Bristol-Myers Squibb Company
Worldwide Medicines Group
P.O. Box 5400 Princeton, NJ 08543-5400
609-818-3000

P-1

February 26, 2003

Ms. Leanne Harrison
Nuclear Material Safety Branch
US NRC Region I
475 Allendale Road
King of Prussia, PA 19406

030-05222

RE: DOCKET NO. 030-05222 – DECOMMISSIONING COST ESTIMATE FOR LICENSE NO. 29-00139-02

Dear Ms. Harrison:

E. R. Squibb & Sons, a wholly owned subsidiary of Bristol-Myers Squibb Company, is providing for your review the enclosed Decommissioning Cost Estimate for its broad scope Radioactive Material License No. 29-00139-02. This estimate was completed in December 2002 and reflects current licensed operations. As discussed in previous correspondence, the Financial Assurance mechanism to guarantee the cost estimate total will be provided to the Commission when our corporate 2002 financial data is finalized.

If you require any additional information or wish to discuss our Decommissioning Funding Plan, please contact me at michael.vala@bms.com or (609) 818-4907.

Sincerely,

Michael J. Vala, CHP
Radiation Safety Officer, Manger EHS

MJV:bl

Enclosure

cc: E. Barry*
M. Koza*
R. McLaughlin*
C. Wooodard*

Cover letter only

131014

NMSS/RGNI MATERIALS-002

REC'D IN LAT FEB 27 2003

DECOMMISSIONING COST ESTIMATE

NRC LICENSE #29-00139-02

E. R. Squibb & Sons, Inc.
311 Pennington-Rocky Hill Road
Pennington, NJ

December, 2002

Table of Contents

I. Executive Summary.....1

II. Process.....2

III. General Assumptions.....4

IV. Specific Assumptions.....8

V. Appendix 1 - Hamilton Site Cost Estimate and Detail

VI. Appendix 2 - Pennington Site Cost Estimate and Detail

VII. Appendix 3 - Lawrenceville Site Cost Estimate and Detail

VIII. Appendix 4 - New Brunswick Site Cost Estimate and Detail

IX. Appendix 5 - Bristol-Myers Squibb Radioactive Materials License

X. Appendix 6 - Disposal Quotation – Self-Shielded Irradiators

I. Executive Summary

This report documents the basis, assumptions and results for a decommissioning cost estimate prepared on behalf of Bristol-Myers Squibb by Philotechnics, Ltd. for four pharmaceutical research and development sites in New Jersey. The four sites are licensed under U.S. NRC license number 29-00139-02 and include facilities located at:

- One Squibb Drive, New Brunswick, NJ
- 311 Pennington-Rocky Hill Road, Pennington, NJ
- Route 206 and Provinceline Road, Lawrenceville, NJ
- Three Hamilton Health Place, Hamilton, NJ

The decommissioning cost estimate was prepared in accordance with the guidance provided in Section 3, Appendix F of NUREG 1727, *NMSS Decommissioning Standard Review Plan* dated September 2000.

The estimates were prepared based upon on-site inspection and photographic documentation of each area and laboratory radioactive materials are used in. Facility features (e.g., hoods, cabinets, floor areas, etc.) were inventoried for each area using the photographs, facility CADD drawings, and radiological survey maps. The facility features for each lab were then summed by building. Cost estimates were prepared for each site based on the number of laboratories and the summed features of each building using the format contained in NUREG 1727.

The estimated decommissioning costs are:

Site	Estimate	25% Contingency	Total Cost Estimate
Hamilton	$235,646	$58,911	$294,557
Pennington	$2,673,895	$668,474	$3,342,369
Lawrenceville	$3,423,693	$855,923	$4,279,616
New Brunswick	$785,093	$196,273	$981,366
Total	$7,118,327	$1,779,581	$8,897,908

The 25% contingency is that required by the US Nuclear Regulatory Commission for decommissioning cost estimates.

II. Process

The Bristol-Myers Squibb decommissioning estimates were prepared based upon the use of radioactive materials at each site. An inventory of facility features and dimensions was taken for each laboratory or area in which radioactive materials are used or stored. The laboratory features and dimensions were summed by building and decommissioning costs were estimated for each building. Individual building decommissioning costs were then summed into an estimate for each site. This report documents the development of the entire cost estimate from the laboratory inventory through the summarized totals for each site. This report is organized into a main body documenting the approach and assumptions utilized and appendices that contain the actual cost estimates and basis for each facility. Assumptions applicable to all sites are contained in Section III General Assumptions; assumptions regarding individual sites are contained in the discussion for each site.

Decommissioning cost estimates were prepared in accordance with the guidance contained in Section 3, Appendix F of NUREG-1727 *NMSS Decommissioning Standard Review Plan* dated September 2000. Specifically, this is a "best estimate" approximation of all direct and indirect costs of facility decommissioning under the routine facility conditions expected to exist. This estimate reflects current radiological conditions and operations routinely performed at these facilities.

The process used to develop the inventory of facility laboratories consisted of an on-site inspection and photographing of each laboratory and radioactive materials use or storage area. Multiple digital photographs were taken of each area to document the general features of each room. These photographs were then used together with facility CADD drawings to develop a detailed feature inventory (e.g., number of hoods, linear feet of casework, floor area, etc.). These features were estimated on a room by room basis for each building. The room by room estimates are included in this report.

The on-site inspection was supplemented by discussions with the facility radiation safety staff regarding facility operations, radioactive material use, and radioactive waste disposal practices. Radiological surveys were reviewed to determine the levels of contamination present.

Based on the inventory of facility features the level of effort was estimated to perform decontamination and decommissioning for each building. The level of effort was based upon the number of laboratories as well as the size of each area and the amount of equipment, casework, shelving and similar items contained within each area.

Waste generation from D&D activities was also determined based upon the number of laboratories and amount of equipment, casework, shelving, and similar items.

Restoration activities were estimated based upon the expected scope of remediation and similar work that Philotechnics has performed decommissioning other pharmaceutical research facilities.

The level of effort estimated for final status surveys was based upon license termination criteria of 25 mrem per year and NUREG 1575 *Multi-Agency Radiation Site Survey and Site Investigation Manual* (MARSSIM) survey protocols.

A facility description is provided for each estimate. It includes:

- the license number and type
- specific quantities and types of materials authorized by the license
- a general discussion of how radioactive materials are use at the facility
- a description of facility buildings, rooms and grounds including the number and dimensions of areas requiring decontamination
- the number and dimension of facility components
- levels of contamination
- quantities of materials or wastes accumulated prior to shipping or disposal

The cost estimates account for all phases of the decommissioning process and distinguish between labor and non-labor costs. Labor costs are broken out for:

- planning and preparation
- D&D of facility components
- facility restoration, as needed
- final radiation survey

Non-labor costs are broken out for:

- packing materials
- shipping costs
- disposal costs
- equipment and supplies
- laboratory costs
- miscellaneous expenses

Consistent with NRC guidance, a 25% contingency is factor is provided for unforeseen circumstances that could increase decommissioning costs.

The cost estimates are patterned after and numbered consistent with the cost estimating tables contained in Section 3, Appendix F of NUREG 1727.

III. General Assumptions

The following assumptions were used to develop the decommissioning cost estimates. These assumptions are consistent with the guidance contained in NUREG 1727 and MARSSIM.

Inventories of materials and wastes at the time of decommissioning are in amounts consistent with routine facility conditions over time. For example, since radioactive waste is continuously generated but is not disposed until a certain amount has accumulated; it is assumed that the facility waste inventory is equal to that on-site just prior to disposal.

Costs will be incurred to decontaminate some areas where contamination is possible but uncertain. This condition is reflected in the assumption that 25% of installed equipment, cabinets, ventilation ducts, sinks and drains are disposed of as radioactive waste and in the level of effort (person-days) estimated to perform D&D activities.

Costs will be incurred for minor or cumulative spills that might have gone undetected under routine facility conditions before decommissioning. This condition is also reflected in the assumption that 25% of installed equipment, cabinets, ventilation ducts, sinks and drains are disposed of as radioactive waste and in the level of effort (person-days) estimated to perform D&D activities. For example, D&D estimates allow for cleanup of minor spills under casework or in lab bench drawers.

Decommissioning activities take place immediately on cessation of operations without multi-year storage-for-decay periods. This cost estimate reflects conditions during routine research operations. It does not rely on decay to meet license termination criteria.

Work is performed by an independent third-party contractor.

The cost estimate does not take credit for any salvage value that might be realized from the sale of potential assets during or after decommissioning.

The radionuclides present were those authorized in the radioactive materials license and identified in discussions with the facility radiation safety staff. The predominant radionuclides are H-3, C-14, I-125, I-131, P-32, P-33, and S-35. Ni-63 is used as sources and foils in analytical equipment. Other Byproduct Materials are authorized in limited quantities. The Lawrenceville site also possesses two self-shielded irradiators. One contains 1100 Ci of Cs-137, the other contains 2200 Ci of Cs-137.

The decontamination endpoint was considered to be the derived concentration guideline values (DCGL's) associated with license termination criteria of 25 mrem per year for installed fixtures and equipment. For removable equipment it was assumed that contaminated equipment would be decontaminated to facility unrestricted release criteria or would be disposed of as radioactive waste.

Number and Dimensions of Facilities Components

Glove boxes were assumed to be 4ft. wide, 3ft. deep and 3ft. tall.

Fume hoods were assumed to be 5ft. wide, 4ft. deep and 8ft. tall.

Lab benches were assumed to be 4ft. deep and 3ft. tall. Total length was estimated from facility photographs and drawings.

Cabinets were assumed to be 3 ft. deep and 3 ft. tall. The total length was determined by a ratio to lab bench length. This ratio was generally between 0.1 and 1.0 and was based on facility photographs and drawings.

Sinks were assumed to be 4ft. wide, 4ft. deep and 3ft. tall.

Length of drain piping was estimated as 20 linear feet per sink per room plus 20 linear feet per room for floor elevation. For example, a basement room containing two sinks would be estimated as 20 linear feet per sink plus 20 linear feet for a first floor elevation for a total of 60 linear feet. A floor drain was considered as an additional sink.

Drain lines are assumed to be 3" in diameter. Drain line is not collapsed during decommissioning. Waste volume per linear foot of drain line is equal to:

$$1 \text{ foot} \times (3.14) \times (.125)^2 \approx 0.05 \text{ ft}^3$$

Length of glove box and hood ventilation ducts was estimated as 20 linear feet per hood or glove box plus 20 linear feet per lab for floor elevation plus roof. For example, a laboratory containing one hood on the second floor of a four story building would be estimated as 20 linear feet for the hood plus 60 linear feet for floor elevation plus roof for a total of 80 linear feet.

Ventilation ducting is assumed to be 18" in diameter unless specifically called out (e.g., New Brunswick Facility). During decommissioning ventilation ducting is collapsed to one half its original volume. Waste volume per linear foot of ducting is equal to:

$$0.5 \times 1 \text{ foot} \times (3.14) \times (.75)^2 \approx 0.88 \text{ ft}^3$$

Equipment was estimated from facility photographs and drawings as a number of 50 cubic foot units. For example, a piece of equipment 3.5 ft deep, 3.5 ft tall and 4ft wide would be considered one 50 cubic foot unit.

For waste estimation purposes, 25% of the volume of equipment, glove boxes, hoods, lab benches, shelves, sinks, drains, and ventilation duct was assumed to be disposed of as radioactive waste. A density of 20 pounds per cubic foot was used for this material.

Floors, Walls and Ceilings

Survey units are defined as:

Class 1 Area: Impacted areas with concentrations of residual activity, prior to remediation, that exceed the $DCGL_W$

Class 2 Area: Impacted areas for which concentrations of residual activity that exceed the $DCGL_W$ are not expected.

Class 3 Area: Impacted areas that have a low probability of containing areas with residual radioactivity.

Laboratory and radioactive material storage areas floor dimensions are estimated from facility drawings and are considered MARSSIM class 1 survey areas.

Ceiling areas are equivalent to floor areas but are considered MARSSIM class 2 survey areas.

Walls are generally taken to be 15 ft. tall except where noted. For labs and radioactive materials areas the lower half is considered MARSSIM class 1 survey area. For 20 foot walls the lower 8 ft. is considered class 1.

Building floor areas outside labs and radioactive material storage areas are assigned 25% to MARSSIM class 2 and 75% to MARSSIM class 3 survey units.

Roof Areas are considered class 3 survey units. Ventilation fans, filter housings, and ducting installed on roof tops are assigned as a class 1 survey unit in the area immediately under and around the ventilation components. The remainder of the roof is divided 25% to class 2 survey units and 75% to class 3.

For determination of number of survey units the following limits were used:

Classification	Suggested Area
Class 1	
Structures	Up to 100 m^2
Land Areas	Up to 2000 m^2
Class 2	
Structures	100 to 1,000 m^2
Land Areas	2,000 to 10,000 m^2
Class 3	
Structures	No limit
Land Areas	No limit

Using the conversion of approximately 10 ft^2 per square meter, class 1 survey units were limited to 1,000 ft^2 and class 2 structure survey units were limited to 10,000 ft^2.

Labor Costs

The cost estimates are based on fully burdened market place wage rates for all personnel. An overhead rate equal to 100% of base salary and fringe benefits was assumed. In addition, the Project Manager, Supervisors, Shipper, Health Physicist, and Health Physics technicians are assumed to be non-local hires. Consequently their wage rate also reflects a daily living allowance of $210. This is the approximate government per diem rate for northern New Jersey. Skilled, Non-skilled and Clerical workers are assumed to be local hires.

Packaging, Shipping and Disposal of Radioactive Wastes

The radioactive waste generated from facility D&D activities is assumed to be metal waste at a density of 20 pounds per cubic foot. This waste is shipped in 40 foot cargo vans with each van holding 2000 ft^3 of waste. Mileage charges are based on shipping to a waste processing facility located 800 miles away. The shipping expense is $1.70 per mile based on current industry rates.

Dry active waste volumes include both those assumed to be in facility operational inventory and those generated in the process of facility D&D. DAW is packaged in B-25 boxes consistent with standard industry practice.

Waste processing and disposal costs are based on those available in the industry for large facility decommissioning projects.

Miscellaneous Costs

Insurance includes General Liability Insurance at a rate of $7.00 per $1,000 of project price.

Since work is assumed to be provided by an independent third party cost estimates also include an allowance for sales tax (professional services) taken as 10% of project costs, minus miscellaneous costs. The tax allowance is listed as a miscellaneous cost.

IV. Specific Assumptions

Hamilton Site

The Hamilton site consists of six radioactive materials laboratories/areas in one building.

The onsite D&D crew consists of one project manager, two health physics technicians, one shipper half time, one draftsman halftime, and three non-skilled radiation workers. D&D duration is two weeks.

License and access fees are included in the Pennington site decommissioning estimate.

The roof area is 28,125 square feet and is a class 3 survey unit.

Pennington Site

The Pennington site estimate is based on the following buildings and areas. A small radioactive waste storage area also exists in Building 10.

Building	Elevation	Area (ft^2)
3	First Floor (Basement)	33,000
	Second Floor	33,000
	Third Floor	30,600
17	First Floor	87,300
21	First Floor	59,200
	Second Floor	59,200

The onsite D&D crew varies with the building being decommissioned and the number of crews working in parallel at one time. It is assumed that a laboratory takes a crew of one health physics technician, two skilled radiation workers and three unskilled radiation workers one week to D&D. The D&D crews are supported proportionately by the project manager, supervisors, the project shipper, and clerical support.

The Pennington site decommissioning estimate also includes an allowance for radioactive material license fees and disposal site access fees for the Barnwell disposal facility.

Lawrenceville Site

The Lawrenceville site estimate is based on the following buildings and areas.

Building/Module	Elevation	Area (ft^2)
F1	First Floor (Basement)	21,500
	Second Floor	21,500
	Third Floor	21,500
	Fourth Floor	21,500
G1	Second Floor	34,000
	Fourth Floor	15,200
H	First Floor (Basement)	27,100
	Third Floor	30,000
	Fourth Floor	30,000
K	Second Floor	39,400
	Third Floor	39,400
	Fourth Floor	39,400
L	First Floor (Basement)	33,100
	Fourth Floor	33,100

The onsite D&D crew varies with the building being decommissioned and the number of crews working in parallel at one time. It is assumed that a laboratory takes a crew of one health physics technician, two skilled radiation workers and three unskilled radiation workers one week to D&D. The D&D crews are supported proportionately by the project manager, supervisors, the project shipper, and clerical support.

The Lawrenceville site also includes two self-shielded irradiators. A quote was obtained from the manufacturer for removal and disposal of these units. The quotation is provided in Appendix 6.

New Brunswick Site

The New Brunswick site estimate is based on the following buildings and areas. There is also one small laboratory in building 134.

Building	Elevation	Area (ft^2)
107	Second Floor	54,000
	Roof	54,000
105	First Floor	50,500
80-84	Basement	18,200
	Second Floor	18,200
	Roof	18,200
81	First Floor	13,500

The onsite D&D crew varies with the building being decommissioned and the number of crews working in parallel at one time. It is assumed that a laboratory takes a crew of one health physics technician, two skilled radiation workers and three unskilled radiation workers one week to D&D. The D&D crews are supported proportionately by the project manager, supervisors, the project shipper, and clerical support.

The floors, walls, and ceilings of all laboratories in the radio-synthesis suite and the adjacent ventilation equipment room located in Building 107 are considered to be MARSSIM Class 1 survey units. A waste fraction of 50% was applied to all installed and movable equipment located in this suite.

3.4 FACILITY DECOMMISSIONING SUMMARY

Radioactive Material license numbers and types (i.e., Byproduct, Source):
The Bristol-Myers Squibb Clinical Trials Unit located at Three Hamilton Health Place, Hamilton, NJ is licensed under USNRC Byproduct Materials license number 29-00139-02.
Types and quantities of materials authorized under the licenses listed above:
Byproduct Material atomic number 1 through 83, except Sr-90, 10 mCi per nuclide, 1 Ci total; H-3 100 mCi; C-14 100 mCi; S-35 300 mCi; P-32 100 mCi; P-33 200 mCi; I-125 50 mCi; Ni-63 Sources per registration IAW 10 CFR 32.210.
Description of how licensed materials are used:
Radioactive Materials are used in research and development of new pharmaceuticals and pharmaceutical applications. This facility performs clinical trials in a hospital setting. The facility is used for performing metabolic and blood chemistry studies.
Description of facility, including buildings, rooms, grounds, and description of where particular types of materials are used:
The Hamilton Clinical Trials Unit is a single story structure comprised jointly of Bristol-Myers Squibb laboratory space and Robert Wood Johnson inpatient hospital facilities dedicated to clinical trials. It is located on the campus of the Robert Wood Johnson Hospital in Hamilton, NJ.
Quantities of materials or waste accumulated before shipping or disposal
This facility has limited space available for radioactive waste storage. Quantities of materials accumulated before shipping and disposal are limited to approximately 75 cubic feet of waste.

