# VOID SHEET

10:	License Fee Management Branch		
FROM:	RIII - KEVIN G. NULL		
SUBJECT:	VOIDED APPLICATION		
Cortrol Number	r: 300230		
Applicant:	Wisconsin-Madision,	University 1	
License Numbe	r: 48-09843-18	of the state of	
Docket Number		*	
Date Voided:	7/7/97		
Reason for Vo		. 0 . 10	
lusing act	on was requested TO .	ded because no	
submitted,	were acceptable, but no any	Jasse are instrumates	
	man mo ame	almos was required.	
	Charles 7. Died for Kern G. No.	20 7/1/97	
Attachment: Official Recor Voided Actio	d Copy of	Date	
FOR LEMB USE O	NLY		
Ref	und Authorized and processed		
	Refund Due		0 /
Fee	Exempt or Fee Not Required		
Comments:			
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(FOR LFMS USE)
INFORMATION FROM LTS BETWEEN: Program Code: 02110

Status Code: 2

Fee Category: 78 EX 2C 2B 1D

Exp. Date: 19940331

Fee Comments: 170.11(A)(4)

Decom Fin Assur Reqd: Y License Fee Management Branch, ARM and Regional Licensing Sections LICENSE FEE TRANSMITTAL A. REGION 1. APPLICATION ATTACHED Applicant/Licensee: WISCONSIN-MADISON, UNIVERSITY OF Proceed Date: 970113

Docket No: 3003465

Control No.: 300230

License No.: 48-09843-18

Action Type: Amendment 2. FEE ATTACHED Amount: Check No. 1 3. COMMENTS Signed \_\_\_\_ B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered /\_/) 1. Fee Category and Amount: 2. Correct Fee Paid. Application may be processed for: Amendment -----Renewal License ------Signed --

DFP - under reperse C/V + TAN sect to HQ 1/97

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September 18, 1996

U.S. Nuclear Regulatory Commission, Region III ATTN: Kevin Null Nuclear Materials Licensing Section 801 Warrenville Road Lisle, Illinois 60532-4351

RE: Decommissioning Funding Plan and Statement of Intent - BML No. 48-09843-18, Control No. 396520

#### References

1. Reg Guide 3.65, Standard format and Content of Decommissioning Plans for Licensees under 10 CFR Parts 30, 40, and 70.

2. Reg Guide 3.66, Standard format and Content of Financial Assurance Mechanisms Required for Decommissioning under 10 CFR Parts 30, 40, 70 and 72.

Spreadsheets titled:

- a. Nuclides and Activity (mCi) Received under UW Broadscope License for the Year Indicated.
- b. Sealed Source Nuclides and Activity (mCi) Received under UW Broadscope License for the Year Indicated.
- c. Unsealed Nuclides and Act ...ty (mCi) Received under UW Broadscope License for the Year Indicated.
- d. Unsealed Long-Lived (T > 120 days) NRC-Regulated Nuclides and Activity (mCi) Received under UW Broadscope License for the Year Indicated.

Spreadsheets titled:

- Activity (mCi) Incinerated at Herrick Drive Incinerator for the Year Indicated.
- b. Activity (mCi) Disposed of to the Sanitary Sewer for the Year Indicated.

5. Radiation Safety Composite Inventory Report, 07/02/96

6. University of Wisconsin Radiation Safety Regulations.

## Background

The University of Wisconsin, Madison (UW) is a Category A Licensee of Broad Scope authorizing "any byproduct material between Atomic Nos. 3 through 83, inclusive" in individual activities not to exceed 3 Ci each and 30 Ci in aggregate. The UW also has a separately licensed (R-74) TRIGA research reactor. This reactor is capable of producing a broad spectrum of radionuclides, however the R-74 license specifies the licensee may "possess, but not to separate, such byproduct material as may be produced by operation of the reactor." Thus, the broad scope license serves to complement the reactor license EIVED enabling all researchers at the UW to obtain irradiated product.

Safety Department

JAN 1 3 1997

On 16 July, 1990, the UW submitted a Statement of Intent to obtain \$750,000 for decommissioning when necessary. Reference 2 requires the UW to submit a Decommissioning Funding Plan (DFP) for the broad scope license "at the time of their next license renewal occurring after July 27, 1990." This document will review uses of radionuclides licensed under the broad scope license (BML 48-09843-18) at the UW, review regulations appropriate to decommissioning, analyze anticipated costs for such a decommissioning, and provide an appropriate financial assurance mechanism.

#### Radionuclide Use at the UW

References 3 and 4 are spreadsheets describing the use of radioactive materials under the broad scope license over at least a 10 year period. (Note that the activities listed for 1996 – RECPT96 – are for 8 months of receipts; to normalize for the entire year the activities of the more routinely used isotopes (e.g., <sup>3</sup>H, <sup>14</sup>C, <sup>32</sup>P, <sup>35</sup>S, <sup>125</sup>I) for the entire year, multiply entries by 1.5). While there may be spikes indicative of unique, one-time research or time sensitive events, references 3 and 4 demonstrate the scope of our use and disposal of authorized radionuclides. Reference 5 represents a snap-shot of user possessions at the beginning of July, 1996.

Reference 3a is a gross summary of all radionuclides received by the UW, including both sealed and unsealed radionuclides. Reference 3b focuses on the receipt of sealed sources. Entries in this table include the transfer of sealed sources between one activity on campus and another. An explanation of some of the higher activities includes:

- a. Transfer of a 90Sr eye applicator from the Medical Physics Radiation Calibration Lab to the Radiation Therapy Department at the hospital.
- Receipt of 400 mCi of <sup>85</sup>Kr from a vendor in California to perform calibration measurements. The source was returned to the owner in 1991.
- c. Receipt of the <sup>192</sup>Ir HDR and other brachytherapy sources/seeds which were used in cancer therapy and then returned to the vendor.
- d. The UW had been conducting research requiring large quantities of gaseous <sup>3</sup>H. This research was concluded in 1994 and the facility converted to a tomographic-Linac facility, hence the dramatic drop of <sup>3</sup>H receipts.
- e. Periodically <sup>63</sup>Ni gas chromatographic sources require replacement. This is usually effected by a direct exchange with the vendor.

Thus, receipt as reported in reference 3 does not necessarily represent the acquisition of new sources nor does it necessarily mean the source received is still in the possession of the UW.

Reference 3d is a summary of the UW's receipts of radionuclides of interest for decommissioning (reference 2, Appendix G, Conversion Table for Determining Amount of Financial Assurance Required as a Function of Radionuclide Activity Levels). A comparison of activities received (ref 3d) with Radionuclide Conversion Table activities in Appendix G shows that, based upon actual receipts, the UW would not be required to complete a Decommissioning Funding Plan and, further, that Financial Assurance would realistically be below the "\$150,000 (unsealed) (≥ 10³, ≤ 10⁴)" range.

#### Decommissioning Funding Considerations

In the event of decommissioning, the UW would perform its own radiation safety support with in-house assets. To determine an accurate estimate of decommissioning costs we have detailed our anticipated expenses for decommissioning the license.

- a. Use of unsealed radioactive material in research is done according to the University Radiation Safety Regulations (reference 6). When a researcher has completed using radioactive materials in a laboratory, they are required to perform a final survey for "gross contamination and/or radiation exposure levels, ... and for removable contamination,..." (Section IX, Part C, <u>Deletions and Final Surveys</u>). The Safety Department maintains a listing of these surveys in a room decommissioning file. Thus, decommissioning of individual rooms is accomplished at no cost.
- b. Sealed sources consist of some Am-Be soil probes, calibration sources (< 1 Ci), and some higher activity irradiator sources. Commercial gage sources may be returned to the vendor or some other source for approximately \$5000 each. Irradiator sources may be transferred to some other licensee. Estimated cost to dispose of all sealed sources under this license is approximately \$100,000.
- c. At this time, we anticipate the incinerator to be the only contaminated facility. Based upon our experience demolishing radioactive waste incinerators, to dismantle and appropriately dispose of the contaminated debris would cost approximately \$130,000 (i.e., \$90,000 for refractory and other debris, \$40,000 for demolishing).
- d. Our policy on sewer disposal is to decay all liquids and centralize disposal of non-hazardous, aqueous liquid wastes at our Mills Street waste facility. Because of the type of waste so disposed, we do not anticipate any residue in the plumbing. Sampling of sewer lines at this point would verify that belief. The cost to sample and clean this disposal route would be low; not likely in excess of \$50,000.
- e. Volatile radionuclides may only be used in adequately vented fume hoods where the releases may be monitored. The Safety Department routinely surveys exhaust ducts prior to maintenance. We have never detected contamination in fume hood exhaust ducts in excess of 0.5 nCi/100 cm². Therefore, we do not believe exhaust ducting in any of our facilities will require decontamination and disposal as radioactive waste.

Thus, a good estimate of decommissioning costs for the UW's broad scope license is \$280,000.

Paragraph 1.3, reference 2 (LICENSEES USING MORE THAN ONE TYPE OF NUCLE-AR MATERIAL) notes that it "would be difficult to require separate decommissioning plans and financial responsibility requirements in circumstances where there is an interdependence of facilities, operations, or projected decommissioning activities." In our view, three (3) other byproduct material licenses should be consolidated with this plan.

- a. BML 48-09843-28 licenses 5 closed-beam irradiators. We recently decommissioned an irradiator site at a cost of \$5000. A good estimate of decommissioning this license would be \$10,000 per source or \$50,000.
- b. BML 48-09843-32 licenses panorami: irradiators for use by our Medical Physics Department. In 1993 we disposed of a teletherapy unit, several lower activity irradiator and brachytherapy sources, an Am-Be source, and some smaller activity sources for \$90,000. A good estimate to decommission this license is the \$75,000 mandated.
- c. BML 48-09843-34 licenses a <sup>60</sup>Co teletherapy unit for use in the School of Veterinary Medicine. We believe the \$75,000 mandated to be a valid decommissioning estimate.

We do not intend including the UW's Research reactor in the plan because it is distinct with its own building and will require a DFP upon renewal in 2000. Therefore, we estimate that byproduct material licensure decommissioning would not be expected to exceed \$500,000.

## Summary

The IJW has a Category A specific license of broad scope issued by the NRC to be used in education, to conduct basic research and to perform medical diagnosis and therapy using radioactive materials and several irradiator licenses. Because use of the radioactive materials is dictated by the needs of the researchers and to complement the UW's research reactor program, this license is necessarily one authorizing a broad spectrum of nuclides in relatively unspecified quantities. In reality, the isotopes used under the broad scope license are those commonly used in biological research (e.g., <sup>3</sup>H, <sup>14</sup>C, <sup>32</sup>P, <sup>35</sup>S, <sup>51</sup>Cr, <sup>125</sup>I) and use of rarer isotopes tends to be of extremely low activity for a short duration only. Thus, the cost to decommission the UW's broad scope and irradiator licenses would be similarly low. We estimate this cost not to exceed \$500,000.

To that end, we have included a Statement of Intent by the UW Board of Regents to provide adequate funding for decommissioning activities when required.

If you have any questions pertaining to this request, please call me at (608) 262-9178 or FAX me at (608) 262-6767.

Sincerely,

Ronald R. Bresell

Radiation Safety Officer

Power Rhill



# The University of Wisconsin System

Office of General Counsel 1738 Van Hise Hall, 1220 Linden Drive Madison, Wisconsin 53706 (608) 262-2995 FAX(608) 262-3985 Charles J. Stathas (608) 262-6166 John B. Tallman 262-0747 Patricia A. Brady 262-6497 Edward S. Alschuler 265-2960

September 17, 1996

United States Nuclear Regulatory Commission Region III 801 Warrenville Road Lisle, Illinois 60532-4351

TO WHOM IT MAY CONCERN:

The Board of Regents of the University of Wisconsin System, an agency of the State of Wisconsin, doing business as the University of Wisconsin- Madison, hereby states its intent to obtain the funds for decommissioning when necessary for the following licenses:

48-09843-18	Broad Scope A License	\$300,000
48-09843-28	Irradiator License	50,000
48-09843-32	Panoramic Irradiator License	75,000
48-09843-34	Panoramic Irradiator License	75,000

I hereby certify that I am authorized to act on behalf of the Board of Regents in signing this document.

Board of Regents of the University of Wisconsin System

Charles J. Stathas General Counsel and

Assistant Trust Officer

xc: John Torphy Ronald Bresell

Kathleen Irwin

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NUCLID	The second secon				RECPT89			RECPT92	RECPT93 F	RECPT94	RECPT95	RECPT96
	AMERICIUM-241	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.0000	0.0000	0.0000
	AMERICIUM-241 * GOLD-198	0.0000	250.0005 805.3400	0.0000	0.0000	0.0000	50.0000	0.0000	0.0100	0.0000	145.1800	0.0000
		0.0000	0.0000		165.9000	210.9000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00CO
	BARIUM-133			0.0000	0.0001	0.0070	0.0000	0.0000	0.1000	0.0000	0.0000	0.0000
	BROMINE-82	0.0000	0.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
C-14 CA-41S	CARBON-14 *	272.4380	414.2142		240.3372	146.5089	259.7868	203.7551	145.6480	162.4562	164.5978	122.8640
- 100 pt - 10 (100 pt )	CALCIUM-41 SEAL	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0050	0.0000	0.0000	0.0000	0.0000
	CALCIUM-45	18.0580	60.2000	48.0100	55.0000	77.0000	70.0000	43.0000	21.0030	33.0020	23.0000	7.0000
	CADMIUM-109 SEA	0.5010	1.0021	0.1021	0.5031	1.0021	1.0021	3.0021	2.0021	1.0021	1.5000	2.0000
	CADMIUM 109 SS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	45.0000	19.5000	0.0000	36.5000	30.0000
	CERIUM-141	1.2500	0.0000	0.0000	5.0000	2.9000	4.0000	5.0000	2.5000	1.5000	1.5000	1.0000
	CHLORINE-36	0.1000	0.0500	5.0250	0.2020	0.1500	1.1000	0.7000	1.2750	4.1750	1.5500	0.0000
	CHLORINE-38	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0170	0.0000	0.0000	0.0300
	CURIUM 244*	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	CURIUM-244	0.0000	0.0000	0.0000	1.0000	0.0000	1.0000	2.0000	0.0000	0.0000	0.0000	0.0000
	COBALT-56	0.0000	54.1142	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO-57	COBALT-57	0.0736	1 000 000 150 150 150 150	6.0701	15.1485	103.0280	30.1000	11.0100	27.2100	61.5000	18.7000	10.0000
		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000
CO-60	COBALT-60 *	648.0000	1364.0000	1147.0100	102.0004	0.0000	0.0000	0.0000	0.0020	0.0000	0.0056	0.0000
CR-51	CHROMIUM-51	0.0000	0.0015	0.0000		760,0000	764.0000	749.2260	627.5000	588.0000	443.0000	304.0000
	CESIUM-137 *	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
	CESIUM-137S	0.0500	0.0000	0.0000	55.0000	0.0000	1177.2000	47.0000	0.0000	30.8000	50.0000	199.9500
CU-64	COPPER-64	0.0000	0.0000	0.0000	0.0000	0.0000	10.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CU-67	COPPER-67	0.0000	0.0000	0.0100	0.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
EU-1 2	EUROPIUM-152	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	1.8600	0.0000	0.0000
EU-152	EUROPIUM-152M	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	8.0000	0.0000	0.0000
EU-154	EUROPIUM-154 EUROPIUM-155	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0890	0.0000	0.0000
F-18	FLUORINE-18	0.0000	80.0000	0.0000	12.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		0.0760	0.0000	0.1000	0.1001	0.0000	0.0000					
FE-55S	IRON-55 IRON-55 SS	0.0000	0.0000	10.0000	0.0000		0.0000	0.0000	1.1007	0.0000	5.0030	0.0130
	IRON-59	0.2535	0.2500	0.0000	0.5000		0.0000	0.0000	0.5040		0.0000	0.0000
FE-59 GA-67	GALLIUM-67	0.2535	0.2500	0.0000	6.0000		18.0000	12.0000	18.0000	0.0020	0.0010	0.0070
GD-153		712.0002	1795.0000	1.0001	1.0002	1.0000	0.0000	0.1000				0.0000
GD-153	GADOLINIUM-153	0.0000	3750.0000		1000.0000		510.0000		0.0000	0.0000	0.0000	0.0000
GE-68	GADOLINIUM-153	0.0000	4.0000	0.0000	0.0000		0.0000	0.0000		0.0000	65.8000	0.0000
	GERMANIUM-68 GERMANIUM-68	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
GE-68S		0.0000	0.0000	0.0000	0.0000		0.0000	7.0000	0.0000	0.0000	0.0000	0.0000
1.000.00	Carrier and Carrie	3367 1121	14314.7156				1185.6586			801.6350		
H-3	TRITIUM *		22.0300	0.0000							911.4390	394.8440
1-123	IODINE-123 *	917.3188	1741.1115		0.0000		0.0000			0.0000	0.0000	0.0000
I-125	IODINE-125		1412.0188		1232.8107		148.5353			825.5197	714.7322	327.4237
I-125B	I-125 Bone min	2047.8898		0.0000			77.9400			0.0000	0.0000	0.0000
1-1255	IODINE-1258			0.0000						338.7600	243.1400	211.3800
1-129	IODINE-129	0.0000	451.3120		623.5036		106.0030			0.0000	1.5011	0.0000
1-131	IODINE-131 INDIUM-111	35.0000		42.0000			42.0000			6.0000	7.0000	0.0000
IN-111		3259 9880								0.0000	0.0000	0.0000
IR-192	IRIDIUM-192 IRIDIUM-192A	0.0000								29997.0000	40976.0000	
IR-192A IR-192S		0.0000					78.2300			442.7920	257.1233	405.3728
K-42	POTASSIUM-42	0.0240								0.2020	0.1900	0.0820
KR-85	KRYPTON-85	0.0000								0.0000	0.0000	0.0000
		0.0000								0.0001	0.0000	0.0000
LU-176	LUTETIUM 176	0.5000								1.5000	1.5000	0.0000
MN-54	MANGANESE-54									5.0000		0.0030
MN-56	MANGANESE-56 RE									0.0000	6.2000	0.0000
MO-99	MOLYBDENUM-99	0.7000								2.4000	0.7000	1.3000
NA-22	SODIUM-22	0.5100								1.9800	2.8000	1.5470
NA-24 NB-95	SODIUM-24 NIOBIUM-95	0.0000								1.0000	2.0000	0.0000
NI-63	NICKEL-63	12 0000								9.0000	0.0000	0.0000
	C NICKEL-63 GAS C	75.0000						The second of		30.0000	15.0000	23.0000
P-32	PHOSPHORUS-32									2947.7436	2990.4748	
P-33	PHOSPHORUS-33	6.0000								15.5000	27,4400	
	PROMETHIUM-147	0.0000								0.0000	0.0000	
	POLONIUM-210	0.0000								0.0000	0.0000	
	PLUTONIUM-239	0.0000								0.0000	0.0000	
RA-226		0.000								0.0000	0.0000	
	RADIUM 228	0.0000								0.0000	0.0000	
RB-86	RUBIDIUM-86	1.0000								0.0000	0.0000	
	RUTHENIUM-103	0.0000								0.5000	1.0000	
	RUTHENIUM-106	0.0000								0.0000	0.0000	0.0000
8-35	SULFUR-35	887.200								2155.3500		
SC-46	SCANDIUM-46	1.2500	7.0000	4.000	2.000	0 5.0000	1.0000	4.0000	1.5000	2.0000	2.5000	1.0000
SE-75	SELENIUM-75	0.000								3.0000	10.0340	
\$1-31	SILICON-REACTOR	0.000	0.0000	0.000	0 000	0.0000	0.0000	0.000	0.0000	2,0000	2.5000	
SN-113	TIN-113	0.000	4.0000	6.000	0 3.000	0 3.0000	3.0000	5.000	3.0000	2.0000		
SN-119	TIN-119-SEALED	0.000	0.0000	0.000	0.000	0.0000	0.000	0.000	0.0000	0.0000	0.0000	
	TIN-121M	0.000								0.0000		
SR-82	STRONTIUM-82, D	0.000	0.000	0.000	0.000	0.000	0.000			0.0000		
SR-85	STRONTIUM-85	2.750								1.0000		
SR-89	STRONTIUM-89	0.000								8.0002		
	STRONTIUM-90SS	27.000								0.0000		
	TERBIUM-158	0.000								0.0000		
	A TECHNETIUM	0.000										
TC-99	TECHNETIUM-99	0.000										
	N TECHNETIUM-∂9M											
	THORIUM 230	0.000										
TL-201		0.000										
TL-204		0.000										
U-235	URANIUM-235 *	0.000										
U-238	URANIUM-238 *	0.000										
XE-133		0.000										
Y-68	YTTRIUM-88 SEAL	0.000										
Y-90	YTTRIUM-90	0.000										
ZN-62	ZINC-62	0.000										
ZN-65 ZN-69	ZINC-65 ZINC -69	0.150										
	C LEWIS - LEVIS -	1.300	0.000	0.000	0.000	0:000	0.000	0.000	0.0000	0.000	0.000	W. WILLIAM

Sealed Source Nuclides and Activities (mCl) Received ander UW Broadscope License for Year Indicated

NUCLIDA	The state of the s	RECPT86	RECPT87	RECPT88	RECPT89	RECPT90	RECPT91	RECPT92	RECPT93	RECPT94	RECPT95	RECPT96
AM-2415	The state of the s	50.0000	250.0005	0.0000	0.0000	0.0000	50.0000	0.0000	0.0100	0.0000	145 1800	0.0000
AU-198	GOLD-198	0.0000	805.3400	1057.6200	165.9000	210.9000	0.0000	0.0000		0.0000	0.0000	0.0000
CA-41S	CALCIUM-41 SEAL	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0050		0.0000	0.0000	0.0000
CD-109	CADMIUM-109 SEA	0.5010	1.0021	0.1021	0.5031	1.0021	1.0021	3.0021	2.0021	1.0021	1.5000	2.0000
CD-109S		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	45.0000	19.5000	0.0000	36.5000	30.0000
CM-2445		0.0000	0.0000	0.0000	1.0000	0.0000	1.0000	2.0000	0.0000	0.0000	0.0000	0.0000
CO-578	COBALT-57	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000
CO-60	COBALT-60 *	0.0509	0.0010	0.0000	102.0004	0.0000	0.0000	0.0000		0.0000		0.0000
CS-137	CESIUM-137 *	0.0000	0.0015	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
CS-1375	William Services Control of the Cont	0.0000	0.0000	0.0000	55.0000	0.0000	1177.2000	47.0000	0.0000	30.8000	50.0000	199.9500
FE-55S	IRON-55 SS	0.0000	0.0000	0.0000	0.0000	10.0000	0.0000	0.0000	0.0000	0.0000		0.0000
GD-153	GADOLINIUM-153	712.0002	1795.0000	1.0001	1.0002	1.0000	0.0000	0.1000	0.0000	0.0000	0.0000	0.0000
GD-1538		0.0000	3750.0000	3665 9000	1000.0000	280.0000	510.0000	2366.9591	0.0000	0.0000	65.8000	0.0000
GE-68S	GERMANIUM-68	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
GE-6855	GERMANIUM 68 SS	0.0000	0.0000	0.0000	0.0000	2.5000	0.0000	7.0000	0.0000	0.0000	0.0000	0.0000
I-125B	I-125 Bone min	2047.8898	1412.0188	1446.0000	1400.0000	650.0000	148.5353	0.0000	0.0000	0.0000	0.0000	0.0000
1-1258	IODINE-125S	0.0000	0.0000	0.0000	0.0000	0.0000	77.9400	292.8300	533.5900	338.7600	243 1400	211.3800
1-129	IODINE-129	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
IR-192	IRIDIUM-192	3259.9880	5746.7830	4962.1489	34189.2810	1791 4395	12315.3425	0.0000	0.0000	0.0000	0.0000	0.0000
IR-192A	IRIDIUM-192A	0.0000	0.0000	0.0000	0.0000	39397.0000	37497.0000	39398.9999	39996.0000		40976 0000	18999.0000
IR-192S	IRIDIUM-192S	0.0000	0.0000	0.0000	0.0000	0.0000	78.2300	1219.7195	515.3261	920	257 1233	405.3728
KR-85	KRYPTON-85	0.0000	0.0000	0.0000	400.0000	0.0000	0.0000	0.0000	0.0000	J.0000	0.0000	0.0000
NI-63GC	NICKEL-63 GAS C	75.0000	60.0000	38.0000	100.0000	85.0000	15.0000	0.0000	60.0000	30,0000	15.0000	23.0000
PM-147	PROMETHIUM-147	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1000.0000	0.0000	0.0000	0.0000
PO-210	POLONIUM-210	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	6.0000
PU-239	PLUTONIUM-239	0.0000	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
RA-226	RADIUM-226S	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SN-119	TIN-119-SEALED	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SR-90S	STRONTIUM-90SS	27.0000	55.0000	25.0000	0.0000	0.0000	6.8500	0.0000	0.1000	0.0000	0.0000	50.0000
TC-99	TECHNETIUM-99	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TL-204	THALLIUM-204 SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Y-88	YTTRIUM-88 SEAL	0.0000	0.0000	0.0000	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
										0.0000	0.0000	0.0000

Unsealed Nuclides and Activities (mCi) Received under UW Broadscope License for Year Indicated

