

October 22, 2015

Dennis Lawyer
Health Physicist
U.S. Nuclear Regulatory Commission
Division of Nuclear Materials Safety
License No. 52-25361-01MD & 52-25361-02
Control No. 588543

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03038114
52-25361-02

REC RG 10 29 15 AM 08:02

SUBJECT: Additional Information Concerning Application for a License Amendment.

Dear Mr. Lawyer:

As requested on your email dated September 28, 2015, I'm sending a copy of the most recent Decommissioning funding plan for our facility. Also, you will receive a copy of a Verification Certificate of the Surety Bond who supports the Decommissioning Plan.

If you need additional information, don't hesitate on contact me.

Regards,



Eduardo Díaz-Montes, R.Ph., BCNP, RSO
Senior Manager of Operations
Lantheus Medical Imaging
787.765.5598 ext. 2503
eduardo.diaz@lantheus.com

588543
NMSS/RGN1 MATERIALS-002

WESTCHESTER FIRE INSURANCE COMPANY
436 Walnut Street, WA10H, Philadelphia, PA 19106-3703

**VERIFICATION CERTIFICATE
TO VERIFY THAT A
CONTINUOUS FORM OF BOND OR POLICY
HAS NOT BEEN CANCELLED**

This is to certify that **Payment Surety Bond** [REDACTED], issued by **Westchester Fire Insurance Company**, effective **March 15, 2010**, on behalf of **Lantheus MI Radiopharmaceuticals, Inc.**, in favor of the **Nuclear Regulatory Commission (NRC)**, is in the penal sum of **\$572,604.00** is a continuous instrument covering an indefinite term. is now in full force and effect and will continue in full force and effect until cancelled or terminated.

Signed, sealed and dated **June 17, 2015**

Westchester Fire Insurance Company

By *Patricia A. Hopgood*
Patricia A. Hopgood, Attorney-in-Fact

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Power of Attorney

WESTCHESTER FIRE INSURANCE COMPANY

Know all men by these presents: That WESTCHESTER FIRE INSURANCE COMPANY, a corporation of the Commonwealth of Pennsylvania pursuant to the following Resolution, adopted by the Board of Directors of the said Company on December 11, 2006, to wit:

"RESOLVED, that the following authorizations relate to the execution, for and on behalf of the Company, of bonds, undertakings, recognizances, contracts and other written commitments of the Company entered into the ordinary course of business (each a "Written Commitment"):

- (1) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise.
- (2) Each duly appointed attorney-in-fact of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise, to the extent that such action is authorized by the grant of powers provided for in such persons written appointment as such attorney-in-fact.
- (3) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to appoint in writing any person the attorney-in-fact of the Company with full power and authority to execute, for and on behalf of the Company, under the seal of the Company or otherwise, such Written Commitments of the Company as may be specified in such written appointment, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (4) Each of the Chairman, the President and Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to delegate in writing any other officer of the Company the authority to execute, for and on behalf of the Company, under the seal of the Company or otherwise, such Written Commitments of the Company as are specified in such written delegation, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (5) The signature of any officer or other person executing any Written Commitment or appointment or delegation pursuant to this Resolution, and the seal of the Company, may be affixed by facsimile on such Written Commitment or written appointment or delegation.

FURTHER RESOLVED, that the foregoing Resolution shall not be deemed to be an exclusive statement of the powers and authority of officers, employees and other persons to act for and on behalf of the Company, and such Resolution shall not limit or otherwise affect the exercise of any such power or authority otherwise validly granted or vested.

