER			0		UNDERGRU	<100	50
LUCKY TURK 15	BLACK BUTTES URAN	SWEETWATER			0		SURFACE	<100	50
SEC.36,24.-34	FREMONT URAN.CO.	SWEETWATER	36	24 N	94,0 W	06	SURFACE	100 = 1,000	50
ARLUSTAR 3	PACMER, FLEMER	WASHAKIE			0		SURFACE	<100	0
SCORPION	S.+ M.MNG.+ EXPL	WASHAKIE			0		UNDERGRU	<100	50
SEC. 16-42-60	WYNNING, STATE OF	WESTON	16	42 N	60,0 W	06	SURFACE	100 = 1,000	100
***** UNKNOWN *****									
BELT MINE	NICKERSON, ALBERT	UNKNOWN			0		UNDERGRU	<100	0
BLACK SHEEP	ARMINE, W.H.	UNKNOWN			0		SURFACE	<100	0
CROP OUT	FULLER, BLANCHE	UNKNOWN			0		SURFACE	<100	0
CIP 1	WAGNER BANKS+ HO	UNKNOWN			0		UNDERGRU	<100	0
DIEGO 11	C.U.DEVELOPMENT	UNKNOWN			0		UNDERGRU	<100	0
FRIDAY 1	LONGWILL, J.E.JR	UNKNOWN			0		UNDERGRU	<100	0
HOT ROCKS 1	WHITE KING URAN	UNKNOWN			0		UNDERGRU	<100	0
LE ROY BENSON	BENSON, LEPOY	UNKNOWN			0		SURFACE	<100	0
RAFFINATE-CANADA	SHERRITT GORDON	UNKNOWN			0		MISC.-PB	100 = 1,000	0
RAFFINATE-CONGO	COMMERCIAL DI	UNKNOWN			0		MISC.-PB	1,000 = 100,000	0
STANLEY 1	SOUTHERN ILL.MAT	UNKNOWN			0		SURFACE	<100	0
URANIUM	AYERS, EVERETT	UNKNOWN			0		SURFACE	<100	0

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INACTIVE URANIUM MINES IN THE UNITED STATES
SOURCE: DOE, GRAND JUNCTION, COLORADO

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MINE NAME	CONTROLLER NAME	COUNTY	SEC.	TOWNSHIP	RANGE	MERID.	MINING METHOD	TOTAL PRODUCTION (TONS AS OF 01/01/79)	DEPTH (FT.)
***** UNKNOWN	(CONT'D)	*****							
WM STAHR	F.+ C. EXPLORATIO	UNKNOWN			0		SURFACE	<100	0

APPENDIX G

GENERAL OBSERVATIONS OF URANIUM MINE SITES IN
COLORADO, NEW MEXICO, TEXAS, AND WYOMING

G.1. General observations on inactive uranium mine sites in Colorado, New Mexico, Texas, and Wyoming

"Walk through" surveys were conducted at selected inactive uranium mines in Colorado, New Mexico, Texas, and Wyoming. The primary purpose of the "walk through" surveys was to note and describe the general environmental conditions of the mines. Limited gamma radiation rate measurements were made at each site and estimates were made of the volume and area of the mine wastes. In addition, each waste area was observed for indications of wind and water erosion and to see if the mine entry and vents were open to the atmosphere.

G.1.1 Colorado

The surveys were conducted at mining areas near Uravan and Boulder, Colorado. Each area is listed, and the survey results at each mine are discussed.

G.1.1.1 Uravan Area

The Uravan area lies within the Uravan Mineral Belt, which is situated on the Utah-Colorado border, encompassing parts of Mesa, Montrose, and San Miguel Counties in Colorado and Grand and San Juan Counties in Utah. Uranium has been mined in the belt from the Salt Wash Member of the Morrison Formation since 1900. About 150 mines were being worked in the belt in 1978. Three companies have announced their intention to build mills in the belt area (Wh78). Ore deposits are found mainly in sandstone lenses which are up to 1,600 m wide and average about 15 m thick. The ore deposits range in size from a few MT in the form of a fossil log to many thousands of MT. The ore deposits generally range in thickness from a few centimeters to 7.6 m. Irregularly shaped, they can be found almost anywhere within the sandstone lenses. One study of the Salt Wash deposits indicated that 70 percent of the deposits contained less than 2,700 MT of ore each (Wh78).

Since the ore bodies occur as rolls, pods, or tabular masses, their size precludes the use of a prearranged and uniform stoping system. Mining practices were to simply follow the ore and leave open stopes behind. Consequently, a large number of relatively small mines have been operated in this mineral belt. One mill processed ore from 200 mines which have produced ore ranging from 91 to 910,000 MT.

A substantial fraction of the inactive mines are located in or near the Uravan Mineral Belt and are listed by State and county. A total of 1860 inactive uranium mines, or about 57 percent of all inactive uranium mines in the entire United States, are located in or near the Uravan Mineral Belt.

<u>State</u>	<u>County</u>	<u>Inactive Mines</u>	
		<u>Surface</u>	<u>Underground</u>
Colorado	Mesa	77	109
Colorado	Montrose	76	404
Colorado	San Miguel	70	269
Utah	Emery	60	126
Utah	Grand	69	95
Utah	San Juan	<u>140</u>	<u>365</u>
	Total	492	1368

G.1.1.1.1 Mine 1

This mine had a vertical shaft which was barricaded to prevent livestock from falling into it; however, it remains open to the atmosphere. About 13,800 cubic meters of mine wastes were dumped on a downslope area adjacent to the shaft presently covering an area of about 0.1 hectare (Fig. G.1). There was evidence of wind and water erosion of the wastes. Exposure rates, measured 0.914 m above the wastes, ranged from 140-170 $\mu\text{R/hr}$ with several spots reaching 250 $\mu\text{R/hr}$. Several small adjacent waste piles had exposure rates of 110 $\mu\text{R/hr}$. No springs or standing water were observed near the wastes.

G.1.1.1.2 Mine 2

This rim mine (Fig. G.2) faces the San Miguel river valley and produced about 1,200 cubic meters of wastes, which were dumped down the canyon wall and presently cover an area of about 0.4 hectare. Exposure rates measured near the dump point were about 200 $\mu\text{R/hr}$; measurements on the road around the ore bins ranged from 50-150 $\mu\text{R/hr}$. The mine entry remains open to the atmosphere. There was evidence of wind and water erosion of the mine wastes.

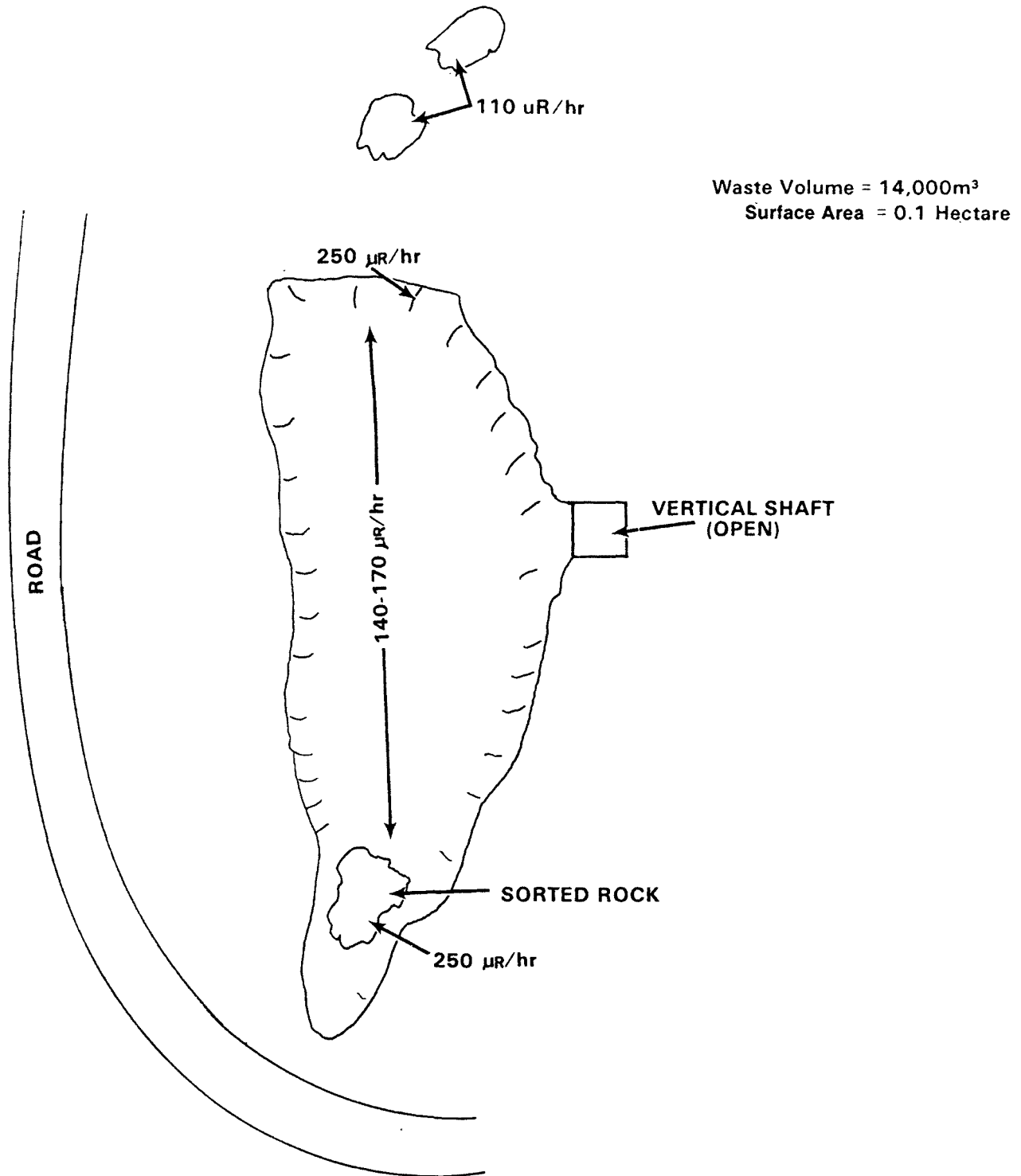


Figure G.1 Plan view of inactive underground uranium mine No. 1, related waste rock piles, and surface gamma exposure rates, Uravan Mineral Belt, Colorado

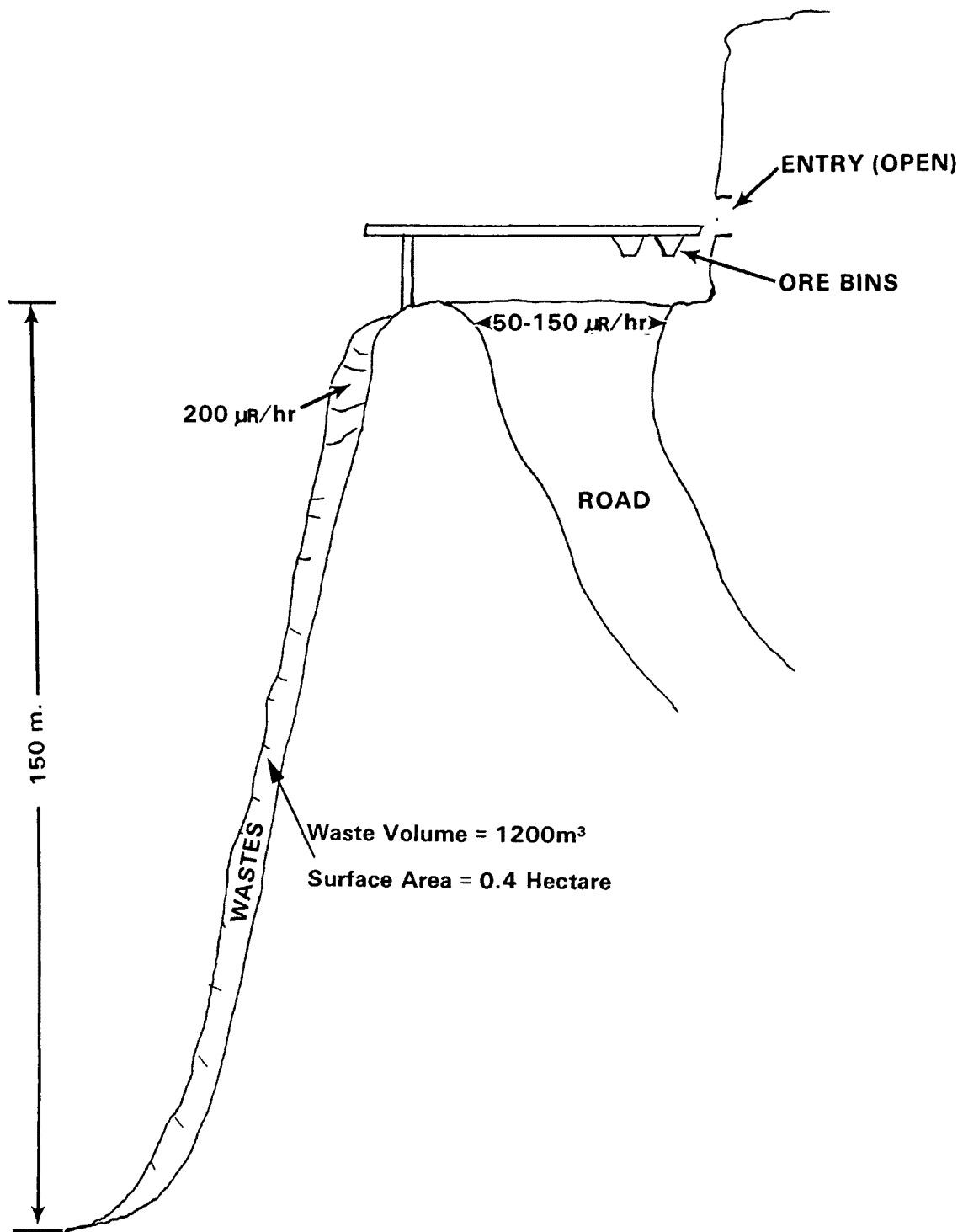


Figure G.2 Sectional view of inactive underground uranium mine No. 2, related waste rock piles, and surface gamma exposure rates, Uravan Mineral Belt, Colorado

G.1.1.1.3 Mine 3

This mine has an incline entry that remains open to the atmosphere. Two waste piles were built up to support ore bins (Fig. G.3). About 38,300 cubic meters of wastes, which have a surface area of about two hectares, are contained in the two piles. Part of the waste piles extend into an adjacent wash and are subject to water erosion. Wind erosion of the wastes was also evident. Gamma exposure rates on the waste piles ranged from 120-150 $\mu\text{R/hr}$, while areas adjacent to the piles were about 160 $\mu\text{R/hr}$. The exposure rate on the mine access road was 80 $\mu\text{R/hr}$.

G.1.1.1.4 Mine 4

This was a rim mine with a portal remaining open. The mine wastes volume was about 6,100 cubic meters covering an area of about 0.4 hectares (Fig. G.4). Wastes have eroded down the slope, through a drain pipe under the highway, and into the San Miguel River. Exposure rates on the access road and under the ore bins were about 70 $\mu\text{R/hr}$. Wind erosion of the wastes was also evident.

G.1.1.1.5 Mine 5

This mine contained a vertical shaft used for forced ventilation of connecting mines (Fig. G.5). An undetermined amount of low-grade ore had been dumped in small piles covering an area of about 5 hectares and was later removed for milling. The two remaining piles cover about 1.2 hectares and contain about 76,500 m^3 of protore and barren wastes including clean-up materials from the 5 hectare area. Gamma exposure rates over the former waste area ranged from 50-150 $\mu\text{R/hr}$. Exposure rates over the consolidated piles ranged from 50-220 $\mu\text{R/hr}$. Wind and water erosion were evident at both the former and present waste storage areas.

G.1.1.1.6 Mine 6

This mine had a vertical shaft used to force ventilate connecting active mines (Fig. G.6). About 45,900 cubic meters of wastes were dumped on a downslope adjacent to the mine shaft and now cover about 0.4 hectare of ground. Gamma exposure rates measured over the waste pile ranged from 180-220 $\mu\text{R/hr}$. Runoff and wind erosion of the wastes were evident. Some of the runoff appeared to have entered a nearby stock pond.

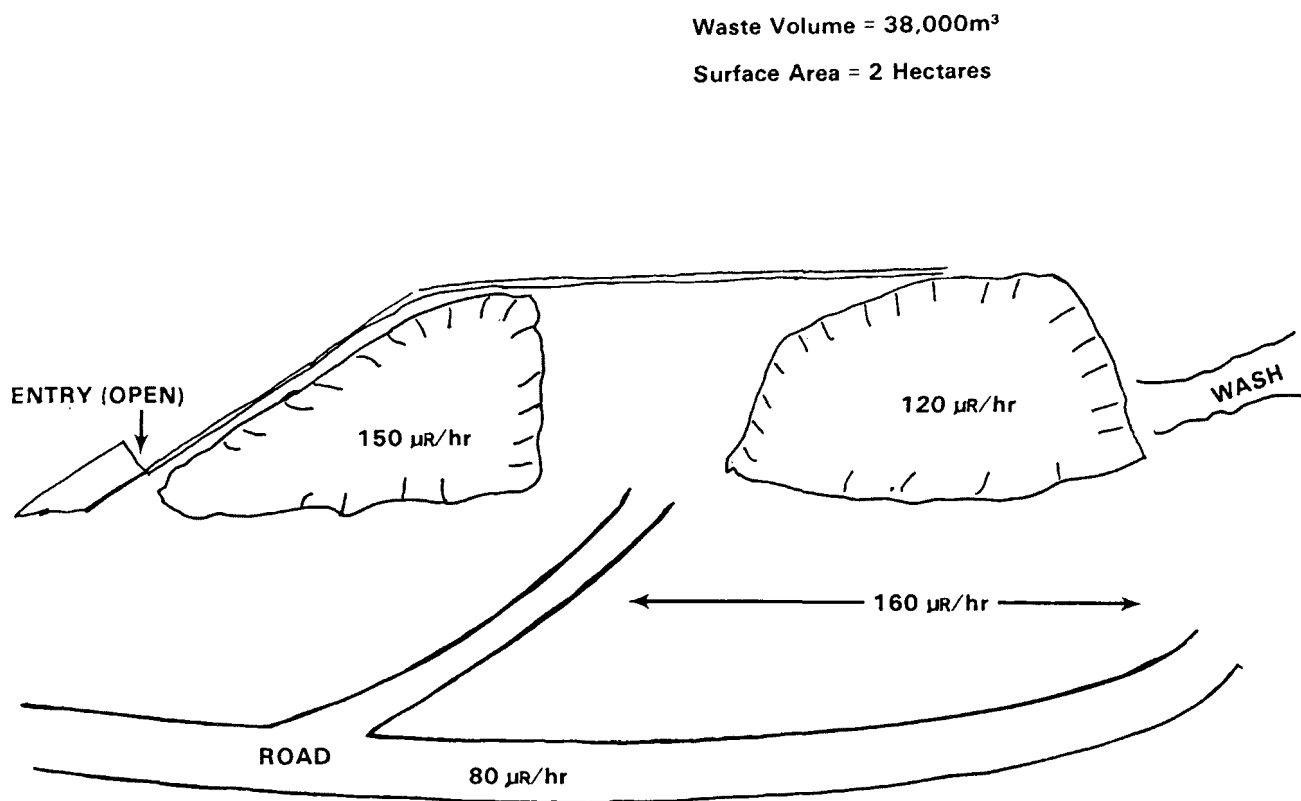


Figure G.3 Plan view of inactive underground uranium mine No. 3, related waste rock piles, and surface gamma exposure rates, Urvan Mineral Belt, Colorado

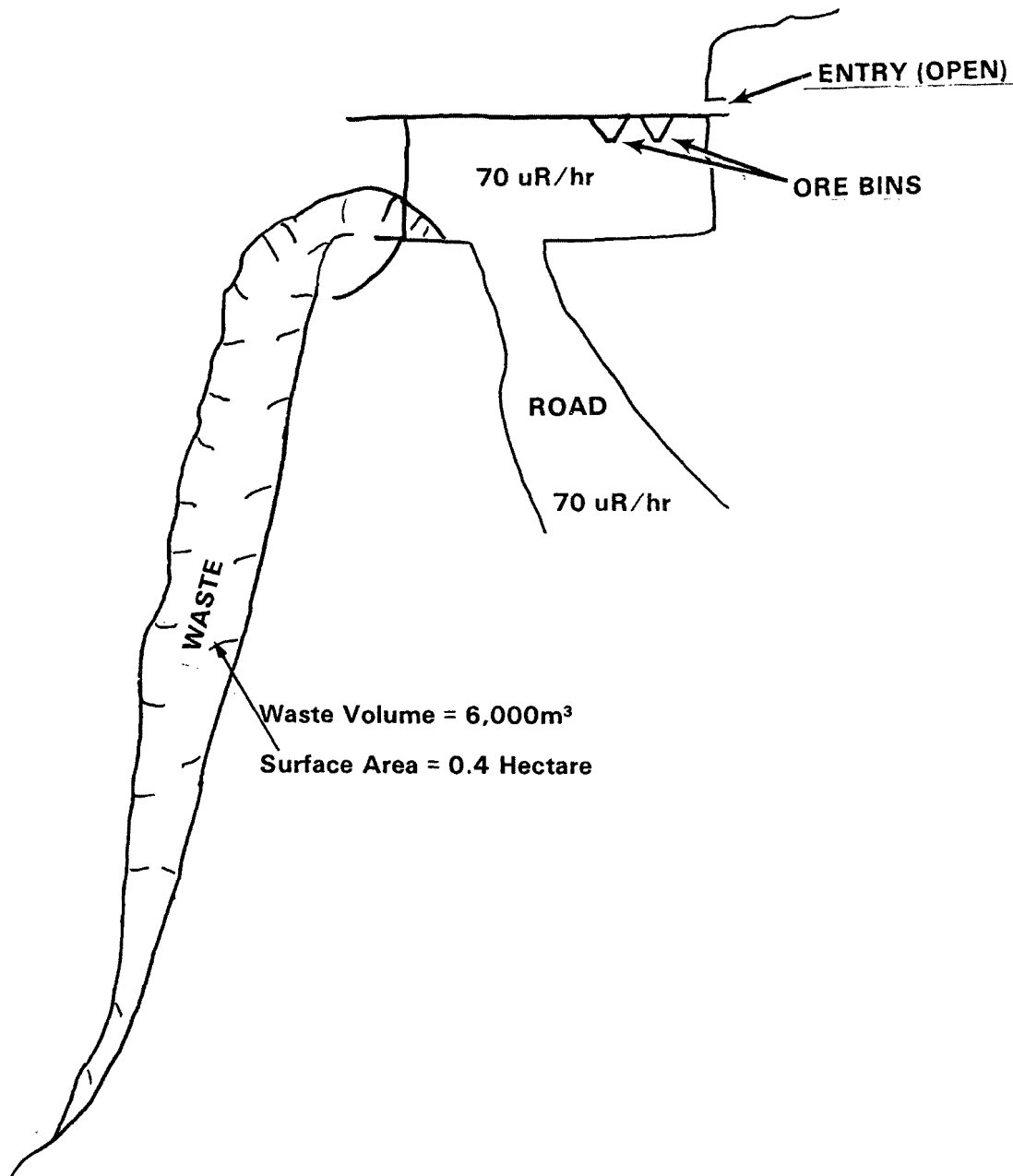


Figure G.4 Sectional view of inactive underground uranium mine No. 4, related waste rock piles, and surface gamma exposure rates, Uravan Mineral Belt, Colorado

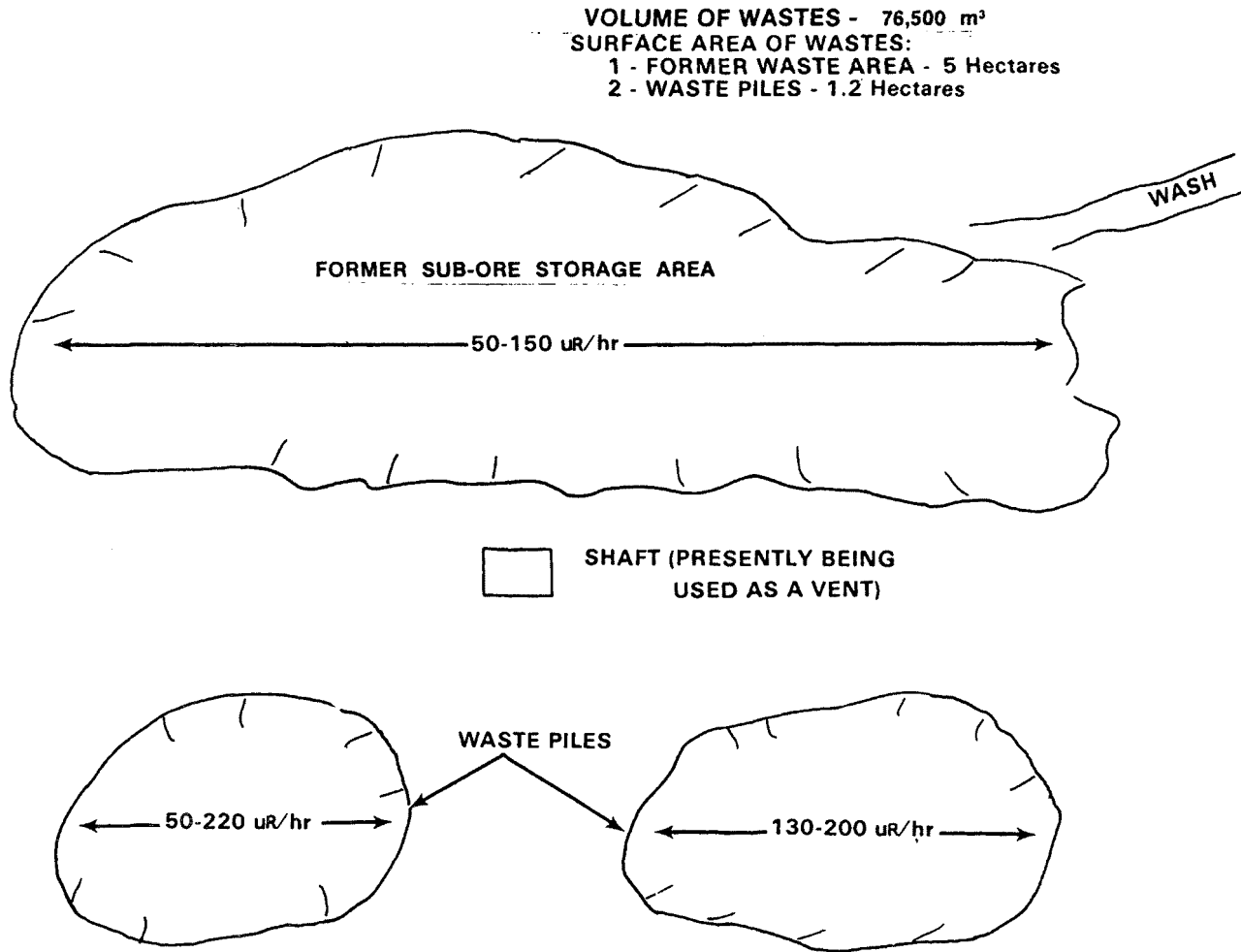


Figure G.5 Plan view of inactive underground uranium mine No. 5, related rock piles, and surface gamma exposure rates, Uravan Mineral Belt, Colorado

Waste Volume = 46,000m³

Surface Area = 0.4 Hectare

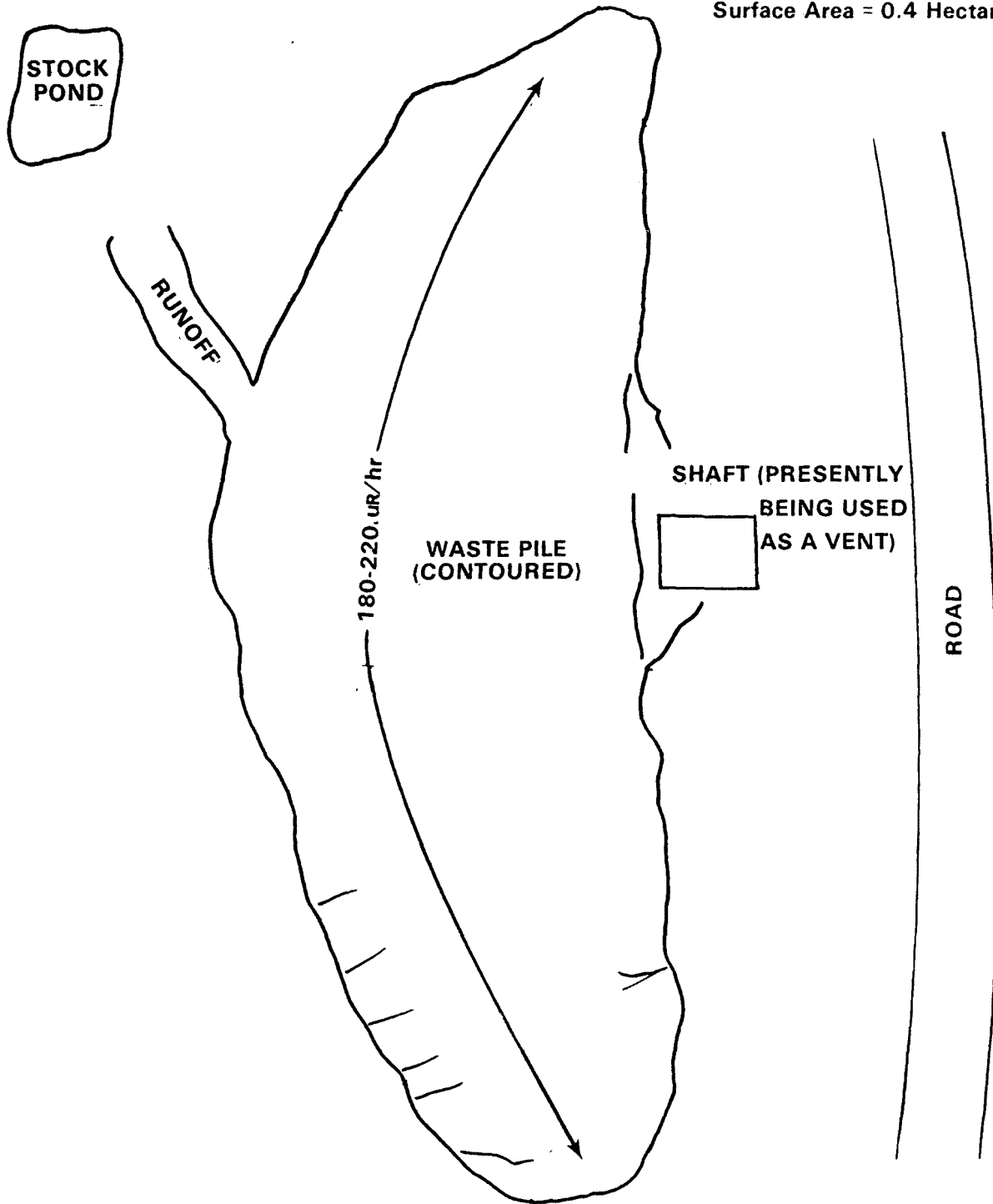


Figure G.6 Plan view of inactive underground uranium mine No. 6, related waste rock piles, and surface gamma exposure rates, Uravan Mineral Belt, Colorado

G.1.1.2 Jamestown Area

Uranium ore bodies in the Central City District area generally tend to be small but high in grade. They are mined in conjunction with precious and base-metal ores, particularly gold mining. Pitchblende, associated with all types of veins and shoots, occurs in small pods or lenses systematically arranged in some veins but erratically distributed in others (Si56). Small quantities of pitchblende ore have been shipped from the Central City District since 1872; however, most of the ore mined before 1917 was used as a source of radium. The fluorite ores of the Jamestown District contain small amounts of base metal sulfides and some uranium ore. The quantity of uranium ore was insufficient to be mined for uranium alone (Bu56). The surveys conducted in the Jamestown, Colorado area were made to evaluate some mining areas where uranium was recovered as a by-product.

G.1.1.2.1 Mine 7

This mine was relatively small and produced high grade ore (Fig. G.7). About 38 cubic meters of wastes remain around the shaft, and gamma exposure rates of 400 $\mu\text{R/hr}$ were measured. Erosion of the wastes into the nearby wash was evident. Wind erosion is probably minimal. The mine shaft remains open but filled with water.

G.1.1.2.2 Mine 8

This mine was principally a fluorspar producer; however, uranium ore was also produced and sold (Fig. G.8). The mine shaft remains open to the atmosphere. Mine wastes, adjacent to the shaft, occupy about 800 m^2 , estimated to be about 1,700 cubic meters. Gamma exposure rates on the waste pile ranged from 60-80 $\mu\text{R/hr}$. Extensive water erosion of the wastes has occurred and has produced exposure rates below the waste piles ranging from 40-100 $\mu\text{R/hr}$. Wind erosion of the wastes is probably minimal.

G.1.1.2.3 Mine 9

This mine (Fig. G.9) was located adjacent to the highway just south of Jamestown, Colorado. The mine entry has been covered by a landslide. About 460 cubic meters of wastes, an area of about 400 m^2 , are present on the site. Exposure rates near the entry were about 100 $\mu\text{R/hr}$ and ranged from 40-60 $\mu\text{R/hr}$ near the highway.

Waste Volume = 38m³
Surface Area = 0.04 Hectare

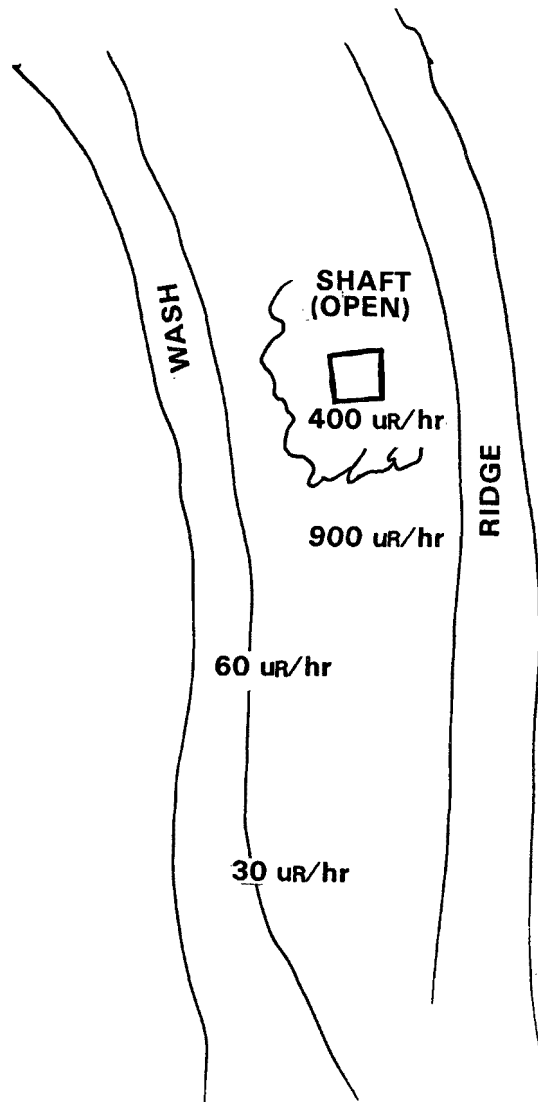


Figure G.7 Plan view of inactive underground uranium mine No. 7, related waste rock piles, and surface gamma exposure rates, Central City District, Colorado

Waste Volume = 1700m³
Surface Area = 0.1 Hectare

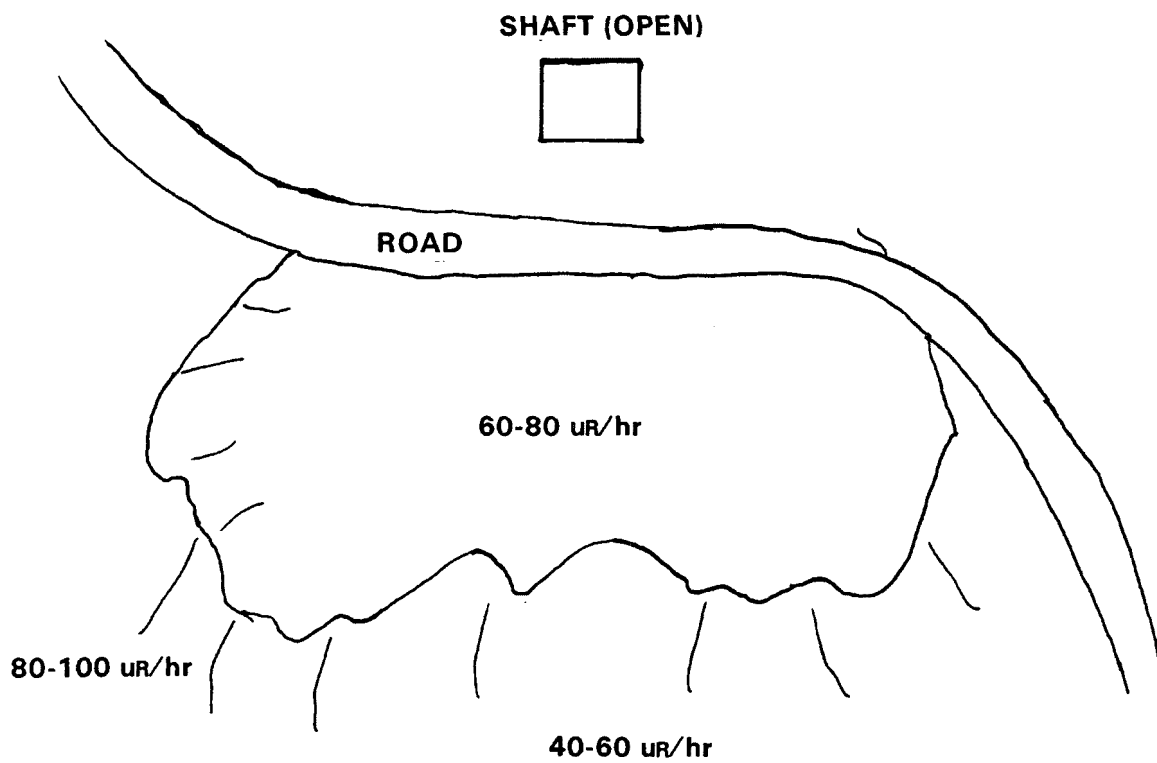


Figure G.8 Plan view of inactive underground uranium mine No. 8, related waste rock piles, and surface gamma exposure rates, Central City District, Colorado

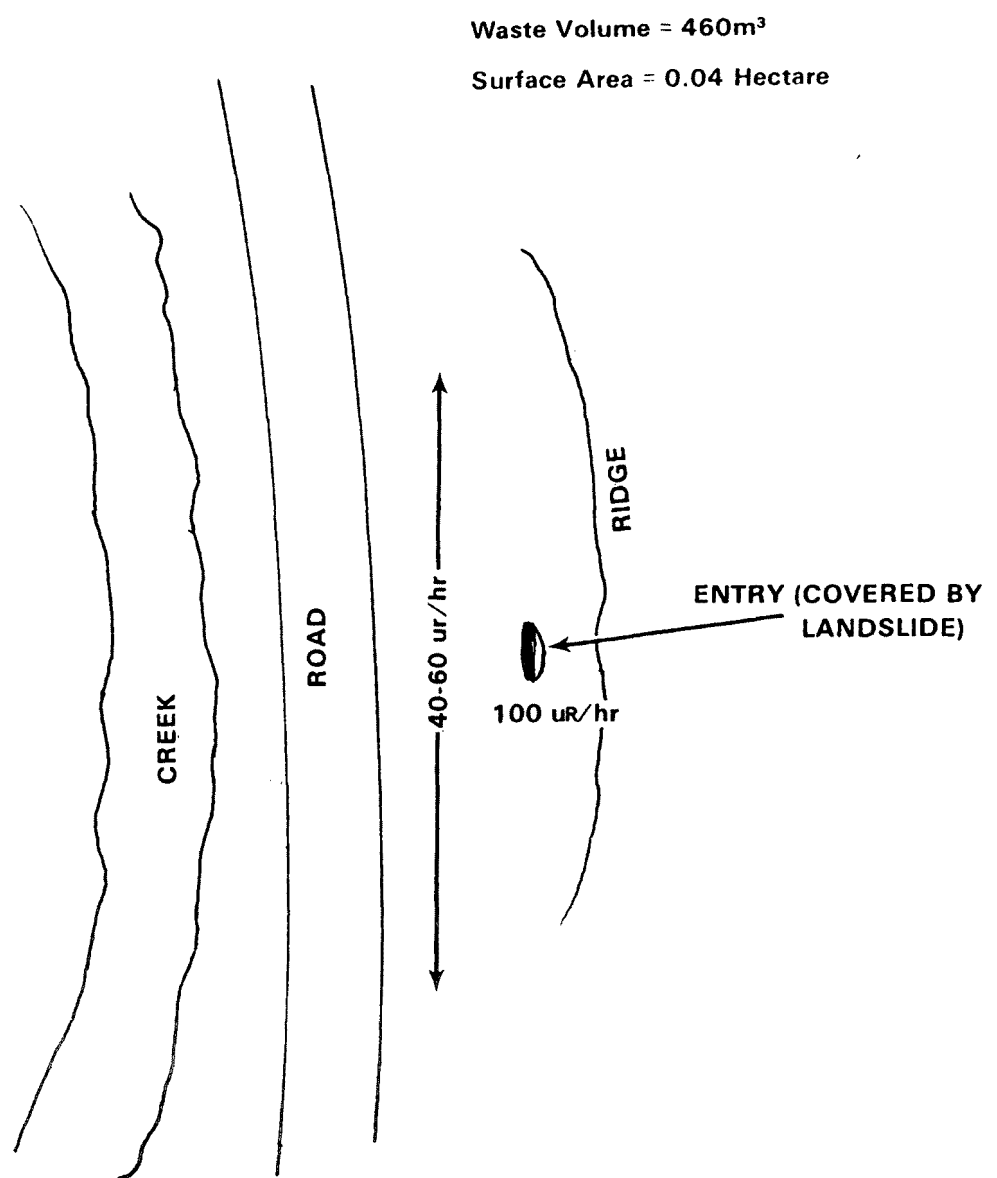


Figure G.9 Plan view of inactive underground flurospar-uranium mine No. 9, related waste rock piles, and surface gamma exposure rates, near Jamestown, Colorado

G.1.1.2.4 Mine 10

This mine was relatively small and the entry remains open (Fig. G.10). Exposure rates near the entry ranged from 100-600 $\mu\text{R/hr}$. Exposure rates on the mine access road were about 70 $\mu\text{R/hr}$. Piles containing mine wastes occupy about 0.1 hectare with a volume of 150 cubic meters. Water and wind erosion of the wastes was evident.

