Dr. 1759-L

List of DOE Radioisotope Customers with Summary of Radioisotope Shipments, FY 1982

Margaret P. Richards

August 1983

Prepared for
Office of Health and Environmental Research
Office of Energy Research, ER-73
U.S. Department of Energy
under Contract DE-AC06-76RL0 1830

Pacific Northwest Laboratory
Operated for the U.S. Department of Energy
by Battelle Memorial Institute

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SUMMARY OF RADIOISOTOPE SHIPMENTS, FY 1982

Margaret P. Richards

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Pacific Northwest Laboratory
Richland, Washington 99352

MASTER

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Larry E. Williams
Authorizing Official
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Argonne National Laboratory
Brookhaven National Laboratory
Hanford Engineering Development Laboratory
Idaho Operations Office/EG & Idaho, Inc.
Los Alamos Scientific Laboratory
Oak Ridge National Laboratory
Pacific Northwest Laboratory
Savannah River Plant/DOE
UNC Nuclear Industries, Inc.

PREVIOUS REPORTS

Previous reports in this series are:

TID-2160 (FY 1964)	ORNL-IIC-32 (FY 1970)	BNWL-2147 (FY 1976)
ORNL-IIC-6 (FY 1965)	ORNL-IIC-38 (FY 1971)	PNL-2572 (FY 1977)
ORNL-IIC-9 (FY 1966)	BNWL-1774 (FY 1972)	PNL-2930 (FY 1978)
ORNL-IIC-13 (FY 1967)	BNWL-1824 (FY 1973)	PNL-3274 (FY 1979)
ORNL-IIC-17 (FY 1968)	BNWL-1902 (FY 1974)	PNL-3839 (FY 1980)
ORNL-IIC-27 (FY 1969)	BNWL-1993 (FY 1975)	PNL-4177 (FY 1981)

Similar reports covering DOE's stable isotopes distribution programs have also been prepared and are available from the National Technical Information Center, U.S. Department of Commerce, 5285 Port Royal Rd, Springfield, VA 22161.

"Stable Isotope Sales: Mound Facility Customer and Shipment Summary, FY 1979, MLM-2718, FY 1980", MLM-2843.

Stable Isotope Customer List and Summary of Shipments, FY 1979, ORNL/TM-7214, FY 1980, ORNL/TM-7764, FY 1981, ORNL/TM-8302, FY 1982", ORNL/TM-8704.

SUMMARY

This edition of the radioisotope customer list was prepared at the request of the Office of Health and Environmental Research (ER-73), Office of Energy Research, Department of Energy (DOE). This document lists DOE's radioisotope production and distribution activities by its facilities at Argonne National Laboratory; Pacific Northwest Laboratory; Brookhaven National Laboratory; Harford Engineering Development Laboratory; Idaho Operations Office; Los Alamos Scientific Laboratory; Oak Ridge National Laboratory; Savannah River Laboratory; and UNC Nuclear Industries, Inc.

The information is divided into five sections:

1. Isotope Suppliers, Facility, Contacts and Isotopes or Services Supplied. Section 1 lists suppliers of isotopes supplied, and the contact person for each DOE facility. If a reader needs more specific information that is not supplied in this report about isotope sales or shipments for a particular facility, he or she should contact the person listed for that facility.
2. Alphabetical List of Customers, and Isotopes Purchased. Section 2 is an alphabetical list of domestic and foreign customers and their addresses. Each customer has a customer number. This number is used to cross-reference data in the other sections of the report. Isotope purchases are listed after each customer's address, and the laboratory supplying each isotope is indicated by a letter abbreviation set off by parentheses.
3. Alphabetical List of Isotopes Cross-Referenced to Customer Numbers. Section 3 alphabetically lists isotopes and cross-references them to customer numbers. This section provides a quick idea of the number of customers purchasing a particular isotope.
4. Geographical Location of Radioisotope Customers. Section 4 is an alphabetical list of states and foreign countries that is cross-referenced to customer numbers and indicates the geographical concentration of isotope users.
5. Radioisotope Sales and Transfers-FY 1982. Section 5 summarizes the FY-1982 radioisotope shipment activities of the DOE laboratory facilities listed in Section 1. A table alphabetically lists the isotopes and their suppliers. Data on shipments, quantities, and dollar values of each isotope are listed under domestic, foreign, and project (DOE facilities) categories.

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LIST OF ACRONYMS

The following abbreviations are used in this listing:

Cyclotron Service Irradiations	CSI	Natural Uranium	NU
Depleted Uranium	DU	Oak Ridge National Laboratory	
Encapsulation	Cap	Reactor Service Irradiations	RSI
Enriched Uranium	EU	Withdrawn radioisotopes prepared under special approval	RW
Fission Products	FP	Special Services	SS
Miscellaneous Compound Preparations	MCP	Targets	Tgs

1. ISOTOPE SUPPLIER, FACILITY CONTACT, AND
ISOTOPES OR SERVICES SUPPLIED

1. ISOTOPE SUPPLIER, FACILITY CONTACT, AND ISOTOPES OR SERVICES SUPPLIED

Isotope Supplier	Supplier Code	Facility Contact	Isotopes or Service
Argonne National Laboratory	(A)	R. C. Damm Special Materials Division Argonne National Laboratory 9700 S. Cass Ave. Argonne, IL 60439 FTS 972-6770 Commercial (312) 972-6770	CSI - No processed isotopes sold in FY82
Brookhaven National Laboratory	(B)	P. Colsmann Isotopes and Special Materials Group Brookhaven National Laboratory Upton, Long Island, NY 11973 FTS 666-4058 Commercial (516) 282-4058	²¹¹ At, ¹⁹⁵ Au, ⁷⁷ Br, ¹⁰⁹ Cd, ¹⁸ F, ⁵² Fe, ⁶⁸ Ge, ¹²³ I, ²⁸ Mg, ²⁴ Na, ¹⁰⁹ Pd, ⁹⁷ Ru, ⁸² Sr, ¹¹⁷ Sn, ⁸⁸ Y, ¹²⁷ Xe
Hanford Engineering Development Laboratory	(H)	W. R. Brooksher, Manager Safeguards and Security H.E.D.L. P.O. Box 1970 Richland, WA 99352 FTS 444-3548 Commercial (509) 942-3548	No Isotopes Produced in FY82
Idaho Operations Office	(I)	R. E. Korenke EG&G Idaho, Inc. P.O. Box 1625 Idaho Falls, ID 83415 FTS 583-1439 Commercial (208) 526-1439	RSI-No processed isotopes sold in FY82
Los Alamos Scientific Laboratory	(L)	Mrs. Karen E. Peterson Group INC-3, Mail Stop J514 University of California Los Alamos National Laboratory Los Alamos, NM 87545 FTS 843-4675 Commercial (505) 667-4675	⁷⁷ Br, ¹⁰⁹ Cd, ⁶⁷ Cu, ⁵² Fe, ⁶⁸ Ge, ¹⁷² Hf, ¹⁷² Lu, ²² Na, ⁸³ Rb, ⁸² Sr, ¹⁶⁷ Tm, ⁴⁸ V, ¹²⁷ Xe, ⁸⁸ Y

Isotope Supplier	Supplier Code	Facility Contact	Isotopes or Service
Oak Ridge National Laboratory	(O)	C. M. Carpenter Isotope Sales Oak Ridge National Laboratory P.O. Box X Oak Ridge, TN 37830 FTS 624-6984 Commercial (615) 575-6984	241 Am, 243 Am, 37 Ar, 249 Bk, 14 C, 48 Ca, 249 Cf, 248 Cm, 252 Cf, 243 Cm, 244 Cm, 253 Es, 60 Co, 137 Cs, 129 I, 192 Ir, 153 Gd, 3 H, 28 I, 63 Ni, 85 Kr, MCP, 33 Mg, 147 Pm, 250 Pu, 237 Np, 238 Pu, 239 Pu, 242 Pu, 244 Pu, 103 Ru, 151 Sm, 106 Ru, RW, 99 Se, 99 Tc, 233 U, 89 Sr, 229 Sr, 230 Th, 236 U, 238 U, TGS, 234 U, 235 U, 236 U, 238 U, 127 Xe, 95 Zr
Pacific Northwest Laboratory	(P)	J. V. Filsinger Safety and Materials Management Pacific Northwest Laboratory P.O. Box 999 Richland, WA 99352 Commercial (509) FTS 375-2051	DU, EU, Not produced at PNL
Savannah River Plant	(S)	C. C. Halsted Technical and Production Division Department of Energy P.O. Box A Aiken, SC 29801 FTS 239-2217 Commercial (803) 725-6211 Extension 2217	252 Cf
UNC Nuclear industries, Inc.	(U)	C. L. Smith, Manager UNC Nuclear Industries, Inc. P.O. Box 490 Technology Section Operation Division Richland, WA 99352 FTS 444-1519 Commercial (509) 373-4909	60 Co, 97 Ru, 170 Tm All produced from reactor service irradiations

2. ALPHABETICAL LIST OF CUSTOMERS, SUPPLIERS, AND
ISOTOPES PURCHASED

2. ALPHABETICAL LIST OF CUSTOMERS, SUPPLIERS AND ISOTOPES PURCHASED

The letter following each isotope or service entry is the supplier code listed in Section 1.

