

Cardinal Health
Nuclear Pharmacy Services
Quality & Regulatory
7000 Cardinal Place
Dublin, OH 43017
tel 614.757.4120
fax 614.652.4598

www.cardinalhealth.com



September 17, 2019

Elizabeth Ullrich
Licensing Assistance Team
U.S. NRC Region I DNMS
2100 Renaissance Road
King of Prussia, PA 19406

Re: Additional Information for Amendment Request to Radioactive Materials License number 34-32780-02, Cardinal Health PET Manufacturing Services, East Hartford, CT.

Dear Ms. Ullrich:

Cardinal Health 414, LLC (Nuclear Pharmacy Services and PET Manufacturing Services, hereafter Cardinal Health) hereby submits additional information to the radioactive materials license amendment request dated July 2, 2019 for the licensed location described above and requests an additional change as part of this amendment request.

Cardinal Health requests an amendment to the license to remove Beau Dugas as the Manufacturing Radiation Safety Officer (MRSO) and add Arshad Mehmood as the MRSO. Arshad Mehmood is an authorized user (AU) cyclotron operator on this license and is familiar with the radiation safety program. Documentation of training is enclosed as attachment A.

In addition, Cardinal Health submits a revised Decommissioning Funding Plan as attachment B per discussions with the U.S. NRC. The proposed licensed activities at this facility will change to accommodate the construction of a second cyclotron vault to house a self-shielded GE PETtrace 880 cyclotron. The existing cyclotron vault, which also houses a GE PETtrace 880 cyclotron, will not change. The remainder of the existing restricted area floor plan and production equipment will not change at this time.

Therefore, Cardinal Health submits the revised DFP, which updates the decommissioning cost estimate to account for the addition of the new cyclotron and vault (labeled as "Vault 2"). Please note that the previous plan submitted in August 2018 indicated that shielding tanks and water were in use in the original vault at this facility ("Vault 1"); this was an error, as these tanks are not present in Vault 1. However, Vault 2 will utilize self-shields in addition to the concrete walls of the vault itself. This will reduce the amount of remediation required in Vault 2.

To update the cost estimate, the labor hours and quantities of material for remediation and disposal were updated, but the original unit cost estimate numbers from August 2011 were used. As a result, Cardinal Health has added an inflation adjustment in the summary to adjust from August 2011 to August 2019 dollars. An inflation rate of 13.248% was used. This value is based on the ratio of the Consumer Price Index for All Urban Consumers (CPI-U) values for

NRC Region I Licensing
License No. 34-32780-02
Sept. 17, 2019

August 2011 (226.545) and August 2019 (256.558), as published by the United States Bureau of Labor Statistics in its report titled "Historical Consumer Price Index for All Urban Consumers (CPI-U): U.S. city average, all items, by month," dated August 2019. The relevant section of this report is included for reference as Attachment C.

As a result of this update to the final dollar amounts, the total of the decommissioning cost estimate (DCE) is \$663,259.68, which includes a built-in 25% contingency (totaling \$132,651.94) to account for unexpected variations in the DCE. The value of the existing surety bond held by Cardinal Health is \$500,000 and does not exceed the DCE; therefore, Cardinal Health requests formal approval of this cost estimate from the NRC to begin the process of increasing the value of the surety bond to ensure compliance with 10 CFR 30.35(e)(1). Cardinal Health will then provide a copy of the updated bond to the NRC as soon as possible once that process is completed.

Finally, Cardinal Health requests approval of the MRSO change and the requests in the July 2, 2019 letter to add the second cyclotron, amend the facility floor plan, and add authorized users to the license while the change to the surety bond is in process.

If you have any questions regarding this request, please contact me at 614.553.4555.

Sincerely,

A handwritten signature in black ink, appearing to read "Evan T. Western", written in a cursive style.