G.1.1.3 Summary

Those mines surveyed in the Uravan area are probably typical of the many inactive uranium mines in that area. Most of the mines are underground and relatively small. Wind and water erosion of the waste piles was evident at all of the mines having entryways open, except where noted. Information derived from these mine surveys is presented in Table G.1 below. Some typical mine waste piles are shown in Fig. G.11. Subsequent photographs depict a typical rim mine (Fig. G.12), an accumulation of wastes on a ledge from a typical rim mine (Fig. G.13), and a mine waste dump from a rim mine (Fig. G.14).

Table G.1 Uravan and Jamestown areas

Mine	Cubic Meters of Wastes	Surface Area of Wastes (Hectares)
<u>Uravan area</u>		
1	13,800	0.1
2	1,200	0.4
3	38,000	2.0
4	6,100	0.4
5	76,500	1.2
6	46,000	0.4
<u>Jamestown area</u>		
7	38	0.04
8	1,700	0.08
9	460	0.04
10	150	0.1

Waste Volume = 150m³
Surface Area = 0.1 Hectare

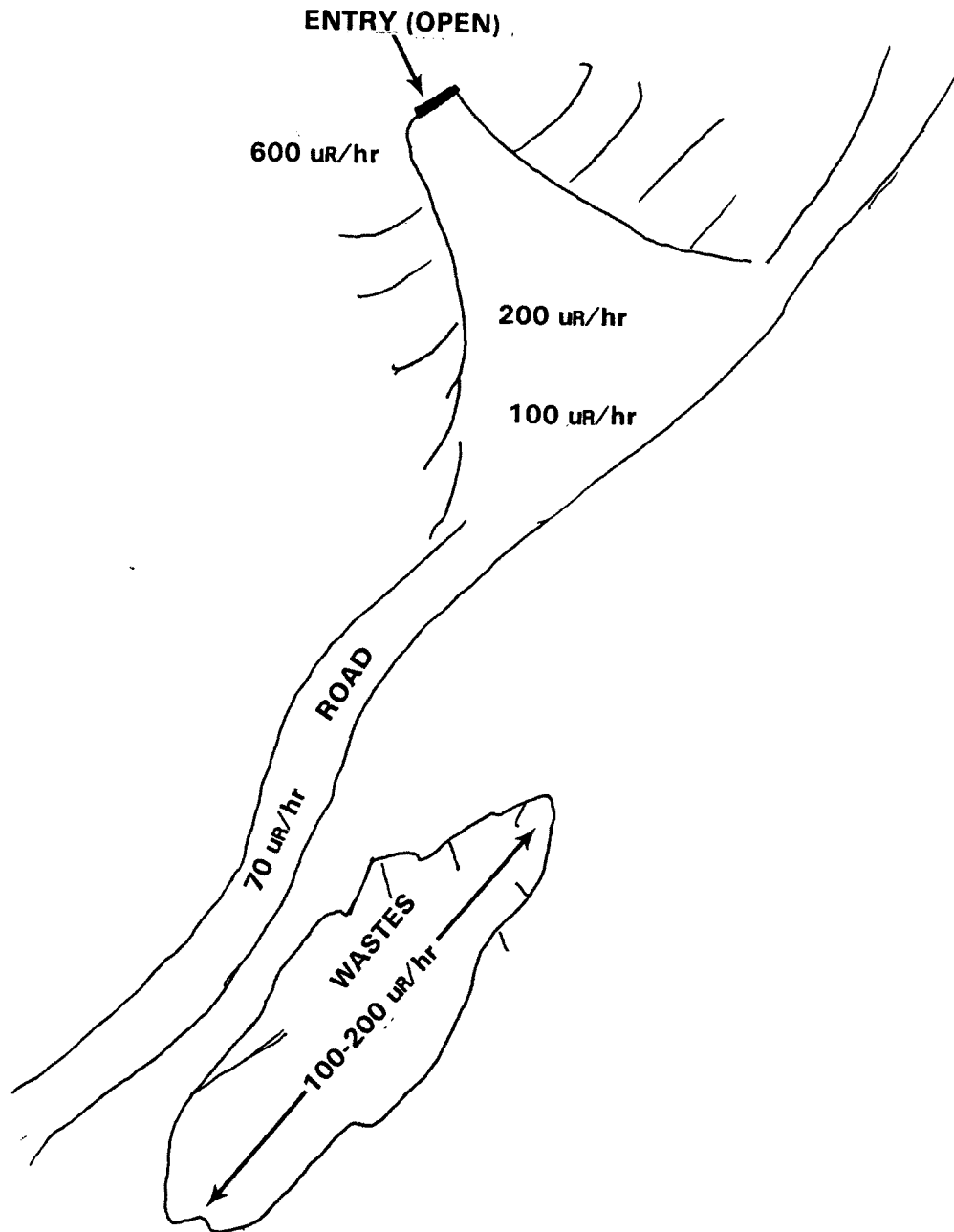


Figure G.10 Plan view of inactive underground uranium mine No. 10, related waste rock piles, and surface gamma exposure rates, Central City District, Colorado

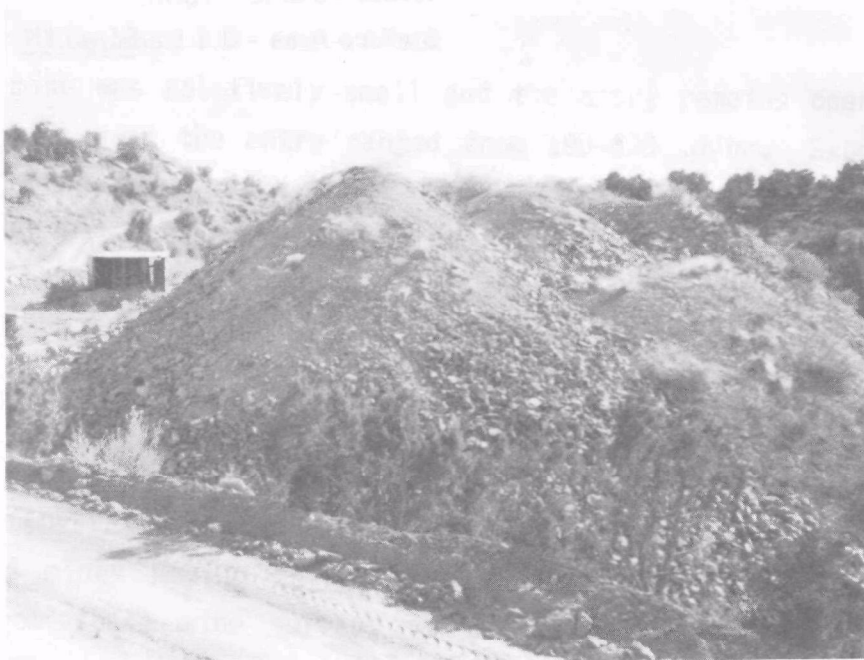


Figure G.11 Typical mine waste pile associated with a small- to medium-sized inactive underground uranium mine in the Uravan Mineral Belt, Colorado

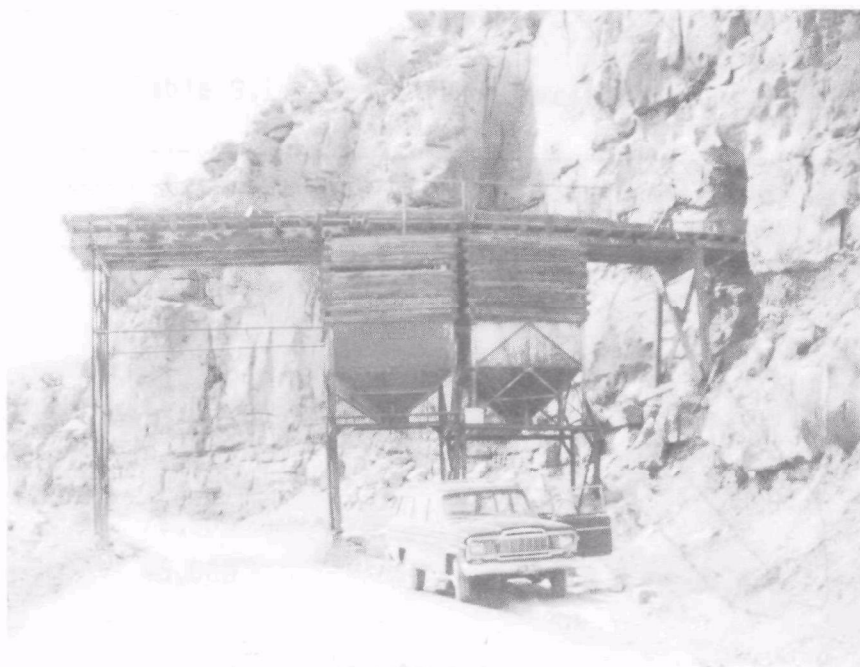


Figure G.12 Side view of a typical underground uranium mine located on the rim of a sandstone mesa in the Uravan Mineral Belt, Colorado



Figure G.13 Mine waste accumulations near the portal of a typical underground rim-type uranium mine in western Colorado



Figure G.14 Mine waste dump associated with a typical rim-type underground uranium mine in western Colorado

Ore-hauling losses have occurred along the mine access and public roads. In addition, mine wastes have been used for road ballast. The ore losses and mine wastes used for road construction probably became airborne with some of the large quantities of dust produced by ore-hauling equipment. The lands in the mining areas generally are used for grazing. Some enhanced uptake of radioactive materials and trace metals by cattle may be occurring. Exploratory drilling is abundant throughout the survey area. Little or no reclamation of abandoned drill sites was observed.

Mines 7 through 10 were surveyed near Jamestown, Colorado. This type of mine was prevalent in this area. Although uranium was not principally produced by many of the mines, the mine wastes generally contain radioactivity. Figure G.15 shows wastes at one such mine entering a stream. Mine wastes producing exposure rates of 40-100 μ R/hr in that area were used as a fill for the Jamestown Park (210 acres). Evidence indicates that some dwellings were built on or near the mine wastes. Surface and groundwater contamination from the mining activities is possible.

G.1.2 New Mexico

Uranium mining operations are continuing to expand production throughout the Grants Mineral Belt region of New Mexico. Underground mining is predominant in the Ambrosia Lake, Churchrock, and Crownpoint areas. Surface mining operations are also expanding at the Jackpile and St. Anthony mines near Paguate/Laguna. However, the majority of inactive uranium mines are located in the area around Grants; therefore, this area was selected for the reconnaissance and field study surveys in New Mexico.

G.1.2.1 Inactive Surface Mines

Two inactive surface mining areas were observed - the Poison Canyon and Zia strip mining areas. Both inactive sites appear to have been more of a shallow strip mining operation compared to the extensive and deeper open pit operations currently underway at the Jackpile and St. Anthony mines. Shallow ore pockets were removed at the Poison Canyon and Zia areas, leaving relatively small pits and waste piles scattered over several hectares. Field studies were completed at several of the Poison Canyon open pits; the radiological data obtained from these surveys are summarized below.

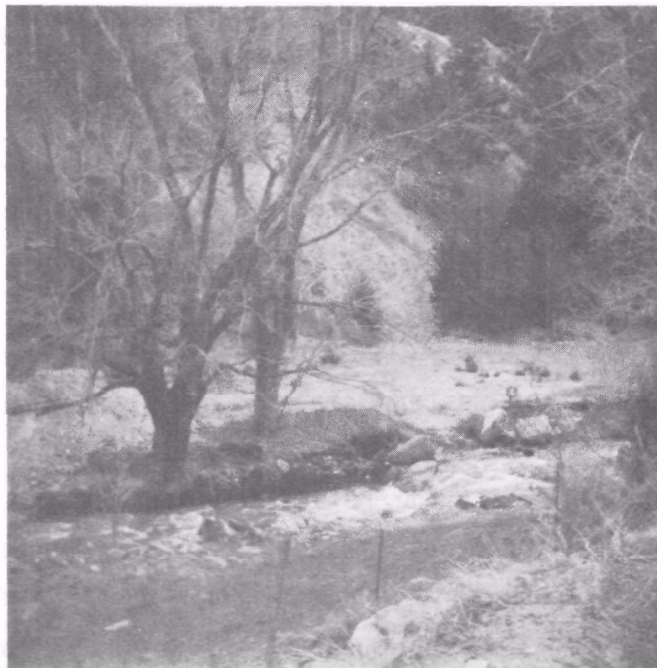


Figure G.15 Movement of fluorspar-uranium mine wastes from a tailings pile into a stream in the Jamestown area of Colorado

G.1.2.2 Inactive Underground Mines

Six underground mines (vertical shaft and incline mining) were observed on Mesa Montanosa: Beacon Hill, Davenport, Dog, Flea, Mesa Top, and Malpais. Several of these mines (e.g., Mesa Top and Malpais mines) were interconnected during their active mining periods. A few of these inactive mines are being used today as fresh air intake points for active mining operations in the area (e.g., mine vents of the inactive Gossett mine are being used in the ventilation system of the active Poison Canyon Mine).

Five underground mines were visited in the Poison Canyon area - Barbara Jane 1 and 3, Westvaco, Santa Fe, and Flat Top mines. Also visited were the Marcus, San Mateo, Anaconda F-33, Hogan, Dakota, and Dysart No. 1 mines. Table G.2 summarizes the reconnaissance and field study survey results.

G.1.2.3 Summary

In summary, the open pit (strip mining) areas of New Mexico have not been restored and numerous shallow open pits or trenches remain with their waste piles undergoing rainwater runoff and windblown contamination of surrounding areas. Most of the inactive underground mine sites have had the head frame and buildings removed and the portals sealed by timber or steel plates to prevent entry, but openings do allow radon exhaust via natural ventilation of the mine. Most mine sites have waste piles which are undergoing rainwater runoff and windblown contamination of surrounding areas. Most of the cased mine vents are not capped to prevent radon exhausting. No mine water drainage was apparent at any of the sites, and most of the mines appear to have collapsed or are flooded.

G.1.3 Texas

Compared to some other western states, the uranium production of south Texas is relatively insignificant, comprising 5 percent of the current United States annual total. However, the relative impact of the mining operations is of interest herein for several reasons: 1) geographic concentration of the actual mine operations, 2) close proximity of the mines to the general population, 3) effect of the high precipitation of the region on the relatively abundant toxic trace elements in the uranium ore and overburden, and 4) minimal land reclamation of some of the older mines which produced high grade ore. The location of uranium ore deposits in south Texas can be readily estimated from the mine locations shown in Fig. 2.4. The deposits

Table G.2 Inactive uranium mine sites surveyed in New Mexico

Mine	Township and Range	Description
Anaconda F-33	T12N R9W Sect. 33 and 34	Two portals sealed by steel doors, large waste piles, no water, runoff apparent, no vents found.
Barbara Jane 1	T13N R19W Sect. 30	No head frame, portal covered by steel plate, but open. Shaft appears to be open, no water, relatively small waste pile, runoff from waste pile, three open mine vents and one capped. Surveys completed at this site.
Barbara Jane 3	T13N R19W Sect. 30	Head frame remains, portal covered by steel plate but openings. Shaft appears to have collapsed. Water drainage from active mine flows through area, small waste piles cleaned off to surface. Several (about six) cased mine vents open to surface.
Beacon Hill	T13N R9W Sect. 20	Small head frame, incline shaft is collapsed. Waste piles in area, no water but runoff apparent. No vents found.
Dakota	T13N R10W Sect.4	Two open portals but mine not deep. Some waste piles, no vents found, no water, runoff apparent.
Davenport	T13N R9W Sect. 20	Open incline but roof collapsed about 60 yards into mine. No vents found. Waste piles in area, no water, runoff apparent. Surveys completed at this site.
Dog Mine	T13N R9W Sect.20	Head frame, incline shaft sealed but appears to have collapsed. No vents found. Large water drainage ditch, large waste piles, runoff apparent.
Dysart 1	T14N R10W Sect. 11	Head frame and buildings, open vents but used in nearby active mine system, waste piles, no water, no runoff.

Table G.2 (continued)

Mine	Township and Range	Description
Flat Top	T13N R9W Sect. 30	No head frame, timber and concrete slab over shaft. No water, waste pile cleaned to surface. No runoff. Several open mine vents found nearby.
Flea Mine	T13N R9W Sect. 20	No head frame, portal sealed with timber. No vents. No water but runoff apparent. Large waste piles.
Hogan	T13N R9W Sect. 14	No head frame, concrete pad covers shaft. No vents found, no water. Waste cleaned to surface, no runoff.
Malpais	T13N R9W Sect. 20	Mine shaft not found but believed to be covered by waste piles. No water but runoff apparent.
Marquez	T13N R9W Sect. 23	Building, portal sealed with timber, several open vents. San Mateo Creek flows through site. Waste piles and water runoff.
Mesa Top	T13N R9W Sect. 20	No head frame, shaft sealed with timber but open, large waste piles. Several open mine vents in area. No water runoff apparent. Surveys completed at this site.
Poison Canyon Strip Mines	T13N R10W Sects. 25, 26 and 139	Open pit or strip mining areas. No shafts or buildings, extensive waste piles and numerous pits, no vents. One abandoned water well, rain water in one pit. Runoff apparent, creek flows between several waste piles in Section 25. Surveys completed at this site.
San Mateo	T13N R8W Sect. 30	No head frame, shaft area collapsed. Large waste piles. Heap leach pile, mine water drainage areas. No water, extensive runoff. One open vent found. Surveys completed at this site.

Table G.2 (continued)

Mine	Township and Range	Description
Santa Fe	T13N R9W Sect. 24	Head frame and building, waste cleaned to surface. No water, no runoff, no vents found.
Westvaco	T13N R10W Sect. 25	No head frame, portal caved in to form hole, no vents found. Small waste pile, no water, runoff apparent.
Zia Strip Mines	T12N R9W Sect. 15	Shallow strip mining areas, no shafts or buildings. Waste piles, no water, no runoff apparent, no vents.

are in tuffaceous, zeolitic sandstone and mudstone beds that strike north eastward and dip gently southeastward (Ea75). Uranium is produced from a three-county area comprised of Karnes, Live Oak, and Duval counties. In each area the host rock is different and ranges in age from Eocene to Pliocene. The Catahoula Tuff is believed by many authors to be the principal source rock for uranium and other elements in the deposits.

Uranium ores currently mined in south Texas are generally of very low grade, the average being about 0.06 percent U_3O_8 . In the recent past many operations, now inactive, were mining ore of the range 0.20-0.25 percent U_3O_8 . The ore zone thickness, although variable, is seldom more than 3.05 m. The usual mining method is by open pit, however, in situ leaching is becoming commonplace and useful under certain conditions. Mine size and geometry are variable, depending on the period of mining activity, the depth of the ore zone, and the proximity (vertically and laterally) of other ore bodies. Many of the mines have a linear trend, paralleling the mineralized roll front. A typical open pit mine would be 30-100 m deep and cover approximately 250,000 m^2 . Currently, a stripping ratio of 35:1 is followed in this area. Any groundwater encountered is diverted to sumps and, from there, pumped to holding ponds.

The reclamation of the pit areas involves contouring the land surface such that all drainage is internal to an on-site holding pond. Topsoil cover is spread about evenly and then seeded with various grasses. It is uneconomical to backfill all of the overburden into the pits and, consequently, some pit remnants consisting of steep walls, etc. are usually left. Generally, reduced agricultural and grazing productivity can be expected in the immediate area of the pit and overburden piles, particularly in the case of older mines.

In situ leaching is common when the depth, size, water content, etc. of the ore body prevents economical open pit mining. It is carefully controlled by the State, especially with respect to monitoring requirements. With cessation of leaching it should be noted that local baseline water quality of the mined aquifer is never fully attained. Potential problem areas are locally increased mobility of trace metals and elevated ammonia levels in the leached ore zone. Tailings from in situ leaching operations can be stored on site or transferred to mill tailings piles.

A compilation of both active and inactive mines by location (county) and type of operation is presented in Table G.3 and Fig. 2.4, both of which are based on State data (Co78).

Table G.3 Status and location of uranium mines in Texas

County	Open Pit ^(a)			In Situ Leaching ^(a)			Total
	A	I	P	A	I	P	
Karnes	8	35	9				52
Karnes-Gonzales	2						2
Karnes-Atascosa	1						1
Gonzales	1						1
Atascosa		1					1
Bee				1			1
Live Oak	6	8		6			20
Duval	1			2		5	8
Webb-Duval				1			1
Webb				1			1
Total	19	44	9	11	0	5	88

^(a)A = active; I = inactive; P = planned.

G.1.3.1 Field Surveys

On May 24-30, 1979, active and inactive open pit uranium mines in Karnes County, Texas were visited in the company of Texas Health Department radiation specialists. The survey included mine wastes and pits in varying stages--active-mining underway, inactive-being reclaimed, inactive-reclaimed, and inactive-abandoned without reclamation. A gamma survey was conducted at one open pit mine that had just been regraded and covered with topsoil but not yet reseeded. The field survey results were supplemented with extensive gamma survey and environmental monitoring results from the Texas Health Department and the Texas Railroad Commission.

Uranium mining in Texas involves considerable and successive description of the land surface as ore bodies are first uncovered and then removed. Tremendous volumes of topsoil, overburden, and water must be relocated a number of times in the course of mining. Dewatering has reached the stage where off-site release is becoming necessary. In the past, mine waters were rarely discharged but were stored in temporary basins on site. Occasionally, mine water was pumped to stock ponds to augment other supplies, typically derived from rainfall runoff. Water quality had to meet accepted standards for stock use.

Figures G.16 and G.17 are of a typical large open pit mine in Texas as of 1972 and 1978. Note the extensive changes in the landscape as unmined land is stripped, mined, and then reclaimed. Much of the overburden is left adjacent to the mines, and standing water remains in most pits. The water originates as groundwater seepage and overland flow from precipitation. The Galen mine, in the right foreground, was abandoned without stabilization about 10 years ago. Natural vegetation is very thin owing to the lack of topsoil and probable toxic effects of trace elements in the wastes. The pile is deeply eroded in places as was shown previously in Figs. 6.10 and 6.11.

Current Texas requirements for stabilization specify that the gamma radiation dose rate must be no more than 0.5 rem per year. For continuous exposure, this corresponds to $57 \mu\text{R/hr}$ above background (about $5 \mu\text{R/hr}$). Results of 21 mine surveys in Texas (Co77) indicated that gamma-ray exposures in excess of $62 \mu\text{R/hr}$ were found at 16 of the mines surveyed. Contributing causes are mineralized overburden (15 of 16), ore pads not properly decontaminated (8 of 16), and mineralized rock in the pit (4 of 16).

G.1.3.2 Summary

In summary, uranium mining has caused radiation levels at some abandoned uranium mines to exceed natural background levels. On approximately one-tenth of the mined area of south Texas, exposure rates could exceed $60 \mu\text{R/hr}$ (the equivalent of 0.5 rem per year for continuous exposure). Although no one is believed to be receiving an exposure in excess of 0.5 rem per year now, the area being mined is increasing, and so is the State's population; hence, the potential for increased population exposures is becoming greater. Individuals occupying a dwelling built on abandoned mine

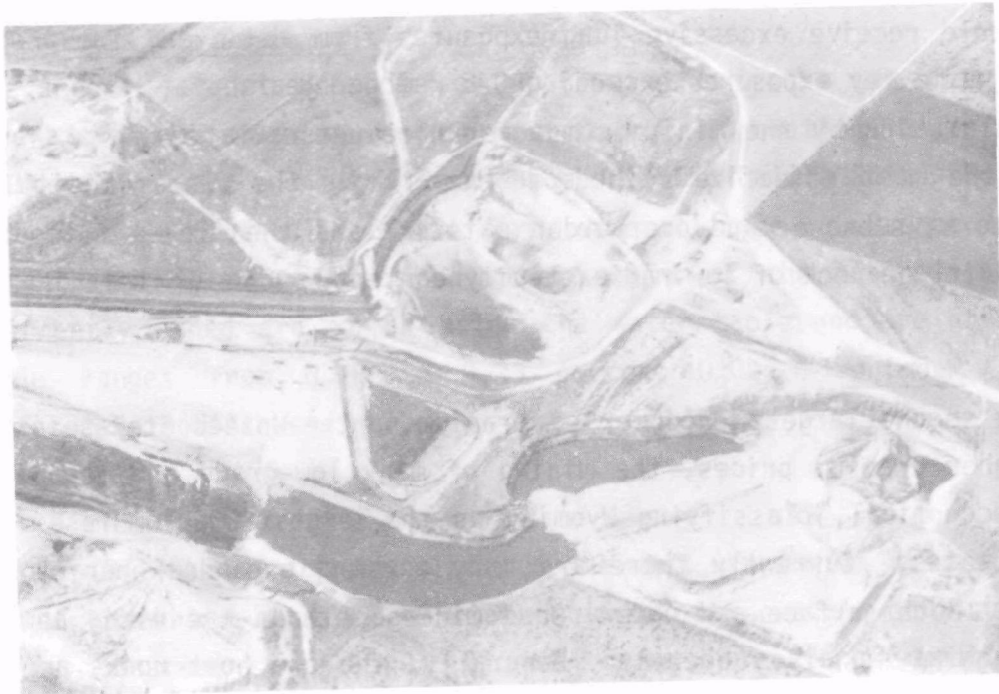


Figure G.16 1972 aerial photograph of the Galen and Pawelek open pit mines, Karnes County, Texas



Figure G.17 1978 aerial photograph of the Galen and Pawelek open pit mines, Karnes County, Texas

areas could receive excessive lung exposures from radon and its progeny, as well as gamma ray exposures exceeding 0.5 rem per year.

Reclamation by the mining company can reduce radiation levels on mines. One of the most effective methods is to fill in the pit area with the remaining ore, sub-ore, and overburden material and then cover this area with natural dirt or rock of low radioactivity content.

G.1.4 Wyoming

The second largest producer of uranium in the United States is Wyoming. With higher uranium prices, the mining of many low-grade ore deposits would become economical, classifying Wyoming as the largest uranium reserve in the United States. Currently there are many new and expanded operations being planned. Both surface and underground mining methods are used; however, in situ leaching is also underway. Generally, the ore host rocks are arkosic sandstones and conglomerates. Currently, unoxidized ores are being mined, whereas, in the past, shallow oxidized ore bodies were worked. As a result, newer mines are discharging considerably more water to formerly ephemeral streams and, in one case, to a dry lake bed. Within Wyoming, there are 14 major uranium districts, 4 of which are currently producing. These four districts, which are detailed below, exemplify the overall geology of Wyoming uranium occurrences.

G.1.4.1 Highland Flats - Box Creek District

Currently, the largest producing area is the Highland Flats - Box Creek district, located in central Converse County. Host rocks for this deposit are arkosic sandstones of fluvial origin lying within the Fort Union Formation. The ore occurs in roll-type, tabular, and dish-shaped deposits. The largest and most significant of these are the roll-type deposits, varying between 1.5 m and 6.1 m thick. All types are generally associated with each other, occurring from about 46-91 m below the land surface. The ore grade ranges from 0.1 to 0.15 percent U_3O_8 . Former mining operations in this area were in the overlying Wasatch Formation and produced ore of approximately 0.22 percent U_3O_8 .

G.1.4.2 Crooks Gap District

The second largest producer of uranium, the Crooks Gap district, is located in the Green Mountains of Fremont County. Operations began there in 1954. The host rocks are arkosic sandstones in the Battle Spring Formation. The ore bodies are of tabular, stratiform, and roll-type occurrence modes and are concentrated in narrow zones at the margins of the altered sandstone. Those currently mined are at or below the water table and are unoxidized. Ore grade ranges from 0.18 to 0.23 percent U_3O_8 . Formerly, smaller, near-surface ore bodies were mined.

G.1.4.3 Gas Hills District

The Gas Hills district has produced the most uranium in Wyoming and has the largest number of mine and mill operations. Large-scale continuous production has occurred since 1960. It is located in eastern Fremont County. The host rocks are arkosic sandstones in the Wind River Formation. Within this region there are four types of deposits, the roll-type being the most important. These are found at depths of about 30 m to 150 m below the surface and up to 122 m below the water table. The ore zones are 0.3 m to 3.1 m thick, occasionally ranging from 6 m to 10 m thick. The current ore grade is approximately 0.1 to 0.15 percent U_3O_8 . Also within the district are small, high-grade residual deposits behind the main solution front deposits.

G.1.4.4 Shirley Basin District

The Shirley Basin district in northwest Carbon County has been actively mined since 1960 and is expected to expand considerably. The host rocks are arkosic sandstones within the Wind River Formation and the deposits are of the roll-type. Found at the leading edge of the tongue of the roll-front, the ore bodies tend to be large, about 15 m wide by 760 m long. Smaller ore bodies are found along the top and bottom of the roll-front. Overall, the ore bodies vary from a few hundred to a few thousand MT, at depths from 45 m to 90 m below the surface. Main ore bodies lie below the groundwater table, sometimes to depths of 90 m. The ore grade ranges from 0.2 to 0.6 percent U_3O_8 .

G.1.4.5 Summary

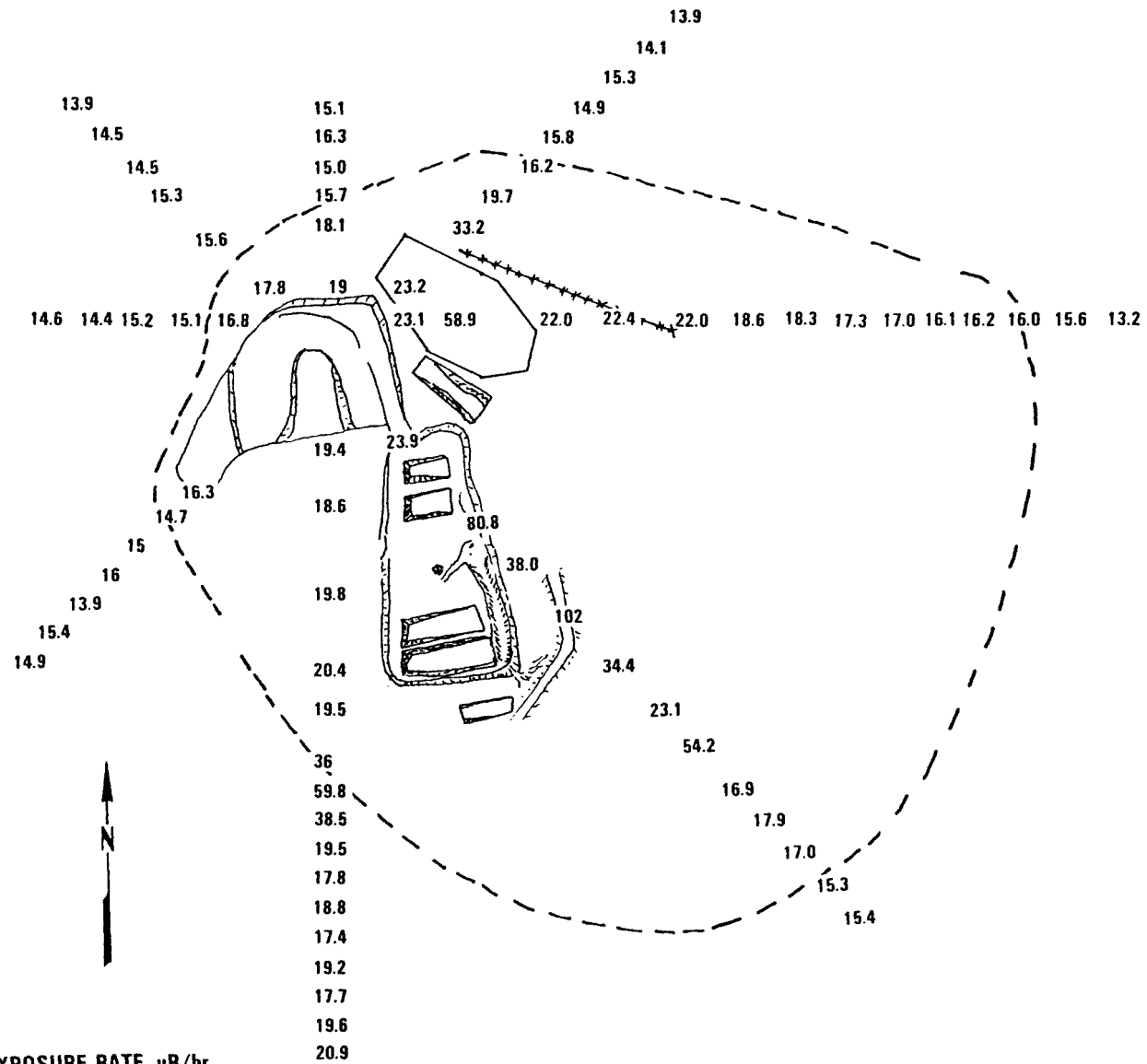
Approximately 90 percent of the ore produced comes from surface mining operations. Overburden thickness ranges from 30.5 m to 137 m below ground surface. Spoils bank accumulation is on the order of $764 \times 10^3 \text{ m}^3/\text{month}$ for an average lifetime of 15 years. This material is stockpiled for later reclamation pursuant to the State Environmental Quality Act of 1973; however, to date, land reclamation has not begun at any surface mine site. It is evident that the mine waste volume from an underground mining operation is much less than that generated by an open pit mine; therefore, it is estimated that about two hectares per portal would be sufficient to dispose of the waste rock.

The majority of the inactive mines are located in the Gas Hills and Shirley Basin mining districts, located in Fremont and Carbon Counties, respectively (Personal communication with UNC staff 1979). There are some inactive but not abandoned mines at every production area. Any increase in the value of U_3O_8 will lead to the reopening of many mines. Therefore, it is difficult to select an inactive mine that would be considered abandoned (mined out).

The Morton Ranch leasehold, described as typical of smaller inactive and perhaps abandoned operations, was the site of the radiological survey. The topographical and climatological parameters of the area are similar in practically any portion of central Wyoming. Precipitation ranges from 30 cm to 36 cm per year, with June being the wettest month, November the driest. The wind blows constantly at variable frequencies up to 129 km/hr (NUREG 0438). The topography is dominated by plains, low-lying hills, and table lands interrupted by stream channelways.

In 1973, an inactive pit, 1601, was very briefly mined to determine the metallurgical qualities of the underlying ore. A pit 110 m x 238 m x 12.2 m deep remains. Adjacent to the pit, piles containing $237,000 \text{ m}^3$ [$73,000 \text{ m}^3$ of ore and $164,000 \text{ m}^3$ of spoil (sub-ore)] of spoil material occupies less than 2.5 hectares.

Results of the gamma survey performed along radials originating from the center of the pit appear in Fig. G.18. The near-surface ore body complicated field results from the survey; therefore, soil samples were taken at every 366 m to determine the presence of wind-blown material or surface ore outcropping. Additional soil samples, 75 cm profiles, were taken at erosional occurrences and in drainages.



GROSS GAMMA EXPOSURE RATE uR/hr

Figure G.18 Results of gamma exposure rate survey at the 1601 pit and environs, Morton Ranch uranium mine, Converse County, Wyoming

G.2 Aqueous Transport of Mining Wastes in New Mexico and Wyoming

G.2.1 Description of Field Studies

Field studies were conducted to investigate the transport of trace elements and radionuclides from inactive mining areas to off-site locations in New Mexico and Wyoming. These areas were selected because extensive uranium mining has occurred to date and is likely to continue. Since the mid 1950's, these States have produced the majority of domestic U_3O_8 .

Samples of surface soils, stream sediments, mine drainage water, and surface water were collected. Interpretation of the data is complex since wind and water erosion work together at different seasons of the year to transport the mine material stored above ground. Compounding the problem is the semiarid environment of Wyoming and New Mexico where precipitation averages 13 to 31 centimeters per year and occurs primarily in the spring. The short-duration "flash flood" summer thundershower will move large quantities of material in increments rather than a gradual erosional pattern.

Sampling was conducted during April and May 1979 at a site within the South Powder River Basin in Wyoming, at two sites in Poison Canyon drainage, and at the San Mateo mine areas in New Mexico. Most of the soil samples were obtained in well-defined runoff gullies where mine and mine spoil drainage intersected stream beds. The arid nature of the locations did not provide much opportunity to observe and to measure surface runoff characteristics.

Sampling locations at the Morton Ranch property in Wyoming are summarized in Fig. G.19. The types of samples are identified in the legend. Samples taken at the San Mateo mine in New Mexico are depicted in Fig. G.20.

At three locations at Morton Ranch, a 75 cm profile was taken which consisted of 15 consecutive 5 cm segments. The potential variability of trace metals and radionuclides at depth may be related to the solubility of the species and the amount of surface water residence time. Understanding the fractionation of surface contaminants in the soil column is important in evaluating the transport of various species by redissolution or leaching.

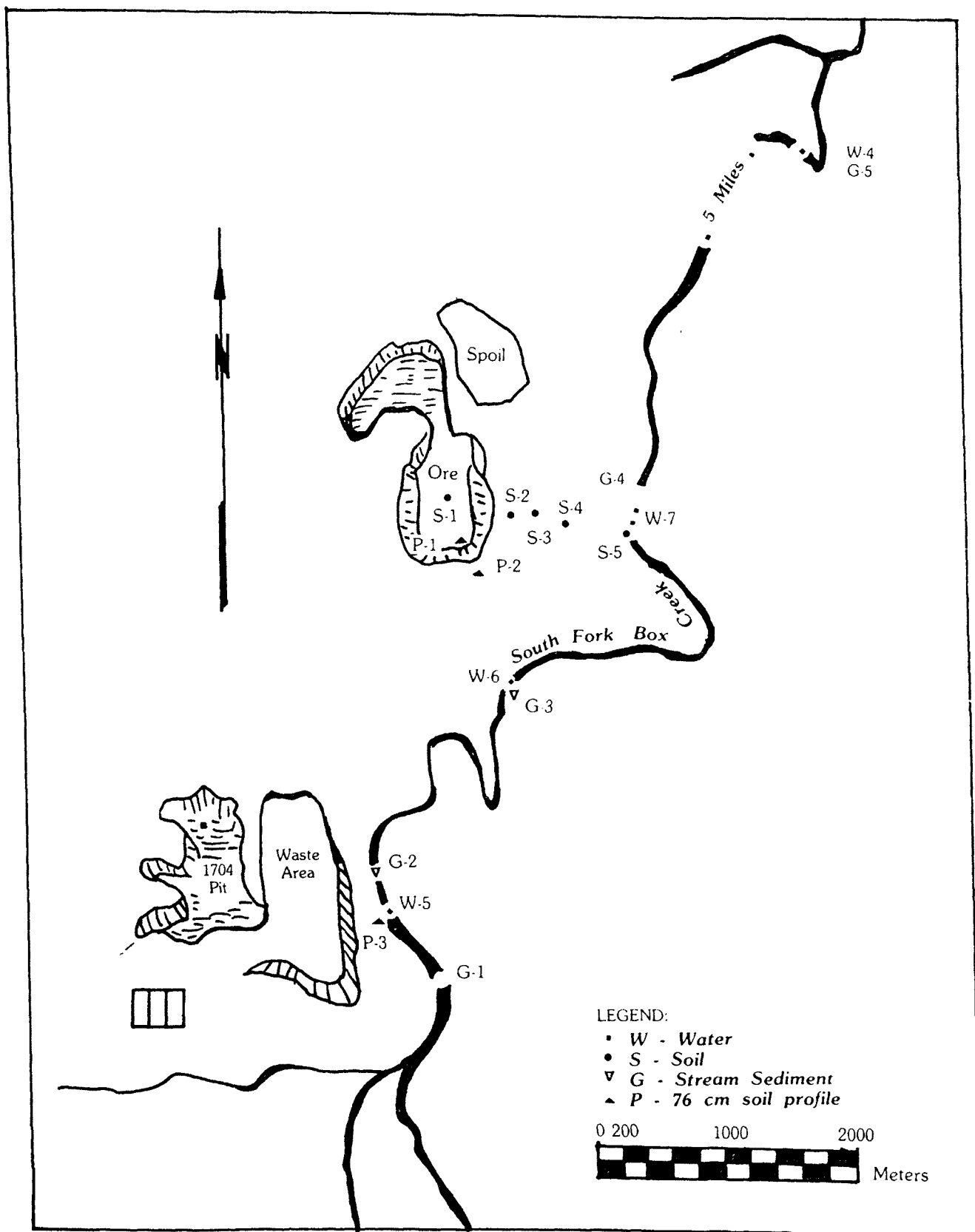


Figure G.19 Location of sampling sites at the Morton Ranch mine, South Powder River Basin, Wyoming.