Does hereby nominate, constitute and appoint Christopher R Kelly, Patricia A Hopgood, Sally E Palmer, Thomas W Weber, all of the City of BOSTON, Massachusetts, each individually if there be more than one named, its true and lawful attorney-in-fact, to make, execute, seal and deliver on its behalf, and as its act and deed any and all bonds, undertakings, recognizances, contracts and other writings in the nature thereof in penalties not exceeding Ten million dollars & zero cents (\$10,000,000.00) and the execution of such writings in pursuance of these presents shall be as binding upon said Company, as fully and amply as if they had been duly executed and acknowledged by the regularly elected officers of the Company at its principal office,

IN WITNESS WHEREOF, the said Stephen M. Haney, Vice-President, has hereunto subscribed his name and affixed the Corporate seal of the said WESTCHESTER FIRE INSURANCE COMPANY this 26 day of May 2015.

WESTCHESTER FIRE INSURANCE COMPANY

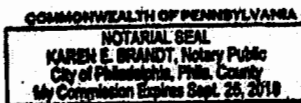


Stephen M. Haney, Vice President

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF PHILADELPHIA ss.

On this 26 day of May, AD. 2015 before me, a Notary Public of the Commonwealth of Pennsylvania in and for the County of Philadelphia came Stephen M. Haney, Vice-President of the WESTCHESTER FIRE INSURANCE COMPANY to me personally known to be the individual and officer who executed the preceding instrument, and he acknowledged that he executed the same, and that the seal affixed to the preceding instrument is the corporate seal of said Company; that the said corporate seal and his signature were duly affixed by the authority and direction of the said corporation, and that Resolution, adopted by the Board of Directors of said Company, referred to in the preceding instrument, is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at the City of Philadelphia the day and year first above written.



Notary Public

I, the undersigned Assistant Secretary of the WESTCHESTER FIRE INSURANCE COMPANY, do hereby certify that the original POWER OF ATTORNEY, of which the foregoing is a substantially true and correct copy, is in full force and effect.

In witness whereof, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of the Corporation, this 17 day of June 2015



William L. Kelly, Assistant Secretary

THIS POWER OF ATTORNEY MAY NOT BE USED TO EXECUTE ANY BOND WITH AN INCEPTION DATE AFTER May 26, 2017.

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DocuGard #04546 contains a security pantograph, blue background, heat-sensitive ink, coin-reactive watermark, and microtext printing on border.



PAYMENT SURETY BOND

Date bond executed: March 15, 2010

Effective Date: March 15, 2010

Principal: Lantlieus MI Radiopharmaceuticals, Inc.

Type of organization: Corporation

State of incorporation: Delaware (if applicable)

Nuclear Regulatory Commission license number, name and address of facility, and amount for decommissioning activities guaranteed by this bond: License number 52-25361-02, 150 Federico Costa - Suite 1, San Juan, PR 00918-1303. Amount guaranteed for decommissioning is \$572,604.00

Surety: Westchester Fire Insurance Company

Type of organization: Corporation

State of incorporation: New York (if applicable)

Surety's qualification in jurisdiction where licensed facility is located: Treasury Listed for single bonds up to \$75,953,000 and licensed in all 50 states, as well as Puerto Rico, Virgin Islands, District of Columbia and Guam.

Surety's bond number: [REDACTED]

Total Penal sum of bond: \$ 572,604.00

Know All Persons by These Presents we, the Principal and Surety hereto are firmly bound to the Nuclear Regulatory Commission (hereinafter called NRC), in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally; provided that, where the Surety(ies) are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

Whereas, NRC pursuant to regulations at 10 CFR 30.35, 40.36, 70.25 and 72.30 applicable to the Principal, which require that a license holder or an applicant for a facility license provide financial assurance that funds will be available when needed for facility decommissioning;

Now, Therefore, the conditions of the obligation are such that if the Principal shall faithfully, before the beginning of decommissioning of each facility identified above, fund the standby trust fund in the amount(s) identified above for the facility;

Or, if the Principal shall fund the standby trust fund in such amount(s) after an order to begin facility decommissioning is issued by NRC or a U.S. District Court or other court of competent jurisdiction;

Or, if the Principal shall provide alternate financial assurance, and obtain NRC's written approval of such assurance, within 30 days after the date notice of cancellation from the Surety is received by both the Principal and NRC, then this obligation shall be null and void; otherwise it is to remain in full force and effect.