DOMESTIC CUSTOMERS

1 Acme Equipment Corporation
3728 Lexington Avenue
Madison, Wisconsin 53714

$^{85}\text{Kr}(\text{O})$ | 7 Analytics Incorporated
P.O. Box 27565
Atlanta, Georgia 30327

$^{127}\text{Xe}(\text{B}^*)$ |
| 2 Aerojet Nuclear Company
550 Second Street
P.O. Box 1845
Idaho Falls, Idaho 83401

$^{252}\text{Cf}(\text{O})$, $^{237}\text{Np}(\text{O})$,
$^{103}\text{Ru}(\text{O})$, $^{75}\text{Se}(\text{O})$, $\text{SS}(\text{O})$,
$^{95}\text{Zr}(\text{O})$ | 8 Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439

$^{249}\text{Bk}(\text{O})$, $^{243}\text{Cm}(\text{O})$, $^{248}\text{Cm}(\text{O})$,
$^{253}\text{Es}(\text{O})$, $^{52}\text{Fe}(\text{B})$, $^{237}\text{Np}(\text{O})$,
$^{236}\text{Pu}(\text{O})$, $\text{TGS}(\text{O})$, $^{230}\text{Th}(\text{O})$,
$^{238}\text{U}(\text{O})$, $^{95}\text{Zr}(\text{O})$ |
| 3 AIRCO Inc.
Central Research Laboratories
Murray Hill, New Jersey 07974

$^{85}\text{Kr}(\text{O})$ | 9 Atlantic Richfield Hanford Company
P.O. Box 769
Richland, Washington 99352

$^{95}\text{Zr}(\text{O})$ |
| 4 Albert Einstein College of
Medicine
Rose F. Kennedy Center
1410 Pelham Parkway South
Bronx, NY 10461

$\text{RSI}(\text{B})$ | 10 Automation Industries, Inc.
P.O. Box 245'
Phoenixville, Pennsylvania 19460

$^{192}\text{Ir}(\text{O})$ |
| 5 Amersham Corporation
Arlington Heights, Illinois 60005

$^{153}\text{Gd}(\text{O})$, $^{192}\text{Ir}(\text{O})$, $^{85}\text{Kr}(\text{O})$ | 11 Babcock Electronics Corporation
P.O. Box 1499
Costa Mesa, California 92626

$^{85}\text{Kr}(\text{O})$ |
| 6 Analog Devices Semiconductor
829 Woburn Street
Wilmington, Massachusetts 01887

$^{85}\text{Kr}(\text{O})$ | 12 Babcock and Wilcox Company
Research and Development Division
1562 Beeson Street
Alliance, Ohio 44601

$^{236}\text{Pu}(\text{O})$ |

- 13 Battelle Pacific Northwest Laboratories
P.O. Box 999
Richland, Washington 99352
 $^{244}\text{Cm}(0)$, $^{85}\text{Kr}(0)$, $^{97}\text{Ru}(U)$,
 $\text{TGS}(0)$, $^{230}\text{Th}(0)$, $^{170}\text{Tm}(U)$,
 $^{95}\text{Zr}(0)$
- 14 Bell Telephone Laboratories
Murray Hill, New Jersey 07971
 $\text{CSI}(0)$, $\text{MCP}(0)$, $\text{SS}(0)$
- 15 Bendix Corporation, The
2000 East Bannister Road
Kansas City, Missouri 64131
 $^{147}\text{Pm}(0)$, $\text{SS}(0)$
- 16 Bendix Field Engineering Corporation
P.O. Box 1569
Grand Junction, CO 81501
 $^{229}\text{Th}(0)$
- 17 Best Industries, Incorporated
P.O. Box 681
Washington, D.C. 20041
 $^{137}\text{Cs}(0)$, $\text{MCP}(0)$
- 18 Boston College
Chestnut Hill, Massachusetts 02167
 $^{99}\text{Tc}(0)$
- 19 Brookhaven National Laboratory
Upton, Long Island, New York 11973
 $^{77}\text{Br}(L)$, $^{68}\text{Ge}(L)$, $^3\text{H}(0)$,
 $^{103}\text{Ru}(0)$, $^{127}\text{Xe}(L)$
- 20 Bulova Systems and Instruments Corporation
P.O. Box 185
Valley Stream, New York 11582
 $\text{RSI}(B)$
- 21 Burroughs Corporation
460 Sierra Madre Villa
Pasadena, California 91109
 $^{85}\text{Kr}(0)$
- 22 Burroughs Corporation
16701 W. Bernardo Drive
San Diego, California 92127
 $^{85}\text{Kr}(0)$
- 23 California State University
Department of Chemistry
Fullerton, California 92624
 $^{67}\text{Cu}(L)$
- 24 California State University
Northridge, California 91330
 $^{48}\text{v}(L)$
- 25 Case Western Reserve University
2220 Circle Drive
Cleveland, Ohio 44106
 $^{28}\text{Mg}(B^*)$
- 26 Chevron Research Company
Richmond, California 94802
 $^{172}\text{Hf}(L)$, $^{85}\text{Kr}(0)$, $^{172}\text{Lu}(L)$
- 27 Columbia University
630 West 168 Street
New York, New York 10032
 $^{109}\text{Pd}(B)$, $^{88}\text{Y}(B)$
- 28 Columbia University Medical School
Neurological Institute
710 W. 168th Street
New York, New York 10032
 $^{18}\text{F}(B)$

- 29 Combustion Engineering, Inc.
Box 400
Windsor, Connecticut 06095
 $^{237}\text{Np}(0)$, TGS(0)
- 30 Continental Oil Company
Research and Development
Department
P.O. Box 1267
Ponca City, Oklahoma 74601
 $^{89}\text{Sr}(0)$, $^{230}\text{Th}(0)$, $^{235}\text{U}(0)$
- 31 Cornell University
Purchasing
120 Maple Avenue
Ithaca, New York 14850
 $^{47}\text{Ca}(0)$, $^{28}\text{Mg}(B^*)$
- 32 Creighton University
2410 California
Omaha, Nebraska 68131
 $^{47}\text{Ca}(0)$
- 33 Cryogenic Rare Gas Laboratories,
Inc.
730 South 13th Street
Newark, New Jersey 07103
 $^{85}\text{Kr}(0)$
- 34 Cyclotron Corporation
950 Gilman Street
Berkeley, California 94710
 $^3\text{H}(0)$
- 35 DCA Reliability Laboratory
975 Benicia Avenue
Sunnyvale, California 94086
 $^{85}\text{Kr}(0)$
- 36 E. I. du Pont de Nemours
Company, Inc.
Savannah River Plant
Aiken, South Carolina 29801
 $^{252}\text{Cf}(0)$, $^{243}\text{Cm}(0)$, SS(0),
 $^{237}\text{Np}(0)$, $^{236}\text{Pu}(0)$
- 37 E. A. D. Metallurgical, Inc.
71 Pearce Avenue
Tonawanda, New York 14150
 $^{241}\text{Am}(0)$, Cap(0)
- 38 EG & Idaho, Inc.
P.O. Box 1625
Idaho Falls, Idaho 83415
RSI(I)
- 39 E. M. R. Photo Electric
Div. of Weston Instruments
P.O. Box 44
Princeton, New Jersey 08540
 $^3\text{H}(0)$
- 40 Exxon Nuclear Company, Inc.
P.O. Box 130
Richland, Washington 99352
 $^{238}\text{U}(0)$
- 41 Fairchild Semiconductor
P.O. Box 790
Mountain View, California 94040
 $^{85}\text{Kr}(0)$
- 42 Florida Power Corporation
Purchasing Department
St. Petersburg, Florida 33733
 $^{243}\text{Am}(0)$

- 43 Florida State University
Tallahassee, Florida 32306
 ^{147}Pm , ^{230}Th , $^{235}\text{U}(0)$
- 44 Gamma Industries, Inc.
P.O. Box 2543
Baton Rouge, Louisiana 70821
 $^{192}\text{Ir}(0)$
- 45 General Dynamics Corporation
Electric Boat Division
Groton, CT 06340
 $\text{RSI}(B)$
- 46 General Electric Company
Lynchburg, Virginia 24502
 $^{85}\text{Kr}(0)$
- 47 General Electric Company
P.O. Box 254
San Jose, California 95103
 $\text{CAP}(0)$, $\text{MCP}(0)$, $\text{SS}(0)$, $^{234}\text{U}(0)$
- 48 General Electric Company
175 Curtner Avenue
San Jose, California 95125
 $\text{U}^{235}(0)$
- 49 General Electric Company
Vallecitos Nuclear Company
Vallecitos Road
Pleasanton, California 94566
 $\text{RSI}(I)$, $^{252}\text{Cf}(S)$
- 50 General Electric Company
General Electric Drive
Waynesboro, Virginia 22980
 $^{85}\text{Kr}(0)$
- 51 General Nucleonics Division,
TYCO Laboratories
2811 Metropolitan Place
Pomona, California 91767
 $^{85}\text{Kr}(0)$
- 52 George Washington University
23 I Street NW.
Washington, D.C. 20037
 $^{123}\text{I}(B)$
- 53 Georgia Institute of Technology
Nuclear Research Center
900 Atlantic Drive NW.
Atlanta, Georgia 30332
 $^{127}\text{Xe}(B^*)$
- 54 Gollob Analytical Service
Corporation
47 Industrial Road
Berkeley Heights, New Jersey 07922
 $^{14}\text{C}(0)$, $^3\text{H}(0)$, $^{85}\text{Kr}(0)$
- 55 Gulf Energy and Environmental
Systems
P.O. Box 608
San Diego, California 92112
 $^3\text{H}(0)$
- 56 Gulf Nuclear Incorporated
202 Medical Center
Webster, Texas 77598
 $^{241}\text{Am}(0)$, $\text{Cap}(0)$, $^{137}\text{Cs}(0)$,
 $^{153}\text{Gd}(0)$, $^{192}\text{Ir}(0)$, $\text{MCP}(0)$,
 $\text{TGS}(0)$
- 57 Harvard Medical School
Shields Warren Laboratory
Boston, Massachusetts 02115
 $^{211}\text{At}(B)$, $^{18}\text{F}(B)$, $^{28}\text{Mg}(B^*)$,
 $^{97}\text{Ru}(B)$, $^{117}\text{Sn}(B)$