NUCLIDE	FULL	RECPT86	RECPT87	RECPT88	RECPT89	DECETOO	DECDIO	DECREO	DECEMBER 1			
AM-241	AMERICIUM-241	0.0000	0.0000	0.0000	0.0000	RECPT90	RECPT91	RECPT92	RECPT93	RECPT94	RECPT95	RECPT96
BA-133	BARIUM-133	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0 0005	0.0000	0.0000	0.0000
BR-82	BROMINE-82	0.0000	0.0000	1.0000	1.0000		0.0000	0.0000	0.1000	0.0000	0.0000	0.0000
C-14	CARBON-14 *	272.4380	414.2142	273.9533	240.3372		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CA-45	CALCIUM-45	18.0580	60.2000	48.0100	55.0000		259.7868	203.7551	145.6480	162.4562	164.5978	122.8640
CE-141	CERIUM-141	1.2500	0.0000	0.0000	5.0000		70.0000	43.0000	100.000.000.000.000.000	33.0020	23.0000	7.0000
CL-36	CHLORINE-36	0.1000	0.0500	5.0250	0.2020		4 0000	5.0000		1.5000	1.5000	1.0000
CL-38	CHLORINE-38	0.0000	0.0000	0.0000	0.0000		1.1000	0.7000		4.1750	1.5500	0.0000
CM-244	CURIUM 244*	0.0000	0.0001	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0300
CO-56	COBALT-56	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000
CO-57	COBALT-57	0.0736	54.1142	6.0701	15.1485		0.0000	0.0000		0.0000	0.0000	0.0000
CO-60	COBALT-60 *	0.0509	0.0010	0.0000	2.0004		0.0000	11.0100		61.5000	18.7000	10.0000
CR-51	CHROMIUM-51	648.0000	1364.0000	1147.0100	1094 0128		764.0000	0.0000		0.0000	0.0056	0.0000
CS-137	CESIUM-137 *	0.0000	0.0015	0.0000	0.0000		0.0000	749.2260	627.5000	588.0000	443.0000	304.0000
CU-64	COPPER-64	0.0500	0.0000	0.0000	0.0000		10.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CU-67	COPPER-67	0.0000	0.0000	0.0000	0.0000		3.0000	0.0000		0.0000	0.0000	0.0000
EU-152	EUROPIUM-152	0.0000	0.0000	0.0100	0.0001		0.0000	0.0000		0.0000	0.0000	0.0000
EU-152M	EUROPIUM-152M	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		1.8600	0.0000	0.0000
EU-154	EUROPIUM-154	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		8.0000	0.0000	0.0000
EU-155	EUROPIUM-155	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0890	0.0000	0.0000
F-18	FLUORINE-18	0.0000	80 0000	0.0000	12.0000		0.0000	0.0000		0.0000	0.0000	0.0000
FE-55	IRON-55	0.0760	0.0000	10.1000	0.1001	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
FE-59	IRON-59	0.2535	0.2500	0.0000	0.5000		0.0000	0.0000		8.0060	5.0030	0.0130
GA-67	GALLIUM-67	0.0000	0.0000	0.0000	6.0000		18 0000	12.0000		0.0020	0.0010	0.0070
GE-68	GERMANIUM-68	0.0000	4.0000	0.0000	0 0000		0.0000	0.0000	5.2000	0.0000	0.0000	0.0000
H-3	TRITIUM *	3367.1121	14314.7156	4061.2099	2955.6888		1185.6586	2395.3914	2939.8904	0.0000	0.0000	0.0000
1-123	IODINE-123 *	0.0000	22.0300	0.0000	0.0000		0.0000	0.0000		801.6350	911.4390	394.8440
1-125	IODINE-125	917.3188	1741.1115	1504 8233	1232.8107		1287.1398	850.9060	701.5889	0.0000 825.5197	0.0000	0.0000
1-129	IODINE-129	0.0000	0.0001	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	714.7322	327.4237
1-131	IODINE-131	364.0023	451.3120	1004.4091	623.5036		106.0030	32.0089		0.5010	Charles Service Co.	0.0000
IN-111	INDIUM-111	35.0000	53 0000	42.0000	36 0000		42.0000	52.2440		6.0000	0.0000000000000000000000000000000000000	4.0009
K-42	POTASSIUM-42	0.0240	0.0000	0.0000	0.0000		0.0000	0.0000		0.2020	7.0000	0.0000
LU-176	LUTETIUM 176	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0001	0.0000	0.0820
MN-54	MANGANESE-54	0.5000	0.5010	0.7000	0.5000		0.0000	0.2000		1.5000	1.5000	0.0000
MN-56	MANGANESE-56 RE	0.4100	0.0000	0.0000	0.0000		0.0000	0.0000		5.000	6.2000	0.0030
MO-99	MOLYBDENUM-99 *	0.0000	500.5000	200.0000	205.9600		0.0000	0.0000		0.0000	200.0000	0.0000
NA-22	SODIUM-22	0.7000	1.2010	6.4000	2.2000		3.8000	5.7000		2.4000	0.7000	1.3000
NA-24	SODIUM-24	0.5100	0.0000	0.0000	0.0000		0.0000	0.0000		1.9800	2.8000	1.5470
NB-95	NIOBIUM-95	0.0000	6.0000	4.0000	3.0000		2.0000	2.0000		1.0000	2.0000	0.0000
Ni-63	NICKEL-63	12.0000	2.0000	2.0000	2.0050		0.0000	1.0000		9.0000	0.0000	0.0000
P-32	PHOSPHORUS-32 *	1949.7500	3645.7020	3279.9849	3596.5510		3941.3851	3859 7186	3186 0089	2947.7436	2990 4748	1705.3980
P-33	PHOSPHORUS-33	6.0000	0.0000	24.0000	6.0000	4.0000	0.0000	3.0000		15.5000	27.4400	18.0495
RA-228	RADIUM 228	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000
RB-86	RUBIDIUM-86	1.0000	5.0000	5.0000	9.0000	4.0000	7.0000	6.0000		0.0000	0.0000	1.0000
RU-103	RUTHENIUM-103	0.0000	0.0000	0.0000	2.0000	2.0000	3.0000	3.5000		0.5000	1.0000	0.5000
RU-106	RUTHENIUM-106	0.0000	0.0000	0.2000	0.0000	0.0000	0.0000	4.0000		0.0000	0.0000	0.0000
S-35	SULFUR-35	887.2000	1359.7869	1573.0500	1874.2650	2134.6700	2193.1000	2663.4000	2768 4240	2155.3500	1772.2500	1129.4400
SC-46	SCANDIUM-46	1.2500	7.0000	4.0000	2.0000	5.0000	1.0000	4.0000	1.5000	2.0000	2.5000	1.0000
SE-75	SELENIUM-75	0.0000	2.5000	2.0000	4.0000	2.0000	0.0000	0.0000		3.0000	10.0340	0.0000
SI-31	SILICON-REACTOR	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		2.0000	2.5000	0.0000
SN-113	TIN-113	0.0000	4.0000	6.0000	3.0000	3.0000	3.0000	5.0000	3.0000	2.0000	2.5000	0.5000
	TIN-121M	0.0000	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SR-82	STRONTIUM-82, D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.0000	0.0000	0.0000	0.0000	0.0000
SR-85	STRONTIUM-85	2.7500	6.0000	4.0000	4.5000	3.0000	2.0000	2.0000	1.0000	1.0000	1.0000	1.0000
SR-89	STRONTIUM-89	0.0000	0.0006	0.0000	0.0000	0.0001	0.0000	0.0004	0.0001	8.0002	0.0000	0.0003
TB-158	TERBIUM-158	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000
TC-94M	TECHNETIUM-94M	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000
TC-99	TECHNETIUM-99	0.0000		0.0004	0.0000	0.0000	0.0000	0.0000		0.0000		0.0000
TC-99M	TECHNETIUM-99M	0.0000		91.0000	0.0000	153.1000	759.1000	3324 8267	3139.0000	1271.0000	275.0000	1840.0000
TH-230	THORIUM 230	0.0000		0.0000	0.0000		0.0000	0.0001	0.0000	0.0000		0.0000
TL-201	THALLIUM-201	0.0000		29.9822	25.1802		4.4116	0.1420	1.7500	0.0000		0.0000
U-235	URANIUM-235 *	0.0000		0.0000	0.0520		0.0000	0.0000				0.0000
U-238	URANIUM-238 *	0.0001	0.0000	0.0000	0.0000		0.0000	0.0001	0.0000			0.0000
XE-133	XENON-133	0.0000		0.0000	0.0000		0.0000		0.0000	0.0000	0.0000	0.0000
ZN-62	ZINC-62	0.0000		0.0000	0.0000		0.0000			240.0000	230.0000	150.0000
ZN-65	ZINC-65	0.1500		0.1000	0.5000		0.5000				0.0000	2.5000
ZN-69	ZINC -69	1.3000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Unsealed Long-Lived (T > 120 days) NRC-Regulated Nuclides and Activities (mCi) Received under UW Broadscope License for Year Indicated

			RECPT87	RECPT88	RECPT89	RECPT90	RECPT91	RECPT92	RECPT93	RECPT94	RECPT95	RECPT96
AM-241	AMERICIUM-241	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000		
BA-133	BARIUM-133	0.0000	0.0000	0.0000	0.0001	0.0070	0.0000			0.0000		0.0000
C-14	CARBON-14 *	272.4380	414.2142	273.9533	240.3372	146.5089	259.7868	203.7551	145.6480	162.4562	164,5978	122.8640
CA-45	CALCIUM-45	18.0580	60.2000	48.0100	55.0000	77.0000	70,0000	43.0000	21.0030			7.0000
CL-36	CHLORINE-36	0.1000	0.0500	5.0250	0.2020	0.1500	1.1000	0.7000				
CM-244	CURIUM 244*	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000					
CO-60	COBALT-60 *	0.0509	0.0010	0.0000	2.0004	0.0000		100.000.000.000.000				0.0000
CS-137	CESIUM-137 *	0.0000	0.0015	0.0000	0.0000	0.0000			0.0000			0.0000
EU-152	EUROPIUM-152	0.0000	0.0000	0.0100	0.0001	0.0000				1.8600		
EU-154	EUROPIUM-154	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000			0.0000
EU-155	EUROPIUM-155	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	200				
FE-55	IRON-55	0.0760	0.0000		0.1001	0.0000				8.0060		
H-3	TRITIUM *	3367.1121	14314.7156	4061.2099	2955.6888	11406.0569		2395.3914	(A) (1) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	801.6350		
1-129	IODINE-129	0.0000	0.0001	0.0000	0.0000	0.0000			The second second second	0.0000		
LU-176	LUTETIUM 176	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000			0.0000	100 0000000
MN-54	MANGANESE-54	0.5000	0.5010	0.7000	0.5000	1.0000						
NI-63	NICKEL-63	12.0000	2.0000	2.0000	2.0050							0.000
RU-106	RUTHENIUM-106	0.0000	0.0000	0.2000	0.0000	0.0000		1.000		0.0000	2.5000	
SN-121M	TIN-121M	0.0000	0.5000	0.0000	0.0000	0.0000						-0.139-0-3030
TB-158	TERBIUM	0.0000	0.0000	0.0000	0.0000	0.0000				- 10.3 (10.00)		0.0000
TC-99	TECHNETIUM-99	0.0000	0.0000	0.0004	0.0000	0.0000		70.170.000.000		0.0000		
TH-230	THORIUM 230	0.0000	0.0000	0.0000			70.000		0.0000			10.000000000000000000000000000000000000
U-235	URANIUM-235 *	0.0000	0.0000	0.0000						0.0000	77.77.77.77	0.0000
U-238	URANIUM-238 *	0.0001	0.0000			0.0000			0.0000			
ZN-65	ZINC-65	0.1500	0.5000		25.50.0000	1.0000		0.0000		0.0000		
									2.000.00			2.0000

Activity (mCi)	Incinerated 1981	at Herrick I 1982	Drive Inciner 1983	ator for Year 1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	and the second second second	Totals
H-3	1422.22	1432.64	2249.91	10354.1	48816.9	1300	1625	1042.15	352.006	2275.011	552.976	426.7051	796.8366	241.5642	475.031	73363.05
C-14	87	20.4645	119.245	246.395	668.852	126	117	56.23	79.032	138.721	68.628	85.3515	109.1228	80.9645	147.229	2150.235
Na-22	0.13	0.05	1.288	0	5.5099	0.82	0.132	0.44	1.695	2.453	1.844	1.29292	1.9013	0.557	0.26	18.37312
P-32	1.5	0.99	5.109	7.128	9.3547	7.3	123	46.85	46.693	42.22	21.223	13.99898	16.103	23.89269	13.573	378.9354
P-33	0	0	0	0	0	0	0.0365	0	0	0	0	0	0	0	0.249	0.2855
S-35	13.36	27 444	58.16	488.544	335.431	267	338	287.09	384.588	136.545	333.43	392.0034	220.655	205.5203	181.499	3669.27
CI-36	0	0	0.001	0	0.448	0.001	0.43	0	0.981	0.681	0.003	0.08579	0.1604	0.172	1.547	4.51019
Ca-45	0.48	0	0.071	21.3645	13.0299	- 8	9.65	7.64	20.005	3.311	6.987	4.1365	4.60971	2.851623	3.063	105.1992
Sr-46	5.1	1,6718	2.065	2.479	2.7278	1.8	3.34	1.07	1.439	7.23	0.831	2.6047	0.9532	0.929	1.217	35.4575
Cr-51	23.9	21.713	21.024	18.92	17.961	51	7.97	0.006	1.688	265.102	18.109	39.5	32.455	17.684	24.311	561.343
Mn-54	0	0	0.2	0	0.0819	0.15	0.158	0.108	0.285	1.044	0.051	0.07715	0.2896	0.00007	0.326	2.77072
Fe-55	0	0	0	0.002	0.0262	0	0	0	0	0	0	0	0	0	0	0.0282
	2.3	0.67	0	0	1.4141	1.3	3.03	1.43	1.6	5.914	0.92	1.670744	0.7195	1.34025	1.817	24.12559
Co-57 Fe-59	0.19	0.004	0	0	0	0.2	0.332	0.002	0.302	0.307	0.2	0	0	0	0	1.537
	0.19	0.004	0.26	0	0	0.082	0	0	0	0.002	0.1	0	0	0	0	0.444
Co-60 Ni-63	0	0	0.20	0	19.9584	0.22	15.7	0.001	0	0.042	0.068	0.0001	0.053	0	0.027	36.0695
	0	0.36	0.67	0	0.0173	0.1	0.0505	0	0.051	0.008	0	0	0.0024	0.032	0	1.2912
Zn-65	0	0.30	0	0	0.0136	0.01	0	0	0	0	0	0	0	0	0	0.0236
Ga-68	0.94	0.387	0.7122	1.589	0.9939	0.62	0.118	0.0354	0.068	0	10.402	0.0002	0	0	0	15.8657
Se-75 Sr-85	3.1	1.5173	2.011	2.557	2.7408	1.6	2.51	0.67	1.84	1.355	0.43	1.93	0.44	0.43102	0.7 32	23.87412
	0	0	0	0	0.012	0.048	0.03	0.001	0	0.277	0	0.01077	0	0	0	0.37877
Rb-86	0	0	0	0	0	0	0	0	0	0.102	0	0	0.00001	0	0	0.10201
Y-88	0	0	0	0	0.004	0.0001	0	0	0	0	0	0	0	0	0	0.0041
Sr-90	0	0	0	0	0.004	0.0001	0.12	0	0	0.001	0	0	0	0	0	0.1251
Y-90 Nb-95	0	0	0	0	0.493	1.2	2.36	0.68	1.25	0.98	0.431	2.07472	0.85734	0.328	0.626	11.28006
	0	0	0.12	0	0	0	0	0	0	0	0	0	0	0	0	0.12
Mo-99	0	0	0.72	0	0	0.05	0	0	0	0	0	0	0	0	0	0.05
Tc-99	0.17	0.04	0	0	0.013	0	0	0	0.275	3.523	0.816	1.66939	0.4919	0.1704	0.415	7.58369
Ru-103	0.17	0.04	0	0	0.0346	0.13	0.438	0.095	0.017	0.757	0.16	1.93	0.1379	0.3431	0.549	5.0916
Cd-109	0.2	2.636	0	0	0	3.1	2.18	1.996	2.35	4.195	5.507	0.9149	0.04992	0	0.229	23.15782
In-111	0	2.030	0	0	0.9471	1.3	2.74	1.24	1.167	1.865	1.2	3.9895	2.0471	1.0798	1.311	18.8865
Sn-113	0	0	0	0	0	0	0.56	0	0	0	0	0	0	Ü	0	0.56
1-125	18.8	25.84	38.002	22.519	25.7177	46	33.7	24.66	32.657	20.424	17.493	13.8349	8.1433	9.346596	15.574	352.7115
I-125 I-131	0	23.04	0	0	0	0	0.92	0.207	0.853	0.244	0.006	0	0	0.013	0.118	2.361
Ba-133	0	0	0	0	0.0967	0	0	0	0	0	0	0	0	0	0	0.0967
	0	0	0.002	0	4.6226	2	0	0	0	0.066	0.009	0	0	0.0019	0	6.7015
Cs-137 Ce-141	0	0.7039	2.614	2.168	1.722	0.28	0.131	0	2.008	0.633	1.33	2.75091	0.96511	0.3694	0.399	16.07432
Eu-152	0	0.7038	0	0	0	0.25	0	0	0	0	0	0	0	0	0	0.25
Gd-153	0	0	0	0	0.1	0.031	0	0	0.317	0.289	0	0	0	0	0.008	0.745
Eu-154	0	0	0	0	0	0.064	0	0	0	0	0	0	0	0	0	0.064
TI-201	0	0	0	0	0	0	0	7.865	0.943	0.176	0.001	0	0	0	0	8.985
Pb-210	0	0	0.012	0	0	0	0	0	0	0	0	0	0	0	0	0.012
Po-210	0	0	0	0	0	0	0	0	0	0.005	0	0	0	0	0	0.005
Totals:	1579.39	1537.132	2501.476	11167.77	49929.23	1820.656	2289.636	1480.466	934.11	2913.483	1043.155	996.5322	1196.994	587.8908	870.12	80848.03
Labware (ft3)			1845.5	9732	1516	2312	4517	4901	6902	5769	3816.25	6565.85	5916.45	5008	5252.85	64053.9
Animals (lb)			23731	15354	16555	14427	12948	10732	12357	15747	7907	17000	11985	6760	8540	174043

Activity (mCi	i) Disposed 1981	of to the Sa 1982	nitary Sewer 1983	r for Year Inc 1984		1986	1987	1988	1989	1990	1991	1992	1993	1994	1005	Totals
LI 2	0.24	197.991	1586.84			688	566.4606	395.8572	298.8591	657.498	345.814		303.9904		763.844	
H-3 C-14	0.79	8.59	320.64	37.5088	34.7	28.6	17.6369	31.3014	10.995	17.4094	12.6446	13.1187	9.7477		5.312	
Na-22	0.75	0.105	0.04	1.048		0.074	0.393	0.54	1.005	1.385	0.5089	2.2647	1.2837		1.77	
P-32	0.18	0.103	0.56	9.105		5.1	11.8829	12.2515	16.9604	15.0229	7.422	8.1804	5.5727		4.068	
P-33	0.10	0.01	0.50	0.700		0	0	0	0	0.0139	0		0.0121		0	
S-35	1.12	27.34	9	39.127	44.85	48.2	57.2915	34.3217	64.7508	95.673	72.7558		87.5166	Contract to the last	83.625	
CI-36	0	0	0	0.01	0	0	0.0381	0	0.002	0.476	0.0469	0.321	2.142		5.503	
Ca-45	0.1	0.363	101.9	11,674	13.13	4.82	3.334	1.719	2.5591	6.1471	7.989	7.974	6.5865		6.602	
Sc-46	0	0	0	0.0102	0.016	0.0056	0.003	0	0.1204	0.0744	0.0035	0	0.002	0	0	0.2351
Cr-51	0	0	0.2	0.293	0.49	0	21.02	5.937	25.235	10.067	8.852	5.092	2.834	2.447	7.817	90.284
Mn-54	0	0	0	0.029	0.0411	0.013	0	0	0	0	0	0.907	0.052	0	0.99	1.1321
Fe-55	0	0	0	0	0	0	0	0	0.01	0.008	0	0	0	0	2.18	2.198
Co-57	0	0	0	0.116	0.0072	0.105	0.0145	0.0063	0.053	0.029	0.032	0.07	1.401	0.715	0.01	2.559
Fe-59	0	0.0056	0	0.151	0	0.105	0	0	0	0	0	0.00039	0	0	0	0.26199
Co-60	0	0	0	. 0	0.0007	0.0004	0	0	0	0	0	0	0	0	0	0.0011
4i-63	0	0	0	0.334	0.03	0.9	0	0	0.015	4.25	0.0271	0.415	0		2.06	9.5311
n-65	0	0.0105	0.05	0.045	0	0	0	0	0	0	0	0	0.245		0	0.3514
Sa-67	0	0	0	0	0	0	0	0	0	0	0.1	0	0		0	0.1
\s-73	0	0.0009	0	0	0	. 0	0	0	0	. 0	0	0	0	0	0	0.0009
Se-75	. 0	0	0.3	0	0.0028	0	0.5	0.147	0	0	0	0.8797	0	0	0	1.8295
Sr-85	0	0	0	0.0102	0.0153	0.0004	0.0042	0	0	0.002	0	0	0	0	0	0.0321
88-ds	0	0	0	0	0.007	0	0	0	0	0.002	0.025	0.026	0		0	0.06
-88	0	0	0	0	0.0014	0.0008	0	0	0	0	0	0	0		0	0.0022
F-89	0	0	0	0	0	0.0004	0	0	0	0	0	0	0		0	0.0004
Sr-90	0	0	0	0	0	0.004	0	0	0	0	0	0	0	0	0	0.004
r-95	0	0	0	0	0	0.0001	0	0	0	0	0	20.1	0	0	0	0.0001
c-99m	0	0	0	0	0	0	0		0 2250	4.1	10.52	40.1	20	0	0	54.72
tu-103	0	0	0	0	0	0	0	0	0.2258	0.006	0.0074	0	0	0	0	0.2392
lu-106	0	0.0001	0.004	0	0.0033	0.0021	0.003	0	0	0	0	0	0	0	0	0.0001
d-109	0	0	0.004	0	0.0033	0.0021	0.003	0	0.0226	0.0035	0	0	0	0	0	0.0124
in-113 ib-125	0	0.001	0	0	0.0000	0.0003	0	0	0.0220	0.0033	0	0	0	0	0	0.001
125	2.86	3.49	19.83	180.2753	95.3	45.2	28.7926	26.3179	126.6762	25.6563	18.6114	13.9491	13.2255	13.29	16.089	629.5633
131	2.00	0	0	0	0	0.9905	0.0908	1.1811	3.1042	2.995	3.56	0.03	0.03	0	0	11.9816
a-133	0	0	0	0	0.1227	0.002	0.0000	0.0003	0	0	0	0	0.00	0	0	0.125
s-134	0	0	0	0	0	0.0001	0	0	0	0	0	0	0	0	0	0.0001
s-137	0	0	0.001	0	0.0008	0.0066	0	0	0	0.0002	0	0	0	0	0	0.0086
Ce-139	0	0	0	0	0.0001	0.0001	0	0	0	0	0	0	0	0	0	0.0002
e-141	0	0	0	0.0102	0.013	0	0	0	0.3935	0.015	0.0085	0	0	0	0	0.4402
u-152	0	0	0	0	0	0.0013	0	0	0	0	0	0	0	0	0	0.0013
3d-153	0	0	0	0	0	0	0.0235	0	0	0	0	0	0	0	0.04	0.0635
1-201	0	0	0	0	0	0	0	0	0	1.8962	0	0	0	0	0	1.8962
lg-203	0	0	0.03	0	0.0004	0.0002	0	0	0	0	0	0	0	0	0	0.0306
1-204	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0	0.01
1-207	0	0	0	0	0	0.0001	0	0	0	0	0	0	0	0	0	0.0001
b-210	0	0	0	0.318	0	0	0	0	0	0	0	0	0	0	0	0.318
a-226	0	0	0	0	0.0001	0	0	0	0	0	0	0	0	0	0	0.0001
m-241	0	0	0	0	0.0003	0.0001	0	0	0	0.0001	0	0	0	0	0	0.0005
otals:	5.84	237.9071	2039.395	3228.049	1895.162	822.142	707.4886	509.5804	550.9871	842.7299	488.9281	606.0917	454.6291	416.1099 19.93	899.91	13704.95 19.93
Jser Sewer (i /olume (i)	mGI)						10224	9376	22807.77	12914.35	11568	10166.9	9964.11	11,022.43	9,001.38	107044.9

1

Nuclide	License Status	Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
AR-41	0	50	0	0	2000
AS-76	0	200	Ö	0	3000
AU-198	0	202	0	0	3000
AU-198S	0	2000	107	107	3000
BA-133	0	28	1	1	3000 3000
BA-140	0	0	0	ō	3000
BR-80	0	1	0	o o	3000
BR-82	0	221	0	ő	3000
CA-45	0	563	42	42	3000
CA-47	0	12	0	0	3000
CD-109	0	156	7	7	3000
CD-109S	0	95	0	Ó	3000
CD-115	0	2	0	0	3000
CE-139	0	110	0	0	3000
CE-141	0	39	0	0	3000
CE-144	0	0	0	0	3000
CL-36	0	22	1	1	3000
CL-38	0	11	0	0	3000
CR-51 CS-134	0	895	127	127	3000
CU-64	0	1	0	0	3000
CU-67	0	364	0	0	3000
DY-159	0	54	0	0	3000
EU-152	0	0	0	0	3000
EU-152M	0	25	2	2	3000
EU-154	0	10	0	0	3000
F-18	0	15	0	0 -	3000
FE-55	0	3000	0	0	3000
FE-59	0	81	7	7	3000
GD-153	0	48	0	0	3000
HG-203	o	24	0	0	3000
I-125	0	19	0	0	3000
I-125S	o o	2098	814	814	3000
I-129	0	1300	62	62	3000
I-131	0	0 736	0	0	1000
IN-111M	0	10	1	1	3000
IN-113M	0	100	0	0	3000
IN-114M	0	200	0	0	3000
IR-192	0	100	0	0	3000
IR-192S	0	2500	144	0	3000
K-42	0	26	0	144	3000
KR-79	0	0	0	0	3000
KR-81	0	30	0	0	3000
KR-85	0	400	0	0	3000
LA-140	0	0	0	0	3000
LU-176	0	0	o	0	3000

2

Nuclide	License Status	Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
MN-56	0	10	6	6	3000
NB-95	0	127	1	1	3000
NI-63	0	213	55	55	3000
NI-63GC	0	849	397	397	3000
0-15	0	2700	0	0	3000
0-19	0	5	0	0	3000
P-33	0	948	20	20	3000
PB-210	0	10	0	0	3000
PB-210S	0	0	0	0	1
PM-147	0	1000	0	0	3000
PO-210	0	20	6	6	80
PR-144	0	0	0	0	3000
PT-197	0	0	0	0	3000
PU-238	0	0	0	0	0
RB-86	0	165	2	2	3000
RH-106	0	0	0	0	3000
RU-103	0	102	0	0	3000
RU-106	0	0	0	0	3000
RU-106S	0	10	4	4	3000
S-35	0	7208	2107	2107	3000
SB-124	0	101	0	0	3000
SB-125	0	0	0	0	3000
SC-46	0	28	1	1	3000
SE-75	0	58	3	3	3000
SM-151	0	50	50	50	3000
SN-113	0	35	1	1	3000
SN-119M SN-121M	0	50	10	10	3000
SR-85	0	0	0	0	3000
SR-87M	0	4041	1	1	3000
SR-89	0	400	0	0	3000
SR-90	0	65	0	0	3000
TB-158	0	92	1	1	3000
TC-99	0	0	0	0	3000
TE-123	0	10	0	0	3000
TL-201	0		0	0	3000
TL-204	0	203	0		3000
TM-170	0	1 0		0	3000
XE-127	0	300	0	0	3000
XE-133	0	2011	0	0	
Y-90	0	2011	0	0	3000
YB-169	0	4700	0	0	3000
ZN-65	0	433	5	5	3000
ZN-69	o	10	0	0	3000
ZR-95	ő	0	0	o	3000

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Radiation Safety Composite Inventory Report UW - Madison

Nuclide License Total of Total of Status User User Possession Balances Limits (mCi)	UW-Madison NRC Balance License uncorrected Limit (mCi) (mCi)
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\*\*\* Total \*\*\*

41704

3985

3985

1.