The Surety shall become liable on this bond obligation only when the Principal has failed to fulfill the

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conditions described above. Upon notification by NRC that the Principal has failed perform as guaranteed by this bond, the Surety shall place funds in the amount guaranteed for the facility into the standby trust fund.

The liability of the Surety shall not be discharged by any payment or succession of payments hereunder, unless and until such payment or payments shall amount in the aggregate to the penal sum of the bond, but in no event shall the obligation of the Surety hereunder exceed the amount of said penal sum.

The Surety may cancel the bond by sending notice of cancellation by certified mail to the Principal and to NRC provided, however, that cancellation shall not occur during the 90 days beginning on the date of receipt of the notice of cancellation by both the Principal and NRC, as evidenced by the return receipts.

The Principal may terminate this bond by sending written notice to NRC and to the Surety 90 days prior to the proposed date of termination, provided, however, that no such notice shall become effective until the Surety receives written authorization for termination of the bond from NRC.

If any part of this agreement is invalid, it shall not affect the remaining provisions that will remain valid and enforceable.

In Witness Whereof, the Principal and Surety have executed this financial guarantee bond and have affixed their seals on the date set forth above.

The persons who signatures appear below hereby certify that they are authorized to execute this surety bond on behalf of the Principal and Surety.

Lantheus MI Radiopharmaceuticals, Inc.

(Seal)

By: _____
Name & Title

Surety: Westchester Fire Insurance Company
Address: 436 Walnut Street, P.O. Box 1000, Philadelphia, PA 19106

(Seal)

State of Incorporation: New York

Liability Limit: \$572,604.00

By: _____
Karen Daniel, Attorney-in-Fact

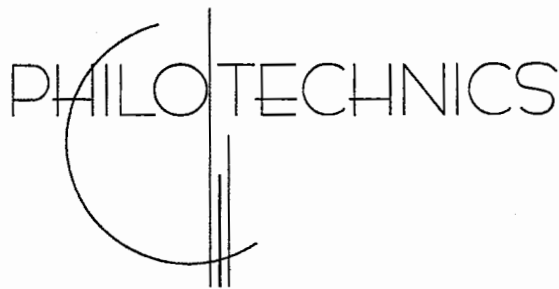
Bond Premium: \$11,452.08

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**Decontamination and Decommissioning
Cost Estimate
for
Nuclear Pharmacy**

Lantheus Medical Imaging
150 Frederica Costa Street, Suite #1
San Juan, Puerto Rico

Prepared by:



Philotechnics, Ltd.
201 Renovare Boulevard
Oak Ridge, TN 37830

September 2015

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I. Executive Summary

Lantheus Medical Imaging (Lantheus) operates facilities in San Juan, Puerto Rico under the authority of U.S. Nuclear Regulatory Licenses 52-25361-01MD and 52-25361-02. To estimate future decommissioning costs, Lantheus contracted Philotechnics, Ltd. to develop facility decommissioning cost estimates in accordance with the guidance provided in NUREG 1757, "Consolidated NMSS Decommissioning Guidance". The facility consists of a nuclear pharmacy, 11 MeV cyclotron, and preparation and examination rooms.

Philotechnics had developed a detailed cost estimate in 2009 and updated it in 2012. Because the facility configuration and authorized uses of radioactive materials are essentially unchanged since that time, this report describes only the process of updating the cost estimate. As such, this report should be used as an addendum to the detailed report developed in March 2009.

Major cost changes result from changes in labor rates and waste disposal costs.