Evan T. Western, CHP
Manager, Health Physics
Quality and Regulatory
Nuclear Pharmacy Services

Attachments: A: MRSO Training Documentation
B. Revised Decommissioning Funding Plan
C: Excerpt from US Bureau of Labor Statistics table "Historical Consumer Price Index for All Urban Consumers (CPI-U)"

cc: Arshad Mehmood, MRSO loc. 5869
John Taylor Vernon
License File 5869 (3)

ATTACHMENT A

MRSO Training Documentation



TO: All Employees, PMS Location 5869, East Hartford, Connecticut
FROM: Glenn Sullivan, Corporate Radiation Safety Officer, Director, Health Physics
DATE: September 3, 2019
SUBJECT: Delegation of Authority


Arshad Mehmood has been appointed Manufacturing Radiation Safety Officer (MRSO) and is responsible for ensuring the safe use of radioactive materials. The MRSO is responsible for managing the radiation safety program; identifying radiation safety problems; initiating, recommending, or providing corrective actions; verifying implementation of corrective actions; and ensuring compliance with regulations. The MRSO is hereby delegated the authority necessary to meet those responsibilities. This specifically includes having sufficient authority, organizational freedom, and management prerogative to:

1. Have unhampered access to all activities at his or her facility involving radioactive materials to identify radiation safety problems;
2. Immediately stop, without coordination with management, any activity at his or her facility involving the use of licensed materials by any user that might result in an unsafe situation or a violation of Agreement State requirements;
3. Initiate, recommend, or implement appropriate corrective actions; and
4. Verify the implementation of actions taken to correct radiation safety problems.

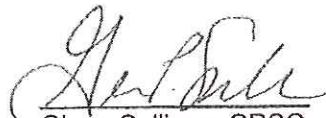
The MRSO is also responsible for assisting the Corporate Radiation Safety Committee and Corporate Radiation Safety Officer in the performance of their duties.

All of us have a critical responsibility in ensuring the safe use of radioactive materials. I refer you to one of our six values: "The health and safety of our employees, customers and community will never be compromised."

I understand and accept the responsibilities associated with being MRSO.


Arshad Mehmood, MRSO

17 Sept 19
Date


Glenn Sullivan, CRSO

9/3/19
Date

1 on 1 call completed _____ Date, CRSO Initials _____



Cardinal Health
Nuclear Pharmacy Services
Quality and Regulatory Department
7000 Cardinal Place
Dublin, OH 43017
tel 614.757.5000
fax 614.652.4598

www.cardinal.com

DOCUMENTATION OF PET MANUFACTURING SERVICES RADIATION SAFETY OFFICER TRAINING

I hereby certify that the individual below has satisfactorily received 200 hours didactic training and 500 hours of practical radioisotope handling experience and that the individual has achieved a level of competency sufficient to independently operate as a PET Manufacturing Services radiation safety officer. This includes training as radiation safety officer under a current radiation safety officer.

RSO Name (Print) Brian A. Jefferson

RSO Signature: Brian A. Jefferson Date: 29 Aug 19

RSO Designee Name (Print) Ashad mehmood

RSO Designee Signature: Ashad Date: 03 Sep 19

ATTACHMENT B

Revised Decommissioning Funding Plan

License Number	Description	RAM Authorized by License or Reg	Max Qty
NRC RAML 34-32780-02		Carbon-11	10 curies
State Reg. 00112233	Dept. of Environmental Protection	Nitrogen-13	10 curies
	Radioactive Material Registration	Oxygen-15	10 curies
Cardinal Health		Fluorine-18	60 curies
PET Manufacturing Services		Activation products T1/2 < 120 days	10 curies total
131 E. Hartland St.		Hydrogen-3	20 millicuries
East Hartford, CT 06108		Manganese-54	20 millicuries
		Cobalt-57	200 millicuries
	16.5 MeV G.E. PETtrace	Cobalt-60	30 millicuries
	cyclotron installed in (2001)	Zinc-65	30 millicuries
	Syncor Advanced Isotopes(2001)	Niobium-93m	30 millicuries
	Cardinal Health (2004)	Niobium-94m	100 millicuries
	<i>Additional self-shielded G.E.</i>	Sodium-22 sealed source	400 microcuries
Cardinal Health owns/leases	<i>PETtrace to be installed</i>	Sodium-22 sealed source	2 microcuries
space in this building		Technetium-99m	5 curies

Typical Waste Products: Typical activated components of the cyclotron are internal parts, targets, target bodies magnet coils, tanks, shielding and cables. Radioactive Wastes from target rebuilds replacement of parts or components during maintenance are packaged and shipped through LLRW radioactive waste brokers.