Nuclide	License Status	Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
AM-241	1	1	0	0	250
AM-241S	î	3421	2414	2414	5000
AM-BE	1	100	50	50	100
AS-73	i	200	0	0	3000
C-14	1	5892	500	500	5000
CM-244	1	0	0	0	1
CM-244S	1	20	4	4	40
CO-60	1	612	1	i	5000
CO-60S	1	102	101	101	5000
CS-137	1	8239	674	674	20000
CS-137S	1	2022201	6289	6289	20000
FE-55S	1	120	28	28	3000
GD-153S	1	12001	2058	2058	12000
H-3	1	1642884	369142	369142	2000000
H-3GC	1	600	0	0	500000
I-125B	1	2050	0	0	3000
MO-99	1	8801	0	0	10000
P-32	1	9483	1439	1439	5000
PU-239	1	0	0	0	0
SI-31	1	10	4	4	3000
TC-94M	1	300	1	1	10
TC-99M	1	8562	160	160	10000
U-238	1	864	0	0	166
*** Total	***				
		3726463	382867	382867	
nuclide nuk->lic	cense	poss_lim	balance	nuk->balance	nuk->nrcli
CM-244 1		0.0150	0.0031	0.0031	1.000
CM-244S 1		20.0000	4.0000	4.0000	40.000
PU-239 1		0.1010	0.0005	0.0005	0.035
PU-2398 2		5000.0000	3000.0000	3000.0000	3000.000

1

Nuclide	License Status	Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
PU-239S	2	5000	3000	3000	3000
SR-90S	2	1677	222	222	3000
TH-230	2	0	0	0	0
U-235 *** Total	2	0	0	0	0
		6677	3223	3223	

1

Nuclide	License Status	Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
AS-72	3	200	0	0	3000
AS-74	3	204	0	0	3000
AU-195	3	150	0	0	3000
BE-7	3	2	0	0	3000
BI-207	3	0	0	0	3000
BR-76	3	550	0	0	3000
BR-77	3	220	0	0	3000
C-10	3	101	0	0	3000
C-11	3	1700	0	0	3000
CO-55	3	20	0	0	3000
CO-56	3	100	0	0	3000
CO-57	3	409	147	147	3000
CO-57S	3	1	0	0	1000
CO-58	3	200	0	0	3000
CS-129	3	0	0	0	3000
CU-61 CU-62	3	220	0	0	3000
F-17	3	400	0	0	3000
FE-52	3	200	0	0	3000
GA-67	3	110	0	0	3000
GA-68	3	313 650	0	0	3000
GE-68	3	220	0	0	3000
GE-68S	3	50	12	12	3000 50
GE-68SS	3	7	0	0	3000
HG-195	3	150	0	0	3000
HG-197	3	6	0	0	3000
I-123	3	230	0	0	3000
I-124	3	100	0	o	3000
IN-111	3	391	0	0	3000
IR-192A	3	22000	9697	9697	2
K-38	3	20	0	0	3000
K-40	3	1	0	0	3000
KR-77	3	1	0	0	3000
MG-28	3 3 3 3 3	0	0	0	3000
MN-51	3	100	0	0	3000
MN-52	3	101	0	0	3000
MN-52M	3	100	0	0	3000
MN-54	3	25	1	1	3000
N-13	3	1260	0	0	3000
NA-22	3	52	5	5	1500
NA-24	3	21	4	4	3000
0-14	3	250	0	0	3000
RA-226	3	213	101	101	1000000
RA-226S	3	25	0	0	1000000
RA-228	3	0	0	0	3000
RB-81	3	60	0	0	3000

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Nuclide License Status		Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
RB-82	3	750	0	0	3000
SR-82	3	750	0	0	3000
TE-123M	3	100	0	0	3000
TH-228	3	0	0	0	3000
TH-232	3	10	0	0	3000
TI-44	3	0	0	0	3000
V-48	3	120	0	0	3000
V-50	3	1	0	0	3000
XE-123	3	1	0	0	3000
Y-87	3	600	0	0	3000
Y-88	3	111	0	0	3000
ZN-62	3	400	0	0	3000
*** Total	***				
		33977	9966	9966	

Page No.

1 Summary of nuclides where Total Poss Limits > NRC Limit

07/02/96

Nuclide	License Status	Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
AM-BE	1	100	50	50	100
AS-70		100	0	0	0
BA-137M		0	0	0	0
BR-74M		100	0	0	0
BR-75		150	0	0	0
BR-80M		520	0	0	0
C-14	1	5892	500	500	5000
C0-57		10	0	0	0
CA-41S	0	0	0	0	0
CD-107		100	0	0	0
CL-34M		150 100	0	0	0
CO-54M CS-137I		1450000	0	0	0
CS-1375	1	2022201	6289	6289	20000
CU-60	*	520	0	0	0
EU-155		0	o	Ö	0
F-18	0	3000	0	0	3000
GA-64		100	0	0	0
GA-66		200	0	0	0
GD-153S	1	12001	2058	2058	12000
GE-68S	1 3	50	12	12	50
GE-71S		0	0	0	0
GE-75S		0	0	0	0
GE-77S		0	0	0	0
1-126		100	0	0	0
I-130		100	0	0	0
IN-110		100	0	0	0
IN-112		100	0	0	0
IN-115M		100	0	0	0
IR-192A	3	22000	9697	9697	2
KR-81M MO-93M		50 100	0	0	0
NB-90		200	0	0	0
NB-92M		100	0	0	0
NB-96		100	0	0	0
NI-63S		15	0	0	0
P-210SS		20	0	0	0
P-30		100	0	0	0
P-32	1	9483	1439	1439	5000
PB-205		0	0	0	0
PD-103		4500	0	0	0
PD-103S		300	0	0	0
PN-13		0	0	0	0
PU-238	0	0	0	0	0
PU-239	1	0	0	0	0

. Page No.

2 Summary of nuclides where Total Poss Limits > NRC Limit

07/02/96

Nuglide	*!	m-t-3 -6			
Nuclide	License	Total of	Total of	UW-Madison	NRC
	Status	User	User	Balance	License
		Possession	Balances	uncorrected	Limit
		Limits	(mCi)	(mCi)	(mCi)
PU-239S	2	5000	3000	3000	3000
PU-240		0	0	0	0
RB-82GE		3000	0	0	0
RB-82M		200	0	0	0
RB-83		100	0	0	0
RB-84		100	0	0	0
RB-84M		500	0	0	0
RB-87		0	0	0	0
RH-100 RH-102M		100	0	0	0
RH-96		100	0	0	0
RH-98		100	0	0	0
RH-99		100	0	0	0
RH-99M		100	0	0	0
S-35		100	0	0	0
SB-116	0	7208	2107	2107	3000
SB-116M		100	0	0	0
SB-117		100	0	0	0
SB-117		100	0	0	0
SB-120		100	0	0	0
SB-122		100	0	0	0
SC-43		200	0	0	0
SC-44		100	0	0	0
SC-44M		100	0	0	0
SC-48		100	0	0	0
SN-113M		100	0	0	0
SR-82GE		3000	0	0	0
SR-85	0	4041	1	1	3000
TC-92		100	0	0	3000
TC-94		100	0	0	0
TC-94M	1	300	1	1	10
TC-95		200	0	0	0
TC-95M		300	0	0	0
TC-96		300	0	0	0
TE-121		100	0	0	0
TE-121M		100	0	0	O
TI-45		100	0	o o	o o
TL-45		500	0	0	0
TN-113		0	0	o o	0
U-234		0	0	Ö	0
U-236		0	0	o o	0
U-238	1	864	0	o o	166
V-47		200	0	o o	0
XE-127M		500	0	0	0
Y-84		200	0	0	0

#### JUL 1 0 1997

Ronald R. Bresell Radiation Safety Officer The University of Wisconsin Safety Department 30 North Murray Street Madison, WI 53715

Dear Mr. Bresell:

We have reviewed your decommissioning financial assurance submittal dated September 18, 1996, with Statement of Intent dated September 17, 1996, and subsequent submittal dated June 3, 1997.

Within the scope of our review, no further deficiencies were identified. If additional information is required, we will contact you.

If you have any questions, please feel free to contact me at (630) 829-9854.

Sincerely.

Original Signed By Kevin G. Null, Acting Chief Nuclear Materials Licensing Branch

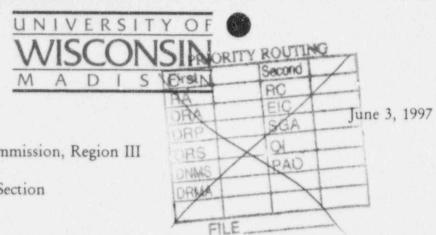
License No. 48-09843-18 Docket No. 030-03465

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U.S. Nuclear Regulatory Commission, Region III ATTN: Kevin Null Nuclear Materials Licensing Section 801 Warrenville Road Lisle, Illinois 60532-4351

Re: Decommissioning Funding Plan and Statement of Intent - BML No. 48-09843-18, Docket No. 030-03465

Dear Mr. Null:

We believe that the 18 September 1996 DFP we submitted was substantially complete. Per Reg Guide 3.66, "...licensees initiate decommissioning activities when they decide to terminate licensed activity at a facility ... remov[ing] ... safely from service and reduc[ing] residual radioactivity to a level that permits release of the property for unrestricted use...." Thus, our decommissioning is initiated if the UW terminates its use of radioactivity at all authorized locations (probability  $\sim 10^{-6}$ ) while continuing to perform its primary (education) mission. We assume that the UW will not cease to exist since that event is extremely unlikely (probability  $\sim \aleph_0^{-1}$ ). Even if the UW terminated licensed activity, that action would not occur instantaneously. Because of contractual obligations with such Federal agencies as the NIH, DOE, etc., termination would be a gradual (at least 2 years) process. These assumptions mean that personnel with technical expertise in biophysics, radiation and chemical safety will continue to be on the staff of the UW. Given that, we shall address some of your requested information items.

#### 1. Additional detail for cost estimates:

Since this DFP was submitted with the renewal, our assumption was that you had a facility description. To expand, the UW performs routine biochemical research using very small quantities of radioactivity. Most of the laboratories we have are (what we have defined in our license renewal as) Type I, common laboratories. The activities used are appropriate for Type I work places. In our original lette., we described (para a, pg. 3) our survey procedure to insure that contamination is not an acceptable outcome for radiation work. Our regulations call for removable contamination limits of 2200 dpm/100 cm² for low energy ß emitters and 660 dpm/100 cm² for all other radionuclides. For an authorized user to remove a room from his authorized listing, these levels (and preferably levels closer to background) must be demonstrated by meter and wipe surveys. These limits are also maintained for the use of radioactive materials in these labs, so materials are under decommissioning levels at all times.

Pm: 6-3-97

Safety Department

JUN 0 6 1997

- While we do not believe that the planning and preparation activities will be needed (i.e., the UW will not terminate its nuclide related research), we are prepared to perform them. First, the UW has the expertise to perform the complex planning and preparation for decommissioning tasks in-house. That is because the UW has both NRC licenses and EPA (chemical) permits, both of which require planning and preparation activities to operate. We envision using this same in-house expertise to prepare detailed decommissioning plans and any other documentation/planning/training required to effect a decommissioning. Second, we have sent Health Physicists to ORAU to attend formal decommissioning training classes, enabling us to understand and comply with changing requirements. Third, with only very few exceptions, over 99.% of routine decommissioning is the deleting rooms from authorized users' listings after the performance of surveys demonstrating an essentially contamination free lab. Therefore, consultative planning and preparation activities for decommissioning are not budgeted because they are a part of everyday operations and those costs (e.g., Table 1, Appendix F, RegGuide 3.66) we assumed to be zero.
- In our original letter (para. c, pg. 3) we stated, "At this time, we anticipate the incinerator to be the only contaminated facility." This statement takes into account both the UW's internal requirement for each authorized researcher to decontaminate authorized space prior to deleting them from radioactive material work and our long history of performing surveys on ductwork for contamination prior to maintenance or upgrade (these surveys have routinely demonstrated negligible contamination in these facilities). Although the UW is authorized to perform research of a broad scope, the type of work performed is routine laboratory work. A review of protocols indicates that the only airborne effluents generated are gaseous (e.g., CO<sub>2</sub>, I<sub>2</sub>, IO<sub>x</sub>, etc.). Most of the liquid work performed involves aqueous liquids. Our general policy is to collect all liquid (and solid) wastes for centralized processing and disposal. Thus, residual contamination in laboratories and buildings is nonexistent.
- Worker costs (Tables 2 and 3, Appendix F, RegGuide 3.66) are not a consideration. As noted above, we envision time to perform these activities inhouse. Even if the termination of licensed activities resulted in the reduction or ultimate elimination of the Radiation Safety Office, decommissioning would be accomplished without personnel costs. Approximately half of our authorized users are tenured faculty. Tenured faculty salaries are budgeted (and essentially guaranteed) by the state legislature. Regardless of the economic circumstances, never has a tenured faculty member been furloughed. Facilities Planning and Management (FP&M), the parent organization of the Safety Department, is responsible for the upkeep of facilities. These personnel could be adequately trained to conduct minor decontamination in the

event that the radiation safety staff is reduced to a skeleton staff. Thus, we did not calculate worker costs because, (1) there is no contamination anticipated and (2) the faculty and staff assigned would decontaminate if any were detected.

- On page 3 we provided an estimate of \$280,000 for decommissioning, primarily disposal costs. This estimate was based on sealed source and incinerator waste disposal. This value was derived from a cost estimate provided by EnviroCare to accept low activity contaminated debris and the costs we have experienced in routinely disposing of routine radioactive material (both sealed sources and waste). This cost estimate included decommissioning generated waste.
- The UW generates approximately 14 cubic feet of low level radioactive waste annually which would require disposal under decommissioning. This waste stream is primarily incinerator ash which does not meet the activity levels for disposal without regard to radioactivity and is stored in DOT type 17H 55 gallon drums (already on-hand). Including the incinerator debris (above), we believe volume can be disposed within the \$90,000.
- The final radiation survey would be accomplished by the staff of the Safety Department and is thus without cost. Legally, a NRC license can not be unilaterally terminated. That license mandates staffing to accomplish the tasks. The performance and analysis of surveys is a function that the Safety Department performs on a daily basis. There is no reason to employ outside consultation.
- There are no contaminated grounds nor areas at the UW. There is no need to perform any extra-license tasks to return the property to public use.
- 2. We believe that attempting to salvage contaminated material for resale is contrary to ALARA. Although we do not foresee encountering contaminated equipment, if items cannot be decontaminated, they will be disposed of as radioactive waste.
- 3. We built in sufficient margin in our estimates to account for contingencies. For example, we know an irradiator source can be disposed of for \$5000 \$7000 (for a total of \$42,000 \$50,000), but allocated \$200,000 for this. We believe our commitment of \$500,000 to overestimate the real expenses of decommissioning by a factor of at least 50%. We did that to incorporate a contingency factor.
- 4. Adjusting estimates will be accomplished as an integral component of "license renewal or when the amounts/types of material" at the UW changes. This revision will include an updated estimates based upon "current prices for goods and services at the time."

If you have any questions pertaining to this information, please call me at (608) 262-9178 or FAX me at (608) 262-6767.

Sincerely,

Ronald R. Bresell

Radiation Safety Officer

Row Marce

Ronald R. Bresell Radiation Safety Officer University of Wisconsin - Madison 30 North Murray Street Madison, WI 53715-2609

Dear Mr. Bresell:

We have reviewed your Decommissioning Funding Plan and Statement of Intent attached to letter dated September 18, 1996, and find that you will need to modify the submission in the following ways:

 Submit Additional Detail to Support the Cost Estimate (Regulatory Guide 3.66, Appendix F)

The submission includes a four-page decommissioning funding plan that describes radionuclide usage at the University's facilities and provides a cost estimate for decommissioning the facilities operating under your four byproduct material licenses. The DFP, however, does not identify cost subtotals for planning and preparation, decontamination and dismantling of facility components, and packaging, shipping, and disposal of radioactive wastes. Moreover, the DFP does not include sufficient detail to allow an adequate evaluation of the total cost estimate. In particular, the submission does not include the following information:

- Descriptions of the facilities, the activities that occur at the facilities, and the levels of contamination that may be present;
- A description of all planning and preparation activities such as preparing a
  detailed decommissioning plan, preparing other state and/or local
  documentation, developing work plans, performing staff training, or
  procuring special equipment;
- The number and dimensions of the laboratories and facility components (e.g., fume hoods, glove boxes, laboratory benches, ductwork) that need to be decontaminated;
- A worker unit cost schedule and a table of worker hours for each task;
- Unit cost data for containers, transportation, and disposal;
- A detailed list of the types and amounts of radioactive waste that will need to be disposed, including any waste generated by decommissioning such as contaminated paper towels or personal protective equipment;

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- The cost of performing a final radiation survey of the facility; and
- A description of any planned activities to restore contaminated areas on facility grounds, stabilize the site, or perform long-term surveillance to properly decommission the facility.

In order to allow an adequate evaluation of the estimated decommissioning costs, please revise your cost estimate to include the information listed above and to increase the level of detail, especially for decontamination and dismantling activities, to be consistent with the cost estimating tables in Appendix F of NRC's Regulatory Guide 3.66 "Standard Format and Content of Financial Assurance Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, 70, and 72," June 1990. Please use the tables found in Appendices A and E of NUREG/CR-1754, Addendum 1, to help estimate your decommissioning costs. The tables estimate the number of person-days required, the cost of equipment and supplies, and the quantity of waste generated in decontaminating individual facility components (e.g., individual time, cost, and waste generation estimates for decontaminating floors, ceilings, walls, fume hoods, glove boxes, and ductwork).

 Clarify that No Credit Was Taken for Salvage Value (Regulatory Guide 3.66, page 1-10)

The cost estimate does not state whether credit has been taken for any salvage value that may be realized with the sale of potential assets during decommissioning. If estimated credits are taken for salvage value but are not fully realized at the time of decommissioning, the cost estimate may be significantly low. To ensure the adequacy of the cost estimate, *Regulatory Guide 3.66*, page 1-10, states that cost estimates should not incorporate any credit for salvage value. Please clarify that you have not included in your cost estimate credit for any salvage value that may be realized with the sale of potential assets at the time of decommissioning.

 Incorporate a Contingency Factor into the Total Decommissioning Cost Estimate (Regulatory Guide 3.66, page 1-10, and NUREG/CR-1754, Addendum 1)

The cost estimate submitted by the University does not explicitly allow for contingencies. *Regulatory Guide 3.66*, page 1-10, recommends that a contingency factor be included in the decommissioning cost estimate. A contingency factor helps ensure coverage for unexpected circumstances that could increase decommissioning costs. NUREG/CR-1754 uses a contingency factor of 25 percent in its cost estimates for each of six reference laboratories. Please incorporate a contingency factor of at least 25 percent into your decommissioning cost estimate.

4. Describe the Means to be Used for Adjusting Cost Estimates and Associated Funding Levels Over the Life of the Facility (10 CFR 30.35(e))

10 CFR 30.35(e) requires licensees to describe the means they will use to adjust decommissioning cost estimates and associated funding levels over the lives of their facilities. The University does not provide such a description in its decommissioning funding plan. Please use the method described in Regulatory Guide 3.66 for adjusting cost estimates. Regulatory Guide 3.66 suggests that cost estimates be updated with current prices for goods and services at the time of license renewal or when the amounts/types of material at the facility change. Adjustments should be made to account for inflation, for other changes in prices of goods and services, for changes in facility conditions, and for changes in expected decommissioning procedures.

Sincerely,

Original Signed By Kevin G. Null Nuclear Materials Licensing Branch

License No. 48-09843-18 Docket No. 030-03465

- Enclosures: 1. Regulatory Guide 3.66
  - 2. NUREG 1754, Addendum 1

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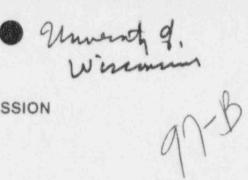
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# NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001 April 28, 1997



MEMORANDUM TO:

Cassandra Frazier

Materials Licensing Section Division of Radiation Safety and Safeguards, Region III

FROM:

Louis M. Bykoski

Facilities Decommissioning Section Low-Level Waste and Decommissioning

Projects Branch

Division of Waste Management, NMSS

SUBJECT:

THE OFFICE OF THE GENERAL COUNSEL AND CONTRACTOR COMMENTS ON

NON-STANDARD FINANCIAL ASSURANCE SUBMITTALS

Our contractor, ICF Incorporated, and the Office of the General Counsel (OGC) have reviewed and provided comments on the CSM Industries and University of Wisconsin nonstandard financial assurance submittals sent to us for review.

The ICF comments are presented in two parts. The first part deals with specific recommendations to current deficiencies. The second part (Other Issues) provides a discussion of changes to the standard wording that are acceptable and are not considered to be deficiencies. The OGC comments may include additional deficiencies that need to be corrected by the licensee and comments for our internal use.

You should carefully review all the comments before preparing the deficiency letter. We have attached both the ICF and OGC comments to assist you in your review.

Attachments: As stated

CONTACT: Louis M. Bykoski, NMSS/DWM

415-6754

Stephen Lewis, OGC

415-1684

# LIST OF INSTRUCTIONS

University of Wisconsin - Malison

In reviewing the comments the reviewer will note that there will be some overlap between ICF and OGC comments. The following comments should be included in the basis for the deficiency letter:

- 1. ICF comments 1 through 6 plus last paragraph.
- 2. All OGC comments.

All other comments and discussions are for reviewer information.

MEMO TO:

Louis M. Bykoski, NMSS

FROM:

OGC

RE:

REVIEW OF NONSTANDARD SUBMITTALS

University of Wisconsin - Madison: ICF recommendations 5 and 6 relate to the adequacy of the Statement of Intent, dated September 17, 1996, submitted by the General Counsel/ Assistant Trust Officer on behalf of the Licensee. OGC notes that the wording of the Statement of Intent meets the requirements of 10 CFR § 30.35 (f) (4). The commitment in question is that "funds for decommissioning will be obtained when necessary." Since the Licensee has provided a Statement of Intent that makes this precise commitment, OGC does not believe the NRC has a basis to require the Licensee to submit a revised Statement of Intent. We have also considered ICF's comment that, apart from the representation in the Statement of Intent, there is no evidence that the General Counsel/ Assistant Trust Officer is authorized to execute the docima int on behalf of the Licensee. While such evidence might provide additional assurance that the Statement of Intent has been properly executed, OGC does not believe that the Statement of Intent needs to be resubmitted on this account. We note that 10 CFR § 30.9 (a) requires that information provided to the NRC by a licensee shall be complete and accurate on all material respects. We consider that the statement by the Licensee is a material statement covered by section 30.9 (a). Thus, if the statement were to be inaccurate and the Licensee were to repudiate the Statement of Intent on that basis, strong enforcement action could be taken. On this basis, OGC does not believe that resubmittal of the Statement of Intent with further evidence of authorization is required.