Cost estimates were developed using conservative assumptions regarding likely extent and duration of remediation activities. Remediation was assumed to proceed to unrestricted release. Cost estimates were prepared in accordance with and in the format of NUREG 1757 "Consolidated NMSS Decommissioning Guidance"¹ Volume 3. Per NUREG 1757 a contingency of 25% is required to be added to decommissioning estimates to address unidentified and unanticipated conditions. The overall estimate for the San Juan facility is:

Estimate	25% Contingency	TOTAL
\$322,870	\$80,717	\$403,587

II. Cost Update Process

Cost estimates for decommissioning activities were based on the methodology contained in the US Nuclear Regulatory Commission's (NRC) NUREG 1757 and 10 CFR 30.35. This methodology was modified and supplemented as necessary to account for realities associated with project field implementation at the San Juan site.

Radioactive Waste Management

Philotechnics provides waste brokerage and decontamination and decommissioning (D&D) services throughout the nation. The estimated costs for

¹ "Consolidated NMSS Decommissioning Guidance", NUREG-1757, US Nuclear Regulatory Commission, September 2006, Washington, DC.

packaging, transportation and disposal, as well as labor needs, are realistic estimates based on experience and contractual arrangements with waste processors and disposal facilities.

Realistic assumptions were made concerning the likely extent and duration of necessary remedial activities. Remediation to unrestricted levels (i.e., the facility could be released for any future use without restrictions) was assumed, meaning there are no long term costs associated with site surveillance and monitoring following decommissioning.

The radioactive materials of concern at this site are primarily long-lived activation products. It is assumed decommissioning activities will begin within a few months after cyclotron operation ceases; short-lived activation products will have decayed to negligible levels. All waste resulting from the cyclotron operations and decommissioning is acceptable for disposal at US Ecology Grandview, Idaho. Estimated price is \$0.50 per pound.

Decommissioning Labor Cost

Annual salaries reflect wages published in May 2014 by the U.S. Department of Labor, Bureau of Labor Statistics (BLS). This is the most recent data available. Specifically, the following labor categories and salaries are used:

	Value	Occupation Code, Location
Project Manager	\$65,040	11-9021, Puerto Rico
Shipper	\$30,500	53-1031, Puerto Rico
HP Technician	\$29,930	19-4099, Puerto Rico
Skilled Laborer	\$43,670	47-4041, Puerto Rico
Admin	\$21,490	43-6014, Puerto Rico

Living expenses are taken from U.S. Department of Defense per diem rates published September 2015. The per diem rate is \$323 per day for San Juan. Project management, supervision and technical staff are paid the daily living allowance since they are assumed to be from outside the local area. Radiation workers (laborers) and administrative support staff were assumed to be local hires and are not paid a living allowance. The daily living expenses were multiplied by 7 days per week then divided by 5 workdays per week to correctly incorporate living expenses into the daily wage rate.

This decommissioning plan will be evaluated at least every 3 years or more frequently if the amounts or types of material at the facility change, facility conditions or operations change, changes occur in expected decommissioning procedures, or to account for inflation.

3.4 FACILITY DECOMMISSIONING SUMMARY

Radioactive Material license numbers and types (i.e., Byproduct, Source):
U.S. Nuclear Regulatory Licenses 52-25361-01MD and 52-25361-02
Types and quantities of materials authorized under the licenses listed above:
The facility is in operation. Therefore, activation products are present in building materials, cyclotron components – especially in the vicinity of the targets, and on surfaces. Pharmacy areas may be contaminated; however, because any contamination present is F-18 or similar short-lived positron emitting radionuclides, the amount of contaminated material at the time of decommissioning is expected to be minimal
Description of how licensed materials are used:
Fluorine-18 is used for positron emission tomography. All other activation products are waste materials. Radioactive waste is disposed of regularly and does not accumulate more than a few drums.
Description of facility, including buildings, rooms, grounds, and description of where particular types of materials are used:
The facility consists of the Cyclotron room, maintenance area (including cooling system) and the radiochemistry/pharmacy labs. Negative ventilation takes suction from the cyclotron room and discharges on the roof through a high efficiency particulate air (HEPA) filter. Total area of these rooms is approximately 3500 squat feet. The cyclotron room contains the RDS Eclipse cyclotron including spent target material, laboratory benches, and accumulated waste. The radiochemistry area contains laboratory benches and three hot cells.
Quantities of materials or waste accumulated before shipping or disposal
A few drums of high-activity, short lived waste are stored for several months (up to a year) to allow decay of (primarily) Co-56 to levels at which it can be safely handled. Additionally, a drum or two of low activity waste typically accumulate before shipping. Waste storage space is limited.