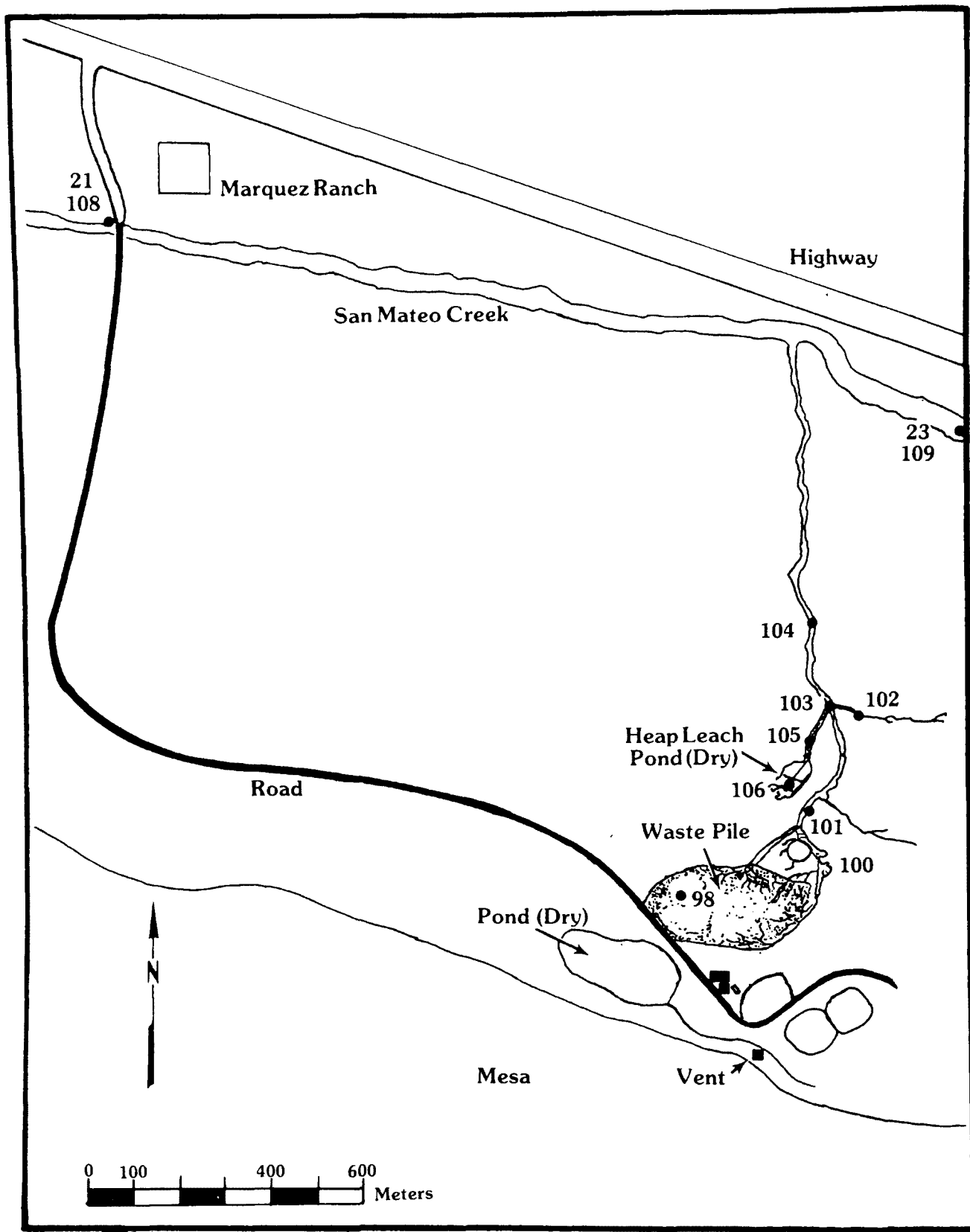


Figure G.20 Sample locations for radionuclides and select trace metals in sediments, San Mateo Mine, New Mexico

G.2.2 Discussion of Results

The radiochemical and trace metal analyses for the stations shown in Fig. G.19 are contained in Tables G.4, G.5, G.6, and G.7 (Written Communication from N.A. Wogman, Battelle Pacific Northwest Laboratory, 1979).

Table G.4 Trace elements and radionuclides in water in the South Fork of Box Creek drainage at UNC Morton Ranch lease

Location ^(a)	pCi/ℓ		μg/ℓ			
	Ra-226	U-238	Ba	Se	V	Mn
W-3 H ₂ O	15.5	1220	63	334	8	77
Filter	18.7	33.7	22	38	47	22
W-5 H ₂ O	4.2	287	76	78	5	9
Filter	4.48	2.97	16	0.6	8.1	29
W-6 H ₂ O	0.6	34.2	11	<4	10	91
Filter	0.091	0.209	<4	<.1	<.6	11
W-7 H ₂ O	0.5	38.7	86	<4	7	22
Filter	0.18	0.976	4	<.1	1.0	18
W-4 H ₂ O	0.13	10.9	44	<4	6	149
Filter	0.045	0.188	<3	<.1	1.7	6.7
Acid Blank H ₂ O	N.D.	N.D.	1	<4	<5	<3
Filter	0.59	0.073	<3	<.12	<.4	<.2

(a) See Figure G.19.

Note. -- United Nuclear Corporation (UNC) has recently transferred its interest to the Tennessee Valley Authority.

Table G.5 Radionuclides and trace metals in sediments in the South Fork of Box Creek at UNC Morton Ranch lease

Location ^(a)	pCi/g		µg/g				
	Ra-226	U-238	Ba	Se	V	Mn	As
G-1	1.3	0.41	750	<1	<39	70	< 1.6
G-2	1.8	1.04	690	<1	<42	114	2.9
G-3	6.8	7.46	550	7	90	3390	10
G-4	1.4	1.45	750	<1	<51	100	<1.7
G-5	1.2	0.87	720	<1	<50	107	3.4

(a) See Figure G.19.

The results in Tables G.4 through G.7 may indicate dispersal patterns of mine drainage and waste in a semiarid environment. Intermittent runoff from surface or underground mining spoils or an irregular low-volume discharge of mine water compounds the difficulty in attributing the impacts to either suspended or dissolved species. The analyses performed on samples from the South Fork of Box Creek cannot be used to describe typical impacts from larger operations; yet the complexity of stream sedimentation and dilution is evident and can signal precautions in monitoring any site of mining operation.

For instance, water samples collected from Box Creek represent an intermittently flowing stream without a constant mine discharge. Even in spring after most of the snow has melted and recharged the upper reaches, streams such as Box Creek do not flow but rather contain shallow impoundments. There seems to be a movement of water beneath the stream sediments which supports these impoundments without observable surface flow. Each of the water and sediment samples was from impoundments, except for sediment sample G-1 which was from a dry stream bed. The results in Table G.4 show that radium-226 and uranium-238 in solution decrease in concentration with downstream distance. Station W-3 is hydrologically separate from the drainage basin at the present time, but represents mine discharge when dewatering begins.

Table G.6 Radionuclides and trace metals in soils near the 1601 open pit mine, UNC Morton Ranch lease, Wyoming

Location ^(a)	pCi/g			μg/g					
	Ra-226	U-238	Th-230	Ba	Mn	V	Zn	Se	As
S-1	119	188	161	760	205	110	29	17	7.5
S-2	33	7.21	38.6	800	250	160	85	25	11
S-3	3.8	1.87	3.71	760	200	70	36	<1	6.8
S-4	1.9	1.78	3.54	530	190	100	58	<1	6.0
S-5	2.5	1.64	1.91	810	140	<50	27	<1	4.2
S-6 ^(b)	1.86	1.62	1.74	680	180	100	33	<1	3.9
S-7	3.4	1.60	2.71	570	180	70	32	<1	5.6

^(a) See Figure G.19.

^(b) Background sample.

In conjunction with the decreasing soluble species with distance downstream, there is a possible trend of increased levels in sediments (see Table G.5). This may be, in part, due to the sampling locations (ponded water). It is possible that the soluble species precipitate in standing water either because of evaporation increasing the solute concentration or the increase in pH. The pH of the 1704 mine water increased from 5.2 to 7.2 eight km downstream in Box Creek. Another possibility is that these ponds receive surface runoff from several hundred meters of stream bed and, therefore, have higher sediment loading.

The data in Table G.6 are from a series of soil samples obtained from the natural drainage leading from the inactive 1601 open pit to the South Fork of Box Creek. This mine is dry and therefore it has no liquid discharge to Box Creek. Over 1,100 m separate the mine spoils material from the creek bank. The soil samples were collected at 183, 366, 567, and 1,100 m from the spoils bank. If there had been runoff from cloudbursts or snow melt, sheet erosion across this plane could move the spoils material to the creek. This mine was operated for a very short time eight years ago; therefore, the full

impact of the long-term erosion could not be measured. Also, wind erosion complicates the predictive value of these results since this channel is aligned with the predominant wind direction.

Table G.7 Radionuclides and trace metals in soil profiles at the open pit mines, UNC Morton Ranch lease, Wyoming

Location ^(a)	Depth (cm)	pCi/g			µg/g			
		U-238	Ra-226	Th-230	Mn	Se	Ba	V
P-1	0-2	188	119	161	205	17	760	110
	4-6	1.62	2.8	1.79	120	1.2	720	< 50
	10-12	2.12	1.8	1.87	59	< 1	470	150
	22-24	1.21	1.4	1.0	86	1.9	550	130
	28-30	1.26	1.5	1.16	57	< 1	590	70
P-2	0-2	11.0	33.2	31.4	130	2.7	690	90
	4-6	5.39	13.0	18.0	94	1.1	760	< 50
	10-12	1.57	2.6	2.15	130	< 1	770	60
	22-24	11.0	146	238	190	1.3	560	120
	28-30	5.73	485	481	72	< 1	730	90
P-3	0-2	3.3	8.2	5.5	120	1.3	701	130
	4-6	3.0	52.0	11.1	110	1.1	693	70
	10-12	2.69	1.86	1.35	210	1.4	591	130
	22-24	1.97	1.62	1.78	270	1.1	618	90
	28-30	3.51	2.1	1.5	350	1.1	660	70

^(a) See Figure G.19

The trend of decreasing radioactive species with increasing distance from the spoils bank is evident. The background results for S-6 are composite samples of at least six locations where the gamma survey indicated no surface contamination. The results show that Ra-226, U-238, and Th-230 are measurable and decreasing towards the creek. These concentrations above

the background samples can be attributed either to wind or water erosion from the 1601 spoils bank.

Water erosion of the mine waste pile is documented by the gullying scars on the sloped surfaces. Data in Table G.6 indicate definite migration of this material at least 360 m from the largest gully. Yet it is possible that this contamination may have occurred while the mine was active. The ore body is sandstone, the fines of which could be resuspended by vehicle traffic or equipment operation.

In Fig. G.20 the drainage pattern for the San Mateo mine in New Mexico is depicted. As in the case of the 1601 mine in Wyoming, nearby drainage courses are dry most of the year. Runoff in San Mateo Creek lasts for several months as a result of snow melt, and is nil the rest of the year, except for brief runoff from storms. Radium-226 data for the sediments (see Table G.8) reflect decreasing concentration with distance to San Mateo Creek, especially within 350 to 460 m from the waste pile. The radium in San Mateo Creek downstream from the intersection of the mine drainage is higher than the gully data would indicate. Data for sample 104 seem to indicate that contamination has not moved from the gully wash to the creek beds, but this is considered most unlikely on the basis of known erosion and obvious topographic relations.

Barium and selenium trends, for the most part, follow a similar pattern of decreasing concentration with distance from the waste pile. Arsenic concentrations are an exception. Sediments show increasing arsenic to 350 to 460 m downstream and then decrease from that point to San Mateo Creek. In the creek sediments, arsenic and barium concentrations are higher than would be expected if mine wastes were the sole source of these elements.

Sediment and water samples (Tables G.8 and G.9, respectively) from San Mateo Creek indicate that barium and manganese concentrations are either equal to or higher upstream of the gulley intersection than below it. This apparent anomaly and the higher-than-expected concentrations for radium and arsenic in sediments cannot be readily explained.

In summary, the data collected during April and May 1979 at the San Mateo mine do not indicate that mine waste has reached San Mateo Creek; yet downstream sediments show anomalies for certain elements. The transport of mine waste is measurable approximately 370 to 460 meters from the waste pile.

Water erosion is the likely reason for the contamination, but wind may also be dispersing material. Meteorological data, particularly wind roses, are unavailable at this time.

Table G.8 Radionuclides and trace metals in sediments from the drainage of the San Mateo mine and from San Mateo Creek, New Mexico

Location ^(a)	pCi/g		$\mu\text{g/g}$					Remarks
	Ra-226	Th-232	Ba	Se	V	Mn	As	
98	117	0.86	-	-	-	-	-	Waste pile
100	55	0.64	566	3.9	78	176	3.1	Base of pile
101	36	0.66	484	3.7	114	179	5.1	100 m from pile
103	1.6	0.43	383	1.2	<50	191	6.2	400-500 m from pile
104	0.77	0.54	434	<1	<42	146	3.6	600-700 m from pile
105	1.2	0.80	517	<1	<52	186	3.8	Heap leach pile
102	0.77	0.55	562	1.2	102	473	5.5	Background
109	0.38	0.39	695	<1	<51	152	2.2	2 km upstream
108	8.1	0.53	597	<1	55	157	5.2	Downstream

^(a) See Figure G.20.

Table G.9 Radium-226 and trace elements in water from San Mateo Creek near San Mateo mine discharge point

Location ^(a)	pCi/ℓ	$\mu\text{g}/\ell$						
	Ra-226	Ba	Se	V	Mn	As	Mo	Zn
23 (upstream)	---	79	< 4	8	55	9	23	56
21 (downstream)	12.5	26	21	21	10	9	170	150

^(a) See Figure G.20.

Data from three soil profiles near the spoils areas of the 1601 and 1704 mines at Morton Ranch were used to investigate possible downward migration of soluble species. In semiarid environments, small precipitation events usually result in little noticeable runoff. In many areas, the surface soil is very porous and rain immediately infiltrates. The disturbed spoils material is probably of even higher porosity; therefore, soluble species could, over a period of time, begin to migrate to greater depths. Based upon solubility and frequency of rewetting, a fractionation of species could occur.

The overburden at 1601 and 1704 mines contains a high percentage of clay. The resultant spoils bank is a homogeneous mixture of clay and sandstone. It was observed during the collection of the soil samples that the clay was moist, highly plastic, and obviously of low permeability. Very slow downward migration of surface water would be expected; consequently, not much fractionation of the species would result.

The results in Table G.7, however, show contradictory evidence of isotopic disequilibrium. The isotopes of uranium, radium, and thorium are near equilibrium conditions throughout the profile P-1 taken above the slope of the 1601 spoils bank. However, the lower layers of profile P-2 show a marked departure of uranium from the radium and thorium. Since uranium is more soluble than the other species, it is difficult to explain the anomaly.

In profile number 1, the top segment probably contains ore material eroded to the spoil surface. The segments at greater depth show species equal to or less than the data reported as background on the surface in Table G.6 (S-6). This would imply that no downward migration had occurred on the surface of the spoils area. Note that the clay-like matrix of the spoils may have prevented much surface infiltration, which accounts for the shallow erosional scars on horizontal surfaces.

Profile number 2 was obtained in an alluvial fan below the spoil bank slope. The data suggest that the profile did not extend below the alluvium and into the spoil material. The anomaly at greater depth cannot be explained, but, perhaps, irregular wind and water erosion of the spoils material caused this layering effect. Still, the isotopic disequilibrium is not explained.

Profile number 3 was a saturated clay column which contained, from the odor, a percentage of organic material that was undergoing bacterial decomposition. Sheep in the area use the pond nearby and this may account for the source of the organics. The results for profile 3, again, show little above background concentrations at greater depth, except for slight increases in manganese, selenium, and uranium. The profile was in the sediments of Box Creek close to the runoff observed from the 1704 spoils bank. The radium and uranium data show that concentrations in sediments in the first 30 cm are higher than what was observed further downstream at point G-2 (Table G.5). This is undoubtedly the result of erosion from the spoils bank. This clay sediment matrix could be subject to transport further down Box Creek but only under high flow conditions.

G.2.3 Conclusions

In summary, the field studies attempted to identify and quantify the transport of mine spoils material. There is evidence that contamination is measurable up to 370 to 460 m in a gully draining the San Mateo pile and, perhaps, 570 m in the natural sloping plane in which the 1601 Morton Ranch mine waste is located. The mechanism of transport is complex because of the semiarid environments. There is a good chance of wind and water erosion combining to move spoils material these distances in under 10 years.

The data also support the conclusion that it is not evident that radio-nuclides or trace metal species have reached intermittent streams, either as soluble or particulate material. Anomalies were uncovered in San Mateo creek which cannot be explained from the samples collected so far. The water and sediment samples in the South Fork of Box Creek show decreasing concentrations of radium and uranium isotopes with downstream distance, but not so clearly for the trace metals. The levels of radium and uranium are not conclusive of major off-site movement of the spoils material.

The soil profiles obtained at the Morton Ranch leasehold do not support the conjecture of downward migration. Perhaps the clay-like consistency of the spoils material allows for too little fractionation after only eight years. The isotopic ratio discrepancy at greater depth in the profile of an alluvial fan of spoils is not understood at this time.

G.3 References

- Bu56 Butler, A., Schnabel R., 1956, "Distribution and General Features of Uranium Occurrences in the United States," Geological Survey Professional Paper No. 300.
- Co77 Cook, L.M., Caskey, B.W., and Wukasch, M., 1977, "The Effect of Uranium Mining on Environmental Gamma Ray Exposures," in Proceedings IRPA IV International Congress, Paris, April 24-30, pp. 1029-1032.
- Co78 Cook, L.M. 1978, "The Uranium District of the Texas Gulf Coastal Plain," Texas Department of Health, Austin, Texas.
- Da59 Dare, W., 1959, "Uranium-Mining Practices and Costs at Ten Salt Wash Lease Operations of Union Carbide Nuclear Co.," Bureau of Mines Information circular 7972.
- Ea75 Eargle, D.H., Dickinson, K.A., and Davis, B.O., 1975, "South Texas Uranium Deposits," American Association of Petroleum Geologists Bulletin, volume 59, number 5, May 1975.
- Si56 Sims, P., Tooker, E., 1956, "Pitchblende Deposits in the Central City District and Adjoining Areas, Gilpin and Clear Creek Counties, Colorado." Geological Survey Professional Paper No. 300.
- Wh78 White, L., 1978, Engineering and Mining Journal, Vol. 179, p. 25.

APPENDIX H

INFLUENCE OF MINE DRAINAGE ON SEEPAGE TO
GROUNDWATER AND SURFACE WATER OUTFLOW

H.1.0 Influence of Mine Drainage on Seepage to Groundwater and Surface Water Outflow

H.1.1. Surface Mines

Mine water discharge from each open pit mine in the Wyoming model area is estimated to be $3.00 \text{ m}^3/\text{min}$. Discharge is to natural ephemeral streams which will, in some cases, become perennial as a result of the discharge. Effects of mine drainage on water quality, stream biota, and downstream potable water uses are largely a result of dilution of suspended and dissolved load. The first step in the analysis is to determine what the net outflow of water from the sub-basin will be and then to route this water downstream where contact with man or the food chain is possible. It is assumed that suspended and dissolved chemical loads not leaving the sub-basin because of infiltration and evaporation remain on the stream bed and are available for subsequent transport in flood flows, which are calculated in Section 3.3.3.

Numerous assumptions are made in the analysis to follow, which is patterned after that in NUREG-0511 (Generic Environmental Impact Statement on Uranium Milling), with certain corrections and modifications. The calculations are based on the operation of three surface mines dewatering at a rate of $9.00 \text{ m}^3/\text{min}$ (3 mines, $3.00 \text{ m}^3/\text{min}$ each) into a sub-basin of 11.4 km^2 area. This will transform 22.7 kilometers of channel (in the sub-basin and basin) into perennial streams. Note that $7.04 \text{ m}^3/\text{min}$ will discharge from the sub-basin. The remainder of the flow ($1.96 \text{ m}^3/\text{min}$) is lost by infiltration and seepage in the sub-basin.

Mine discharge is assumed to enter into a hydrographic area described as follows (Table H.1) and shown in Fig. H.1:

Table H.1 Characteristics of the sub-basin containing the model mines

	Symbol	Value	Units
Slope of region		0.01	%
Substrate hydraulic conductivity (vertical)	K_v	6×10^{-6}	m/min
Substrate hydraulic conductivity (horizontal)	K_h	6×10^{-4}	m/min
Composite hydraulic conductivity	K	6×10^{-5}	m/min
Total outflow of a stream section	Q_T	Calculated	m^3/min
Total loss due to infiltration (seepage) and evaporation	Q_L	Calculated	m^3/min
Seepage loss	Q_s	Calculated	m^3/min
Evaporative loss	Q_e	Calculated	m^3/min
Annual evaporation rate	E	2×10^{-6}	m/min
Length of stream section	L	Variable	m
Reach of stream section with perennial flow	R	Variable	m
Channel dimensions (see Figure H.2)	a, b	Variable	m
Cross sectional area of channel calculated from Q_{in} and V	A	Variable	m^2
Water input from mine drainage	Q_{in}	3.00 per mine	m^3/min
Wetted perimeter of stream bed	B	Variable	m
Velocity of flow	V	36	m/min

$$\begin{aligned}
 K &= (K_h \cdot K_v)^{1/2} \\
 &= (6 \times 10^{-6} \times 6 \times 10^{-4})^{1/2} \\
 &= 6 \times 10^{-5} \text{ m/min}
 \end{aligned}$$

$$\begin{aligned}
 Q_L &= (Q_s + Q_e) \\
 B &= a + 2b
 \end{aligned}$$

$$\begin{aligned}
 Q_s &= KB \times f(L) && \text{Assuming that } B \text{ and } a \text{ are dependent only on } Q_{in}. \\
 Q_e &= Ea \times f(L) && V \text{ is assumed constant at } 36 \text{ m/min, and } f \text{ is a} \\
 V &= 36 \text{ m/min} && \text{function of } L.
 \end{aligned}$$

$$A = \frac{Q_{in}}{V}$$

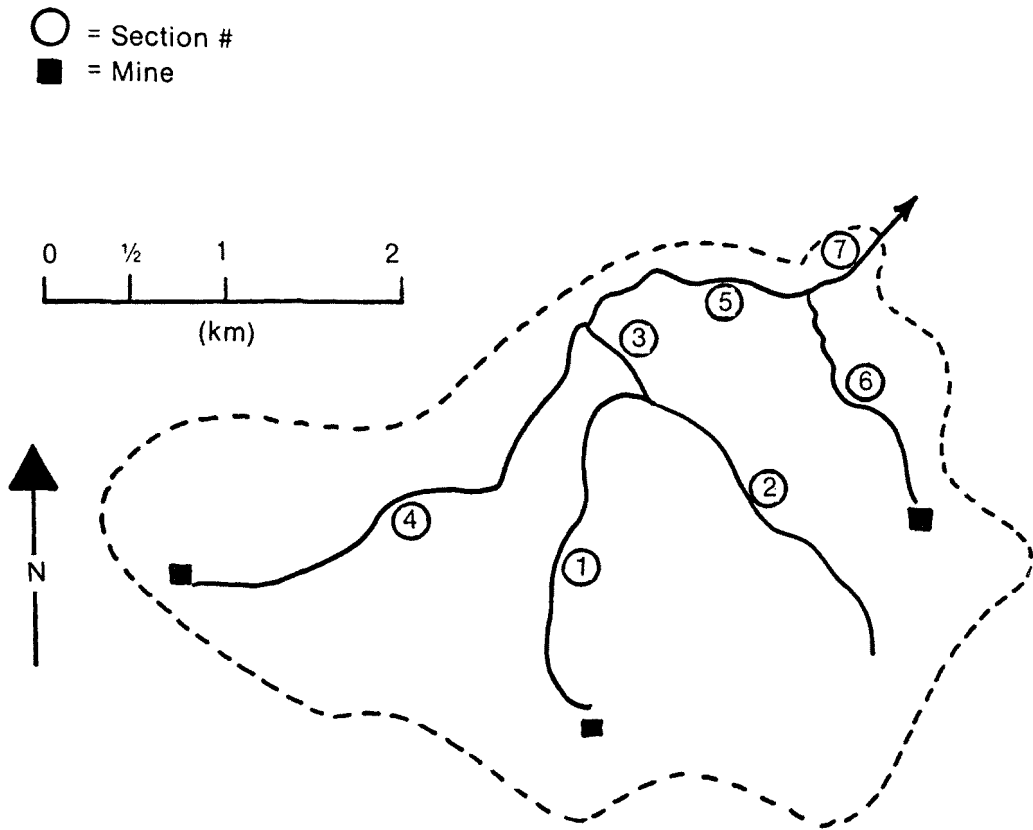


Figure H.1 Wyoming model area sub-basin drainage system

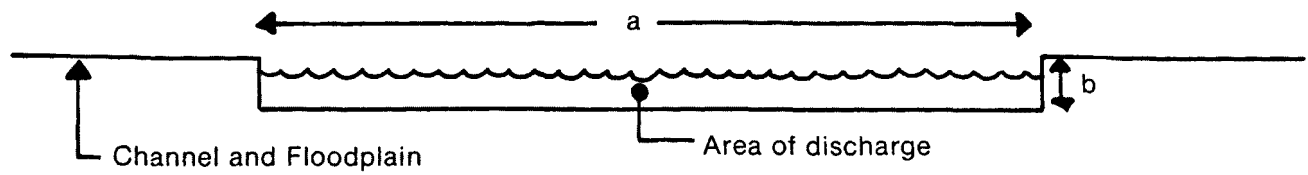


Figure H.2 Model area stream cross section

To find the total outflow (Q_T) from a stream section of length L :

$$\frac{dQ_T}{dL} = -KB - Ea$$

$$\int dQ_T = -(KB + Ea) \int dL$$

$$Q_T = -(KB + Ea)L + C$$

At $L = 0$, $Q_T = Q_{in}$, so $C = Q_{in}$:

$$Q_T = Q_{in} - (KB + Ea)L$$

To find the total loss (Q_L) associated with a stream of length L :

$$\text{Since } Q_T = Q_{in} - Q_L,$$

$$Q_L = (KB + Ea)L$$

$$A = a \times b$$

Assuming a ratio of $b/a = 0.01$,

$$a = \left(\frac{Q_{in}}{0.36} \right)^{1/2}$$

$$B = 1.02a$$

$$\text{so } Q_L = (1.02 K + E) aL$$

$$= [(1.02 (6 \times 10^{-5} \text{ m/min})) + (2 \times 10^{-6} \text{ m/min})]aL$$

$$= (6.32 \times 10^{-5} \text{ m/min})aL$$

$$= (6.32 \times 10^{-5} \text{ m/min}) \left(\frac{Q_{in}}{0.36} \right)^{1/2} L$$

To find the reach (R) of perennial stream created by discharge (if there is no net outflow from the section):

$$\text{If } Q_T = 0 \text{ then } 0 = Q_{in} - (KB + Ea)L$$

$$L_Q = 0 = R = \left(\frac{Q_{in}}{KB + Ea} \right)$$

Assuming a ratio of $b/a = 0.01$,

$$a = \left(\frac{Q_{in}}{0.36} \right)^{1/2}$$

$$B = 1.02a$$

$$\text{so } R = \frac{Q_{in}}{(1.02K + E) \left(\frac{Q_{in}}{0.36} \right)^{1/2}} = \frac{(0.36 Q_{in})^{1/2}}{1.02K + E} = 9493.67 \times Q_{in}^{1/2}$$

The basin drainage channels are assumed to be considerably larger than those of the sub-basin and therefore effect a greater evaporation and seepage loss on the system. Consequently, loss rates due to seepage were doubled, producing the following equations for estimating flows within the basin channels:

$$Q_L = (1.24 \times 10^{-4} \text{ m/min}) \left(\frac{Q_{in}}{0.36} \right)^{1/2}$$

$$R = 4823.15 \times Q_{in}^{1/2}$$

Table H.2 contains the calculations of seepage and evaporation loss and cumulative discharge for the sub-basin and contiguous areas of the basin.

Infiltration of mine discharge to ephemeral streams was not calculated separately but instead was solved as a combined loss for evaporation and infiltration. Both losses are a function of surface area. Infiltration takes place in both the sub-basin and the basin and at different rates. The final calculated infiltration percentage represents a combination of the sub-basin and basin losses, which were calculated separately. When 3 mines are operating, the full reach of perennial stream created is 22.7 km.

Infiltration losses in the sub-basin can be calculated as follows:

$$Q_L = [1.02 (6 \times 10^{-5}) + (2 \times 10^{-6})] aL \quad (\text{H.1})$$

where Q_L = flow rate or loss as infiltration plus evaporation, m^3/min
 a = width of stream, meters
 L = length of stream, meters
 Q_s = $6.12 \times 10^{-5} \times aL$
= infiltration loss, m^3/min
 Q_e = $2.0 \times 10^{-6} \times aL$
= evaporation loss, m^3/min

Table H.2 Seepage and outflow calculations for the Wyoming model mine drainage system

Section Number ^(a)	Section Length L (m)	Q_{in} (3.00 m ³ /min per mine)	Total Q_{in} (m ³ /min)	Q_L (m ³ /min)	$Q_{in} - Q_L$ (m ³ /min)	R (m)	Cumulative Discharge (m ³ /min)
1	2400	3.00	3.00	0.44	2.56	-	
2	2100	----	----	----	----	-	
3	600	----	2.56	0.10	2.46	-	
4	3000	3.00	3.00	0.55	2.45	-	
5	1400	----	4.91	0.33	4.59	-	
6	1600	3.00	3.00	0.29	2.71	-	
7	900	----	7.30	0.26	7.04	-	7.04
Basin	141000	7.04	7.04	7.04	----	12797	0

(a) See Fig. H.1.

$$\text{Therefore, } \frac{Q_s}{Q_e} = 30.6 \quad (\text{H.2})$$

$$\begin{aligned} \text{Since total loss} &= Q_s + Q_e = 1.96 \text{ m}^3/\text{min} \\ \text{and } Q_s &= Q_e \times 30.6 \\ \text{then } Q_s &= 1.96 - Q_e \text{ and } Q_e = \frac{1.96}{31.6} = 0.062 \text{ m}^3/\text{min} \end{aligned}$$

$$\begin{aligned} \text{Then loss due to infiltration in the sub-basin:} \\ &= 1.96 - 0.062 \\ &= 1.898 \text{ m}^3/\text{min} \end{aligned}$$

$$\begin{aligned} \text{Infiltration losses in the basin can be calculated as follows:} \\ Q_L &= [1.02 (1.2 \times 10^{-4}) + (2 + 10^{-6})] \text{ aL} \quad (\text{H.3}) \end{aligned}$$

$$\begin{aligned} \text{where } Q_s &= 1.22 \times 10^{-4} \text{ x aL} \\ Q_e &= 2 \times 10^{-6} \text{ x aL} \end{aligned}$$

$$\text{Therefore, } \frac{Q_s}{Q_e} = 61.0 \quad (\text{H.4})$$

$$\text{Total Loss} = Q_s + Q_e = 7.04 \text{ m}^3/\text{min}$$

$$\begin{aligned} \text{Then loss due to infiltration in the basin:} \\ &= 7.04 - 0.114 \\ &= 6.926 \text{ m}^3/\text{min} \end{aligned}$$

Therefore, total inflow equals $9 \text{ m}^3/\text{min}$ or $4.73 \times 10^6 \text{ m}^3/\text{yr}$, and total annual infiltration loss equals $4.65 \times 10^6 \text{ m}^3$. Restated, 98.2 percent of the discharge infiltrates and the remainder evaporates.

H.1.2 Underground Mines

Mine water discharge from underground mines in the New Mexico model area averages slightly under $2 \text{ m}^3/\text{min}$. Flow characteristics parallel those in the Wyoming model area, as does the methodology applied in calculating the infiltration and evaporation losses and the net outflow. The calculations are based on the operation of 14 mines dewatering at a rate of $28 \text{ m}^3/\text{min}$ ($2.00 \text{ m}^3/\text{min}$ per mine) into a sub-basin of 246 km^2 area. This will result in transformation of 24.8 km of channel (in the sub-basin only) into perennial streams. Note that there is no discharge from the sub-basin to the basin.

Mine discharge is assumed to enter into a small sub-basin hydrographic unit shown in Figure H.3. The sub-basin characteristics used as model input parameters are the same as those for Wyoming (Table H.1) with the exception of those presented in Table H.3.

Table H.3 Characteristics of the sub-basin hydrographic unit in the model underground uranium mine area

Parameter	Symbol	Value	Units
Substrate hydraulic conductivity (vertical)	K_v	6×10^{-5}	m/min
Substrate hydraulic conductivity (horizontal)	K_h	6×10^{-3}	m/min
Substrate hydraulic conductivity	K	6×10^{-4}	m/min
Annual evaporation rate	E	4.0×10^{-6}	m/min
Water input from mine discharge	Q_{in}	2.00 per mine	m^3/min

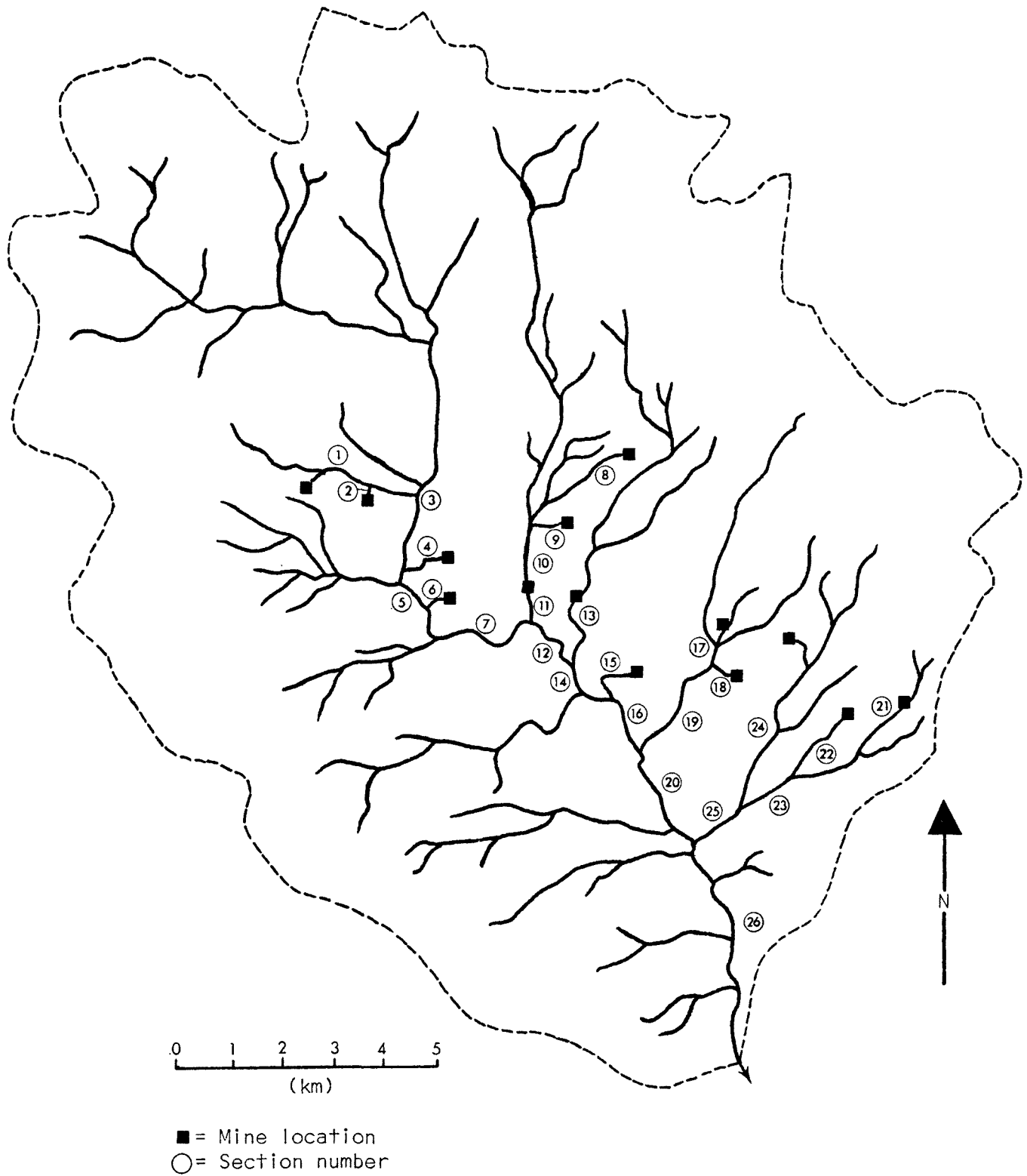


Figure H.3 New Mexico model area sub-basin drainage system

The loss and outflow formulas are of the same format and derivation as the Wyoming equations (see Surface Mines), but have different final forms due to the change in infiltration and evaporation rates. The final equations for the New Mexico model area are as follows:

To find the total loss (Q_L) associated with a stream segment of length L :

$$\begin{aligned} Q_L &= (1.02K + E)aL && \text{(H.5)} \\ &= [(1.02 (6 \times 10^{-4} \text{ m/min})) + (4.0 \times 10^{-6} \text{ m/min})] aL \\ &= (6.16 \times 10^{-4} \text{ m/min}) aL \\ &= (6.16 \times 10^{-4}) \left(\frac{Q_{in}}{0.36} \right)^{1/2} L \end{aligned}$$

To find the reach (R) of perennial stream created by discharge (if there is no net outflow from the section):

$$\begin{aligned} R &= \frac{Q_{in}}{(1.02 K + E) \left(\frac{Q_{in}}{0.36} \right)^{1/2}} && \text{(H.6)} \\ &= \frac{(0.36 Q_{in})^{1/2}}{(1.02 K + E)} \\ &= 974.03 \times (Q_{in})^{1/2} \end{aligned}$$

Since no net outflow from the sub-basin occurs, equations modified for the basin channel characteristics are not necessary for this model area. Table H.4 presents the calculations of infiltration and evaporation loss and cumulative discharge within the sub-basin.

Infiltration of mine discharge to ephemeral streams was not calculated separately but instead was solved as a combined loss for evaporation and infiltration. Both losses are a function of surface area. Infiltration takes place only in the sub-basin as there is no net outflow. When 14 mines are operating, the full reach of the perennial stream created is 24.8 km.

Infiltration losses can be calculated as follows:

$$Q_L = [(1.02 (6 \times 10^{-4})) + (4.0 \times 10^{-6})] aL \quad \text{(H.7)}$$

Table H.4 Seepage and outflow calculations for the New Mexico model mine area drainage system

Section Number ^(a)	Section Length L(m)	Q_{in} (2.00 m ³ /min per mine)	Total Q_{in} (m ³ /min)	Q_L (m ³ /min)	$Q_{in} - Q_L$ (m ³ /min)	R (m)	Cumulative Discharge (m ³ /min)
1	1500	2.00	2.00	-	-	1948	
2	200	2.00	2.00	0.29	1.71	-	
3	2300	0	1.71	-	-	1665	
4	1000	2.00	2.00	1.45	0.55	-	
5	800	0	0.55	-	-	534	
6	500	2.00	2.00	0.73	1.27	-	
7	3000	0	1.27	-	-	1241	
8	3400	2.00	2.00	-	-	1948	
9	1000	2.00	2.00	1.45	0.55	-	
10	700	0	0.55	0.53	0.02	-	
11	500	2.00	2.02	0.73	1.29	-	
12	1100	0	1.29	1.28	0.01	-	
13	1500	2.00	2.00	-	-	1948	
14	1400	0	0.01	-	-	10	
15	1200	2.00	2.00	1.74	0.26	-	
16	1100	0	0.26	-	-	251	
17	1000	2.00	2.00	1.45	0.55	-	
18	600	2.00	2.00	0.87	1.13	-	
19	1900	0	1.68	-	-	1635	
20	2100	0	0	-	-	-	
21	3200	2.00	2.00	-	-	1948	
22	2100	2.00	2.00	-	-	1948	
23	1200	0	0	-	-	-	
24	3900	2.00	2.00	-	-	1948	
25	1300	0	0	-	-	-	
26	4900	0	0	-	-	-	0

(a) See Fig. H.3.

where Q_L = flow rate or loss as infiltration plus evaporation, m^3/min
 a = width of stream, meters
 L = length of stream, meters
 $Q_s = 6.12 \times 10^{-4} \times aL$
 = infiltration loss, m^3/min
 $Q_e = 4.0 \times 10^{-6} \times aL$
 = evaporation loss, m^3/min

$$\text{Therefore, } \frac{Q_s}{Q_e} = 153 \quad (\text{H.8})$$

Since total loss = $Q_s + Q_e = 28 \text{ m}^3/\text{min}$

and $Q_s = Q_e \times 153$

$$\text{then } Q_s = 28 - Q_e \text{ and } Q_e = \frac{28}{154} = 0.18 \text{ m}^3/\text{min}$$

Then loss due to infiltration in the sub-basin:

$$= 28 - 0.18$$

$$= 27.82 \text{ m}^3/\text{min}$$

Therefore, total inflow equals $28.0 \text{ m}^3/\text{min}$ or $1.47 \times 10^7 \text{ m}^3/\text{yr}$, and total annual infiltration loss equals $1.46 \times 10^7 \text{ m}^3$. Restated, 99.3 percent of the discharge infiltrates and the remainder evaporates.