#### CONSULTING GROUP

ICF Incorporated 9300 Lee Highway Fairfax, VA 22031-1207 703/934-3000 Fax 703/934-9740

March 11, 1997

To:

Dr. Lou Bykoski, NMSS/NRC

From:

Larry Huffman, Matt Borick, and John Collier, ICF Incorporated

Subject:

Review of Decommissioning Funding Plan and Statement of Intent

Submitted by the University of Wisconsin-Madison

The University of Wisconsin-Madison in Madison, Wisconsin, submitted a decommissioning funding plan (DFP), using a statement of intent (dated September 17, 1996) in the amount of \$500,000. The submission addresses decommissioning costs of \$480,000 for licenses 48-09843-18, 48-09843-28, 48-09843-32, and 48-09843-34 issued under 10 CFR Part 30. Upon review of the submission, ICF recommends that NRC require the licensee to modify the submission in the following ways:

- (1) Submit additional detail to support the cost estimate (Regulatory Guide 3.66, Appendix F);
- (2) Clarify that no credit was taken for salvage value (Regulatory Guide 3.66, page 1-10);
- (3) Incorporate a contingency factor into the total decommissioning cost estimate (Regulatory Guide 3.66, page 1-10, and NUREG/CR-1754, Addendum 1);
- (4) Describe the means to be used for adjusting cost estimates and associated funding levels over the life of the facility (10 CFR 30.35(e));
- (5) Revise the statement of intent to state that funds will be requested and obtained from the appropriate funding body sufficiently in advance of decommissioning (Regulatory Guide 3.66, page 3-25); and
- (6) Submit evidence that the person signing the statement of intent is authorized to represent the licensee and to request funds from the appropriate funding body (Regulatory Guide 3.66, page 3-25).

These recommendations and other issues are discussed below.

# (1) Submit Additional Detail to Support the Cost Estimate (Regulatory Guide 3.66, Appendix F)

The submission includes a four-page decommissioning funding plan that describes radionuclide usage at the licensee's facilities and provides a cost estimate for decommissioning the facilities operating under the licensee's four byproduct material licenses. The DFP, however, does not identify cost subtotals for planning and preparation, decontamination and dismantling of facility components, and packaging, shipping, and disposal of radioactive wastes. Moreover, the DFP does not include sufficient detail to allow an adequate evaluation of the total cost estimate. In particular, the submission does not include the following information:

- Descriptions of the facilities, the activities that occur at the facilities, and the Jevels of contamination that may be present;
- A description of all planning and preparation activities such as preparing a detailed decommissioning plan, preparing other state and/or local documentation, developing work plans, performing staff training, or procuring special equipment;
- The number and dimensions of the laboratories and facility components (e.g., fume hoods, glove boxes, laboratory benches, ductwork) that need to be decontaminated;
- A worker unit cost schedule and a table of worker hours for each task;
- Unit cost data for containers, transportation, and disposal;
- A detailed list of the types and amounts of radioactive waste that will need to be disposed, including any waste generated by decommissioning such as contaminated paper towels or personal protective equipment;
- The cost of performing a final radiation survey of the facility; and
- A description of any planned activities to restore contaminated areas on facility grounds, stabilize the site, or perform long-term surveillance to properly decommission the facility.

In order to allow an adequate evaluation of the estimated decommissioning costs, ICF recommends that NRC require the licensee to revise its cost estimate to include the information listed above and to increase the level of detail, especially for decontamination and dismantling activities, to be consistent with the cost estimating tables in Appendix F of NRC's Regulatory Guide 3.66 "Standard Format and Content of Financial Assurance

Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, 70, and 72," June 1990. ICF also recommends that the licensee use the tables found in Appendices A and E of NUREG/CR-1754, Addendum 1, to help estimate its decommissioning costs. The tables estimate the number of person-days required, the cost of equipment and supplies, and the quantity of waste generated in decontaminating individual facility components (e.g., individual time, cost, and waste generation estimates for decontaminating floors, ceilings, walls, fume hoods, glove boxes, and ductwork).

# (2) Clarify that No Credit Was Taken for Salvage Value (Regulatory Guide 3.66, page 1-10)

The cost estimate does not state whether credit has been taken for any salvage value that may be realized with the sale of potential assets during decommissioning. If estimated credits are taken for salvage value but are not fully realized at the time of decommissioning, the cost estimate may be significantly low. To ensure the adequacy of the cost estimate, Regulatory Guide 3.66, page 1-10, states that cost estimates should not incorporate any credit for salvage value. ICF recommends that NRC require the licensee to clarify that it has not included in its cost estimate credit for any salvage value that may be realized with the sale of potential assets at the time of decommissioning.

#### (3) Incorporate a Contingency Factor into the Total Decommissioning Cost Estimate (Regulatory Guide 3.66, page 1-10, and NUREG/CR-1754, Addendum 1)

The cost estimate submitted by the licensee does not explicitly allow for contingencies. Regulatory Guide 3.66, page 1-10, recommends that a contingency factor be included in the decommissioning cost estimate. A contingency factor helps ensure coverage for unexpected circumstances that could increase decommissioning costs. NUREG/CR-1754 uses a contingency factor of 25 percent in its cost estimates for each of six reference laboratories. ICF recommends that the licensee incorporate a contingency factor of at least 25 percent into its decommissioning cost estimate.

#### (4) Describe the Means to be Used for Adjusting Cost Estimates and Associated Funding Levels Over the Life of the Facility (10 CFR 30.35(e))

10 CFR 30.35(e) requires licensees to describe the means they will use to adjust decommissioning cost estimates and associated funding levels over the lives of their facilities. The licensee does not provide such a

NUREG/CR-1754, Addendum 1, <u>Technology</u>, <u>Safety and Costs of</u>

<u>Decommissioning Reference Non-Fuel-Cycle Nuclear Facilities: Compendium of Current Information</u>, <u>Pacific Northwest Laboratory</u>, October 1989.

<sup>2</sup> Ibid.

description in its decommissioning funding plan. ICF recommends that the licensee use the method described in Regulatory Guide 3.66 for adjusting cost estimates. Regulatory Guide 3.66 suggests that cost estimates be updated with current prices for goods and services at the time of license renewal or when the amounts/types of material at the facility change. Adjustments should be made to account for inflation, for other changes in prices of goods and services, for changes in facility conditions, and for changes in expected decommissioning procedures.

(5) Revise the Statement of Intent to State that Funds Will Be Requested and Obtained from the Appropriate Funding Body Sufficiently in Advance of Decommissioning (Regulatory Guide 3.66, page 3-25)

According to Regulatory Guide 3.66, page 3-25, the purpose of a statement of intent is to ensure that, early in the life of the licensed facility, government entities make their funding bodies aware of decommissioning requirements and costs and the eventual need for funding. To prevent delay of required decommissioning activities, statements of intent must indicate that funds will be requested and obtained from the appropriate funding body sufficiently in advance of decommissioning.

The statement of intent submitted by the licensee contains two problems. First, it does not state that the licensee intends to request and obtain decommissioning funds from the appropriate funding body. Consequently, the licensee may intend to use internal resources to pay for decommissioning. In that case the statement of intent could be interpreted as a self-guarantee. The licensee, however, has not demonstrated its ability to pass the financial test for self-guarantees. Second, the statement of intent states that the licensee intends "to obtain the funds for decommissioning when necessary" (emphasis added). This could mean that funding will not be requested sufficiently in advance, and that required decommissioning activities may be delayed while funding is being obtained. ICF recommends that NRC require the licensee to obtain a revised statement of intent indicating that funds will be requested and obtained from the appropriate funding body sufficiently in advance of decommissioning to prevent delay of required activities.

(6) Submit Evidence that the Person Signing the Statement of Intent is Authorized to Represent the Licensee and to Request Funds from the Appropriate Funding Body (Regulatory Guide 3.66, page 3-25)

The submitted statement of intent is signed by Charles J. Stathas, the licensee's General Counsel and Assistant Trust Officer. However, apart from a sentence in the statement of intent itself ("I hereby certify that I am authorized to act on behalf of the Board of Regents in signing this document."), the submission does not provide any evidence of the authority of this individual to represent the licensee, as recommended by Regulatory Guide 3.66, page 3-25, or to request funds when necessary from the State of Wisconsin. To help ensure that the licensee will request and obtain funds when needed, ICF recommends that NRC require the licensee to submit evidence that the person signing the statement of intent is authorized to represent the licensee in requesting funds from the State of Wisconsin.

#### Other Issues

The submission indicates that on July 16, 1990, the licensee submitted a statement of intent to NRC in the amount of \$750,000. ICF has not reviewed this statement of intent.

Finally, NRC should verify that the documents submitted by the licensee are originally signed duplicates, as recommended by Regulatory Guide 3.66. Unless the documents have been properly signed, NRC cannot be certain that the financial assurance mechanism is enforceable. Because ICF does not possess the original submission, we cannot verify compliance with these requirements.

attachments

#### REVIEW OF DECOMMISSIONING PUNDING PLAN (DFF)

Name of company or instit	nerous Nu	iversity	of Wisconin	n - Madison
Number of licenses and applicable regulations:	_4		10 CPR Pe	ure 30
		-	10 CFR Pa	ure 40
			10 CFR Pe	urt 70
	-	Menuses	10 CPR Pa	et 72
Isotopes handled and possession limits (specify units):				
	*******		-	NT NC CALLES
	-	BALIFICADO .		CONTRACTOR .
	***************************************	CATALOGICA	-	
		NURSE .	***************************************	
	***************************************		-	
	-	MERCHAN	-	MATERIAL STATE OF THE STATE OF
	-	Married 1		MANAGEMEN.
otal cost estimate for .icenses listed above:	s <u>t</u>	,480,0	00	
deneral comments on DFF:				
License Number	Type		Amount	
48-09843-18	Bread scope A		\$ 280,000	
48-01843-28	Closed-beam irradiators	,	\$ 50,000	
48-09843 - 32	Panoramic		\$ 75,000	("mandated" amount)
48-09843-34	Teletherapy unit		\$ 75,000	("mandsted" amount)
	_		\$ 480,000	
* For licenses 48-09843-32 amount as the cost est.	and 48-01843	, license	e appears to b	re using the ce-tification

#### CHECKLIST FOR REVIEWING DECOMMISSIONING FUNDING PLANS (DFP's)

QUESTIONS

COMMENTS

(1)	Does the licensee provide supporting documentation for its cost estimates?  Yes No	
(2)	Does the licensee use the Appendix F "Cost Estimating Tables?"	
(3)	Does the cost estimate include the following major cost elements?	
(i)	Planning and Preparation?  Yes X No	
(ii)	Decontamination and/or Dismantling of Radioactive Facility Components?  Yes X No	
(111)	Packaging, Shipping, and Disposal of Radioactive Wastes?  Yes No	
(iv)	Restoration of Contaminated Areas on Facility Grounds?	
(v)	Final Radiation Survey?  Yes X No	
(vi)	Site Stabilization, Long-Term Surveillance?	

#### CHECKLIST FOR REVIEWING DFP's (continued)

QUESTIONS

COMMENTS

(4)	Is the total cost estimate reasonable for the type(s) and size(s) of facility licensed?  Yes No No Not Sure	No detril povided
(5)	Are the cost estimates for individual facility activities and/or components reasonable?  Yes No	No detail provided.

### CHECKLIST FOR REVIEWING DFP's (continued)

QUESTIONS

COMMENTS

(6)	Do the computations seem correct?  Yes No	None provided.
(7)	Does the licensee take credit for the potential salvage value of recovered materials or decontaminated equipment?  Yes No	No mention.
(8)	Does the licensee include a contingency factor in the cost estimate?  Yes No	
(9)	Does the licensee provide a description of the methods that will be used to adjust the decommissioning cost estimate periodically over the life of the facility?  Yes No	

# CHECKLIST FOR DECOMMISSIONING FINANCIAL ASSURANCE

MATLIN	G ADDRESS University of Wisconsin - Madison
-	30 No-th Murray Street
	Madison WI 53715
A. Lic	censee Part (check one of the following):
X	Part 30 Licensee or Applicant Part 70 Licensee or Applican
COMPANIES COMP	Part 40 Licensee or Applicant Part 72 Licensee or Applican
8. Che 1.	Received by ARC on Sept 23 1446 Date of Financial Assurance Submission
2.	X Public Entity State University
	Private Entity
3.	Certification of Financial Assurance
	Decommissioning Funding Plan \$ 480,000 Lost estimate include
4.	(a) Prepayment Option (See Appendix 8) Trust FundEscrow AccountCertificate of DepositGovernment FundDeposit of Government Securities
	(b) Surety/Insurance/Other Guarantee (See Appendix C) Surety bond Letter of Credit Line of Credit Parent Company Guarantee/Financial Test
	(c)External Sinking Fund, Sinking Account and Surety/ Insurance (See Appendix D)Trust FundEscrow AccountCertificate of DepositGovernment FundDeposit of Government SecuritiesSurety BondLetter of CreditLine of Credit
	(d) X Statement of Intent (public entities only) \$500,000

# APPENDIX E CHECKLIST FOR STATEMENT OF INTENT

A.	Type of Licensee (check one):
	Federal Government Licensee
	X State Government Licensee State University
	Local Government Licensee
8.	Check Documents Submitted for Statement of Intent
	X Statement Guaranteeing Decommissioning (States that funds will be subturned "when necessary")
	Description of Authority of Government Entity to Make Statement of Intent

# EXHIBIT 3-9

#### CHECKLIST OF CRITERIA FOR REVIEW OF STATEMENTS OF INTENT

- NO Copy of evidence indicating that parties signing the financial instrument (for the applicant) are authorized to represent the organization in the transaction.
- weck Evidence that the statement of intent is an originally signed duplicate.
  - Identification of Federal, State, or local government licensee.
  - Description of facilities for which Statement of Intent produces financial assurance and corresponding decommissioning costs.
  - Statement that funds for decommissioning will be obtained when necessary.
  - Recitation of authority to sign the Statement of Intent.
- · Date.
- Names and positions of signatories.
- · Signatures.

48 - 09843 - 18 48 - 09843 - 28 48 - 09843 - 32

48 - 04843 - 34

CMD: LICENSE SCREEN . . - DECEMMISSIONING FINANCIAL ASSURANCE INFORMATION NAME: University of Wisconsin - Madison DOCKET: 300230 LICE ASSUR TYPE : " CENT (FE) FARTY ISSUING MECHANISM: NAME: University of Wisconsin - Madison MECH TYPE : SI ADDRIE 30 North murray Street MECH AMOUNT! 0 \$ 500,000 EXPIRES ? DATE: 1) until concelled ADDRZ: CITY & madison STATE: WI ZIP: 53715 ACTION (AMADO COCHO DODELETE PARTY ISSUING MECHANISM: ASSLE TYPE : ? CERT MECH TYPE-! ADDR1: MECH AMOUNT! O ADDRZ: APPROVED? DATE: 0\_ CITY 8 DATES O STATES .... ACTION (AMADD COCHE DEDELETE) \*\* 000 000 \*\* B MJ LIU10 PALJEY RS CO T for Attention. Home to Switch CABRUPO 044 1 Numbers CMD

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### JAN 2 1 1997

97-1

MEMORANDUM TO: Louis M. Bykoski

Materials Decommissioning Section Low Level Waste and Decommissioning

Projects Branch

Division of Waste Management, NMSS

FROM:

B. J. Holt, Chief

Nuclear Materials Licensing Branch

Division of Nuclear Materials Safety Branch, RIII

SUBJECT:

REQUEST FOR ASSISTANCE IN THE REVIEW OF A

DECOMMISSIONING

FUNDING PLAN SUBMITTED BY THE UNIVERSITY OF WISCONSIN: NRC LICENSE NUMBER 48-09843-18

Attached you will find a Decommissioning Funding Plan (DFP) submitted by the University of Wisconsin. The DFP was submitted as part of the University's application for renewal of their broad scope license. We are currently in the process of performing a technical review of the application.

We request your assistance in the review of the licensee's DFP. If you have any questions please feel free to contact us.

Attachments: As stated

CONTACT: Kevin G. Null

(630) 829-9854

cc: C. D. Pederson

DOCUMENT NAME: M:\03003465.DE7

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" =

Copy with attachment/enclosure "N" = No copy

OFFICE	DNMS/RIII	C DNMS/RIII	
NAME	KGNull:brt / N	BJHolt 1997	
DATE	01//6/97	01/16/97	



September 18, 1996

U.S. Nuclear Regulatory Commission, Region III ATTN: Kevin Null Nuclear Materials Licensing Section 801 Warrenville Road Lisle, Illinois 60532-4351

RE: Decommissioning Funding Plan and Statement of Intent - BML No. 48-09843-18, Control No. 396520

#### References

1. Reg Guide 3.65, Standard format and Content of Decommissioning Plans for Licensees under 10 CFR Parts 30, 40, and 70.

 Reg Guide 3.66, Standard format and Content of Financial Assurance Mechanisms Required for Decommissioning under 10 CFR Parts 30, 40, 70 and 72.

3. Spreadsheets titled:

- a. Nuclides and Activity (mCi) Received under UW Broadscope License for the Year Indicated.
- b. Sealed Source Nuclides and Activity (mCi) Received under UW Broadscope License for the Year Indicated.
- Unsealed Nuclides and Activity (mCi) Received under UW Broadscope License for the Year Indicated.
- d. Unsealed Long-Lived (T > 120 days) NRC-Regulated Nuclides and Activity (mCi) Received under UW Broadscope License for the Year Indicated.

Spreadsheets titled:

- a. Activity (mCi) Incinerated at Herrick Drive Incinerator for the Year Indicated.
- b. Activity (mCi) Disposed of to the Sanitary Sewer for the Year Indicated.

5. Radiation Safety Composite Inventory Report, 07/02/96

6. University of Wisconsin Radiation Safety Regulations.

#### Background

The University of Wisconsin, Madison (UW) is a Category A Licensee of Broad Scope authorizing "any byproduct material between Atomic Nos. 3 through 83, inclusive" in individual activities not to exceed 3 Ci each and 30 Ci in aggregate. The UW also has a separately licensed (R-74) TRIGA research reactor. This reactor is capable of producing a broad spectrum of radionuclides, however the R-74 license specifies the licensee may "possess, but not to separate, such byproduct material as may be produced by operation of the reactor." Thus, the broad scope license serves to complement the reactor license license at the UW to obtain irradiated product.

Safety Department

SEP 2 3 1996

On 16 July, 1990, the UW submitted a Statement of Intent to obtain \$750,000 for decommissioning when necessary. Reference 2 requires the UW to submit a Decommissioning Funding Plan (DFP) for the broad scope license "at the time of their next license renewal occurring after July 27, 1990." This document will review uses of radionuclides licensed under the broad scope license (BML 48-09843-18) at the UW, review regulations appropriate to decommissioning, analyze anticipated costs for such a decommissioning, and provide an appropriate financial assurance mechanism.

#### Radionuclide Use at the UW

References 3 and 4 are spreadsheets describing the use of radioactive materials under the broad scope license over at least a 10 year period. (Note that the activities listed for 1996 – RECPT96 – are for 8 months of receipts; to normalize for the entire year the activities of the more routinely used isotopes (e.g., <sup>3</sup>H, <sup>14</sup>C, <sup>32</sup>P, <sup>35</sup>S, <sup>125</sup>I) for the entire year, multiply entries by 1.5). While there may be spikes indicative of unique, one-time research or time sensitive events, references 3 and 4 demonstrate the scope of our use and disposal of authorized radionuclides. Reference 5 represents a snap-shot of user possessions at the beginning of July, 1996.

Reference 3a is a gross summary of all radionuclides received by the UW, including both sealed and unsealed radionuclides. Reference 3b focuses on the receipt of sealed sources. Entries in this table include the transfer of sealed sources between one activity on campus and another. An explanation of some of the higher activities includes:

- a. Transfer of a 90Sr eye applicator from the Medical Physics Radiation Calibration Lab to the Radiation Therapy Department at the hospital.
- Receipt of 400 mCi of <sup>85</sup>Kr from a vendor in California to perform calibration measurements. The source was returned to the owner in 1991.
- c. Receipt of the 192 Ir HDR and other brachytherapy sources/seeds which were used in cancer therapy and then returned to the vendor.
- d. The UW had been conducting research requiring large quantities of gaseous <sup>3</sup>H. This research was concluded in 1994 and the facility converted to a tomographic-Linac facility, hence the dramatic drop of <sup>3</sup>H receipts.
- e. Periodically <sup>63</sup>Ni gas chromatographic sources require replacement. This is usually effected by a direct exchange with the vendor.

Thus, receipt as reported in reference 3 does not necessarily represent the acquisition of new sources nor does it necessarily mean the source received is still in the possession of the UW.

Reference 3d is a summary of the UW's receipts of radionuclides of interest for decommissioning (reference 2, Appendix G, Conversion Table for Determining Amount of Financial Assurance Required as a Function of Radionuclide Activity Levels). A comparison of activities received (ref 3d) with Radionuclide Conversion Table activities in Appendix G shows that, based upon actual receipts, the UW would not be required to complete a Decommissioning Funding Plan and, further, that Financial Assurance would realistically be below the "\$150,000 (unsealed) (≥ 10³, ≤ 10⁴)" range.

#### Decommissioning Funding Considerations

In the event of decommissioning, the UW would perform its own radiation safety support with in-house assets. To determine an accurate estimate of decommissioning costs we have detailed our anticipated expenses for decommissioning the license.

- a. Use of unsealed radioactive material in research is done according to the University Radiation Safety Regulations (reference 6). When a researcher has completed using radioactive materials in a laboratory, they are required to perform a final survey for "gross contamination and/or radiation exposure levels, ... and for removable contamination,..." (Section IX, Part C, <u>Deletions and Final Surveys</u>). The Safety Department maintains a listing of these surveys in a room decommissioning file. Thus, decommissioning of individual rooms is accomplished at no cost.
- b. Sealed sources consist of some Am-Be soil probes, calibration sources (< 1 Ci), and some higher activity irradiator sources. Commercial gage sources may be returned to the vendor or some other source for approximately \$5000 each. Irradiator sources may be transferred to some other licensee. Estimated cost to dispose of all sealed sources under this license is approximately \$100,000.
- c. At this time, we anticipate the incinerator to be the only contaminated facility. Based upon our experience demolishing radioactive waste incinerators, to dismantle and appropriately dispose of the contaminated debris would cost approximately \$130,000 (i.e., \$90,000 for refractory and other debris, \$40,000 for demolishing).
- d. Our policy on sewer disposal is to decay all liquids and centralize disposal of non-hazardous, aqueous liquid wastes at our Mills Street waste facility. Because of the type of waste so disposed, we do not anticipate any residue in the plumbing. Sampling of sewer lines at this point would verify that belief. The cost to sample and clean this disposal route would be low; not likely in excess of \$50,000.
- e. Volatile radionuclides may only be used in adequately vented fume hoods where the releases may be monitored. The Safety Department routinely surveys exhaust ducts prior to maintenance. We have never detected contamination in fume hood exhaust ducts in excess of 0.5 nCi/100 cm². Therefore, we do not believe exhaust ducting in any of our facilities will require decontamination and disposal as radioactive waste.

Thus, a good estimate of decommissioning costs for the UW's broad scope license is \$280,000.

Paragraph 1.3, reference 2 (LICENSEES USING MORE THAN ONE TYPE OF NUCLE-AR MATERIAL) notes that it "would be difficult to require separate decommissioning plans and financial responsibility requirements in circumstances where there is an interdependence of facilities, operations, or projected decommissioning activities." In our view, three (3) other byproduct material licenses should be consolidated with this plan.

- a. BML 48-09843-28 licenses 5 closed-beam irradiators. We recently decommissioned an irradiator site at a cost of \$5000. A good estimate of decommissioning this license would be \$10,000 per source or \$50,000.
- b. BML 48-09843-32 licenses panoramic irradiators for use by our Medical Physics Department. In 1993 we disposed of a teletherapy unit, several lower activity irradiator and brachytherapy sources, an Am-Be source, and some smaller activity sources for \$90,000. A good estimate to decommission this license is the \$75,000 mandated.
- c. BML 48-09843-34 licenses a <sup>60</sup>Co teletherapy unit for use in the School of Veterinary Medicine. We believe the \$75,000 mandated to be a valid decommissioning estimate.

We do not intend including the UW's Research reactor in the plan because it is distinct with its own building and will require a DFP upon renewal in 2000. Therefore, we estimate that byproduct material licensure decommissioning would not be expected to exceed \$500,000.

#### Summary

The UW has a Category A specific license of broad scope issued by the NRC to be used in education, to conduct basic research and to perform medical diagnosis and therapy using radioactive materials and several irradiator licenses. Because use of the radioactive materials is dictated by the needs of the researchers and to complement the UW's research reactor program, this license is necessarily one authorizing a broad spectrum of nuclides in relatively unspecified quantities. In reality, the isotopes used under the broad scope license are those commonly used in biological research (e.g., <sup>3</sup>H, <sup>14</sup>C, <sup>32</sup>P, <sup>35</sup>S, <sup>51</sup>Cr, <sup>125</sup>I) and use of rarer isotopes tends to be of extremely low activity for a short duration only. Thus, the cost to decommission the UW's broad scope and irradiator licenses would be similarly low. We estimate this cost not to exceed \$500,000.