Use this table to summarize relevant features of the facility. Copy and complete the table as necessary for each room, laboratory, or area. Rooms laboratories, or areas with similar levels of contamination may be consolidated into one table.

Name of room, laboratory, or area:		Cyclotron Vessel: Yoke and lead shielding		
Level of Contamination:		Low; some activated equipment and structures		
Component	Number of Components	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes				ft3
Fume Hoods				ft3
Lab Benches				ft3
Sinks				ft3
Drains				ft3
Floors				ft2
Walls				ft2
Ceilings				ft2
Ventilation/Ductwork				ft3
Hot Cells				ft3
Equipment/Materials			22000	lb
Soil Plots				ft2
Storage Tanks				ft3
Storage Areas				ft3
Radwaste Areas				ft3
Scrap Recovery Areas				ft3
Maintenance Shop				ft3
Equipment Decon Areas				ft3
Concrete shields				lb
Concrete floor	5'x5'x1' deep for removal		25	ft3
			Feature/Equipment Mass	22000 lb
			Waste Fraction	1.00
			Waste Mass	22000 lb

Use this table to summarize relevant features of the facility. Copy and complete the table as necessary for each room, laboratory, or area. Rooms laboratories, or areas with similar levels of contamination may be consolidated into one table.

Name of room, laboratory, or area:		Cyclotron Concrete shield blocks		
Level of Contamination:		Low		
Component	Number of Components	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes				ft3
Fume Hoods				ft3
Lab Benches				ft3
Sinks				ft3
Drains				ft3
Floors				ft2
Walls				ft2
Ceilings				ft2
Ventilation/Ductwork				ft3
Hot Cells				ft3
Equipment/Materials				ft3
Soil Plots				ft2
Storage Tanks				ft3
Storage Areas				ft3
Radwaste Areas				ft3
Scrap Recovery Areas				ft3
Maintenance Shop				ft3
Equipment Decon Areas				ft3
Composite shielding			84620	lb
Lead Shielding			19380	lb
			Feature/Equipment Volume	104000 lb
			Waste Fraction	1.00
			Waste Volume	104000 lb

Use this table to summarize relevant features of the facility. Copy and complete the table as necessary for each room, laboratory, or area. Rooms laboratories, or areas with similar levels of contamination may be consolidated into one table.

Name of room, laboratory, or area:	Balance of facility, minus cyclotron and shielding			
Level of Contamination:	Low			
Component	Number of Components	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	2		48	ft3
Fume Hoods	4		600	ft3
Lab Benches/tables/casework	1		750	ft3
Sinks	2		6	ft3
Drains	1		3	ft3
Floors	0		3425	ft2
Walls	0		7250	ft2
Ceilings	0		3425	ft2
Ventilation/Ductwork	1		232	ft3
Hot Cells	3		244	ft3
Equipment/Materials			1000	ft3
Soil Plots	0		0	ft2
Storage Tanks			0	ft3
Storage Areas			0	ft3
Radwaste Areas			75	ft3
Scrap Recovery Areas			0	ft3
Maintenance Shop			0	ft3
Equipment Decon Areas			0	ft3
Concrete shields			0	lb
Concrete floor				ft3
Feature/Equipment Volume			2883	ft3
Waste Fraction			0.05	
Waste Volume			144.15	ft3
Density (lb/ft3)			15	
Waste Mass			2162.25	lb

3.6 PLANNING AND PREPARATION

(Work Days)

