VOID SHEET

TO: License Fee Manage	ement Branch	
FROM: RIII - CHARLE	SF. GILL	
SUBJECT: VOIDED APPLIC	CATION	
Control Number:	300237	
Applicant:	Dow Chamical Company	
License Number:	21-00265-06	
Docket Number:	030-04782	
Date Voided:	February 26, 1999	
Reason for Void:	No lucquing action was required.	
Decommissioning Fo	No licensing action was required.	
	Charles 7 200 February 26,1999 Date	-
Attachment: Official Record Copy of Voided Action		
FOR LFMB USE ONLY		
Refund Authorized a	and processed	
No Refund Due		
Fee Exempt or Fee	Not Required //	
Comments:	Log completed	
	Processed by: SAC 3/11/99	
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(FOR LFMS USE)
INFORMATION FROM LTS BETWEEN: Program Code: 03610

Status Code: 0

Fee Category: 3L 1C 2C

Exp. Date: 20070930

Fee Comments: 2C EFF 9/8/97

Decom Fin Assur Reqd: Y License Fee Management Branch, ARM and Regional Licensing Sections LICENSE FEE TRANSMITTAL REGION APPLICATION ATTACHED APPLICATION ATTACKED
Applicant/Licensee: DOW CHEMICAL COMPANY
Received Date: 970929
Docket No: 3004783 Docket No: Control No.: License No.: Action Type: 300237 21-00265-06 Amendment FEE ATTACHED Amount: Check No.: 3. COMMENTS Signed Date B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered /_/) Fee Category and Amount: Correct Fee Paid. Application may be processed for: Amendment Renewal License 3. OTHER Signed Late

The Dow Chemical Company Midland, Michigan 48674

September 22, 1997

Charles Gill
Health Physicist
Nuclear Materials Licensing Branch
USNRC, Region III
801 Warrenville Road
Lisle, Illinois 60532-4351

Dear Mr. Gill:

I have enclosed an updated copy of our Decommissioning Funding Plan. I have added information regarding decommissioning of areas using thorium and plutonium.

If you have any questions please contact me at (517) 636-1440.

Smet A. Grappin

Sincerely.

Radiation Safety Officer

Michigan Industrial Hygiene Service Center

The Dow Chemical Company

1803 Building

Midland, Michigan 48674

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300237

Decemmissioning Funding Plan

9/18/97

GENERAL INFORMATION

License Number:

21-00265-06

Licensee's Name:

The Dow Chemical Company

Address:

1803 Building,

Midland, MI 48674

2. DESCRIPTION OF PLANNED DECOMMISSIONING ACTIVITIES

2.1 Decommissioning Objective, Activities and Tasks

- 2.1.1 The objective of decommissioning is to properly dispose of radioactive materials covered by NRC License Number 21-00265-06 such that remaining amounts of radioactive materials do not exceed those levels specified in "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material", USNRC. Radioactive warning signs and labels will also be disposed of or defaced.
 - Properly dispose of all sealed sources through transfer to an authorized licensee.
 - Incinerate C-14 and H-3 wastes according to conditions in License.
 - 3. Properly dispose of all other long lived isotopes (half life greater than 120 days) through transfer to authorized licensees.
 - 4. Thoroughly survey laboratories and areas where radioactive materials have been used or stored (including ventilation and compaction systems) for contamination, following established written procedures.
 - 5. Decontaminate, according to established written procedures all areas, where contamination levels above guidelines are found.
 - 6. Perform a thorough final survey.
 - Dispose of all radioactive waste created during decontamination activities by transfer to an authorized licensee or incineration.

2.12 Description

The activities listed above will be performed and documented for all areas where radioactive materials have been used or stored. Byproduct materials are currently used in the following buildings: 1602 Building - 3 labs, 1803 Building - 20 labs, several hundred sealed sources are located throughout the Michigan Division and the Research area, radioactive materials are incinerated in 703 Building, and small amounts of radioactive materials were buried at the Midland plant.

Thorium will be used in 677 Building in 2 laboratories. Plutonium, up to 1 mCi in loose form, will be used in the 3 labs that are currently approved for use of radioactive material in 1602 Building.

Little or no residual contamination is expected in any of the lab areas, plant areas or the incinerator. Potential for accidents during this decommissioning is very low. The most likely type of accident would be a small spill of radioactive material during clean up. This type of accident would be handled according to established written procedures.

2.1.3 Procedures

Decontamination, surveys and emergency response will be conducted according to the written procedures for these activities established for the use of radioactive materials.