3.5 Number and Dimensions of Facilities Components

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:	Bristol-Myers Squibb Clinical Trials Unit, Hamilton, NJ
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2

Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	2	Each	4'w x 3'd x 3't	72	ft^3
Fume Hoods	4	Each	5'w x 4'd x 8't	640	ft^3
Lab Benches (Casework)	205	Linear Feet	4'd x 3't	2,460	ft^3
Sinks	3	Each	4'w x 4'd x 3't	144	ft^3
Drains	120	Linear Feet	3" diameter	6	ft^3
Floors	See Listing	Class 1 Sq. Feet		2,392	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		3,510	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		3,510	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		2,392	ft^2
Ventilation/Ductwork	160	Linear Feet	18" diameter	141	ft^3
Cabinets	74	Linear Feet	3'd x 3't	666	ft^3
Hot Cells	0	Each		0	ea
Equipment/Materials	19	50 Ft^3 Units		950	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	3	Each		3	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination	0	Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		3,827	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet		39,600	ft^2
Other (Specify)		Each		0	ea
Other (Specify)		Each		0	ea

Features/Equipment Volume	5,079	ft^3
Waste Fraction	0.25	
Waste Volume	1,270	ft^3
Waste Density (lb/ft3)	20	
Waste Mass	25,394	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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers	Clerical
Preparation of Documentation for Regulatory Agencies	10	10	10	5	0	10
Submittal of Decommissioning Plan to NRC when required by 10 CFR 30.36(g)(1), 40.42(g)(1), or 70.38(g)(1)	1	1	0	0	0	1
Development of Work Plans	10	10	10	0	0	0
Procurement of Special Equipment	0	5	0	0	0	0
Staff Training	2	2	2	6	4	2
Characterization of Radiological Condition (including sampling, soil and tailings analysis, or groundwater analysis, if applicable)	2	2	1	3	0	1
Other (specify) Mobilization	1	1	1	3	2	1
TOTALS	26	31	24	17	6	15

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:	Bristol-Myers Squibb Clinical Trials Unit, Hamilton, NJ
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2

Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers	Clerical
Glove Boxes	Remove/Disp	0		0	0	0.5	0
Fume Hoods	Remove/Disp	0.5		0.5	1	1.5	0.5
Lab Benches	Decon/Remove	0.5		0.5	1	1.5	0.5
Sinks	Decon/Remove	0.5		0.5	1	1.5	0.5
Drains	Remove/Disp	0.5		0.5	1	1.5	0.5
Floors	Decon/Wipe	1		1	2	2.5	1
Walls	Decon/Wipe	1.5		0.5	1	1.5	1.5
Ceilings	Decon/Wipe	0.5		0.5	1	1.5	0.5
Ventilation/Ductwork	Remove/Disp	1		0.5	1	1.5	1
Cabinets	Decon/Remove			0.5	1	1.5	
Hot Cells	Remove/Disp	0					0
Equipment/Materials	Sur/Rem/Disp	3		4	8	12	3
Soil Plots	Sample	0					0
Storage Tanks	N/A	0					0
Storage Areas	Remove/Disp	0					0
Radwaste Areas	Remove/Disp	1		1	2	3	1
Scrap Recovery Areas	N/A	0					0
Maintenance Shop	Remove/Disp	0					0
Equipment Decontamination	Remove/Disp	0					0
Other (specify)	Remove/Disp						
Other (specify)	Remove/Disp						
TOTALS		10	0	10	20	30	10

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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers	Clerical
Restore Floors	1	0	0	0	3	0
Restore Walls	0	0	0	0	0	0
Restore Roof	2	0	0	0	6	0
Restore Utilites	2	0	0	0	6	0
	0	0	0	0	0	0
TOTALS	5	0	0	0	15	0

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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers	Clerical
FSS Setup	3	0	2	3	0	1
Survey Packages	1	0	1	3	0	1
Class 1	1	0	1	3	0	1
Class 2	1	0	1	3	0	1
Class 3	1	0	1	3	0	1
TOTALS	7	0	6	15	0	5

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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers	Clerical
No Site Stabilization or						
Long Term Maintenance						
TOTALS	0	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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers	Clerical
Planning and Preparation (TOTALS from Table 3.6)	26	31	24	17	6	15
Decontamination and/or Dismantling of Radioactive Facility Components (Sum of TOTALS from all copies of Table 3.7)	10	0	10	20	30	10
Restoration of Contaminated Areas on Facility Grounds (TOTALS from Table 3.8)	5	0	0	0	15	0
Final Radiation Survey (TOTALS from Table 3.9)	7	0	6	15	0	5
Site Stabilization and Long-Term Surveillance (TOTALS from Table 3.10)	0	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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers	Clerical
Salary & Fringe ($/year)	$85,000	$60,000	$60,000	$40,000	$30,000	$22,000
Overhead Rate (%)	100%	100%	100%	100%	100%	100%
Total Cost Per Year	$170,000	$120,000	$120,000	$80,000	$60,000	$44,000
Living Expenses (PD*7/5)[1]	$294	$294	$294	$294	0	0
Total Cost Per Work Day[2]	$948	$756	$756	$602	$231	$169

[1] Per Diem Rate: $210 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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers	Clerical	Total Labor Cost
Planning and Preparation	$24,644	$23,422	$18,133	$10,229	$1,385	$2,538	$80,350
Decontamination and/or Dismantling of Radioactive Facility Components	$9,478	$0	$7,555	$12,034	$6,923	$1,692	$37,683
Restoration of Contaminated Areas on Facility Grounds	$4,739	$0	$0	$0	$3,462	$0	$8,201
Final Radiation Survey	$6,635	$0	$4,533	$9,025	$0	$846	$21,040
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	165	2	B-25	$700	$1,400
Metal	1,270	1	40' Sea-Land	$1,000	$1,000
Contaminated Lead	0	0			$0
Class B/C	0	0			$0
TOTAL					$2,400

(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 ($/mile/truckload)	Surcharges ($/mile)	Overweight Charges($/mile)	Distance Shipped (miles)	Total Shipping Costs
DAW	1	$1.70	1	1	800	$1,360
Metal	1	$1.70	1	1	800	$1,360
Contaminated Lead	0	$1.70	1	1	1	$0
Class B/C	0	$1.70	1	1	1	$0
TOTAL	2					$2,720

(c) Waste Disposal Costs

Estimate the volume of waste to be disposed. Multiply the volume of waste disposed by the unite\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	165	15	2475	6.70	1	$16,583
Metal	1270	20	25394	1.25	1	$31,743
Contaminated Lead	0	350	0	7.00	1	$0
Class B/C	0	20	0	25.00	1	$0
TOTAL	1435					$48,325

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	1	$3,000	$3,000
Respirators	0		$0
Misc Tools	1	$3,000	$3,000
Consumables	1	$2,000	$2,000
TOTAL			$8,000

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	20	$100	$2,000
Transport of Samples	3	$50	$150
Testing and Analysis	20	$100	$2,000
Other (specify)			
TOTAL			$4,150

3.17 MISCELLANEOUS COSTS

Estimate any other applicable costs.	
Activity	Total Cost
License Fees	---
Insurance	$1,490
Taxes	$21,287
Other (specify): Access Fee	---
TOTAL	$22,777

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 then 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)	$80,350	34.1%
Decontamination and/or Dismantling of Radioactive Facility (From Table 3.13)	$37,683	16.0%
Restoration of Contaminated Areas on Facility Grounds (From Table 3.13)	$8,201	3.5%
Final Radiation Survey (From Table 3.13)	$21,040	8.9%
Packing Material Costs (TOTAL from Table 3.14(a))	$2,400	1.0%
Shipping Costs (TOTAL from Table 3.14(b))	$2,720	1.2%
Waste Disposal Costs (TOTAL from Table 3.14(c))	$48,325	20.5%
Equipment/Supply Costs (TOTAL from Table 3.15)	$8,000	3.4%
Laboratory Costs (TOTAL from Table 3.16)	$4,150	1.8%
Miscellaneous Costs (TOTAL from Table 3.17)	$22,777	9.7%
SUBTOTAL	$235,646	100.0%
25% Contingency	$58,911	25.0%
TOTAL DECOMMISSIONING COST ESTIMATE	$294,557	125.0%

| | Features | | |

	Floors				Walls				Ceilings				Waste		
CTU	Number	Length (ft.)	Width (ft.)	Area (ft²)	Number	Width (ft.)	Height (ft.)	Area (ft²)	Number	Length (ft.)	Width (ft.)	Area (ft²)	Type	Volume (ft³)
Laboratory														
162	1	35	18	630	2	35	15	1050	1	35	18	630		
					2	18	15	540						
242	1	23	18	414	2	23	15	690	1	23	18	414		
					2	18	15	540						
164	1	35	20	700	2	35	15	1050	1	35	20	700		
					2	20	15	600						
Radwaste (180)	1	30	15	450	2	30	15	900	1	30	15	450	DAW	30
					2	15	15	450					Biological	15
Freezer (151)	1	9	11	99	2	9	15	270	1	9	11	99	Biological	15
					2	11	15	330						
Freezer (152)	1	9	11	99	2	9	15	270	1	9	11	99	Biological	15
					2	11	15	330						
					2	11	15	330						
Freezer (152)	1	9	11	99	2	9	15	270	1	9	11	99	Biological	15
Facility Totals				2392				7020				2392	Waste	
Floor Areas													DAW	30
Total Facility													Liquid	0
Class 1													Biological	45
Class 2														
Class 3														
Non-Impacted														

3.4 FACILITY DECOMMISSIONING SUMMARY

Radioactive Material license numbers and types (i.e., Byproduct, Source):
The Bristol-Myers Squibb facility located at 311 Pennington-Rocky Hill Road, Pennington, NJ is licensed under USNRC Byproduct Materials license number 29-00139-02.
Types and quantities of materials authorized under the licenses listed above:
Byproduct Material atomic number 1 through 83, except Sr-90, 200 mCi per radionuclide, 6 Ci total; H-3 500 mCi; C-14 500 mCi; S-35 300 mCi; Ca-45 300 mCi; Ni-63 Sources per registration IAW 10 CFR 32.210.
Description of how licensed materials are used:
Low energy beta emitting radionuclides and radioiodines are used in pharmaceutical research and development. This work involves the use of labeled compounds for research activities including new discovery, applications testing, metabolic studies, and biological testing involving animal studies. The radioactive materials are used in laboratory facilities on a research and development scale.
Description of facility, including buildings, rooms, grounds, and description of where particular types of materials are used:
The Pennington Facility consists of several single and multi-story laboratory buildings. Radionuclides are used extensively in Building 21. Radioactive materials are also used in Building 17 laboratories. Building 17 provides radioactive waste storage for both Building 17 and 21. Radionuclides are used and stored on a limited basis in Buildings 3 and 10. A complete listing of laboratories in by building is attached to this cost estimate.
Quantities of materials or waste accumulated before shipping or disposal
The principal waste collection and storage areas for the Pennington facility are rooms 3A-009 in Building 3, 10.1107B in Building 10, and 17.301 in Building 17. Waste storage areas are limited, consequently large volumes of waste are not accumulated. For purposes of this estimate, a waste inventory of 250 cubic feet of DAW and 65 cubic feet of biological waste was assumed.

3.5 Number and Dimensions of Facilities Components

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:	Pennington Building 3				
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2				
Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	1	Each	4'w x 3'd x 3't	36	ft^3
Fume Hoods	4	Each	5'w x 4'd x 8't	640	ft^3
Lab Benches (Casework)	82	Linear Feet	4'd x 3't	984	ft^3
Sinks	4	Each	4'w x 4'd x 3't	192	ft^3
Drains	260	Linear Feet	3" diameter	13	ft^3
Floors	See Listing	Class 1 Sq. Feet		940	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		1,905	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		1,905	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		940	ft^2
Ventilation/Ductwork	240	Linear Feet	18" diameter	211	ft^3
Cabinets	47	Linear Feet	3'd x 3't	423	ft^3
Hot Cells	0	Each		0	ea
Equipment/Materials	10	50 Ft^3 Units		500	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	1	Each		1	ea
Scrap Recovery Areas		Each		0	ft^2
Maintenance Shop		Each		0	ft^2
Equipment Decontamination		Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		22,265	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet	Includes 33,000 ft^2 for roof	99,800	ft^2
Other (Specify)		Each		0	ea
Other (Specify)		Each		0	ea

Features/Equipment Volume	2,999	ft^3
Waste Fraction	0.25	
Waste Volume	750	ft^3
Waste Density (lb/ft3)	20	
Waste Mass	14,996	lb

Name of room, laboratory, or area:	Pennington Building 10				
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2				
Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	1	Each	4'w x 3'd x 3't	36	ft^3
Fume Hoods	1	Each	5'w x 4'd x 8't	160	ft^3
Lab Benches (Casework)	6	Linear Feet	4'd x 3't	72	ft^3
Sinks	1	Each	4'w x 4'd x 3't	48	ft^3
Drains	40	Linear Feet	3" diameter	2	ft^3
Floors	See Listing	Class 1 Sq. Feet		400	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		600	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		600	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		400	ft^2
Ventilation/Ductwork	240	Linear Feet	18" diameter	211	ft^3
Cabinets	3	Linear Feet	3'd x 3't	27	ft^3
Hot Cells	0	Each		0	ea
Equipment/Materials	3	50 Ft^3 Units		150	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	1	Each		1	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination	0	Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		900	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet		2,700	ft^2
Other (Specify)		Each		0	ea
Other (Specify)		Each		0	ea

Features/Equipment Volume	706	ft^3
Waste Fraction	0.25	
Waste Volume	177	ft^3
Waste Density (lb/ft3)	20	
Waste Mass	3,531	lb

Name of room, laboratory, or area:	Pennington Building 17				
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2				
Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	2	Each	4'w x 3'd x 3't	72	ft^3
Fume Hoods	12	Each	5'w x 4'd x 8't	1,920	ft^3
Lab Benches (Casework)	786	Linear Feet	4'd x 3't	9,432	ft^3
Sinks	14	Each	4'w x 4'd x 3't	672	ft^3
Drains	380	Linear Feet	3" diameter	19	ft^3
Floors	See Listing	Class 1 Sq. Feet		5,924	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		5,235	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		5,235	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		5,924	ft^2
Ventilation/Ductwork	640	Linear Feet	18" diameter	563	ft^3
Cabinets	314	Linear Feet	3'd x 3't	2,826	ft^3
Hot Cells	0	Each			ea
Equipment/Materials	21	50 Ft^3 Units		1,050	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	2	Each		2	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination	0	Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		20,344	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet	Includes 87,300 ft^2 for roof	148,332	ft^2
Other (Specify)		Each		0	ea
Other (Specify)		Each		0	ea

Features/Equipment Volume	16,554	ft^3
Waste Fraction	0.25	
Waste Volume	4,139	ft^3
Waste Density (lb/ft3)	20	
Waste Mass	82,771	lb

Name of room, laboratory, or area:	Pennington Building 21				
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2				
Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	5	Each	4'w x 3'd x 3't	180	ft^3
Fume Hoods	86	Each	5'w x 4'd x 8't	13,760	ft^3
Lab Benches (Casework)	3310	Linear Feet	4'd x 3't	39,720	ft^3
Sinks	71	Each	4'w x 4'd x 3't	3,408	ft^3
Drains	3040	Linear Feet	3" diameter	152	ft^3
Floors	See Listing	Class 1 Sq. Feet		33,304	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		41,970	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		41,970	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		33,304	ft^2
Ventilation/Ductwork	2860	Linear Feet	18" diameter	2,517	ft^3
Cabinets	2009	Linear Feet	3'd x 3't	18,081	ft^3
Hot Cells	0	Each			ea
Equipment/Materials	217	50 Ft^3 Units		10,850	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	0	Each		0	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination		Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		21,274	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet	Includes 59,200 ft^2 for roof	123,022	ft^2
Other (Specify)		Each		0	ea
Other (Specify)		Each		0	ea

Features/Equipment Volume	88,668	ft^3
Waste Fraction	0.25	
Waste Volume	22,167	ft^3
Waste Density (lb/ft3)	20	
Waste Mass	443,339	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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Preparation of Documentation for Regulatory Agencies	15	10	10	5	0	0	20
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	2	2	0	0	0	2
Development of Work Plans	10	15	10	0	0	0	20
Procurement of Special Equipment	3	10	0	0	0	0	4
Staff Training	1	3	2	6	4	12	2
Characterization of Radiological Condition (including sampling, soil and tailings analysis, or groundwater analysis, if applicable)	15	15	15	60	0	0	2
Other (specify) Mobilization	1	3	2	6	4	12	2
TOTALS	47	58	41	77	8	24	52

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:	Pennington Building 3
Level of Contamination:	≈1,000 -10,000 dpm/100 cm2

Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp		0.5		0.2		1	
Fume Hoods	Remove/Disp	0.5	0.5		0.5	0.5	1.5	0.5
Lab Benches	Decon/Remove	0.5	0.5		0.5	0.5	1	0.5
Sinks	Decon/Remove	0.5	0.5		0.5	0.5	0.5	0.5
Drains	Remove/Disp	0.5	0.5		0.5	0.5	0.5	
Floors	Decon/Wipe	0.5	0.5		0.5	0.5	1	0.5
Walls	Decon/Wipe	0.5	0.5		0.5	0.5	1	0.5
Ceilings	Decon/Wipe	0.5	0.5		0.5	0.5	1	0.5
Ventilation/Ductwork	Remove/Disp	0.5	0.5		0.5	0.5	1	0.5
Cabinets	Decon/Remove	0.5	0.5		0.5	0.5	1	0.5
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp		1	2	1	0.5	1.5	0.5
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp	0.5	1		1	1	1	0.5
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify)	Remove/Disp							
Other (specify)	Remove/Disp							
TOTALS		5	7	2	6.7	6	12	5