- 58 Harvard University
Biology Lab
16 Divinity Avenue
Cambridge, Massachusetts 02138
 $^{28}\text{Mg}(\text{B}^*)$
- 59 Hughes Aircraft Company
P.O. Box 92907
Los Angeles, California 90009
 $^{85}\text{Kr}(\text{O})$
- 60 I C I America, Inc.
Atlas Aerospace Division
Valley Forge, Pennsylvania 19481
 $^{85}\text{Kr}(\text{O})$
- 61 I C N N B Co.
26201 Miles Road
Cleveland, Ohio 44128
 $\text{CSI}(\text{O}), ^3\text{H}(\text{O}), ^{33}\text{P}(\text{O}),$
 $^{147}\text{Pm}(\text{O}), ^{106}\text{Ru}(\text{O}),$
 $^{75}\text{Se}(\text{O}), ^{90}\text{Sr}(\text{O}), ^{99}\text{Tc}(\text{O})$
- 62 Industrial Nuclear Company
1124 Chess Drive
Forest City, California 94404
 $^{192}\text{Ir}(\text{O})$
- 63 Iowa State University
Ames, Iowa 50010
 $^{239}\text{Pu}(\text{O}), ^{240}\text{Pu}(\text{O}),$
 $^{242}\text{Pu}(\text{O}), ^{95}\text{Zr}(\text{O})$
- 64 Isomedix Inc.
P.O. Box 177
25 Eastmans Road
Parsippany, New Jersey 07054
 $^{137}\text{Cs}(\text{O}), \text{MCP}(\text{O})$
- 65 Isotope Products Laboratories
404 South Luke Street
Burbank, California 91502
 $^{109}\text{Cd}(\text{B}^*), ^{252}\text{Cf}(\text{O}),$
 $^{137}\text{Cs}(\text{O}), \text{CSI}(\text{O}), ^{153}\text{Gd}(\text{O}),$
 $^{85}\text{Kr}(\text{O}), \text{MCP}(\text{O}), ^{237}\text{Np}(\text{O}),$
 $^{147}\text{Pm}(\text{O}), ^{208}\text{Po}(\text{B}),$
 $^{236}\text{Pu}(\text{O}), ^{106}\text{Ru}(\text{O}), ^{234}\text{U}(\text{O}),$
 $^{90}\text{Sr}(\text{O}), ^{230}\text{Th}(\text{O}), ^{235}\text{U}(\text{O}),$
 $^{127}\text{Xe}(\text{B}^*), ^{95}\text{Zr}(\text{O})$
- 66 Isovac Engineering Company
6220 San Fernando Road
Glendale, California 92104
 $^{85}\text{Kr}(\text{O})$
- 67 Jewish Hospital of St. Louis
216 S. Kingshighway Boulevard
St. Louis, Missouri 63110
 $^{47}\text{Ca}(\text{O})$
- 68 John Hopkins Medical Institute
Division of Nuclear Medicine
622 N. Washington Street
Baltimore, Maryland 21205
 $^{77}\text{Br}(\text{B}), ^{77}\text{Br}(\text{L}), ^{123}\text{I}(\text{B}),$
 $^{82}\text{Sr}(\text{L})$
- 69 Kaman Nuclear
1700 Garden of the Gods Roads
Colorado Springs, Colorado 80907
 $^3\text{H}(\text{O})$
- 70 Lamont-Doherty Geological
Observatory
Palisades, New York 10964
 $^{236}\text{U}(\text{O})$

- 71 Los Angeles County USC Med. Center
1200 N. State Street
Box 112 G.H.
Los Angeles, California 90033
 $^{47}\text{Ca}(0)$
- 72 Los Alamos Scientific Laboratory
CNC-11, PIS-824
P.O. Box 1663
Los Alamos, NM 87545
 $^{68}\text{Ge}(\text{B}^*)$
- 73 Lovelace Clinic
4800 Gibson Boulevard, S.E.
Albuquerque, New Mexico 87108
 $^{243}\text{Cm}(0)$, $\text{MCP}(0)$, $^{147}\text{Pm}(0)$,
 $\text{TGS}(0)$
- 74 Lovelace Biomedical and
Environmental Research
Institute
P.O. Box 5890
Albuquerque, New Mexico 87108
 $^{235}\text{U}(0)$
- 75 Loyola University Medical Center
2160 So. First Avenue
Maywood, Illinois 60153
 $\text{CSI}(\text{A})$
- 76 Mallinckrodt Chemical Works
3600 N. Second Street
St. Louis, Missouri 63160
 $\text{CSI}(0)$, $^{75}\text{Se}(0)$, $\text{SS}(0)$
- 77 Mallinckrodt Nuclear
P.O. Box 5840
St. Louis, Missouri 63134
 $^{127}\text{Xe}(\text{B}^*)$
- 78 Marubeni America Corporation
14 Henderson Drive
West Caldwell, New Jersey 07006
 $^{233}\text{U}(0)$
- 79 Massachusetts General Hospital
Boston, Massachusetts 02114
 $^{47}\text{Ca}(0)$, $^{18}\text{F}(\text{B})$, $^{68}\text{Ge}(\text{L})$,
 $^{82}\text{Sr}(\text{L})$, $^{123}\text{I}(0)$
- 80 Massachusetts Institute of
Technology
Box 69
Cambridge, Massachusetts 02139
 $^{230}\text{Th}(0)$
- 81 Mayo Foundation
Rochester, Minnesota 55901
 $^{47}\text{Ca}(0)$, $^{127}\text{Xe}(\text{B}^*)$
- 82 Measurex Corporation
10475 Imperial Avenue
Cupertino, California 95014
 $^{85}\text{Kr}(0)$
- 83 Medical College of Georgia
Talmadge Memorial Hospital
Augusta, Georgia 30902
 $^{47}\text{Ca}(0)$
- 84 Methodist Hospital
1604 W. Capitol
Indianapolis, Indiana 46202
 $^{127}\text{Xe}(\text{B}^*)$
- 85 Michael Reese Hospital
29th Street and Ellis Avenue
Chicago, Illinois 60616
 $^{47}\text{Ca}(0)$

- 86 Microtest Systems, Incorporated
1188 Bordeaux Drive
Sunnyvale, California 94086
 $^{85}\text{Kr}(0)$
- 87 Midwest Research Institute
425 Volker
Kansas City, Missouri 64110
 $^{14}\text{C}(0)$
- 88 Minnesota Mining Manufacturing Co.
P.O. Box 3121
St. Paul, Minnesota 53101
 $^{137}\text{Cs}(0)$, $\text{MCP}(0)$, $^{95}\text{Nb}(0)$,
 $^{95}(0)$
- 89 Mobil Research and Development
Corporation
Paulsboro Laboratory
Paulsboro, New Jersey 08066
 $^{235}\text{U}(0)$
- 90 Monolithic Memories Incorporated
1165 East Argue Avenue
Sunnyvale, California 94086
 $^{85}\text{Kr}(0)$
- 91 Monsanto Research Corporation
Dayton Laboratory
151 Nicholas Road
Dayton, Ohio 45407
 $^{241}\text{Am}(0)$, $\text{Cap}(0)$, $^{252}\text{Cf}(S)$
- 92 Moravek Biochemicals Inc.
577 Mercury Lane
Brea, California 92621
 $^3\text{H}(0)$
- 93 Motorola Inc.
5005 East McDowell Road
Phoenix, Arizona 85008
 $^{85}\text{Kr}(0)$
- 94 Motorola, Inc.
3501 Ed Bluestein Boulevard
Austin, Texas 7821
 $^{85}\text{Kr}(0)$
- 95 Mount Sinai Hospital
Fifth Avenue and 100th Street
New York, New York 10029
 $\text{MCP}(0)$, $^{82}\text{Sr}(L)$
- 96 National Semiconductor Corporation
2900 Semiconductor Drive
Santa Clara, California 95051
 $^{85}\text{Kr}(0)$
- 97 Neutron Products, Inc.
P.O. Box 68
Bickerson, Maryland 20573
 $^{60}\text{Co}(0)$
- 98 New England Medical Center
Boston, Massachusetts 02111
 $^{77}\text{Br}(L)$
- 99 New England Nuclear Corporation
575 Albany Street
Boston, Massachusetts 02118
 $\text{CSI}(0)$, $^3\text{H}(0)$, $^{129}\text{I}(0)$,
 $^{85}\text{Kr}(0)$, $\text{MCP}(0)$, $^{95}\text{Nb}(0)$,
 $^{63}\text{Ni}(0)$, $^{33}\text{P}(0)$, $^{103}\text{Ru}(0)$,
 $^{89}\text{Sr}(0)$, $^{90}\text{Sr}(0)$, $\text{SS}(0)$,
 $^{99}\text{Tc}(0)$, $^{95}\text{Zr}(0)$
- 100 New England Nuclear Corporation
Radiopharmaceutical Div.
601 Treble Cove Road
Billerica, Massachusetts 01862
 $^{195}\text{Au}(B)$, $^{109}\text{Cd}(B^*)$, $^{82}\text{Sr}(B)$,
 $^{68}\text{Ge}(B^*)$, $^{22}\text{Na}(L)$, $^{88}\text{Y}(L)$

<p>101 New Jersey College of Medicine
and Den.
100 Bergen Street
Newark, New Jersey 07103</p> <p>MCP(0)</p> <p>102 New Mexico Institute of Mining
and Tech.
Socorro, New Mexico 87801</p> <p>$^{234}\text{U}(0)$</p> <p>103 New York State Department of
Health
Division of Labs and Res.
Empire State Plaza
Albany, NY 12201</p> <p>RSI(B)</p> <p>104 New York University Medical Center
550 First Avenue
New York, New York 10016</p> <p>$^{243}\text{Am}(0)$, ^{237}Np</p> <p>105 North Carolina Baptist Hospital
Nuclear Medicine
300 S. Hawthorne
Winston-Salem, North Carolina 27103</p> <p>$^{127}\text{Xe}(B^*)$</p> <p>106 North Carolina Memorial Hospital
NCNB Plaza, 6th Floor
Chapel Hill, North Carolina 27514</p> <p>$^{127}\text{Xe}(B^*)$</p> <p>107 Nuclear Radiation Development,
Inc.
2937 Alt Blvd
Grand Island, New York 14072</p> <p>$^{241}\text{Am}(0)$, Cap(0), $^3\text{H}(0)$</p> | <p>108 Nuclear Research Corporation
2 Richwood Place
Denville, New Jersey 07834</p> <p>$^{239}\text{Pu}(0)$</p> <p>109 Nuclear Sources and Services
P.O. Box 14023
Houston, Texas 77021</p> <p>$^{241}\text{Am}(0)$, Cap(0), $^{85}\text{Kr}(0)$</p> <p>110 Oak Ridge Associated Universities
P.O. Box 117
Oak Ridge, Tennessee 37830</p> <p>$^{241}\text{Am}(0)$, Cap(0), CSI(0),
$^{68}\text{Ge}(L)$, SS(0)</p> <p>111 Oak Ridge National Laboratory
Receiving
Oak Ridge, TN 37830</p> <p>$^{123}\text{I}(B)$</p> <p>112 Ohio State University
Research Foundation
1314 Kinnear Road
Columbus, Ohio 43212</p> <p>$^{89}\text{Sr}(0)$</p> <p>113 Ohio University
Athens, Ohio 45701</p> <p>$^3\text{H}(0)$</p> <p>114 Old Dominion University Research
Foundation
P.O. Box 6369
Norfolk, Virginia 23508-0369</p> <p>$^{236}\text{U}(0)$</p> |
|---|---|