Name of room, laboratory or area: Cyclotron Vault 1

Level of Contamination: MARSSIM Class 1 - Activated materials with concentrations up to 10's to 100's of pCi/gm

COMPONENT	NUMBER OF COMPONENTS	DIMENSIONS (ft ³)	Total Dimensions (ft ³)
Glove Boxes			0
Fume Hoods			0
Lab Benches	1	18	18
Sinks			0
Sink Drains			0
Floors (25' x 25')	1	625	625
Walls (4 - 25' x 10')	1	1000	1000
Ceiling (25' x 25')	1	625	625
Ventilation / Ductwork	1	30	30
Hot Cells			0
Equipment / Materials	1	15	15
Soil Plots			0
Shielding Tanks (16' x 10' x 9')			0
Storage Areas			0
Radwaste Areas (Storage Pit)	1	32	32
Scrap Recovery Areas			0
Maintenance Areas			0
Equipment Decon Areas			0
Other (specify) Cyclotron	1	231	231
Other (specify) Shielding Water			0

Name of room, laboratory or area: Cyclotron Vault 2

Level of Contamination: MARSSIM Class 1 - Activated materials with concentrations up to 10's to 100's of pCi/gm

COMPONENT	NUMBER OF COMPONENTS	DIMENSIONS (ft ³)	Total Dimensions (ft ³)
Glove Boxes			0
Fume Hoods			0
Lab Benches	1	18	18
Sinks			0
Sink Drains			0
Floors (25' x 25')	1	625	625
Walls (4 - 25' x 10')	1	1000	1000
Ceiling (25' x 25')	1	625	625
Ventilation / Ductwork	1	30	30
Hot Cells			0
Equipment / Materials	1	15	15
Soil Plots			0
Shielding Tanks (16' x 10' x 9')	1	1440	1440
Storage Areas			0
Radwaste Areas (Storage Pit)			0
Scrap Recovery Areas			0
Maintenance Areas			0
Equipment Decon Areas			0
Other (specify) Cyclotron	1	231	231
Other (specify) Shielding Water	1	962.5	962.5

Name of room, laboratory or area: Radiochemistry and Clean Room

Level of Contamination: MARSSIM Class 2 - meets release criteria

COMPONENT	NUMBER OF COMPONENTS	DIMENSIONS (ft ³)	TOTAL DIMENSIONS (ft ³)
Glove Boxes			0
Fume Hoods	1	72	72
Lab Benches	5	82	82
Sinks	1	4	4
Sink Drains	1	3	3
Floors (25' x 25') Vestibule / DOT	1	565	565
Walls (4 - 25' x 10')	1	1020	1020
Ceiling (25' x 25')			0
Ventilation / Ductwork	3	30	30
Hot Cells	1	108	108
Mini Cells	2	27	27
Equipment / Synthesis modules	1	6	6
Soil Plots			0
Storage Tanks			0
Storage Areas			0
Radwaste Areas (within LAB)	1	8	8
Scrap Recovery Areas			0
Maintenance Areas			0
Equipment Decon Areas			0
Other (specify) Laminar Flow hood	1	24	24
Other (specify)			0

Name of room, laboratory or area: Indoor Areas not Classified as Marssim Class 1 or Class 2

Level of Contamination: MARSSIM Class 3 - meets release criteria

COMPONENT	NUMBER OF COMPONENTS	DIMENSIONS (ft ³)	TOTAL DIMENSIONS (ft ³)
Glove Boxes			0
Fume Hoods			0
Lab Benches	1	20	20
Sinks	3	4	4
Sink Drains			0
Floors (25' x 25') Vestibule / DOT	1	1522	1522
Walls (4 - 25' x 10')	1	3805	3805
Ceiling (25' x 25')			0
Ventilation / Ductwork			0
Hot Cells			0
Equipment / Materials			0
Soil Plots			0
Storage Tanks			0
Storage Areas			0
Radwaste Areas (within LAB)			0
Scrap Recovery Areas			0
Maintenance Shop			0
Equipment Decontamination			0
Other (specify)			0
Other (specify)			0

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: Supervisor, Foreman, Craftsman, Technician, Health Physicist, Laborer, Clerical, and others as needed.