Name of room, laboratory, or area:		Pennington Building 10						
Level of Contamination:		≈1,000 -10,000 dpm/100 cm2						
Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp	0.1	0.1		0.1	0.1	0.2	0.1
Fume Hoods	Remove/Disp	0.1	0.1		0.2	0.2	0.4	0.1
Lab Benches	Decon/Remove	0.1			0.1	0.1	0.2	0.1
Sinks	Decon/Remove	0.1			0.1	0.1	0.2	0.1
Drains	Remove/Disp	0.1	0.1		0.2	0.2	0.4	0.1
Floors	Decon/Wipe	0.1	0.1		0.1	0.1	0.2	0.1
Walls	Decon/Wipe	0.1	0.1		0.1	0.1	0.2	0.1
Ceilings	Decon/Wipe	0.1			0.1	0.1	0.2	0.1
Ventilation/Ductwork	Remove/Disp	0.1	0.1		0.2	0.2	0.4	0.1
Cabinets	Decon/Remove	0.1	0.1		0.1	0.1	0.2	0.1
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp		0.1	0.5	0.1	0.1	0.2	
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp		0.2	0.5	0.1	0.1	0.2	
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify)	Remove/Disp							
Other (specify)	Remove/Disp							
TOTALS		1	1	1	1.5	1.5	3	1

Name of room, laboratory, or area:		Pennington Building 17						
Level of Contamination:		≈1,000 -10,000 dpm/100 cm2						
Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp	1	1	1	1	1	3	1
Fume Hoods	Remove/Disp	3	4		4	4	12	3
Lab Benches	Decon/Remove	3	3		2	2	6	3
Sinks	Decon/Remove	2	1		2	2	6	2
Drains	Remove/Disp	2	1	1	2	2	6	2
Floors	Decon/Wipe	1	1		1	1	3	1
Walls	Decon/Wipe	1	1		1	1	3	1
Ceilings	Decon/Wipe	1	1		1	1	3	1
Ventilation/Ductwork	Remove/Disp	2	2		2	2	6	2
Cabinets	Decon/Remove	1	1		2	2	6	1
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp	3	4	1	2	2	6	3
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp							
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify)	Remove/Disp							
Other (specify)	Remove/Disp							
TOTALS		20	20	3	20	20	60	20

Name of room, laboratory, or area:		Pennington Building 21						
Level of Contamination:		≈1,000 -10,000 dpm/100 cm2						
Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp	2	6	4	12	8	24	4
Fume Hoods	Remove/Disp	12	36	10	72	48	144	24
Lab Benches	Decon/Remove	10	30	5	60	40	120	20
Sinks	Decon/Remove	5	15	5	30	20	60	10
Drains	Remove/Disp	5	15	5	30	20	60	10
Floors	Decon/Wipe	10	30	10	60	40	120	20
Walls	Decon/Wipe	5	15	5	30	20	60	10
Ceilings	Decon/Wipe	3	9	4	18	12	36	6
Ventilation/Ductwork	Remove/Disp	10	30	10	60	40	120	20
Cabinets	Decon/Remove	5	15	4	30	20	60	10
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp	10	30	15	60	40	120	20
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp	3	9	3	18	12	36	6
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify)	Remove/Disp							
Other (specify)	Remove/Disp							
TOTALS		80	240	80	480	320	960	160

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.

Name of room, laboratory, or area:	Pennington Building 3						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	0	0.2	0	0	0.2	0.3	0
Restore Walls	0	0.2	0	0	0.2	0.3	0
Restore Roof	0	0.2	0	0	0.2	0.3	0
Restore Utilites	0	0.4	0	0	0.4	0.1	0
TOTALS	0	1	0	0	1	1	0

Name of room, laboratory, or area:	Pennington Building 10						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	0	0	0	0	0.2	0.3	0
Restore Walls	0	0	0	0	0.1	0.3	0
Restore Roof	0	0	0	0	0.2	0.3	0
Restore Utilites	0	0.5	0	0	0.5	0.1	0
TOTALS	0	0.5	0	0	1	1	0

Name of room, laboratory, or area:	Pennington Building 17						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	0.5	0.5	0	0	1	1	
Restore Walls	0.5	0.5	0	0	1	1	
Restore Roof	0.5	0.5	0	0	1	1	
Restore Utilites	0.5	0.5	0	0	1	1	
TOTALS	2	2	0	0	4	4	0

Name of room, laboratory, or area:	Pennington Building 21						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	2	2	0	0	4	6	2
Restore Walls	1	1	0	0	2	3	1
Restore Roof	2	2	0	0	4	6	2
Restore Utilites	3	3	0	0	6	9	3
TOTALS	8	8	0	0	16	24	8

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.

Name of room, laboratory, or area:	Pennington Building 3						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	1	1	1	1	0	0	0.5
Survey Packages	1	1	0	1	0	0	0.5
Class 1	0.2	0.2	0	3	0	0	0.1
Class 2	0.2	0.2	0	3	0	0	0.1
Class 3	0.2	0.2	0	3	0	0	0.1
TOTALS	2.6	2.6	1	11	0	0	1.3

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

Name of room, laboratory, or area:	Pennington Building 10						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	0.5	0.5	0.5	0.5	0		0.2
Survey Packages	0.5	0.5	0	0.5	0		0.2
Class 1	0.1	0.1	0	1.5	0		0.2
Class 2	0.1	0.1	0	1.5	0		0.2
Class 3	0.1	0.1	0	1.5	0		0.2
TOTALS	1.3	1.3	0.5	5.5	0	0	1

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

Name of room, laboratory, or area:	Pennington Building 17						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	2	2	2	2	0	0	2
Survey Packages	2	2	2	2	0	0	2
Class 1	3	3	2	18	0	0	3
Class 2	2	2	2	5	0	0	2
Class 3	1	1	2	3	0	0	1
TOTALS	10	10	10	30	0	0	10

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

Name of room, laboratory, or area:	Pennington Building 21						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	5	5	5	5	0	0	5
Survey Packages	5	5	5	5	0	0	5
Class 1	12	12	12	113	0	0	12
Class 2	2	2	2	15	0	0	2
Class 3	2	2	2	5	0	0	2
TOTALS	26	26	26	143	0	0	26

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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
No Site Stabilization or							
Long Term Maintenance							
TOTALS	0	0	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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Planning and Preparation (TOTALS from Table 3.6)	47	58	41	77	8	24	52
Decontamination and/or Dismantling of Radioactive Facility Components (Sum of TOTALS from all copies of Table 3.7)	106	268	86	508.2	347.5	1035	186
Restoration of Contaminated Areas on Facility Grounds (TOTALS from Table 3.8)	10	11.5	0	0	22	30	8
Final Radiation Survey (TOTALS from Table 3.9)	39.9	39.9	37.5	189.5	0	0	38.3
Site Stabilization and Long-Term Surveillance (TOTALS from Table 3.10)	0	0	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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Salary & Fringe ($/year)	$85,000	$60,000	$60,000	$40,000	$44,000	$30,000	$22,000
Overhead Rate (%)	100%	100%	100%	100%	100%	100%	100%
Total Cost Per Year	$170,000	$120,000	$120,000	$80,000	$88,000	$60,000	$44,000
Living Expenses (PD*7/5)[1]	$294	$294	$294	$294	$0	0	0
Total Cost Per Work Day[2]	$948	$756	$756	$602	$338	$231	$169

[1] Per Diem Rate: $210 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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical	Total Labor Cost
Planning and Preparation	$44,549	$43,821	$30,977	$46,330	$2,708	$5,538	$8,800	$182,724
Decontamination and/or Dismantling of Radioactive Facility Components	$100,472	$202,484	$64,976	$305,780	$117,615	$238,846	$31,477	$1,061,651
Restoration of Contaminated Areas on Facility Grounds	$9,478	$8,689	$0	$0	$7,446	$6,923	$1,354	$33,890
Final Radiation Survey	$37,819	$30,146	$28,333	$114,021	$0	$0	$6,482	$216,800
Site Stabilization and Long-Term Surveillance	$0	$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	1000	11	B-25	$700	$7,700
Metal	27,232	14	40' Sea-Land	$1,000	$14,000
Liquids	5	1	55 gal. inner 85 gal.overpack	$200	$200
Biological	15	2	55 gal. inner 85 gal.overpack	$200	$400
TOTAL					$22,300

(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 ($/mile/truckload)	Surcharges ($/mile)	Overweight Charges($/mile)	Distance Shipped (miles)	Total Shipping Costs
DAW	2	$1.70	1	1	800	$2,720
Metal	14	$1.70	1	1	800	$19,040
Liquids	0	$1.70	1	1	1	$0
Biological	0	$1.70	1	1	1	$0
TOTAL	16					$21,760

(c) Waste Disposal Costs

Estimate the volume of waste to be disposed. Multiply the volume of waste disposed by the unite\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	1000	15	15000	6.70	1	$100,500
Metal	27232	20	544637	1.25	1	$680,796
Liquids	5	60	300	7.00	1	$2,100
Biological	15	20	300	10.00	1	$3,000
TOTAL	28252					$786,396

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	1	$20,000	$20,000
Respirators	0		$0
Misc Tools	1	$10,000	$10,000
Consumables	1	$20,000	$20,000
TOTAL			$50,000

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	100	$100	$10,000
Transport of Samples	10	$50	$500
Testing and Analysis	100	$100	$10,000
Other (specify)			
TOTAL			$20,500

3.17 MISCELLANEOUS COSTS

Estimate any other applicable costs.	
Activity	Total Cost
License Fees	$20,000
Insurance	$16,772
Taxes	$239,602
Other (specify): Disposal Access Fee	$1,500
TOTAL	$277,874

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 then 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)	$182,724	6.8%
Decontamination and/or Dismantling of Radioactive Facility (From Table 3.13)	$1,061,651	39.7%
Restoration of Contaminated Areas on Facility Grounds (From Table 3.13)	$33,890	1.3%
Final Radiation Survey (From Table 3.13)	$216,800	8.1%
Packing Material Costs (TOTAL from Table 3.14(a))	$22,300	0.8%
Shipping Costs (TOTAL from Table 3.14(b))	$21,760	0.8%
Waste Disposal Costs (TOTAL from Table 3.14(c))	$786,396	29.4%
Equipment/Supply Costs (TOTAL from Table 3.15)	$50,000	1.9%
Laboratory Costs (TOTAL from Table 3.16)	$20,500	0.8%
Miscellaneous Costs (TOTAL from Table 3.17)	$277,874	10.4%
SUBTOTAL	$2,673,895	100.0%
25% Contingency	$668,474	25.0%
TOTAL DECOMMISSIONING COST ESTIMATE	$3,342,369	125.0%

Bldg. 3		Features										
		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft³ - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft³)	
3A-009	1	6	1	40	1	1	100	0	0	3	150	
Waste Stg.												
3B-224A	3	35	1	80	1	0	40	0.4	14	2	100	
3B-224	3	6	1	80	1	0	40	2	12	4	200	
3A-128	2	35	1	60	1	0	60	0.6	21	1	50	
Facility Totals		82	4	260	4	1	240		47	10	500	
Floor Areas												
Total Facility	101,200											
Class 1	940											
Class 2	22,265	25%										
Class 3	66,795	75%										
Non-Impacted	11,200											

Bldg. 10		Features										
		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft³ - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft³)	
10.1107B	1	6	1	40	1	1	100	0.5	3	3	150	
Waste Stg.												
Facility Totals		6	1	40	1	1	100		3	3	150	
Floor Areas												
Total Facility	4,000											
Class 1	400											
Class 2	900	25%										
Class 3	2,700	75%										
Non-Impacted	0											

	Floors				Walls				Ceilings				Waste	
Bldg. 3	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
3A-009	1	15	20	300	2	15	15	450	1	15	20	300	DAW	50
Waste Stg.					2	20	15	600						
3B-224A	1	12	20	240	2	12	15	360	1	12	20	240		
					2	20	15	600						
3B-224	1	8	20	160	2	8	15	240	1	8	20	160		
					2	20	15	600						
3A-128	1	20	12	240	2	20	15	600	1	20	12	240		
					2	12	15	360						
Facility Totals				940				3810				940	Waste	
Floor Areas														
Total Facility													DAW	50
Class 1													Liquid	0
Class 2													Biological	0
Class 3														
Non-Impacted														

	Floors				Walls				Ceilings				Waste	
Bldg. 10	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
10.1107B	1	20	20	400	2	20	15	600	1	20	20	400	DAW	50
Waste Stg.					2	20	15	600					Liquid	5
Facility Totals				400				1200				400	Waste	
Floor Areas														
Total Facility													DAW	50
Class 1													Liquid	5
Class 2													Biological	0
Class 3														
Non-Impacted														

Bldg. 17	Features											
		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft³ - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft³)	
264	1	640	10	220	7	1	220	0.4	256	10	500	
Open Lab												
244	1	26	1	40	1	0	80	0.4	10	2	100	
903	1	40	1	40	1	0	80	0.4	16	1	50	
923	1	40	1	40	1	0	80	0.4	16	1	50	
313	1	40	1	40	1	0	80	0.4	16	1	50	
408	1	0	0	0	0	0	0	0	0	2	100	
Bio Waste Frzr												
301	1	0	0	0	1	1	100	0	0	4	200	
Rad Waste Stg												
Facility Totals		786	14	380	12	2	640		314.4	21	1050	
Floor Areas												
Total Facility	87,300											
Class 1	5,924											
Class 2	20,344	25%										
Class 3	61,032	75%										
Non-Impacted	0											

	Floors				Walls				Ceilings				Waste	
Bldg. 17	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
264	1	90	45	4050	2	90	15	2700	1	90	45	4050	DAW	50
Open Lab					2	45	15	1350					Biological	15
244	1	12	20	240	2	12	15	360	1	12	20	240		
					2	20	15	600						
903	1	22	14	308	2	22	15	660	1	22	14	308		
					2	14	15	420						
923	1	22	14	308	2	22	15	660	1	22	14	308		
					2	14	15	420						
313	1	22	12	264	2	22	15	660	1	22	12	264		
					2	12	15	360						
408	1	17	12	204	2	17	15	510	1	17	12	204	Biological	50
Bio Waste Frzr					2	12	15	360						
301	1	22	25	550	2	22	15	660	1	22	25	550	DAW	100
Rad Waste Stg					2	25	15	750						
Facility Totals				5924				10470				5924	Waste	
Floor Areas														
Total Facility													DAW	150
Class 1													Liquid	0
Class 2													Biological	65
Class 3														
Non-Impacted														

	Features											
Bldg. 21		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft^3 - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft^3)	
1310	1	24	1	40	0	0	0	1	24	1	50	
1312	1	42	1	40	0	0	0	0.4	17	8	400	
1315	1	14	0	0	4	0	120	1	14	4	200	
1215	1	20	1	40	4	0	120	0.4	8	4	200	
1217	1	8	1	40	1	0	60	0.2	2	2	100	
1212	1	24	0	0	0	0	0	1	24	8	400	
1210	1	17	1	40	0	0	0	0.4	7	1	50	
1211	1	18	1	40	0	0	0	0.4	7	1	50	
1209	1	54	1	40	2	0	80	0.4	22	2	100	
1206	1	86	2	60	1	2	100	0.4	34	4	200	
1208	1	112	2	60	2	0	80	0.8	90	4	200	
1214	1	112	2	60	2	0	80	0.8	90	4	200	
1218	1	112	2	60	2	0	80	0.8	90	4	200	
1402	1	0	0	0	0	0	0	0	0	12	600	
1404/06	1	20	1	40	8	0	200	1	20	4	200	
1408/10	1	120	1	40	0	0	0	0.4	48	3	150	
1412	1	9	1	40	0	0	0	0.4	4	1	50	
Cold Room												
1416	1	12	1	40	1	0	60	0.4	5	1	50	
1418	1	30	1	40	4	0	120	0.4	12	1	50	
1420	1	46	1	40	0	0	0	0.4	18	1	50	
1422	1	30	0	0	0	0	0	0.4	12	6	300	
1409	1	90	2	60	2	0	80	0.6	54	4	200	
1407	1	90	2	60	1	0	60	0.6	54	4	200	
1405	1	90	2	60	2	0	80	0.4	36	4	200	
1403	1	60	1	40	2	0	80	0.4	24	3	150	
1330	1	10	0	0	0	0	0	1	10	4	200	

	Floors				Walls				Ceilings				Waste	
Bldg. 21	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
1310	1	14	12	168	2	14	15	420	1	14	12	168		
					2	12	15	360						
1312	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
1315	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
1215	1	30	20	600	2	30	15	900	1	30	20	600		
					2	20	15	600						
1217	1	9	15	135	2	9	15	270	1	9	15	135		
					2	15	15	450						
1212	1	20	20	400	3	20	15	900	1	20	20	400		
					2	20	15	600						
1210	1	10	12	120	2	10	15	300	1	10	12	120		
					2	12	15	360						
1211	1	10	12	120	2	10	15	300	1	10	12	120		
					2	12	15	360						
1209	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
1206	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
1208	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
1214	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
1218	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
1402	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
1404/06	1	20	40	800	2	20	15	600	1	20	40	800		
					2	40	15	1200						
1408/10	1	20	30	600	2	20	15	600	1	20	30	600		
					2	30	15	900						
1412	1	20	9	180	2	20	15	600	1	20	9	180		
Cold Room					2	9	15	270						
1416	1	20	10	200	2	20	15	600	1	20	10	200		
					2	10	15	300						
1418	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
1420	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
1422	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
1409	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
1407	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
1405	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
1403	1	33	20	660	2	33	15	990	1	33	20	660		
					2	20	15	600						
1330	1	20	30	600	2	20	15	600	1	20	30	600		
					2	30	15	900						

Bldg. 21		Features										
		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft^3 - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft^3)	
2424	2	0	0	0	0	0	0	0	0	10	500	
2422	2	44	0	0	0	1	40	0.1	4	1	50	
2420	2	44	1	60	0	1	40	0.2	9	1	50	
2418	2	24	1	60	0	0	0	0.2	5	4	200	
2414	2	24	1	60	4	0	100	0.4	10	4	200	
2410	2	20	1	60	0	0	0	0.2	4	4	200	
2408A	2	15	1	60	0	0	0	0.2	3	1	50	
2408	2	55	1	60	0	0	0	0.4	22	4	200	
2406	2	28	1	60	4	0	100	0.4	11	2	100	
2404	2	12	0	0	2	0	60	0.2	2	2	100	
2402	2	24	2	80	0	0	0	0.4	10	2	100	
2417	2	120	2	80	2	0	60	0.6	72	4	200	
2409	2	120	2	80	2	0	60	0.6	72	4	200	
2407	2	120	2	80	2	0	60	0.6	72	4	200	
2405	2	120	2	80	2	0	60	0.6	72	4	200	
2403	2	80	1	60	1	0	40	0.6	48	2	100	
2203	2	26	1	60	4	0	100	0.6	16	4	200	
2205	2	40	0	0	0	0	0	0.4	16	4	200	
2207	2	30	1	60	1	0	40	0.4	12	2	100	
2210	2	0	0	0	0	0	0	0	0	1	50	
2211	2	0	0	0	0	0	0	0	0	1	50	