2.2 Decommissioning Organization and Responsibilities

The decommissioning activities will be overseen by the RSO and the Radiation Safety Co imittee. Decommissioning activities will be performed by the Health Physics staff and Authorized Users and other Dow employees. Contract workers may be used to perform some demolition related tasks such as removing equipment such as fume hoods that can not be decontaminated.

2.3 Training

The RSO, Authorized Users and other Dow employees involved in the decommissioning will receive training as specified Dow's written Radiation Safety Program. Contractors will receive the same training as Dow ancillary employees.

3. DESCRIPTION OF METHODS USED FOR PROTECTION OF OCCUPATIONAL AND PUBLIC HEALTH AND SAFETY

3.1 Facility Radiological History Information

The following historical information will be reviewed and dealt with during the decommissioning:

Locations of use of radioactive materials:

- Currently 1602, 1701, 1803, 703, Midland Plant Hazardous Materials burial area
- Thorium will be used in 677 Building in 2 laboratories.
- The plutonium, up to 1 mCi in loose form, will be used in the 3 labs that are currently approved for use of radioactive material in 1602 Building.

Types of operations performed in these locations:

- 1602, several sealed sources Na-22, Pu-238, low level lab analytical work such as gamma spectroscopy also work with up to 1 mCi loose pu-238.
- 1701, mCi quantities of C-14 and H-3, tracer studies and animal studies.
- 1803, mCi quantities of C-14 and H-3, tracer studies and animal studies.
- 703 up to 25 mCi of C-14 or H-3 incinerated per day
- 677 research using small quantities of thorium

Typical radiation and contamination levels:

- 1602 Building < 1 mR/hr and < 50 dpm/100 cm²
- 1701 Building < 1 mR/hr and < 50 dpm/100 cm²
- 1803 Building < 1 mR/hr and < 50 dpm/100 cm²
- 703 Building < 1 mR/hr and < 50 dpm/100 cm²
- 677 Building < 1 mR/hr and < 50 dpm/100 cm²

Ventilation systems for labs in 677, 1602, 1701 and 1803 may be contaminated.

3.2 Ensuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA)

See ALARA Program in Appendix 10.

3.3 Health Physics Program

The Health Physics staff will audit all areas decommissioned by Authorized Users. The Radiation Safety Committee will review all Health Physics audits.

Radiation surveys in areas where gamma and high energy beta emitters were used will be performed using Victoreen Model 450 ion chamber survey meters or equivalent meters. Contamination surveys in areas where gamma and high energy beta emitters were used will be performed using a Ludlum Model 3 survey meter with a model 44-9 pancake probe or a Ludlum Model 3-98 meter with a 44-3 probe (scintillation probe) or equivalent. Wipe tests using dry cotton swabs analyzed by scintillation counter will be used to measure removable contamination levels.

Survey meters will be calibrated as described in Dow's written Radiation Safety Program.

Radiation field surveys will not be performed in areas where only C-14 and/or H-3 were used. Wipe tests using dry cotton swabs analyzed by scintillation counter will be used to measure removable contamination levels.

Personal and area monitoring will be performed as described in the written Radiation Safety Program.

3.4 Contractor Personnel

Contractors will follow the same policies and procedures as Dow Employees.

3.5 Radioactive Waste Management

Sealed sources removed from plant areas will be stored in a locked sealed source storage area, currently 1138 Building, until transfer to an authorized licensee.

Loose isotope wastes and contaminated wastes produced during decontamination activities will be stored in the radioactive waste storage area, currently 1365 building, until they can be disposed of or incinerated.

Thorium wastes and contaminated wastes produced during decontamination activities will be stored in the radioactive waste storage area, currently 1365 building, until they can be disposed of through shipment to an authorized licensee.

Plutonium wastes and contaminated wastes produced during decontamination activities will be stored in the radioactive waste storage area, currently 1365 building, until they can be disposed of through shipment to an authorized licensee.

Projected generation of radwaste:

- Approximately 300 sealed sources will be disposed of through transfer to an authorized licensee.
- An estimated 4, 55 gallon drums of thorium contaminated waste will be disposed of through transfer to an authorized licensee.
- Approximately 1, 55 gallon drum of plutonium contaminated waste will be returned to NIST.
- Approximately 1000 mCi of C-14 will probably need to be incinerated according to existing license conditions.
- Approximately 100 mCi of H-3 will probably need to be incinerated according to existing license conditions.
- An estimated 20, 55 gallon drums of slightly contaminated (C-14 and/orH-3) may be produced during decommissioning. This will also be incinerated according to conditions in the existing license.
- Any isotopes requiring decay in storage will be stored at 1365 building until they have decayed sufficiently to be incinerated.