Activity	Project Manager	HPS / Foreman / Equip. Op.	Health Physicist / Shipper	HPT / Draftsman	Laborer	Clerical
Preparation of Documentation for Regulatory Agencies	1	0	1	0	0	1
Submittal of Decommissioning Plan	5	0	0	2	0	1
Development of Work Plans	2	1	1	0	0	1
Procurement of Special Equipment	1	0	0	0	0	1
Staff Training	0.5	1.5	1	0.5	1	0
Characterization of Radiological Conditions (includes sampling, soil and environmental analysis, groundwater analysis if applicable)	3	3	0	2	0	0
Other (specify) Mobilization	1	3	1	2	0	0
Totals	13.5	8.5	4	6.5	1	4

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:	Cyclotron Vault						
Level of Contamination:	Class 1 - Activated materials with concentrations up to 10's or 100's of pCi / gm						
Component	Decon Method	Project Mgr.	HPS / Foreman Equip. Op.	Health Physicist/ Shipper	HPT / Draftsman	(2) Laborer	Clerical
Fume Hoods / Hot Cells	Remove / Disp						
Lab Benches	Remove / Disp						
Sinks	Remove / Disp						
Drains	Remove / Disp						
Floors	Remove / Disp	5	5		10	10	
Ventilation / Ductwork	Remove / Disp	1					
Hot Cells	Remove / Disp						
Maintenance Areas	Sur/Remove/Disp						
Soil Plots	Remove / Disp						
Shielding Tanks (16' x 10' x 9')	Remove / Disp	2	2		4	4	
Shielding Tanks Water	Sample	0.5	1		1	1	
Shielding Tanks Water	Remove / Disp	1	3		2	2	
Storage Areas	Remove / Disp						
Radwaste Areas	Remove / Disp						
Scrap Recovery Areas	NA						
Maintenance Areas	Remove / Disp						
Equipment Decon Areas	Remove / Disp						
Other (specify) Cyclotron	Remove / Disp	4	12		8	8	
Other (specify) Shipping	Remove / Disp			4			
TOTALS		13.5	23	4	25	25	

RESTORATION OF CONTAMINATED AREAS ON FACILITY GROUNDS

(Work Days)

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

Activity	Project Mgr.	HPS / Foreman Equip. Op.	Health Physicist/ Shipper	HPT / Draftsman	(2) Laborer	Clerical
Restore Floors	1	1			2	
Restore Roof	3	3			6	
Restore Utilities						
Totals	4	4	0	0	8	0

FINAL RADIATION SURVEY

(Work Days)

Estimate the number of workdays, by specific labor category, that will be required to conduct a final radiation survey

Activity	Project Mgr.	HPS / Foreman Equip. Op.	Health Physicist/ Shipper	HPT / Draftsman	(2) Laborer	Clerical
FSS Setup	1		1			
Survey Packages	1					
Class 1	3	3		5	5	
Class 2	1	1		2		
Class 3	1	1		2		
Final Report	10					2
Totals	17	5	1	9	5	2

SITE STABILIZATION AND LONG TERM SURVEILLANCE

(Work Days)

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

Activity	Project Mgr.	HPS / Foreman Equip. Op.	Health Physicist/ Shipper	HPT / Draftsman	(2) Laborer	Clerical
FSS Setup						
Survey Packages						
Class 1						
Class 2						
Class 3						
Final Report						
Totals	0	0	0	0	0	0

TOTAL WORK DAYS BY LABOR CATEGORY

(Work Days)

Estimate the total number of workdays, by specific labor category from the applicable table.