To that end, we have included a Statement of Intent by the UW Board of Regents to provide adequate funding for decommissioning activities when required.

If you have any questions pertaining to this request, please call me at (608) 262-9178 or FAX me at (608) 262-6767.

Sincerely,

Ronald R. Bresell

Radiation Safety Officer

Pour Rhill



### The University of Wisconsin System

Office of General Counsel 1738 Van Hise Hall, 1220 Linden Drive Madison, Wisconsin 53706 (608) 262-2995 FAX(608) 262-3985

Charles J. Stathas (608) 262-6166 John B. Tallman 262-0747 Patricia A. Brady 262-6497 Edward S. Alschuler 265-2960

September 17, 1996

United States Nuclear Regulatory Commission Region III 801 Warrenville Road Lisle, Illinois 60532-4351

TO WHOM IT MAY CONCERN:

The Board of Regents of the University of Wisconsin System, an agency of the State of Wisconsin, doing business as the University of Wisconsin- Madison, hereby states its intent to obtain the funds for decommissioning when necessary for the following licenses:

48-09843-18	Broad Scope A License	\$300,000
48-09843-28	Irradiator License	50,000
48-09843-32	Panoramic Irradiator License	75,000
48-09843-34	Panoramic Irradiator License	75,000

I hereby certify that I am authorized to act on behalf of the Board of Regents in signing this document.

Board of Regents of the University of Wisconsin System

Charles J. Stathas General Counsel and

Assistant Trust Officer

xc: John Torphy Ronald Bresell Kathleen Irwin Nuclides and Activities (mCi) Received under UW Broadscope Licens for Year Indicated