<p>115 Parkland Hospital
Nuclear Medicine Department
5201 Harry Hines Blvd.
Dallas, TX 75235
$^{127}\text{Xe}(\text{B}^*)$</p> <p>116 Potter and Brumfield
Princeton, Indiana 47570
$^{85}\text{Kr}(\text{O})$</p> <p>117 Radian Corporation
8500 Shoal Creek
Austin, Texas 78766
$^{237}\text{Np}(\text{O})$</p> <p>118 Radium Chemical Company, Inc.
161 East 42nd Street
New York, New York 10036
$^3\text{H}(\text{O})$</p> <p>119 Raytheon Company
350 Ellis Street
Mountain View, California 94042
$^{85}\text{Kr}(\text{O})$</p> <p>120 Raytheon Company
350 Lowell Street
West Ardover, Massachusetts 01810
$^{85}\text{Kr}(\text{O})$</p> <p>121 Reactor Experiments, Inc.
963 Terminal Way
San Carlos, California 94070
$\text{NU}(\text{O}), \text{TGS}(\text{O})$</p> <p>122 Rensselaer Polytechnic Institute
110 8th Street
Troy, New York 12181
$\text{RSI}(\text{B})$</p> | <p>123 Reuter Stokes Electronics
Components
18530 South Miles Parkway
Warrensville Heights
Cleveland, Ohio 44128
$^{234}\text{U}(\text{O}), ^{235}\text{U}(\text{O})$</p> <p>124 Rockwell International
Autonetics
Anaheim, California 92803
$^{85}\text{Kr}(\text{O})$</p> <p>125 Rush Presbyterian - St. Luke's
Medical Center
Nuclear Medicine
1753 W. Congress Parkway
Chicago, Illinois 60612
$^{52}\text{Fe}(\text{B}^*)$</p> <p>126 Saint Jude Hospital
Children's Research Hospital
333 North Lauderdale
Memphis, Tennessee 38101
$\text{MCP}(\text{O})$</p> <p>127 Sandia Corporation
P.O. Box 5800
Albuquerque, New Mexico 87115
$^{252}\text{Cf}(\text{O}), \text{SS}(\text{O})$</p> <p>128 Science Applications
3 Choke Cherry Road
Rockville, Maryland 20850
$^{85}\text{Kr}(\text{O}), ^{95}\text{Nb}(\text{O})$</p> <p>129 Self Powered Lighting, LTd.
8 Westchester Plaza
Elmsford, New York 10523
$^3\text{H}(\text{O})$</p> |
|--|--|

<p>130 J. L. Shepherd and Associates
1614 Victory Boulevard
Glendale, California 91201

$^{137}\text{Cs}(0)$, MCP(0)</p> <p>131 Signetics Corporation
1275 South 800 East
Orem, Utah 84057

$^{85}\text{Kr}(0)$</p> <p>132 Signetics Incorporated
811 East Argue Avenue
Synnyvale, California 94086

$^{85}\text{Kr}(0)$</p> <p>133 Sloan Ketterng Cancer Center
Central Isotope Lab
1275 York Avenue
New York, New York 10032

$^{24}\text{Na}(B)$, $^{82}\text{Sr}(L)$</p> <p>134 Source Production and Equipment
Co., Inc.
625 Oxley Street
Kenner, Louisiana 70062

$^{192}\text{Ir}(0)$</p> <p>135 Southern California University of
University Park
Los Angeles, California 90007

MCP(0)</p> <p>136 E. R. Squibb and Sons
New Brunswick, New Jersey 08903

$^{82}\text{Sr}(L)$</p> <p>137 State University of New York
at Stony Brook
Department of Earth Sciences
Stony Brook, New York 11794

RSI(8)</p> | <p>138 State University of New York
at Stony Brook
University Hospital
Stony Brook, New York 11794

$^{117}\text{Sn}(B)$, $^{127}\text{Xe}(B^*)$</p> <p>139 Syracuse University
150 Marshall Street
Syracuse, New York 13210

MCP(0)</p> <p>140 Technical Operations
South Avenue
Burlington, Massachusetts 01803

$^{192}\text{Ir}(0)$, SS(0)</p> <p>141 Teledyne Isotopes
Nuclear Systems Division
110 W. Timonium Road
Timonium, Maryland 21093

MCP(0), $^{90}\text{Sr}(0)$</p> <p>142 Teledyne Isotopes
123 Woodland Avenue
Westwood, New Jersey 07675

$^{89}\text{Sr}(0)$</p> <p>143 Tennessee Valley Authority
Central Accounting Office
Knoxville, Tennessee 37902

MCP(0)</p> <p>144 Texas A M University
P.O. Box 44
College Station, Texas 77843

TGS(0), $^{230}\text{Th}(0)$, $^{238}\text{U}(0)$</p> <p>145 Texas Instruments, Inc.
Science Services Division
P.O. Box 5012, Mail Stop 6
Dallas, Texas 75222

$^{85}\text{Kr}(0)$</p> |
|--|--|

146 TII Industries, Incorporated
P.O. Box 433
Toa Alta, Puerto Rico 00758

$^{85}\text{Kr}(0)$

147 Trio Tech International
2040 W. Lincoln Street
Burbank, California 91504

$^{85}\text{Kr}(0)$

148 UNC Nuclear Industries
P.O. Box 490
Richland, Washington 99352

$^{60}\text{Co}(U)$

149 Union Carbide Corporation Nuclear
Division
Oak Ridge Gaseous Diffusion Plant
P.O. Box P
Oak Ridge, Tennessee 37830

$\text{CAP}(0)$, $\text{TGS}(0)$, $^{233}\text{U}(0)$

150 Union Carbide Corporation Nuclear
Division
Oak Ridge National Laboratory
P.O. Box X
Oak Ridge, Tennessee 37830

$^{241}\text{Am}(0)$, $^{241}\text{Am}(S)$,
 $^{243}\text{Am}(0)$, $^{252}\text{Cf}(0)$,
 $^{244}\text{Cm}(B)$, $^{244}\text{Cm}(0)$,
 $^{137}\text{Cs}(0)$, $\text{CSI}(0)$, $^3\text{H}(0)$,
 $^{129}\text{I}(0)$, $^{85}\text{Kr}(0)$, $\text{MCP}(0)$,
 $^{237}\text{Np}(0)$, $^{236}\text{Pu}(0)$,
 $^{238}\text{Pu}(0)$, $^{239}\text{Pu}(0)$,
 $^{240}\text{Pu}(0)$, $^{241}\text{Pu}(0)$,
 $^{242}\text{Pu}(0)$, $^{244}\text{Pu}(0)$,
 $^{103}\text{Ru}(0)$, $^{89}\text{Sr}(0)$, $^{90}\text{Sr}(0)$,
 $\text{SS}(0)$, $^{99}\text{Tc}(0)$, $\text{Tgs}(0)$,
 $^{233}\text{U}(0)$, $^{234}\text{U}(0)$, $^{235}\text{U}(0)$,
 $^{236}\text{U}(0)$, $^{238}\text{U}(0)$

151 Union Carbide Corporation
Nuclear Division
Y 12 Plant
P.O. Box Y
Oak Ridge, Tennessee 37830

$\text{CSI}(0)$, $^{153}\text{Gd}(0)$, $^{192}\text{Ir}(0)$,
 $^{147}\text{Pm}(0)$, $^{236}\text{Pu}(0)$, $\text{SS}(0)$,
 $^{234}\text{U}(0)$