Task	Project Mgr.	HPS / Foreman Equip. Op.	Health Physicist/ Shipper	HPT / Draftsman	(2) Laborer	Clerical
Planning and Preparation	13.5	8.5	4	6.5	1	4
Decontamination and Dismantling	13.5	23	4	25	25	0
Radioactive Components	4	4	0	0	8	0
Restoration of Contaminated	17	5	1	9	5	2
Areas on Facility Grounds	0	0	0	0	0	0
Final Radiation Survey						
Site Stabilization and Long-						
Term Surveillance						
Totals	48	40.5	9	40.5	39	6

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.	HPS / Foreman Equip. Op.	Health Physicist/ Shipper	HPT / Draftsman	(2) Laborer	Clerical
Salary & Fringe	\$ 125,000.00	\$ 95,000.00	\$ 90,000.00	\$ 75,000.00	\$ 45,000.00	\$ 35,000.00
Overhead Rate (%)	50%	50%	50%	50%	50%	50%
Total Cost Per Year	\$ 187,500.00	\$ 142,500.00	\$ 135,000.00	\$ 112,500.00	\$ 67,500.00	\$ 52,500.00
Living Expense (PD*7/5)	\$ 203.00	\$ 203.00	\$ 203.00	\$ 203.00	\$ -	\$ -
Total Cost Per Work Day	\$ 924.00	\$ 751.00	\$ 722.00	\$ 636.00	\$ 260.00	\$ 202.00
Per Diem Rates	\$145					

TOTAL LABOR COSTS BY MAJOR DECOMMISSIONING TASK

Estimate the total number of workdays, by specific labor category from the applicable table.
--

Task	Project Mgr.	HPS / Foreman Equip. Op.	Health Physicist/ Shipper	HPT / Draftsman	(2) Laborer	Clerical	Total Labor Cost
Planning and Preparation	\$ 14,431.50	\$ 6,383.50	\$ 2,888.00	\$ 4,134.00	\$ 260.00	\$ 808.00	\$ 28,905.00
Decontamination and Dismantling							\$ 56,992.50
Radioactive Components	\$ 14,431.50	\$ 17,273.00	\$ 2,888.00	\$ 15,900.00	\$ 6,500.00	\$ -	
Restoration of Contaminated Areas on Facility Grounds	\$ 4,276.00	\$ 3,004.00	\$ -	\$ -	\$ 2,080.00	\$ -	\$ 9,360.00
Final Radiation Survey	\$ 18,173.00	\$ 3,755.00	\$ 722.00	\$ 5,724.00	\$ 1,300.00	\$ 404.00	\$ 30,078.00
Site Stabilization and Long- Term Surveillance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Totals	\$ 51,312.00	\$ 30,415.50	\$ 6,498.00	\$ 25,758.00	\$ 10,140.00	\$ 1,212.00	\$ 125,335.50

PACKING, SHIPPING AND DISPOSAL OF RADIOACTIVE WASTES**(a) Packing Material Costs**

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

Waste Type	Volume (ft ³)	Number of Containers	Type of Containers	Unit Cost of Container	Total Packaging
DAW / Concrete Slurry / Sealed Sources	230	17	Purchased Drum	\$ 70.00	\$ 1,190.00
Cyclotron	462	2	1280 ft ³ rented Seavan	\$ 2,000.00	\$ 4,000.00
Concrete Rubble / Slurry, Steel, Lead, DAW, and Sealed Source	300	1	1280 ft ³ rented Seavan	\$ 2,000.00	\$ 2,000.00
TOTAL					\$ 7,190.00

(b) Shipping Costs

Estimate the number of truckloads of waste expected to be shipped. Multiply shipping costs per mile (including truckload costs surcharges, and overweight charges) by the total distance shipped.

Waste Type	Number of Truckloads	Unit Cost	Surcharges	Overweight Charges	Distance Shipped (miles)	Total Shipping Costs
Concrete Rubble / Slurry, Steel, Lead, DAW, and Sealed Source	1	\$ 4.00	\$ -	\$ -	950	\$ 3,800.00
Cyclotron	2	\$ 4.00	\$ -	\$ 1.00	950	\$ 9,500.00
TOTAL	3					\$ 13,300.00

(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.