APPENDIX I
COMPUTATION OF MASS EMISSION FACTORS
FOR WIND EROSION

I.1.0 Computation of Mass Emission Factors for Wind Erosion

Mass emission factors due to wind erosion of overburden, waste rock, and sub-ore piles were computed by the equation (Hu76)

$$EF = aIKCLV \quad (I-1)$$

where,

EF = emission factor, MT/hectare-yr,

a = the portion of total wind erosion losses that would be measured as suspended particulates - a has the value of 0.025 for rocky, gravelly surfaces (Hu76),

I = soil erodibility - I has the value of 85 MT/hectare-yr for rocky, gravelly surfaces (Hu76),

K = surface roughness factor, assumed to be 1.0,*

C = climatic factor - reported to be 1.0 for New Mexico and 0.40 for Wyoming mining regions (Hu76),

L = unshielded field width factor - assumed to be 1.0,* and

V = vegetative cover factor - assumed to be 1.0*.

Substituting the assigned values into the equation yields an emission factor of 2.12 MT/hectare-yr for New Mexico mines and 0.850 MT/hectare-yr for Wyoming mines. These factors are applied with appropriate parameters in Sections 3.3.4.1 and 3.4.4.3 to estimate the average annual contaminant emissions due to wind erosion.

The mass emission factors due to wind erosion of the ore stockpiles were computed by the equation (Bo78)

$$EF = 0.025 \frac{(S)}{1.5} \frac{(D)}{90} \frac{(d)}{235} \frac{(f)}{15} \quad (I-2)$$

*Dale, J.T., 1979, Air Program Branch, U.S. Environmental Protection Agency, Region VIII, Denver, CO, Memo Concerning Uranium Resources Development Company's Mining Operation in San Juan County, Utah - PDS Permit Requirements.

where,

- EF = emission factor, kg of dust per annual MT of material put through storage cycle,
 S = silt content - assumed to be 3.0,*
 D = duration of storage - 41 days,
 d = dry days per year - reported to be 273 days at Casper, WY and 306 days at Albuquerque, NM (DOC77), and
 f = percent of the time the wind speed exceeds 19.3 km/hr - reported to be 49 percent at Casper, WY and 20 percent at Albuquerque, NM (DOC51-60).

Substituting the assigned values into Equation I-2 provides emission factors related to ore storage piles at mines in New Mexico and Wyoming of 0.040 kg/MT and 0.086 kg/MT, respectively. These factors are applied with the appropriate parameters in Sections 3.3.4.1 and 3.4.4.3 to estimate the average annual contaminant emissions from ore stockpiles due to wind erosion.

I.2.0 References

- Bo78 Bohn, R., Cuscino, T., and Cowherd, C., 1978, "Fugitive Emissions from Integrated Iron and Steel Plants," U.S. Environmental Protection Agency Report, EPA-600/2-78-050.
- DOC51-60 Department of Commerce, U.S. Weather Bureau, 1951-1960, "Climatography of the United States Series 82 -- Decennial Census of the United States Climate."
- DOC77 Department of Commerce, National Oceanic and Atmospheric Administration, 1977, "Climatological Data - National Summary," Volume 28, No. 13.
- Hu76 Hubbard, S.J., 1976, "Evaluation of Fugitive Dust Emissions from Mining: Task 1 Report - Identification of Fugitive Dust Sources Associated with Mining," Report prepared by PEDCO-Environmental Specialists, Inc. for the U.S. Environmental Protection Agency, Las Vegas, NV.

APPENDIX J

AQUATIC DOSIMETRY AND HEALTH EFFECTS MODELS
AND PARAMETER VALUES

J.1 Introduction

This appendix describes the methodology and the parametric values used to estimate dose equivalents and health risks for maximum and average individuals and for the population within the assessment area surrounding the generic underground uranium mine site in New Mexico and the generic surface mine site in Wyoming. In the appendix, the term dose equivalents refers to the following:

For radionuclides inhaled or ingested by an individual, dose equivalents are the annual committed dose equivalents that will be accumulated over 70 years following intake for an adult. For external exposure to an individual, dose equivalents are the annual dose equivalents to an adult for a radionuclide buildup time in the environment of 8.5 years (one-half the assumed period of mine operation of 17 years). For radionuclides inhaled or ingested by the population, dose equivalents are the annual collective dose equivalents that will be accumulated over 70 years following intake for an adult. For external exposure to a population, dose equivalents are the annual collective dose equivalents to an adult for a radionuclide buildup time in the environment of 8.5 years (one-half the assumed period of mine operation of 17 years).

Simple models are used throughout these calculations. The maximum individual calculations are performed independently from the population calculations. However, the average individual calculations are obtained by dividing the population calculations by the population size.

J.2 Pathways Considered

The aquatic pathway analyses consider the general surface stream flow pattern shown in Fig. J.1. The generic mine is dewatered by pumping water into the third order stream. Much of the year the only water flowing in the third order stream is mine water discharge. As the mine water travels downstream in the third order stream, it either percolates into the soil beneath the stream or evaporates. At some location downstream before the third order stream enters the second order stream, the third order stream dries up so that, for a large part of the year, the radioactive discharges in the mine water do not reach the second nor the first order streams. Some of the discharged radioactivity moves into the soil beneath the third order stream

bed and the rest is probably deposited in the sediment on the stream bottom. The radioactivity deposited in the sediment is subject to resuspension and transport to the second order and first order streams during periods of flooding. However, during these floods, the resuspended radioactivity would be subject to the large dilution volumes associated with the flood. Some of the radioactivity that percolates into the soil could eventually reach shallow groundwater, but many of the radionuclides would be subject to large removal factors because of ion-exchange interactions between radionuclides and components of the soil. These interactions would cause groundwater concentrations of radionuclides to be greatly reduced when compared to the original surface water concentrations.

An effort has been made to use realistic computational methods and parametric data in these analyses whenever possible. However, when actual data did not exist, some conservative assumptions were made. The continuous stream flow assumption discussed in the following paragraph is the major conservative assumption in these aquatic analyses.

To correctly analyze the effects of radionuclides discharged from the mine to third order streams, one would have to have extensive hydrologic information on stream flow rates over a long period of record in order to predict the quantities of radionuclides reaching the second order and first order streams. One would also need extensive information on soil types and ion-exchange characteristics of the soils within the stream bed areas. Because these data are not obtainable for use in these analyses, the simplifying assumption is made that the third order stream discharges mine water continuously into the second order stream and that the second order stream discharges continuously into the first order stream. Thus, the water concentrations of radionuclides in the first order stream are computed by dividing the annual radionuclide discharge from one mine by the average-annual flow rate in the first order stream. Population and average individual dose equivalents and health effects estimates are calculated using these water concentrations. Maximum individual dose equivalents and health effects are computed using the water concentrations in the second order stream which are computed by dividing the annual radionuclide discharges from one mine by the annual average flow rate for the second order stream. These

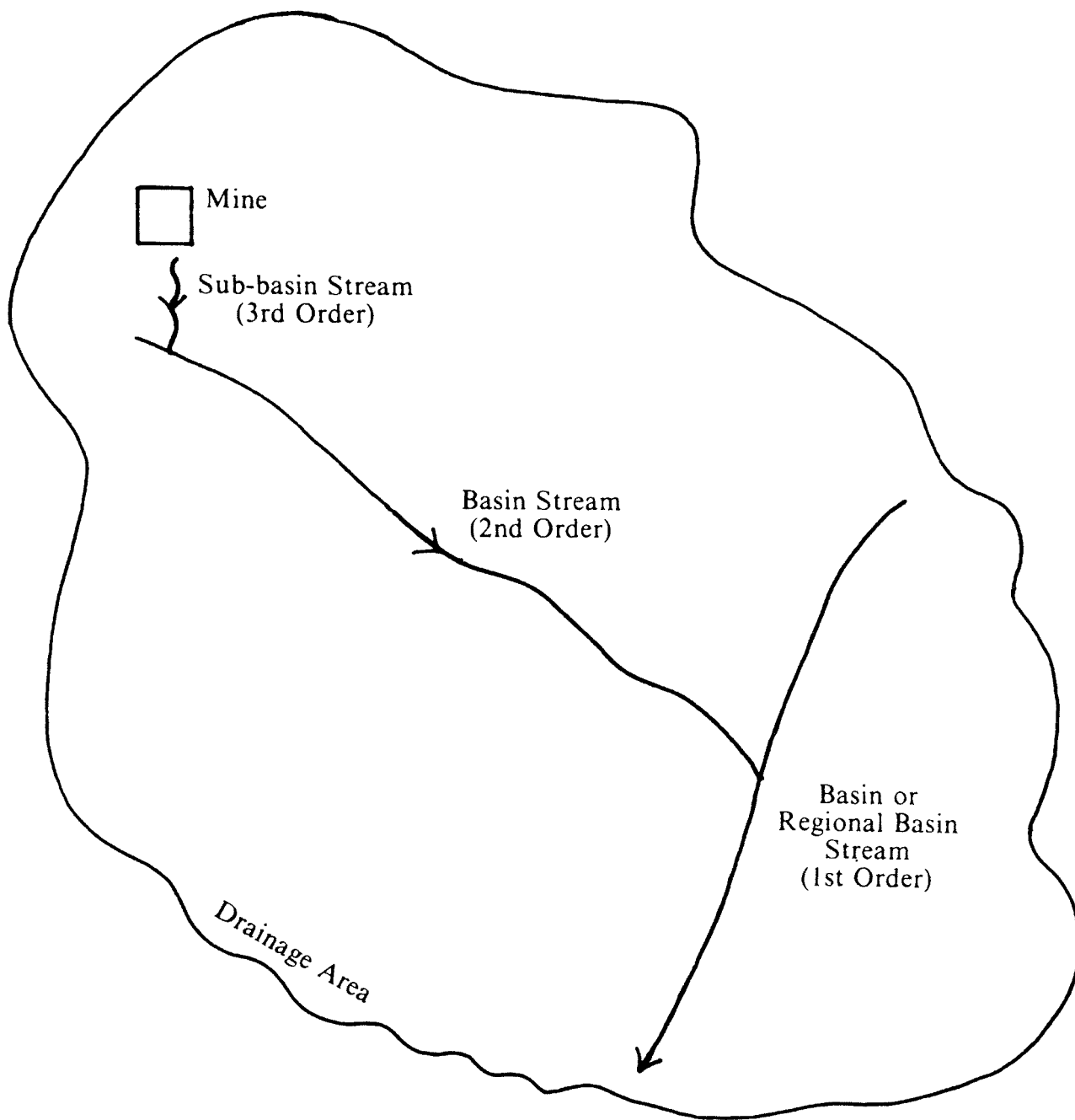


Figure J.1 Surface stream flow pattern within drainage area

techniques for predicting water concentration should be quite conservative since they do not account for periods of no-flow in the third order streams nor for loss of radioactivity from the water by percolation into the soil.

The environmental transport pathways which are examined as potential contributors of dose equivalents and health effects to individuals and to the population are listed in Table J.1. It was found that essentially all potable drinking water in both the New Mexico and the Wyoming assessment areas is taken from groundwater supplies. Public water supplies are taken from aquifers below the elevation of the aquifers which could be affected by recharge from the mine surface water. For this reason, drinking water (pathway 1) is not considered as a pathway of exposure to the population. Drinking water could be a significant pathway of exposure for the maximum individual living near a uranium mine if he were drinking surface water downstream of the mine discharge point or water from a shallow aquifer which had been recharged by the mine surface water. However, this pathway was not assessed because it was not possible to quantify radionuclide concentrations in potable groundwater from mine discharges with available information. Also, it is believed that the occurrence of direct consumption by individuals of surface water containing mine discharges would be infrequent or non-existent.

Through telephone conversations, it was learned that almost all milk cows in the assessment areas obtain their drinking water from groundwater supplies. In addition, most of the dairy cattle are located 50 km or more away from the uranium mines (Romo, T., Valencia County Agent, Los Lunas, NM, 1979, personal communication and Loper, R., Soil Conservation Service, U.S. Department of Agriculture, Douglas, WY, 1979, personal communication). For these reasons, consumption of milk produced by cows drinking contaminated water is not considered in the population dose equivalent calculations. Thus, the pathways listed in Table J-1 which are considered for the population dose equivalent calculations are 2 through 8 and 10. For the maximum individual dose equivalent calculations, the pathways considered are 2 through 10.

For these generic site analyses, detailed data are not readily available regarding fish catch and surface stream water usage as a function of distance downstream from the mine for the third, second, and first order streams.

Thus, a simplified approach is taken in computing the population dose equivalents and health effects. The population assessment area is defined as the areas draining into the streams shown in Fig. J.1. These drainage areas are discussed in more detail in Sections 3.3.3 and 3.4.3*. To compute the population dose equivalents and health effects, the assumption is made that the water concentrations in the first order stream are representative of the radionuclide concentrations to which persons within the assessment area could be exposed. The resulting river water concentrations of radionuclides are applied to each of the eight pathways for which population dose equivalents are calculated.

The mathematical models used for the population and maximum individual dose equivalents and health effects calculations will be discussed in the following paragraphs. Average individual dose equivalents and health effects are computed by dividing the population values by the number of persons in the assessment area. For each pathway, dose equivalents are calculated for endosteal cells (bone), red bone marrow, lung, liver, stomach wall, lower large intestine (LLI) wall, thyroid, kidney, muscle, ovaries, testes and a weighted mean dose equivalent which is weighted over all organs. For the external exposure pathways (pathways 7 and 8) these dose equivalents are used to estimate health impact by applying a dose-to-health-impact conversion factor. This factor is a function of organ and is independent of the nuclide involved. However, for all of the internal exposure pathways (pathways 1 through 6, 9, and 10) dose equivalents are calculated and reported only for the purpose of supplying this information to the reader. The health impact for each pathway is estimated by computing the quantity of each radionuclide taken in by the population or a maximum individual and applying an intake-to-health-impact conversion factor. This factor is a function of the nuclide involved but is not a function of organ. When estimates of health impacts have been computed for each pathway and radionuclide involved, they may be summed over pathways and radionuclides to obtain an estimate of total health impacts to the population, and the average and maximum individuals.

*For the Wyoming site, the assessment area is the 13,650 km² regional basin drainage area of the Cheyenne River discussed in Section 3.3.3.1.2. For the New Mexico site, the assessment area is the 19,037 km² basin drainage area of the Rio San Jose-Rio Puerco Rivers discussed in Section 3.4.3.1.2.

Table J.1 Aquatic environmental transport pathways examined

Pathway Number	Pathway
1	Drinking water ingestion
2	Freshwater fish ingestion
3	Above-surface crops ingestion -- Irrigated Cropland
4	Milk ingestion -- cows consuming forage raised on irrigated pastures
5	Beef ingestion -- cows consuming forage raised on irrigated pastures
6	Inhalation of resuspended material deposited during irrigation
7	External exposure due to ground contamination by material deposited during irrigation
8	External exposure due to air submersion in resus- pended material originally deposited during irrigation
9	Milk ingestion -- cows drinking contaminated surface water
10	Beef ingestion -- cows drinking contaminated surface water

J.3 Freshwater Fish Ingestion

The computational equation for intake of a radionuclide by the maximum individual is

$$II_{np} = \frac{Q_n \cdot CF_n \cdot I_f}{R_{ind}} \quad (J.1)$$

where,

II_{np} = annual intake of radionuclide n through pathway p for the maximum individual (Ci/y),

Q_n = release rate of radionuclide n to the third order stream (Ci/y),

CF_n = concentration factor for freshwater fish for radionuclide n (Ci/kg per Ci/ℓ),

I_f = freshwater fish annual consumption rate for an individual (kg/y),
and

R_{ind} = flow rate in 2nd order stream (ℓ /y).

The maximum individual dose equivalent may be computed from the equation

$$DI_{nop} = II_{np} \cdot D_{nop} \quad (J.2)$$

where,

DI_{nop} = dose equivalent rate to the maximum individual for nuclide n, organ o, and pathway p (rem/y), and

D_{nop} = dose equivalent conversion factor for nuclide n, organ o, and pathway p (rem/Ci intake unless specified otherwise).

The maximum individual increased health risk may be computed using the equation

$$IR_{np} = II_{np} \cdot HI_{np} \quad (J.3)$$

where,

IR_{np} = increased annual health risk* rate to the maximum individual for nuclide n and pathway p (increase in risk per year of release), and
 HI_{np} = health risk conversion factor for nuclide n and pathway p (increase in risk/Ci intake).

Equation J.3 may be applied for computing either fatal cancer risk or genetic risk to future generations by applying HI_{np} for fatal cancer risk or genetic risk, respectively.

The equation used to compute total intake of a radionuclide by the population was

$$IP_{np} = \frac{Q_n \cdot CF_n \cdot I_f \cdot P_{ff}}{R}, \quad (J.4)$$

where,

IP_{np} = annual intake of radionuclide n through pathway p for the population (person Ci/y),
 R = flow rate in 1st order stream (l/y), and
 P_{ff} = population eating freshwater fish taken from streams in the assessment area (persons).

The population dose equivalent may be computed from the equation

$$DP_{nop} = IP_{np} \cdot D_{nop} \quad (J.5)$$

where,

DP_{nop} = annual dose equivalent to the population for nuclide n, organ o, and pathway p (person-rem/y);

*The term health risk is used to describe the increase in fatal cancer risk to an individual during his lifetime for somatic risks. For genetic risk, the term health risk refers to the increased chance for genetic defects in all the descendants of an exposed individual.

and the annual health effects to the population may be computed using the equation

$$PR_{np} = IP_{np} \cdot HI_{np} \quad (J.6)$$

where,

PR_{np} = annual health effects to the population for nuclide n and pathway p (health effects /y of release).

Equation J.6 may be applied for computing either fatal cancers or genetic effects to future generations by applying the proper value for HI_{np} , as discussed above.

The annual dose equivalent and increased health risk to an average individual may be computed using equations J.7 and J.8, respectively.

$$DAI_{nop} = DP_{nop}/P_T \quad (J.7)$$

$$AIR_{np} = PR_{np}/P_T \quad (J.8)$$

where,

DAI_{nop} = annual dose equivalent to the average individual within the assessment area for nuclide n, organ o, and pathway p (rem/y),

AIR_{np} = increased annual risk to the average individual for nuclide n and pathway p (increase in risk per year of release), and

P_T = size of population residing within the assessment area (persons).

J.4 Above-Surface Crops, Milk, and Beef Ingestion - Irrigated Crop Land

The equation used to compute intake of a radionuclide by the maximum individual was

$$II_{np} = \frac{Q_n \cdot W \cdot RI_{np}}{R_{ind}} \quad (J.9)$$

where,

W = irrigation rate of irrigated farmland ($\ell/m^2\text{-y}$), and

RI_{np} = intake rate of radionuclide n by standard man for above-surface crops and for a continuous deposition rate to the surface for root uptake due to ditch irrigation (C_i intake/y per $C_i/m^2\text{-y}$ deposited).

The approach for calculation of RI_{np} uses techniques described in Regulatory Guide 1.109 (NRC77) and AIRDOS-EPA (Mo79) to compute intake rate by receptors per unit deposition rate (by ditch irrigation) to the ground surface. Basically, equations 49 (vegetation), 51 (milk), or 52 (beef) from the AIRDOS-EPA document (Mo79) are utilized to predict concentrations of radionuclides in the foodstuffs at equilibrium. Only the root uptake portion of these equations is used since essentially all irrigation in the assessment areas is ditch irrigation (Romo, T., Valencia County Agent, Los Lunas, NM., 1979, personal communication, and Loper, R., Soil Conservation Service, U.S. Department of Agriculture, Douglas, WY, 1979, personal communication). The effects of removal of radionuclides from the soil root zone by leaching are added to the equations used to predict concentrations of radionuclides in foodstuffs since this is an important removal mechanism for the long-lived radionuclides considered in this analysis. The concentrations are multiplied by the annual intake rate of the foodstuff by an individual and divided by the annual deposition rate of radionuclides to the ground surface to yield the quantity RI_{np} . The maximum individual dose equivalents may be computed using equation J.2 and the increased health risk to the maximum individual may be computed using equation J.3.

The equation to use in computing total intake of a radionuclide by the population is

$$IP_{np} = \frac{Q_n \cdot W \cdot RI_{np} \cdot P_p}{R} \quad (J.10)$$

where,

P_p = population consuming foodstuffs raised on irrigated land (persons).

P_p can be determined using the equation

$$P_p = CP_p \cdot f_p \cdot A_I \quad (J.11)$$

and the ratio can be written

$$W/R = \frac{R_I}{A_I \cdot R} = \frac{f_R}{A_I} \quad (J.12)$$

where,

CP_p = persons per unit area that can be fed from foodstuff p raised on irrigated land (persons fed/m²),

f_p = fraction of irrigated land used to raise foodstuff p ,

A_I = irrigated land area within the assessment area (m²),

R_I = total flow of irrigation water (l/yr), and

$f_R = \frac{R_I}{R}$ = fraction of river flow used for irrigation.

Substituting equations J.11 and J.12 into J.10 and cancelling like terms yields

$$IP_{np} = Q_n \cdot f_R \cdot RI_{np} \cdot CP_p \cdot f_p \quad (J.13)$$

The population annual dose equivalents may be computed using equation J.5 and the annual increased health effects to the population may be computed using equation J.6. The annual dose equivalents and increased health risks to an average individual may be computed using equations J.7 and J.8.

J.5 Inhalation of Resuspended Material Deposited During Irrigation

In determining the equations to use to model resuspension of radioactive materials deposited by irrigation water, it is assumed that the resuspended material does not disperse beyond the irrigation area. This assumption should be acceptable for dose equivalent and health effects calculations where the irrigation area is large compared to a point resuspension source and where the population density does not vary greatly within an assessment area. Both of these criteria are met for the New Mexico and the Wyoming assessment areas.

Figure J.2 shows, pictorially, the conservation of mass relationship used in the resuspension model. The differential equation which expresses the change in soil surface concentration as a function of time is

$$\frac{d\Omega_n}{dt} = \frac{Q_n \cdot W}{R} + v_{gn} \cdot X_n - \lambda_R \Omega_n - \lambda_{Dn} \Omega_n - \lambda_{sn} \Omega_n \quad (J.14)$$

where,

- Ω_n = ground concentration of nuclide n at time t (Ci/m^2),
 t = time after release of material to surface stream (y),
 v_{gn} = deposition velocity from air to land surface (m/y),
 X_n = air concentration of nuclide n (Ci/m^3),
 λ_R = rate constant for resuspension of radionuclides from soil to air (y^{-1}),
 λ_{Dn} = radioactive decay constant for radionuclide n (y^{-1}),
 λ_{sn} = rate constant for transfer of radionuclides from available to unavailable status in soil (y^{-1}),

and the other terms are as previously defined.

If it is further assumed that, at equilibrium, the material resuspended from the ground surface is equal to the material redeposited to the ground surface (i.e., $v_{gn}X_n = \lambda_R\Omega_n$), the differential equation can be simplified to yield

$$\frac{d\Omega_n}{dt} = \frac{Q_n \cdot W}{R} - (\lambda_{Dn} + \lambda_{sn})\Omega_n \quad (\text{J.15})$$

Equation J.15 would rigorously hold only for equilibrium conditions. It can be shown that it is conservative to apply the nonequilibrium initial conditions,

$$\Omega_n = 0 \text{ at } t = 0, \text{ in solving equation J.15 to yield}$$

$$\Omega_n = \frac{Q_n \cdot W}{R(\lambda_{Dn} + \lambda_{sn})} [1 - e^{-(\lambda_{Dn} + \lambda_{sn})t}]$$

When using equation J.16 in computations involving the maximum individual, R is replaced by R_{ind} .

As mentioned previously, assuming a fairly large uniformly contaminated area, the air concentration of radionuclides due to resuspension can be expressed as

$$X_n = RF \cdot \Omega_n \quad (\text{J.17})$$

where,

$$RF = \lambda_R/v_{gn} = \text{resuspension factor } (\text{m}^{-1}).$$

Combining equations J.16 and J.17 yields

$$X_n = \frac{Q_n \cdot W \cdot RF}{R(\lambda_{Dn} + \lambda_{sn})} [1 - e^{-(\lambda_{Dn} + \lambda_{sn})t}] \quad (\text{J.18})$$

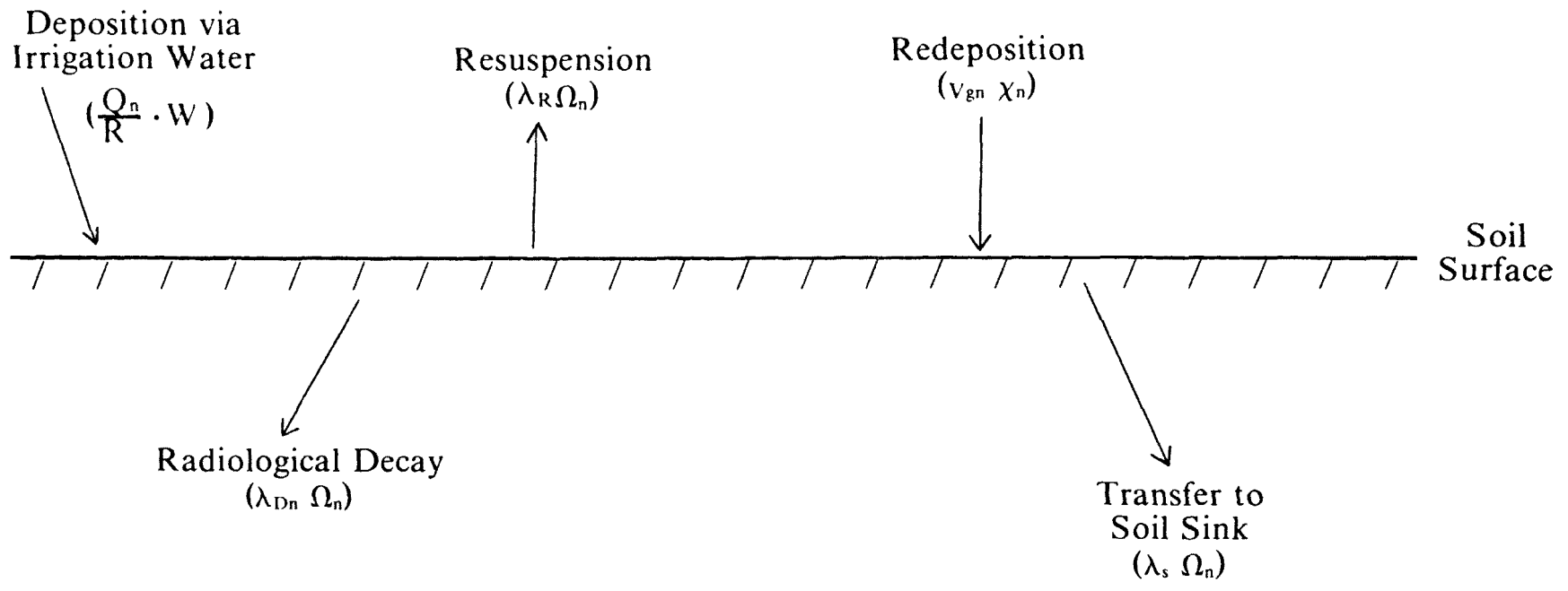


Figure J.2 Conservation of mass relationship for resuspension model

This equation is appropriate to apply for the population dose equivalent calculations. For calculations involving the maximum individual, R is replaced by R_{ind} .

The equation used to compute intake of a radionuclide by the maximum individual is

$$II_{np} = X_n I_B \quad (J.19)$$

where,

I_B = breathing rate for standard man (m^3/y).

Combining equations J.18 and J.19 yields

$$II_{np} = \frac{Q_n \cdot W \cdot RF \cdot I_B}{R_{ind} (\lambda_{Dn} + \lambda_{sn})} [1 - e^{-(\lambda_{Dn} + \lambda_{sn})t}] \quad (J.20)$$

The maximum individual annual dose equivalents may be computed using equation J.2 and the maximum individual annual increased health risks may be computed using equation J.3.

The equation to use in computing total intake of a radionuclide by the population is

$$IP_{np} = X_n \cdot I_B \cdot p \cdot A_I \quad (J.21)$$

where,

p = population density within the assessment area ($person/m^2$).

After substitution of equations J.18 and J.12, we have

$$IP_{np} = \frac{Q_n \cdot f_R \cdot RF \cdot I_B \cdot P}{(\lambda_{Dn} + \lambda_{sn})} [1 - e^{-(\lambda_{Dn} + \lambda_{sn})t}]. \quad (J.22)$$

The annual population dose equivalents may be computed using equation J.5 and the annual increased health effects to the population may be computed using equation J.6. The annual dose equivalents and increased health risks to an average individual may be computed using equations J.7 and J.8.

J.6 External Exposure Due to Ground Contamination by Material Deposited from Irrigation Water

As was discussed earlier, health risks are computed from dose equivalents for the external exposure pathways. The equation used in computing annual dose

equivalents to the maximum individual is

$$DI_{nop} = \Omega_n \cdot D_{nop} \cdot SOF \quad (J.23)$$

where,

D_{nop} = dose equivalent factor for external ground contamination for nuclide n, organ o, and pathway p (rem/y per Ci/m²), and
 SOF = household shielding and occupancy factor (dimensionless).

Upon substitution of equation J.16 we have (substituting R_{ind} for R)

$$DI_{nop} = \frac{Q_n \cdot W \cdot D_{nop} \cdot SOF}{R_{ind} (\lambda_{Dn} + \lambda_{sn})} [1 - e^{-(\lambda_{Dn} + \lambda_{sn})t}]. \quad (J.24)$$

The increase in annual health risks for the maximum individual can be computed using the equation

$$IR_{nop} = DI_{nop} \cdot HE_{op} \quad (J.25)$$

where,

IR_{nop} = increased annual risk to the maximum individual for nuclide n, organ o, and pathway p (increase in risk/year of release), and
 HE_{op} = health risk conversion factor for external doses for organ o and pathway p (increase in risk/rem).

The equation for computing annual external population dose equivalents due to uniform ground contamination is

$$DP_{nop} = \Omega_n \cdot D_{nop} \cdot SOF \cdot p \cdot A_I \quad (J.26)$$

Substitution of equations J.16 and J.12 into this equation yields

$$DP_{nop} = \frac{Q_n \cdot f_R \cdot D_{nop} \cdot SOF \cdot p}{(\lambda_{Dn} + \lambda_{sn})} [1 - e^{-(\lambda_{Dn} + \lambda_{sn})t}]. \quad (J.27)$$

For equations J.24 and J.27, the exposed persons are represented as a point receptor 1 m above a plane surface with a uniform distribution of radioactivity. The increase in health risks for the population are estimated using the equation

$$PR_{nop} = DP_{nop} \cdot HE_{op} \quad (J.28)$$

where,

PR_{nop} = increased annual health effects to the population for nuclide n, organ o, and pathway p (health effects /y of release).

The annual dose equivalents and increased health risks to an average individual may be computed using equations J.7, and J.29, respectively:

$$AIR_{nop} = PR_{nop}/P_T \quad (J.29)$$

where,

AIR_{nop} = annual increased health risk to the average individual for nuclide n, organ o, and pathway p (increase in risk/year of release).

J.7 External Exposure Due to Air Submersion in Resuspended Material Originally Deposited During Irrigation

The equation applied in calculating maximum individual annual external dose equivalents due to submersion is

$$DI_{nop} = X_n \cdot D_{nop} \cdot SOF \quad (J.30)$$

where,

D_{nop} = dose equivalent conversion factor for external air submersion for nuclide n, organ o, and pathway p (rem/y per Ci/m³).

Upon combining equations J.30 and J.18, the dose equivalent rate equation becomes

$$DI_{nop} = \frac{Q_n \cdot W \cdot RF \cdot D_{nop} \cdot SOF}{R_{ind} (\lambda_{Dn} + \lambda_{sn})} [1 - e^{-(\lambda_{Dn} + \lambda_{sn})t}]. \quad (J.31)$$

The increase in annual health risks for the maximum individual can be computed using equation J.25.

The equation for computing external population annual dose equivalents due to air submersion is

$$DP_{nop} = X_n \cdot D_{nop} \cdot SOF \cdot p \cdot A_I \quad (J.32)$$

Substitution of equations J.18 and J.12 into equation J.32 yields

$$DP_{nop} = \frac{Q_n \cdot f_R \cdot RF \cdot D_{nop} \cdot SOF \cdot p}{(\lambda_{Dn} + \lambda_{sn})} [1 - e^{-(\lambda_{Dn} + \lambda_{sn})t}]. \quad (J.33)$$

Equations J.31 and J.33 are derived assuming a point receptor immersed in a semi-infinite hemispherical cloud of air in which the distribution of activity is spatially uniform.

The increase in annual health risks for the population are estimated using equation J.28. The annual dose equivalent and increased health risk to an average individual may be computed using equations J.7 and J.29, respectively.

J.8 Milk Ingestion--Cows Drinking Contaminated Surface Water

The computational equation for intake of a radionuclide by the maximum individual is

$$II_{np} = \frac{Q_n \cdot I_{wm} \cdot F_{mn} \cdot I_{mF}}{R_{ind}} \quad (J.34)$$

where,

- I_{wm} = milk cow drinking water ingestion rate (ℓ/d),
- F_{mn} = concentration of radionuclide n in the milk per unit daily intake of the radionuclide via cattle drinking water (Ci/ℓ milk per Ci/day), and
- I_{mF} = adult consumption rate of milk (ℓ/y).

The maximum annual individual dose equivalents may be computed from equation J.2 and the maximum annual individual increased health risks may be computed using equation J.3. Annual population dose equivalents and increased health impacts were not calculated for this pathway since it was determined that consumption of contaminated drinking water by milk cows would be infrequent or nonexistent.

J.9 Beef Ingestion--Cows Drinking Contaminated Surface Water

The computational equation for intake of a radionuclide by the maximum individual is

$$II_{np} = \frac{Q_n \cdot I_{WB} \cdot F_{Bn} \cdot I_{BF}}{R_{ind}} \quad (J.35)$$

where,

- I_{WB} = beef cattle drinking water ingestion rate (ℓ/d),
- F_{Bn} = concentration of radionuclide n in beef per unit daily intake of the radionuclide via cattle drinking water (Ci/kg beef per Ci/day), and
- I_{BF} = adult consumption rate of beef (kg/y).

The maximum individual annual dose equivalents may be computed from equation J.2 and the maximum individual annual increased health risks may be computed using equation J.3.

For computing total intake of a radionuclide by the population, the appropriate equation is

$$IP_{np} = \frac{Q_n \cdot I_{WB} \cdot F_{Bn} \cdot I_{BF} \cdot P_{BW}}{R} \quad (J.36)$$

where,

P_{BW} = number of persons eating beef from cows which drink contaminated water (persons).

The annual population dose equivalents may be computed from equation J.5 and the annual increased health effects to the population may be computed using equation J.6. The annual dose equivalents and increased health risks to an average individual may be computed using equations J.7 and J.8, respectively.

J.10 Generic Sites

Two generic sites were chosen to represent locations where uranium mines may be located. A generic site in Converse County, Wyoming, was chosen to represent typical surface mine sites and one in Valencia County, New Mexico, was chosen to represent typical underground mining sites. Figure J.1 shows the general assessment area for both generic sites. These sites are described more fully in Sections 3.3.3 and 3.4.3 and in Subsection J.2 of this appendix. Some of the characteristics of these sites used in the dose equivalent and health effects calculations are listed in Table J.2.

Table J.2 Characteristics of the generic sites

	New Mexico	Wyoming
Annual rainfall (cm)	20	28
Total population in assessment area	64,950	16,230
Population density in assessment area (persons/m ²)	3.41x10 ⁻⁶	1.19x10 ⁻⁶
Assessment area size (km ²)	19,037	13,650
Streams within assessment area ^(a) (avg. annual flow rate, μ /yr)	Arroyo del Puerto-San Mateo Creek	Not named
Third order	(small)	(small)
Second order	Rio San Jose (5.83x10 ⁹)	Lance Creek (2.18x10 ¹⁰)
First order	Rio Puerco (4.26x10 ¹⁰)	Cheyenne, Dry Fork (5.64x10 ¹⁰)
Number of persons eating fish containing radionuclides from mine discharges	6,495	1,623
Annual irrigation rate within assessment areas (m)	1.07(b)	0.59
Fraction of annual-average first order stream flow used for irrigation	0.30	0.29
Land area irrigated with- ₂ in assessment area (km ²)	12 ^(b)	28
Number of persons eating beef from cows drinking contaminated water	38,510	3,454

(a) See Sections 3.3.3 and 3.4.3 for a full discussion of assessment area streams and hydrology.

(b) Some groundwater used for irrigation. See discussion in Subsection J.13.

J.11 Population and Population Density in Assessment Areas

For both generic sites, the population within the assessment area is determined by computing the population density for a county containing a significant part of the assessment area and then scaling this population density up to the assessment area size. For New Mexico, Valencia County data are used (Romo, T., Valencia County Agent, Los Lunas, NM, 1979, personal communication). The current population of Valencia County is about 50,000 persons. The county area is 14,650 km². The population density, based on these data, is 3.41×10^{-6} persons/m². Considering the size of the assessment area to be 19,037 km² (Section 3.4.3), the estimated total population in the assessment area is 64,950 persons. For Wyoming, Converse County data are applied (Zaborac, J., Converse Area Planning Office, Douglas, WY, 1979, personal communication). The estimated current population of Converse County is 13,000 persons and the county area is 10,930 km². Thus, the population density is calculated to be 1.19×10^{-6} persons/m². The assessment area contains 13,650 km² (Section 3.3.3); therefore, the total population within the Wyoming assessment area is estimated to be 16,230.

J.12 Population Consuming Fish Containing Radionuclides Discharged from Mines

Information on fish catch specific to the assessment areas is not available. However, three sources agreed that there is very little fishing activity in the streams in these areas (Patterson, R., New Mexico Game and Fish Department, Santa Fe, NM, 1979, personal communication; Baughman, J., Wyoming Game and Fish Division, Cheyenne, WY, 1979, personal communication; and Kaufmann, R., U.S. Environmental Protection Agency, Office of Radiation Programs, Las Vegas Facility, Las Vegas, NV, 1979, personal communication). Considering these data and the lack of specific information, it is assumed that 10 percent of the population within each assessment area consumes fish taken from streams within the assessment area. Based on the hydrologic characteristics of these areas, this is probably a conservative assumption.

J.13 Irrigation Within the Assessment Areas

For the New Mexico site, the following irrigation information was

obtained for Valencia County (Romo, T., Valencia County Agent, Los Lunas, NM, 1979, personal communication). Valencia County is a very large county and the Rio Grande flows through the eastern part of the county at a distance of about 100 km from the uranium mine site. Since it is known that a large amount of irrigation within the county occurs along the Rio Grande and since the Rio Grande was not included in the assessment area, the effect of the irrigation along the Rio Grande was extracted from the county data in estimating the amount of irrigated land within the assessment area. The calculational procedure is described below.

The three major streams for irrigation in Valencia County are the Rio San Jose (second order), the Rio Puerco (first order), and the Rio Grande. The average irrigation rate is 1.07 m/yr. Within Valencia County, 11,234 hectares are irrigated with surface water only, and 5,306 hectares use a combination of surface water and groundwater for irrigation. It is assumed that for this 5,306 hectares 50 percent of the irrigation water is surface water and 50 percent of this is groundwater that does not contain mine-related radionuclides. To calculate the equivalent acres of land totally irrigated from the Rio San Jose and the Rio Puerco within Valencia County we assume that the amount of irrigation existing along a stream is directly proportional to the product of the annual-average flow rate and the length of the stream within the county. Thus a ratio is established to predict the fraction of total land irrigated in Valencia County that is irrigated from the Rio San Jose and the Rio Puerco. The data applied in calculating this ratio are listed in Table J.3.

The ratio is

$$\frac{47.5(4.3 \times 10^7) + 132.5(5.8 \times 10^6)}{47.5(4.3 \times 10^7) + 132.5(5.8 \times 10^6) + 45(8.7 \times 10^8)} = 0.067.$$

Then the equivalent land irrigated using surface water from the Rio San Jose and Rio Puerco in Valencia County is $11,234 (0.067) + 5,306 (0.5)(0.067) = 930$ hectares. Scaling this up to the assessment area size using the ratio of assessment area size to Valencia County size yields:

Table J.3 Stream data for Valencia County

Stream	Length Within Valencia County (km)	Annual Average Flow Rate (m ³ /yr)
Rio San Jose	132.5	5.8x10 ⁶
Rio Puerco	47.5	4.3x10 ⁷
Rio Grande	45	8.7x10 ⁸

$$930 \text{ hectares} \times \frac{19,037}{14,650} \times \frac{0.01 \text{ km}^2}{\text{hectares}} = 12.1 \text{ km}^2.$$

The surface water usage to irrigate this land (1.07 m/y) is 1.29×10^{10} ℓ /y and the fraction of the river flow in the first order stream that the surface water irrigation represents is $1.29 \times 10^{10} / 4.26 \times 10^{10} = 0.30$.

For the Wyoming site, the area of land irrigated within the assessment area is given in Section 3.3.3 as 2,800 hectares (28 km²). This land is irrigated almost entirely with surface water (Loper, R., Soil Conservation Service, U.S. Department of Agriculture, Douglas, WY, 1979, personal communication). The average irrigation rate within the area is $0.588 \frac{\text{m}^3}{\text{m}^2\text{-y}}$ (WSG77).

Thus the estimated total irrigation water usage within the assessment area is

$$(0.588 \frac{\text{m}}{\text{y}})(2.8 \times 10^7 \text{ m}^2) = 1.65 \times 10^7 \frac{\text{m}^3}{\text{y}} = 1.65 \times 10^{10} \ell / \text{yr}.$$

Then, the fraction of the first order stream flow that is used for irrigation is $1.65 \times 10^{10} / 5.6 \times 10^{10} = 0.29$.