152 Unit Process Assemblies, Inc.
53 15 37th Avenue
Woodside, New York 11377

$^{90}\text{Sr}(0)$

153 United States Army
Armed Forces Radiobiology Research
Institute
Defense Nuclear Agency
Bethesda, Maryland 20014

$^{89}\text{Sr}(0)$

154 United States Department of Energy
New Brunswick Laboratory
9800 South Cass Avenue
Argonne, Illinois 60439

$^{239}\text{Pu}(0)$, $^{242}\text{Pu}(0)$, $\text{TGS}(0)$

155 United States Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

$^{236}\text{Pu}(0)$

156 United States Department of
Interior
Geology Survey
Bldg. 21, Denver Federal Center
Denver, Colorado 80225

$^{239}\text{Pu}(0)$

- 157 United States Environmental
Protection Agency
EERF 1890 Federal Drive
Montgomery, Alabama 36193
 $^{83}\text{Rb}(\text{L})$
- 158 United States National Aeronautics
and ~~Ames~~ Research Center
Moffet Field, California 94035
 $\text{MCP}(\text{O})$
- 159 United States National Aeronautics
and Space Administration
Manned Spacecraft Center
Houston, Texas 77058
 $^{47}\text{Ca}(\text{O})$, $\text{RSI}(\text{B})$
- 160 United States National Bureau of
Standards
Connecticut Avenue and Van Ness St.
N.W.
Washington, D.C. 20234
 $^{243}\text{Am}(\text{O})$, $^{230}\text{Th}(\text{O})$
- 161 United States National Bureau of
Standards
Rec. Room, Bldg. 301
Route 270 Quince Orchard Road
Gaithersburg, Maryland 20760
 $^{127}\text{Xe}(\text{B}^*)$
- 162 United States National Institute
of Health
Neurosurgery Branch
Bldg. 10, Room 11N242
Bethesda, Maryland 20014
 $^{18}\text{F}(\text{B})$
- 163 United States National Institute
of Health
Bldg. 21
Bethesda, Maryland 20014
 $^{82}\text{Sr}(\text{L})$, $^{52}\text{Fe}(\text{B})$, $^{127}\text{Xe}(\text{B}^*)$
- 164 United States Navy
National Naval Medical Center
Bethesda, Maryland 20014
 $^{127}\text{Xe}(\text{B}^*)$
- 165 United States Navy
Naval Regional Medical Center
8750 Mountain Boulevard and
Building 505
Oakland, California 94627
 $^{127}\text{Xe}(\text{B}^*)$
- 166 United States Public Health
Service
National Institutes of Health
Isotope Laboratory
Building 21
Bethesda, Maryland 20014
 $\text{CSI}(\text{O})$, $\text{MCP}(\text{O})$, $^{127}\text{Xe}(\text{B}^*)$
- 167 United States Public Health
Service
P.O. Box 61
Montgomery, Alabama 36101
 $^{236}\text{Pu}(\text{O})$, $^{233}\text{U}(\text{O})$
- 168 United States Radium Corporation
4150 Old Berwick Road
P.O. Box 380
Bloomsburg, Pennsylvania 17815
 $^3\text{H}(\text{O})$
- 169 Unitrode Corporation
580 Pleasant Street
Watertown, Massachusetts 01970
 $^{85}\text{Kr}(\text{O})$
- 170 University of Alabama
Medical Center
1919 Seventh Avenue, South
Birmingham, Alabama 35486
 $^{99}\text{Tc}(\text{O})$

- 171 University of Arkansas
Business Manager's Office
Purchasing Section
321 Admin. Bldg.
Fayetteville, Arkansas 72701
 $\text{TGS}(0)$, $^{229}\text{Th}(0)$, $^{238}\text{U}(0)$
- 172 University of California
Davis, California 95616
 $^{85}\text{Kr}(0)$
- 173 University of California
405 Hilgard Avenue
Los Angeles, California 90024
 $^{47}\text{Ca}(0)$, $\text{MCP}(0)$
- 174 University of California
Lawrence Berkeley Laboratory
Berkeley, California 94701
 $^{243}\text{Cm}(0)$, $^{82}\text{Sr}(L)$, $^{235}\text{U}(0)$,
 $^{236}\text{U}(0)$
- 175 University of California
Lawrence Livermore Laboratory
Box 808
Livermore, California 94550
 $^{241}\text{Am}(0)$, $^{249}\text{Bk}(0)$, $\text{CaP}(0)$,
 $^{249}\text{Cf}(0)$, $^{252}\text{Cf}(0)$, $^3\text{H}(0)$,
 $^{241}\text{Pu}(0)$, $\text{SS}(0)$, $\text{TGS}(0)$,
 $^{230}\text{Th}(0)$, $^{167}\text{Tm}(L)$, $^{238}\text{U}(0)$
- 176 University of California
Los Alamos Scientific Laboratory
P.O. Box 1663
Los Alamos, New Mexico 87545
 $^{243}\text{Am}(0)$, $\text{CaP}(0)$, $^{249}\text{Cf}(0)$,
 $^{236}\text{Pu}(0)$, $^{238}\text{Pu}(S)$,
 $^{240}\text{Pu}(0)$, $^{151}\text{Sm}(0)$, $\text{SS}(0)$,
 $\text{TGS}(0)$
- 177 University of California at Davis
Sacramento, California 95817
 $^{77}\text{Br}(L)$, $^{67}\text{Cu}(L)$
- 178 University of California
Parnassus Avenue
San Francisco, California 94143
 $^{47}\text{Ca}(0)$
- 179 University of Chicago
Office of the Comptroller
1525 E. Hyde Park Boulevard
Chicago, Illinois 60615
 $^{47}\text{Ca}(0)$, $^{89}\text{Sr}(0)$, $^{127}\text{Xe}(8^*)$
- 180 University of Chicago
Physical Science Department
5641 S. Ingleside Avenue
Chicago, Illinois 60637
 $^{68}\text{Ge}(L)$
- 181 University of Chicago
Radiation Protection Service
5835 S. Ellis Avenue
Chicago, IL 60637
 $^{127}\text{Xe}(8^*)$
- 182 University of Connecticut
U-114
Central Warehouse
Storrs, Connecticut 06268
 $^{28}\text{Mg}(8^*)$
- 183 University of Kansas Medical
Center
Kansas City, Kansas 66103
 $^{77}\text{Br}(L)$
- 184 University of Kentucky Medical
School
800 Rose Street
Lexington, Kentucky 40506
 $\text{CSI}(0)$, $^{77}\text{Br}(L)$
- 185 University of Massachusetts
Amherst, Massachusetts 01003
 $^{77}\text{Br}(L)$

- 186 University of Miami
P.O. Box 8066
Coral Gables, Florida 33146
 $^{236}\text{Pu}(0)$
- 187 University of Michigan
University Bldg. 1061 North
Ann Arbor, Michigan 48101
 $^{68}\text{Ge}(L)$
- 138 University of Missouri
Columbia, Missouri 65201
 $\text{MCP}(0)$
- 189 University of Nebraska Medical
Center
Division of Nuclear Medicine
42 Dewey Avenue
Omaha, Nebraska 68101
 $^{52}\text{Fe}(L)$
- 190 University of New Mexico
Medical Department
Albuquerque, New Mexico 87131
 $^{77}\text{Br}(L)$, $^{65}\text{Cu}(L)$
- 191 University of Oklahoma
Purchasing Department
Health Sciences Center/
Nuclear Pharmacy
Service Center Building
Oklahoma City, Oklahoma 73190
 $^{75}\text{Se}(0)$
- 192 University of Pennsylvania
Hospital
Radiology Department
3400 Spruce Street
Philadelphia, Pennsylvania 19104
 $^{18}\text{F}(B)$
- 193 University of Rochester Medical
Center
Health Physics
575 Elwood Avenue
Rochester, New York 14642
 $\text{RSI}(B)$
- 194 University of Texas Medical School
6431 Fannin
Houston, Texas 77025
 $^{82}\text{Sr}(L)$
- 195 University of Texas
Nuclear Medicine Division
Galveston, Texas 77550
 $^{127}\text{Xe}(B^*)$
- 196 University of Texas at Dallas
P.O. Box 30365
Dallas, Texas 75230
 $^{47}\text{Ca}(0)$, $^{89}\text{Sr}(0)$
- 197 University of Virginia
Radiation Safety Officer
RWMF, 124 11th Street, S.W.
Charlottesville, Virginia 22903
 $^{127}\text{Xe}(B^*)$
- 198 University of Wisconsin
750 University Avenue
Madison, Wisconsin 53706
 $^3\text{H}(0)$, $^{28}\text{Mg}(B^*)$, $^{68}\text{Ge}(L)$
- 199 U.S. Testing Company, Inc.
2800 George Washington Way
Richland, Washington 99352
 $\text{SS}(0)$

- 200 Veteran's Administration Medical Center
Chief Supply Service
2411 Old Spanish Trail
Houston, TX 77211
 $^{127}\text{Xe}(\text{B}^*)$
- 201 Veteran's Administration Medical Center
Nuclear Medicine, Building 5
3495 Bailey Avenue
Buffalo, NY 14215
 $^{123}\text{I}(\text{B})$
- 202 Veteran's Administration
San Diego, California 92161
 $^{172}\text{Lu}(\text{L})$, $^{88}\text{Y}(\text{L})$
- 203 Veteran's Administration
Calm 361
Data Processing Center
1615 Woodward Street East
Austin, Texas 78772
 $^{47}\text{Ca}(\text{O})$, $^{127}\text{Xe}(\text{B}^*)$
- 204 Veterans Administration Hospital
Chief, Supply Service
Bldg. 1, Room 6137
Hines, Illinois 60141
 $^{28}\text{Mg}(\text{B}^*)$
- 205 Veteran's Administration Hospital
Chief, Supply Service
11201 Benton Street
Loma Linda, California 92357
 $^{127}\text{Xe}(\text{B}^*)$
- 206 Veteran's Administration Hospital
Northport, New York 11768
 $^{127}\text{Xe}(\text{B}^*)$
- 207 Veteran's Administration Hospital
Chief of Supply
1440 V.F.W. Parkway
West Roxbury, Massachusetts 02132
 $^{127}\text{Xe}(\text{B}^*)$
- 208 Veteran's Administration Hospital
Nuclear Medicine
1400 V.F.W. Parkway
West Roxbury, Massachusetts 02132
 $^{127}\text{Xe}(\text{B}^*)$
- 209 Washington University
499 S. Euclid
St. Louis, Missouri 63110
 $^{77}\text{Br}(\text{L})$, $^{68}\text{Ge}(\text{L})$, $^{85}\text{Kr}(\text{O})$,
 $^{89}\text{Sr}(\text{O})$, $^{123}\text{I}(\text{B})$
- 210 Western Electric Company, Inc.
P.O. Box 1409
Lawrence, Massachusetts 01842
 $^{85}\text{Kr}(\text{O})$
- 211 Western Electric Company, Inc.
777 North Blue Parkway
Lee's Summit, Missouri 64063
 $^{85}\text{Kr}(\text{O})$
- 212 Westinghouse Electric Corporation
Research and Development Center
Beulah Road, Churchill Borough
Pittsburgh, Pennsylvania 15235
 $^{85}\text{Kr}(\text{O})$
- 213 Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352
 $^{237}\text{Np}(\text{O})$, $^{239}\text{Pu}(\text{O})$, $\text{TGS}(\text{O})$