Waste Type	Disposal Volume (ft ³)	Density (lb/ft ³)	Disposal Mass (lbs)	Unit Cost (\$/lb)	Surcharges (\$/ft ³ or \$/container)	Total Shipping Costs
DAW	81	10	810	\$ 6.00	0	\$ 4,860.00
Cyclotron	462	200	92,400	\$ 2.50	0	\$ 231,000.00
Concrete/Slurry	90	160	10,240	\$ 2.50	0	\$ 25,600.00
Steel and Lead	54	74	4,000	\$ 2.50	0	\$ 10,000.00
Sealed Sources	8		100			\$ 1,000.00
TOTAL	695					\$ 272,460.00

RADIOACTIVE WASTE DISPOSAL COSTS (ITEMIZED)**(b) Shipping Costs**

Estimate the number of truckloads of waste expected to be shipped. Multiply shipping costs per mile (including truckload costs surcharges, and overweight charges) by the total distance shipped.

Waste Type	Number of Truckloads	Unit Cost	Surcharges	Overweight Charges	Distance Shipped (miles)	Total Shipping Costs
Concrete Rubble / Slurry, Steel, Lead, DAW, and Sealed Source	1	\$ 4.00	\$ -	\$ 4.30	950	\$ 7,885.00
Cyclotron	2	\$ 4.00	\$ -	\$ 1.00	950	\$ 9,500.00
TOTAL	3					\$ 17,385.00

(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.

Waste Type	Disposal Volume (ft ³)	Density (lb/ft ³)	Disposal Mass (lbs)	Unit Cost (\$/lb)	Surcharges (\$/ft ³ or \$/container)	Total Shipping Costs
DAW	81	10	810	\$ 6.00	0	\$ 4,860.00
Cyclotron	462	200	92,400	\$ 2.50	0	\$ 231,000.00
Concrete/Slurry	90	160	14,400	\$ 2.50	0	\$ 36,000.00
Steel and Lead	54	74	4,000	\$ 2.50	0	\$ 10,000.00
Sealed Sources	8		100			\$ 1,000.00
TOTAL	695					\$ 282,860.00

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 (per dress out)	100	\$ 8.00	\$ 800.00
Instrumentation Rental (per week)	5	\$ 250.00	\$ 1,250.00
Misc. Tools (per week)	5	\$ 1,000.00	\$ 5,000.00
Crane Rental (per day)	3	\$ 4,500.00	\$ 13,500.00
Concrete Saw Rental (per week)	2	\$ 1,000.00	\$ 2,000.00
Forklift (per week)	1	\$ 1,000.00	\$ 1,000.00
Consumables (per week)	5	\$ 1,000.00	\$ 5,000.00
TOTAL			\$ 28,550.00

LABORATORY COSTS

If applicable, estimate costs for the analyses to be performed by an independent third-party laboratory.

Activity	Quantity	Unit Cost	Total Item Cost
Sampling (captured in labor estimates)	0	\$ -	\$ -
Transport of Samples	3	\$ 200.00	\$ 600.00
Testing and Analysis - Concrete	46	\$ 150.00	\$ 6,900.00
Other (specify) Analysis - Water	4	\$ 800.00	\$ 3,200.00
TOTAL			\$ 10,700.00

MISCELLANEOUS COSTS

Estimate any other applicable costs	
Activity	Total Item Cost
License Fees (Reciprocity)	\$ 600.00
Insurance	\$ -
Taxes	\$ -
Other (specify)	\$ -
TOTAL	\$ 600.00

TOTAL DECOMMISSIONING COSTS

Enter the total costs reported by task/component into the appropriate cells below, and then add to obtain a subtotal. Add to the subtotal a contingency allowance of 25%.

Costs in August 2011 dollars are adjusted for August 2019 dollars using an overall inflation rate of 13.248% as calculated by the difference in the overall Consumer Price Index.