	Floors				Walls				Ceilings				Waste	
Bldg. 21	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
2424	1	20	10	200	2	20	15	600	1	20	10	200		
					2	10	15	300						
2422	1	20	10	200	2	20	15	600	1	20	10	200		
					2	10	15	300						
2420	1	20	10	200	2	20	15	600	1	20	10	200		
					2	10	15	300						
2418	1	20	10	200	2	20	15	600	1	20	10	200		
					2	10	15	300						
2414	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
2410	1	20	15	300	2	20	15	600	1	20	15	300		
					2	15	15	450						
2408A	1	9	9	81	2	9	15	270	1	9	9	81		
					2	9	15	270						
2408	1	20	25	500	2	20	15	600	1	20	25	500		
					2	25	15	750						
2406	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
2404	1	20	10	200	2	20	15	600	1	20	10	200		
					2	10	15	300						
2402	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
2417	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
2409	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
2407	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
2405	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
2403	1	33	20	660	2	33	15	990	1	33	20	660		
					2	20	15	600						
2203	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
2205	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
2207	1	20	10	200	2	20	15	600	1	20	10	200		
					2	10	15	300						
2210	1	10	12	120	2	10	15	300	1	10	12	120		
					2	12	15	360						
2211	1	10	12	120	2	10	15	300	1	10	12	120		
					2	12	15	360						

Bldg. 21		Features										
		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft^3 - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft^2)	
2311	2	10	1	60	0	0	0	0.4	4	2	100	
2310	2	0	0	0	0	0	0	0	0	2	100	
2309	2	0	0	0	0	0	0	0	0	8	400	
2215	2	30	1	60	4	0	100	0.4	12	2	100	
2217	2	36	1	60	0	0	0	0.4	14	3	150	
2315	2	30	1	60	4	0	100	0.4	12	2	100	
2307	2	20	1	60	0	0	0	0.4	8	4	200	
2305	2	18	1	60	0	0	0	0.4	7	2	100	
2303	2	20	2	80	0	0	0	0.4	8	3	150	
2302	2	82	1	60	2	0	60	0.8	66	4	200	
2306	2	124	2	80	2	0	60	0.8	99	4	200	
2308	2	124	2	80	2	0	60	0.8	99	4	200	
2314	2	124	2	80	2	0	60	0.8	99	4	200	
2318	2	124	2	80	2	0	60	0.8	99	3	150	
2218	2	124	2	80	2	1	80	0.8	99	3	150	
2208	2	124	2	80	2	0	60	0.8	99	3	150	
2206	2	124	2	80	2	0	60	0.8	99	4	200	
Facility Totals		3310	71	3040	86	5	2860		2009	217	10850	
Floor Areas												
Total Facility	118,400											
Class 1	33,304											
Class 2	21,274	25%										
Class 3	63,822	75%										
Non-Impacted	0											

	Floors				Walls				Ceilings				Waste	
Bldg. 21	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
2311	1	10	12	120	2	10	15	300	1	10	12	120		
					2	12	15	360						
2310	1	10	12	120	2	10	15	300	1	10	12	120		
					2	12	15	360						
2309	1	10	20	200	2	10	15	300	1	10	20	200		
					2	20	15	600						
2215	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
2217	1	20	16	320	2	20	15	600	1	20	16	320		
					2	16	15	480						
2315	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
2307	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
2305	1	10	10	100	2	10	15	300	1	10	10	100		
					2	10	15	300						
2303	1	20	20	400	2	20	15	600	1	20	20	400		
					2	20	15	600						
2302	1	33	20	660	2	33	15	990	1	33	20	660		
					2	20	15	600						
2306	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
2308	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
2314	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
2318	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
2218	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
2208	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
2206	1	33	30	990	2	33	15	990	1	33	30	990		
					2	30	15	900						
Facility Totals				33304				83940				33304	Waste	
Floor Areas														
Total Facility													DAW	0
Class 1													Liquid	0
Class 2													Biological	0
Class 3														
Non-Impacted														

3.4 FACILITY DECOMMISSIONING SUMMARY

Radioactive Material license numbers and types (i.e., Byproduct, Source):
The Bristol-Myers Squibb facility located at Route 206 and Provinceline Rd, Lawrenceville, NJ is licensed under USNRC Byproduct Materials license number 29-00139-02.
Types and quantities of materials authorized under the licenses listed above:
Byproduct Material atomic number 1 through 83, except Sr-90, 200 mCi per radionuclide, 6 Ci total; H-3 7 Ci; C-14 5 Ci; P-33 1 Ci; S-35 10 Ci; I-125 500 mCi; Ni-63 sources per registration IAW 10 CFR 32.210. Cs-137 Sealed sources J. L. Shepherd and Assocs. Model 6810 IAW USNRC device registration certificate.
Description of how licensed materials are used:
Low energy beta emitting radionuclides and radioiodines are used in pharmaceutical research and development. This work involves both labeling compounds on a small scale and use of labeled compounds. Research includes new discovery, applications testing, metabolic studies, and biological testing involving animal studies.The radioactive materials are used in laboratory facilities on a research and development scale.
Description of facility, including buildings, rooms, grounds, and description of where particular types of materials are used:
The Lawrenceville facility consists of multi-story research and development laboratory buildings constructed as a series of modules attached to a large central "backbone" building. Each building module elevation is generally on the order of 35,000 gross square feet. Radionuclides are used extensively in Buildings F1, H and K. Laboratory H.4613 is used for iodination and is equipped with a dedicated ventilation system located in an equipment penthouse on top of building H. Radionuclides are used on a limited basis in Buildings G1 and L1. Two Cs-137 kiloCurie self-shielded irradiators are used at the facility. One is located in laboratory G1.2109A and the other is located in the K building basement. Building G also includes a vivarium for mammal studies.
Quantities of materials or waste accumulated before shipping or disposal
The principal waste collection and storage areas for the Lawrenceville facility are F1.1514 room and F1.1190 cage. Waste types typically include DAW, a small amount of biological waste and aqueous liquid wastes. All wastes, including liquids are collected and sent for offsite processing and disposal. The facility does not release radionuclides to the sanitary sewer or stormdrain systems. Typically waste is shipped offsite when waste inventory reaches 300 cubic feet. In general 3 shipments are made per year. For purposes of this estimate a waste inventory of 500 cubic feet of DAW and 64 cubic feet of aqueous liquid was assumed.

3.5 Number and Dimensions of Facilities Components

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:	Lawrenceville Building F1
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2

Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	3	Each	4'w x 3'd x 3't	108	ft^3
Fume Hoods	35	Each	5'w x 4'd x 8't	5,600	ft^3
Lab Benches (Casework)	1614	Linear Feet	4'd x 3't	19,368	ft^3
Sinks	46	Each	4'w x 4'd x 3't	2,208	ft^3
Drains	2620	Linear Feet	3" diameter	131	ft^3
Floors	See Listing	Class 1 Sq. Feet		17,133	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		24,435	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		24,435	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		17,133	ft^2
Ventilation/Ductwork	1780	Linear Feet	18" diameter	1,566	ft^3
Cabinets	631	Linear Feet	3'd x 3't	5,679	ft^3
Hot Cells	0	Each		0	ea
Equipment/Materials	70	50 Ft^3 Units		3,500	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	2	Each		2	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination	0	Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		17,217	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet	Includes 21,400 ft^2 for roof	73,050	ft^2
Other (Specify)		Each		0	ea
Other (Specify)		Each		0	ea

Features/Equipment Volume	38,160	ft^3
Waste Fraction	0.25	
Waste Volume	9,540	ft^3
Waste Density (lb/ft3)	20	
Waste Mass	190,802	lb

Name of room, laboratory, or area:	Lawrenceville Building H				
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2				
Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	2	Each	4'w x 3'd x 3't	72	ft^3
Fume Hoods	1	Each	5'w x 4'd x 8't	160	ft^3
Lab Benches (Casework)	316	Linear Feet	4'd x 3't	3,792	ft^3
Sinks	9	Each	4'w x 4'd x 3't	432	ft^3
Drains	780	Linear Feet	3" diameter	39	ft^3
Floors	See Listing	Class 1 Sq. Feet		4,905	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		7,020	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		7,020	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		4,905	ft^2
Ventilation/Ductwork	180	Linear Feet	18" diameter	158	ft^3
Cabinets	79	Linear Feet	3'd x 3't	711	ft^3
Hot Cells	0	Each		0	ea
Equipment/Materials	28.5	50 Ft^3 Units		1,425	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	0	Each		0	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination	0	Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		20,549	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet	Includes 30,000 ft^2 for roof	91,646	ft^2
Other (Specify)		Each		0	ea
Other (Specify)		Each		0	ea

Features/Equipment Volume	6,789	ft^3
Waste Fraction	0.25	
Waste Volume	1,697	ft^3
Waste Density (lb/ft3)	20	
Waste Mass	33,947	lb

Name of room, laboratory, or area:	Lawrenceville Building K				
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2				
Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	3	Each	4'w x 3'd x 3't	108	ft^3
Fume Hoods	56	Each	5'w x 4'd x 8't	8,960	ft^3
Lab Benches (Casework)	2178	Linear Feet	4'd x 3't	26,136	ft^3
Sinks	59	Each	4'w x 4'd x 3't	2,832	ft^3
Drains	2900	Linear Feet	3" diameter	145	ft^3
Floors	See Listing	Class 1 Sq. Feet		23,127	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		33,000	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		33,000	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		23,127	ft^2
Ventilation/Ductwork	2180	Linear Feet	18" diameter	1,918	ft^3
Cabinets	1093	Linear Feet	3'd x 3't	9,837	ft^3
Hot Cells	0	Each			ea
Equipment/Materials	86.5	50 Ft^3 Units		4,325	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	0	Each		0	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination	0	Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		18,518	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet	Includes 33,000 ft^2 for roof	88,555	ft^2
Other (Specify)	1	Each	Self Shielded Irradiator	1	ea
Other (Specify)		Each		0	ea

Features/Equipment Volume	54,261	ft^3
Waste Fraction	0.25	
Waste Volume	13,565	ft^3
Waste Density (lb/ft3)	20	
Waste Mass	271,307	lb

Name of room, laboratory, or area:	Lawrenceville Building G1				
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2				
Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	1	Each	4'w x 3'd x 3't	36	ft^3
Fume Hoods	0	Each	5'w x 4'd x 8't	0	ft^3
Lab Benches (Casework)	38	Linear Feet	4'd x 3't	456	ft^3
Sinks	1	Each	4'w x 4'd x 3't	48	ft^3
Drains	100	Linear Feet	3" diameter	5	ft^3
Floors	See Listing	Class 1 Sq. Feet		677	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		1,620	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		1,620	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		677	ft^2
Ventilation/Ductwork	40	Linear Feet	18" diameter	35	ft^3
Cabinets	6	Linear Feet	3'd x 3't	54	ft^3
Hot Cells	0	Each		0	ea
Equipment/Materials	5	50 Ft^3 Units		250	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	0	Each		0	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination	0	Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		15,733	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet		47,198	ft^2
Other (Specify)	1	Each	Self Shielded Irradiator	1	ea
Other (Specify)		Each		0	ea

Features/Equipment Volume	884	ft^3
Waste Fraction	0.25	
Waste Volume	221	ft^3
Waste Density (lb/ft3)	20	
Waste Mass	4,421	lb

Name of room, laboratory, or area:	Lawrenceville Building L1				
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2				
Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	0	Each	4'w x 3'd x 3't	0	ft^3
Fume Hoods	3	Each	5'w x 4'd x 8't	480	ft^3
Lab Benches (Casework)	151	Linear Feet	4'd x 3't	1,812	ft^3
Sinks	3	Each	4'w x 4'd x 3't	144	ft^3
Drains	180	Linear Feet	3" diameter	9	ft^3
Floors	See Listing	Class 1 Sq. Feet		3,270	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		2,985	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		2,985	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		3,270	ft^2
Ventilation/Ductwork	240	Linear Feet	18" diameter	211	ft^3
Cabinets	45.3	Linear Feet	3'd x 3't	408	ft^3
Hot Cells	0	Each			ea
Equipment/Materials	13	50 Ft^3 Units		650	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	0	Each		0	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination	0	Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		15,733	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet		47,198	ft^2
Other (Specify)		Each		0	ea
Other (Specify)		Each		0	ea
				3,714	ft^3
			Waste Fraction	0.25	
			Waste Volume	928	ft^3
			Waste Density (lb/ft3)	20	
			Waste Mass	18,570	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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Preparation of Documentation for Regulatory Agencies	15	10	10	5	0	0	20
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	2	2	0	0	0	2
Development of Work Plans	10	15	10	0	0	0	20
Procurement of Special Equipment	3	10	0	0	0	0	4
Staff Training	1	3	2	6	4	12	2
Characterization of Radiological Condition (including sampling, soil and tailings analysis, or groundwater analysis, if applicable)	15	15	15	60	0	0	2
Other (specify) Mobilization	1	3	2	6	4	12	2
TOTALS	47	58	41	77	8	24	52

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:		Lawrenceville Building F1						
Level of Contamination:		≈1,000 -10,000 dpm/100 cm2						
Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp	1	3	3	6	4	12	2
Fume Hoods	Remove/Disp	8	24	8	48	32	96	16
Lab Benches	Decon/Remove	7	21	6	42	28	84	14
Sinks	Decon/Remove	3	9	3	18	12	36	6
Drains	Remove/Disp	4	12	3	24	16	48	8
Floors	Decon/Wipe	8	24	6	48	32	96	16
Walls	Decon/Wipe	4	12	4	24	16	48	8
Ceilings	Decon/Wipe	3	9	4	18	12	36	6
Ventilation/Ductwork	Remove/Disp	8	24	8	48	32	96	16
Cabinets	Decon/Remove	4	12	4	24	16	48	8
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp	8	24	8	48	32	96	16
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp	2	6	3	12	8	24	4
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify)	Remove/Disp							
Other (specify)	Remove/Disp							
TOTALS		60	180	60	360	240	720	120

Name of room, laboratory, or area:		Lawrenceville Building H						
Level of Contamination:		≈1,000 -10,000 dpm/100 cm2						
Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp	0	0.5	0.5	1	1	2	0
Fume Hoods	Remove/Disp	1	3	1	6	4	12	2
Lab Benches	Decon/Remove	1	3	1	5	4	12	2
Sinks	Decon/Remove	0.5	1	0.5	2	2	5	1
Drains	Remove/Disp	0.5	2		3	2	6	1
Floors	Decon/Wipe	1	3	1	6	4	13	2
Walls	Decon/Wipe	0.5	2	1	3	2	6	1
Ceilings	Decon/Wipe	0.5	1		2	2	5	1
Ventilation/Ductwork	Remove/Disp	1	3	1	6	4	13	2
Cabinets	Decon/Remove	0.5	2	1	3	2	6	1
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp	1	3	1	6	4	13	2
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp	0.5	1	1	2	1	3	1
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify)	Remove/Disp							
Other (specify)	Remove/Disp							
TOTALS		8	24.5	9	45	32	96	16

Name of room, laboratory, or area:		Lawrenceville Building K						
Level of Contamination:		≈1,000 -10,000 dpm/100 cm2						
Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp	1	3	3	6	4	12	2
Fume Hoods	Remove/Disp	8	24	8	48	32	96	16
Lab Benches	Decon/Remove	7	21	6	42	28	84	14
Sinks	Decon/Remove	3	9	3	18	12	36	6
Drains	Remove/Disp	4	12	3	24	16	48	8
Floors	Decon/Wipe	8	24	6	48	32	96	16
Walls	Decon/Wipe	4	12	4	24	16	48	8
Ceilings	Decon/Wipe	3	9	4	18	12	36	6
Ventilation/Ductwork	Remove/Disp	8	24	8	48	32	96	16
Cabinets	Decon/Remove	4	12	4	24	16	48	8
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp	8	24	8	48	32	96	16
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp	2	6	3	12	8	24	4
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify): Irradiator	Remove/Disp	1	2	2	2	0	0	0
Other (specify)	Remove/Disp							
TOTALS		61	182	62	362	240	720	120

Name of room, laboratory, or area:		Lawrenceville Building G1						
Level of Contamination:		≈1,000 -10,000 dpm/100 cm2						
Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp		0.1		0.1	0.2	0.2	0.1
Fume Hoods	Remove/Disp				0.2	0.4	0.4	0.1
Lab Benches	Decon/Remove		0.1		0.1	0.2	0.2	0.1
Sinks	Decon/Remove				0.1	0.2	0.2	0.1
Drains	Remove/Disp		0.1		0.2	0.4	0.4	0.1
Floors	Decon/Wipe		0.1		0.1	0.2	0.2	0.1
Walls	Decon/Wipe		0.1		0.1	0.2	0.2	0.1
Ceilings	Decon/Wipe		0.1		0.1	0.2	0.2	0.1
Ventilation/Ductwork	Remove/Disp		0.2		0.3	0.6	0.6	0.1
Cabinets	Decon/Remove		0.1		0.1	0.2	0.2	0.1
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp		0.1		0.1	0.2	0.2	
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp							
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify) Irradiator	Remove/Disp		1		1	1		
Other (specify)	Remove/Disp							
TOTALS		0	2	0	2.5	4	3	1

Name of room, laboratory, or area:		Lawrenceville Building L1						
Level of Contamination:		≈1,000 -10,000 dpm/100 cm2						
Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp		0.1		0.1	0.2	0.2	0.1
Fume Hoods	Remove/Disp				0.2	0.4	0.4	0.1
Lab Benches	Decon/Remove		0.1		0.1	0.2	0.2	0.1
Sinks	Decon/Remove				0.1	0.2	0.2	0.1
Drains	Remove/Disp		0.1		0.2	0.4	0.4	0.1
Floors	Decon/Wipe		0.1		0.1	0.2	0.2	0.1
Walls	Decon/Wipe		0.1		0.1	0.2	0.2	0.1
Ceilings	Decon/Wipe		0.1		0.1	0.2	0.2	0.1
Ventilation/Ductwork	Remove/Disp		0.2		0.3	0.6	0.6	0.1
Cabinets	Decon/Remove		0.1		0.1	0.2	0.2	0.1
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp		0.1		0.1	0.2	0.2	
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp							
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify)	Remove/Disp							
Other (specify)	Remove/Disp							
TOTALS		0	1	0	1.5	3	3	1

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.