214 Westinghouse Electric Corporation
Westinghouse Circle
Horseheads, New York 14845

$^{235}\text{U}(0)$, $^{238}\text{U}(0)$

215 William Beaumont Hospital
Nuclear Medical Department
3601 West 13 Mile Road
Royal Oaks, Michigan 48072

$^{127}\text{Xe}(B^*)$

216 Zilog, Incorporated
10460 Burbank Road
Cupertino, California 95014

$^{85}\text{Kr}(0)$

FOREIGN COUNTRIES

Australia

- 217 Australian Atomic Energy
Commission
Research Establishment
Lucas Heights, NSW
AUSTRALIA
 $^{237}\text{Np}(0)$, $^{127}\text{Xe}(B^*)$
- 218 Embassy of Australia
1601 Massachusetts Avenue, N.W.
Washington, D.C. 20036
 $^{237}\text{Np}(0)$

Austria

- 219 International Atomic Energy Agency
Kaerntnerring 11 13
A 1010 Vienna, AUSTRIA
 $^{241}\text{Am}(0)$, $\text{Tgs}(0)$

Belgium

- 220 IRE, Institut National des
Radioelement
Avenue Eugene Plasky, 144
1040 Brussels, BELGIUM
 $^{129}\text{I}(0)$

Canada

- 221 Acute Care Hospital
Department of Medicine
2211 Westbrook Mall
Vancouver, British Columbia
CANADA
 $^{28}\text{Mg}(B^*)$
- 222 Atomic Energy of Canada Limited
Chalk River, Ontario, CANADA
 $\text{TGS}(0)$, $^{230}\text{Th}(0)$, $\text{RSI}(I)$,
 $^{238}\text{U}(0)$

- 223 Atomic Energy of Canada, Ltd.
Whiteshell Nuclear Research
Establishment
Pinawa, Manitoba, CANADA
 $^{244}\text{Cm}(0)$, $^{237}\text{Np}(0)$, $\text{TGS}(0)$
- 224 Atomic Energy of Canada, Ltd.
P.O. Box 6300
Postal Station J
Ottawa, CANADA
 $^{137}\text{Cs}(0)$, $\text{MCP}(0)$, $^{127}\text{Xe}(B^*)$
- 225 Atomic Energy of Canada Limited
4004 Wesbrook Mall
Vancouver, B.C. VET 2A8
CANADA
 $^{109}\text{Cd}(L)$
- 226 Atomic Energy of Canada, Ltd.
4004 Westbrook Mall
Vancouver, British Columbia
CANADA
 $^{127}\text{Xe}(B^*)$
- 227 Ontario Hydro
700 University Avenue
Toronto, Ontario
CANADA
 $^{238}\text{U}(0)$
- 228 McMaster University Medical Center
Forsyth Avenue Receiving
Hamilton, Ontario
CANADA
 $^3\text{H}(0)$, $^{99}\text{Tc}(0)$, $^{127}\text{Xe}(B^*)$
- 229 Scarborough General Hospital
Nuclear Medicine
3050 Lawrence Avenue
Scarborough, Ontario
CANADA
 $^{127}\text{Xe}(B^*)$

- 230 University Hospital
Nuclear Medicine Department
339 Windermere Road
London, Ontario
CANADA
 $^{99}\text{Tc}(0)$
- 231 University of Alberta
Edmonton, Alberta
CANADA
 $^3\text{H}(0)$
- 232 University of British Columbia
Vancouver 8, British Columbia
CANADA
 $^{28}\text{Mg}(\text{B}^*)$
- 233 University of Ottawa
Department of Anatomy
Ottawa, Ontario K1H8M5
CANADA
 $^{28}\text{Mg}(\text{B}^*)$
- 234 University of Saskatoon
Saskatchewan
CANADA
 $^3\text{H}(0)$

Denmark

- 235 Atomic Energy Commission
Research Establishment Riso
Isotope Division
Roskilde
DENMARK
 $^{244}\text{Cm}(0)$, $^{237}\text{Np}(0)$,
 $^{239}\text{Pu}(0)$, $^{242}\text{Pu}(0)$
- 236 Isotope Pharmacy
378 Frederiksbundsvej
Broenshoej
DENMARK
 $^{127}\text{Xe}(\text{B}^*)$

Federal Republic of Germany

- 237 Buchler and Company
Frankfurter Str. 294
Braunschweig,
FEDERAL REPUBLIC OF GERMANY
 $^{129}\text{I}(0)$
- 238 EURATOM Transuranium Institute
P.O. Box 452
75 Karlsruhe,
FEDERAL REPUBLIC OF GERMANY
 $^{230}\text{Th}(0)$
- 239 Freie Universitat Berlin
Fachbereich Physik
F820, WE1A
Boltzmannstrasse 20
1000 Berlin 33
P. West
FEDERAL REPUBLIC OF GERMANY
 $^{129}\text{I}(0)$, MCP(0)
- 240 Gesellschaft Fur Kernforschung
Mbh
Institute Fuer Angewandte
Reaktor Physik
Weverstrasse 5
75 Karlsruhe
FEDERAL REPUBLIC OF GERMANY
 $^{236}\text{Pu}(0)$
- 241 Institute fur Metallforschung-
Metallphy
Technische Universitat Berlin
1 Berlin 15 Joachimstaler
Str - 31/32
FEDERAL REPUBLIC OF GERMANY
MCP (0)
- 242 Kernforschung Sanlage
Postfach 365
517 Julich
FEDERAL REPUBLIC OF GERMANY
 $^{99}\text{Tc}(0)$

243 Munchen, Technischen Hochschule
Arcistrasse 21
8 Munchen 2
FEDERAL REPUBLIC OF GERMANY

$^{243}\text{Am}(0)$, $^{240}\text{Pu}(0)$, TGS(0)

244 Physikalisch-Technische
Bundesanstalt
FEDERAL REPUBLIC OF GERMANY

$^{252}\text{Cf}(S)$

245 University of Bremen
Zentraler Einkauf
280 Bremen
FEDERAL REPUBLIC OF GERMANY

$^{127}\text{Xe}(B^*)$

246 W. Maier Komm. Ges
722 Schwenningen a.N.
Postfach (P.O. B.-126)
West
FEDERAL REPUBLIC OF GERMANY

$^{147}\text{Pm}(0)$

France

247 Bureau the Recharches Geologiques
DT. Minieres
B.P. 6009
F45060 Orleans, Cedex
FRANCE

$^{235}\text{U}(0)$

248 CEA
Department Des Radioelements
B.P. No. 2
91190 Gif Sur Yvette
FRANCE

$^{144}\text{Ce}(0)$, $^{106}\text{Ru}(0)$,
 $^{230}\text{Th}(0)$, $^{95}\text{Zr}(0)$

249 Centre d' Etudes Nuclearies
de Sontenay-Aux-Roses
92260 Sontenay-Aux-Roses
FRANCE

$^{252}\text{Cf}(S)$

Great Britain

250 Amersham International Limited
White Lion Road Amersham
Buckinghamshire England
H P7 9 LL
GREAT BRITAIN

$^{22}\text{Na}(L)$, $^{127}\text{Xe}(B^*)$

251 Brandhust Co. Ltd
Wellington Road
High Wycombe, Bucks
H P 12 3 P S England
GREAT BRITAIN

$^3\text{H}(0)$

252 British Embassy
3100 Massachusetts, Avenue, N.W.
Washington, D.C. 20008

SS(0)

253 Hammersmith Hospital
Ducane Road
London, W. 12, England
GREAT BRITAIN

$^{68}\text{Ge}(L)$, $^{82}\text{Sr}(L)$

254 Radiochemical Centre
White Lion Road
Amersham, Bucks England
GREAT BRITAIN

$^{244}\text{Cm}(0)$, $^{137}\text{Cs}(0)$, $^{55}\text{Fe}(0)$,
 $^3\text{H}(0)$, $^{129}\text{I}(0)$, MCP(0),
 $^{95}\text{Nb}(0)$, $^{147}\text{Pm}(0)$, $^{106}\text{Ru}(0)$,
 $^{151}\text{Sm}(0)$, $^{99}\text{Tc}(0)$, TGS(0),
 $^{95}\text{Zr}(0)$

255 Saunders Roe Developments, Ltd.
North Hyde Road
Hayes, Middlesex, England
GREAT BRITAIN

$^3\text{H}(0)$

256 United Kingdom Atomic Energy
Establishment
Harwell, Didcot, Berkshire
England
GREAT BRITAIN

$^{241}\text{Pu}(0)$, $^{235}\text{U}(0)$, $^{238}\text{U}(0)$

257 United Kingdom Treasury and Supply
25 Broadway
New York, New York 10004

$^{99}\text{Tc}(0)$

258 University of Edinburgh
Royal Infirmary
c/o James Dooley AF Ltd.
London, England
GREAT BRITAIN

$^{127}\text{Xe}(B^*)$

Hong Kong

259 Semi-Conductor Devices, Ltd.
59-61 Wong Chuk Hang Road
Aberden, HONG KONG

$^{85}\text{Kr}(0)$

Israel

260 Embassy of Israel
1621-22nd Street, NW.
Washington, D.C. 20008

$^3\text{H}(0)$

Japan

261 Mitsubishi International
Corporation
277 Park Avenue
New York, New York 10017

$\text{SS}(0)$, $^{235}\text{U}(0)$

262 Tohoku University
Department of Physics
Katahira Z Chrome
Sendai
JAPAN

$\text{RSI}(B)$

Korea

263 Korea Atomic Energy Research
Institute
P.O. Box 7, Cheong Fyang
Seoul
KOREA

CAP , $^{238}\text{Pu}(0)$, $^{242}\text{Pu}(0)$,
 $^{233}\text{U}(0)$

264 Korea Institute of Energy and
Resources
Seoul
KOREA

$^{235}\text{U}(0)$

265 Korea Research Institute of
Geoscience and Mineral Resources
Seoul
KOREA

$^{230}\text{Th}(0)$

The Netherlands

266 Interuniversity Reactor Institute
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262Y JB Delft
THE NETHERLANDS

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267 N. V. Philips Duphar
P.O. Box 2
Weesp
THE NETHERLANDS