NUCLID FULL	RECPT86		RECPT88	RECPT89	RECPT90	RECPT91	RECPT92	RECPT93	RECPT94	RECPT95	RECPT96
AM-241 AMERICIUM-241	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.0000		
AM-241 AMERICUM-241*	50.0000	250.0005	0.0000	0.0000	0.0000	50.0000	0.0000			0.0000	0.0000
AU-198 GOLD-198	0.0000	805.3400	1057.6200	165.9000	210.9000			0.0100	0.0000	145.1800	0.0000
BA-133 BARIUM-133	0.0000	0.0000	0.0000	0.0001		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
BR-82 BROMINE-82	0.0000	0.0000			0.0070	0.0000	0.0000	0.1000	0.0000	0.0000	0.0000
			1.0000	1,0000	0.0000	0.0000	0.0000	0.0000)	0.0000	0.0000	0.0000
C-14 CARBON-14 *	272.4380	414.2142	273.9533	240.3372	146.5089	259.7868	203.7551	145.6480	162.4562	164.5978	122.8640
CA-41S CALCIUM-41 SEAL	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0050	0.0000	0.0000	0.0000	0.0000
CA-45 CALCIUM-45	18.0580	60.2000	48.0100	55.0000	77.0000	70.0000	43.0000	21.0030	33.0020	23.0000	7.0000
CD-109 CADMIUM-109 SEA	0.5010	1.0021	0.1021	0.5031	1.0021	1.0021	3.0021	2.0021			
CD-109S CADMIUM 109 SS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			1.0021	1.5000	2.0000
CE-141 CERIUM-141	1.2500	0.0000	0.0000				45.0000	19.5000	0.0000	36.5000	30.0000
				5.0000	2.0000	4.0000	5.0000	2.5000	1.5000	1.5000	1.0000
CL-36 CHLORINE-36	0.1000	0.0600	5.0250	0.2020	0.1500	1.1000	0.7000	1.2750	4.1750	1.5500	0.0000
CL-38 CHLORINE-38	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0170	0.0000	0.0000	0.0300
CM-244 CURIUM 244*	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CM-244 CURIUM-244	0.0000	0.0000	0.0000	1.0000	0.0000	1.0000	2.0000	0.0000			
CO-56 COBALT-56	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000
	0.0736						0.0000	0.0000	0.0000	0.0000	0.0000
CO-57 COBALT-57		54.1142	8.0701	15.1485	103.0280	30.1000	11.0100	27.2100	61.5000	18.7000	10.0000
CO-57S COBALT-57	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000
CO-60 COBALT-60 *	0.0509	0.0010	0.0000	102.0004	0.0000	0.0000	0.0000	0.0020	0.0000	0.0056	0.0000
CR-51 CHROMILM-51	648.0000	1364.0000	1147.0100	1094.0128	760.0000	764.0000	749.2260	627.5000	588.0000	443.0000	304.0000
CS-137 CESIUM-137 *	0.0000	0.0015	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000		
CS-137S CESIUM-137S	0.0000	0.0000	0.0000	55.0000	0.0000					0.0000	0.0000
	0.0500					1177.2000	47.0000	0.0000	30.8000	50.0000	199.9500
CU-64 COFPER-64		0.0000	0.0000	0.0000	0.0000	10.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CU-67 COPPER-67	0.0000	0.0000	0.0000	0.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
EU-152 EUROPIUM-152	0.0000	0.0000	0.0100	0.0001	0.0000	0.0000	0.0000	0.0000	1.8600	0.0000	0.0000
EU-152 EUROPIUM-152M	0.6000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	8.0000	0.0000	0.0000
EU-154 EUROPIUM-154	0.0 100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0890	0.0000	0.0000
EU-156 EUROPIUM-155	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000			
F-18 FLUORINE-18	0.0000	80 0000							0.0000	0.0000	0.0000
			0.0000	12.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000
FE-55 IRON-55	0.0760	0.0000	0.1000	0.1001	0.0000	0.0000		1.1007	8.0060	5.0030	0.0130
FE-855 IRON-55 SS	0.0000	0.0000	10.0000	0.0000	10.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
FE-59 IRON-59	0.2535	0.2500	0.0000	0.5000	0.5000	0.0000	0.0000	0.5040	0.0020	0.0010	0.0070
GA-67 GALLIUM-67	0.0000	0.0000	0.0000	6.0000	7.0000	18.0000		18.0000	0.0000	0.0000	0.0000
GO-153 GADOLINIUM-153	712.0002	1795.0000	1.0001	1.0002	1.0000	0.0000		0.00.0	0.0000	0.0000	
GD-153 GADOLINIUM-153	0.0000	3750 0000		1000.0000	280.0000	510.0000					0.0000
GE-68 GERMANIUM-68	0.0000	4.0000	0.0000	0.0000				0.0000	0.0000	65.8000	0.0000
					0.0000	0.0000		5.2000	0.0000	0.0000	0.0000
GE-68\$ GERMANIUM-68	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	10.0000	0.0000
GE-685 GERMANIUM 68 SS	0.0000	0.0000	0.0000	0.0000	2.5000	0.0000	7.0000	0.0000	0.0000	0.0000	0.0000
H-3 TRITIUM *	3367.1121	14314.7156	4061.2099	2955 6888	11406.0569	1185.6586	2395.3914	2939.8904	801.6350	911.4390	394.8440
1-123 IODINE-123 *	0.0000	22.0300	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-125 KODINE-125	917,3188	1741.1115	1504.8233	1232.8107	1064.6298	1287.1398		701.5889	825.5197	714.7322	327.4237
1-1258 1-125 Bone min	2047.8898	1412.0188	1446.0000	1400.0000	650.0000	148.5353			0.0000		
1-1258 IODINE-1258	0.0000	0.0000	0.0000							0.0000	0.0000
				0.0000	0.0000	77.9400			338.7600	243.1400	211.3800
1-129 IODINE-129	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
I-131 IODINE-131	364.0023	451.3120	1004.4091	623.5036	226.0006	106.0030	32.0089	3.5022	0.5010	1.5011	4.0009
IN-111 INDIUM-111	35.0000	53.00C0	42.0000	36.0000	22.0000	42.0000	52.2440	49.4660	6.0000	7.0000	0.0000
IR-192 IRIDIUM-192	3259,9880	5746.7830	4962.1489	34189.2810	1791.4395	12315.3425	0.0000		0.0000	0.0000	0.0000
BALLING BUILDINGS 1957											
IR-192A IRIDIUM-192A	0.0000	0.0000	0.0000	0.0000	39397.0000	37497.0000	39398.9999	39996.0000	29997.0000	40976.0000	18999.0000
IR-192A IRIDIUM-192A IR-1925 IRIDIUM-192S	0.0000	0.0000	0.0000	0.0000	39397.0000	37497.0000 78.2300	39398.9999 1219.7195	39996.0000 515.3261	29997.0000 442.7920	40976.0000 257.1233	18999.0000 405.3728
IR-1925 IRIDIUM-1925 IR-1925 IRIDIUM-1925 K-42 POTASSIUM-42	0.0000 0.0000 0.0240	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	39397.0000 0.0000 0.0000	37497.0000 78.2300 0.0000	39398.9999 1219.7195 0.0000	39996.0000 515.3261 0.0000	29997.0000 442.7920 0.2020	40976.0000 257.1233 0.1900	18999.0000 405.3728 0.0820
IR-192A IRIDIUM-192A IR-1928 IRIDIUM-192S K-42 POTASSIUM-42 KR-85 KRYPTON-85	0.0000 0.0000 0.0240 0.0000	0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 400.0000	39397.0000 0.0000 0.0000 0.0000	37497.0000 78.2300 0.0000 0.0000	39398.9999 1219.7195 0.0000 0.0000	39996.0000 515.3261 0.0000 0.0000	29997.0000 442.7920	40976.0000 257.1233	18999.0000 405.3728
R-192A IRIDIUM-192A R-1925 IRIDIUM-192S K-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176	0.0000 0.0000 0.0240 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	39397.0000 0.0000 0.0000	37497.0000 78.2300 0.0000	39398.9999 1219.7195 0.0000 0.0000	39996.0000 515.3261 0.0000 0.0000	29997.0000 442.7920 0.2020	40976.0000 257.1233 0.1900	18999.0000 405.3728 0.0820
IR-192A IRIDIUM-192A IR-1928 IRIDIUM-192S K-42 POTASSIUM-42 KR-85 KRYPTON-85	0.0000 0.0000 0.0240 0.0000	0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 400.0000	39397.0000 0.0000 0.0000 0.0000	37497.0000 78.2300 0.0000 0.0000	39398.9999 1219.7195 0.0000 0.0000 0.0000	39996.0000 515.3261 0.0000 0.0000	29997,0000 442,7920 0,2020 0,0000 0,0001	40976.0000 257.1233 0.1900 0.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000
R-192A IRIDIUM-192A R-1925 IRIDIUM-192S K-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176	0.0000 0.0000 0.0240 0.0000 0.0000 0.5000	0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 400.0000 0.0000 0.5000	39397.0000 0.0000 0.0000 0.0000 0.0000 1.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000	39398.9999 1219.7195 0.0000 0.0000 0.0000 0.2000	39996.0000 515.3261 0.0000 0.0000 0.0000 1.7000	29997,0000 442,7920 0,2020 0,0000 0,0001 1,5000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-1928 K-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETRIM 176 MM-54 MANGANESE-54 MM-56 MANGANESE-56 R	0.0000 0.0000 0.0240 0.0000 0.0000 0.5000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.7000 0.0000	0.0000 0.0000 9.0000 400.0000 0.0000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000	39398.9999 1219.7195 0.0000 0.0000 0.0000 0.2000 0.0000	39996.0000 515.3261 0.0000 0.0000 0.0000 1.7000 0.3400	29997,0000 442,7920 0,2020 0,0000 0,0001 1,5000 5,0000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 6.2000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-122S IR-1928 IRIDIUM-122S K-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99	0.0000 0.0000 0.0240 0.0000 0.0000 0.5000 E 0.4100	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000	0.0000 0.0000 0.0000 0.0000 0.0000 0.7000 0.0000	0.0000 0.0000 0.0000 400.0000 0.0000 0.5000 0.0000 205.9600	39397.0000 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000	39398.9999 1219.7195 0.0000 0.0000 0.0000 0.2000 0.0000 0.0000	39996.0000 515.3261 0.0000 0.0000 0.0000 1.7000 0.3400 0.0000	26997.0000 442.7920 0.2020 0.0000 1.5000 5.0000 0.0000	40976.0000 257.1233 0.1900 0.0000 9.0000 1.5000 6.2000 200.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 0.0030 0.0000
R-192A IRIDIUM-192A R-1928 IRIDIUM-192S K-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-54 MN-56 MANGANESE-56 R MO-99 MA-22 SODIUM-22	0.0000 0.0000 0.0240 0.0000 0.0000 0.5000 E 0.4100 0.0000 0.7000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010	0.0000 0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 200.0000 6.4000	0.0000 0.0000 0.0000 400.0000 0.5000 0.0000 205.9600 2.2000	39397,0000 0,0000 0,0000 0,0000 1,0000 0,0000 0,0000 4,6000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000	39398.9999 1219.7195 0.0000 0.0000 0.0000 0.2000 0.0000 0.0000 0.0000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000	26997.0000 442.7920 0.2020 0.0000 1.5000 5.0000 0.0000 2.4000	40976.0000 257.1233 0.1900 0.0000 9.0000 1.5000 6.2000 200.0000 0.7000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 0.0000 0.0000 1.3000
IR-192A IRIDIUM-192A IR-1928 IRIDIUM-1928 K-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-54 MN-56 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SOGIUM-22 NA-24 SODIUM-24	0.0000 0.0000 0.0240 0.0000 0.0000 0.5000 E 0.4100 0.7000 0.5100	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 200.0000 6.4000 0.0000	0.0000 0.0000 400.0000 0.0000 0.5000 0.0000 205.9600 2.2000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 4.6000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000	39398.9999 1219.7195 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	39996.0000 515.3261 0.0000 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000	26997.0000 442.7920 0.2020 0.0000 1.5000 5.0000 0.0000 2.4000 1.9600	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 6.2000 200.0000 0.7000 2.8000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 0.0000 0.0000 1.3000 1.5470
R-192A IRIDIUM-192A IR-1928 IRIDIUM-122S IR-1928 IRIDIUM-122S VAR-85 KRYPTON-85 LU-176 LUTETRIM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SODIUM-22 NA-24 NB-95 NIOBIUM-95	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.4100 0.7000 0.5100 0.5100	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 0.0000 0.0000 6.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.7000 200.0000 6.4000 0.0000 4.0000	0.0000 0.0000 400.0000 0.5000 0.5000 205.9600 2.2000 0.0000 3.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000 4.6000 0.0000 3.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 2.0000	39398.9999 1219.7195 0.0000 0.0000 0.0000 0.2000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	39996.0000 515.3261 0.0000 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000	26997.0000 442.7920 0.2020 0.0000 1.5000 5.0000 0.0000 2.4000	40976.0000 257.1233 0.1900 0.0000 9.0000 1.5000 6.2000 200.0000 0.7000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 0.0000 0.0000 1.3000 1.5470
IR-192A IRIDIUM-192A IR-1928 IRIDIUM-1928 K-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-54 MN-56 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SOGIUM-22 NA-24 SODIUM-24	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.7000 0.7000 0.5100 0.5100 0.0000	0,0000 0,0000 0,0000 0,0000 0,5010 0,0000 500,5000 1,2010 0,0000 6,0000 2,0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 200.0000 6.4000 0.0000	0.0000 0.0000 400.0000 0.5000 0.5000 205.9600 2.2000 0.0000 3.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 4.6000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000	39398.9999 1219.7195 0.0000 0.0000 0.0000 0.2000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	39996.0000 515.3261 0.0000 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000 0.0000	26997.0000 442.7920 0.2020 0.0000 1.5000 5.0000 0.0000 2.4000 1.9600	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 6.2000 200.0000 0.7000 2.8000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 0.0030 0.0000 1.3000 1.5470 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-122S IR-1928 IRIDIUM-122S VAR-85 KRYPTON-85 LU-176 LUTETRIM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SODIUM-22 NA-24 NB-95 NIOBIUM-95	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.4100 0.7000 0.5100 0.5100	0,0000 0,0000 0,0000 0,0000 0,5010 0,0000 500,5000 1,2010 0,0000 6,0000 2,0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 200.0000 6.4000 0.0000 4.0000 2.0000	0.0000 0.0000 400.0000 0.0000 0.5000 0.0000 205.9600 2.2000 0.0000 3.0000 2.0050	39397.0000 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000 4.6000 0.0000 3.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 2.0000	39398.9999 1219.7195 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	39996.0000 515.3261 6.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000 0.0000 0.0000 7.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 1.0000 9.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 6.2000 200.0000 0.7000 2.8000 2.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 0.0030 0.0000 1.3000 1.5470 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 K-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SOGIUM-22 NA-24 SODIUM-24 NB-95 NIOBIUM-95 NI-63 NICKEL-63	0.0000 0.0000 0.0240 0.0000 0.0000 0.5000 E 0.4100 0.7000 0.5100 0.5100 0.5100 0.7000 0.5100 0.75000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 6.0000 2.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 200.0000 6.4000 0.0000 4.0000 2.0000 38.0000	0.0000 0.0000 400.0000 0.0000 0.0000 0.5000 0.0000 205.9600 2.2000 0.0000 3.0000 2.0500 100.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 4.6000 0.0000 3.0000 85.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 2.0000 0.0000 15.0000	39398.9999 1219.7195 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	26997.0000 442.7920 0.2020 0.0000 1.5000 0.0001 2.4000 1.9800 1.0000 9.0000 30.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 6.2000 200.0000 2,7000 2.8000 2.0000 0.0000 15.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 0.0000 23.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-122S IR-1928 IRIDIUM-122S VA-2 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETRIM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SODIUM-22 NA-24 SODIUM-24 NB-95 NIOBIUM-95 NI-63 NICKEL-63 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-32	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.5000 0.7000 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 6.0000 2.0000 60.0000 3645.7020	0.0000 0.0000 0.0000 0.0000 0.0000 200.0000 200.0000 6.6000 0.0000 4.0000 38.0000 38.0000	0.0000 0.0000 0.0000 400.0000 0.0000 0.5000 0.0000 205.9600 2.2000 0.0000 3.0000 2.0050 100.0000 3596.5510	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 4.6000 0.0000 3.0000 85.0000 3755.7500	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 2.0000 0.0000 3.8000 0.0000 3.8000 0.0000 3.8000 0.0000 3.8000 0.0000 3.8000 0.0000 3.8000 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	39398.9999 1219.7195 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000 2.0000 2.0000 7.0000 60.0000 3186.0069	26997.0000 442.7920 0.2020 0.0000 1.5000 0.0000 0.0000 2.4000 1.9800 1.0000 9.0000 30.0000 2947.7436	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 200.0000 0.7000 2.8000 2.0000 0.0000 0.0000 0.0000 15.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 0.0000 1.5000 1.5470 0.0000 0.0000 23.0000 1705.3980
R-192A IRIDIUM-192A IR-1928 IRIDIUM-122S IR-1928 IRIDIUM-122S KR-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SOGIUM-22 NA-24 SOGIUM-24 NB-95 NICKEL-63 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-33 P-33 PHOSPHORUS-33	0.0000 0.0000 0.0240 0.0000 0.0000 0.5000 0.4100 0.7000 0.5100 0.5100 0.0000 12.0000 12.0000 1949.7500	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 6.0000 2.0000 3645.7020	0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 200.0000 6.4000 0.0000 2.0000 38.0000 24.0000 38.0000	0.0000 0.0000 400.0000 0.0000 0.5000 0.0000 2.2000 2.2000 3.0000 2.0050 100.0000 3596.5510 6.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.6000 0.0000 3.0000 85.0000 4.0000 4.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 2.0000 15.0000 3941.3851 0.0000	39398.9999 1219.7195 0.0000 0.0000 0.2000 0.2000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000 0.2,0000 0.7,0000 60.0000 3186.0089 7.2500	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9600 0.0000 9.0000 30.0000 2947.7436	40976.0000 257.1233 0.1900 0.0000 1.5000 0.7000 2.0000 2.0000 0.7000 2.0000 0.5000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000 0.2000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 23.0000 21705.3980 18.0495
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192S IR-1928 IRIDIUM-122S KR-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SODIUM-24 NB-95 NIOBIUM-95 NI-63 NICKEL-63 GAS C P-32 PHOSPHORUS-32 PH-32 PHOSPHORUS-32 PM-147 PROMETHIUM-147	0.0000 0.0000 0.0240 0.0000 0.5000 0.0000 0.7000 0.5100 0.0000 12.0000 75.0000 1949.7500 6.0000 6.0000	9.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 2.0000 2.0000 3645.7020 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 200.0000 6.4000 0.0000 2.0000 38.0000 3279.9849 24.0000 0.0000	0.0000 0.0000 400.0000 0.0000 0.0000 0.0000 205.9600 2.2000 0.0000 3.0000 2.050 100.0000 3596.5510 6.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 4.6000 0.0000 3.0000 0.0000 85.0000 3755.7500 4.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 2.0000 0.0000 15.0000 3941.3851 0.0000	39398.9999 1219.7195 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000 1.9000 0.0000 1.9000 0.0000 1.9000 0.0000 1.9000 0.0000 1.9000 0.0000 1.9000 0.0000 1.7000 0.0000 1.7000 0.0000 1.9000 0.0000 1.7000 0.0000 1.7000 0.0000 1.7000 0.0000 1.7000 0.0000 1.7000 0.0000 1.7000 0.0000 1.7000 0.0000 1.7000 0.0000 1.7000 0.0000 0.0000 1.7000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.0000 0.	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 9.0000 30.0000 2947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 200.0000 0.7000 2.6000 0.7000 2.0000 0.0000 15.0000 299.4748 27.4400 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 23.0000 1705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-1928 IRIDIUM-1928 IRIDIUM-1928 IRIDIUM-1928 IRIDIUM-1928 IRIDIUM-1928 IRIDIUM-195 IRIDIUM-	0.0000 0.0000 0.0240 0.0000 0.5000 E 0.4100 0.0000 0.7000 0.5100 0.0000 12.0000 75.0000 1949.7500 6.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 6.0000 2.0000 6.0000 3645.7020 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 200.0000 6.4000 0.0000 4.0000 2.0000 38.0000 3279.9849 24.0000 0.0000	0.0000 0.0000 400.0000 0.0000 0.5000 0.0000 205.9600 2.2000 0.0000 2.05596 100.0000 3.596 5510 6.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 4.6000 0.0000 3.0000 85.0000 3755.7500 4.0000 0.0000	37497.0000 78.2300 0.0000	39398.9999 1219.7195 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 2.0000 0.2.0000 0.7.0000 0.3186.0089 7.2500 0.0000 0.0000	26997.0000 442.7920 0.2020 0.0000 1.5000 0.0001 2.4000 1.9800 1.9800 9.0000 30.0000 2947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 6.2000 200.0000 0.7000 2.5000 2.0000 0.0000 0.5000 2.990.4748 27.4400 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.0000 1.5470 0.0000 0.0000 23.0000 1705.3980 18.0495 0.0000 6.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETHUM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SOCIUM-22 NA-24 SOCIUM-24 NB-95 NIOBIUM-95 NI-63 NICKEL-63 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-32 P-33 PHOSPHORUS-32 P-33 PHOSPHORUS-32 P-33 PHOSPHORUS-39 PM-147 PROMETHIUM-147 PO-210 POLONIUM-230	0.0000 0.0000 0.0240 0.0000 0.5000 0.4100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.50000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.50000 0.5	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 2.0000 6.0000 3645,7020 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.7000 0.7000 0.0000 6.4000 2.0000 4.0000 2.0000 3279.9849 24.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000 2.2500 0.0000 3.0000 2.0050 100.0000 0.0000 0.0000 0.0000 0.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.6000 0.0000 3.0000 3.0000 3.755.7500 4.0000 0.0000 0.0000	37497.0000 78.2300 0.0000	39398.9996 1219.7195 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000 0.0000 2.0000 7.0000 60.0000 63.186.0089 7.2500 1000.0000 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 1.0000 9.0000 2947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 200.0000 0.7000 2.5000 2.5000 2.0000 0.0000 0.5000 2.900.4746 27.4400 0.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 0.0000 1705.3980 18.0495 0.0000 0.0000 0.0000
R-192A IRIDIUM-192A R-1928 IRIDIUM-192A R-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SOGIUM-24 NB-95 NICKEL-63 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-32 P-33 PHOSPHORUS-32 P-33 PHOSPHORUS-33 PM-147 PROMETHIUM-147 PO-210 POLONIUM-210 PU-239 RA-226 RADIUM-226S	0.0000 0.0000 0.0240 0.0000 0.0000 0.0000 0.7000 0.5100 0.0000 12.0000 75.0000 1949.7500 6.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 6.0000 3645.7020 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 200.0000 6.4000 0.0000 2.0000 38,0000 3279.9849 24,0000 0.0000 0.0000 0.0000	0.0000 0.0000 400.0000 0.0000 0.0000 0.0000 205.9600 2.2000 0.0000 3.0000 2.0050 100.0000 3.56.5510 0.0000 0.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 4.6000 0.0000 3.0000 3.765.7500 4.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 0.0000 15.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	39398.9999 1219.7195 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.2,0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9000 9.0000 30.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 0.7000 2.0000 0.7000 2.0000 0.0000 15.0000 2990.4748 27.4400 0.0000 0.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 23.0000 23.0000 18.0495 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
R-192A IRIDIUM-192A R-1928 IRIDIUM-192A R-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-54 MAN-86 MANGANESE-56 R MO-88 MOLY8DENUM-99 NA-22 SODIUM-22 NA-24 SODIUM-24 NB-95 NIOBEUN-95 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-32 PHOSPHORUS-33 PM-147 PROMETHIUM-147 PO-210 POLONIUM-210 PU-239 PLUTONIUM-229 RA-226 RADIUM-228	0.0000 0.0000 0.0240 0.0000 0.5000 0.4100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.50000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.50000 0.5	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 6.0000 2.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 200.0000 6.4000 0.0000 2.0000 38,0000 3279.9849 24,0000 0.0000 0.0000 0.0000	0.0000 0.0000 400.0000 0.0000 0.0000 0.0000 205.9600 2.2000 0.0000 3.0000 2.0050 100.0000 3.56.5510 0.0000 0.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 4.6000 0.0000 3.0000 3.765.7500 4.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 0.0000 15.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	39398.9999 1219.7195 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9000 9.0000 30.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 0.7000 2.0000 0.7000 2.0000 0.0000 15.0000 2990.4748 27.4400 0.0000 0.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 23.0000 270.3980 18.0495 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
R-192A IRIDIUM-192A R-1928 IRIDIUM-192A R-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SOGIUM-24 NB-95 NICKEL-63 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-32 P-33 PHOSPHORUS-32 P-33 PHOSPHORUS-33 PM-147 PROMETHIUM-147 PO-210 POLONIUM-210 PU-239 RA-226 RADIUM-226S	0.0000 0.0000 0.0240 0.0000 0.0000 0.0000 0.7000 0.5100 0.0000 12.0000 75.0000 1949.7500 6.0000 0.0000 0.0000	9.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 2.0000 3645.7020 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 200.0000 6.4000 0.0000 2.0000 38.0000 38.0000 3279.9849 24.0000 0.0000 0.0000 0.0000	0.0000 0.0000 400.0000 0.0000 0.0000 0.0000 205.9600 2.2000 0.0000 3.0000 2.056 100.0000 0.0000 0.0000 0.0000 0.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 4.6000 3.0000 0.0000 4.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	37497.0000 78.2300 0.0000	39398.9999 1219.7195 0.0000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000 0.0000 7.0000 0.3400 0.0000 1.9000 0.0000	26997.0000 442.7920 0.2020 0.0000 1.5000 0.0001 1.5000 0.0000 2.4000 1.9600 30.0000 2947.7436 15.5000 0.0000 0.0000 0.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 200.0000 0.7000 2.6000 0.0000 15.0000 2.9000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 23.0000 1705.3980 18.0495 0.0000 0.0000 0.0000 0.0000
R-192A IRIDIUM-192A R-1928 IRIDIUM-192A R-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-54 MAN-86 MANGANESE-56 R MO-88 MOLY8DENUM-99 NA-22 SODIUM-22 NA-24 SODIUM-24 NB-95 NIOBEUN-95 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-32 PHOSPHORUS-33 PM-147 PROMETHIUM-147 PO-210 POLONIUM-210 PU-239 PLUTONIUM-229 RA-226 RADIUM-228	0.0000 0.0000 0.0240 0.0000 0.5000 0.0000 0.7000 0.5100 0.0000 12.0000 75.0000 1949.7500 6.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 6.0000 2.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 6.4000 0.0000 4.0000 2.0000 38.0000 3279.9849 24.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5000 0.0000 205.9600 2.2000 0.0000 3.0000 2.0050 100.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000 4.6000 3.0000 3.0000 4.0000 5.0000 3.755.7500 9.0000 0.0000 0.0000 0.0000 0.0000	37497.0000 78.2300 0.0000	39398.9996 1219.7195 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 0.0000 0.3400 0.0000 1.9000 0.0000 2.0000 0.0000 3186.0080 0.0000 3186.0080 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 1.0000 9.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 2.0000 0.7000 0.7000 0.0000 0.5000 2.900.4746 27.4400 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 23.0000 1705.3980 18.0495 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETRUM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SODIUM-22 NA-24 NB-95 NIOBIUM-95 NI-63 NICKEL-63 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-32 P-33 PHOSPHORUS-32 P-34 PROMETHUM-147 PO-210 POLONIUM-239 RA-226 RADIUM-228 RA-226 RADIUM-228 RA-26 RADIUM-28	0.0000 0.0000 0.0240 0.0000 0.0000 0.5000 0.4100 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5000 12.0000 12.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 6.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 6.6000 0.0000 2.0000 3279.9849 24.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5000 0.0000 2.25,9600 2.2000 3.0000 3.596,5510 6.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 4.6000 0.0000 3.765.7500 4.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	37497.0000 78.2300 0.0000	39398.9999 1219.7195 0.0000 0.0000 0.2000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.2000 2.0000 0.2000 0.3186.0089 7.2500 1000.0000 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 1.0000 2947.7436 15.5000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 2.0000 0.7000 2.6000 2.6000 2.900.4748 27.4400 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 23.0000 1705.3980 18.0495 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MM-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SOGIUM-24 NB-95 NIOBIUM-95 NI-63 NICKEL-63 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-32 PHOSPHORUS-32 PHO-210 POLONIUM-210 PU-239 PLUTONIUM-239 RA-226 RADIUM-228 RA-228 RADIUM-228 RA-228 RADIUM-228 RB-96 RUBIDIUM-86 RU-103 RUTHENIUM-103 RU-106 RUTHENIUM-103	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.7000 0.5100 0.5100 75.0000 1949.7500 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 60.0000 3645.7020 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 200.0000 4.0000 2.0000 38.0000 3279.9849 24.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 400.0000 0.0000 0.5000 0.0000 225.9600 2.2000 0.0000 3.0000 2.050 100.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39397.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.6000 0.0000 3.0000 3.55.7500 4.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	37497.0000 78.2300 0.0000	39398.9999 1219.7195 0.0000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 0.0000 2947.7436 15.5000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 2.0000 0.7000 2.8000 0.0000 15.0000 2.90.4748 27.4400 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 23.0000 23.0000 18.0495 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETRIM 176 MN-54 MANGANESE-54 MANGANESE-54 MANGANESE-56 MO-98 MOLYBDENUM-99 N-22 SODIUM-22 NA-24 SODIUM-24 NB-95 NICBIUM-95 NI-63 CNICKEL-63 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-32 P-32 PHOSPHORUS-32 P-33 PHO-147 PO-210 POLONIUM-239 RA-226 RADIUM-226 RA-226 RADIUM-226 RA-226 RADIUM-226 RA-226 RADIUM-226 RA-226 RADIUM-226 RA-226 RADIUM-239 RA-236 RADIUM-103 RU-103 RUTHENIUM-103 RU-104 RUTHENIUM-106 S-35 SULFUR-35	0.0000 0.0000 0.0240 0.0000 0.5000 0.4100 0.7000 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 0.5100 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 200.0000 6.4000 0.0000 2.0000 3279.9849 24.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000 205.9600 2.2000 0.0000 3.0000 2.0050 100.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 4.6000 0.0000 3.0000 4.0000 3.755.7500 4.0000 0.0000	37497.0000 78.2300 0.0000	39398.9996 1219.7195 0.0000 0.0000 0.2000 0.2000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 1.0000 30.0000 2947.7436 15.5000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 6.2000 2.00.0000 0.7000 2.5000 2.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.5000 1.5470 0.0000 1.5470 0.0000 1.705.3980 18.0495 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETHUM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SOCIUM-22 NA-24 SOCIUM-24 NB-95 NIOBIUM-95 NI-63 NICKEL-63 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-32 PHO-147 PROMETHIUM-147 PO-219 PULTONIUM-239 RA-228 RADIUM-226 RA-226 RADIUM-226 RA-226 RADIUM-286 RU-103 RUTHENIUM-103 RU-106 RUTHENIUM-103 RU-106 S-35 SULFER-35 SC-46 SCANDIUM-46	0.0000 0.0000 0.0240 0.0000 0.5000 0.4100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 12.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 2.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.0000 2.0000 3279.9849 24.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	0.0000 0.0000 0.0000 0.0000 0.5000 0.0000 2.25,9600 2.2000 0.0000 3.596,5510 6.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 0.0000 0.0000 3.0000 0.0000 3.765.7500 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	37497.0000 78.2300 0.0000	39398.9996 1219.7195 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000 2.0000 2.0000 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9600 1.0000 2.947.7436 15.5000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	40976.0000 257.1233 0.1900 0.0000 fl.0000 fl.0000 200.0000 0.7000 2.8000 2.8000 2.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 23.0000 1705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-24 IR-1928 IRIDIUM-24 IR-1928 IRIDIUM-25 IR-1938 IRICKEL-63 IR-63GC IRICKEL-63 GAS C IRICKEL-63 IR-63GC IRICKEL-63 GAS C IRICKEL-63 IR-63GC IRICKEL-63 IRICK	0.0000 0.0000 0.0240 0.0000 0.0000 0.0000 0.7000 0.5100 0.0000 12.0000 75.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 3645.7020 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 200.0000 6.4000 2.0000 38,0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	0.0000 0.0000 0.0000 400.0000 0.0000 0.0000 0.5000 0.0000 2.255,9600 2.2000 0.0000 3.596,5510 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 4.6000 0.0000 3.0000 3.765.7500 4.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	37497.0000 78.2300 0.0000	39398.9999 1219.7195 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 2.0000 0.0000 3186.0089 7.2500 0.0000	28997.0000 442.7920 0.2020 0.0000 1.5000 0.0001 1.5000 0.0000 2.4000 1.9000 30.0000 0.0000	40976.0000 257.1233 0.1900 0.0000 fl.0000 fl.0000 200.0000 2.0000 2.0000 0.0000 2990.4748 27.4400 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000 1.0000 0.0000 1.0000 0.0000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 23.0000 1705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-54 MANGANESE-54 MANGANESE-56 MO-98 MOLYBDENUM-99 NA-22 SODIUM-22 NA-24 SODIUM-24 NB-95 NICHEL-63 NICHEL-63 NICHEL-63 NICHEL-63 GAS C P-32 PHOSPHORUS-32 P-33 PHOSPHORUS-32 P-34 PROMETHIUM-147 PO-210 POLONIUM-210 PU-239 PLUTONIUM-239 RA-226 RADIUM-226S RA-226 RADIUM-226S RA-226 RADIUM-226S RA-226 RADIUM-26S RA-226 RADIUM-26S RA-236 RUBIDIUM-86 RU-103 RUTHENIUM-103 RU-105 SULFUR-35 SC-46 SCANDIUM-75 SI-31 SILICON-REACTOR	0.0000 0.0000 0.0240 0.0000 0.5000 0.4100 0.5000 0.5100 0.5100 0.5100 12.0000 75.0000 0.5100 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 6.0000 2.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 4.0000 2.0000 38.0000 38.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	0.0000 0.0000 0.0000 400.0000 0.0000 0.0000 0.0000 205.9600 2.2000 0.0000 3.966.5510 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 4.6000 0.0000 3.0000 3.765.7500 4.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	37497.0000 78.2300 0.0000	39398.9999 1219.7195 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 2.0000 0.0000 3186.0089 7.2500 0.0000	28997.0000 442.7920 0.2020 0.0000 1.5000 0.0001 1.5000 0.0000 2.4000 1.9000 30.0000 0.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 0.7000 2.6000 0.2000 0.5000 15.0000 0.9000 15.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 23.0000 23.0000 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-24 IR-1928 IRIDIUM-24 IR-1928 IRIDIUM-25 IR-1938 IRICKEL-63 IR-63GC IRICKEL-63 GAS C IRICKEL-63 IR-63GC IRICKEL-63 GAS C IRICKEL-63 IR-63GC IRICKEL-63 IRICK	0.0000 0.0000 0.0240 0.0000 0.0000 0.0000 0.7000 0.5100 0.0000 12.0000 75.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 6.0000 2.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 4.0000 2.0000 38.0000 38.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 0.0000 3.0000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000	39398.9996 1219.7195 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 1.9800 1.0000 9.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 6.2000 2.0000 0.7000 0.0000 1.5000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.0000 1.5470 0.0000 1.5470 0.0000 1.705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-54 MANGANESE-54 MANGANESE-56 MO-98 MOLYBDENUM-99 NA-22 SODIUM-22 NA-24 SODIUM-24 NB-95 NICHEL-63 NICHEL-63 NICHEL-63 NICHEL-63 GAS C P-32 PHOSPHORUS-32 P-33 PHOSPHORUS-32 P-34 PROMETHIUM-147 PO-210 POLONIUM-210 PU-239 PLUTONIUM-239 RA-226 RADIUM-226S RA-226 RADIUM-226S RA-226 RADIUM-226S RA-226 RADIUM-26S RA-226 RADIUM-26S RA-236 RUBIDIUM-86 RU-103 RUTHENIUM-103 RU-105 SULFUR-35 SC-46 SCANDIUM-75 SI-31 SILICON-REACTOR	0.0000 0.0000 0.0240 0.0000 0.5000 0.4100 0.5000 0.5100 0.5100 0.5100 12.0000 75.0000 0.5100 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 6.4000 0.0000 4.0000 2.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000	39398.9996 1219.7195 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 0.0000 0.3400 0.0000 0.3400 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 1.0000 2947.7436 15.5000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000 0.5000 0.0000 0.5000 0.2155.3500 0.2000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 2.0000 0.7000 0.0000 15.0000 2.900.4748 27.4400 0.0000 0.0000 0.0000 0.0000 1.	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 1.5470 0.0000 1.705.3980 18.0495 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-25-6 IR-1928 IRIDIUM-25-6 IR-1928 IRIDIUM-25 IR-1928 IRIDIUM-25 IR-1928 IRIDIUM-25 IR-1928 IRIDIUM-210 IRIDIUM-210 IRIDIUM-210 IRIDIUM-226 IRIDIUM-236 IRIDIUM-237 IRIDIUM-238 IRIDIUM-248 IRIDIUM-258 IR	0.0000 0.0000 0.0240 0.0000 0.0000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 12.0000 12.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 500.5000 1.2010 0.0000 6.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000 2.25,9600 2.2000 0.0000 3.596,5510 6.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 0.0000 0.0000 3.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	37497.0000 78.2300 0.0000	39398.9999 1219.7195 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.7000 0.3400 0.0000 0.3400 0.0000	28997.0000 442.7920 0.2020 0.2020 0.0001 1.5000 0.0000 2.4000 1.9800 0.0000 2.947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 0.7000 0.7000 0.7000 0.9000 15.0000 2990.4748 27.4400 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.7000 0.0000 1.7000 0.0000 1.0000 0.0000 1.0	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 1705.3980 18.0495 0.0000
R-192A IRIDIUM-192A R-1928 IRIDIUM-192A R-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SOGIUM-24 NB-95 NICKEL-63 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-32 PHOSPHORUS-32 PHOSPHORUS-33 PM-147 PROMETHIUM-147 PO-210 POLONIUM-210 PU-239 PLUTONIUM-239 RA-226 RADIUM-226 RA-226 RADIUM-226 RA-226 RADIUM-103 RU-106 RU-103 RU-106 S-35 SULFUR-35 SC-46 SCANDIUM-46 S-25 SELENIUM-75 SI-31 SILICON-REACTOR SN-113 TIN-113 SN-119 TIN-113 SN-119 TIN-113 SN-119 TIN-113	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 6.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 200.0000 4.0000 2.0000 38,0000 0.0000	0.0000 0.0000 0.0000 400.0000 0.5000 0.0000 2.265,9600 2.2000 0.0000 3.0000 3.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.0000 3.0000 0.0000	37497.0000 78.2300 0.0000	39398.9999 1219.7195 0.0000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.20000 0.0000	28997.0000 442.7920 0.2020 0.0000 1.5000 0.0000 2.4000 1.9600 0.0000 2947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 6.2000 2.00.0000 0.7000 0.0000 15.0000 2.990.4748 27.4400 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000 1.0000 1.7772.2500 2.5000 0.0000 1.0000 0.0000 1.0000 0.0000 1.0000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.0000 1.3000 1.5470 0.0000 0.0000 23.0000 1705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-54 MO-98 MOLYBDENUM-99 NA-22 SODIUM-22 NA-24 NB-95 NICHEL-63 NI	0.0000 0.0000 0.0240 0.0000 0.5000 0.4100 0.5000 0.5100 0.5100 0.5100 0.5100 0.5000 0.5100 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.0000 2.0000 38.0000 3279.9849 24.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000 2.255,9600 2.2000 0.0000 3.0000 3.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 0.0000 3.8000 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 6.0000 0.0000 0.0000 0.3400 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 1.0000 30.0000 2947.7436 15.5000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000 0.5000	40976.0000 257.1233 0.1900 0.0000 0.0000 0.0000 0.0000 0.7000 0.2000 0.2000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000 1.0000 0.0000 1.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 23.0000 1705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-126 IRIDIUM-129 IRIDIUM-129 IRIDIUM-1218 IRIDIUM-12	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 2.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.0000 3279.9849 24.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000 2.255,9600 2.2000 0.0000 3.596,5510 6.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 0.0000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000	39398.9996 1219.7195 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.000000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.2000 2.0000 0.3186.0089 7.2500 0.0000	28997.0000 442.7920 0.2020 0.2020 0.0000 1.5000 0.0000 2.4000 1.9600 1.9600 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 0.0000 0.0000 0.7000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000 1.0000 1.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 1.5470 0.0000 1.705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-126 IR-1928 IRIDIUM-126 IR-1928 IRIDIUM-127 IR-1928 IRIDIUM-128 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-193 IRIDIUM-193 IR-196 IRIDIUM-198 IR-195 IRIDIUM-195 IRIDIUM-195 IRIDIUM-195 IRIDIUM-195 IRIDIUM-195 IRIDIUM-195 IRIDIUM-195 IRIDIUM-195 I	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 12.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 3645,7020 0.0000	0.0000 0.0000	0.0000 0.0000 0.0000 400.0000 0.5000 0.5000 0.0000 2.255,9600 2.2000 0.0000 3.596,5510 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 0.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000	39398.9999 1219.7195 0.0000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.7000 0.3400 0.0000 1.9000 0.2,0000 0.3186.0089 7.2500 0.0000 0.10000 0.0000	28997.0000 442.7920 0.2020 0.2020 0.0001 1.5000 0.0000 2.4000 1.9800 0.0000 2947.7438 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 0.7000 2.6000 2.6000 2.900.0000 15.0000 0.9000 15.0000 0.9000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.772.2500 2.5000 1.772.2500 2.5000 1.0000 0.0000 1.0000 0.0000 1.0000 0.00000 0.00000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.3000 1.5470 0.0000 1.705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-54 MANGANESE-54 MANGANESE-56 MO-98 MOLYBDENUM-99 NA-22 SODIUM-22 NA-24 SODIUM-24 NB-95 NICHEL-63 NICHEL-63 GAS C P-32 PHOSPHORUS-32 PHOSPHORUS-32 PHOSPHORUS-33 PM-147 PROMETHIUM-147 PO-210 POLONIUM-239 RA-226 RADIUM-228 RA-906 RUTHENIUM-103 RUTHENIUM-106 S-35 SULFUR-35 SC-46 SCANDIUM-46 SE-75 SELENIUM-75 SI-31 SILICON-REACTOR SN-113 TIN-113 SN-119 TIN-113 SN-119 TIN-119-SEALED SN-82 STRONTIUM-85 SR-89 STRONTIUM-85 SR-89 STRONTIUM-85 SR-89 STRONTIUM-85 SR-90S STRONTIUM-90SS	0.0000 0.0000 0.0240 0.0000 0.5000 0.4100 0.5000 0.4100 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.0000 2.0000 38.0000 3279.9849 24.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 15.0000 3941.3851 0.0000 0.0000 0.0000 0.0000 15.0000 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 6.0000 0.0000 0.0000 0.3400 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 1.0000 30.0000 2947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 0.7000 2.0000 2.0000 0.7000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000 1.7772.2500 2.5000 1.0000 0.0	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.0000 1.3000 1.5470 0.0000 0.0000 1705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-125 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-29 IR-1928 IRIDIUM-29 IR-193 IRIDIUM-39 IR-193 IRIDIUM-39 IR-193 IRIDIUM-39 IR-193 IRIDIUM-39 IR-193 IRIDIUM-39 IR-193 IRIDIUM-36 IRIDIUM-3	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 12.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.0000 2.0000 38.0000 3279.9849 24.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 15.0000 3941.3851 0.0000 0.0000 0.0000 0.0000 15.0000 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 6.0000 0.0000 0.0000 0.3400 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9000 30.0000 2947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 0.7000 2.0000 2.0000 0.7000 0.0000 15.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000 1.7772.2500 2.5000 1.0000 0.	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.0000 1.3000 1.5470 0.0000 0.0000 1705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-54 MANGANESE-54 MANGANESE-56 MO-98 MOLYBDENUM-99 NA-22 SODIUM-22 NA-24 SODIUM-24 NB-95 NICHEL-63 NICHEL-63 GAS C P-32 PHOSPHORUS-32 PHOSPHORUS-32 PHOSPHORUS-33 PM-147 PROMETHIUM-147 PO-210 POLONIUM-239 RA-226 RADIUM-228 RA-906 RUTHENIUM-103 RUTHENIUM-106 S-35 SULFUR-35 SC-46 SCANDIUM-46 SE-75 SELENIUM-75 SI-31 SILICON-REACTOR SN-113 TIN-113 SN-119 TIN-113 SN-119 TIN-119-SEALED SN-82 STRONTIUM-85 SR-89 STRONTIUM-85 SR-89 STRONTIUM-85 SR-89 STRONTIUM-85 SR-90S STRONTIUM-90SS	0.0000 0.0000 0.0240 0.0000 0.5000 0.4100 0.5000 0.4100 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 2.0000 2.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.0000 3279.9849 24.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000	28997.0000 442.7920 0.2020 0.2020 0.0000 1.5000 0.0000 1.9800 1.0000 2947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 0.0000 0.0000 0.7000 0.2000 0.2000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000 1.0000 1.0000 1.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.3000 1.5470 0.0000 1.5470 0.0000 1.705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-125 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-29 IR-1928 IRIDIUM-29 IR-193 IRIDIUM-39 IR-193 IRIDIUM-39 IR-193 IRIDIUM-39 IR-193 IRIDIUM-39 IR-193 IRIDIUM-39 IR-193 IRIDIUM-36 IRIDIUM-3	0.0000 0.0000 0.0240 0.0000 0.5000 0.4100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000 2.255,9600 2.2000 3.0000 3.596,5510 6.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000	37497.0000 78.2300 0.0000	39398.9999 1219.7195 0.0000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.7000 0.3400 0.0000 0.3400 0.0000	28997.0000 442.7920 0.2020 0.2020 0.0000 1.5000 0.0000 2.4000 1.9800 0.0000 2.947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 2.0000 0.7000 0.7000 0.9000 15.0000 2.900.4748 27.4400 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000 1.0000 1.0000 0.	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.3000 1.5470 0.0000 0.0000 1705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-54 MANGANESE-54 MANGANESE-56 MO-98 MOLYBDENUM-99 NA-22 SODIUM-22 NA-24 SODIUM-24 NB-95 NICHEL-63 NICHEL-63 NICHEL-63 NICHEL-63 SODIUM-24 NB-95 NICHEL-63 SODIUM-24 NB-95 NICHEL-63 SODIUM-24 NB-95 NICHEL-63 SODIUM-24 NB-95 NICHEL-63 SODIUM-25 PHOSPHORUS-32 PHOSPHORUS-32 PHOSPHORUS-33 PH-147 PROMETHIUM-147 PO-210 POLONIUM-210 PU-239 PLUTONIUM-239 RA-226 RADIUM-226 RA-226 RADIUM-226 RA-226 RADIUM-226 RA-226 RADIUM-226 RA-96 RUBIDIUM-86 RU-103 RUTHERIUM-103 RU-105 SULFUR-35 SC-46 SCANDIUM-46 SC-35 SELENIUM-75 SI-31 SILICON-REACTOR SN-113 TIN-113 SN-119 TIN-119-SEALED SN-121 TIN-119-SEALED SN-121 TIN-119-SEALED SN-121 TIN-119-SEALED SN-121 TIN-119-SEALED SN-121 TIN-119-SEALED SN-90S STRONTIUM-80 SR-90S STRONTIUM-89 SR-90S STRONTIUM-90 TECHNETIUM-199	0.0000 0.0000 0.0000 0.5000 0.5000 0.4100 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.0000 38.0000 38.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 3.0000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 6.0000 0.0000 0.0000 0.3400 0.0000 1.7000 0.3400 0.0000	28997.0000 442.7820 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 1.0000 30.0000 2947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 0.7000 0.7000 0.0000 0.7000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.0000 1.3000 1.5470 0.0000 0.0000 1.705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-54 MAN-68 MOLYBDENUM-99 NA-22 SODIUM-22 NA-24 NB-95 NICKEL-63 NI-63GC NICKEL-63 NI-63 NICKEL-63 NI-63 ROSEN-229 PHOSPHORUS-32 PA-229 PHOSPHORUS-33 PM-147 PROMETHUM-129 RA-226 RADIUM-239 RA-226 RADIUM-228 RA-226 RADIUM-228 RA-226 RADIUM-228 RA-226 RADIUM-228 SA-226 SCANDIUM-46 SE-75 SELENIUM-75 SI-31 SILICON-REACTOR SN-113 TIN-113 SN-119 TIN-119-SEALED SN-121 TIN-121M SR-82 STRONTIUM-85 SR-90 STRONTIUM-85 SR-90 STRONTIUM-89 TC-99M TECHNETIUM-99	0.0000 0.0000 0.0000 0.0000 0.5000 0.5000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.0000 3279.9849 24.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 0.0000 3.8000 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 6.0000 0.0000 0.0000 0.0000 0.3400 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 1.0000 30.0000 2947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 0.0000 0.0000 0.7000 0.7000 0.20000 0.7000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 1.0000 0.0000 1.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 1.5470 0.0000 1.5570 0.0000 1.0000 1.0000 0.0000 1.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-56 R MO-98 MOLYBDENUM-99 NA-22 SOCIUM-22 NA-24 SOCIUM-25 NI-63 NICKEL-63 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-32 P-33 PHOSPHORUS-32 P-33 PHOSPHORUS-32 P-33 PHOSPHORUS-32 P-34 PROMETHIUM-147 PO-210 POLONIUM-230 RA-226 RADIUM-226 RA-226 RADIUM-226 RA-226 RADIUM-226 RA-226 RADIUM-25 SA-226 SCANDIUM-46 S-35 SULFUR-35 SC-46 SCANDIUM-46 SE-75 SELENIUM-75 SI-31 SILICON-REACTOR SN-113 TIN-113 SN-119 TIN-119-SEALED SN-121 TIN-113 SN-119 TIN-119-SEALED SN-121 TIN-113 SN-119 TIN-119-SEALED SN-121 TIN-119-SEA	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000	0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000	37497.0000 78.2300 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 0.0000 0.0000 0.0000 0.3400 0.0000 0.3400 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000	28997.0000 442.7920 0.2020 0.2020 0.0000 1.5000 0.0000 2.4000 1.0000 9.0000 2.4000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 0.0000 0.7000 0.7000 0.2000 0.2000 0.2000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.10000 0.0000 1.0000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 1.5470 0.0000 1.5570 0.0000 0.0000 1705.3980 18.0495 0.0000
R-192A IRIDIUM-192A R-1928 IRIDIUM-192A R-1928 IRIDIUM-1228 R-42 POTASSIUM-42 KR-85 KRYPTON-85 LU-176 LUTETIUM 176 MN-54 MANGANESE-56 MO-98 MOLYBDENUM-99 NA-22 SOCIUM-22 NA-24 SOCIUM-24 NB-95 NICKEL-63 NI-63GC NICKEL-63 GAS C P-32 PHOSPHORUS-32 P-33 PHOSPHORUS-32 P-33 PHOSPHORUS-32 P-33 PHOSPHORUS-32 P-34 PROMETHIUM-147 PO-210 POLONIUM-210 PU-239 PLUTONIUM-226 RA-226 RADIUM-226 RA-226 RADIUM-26 RU-103 RUTHENIUM-103 RU-108 RUTHENIUM-103 RU-108 RUTHENIUM-105 S-35 SULFUR-35 SC-46 SCANDIUM-46 SE-75 SELENIUM-75 SI-31 SILICON-REACTOR SN-113 TIN-113 SN-119 TIN-119-SEALED SN-121 TIN-121M SR-82 STRONTIUM-82 O SR-85 STRONTIUM-89 SR-90S STRONTIUM-89 SR-90S STRONTIUM-90SS TB-158 TECHNETIUM-99 TC-99M TECHNETIUM-93 TC-99M TECHNETIUM-99	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 12.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 6.0000 0.0000	0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.5000 0.0000 2.25,9600 2.2000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 0.0000 0.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 3.8000 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.7000 0.0000 0.3400 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 0.9000 0.9000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 0.7000 0.7000 0.7000 0.7000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 0.0000 1.5000 0.0000 1.5470 0.0000 1.705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-125 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1939 IRIDIUM-138 IRIDIUM-	0.0000 0.0000 0.0000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.0000 2.0000 3279.9849 24.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 3.8000 0.0000 3.941.3851 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 6.0000 0.0000 0.0000 0.0000 0.3400 0.0000 0.3400 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 1.0000 30.0000 2947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.50000 2.00.0000 0.70000 2.0000 0.70000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.3000 1.5470 0.0000 0.0000 1705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-125 IR-1928 IRIDIUM-125 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1939 IR-1	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000	37497.0000 78.2300 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 0.0000 0.0000 0.0000 0.0000 0.3400 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	28997.0000 442.7920 0.2020 0.2020 0.0000 1.5000 0.0000 2.4000 1.9600 0.0000 2.947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 0.0000 0.0000 0.7000 0.7000 0.0000 0.7000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 1.5470 0.0000 1.5470 0.0000 0.0000 1.705.3980 18.0495 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-125A IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1939 IRIDIUM-129 IR-1930 IRIDIUM-129 IRIDIUM-199 IRIDIUM	0.0000 0.0000 0.0000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.0000 3279.9849 24.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000	37497.0000 78.2300 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 0.0000 0.0000 0.0000 0.0000 0.3400 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	28997.0000 442.7920 0.2020 0.2020 0.0000 1.5000 0.0000 2.4000 1.9600 0.0000 2.947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 0.0000 0.0000 0.7000 0.7000 0.0000 0.7000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.3000 1.5470 0.0000 1.5470 0.0000 1.5670 0.0000 0.0000 1.0000 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-125 IR-1928 IRIDIUM-125 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1939 IR-1	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 0.0000	0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.5000 0.0000 2.255,9600 2.2000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000	37497.0000 78.2300 0.0000	39398.9999 1219.7195 0.0000	39996.0000 515.3261 0.0000 0.0000 1.7000 0.3400 0.0000 1.7000 0.3400 0.0000	28997.0000 442.7920 0.2020 0.2020 0.0000 1.50000 0.0000 2.4000 1.9800 0.0000 2.947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 1.5000 0.7000 0.7000 0.200.0000 0.7000 0.0000 15.0000 0.9000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 1.5470 0.0000 1.5470 0.0000 1.5470 0.0000 0.0000 1.0000 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-125A IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1928 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1939 IRIDIUM-129 IR-1930 IRIDIUM-129 IRIDIUM-199 IRIDIUM	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.5000 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.0000 2.0000 3279.9849 24.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 3.8000 0.0000 3.941.3851 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 6.0000 0.0000 0.0000 0.0000 1.7000 0.3400 0.0000 1.9000 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 0.0000 1.9800 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 0.7000 0.7000 0.0000 0.7000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.0000 1.3000 1.5470 0.0000 1.5570 0.0000 1705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-125 IR-1928 IRIDIUM-125 IR-1928 IRIDIUM-129 I	0.0000 0.0000 0.0000 0.0000 0.5000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.5000 0.5000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.0000 3279.9849 24.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 4.6000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 0.0000 3.8000 0.9000 0.9000 0.9000 0.9000 0.9000 0.9000 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 6.0000 0.0000 0.0000 0.0000 0.3400 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 0.0000 0.0000 0.7000 0.7000 0.0000 0.7000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.3000 1.5470 0.0000 23.0000 1705.3980 18.0495 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-125A IR-1928 IRIDIUM-199 IR-1928 IRIDIUM-199 IR-1928 IRIDIUM-199 IR-1938 IRIDIUM-199 IR-1939 IRIDIUM-199 IR-1939 IRIDIUM-199 IR-1939 IRIDIUM-199 IR-1939 IRIDIUM-199 IR-1939 IRIDIUM-193 IRIDIUM	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000	0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.0000 2.205.9600 2.2000 0.0000 3.596.5510 6.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000	37497.0000 78.2300 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 0.0000 0.0000 0.0000 0.3400 0.0000 0.3400 0.0000	28997.0000 442.7920 0.2020 0.2020 0.0000 1.50000 0.0000 2.4000 1.9600 0.0000 2.947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 0.0000 0.7000 0.7000 0.2000 0.7000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.5470 0.0000 1.5470 0.0000 1.5470 0.0000 1.5470 0.0000 0.0000 1.0000 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-1228 IR-1928 IRIDIUM-125 IR-1928 IRIDIUM-125 IR-1928 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-129 IR-1929 IRIDIUM-109 IR-1929 IRIDIUM-119-IRIDIUM-109 IR-1929 IRIDIUM-119-IRIDIUM-109 IR-1929 IRIDIUM-119-IRIDIUM-109 IR-1930 IRIDIUM-120 IR-19	0.0000 0.0000 0.0000 0.5000 0.5000 0.4100 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 4.0000 3279.9849 24.0000 0.0000	0.0000 0.0000	39397.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 0.5000 0.0000	39398.9996 1219.7196 0.00000 0.0000	39996.0000 515.3261 6.0000 0.0000 0.0000 0.3400 0.0000 1.7000 0.3400 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 5.0000 0.0000 1.9600 1.0000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 1.5000 0.7000 0.7000 0.0000 0.7000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 0.0000 1.5070 0.0000 1.5470 0.0000 1.5470 0.0000 1.5470 0.0000
R-192A IRIDIUM-192A IR-1928 IRIDIUM-192A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-122A IR-1928 IRIDIUM-125A IR-1928 IRIDIUM-199 IR-1928 IRIDIUM-199 IR-1928 IRIDIUM-199 IR-1938 IRIDIUM-199 IR-1939 IRIDIUM-199 IR-1939 IRIDIUM-199 IR-1939 IRIDIUM-199 IR-1939 IRIDIUM-199 IR-1939 IRIDIUM-193 IRIDIUM	0.0000 0.0000 0.0240 0.0000 0.5000 0.5000 0.5100 0.5100 0.5100 0.5100 0.5100 0.5100 0.0000 0.5100 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5010 0.0000 1.2010 0.0000 6.0000 2.0000 0.0000	0.0000 0.0000	0.0000 0.0000 0.0000 0.0000 0.0000 0.5000 0.5000 0.0000	39397.0000 0.0000 0.0000 0.0000 1.0000 0.0000 4.6000 0.0000 3.0000 0.0000 3.0000 0.0000	37497.0000 78.2300 0.0000 0.0000 0.0000 0.0000 3.8000 0.0000 0.5000 3.8000 0.0000	39398.9996 1219.7195 0.0000	39996.0000 515.3261 6.0000 0.0000 0.0000 0.0000 0.3400 0.0000	28997.0000 442.7920 0.2020 0.0000 0.0001 1.5000 0.0000 2.4000 1.9800 1.0000 30.0000 2947.7436 15.5000 0.0000	40976.0000 257.1233 0.1900 0.0000 0.0000 0.0000 0.0000 0.7000 0.7000 0.20000 0.7000 0.0000	18999.0000 405.3728 0.0820 0.0000 0.0000 0.0000 1.3000 1.3000 1.5470 0.0000 1.5470 0.0000 1.705.3980 18.0495 0.0000