J.14 Population Consuming Beef from Cattle Drinking Water Containing Radionuclides Discharged from the Uranium Mine

For the New Mexico site, information on beef consumption is taken from the USDA (DOA73), (Herman, J., Statistician-in-Charge, New Mexico Crop and Livestock Reporting Service, U.S. Department of Agriculture, Las Cruces, NM, 1979, personal communication). The term "beef" is a misnomer in that total red meat consumption is actually considered in these calculations. Since well over 50 percent of the red meat production is beef, the calculations are simplified by assuming that all meat production, excluding poultry, is beef for the purpose of this assessment. Table J.4 shows the computational procedure used to estimate the total meat production for Valencia County for 1977. Using this information, the total edible meat production for the assessment area can be estimated as

$$\frac{19,037 \text{ km}^2}{14,650 \text{ km}^2} (5.038 \times 10^6 \text{ kg/y}) = 6.547 \times 10^6 \text{ kg/y}.$$

It is estimated that about 50 percent of the water drunk by meat producing animals in the assessment area is surface water and 50 percent uncontaminated groundwater (Kaufmann, R., U.S. Environmental Protection Agency, Office of Radiation Programs, Las Vegas Facility, Las Vegas, NV, 1979, personal communication). Then the weight of edible meat from animals drinking surface water containing mine effluents is 3.273×10^6 kg/y. Since it is estimated that an adult eats 85 kg/y of meat (Mo79), the number of persons eating meat from animals raised in the assessment area which drink water containing mine effluent is 38,510 persons.

For the Wyoming site, information on meat consumption was obtained from the USDA (DOA79). The information listed in Table J.5 shows the computational procedure used to estimate the meat production for Converse County for 1976. Thus, the total edible meat production for the assessment area can be estimated as

$$\frac{13,650 \text{ km}^2}{10,930 \text{ km}^2} (469,700 \frac{\text{kg}}{\text{y}}) = 5.866 \times 10^5 \frac{\text{kg meat}}{\text{y}}.$$

J.4 Estimation of meat production in Valencia County for 1977

Animal	1977 NM State	Edible	1977 NM State	Total Animals		Ratio of Animals	Estimated Edible
	Live Weight	Fraction	Edible Meat, Com-	on Pasture		on Pasture,	
	Slaughter ^(a)	Live Weight ^(b)	puted from	Jan. 1, 1973 ^(c)		Valencia County*	Meat Production
	(kg)		Col. 2 and 3	NM State	Valencia	(Computed from	for Valencia
			(kg)		County	Col. 5 and 6)	County (Computed
							from Col. 4 and 7)
							(kg/y)
1	2	3	4	5	6	7	8
Cattle	260,813,700	.55	143,447,500	1,615,000	54,000	0.0334	4,791,000
Hogs	8,862,900	.65	5,760,880	63,000	1,500	0.0238	137,100
Sheep	4,487,460	.55	2,468,110	743,000	30,000	0.0404	<u>99,700</u>
				Total Edible Meat Valencia County			5,027,800

(a) Herman, J., Statistician-in-Charge, New Mexico Crop and Livestock Reporting Service, U.S. Department of Agriculture, Las Cruces, NM, 1979, personal communication.

(b) Walsh, P., Statistician-in-Charge, Alabama Crop and Livestock Reporting Service, U.S. Department of Agriculture, 1979, personal communication.

(c) DOA73.

Table J.5 Estimation of meat production in Converse County, Wyoming for 1976

Animals	1976 Wyoming State Red Meat Production ^(a) (kg)	Total Animals on Pasture Jan. 1, 1976 ^(a)		Ratio of Animals on Pasture, Converse County + Wyoming State (Computed from Col. 3 and 4)	Estimated Edible Meat Production for Converse County (Computed from Col. 2 and 5) <u>(kg)</u> y
		Wyoming State	Converse County		
1	2	3	4	5	6
Cattle	--	1,580,000	74,000	0.0468	--
Red Meat Animals (Cattle, hogs, and sheep)	10,028,200	--	--	0.0468 ^(b)	469,300

^(a)D0A79.

^(b)Applied value for cattle since cattle furnish the majority of the red meat production for Converse County and for the State of Wyoming.

As for New Mexico, it was estimated that about 50 percent of the water drunk by meat producing animals in the assessment area is surface water and 50 percent uncontaminated groundwater (Loper, R., Soil Conservation Service, U.S. Department of Agriculture, Douglas, WY, 1979, personal communication). Thus, the estimated weight of edible meat from animals drinking surface water containing mine effluents is 293,500 kg meat/y. Using the 85 kg/y adult meat consumption rate (Mo79) used for New Mexico, the number of persons eating meat from animals raised in the assessment area which drink water containing mine effluent is 3,454 persons.

J.15 Radionuclide Releases

For both the New Mexico and the Wyoming sites, radionuclide releases are given for "total uranium" and radium-226 in Tables 3.44 and 3.25, respectively. The total uranium releases are kg per year. This "total uranium" will be almost totally U-238 by weight. For this reason, it is assumed that the "total uranium" release is entirely U-238. Further assumptions are that U-234 is in secular equilibrium with U-238 but that Th-230 precipitates out of the mine water. Also, it is assumed that Rn-222, Pb-214, Bi-214, Pb-210, and Po-210 are in secular equilibrium with Ra-226. The radionuclides Pa-234m, Pa-234, Po-218, At-218, Po-214, Tl-210, Bi-210 and Tl-206 are not included in the analysis because they are not dosimetrically significant or they have very low branching ratios.

The total uranium release rate for New Mexico is listed as 1,480 kg/y-mine. The conversion from kg to Ci for U-238 is 3.336×10^{-4} Ci/kg. Using this factor, the estimated release rate of U-238 is 0.494 Ci/y-mine. The release rate for Ra-226 is 0.0144 Ci/y-mine. The total uranium release rate at the Wyoming site is listed as 110 kg/y-mine. Using the conversion factor, this release rate can be stated as 0.0367 Ci/y-mine. The Ra-226 release rate is 0.0065 Ci/y-mine.

As discussed in Section 3.3.3.1.4, radium-226 is strongly sorbed onto stream sediments and is subject to precipitation. For these reasons, it is assumed that only 10% of the Ra-226 released in mine discharges is still available in surface water in the second and first order streams. Thus, the

"effective" annual release of Ra-226 is 10% of the actual releases in mine water. Using the assumptions regarding secular equilibrium stated above, the radionuclide release rates used in the analyses for both sites are listed in Table J.6.

J.16 Fish Concentration Factors

The fish concentration factors express the ratio of radionuclide level in freshwater fish (Ci/kg) per unit concentration in water (Ci/l). The values used for this parameter are suggested by Thompson (Th72) and are listed in Table J.7.

J.17 Fish Consumption and Air Inhalation Rates

The freshwater fish consumption for an individual is taken as 1.0 kg/y which is the value used in the report by the United Nations Scientific Committee on the Effects of Atomic Radiation (UN77). This value is not specifically stated in Regulatory Guide 1.109 (NRC77). The breathing rate for an individual of 8030 m³/y (Mo79) is used for this analysis. This value is in close agreement with the value of 8,000 m³/y listed in Regulatory Guide 1.109.

J.18 Stream Flow Rates

As was noted in Section J.2, second order stream flow rates were used in computing maximum individual dose equivalents. These flow rates are listed in Table J.2. For the New Mexico site, the second order stream flow rate is 5.83×10^9 l/y and for the Wyoming site it is 2.18×10^{10} l/y. First order stream flow rates are considered to be more representative for computations involving the population and an average individual. These flow rates are also listed in Table J.2 and are 4.26×10^{10} l/y for the New Mexico site and 5.64×10^{10} l/y for the Wyoming site.

J.19 Normalized Human Intake Rate Factors

The normalized human intake rate factors, RI_{np} , express the intake rate of radionuclide n by standard man from consumption of above-surface crops, milk, and beef for a continuous deposition rate to the surface. For this

Table J.6 Annual radionuclide release rates to streams for active uranium mines

Nuclide	Release Rates for 1 Mine (Ci/y-mine)	
	New Mexico Site	Wyoming Site
U-238	0.494	0.0367
U-234	0.494	0.0367
Th-230	0	0
Ra-226	0.00144	0.00065
Rn-222	0.00144	0.00065
Pb-214	0.00144	0.00065
Bi-214	0.00144	0.00065
Pb-210	0.00144	0.00065
Po-210	0.00144	0.00065

Table J. 7 Freshwater fish concentration factors

Nuclide	Concentration Factor (Ci/Kg ÷ Ci/l)
U-238	2
U-234	2
Ra-226	50
Rn-222	57
Pb-214	100
Bi-214	15
Pb-210	100
Po-210	500

pathway, the source of deposition to the surface is irrigation of farmland. Only the quantity of radionuclides taken up through the root systems of plants is considered in deriving these factors since essentially all irrigation in the assessment areas is ditch irrigation. The method used to calculate these factors was discussed in Section J.4 of this appendix and is taken from the AIRDOS-EPA computer code. The values for various parameters used in computing RI_{np} for above-surface crops, milk, and beef are discussed in the AIRDOS-EPA manual (Mo79). The normalized human intake rate factors are tabulated in Table J.8.

J.20 Persons Fed from Foodstuffs Raised on Irrigated Land and Irrigated Land Usage

The number of persons who can be fed from a unit area of irrigated land for above-surface crops, milk, and beef is determined from data contained in the AIRDOS-EPA computer code (Mo79). The values used for these analyses are, in units of persons fed/m², 3.69×10^{-3} for above-surface crops, 1.76×10^{-3} for milk, and 1.16×10^{-4} for beef. In both New Mexico and Wyoming, irrigated farmland is used for raising above surface foods for direct consumption by humans and for raising silage for consumption by both milk and beef cows. After telephone conversations with both the New Mexico and Wyoming county agents, the fractions of irrigated land supporting above-surface crops, dairy farming, and beef farming (see Table J.9) were determined (Romo, T., Valencia County Agent, Los Lunas, NM, 1980, personal communication and Henderson, F. Converse County Agent, Douglas, WY, 1980, personal communication).

J.21 Resuspension Factor

The irrigated areas within the assessment sites are assumed to be relatively large, uniformly contaminated areas. For this situation, the resuspension factor (RF) is defined as the ratio of air concentration above a surface to ground surface concentration. It can be shown that this ratio is $RF = \lambda_R / v_{gn}$. The resuspension rate constant, λ_R , can vary over a wide range of values between 10^{-7} and 10^{-11} sec⁻¹ (Ne78). Since resuspension for this analysis is confined to irrigated land which should have a relatively damp surface, it is believed that a low resuspension rate should be used. The resuspension rate constant chosen for this analysis is $\lambda_R = 10^{-11}$ sec⁻¹. The deposition velocity to the ground surface (v_{gn}) can vary from values as low as 0.001 m/sec to as high as 0.1 m/sec (Sl68). For generic analyses where

Table J.8 Normalized human intake rate factors for radionuclide uptake via plant root systems

Nuclide	RI_{np} (Ci/day intake per Ci/m ² -day deposited)		
	Above Surface		
	Crops	Milk	Beef
U-238	3.21×10^{-2}	2.02×10^{-4}	1.75×10^{-6}
U-234	3.21×10^{-2}	2.02×10^{-4}	1.75×10^{-6}
Ra-226	1.90×10^{-2}	3.93×10^{-3}	2.53×10^{-3}
Rn-222	6.39×10^{-1}	4.61×10^{-1}	3.49×10^{-1}
Pb-214	3.68×10^{-2}	8.40×10^{-4}	6.66×10^{-3}
Bi-214	8.43×10^{-1}	1.51×10^{-2}	3.92×10^{-1}
Pb-210	2.98×10^{-2}	7.51×10^{-4}	5.23×10^{-3}
Po-210	1.97×10^{-3}	3.42×10^{-5}	1.88×10^{-3}

Table J.9 Irrigated land usage

Type of food	Fraction of irrigated land used to raise each type of food	
	New Mexico	Wyoming
	Above-surface crops	0.70
Milk	0.15	0.45
Beef	0.15	0.45

the site specific value is not known, a commonly chosen value for v_{gn} is 0.01 m/sec, and this is the value used in this analysis. The value for RF inferred from the values chosen for λ_R and v_{gn} is

$$RF = \lambda_R / v_{gn} = \frac{10^{-11} \text{ sec}^{-1}}{0.01 \text{ m sec}^{-1}} = 10^{-9} / \text{m}$$

J.22 Soil Removal Rate Constant

The soil removal rate constant from available to unavailable soil (λ_{sn}) expresses the rate of movement of radionuclides from the plant root zone in soil to the soil below the root zone. The values used in this analysis are based upon a method described by Baes (Ba79). The soil removal rate constants were computed using the data suggested by Baes except that values for the distribution coefficients for the nuclides not discussed by Baes were taken from a report by the Arthur D. Little Company (EPA77). The values used for the soil removal rate constant in this analysis are listed in Table J.10.

J.23 Radionuclide Decay Constants

The radionuclide decay constants express the rate of radioactive decay for the nuclides considered in this analysis. The values of this parameter for these nuclides are listed in Table J.10 and are derived using the half-lives given in the Radiological Health Handbook (HEW70). Since secular equilibrium was assumed (see J.15), the radionuclide decay constant for Ra-226 was used for its short-lived daughter products.

J.24 Shielding and Occupancy Factor

The shielding and occupancy factor is used to account for shielding of persons by buildings during the time that they spend indoors. It is also used to account for time spent away from the radiation exposure area. The shielding and occupancy factor used in this analysis is 0.5 and is taken from Regulatory Guide 1.109 (NRC77).

Table J.10 Soil removal rate constants and radioactive decay constants

Nuclide	Soil Removal Rate Constants (y^{-1})	Radioactive Decay Constants, λ Dn (y^{-1})
U-238	2.58×10^{-4}	1.54×10^{-10}
U-234	2.58×10^{-4}	2.81×10^{-6}
Ra-226	7.74×10^{-3}	4.33×10^{-4}
Rn-222	4.93	6.62×10^1
Pb-214	1.94×10^{-4}	1.36×10^4
Bi-214	7.63×10^{-2}	1.85×10^4
Pb-210	1.94×10^{-4}	3.30×10^{-2}
Po-210	3.26×10^{-3}	1.83×10^0

Table J.11 Milk and beef concentration factors

Nuclide	Milk Concentration Factor (Ci/g milk per Ci/d intake)	Beef Concentration Factor (Ci/kg beef per Ci/day intake)
U-238	1.40×10^{-4}	1.60×10^{-6}
U-234	1.40×10^{-4}	1.60×10^{-6}
Ra-226	5.90×10^{-4}	5.00×10^{-4}
Rn-222	2.00×10^{-2}	2.00×10^{-2}
Pb-214	8.70×10^{-5}	9.10×10^{-4}
Bi-214	5.00×10^{-4}	1.70×10^{-2}
Pb-210	9.90×10^{-5}	9.10×10^{-4}
Po-210	1.20×10^{-4}	8.70×10^{-3}

J.25 Milk and Beef Ingestion Rates by Humans and Milk and Beef Cow Drinking Water Rates

The milk ingestion rate by humans is assumed to be 112 g/y which is the value used in AIRDOS-EPA (Mo79). In computing dose equivalents for the beef ingestion pathway, hogs and sheep are lumped into the beef pathway. This simplified the calculations, and it is believed that the assumption is reasonable since cattle account for well over 50 percent of the meat production in both the New Mexico and Wyoming assessment areas (DOA73, DOA79). The meat ingestion rate by humans is assumed to be 85 kg/y, which is the value listed for adults in AIRDOS-EPA (Mo79). This ingestion rate is employed in determining the number of persons who could be fed from meat produced within the assessment areas, as discussed in Section J.14.

The milk cow drinking water intake used in these calculations is 60 g/d; for beef cattle, the value is 50 g/d. Both values are the ones suggested in Regulatory Guide 1.109 (NRC77).

J.26 Radionuclide Concentration Factors for Milk and Beef

The radionuclide concentration factors for milk and beef express the concentration of radionuclides in milk or beef per unit daily intake of radionuclides by cattle drinking water. The values for these parameters are taken from AIRDOS-EPA (Mo79) and are listed in Table J.11.

J.27 Dosimetry Factors

Internal and external dosimetry factors are derived from the RADRISK data library which is being developed by Oak Ridge National Laboratory (Du80). The organs listed are considered to be the more dosimetrically significant organs. Breast dosimetry factors were used for the calculations for muscle since the muscle factors were not listed in RADRISK and since the breast and muscle factors should be similar in magnitude. The dosimetry factors tabulated as "weighted mean" were obtained by summing over organs the product of the organ dosimetry factors and a relative-risk weighting factor for the organ. These dosimetry factors are not the same as total-body dosimetry factors but are an attempt to express an overall dose that has been weighted for risk due to exposing each individual organ. Weighting factors were chosen to have a sum of 1.

For the inhalation pathway, the dosimetry factors incorporate the "Task Group Lung Model" (TGLD66). All nuclides are assumed to be of Class W solubility and an AMAD of $1.0\mu\text{m}$ is used. Class W solubility is assumed rather than Class Y because it is believed that in order for radioactive compounds to be soluble in mine water they must be in a more soluble chemical form than Class Y compounds. The dosimetry factors used in these assessments are listed in Table J.12.

J.28 Health Effects Conversion Factors

Health effects conversion factors for the internal and external pathways are derived from the RADRISK data library (Du80). Internal health effects conversion factors are needed for both inhalation and ingestion. For these internal pathways, the conversion factors are specific to each radionuclide and express the potential health impact per unit radionuclide intake. External health effects conversion factors are a function of organ but are radionuclide independent. The factors relate potential health impact to external radiation dose equivalent. Separate sets of health effect conversion factors are needed to estimate potential somatic health effects (fatal cancers) and potential genetic effects (genetic defects in the offspring of the exposed persons). The health effects conversion factors for the internal pathways are listed in Table J.13, and those for the external pathways are listed in Table J.14. Additional discussion of the philosophy of health impact determination used to obtain the data in the RADRISK data library is included in Section L.1 of Appendix L.

TABLE J.12
DOSE EQUIVALENT CONVERSION FACTORS

NUCLIDE	PATHWAY	(INHALATION AND INGESTION=REM/CI INTAKE AIR SUBMERSION=REM/Y PER CI/M**3 GROUND CONTAMINATION=REM/Y PER CI/M**2)											
		ENDOST. CELLS	RED MARROW	LUNG	LIVER	STOMACH WALL	LLI WALL	THYROID	KIDNEY	WEIGHTED MEAN	MUSCLE	OVARIES	TESTES
U-238	INHALATION	1.29E+07	4.54E+05	8.40E+07	6.40E+04	8.11E+03	1.02E+05	6.30E+04	6.63E+06	2.48E+07	6.31E+04	6.00E+04	6.01E+04
	INGESTION	1.15E+07	4.02E+05	4.99E+03	5.30E+04	8.56E+03	1.40E+05	5.58E+04	5.90E+06	3.61E+05	5.59E+04	5.30E+04	5.34E+04
	EXT. AIR SUBMERSION	3.47E+02	3.08E+02	1.26E+02	2.86E-03	1.07E+02	8.18E+01	1.58E+02	9.06E+01	1.83E+02	2.37E+02	9.60E+01	2.62E+02
	EXT. GROUND CONTAM.	2.71E+01	2.32E+01	8.59E+00	2.97E+00	7.26E+00	8.41E+00	7.05E+00	3.04E+00	1.84E+01	3.29E+01	5.32E+00	3.89E+01
U-234	INHALATION	1.58E+07	4.66E+05	9.52E+07	7.04E+04	8.33E+03	8.19E+04	7.04E+04	7.46E+06	2.82E+07	7.04E+04	7.04E+04	7.04E+04
	INGESTION	1.41E+07	4.24E+05	5.53E+03	6.26E+04	9.63E+03	1.52E+05	6.26E+04	6.64E+06	4.19E+05	6.26E+04	6.26E+04	6.26E+04
	EXT. AIR SUBMERSION	1.08E+03	9.80E+02	4.68E+02	3.76E+02	3.72E+02	2.90E+02	6.18E+02	3.75E+02	5.91E+02	6.15E+02	2.96E+02	6.85E+02
	EXT. GROUND CONTAM.	4.82E+01	4.22E+01	1.77E+01	1.00E+01	1.45E+01	1.46E+01	1.85E+01	9.92E+00	3.06E+01	4.71E+01	1.07E+01	5.53E+01
RA-226	INHALATION	2.54E+07	1.46E+06	9.55E+07	5.97E+05	3.91E+03	1.81E+05	6.37E+05	5.98E+05	2.87E+07	6.37E+05	6.38E+05	6.37E+05
	INGESTION	2.26E+07	1.30E+06	1.91E+03	5.32E+05	5.45E+03	3.35E+05	5.67E+05	5.33E+05	8.07E+05	5.68E+05	5.69E+05	5.67E+05
	EXT. AIR SUBMERSION	5.87E+04	5.49E+04	3.37E+04	2.91E+04	2.49E+04	2.09E+04	3.81E+04	2.76E+04	3.65E+04	3.42E+04	2.00E+04	4.68E+04
	EXT. GROUND CONTAM.	1.30E+03	1.21E+03	7.43E+02	6.41E+02	5.49E+02	4.61E+02	8.41E+02	6.09E+02	8.05E+02	7.57E+02	4.41E+02	1.02E+03
RN-222	INHALATION	3.32E+01	5.46E+00	1.03E+03	7.32E+00	4.88E-01	1.43E-02	1.02E+00	4.46E+01	3.03E+02	1.02E+00	1.01E+00	1.00E+00
	INGESTION	3.40E+04	6.00E+03	1.17E+02	7.39E+03	1.48E+04	6.87E+05	4.50E+02	1.40E+04	2.61E+04	1.06E+03	5.62E+03	9.12E+02
	EXT. AIR SUBMERSION	2.59E+03	2.48E+03	2.00E+03	1.85E+03	2.12E+03	1.56E+03	1.77E+03	1.86E+03	2.09E+03	2.14E+03	7.96E+02	2.40E+03
	EXT. GROUND CONTAM.	5.33E+01	5.12E+01	4.12E+01	3.80E+01	4.36E+01	3.21E+01	3.65E+01	3.83E+01	4.30E+01	4.40E+01	1.64E+01	4.94E+01
PB-214	INHALATION	7.37E+03	1.15E+03	9.34E+04	1.49E+03	1.03E+02	3.02E+00	1.55E+02	9.11E+03	2.78E+04	1.56E+02	1.52E+02	1.50E+02
	INGESTION	2.17E+03	3.19E+02	7.70E+00	4.18E+02	3.14E+03	1.03E+02	2.51E+01	1.01E+03	2.79E+02	3.55E+01	6.44E+01	2.70E+01
	EXT. AIR SUBMERSION	1.86E+06	1.76E+06	1.25E+06	1.11E+06	1.11E+06	8.72E+05	1.23E+06	1.09E+06	1.32E+06	1.30E+06	6.14E+05	1.61E+06
	EXT. GROUND CONTAM.	4.02E+04	3.81E+04	2.68E+04	2.39E+04	2.39E+04	1.87E+04	2.66E+04	2.35E+04	2.84E+04	2.81E+04	1.32E+04	3.45E+04
BI-214	INHALATION	5.38E+02	1.35E+02	6.97E+04	8.44E+01	7.17E+01	2.83E+01	7.93E+01	8.42E+03	2.05E+04	8.00E+01	7.69E+01	7.62E+01
	INGESTION	2.37E+02	2.83E+01	7.57E+00	1.63E+01	3.18E+03	2.57E+01	4.17E+00	3.85E+02	1.54E+02	1.05E+01	2.02E+01	4.88E+00
	EXT. AIR SUBMERSION	9.43E+06	8.72E+06	8.28E+06	7.54E+06	7.92E+06	6.81E+06	7.87E+06	7.04E+06	8.33E+06	8.74E+06	6.93E+06	6.74E+06
	EXT. GROUND CONTAM.	1.65E+05	1.52E+05	1.44E+05	1.31E+05	1.38E+05	1.17E+05	1.35E+05	1.23E+05	1.45E+05	1.52E+05	1.17E+05	1.20E+05
PB-210	INHALATION	6.52E+06	3.81E+05	1.08E+07	2.58E+06	1.18E+03	4.56E+04	1.48E+05	2.30E+06	3.58E+06	1.48E+05	1.48E+05	1.48E+05
	INGESTION	5.80E+06	2.91E+05	9.05E+01	2.16E+06	2.04E+02	1.77E+04	8.17E+04	1.00E+06	3.39E+05	8.17E+04	8.18E+04	8.17E+04
	EXT. AIR SUBMERSION	1.32E+04	1.19E+04	4.94E+03	3.93E+03	4.19E+03	2.38E+03	7.34E+03	4.36E+03	6.47E+03	6.29E+03	3.97E+03	6.72E+03
	EXT. GROUND CONTAM.	4.42E+02	3.97E+02	1.66E+02	1.28E+02	1.46E+02	8.07E+01	2.42E+02	1.42E+02	2.22E+02	2.28E+02	1.32E+02	2.62E+02
PO-210	INHALATION	3.78E+05	8.20E+05	7.84E+07	2.52E+06	2.22E+03	8.84E+04	8.10E+05	1.46E+07	2.37E+07	8.10E+05	8.10E+05	8.10E+05
	INGESTION	2.44E+05	5.32E+05	1.15E-02	1.63E+06	4.52E+03	1.80E+05	5.26E+05	9.44E+06	5.67E+05	5.26E+05	5.26E+05	5.26E+05
	EXT. AIR SUBMERSION	5.26E+01	4.87E+01	4.33E+01	3.93E+01	4.11E+01	3.08E+01	3.52E+01	4.25E+01	4.39E+01	4.62E+01	2.38E+01	4.49E+01
	EXT. GROUND CONTAM.	1.02E+00	9.45E-01	8.40E-01	7.62E-01	7.97E-01	5.97E-01	6.82E-01	8.24E-01	8.51E-01	8.95E-01	4.62E-01	8.70E-01

Table J.13 Health effects conversion factors for internal pathways

Nuclide	Somatic		Genetic	
	(fatal cancers/Ci intake)		(genetic defects/Ci intake)	
	Inhalation	Ingestion	Inhalation	Ingestion
U-238	3.67×10^3	4.79×10^1	8.07×10^1	7.20×10^1
U-234	4.14×10^3	5.38×10^1	9.57×10^1	8.55×10^1
Ra-226	4.21×10^3	1.01×10^2	8.57×10^2	7.65×10^2
Rn-222	4.51×10^{-2}	5.64	1.49×10^{-3}	1.49
Pb-214	4.15	6.47×10^{-2}	2.30×10^{-1}	4.24×10^{-2}
Bi-214	3.04	3.34×10^{-2}	1.13×10^{-1}	7.81×10^{-3}
Pb-210	5.31×10^2	3.94×10^1	1.69×10^2	7.82×10^1
Po-210	3.50×10^3	9.67×10^1	1.21×10^3	7.84×10^2

Table J.14 Health effects conversion factors for external pathways

Organ	Somatic	Genetic
	(fatal cancers/rem)	(genetic defects/rem)
Endosteal	4.35×10^{-6}	0
Red Marrow	4.59×10^{-5}	0
Lung	8.59×10^{-5}	0
Liver	2.20×10^{-5}	0
Stomach Wall	1.23×10^{-5}	0
LLI Wall	9.81×10^{-6}	0
Thyroid	1.20×10^{-5}	0
Kidney	4.90×10^{-6}	0
Muscle	9.31×10^{-5}	0
Ovaries	2.46×10^{-6}	3.00×10^{-4}
Testes	2.46×10^{-6}	3.00×10^{-4}

J.29 References

- Ba79 Baes, C. F., III, 1979, "The Soil Loss Constant λ_{Sl} Due to Leaching from Soils", in "A Statistical Analysis of Selected Parameters for Predicting Food Chain Transport and Internal Dose of Radionuclides", Oak Ridge National Laboratory Report, ORNL/NUREG/TM-282.
- DOA73 U.S. Department of Agriculture, New Mexico Crop and Livestock Reporting Service, Las Cruces, NM, 1973, "New Mexico Agricultural Statistics-1972".
- DOA79 U.S. Department of Agriculture, Wyoming Crop and Livestock Reporting Service, Cheyenne, WY, 1979, "Wyoming Agricultural Statistics-1978".
- Du80 Dunning, D.E., Jr., Leggett, R.W., and Yalcintas, N.G., 1980, "A Combined Methodology for Estimating Dose Rates and Health Effects from Radioactive Pollutants", Oak Ridge National Laboratory Report, ORNL/TM-7105.
- EPA77 U.S. Environmental Protection Agency, Office of Radiation Programs, 1977, "Technical Support of Standards for High-Level Radioactive Waste Management, Task C Report, Assessment of Migration Pathways", Prepared by Arthur D. Little, Inc., EPA 520/4-79-007C.
- HEW70 U.S. Department of Health, Education, and Welfare, U.S. Public Health Service, Bureau of Radiological Health, 1970, "Radiological Health Handbook", PHS Publication No. 2016.
- Ki76 Killough, G.G., and McKay, L.R., 1976, "A Methodology for Calculating Radiation Doses from Radioactivity Releases to the Environment", Oak Ridge National Laboratory Report, ORNL-4992.

- Mo79 Moore, R.E., et al., 1979, "AIRDOS-EPA: A Computerized Methodology for Estimating Environmental Concentrations and Dose to Man from Airborne Releases of Radionuclides", U.S. Environmental Protection Agency Report, EPA 520/1-79-009 (Reprint of ORNL-5532).
- Ne78 Nelson, C., Davis, R., and Fowler, T., 1978, "A Model to Assess Population Inhalation Exposure from a Transuranium Element Contaminated Land Area" in "Selected Topics: Transuranium Elements in the General Environment", Criteria and Standards Division, Office of Radiation Programs, U.S. Environmental Protection Agency, Technical Note, ORP/CSD-78-1.
- NRC76 U.S. Nuclear Regulatory Commission, Office of Standards Development, 1976, "Calculation of Annual Dose to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I", Regulatory Guide 1.109.
- NRC77 U.S. Nuclear Regulatory Commission, Office of Standards Development, 1977, "Calculation of Annual Dose to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I", Regulatory Guide 1.109, Revision.
- S268 Slade, D.H., 1968, "Meteorology and Atomic Energy - 1968", U.S. Department of Commerce, Environmental Science Services Administration, Air Resources Laboratories, TID-24190.
- Sn75 Snyder, W.S., et al, 1975, "Report of the Task Group on Reference Man", International Commission on Radiological Protection, ICRP Report No. 23.
- TGLD66 Task Group on Lung Dynamics, 1966, "Deposition and Retention Models for Internal Dosimetry of the Human Respiratory Tract", Health Phys. 12, 173-207.

Th72 Thompson, S.E., Burton, C.A., Quinn, D.J. and Ng, Y.C., 1972, "Concentration Factors of Chemical Elements in Edible Aquatic Organisms", University of California, Lawrence Livermore Laboratory Report, UCRL-50564, Rev. 1.

UN77 United Nations Scientific Committee on the Effects of Atomic Radiation, 1977, "Sources and Effects of Ionizing Radiation".

WSG77 Wyoming State Government, Department of Administration and Fiscal Control, Division of Research and Statistics, 1977, "Wyoming Data Handbook-1977".

APPENDIX K
AIRBORNE PATHWAY MODELING

K.1 Generic Sites

Two generic sites were selected to represent locations where various uranium mines are present. The characteristics of these sites, as shown in Table K.1, were used in the AIRDOS-EPA code (Mo79).

Table K.1 Characteristics of the generic sites

	New Mexico (Ambrosia Lake)	Wyoming (Gas Hills)
Meteorological data: Stability Categories	Grants/Gnt-Milan (WBAN=93057) A-F	Casper (WBAN-24089) A-G
Period of Record:	54/01-54/12	67/01-71/12
Annual Rainfall:	20 cm	29 cm
Average Mixing Height:	800 m	500 m
Mean Ambient Temperature:	13.8°C	7.4°C
Atmospheric dispersion factors (Chi/Q) for maximum individual:		
gases	5.5 E-6 sec/m ³	2.5 E-6 sec/m ³
particulates	1.4 E-6 sec/m ³	1.0 E-6 sec/m ³
Population: (0-80 km):	3.60E+4 persons	1.43E+4 persons
Dairy Cattle (0-80 km):	2.30E+3 head	1.17E+3 head
Meat Animals (0-80 km):	8.31E+4 head	1.03E+5 head
Vegetable Crop Area: (0-80 km)	2.78E+3 ha	3.20E+3 ha

The model active and inactive underground mines were assumed to be situated at the New Mexico site (see Section 2). The Wyoming site was used for both the model active and inactive surface mines and the model in situ leach mine (see Section 2).

K.2 Meteorological Data

Joint frequency distributions by stability category were obtained from the National Climatic Center (NOAA-Asheville, NC). These distributions are identified in Table K.1 by location, stability category range, and period of record.

The average mixing height (Table K.1) is the distance between the ground surface and a stable layer of air where no further mixing occurs. This average was computed by determining the harmonic mean of the annual morning mixing height and the annual afternoon mixing height for the location (Ho72). The rainfall rate determines the value used for the scavenging coefficient. No attempt was made to be any more accurate than one significant figure for both average mixing height and scavenging coefficient. Both sites are relatively dry locations, as reflected by a scavenging coefficient of $2.0 \times 10^{-6} \text{ sec}^{-1}$. A dry deposition velocity of 1 cm/s was assigned to particulates, while radon was assumed to be non-depositing.

K.3 Population

The population data for both generic sites were generated by a computer program (At74) that uses an edited and compressed version of the 1970 United States Census Bureau's "Master Enumeration District List with Coordinates" containing housing and population counts for each census enumeration district (CED) and the geographic coordinates of the population centroid for the district. In the Standard Metropolitan Statistical Areas, the CED is usually a "block group" that consists of a physical city block. In other areas, the district used is called an "enumeration district", and it may cover several square miles in a rural area.

There are approximately 250,000 CED's in the United States and the average population is about 800. The position of the population centroid for each CED was marked on the district maps by the individual census official responsible for each district and is based only on his judgment from inspection of the population distribution on the map. The CED entries are sorted in ascending order by longitude on the final data tape.

K.4 Dairy and Meat Animals

Dairy cattle and meat animal distributions are part of the AIRDOS-EPA

input. A constant animal density is assumed. The animal densities are provided by state in Table K.2. These densities were derived from information developed by NRC (NRC75). Milk production density in units of liter/day-square mile was converted to number of dairy cattle/square kilometer by assuming a milk production rate of 11.0 liters/day per dairy cow. Meat production density in units of kilograms/day-square mile was changed to an equivalent number of meat animals/square kilometer by assuming a slaughter rate of 0.00381 day^{-1} and 200 kilograms of meat/animal slaughtered.

Table K.2 Animal and vegetable crop distributions
for use with AIRDOS-EPA

State	Dairy Cattle Density (No./km ²)	Meat Animal Density (No./km ²)	Vegetable Crop Fraction (Km ² /km ²)
New Mexico	1.14E-1	4.13	1.38E-3
Wyoming	5.79E-2	5.12	1.59E-3

K.5 Vegetable Crop Area

A certain fraction of the land within 80 km of the source is used for vegetable crop production, which is assumed to be uniformly distributed throughout the entire assessment area. Information on the vegetable production density in terms of kilograms(fresh weight)/day-square mile was obtained from NRC data (NRC75). The vegetable crop fractions (Table K.2) by state were computed from the production densities by assuming a production rate of 2 kilograms (fresh weight)/year-square meter (NRC77).

K.6 Food Intake

Table K.3 summarizes the ingestion values used for both generic sites for the maximum individual. These values are based on a USDA report (USDA72) for a rural farm situation. F1 and F2 are the percentages produced at the

individual's home and within the 80 km assessment area, respectively. The balance of the diet, F3, is considered to be imported from outside the assessment area with negligible radionuclide concentrations due to the assessed source. The F1 values are obtained by dividing the home-produced quantity by the quantity from all sources. The meat values include a combination of beef and pork. The vegetable values only include fresh vegetables.

Table K.3 Sources of food for the maximum individual (percent)

	F1	F2	F3
Vegetables	70.0	0.0	30.0
Meat	44.2	0.0	55.8
Milk	39.9	0.0	60.1

For population exposure estimates, the AIRDOS-EPA code determines the imported fraction needed to supply the nutritional requirements of the entire population within 80 km. The quantity of food that is not imported is assumed to be grown or produced throughout the entire assessment area and consumed by the population within the assessment area as an average value for the entire assessment area. The surplus food grown at a given site we assumed was shipped outside the assessment area. We did not calculate dose for this exported fraction.

The ingestion pathway is handled by the terrestrial model (NRC77) portion of the AIRDOS-EPA code. The input values shown in Table K.4 were used and are independent of location and radionuclide. Selected terrestrial pathway parameters, which are radionuclide dependent, are given in Table K.5.

K.7 AIRDOS-EPA Output

An example output of AIRDOS-EPA can be found in the AIRDOS-EPA manual (Mo79). Doses calculated by AIRDOS-EPA were not used in this report. Another code, DARTAB, performed dose and risk estimates based on air and ground concentrations and ingestion and inhalation intakes and working levels calculated by AIRDOS-EPA. An explanation of the DARTAB code can be found in

Table K.4 Selected Input Parameters to AIRDOS-EPA

SYMBOLIC VARIABLE	DESCRIPTION	VALUE
PR	Plume rise	0.0 m
PH	Release height	1.0 m
BRTHRT	Human breathing rate	9.17E+5 cm ³ /hr
T	Buildup time for surface deposition	source dependent
DD1	Fraction of radioactivity retained on leafy vegetables and produce after washing	1.0
TSUBH1	Time delay-ingestion of pasture grass by animals	0.0 hr
TSUBH2	Time delay-ingestion of stored feed by animals	2.16E+3 hr
TSUBH3	Time delay-ingestion of leafy vegetables by man	3.36E+2 hr
TSUBH4	Time delay-ingestion of produce by man	3.36E+2 hr
LAMW	Removal rate constant for physical loss by weathering	2.1E-3 hr ⁻¹
TSUBE1	Period of exposure during growing season-pasture grass	7.2E+2 hr
TSUBE2	Period of exposure during growing season-crops or leafy vegetables	1.44E+3 hr
YSUBV1	Agricultural productivity by unit area (grass-cow-milk-man pathway)	0.28 kg/m ²
YSUBV2	Agricultural productivity by unit area (produce or leafy vegetables ingested by man)	0.716 kg/m ²
FSUBP	Fraction of year animals graze or pasture	0.40
FSUBS	Fraction of daily feed that is pasture grass when animals graze on pasture	0.43
QSUBF	Consumption rate of contaminated feed or forage by an animal (dry weight)	15.6 kg/day
TSUBF	Transport time from animal feed-milk-man	2.0 days

Table K.4 (Continued)

SYMBOLIC VARIABLE	DESCRIPTION	VALUE
UV	Rate of ingestion of produce by man	1.76E+2 kg/yr ^(a)
UM	Rate of ingestion of milk by man	1.12E+2 l/yr
UF	Rate of ingestion of meat by man	85.0 kg/yr
UL	Rate of ingestion of leafy vegetables by man	18.0 kg/yr
TSUBS	Average time from slaughter of meat animal to consumption	20.0 days
FSUBG	Fraction of produce ingested grown in garden of interest	1.0
FSUBL	Fraction of leafy vegetables grown in garden of interest	1.0
TSUBB	Period of long-term buildup for activity in soil	Same as T
P	Effective surface density of soil (dry weight) (assumes 15 cm plow layer)	2.15E+2 kg/m ²
TAUBEF	Fraction of meat producing herd slaughtered per day	3.81E-3 day ⁻¹
MSUBB	Muscle mass of meat producing animal at slaughter	2.0E+2 kg
VSUBM	Milk production of cow	11.0 l/day
R1	Fallout interception fraction for pasture	0.57
R2	Fallout interception for vegetable crops	0.20

^(a)This value, which was used in our analysis, is conservative because it includes fruit consumption. Without fruit consumption, the ingestion rate is 122 kg/yr.

Table K.5 Selected terrestrial pathway parameters by radionuclide

Radionuclide	Environmental Removal Rate (day ⁻¹)	B _{iv1} (a)	B _{iv2} (b)	Milk-transfer Coefficient F _m (day/l)	Meat-transfer Coefficient F _f (day/kg)
Uranium-238	7.06E-7	2.1E-2	4.2E-3	1.4E-4	1.6E-6
Uranium-235	7.06E-7	2.1E-2	4.2E-3	1.4E-4	1.6E-6
Uranium-234	7.06E-7	2.1E-2	4.2E-3	1.4E-4	1.6E-6
Thorium-232	5.61E-8	6.3E-3	3.5E-4	5.0E-6	1.6E-6
Thorium-230	5.61E-8	6.3E-3	3.5E-4	5.0E-6	1.6E-6
Thorium-228	5.61E-8	6.3E-3	3.5E-4	5.0E-6	1.6E-6
Actinium-228	2.12E-6	1.0E-2	2.5E-3	2.0E-5	1.6E-6
Radium-228	2.12E-5	1.0E-1	7.2E-2 ^(c)	5.9E-4	5.0E-4
Radium-226	2.12E-5	1.0E-1	7.2E-2 ^(c)	5.9E-4	5.0E-4
Radium-224	2.12E-5	1.0E-1	7.2E-2 ^(c)	5.9E-4	5.0E-4
Radon-222	0.0	0.0	0.0	0.0	0.0
Bismuth-214	2.09E-4	6.0E-1	1.5E-1	5.0E-4	1.7E-2
Bismuth-212	2.09E-4	6.0E-1	1.5E-1	5.0E-4	1.3E-2
Lead-214	5.31E-7	1.4E-1	4.8E-3	8.7E-5	9.1E-4
Lead-212	5.31E-7	1.4E-1	4.8E-3	8.7E-5	9.1E-4
Lead-210	5.31E-7	1.1E-1	3.9E-3	9.9E-5	9.1E-4
Polonium-210	8.93E-6	4.2E-3	2.6E-4	1.2E-4	8.7E-3
Thallium-208	9.84E-4	1.0E+0	2.5E-1	2.3E-2	4.0E-2

(a) $B_{iv1} = \frac{\text{Radionuclide concentration in entire above-ground portion of pasture grasses at maturity per unit dry weight}}{\text{Radionuclide concentration in soil per unit dry weight}}$
 $= \frac{\text{pCi/kg dry weight}}{\text{pCi/kg dry soil}}$

(b) $B_{iv2} = \frac{\text{Radionuclide concentration in edible portion of leafy vegetables and fresh produce at maturity per unit fresh weight}}{\text{Radionuclide concentration in soil per unit dry weight}}$
 $= \frac{\text{pCi/kg wet weight}}{\text{pCi/kg dry soil}}$

(c) This value, which was used in our analysis is conservatively high. Using data from DeBortoli (De72) for vegetables and grain products, a more realistic value would be 2.6E-3.