$^{103}\text{Ru}(0)$

268 State University of Groningen
Westersingel 34
Groningen
THE NETHERLANDS

$^{106}\text{Ru}(0)$

Norway

269 Institute for Atomic Energy
Isotope Laboratories
N-2007
Kjeller
NORWAY

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274 Eidg. Technische Hochschule
8049 Zurich
SWITZERLAND

$^{230}\text{Th}(0)$, $^{233}\text{U}(0)$, $^{234}\text{U}(0)$,
 $^{235}\text{U}(0)$

275 Merz and Bentelli AG
Bumplizstrasse 91
3018 Bern
SWITZERLAND

$^3\text{H}(0)$, $\text{MCP}(0)$, $^{147}\text{Pm}(0)$

276 Schweizerisches Institut für
Nuklearforschung
Neunbrunnenstrasse 85,
8050 Zurich, Switzerland

$^3\text{H}(0)$

Union of South Africa

277 J. A. Ewing and McDonald, Inc.
51 Madison Avenue
New York, New York 10010

$^{99}\text{Tc}(0)$

3. ALPHABETICAL LIST OF ISOTOPES CROSS-REFERENCED
TO CUSTOMER NUMBER

3. ALPHABETICAL LIST OF ISOTOPES CROSS-REFERENCED TO CUSTOMER NUMBER

Americium (Am) 241	Cesium (Cs) 137
37, 56, 91, 107, 109, 110, 150, 175, 219	17, 56, 64, 88, 130, 150, 224
Americium (Am) 243	Cobalt (Co) 60
42, 104, 150, 160, 176, 243	97, 148
Astatine (At) 211	Copper (Cu) 65
57	190
Berkelium (Bk) 249	Copper (Cu) 67
8, 175	23
Bromine (Br) 77	Curium (Cm) 243
19, 68, 98, 177, 183, 184, 185, 190, 209	8, 36, 73, 174
Cadmium (Cd) 109	Curium (Cm) 244
65, 100, 225	13, 150, 223, 235
Calcium (Ca) 47	Curium (Cm) 248
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Californium (Cf) 252	Ensteinium (Es) 253
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Carbon (C) 14	Encapsulation (Cap)
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Cerium (Ce) 144	Fluorine (F) 18
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Gadolinium (Gd) 153

5, 56, 65, 151

Germanium (Ge) 68

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198, 209, 253

Gold (Au) 195

100

Hafnium (Hf) 172

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Iodine (I) 123

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Iodine (I) 129

99, 220, 237, 239

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Krypton (Kr) 85

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33, 35, 41, 46, 50, 51, 54, 59,
60, 65, 66, 82, 86, 90, 93, 94,
96, 99, 109, 116, 119, 120, 124,
128, 131, 132, 145, 146, 147,
150, 169, 172, 209, 210, 211,
212, 216, 259

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26, 202

Magnesium (Mg) 28

25, 31, 57, 58, 182, 198, 204,
221, 232, 233

Miscellaneous Compounds (MCP)

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95, 99, 101, 126, 130, 135, 139,
141, 143, 150, 158, 166, 173,
188, 224, 239, 241, 275

Natural Uranium (NU)

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Neptunium (Np) 237

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217, 218, 223, 235

Nickel (Ni) 63

99

Niobium (Nb) 95

88, 99, 128

Palladium (Pd) 109

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Phosphorus (P) 33

61, 99

Plutonium (Pu) 236

8, 12, 36, 65, 150, 155, 167,
176, 186, 240, 272

Plutonium (Pu) 238

150, 176, 263

Plutonium (Pu) 239

63, 108, 150, 154, 156, 235

Plutonium (Pu) 240

63, 150, 176, 243

Plutonium (Pu) 241	Special Services (SS)
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Plutonium (Pu) 242	110, 127, 140, 150, 151, 175,
63, 150, 154, 235, 263	176, 199, 252, 261
Polonium (Po) 208	Strontium (Sr) 82
65	68, 79, 95, 100, 133, 136, 163,
Promethium (Pm) 147	174, 194, 253
15, 43, 61, 65, 73, 151, 246, 275	Strontium (Sr) 89
Reactor Services Irradiations (RSI)	30, 99, 112, 142, 150, 153, 179,
4, 20, 38, 45, 49, 103, 122, 137,	196, 209
193, 222, 262	Strontium (Sr) 90
Rubidium (Rb) 83	bl, 65, 99, 141, 150, 152
157	Target Preparations (Tgs)
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13, 57	154, 213, 219, 222, 223, 243, 254
Ruthenium (Ru) 103	Technetium (Tc) 99
2, 19, 99, 267	18, 61, 99, 150, 170, 228, 230,
Ruthenium (Ru) 106	242, 257, 277
61, 65, 248, 268, 279	Thorium (Th) 229
Samarium (Sm) 151	16, 171
176	Thorium (Th) 230
Selenium (Se) 75	8, 13, 30, 43, 65, 80, 144, 160,
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100, 250	175
Sodium (Na) 24	Thulium (Tm) 170
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	Tin (Sn) 117
	57, 138

Tritium (H) 3

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99, 107, 113, 118, 129, 150, 168,
175, 198, 228, 231, 234, 251,
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Uranium (U) 233

78, 149, 150, 167, 263, 274

Uranium (U) 234

47, 65, 102, 123, 150, 151, 274

Uranium (U) 235

30, 43, 48, 74, 89, 150, 174,
213, 214, 247, 256, 261, 264, 274

Uranium (U) 236

70, 114, 150, 174, 266

Uranium (U) 238

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222, 227, 256

Vanadium (V) 48

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Xenon (Xe) 127

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106, 115, 138, 161, 163, 164,
165, 166, 179, 181, 195, 197,
200, 203, 205, 206, 207, 208,
215, 217, 224, 226, 228, 229,
236, 245, 250, 258, 269, 270,
271, 273

Yttrium (Y) 88

27, 202

Zirconium (Zr) 95

2, 8, 9, 13, 63, 65, 99, 248

4. GEOGRAPHICAL LOCATION OF RADIOISOTOPE CUSTOMERS

4 GEOGRAPHICAL LOCATION OF RADIOISOTOPE CUSTOMERS (identified by customer numbers)

<u>STATES</u>	
Alabama	Illinois (IL)
157, 167, 170	5, 8, 75, 85, 125, 154, 179, 180, 181, 204
Arizona (AZ)	Indiana (IN)
93	84, 110
Arkansas (AR)	Iowa (IA)
171	63
California (CA)	Kansas (KS)
11, 21, 22, 23, 24, 26, 34, 35, 41, 47, 48, 49, 51, 55, 59, 62, 65, 66, 71, 82, 86, 90, 92, 96, 119, 121, 124, 130, 132, 135, 147, 158, 165, 172, 173, 174, 175, 177, 178, 202, 205, 216	183
Colorado (CO)	Kentucky (KY)
16, 69, 156	184
Connecticut (CT)	Louisiana (LA)
29, 45, 182	44, 134
District of Columbia (DC)	Maryland (MD)
17, 52, 160	68, 97, 128, 141, 153, 182, 183, 184, 166
Florida (FL)	Massachusetts (MA)
42, 43, 186	6, 18, 57, 58, 79, 80, 98, 99, 100, 120, 140, 169, 185, 207, 208, 210
Georgia (GA)	Michigan (MI)
7, 53, 83	187, 215
Idaho (ID)	Minnesota (MN)
2, 38	81, 88
	Missouri (MO)
	15, 67, 70, 77, 87, 188, 209, 211

Nebraska (NB)	Virginia (VA)
32, 189	46, 50, 114, 197
New Jersey (NJ)	Washington (WA)
3, 14, 33, 39, 54, 64, 78, 89, 101, 108, 136, 142	9, 13, 40, 148, 155, 199, 213
New Mexico (NM)	Wisconsin (WI)
72, 73, 74, 102, 127, 176, 190	1, 198
New York (NY)	<u>FOREIGN</u>
4, 19, 20, 27, 28, 31, 37, 70, 95, 103, 104, 107, 118, 122, 133, 137, 138, 139, 152, 206, 214	Australia
North Carolina (NC)	217, 218
105, 106	Austria
Ohio (OH)	219
12, 25, 111, 91, 112, 113, 123	Belgium
Ok lahoma (OK)	220
30, 191	Canada
Pennsylvania (PA)	221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234
10, 60, 168, 192, 212	Denmark
South Carolina (SC)	235, 236
36	Federal Republic of Germany
Tennessee (TN)	237, 238, 239, 240, 241, 242, 243, 244, 245, 246
110, 111, 126, 143, 149, 150, 151	France
Texas (TX)	247, 248, 249
56, 94, 109, 115, 117, 144, 145, 194, 195, 196, 200, 203	Great Britain
Utah (UT)	250, 251, 252, 253, 254, 255, 256, 257, 258
131	