Name of room, laboratory, or area:	Lawrenceville Building F1						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	1.5	1.5	0	0	3	4.5	1.5
Restore Walls	1	1	0	0	2	3	1
Restore Roof	1.5	1.5	0	0	3	4.5	1.5
Restore Utilites	2	2	0	0	4	6	2
TOTALS	6	6	0	0	12	18	6

Name of room, laboratory, or area:	Lawrenceville Building H						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	0.2	0.2	0	0	0.5	0.5	0
Restore Walls	0.3	0.3	0	0	0.5	0.5	0
Restore Roof	0.2	0.2	0	0	0.5	0.5	0
Restore Utilites	0.3	0.3	0	0	0.5	0.5	0
TOTALS	1	1	0	0	2	2	0

Name of room, laboratory, or area:	Lawrenceville Building K						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	1.5	1.5	0	0	3	4.5	1.5
Restore Walls	1	1	0	0	2	3	1
Restore Roof	1.5	1.5	0	0	3	4.5	1.5
Restore Utilites	2	2	0	0	4	6	2
TOTALS	6	6	0	0	12	18	6

Name of room, laboratory, or area:	Lawrenceville Building G1						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	0	0.2	0	0	0.2	0.3	0
Restore Walls	0	0.2	0	0	0.2	0.3	0
Restore Roof	0	0.2	0	0	0.2	0.3	0
Restore Utilites	0	0.4	0	0	0.4	0.1	0
TOTALS	0	1	0	0	1	1	0

Name of room, laboratory, or area:		Lawrenceville Building L1					
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	0	0.2	0	0	0.2	0.3	0
Restore Walls	0	0.2	0	0	0.2	0.3	0
Restore Roof	0	0.2	0	0	0.2	0.3	0
Restore Utilites	0	0.4	0	0	0.4	0.1	0
TOTALS	0	1	0	0	1	1	0

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.

Name of room, laboratory, or area:	Lawrenceville Building F1						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	4	4	4	4	0	0	4
Survey Packages	4	4	4	4	0	0	4
Class 1	10	10	10	63	0	0	10
Class 2	1.5	1.5	1	9	0	0	1.5
Class 3	1.5	1.5	1	6	0	0	1.5
TOTALS	21	21	20	86	0	0	21

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

Name of room, laboratory, or area:	Lawrenceville Building H						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	0.5	0.5	0.5	1	0	0	0.5
Survey Packages	0.5	0.5	0.5	1	0	0	0.5
Class 1	1	1	1	18	0	0	1
Class 2	0.5	0.5	0.5	5	0	0	0.5
Class 3	0.5	0.5	0.5	3	0	0	0.5
TOTALS	3	3	3	28	0	0	3

Estimate the number of work days, by specific labor category, that will be required to conduct a final radiation survey.							
Name of room, laboratory, or area:	Lawrenceville Building K						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	4	4	4	4	0	0	4
Survey Packages	4	4	4	4	0	0	4
Class 1	10	10	10	84	0	0	10
Class 2	1.5	1.5	1.5	12	0	0	1.5
Class 3	1.5	1.5	1.5	6	0	0	1.5
TOTALS	21	21	21	110	0	0	21

Estimate the number of work days, by specific labor category, that will be required to conduct a final radiation survey.							
Name of room, laboratory, or area:	Lawrenceville Building G1						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	0.5	0.5	0.5	0.5	0	0	0.2
Survey Packages	0.5	0.5	0	0.5	0	0	0.2
Class 1	0.1	0.1	0	3	0	0	0.2
Class 2	0.1	0.1	0	3	0	0	0.2
Class 3	0.1	0.1	0	3	0	0	0.2
TOTALS	1.3	1.3	0.5	10	0	0	1

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

Name of room, laboratory, or area:	Lawrenceville Building L1						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	1	1	1	1	0	0	1
Survey Packages	1	1	0	1	0	0	1
Class 1	0.2	0.2	0	10	0	0	0.2
Class 2	0.2	0.2	0	3	0	0	0.2
Class 3	0.2	0.2	0	3	0		0.2
TOTALS	2.6	2.6	1	18	0	0	2.6

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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
No Site Stabilization or							
Long Term Maintenance							
TOTALS	0	0	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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Planning and Preparation (TOTALS from Table 3.6)	47	58	41	77	8	24	52
Decontamination and/or Dismantling of Radioactive Facility Components (Sum of TOTALS from all copies of Table 3.7)	129	389.5	131	771	519	1542	258
Restoration of Contaminated Areas on Facility Grounds (TOTALS from Table 3.8)	13	15	0	0	28	40	12
Final Radiation Survey (TOTALS from Table 3.9)	48.9	48.9	45.5	252	0	0	48.6
Site Stabilization and Long-Term Surveillance (TOTALS from Table 3.10)	0	0	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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Salary & Fringe ($/year)	$85,000	$60,000	$60,000	$40,000	$44,000	$30,000	$22,000
Overhead Rate (%)	100%	100%	100%	100%	100%	100%	100%
Total Cost Per Year	$170,000	$120,000	$120,000	$80,000	$88,000	$60,000	$44,000
Living Expenses (PD*7/5)[1]	$294	$294	$294	$294	$0	0	0
Total Cost Per Work Day[2]	$948	$756	$756	$602	$338	$231	$169

[1] Per Diem Rate: $210 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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical	Total Labor Cost
Planning and Preparation	$44,549	$43,821	$30,977	$46,330	$2,708	$5,538	$8,800	$182,724
Decontamination and/or Dismantling of Radioactive Facility Components	$122,272	$294,282	$98,976	$463,905	$175,662	$355,846	$43,662	$1,554,604
Restoration of Contaminated Areas on Facility Grounds	$12,322	$11,333	$0	$0	$9,477	$9,231	$2,031	$44,394
Final Radiation Survey	$46,350	$36,946	$34,377	$151,626	$0	$0	$8,225	$277,524
Site Stabilization and Long-Term Surveillance	$0	$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	1,500	11	B-25	$700	$7,700
Metal	25,952	13	40' Sea-Land	$1,000	$13,000
Liquids	64	10	55 gal. inner 85 gal.overpack	$200	$2,000
Biological	0	0	55 gal. inner 85 gal.overpack	$200	$0
TOTAL					$22,700

(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 ($/mile/truckload)	Surcharges ($/mile)	Overweight Charges($/mile)	Distance Shipped (miles)	Total Shipping Costs
DAW	2	$1.70	1	1	800	$2,720
Metal	13	$1.70	1	1	800	$17,680
Liquids	0	$1.70	1	1	1	$0
Biological	0	$1.70	1	1	1	$0
TOTAL	15					$20,400

(c) Waste Disposal Costs

Estimate the volume of waste to be disposed. Multiply the volume of waste disposed by the unite\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	1,500	15	22500	6.70	1	$150,750
Metal	25952	20	519047	1.25	1	$648,808
Liquids	64	60	3840	7.00	1	$26,880
Biological	0	20	0	10.00	1	$0
TOTAL	27516					$826,438

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	1	$30,000	$30,000
Respirators	0		$0
Misc Tools	1	$10,000	$10,000
Consumables	1	$30,000	$30,000
TOTAL			$70,000

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	150	$100	$15,000
Transport of Samples	15	$50	$750
Testing and Analysis	150	$100	$15,000
Other (specify)			
TOTAL			$30,750

3.17 MISCELLANEOUS COSTS

Estimate any other applicable costs.	
Activity	Total Cost
License Fees	---
Insurance	$20,717
Taxes	$295,953
Irradiator Disposal (JL Shepherd)	$70,000
TOTAL	$386,670

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 then 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)	$182,724	5.3%
Decontamination and/or Dismantling of Radioactive Facility (From Table 3.13)	$1,554,604	45.4%
Restoration of Contaminated Areas on Facility Grounds (From Table 3.13)	$44,394	1.3%
Final Radiation Survey (From Table 3.13)	$277,524	8.1%
Packing Material Costs (TOTAL from Table 3.14(a))	$22,700	0.7%
Shipping Costs (TOTAL from Table 3.14(b))	$20,400	0.6%
Waste Disposal Costs (TOTAL from Table 3.14(c))	$826,438	24.1%
Equipment/Supply Costs (TOTAL from Table 3.15)	$70,000	2.0%
Laboratory Costs (TOTAL from Table 3.16)	$30,750	0.9%
Miscellaneous Costs (TOTAL from Table 3.17)	$394,160	11.5%
SUBTOTAL	$3,423,693	100.0%
25% Contingency	$855,923	25.0%
TOTAL DECOMMISSIONING COST ESTIMATE	$4,279,616	125.0%

Bldg. F1		Features										
		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft^3 - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft^3)	
F1.1514	1	0	2	60	0	1	100	0	0	8	400	Ventilation Filters
F Bldg Basement												Holding Tank
F1.1190	1	0	0	0	0	0	0	0	0	0	0	
F Bldg Basement												
F1.2105	2	60	1	60	1	0	80	0.2	12	1	50	
F1.2109	2	60	1	60	1	0	80	0.2	12	1	50	
F1.2309	2	20	1	60	0	0	0	0	0	8	400	
F1.2306	2	14	1	60	0	0	0	0	0	0	0	
Cold Room												
F1.2307	2	35	1	60	0	0	0	0.1	4	1	50	
F1.2800	2	60	2	80	1	0	80	0.2	12	4	200	
F1.3100	3	120	2	100	2	0	80	0.3	36	4	200	
F1.3103	3	60	2	100	2	0	80	0.3	18	2	100	
F1.3105	3	60	2	100	2	0	80	0.3	18	2	100	
F1.3107	3	90	2	100	2	0	80	0.3	27	3	150	
F1.3110	3	60	0	0	1	1	80	0.2	12	3	150	
F1.3112	3	60	2	100	1	0	60	0.3	18	3	150	
F1.3813	3	60	1	80	1	0	60	0.8	48	1	50	
F1.3811	3	60	1	80	1	0	60	0.8	48	1	50	
F1.3809	3	60	2	100	2	0	80	0.8	48	1	50	
F1.3806	3	60	2	100	2	0	80	0.6	36	2	100	
F1.3804	3	60	2	100	2	0	80	0.6	36	2	100	
F1.3802	3	60	2	100	2	0	80	0.4	24	2	100	
F1.3800	3	60	2	100	3	0	100	0.5	30	2	100	
F1.3601	3	30	1	80	0	0	0	0.3	9	0.5	25	
F1.3603	3	20	1	80	0	0	0	0.2	4	0	0	
F1.3603A	3	0	0	0	0	0	0	0	0	0	0	
F1.3605	3	20	1	80	2	0	80	1	20	1	50	
F1.3305	3	0	0	0	0	0	0	0	0	1	50	
CACO Lab												

	Floors				Walls				Ceilings				Waste	
Bldg. F1	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
F1.1514	1	43	33	1419	2	43	15	1290	1	43	33	1419	DAW	200
F Bldg Basement					2	33	15	990					Liquid	64
F1.1190	1	35	11	385	2	35	15	1050	1	35	11	385	DAW	300
F Bldg Basement					2	11	15	330						
F1.2105	1	27	21	567	2	27	15	810	1	27	21	567		
					2	21	15	630						
F1.2109	1	27	21	567	2	27	15	810	1	27	21	567		
					2	21	15	630						
F1.2309	1	25	21	525	2	25	15	750	1	25	21	525		
					2	21	15	630						
F1.2306	1	8	14	112	2	8	15	240	1	8	14	112		
Cold Room					2	14	15	420						
F1.2307	1	12	15	180	2	12	15	360	1	12	15	180		
					2	15	15	450						
F1.2800	1	27	21	567	2	27	15	810	1	27	21	567		
					2	21	15	630						
F1.3100	1	26	31	806	2	26	15	780	1	26	31	806		
					2	31	15	930						
F1.3103	1	26	21	546	2	26	15	780	1	26	21	546		
					2	21	15	630						
F1.3105	1	26	21	546	2	26	15	780	1	26	21	546		
					2	21	15	630						
F1.3107	1	26	31	806	2	26	15	780	1	26	31	806		
					2	31	15	930						
F1.3110	1	26	21	546	2	26	15	780	1	26	21	546		
					2	21	15	630						
F1.3112	1	26	21	546	2	26	15	780	1	26	21	546		
					2	21	15	630						
F1.3813	1	24	21	504	2	24	15	720	1	24	21	504		
					2	21	15	630						
F1.3811	1	24	21	504	2	24	15	720	1	24	21	504		
					2	21	15	630						
F1.3809	1	26	21	546	2	26	15	780	1	26	21	546		
					2	21	15	630						
F1.3806	1	26	21	546	2	26	15	780	1	26	21	546		
					2	21	15	630						
F1.3804	1	26	21	546	2	26	15	780	1	26	21	546		
					2	21	15	630						
F1.3802	1	26	21	546	2	26	15	780	1	26	21	546		
					2	21	15	630						
F1.3800	1	26	21	546	2	26	15	780	1	26	21	546		
					2	21	15	630						
F1.3601	1	21	15	315	2	21	15	630	1	21	15	315		
					2	15	15	450						
F1.3603	1	15	13	195	2	15	15	450	1	15	13	195		
					2	13	15	390						
F1.3603A	1	10	13	130	2	10	15	300	1	10	13	130		
					2	13	15	390						
F1.3605	1	21	22	462	2	21	15	630	1	21	22	462		
					2	22	15	660						
F1.3305	1	20	22	440	4	20	15	1200	1	20	22	440		
CACO Lab					4	22	15	1320						

Bldg. F1		Features										
		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft^3 - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft^2)	
F1.3609	3	20	1	80	0	0	0	0.3	6	0.5	25	
Cold Room												
F1.3609A	3	14	0	0	0	0	0	0.5	30	0.5	25	
Freezer												
F1.3309	3	60	1	80	1	0	60	0.2	12	1	50	
F1.3301	3	45	0	0	0	0	0	0	0	1	50	
F1.3300	3	24	1	80	1	0	60	0.2	4.8	1	50	
F1.3307	3	15	1	80	1	0	60	0.2	3	1	50	
F1.3507	3	45	1	80	1	0	60	0.3	13.5	1	50	
F1.4100	4	30	2	120	0	0	0	0.3	9	2	100	
Darkroom												
F1.4600	4	128	4	160	3	0	80	0.5	64	6	300	
F1.4600A	4	6	0	0	0	0	0	0.5	3	0.5	25	
F1.4600B	4	6	0	0	0	0	0	0.5	3	1	50	
F1.4600C	4	6	0	0	0	0	0	0.5	3	0.5	25	
F1.4600D	4	26	1	100	0	1	40	0.3	7.8	0.5	25	
Facility Totals		1614	46	2620	35	3	1780		630.6	70	3500	
Floor Areas												
Total Facility	86,000											
Class 1	17,133											
Class 2	17,217	25%										
Class 3	51,650	75%										
Non-Impacted	0											

	Floors				Walls				Ceilings				Waste	
Bldg. F1	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
F1.3609	1	11	19	209	2	11	15	330	1	11	19	209		
Cold Room					2	19	15	570						
F1.3609A	1	7	19	133	2	7	15	210	1	7	19	133		
Freezer					2	19	15	570						
F1.3309	1	21	21	441	2	21	15	630	1	21	21	441		
					2	21	15	630						
F1.3301	1	21	15	315	2	21	15	630	1	21	15	315		
					2	15	15	450						
F1.3300	1	24	17	408	2	24	15	720	1	24	17	408		
					2	17	15	510						
F1.3307	1	10	15	150	2	10	15	300	1	10	15	150		
					2	15	15	450						
F1.3507	1	28	15	420	2	28	15	840	1	28	15	420		
					2	15	15	450						
F1.4100	1	10	21	210	2	10	15	300	1	10	21	210		
Darkroom					2	21	15	630						
F1.4600	1	30	32	960	2	30	15	900	1	30	32	960		
					2	32	15	960						
F1.4600A	1	12	6	72	2	12	15	360	1	12	6	72		
					2	6	15	180						
F1.4600B	1	12	13	156	2	12	15	360	1	12	13	156		
					2	13	15	390						
F1.4600C	1	12	6	72	2	12	15	360	1	12	6	72		
					2	6	15	180						
F1.4600D	1	21	9	189	2	21	15	630	1	21	9	189		
					2	9	15	270						
Facility Totals				17133				48870				17133	Waste	
Floor Areas														
Total Facility													DAW	500
Class 1													Liquid	64
Class 2													Biological	0
Class 3														
Non-Impacted														

		Features										
Bldg. H		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft^3 - ea.)		Comments
								Factor	(ft.)	(3.5 x 3.5 x 4)	(ft^3)	
Laboratory	Floor											
H.4308	4	0	0	0	0	0	0	0	0	0	0	Empty Room
H.4309	4	8	1	100	0	0	0	0	0	1	50	
H.4613	4	45	1	100	0	2	60	0	0	0.5	25	Iodination
Iodination												
H.4611	4	20	1	100	0	0	0	0	0	1	50	
H.3313	3	40	1	80	0	0	0	0.1	4	2	100	Eqmt Stg
H.3315 & H.3315A	3	10	1	80	0	0	0	0.2	2	1	50	
H.3319	3	30	1	80	0	0	0	0.2	6	1	50	
H.3324	3	90	1	80	1	0	60	0.3	27	6	300	
H.3322	3	20	1	80	0	0	0	0	0	1	50	
H.3619	3	16	1	80	0	0	0	0.2	3.2	1	50	
H.1305	1	37	0	0	0	0	0	1	37	2	100	
H Penthouse	Penthouse	0	0	0	0	0	60	0	0	12	600	HEPA Filter Bank and Duct
Facility Totals		316	9	780	1	2	180		79.2	28.5	1425	
Floor Areas												
Total Facility	87,100											
Class 1	4,905											
Class 2	20,549	25%										
Class 3	61,646	75%										
Non-Impacted	0											