Appendix L. Concentrations and intakes computed by AIRDOS-EPA are by radionuclide and receptor location. Table K.6 lists values for effective radioactive decay constants, assumed for the plume (air) and ground surface, which influence the concentration and intake estimates. The values chosen for the decay constants attempt to account for daughter buildup in the air and on the ground surface.

Table K.6 Effective radioactive decay constants

Radionuclide	Decay constant in plume (day ⁻¹)	Decay constant on ground surface (day ⁻¹)
Uranium-238	4.25E-13	4.25E-13
Uranium-235	2.68E-12	2.68E-12
Uranium-234	7.77E-9	7.77E-9
Thorium-232	1.35E-13	1.35E-13
Thorium-230	2.47E-8	2.47E-8
Thorium-228	9.92E-4	1.35E-13
Actinium-228	2.72E+0	1.35E-13
Radium-228	3.30E-4	1.35E-13
Radium-226	1.19E-6	1.19E-6
Radium-224	1.89E-1	1.35E-13
Radon-222	1.81E-1	1.81E-1
Bismuth-214	1.81E-1	1.19E-6
Bismuth-212	1.35E-13	1.35E-13
Lead-214	1.81E-1	1.19E-6
Lead-212	1.35E-13	1.35E-13
Lead-210	8.52E-5	1.19E-6
Polonium-210	5.02E-3	1.19E-6
Thallium-208	1.35E-13	1.35E-13

K.8 References

- At74 Athey, T.W., Tell, R.A. and Janes, D.E., 1974, "The Use of an Automated Data Base in Population Exposure Calculations", from Population Exposures, Health Physics Society, Conf-74018.
- De72 DeBortoli, M. and Gaglione, P., 1972, "Radium-226 in Environmental Materials and Foods", Health Phys. 22, 43-48.
- Ho72 Holzworth, G.C., 1972, "Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States", U.S. Office of Air Programs, Report AP-101.
- Mo79 Moore, R.E., et al., 1979, "AIRDOS-EPA: A Computerized Methodology for Estimating Environmental Concentrations and Dose to Man from Airborne Releases of Radionuclides", EPA 520/1-79-009 (Reprint of ORNL-5532).
- NRC75 Nuclear Regulatory Commission, Radiological Assessment Branch, Division of Technical Review, 1975, "Code Input Data for Man-Rem Estimates", memo by K. Eckerman, N. Dayem and R. Emch.
- NRC77 Nuclear Regulatory Commission, Office of Standards Development, 1977, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 20 CFR Part 50, Appendix I", Regulatory Guide 1.109, Revision 1, October 1977.
- USDA72 United States Department of Agriculture, Agricultural Research Service, 1972, "Food Consumption of Households in the United States (Seasons and Year 1965-1966)", Household Food Consumption Survey 1965-1966, Report No. 12.

APPENDIX L

HEALTH RISK ASSESSMENT METHODOLOGY

L.1 Airborne Emissions

We estimated the health impact risks of airborne radionuclide emissions with the DARTAB (Be80) computer code using external exposure input data (air concentration and ground surface concentration) and internal intake input data (inhalation and ingestion) from the AIRDOS-EPA (Mo79) computer code. For radon-222 daughter calculations, we performed a working level calculation using the AIRDOS-EPA code and the working level exposures for each location were used as input by the DARTAB code. We assumed the fraction of equilibrium for the working level calculations to be 0.700 (Ge78). Doses calculated by AIRDOS-EPA were not used in DARTAB.

Tables L.1 and L.2 contain the data used by DARTAB in the health impact assessment, and Table L.3 is an example input data file for a DARTAB run. The variables are described in the DARTAB manual (Be80). We calculated dose rates and somatic health risks with DARTAB using a data base developed using the RADRISK (Du80) computer code. The dose conversion factors for each radionuclide are shown in Table L.1.

The doses calculated using DARTAB were not used in the risk calculations. We used the risk conversion factors in Table L.1 for this purpose. We calculated genetically significant doses for a 30-year exposure period (the mean years of life where gonadal doses are genetically significant). In calculating external dose rates from the ground surface, external dose conversion factors for the ground surface (see Table L.1), which are for a perfect plane surface, are multiplied by 0.5 to correct for the roughness of the soil surface. A weighted mean dose equivalent rate is calculated instead of a total body dose equivalent rate. Weighting factors are chosen to have a sum of one (see Table L.2). These weighted mean dose equivalent rates are presented for perspective purposes and are not used in the risk calculations.

The somatic risk conversion factors for Rn-222 and particulate radionuclides (see Table L.1) are calculated based on external exposures and internal intakes existing for the cohort lifetime (70.7565 years average

lifetime expectancy). When the exposure time for the calculated risks was less than the expected lifetime for an individual, we calculated the risk by multiplying the risk calculated by DARTAB with the ratio of the actual exposure time to the average lifetime expectancy for an individual (e.g., the DARTAB calculated risk is multiplied by $1/70.7565$ for a one-year exposure time). The risk conversion factor for Rn-222 in Table L.1 is for Rn-222 only and does not include the risk due to radon daughters. The risk due to radon daughters was calculated using a working level calculation and the fatal lung cancer risk conversion factor for a lifetime exposure given in Table L.2. The somatic health impact for the regional population (fatal cancers per year) is calculated at equilibrium for continuous exposure and is equal to the additional fatal cancers committed over all time per year of exposure.

Genetic effect risks (effects/birth) to the descendants of the exposed parent are calculated based on a 30-year exposure period. When the exposure time for the calculated risks was less than 30 years, we calculated the risk by multiplying the risk calculated by DARTAB with the ratio of the actual exposure time to 30 years (e.g., the DARTAB calculated risk is multiplied by $1/30$ for a one year exposure time). Since the presented genetic effect risk is to descendants of the exposed individual or individuals, one cannot add the individual somatic and genetic effect risks presented in this report. The genetic effects per year in the regional population due to radionuclide releases from the mine are calculated for an equilibrium exposure situation. The calculated genetic effects per year at equilibrium is equal to the genetic effects committed over all time from one year exposure since the total genetic damage expressed over all generations is equal to the value in each generation reached after prolonged continuous exposure (UN77). The genetic effects committed to the regional population are calculated using risk coefficients (see Table L.2) that are based on a genetically significant dose (GSD). The fraction of the population gonadal dose that is genetically significant is $30/70.7565$ where 30 is the mean individual reproductive life in years and 70.7565 is the average individual lifetime expectancy in years.

For each model uranium mine site, calculations are done separately for each mine source as well as for the total source term for the evaluated mine. The additional runs for each source allows us to identify the percentage contribution of each source to the total risk. The tables in Chapter 6

reflect results for the total mine source term and tables in Appendix L present the risk by source term as well as the total risk for each model uranium mine type. Tables L.4-L.6 contain individual fatal cancer risks and Tables L.7-L.9 contain genetic effect risks.

L.2 Aqueous Emissions

The health effects conversion factors used in the aquatic pathways are based on information contained in the RADRISK data library (Du80). The RADRISK data library is the data base used by the DARTAB computer code in computing the health impact of airborne releases. Thus, most of the philosophy of health impact determination discussed in Section L.1 above applies to aquatic releases as well as to airborne releases. The numerical values for the health effects conversion factors used for the aquatic releases are given in Appendix J along with additional discussions of the use of these factors in the aquatic calculations.

TABLE I.1
RADIONUCLIDE DOSE RATE AND HEALTH EFFECT RISK CONVERSION
FACTORS USED IN URANIUM MINE ASSESSMENTS

FOR NUCLIDE : U-238, RESP CLEARANCE CLASS=Y, PARTICLE SIZE=1.0 AMAD, F1=0.200E-02

DOSE CONVERSION FACTORS ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET	HIGH LET	LOW LET	HIGH LET	IMMERSION	SURFACE
	(A)	(A)	(A)	(A)	(B)	(C)
R MAR	9.64E-07	1.53E-07	3.34E-05	3.89E-06	3.08E+05	232.
ENDOST	1.96E-06	5.63E-06	6.52E-05	1.43E-04	3.47E+05	271.
PUL	1.37E-09	2.43E-09	1.62E-02	4.13E-02	1.26E+05	85.9
MUSCLE	7.06E-09	2.76E-08	2.53E-06	7.08E-07	2.37E+05	329.
LIVER	6.07E-09	2.62E-08	5.38E-06	6.71E-07	8.53E+04	29.7
S WALL	4.31E-08	1.81E-07	6.41E-06	1.67E-07	1.07E+05	72.6
PANCREAS	6.74E-09	2.76E-08	3.29E-06	7.08E-07	7.63E+04	57.6
LLI WALL	9.76E-06	7.94E-06	2.05E-04	4.71E-06	8.18E+04	84.1
KIDNEYS	5.94E-07	2.92E-06	1.70E-05	7.47E-05	9.06E+04	30.4
BL WALL	4.57E-09	1.50E-08	7.15E-07	3.85E-07	6.58E+04	21.4
ULI WALL	1.73E-06	2.64E-06	6.94E-05	1.61E-06	6.92E+04	22.8
SI WALL	1.58E-07	4.48E-07	1.22E-05	3.23E-07	6.22E+04	20.8
OVARIES	1.45E-08	2.63E-08	1.42E-06	6.71E-07	9.60E+04	53.2
TESTES	6.04E-09	2.64E-08	1.19E-06	6.75E-07	2.62E+05	389.
SPLEEN	6.59E-09	2.76E-08	3.13E-06	7.08E-07	8.91E+04	45.8
UTERUS	7.76E-09	2.77E-08	1.38E-06	7.07E-07	2.36E+04	7.70
THYMUS	6.12E-09	2.76E-08	4.80E-06	7.08E-07	9.25E+04	30.4
THYROID	6.01E-09	2.76E-08	2.16E-06	7.07E-07	1.58E+05	70.5
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD						
	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	1.55E-07	7.20E-07	1.73E-05	1.55E-05	7.86E+06	1.17E+04
OVARIES	4.03E-07	7.17E-07	2.27E-05	1.54E-05	2.88E+06	1.60E+03
AVERAGE	2.79E-07	7.19E-07	2.00E-05	1.55E-05	5.37E+06	6.63E+03
FATAL CANCER RISK CONVERSION FACTORS FOR LIFETIME EXPOSURE						
CANCER	INGESTION		INHALATION		AIR	GROUND
	LOW LET	HIGH LET	LOW LET	HIGH LET	IMMERSION	SURFACE
	(G)	(G)	(G)	(G)	(H)	(I)
R MARROW	2.27E-07	7.62E-07	7.15E-06	1.77E-05	.100	7.55E-05
ENDOST	4.22E-08	1.22E-06	1.26E-06	2.78E-05	1.07E-02	8.34E-06
PULMINARY	5.33E-10	1.48E-08	6.32E-03	.238	7.67E-02	5.23E-05
BREAST	2.42E-09	1.02E-08	5.92E-07	2.24E-07	9.46E-02	1.31E-04
LIVER	8.26E-10	3.78E-08	4.73E-07	8.33E-07	1.33E-02	4.64E-06
ST WALL	3.72E-09	1.57E-07	4.72E-07	1.36E-07	9.28E-03	6.30E-06
PANCREAS	7.07E-10	3.10E-08	2.38E-07	6.83E-07	9.27E-03	7.00E-06
LLI WALL	6.77E-07	5.51E-06	1.32E-05	3.22E-06	5.68E-03	5.84E-06
KIDNEYS	1.89E-08	9.29E-07	4.49E-07	2.04E-05	3.14E-03	1.05E-06
BL WALL	1.42E-10	4.85E-09	1.41E-08	1.07E-07	2.28E-03	7.43E-07
ULI WALL	6.00E-08	9.16E-07	2.23E-06	5.48E-07	2.40E-03	7.91E-07
SI WALL	2.73E-09	7.78E-08	1.94E-07	5.40E-08	1.08E-03	3.61E-07
OVARIES	2.36E-10	4.21E-09	1.44E-08	9.26E-08	1.67E-03	9.23E-07
TESTES	9.20E-11	4.23E-09	1.12E-08	9.30E-08	4.55E-03	6.75E-06
SPLEEN	9.96E-11	4.43E-09	3.23E-08	9.75E-08	1.55E-03	7.95E-07
UTERUS	1.21E-10	4.43E-09	1.34E-08	9.75E-08	4.09E-04	1.34E-07
THYMUS	9.22E-11	4.43E-09	5.02E-08	9.76E-08	1.61E-03	5.27E-07
THYROID	4.61E-10	2.22E-09	1.19E-07	5.13E-08	1.34E-02	5.97E-06
GENETIC EFFECT RISK CONVERSION FACTORS						
	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	8.37E-14	2.16E-11	6.00E-12	4.65E-10	1.61E+00	2.00E-03

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICO CURIE)
 (B) - (MILLIRAD/YR)/(PERSON MICRO CURIE/CC)
 (C) - (MILLIRAD/YR)/(PERSON MICRO CURIE/CM**2)
 (D) - (MILLIRAD)/(PERSON PICO CURIE/YR)
 (E) - (MILLIRAD)/(PERSON MICRO CURIE/CC)
 (F) - (MILLIRAD)/(PERSON MICRO CURIE/CM**2)
 (G) - (DEATHS)/(1E+5 PERSONS PICO CURIE/YR)
 (H) - (DEATHS)/(1E+5 PERSONS PICO CURIE/CC)
 (I) - (DEATHS)/(1E+5 PERSONS PICO CURIE/CM**2)
 (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICO CURIE/YR)
 (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICRO CURIE/CC)
 (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICRO CURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : U-234, RESP CLEARANCE CLASS=Y, PARTICLE SIZE=1.0 AMAD, F1=0.200E-02

DOSE CONVERSION FACTORS ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET	HIGH LET	LOW LET	HIGH LET	IMMERSION	SURFACE
	(A)	(A)	(A)	(A)	(B)	(C)
R MAR	4.40E-09	2.07E-07	1.21E-07	5.26E-06	9.80E+05	422.
ENDOST	1.84E-08	7.03E-06	4.83E-07	1.78E-04	1.08E+06	482.
PUL	2.77E-11	2.76E-09	2.73E-04	4.70E-02	4.68E+05	177.
MUSCLE	2.70E-10	3.13E-08	1.09E-07	8.01E-07	6.15E+05	471.
LIVER	1.48E-10	3.13E-08	4.24E-08	8.01E-07	3.76E+05	100.
S WALL	4.98E-08	2.06E-07	5.34E-08	1.89E-07	3.72E+05	145.
PANCREAS	2.02E-10	3.13E-08	1.92E-08	8.01E-07	2.87E+05	115.
LLI WALL	2.19E-06	9.01E-06	1.28E-06	5.34E-06	2.90E+05	146.
KIDNEYS	8.63E-09	3.32E-06	2.24E-07	8.49E-05	3.75E+05	99.2
BL WALL	2.66E-10	1.71E-08	1.42E-09	4.37E-07	3.20E+05	82.1
ULI WALL	7.37E-07	3.00E-06	4.33E-07	1.82E-06	3.14E+05	81.7
SI WALL	1.31E-07	5.10E-07	7.77E-08	3.68E-07	3.07E+05	79.4
OVARIES	5.67E-09	3.13E-08	5.92E-09	8.01E-07	2.96E+05	107.
TESTES	1.30E-10	3.13E-08	2.18E-09	8.01E-07	6.85E+05	553.
SPLEEN	1.62E-10	3.13E-08	3.19E-08	8.01E-07	3.50E+05	112.
UTERUS	4.13E-10	3.13E-08	2.72E-09	8.01E-07	1.77E+05	43.7
THYMUS	9.68E-11	3.13E-08	3.45E-08	8.01E-07	3.35E+05	89.2
THYROID	8.99E-11	3.13E-08	6.47E-09	8.01E-07	6.18E+05	185.
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	3.62E-09	8.55E-07	4.92E-08	1.84E-05	2.06E+07	1.66E+04
OVARIES	1.70E-07	8.55E-07	1.55E-07	1.84E-05	8.88E+06	3.21E+03
AVERAGE	8.68E-08	8.55E-07	1.02E-07	1.84E-05	1.47E+07	9.90E+03

CANCER	FATAL CANCER RISK		CONVERSION FACTORS		FOR LIFETIME EXPOSURE	
	INGESTION		INHALATION		AIR	GROUND
	LOW LET	HIGH LET	LOW LET	HIGH LET	IMMERSION	SURFACE
	(G)	(G)	(G)	(G)	(H)	(I)
R MARROW	1.10E-09	1.02E-06	2.70E-08	2.37E-05	.319	1.37E-04
ENDOST	3.99E-10	1.52E-06	9.50E-09	3.48E-05	3.32E-02	1.48E-05
PULMINARY	1.39E-11	1.68E-08	1.15E-04	.270	.285	1.08E-04
BREAST	1.02E-10	1.15E-08	2.96E-08	2.54E-07	.245	1.88E-04
LIVER	2.16E-11	4.52E-08	4.54E-09	9.94E-07	5.87E-02	1.56E-05
ST WALL	4.32E-09	1.78E-07	3.93E-09	1.54E-07	3.23E-02	1.26E-05
PANCREAS	2.29E-11	3.51E-08	1.61E-09	7.73E-07	3.49E-02	1.40E-05
LLI WALL	1.52E-07	6.25E-06	8.77E-08	3.65E-06	2.01E-02	1.01E-05
KIDNEYS	2.75E-10	1.06E-06	6.09E-09	2.32E-05	1.30E-02	3.44E-06
BL WALL	9.08E-12	5.51E-09	3.90E-11	1.21E-07	1.11E-02	2.85E-06
ULI WALL	2.56E-08	1.04E-06	1.48E-08	6.22E-07	1.09E-02	2.84E-06
SI WALL	2.27E-09	8.85E-08	1.32E-09	6.14E-08	5.33E-03	1.38E-06
OVARIES	9.83E-11	5.02E-09	9.11E-11	1.10E-07	5.14E-03	1.86E-06
TESTES	2.12E-12	5.02E-09	2.97E-11	1.10E-07	1.19E-02	9.60E-06
SPLEEN	2.53E-12	5.02E-09	3.80E-10	1.10E-07	6.07E-03	1.94E-06
UTERUS	7.03E-12	5.02E-09	3.71E-11	1.10E-07	3.07E-03	7.58E-07
THYMUS	1.49E-12	5.02E-09	4.12E-10	1.10E-07	5.81E-03	1.55E-06
THYROID	7.02E-12	2.51E-09	4.24E-10	5.81E-08	5.23E-02	1.57E-05
GENETIC EFFECT RISK CONVERSION FACTORS	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	2.61E-14	2.57E-11	3.06E-14	5.52E-10	4.41E+00	2.97E-03

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICOCURIE)
 (B) - (MILLIRAD/YR)/(PERSON MICROCURIE/CC)
 (C) - (MILLIRAD/YR)/(PERSON MICROCURIE/CM**2)
 (D) - (MILLIRAD)/(PERSON PICOCURIE/YR)
 (E) - (MILLIRAD)/(PERSON MICROCURIE/CC)
 (F) - (MILLIRAD)/(PERSON MICROCURIE/CM**2)
 (G) - (DEATHS)/(1E+5 PERSONS PICOCURIE/YR)
 (H) - (DEATHS)/(1E+5 PERSONS MICROCURIE/CC)
 (I) - (DEATHS)/(1E+5 PERSONS MICROCURIE/CM**2)
 (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICOCURIE/YR)
 (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CC)
 (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : TH-230, RESP CLEARANCE CLASS=Y, PARTICLE SIZE=1.0 AMAD, F1=0.200E-03

ORGAN	DOSE CONVERSION FACTORS					
	INGESTION		INHALATION		AIR	GROUND
	LOW LET (A)	HIGH LET (A)	LOW LET (A)	HIGH LET (A)	IMMERSION (B)	SURFACE (C)
R MAR	2.21E-08	5.79E-05	5.23E-06	1.42E-02	3.24E+06	884.
ENDOST	1.19E-07	9.09E-04	2.91E-05	.223	3.54E+06	977.
PUL	1.65E-10	5.01E-11	3.09E-04	4.60E-02	1.66E+06	438.
MUSCLE	1.11E-09	2.28E-07	3.01E-07	5.70E-05	1.83E+06	633.
LIVER	3.49E-09	1.09E-06	9.01E-07	2.73E-04	1.40E+06	339.
S WALL	5.76E-08	1.99E-07	1.00E-07	1.29E-07	1.30E+06	353.
PANCREAS	1.10E-09	2.28E-07	2.64E-07	5.70E-05	1.03E+06	274.
LLI WALL	2.52E-06	8.83E-06	1.52E-06	5.18E-06	9.88E+05	275.
KIDNEYS	1.04E-09	2.28E-07	2.17E-07	5.70E-05	1.38E+06	335.
BL WALL	1.09E-09	1.14E-07	9.59E-08	2.85E-05	1.17E+06	284.
ULI WALL	8.45E-07	2.94E-06	5.24E-07	1.73E-06	1.20E+06	289.
SI WALL	1.49E-07	4.97E-07	1.16E-07	3.03E-07	1.16E+06	280.
OVARIES	6.69E-09	2.28E-07	1.98E-07	5.70E-05	1.04E+06	270.
TESTES	8.91E-10	2.28E-07	1.83E-07	5.70E-05	2.14E+06	769.
SPLEEN	9.95E-10	2.28E-07	2.62E-07	5.70E-05	1.32E+06	329.
UTERUS	1.78E-09	2.28E-07	1.88E-07	5.70E-05	7.27E+05	171.
THYMUS	7.83E-10	2.28E-07	2.88E-07	5.70E-05	1.29E+06	310.
THYROID	7.74E-10	2.28E-07	2.08E-07	5.70E-05	2.16E+06	544.
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD						
	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	2.38E-08	6.20E-06	3.96E-06	1.30E-03	6.42E+07	2.31E+04
OVARIES	1.97E-07	6.20E-06	4.24E-06	1.30E-03	3.12E+07	8.10E+03
AVERAGE	1.11E-07	6.20E-06	4.10E-06	1.30E-03	4.77E+07	1.56E+04
FATAL CANCER RISK CONVERSION FACTORS FOR LIFETIME EXPOSURE						
CANCER	INGESTION		INHALATION		AIR	GROUND
	LOW LET (G)	HIGH LET (G)	LOW LET (G)	HIGH LET (G)	IMMERSION (H)	SURFACE (I)
R MARROW	4.76E-09	2.39E-04	1.00E-06	5.36E-02	1.05	2.88E-04
ENDOST	2.22E-09	1.70E-04	4.91E-07	3.76E-02	.109	3.01E-05
PULMINARY	6.15E-11	3.05E-10	1.30E-04	.265	1.01	2.66E-04
BREAST	3.91E-10	8.35E-08	8.53E-08	1.80E-05	.730	2.53E-04
LIVER	4.98E-10	1.57E-06	1.09E-07	3.39E-04	.219	5.29E-05
ST WALL	5.00E-09	1.72E-07	6.47E-09	1.09E-07	.113	3.06E-05
PANCREAS	1.18E-10	2.54E-07	2.33E-08	5.49E-05	.125	3.33E-05
LLI WALL	1.75E-07	6.13E-06	1.02E-07	3.55E-06	6.86E-02	1.91E-05
KIDNEYS	3.21E-11	7.26E-08	5.52E-09	1.57E-05	4.79E-02	1.16E-05
BL WALL	3.59E-11	3.63E-08	2.48E-09	7.85E-06	4.06E-02	9.86E-06
ULI WALL	2.93E-08	1.02E-06	1.75E-08	5.92E-07	4.16E-02	1.00E-05
SI WALL	2.58E-09	8.62E-08	1.73E-09	5.17E-08	2.01E-02	4.86E-06
OVARIES	1.14E-10	3.63E-08	2.59E-09	7.85E-06	1.80E-02	4.68E-06
TESTES	1.40E-11	3.63E-08	2.42E-09	7.85E-06	3.71E-02	1.33E-05
SPLEEN	1.51E-11	3.63E-08	3.28E-09	7.85E-06	2.29E-02	5.71E-06
UTERUS	2.94E-11	3.63E-08	2.50E-09	7.85E-06	1.26E-02	2.97E-06
THYMUS	1.19E-11	3.63E-08	3.65E-09	7.85E-06	2.24E-02	5.38E-06
THYROID	5.91E-11	1.82E-08	1.43E-08	4.14E-06	.183	4.61E-05
GENETIC EFFECT RISK CONVERSION FACTORS						
	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	3.31E-14	1.86E-10	1.23E-12	3.90E-08	1.43E+01	4.68E-03

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICOCURIE)
 (B) - (MILLIRAD/YR)/(PERSON MICROCURIE/CC)
 (C) - (MILLIRAD/YR)/(PERSON MICROCURIE/CM**2)
 (D) - (MILLIRAD)/(PERSON PICOCURIE/YR)
 (E) - (MILLIRAD)/(PERSON MICROCURIE/CC)
 (F) - (MILLIRAD)/(PERSON MICROCURIE/CM**2)
 (G) - (DEATHS)/(1E+5 PERSONS PICOCURIE/YR)
 (H) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CC)
 (I) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CM**2)
 (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICOCURIE/YR)
 (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CC)
 (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : RA-226, RESP CLEARANCE CLASS=W, PARTICLE SIZE=1.0 AMAD, F1=0.200E+00

DOSE CONVERSION FACTORS ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET	HIGH LET	LOW LET	HIGH LET	IMMERSION	SURFACE
	(A)	(A)	(A)	(A)	(B)	(C)
R MAR	2.54E-05	6.40E-05	2.84E-05	7.18E-05	5.49E+07	1.21E+04
ENDOST	5.07E-05	1.13E-03	5.69E-05	1.27E-03	5.87E+07	1.30E+04
PUL	1.91E-06	.0	6.33E-06	4.77E-03	3.37E+07	7.43E+03
MUSCLE	2.27E-06	2.83E-05	2.50E-06	3.17E-05	3.42E+07	7.57E+03
LIVER	1.51E-06	2.65E-05	1.70E-06	2.98E-05	2.91E+07	6.41E+03
S WALL	1.30E-06	2.08E-07	1.49E-06	1.21E-07	2.49E+07	5.49E+03
PANCREAS	2.14E-06	2.83E-05	2.41E-06	3.17E-05	2.19E+07	4.84E+03
LLI WALL	4.15E-05	1.47E-05	2.38E-05	7.84E-06	2.09E+07	4.61E+03
KIDNEYS	2.01E-06	2.65E-05	2.21E-06	2.98E-05	2.76E+07	6.09E+03
BL WALL	1.58E-06	1.41E-05	1.56E-06	1.59E-05	2.42E+07	5.35E+03
ULI WALL	8.07E-06	3.58E-06	5.57E-06	1.94E-06	2.69E+07	5.94E+03
SI WALL	2.58E-06	4.63E-07	2.42E-06	2.59E-07	2.60E+07	5.74E+03
OVARIES	2.96E-06	2.83E-05	2.68E-06	3.17E-05	2.00E+07	4.41E+03
TESTES	1.66E-06	2.83E-05	1.80E-06	3.17E-05	4.68E+07	1.03E+04
SPLEEN	1.56E-06	2.65E-05	1.75E-06	2.98E-05	2.95E+07	6.49E+03
UTERUS	1.75E-06	2.83E-05	1.73E-06	3.17E-05	2.13E+07	4.68E+03
THYMUS	1.35E-06	2.83E-05	1.58E-06	3.17E-05	2.89E+07	6.36E+03
THYROID	1.49E-06	2.83E-05	1.69E-06	3.17E-05	3.81E+07	8.41E+03
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD						
	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	2.69E-05	7.65E-04	2.82E-05	8.57E-04	1.40E+09	3.09E+05
OVARIES	6.17E-05	7.65E-04	5.00E-05	8.57E-04	6.00E+08	1.32E+05
AVERAGE	4.43E-05	7.65E-04	3.91E-05	8.57E-04	1.00E+09	2.21E+05

CANCER	FATAL CANCER RISK		CONVERSION FACTORS		FOR LIFETIME EXPOSURE	
	INGESTION		INHALATION		AIR	GROUND
	LOW LET	HIGH LET	LOW LET	HIGH LET	IMMERSION	SURFACE
	(G)	(G)	(G)	(G)	(H)	(I)
R MARROW	5.77E-06	3.37E-04	6.43E-06	3.78E-04	17.9	3.94E-03
ENDOST	1.05E-06	2.34E-04	1.18E-06	2.63E-04	1.81	4.00E-04
PULMINARY	6.95E-07	.0	3.32E-06	2.90E-02	20.5	4.52E-03
BREAST	5.48E-07	1.04E-05	5.95E-07	1.16E-05	13.6	3.02E-03
LIVER	1.42E-07	3.80E-05	1.60E-07	4.25E-05	4.54	1.00E-03
ST WALL	7.19E-08	1.80E-07	8.39E-08	1.04E-07	2.16	4.76E-04
PANCREAS	1.56E-07	3.15E-05	1.75E-07	3.53E-05	2.66	5.88E-04
LLI WALL	2.82E-06	1.02E-05	1.59E-06	5.43E-06	1.45	3.20E-04
KIDNEYS	4.20E-08	8.45E-06	4.57E-08	9.46E-06	.958	2.11E-04
BL WALL	3.75E-08	4.50E-06	3.46E-08	5.04E-06	.840	1.86E-04
ULI WALL	2.59E-07	1.24E-06	1.69E-07	6.72E-07	.934	2.06E-04
SI WALL	3.36E-08	8.03E-08	2.93E-08	4.48E-08	.451	9.96E-05
OVARIES	3.81E-08	4.50E-06	3.16E-08	5.04E-06	.347	7.65E-05
TESTES	1.77E-08	4.50E-06	1.86E-08	5.04E-06	.812	1.79E-04
SPLEEN	1.64E-08	4.22E-06	1.83E-08	4.73E-06	.512	1.13E-04
UTERUS	2.09E-08	4.50E-06	1.94E-08	5.04E-06	.370	8.12E-05
THYMUS	1.38E-08	4.50E-06	1.67E-08	5.04E-06	.501	1.10E-04
THYROID	8.46E-08	2.26E-06	9.60E-08	2.53E-06	3.23	7.12E-04
GENETIC EFFECT RISK CONVERSION FACTORS						
	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	1.33E-11	2.29E-08	1.17E-11	2.56E-08	3.00E+02	6.62E-02

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICOCURIE)
- (B) - (MILLIRAD/YR)/(PERSON MICROCURIE/CC)
- (C) - (MILLIRAD/YR)/(PERSON MICROCURIE/CM**2)
- (D) - (MILLIRAD)/(PERSON PICOCURIE/YR)
- (E) - (MILLIRAD)/(PERSON MICROCURIE/CC)
- (F) - (MILLIRAD)/(PERSON MICROCURIE/CM**2)
- (G) - (DEATHS)/(1E+5 PERSONS PICOCURIE/YR)
- (H) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CC)
- (I) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CM**2)
- (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICOCURIE/YR)
- (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CC)
- (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : RN-222, RESP CLEARANCE CLASS=Y, PARTICLE SIZE=1.0 AMAD, FI=0.0

ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET	HIGH LET	LOW LET	HIGH LET	IMMERSION	SURFACE
	(A)	(A)	(A)	(A)	(B)	(C)
R MAR	.0	.0	4.29E-11	2.71E-10	2.48E+06	512.
ENDOST	.0	.0	4.84E-11	1.66E-09	2.59E+06	533.
PUL	.0	.0	2.67E-09	5.14E-08	2.00E+06	412.
MUSCLE	.0	.0	3.29E-11	4.96E-11	2.14E+06	440.
LIVER	.0	.0	9.80E-11	3.61E-10	1.85E+06	380.
S WALL	.0	.0	2.08E-10	1.40E-11	2.12E+06	436.
PANCREAS	.0	.0	6.38E-11	4.96E-11	1.19E+06	246.
LLI WALL	.0	.0	1.02E-11	2.05E-13	1.56E+06	321.
KIDNEYS	.0	.0	2.37E-10	2.22E-09	1.86E+06	383.
BL WALL	.0	.0	7.87E-12	2.48E-11	1.71E+06	352.
ULI WALL	.0	.0	4.60E-11	2.22E-12	1.74E+06	359.
SI WALL	.0	.0	8.80E-11	6.38E-12	1.56E+06	322.
OVARIES	.0	.0	1.51E-11	4.96E-11	7.96E+05	164.
TESTES	.0	.0	7.59E-12	4.96E-11	2.40E+06	494.
SPLEEN	.0	.0	9.53E-11	6.08E-10	2.27E+06	468.
UTERUS	.0	.0	1.60E-11	4.96E-11	1.44E+06	296.
THYMUS	.0	.0	8.27E-11	4.96E-11	1.31E+06	270.
THYROID	.0	.0	2.67E-11	4.96E-11	1.77E+06	365.
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD						
	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	.0	.0	.0	.0	7.20E+07	1.48E+04
OVARIES	.0	.0	.0	.0	2.39E+07	4.92E+03
AVERAGE	.0	.0	.0	.0	4.79E+07	9.87E+03

CANCER	FATAL CANCER RISK		CONVERSION FACTORS		AIR	GROUND
	INGESTION	INGESTION	INHALATION	INHALATION	IMMERSION	SURFACE
	LOW LET	HIGH LET	LOW LET	HIGH LET	(H)	(I)
	(G)	(G)	(G)	(G)		
R MARROW	.0	.0	1.39E-11	1.75E-09	.807	1.67E-04
ENDOST	.0	.0	1.48E-12	5.05E-10	7.97E-02	1.64E-05
PULMINARY	.0	.0	1.63E-09	3.13E-07	1.22	2.51E-04
BREAST	.0	.0	1.31E-11	1.98E-11	.854	1.76E-04
LIVER	.0	.0	1.53E-11	5.63E-10	.289	5.93E-05
ST WALL	.0	.0	1.81E-11	1.22E-11	.184	3.78E-05
PANCREAS	.0	.0	7.74E-12	6.02E-11	.145	2.99E-05
LLI WALL	.0	.0	7.07E-13	1.42E-13	.108	2.23E-05
KIDNEYS	.0	.0	8.23E-12	7.70E-10	6.45E-02	1.33E-05
BL WALL	.0	.0	2.73E-13	8.60E-12	5.93E-02	1.22E-05
ULI WALL	.0	.0	1.60E-12	7.71E-13	6.04E-02	1.25E-05
SI WALL	.0	.0	1.53E-12	1.11E-12	2.71E-02	5.59E-06
OVARIES	.0	.0	2.62E-13	8.60E-12	1.38E-02	2.85E-06
TESTES	.0	.0	1.32E-13	8.60E-12	4.16E-02	8.57E-06
SPLEEN	.0	.0	1.65E-12	1.06E-10	3.94E-02	8.12E-06
UTERUS	.0	.0	2.77E-13	8.60E-12	2.50E-02	5.14E-06
THYMUS	.0	.0	1.43E-12	8.60E-12	2.27E-02	4.68E-06
THYROID	.0	.0	2.26E-12	4.20E-12	.150	3.09E-05
GENETIC EFFECT RISK CONVERSION FACTORS						
	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	0.00E-01	0.00E-01	0.00E-01	0.00E-01	1.44E+01	2.96E-03

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICO CURIE)
 (B) - (MILLIRAD/YR)/(PERSON MICRO CURIE/CC)
 (C) - (MILLIRAD/YR)/(PERSON MICRO CURIE/CM**2)
 (D) - (MILLIRAD)/(PERSON PICO CURIE/YR)
 (E) - (MILLIRAD)/(PERSON MICRO CURIE/CC)
 (F) - (MILLIRAD)/(PERSON MICRO CURIE/CM**2)
 (G) - (DEATHS)/(1E+5 PERSONS PICO CURIE/YR)
 (H) - (DEATHS)/(1E+5 PERSONS PICO CURIE/CC)
 (I) - (DEATHS)/(1E+5 PERSONS PICO CURIE/CM**2)
 (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICO CURIE/YR)
 (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICRO CURIE/CC)
 (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICRO CURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : PB-214, RESP CLEARANCE CLASS=W, PARTICLE SIZE=1.0 AMAD, F1=0.200E+00

DOSE CONVERSION FACTORS

ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET (A)	HIGH LET (A)	LOW LET (A)	HIGH LET (A)	IMMERSION (B)	SURFACE (C)
R MAR	1.46E-08	1.52E-08	9.59E-09	5.70E-08	1.76E+09	3.81E+05
ENDOST	7.30E-09	1.08E-07	1.10E-08	3.68E-07	1.86E+09	4.02E+05
PUL	7.70E-09	.0	6.07E-07	.0	1.25E+09	2.68E+05
MUSCLE	1.15E-08	1.20E-09	7.21E-09	7.45E-09	1.30E+09	2.81E+05
LIVER	1.82E-08	2.00E-08	2.19E-08	7.32E-08	1.11E+09	2.39E+05
S WALL	1.40E-06	8.68E-08	4.60E-08	2.84E-09	1.11E+09	2.39E+05
PANCREAS	6.50E-08	1.20E-09	1.40E-08	7.45E-09	7.90E+08	1.69E+05
LLI WALL	5.57E-08	2.36E-09	2.16E-09	4.31E-11	8.72E+08	1.87E+05
KIDNEYS	2.86E-08	4.89E-08	5.05E-08	4.53E-07	1.09E+09	2.35E+05
BL WALL	1.32E-08	6.00E-10	1.55E-09	3.72E-09	9.80E+08	2.10E+05
ULI WALL	3.69E-07	2.44E-08	9.86E-09	4.70E-10	1.05E+09	2.25E+05
SI WALL	8.01E-07	6.12E-08	1.89E-08	1.36E-09	9.69E+08	2.08E+05
OVARIES	4.04E-08	1.20E-09	3.04E-09	7.45E-09	6.14E+08	1.32E+05
TESTES	3.02E-09	1.20E-09	1.40E-09	7.45E-09	1.61E+09	3.45E+05
SPLEEN	3.84E-08	1.13E-09	1.16E-08	7.21E-09	1.26E+09	2.70E+05
UTERUS	3.52E-08	1.20E-09	3.14E-09	7.45E-09	8.45E+08	1.81E+05
THYMUS	2.88E-09	1.20E-09	1.86E-08	7.45E-09	9.40E+08	2.02E+05
THYROID	1.06E-09	1.20E-09	5.81E-09	7.45E-09	1.23E+09	2.66E+05
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	9.05E-08	3.59E-08	4.20E-08	2.23E-07	4.83E+10	1.04E+07
OVARIES	1.21E-06	3.59E-08	9.11E-08	2.23E-07	1.84E+10	3.96E+06
AVERAGE	6.52E-07	3.59E-08	6.65E-08	2.23E-07	3.34E+10	7.16E+06

CANCER	FATAL CANCER RISK		CONVERSION FACTORS		FOR LIFETIME EXPOSURE	
	INGESTION	INGESTION	INHALATION	INHALATION	AIR	GROUND
	LOW LET (G)	HIGH LET (G)	LOW LET (G)	HIGH LET (G)	IMMERSION (H)	SURFACE (I)
R MARROW	4.73E-09	9.72E-08	3.11E-09	3.69E-07	573.	.124
ENDOST	2.22E-10	3.20E-08	3.34E-10	1.12E-07	57.3	1.24E-02
PULMINARY	4.68E-09	.0	3.69E-07	2.82E-05	760.	.163
BREAST	4.58E-09	4.78E-10	2.88E-09	2.97E-09	519.	.112
LIVER	2.83E-09	3.11E-08	3.41E-09	1.14E-07	173.	3.73E-02
ST WALL	1.22E-07	7.53E-08	3.99E-09	2.46E-09	96.3	2.07E-02
PANCREAS	7.90E-09	1.45E-09	1.70E-09	9.04E-09	95.9	2.05E-02
LLI WALL	3.87E-09	1.64E-09	1.50E-10	2.99E-11	60.5	1.30E-02
KIDNEYS	9.94E-10	1.70E-08	1.75E-09	1.57E-07	37.8	8.16E-03
BL WALL	4.59E-10	2.08E-10	5.39E-11	1.29E-09	34.0	7.29E-03
ULI WALL	1.28E-08	8.47E-09	3.42E-10	1.63E-10	36.4	7.81E-03
SI WALL	1.39E-08	1.06E-08	3.28E-10	2.36E-10	16.8	3.61E-03
OVARIES	7.01E-10	2.08E-10	5.27E-11	1.29E-09	10.7	2.29E-03
TESTES	5.23E-11	2.08E-10	2.43E-11	1.29E-09	27.9	5.99E-03
SPLEEN	6.67E-10	1.96E-10	2.02E-10	1.25E-09	21.9	4.68E-03
UTERUS	6.11E-10	2.08E-10	5.45E-11	1.29E-09	14.7	3.14E-03
THYMUS	5.00E-11	2.08E-10	3.23E-10	1.29E-09	16.3	3.51E-03
THYROID	8.95E-11	1.01E-10	4.92E-10	6.30E-10	104.	2.25E-02
GENETIC EFFECT RISK CONVERSION FACTORS	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	1.95E-13	1.08E-12	2.00E-14	6.70E-12	1.00E+04	2.14E+00