Hong Kong

259

Israel

260

Japan

261, 262

Korea

263, 264, 265

The Netherlands

266, 267, 268

Norway

269

Republic of Ireland

270

Scotland

271, 272

Switzerland

273, 274, 275, 276

Union of South Africa

277

5. RADIOISOTOPE SALES AND TRANSFERS - FY1982

5. RADIOISOTOPE SALES AND TRANSFERS--FY1982

	Domestic			Foreign			Project			Total		
	Ship	Amount mCi(a)	Dollars	Ship	Amount mCi	Dollars	Ship	Amount mCi	Dollars	Ship	Amount mCi	Dollars
Americium-241 (O)	58	2,553 g	3,582,175	1	15 g	141	4	100 g	143,519	63	2,653 g	3,725,835
Americium-243 (O)	3		510	2	40 mg	4,295	5	13 mg	450	10	53 mg	5,255
Argon-37 (O)	1	1	410							1	1	410
Astatine-211 (B)	10	11								10	11	
Berkelium-249 (O)							3	19 µg	210	3	19 µg	210
Bromine-77 (B)	1	11								1	11	
Bromine-77 (L)	29	2,715					10	395		39	3,110	
Cadmium-109 (B*)(b)	3	1,860	21,678							3	1,860	21,678
Cadmium-109 (L)				1	1					1	1	
Calcium-47 (O)	141	42	13,516	1	.1		12	2	b50	154	45	14,166
Californium-249 (O)							2	3 µg	140	2	3 µg	140
Californium-252 (O)	4		365	2			7	178 µg	820	13	178 µg	1,185
Californium-252 (S)	8	12.2 mg	125,506	3	9 mg	118,086				11	21 g	243,592
Carbon-14 (O)	1	88 C	1,819							1	88 Ci	1,819
Cerium-144 (O)				1	50	200				1	50	200
Cesium-137 (O)	38	79,428 C	9,168	1			1	8,910 Ci	1,471	40	88,338 Ci	10,639
Cobalt-60 (O)		1,213,937 C	105,077								1,213,937	105,077
Cobalt-60 (U)	1	.001	250							1	.001	250
Copper-67 (L)	14	1,140								14	1,140	
Curium-243 (O)							4	26 mg	280	4	26 mg	280
Curium-244 (O)				7	422 mg	43,120	2	1,200 mg	195	9	1,622 mg	43,315
Curium-248 (O)							1	18 µg	70	1	18 µg	70
Cyclotron Service Irradiations												
BNL (B*)		15	97,641					1	2,574		16	100.2 15
Cyclotron Service Irradiations												
LASL (L*)		23	18,685		3	3,712		3	4,414		29	26,811
Cyclotron Service Irradiations (A)	17		2,975							17		2,975
Cyclotron Service Irradiations (O)	35	22	127,522	4	1	12,152	1	17	15,311	40	40	154,985
Depleted Uranium (P)(c)	103	15,021 kg	510				8	10,223 kg	480	111	25,244 kg	990

NOTE: All isotopes shipped from LASL are billed from ORNL and included in Cyclotron Service Irradiations. All isotopes from Brookhaven without dollars are produced by a chemical reaction.
(a) All amounts in mCi of activity unless otherwise noted.
(b) Oak Ridge billed.
(c) Not produced at PNL appears only on this table.

	Domestic			Foreign			Project			Total		
	Ship	Amount mCi	Dollars	Ship	Amount mCi	Dollars	Ship	Amount mCi	Dollars	Ship	Amount mCi	Dollars
Einsteinium-253 (O)							1		70	1		70
Encapsulation (O)	12		409,129			57,000	2		141,344	14		607,473
Enriched Uranium (P)(d)	4	7,803 g	42,100	1	1,830 g	10,000	34	59,719 g	846,600	39	169,352 g	898,700
Fluorine-18 (8)	34	939								34	939	
Gadolinium-153 (O)	26	27,860	125,370				2	5,000	22,500	28	32,860	147,870
Germanium-68 (C)	6	95		4	97		2	15		12	207	
Germanium-68 (8*)	4	1,117	10,240							4	1,117	10,240
Gold-195 (8)	1	40								1	40	
Hafnium-172 (L)	1	50								1	50	
Iodine-123 (8)	27	1,257								27	1,256	
Iodine-129 (O)	5	3,467 mg	6,934	7	6,797 mg	13,593				12	10,264 mg	20,527
Iridium-192 Meta (O)	211	1,146,861 Ci	1,907,378				11	1,690 Ci	3,737	222	1,148,551 Ci	1,911,116
Iron-52 (8)	10	175	110							10	175	110
Iron-52 (L)	1	54								1	55	
Iron-55 (O)				3	2,100	4,125				3	2,100	4,125
Krypton-85 (O)	220	5,742 Ci	415,018	6	115 Ci	8,315	3	31 Ci	2,424	229	5,889 Ci	425,757
Krypton-85 Enriched (O)	12	842 Ci	176,866							12	842 Ci	176,866
Lutetium-172 (L)	1	13								1	13	
Magnesium-28 (8*)	22	9	4,616	6	0.81	369				28	9	4,986
Miscellaneous Compounds (8)	18		540	3		90				21		630
Miscellaneous Compounds (O)	39	12	20,317	1	1	269	4	4	1,076	44	17	21,662
Miscellaneous Services (O)			375						12,100			12,475
Natural Uranium (O)	1	20 g	370							1	20 g	370
Neptunium-237												
High-Purity (O)	3	1,406 g	627	3	21,150 g	6,492	8	20,616 g	17,845	14	43,172 g	24,964
Neptunium-237												
Oxide (O)	1	142 g	105	3	5,000 g	1,481	3	2,440 g	698	7	7,582 g	2,284
Nickel-63 (O)	7	1,050	17,880							7	1,050	17,880
Niobium-95 (O)	13	291	11,800	1	2	200				14	293	12,000
Palladium-109 (8)	10	5,663								10	5,663	
Phosphorus-33 (O)	7	910	13,090							7	910	13,090
Plutonium-236 (O)	6		6,370	2		665	7		6,210	15		13,245

NOTE: All isotopes shipped from LASL are billed from ORNL and included in Cyclotron Service Irradiations. All isotopes from Brookhaven without dollars are produced by a chemical reaction.

	Domestic			Foreign			Project			Total		
	Ship	Amount mCi	Dollars	Ship	Amount mCi	Dollars	Ship	Amount mCi	Dollars	Ship	Amount mCi	Dollars
Plutonium-238 (0)							1	1 mg	70	1	1 mg	70
Plutonium-238 S) (0)				1	50 mg	215				1	50 mg	215
Plutonium-239 (0)	1	66 mg	164	1	1 mg	72	6	5,267 mg	539	8	5,334 mg	776
Plutonium-240 (0)				1	50 mg	219	3	325 mg	210	4	375 mg	429
Plutonium-241 (0)				1	10 mg	204	2	5,500 mg	250	3	5,510 mg	454
Plutonium-242 (0)	1		370	2	70 mg	1,252	3	5,100 mg	210	6	5,170 mg	1,832
Plutonium-244 (0)							1	3 mg	70	1	3 mg	70
Promethium-147 (0)	6	3 Ci	800	14	4,322 Ci	6,851	3	278 Ci	615	23	4,631 Ci	8,266
Radio Isotopes												
Withdrawn (0)	2	150	575	4	815	24,450				6	965	25,025
Reactor Services												
Irradiations (B)	25		10,773							25		10,773
Reactor Services												
Irradiations (I)(d)	1			1			1			3		
Rubidium-83 (L)	2	3								2	3	
Ruthenium-97 (B)	1	6								1	6	
Ruthenium-97 (U)							1	>0.001	250	1	>0.001	250
Ruthenium-103 (0)	1	5	200	2	50	2,000	5	27	1,200	8	82	3,400
Ruthenium-106 (0)	8	165	6,100	5	195	7,800				13	360	13,900
Samarium-151 (0)				1	131 g	5,440	1	1 g	200	2	132 g	5,640
Selenium-75 (0)	18	32,375	25,375				1	1	200	19	32,376	25,575
Sodium-22 (L)	3	1,004		1	b					4	1,010	
Sodium-24 (B)	1	.06								1	.06	
Special Services (0)	33		209,040	4		4,850			4,520	37		263,410
Strontium-82 (B)	1	3					2			3	3	
Strontium-82 (L)	9	1,425		6	820		6	1,125		21	3,370	
Strontium-8Y (0)	11	67	3,040				7	34	1,400	18	101	4,440
Strontium-90 (0)	13	190,712 Ci	19,858					0.047 Ci	200	13	190,711 Ci	20,058
Target Preparations			45,217			11,250			217,365			273,830
Technetium-99 (0)	21	61 g	3,527	8	116 g	6,525	2	72 g	4,637	31	249 g	14,690
Thorium-229 (0)	4	20,000 µg	630				1		170	5	20,000 µg	800
Thorium-230 (0)	2	5 mg	477	1	49 mg	1,200	2	100 mg	156	5	154 mg	1,833
Thorium-230 > 95 (0)	3	g mg	1,083	3	53 mg	5,354	1	1 mg	167	7	63 mg	6,605
Thorium-230 8C-9 (0)	2	5 mg	255	1	g mg	277	3	3 mg	258	6	17 mg	791
Thorium-232 (0)	1	5,000 mg	1,066				3	319 mg	210	4	5,000 mg	1,276
Thulium-167 (L)							1	0.001		1	0.001	
Thulium-170 (U)							3	27	750	3	27	750

NOTE: All isotopes shipped from LASL are billed from ORNL and included in Cyclotron Service Irradiations. All isotopes from Brookhaven without dollars are produced by a chemical reaction.
(d) Reflects customer total only, not number of irradiations.

	Domestic			Foreign			Project			Total		
	Ship	Amount mCi	Dollars	Ship	Amount mCi	Dollars	Ship	Amount mCi	Dollars		Amount mCi	Dollars
Tritium (O)	201	524,990 Ci	526,105	25	588,608 Ci	562,398	4	89,945 Ci	49,716	230	1,203,543 Ci	1,138,220
Vandium-48 (L)	1	10								1	10	
Uranium-233 (O)				4	4,125 mg	10,922	4	601 mg	282	8	4,726 mg	11,205
Uranium-234 (O)	5	7,202 mg	202,006	1	5 mg	210	1	50 mg	1,238	7	7,257 mg	203,454
Uranium-235 (O)	7	168 g	8,970	29	55 g	7,441	6	23 g	420	42	246 g	16,831
Uranium-236 (O)	2	250 mg	244	1	350 mg	213	2	521 mg	140	5	1,121 mg	598
Uranium-238 (O)	5	798 g	1,840	5	1,085 g	2,427	5	2 g	350	15	1,885 g	4,617
Xenon-127 (8*)(L*)	69	14,200	48,599	19	7,275	24,904		3,600	13,009	88	25,075	86,512
Yttrium88 (L)	3	46								3	46	
Yttrium88 (B)	1									1		
Zirconium-95/ Niobium95 (O)	3	225	1,900	5	46	900	5	56	1,000	13	327	3,800
TOTAL	1,635		8,395,256	208		971,679	222		1,569,990	2,065		10,936,925

NOTE: All isotopes shipped from IASL are billed from ORNL and included in Cyclotron Service Irradiations. All isotopes from Brookhaven without dollars are produced by a chemical reaction.

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