	Floors				Walls				Ceilings				Waste	
Bldg. H	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
H.4308	1	30	12	360	2	30	15	900	1	30	12	360		
					2	12	15	360						
H.4309	1	30	10	300	2	30	15	900	1	30	10	300		
					2	10	15	300						
H.4613	1	15	15	225	2	15	15	450	1	15	15	225		
Iodination					2	15	15	450						
H.4611	1	10	19	190	2	10	15	300	1	10	19	190		
					2	19	15	570						
H.3313	1	30	15	450	2	30	15	900	1	30	15	450		
					2	15	15	450						
H.3315 &	1	20	10	200	2	20	15	600	1	20	10	200		
H.3315A					4	10	15	600						
H.3319	1	15	10	150	2	15	15	450	1	15	10	150		
					2	10	15	300						
H.3324	1	30	30	900	2	30	15	900	1	30	30	900		
					2	30	15	900						
H.3322	1	10	10	100	2	10	15	300	1	10	10	100		
					2	10	15	300						
H.3619	1	10	10	100	2	10	15	300	1	10	10	100		
					2	10	15	300						
H.1305	1	15	22	330	2	15	15	450	1	15	22	330		
					2	22	15	660						
H Penthouse	1	40	40	1600	2	40	15	1200	1	40	40	1600		
					2	40	15	1200						
Facility Totals				4905				14040				4905	Waste	
Floor Areas														
Total Facility													DAW	0
Class 1													Liquid	0
Class 2													Biological	0
Class 3														
Non-Impacted														

Bldg. K	Features											
		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft² ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4')	(ft²)	
K Basement	1	0	0	0	0	0	0	0	0	0	0	Self Shielded
Irradiator												Irradiator
K.4107	4	140	3	140	1	0	40	0.7	98	5	250	
K.4122	4	72	2	120	7	0	160	0.7	50.4	8	400	
K.4614	4	20	1	100	1	0	40	0.3	6	2	100	
K.4422	4	16	1	100	0	0	0	0.6	9.6	0.5	25	
K.4324	4	32	1	100	7	0	160	0.5	16	8	400	
K.4319	4	30	0	0	0	2	60	0.1	3	0.5	25	
K.4318	4	35	1	100	0	0	0	0.2	7	1	50	
K.4306	4	10	1	100	2	0	60	0.2	2	1	50	
K.3825	3	130	3	120	2	0	80	0.7	91	6	300	
See 4107												
K.3625 & K.3325	3	30	1	80	1	0	60	0.2	6	1	50	
K.3326	3	20	0	0	0	0	0	0.2	4	1	50	
K.3622	3	20	1	80	0	0	0	0.1	2	0.5	25	
K.3315	3	20	1	80	2	0	80	0.2	4	1	50	
K.3615	3	10	1	80	0	0	0	0	0	0.5	25	
Visual Inspection												
K.3314	3	20	1	80	1	0	60	0.2	4	2	100	
K.3310	3	18	1	80	0	0	0	1	18	0.5	25	
Cold Room												
K.3310A	3	0	0	0	0	0	0	0	0	0.5	25	
Freezer												
K.3610	3	18	1	80	0	0	0	1	18	0.5	25	
Cold Room												
K.3 Waste Stg.	3	0	0	0	0	0	0	0	0	0	0	
Stg. Closet												
K.3308	3	20	0	0	0	0	0	0.3	6	1	50	
Inst. Stg.												
K.2807	2	80	2	80	1	0	80	0.5	40	1	50	
K.2809	2	280	6	160	4	1	160	0.6	168	6	300	
K.2819	2	190	4	120	3	0	120	0.5	95	4	200	
K.2826	2	240	6	160	4	0	140	0.5	120	3	150	
K.2123	2	240	6	160	4	0	140	0.5	120	1	50	

	Floors				Walls				Ceilings				Waste	
Bldg. K	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
K Basement	1	10	8	80	2	10	15	300	1	10	8	80		
Irradiator					2	8	15	240						
K.4107	1	36	42	1512	2	36	15	1080	1	36	42	1512		
					2	42	15	1260						
K.4122	1	36	21	756	2	36	15	1080	1	36	21	756		
					2	21	15	630						
K.4614	1	15	11	165	2	15	15	450	1	15	11	165		
					2	11	15	330						
K.4422	1	9	16	144	2	9	15	270	1	9	16	144		
					2	16	15	480						
K.4324	1	31	19	589	2	31	15	930	1	31	19	589		
					2	19	15	570						
K.4319	1	15	10	150	2	15	15	450	1	15	10	150		
					2	10	15	300						
K.4318	1	15	16	240	2	15	15	450	1	15	16	240		
					2	16	15	480						
K.4306	1	15	10	150	2	15	15	450	1	15	10	150		
					2	10	15	300						
K.3825	1	36	42	1512	2	36	15	1080	1	36	42	1512		
See 4107					2	42	15	1260						
K.3625 &	1	30	10	300	2	30	15	900	1	30	10	300		
K.3325					4	10	15	600						
K.3326	1	15	10	150	2	15	15	450	1	15	10	150		
					2	10	15	300						
K.3622	1	10	10	100	2	10	15	300	1	10	10	100		
					2	10	15	300						
K.3315	1	20	10	200	2	20	15	600	1	20	10	200		
					2	10	15	300						
K.3615	1	10	10	100	2	10	15	300	1	10	10	100		
Visual Inspection					2	10	15	300						
K.3314	1	20	15	300	2	20	15	600	1	20	15	300		
					2	15	15	450						
K.3310	1	10	12	120	2	10	15	300	1	10	12	120		
Cold Room					2	12	15	360						
K.3310A	1	10	12	120	2	10	15	300	1	10	12	120		
Freezer					2	12	15	360						
K.3610	1	10	12	120	2	10	15	300	1	10	12	120		
Cold Room					2	12	15	360						
K.3 Waste Stg.	1	3	8	24	2	3	15	90	1	3	8	24		
Stg. Closet					2	8	15	240						
K.3308	1	30	20	600	2	20	15	600	1	30	20	600		
Inst. Stg.					2	20	15	600						
K.2807	1	40	32	1280	4	40	15	2400	1	40	32	1280		
					2	32	15	960						
K.2809	1	40	73	2920	4	40	15	2400	1	40	73	2920		
					4	73	15	4380						
K.2819	1	40	52	2080	4	40	15	2400	1	40	52	2080		
					4	52	15	3120						
K.2826	1	40	52	2080	4	40	15	2400	1	40	52	2080		
					4	52	15	3120						
K.2123	1	40	52	2080	4	40	15	2400	1	40	52	2080		
					4	52	15	3120						

Bldg. K		Features										
		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft³ ea.)		Comments
								Factor	(ft.)	(3.5 x 3.5 x 4)	(ft²)	
Laboratory	Floor											
K.2119	2	240	4	120	5	0	160	0.6	144	3	150	
K.2307	2	26	1	60	0	0	0	0.5	13	6	300	
K.2309	2	15	1	60	2	0	100	0.3	4.5	3	150	
K.2313A	2	10	1	60	2	0	100	0.2	2	1	50	
K.2315	2	20	1	60	1	0	80	0.2	4	0.5	25	
K.2323	2	25	1	60	2	0	100	0.4	10	1	50	
K.2324	2	18	1	60	0	0	0	0.1	1.8	0.5	25	
Cold Room												
K.2324A	2	0	0	0	0	0	0	0	0	0.5	25	
Freezer												
K.2326	2	42	1	60	0	0	0	0.3	12.6	4	200	
K.2624	2	18	1	60	0	0	0	0.1	1.8	0.5	25	
Cold Room												
K.2619	2	0	0	0	0	0	0	0	0	4	200	
K.2618	2	30	1	60	1	0	80	0.1	3	2	100	
K.2610	2	25	1	60	3	0	120	0.2	5	4	200	
K.2608	2	18	1	60	0	0	0	0.2	3.6	0.5	25	
Cold Room												
K.2608A	2	0	0	0	0	0	0	0	0	0.5	25	
Freezer												
Facility Totals		2178	59	2900	56	3	2180		1093.3	86.5	4325	
Floor Areas												
Total Facility	118,200											
Class 1	23,127											
Class 2	18,518	25%										
Class 3	55,555	75%										
Non-Impacted	21,000											

	Floors				Walls				Ceilings				Waste	
Bldg. K	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
K.2119	1	40	52	2080	4	40	15	2400	1	40	52	2080		
					4	52	15	3120						
K.2307	1	30	15	450	2	30	15	900	1	30	15	450		
					2	15	15	450						
K.2309	1	20	10	200	2	20	15	600	1	20	10	200		
					2	10	15	300						
K.2313A	1	15	11	165	2	15	15	450	1	15	11	165		
					2	11	15	330						
K.2315	1	15	10	150	2	15	15	450	1	15	10	150		
					2	10	15	300						
K.2323	1	15	21	315	2	15	15	450	1	15	21	315		
					2	21	15	630						
K.2324	1	8	13	104	2	8	15	240	1	8	13	104		
Cold Room					2	13	15	390						
K.2324A	1	8	13	104	2	8	15	240	1	8	13	104		
Freezer					2	13	15	390						
K.2326	1	30	19	570	2	30	15	900	1	30	19	570		
					2	19	15	570						
K.2624	1	8	13	104	2	8	15	240	1	8	13	104		
Cold Room					2	13	15	390						
K.2619	1	20	10	200	2	20	15	600	1	20	10	200		
					2	10	15	300						
K.2618	1	20	16	320	2	20	15	600	1	20	16	320		
					2	16	15	480						
K.2610	1	15	19	285	2	15	15	450	1	15	19	285		
					2	19	15	570						
K.2608	1	8	13	104	2	8	15	240	1	8	13	104		
Cold Room					2	13	15	390						
K.2608A	1	8	13	104	2	8	15	240	1	8	13	104		
Freezer					2	13	15	390						
Facility Totals				23127				66000				23127	Waste	
Floor Areas														
Total Facility													DAW	0
Class 1													Liquid	0
Class 2													Biological	0
Class 3														
Non-Impacted														

Bldg. G1	Features											
		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft^3 - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft^2)	
G1.2712/12A	2	8	0	0	0	0	0	0	0	3	150	
Isotope Receipt												
G1.2109A	2	0	0	0	0	0	0	0	0	0	0	
Irradiator												
G1.4804	4	30	1	100	0	1	40	0.2	6	2	100	
Facility Totals		38	1	100	0	1	40		6	5	250	
Floor Areas												
Total Facility	49,200											
Class 1	677											
Class 2	12,131	25%										
Class 3	36,392	75%										
Non-Impacted	0											

Bldg. L1	Features											
		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft^3 - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft^2)	
L1.1300-1	1	15	1	40	1	0	100	0.3	4.5	6	300	
L.1225	1	50	1	40	1	0	100	0.3	15	4	200	
L.4417	4	86	1	100	1	0	40	0.3	25.8	3	150	
Facility Totals		151	3	180	3	0	240		45.3	13	650	
Floor Areas												
Total Facility	66,200											
Class 1	3,270											
Class 2	15,733	25%										
Class 3	47,198	75%										
Non-Impacted	0											

	Floors				Walls				Ceilings				Waste	
Bldg. G1	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
G1.2712/12A	1	17	19	323	4	17	15	1020	1	17	19	323		
Isotope Receipt					2	19	15	570						
G1.2109A	1	6	9	54	2	6	15	180	1	6	9	54		
Irradiator					2	9	15	270						
G1.4804	1	30	10	300	2	30	15	900	1	30	10	300		
					2	10	15	300						
Facility Totals				677				3240				677	Waste	
Floor Areas														
Total Facility													DAW	0
Class 1													Liquid	0
Class 2													Biological	0
Class 3														
Non-Impacted														

	Floors				Walls				Ceilings				Waste	
Bldg. L1	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
L1.1300-1	1	40	30	1200	2	40	15	1200	1	40	30	1200	DAW	
					2	30	15	900					Biological	
L.1225	1	27	30	810	2	27	15	810	1	27	30	810	DAW	
					2	30	15	900					Biological	
L.4417	1	30	42	1260	2	30	15	900	1	30	42	1260	DAW	
					2	42	15	1260					Biological	
Facility Totals				3270				5970				3270	Waste	
Floor Areas														
Total Facility													DAW	0
Class 1													Liquid	0
Class 2													Biological	0
Class 3														
Non-Impacted														

3.4 FACILITY DECOMMISSIONING SUMMARY

Radioactive Material license numbers and types (i.e., Byproduct, Source):
The Bristol-Myers Squibb facility located at One Squibb Drive, New Brunswick, NJ is licensed under USNRC Byproduct Materials license number 29-00139-02.
Types and quantities of materials authorized under the licenses listed above:
Byproduct Material atomic number 1 through 83, except Sr-90, 100 mCi per radionuclide, 2 Ci total; H-3 150 Ci; C-14 20 Ci; Sr-90 2 mCi; Tc-99m 750 mCi; Byproduct Material aomic number 84 through 103 1 mCi; Ni-63 Sources per registration IAW 10 CFR 32.210.
Description of how licensed materials are used:
Radionuclides are used in pharmaceutical research and development. This facility synthesizes radioactive compounds for use and distributes them to other research and development facilities. Synthesis activities primarily involve the use of large quantities of H-3 and C-14. Research and development activities are also conducted on a limited basis at this site. Research activities include new discovery, applications testing, and animal studies.
Description of facility, including buildings, rooms, grounds, and description of where particular types of materials are used:
Radio-synthesis activities are conducted in a laboratory suite located on the second floor of Building 107. This is a self-contained unit with a dedicated ventilation system located in an adjoining equipment space. Limited research and development activites are performed in laboratories in Buildings 105, 80-84, and 134. A small waste storage area is present in the basement of Building 80-84. Waste is primarily stored in Building 81. A detailed listing of laboratories and storage areas is attached to this estimate.
Quantities of materials or waste accumulated before shipping or disposal
The primary waste collection and storage area is located in Building 81. A smaller waste storage cage is located in the basement of Building 80-84. For purposes of this estimate a waste inventory of 300 cubic feet of DAW was used.

3.5 Number and Dimensions of Facilities Components

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:	New Brunswick Building 107 Synthesis Suite
Level of Contamination:	≈1,000 -500,000 dpm/100 cm^2

Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	0	Each	4'w x 3'd x 3't	0	ft^3
Fume Hoods	16	Each	5'w x 4'd x 8't	2,560	ft^3
Lab Benches (Casework)	367	Linear Feet	4'd x 3't	4,404	ft^3
Sinks	9	Each	4'w x 4'd x 3't	432	ft^3
Drains	460	Linear Feet	3" diameter	23	ft^3
Floors	See Listing	Class 1 Sq. Feet	Includes Ceilings	13,635	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		14,460	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		0	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		0	ft^2
Ventilation/Ductwork	560	Linear Feet	18" diameter	493	ft^3
Cabinets	204	Linear Feet	3'd x 3't	1,836	ft^3
Hot Cells	0	Each		0	ea
Equipment/Materials	39	50 Ft^3 Units		1,950	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	0	Each		0	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination	0	Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		25,664	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet		76,991	ft^2
Other (Specify)	150	Linear Feet	Roof Top Vent Duct	600	ft^3
Other (Specify)		Each		0	ea

Features/Equipment Volume	12,298	ft^3
Waste Fraction	0.50	
Waste Volume	6,149	ft^3
Waste Density (lb/ft3)	20	
Waste Mass	122,978	lb

Name of room, laboratory, or area:	New Brunswick Building 105				
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2				
Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	0	Each	4'w x 3'd x 3't	0	ft^3
Fume Hoods	8	Each	5'w x 4'd x 8't	1,280	ft^3
Lab Benches (Casework)	200	Linear Feet	4'd x 3't	2,400	ft^3
Sinks	5	Each	4'w x 4'd x 3't	240	ft^3
Drains	140	Linear Feet	3" diameter	7	ft^3
Floors	See Listing	Class 1 Sq. Feet		1,760	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		2,040	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		2,040	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		1,760	ft^2
Ventilation/Ductwork	240	Linear Feet	18" diameter	211	ft^3
Cabinets	128	Linear Feet	3'd x 3't	1,152	ft^3
Hot Cells	0	Each		0	ea
Equipment/Materials	5	50 Ft^3 Units		250	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	0	Each		0	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination	0	Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		12,185	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet		36,555	ft^2
Other (Specify)		Each		0	ea
Other (Specify)		Each		0	ea

Features/Equipment Volume	5,540	ft^3
Waste Fraction	0.25	
Waste Volume	1,385	ft^3
Waste Density (lb/ft3)	20	
Waste Mass	27,701	lb

Name of room, laboratory, or area:	New Brunswick Building 80-84				
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2				
Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	3	Each	4'w x 3'd x 3't	108	ft^3
Fume Hoods	1	Each	5'w x 4'd x 8't	160	ft^3
Lab Benches (Casework)	90	Linear Feet	4'd x 3't	1,080	ft^3
Sinks	2	Each	4'w x 4'd x 3't	96	ft^3
Drains	120	Linear Feet	3" diameter	6	ft^3
Floors	See Listing	Class 1 Sq. Feet		1,922	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		1,740	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		1,740	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		1,122	ft^2
Ventilation/Ductwork	180	Linear Feet	18" diameter	158	ft^3
Cabinets	45	Linear Feet	3'd x 3't	405	ft^3
Hot Cells	0	Each		0	ea
Equipment/Materials	15	50 Ft^3 Units		750	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	1	Each		1	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination	0	Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		13,170	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet		39,509	ft^2
Other (Specify)		Each		0	ea
Other (Specify)		Each		0	ea

Features/Equipment Volume	2,763	ft^3
Waste Fraction	0.25	
Waste Volume	691	ft^3
Waste Density (lb/ft3)	20	
Waste Mass	13,817	lb

Name of room, laboratory, or area:	New Brunswick Building 81				
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2				
Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	0	Each	4'w x 3'd x 3't	0	ft^3
Fume Hoods	0	Each	5'w x 4'd x 8't	0	ft^3
Lab Benches (Casework)	0	Linear Feet	4'd x 3't	0	ft^3
Sinks	0	Each	4'w x 4'd x 3't	0	ft^3
Drains	0	Linear Feet	3" diameter	0	ft^3
Floors	See Listing	Class 1 Sq. Feet		1,150	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		1,776	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		2,664	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		1,150	ft^2
Ventilation/Ductwork	40	Linear Feet	18" diameter	35	ft^3
Cabinets	0	Linear Feet	3'd x 3't	0	ft^3
Hot Cells	0	Each		0	ea
Equipment/Materials	5	50 Ft^3 Units		250	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	1	Each		1	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination	0	Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		3,089	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet		9,266	ft^2
Other (Specify)		Each		0	ea
Other (Specify)		Each		0	ea
			Features/Equipment Volume	285	ft^3
			Waste Fraction	0.25	
			Waste Volume	71	ft^3
			Waste Density (lb/ft3)	20	
			Waste Mass	1,426	lb