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICOCURIE)
- (B) - (MILLIRAD/YR)/(PERSON MICROCURIE/CC)
- (C) - (MILLIRAD/YR)/(PERSON MICROCURIE/CM**2)
- (D) - (MILLIRAD)/(PERSON PICOCURIE/YR)
- (E) - (MILLIRAD)/(PERSON MICROCURIE/CC)
- (F) - (MILLIRAD)/(PERSON MICROCURIE/CM**2)
- (G) - (DEATHS)/(1E+5 PERSONS PICOCURIE/YR)
- (H) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CC)
- (I) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CM**2)
- (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICOCURIE/YR)
- (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CC)
- (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : BI-214, RESP CLEARANCE CLASS=W, PARTICLE SIZE=1.0 AMAD, F1=0.500E-01

DOSE CONVERSION FACTORS

ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET (A)	HIGH LET (A)	LOW LET (A)	HIGH LET (A)	IMMERSION (B)	SURFACE (C)
R MAR	6.93E-09	1.07E-09	4.37E-09	6.52E-09	8.72E+09	1.52E+06
ENDOST	3.38E-09	1.17E-08	3.65E-09	2.67E-08	9.43E+09	1.65E+06
PUL	6.37E-09	6.00E-11	3.18E-07	.0	8.28E+09	1.44E+06
MUSCLE	7.02E-09	1.72E-10	4.41E-09	3.78E-09	8.74E+09	1.52E+06
LIVER	9.67E-09	3.33E-10	7.59E-09	3.84E-09	7.54E+09	1.31E+06
S WALL	1.06E-06	1.06E-07	1.89E-08	2.64E-09	7.92E+09	1.38E+06
PANCREAS	5.60E-08	1.72E-10	8.35E-09	3.78E-09	7.94E+09	1.36E+06
LLI WALL	1.76E-08	4.07E-10	9.08E-10	1.37E-09	6.81E+09	1.17E+06
KIDNEYS	1.69E-08	1.84E-08	4.36E-08	4.19E-07	7.04E+09	1.23E+06
BL WALL	5.89E-09	1.16E-10	8.13E-10	2.57E-09	7.40E+09	1.29E+06
ULI WALL	9.75E-08	5.95E-09	2.96E-09	1.44E-09	8.83E+09	1.51E+06
SI WALL	2.89E-07	2.81E-08	4.95E-09	1.71E-09	6.77E+09	1.17E+06
OVARIES	1.68E-08	1.72E-10	1.35E-09	3.78E-09	6.93E+09	1.17E+06
TESTES	1.44E-09	1.72E-10	6.48E-10	3.78E-09	6.74E+09	1.20E+06
SPLEEN	3.22E-08	1.66E-10	7.27E-09	3.79E-09	8.18E+09	1.44E+06
UTERUS	1.52E-08	1.72E-10	1.43E-09	3.78E-09	6.24E+09	1.08E+06
THYMUS	2.37E-09	1.72E-10	1.22E-08	3.78E-09	7.48E+09	1.27E+06
THYROID	7.26E-10	1.72E-10	3.70E-09	3.78E-09	7.87E+09	1.35E+06
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD						
	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	4.31E-08	5.08E-09	1.94E-08	1.13E-07	2.02E+11	3.60E+07
OVARIES	5.03E-07	5.08E-09	4.06E-08	1.13E-07	2.08E+11	3.51E+07
AVERAGE	2.73E-07	5.08E-09	3.00E-08	1.13E-07	2.05E+11	3.56E+07

CANCER	FATAL CANCER RISK		CONVERSION FACTORS		FOR LIFETIME EXPOSURE	
	INGESTION	INGESTION	INHALATION	INHALATION	AIR	GROUND
	LOW LET (G)	HIGH LET (G)	LOW LET (G)	HIGH LET (G)	IMMERSION (H)	SURFACE (I)
R MARROW	2.25E-09	5.53E-09	1.41E-09	4.09E-08	2.84E+03	.495
ENDOST	1.02E-10	2.60E-09	1.10E-10	7.14E-09	290.	5.08E-02
PULMINARY	3.87E-09	3.65E-10	1.93E-07	2.11E-05	5.04E+03	.876
BREAST	2.80E-09	6.77E-11	1.76E-09	1.51E-09	3.49E+03	.607
LIVER	1.51E-09	4.41E-10	1.18E-09	5.91E-09	1.18E+03	.205
ST WALL	9.21E-08	9.19E-08	1.64E-09	2.29E-09	687.	.120
PANCREAS	6.80E-09	2.06E-10	1.01E-09	4.58E-09	964.	.165
LLI WALL	1.22E-09	2.82E-10	6.30E-11	9.54E-10	473.	8.12E-02
KIDNEYS	5.85E-10	6.39E-09	1.51E-09	1.45E-07	244.	4.27E-02
BL WALL	2.04E-10	3.99E-11	2.82E-11	8.93E-10	257.	4.48E-02
ULI WALL	3.38E-09	2.07E-09	1.03E-10	5.00E-10	306.	5.24E-02
SI WALL	5.01E-09	4.88E-09	8.59E-11	2.96E-10	117.	2.03E-02
OVARIES	2.91E-10	2.94E-11	2.35E-11	6.55E-10	120.	2.03E-02
TESTES	2.49E-11	2.94E-11	1.12E-11	6.55E-10	117.	2.08E-02
SPLEEN	5.59E-10	2.85E-11	1.26E-10	6.57E-10	142.	2.50E-02
UTERUS	2.64E-10	2.94E-11	2.47E-11	6.55E-10	108.	1.87E-02
THYMUS	4.11E-11	2.94E-11	2.12E-10	6.55E-10	130.	2.20E-02
THYROID	6.14E-11	1.44E-11	3.13E-10	3.20E-10	666.	.114
GENETIC EFFECT RISK CONVERSION FACTORS						
	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	8.19E-14	1.53E-13	9.00E-15	3.39E-12	6.15E+04	1.07E+01

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICO CURIE)
 (B) - (MILLIRAD/YR)/(PERSON MICRO CURIE/CC)
 (C) - (MILLIRAD/YR)/(PERSON MICRO CURIE/CM**2)
 (D) - (MILLIRAD)/(PERSON PICO CURIE/YR)
 (E) - (MILLIRAD)/(PERSON MICRO CURIE/CC)
 (F) - (MILLIRAD)/(PERSON MICRO CURIE/CM**2)
 (G) - (DEATHS)/(1E+5 PERSONS PICO CURIE/YR)
 (H) - (DEATHS)/(1E+5 PERSONS PICO CURIE/CC)
 (I) - (DEATHS)/(1E+5 PERSONS PICO CURIE/CM**2)
 (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICO CURIE/YR)
 (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICRO CURIE/CC)
 (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICRO CURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : PB-210, RESP CLEARANCE CLASS=W, PARTICLE SIZE=1.0 AMAD, F1=0.200

DOSE CONVERSION FACTORS

ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET (A)	HIGH LET (A)	LOW LET (A)	HIGH LET (A)	IMMERSION (B)	SURFACE (C)
R MAR	5.28E-05	1.19E-05	5.92E-05	1.61E-05	1.19E+07	3.97E+03
ENDOST	1.42E-04	2.83E-04	1.59E-04	3.18E-04	1.32E+07	4.42E+03
PUL	9.05E-08	.0	3.01E-04	5.25E-04	4.94E+06	1.66E+03
MUSCLE	1.54E-06	4.01E-06	1.78E-06	7.29E-06	6.29E+06	2.28E+03
LIVER	3.90E-05	1.06E-04	4.37E-05	1.27E-04	3.93E+06	1.28E+03
S WALL	2.04E-07	2.71E-13	1.07E-06	5.42E-09	4.19E+06	1.46E+03
PANCREAS	1.58E-06	4.01E-06	1.82E-06	7.29E-06	2.60E+06	884.
LLI WALL	1.75E-05	1.06E-08	4.04E-05	2.60E-07	2.38E+06	807.
KIDNEYS	1.82E-05	4.93E-05	2.35E-05	1.14E-04	4.36E+06	1.42E+03
BL WALL	7.61E-07	2.00E-06	8.68E-07	3.65E-06	3.09E+06	1.01E+03
ULI WALL	3.73E-06	7.55E-10	1.38E-05	7.79E-08	3.11E+06	1.01E+03
SI WALL	4.73E-07	1.02E-11	2.43E-06	1.24E-08	2.71E+06	883.
OVARIES	1.56E-06	4.01E-06	1.77E-06	7.29E-06	3.97E+06	1.32E+03
TESTES	1.50E-06	4.01E-06	1.72E-06	7.29E-06	6.72E+06	2.62E+03
SPLEEN	1.47E-06	3.81E-06	1.69E-06	8.72E-05	3.74E+06	1.23E+03
UTERUS	1.52E-06	4.01E-06	1.74E-06	7.29E-06	1.12E+06	366.
THYMUS	1.52E-06	4.01E-06	1.77E-06	7.29E-06	4.41E+06	1.44E+03
THYROID	1.53E-06	4.01E-06	1.75E-06	7.29E-06	7.34E+06	2.42E+03
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	2.93E-05	7.79E-05	3.37E-05	1.69E-04	2.02E+08	7.86E+04
OVARIES	3.05E-05	7.79E-05	3.48E-05	1.69E-04	1.19E+08	3.96E+04
AVERAGE	2.99E-05	7.79E-05	3.43E-05	1.69E-04	1.60E+08	5.91E+04

FATAL CANCER RISK CONVERSION FACTORS FOR LIFETIME EXPOSURE

CANCER	INGESTION		INHALATION		AIR	GROUND
	LOW LET (G)	HIGH LET (G)	LOW LET (G)	HIGH LET (G)	IMMERSION (H)	SURFACE (I)
R MARROW	1.26E-05	5.81E-05	1.41E-05	8.32E-05	3.87	1.29E-03
ENDOST	3.11E-06	6.15E-05	3.47E-06	6.91E-05	.406	1.36E-04
PULMINARY	3.59E-08	.0	1.83E-04	3.19E-03	3.01	1.01E-03
BREAST	4.36E-07	1.13E-06	5.06E-07	2.36E-06	2.51	9.10E-04
LIVER	4.33E-06	1.17E-04	4.84E-06	1.44E-04	.614	2.00E-04
ST WALL	1.64E-08	2.35E-13	9.02E-08	4.63E-09	.364	1.27E-04
PANCREAS	1.36E-07	3.45E-06	1.57E-07	7.17E-06	.316	1.07E-04
LLI WALL	1.22E-06	7.34E-09	2.77E-06	1.78E-07	.165	5.60E-05
KIDNEYS	4.51E-07	1.21E-05	6.08E-07	3.36E-05	.151	4.93E-05
BL WALL	1.88E-08	4.93E-07	2.15E-08	1.02E-06	.107	3.50E-05
ULI WALL	1.29E-07	2.62E-10	4.73E-07	2.66E-08	.108	3.50E-05
SI WALL	7.83E-09	1.76E-12	4.14E-08	2.12E-09	4.70E-02	1.53E-05
OVARIES	1.93E-08	4.93E-07	2.19E-08	1.02E-06	6.89E-02	2.29E-05
TESTES	1.85E-08	4.93E-07	2.13E-08	1.02E-06	.117	4.55E-05
SPLEEN	1.81E-08	4.70E-07	2.10E-08	1.46E-05	6.49E-02	2.13E-05
UTERUS	1.88E-08	4.93E-07	2.15E-08	1.02E-06	1.94E-02	6.35E-06
THYMUS	1.88E-08	4.93E-07	2.20E-08	1.02E-06	7.65E-02	2.50E-05
THYROID	9.99E-08	2.63E-07	1.15E-07	5.27E-07	.621	2.05E-04
GENETIC EFFECT RISK CONVERSION FACTORS	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	8.97E-12	2.34E-09	1.03E-11	5.08E-09	4.81E+01	1.77E-02

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICOCURIE)
- (B) - (MILLIRAD/YR)/(PERSON MICROCURIE/CC)
- (C) - (MILLIRAD/YR)/(PERSON MICROCURIE/CM**2)
- (D) - (MILLIRAD)/(PERSON PICOCURIE/YR)
- (E) - (MILLIRAD)/(PERSON MICROCURIE/CC)
- (F) - (MILLIRAD)/(PERSON MICROCURIE/CM**2)
- (G) - (DEATHS)/(1E+5 PERSONS PICOCURIE/YR)
- (H) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CC)
- (I) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CM**2)
- (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICOCURIE/YR)
- (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CC)
- (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : PO-210, RESP CLEARANCE CLASS=W, PARTICLE SIZE=1.0 AMAD, F1=0.100E+00

DOSE CONVERSION FACTORS

ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET (A)	HIGH LET (A)	LOW LET (A)	HIGH LET (A)	IMMERSION (B)	SURFACE (C)
R MAR	1.91E-11	2.66E-05	3.90E-11	4.10E-05	4.87E+04	9.45
ENDOST	1.21E-11	1.22E-05	2.91E-11	1.89E-05	5.26E+04	10.2
PUL	1.15E-11	.0	3.26E-10	3.92E-03	4.33E+04	8.40
MUSCLE	1.43E-11	2.63E-05	3.51E-11	4.05E-05	4.62E+04	8.95
LIVER	3.14E-11	8.15E-05	7.57E-11	1.26E-04	3.93E+04	7.62
S WALL	2.64E-11	2.26E-07	5.59E-11	1.11E-07	4.11E+04	7.97
PANCREAS	3.76E-11	2.63E-05	8.49E-11	4.05E-05	3.85E+04	7.46
LLI WALL	7.89E-11	9.01E-06	5.02E-11	4.42E-06	3.08E+04	5.97
KIDNEYS	7.50E-11	4.72E-04	1.24E-10	7.28E-04	4.25E+04	8.24
BL WALL	1.92E-11	1.31E-05	2.15E-11	2.03E-05	4.00E+04	7.75
ULI WALL	5.31E-11	3.00E-06	4.47E-11	1.47E-06	4.02E+04	7.80
SI WALL	4.11E-11	5.08E-07	3.67E-11	2.49E-07	3.50E+04	6.79
OVARIES	4.27E-11	2.63E-05	3.64E-11	4.05E-05	2.38E+04	4.62
TESTES	1.08E-11	2.63E-05	1.42E-11	4.05E-05	4.49E+04	8.70
SPLEEN	1.15E-10	8.15E-04	2.02E-10	1.26E-03	4.69E+04	9.09
UTERUS	3.51E-11	2.63E-05	4.26E-11	4.05E-05	3.18E+04	6.17
THYMUS	1.54E-11	2.63E-05	7.40E-11	4.05E-05	3.03E+04	5.87
THYROID	8.16E-12	2.63E-05	2.95E-11	4.05E-05	3.52E+04	6.82
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	3.23E-10	7.84E-04	4.24E-10	1.21E-03	1.35E+06	261.
OVARIES	1.28E-09	7.84E-04	1.09E-09	1.21E-03	7.14E+05	139.
AVERAGE	8.01E-10	7.84E-04	7.55E-10	1.21E-03	1.03E+06	200.

CANCER	FATAL CANCER RISK		CONVERSION FACTORS		FOR LIFETIME EXPOSURE	
	LOW LET (G)	HIGH LET (G)	LOW LET (G)	HIGH LET (G)	AIR IMMERSION (H)	GROUND SURFACE (I)
R MARROW	6.23E-12	1.73E-04	1.27E-11	2.67E-04	1.59E-02	3.08E-06
ENDOST	3.73E-13	3.77E-06	8.95E-13	5.80E-06	1.62E-03	3.14E-07
PULMINARY	6.97E-12	.0	1.98E-10	2.38E-02	2.63E-02	5.11E-06
BREAST	5.70E-12	1.05E-05	1.40E-11	1.61E-05	1.84E-02	3.57E-06
LIVER	4.90E-12	1.27E-04	1.18E-11	1.96E-04	6.14E-03	1.19E-06
ST WALL	2.29E-12	1.96E-07	4.84E-12	9.60E-08	3.57E-03	6.91E-07
PANCREAS	4.57E-12	3.19E-05	1.03E-11	4.91E-05	4.68E-03	9.06E-07
LLI WALL	5.47E-12	6.25E-06	3.48E-12	3.06E-06	2.14E-03	4.14E-07
KIDNEYS	2.60E-12	1.64E-04	4.30E-12	2.52E-04	1.47E-03	2.86E-07
BL WALL	6.67E-13	4.56E-06	7.43E-13	7.01E-06	1.39E-03	2.69E-07
ULI WALL	1.84E-12	1.04E-06	1.55E-12	5.09E-07	1.40E-03	2.71E-07
SI WALL	7.14E-13	8.82E-08	6.36E-13	4.31E-08	6.07E-04	1.18E-07
OVARIES	7.41E-13	4.56E-06	6.30E-13	7.01E-06	4.13E-04	8.02E-08
TESTES	1.88E-13	4.56E-06	2.46E-13	7.01E-06	7.79E-04	1.51E-07
SPLEEN	2.00E-12	1.41E-04	3.50E-12	2.17E-04	8.14E-04	1.58E-07
UTERUS	6.09E-13	4.56E-06	7.38E-13	7.01E-06	5.52E-04	1.07E-07
THYMUS	2.67E-13	4.56E-06	1.28E-12	7.01E-06	5.26E-04	1.02E-07
THYROID	6.91E-13	2.22E-06	2.50E-12	3.42E-06	2.98E-03	5.77E-07
GENETIC EFFECT RISK CONVERSION FACTORS	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	2.40E-16	2.35E-08	2.26E-16	3.63E-08	3.09E-01	6.00E-05

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICO CURIE)
 (B) - (MILLIRAD/YR)/(PERSON MICRO CURIE/CC)
 (C) - (MILLIRAD/YR)/(PERSON MICRO CURIE/CM**2)
 (D) - (MILLIRAD)/(PERSON PICO CURIE/YR)
 (E) - (MILLIRAD)/(PERSON MICRO CURIE/CC)
 (F) - (MILLIRAD)/(PERSON MICRO CURIE/CM**2)
 (G) - (DEATHS)/(1E+5 PERSONS PICO CURIE/YR)
 (H) - (DEATHS)/(1E+5 PERSONS PICO CURIE/CC)
 (I) - (DEATHS)/(1E+5 PERSONS PICO CURIE/CM**2)
 (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICO CURIE/YR)
 (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICRO CURIE/CC)
 (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICRO CURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : TH-232, RESP CLEARANCE CLASS=Y, PARTICLE SIZE=1.0 AMAD, FI=0.200E-03

DOSE CONVERSION FACTORS

ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET (A)	HIGH LET (A)	LOW LET (A)	HIGH LET (A)	IMMERSION (B)	SURFACE (C)
R MAR	9.24E-08	5.22E-05	5.54E-05	1.41E-02	1.40E+06	455.
ENDOST	2.50E-07	9.30E-04	9.91E-05	.243	1.54E+06	511.
PUL	6.82E-09	4.29E-11	5.84E-03	4.22E-02	6.72E+05	209.
MUSCLE	8.80E-09	1.99E-07	2.81E-05	9.18E-05	7.91E+05	389.
LIVER	9.44E-09	9.49E-07	4.81E-05	3.56E-04	5.55E+05	145.
S WALL	5.18E-08	1.70E-07	4.01E-05	2.67E-07	5.39E+05	178.
PANCREAS	8.21E-09	1.99E-07	4.68E-05	9.18E-05	4.09E+05	131.
LLI WALL	2.15E-06	7.57E-06	3.40E-05	9.48E-06	3.97E+05	138.
KIDNEYS	8.46E-09	1.88E-07	2.19E-05	8.82E-05	5.56E+05	145.
BL WALL	5.00E-09	9.95E-08	4.24E-06	4.59E-05	4.69E+05	121.
ULI WALL	7.14E-07	2.52E-06	2.90E-05	3.35E-06	4.63E+05	120.
SI WALL	1.31E-07	4.27E-07	1.52E-05	5.84E-07	4.50E+05	116.
OVARIES	1.33E-08	1.99E-07	8.14E-06	9.18E-05	4.31E+05	131.
TESTES	6.08E-09	1.99E-07	3.85E-06	9.18E-05	8.78E+05	477.
SPLEEN	6.72E-09	1.88E-07	4.22E-05	8.70E-05	5.10E+05	144.
UTERUS	7.41E-09	1.99E-07	7.07E-06	9.18E-05	2.51E+05	62.5
THYMUS	6.31E-09	1.99E-07	7.63E-05	9.18E-05	4.97E+05	130.
THYROID	5.79E-09	1.99E-07	2.43E-05	9.18E-05	9.11E+05	253.
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD						
	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	7.86E-08	5.41E-06	4.35E-05	1.58E-03	2.63E+07	1.43E+04
OVARIES	2.64E-07	5.41E-06	1.13E-04	1.58E-03	1.29E+07	3.93E+03
AVERAGE	1.72E-07	5.41E-06	7.83E-05	1.58E-03	1.96E+07	9.12E+03

FATAL CANCER RISK CONVERSION FACTORS FOR LIFETIME EXPOSURE

CANCER	INGESTION		INHALATION		AIR	GROUND
	LOW LET (G)	HIGH LET (G)	LOW LET (G)	HIGH LET (G)	IMMERSION (H)	SURFACE (I)
R MARROW	1.77E-08	2.14E-04	1.05E-05	5.26E-02	.456	1.48E-04
ENDOST	4.33E-09	1.73E-04	1.63E-06	4.06E-02	4.74E-02	1.57E-05
PULMINARY	1.88E-09	2.61E-10	1.85E-03	.242	.409	1.27E-04
BREAST	1.74E-09	7.29E-08	5.52E-06	2.31E-05	.316	1.55E-04
LIVER	9.62E-10	1.36E-06	3.76E-06	3.75E-04	8.67E-02	2.26E-05
ST WALL	4.31E-09	1.48E-07	1.85E-06	2.09E-07	4.68E-02	1.54E-05
PANCREAS	5.04E-10	2.22E-07	2.82E-06	7.04E-05	4.97E-02	1.59E-05
LLI WALL	1.49E-07	5.25E-06	1.91E-06	6.00E-06	2.76E-02	9.58E-06
KIDNEYS	1.46E-10	5.98E-08	3.77E-07	1.93E-05	1.93E-02	5.03E-06
BL WALL	9.78E-11	3.17E-08	7.39E-08	1.01E-05	1.63E-02	4.20E-06
ULI WALL	2.47E-08	8.74E-07	7.44E-07	1.06E-06	1.61E-02	4.16E-06
SI WALL	2.21E-09	7.40E-08	1.74E-07	9.19E-08	7.81E-03	2.01E-06
OVARIES	1.65E-10	3.17E-08	7.56E-08	1.01E-05	7.48E-03	2.27E-06
TESTES	5.49E-11	3.17E-08	3.11E-08	1.01E-05	1.52E-02	8.28E-06
SPLEEN	5.97E-11	3.00E-08	3.64E-07	9.52E-06	8.85E-03	2.50E-06
UTERUS	7.45E-11	3.17E-08	6.27E-08	1.01E-05	4.36E-03	1.08E-06
THYMUS	5.63E-11	3.17E-08	6.59E-07	1.01E-05	8.62E-03	2.26E-06
THYROID	2.95E-10	1.59E-08	1.21E-06	5.54E-06	7.71E-02	2.14E-05
GENETIC EFFECT RISK CONVERSION FACTORS						
	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	5.16E-14	1.62E-10	2.36E-11	4.74E-08	5.89E+00	2.73E-03

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICO CURIE)
- (B) - (MILLIRAD/YR)/(PERSON MICRO CURIE/CC)
- (C) - (MILLIRAD/YR)/(PERSON MICRO CURIE/CM**2)
- (D) - (MILLIRAD)/(PERSON PICO CURIE/YR)
- (E) - (MILLIRAD)/(PERSON MICRO CURIE/CC)
- (F) - (MILLIRAD)/(PERSON MICRO CURIE/CM**2)
- (G) - (DEATHS)/(1E+5 PERSONS PICO CURIE/YR)
- (H) - (DEATHS)/(1E+5 PERSONS PICO CURIE/CC)
- (I) - (DEATHS)/(1E+5 PERSONS PICO CURIE/CM**2)
- (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICO CURIE/YR)
- (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICRO CURIE/CC)
- (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICRO CURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : RA-228, RESP CLEARANCE CLASS=W, PARTICLE SIZE=1.0 AMAD, F1=0.200E+00

DOSE CONVERSION FACTORS

ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET (A)	HIGH LET (A)	LOW LET (A)	HIGH LET (A)	IMMERSION (B)	SURFACE (C)
R MAR	1.76E-05	3.01E-05	2.26E-05	4.08E-05	2.49E-02	5.10E-05
ENDOST	3.38E-05	3.02E-04	4.12E-05	4.16E-04	3.08E-02	6.31E-05
PUL	2.03E-06	.0	4.75E-04	3.82E-04	1.68E-02	3.45E-05
MUSCLE	4.68E-06	2.04E-05	7.64E-06	2.75E-05	6.97E-02	1.43E-04
LIVER	4.41E-06	1.94E-05	9.64E-06	3.74E-05	1.80E-04	3.68E-07
S WALL	2.15E-06	9.94E-13	8.82E-06	2.51E-08	4.23E-02	8.68E-05
PANCREAS	5.03E-06	2.04E-05	1.00E-05	2.75E-05	1.21E-02	2.47E-05
LLI WALL	7.07E-05	2.08E-08	5.07E-05	9.31E-07	6.97E-03	1.43E-05
KIDNEYS	4.87E-06	1.94E-05	7.41E-06	2.62E-05	2.45E-05	5.01E-08
BL WALL	3.56E-06	1.02E-05	4.00E-06	1.37E-05	2.94E-09	6.03E-12
ULI WALL	2.16E-05	1.81E-09	2.68E-05	3.18E-07	6.00E-05	1.23E-07
SI WALL	5.49E-06	3.58E-11	1.07E-05	5.31E-08	3.28E-05	6.73E-08
OVARIES	6.98E-06	2.04E-05	7.64E-06	2.75E-05	8.99E-03	1.84E-05
TESTES	4.15E-06	2.04E-05	4.74E-06	2.75E-05	.150	3.07E-04
SPLEEN	4.43E-06	1.94E-05	8.85E-06	2.60E-05	4.23E-03	8.68E-06
UTERUS	6.40E-06	2.04E-05	7.43E-06	2.75E-05	1.68E-06	3.43E-09
THYMUS	4.80E-06	2.04E-05	1.27E-05	2.75E-05	2.49E-06	5.10E-09
THYROID	3.89E-06	2.04E-05	6.63E-06	2.75E-05	8.47E-03	1.74E-05
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD						
	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	1.14E-04	5.53E-04	1.30E-04	7.46E-04	4.50	9.21E-03
OVARIES	1.97E-04	5.53E-04	2.15E-04	7.46E-04	.270	5.52E-04
AVERAGE	1.56E-04	5.53E-04	1.72E-04	7.46E-04	2.38	4.88E-03

CANCER	FATAL CANCER RISK		CONVERSION FACTORS		FOR LIFETIME EXPOSURE	
	INGESTION		INGESTION	INHALATION	AIR	GROUND
	LOW LET (G)	HIGH LET (G)	LOW LET (G)	HIGH LET (G)	IMMERSION (H)	SURFACE (I)
R MARROW	5.27E-06	1.82E-04	6.82E-06	2.48E-04	8.11E-09	1.66E-11
ENDOST	9.41E-07	8.02E-05	1.15E-06	1.12E-04	9.48E-10	1.94E-12
PULMINARY	1.10E-06	.0	2.89E-04	2.32E-03	1.02E-08	2.10E-11
BREAST	1.72E-06	7.45E-06	2.88E-06	1.00E-05	2.78E-08	5.71E-11
LIVER	6.41E-07	2.76E-05	1.45E-06	5.40E-05	2.81E-11	5.75E-14
ST WALL	1.74E-07	8.63E-13	7.47E-07	2.13E-08	3.67E-09	7.53E-12
PANCREAS	5.66E-07	2.27E-05	1.17E-06	3.05E-05	1.47E-09	3.00E-12
LLI WALL	4.89E-06	1.44E-08	3.48E-06	6.32E-07	4.84E-10	9.92E-13
KIDNEYS	1.57E-07	6.14E-06	2.42E-07	8.32E-06	8.50E-13	1.74E-15
BL WALL	1.16E-07	3.24E-06	1.30E-07	4.37E-06	1.02E-16	2.09E-19
ULI WALL	7.42E-07	6.29E-10	9.16E-07	1.08E-07	2.08E-12	4.27E-15
SI WALL	9.19E-08	6.21E-12	1.81E-07	9.00E-09	5.69E-13	1.17E-15
OVARIES	1.15E-07	3.24E-06	1.25E-07	4.36E-06	1.56E-10	3.19E-13
TESTES	6.70E-08	3.24E-06	7.62E-08	4.36E-06	2.60E-09	5.33E-12
SPLEEN	7.14E-08	3.07E-06	1.47E-07	4.14E-06	7.34E-11	1.51E-13
UTERUS	1.05E-07	3.24E-06	1.21E-07	4.36E-06	2.92E-14	5.95E-17
THYMUS	7.75E-08	3.24E-06	2.13E-07	4.36E-06	4.32E-14	8.85E-17
THYROID	3.14E-07	1.63E-06	5.43E-07	2.20E-06	7.17E-10	1.47E-12
GENETIC EFFECT RISK CONVERSION FACTORS						
	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	4.68E-11	1.67E-08	5.16E-11	2.24E-08	7.16E-07	1.46E-09

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICOCURIE)
 (B) - (MILLIRAD/YR)/(PERSON MICROCURIE/CC)
 (C) - (MILLIRAD/YR)/(PERSON MICROCURIE/CM**2)
 (D) - (MILLIRAD)/(PERSON PICOCURIE/YR)
 (E) - (MILLIRAD)/(PERSON MICROCURIE/CC)
 (F) - (MILLIRAD)/(PERSON MICROCURIE/CM**2)
 (G) - (DEATHS)/(1E+5 PERSONS PICOCURIE/YR)
 (H) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CC)
 (I) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CM**2)
 (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICOCURIE/YR)
 (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CC)
 (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : AC-228, RESP CLEARANCE CLASS=W, PARTICLE SIZE=1.0 AMAD, F1=0.100E-02

DOSE CONVERSION FACTORS

ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET (A)	HIGH LET (A)	LOW LET (A)	HIGH LET (A)	IMMERSION (B)	SURFACE (C)
R MAR	1.22E-07	9.47E-09	8.38E-08	2.26E-06	5.41E+09	1.02E+06
ENDOST	4.26E-08	1.10E-07	1.01E-07	2.60E-05	5.85E+09	1.11E+06
PUL	2.59E-08	1.95E-14	3.62E-06	3.28E-06	4.82E+09	9.04E+05
MUSCLE	8.14E-08	1.70E-10	5.19E-08	5.72E-08	5.11E+09	9.59E+05
LIVER	9.92E-08	1.35E-08	2.79E-07	1.61E-06	4.34E+09	8.14E+05
S WALL	2.08E-06	8.80E-12	3.50E-07	2.37E-10	4.48E+09	8.39E+05
PANCREAS	1.78E-07	1.70E-10	9.70E-08	5.72E-08	4.49E+09	8.37E+05
LLI WALL	6.16E-06	7.00E-09	9.12E-07	1.02E-08	3.54E+09	6.61E+05
KIDNEYS	1.37E-07	1.65E-10	5.71E-08	5.51E-08	4.49E+09	8.45E+05
BL WALL	1.44E-07	8.52E-11	2.68E-08	2.86E-08	4.42E+09	8.28E+05
ULI WALL	8.05E-06	1.33E-09	1.17E-06	3.24E-09	4.64E+09	8.65E+05
SI WALL	3.74E-06	8.78E-11	5.49E-07	5.15E-10	3.90E+09	7.32E+05
OVARIES	5.15E-07	1.70E-10	8.49E-08	5.72E-08	3.20E+09	5.90E+05
TESTES	3.75E-08	1.70E-10	1.13E-08	5.72E-08	4.73E+09	9.00E+05
SPLEEN	1.19E-07	1.61E-10	7.62E-08	5.42E-08	5.12E+09	9.59E+05
UTERUS	2.98E-07	1.70E-10	5.28E-08	5.72E-08	3.51E+09	6.58E+05
THYMUS	1.08E-08	1.70E-10	1.09E-07	5.72E-08	3.71E+09	6.90E+05
THYROID	3.32E-09	1.70E-10	3.61E-08	5.72E-08	4.19E+09	7.86E+05
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	1.12E-06	4.89E-09	3.35E-07	1.63E-06	1.42E+11	2.70E+07
OVARIES	1.54E-05	4.89E-09	2.54E-06	1.63E-06	9.60E+10	1.77E+07
AVERAGE	8.28E-06	4.89E-09	1.44E-06	1.63E-06	1.19E+11	2.24E+07

CANCER	FATAL CANCER RISK		CONVERSION FACTORS		AIR	GROUND
	LOW LET (G)	HIGH LET (G)	LOW LET (G)	HIGH LET (G)	IMMERSION (H)	SURFACE (I)
R MARROW	3.97E-08	5.92E-08	2.71E-08	1.41E-05	1.76E+03	.332
ENDOST	1.31E-09	3.23E-08	3.08E-09	7.62E-06	180.	3.42E-02
PULMINARY	1.57E-08	1.19E-13	2.20E-06	1.99E-05	2.93E+03	.550
BREAST	3.25E-08	6.55E-11	2.07E-08	2.18E-08	2.04E+03	.383
LIVER	1.55E-08	2.03E-08	4.35E-08	2.42E-06	678.	.127
ST WALL	1.80E-07	7.63E-12	3.04E-08	2.04E-10	389.	7.28E-02
PANCREAS	2.17E-08	1.99E-10	1.18E-08	6.64E-08	545.	.102
LLI WALL	4.28E-07	4.86E-09	6.33E-08	7.05E-09	246.	4.59E-02
KIDNEYS	4.77E-09	5.52E-11	1.98E-09	1.83E-08	156.	2.93E-02
BL WALL	5.00E-09	2.85E-11	9.27E-10	9.50E-09	153.	2.87E-02
ULI WALL	2.79E-07	4.62E-10	4.07E-08	1.12E-09	161.	3.00E-02
SI WALL	6.49E-08	1.52E-11	9.52E-09	8.85E-11	67.7	1.27E-02
OVARIES	8.93E-09	2.85E-11	1.47E-09	9.49E-09	55.5	1.02E-02
TESTES	6.50E-10	2.85E-11	1.94E-10	9.49E-09	82.1	1.56E-02
SPLEEN	2.07E-09	2.70E-11	1.32E-09	9.00E-09	88.8	1.66E-02
UTERUS	5.16E-09	2.85E-11	9.14E-10	9.49E-09	60.9	1.14E-02
THYMUS	1.88E-10	2.85E-11	1.89E-09	9.49E-09	64.4	1.20E-02
THYROID	2.81E-10	1.41E-11	3.05E-09	4.71E-09	355.	6.65E-02
GENETIC EFFECT RISK CONVERSION FACTORS	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	2.49E-12	1.47E-13	4.32E-13	4.89E-11	3.57E+04	6.70E+00

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICO CURIE)
- (B) - (MILLIRAD/YR)/(PERSON MICRO CURIE/CC)
- (C) - (MILLIRAD/YR)/(PERSON MICRO CURIE/CM**2)
- (D) - (MILLIRAD)/(PERSON PICO CURIE/YR)
- (E) - (MILLIRAD)/(PERSON MICRO CURIE/CC)
- (F) - (MILLIRAD)/(PERSON MICRO CURIE/CM**2)
- (G) - (DEATHS)/(1E+5 PERSONS PICO CURIE/YR)
- (H) - (DEATHS)/(1E+5 PERSONS PICO CURIE/CC)
- (I) - (DEATHS)/(1E+5 PERSONS PICO CURIE/CM**2)
- (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICO CURIE/YR)
- (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICRO CURIE/CC)
- (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICRO CURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : TH-228, RESP CLEARANCE CLASS=Y, PARTICLE SIZE=1.0 AMAD, F1=0.200E-03

DOSE CONVERSION FACTORS

ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET (A)	HIGH LET (A)	LOW LET (A)	HIGH LET (A)	IMMERSION (B)	SURFACE (C)
R MAR	2.27E-07	1.17E-05	1.52E-05	1.13E-03	1.68E+07	3.98E+03
ENDOST	2.05E-07	1.33E-04	2.04E-05	1.29E-02	1.81E+07	4.32E+03
PUL	1.75E-08	7.32E-11	1.44E-03	6.21E-02	9.28E+06	2.17E+03
MUSCLE	9.50E-08	3.33E-07	7.94E-06	3.23E-05	9.69E+06	2.44E+03
LIVER	6.37E-08	1.20E-06	1.45E-05	1.26E-04	8.02E+06	1.84E+03
S WALL	1.93E-07	2.36E-07	1.77E-05	3.55E-06	7.10E+06	1.67E+03
PANCREAS	6.26E-08	3.33E-07	1.22E-05	3.23E-05	5.81E+06	1.36E+03
LLI WALL	3.44E-05	2.20E-05	3.91E-04	1.19E-04	5.70E+06	1.35E+03
KIDNEYS	7.92E-08	3.43E-07	7.68E-06	3.99E-05	7.75E+06	1.78E+03
BL WALL	2.62E-07	1.67E-07	4.91E-06	1.61E-05	6.93E+06	1.59E+03
ULI WALL	4.62E-06	5.08E-06	1.31E-04	4.30E-05	7.02E+06	1.61E+03
SI WALL	7.45E-07	6.39E-07	2.73E-05	7.39E-06	6.92E+06	1.59E+03
OVARIES	7.91E-07	3.33E-07	1.41E-05	3.23E-05	5.28E+06	1.23E+03
TESTES	9.75E-08	3.33E-07	2.55E-06	3.23E-05	1.18E+07	2.98E+03
SPLEEN	6.31E-08	3.18E-07	1.09E-05	3.08E-05	7.57E+06	1.74E+03
UTERUS	2.88E-07	3.33E-07	6.79E-06	3.23E-05	4.91E+06	1.12E+03
THYMUS	1.71E-08	3.33E-07	1.70E-05	3.23E-05	7.04E+06	1.61E+03
THYROID	1.11E-08	3.33E-07	5.28E-06	3.23E-05	1.18E+07	2.74E+03
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD						
	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	2.91E-06	9.68E-06	7.19E-05	8.92E-04	3.54E+08	8.94E+04
OVARIES	2.37E-05	9.68E-06	4.05E-04	8.92E-04	1.58E+08	3.69E+04
AVERAGE	1.33E-05	9.68E-06	2.38E-04	8.92E-04	2.56E+08	6.32E+04

CANCER	FATAL CANCER RISK		CONVERSION FACTORS		AIR	GROUND
	LOW LET (G)	HIGH LET (G)	LOW LET (G)	HIGH LET (G)	IMMERSION (H)	SURFACE (I)
R MARROW	7.29E-08	7.31E-05	4.70E-06	6.90E-03	5.47	1.30E-03
ENDOST	6.12E-09	3.91E-05	5.91E-07	3.67E-03	.557	1.33E-04
PULMINARY	1.04E-08	4.45E-10	8.16E-04	.367	5.65	1.32E-03
BREAST	3.77E-08	1.29E-07	2.94E-06	1.19E-05	3.87	9.74E-04
LIVER	9.82E-09	1.82E-06	2.10E-06	1.81E-04	1.25	2.87E-04
ST WALL	1.68E-08	2.05E-07	1.44E-06	2.93E-06	.616	1.45E-04
PANCREAS	7.55E-09	3.94E-07	1.37E-06	3.62E-05	.706	1.65E-04
LLI WALL	2.38E-06	1.53E-05	2.58E-05	7.90E-05	.396	9.37E-05
KIDNEYS	2.73E-09	1.16E-07	2.49E-07	1.29E-05	.269	6.18E-05
BL WALL	9.09E-09	5.63E-08	1.61E-07	5.17E-06	.240	5.52E-05
ULI WALL	1.60E-07	1.76E-06	4.33E-06	1.42E-05	.244	5.59E-05
SI WALL	1.29E-08	1.11E-07	4.49E-07	1.22E-06	.120	2.76E-05
OVARIES	1.37E-08	5.63E-08	2.32E-07	5.17E-06	9.16E-02	2.13E-05
TESTES	1.68E-09	5.63E-08	4.14E-08	5.17E-06	.205	5.17E-05
SPLEEN	1.09E-09	5.38E-08	1.76E-07	4.94E-06	.131	3.02E-05
UTERUS	4.98E-09	5.63E-08	1.11E-07	5.17E-06	8.52E-02	1.94E-05
THYMUS	2.90E-10	5.63E-08	2.73E-07	5.17E-06	.122	2.79E-05
THYROID	9.26E-10	2.77E-08	4.26E-07	2.59E-06	.999	2.32E-04
GENETIC EFFECT RISK CONVERSION FACTORS						
	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	3.99E-12	2.91E-10	7.16E-11	2.67E-08	7.68E+01	1.89E-02