### Sealed Source Nuclides and Activities (mCl) Received under UW Broadscope License for Year Indicated

NUCLIDE	The State of the S	RECPT86	RECPT87	RECPT88	RECPT89	RECPT90	RECPT91	RECPT92	RECPT93	RECPT94	RECPT95	DEADYS
AM-241S	AMERICIUM-241 *	50.0000	250.0005	0.0000	0.0000	0.0000	50.0000	0.0000	0.0100	0.0000	145.1800	RECPT96
AU-198	GOLD-198	0.0000	805.3400	1057.6200	165.9000	210.9000	0.0000		0.0000	0.0000	0.0000	0.0000
F4-415	CALCIUM-41 SEAL	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0050	0.0000	0.0000	0.0000	0.0000
CD-109	CADMIUM-109 SEA	0.5010	1.0021	0.1021	0.5031	1.0021	1.0021	3.0021	2.0021	1.0021		0.0000
CD-109S	CADMIUM 109 SS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	45.0000	19.5000	0.0000	1.5000	2.0000
CM-2445	CURIUM-244	0.0000	0.0000	0.0000	1.0000	0.0000	1.0000	2.0000	0.0000	0.0000	36,5000	30.0000
CO-57S	COBALT-57	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000
CO-60	COBALT-60 *	0.0509	0.0010	0.0000	102.0004	0.0000	0.0000	0.0000	0.0020	0.0000	0.0000	0.0000
CS-137	CESIUM-137 *	0.0000	0.0015	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0056	0.0000
CS-137S	CESIUM-137S	0.0000	0.0000	0.0000	55,0000	0.0000	1177.2000	47.0000	0.0000	30.8000	0.0000	0.0000
FE-55S	IRON-55 SS	0.0000	0.0000	0.0000	0.0000	10.0000	0.0000	0.0000	0.0000	0.0000	50.0000	199.9500
GD-153	GADOLINIUM-153	712.0002	1795.0000	1.0001	1.0002	1.0000	0.0000	0.1000	0.0000	0.0000	0.0000	0.0000
GD-1535	GADOLINIUM-153	0.0000	3750.0000	3660.9000	1000,0000	280.0000	510.0000	2366.9591	0.0000	0.0000	0.0000	0.0000
GE-68\$	GERMANIUM-68	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	65.8000	0.0000
GE-68SS	GERMANIUM 68 SS	0.0000	0.0000	0.0000	0.0000	2.5000	0.0000	7.0000	0.0000	0.0000	10.0000	0.0000
1-1258	I-125 Bone min	2047.8898	1412.0188	1446.0000	1400.0000	650.0000	148.5353	0.0000	0.0000		0.0000	0.0000
1-1258	IODINE-125S	0.0000	0.0000	0.0000	0.0000	0.0000	77.9400	292.8500	533.5900	338.7600	0.0000	0.0000
1-129	IODINE-129	00000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		243.1400	211.3800
IR-192	IRIDIUM-192	3259.9880	5746.7830	4962.1489	34189.2810	1791.4395	12315.3425	0.0000	0.0000	0.0000	0.0000	0.0000
IR-192A	IRIDIUM-132A	0.0000	0.0000	0.0000	0.0000	39397.0000	37497.0000	39398 9999	39996.0000	0.0000	0.0000	0.0000
IR-192S	IRIDIUM-192S	0.0000	0.0000	0.0000	0.0000	0.0000	78.2300	1219.7195	515.3261	29997.0000	40976.0000	18999.0000
KR-85	KRYPTON-85	0.0000	0.0000	0.0000	400 0000	0.0000	0.0000	0.0000	0.0000	442.7920	257.1233	405.3728
NI-63GC	NICKEL-63 GAS C	75.0000	60.0000	38.0000	100.0000	85.0000	15.0000	0.0000	60.0000	0.0000	0.0000	0.0000
PM-147	PROMETHIUM-147	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1000.0000	30.0000	15.0000	23.0000
PO-210	POLONIUM-210	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
PU-239	PLUTONIUM-239	0.0000	0.0000	0.0005	0.0000	0 0000	0.0000	0.0000	0.0000	0.0000	0.0000	6.0000
RA-226	RADIUM-226S	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SN-119	TIN-119-SEALED	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SR-90S	STRONTIUM-90SS	27.0000	55.0000	25.0000	0.0000	0.0000	6.8500		0.0000	0.0000	0.0000	0.0000
TC-99	TECHNETIUM-99	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.1000	0.0000	0.0000	50.0000
TL-204	THALLIUM-204 SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Y-88	YTTRIUM-88 SEAL	0.0000	0.0000	0.0000	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
				0.000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

NUCLIDE	FLEI	RECPT86	DECOTET	DECOVER	DECREE							
AM-241	AMERICIUM-241	0.0000	RECPT87 0.0000	RECPT88	RECPT89	RECPT90	RECPT91	RECPT92	RECPT93	RECPT94	RECPT95	RECPT96
BA-133	BARIUM-133	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.0000	0.0000	0.0000
BR-82	BROMINE-82	0.0000	0.0000	1.0000	1 0000	0.0070	0.0000	0.0000	0.1000	0.0000	0.0000	0.0000
C-14	CARBON-14 *	272.4380	414.2142	273.9533	240.3372	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CA-45	CALCIUM-45	18.0580	60.2000	48.0100		77.0000	259.7868 70.0000	203.7551	145.6480	162.4562	164.5978	122.8640
CE-141	CERIUM-141	1.2500	0.0000	0.0000		2.0000	4.0000	43.0000	21.0030	33.0020	23 0000	7.0000
CL-36	CHLORINE-36	0.1000	0.0600	5.0250	0.2020	0.1500	1.1000	5.0000	2.5000	1.5000	1.5000	1.0000
CL-38	CHLORINE-38	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0170	4.1750	1.5500	0.0000
CM-244	CURIUM 244*	0.0000	0.0001	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0300
CO-56	COBALT-56	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO-57	COBALT-57	0.0736	54.1142	6.0701	15,1485	103.0280	30.1000	11.0100	27.2100	61.5000	18.7000	0.0000
CO-60	COBALT-60 *	0.0509	0.0010	0.0000	2.0004	0.0000	0.0000	0.0000	0.0020	0.0000	0.0056	0.0000
CR-51	CHROMIUM-51	648.0000	1364.0000	1147.0100	1094.0128	760.0000	764.0000	749.2260	627.5000	588.0000	443.0000	304.0000
CS-137	CESIUM-137	0.0000	0.0015	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
CU-84	COPPER-64	0.0500	0.0000	0.0000	0.0000	0.0000	10.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CU-67	COPPER-67	0.0000	0.0000	0.0000	0.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
EU-152	EUROPIUM-152	0.0000	0.0000	0.0100	0.0001	0.0000	0.0000	0.0000	0.0000	1.8600	0.0000	0.0000
EU-152M EU-154		0.0000	9.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	8.0000	0.0000	0.0000
EU-155	EUROPIUM-154	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0890	0.0000	0.0000
F-18	EUROPIUM-155	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
FE-55	FLUORINE-18	0.0000	80.0000	0.0000	12.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
FE-59	IRON-55 IRON-59	0.0760	0.0000	10.1000	0.1001	0.0000	0.0000	0.0000	1.1007	8.0060	5.0030	0.0130
GA-57	GALLIUM-67	0.2535	0.2500	0.0000	0.5000	0.5000	0.0000	0.0000	0.5040	0.0020	0.0010	0.0070
GE-68	GERMANIUM-68	0.0000	0.0000	0.0000	6.0000	7.0000	18.0000	12.0000	18.0000	0.0000	0.0000	0.0000
H-3	TRITIUM *	3367,1121	4 0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.2000	0.0000	0.0000	0.0000
I-123	IODINE-123 *	0.0000	22.0300	4061,2099	2955.6888	11406.0569	1185.6586	2395.3914	2939.8904	801,6350	911.4390	394.8440
1-125	IODINE-125	917.3188	1741.1115	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-129	IODINE-129	0.0000	0.0001	1504.8233	1232.8107	1064.6298	1287.1398	850.9060	701.5889	825.5197	714.7322	327.4237
1-131	IODINE-131	364.0023	451,3120	1004.4091	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
BN-111	INDIUM-111	35.0000	53.0000	42.0000	623.5036 36.0000	226.0006	106.0030	32.0089	3.5022	0.5010	1.5011	4.0009
K-42	POTASSIUM-42	0.0240	0.0000	0.0000	0.0000	0.0000	42.0000	52.2440	49,4660	6.0000	7.0000	0.0000
LU-176	LUTETIUM 176	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2020	0.1900	0.0820
MN-54	MANGANESE-54	0.5000	0.5010	0.7000	0.5000	1.0000		0.0000	0.0000	0.0001	0.0000	0.0000
MN-56	MANGANESE-56 RE	0.4100	0.0000	0.0000	0.0000	0.0000	0.0000	0.2000	1.7000	1.5000	1.5000	0.0000
MO-99	MOLYBDENUM-99 *	0.0000	500.5000	200.0000	205.9600	0.0000	0.0000	0.0000	0.3400	5.0000	6.2000	0.0030
NA-22	SODIUM-22	0.7000	1.2010	6.4000	2.2000	4.6000	3.8000	5.7000	0.0000	0.0000	200.0000	0.0000
NA-24	SODIUM-24	0.5100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.9000	2.4000	0.7000	1.3000
NB-95	NIOBIUM-95	0.0000	6.0000	4.0000	3.0000	3.0000	2.0000	2.0000	0.0000	1.9800	2.8000	1.5470
NI-63	NICKEL-63	12.0000	2.0000	2.0000	2.0050	0.0000	0.0000	1.0000	7.0000	9.0000	2.0000	0.0000
P-32	PHOSPHORUS-32 *	1949.7500	3645.7020	3279.9849	3596.5510	3755.7500	3941.3851	3859.7186	3186.0089	2947.7436	0.0000	0.0000
P-33	PHOSPHORUS-33	6.0000	0.0000	24.0000	6.0000	4.0000	0.0000	3.0000	7.2500		27.4400	18.0495
RA-228	RADIUM 228	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R8-86	RUBIDIUM-86	1.0000	5.0000	5.0000	9.0000	4.0000	7.0000	6.0000	1.0000	0.0000	0.0000	1.0000
RU-103	RUTHENIUM-103	0.0000	0.0000	0.0000	2.0000	2.0000	3.0000	3.5000	1.0000	0.5000	1.0000	0.5000
RU-106	RUTHENIUM-106	0.0000	0.0000	0.2000	0.0000	0.0000	0.0000	4.0000	0.0000	0.0000	0.0000	0.0000
S-35	SULFUR-35	887.2000	1359.7869	1573.0500	1874.2650	2134.6700	2193.1000	2663.4000	2768.4240		1772.2500	1129.4400
SC-46	SCANDIUM-46	1.2500	7.0000	4.0000	2.0000	5.0000	1.0000	4.0000	1.5000		2.5000	1.0000
SE-75	SELENIUM-75	0.0000	2.5000	2.0000	4.0000	2.0000	0.0000	0.0000	0.0000		10.0340	0.0000
SI-31	SILICON-REACTOR	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.0000	2.5000	0.0000
SN-113	TIN-113	0.0000	4.0000	6.0000	3.0000	3.0000	3.0000	5.0000	3.0000		2.5000	0.5000
	TIN-121M	0 0000	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SR-82	STRONTIUM-82, D	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.0000	0.0000	0.0000	0.0000	
SR-85	STRONTIUM-85	2.7500	6.0000	4.0000	4.5000	3.0000	2.0000	2.0000	1.0000	1.0000	1.0000	1.0000
SR-89	STRONTIUM-89	0.0000	0.0006	0.0000	0.0000	0.0001	0.0000	0.0004	0.0001	8.0002	0.0000	0.0003
TB-158	TERBIUM-158	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000
TC-94M	TECHNETIUM-94M	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000
TC-99	TECHNETIUM-99	0.0000	0,0000	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TC-99M	TECHNETIUM-99M	0.0000	0.0000	91.0000	0.0000	153.1000	759.1000	3324.8287	3139.0000	1271.0000	275.0000	
TH-230	THORIUM 230	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
TL-201 U-235	THALLIUM-201	0.0000	0.0000	29.9822	25.1802	18.7383	4.4116	0.1420			0.3000	0.0000
U-238	URANIUM-235 *	0.0000	0.0000	0.0000	0.0520	0.0208	0.0000	0.0000			0.0000	
XE-133	URANIUM-238 * XENON-133	0.0001	0.0000	0.0000		0.0000	0.0000	0.0001			0.0000	
ZN-62	ZINC-62	0.0000	172.1000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	
ZN-65	ZINC-65	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	170,0000			230.0000	
ZN-69	ZINC -69	1.3000	0.5000	0.1000		1.0000	0.5000	0.0000				
201 200	4.1.10	1.3000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

#### Unsealed Long-Lived (T > 120 days) NRC-Regulated Nuclides and Activities (mCl) Received under UW Brandscope License for Year Indicated

NUCLIDE	FULL		RECPT87	RECPT88	RECPT89	RECPT90	Fa. 1	RECPT92	RECPT93	RECPT94	RECPT95	RECPT96
AM-241	AMERICIUM-241	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.0000		
BA-133	BARIUM-133	0.0000	0.0000	0.0000	0.0001	0.0070	0.0000	0.0000	0.1000	0.0000	0.0000	
C-14	CARBON-14 *	272.4380	414,2142	273.9533	240.3372	146.5089	259.7868	203.7551	145.6480	162 4562		
CA-45	CALCIUM-45	18 0580	60.2000	48.0100	55.0000	77.0000	70.0000	43.0000				
CL-36	CHLORINE-36	0.1000	0.0500	5.0250	0 2020	0.1500	1.1000	0.7000	1.2750			
CM-244	CURIUM 244"	0.0000	0.0001	0.0000	0.0200	0.0000	9.0000	0.0000				
CO-60	COBALT-60 *	0.0509	0.0010	0.0000	2.0004	0.0000	0.0000	0.0000	0.0020	0.0000		
CS-137	CESIUM-137 *	0.0000	0.0015	0.0000	0.0000	0.0000	0.2000	0.0001	0.0000	0.0000		
EU-152	EUROPIUM-152	0.0000	0.9000	0.0100	0.0001	0.0000	0.0000	0.0000	0.0000	1.8600		
EU-154	EUROPIUM-154	0.0000	(7)000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0890		
EU-155	EUROPIUM-155	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000		
FE-55	IRON-55	0.0760	0.0000	10.1000	0.1001	0.0000	0.0000	0.0000	1.1007	8.0060		
H-3	TRITE IM *	3367.1121	14314.7156	4061.2099	2955.6888	11406.0569	1185.6586	2395.3914	2939.6904	801,6350		
F129	IODINE-129	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
LU-176	LUTETIUM 176	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
MN-54	MANGANESE-54	0.5000	0.5010	0.7000	0.5000	1.0000	0.0000	0.2000				
NI-63	NICKEL-63	12.0000	2.0000	2.9000	2.0050	0.0000	0.0000	1.0000				
RU-106	RUTHENIUM-106	0.0000	0.0000	0.2000	0.0000	0.0000	0.0000	4.0000				
SN-121M	TIN-121M	0.0000	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000				
TB-158	TERBIUM	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
TC-99	TECHNETIUM-99	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000					
TH-230	THORRUM 230	0.0000	P 2000	0.0000	0.0000	0.0000						
U-235	URANIUM-235 *	0.00	0.0000	0.0000	0.0520	0.0208						
U-238	JRANIUM-238 *	0.0001	0.0000	0.0000	0.0000							
ZN-65	ZINC-65	0.1500	0.5000	0.1000								