Name of room, laboratory, or area:	New Brunswick Building 134				
Level of Contamination:	≈1,000 -10,000 dpm/100 cm^2				
Component	Quantity of Component	Unit	Dimensions of Component (specify units)	Total Dimensions (specify units)	
Glove Boxes	0	Each	4'w x 3'd x 3't	0	ft^3
Fume Hoods	1	Each	5'w x 4'd x 8't	160	ft^3
Lab Benches (Casework)	30	Linear Feet	4'd x 3't	360	ft^3
Sinks	2	Each	4'w x 4'd x 3't	96	ft^3
Drains	60	Linear Feet	3" diameter	3	ft^3
Floors	See Listing	Class 1 Sq. Feet		252	ft^2
Walls (Class1)	See Listing	Class 1 Sq. Feet		495	ft^2
Walls (Class 2)	See Listing	Class 2 Sq. Feet		495	ft^2
Ceilings	See Listing	Class 2 Sq. Feet		252	ft^2
Ventilation/Ductwork	40	Linear Feet	18" diameter	35	ft^3
Cabinets	15	Linear Feet	3'd x 3't	135	ft^3
Hot Cells	0	Each			ea
Equipment/Materials	2	50 Ft^3 Units		100	ft^3
Soil Plots	0	Sq. Feet		0	ea
Storage Tanks	0	Each		0	ea
Storage Areas	0	Each		0	ft^2
Radwaste Areas	0	Each		0	ea
Scrap Recovery Areas	0	Each		0	ft^2
Maintenance Shop	0	Each		0	ft^2
Equipment Decontamination	0	Each		0	ft^2
Other Class 2 Areas	See Listing	Class 2 Sq. Feet		270	ft^2
Other Class 3 Areas	See Listing	Class 3 Sq. Feet		809	ft^2
Other (Specify)		Each		0	ea
Other (Specify)		Each		0	ea

Features/Equipment Volume	889	ft^3
Waste Fraction	0.25	
Waste Volume	222	ft^3
Waste Density (lb/ft3)	20	
Waste Mass	4,446	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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Preparation of Documentation for Regulatory Agencies	7	5	5	3	0	0	10
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	2	2	0	0	0	2
Development of Work Plans	5	7	5	0	0	0	10
Procurement of Special Equipment	2	5	0	0	0	0	2
Staff Training	1	2	2	3	2	6	1
Characterization of Radiological Condition (including sampling, soil and tailings analysis, or groundwater analysis, if applicable)	5	5	5	15	0	0	2
Other (specify) Mobilization	1	2	2	3	2	6	1
TOTALS	23	28	21	24	4	12	28

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:	New Brunswick Building 107 Synthesis Suite
Level of Contamination:	≈1,000 -500,000 dpm/100 cm2

Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp							
Fume Hoods	Remove/Disp	2	2	1	3	4	6	2
Lab Benches	Decon/Remove	2	2	1	3	4	6	2
Sinks	Decon/Remove	2	2		3	4	6	2
Drains	Remove/Disp	2	2		3	4	6	2
Floors	Decon/Wipe	1	1		2	2	3	1
Walls	Decon/Wipe	1	1		2	2	3	1
Ceilings	Decon/Wipe	2	2	1	3	4	6	2
Ventilation/Ductwork	Remove/Disp	4	4	2	6	8	12	4
Cabinets	Decon/Remove							
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp	4	4	2	6	8	12	4
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp							
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify)	Remove/Disp							
Other (specify)	Remove/Disp							
TOTALS		20	20	7	31	40	60	20

Name of room, laboratory, or area:		New Brunswick Building 105						
Level of Contamination:		≈1,000 -10,000 dpm/100 cm2						
Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp							
Fume Hoods	Remove/Disp	1	1	2	1	1	1.5	1
Lab Benches	Decon/Remove	1	1		1	1	1.5	1
Sinks	Decon/Remove	1	1		1	1	1.5	1
Drains	Remove/Disp	1	1		1	1	1.5	1
Floors	Decon/Wipe	1	0.5		1	1	1.5	1
Walls	Decon/Wipe	0.5	0.5		0.5	0.5	1	0.5
Ceilings	Decon/Wipe	0.5	1		1	1	1.5	0.5
Ventilation/Ductwork	Remove/Disp	1	1		1	1	1.5	1
Cabinets	Decon/Remove	0.5	0.5		0.5	0.5	1	0.5
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp	0.5	0.5	2	2	1	1.5	0.5
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp							
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify)	Remove/Disp							
Other (specify)	Remove/Disp							
TOTALS		8	8	4	10	9	14	8

Name of room, laboratory, or area:		New Brunswick Building 80-84						
Level of Contamination:		≈1,000 -10,000 dpm/100 cm2						
Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp		0.5		0.5		1	
Fume Hoods	Remove/Disp	0.5	0.5		0.5	0.5	2	0.5
Lab Benches	Decon/Remove	0.5	0.5		0.5	0.5	2	0.5
Sinks	Decon/Remove	0.5	0.5		0.5	0.5	1	0.5
Drains	Remove/Disp	0.5	0.5		0.5	0.5	1	
Floors	Decon/Wipe	0.5	0.5		2	1	3	0.5
Walls	Decon/Wipe	0.5	0.5		0.5	0.5	2	0.5
Ceilings	Decon/Wipe	0.5	0.5		0.5	0.5	1	0.5
Ventilation/Ductwork	Remove/Disp	0.5	2		2	2	6	0.5
Cabinets	Decon/Remove	0.5	0.5		0.5	0.5	1	0.5
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp		2	2	1	1	2	0.5
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp	1.5	2	2	2	0.5	2	0.5
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify)	Remove/Disp							
Other (specify)	Remove/Disp							
TOTALS		6	10.5	4	11	8	24	5

Name of room, laboratory, or area:		New Brunswick Building 81						
Level of Contamination:		≈1,000 -10,000 dpm/100 cm2						
Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp							
Fume Hoods	Remove/Disp							
Lab Benches	Decon/Remove							
Sinks	Decon/Remove							
Drains	Remove/Disp							
Floors	Decon/Wipe							
Walls	Decon/Wipe							
Ceilings	Decon/Wipe							
Ventilation/Ductwork	Remove/Disp							
Cabinets	Decon/Remove							
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp							
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp	1	1	5	0	0	5	1
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify)	Remove/Disp							
Other (specify)	Remove/Disp							
TOTALS		1	1	5	0	0	5	1

Name of room, laboratory, or area:		New Brunswick Building 134						
Level of Contamination:		≈1,000 -10,000 dpm/100 cm2						
Component	Action	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Glove Boxes	Remove/Disp							
Fume Hoods	Remove/Disp	0.1	0.2	0.2	0.2	0.2	0.3	0.1
Lab Benches	Decon/Remove	0.1	0.2	0.2	0.2	0.2	0.3	0.1
Sinks	Decon/Remove	0.1	0.2		0.2	0.2	0.3	0.1
Drains	Remove/Disp	0.1	0.2		0.2	0.2	0.3	0.1
Floors	Decon/Wipe	0.1	0.2		0.2	0.2	0.3	0.1
Walls	Decon/Wipe	0.1	0.2		0.2	0.2	0.3	0.1
Ceilings	Decon/Wipe	0.1	0.2		0.2	0.2	0.3	0.1
Ventilation/Ductwork	Remove/Disp	0.1	0.2	0.2	0.2	0.2	0.3	0.1
Cabinets	Decon/Remove	0.1	0.2	0.2	0.2	0.2	0.3	0.1
Hot Cells	Remove/Disp							
Equipment/Materials	Sur/Rem/Disp	0.1	0.2	0.2	0.2	0.2	0.3	0.1
Soil Plots	Sample							
Storage Tanks	N/A							
Storage Areas	Remove/Disp							
Radwaste Areas	Remove/Disp							
Scrap Recovery Areas	N/A							
Maintenance Shop	Remove/Disp							
Equipment Decontamination	Remove/Disp							
Other (specify)	Remove/Disp							
Other (specify)	Remove/Disp							
TOTALS		1	2	1	2	2	3	1

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.

Name of room, laboratory, or area:	New Brunswick Building 107 Synthesis Suite						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	2	2	0	0	2	3	1
Restore Walls	1	1	0	0	1	2	1
Restore Roof	2	2	0	0	2	3	1
Restore Utilites	2	2	0	0	2	3	1
TOTALS	7	7	0	0	7	11	4

Name of room, laboratory, or area:	New Brunswick Building 105						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	0	0.2	0	0	0.2	0.3	0
Restore Walls	0	0.2	0	0	0.2	0.3	0
Restore Roof	0	0.2	0	0	0.2	0.3	0
Restore Utilites	0	0.4	0	0	0.4	0.3	0
TOTALS	0	1	0	0	1	1.2	0

Name of room, laboratory, or area:	New Brunswick Building 80-84						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	0.4	0.8	0	0	0.8	1.2	0.2
Restore Walls	0.2	0.4	0	0	0.4	0.6	0.2
Restore Roof	0.2	0.4	0	0	0.4	0.6	0.2
Restore Utilites	0.4	0.8	0	0	0.8	1.2	0.2
TOTALS	1.2	2.4	0	0	2.4	3.6	0.8

Name of room, laboratory, or area:	New Brunswick Building 81						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	0	0	0	0	0	0	0
Restore Walls	0	0	0	0	0	0	0
Restore Roof	0	0	0	0	0	0	0
Restore Utilites	0	0	0	0	0	0	0
TOTALS	0	0	0	0	0	0	0

Name of room, laboratory, or area:		New Brunswick Building 134					
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Restore Floors	0	0.2	0	0	0.2	0.3	0
Restore Walls	0	0.2	0	0	0.2	0.3	0
Restore Roof	0	0.2	0	0	0.2	0.3	0
Restore Utilites	0	0.4	0	0	0.4	0.3	0
TOTALS	0	1	0	0	1	1.2	0

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.

Name of room, laboratory, or area:	New Brunswick Building 107 Synthesis Suite						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	3	3	3	2	0	0	3
Survey Packages	3	3	3	2	0	0	3
Class 1	5	5	3	42	0	0	5
Class 2	3	3	1	5	0	0	3
Class 3	1	1	1	3	0	0	1
TOTALS	15	15	11	54	0	0	15

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

Name of room, laboratory, or area:	New Brunswick Building 105						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	1	2	2	1.5	0	0	0.5
Survey Packages	1	2	1	1.5	0	0	0.5
Class 1	0.2	0.4	0	6	0	0	0.5
Class 2	0.2	0.4	0	3	0	0	0
Class 3	0.2	0.4	0	3	0	0	0
TOTALS	2.6	5.2	3	15	0	0	1.5

Estimate the number of work days, by specific labor category, that will be required to conduct a final radiation survey.							
Name of room, laboratory, or area:	New Brunswick Building 80-84						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	1	2	1	1	0	0	0.5
Survey Packages	1	2	1	1	0	0	0.5
Class 1	0.2	0.4	0	5	0	0	0.5
Class 2	0.2	0.4	0	3	0	0	0
Class 3	0.2	0.4	0	3	0	0	0
TOTALS	2.6	5.2	2	13	0	0	1.5

Estimate the number of work days, by specific labor category, that will be required to conduct a final radiation survey.							
Name of room, laboratory, or area:	New Brunswick Building 81						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	0.5	1	1	0.5	0	0	0.3
Survey Packages	0.5	1	0	0.5	0	0	0.3
Class 1	0.1	0.2	0	3	0	0	0.3
Class 2	0.1	0.2	0	2	0	0	0.1
Class 3	0.1	0.2	0	2	0	0	0
TOTALS	1.3	2.6	1	8	0	0	1

Estimate the number of work days, by specific labor category, that will be required to conduct a final radiation survey.							
Name of room, laboratory, or area:	New Brunswick Building 134						
Activity	Project Mgr	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
FSS Setup	0.5	0.5	0.5	0.5	0	0	0.3
Survey Packages	0.5	0.5	0	0.5	0	0	0.3
Class 1	0.1	0.2	0	2	0	0	0.3
Class 2	0.1	0.2	0	2	0	0	0.1
Class 3	0.1	0.2	0	2	0	0	0
TOTALS	1.3	1.6	0.5	7	0	0	1

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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
No Site Stabilization or							
Long Term Maintenance							
TOTALS	0	0	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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Planning and Preparation (TOTALS from Table 3.6)	23	28	21	24	4	12	28
Decontamination and/or Dismantling of Radioactive Facility Components (Sum of TOTALS from all copies of Table 3.7)	36	41.5	21	54	59	106	35
Restoration of Contaminated Areas on Facility Grounds (TOTALS from Table 3.8)	8.2	11.4	0	0	11.4	17	4.8
Final Radiation Survey (TOTALS from Table 3.9)	22.8	29.6	17.5	97	0	0	20
Site Stabilization and Long-Term Surveillance (TOTALS from Table 3.10)	0	0	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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical
Salary & Fringe ($/year)	$85,000	$60,000	$60,000	$40,000	$44,000	$30,000	$22,000
Overhead Rate (%)	100%	100%	100%	100%	100%	100%	100%
Total Cost Per Year	$170,000	$120,000	$120,000	$80,000	$88,000	$60,000	$44,000
Living Expenses (PD*7/5)[1]	$294	$294	$294	$294	$0	0	0
Total Cost Per Work Day[2]	$948	$756	$756	$602	$338	$231	$169

[1] Per Diem Rate: $210 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	Supervisor	Health Physicist/ Shipper	HPT's/Drafting	Radiation Workers (Craftsmen)	Radiation Workers (Non-skilled)	Clerical	Total Labor Cost
Planning and Preparation	$21,800	$21,155	$15,866	$14,441	$1,354	$2,769	$4,738	$82,124
Decontamination and/or Dismantling of Radioactive Facility Components	$34,122	$31,355	$15,866	$32,491	$19,969	$24,462	$5,923	$164,189
Restoration of Contaminated Areas on Facility Grounds	$7,772	$8,613	$0	$0	$3,858	$3,923	$812	$24,979
Final Radiation Survey	$21,611	$22,364	$13,222	$58,364	$0	$0	$3,385	$118,946
Site Stabilization and Long-Term Surveillance	$0	$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	800	9	B-25	$700	$6,300
Metal	8,518	5	40' Sea-Land	$1,000	$5,000
Liquids	0	0	55 gal. inner 85 gal.overpack	$200	$0
Biological	0	0	55 gal. inner 85 gal.overpack	$200	$0
TOTAL					$11,300

(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 ($/mile/truckload)	Surcharges ($/mile)	Overweight Charges($/mile)	Distance Shipped (miles)	Total Shipping Costs
DAW	1	$1.70	1	1	800	$1,360
Metal	5	$1.70	1	1	800	$6,800
Liquids	0	$1.70	1	1	1	$0
Biological	0	$1.70	1	1	1	$0
TOTAL	6					$8,160

(c) Waste Disposal Costs

Estimate the volume of waste to be disposed. Multiply the volume of waste disposed by the unite\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	800	15	12000	6.70	1	$80,400
Metal	8518	20	170368	1.25	1	$212,960
Liquids	0	60	0	7.00	1	$0
Biological	0	20	0	10.00	1	$0
TOTAL	9318					$293,360

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	0	$15,000	$0
Respirators	0		$0
Misc Tools	0	$5,000	$0
Consumables	0	$15,000	$0
TOTAL			$0

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	30	$100	$3,000
Transport of Samples	3	$50	$150
Testing and Analysis	30	$100	$3,000
Other (specify)			
TOTAL			$6,150

3.17 MISCELLANEOUS COSTS

Estimate any other applicable costs.	
Activity	Total Cost
License Fees	---
Insurance	$4,964
Taxes	$70,921
Other (specify):	---
TOTAL	$75,885

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 then 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)	$82,124	10.5%
Decontamination and/or Dismantling of Radioactive Facility (From Table 3.13)	$164,189	20.9%
Restoration of Contaminated Areas on Facility Grounds (From Table 3.13)	$24,979	3.2%
Final Radiation Survey (From Table 3.13)	$118,946	15.2%
Packing Material Costs (TOTAL from Table 3.14(a))	$11,300	1.4%
Shipping Costs (TOTAL from Table 3.14(b))	$8,160	1.0%
Waste Disposal Costs (TOTAL from Table 3.14(c))	$293,360	37.4%
Equipment/Supply Costs (TOTAL from Table 3.15)	$0	0.0%
Laboratory Costs (TOTAL from Table 3.16)	$6,150	0.8%
Miscellaneous Costs (TOTAL from Table 3.17)	$75,885	9.7%
SUBTOTAL	$785,093	100.0%
25% Contingency	$196,273	25.0%
TOTAL DECOMMISSIONING COST ESTIMATE	$981,366	125.0%

	Features											
Bldg. 107		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft³ - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft³)	
2556	2	0	0	0	0	0	0	0	0	2	100	
Synthesis Ste.												
2557	2	0	0	0	0	0	0	0	0	1	50	
Synthesis Ste.												
2558	2	48	1	60	1	0	40	0.3	14	1	50	
Synthesis Ste.												
2559	2	24	1	60	2	0	60	0.8	19	1	50	
Synthesis Ste.												
2560	2	79	1	60	1	0	40	0.8	63	4	200	
Synthesis Ste.												
2561	2	80	2	80	4	0	100	0.6	48	4	200	
Synthesis Ste.												
2562	2	0	0	0	0	0	0	0	0	4	200	
Synthesis Ste.												
2563	2	0	0	0	0	0	0	0	0	1	50	
Synthesis Ste.												
2564	2	28	1	60	2	0	60	0.2	6	1	50	
Synthesis Ste.												
2565	2	0	0	0	0	0	0	0	0	0	0	
Synthesis Ste.												
2566	2	28	1	60	2	0	60	0.2	6	1	50	
Synthesis Ste.												
2567	2	0	0	0	0	0	0	0	0	0	0	
Synthesis Ste.												
2568	2	80	2	80	4	0	100	0.6	48	4	200	
Synthesis Ste.												
2555	2	0	0	0	0	0	100	0	0	13	650	8 filter banks
(Vent. Filters)												~80 ft3 ea
Bldg. 107 Roof	Roof	0	0	0	0	0	150	0	0	2	100	4 Fans
(Vent Duct/Fans)												
Facility Totals		367	9	460	16	0	710		204	39	1950	
Floor Area												
Total Facility	108,000											
Class 1	5,345											
Class 2	25,664	25%										
Class 3	76,991	75%										
Non-Impacted	0											