Estimate the number of workdays, by specific labor category, that will be required to complete planning and preparation activities. Include all labor categories, including Supervisor, Foreman, Craftsman, Technician, Health Physicist, Laborer, Clerical, and others as needed.						
Activity	Project Mgr/Health Physicist		Shipper	HP Technician	Radiation Workers	Clerical
Preparation of Documentation for Regulatory Agencies	2		5			1
Submittal of Decommissioning Plan to NRC when required by 10 CFR 30.36(g)(1), 40.42(g)(1), or 70.38(g)(1)	2					0.5
Development of Work Plans	5			2		5
Procurement of Special Equipment	5					1
Staff Training	2		1	2	6	2
Characterization of Radiological Condition (including sampling, soil and tailings analysis, or groundwater analysis, if applicable)	2			4		
Other (specify) Mobilization	1		1	2		
TOTALS	19		7	10	6	9.5

3.7 DECONTAMINATION OR DISMANTLING OF RADIOACTIVE FACILITY COMPONENTS (Work Days)

Estimate the number of workdays, by specific labor category, that will be required to complete decontamination and/or dismantling activities for each facility component. Copy and complete this table as necessary for each room, laboratory, or area. Rooms, laboratories, or areas with similar levels of contamination may be consolidated in one table.

Name of room, laboratory, or area:							
Level of Contamination:		Low					
Component	Decon Method	Project Mgr/Health Physicist		Shipper	HP Technician	Radiation Workers	Clerical
Glove Boxes	Remove/Disp						
Fume Hoods	Remove/Disp	1		1	2	4	1
Lab Benches	Remove/Disp				2	4	0.1
Sinks	Remove/Disp	0.25			0.25	0.25	0.1
Drains	Remove/Disp				0.25	0.25	0.1
Floors	Scabble				1	2	0.1
Walls	Remove/Disp				1		0.1
Ceilings	Vac/Wipe				1		0.1
Ventilation/Ductwork	Remove/Disp	2		1	2	4	2
Hot Cells	Remove/Disp	3		2	6	12	3
Equipment/Materials	Sur/Rem/Disp	4		2	8	24	0.1
Soil Plots	Sample						
Storage Tanks	N/A						
Storage Areas	Remove/Disp						
Radwaste Areas	Remove/Disp	0.25		0.5	0.5	1	0.25
Scrap Recovery Areas	N/A						
Maintenance Shop	Remove/Disp						
Equipment Decontamination	Remove/Disp						
Shield blocks	Remove/Disp	2		5	4	8	2
Cyclotron	Remove/Disp	2		5	4	8	2
TOTALS		14.5		16.5	32	67.5	10.95

3.8 RESTORATION OF CONTAMINATED AREAS ON FACILITY GROUNDS (Work Days)

Estimate the number of work days, by specific labor category, that will be required to restore contaminated areas on the facility grounds.

Activity	Project Mgr/Health Physicist		Shipper	HP Technician	Radiation Workers	Clerical
Restore Floors	2		1	5	10	1
Restore Walls						
Restore Roof						
Restore Utilites						
TOTALS	2		1	5	10	1

3.9 FINAL RADIATION SURVEY

(Work Days)

Estimate the number of work days, by specific labor category, that will be required to conduct a final radiation survey.						
Activity	Project Mgr/Health Physicist		Shipper	HP Technician	Radiation Workers	Clerical
FSS Setup	2					1
Survey Packages	1					1
Class 1	5			10		1
Class 2	2.5			5		0.5
Class 3	2.5			5		0.5
TOTALS	13		0	20	0	4

3.10 SITE STABILIZATION AND LONG-TERM SURVEILLANCE (Work Days)

Estimate the number of work days, by specific labor category, that will be required to complete site stabilization and long-term surveillance activities.