Activity (mCi)	) Incinerate 1981	d at Herrick 1982	Drive Incine 1983	rator for Yea	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994		Totals
H-3	1422.22	1432.64	2249.91	10354.1	48816.9	1300	1625	1042.15	352.006	2275.011	552.976	426.7051	796.8366	241.5642	475.031	73363.05
C-14	87	20.4645	119.245	246.395	668.852	126	117	56.23	79.032	138.721	68.628	85.3515	109.1228	80.9645	147.229	2150.235
Na-22	0.13	0.05	1.288	0	5.5099	0.82	0.132	0.44	1.695	2.453	1.844	1.29292	1.9013	0.557	0.26	18.37312
P-32	1.5	0.99	5.109	7.128	9.3547	7.3	123	46.85	46.693	42.22	21.223	13.99898	16.103	23.89269	13.573	378.9354
P-33	0	0	0	0	0	0	0.0365	0	0	0	0	0	0	0	0.249	0.2855
S-35	13.36	27,444	58.16	488.544	335.431	267	338	287.09	384.588	136.545	333.43	392.0034	220.655	205.5203	181.499	3669.27
CI-36	0	0	0.001	0	0.448	0.001	0.43	0	0.981	0.681	0.003	0.08579	0.1604	0.172	1.547	4.51019
Ca-45	0.48	0	0.071	21.3645	13.0299	8	9.65	7.64	20.005	3.311	6.987	4.1365	4.60971	2.851623	3.063	105.1992
Sc-46	5.1	1.6718	2.065	2,479	2.7278	1.8	3.34	1.07	1.439	7.23	0.831	2.6047	0.9532	0.929	1.217	35.4575
Cr-51	23.9	21,713	21.024	18.92	17.961	51	7.97	0.006	1.688	265.102	18.109	39.5	32.455	17.684	24.311	561.343
Mn-54	0	0	0.2	0	0.0819	0.15	0.158	0.108	0.285	1.044	0.051	0.07715	0.2896	0.00007	0.326	2.77072
Fe-55	0	0	0	0.002	0.0262	0	0	0	0	0	0	0	0	0	0	0.0282
Co-57	2.3	0.67	0	0	1.4141	1.3	3.03	1.43	1.6	5.914	0.92	1.670744	0.7195	1.34025	1.817	24.12559
Fe-59	0.19	0.004	0	0	0	0.2	0.332	0.002	0.302	0.307	0.2	0	0	0	0	1.537
Co-60	0	0	0.26	0	0	0.082	0	0	0	0.002	0.1	. 0	0	0	0	0.444
63	0	0	0	0	19.9584	0.22	15.7	0.001	0	0.042	0.068	0.0001	0.053	0	0.027	36.0695
-65	0	0.36	0.67	0	0.0173	0.1	0.0505	0	0.051	0.008	0	0	0.0024	0.032	0	1.2912
Ga-68	0	0	0	0	0.0136	0.01	0	0	0	0	0	0	0	0	0	0.0236
Se-75	0.94	0.387	0.7122	1.589	0.9939	0.62	0.118	0.0354	0.068	. 0	10.402	0.0002	0	0	0	15.8657
Sr-85	3.1	1.5173	2.011	2.557	2.7408	1.6	2.51	0.67	1.84	1.355	0.43	1.93	0.44	0.43102	0.742	23.87412
Rb-86	0	0	0	0	0.012	0.048	0.03	0.001	0	0.277	0	0.01077	0	0	0	0.37877
Y-88	0	0	0	0	0	0	0	0	0	0.102	0	0	0.00001	0	0	0.16201
Sr-90	0	0	0	0	0.004	0.0001	0	0	0	0	0	0	0	0	0	0.0041
Y-90	0	0	0	0	0.004	0.0001	0.12	0	0	0.001	0	0	0	0	0	0.1251
Nb-95	0	0	0	0	0.493	1.2	2.36	0.68	1.25	0.98	0.431	2.07472	0.85734	0.328	0.626	11.28006
Mo-99	0	0	0.12	0	0	0	0	0	0	0	0	0	0	0	0	0.12
Tc-99	0	0	0	0	0	0.05	0	0	0	0	0	0	0	0	0	0.05
Ru-103	0.17	0.04	0	0	0.013	0	0	0	0.275	3.523	0.816	1.66939	0.4919	0.1704	0.415	7.58369
Cd-109	0.2	0	0	0	0.0346	0.13	0.438	0.095	0.017	0.757	0.16	1.93	0.1379	0.6431	0.549	5.0916
In-111	0	2.636	0	0	0	3.1	2.18	1.996	2.35	4.195	5.507	0.9149	0.04992	0	0.229	23.15782
Sn-113	0.	0	0	0	0.9471	1.3	2.74	1.24	1.167	1.865	1.2	3.9895	2.0471	1.0798	1.311	18.8865
1-123	0	0	0	0	0	0	0.56	0	0	0	0	0	0	0	0	0.56
1-125	18.8	25.84	38.002	22.519	25.7177	46	33.7	24.66	32.657	20.424	17.493	13.8349	8.1433	9.346596	15.574	352.7115
I-131	0	0	0	0	0	0	0.92	0.207	0.853	0.244	0.006	0	0	0.013	0.118	2.361
Ba-133	0	0	0	0	0.0967	0	0	0	0	0	0	0	0	0 0010	0	0.0967
Cs-137	0	0	0.002	0	4.6226	2	0	0	0	0.066	0.009	0	0	0.0019	0 200	6.7015 16.07432
Ce-141	- 0	0.7039	2.614	2.168	1.722	0.28	0.131	0	2.008	0.633	1.33	2.75091	0.96511	0.3694	0.399	0.25
Eu-152	0	0	0	0	0	0.25	0	0	0	0	0	0	0	0	0 000	0.25
1-153	0	0	0	0	0.1	0.031	0	0	0.317	0.289	0	0	0	0	800.0	
u-154	0	0	0	0	0	0.064	0	0	0	0	0	0	0	0	0	0.064
TI-201	0	0	0	0	0	0	0	7.865	0.943	0.176	0.001	0	0	0	0	8.985
Pb-210	G	0	0.012	0	0	0	9	0	0	0	0	0	0	0	0	0.012
Po-210	0	0	0	0	0	0	0	0	0	0.005	0	0	0	0	0	0.005
Totals:	1579.39	1537.132	2501.476	11167.77	49929.23	1820.656	2289.636	1480.466	934.11	2913.483	1043.155	996.5322	1196.994	587.8908	870.12	80848.03
Labware (ft3)			1845.5	9732	1516	2312	4517	4901	6902	5769	3816.25	6565.85	5916.45	5008	5252.85	64053.9
Animals (lb)			23731	15354	16555	14427	12948	10732	12357	15747	1907	17000	11985	6760	8540	174043

Volume (i)	Totals:	145-1174	Ka-225	PD-210	DI-201	77204	cons-flu	D 200	71-201	Gd-153	1.152	9-141	Ca-139	Cs.137	Cs-134	Ba-133	1-131	1-125	Sb-125	Sn-113	Cd-109	Ru-106	Ru-103	Tc-99m	Zr-95	Sr-90	Sr-89	Y-88	Rb-86	57-85	Se-75	AS-73	1-00	NI-03	Co-60	Fe-59	Co-57	Fe-55	Mn-54	Cr-51	Sc-46	Ca-45	CI-36	S-35	P-33	P-32	Na-22	072	2	ACTIVITY (FIICH) D
	5.84																	2 8																										nd.		2	200	00	77	(mcJ) Dispor
							, .	, 6	2.6	2 5	2 6	2 (	0 0	0 1	0	0	0	G)	0	0	0	0	0	0	0	0	0	0	0	0	0 6	0 0	2 0	0	C3	0	0	0	0	0	0	* 1	0 1	2	0 0	30 (	A 0	70	001	sed or
	237.9071 2	C	0	0	0	0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 (	0	0	0	3.49	0.001	0	0	0.0001	0	0	0	0	0	0	0	0 (	0	0 0000	0.0105	0	0	0.0056	0	0	0	0	0	0.363	0	27 34	0.00	0.01	0.105	186.161	7861	to the Sar
	2039 395	0	0	0	0	0	U.U.S		0 0	0 0	0 0	0 0	0.000	0.001	0	0	0	19.83	0	0	0.004	0	0	0	0	0	0	0	0	0	0 0	0 0	0.05	0	0	0	0	0	0	0.2	0	101 9	0	00.0	0.00	0 00	0.040	300.0	1981	mary Sewe
	3228.049	c	0	0.318	0	0	00	00	000	00	20100	00102		0 0	0	0 1	0	180.2753	0	0	0	0	0	0	0	0	0	0	0	0.0102	000		0.045	0.334	0	0.151						11 674					1 048		1984	101
	1895.162	0.0003	0.0001	0	0	0	0.0004	0000	0 0	000	0.010	0.000	0.0000	0 0000	0	0 1227	0	95.3													0.0008		00	0.03														20/1	198	ear indicated
	822.142	0.0001	0	0	0.0001	0.01	20002	0		0.0013		0.0001	0.0000	0.000	0.0001	0 002	0 9905	45.2															00											48 2	0.	0.00	007	3 00	5 198	
10224	707.4886	0	0	0	0	0	0	0	0.0235			000			0.0		0 0908				0.003												00		•			0							8700.11	44 900	0 17.030	555,450	6 1987	
9376	509.5804	0	0	0	0	0	0	0	0	000			0 0	0.0	0.0000	0.0003	1 1811	26.3179	0	0	0	0	0	0	0.		0.			0.14	044			0	0		5 0.0063	0		2 5937		4 171							1988	
22807.77	550.9871	0	0	0	0	0	0	0	0		0.3835	0 0000			0.0	4.1046	3 1043	126 6762		0.0228			0.2258											0.015	0			0 0.01		4 6	3 0	0 2 5501	, ,				-		8 1989	
12914.35	842.7299	0.0001	0	0	0	0	0	1.8962	0	0	0.015		0.0002		0 6	2.990	2000	25 6563			0	0	0.006	4				0.000	0.00		, ,		0	-	1													657.498		
	488.9281	0	0	0	0	0	0	0	0	0	0.0005					3.30		186114	0.0	0.0	0		-	10.52	0.0				0000		. 0	0.	0	5 0.027	0		9 0.032	20 0			1 0000				9 7.422			34		
10166.9	606.0917	0	0	0	0	0	0	0	0	0	0	0	0	0		0.00	0.0401	13 0401	0.0		0	0.0		20 1	200	0.0	0.0	0.020	0000	0.8782			0	0.416	0	0.0	2 0.07	0.00			1.0/4			403,0483				430		
9964.11	454.6291	0	0	0	0	0	0	0	0	0	0	0	0	0	000	0.03	13.4400	12 3355		0.0	0 (	0	200	200	0.0	0.0		0.0	0.00		0	0	0.245	0	0		1 401	0.002					O		4 5.5727			303		
19.93 9964.11 11,022.43	416.1099	0	0	0	0	0	0	0	0	0	0	0	0	0	0	000	87.61	13 30	0 0	0 0	0 0	2 (	0.0	200	0 0	0.0	0.0					0	0.0009	1.5		0	0716		144.7		3.153				7 5.395			30		
9,001.38	899.91	(3)	0	0	0	0	0	0	0.04	0	0	0	0	0	00		800.00	***	0.0	0.0	2 6	0 0	0 0	0.0	0.0	0 0								2.06		0.00	0.00	248			6.502				4.068		Ch	76	1995	
19.93	13704.95	0.0005	0.0001	0.318	0.0001	0.01	0.0306	1.8962	0.0635	0.0013	0.4402	0.0002	0.0086	0.0001	0.125	11.9816	CC0C.870	100.0	0.027	0.0124	0.000	0.0001	0 2202	0.0001	0.004	0.0004	0.0022	0.06	0.0321	1.8295	0.0009	0.1	0.3514		0.0011	5		1.1321			1		003		10		Ch		5 Totals	

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Nuclide	License	Total of	Total of	TW	
	Status	User		UW-Madison	NRC
		Possession	User	Balance	License
		Limits	Balances	uncorrected	Limit
		LIMICS	(mCi)	(mCi)	(mCi)
AR-41	0	50			
AS-76	0	200	0	0	3000
AU-198	0	202	0	0	3000
AU-198S	0	2000	107	0	3000
BA-133	0	28		107	3000
BA-140	0	0	1 0	1	3000
BR-80	0	1	0	0	3000
BR-82	0	221	0	0	3000
CA-45	0	563	42	0	3000
CA-47	0	12	0	42	3000
CD-109	0	156	7	0	3000
CD-109S	0	95	ó	7	3000
CD-115	0	2	0	0	3000
CE-139	0	110	0	0	3000
CE-141	0	39	0	0	3000
CE-144	0	ő	0	0	3000
CL-36	0	22	0	0	3000
CL-38	0	11	0	1	3000
CR-51	0	895		0	3000
CS-134	0	1	127	127	3000
CU-64	0	364	0	0	3000
CU-67	0	54	0	0	3000
DY-159	0	0	0	0	3000
EU-152	0	25	0 2	0	3000
EU-152M	0	10	0	2	3000
EU-154	0	15	0	0	3000
F-18	3	3000	0	0	3000
FE-55	0	81	7	0	3000
FE-59	0	48	ó	7	3000
GD-153	0	24		0	3000
HG-203	0	19	0	0	200
I-125	0	2098	814	0	3000
I-125S	0	1300	62	814	3000
I-129	0	0	0	62	3000
I-131	0	736	1	0	1000
IN-111M	0	10	0	1	3000
IN-113M	0	100	0	0	3000
IN-114M	0	200		0	3000
IR-192	0	100	0	0	3000
IR-192S	0	2500	0	0	3000
K-42	0	26	144	144	3000
KR-79	0	0	0	0	3000
KR-81	0	30	0	0	3000
KR-85	0	400	0	0	3000
LA-140	0	0	0	0	3000
LU-176	0	0	0	0	3000
		0	0	0	3000

Nuclide	License Status	Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
MN-56	0	10	6	6	3000
NB-95	0	127	1	1	3000
NI-63	0	213	55	55	3000
NI-63GC	0	849	397	397	3000
0-15	0	2700	0	0	3000
0-19	0	5	0	0	3000
P-33	0	948	20	20	3000
PB-210	0	10	0	0	3000
PB-210S	0	0	0	0	1
PM-147	0	1000	0	0	3000
PO-210	0	20	6	6	80
PR-144	0	0	0	0	3000
PT-197	0	0	0	0	3000
PU-238	0	0	0	0	0
RB-86	0	165	2	2	3000
RH-106	0	0	0	0	3000
RU-103	0	102	0	0	3000
RU-106	0	0	0	0	3000
RU-106S	0	10	4	4	3000
S-35	0	7208	2107	2107	3000
SB-124	0	101	0	0	3000
SB-125	0	0	0	0	3000
SC-46 SE-75	0	28	1	1	3000
SM-151	0	58	3	3	3000
SN-113	0	50	50	50	3000
SN-119M	0	35	1	1	3000
SN-121M	0	50	10	10	3000
SR-85	0	0	0	0	3000
SR-87M	0	4041	1	1	3000
SR-89	0	400	0	0	3000
SR-90	0	65	0	0	3000
TB-158	0	92 0	1	1	3000
TC-99	0	10	0	0	3000
TE-123	0	0	0	0	3000
TL-201	0	203	0	0	3000
TL-204	0	1	0	0	3000
TM-170	0	0	0		3000
XE-127	0	300	0	0	3000 3000
XE-133	0	2011	0	0	3000
Y-90	0	1	0	0	3000
YB-169	0	4700	0	0	3000
ZN-65	0	433	5	5	3000
ZN-69	0	10	0	o o	3000
ZR-95	0	0	o	ō	3000

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Radiation Safety Composite Inventory Report UW - Madison

Nuclide	License Status	Total of User Possession	Total of User Balances	UW-Madison Balance uncorrected	NRC License Limit
		Limits	(mCi)	(mCi)	(mCi)

\*\*\* Total \*\*\*

41704

3985

3985

Nuclide	License Status	e Total of User	Total of User	UW-Madison Balance	NRC License
		Possession	Balances	uncorrected	Limit
		Limits	(mCi)	(mCi)	(mCi)
		Dimitos	(mcr)	(mc1)	(mc1)
AM-241	1	1	0	0	250
AM-241S	1	3421	2414	2414	5000
AM-BE	1	100	50	50	100
AS-73	1	200	0	0	3000
C-14	1	5892	500	500	
CM-244	î	0	0		5000
CM-244S	î	20	4	0	1
CO-60	i	612	1	1	
CO-60S	î	102	101	101	5000
CS-137	1	8239	674		5000
CS-137S	1	2022201		674	20000
FE-55S	1	120	6289	6289	20000
GD-153S	1	12001	28	28	3000
H-3	1		2058	2058	12000
H-3GC	÷	1642884	369142	369142	2000000
I-125B	1	600	0	0	500000
MO-99	1	2050	0	0	3000
P-32	1	8801	0	0	10000
PU-239	1	9483	1439	1439	5000
	1	0	0	0	0
SI-31	1	10	4	4	3000
TC-94M	1	300	1	1	10
TC-99M	1	8562	160	160	10000
U-238 *** Tota	1 ***	864	0	0	166
		3726463	382867	382867	
nuclide nuk->1	icense	poss lim	balance	nuk->balance	nuk->nrcli
CM-244 1		0.0150	0.0031	0.0031	1.000
CM-244S 1		20.0000	4.0000	4.0060	40.000
PU-239 1		0.1010	0.0005	0.0005	0.035
PU-239S 2		5000.0000	3000.0000	3000.0000	3000.000

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Nuclide	License Status	Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
PU-239S	2	5000	3000	3000	3000
SR-90S	2	1677	222	222	3000
TH-230	2	0	0	0	0
U-235	2	0	0	0	0
*** Total	***				
		6677	3223	3223	

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1

Nuclide	License Status	Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
AS-72	3	200	0	0	2000
AS-74	3	204	0	0	3000
AU-195	3	150	0	0	3000
BE-7	3	2	0	0	3000
BI-207	3	0	0	0	3000
BR-76	3	550	0	0	3000
BR-77	3	220	0	0	3000
C-10	3	101	0	0	3000
C-11	3	1700	0	0	3000
CO-55	3	20	0	0	3000
CO-56	3	100	0	0	3000
CO-57	3	409	147	147	3000
CO-57S	3	1	0	0	1000
CO-58	3	200	0	0	3000
CS-129	3	0	0	0	3000
CU-61	3	220	0	0	3000
CU-62	3	400	0	0	3000
F-17 FE-52	3	200	0	0	3000
GA-67	3	110	0	0	3000
GA-68	3	313	0	0	3000
GE-68	3	650	0	0	3000
GE-68S	3	220	0	0	3000
GE-68SS	3	50	12	12	50
HG-195	3	7	0	0	3000
HG-197	3	150	0	0	3000
I-123	3	230	0	0	3000
I-124	3	100	0	0	3000
IN-111	3	391	0	0	3000
IR-192A	3	22000	9697	9697	3000
K-38	3	20	0	0	3000
K-40	3	1	0	0	3000
KR-77	3	1	0	0	3000
MG-28	3	0	0	0	3000
MN-51	3	100	0	Ö	3000
MN-52	3	101	0	0	3000
MN-52M	3	100	0	o o	3000
MN-54	3	25	1	1	3000
N-13	3	1260	0	0	3000
NA-22	3	52	5	5	1500
NA-24	3	21	4	4	3000
0-14	3	250	0	0	3000
RA-226	3	213	101	101	1000000
RA-226S	3	25	0	0	1000000
RA-228	3	0	0	0	3000
RB-81	3	60	0	0	3000

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2

Nuclide	License Status	Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
RB-82	3	750	0	0	3000
SR-82	3	750	0	0	3000
TE-123M	3	100	0	0	3000
TH-228	3	0	0	0	3000
TH-232	3	10	0	0	3000
TI-44	3	0	0	0	3000
V-48	3	120	0	0	3000
V-50	3	1	0	0	3000
XE-123	3	1	0	0	3000
Y-87	3	600	0	o o	3000
X-88	3	111	0	0	3000
ZN-62	3	400	0	o o	3000
*** Total	***				3000
		33977	9966	9966	

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#### 1 Summary of nuclides where Total Poss Limits > NRC Limit

07/02/96

Nuclide	License Status	Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
AM-BE	1	100	50	50	100
AS-70		100	0	0	0
BA-137M		0	0	0	0
BR-74M		100	0	0	0
BR-75		150	0	0	0
BR-80M		520	0	0	0
C-14	1	5892	500	500	5000
C0-57	0	10	0	0	0
CA-41S CD-107	0	0	0	0	0
CL-34M		100	0	0	0
CO-54M		150	0	0	0
CS-137I		100 1450000	0	0	0
CS-1375	1	2022201	6380	0	20000
CU-60		520	6289	6289	
EU-155		0	0	0	0
F-18	0	3000	0	0	3000
GA-64		100	0	0	0
GA-66		200	0	0	0
GD-153S	1	12001	2058	2058	12000
GE-68S	3	50	12	12	50
GE-71S		0	0	0	0
GE-75S		0	0	0	o o
GE-77S		0	0	o o	0
I-126		100	0	0	0
I-130		100	0	0	0
IN-110		100	0	0	0
IN-112		100	0	0	0
IN-115M		100	0	0	0
IR-192A	3	22000	9697	9697	2
KR-81M		50	0	0	0
MO-93M		100	0	0	0
NB-90		200	0	0	0
NB-92M		100	0	0	0
NB-96		100	0	0	0
NI-63S		15	0	0	0
P-210SS		20	0	0	0
P-30		100	0	0	0
P-32	1	9483	1439	1439	5000
PB-205		0	0	0	0
PD-103		4500	0	0	0
PD-103S		300	0	0	0
PN-13		0	0	0	0
PU-238	0	0	0	0	0
PU-239	1	0	0	0	0

#### Page No. 2 Summary of nuclides where Total Poss Limits > NRC Limit

07/02/96

Nuclide	License Status	Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
PU-239S	2	5000	3000	3000	3000
PU-240		0	0	0	0
RB-82GE		3000	0	0	0
RB-82M		200	0	0	0
RB-83		100	0	0	0
RB-84		100	0	0	0
RB-84M		500	0	0	0
RB-87		0	0	0	0
RH-100		100	0	0	0
RH-102M		100	0	0	0
RH-96		100	0	0	0
RH-98		100	0	0	0
RH-99		100	0	0	0
RH-99M S-35	0	100	0	0	0
SB-116	0	7208	2107	2107	3000
SB-116M		100	0	0	0
SB-116M SB-117		100 100	0	0	0
SB-118M		100	0	0	0
SB-120		100	0	0	0
SB-122		100	0	0	0
SC-43		200	0	0	0
SC-44		100	0	0	0
SC-44M		100	0	0	0
SC-48		100	0	ő	Ö
SN-113M		100	0	0	0
SR-82GE		3000	0	o o	o o
SR-85	0	4041	1	1	3000
TC-92		100	0	0	0
TC-94		100	0	0	0
TC-94M	1	300	1	1	10
TC-95		200	0	0	0
TC-95M		300	0	0	0
TC-96		300	0	0	0
TE-121		100	0	0	0
TE-121M		100	0	0	0
TI-45		100	0	0	0
TL-45		500	0	0	0
TN-113		0	0	0	0
U-234		0	0	0	0
U-236		0	0	0	0
U-238	1	864	0	0	166
V-47		200	0	0	0
XE-127M		500	0	0	0
Y-84		200	0	0	0

Page No.

3 Summary of nuclides where Total Poss Limits > NRC Limit

07/02/96

Nuclide	License Status	Total of User Possession Limits	Total of User Balances (mCi)	UW-Madison Balance uncorrected (mCi)	NRC License Limit (mCi)
Y-86		500	0	0	0
Y-87M		200	0	0	0
YB-169	0	4700	0	0	3000
ZN-63		600	, 0	0	0
ZR-89		600	0	0	0
*** Total	***				
		3568175	25154	25154	



## The University of Wisconsin System

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 265-2960

September 17, 1996

United States Nuclear Regulatory Commission Region III 801 Warrenville Road Lisle, I'linois 60532-4351

TO WHOM IT MAY CONCERN:

The Board of Regents of the University of Wisconsin System, an agency of the State of Wisconsin, doing business as the University of Wisconsin- Madison, hereby states its intent to obtain the funds for decommissioning when necessary for the following licenses:

48-09843-18	Broad Scope A License	\$300,000
48-09843-28	Irradiator License	50,000
48-09843-32	Panoramic Irradiator License	75,000
48-09843-34	Panoramic Irradiator License	75,000

I hereby certify that I am authorized to act on behalf of the Board of Regents in signing this document.

Board of Regents of the University of Wisconsin System

Charles J. Stat).
General Counse. and

Assistant Trust Officer

xc: John Torphy Ronald Bresell

Kathleen Irwin