Task/Component	Cost (2011\$)	Percentage	Cost (2019\$)
Planning and Preparation	\$ 28,905.00	6.2%	\$ 32,734.38
Decontamination and/or Dismantling of Components	\$ 56,992.50	12.2%	\$ 64,542.95
Restoration of Contaminated Areas	\$ 9,360.00	2.0%	\$ 10,600.03
Final Radiation Survey	\$ 30,078.00	6.4%	\$ 34,062.78
Site Stabilization	\$ -	0.0%	\$ -
Packing Material Costs	\$ 7,190.00	1.5%	\$ 8,142.54
Shipping Costs	\$ 13,300.00	2.8%	\$ 15,062.00
Waste Disposal Costs	\$ 282,860.00	60.4%	\$ 320,333.69
Equipment / Supply Costs	\$ 28,550.00	6.1%	\$ 32,332.34
Laboratory Analysis Costs	\$ 10,700.00	2.3%	\$ 12,117.55
Miscellaneous Costs	\$ 600.00	0.1%	\$ 679.49
<i>SubTotal</i>	<i>\$ 468,535.50</i>	100.0%	<i>\$ 530,607.74</i>
25% Contingency	\$ 117,133.88	25.0%	\$ 132,651.94
TOTAL Decommissioning Cost Estimate	\$ 585,669.38		\$ 663,259.68

ATTACHMENT C

**Excerpt from US Bureau of Labor Statistics table
“Historical Consumer Price Index for All Urban
Consumers (CPI-U)”**

Historical Consumer Price Index for All Urban Consumers (CPI-U): U.S. city average, all items, by month — Continued

[1982-84=100, unless otherwise noted]