Activity	Project Mgr/Health Physicist		Shipper	HP Technician	Radiation Workers	Clerical
TOTALS	0		0	0	0	0

3.11 TOTAL WORK DAYS BY LABOR CATEGORY

Enter the total work days for each specific labor category from the applicable table above (i.e., from the bottom rows of Tables 3.6 through 3.10).						
Task	Project Mgr/Health Physicist		Shipper	HP Technician	Radiation Workers	Clerical
Planning and Preparation (TOTALS from Table 3.6)	19		7	10	6	9.5
Decontamination and/or Dismantling of Radioactive Facility Components (Sum of TOTALS from all copies of Table 3.7)	14.5		16.5	32	67.5	10.95
Restoration of Contaminated Areas on Facility Grounds (TOTALS from Table 3.8)	2		1	5	10	1
Final Radiation Survey (TOTALS from Table 3.9)	13		0	20	0	4
Site Stabilization and Long-Term Surveillance (TOTALS from Table 3.10)	0		0	0	0	0

3.12 WORKER UNIT COST SCHEDULE

Estimate labor costs (including salary, fringe benefits, and corporate overhead). Include all appropriate labor categories, including Supervisor, Foreman, Craftsman, Technician, Health Physicist, Laborer, Clerical, and others as needed.

Labor Cost Component	Project Mgr/Health Physicist		Shipper	HP Technician	Radiation Workers	Clerical
Salary (\$/year)	\$65,040		\$30,500	\$29,930	\$43,670	\$21,490
Overhead Rate (%)	100%		100%	100%	100%	100%
Total Cost Per Year	\$130,080		\$61,000	\$59,860	\$87,340	\$42,980
Living Expenses (PD*7/5) ¹	\$452		\$452	\$452	0	0
Total Cost Per Work Day ²	\$953		\$687	\$682	\$336	\$165

¹ Per Diem Rate: \$323 per day.

² Based on 260 work days per year (e.g., 260).

3.13 TOTAL LABOR COSTS BY MAJOR DECOMMISSIONING TASK

Multiply the estimated work days for each specific labor category (from Table 3.11) by the total cost per work day for the corresponding labor category (from Table 3.12), and enter the results in the table below. Then, add across all labor categories to determine the total labor costs for each major decommissioning task.

Labor Cost Component	Project Mgr/Health Physicist	0	Shipper	HP Technician	Radiation Workers	Clerical	Total Labor Cost
Planning and Preparation	\$18,098	\$0	\$4,808	\$6,824	\$2,016	\$1,570	\$33,316
Decontamination and/or Dismantling of Radioactive Facility Components	\$13,811	\$0	\$11,332	\$21,838	\$22,675	\$1,810	\$71,467
Restoration of Contaminated Areas on Facility Grounds	\$1,905	\$0	\$687	\$3,412	\$3,359	\$165	\$9,529
Final Radiation Survey	\$12,383	\$0	\$0	\$13,649	\$0	\$661	\$26,692
Site Stabilization and Long- Term Surveillance	\$0	\$0	\$0	\$0	\$0	\$0	\$0

3.14 PACKAGING, SHIPPING, AND DISPOSAL OF RADIOACTIVE WASTES (Excluding Labor Costs)

(a) Packing Material Costs

Estimate the types and volumes of waste expected to be generated, along with the number and types of containers required for packaging the waste. Multiply the number of containers required by the unit cost per container.					
Waste Type	Volume (ft3)	Number of Containers	Type of Containers	Unit Cost of Container	Total Packaging Costs
DAW	75	1	B-25	\$2,200	\$2,200
Concrete	965	3	B-25	\$2,200	\$6,600
Contaminated Lead	65	2	Drum	\$160	\$320
Metal	242	1	20' Sealand	\$1,000	\$1,000
TOTAL					\$10,120

(b) Shipping Costs

Estimate the types and volumes of waste expected to be generated, along with the number and types of containers required for packaging the waste. Multiply the number of containers required by the unit cost per container.