	Floors				Walls				Ceilings				Waste	
Bldg. 107	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
2556	1	7	8	56	2	7	15	210	2	7	8	112		
Synthesis Ste.					2	8	15	240						
2557	1	7	55	385	2	7	15	210	2	7	55	770		
Synthesis Ste.					2	55	15	1650						
2558	1	24	10	240	2	24	15	720	2	24	10	480		
Synthesis Ste.					2	10	15	300						
2559	1	24	10	240	2	24	15	720	2	24	10	480		
Synthesis Ste.					2	10	15	300						
2560	1	27	20	540	2	27	15	810	2	27	20	1080		
Synthesis Ste.					2	20	15	600						
2561	1	27	20	540	2	27	15	810	2	27	20	1080		
Synthesis Ste.					2	20	15	600						
2562	1	24	14	336	2	24	15	720	2	24	14	672		
Synthesis Ste.					2	14	15	420						
2563	1	7	9	63	2	7	15	210	2	7	9	126		
Synthesis Ste.					2	9	15	270						
2564	1	17	13	221	2	17	15	510	2	17	13	442		
Synthesis Ste.					2	13	15	390						
2565	1	7	7	49	2	7	15	210	2	7	7	98		
Synthesis Ste.					2	7	15	210						
2566	1	17	13	221	2	17	15	510	2	17	13	442		
Synthesis Ste.					2	13	15	390						
2567	1	7	9	63	2	7	15	210	2	7	9	126		
Synthesis Ste.					2	9	15	270						
2568	1	27	20	540	2	27	15	810	2	27	20	1080		
Synthesis Ste.					2	20	15	600						
2555	1	21	31	651	2	21	15	630	2	21	31	1302		
(Vent. Filters)					2	31	15	930						
Bldg. 107 Roof	1	120	10	1200	0	0	0	0	0	0	0	0		
(Vent Duct/Fans)					0	0	0	0						
Facility Totals				5345				14460				8290	Waste	
Floor Area														
Total Facility													DAW	
Class 1													Liquid	
Class 2													Biological	
Class 3														
Non-Impacted														

	Features											
Bldg. 105		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft³ - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft³)	
1155	1	160	3	80	4	0	120	0.6	96	3	150	
1149	1	40	2	60	4	0	120	0.8	32	2	100	
Facility Totals		200	5	140	8	0	240		128	5	250	
Floor Area												
Total Facility	50,500											
Class 1	1,760											
Class 2	12,185	25%										
Class 3	36,555	75%										
Non-Impacted	0											

	Features											
Bldg. 80-84		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft³ - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft³)	
207C	3	50	1	80	1	0	20	0.5	25	1	50	
207A	3	40	0	0	0	3	60	0.5	20	2	100	
Waste Cage	1	0	1	40	0	0	0	0	0	2	100	
Bldg 80-84 Roof	Roof	0	0	0	0	0	100	0	0	10	500	
(Vent Duct/Fans)												
Facility Totals		90	2	120	1	3	180		45	15	750	
Floor Area												
Total Facility	54,600											
Class 1	1,922											
Class 2	13,170	25%										
Class 3	39,509	75%										
Non-Impacted	0											

	Floors				Walls				Ceilings				Waste	
Bldg. 105	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
1155	1	40	32	1280	2	32	15	960	1	40	32	1280		
					2	40	15	1200						
1149	1	20	24	480	2	24	15	720	1	20	24	480		
					4	20	15	1200						
Facility Totals				1760				4080				1760	Waste	
Floor Area														
Total Facility													DAW	
Class 1													Liquid	
Class 2													Biological	
Class 3														
Non-Impacted														

	Floors				Walls				Ceilings				Waste	
Bldg. 80-84	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
207C	1	19	19	361	2	19	15	570	1	19	19	361		
					2	19	15	570						
207A	1	19	19	361	2	19	15	570	1	19	19	361		
					2	19	15	570						
Waste Cage	1	20	20	400	2	20	15	600	1	20	20	400	DAW	200
					2	20	15	600					Biological	60
Bldg 80-84 Roof	1	40	20	800	0	0	0	0	0	0	0	0		
(Vent Duct/Fans)					0	0	0	0						
Facility Totals				1922				3480				1122	Waste	
Floor Area														
Total Facility													DAW	200
Class 1													Liquid	0
Class 2													Biological	60
Class 3														
Non-Impacted														

Bldg. 81		Features										
		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft^3 - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft^2)	
1090/91	1	0	0	0	0	0	0	0	0	3	150	
1070	1	0	0	0	0	0	40	0	0	2	100	
Facility Totals		0	0	0	0	0	40		0	5	250	
Floor Area												
Total Facility	13,505											
Class 1	1,150											
Class 2	3,089	25%										
Class 3	9,266	75%										
Non-Impacted	0											

Bldg. 134		Features										
		Casework (linear ft.)	Sinks (ea.)	Drains (ft.)	Hoods (ea.)	Glove Boxes (ea.)	Ventilation Ducting (ft.)	Cabinets/Shelves		Equipment (50 ft^3 - ea.)		Comments
Laboratory	Floor							Factor	(ft.)	(3.5 x 3.5 x 4)	(ft^2)	
405	1	30	2	60	1	0	40	0.5	15	2	100	
Facility Totals		30	2	60	1	0	40		15	2	100	
Floor Area												
Total Facility	1,330											
Class 1	252											
Class 2	270	25%										
Class 3	809	75%										
Non-Impacted	0											

	Floors				Walls				Ceilings				Waste	
Bldg. 81	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
1090/91	1	30	20	600	2	20	20	800	1	30	20	600		
					2	30	20	1200						
1070	1	11	50	550	2	50	20	2000	1	11	50	550		
					2	11	20	440						
Facility Totals				1150				4440				1150	Waste	
Floor Area														
Total Facility													DAW	
Class 1													Liquid	
Class 2													Biological	
Class 3														
Non-Impacted														

	Floors				Walls				Ceilings				Waste	
Bldg. 134	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Number	Width (ft.)	Height (ft.)	Area (ft^2)	Number	Length (ft.)	Width (ft.)	Area (ft^2)	Type	Volume (ft^3)
Laboratory														
405	1	12	21	252	2	21	15	630	1	12	21	252	DAW	
					2	12	15	360					Biological	
Facility Totals				252				990				252	Waste	
Floor Area														
Total Facility													DAW	
Class 1													Liquid	
Class 2													Biological	
Class 3														
Non-Impacted														

NRC FORM 374 U.S. NUCLEAR REGULATORY COMMISSION

Amendment No. 103

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	In accordance with the letter dated April 24, 2002,
1. E. R. Squibb & Sons, Inc.	3. License number 29-00139-02 is amended in its entirety to read as follows:
2. 311 Pennington-Rocky Hill Road Mail Stop HW8T-1.12 Pennington, New Jersey 08534-2130	4. Expiration date September 30, 2008
	5. Docket No. 030-05222 Reference No.

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Any byproduct material with atomic numbers 1 through 83, except Strontium 90	A. Any	A. 100 millicuries per radionuclide and 2 curies total
B. Hydrogen 3	B. Any	B. 150 curies
C. Carbon 14	C. Any	C. 20 curies
D. Strontium 90	D. Any	D. 2 millicuries
E. Technetium 99m	E. Any	E. 750 millicuries
F. Any byproduct material with atomic numbers 84 through 103	F. Any	F. 1 millicurie
G. Nickel 63	G. Foil or plated sources registered either with the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State.	G. No single source to exceed the maximum activity specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State
H. Any byproduct material with atomic numbers 1 through 83, except Strontium 90	H. Any	H. 200 millicuries per radionuclide and 6 curies total

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
29-00139-02

Docket or Reference Number
030-05222

Amendment No. 103

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
I. Hydrogen 3	I. Any	I. 7 curies
J. Carbon 14	J. Any	J. 5 curies
K. Phosphorus 33	K. Any	K. 1 curie
L. Sulfur 35	L. Any	L. 10 curies
M. Iodine 125	M. Any	M. 500 millicuries
N. Nickel 63	N. Foil or plated sources registered either with the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State	N. No single source to exceed the maximum activity specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State
O. Any byproduct material with atomic numbers 1 through 83, except, Strontium 90	O. Any	O. 200 millicuries per radionuclide and 6 curies total
P. Hydrogen 3	P. Any	P. 500 millicuries
Q. Carbon 14	Q. Any	Q. 500 millicuries
R. Sulfur 35	R. Any	R. 300 millicuries
S. Calcium 45	S. Any	S. 300 millicuries
T. Nickel 63	T. Foil or plated sources registered either with the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State	T. No single source to exceed the maximum activity specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State
U. Any byproduct material with atomic numbers 1 through 83, except Strontium 90	U. Any	U. 10 millicuries per radionuclide and 1 curie total

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
29-00139-02

Docket or Reference Number
030-05222

Amendment No. 103

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
V. Hydrogen 3	V. Any	V. 100 millicuries
W. Carbon 14	W. Any	W. 100 millicuries
X. Sulfur 35	X. Any	X. 300 millicuries
Y. Phosphorous 32	Y. Any	Y. 100 millicuries
Z. Phosphorous 33	Z. Any	Z. 200 millicuries
AA. Iodine 125	AA. Any	AA. 50 millicuries
BB. Nickel 63	BB. Foil or plated sources registered either with the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State	BB. No single source to exceed the maximum activity specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State
CC. Cesium 137	CC. Sealed Sources (J.L. Shepherd and Associates Model 6810)	CC. No single source to exceed the maximum activity per source or maximum activity per device specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State

9. Authorized use:

A., B., C., D., and F. Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments.

E. Research and development as defined in 10 CFR 30.4; animal studies.

B. and C. Preparation and distribution of radioactive drugs to authorized recipients in accordance with 10 CFR 32.72.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
29-00139-02

Docket or Reference Number
030-05222

Amendment No. 103

H. through M., O. through S., and U. through AA. Research and development as defined in 10 CFR 30.4; animal studies; and calibration and checking of the licensee's instruments.

G., N., T., and BB. To be used for sample analysis in compatible gas chromatography devices that have been registered either with the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State and have been distributed in accordance with a Commission or Agreement State specific license authorizing distribution to persons specifically authorized by a Commission or Agreement State license to receive, possess, and use the devices.

CC. For irradiation of materials in self-shielded irradiator devices that have been registered either with the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State and which have been distributed in accordance with a Commission or Agreement State specific license authorizing distribution to persons specifically authorized by a Commission or Agreement State license to receive, possess, and use the devices.

CONDITIONS

10. A. Licensed material in Items 6.A. through 6.G. may only be used at the licensee's facilities located at One Squibb Drive, New Brunswick, New Jersey.

    B. Licensed material in Items 6.H. through 6.N. and 6.CC. may only be used at the licensee's facilities located at Route 206 and Provinceline Road, Lawrenceville, New Jersey.

    C. Licensed material in Items 6.O. through 6.T. may only be used at the licensee's facilities located at 311 Pennington-Rocky Hill Road, Pennington, New Jersey.

    D. Licensed material in Items 6.U. through 6.BB. may only be used at the licensee's facilities located at Three Hamilton Health Place, Hamilton, New Jersey.

11. A. Licensed material shall be used by, or under the supervision of, individuals designated by the licensee's Radiation Safety Committee.

    B. The Radiation Safety Officer for this license is Michael J. Vala, CHP.

12. The licensee shall not use licensed material in or on human beings except as provided otherwise by specific condition of this license.

13. The licensee shall not use licensed material in field applications where it is released except as provided otherwise by specific condition of this license.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
29-00139-02

Docket or Reference Number
030-05222

Amendment No. 103

14. Experimental animals administered licensed materials or their products shall not be used for human consumption.

15. This license does not authorize commercial distribution of licensed material to persons generally licensed pursuant to 10 CFR Part 31 or equivalent regulations of any Agreement State or to persons exempt from licensing pursuant to 10 CFR 30.14 through 30.20 inclusive, or equivalent regulations of any Agreement State.

16. This license does not authorize commercial distribution of licensed material.

17.A. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement State.

B. Notwithstanding Paragraph A of this Condition, sealed sources designed to primarily emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.

C. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.

D. In the absence of a certificate from a transferor indicating that a leak test has been made within the intervals specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement State, prior to the transfer, a sealed source received from another person shall not be put into use until tested and the test results received.

E. Sealed sources need not be tested if they contain only hydrogen-3; or they contain only a radioactive gas; or the half-life of the isotope is 30 days or less; or they contain not more than 100 microcuries of beta- and/or gamma-emitting material or not more than 10 microcuries of alpha-emitting material.

F. Sealed sources need not be tested if they are in storage and are not being used; however, when they are removed from storage for use or transferred to another person and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

G. The leak test shall be capable of detecting the presence of 0.005 microcurie (185 becquerels) of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie (185 becquerels) or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(c)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
29-00139-02

Docket or Reference Number
030-05222

Amendment No. 103

H. Tests for leakage and/or contamination, including leak test sample collection and analysis, shall be performed by the licensee or by other persons specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.

18. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.

19. The licensee shall conduct a physical inventory every six months, or at other interval approved by the U.S. Nuclear Regulatory Commission, to account for all sealed sources and/or devices received and possessed under the license.

20. The licensee shall not repair, remove, replace, or alter any of the following: electrical and mechanical systems that control source or shielding movement, the irradiator's shielding or sealed source, safety interlocks, or any component that may affect safe operation of the irradiator. These activities shall be performed by a person specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.

21. For each J. L. Shepherd and Associates, Mark I or Model 81-22, cesium-137 irradiator installed and used, the licensee shall:

A. Permit the use of the irradiator only when a calibrated and operable radiation survey meter or room monitor is available; and

B. Permit the irradiator door to be opened only after the operator has checked visual indicators to verify that the source has returned to its safe storage position; and

C. Have room monitors installed that will:

(i) Operate at all times when the irradiator is in use; and
(ii) Activate a visible and audible alarm when radiation exceeds 2 millirems per hour; and
(iii) Detect any radiation leaking from the irradiator door; and
(iv) Be visible to the irradiator user when the user is next to the irradiator; or

D. If a room monitor is not installed, have available a calibrated and operable survey meter which will be used to:

(i) Determine the radiation level at the irradiator door when the door is closed; and
(ii) Check for any increase in radiation levels each time the irradiator door is opened.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
29-00139-02

Docket or Reference Number
030-05222

Amendment No. 103

E. If abnormal radiation levels or any malfunctions of the irradiator are detected at any time, the licensee shall cease using the irradiator, restrict access to the area housing the irradiator, immediately notify the Radiation Safety Officer, and submit all reports required under 10 CFR Parts 20, 21 or 30.

F. Not repair or authorize repairs of the irradiator except by the manufacturer or other persons specifically authorized by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.

22.A. Detector cells containing a titanium tritide foil or a scandium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents the foil temperatures from exceeding that specified in the certificate of registration referred to in 10 CFR 32.210.

B. When in use, detector cells containing a titanium tritide foil or a scandium tritide foil shall be vented to the outside.

23.The licensee is authorized to hold radioactive material with a physical half-life of less than 120 days for decay-in-storage before disposal in ordinary trash, provided:

A. Waste to be disposed of in this manner shall be held for decay a minimum of ten half-lives.

B. Before disposal as ordinary trash, the waste shall be surveyed at the container surface with the appropriate survey instrument set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.

C. A record of each such disposal permitted under this License Condition shall be retained for three years. The record must include the date of disposal, the date on which the byproduct material was placed in storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.

24. The licensee shall submit a revised Decommissioning Funding Plan that includes all licensed locations and activities, by March 1, 2003 or ninety days following completion of the decommissioning of building 124 at the New Brunswick, New Jersey location, whichever occurs earlier. The Decommissioning Funding Plan shall be sent to the Director, Division of Nuclear Materials Safety, Region I Office referenced in Appendix D of 10 CFR Part 20.

25. The licensee may transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
29-00139-02

Docket or Reference Number
030-05222

Amendment No. 103

26. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.

A. Letter dated March 23, 1992
B. Letter dated May 8, 1992
C. Letter dated February 17, 1994
D. Letter dated June 20, 1994
E. Application dated February 18, 1997
F. Letter dated August 26, 1997
G. Letter dated August 29, 1997
H. Letter dated October 15, 1997
I. Letter dated June 19, 1998
J. Letter dated August 19, 1998
K. Letter dated March 15, 2001
L. Letter dated May 15, 2001
M. Letter dated July 18, 2001, except decommissioning plan
N. Letter dated October 2, 2001
O. Letter dated October 15, 2001
P. Letter dated November 16, 2001
Q. Letter dated December 14, 2001
R. Letter dated January 22, 2002
S. Letter dated February 6, 2002
T. Letter dated April 24, 2002

For the U.S. Nuclear Regulatory Commission

Date May 6, 2002

By _____
Elizabeth Ullrich
Nuclear Materials Safety Branch 2
Region I
King of Prussia, Pennsylvania 19406

97566953

JL SHEPHERD & ASSOCIATES
1010 ARROYO AVE., SAN FERNANDO, CALIFORNIA 91340-1822
818-898-2361 FAX 818-361-8095

November 02, 2002

Annette Leach
Philotechnics, LTD
118 Mitchell Road
Oak Ridge, TN 37830

Fax: 865-220-0686 865 483 1530

Reference: JLS-7238
Decommissioning for Bristol-Meyers Squibb

Dear Ms. Leach:

This letter is in response to your request, concerning decommissioning costs for the 2 each, Mark I Irradiators located at Bristol-Meyers Squibb in New Jersey:

Currently it is possible for J.L. Shepherd and Associates (JLS&A) to perform the decommissioning of these sources/devices. JLS&A would transfer each source/device to our RAM License and perform the shipment, excluding rigging (fork lift, etc.) at a cost of $35,000.00 each.

This commitment is only valid until 12/31/02, under current regulations and JLS&A corporate structure. We will not and can not commit for any decommissioning project for the long term, not knowing future regulations, nor will we guarantee that we will be in business at some distant date in the future when you may actually want to decommission your source/device. Other decommissioning options include land disposal (burial) and again, we cannot guarantee that decommissioning could be performed due to future regulations or future availability of a disposal site.

For license financial surety, we believe that the current maximum decommissioning amount which can be placed on a sealed source of this type is $75,000.00 per NRC guidelines.

Sincerely yours,

J.L. SHEPHERD AND ASSOCIATES

Mary F. Shepherd

Mary F. Shepherd
Vice President