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICOCURIE)
 (B) - (MILLIRAD/YR)/(PERSON MICROCURIE/CC)
 (C) - (MILLIRAD/YR)/(PERSON MICROCURIE/CM**2)
 (D) - (MILLIRAD)/(PERSON PICOCURIE/YR)
 (E) - (MILLIRAD)/(PERSON MICROCURIE/CC)
 (F) - (MILLIRAD)/(PERSON MICROCURIE/CM**2)
 (G) - (DEATHS)/(1E+5 PERSONS PICOCURIE/YR)
 (H) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CC)
 (I) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CM**2)
 (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICOCURIE/YR)
 (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CC)
 (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : RA-224, RESP CLEARANCE CLASS=W, PARTICLE SIZE=1.0 AMAD, F1=0.200E+00

DOSE CONVERSION FACTORS

ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET	HIGH LET	LOW LET	HIGH LET	IMMERSION	SURFACE
	(A)	(A)	(A)	(A)	(B)	(C)
R MAR	8.41E-07	2.06E-05	4.77E-07	1.54E-05	7.61E+07	1.66E+04
ENDOST	7.41E-07	1.78E-04	5.10E-07	1.33E-04	8.06E+07	1.76E+04
PUL	8.77E-08	.0	7.35E-06	6.14E-04	5.04E+07	1.10E+04
MUSCLE	4.06E-07	2.89E-06	2.36E-07	2.16E-06	5.17E+07	1.13E+04
LIVER	4.91E-07	4.16E-06	3.47E-07	2.96E-06	4.40E+07	9.58E+03
S WALL	5.97E-07	7.89E-07	4.94E-07	3.08E-07	3.99E+07	8.69E+03
PANCREAS	3.59E-07	2.89E-06	2.59E-07	2.16E-06	3.24E+07	7.06E+03
LLI WALL	9.03E-05	2.86E-05	3.47E-05	1.07E-05	3.28E+07	7.16E+03
KIDNEYS	5.07E-07	3.59E-06	3.31E-07	2.93E-06	4.21E+07	9.18E+03
BL WALL	8.91E-07	1.44E-06	3.78E-07	1.08E-06	3.69E+07	8.05E+03
ULI WALL	2.40E-05	1.02E-05	1.01E-05	3.86E-06	4.15E+07	9.04E+03
SI WALL	3.25E-06	1.66E-06	1.61E-06	6.42E-07	3.92E+07	8.53E+03
OVARIES	2.73E-06	2.89E-06	1.12E-06	2.16E-06	2.80E+07	6.11E+03
TESTES	3.81E-07	2.89E-06	1.88E-07	2.16E-06	6.99E+07	1.52E+04
SPLEEN	3.16E-07	2.76E-06	2.27E-07	2.07E-06	4.75E+07	1.03E+04
UTERUS	1.12E-06	2.89E-06	5.02E-07	2.16E-06	3.37E+07	7.34E+03
THYMUS	1.58E-07	2.89E-06	2.13E-07	2.16E-06	4.25E+07	9.25E+03
THYROID	1.10E-07	2.89E-06	1.07E-07	2.16E-06	5.26E+07	1.15E+04
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD						
	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	1.14E-05	8.66E-05	5.64E-06	6.48E-05	2.10E+09	4.56E+05
OVARIES	8.19E-05	8.66E-05	3.37E-05	6.48E-05	8.40E+08	1.83E+05
AVERAGE	4.67E-05	8.66E-05	1.97E-05	6.48E-05	1.47E+09	3.20E+05

CANCER	FATAL CANCER RISK		CONVERSION FACTORS		AIR	GROUND
	INGESTION		INHALATION		IMMERSION	SURFACE
	LOW LET	HIGH LET	LOW LET	HIGH LET	(H)	(I)
R MARROW	2.74E-07	1.34E-04	1.55E-07	1.00E-04	24.8	5.40E-03
ENDOST	2.28E-08	5.49E-05	1.57E-08	4.09E-05	2.48	5.42E-04
PULMONARY	5.34E-08	.0	4.47E-06	3.73E-03	30.7	6.69E-03
BREAST	1.62E-07	1.15E-06	9.40E-08	8.63E-07	20.6	4.51E-03
LIVER	7.67E-08	6.50E-06	5.42E-08	4.63E-06	6.87	1.50E-03
ST WALL	5.18E-08	6.84E-07	4.28E-08	2.67E-07	3.46	7.54E-04
PANCREAS	4.36E-08	3.51E-06	3.15E-08	2.63E-06	3.94	8.58E-04
LLI WALL	6.26E-06	1.98E-05	2.41E-06	7.41E-06	2.28	4.97E-04
KIDNEYS	1.76E-08	1.25E-06	1.15E-08	1.02E-06	1.46	3.19E-04
BL WALL	3.09E-08	5.01E-07	1.31E-08	3.75E-07	1.28	2.79E-04
ULI WALL	8.33E-07	3.54E-06	3.49E-07	1.34E-06	1.44	3.14E-04
SI WALL	5.65E-08	2.87E-07	2.79E-08	1.11E-07	.680	1.48E-04
OVARIES	4.74E-08	5.01E-07	1.95E-08	3.75E-07	.486	1.06E-04
TESTES	6.61E-09	5.01E-07	3.26E-09	3.75E-07	1.21	2.64E-04
SPLEEN	5.49E-09	4.79E-07	3.94E-09	3.58E-07	.824	1.79E-04
UTERUS	1.94E-08	5.01E-07	8.71E-09	3.75E-07	.585	1.27E-04
THYMUS	2.74E-09	5.01E-07	3.70E-09	3.75E-07	.737	1.61E-04
THYROID	9.31E-09	2.45E-07	9.05E-09	1.83E-07	4.45	9.74E-04
GENETIC EFFECT RISK CONVERSION FACTORS						
	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	1.40E-11	2.59E-09	5.91E-12	1.95E-09	4.41E+02	9.59E-02

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICOCURIE)
 (B) - (MILLIRAD/YR)/(PERSON MICROCURIE/CC)
 (C) - (MILLIRAD/YR)/(PERSON MICROCURIE/CM**2)
 (D) - (MILLIRAD)/(PERSON PICOCURIE/YR)
 (E) - (MILLIRAD)/(PERSON MICROCURIE/CC)
 (F) - (MILLIRAD)/(PERSON MICROCURIE/CM**2)
 (G) - (DEATHS)/(1E+5 PERSONS PICOCURIE/YR)
 (H) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CC)
 (I) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CM**2)
 (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICOCURIE/YR)
 (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CC)
 (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : PB-212, RESP CLEARANCE CLASS=W, PARTICLE SIZE=1.0 AMAD, F1=0.200E+00

DOSE CONVERSION FACTORS

ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET (A)	HIGH LET (A)	LOW LET (A)	HIGH LET (A)	IMMERSSION (B)	SURFACE (C)
R MAR	4.76E-07	3.64E-06	2.67E-07	2.45E-06	1.15E+09	2.57E+05
ENDOST	4.80E-07	2.73E-05	3.29E-07	1.79E-05	1.23E+09	2.75E+05
PUL	7.63E-08	.0	1.14E-05	9.73E-05	7.25E+08	1.61E+05
MUSCLE	2.21E-07	2.08E-07	1.46E-07	1.90E-07	7.49E+08	1.66E+05
LIVER	9.06E-07	5.23E-06	6.39E-07	3.42E-06	6.32E+08	1.40E+05
S WALL	2.31E-06	1.27E-07	8.89E-07	5.57E-08	5.75E+08	1.27E+05
PANCREAS	3.25E-07	2.08E-07	2.47E-07	1.90E-07	4.62E+08	1.02E+05
LLI WALL	2.49E-05	2.12E-06	4.93E-06	4.18E-07	4.67E+08	1.03E+05
KIDNEYS	7.05E-07	3.30E-06	8.59E-07	6.96E-06	6.08E+08	1.35E+05
BL WALL	3.80E-07	1.04E-07	1.02E-07	9.47E-08	5.34E+08	1.18E+05
ULI WALL	2.16E-05	1.76E-06	4.40E-06	3.56E-07	5.85E+08	1.29E+05
SI WALL	6.40E-06	4.57E-07	1.48E-06	1.10E-07	5.55E+08	1.23E+05
OVARIES	1.27E-06	2.08E-07	3.00E-07	1.90E-07	4.06E+08	9.02E+04
TESTES	1.56E-07	2.08E-07	6.06E-08	1.90E-07	9.78E+08	2.16E+05
SPLEEN	2.27E-07	1.96E-07	2.04E-07	1.78E-07	6.64E+08	1.47E+05
UTERUS	6.35E-07	2.08E-07	1.77E-07	1.90E-07	4.55E+08	1.00E+05
THYMUS	8.88E-08	2.08E-07	2.58E-07	1.90E-07	5.95E+08	1.31E+05
THYROID	5.47E-08	2.08E-07	9.20E-08	1.90E-07	7.98E+08	1.78E+05
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD						
	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	4.68E-06	6.24E-06	1.82E-06	5.69E-06	2.93E+10	6.48E+06
OVARIES	3.82E-05	6.24E-06	9.01E-06	5.69E-06	1.22E+10	2.71E+06
AVERAGE	2.15E-05	6.24E-06	5.41E-06	5.69E-06	2.08E+10	4.59E+06

CANCER	FATAL CANCER RISK		CONVERSION FACTORS		AIR	GROUND
	INGESTION LOW LET (G)	INGESTION HIGH LET (G)	INHALATION LOW LET (G)	INHALATION HIGH LET (G)	IMMERSSION (H)	SURFACE (I)
R MARROW	1.55E-07	2.37E-05	8.69E-08	1.59E-05	374.	8.37E-02
ENDOST	1.48E-08	8.40E-06	1.01E-08	5.52E-06	37.9	8.46E-03
PULMINARY	4.64E-08	.0	6.92E-06	5.92E-04	440.	9.79E-02
BREAST	8.83E-08	8.30E-08	5.84E-08	7.56E-08	298.	6.62E-02
LIVER	1.42E-07	8.16E-06	9.98E-08	5.35E-06	98.6	2.19E-02
ST WALL	2.01E-07	1.10E-07	7.72E-08	4.84E-08	49.9	1.10E-02
PANCREAS	3.95E-08	2.53E-07	3.00E-08	2.30E-07	56.1	1.24E-02
LLI WALL	1.73E-06	1.47E-06	3.42E-07	2.90E-07	32.4	7.15E-03
KIDNEYS	2.45E-08	1.15E-06	2.98E-08	2.42E-06	21.1	4.68E-03
BL WALL	1.32E-08	3.61E-08	3.54E-09	3.29E-08	18.5	4.09E-03
ULI WALL	7.48E-07	6.09E-07	1.53E-07	1.24E-07	20.3	4.48E-03
SI WALL	1.11E-07	7.93E-08	2.57E-08	1.91E-08	9.63	2.13E-03
OVARIES	2.21E-08	3.61E-08	5.21E-09	3.29E-08	7.04	1.57E-03
TESTES	2.70E-09	3.61E-08	1.05E-09	3.29E-08	17.0	3.75E-03
SPLEEN	3.93E-09	3.40E-08	3.53E-09	3.10E-08	11.5	2.55E-03
UTERUS	1.10E-08	3.61E-08	3.08E-09	3.29E-08	7.89	1.74E-03
THYMUS	1.54E-09	3.61E-08	4.48E-09	3.29E-08	10.3	2.27E-03
THYROID	4.63E-09	1.76E-08	7.79E-09	1.60E-08	67.5	1.51E-02
GENETIC EFFECT RISK CONVERSION FACTORS						
	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	6.44E-12	1.88E-10	1.62E-12	1.71E-10	6.23E+03	1.38E+00

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICOCURIE)
 (B) - (MILLIRAD/YR)/(PERSON MICROCURIE/CC)
 (C) - (MILLIRAD/YR)/(PERSON MICROCURIE/CM**2)
 (D) - (MILLIRAD)/(PERSON PICOCURIE/YR)
 (E) - (MILLIRAD)/(PERSON MICROCURIE/CC)
 (F) - (MILLIRAD)/(PERSON MICROCURIE/CM**2)
 (G) - (DEATHS)/(1E+5 PERSONS PICOCURIE/YR)
 (H) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CC)
 (I) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CM**2)
 (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICOCURIE/YR)
 (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CC)
 (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : BI-212, RESP CLEARANCE CLASS=W, PARTICLE SIZE=1.0 AMAD, FI=0.500E-01

DOSE CONVERSION FACTORS

ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET (A)	HIGH LET (A)	LOW LET (A)	HIGH LET (A)	IMMERSION (B)	SURFACE (C)
R MAR	2.43E-08	3.34E-09	1.25E-08	2.35E-08	1.08E+09	2.00E+05
ENDOST	1.24E-08	9.66E-09	1.00E-08	6.80E-08	1.15E+09	2.14E+05
PUL	1.29E-08	7.98E-10	9.87E-07	1.06E-05	9.78E+08	1.80E+05
MUSCLE	2.08E-08	2.23E-09	1.24E-08	1.57E-08	1.04E+09	1.92E+05
LIVER	2.79E-08	2.15E-09	2.04E-08	1.51E-08	8.85E+08	1.63E+05
S WALL	1.95E-06	1.98E-07	8.49E-08	1.23E-08	9.43E+08	1.74E+05
PANCREAS	9.57E-08	2.23E-09	2.37E-08	1.57E-08	8.64E+08	1.58E+05
LLI WALL	1.72E-07	1.40E-08	8.14E-09	6.06E-09	7.66E+08	1.40E+05
KIDNEYS	7.68E-08	2.51E-07	1.81E-07	1.76E-06	8.75E+08	1.63E+05
BL WALL	2.29E-08	1.51E-09	3.54E-09	1.06E-08	8.89E+08	1.64E+05
ULI WALL	8.74E-07	7.77E-08	3.53E-08	8.24E-09	9.71E+08	1.78E+05
SI WALL	1.23E-06	1.30E-07	4.68E-08	1.00E-08	7.91E+08	1.46E+05
OVARIES	7.08E-08	2.23E-09	6.52E-09	1.57E-08	6.87E+08	1.23E+05
TESTES	8.85E-09	2.23E-09	2.96E-09	1.57E-08	9.14E+08	1.71E+05
SPLEEN	5.77E-08	2.15E-09	2.15E-08	1.51E-08	1.04E+09	1.93E+05
UTERUS	5.72E-08	2.23E-09	6.59E-09	1.57E-08	7.18E+08	1.32E+05
THYMUS	9.85E-09	2.23E-09	3.01E-08	1.57E-08	7.86E+08	1.43E+05
THYROID	5.17E-09	2.23E-09	1.01E-08	1.57E-08	8.81E+08	1.61E+05
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD						
	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	2.65E-07	6.68E-08	8.88E-08	4.70E-07	2.74E+10	5.13E+06
OVARIES	2.12E-06	6.68E-08	1.95E-07	4.70E-07	2.06E+10	3.69E+06
AVERAGE	1.19E-06	6.68E-08	1.42E-07	4.70E-07	2.40E+10	4.41E+06

CANCER	FATAL CANCER RISK		CONVERSION FACTORS		FOR LIFETIME EXPOSURE	
	INGESTION	INGESTION	INHALATION	INHALATION	AIR	GROUND
	LOW LET (G)	HIGH LET (G)	LOW LET (G)	HIGH LET (G)	IMMERSION (H)	SURFACE (I)
R MARROW	7.92E-09	2.18E-08	4.08E-09	1.53E-07	352.	6.51E-02
ENDOST	3.82E-10	2.97E-09	3.09E-10	2.09E-08	35.4	6.59E-03
PULMINARY	7.88E-09	4.86E-09	6.00E-07	6.44E-05	593.	.110
BREAST	8.30E-09	8.89E-10	4.96E-09	6.25E-09	415.	7.66E-02
LIVER	4.36E-09	3.36E-09	3.19E-09	2.36E-08	138.	2.55E-02
ST WALL	1.70E-07	1.72E-07	7.36E-09	1.07E-08	81.8	1.51E-02
PANCREAS	1.16E-08	2.71E-09	2.88E-09	1.90E-08	105.	1.92E-02
LLI WALL	1.19E-08	9.72E-09	5.65E-10	4.21E-09	53.1	9.72E-03
KIDNEYS	2.67E-09	8.69E-08	6.29E-09	6.11E-07	30.4	5.66E-03
BL WALL	7.95E-10	5.25E-10	1.23E-10	3.69E-09	30.8	5.69E-03
ULI WALL	3.03E-08	2.70E-08	1.23E-09	2.86E-09	33.7	6.18E-03
SI WALL	2.13E-08	2.26E-08	8.12E-10	1.74E-09	13.7	2.53E-03
OVARIES	1.23E-09	3.87E-10	1.13E-10	2.72E-09	11.9	2.13E-03
TESTES	1.54E-10	3.87E-10	5.13E-11	2.72E-09	15.9	2.97E-03
SPLEEN	1.00E-09	3.73E-10	3.73E-10	2.62E-09	18.0	3.35E-03
UTERUS	9.93E-10	3.87E-10	1.14E-10	2.72E-09	12.5	2.29E-03
THYMUS	1.71E-10	3.87E-10	5.21E-10	2.72E-09	13.6	2.48E-03
THYROID	4.37E-10	1.89E-10	8.53E-10	1.33E-09	74.6	1.36E-02
GENETIC EFFECT RISK CONVERSION FACTORS						
	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	3.59E-13	2.01E-12	4.26E-14	1.41E-11	7.20E+03	1.32E+00

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICOCURIE)
 (B) - (MILLIRAD/YR)/(PERSON MICROCURIE/CC)
 (C) - (MILLIRAD/YR)/(PERSON MICROCURIE/CM**2)
 (D) - (MILLIRAD)/(PERSON PICOCURIE/YR)
 (E) - (MILLIRAD)/(PERSON MICROCURIE/CC)
 (F) - (MILLIRAD)/(PERSON MICROCURIE/CM**2)
 (G) - (DEATHS)/(1E+5 PERSONS PICOCURIE/YR)
 (H) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CC)
 (I) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CM**2)
 (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICOCURIE/YR)
 (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CC)
 (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CM**2)

TABLE L.1
(CONTINUED)

FOR NUCLIDE : TL-208, RESP CLEARANCE CLASS=W, PARTICLE SIZE=1.0 AMAD, F1=0.950E+00

ORGAN	INGESTION		INHALATION		AIR	GROUND
	LOW LET (A)	HIGH LET (A)	LOW LET (A)	HIGH LET (A)	IMMERSION (B)	SURFACE (C)
R MAR	1.72E-09	.0	1.28E-09	.0	1.90E+10	2.98E+06
ENDOST	1.03E-09	.0	1.03E-09	.0	2.13E+10	3.32E+06
PUL	2.57E-09	.0	5.01E-08	.0	1.91E+10	2.94E+06
MUSCLE	2.23E-09	.0	1.33E-09	.0	2.01E+10	3.10E+06
LIVER	3.22E-09	.0	2.30E-09	.0	1.82E+10	2.79E+06
S WALL	2.45E-07	.0	2.35E-09	.0	1.67E+10	2.60E+06
PANCREAS	2.25E-08	.0	2.32E-09	.0	2.33E+10	3.46E+06
LLI WALL	2.45E-09	.0	1.17E-10	.0	1.66E+10	2.52E+06
KIDNEYS	5.12E-09	.0	1.19E-09	.0	1.61E+10	2.50E+06
BL WALL	8.99E-10	.0	1.55E-10	.0	1.96E+10	2.98E+06
ULI WALL	6.36E-09	.0	5.22E-10	.0	2.20E+10	3.32E+06
SI WALL	1.20E-08	.0	4.18E-10	.0	1.67E+10	2.55E+06
OVARIES	2.10E-09	.0	2.57E-10	.0	1.85E+10	2.72E+06
TESTES	3.71E-10	.0	1.05E-10	.0	1.31E+10	2.13E+06
SPLEEN	1.26E-08	.0	2.18E-09	.0	1.60E+10	2.53E+06
UTERUS	2.24E-09	.0	2.98E-10	.0	1.55E+10	2.36E+06
THYMUS	8.80E-10	.0	3.81E-09	.0	2.26E+10	3.36E+06
THYROID	3.65E-10	.0	1.11E-09	.0	2.25E+10	3.39E+06
GENETICALLY SIGNIFICANT DOSE CONVERSION FACTORS FOR 30 YEAR EXPOSURE PERIOD						
	(D)	(D)	(D)	(D)	(E)	(F)
TESTES	1.11E-08	.0	3.16E-09	.0	3.93E+11	6.39E+07
OVARIES	6.29E-08	.0	7.70E-09	.0	5.55E+11	8.16E+07
AVERAGE	3.70E-08	.0	5.43E-09	.0	4.74E+11	7.28E+07

CANCER	INGESTION		INHALATION		AIR	GROUND
	LOW LET (G)	HIGH LET (G)	LOW LET (G)	HIGH LET (G)	IMMERSION (H)	SURFACE (I)
R MARROW	5.59E-10	.0	4.18E-10	.0	6.18E+03	.970
ENDOST	3.16E-11	.0	3.17E-11	.0	656.	.102
PULMONARY	1.56E-09	.0	3.05E-08	.0	1.16E+04	1.79
BREAST	8.89E-10	.0	5.30E-10	.0	8.02E+03	1.24
LIVER	5.02E-10	.0	3.59E-10	.0	2.84E+03	.436
ST WALL	2.13E-08	.0	2.04E-10	.0	1.45E+03	.226
PANCREAS	2.73E-09	.0	2.82E-10	.0	2.83E+03	.420
LLI WALL	1.70E-10	.0	8.15E-12	.0	1.15E+03	.175
KIDNEYS	1.78E-10	.0	4.12E-11	.0	559.	8.68E-02
BL WALL	3.12E-11	.0	5.39E-12	.0	680.	.103
ULI WALL	2.21E-10	.0	1.81E-11	.0	763.	.115
SI WALL	2.07E-10	.0	7.25E-12	.0	290.	4.42E-02
OVARIES	3.64E-11	.0	4.46E-12	.0	321.	4.72E-02
TESTES	6.44E-12	.0	1.82E-12	.0	227.	3.70E-02
SPLEEN	2.18E-10	.0	3.79E-11	.0	278.	4.39E-02
UTERUS	3.89E-11	.0	5.17E-12	.0	269.	4.09E-02
THYMUS	1.53E-11	.0	6.62E-11	.0	392.	5.83E-02
THYROID	3.09E-11	.0	9.40E-11	.0	1.90E+03	.287
GENETIC EFFECT RISK CONVERSION FACTORS						
	(J)	(J)	(J)	(J)	(K)	(L)
AVERAGE	1.11E-14	0.00E-01	1.64E-15	0.00E-01	1.42E+05	2.18E+01

TABLE OF UNITS

- (A) - 70 YEAR COMMITTED DOSE (MILLIRAD)/(PERSON PICOCURIE)
 (B) - (MILLIRAD/YR)/(PERSON MICROCURIE/CC)
 (C) - (MILLIRAD/YR)/(PERSON MICROCURIE/CM**2)
 (D) - (MILLIRAD)/(PERSON PICOCURIE/YR)
 (E) - (MILLIRAD)/(PERSON MICROCURIE/CC)
 (F) - (MILLIRAD)/(PERSON MICROCURIE/CM**2)
 (G) - (DEATHS)/(1E+5 PERSONS PICOCURIE/YR)
 (H) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CC)
 (I) - (DEATHS)/(1E+5 PERSONS PICOCURIE/CM**2)
 (J) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON PICOCURIE/YR)
 (K) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CC)
 (L) - (GENETIC EFFECTS/LIVE BIRTH)/(PERSON MICROCURIE/CM**2)

Table L.2

ADDITIONAL INPUT DATA USED BY DARTAB IN THE
HEALTH IMPACT ASSESSMENT OF AIRBORNE EMISSIONS

Ground surface correction factor for external dose = 0.50
 Quality factor = 1.0 (low LET) and 20.0 (high LET)
 Genetic effect risk coefficient for genetically significant dose (GSD) =
 300 effects/ 10^6 live birth rad(GSD) (low LET) and
 30000 effects/ 10^6 live birth rad (GSD) (high LET)
 Regional population birth rate = 0.14133E-01 births/yr
 Average lifetime expectancy = 70.7565 years
 Rn-222 decay products risk conversion factor for a lifetime exposure =
 1.69 cancer deaths/person-WL
 Organ dose weighting factors used to determine weighted mean dose equivalent

<u>target organ</u>	<u>weighting factor</u>
red marrow	0.15590
endosteal cells	0.01470
pulmonary	0.29080
muscle	0.19080
liver	0.07460
stomach wall	0.04150
pancreas	0.05810
LLI wall	0.03320
kidneys	0.01660
bladder wall	0.01660
ULI wall	0.01660
SI wall	0.00830
ovaries	0.00830
testes	0.00830
spleen	0.00830
uterus	0.00830
thymus	0.00830
thyroid	0.04050

TABLE L.3. EXAMPLE INPUT DATA FILE FOR DARTAB

```

ACT. AV. SURFACE MINE(ORE SOURCE)-MAX. INDIV. DOSE AND RISK PARAMETERS
&INPUT
  ILOC=0, JLOC=0, PLOC=100., ILET=2*1,
  DTABLE=0, 0, 1, 1, 0, 0, 1,
  RTABLE=0, 0, 1, 1, 0, 0, 1,
  FTABLE=0, 0, 1, 1, 0, 0, 1,
  OUTPUT=F, GSCFAC=0.5,
&END
&ORGAN
  NORGN=18,
  ORGN='R MAR', 'ENDOST', '*PUL*', 'MUSCLE', 'LIVER', 'S WALL',
  'PANCREAS', 'LLI WALL', 'KIDNEYS', 'BL WALL', 'ULI WALL', 'SI WALL',
  'OVARIES', 'TESTES', 'SPLEEN', 'UTERUS', 'THYMUS', 'THYROID',
  TIME=20*70.,
&END
&QFACTR
  LLET=20*1., HLET=20*20.,
&CANCER
  NCANC=18,
  CANC='R MARROW', 'ENDOST', 'PULMINARY', 'BREAST', 'LIVER', 'ST WALL',
  'PANCREAS', 'LLI WALL', 'KIDNEYS', 'BL WALL', 'ULI WALL', 'SI WALL',
  'OVARIES', 'TESTES', 'SPLEEN', 'UTERUS', 'THYMUS', 'THYROID',
  RELABS=20*1.,
&END
&GENTIC
  GENEFF=T, NGEN=3, GEN='TESTES', 'OVARIES', 'AVERAGE',
  GRFAC=200., 2000., REPPER=.014133,
  GLLET=3*1., GHLET=3*20.,
&END
&LOCTBL
  NTLOC=1,
  RNLOC='SUM',
  OGLOC='SUM',
  PTLOC=7,
  FALOC=2,
  HLLOC=1,
  LTABLE=1,
&END
&ORGANF
  NORGB=18,
  ORGB='R MAR', 'ENDOST', '*PUL*', 'MUSCLE', 'LIVER', 'S WALL',
  'PANCREAS', 'LLI WALL', 'KIDNEYS', 'BL WALL', 'ULI WALL', 'SI WALL',
  'OVARIES', 'TESTES', 'SPLEEN', 'UTERUS', 'THYMUS', 'THYROID',
  IPATH=18*5,
  ORGDAT=.1559, .0147, .2908, .1908, .0746, .0415, .0581, .0332, .0166,
  .0166, .0166, .0083, .0083, .0083, .0083, .0083, .0083, .0405,
&END

```

Table L.4 Maximum individual fatal cancer risk for one year of exposure to atmospheric radioactive emissions from model uranium mines

Source	Lifetime fatal cancer risk					Total
	Mining Activities	Ore	Sub-ore	Overburden	Vehicular Dust	
Average Surface Mine						
Particulates & Rn-222	1.6E-7	3.6E-7	1.7E-8	8.4E-8	4.8E-8	6.7E-7
Rn-222 daughters	3.3E-6	7.0E-7	8.3E-7	6.6E-7	0	5.5E-6
Total	3.5E-6	1.1E-6	8.5E-7	7.5E-7	4.8E-8	6.2E-6
Average Large Surface Mine						
Particulates & Rn-222	9.6E-7	1.9E-6	5.9E-8	4.7E-7	2.9E-7	3.7E-6
Rn-222 daughters	1.3E-5	1.3E-6	2.8E-6	2.9E-6	0	1.9E-5
Total	1.4E-5	3.2E-6	2.8E-6	3.4E-6	2.9E-7	2.3E-5
Average Underground Mine						
Particulates & Rn-222	3.1E-8	5.8E-8	6.5E-8	6.3E-10	4.0E-9	1.6E-7
Rn-222 daughters	9.0E-6	2.2E-7	1.8E-6	1.4E-8	0	1.1E-5
Total	9.0E-6	2.8E-7	1.9E-6	1.5E-8	4.0E-9	1.1E-5
Average Large Underground Mine						
Particulates & Rn-222	3.4E-7	6.4E-7	3.7E-7	3.3E-9	8.0E-9	1.4E-6
Rn-222 daughters	1.0E-4	2.0E-6	9.8E-6	7.6E-8	0	1.1E-4
Total	1.0E-4	2.6E-6	1.0E-5	7.9E-8	8.0E-9	1.1E-4
Inactive Surface Mine						
Particulates & Rn-222	0	N.A. (a)	N.A.	5.5E-8 ^(b)	N.A.	5.5E-8
Rn-222 daughters	1.3E-7	N.A.	N.A.	2.9E-7 ^(b)	N.A.	4.2E-7
Total	1.3E-7	N.A.	N.A.	3.4E-7 ^(b)	N.A.	4.7E-7
Inactive Underground Mine						
Particulates & Rn-222	0	N.A.	N.A.	1.5E-8 ^(b)	N.A.	1.5E-8
Rn-222 daughters	2.2E-7	N.A.	N.A.	5.0E-8 ^(b)	N.A.	2.7E-7
Total	2.2E-7	N.A.	N.A.	6.5E-8 ^(b)	N.A.	2.8E-7
In situ Leach Mine						
Particulates & Rn-222	1.6E-6	N.A.	N.A.	N.A.	N.A.	1.6E-6
Rn-222 daughters	1.1E-5	N.A.	N.A.	N.A.	N.A.	1.1E-5
Total	1.3E-5	N.A.	N.A.	N.A.	N.A.	1.3E-5

(a) N.A. - Not applicable.

(b) Consists of waste rock covered over by sub-ore (see Sections 3.7.1.1 and 3.7.2.1).

Table L.5 Fatal cancer risk to an average individual in the regional population for one year of exposure to atmospheric radioactive emissions from model uranium mines

Source	Lifetime fatal cancer risk					Total
	Mining Activities	Ore	Sub-ore	Overburden	Vehicular Dust	
Average Surface Mine						
Particulates & Rn-222	1.9E-10	4.0E-10	2.0E-11	9.1E-11	4.7E-11	7.5E-10
Rn-222 daughters	6.5E-9	1.4E-9	1.6E-9	1.3E-9	0	1.1E-8
Total	6.7E-9	1.8E-9	1.6E-9	1.4E-9	4.7E-11	1.2E-8
Average Large Surface Mine						
Particulates & Rn-222	1.1E-9	1.7E-9	7.0E-11	5.5E-10	2.8E-10	3.7E-9
Rn-222 daughters	2.6E-8	3.1E-9	5.4E-9	6.6E-9	0	4.1E-8
Total	2.7E-8	4.8E-9	5.5E-9	7.1E-9	2.8E-10	4.5E-8
Average Underground Mine						
Particulates & Rn-222	9.7E-11	7.8E-11	9.8E-11	9.2E-13	6.5E-12	2.8E-10
Rn-222 daughters	4.0E-8	1.0E-9	8.0E-9	6.6E-11	0	4.9E-8
Total	4.0E-8	1.1E-9	8.1E-9	6.7E-11	6.5E-12	4.9E-8
Average Large Underground Mine						
Particulates & Rn-222	1.1E-9	8.6E-10	5.6E-10	4.9E-12	1.3E-11	2.5E-9
Rn-222 daughters	4.5E-7	9.0E-9	4.4E-8	3.4E-10	0	5.0E-7
Total	4.5E-7	9.9E-9	4.5E-8	3.4E-10	1.3E-11	5.0E-7
Inactive Surface Mine						
Particulates & Rn-222	0	N.A. (a)	N.A.	6.4E-11 ^(b)	N.A.	6.4E-11
Rn-222 daughters	2.6E-10	N.A.	N.A.	5.7E-10 ^(b)	N.A.	8.3E-10
Total	2.6E-10	N.A.	N.A.	6.3E-10 ^(b)	N.A.	8.9E-10
Inactive Underground Mine						
Particulates & Rn-222	0	N.A.	N.A.	2.0E-11 ^(b)	N.A.	2.0E-11
Rn-222 daughters	9.9E-10	N.A.	N.A.	2.2E-10 ^(b)	N.A.	1.2E-9
Total	9.9E-10	N.A.	N.A.	2.4E-10 ^(b)	N.A.	1.2E-9
In situ Leach Mine						
Particulates & Rn-222	8.7E-10	N.A.	N.A.	N.A.	N.A.	8.7E-10
Rn-222 daughters	2.1E-8	N.A.	N.A.	N.A.	N.A.	2.1E-8
Total	2.2E-8	N.A.	N.A.	N.A.	N.A.	2.2E-8

(a) N.A. - not applicable.

(b) Consists of waste rock covered over by sub-ore (see Sections 3.7.1.1 and 3.7.2.1).

Table L.6 Fatal cancer risk to the population for one year of exposure to atmospheric radioactive emissions from model uranium mines

Source	Estimated fatal cancers					Total
	Mining Activities	Ore	Sub-ore	Overburden	Vehicular Dust	
Average Surface Mine						
Particulates & Rn-222	2.6E-6	5.7E-6	2.8E-7	1.3E-6	6.8E-7	1.1E-5
Rn-222 daughters	9.3E-5	2.0E-5	2.3E-5	1.9E-5	0	1.6E-4
Total	9.5E-5	2.6E-5	2.4E-5	2.0E-5	6.8E-7	1.7E-4
Average Large Surface Mine						
Particulates & Rn-222	1.6E-5	2.5E-5	1.0E-6	7.9E-6	4.0E-6	5.4E-5
Rn-222 daughters	3.7E-4	4.5E-5	7.7E-5	9.4E-5	0	5.9E-4
Total	3.9E-4	7.0E-5	7.8E-5	1.0E-4	4.0E-6	6.4E-4
Average Underground Mine						
Particulates & Rn-222	3.5E-6	2.8E-6	3.5E-6	3.3E-8	2.3E-7	1.0E-5
Rn-222 daughters	1.4E-3	3.6E-5	2.9E-4	2.4E-6	0	1.7E-3
Total	1.4E-3	3.9E-5	2.9E-4	2.4E-6	2.3E-7	1.7E-3
Average Large Underground Mine						
Particulates & Rn-222	3.8E-5	3.1E-5	2.0E-5	1.8E-7	4.6E-7	9.0E-5
Rn-222 daughters	1.6E-2	3.2E-4	1.6E-3	1.2E-5	0	1.8E-2
Total	1.6E-2	3.5E-4	1.6E-3	1.2E-5	4.6E-7	1.8E-2
Inactive Surface Mine						
Particulates & Rn-222	0	N.A. (a)	N.A.	9.1E-7 ^(b)	N.A.	9.1E-7
Rn-222 daughters	3.8E-6	N.A.	N.A.	8.1E-6 ^(b)	N.A.	1.2E-5
Total	3.8E-6	N.A.	N.A.	9.0E-6 ^(b)	N.A.	1.3E-5
Inactive Underground Mine						
Particulates & Rn-222	0	N.A.	N.A.	7.4E-7 ^(b)	N.A.	7.4E-7
Rn-222 daughters	3.6E-5	N.A.	N.A.	8.0E-6 ^(b)	N.A.	4.4E-5
Total	3.6E-5	N.A.	N.A.	8.7E-6 ^(b)	N.A.	4.5E-5
In situ Leach Mine						
Particulates & Rn-222	1.2E-5	N.A.	N.A.	N.A.	N.A.	1.2E-5
Rn-222 daughters	3.0E-4	N.A.	N.A.	N.A.	N.A.	3.0E-4
Total	3.1E-4	N.A.	N.A.	N.A.	N.A.	3.1E-4

(a) N.A. - Not applicable.

(b) Consists of waste rock covered over by sub-ore (see Sections 3.7.1.1 and 3.7.2.1).

Table L.7 Genetic effect risk to descendants of maximum exposed individual for one year of parental exposure to atmospheric radioactive particulate and Rn-222 emissions from model uranium mines

Source	Genetic risk (effects/birth)					Total
	Mining Activities	Ore	Sub-ore	Overburden	Vehicular Dust	
Average Surface Mine	1.5E-7	3.4E-7	1.5E-8	8.0E-8	4.4E-8	6.3E-7
Average Large Surface Mine	9.2E-7	2.0E-6	5.2E-8	4.5E-7	2.6E-7	3.7E-6
Average Underground Mine	1.3E-8	5.7E-8	6.2E-8	5.8E-10	3.6E-9	1.4E-7
Average Large Underground Mine	1.4E-7	6.3E-7	3.4E-7	3.2E-9	7.2E-9	1.1E-6
Inactive Surface Mine	3.9E-13	N.A. (a)	N.A.	6.0E-8 ^(b)	N.A.	6.0E-8
Inactive Underground Mine	6.3E-13	N.A.	N.A.	1.6E-8 ^(b)	N.A.	1.6E-8
In situ Leach Mine	8.0E-9	N.A.	N.A.	N.A.	N.A.	8.0E-9

(a) N.A. - Not applicable.

(b) Consists of waste rock covered over by sub-ore (see Sections 3.7.1.1 and 3.7.2.1).

Table L.8 Genetic effect risk to descendants of average individual of the population for one year of parental exposure to atmospheric radioactive particulate and Rn-222 emissions from model uranium mines

Source	Genetic risk (effects/birth)					Total
	Mining Activities	Ore	Sub-ore	Overburden	Vehicular Dust	
Average Surface Mine	6.2E-10	1.4E-9	6.0E-11	3.3E-10	1.6E-10	2.6E-9
Average Large Surface Mine	3.8E-9	6.3E-9	2.1E-10	2.0E-9	9.6E-10	1.3E-8
Average Underground Mine	2.7E-11	1.2E-10	1.3E-10	1.2E-12	9.3E-12	2.9E-10
Average Large Underground Mine	3.0E-10	1.3E-9	7.4E-10	6.4E-12	1.8E-11	2.4E-9
Inactive Surface Mine	7.5E-16	N.A. ^(a)	N.A.	2.4E-10 ^(b)	N.A.	2.4E-10
Inactive Underground Mine	2.8E-15	N.A.	N.A.	3.4E-11 ^(b)	N.A.	3.4E-11
In situ Leach Mine	2.7E-11	N.A.	N.A.	N.A.	N.A.	2.7E-11

(a) N.A. - Not applicable.

(b) Consists of waste rock covered over by sub-ore (see Sections 3.7.1.1 and 3.7.2.1).

Table L.9 Genetic effect risk to descendants of the regional population for one year of parental exposure to atmospheric radioactive particulates and Rn-222 emissions from model uranium mines

Source	Genetic risk (effects/yr)					Total
	Mining Activities	Ore	Sub-ore	Overburden	Vehicular Dust	
Average Surface Mine	3.8E-6	8.6E-6	3.6E-7	2.0E-6	9.9E-7	1.6E-5
Average Large Surface Mine	2.2E-5	3.8E-5	1.3E-6	1.2E-5	5.8E-6	7.9E-5
Average Underground Mine	4.2E-7	1.8E-6	2.0E-6	1.8E-8	1.4E-7	4.4E-6
Average Large Underground Mine	4.5E-6	2.0E-5	1.1E-5	9.9E-8	2.8E-7	3.6E-5
Inactive Surface Mine	4.5E-12	N.A. (a)	N.A.	1.4E-6 ^(b)	N.A.	1.4E-6
Inactive Underground Mine	4.3E-11	N.A.	N.A.	5.0E-7 ^(b)	N.A.	5.0E-7
In situ Leach Mine	1.6E-7	N.A.	N.A.	N.A.	N.A.	1.6E-7

(a) N.A. - Not applicable.

(b) Consists of waste rock covered over by sub-ore (see Sections 3.7.1.1 and 3.7.2.1).

L.3 References

- Be80 Begovich, C.L., Eckerman, K.F., Schlatter, E.C. and Ohr, S.Y., 1980, "DARTAB: A Program to Combine Airborne Radionuclide Environmental Exposure Data with Dosimetric and Health Effects Data to Generate Tabulations of Predicted Impacts," ORNL-5692 (Draft).
- Du80 Dunning, D.E. Jr., Leggett, R.W. and Yalcintas, M.G., 1980, "A Combined Methodology for Estimating Dose Rates and Health Effects from Exposure to Radioactive Pollutants," ORNL/TM-7105.
- Ge78 George, A.C. and Breslin, A.J., 1978, "The Distribution of Ambient Radon and Radon Daughters in Residential Buildings in the New Jersey - New York Area," presented at the symposium on the Natural Radiation Environment III, Houston, Texas, April 23-28.
- Mo79 Moore, R.E., Baes, C.F. III, McDowell-Boyer, L.M., Watson, A.P., Hoffman, F.O., Pleasant, J.C., and Miller, C.W., 1979, "AIRDOS-EPA: A Computerized Methodology for Estimating Environmental Concentrations and Dose to Man from Airborne Releases of Radionuclides," U.S. Environmental Protection Agency Rept., EPA 520/1-79-009 (Reprint of ORNL-5532).
- UN77 United Nations, 1977, "Sources and Effects of Ionizing Radiations: UNSCEAR 1977 Report", United Nations Scientific Committee on the Effects of Atomic Radiation, 1977 report to the General Assembly, with annexes, United Nations Publication Sales No. E.77.IX.1.