Waste Type	Number of Truckloads	Unit Cost (\$/mile/truckload)	Ocean Transport*	Overweight Charges(\$/mile)	Distance Shipped (miles)	Total Shipping Costs
DAW	0.33	\$2.00	1		2642	\$873
Concrete	0.33	\$2.00	1		2642	\$873
Contaminated Lead	0.34	\$2.00	1		2642	\$899
Metal	1	\$2.00	1		2642	\$2,644
Ocean Transport						\$75,000
TOTAL	2					\$80,288

* Add \$50,000 to final transportation cost to account for ocean transport

(c) Waste Disposal Costs

Estimate the volume of waste to be disposed. Multiply the volume of waste disposed by the unit disposal cost (including any volume based surcharges). Add any surcharges that are based on the number of containers of waste along with the number and types of containers required for packaging the waste. Multiply the number of containers required by the unit cost per container.

Waste Type	Disposal Volume (ft3)	Density (lb/ft3)	Disposal Mass (lbs)	Unit Cost	Surcharges (\$/ft3 or \$/container)	Total Disposal Costs
DAW	75	15	1125	0.50	1	\$563
Concrete	965	90	86870	0.50	1	\$43,435
Contaminated Lead	64.6	300	19380	0.50	1	\$9,690
Metal	242	100	24162.25	0.50	1	\$12,081
TOTAL	1346					\$65,769

3.15 EQUIPMENT/SUPPLY COSTS (Excluding Containers)

Estimate the quantity of equipment and supplies required for decommissioning and multiply that quantity by the appropriate unit costs.			
Equipment/Supplies	Quantity	Unit Cost	Total Equipment/Supply Cost
Protective Clothing	200	\$4	\$800
Respirators	10	\$50	\$500
Instrumentation	5	\$100	\$500
Air Fare (round trip)	5	\$700	\$3,500
Crane and Crew (days)	2	\$3,000	\$6,000
TOTAL			\$11,300

3.16 LABORATORY COSTS

If applicable, estimate the costs for analyses to be performed by an independent third party laboratory.			
Activity	Quantity	Unit Cost	Total Item Cost
Sampling & Analysis	20	\$250	\$5,000
Transport of Samples	20	\$10	\$200
Testing and Analysis			\$0
Other (specify)			
TOTAL			\$5,200

3.17 MISCELLANEOUS COSTS

Estimate any other applicable costs.	
Activity	Total Cost
License Fees (Reciprocity)	\$1,900
Insurance	\$5,003
Taxes	\$953
Other (specify): Security	\$1,335
TOTAL	\$9,190

3.18 TOTAL DECOMMISSIONING COSTS

Enter the total costs reported in Tables 3.13, 3.14(a)-(c), 3.15, 3.16, and 3.17 into the appropriate cells below, and add them to obtain a subtotal. Add to the subtotal a contingency allowance in the amount of 25 percent of the total decommissioning cost estimate. Also, calculate for each task/component the percentage it represents of the total.		
Task/Component	Cost	Percentage
Planning and Preparation (from Table 3.13)	\$33,316	10.3%
Decontamination and/or Dismantling of Radioactive Facility (From Table 3.13)	\$71,467	22.1%
Restoration of Contaminated Areas on Facility Grounds (From Table 3.13)	\$9,529	3.0%
Final Radiation Survey (From Table 3.13)	\$26,692	8.3%
Packing Material Costs (TOTAL from Table 3.14(a))	\$10,120	3.1%
Shipping Costs (TOTAL from Table 3.14(b))	\$80,288	24.9%
Waste Disposal Costs (TOTAL from Table 3.14(c))	\$65,769	20.4%
Equipment/Supply Costs (TOTAL from Table 3.15)	\$11,300	3.5%
Laboratory Costs (TOTAL from Table 3.16)	\$5,200	1.6%
Miscellaneous Costs (TOTAL from Table 3.17)	\$9,190	2.8%
SUBTOTAL	\$322,870	100.0%
25% Contingency	\$80,717	25.0%
TOTAL DECOMMISSIONING COST ESTIMATE	\$403,587	125.0%