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1971.....	39.8	39.9	40.0	40.1	40.3	40.6	40.7	40.8	40.8	40.9	40.9	41.1
1972.....	41.1	41.3	41.4	41.5	41.6	41.7	41.9	42.0	42.1	42.3	42.4	42.5
1973.....	42.6	42.9	43.3	43.6	43.9	44.2	44.3	45.1	45.2	45.6	45.9	46.2
1974.....	46.6	47.2	47.8	48.0	48.6	49.0	49.4	50.0	50.6	51.1	51.5	51.9
1975.....	52.1	52.5	52.7	52.9	53.2	53.6	54.2	54.3	54.6	54.9	55.3	55.5
1976.....	55.6	55.8	55.9	56.1	56.5	56.8	57.1	57.4	57.6	57.9	58.0	58.2
1977.....	58.5	59.1	59.5	60.0	60.3	60.7	61.0	61.2	61.4	61.6	61.9	62.1
1978.....	62.5	62.9	63.4	63.9	64.5	65.2	65.7	66.0	66.5	67.1	67.4	67.7
1979.....	68.3	69.1	69.8	70.6	71.5	72.3	73.1	73.8	74.6	75.2	75.9	76.7
1980.....	77.8	78.9	80.1	81.0	81.8	82.7	82.7	83.3	84.0	84.8	85.5	86.3
1981.....	87.0	87.9	88.5	89.1	89.8	90.6	91.6	92.3	93.2	93.4	93.7	94.0
1982.....	94.3	94.6	94.5	94.9	95.8	97.0	97.5	97.7	97.9	98.2	98.0	97.6
1983.....	97.8	97.9	97.9	98.6	99.2	99.5	99.9	100.2	100.7	101.0	101.2	101.3
1984.....	101.9	102.4	102.6	103.1	103.4	103.7	104.1	104.5	105.0	105.3	105.3	105.3
1985.....	105.5	106.0	106.4	106.9	107.3	107.6	107.8	108.0	108.3	108.7	109.0	109.3
1986.....	109.6	109.3	108.8	108.6	108.9	109.5	109.5	109.7	110.2	110.3	110.4	110.5
1987.....	111.2	111.6	112.1	112.7	113.1	113.5	113.8	114.4	115.0	115.3	115.4	115.4
1988.....	115.7	116.0	116.5	117.1	117.5	118.0	118.5	119.0	119.8	120.2	120.3	120.5
1989.....	121.1	121.6	122.3	123.1	123.8	124.1	124.4	124.6	125.0	125.6	125.9	126.1
1990.....	127.4	128.0	128.7	128.9	129.2	129.9	130.4	131.6	132.7	133.5	133.8	133.8
1991.....	134.6	134.8	135.0	135.2	135.6	136.0	136.2	136.6	137.2	137.4	137.8	137.9
1992.....	138.1	138.6	139.3	139.5	139.7	140.2	140.5	140.9	141.3	141.8	142.0	141.9
1993.....	142.6	143.1	143.6	144.0	144.2	144.4	144.4	144.8	145.1	145.7	145.8	145.8
1994.....	146.2	146.7	147.2	147.4	147.5	148.0	148.4	149.0	149.4	149.5	149.7	149.7
1995.....	150.3	150.9	151.4	151.9	152.2	152.5	152.5	152.9	153.2	153.7	153.6	153.5
1996.....	154.4	154.9	155.7	156.3	156.6	156.7	157.0	157.3	157.8	158.3	158.6	158.6
1997.....	159.1	159.6	160.0	160.2	160.1	160.3	160.5	160.8	161.2	161.6	161.5	161.3
1998.....	161.6	161.9	162.2	162.5	162.8	163.0	163.2	163.4	163.6	164.0	164.0	163.9
1999.....	164.3	164.5	165.0	166.2	166.2	166.2	166.7	167.1	167.9	168.2	168.3	168.3
2000.....	168.8	169.8	171.2	171.3	171.5	172.4	172.8	172.8	173.7	174.0	174.1	174.0
2001.....	175.1	175.8	176.2	176.9	177.7	178.0	177.5	177.5	178.3	177.7	177.4	176.7
2002.....	177.1	177.8	178.8	179.8	179.8	179.9	180.1	180.7	181.0	181.3	181.3	180.9
2003.....	181.7	183.1	184.2	183.8	183.5	183.7	183.9	184.6	185.2	185.0	184.5	184.3
2004.....	185.2	186.2	187.4	188.0	189.1	189.7	189.4	189.5	189.9	190.9	191.0	190.3
2005.....	190.7	191.8	193.3	194.6	194.4	194.5	195.4	196.4	198.8	199.2	197.6	196.8
2006.....	198.3	198.7	199.8	201.5	202.5	202.9	203.5	203.9	202.9	201.8	201.5	201.8
2007.....	202.416	203.499	205.352	206.686	207.949	208.352	208.299	207.917	208.490	208.936	210.177	210.036
2008.....	211.080	211.693	213.528	214.823	216.632	218.815	219.964	219.086	218.783	216.573	212.425	210.228
2009.....	211.143	212.193	212.709	213.240	213.856	215.693	215.351	215.834	215.969	216.177	216.330	215.949
2010.....	216.687	216.741	217.631	218.009	218.178	217.965	218.011	218.312	218.439	218.711	218.803	219.179
2011.....	220.223	221.309	223.467	224.906	225.964	225.722	225.922	226.545	226.889	226.421	226.230	225.672
2012.....	226.665	227.663	229.392	230.085	229.815	229.478	229.104	230.379	231.407	231.317	230.221	229.601
2013.....	230.280	232.166	232.773	232.531	232.945	233.504	233.596	233.877	234.149	233.546	233.069	233.049
2014.....	233.916	234.781	236.293	237.072	237.900	238.343	238.250	237.852	238.031	237.433	236.151	234.812
2015.....	233.707	234.722	236.119	236.599	237.805	238.638	238.654	238.316	237.945	237.838	237.336	236.525
2016.....	236.916	237.111	238.132	239.261	240.229	241.018	240.628	240.849	241.428	241.729	241.353	241.432
2017.....	242.839	243.603	243.801	244.524	244.733	244.955	244.786	245.519	246.819	246.663	246.669	246.524
2018.....	247.867	248.991	249.554	250.546	251.588	251.989	252.006	252.146	252.439	252.885	252.038	251.233
2019.....	251.712	252.776	254.202	255.548	256.092	256.143	256.571	256.558	-	-	-	-