4. PLANNED FINAL RADIATION SURVEY

All areas listed in section 3.1 will be surveyed. The final survey will include contamination surveys using a GM counter with a pancake probe or a scintillation counter of all areas where gamma or high energy beta emitting radioactive materials were used or stored. Wipe testing of these areas and areas where low energy beta emitters were used will be performed using dry cotton swabs analyzed by liquid scintillation. The above mentioned surveys will also be performed in areas such as floors, computer keyboards, desks, benchtops and doors of labs where radioactive materials were used or stored.

Release criteria will be "Acceptable Surface Contamination Levels" as specified in "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use of Termination of Licenses for Byproduct, Source, or Special Nuclear Materials", USNRC, August 1987.

Final survey data will be compiled in a final survey report which will be reviewed by the Radiation Safety Committee.

5. FUNDING

. . . .

The following is a detailed cost estimate for decommissioning:

	Description	Estimated Time Required	Rate	Cost
1	Disposal of ~ 300 sealed sources			
	 Move sources to storage area 	0.2 workyears	28/hour	\$11,200
	 Disposal of sealed sources based on 1995 disposal costs 			\$250,000
	 Health Physics support 	0.2 workyear	100/hour	\$40,000
2	Packaging and incinerating loose isotopes	100 hrs	100/hr	\$10,000
3	Decontamination of 27 labs by authorized users or HP Staff	20hrs/lab	100/hr	\$54,000
4	Final survey by RSO and HP Technologist of 27 labs	10 hrs/lab	100/hr	\$27,000
5	Packaging, shipping and disposal of 4 drums thorium contaminated waste ~50 lb/drum		10/lb	\$2,000
6	Packaging and shipping of one 55 gallon drum of plutonium contaminated waste to NIST	20 hrs	100/hr	\$2,000
7	Administrative Total	0.2 workyears	50/hour	\$20,000 \$416,200.00

Financial assurance, by the self guarantee method has been submitted to the NRC for the amount of \$825,000.



UNITED STATES NUCLEAR REGULATORY COMMISSION

REGION III 801 WARREMVILLE ROAD LISLE, ILLINOIS 60532-4351

FEB 2 6 1999

Janet A. Grappin
Radiation Safety Officer
Michigan Industrial Hygiene
Service Center
The Dow Chemical Company
1803 Building
Midland, Mi 48674

Dear Ms. Grappin:

We have reviewed your decommissioning financial assurance submittal dated September 22, 1997, and subsequent submittals dated March 5, 1998, September 15, 1998 and February 22, 1999 in response to our letters dated February 9, 1998, June 30, 1998 and January 6, 1999 regarding your Decommissioning Funding Plan (DFP). Within the scope of our review, no further deficiencies were identified. Your revised DFP is approved by the NRC in the cost amount of \$329,863.99. A copy of this information will be placed in your license file.

The Dow Chemical Company in Midland, Michigan, submitted a letter and a revised cost estimate in support of a previously submitted financial assurance demonstration. The current submission addresses estimated decommissioning costs of \$329,863.99 for license 21-00265-06 issued under 10 CFR Part 30, which was previously assured for the sum of two certification amounts totaling \$825,000 (\$750,000 for unsealed isotopes plus \$75,000 for sealed sources).

If you have any questions or require clarification on any of the information stated above, you may contact us at (630) 829-9887.

Sincerely,

Original signed by Monte P. Phillips Materials Licensing Branch

License No. 21-00265-06 Docket No. 030-04783

¹ The licensee's \$20,655,000 self-guarantee also addresses decommissioning costs of \$18,830,000 for license STB-527 issued under 10 CFR Part 40 and \$1,000,000 for license R-108 issued under 10 CFR Part 50.

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OFFICIAL RECORD COPY

The Dow Chemical Company Midland, Michigan 48674

February 22, 1999

Charles Gill Nuclear Materials Licensing Branch USNRC, Region III 801 Warrenville Road Lisle, Illinois 60532-4351

Dear Mr. Gill:

This letter contains the additional information you requested in your letter dated January 6, 1999 with the control number: 300237.

 Revise the Cost Estimate to Incorporate the Costs of Decontaminating the Midland Plant Hazardous Materials Burial Area and the 1138 Building

1.1 The Midland Plant Hazardous Materials Burial Area

Calculations done using the computer program RESRAD and site specific information, show that this site may be released as an unrestricted site. Therefore, no decommissioning will be necessary.

1.2 1138 Building

Decommissioning of this building will require removal and disposal of the sealed sources that are stored here and removal of any fixed or loose contamination remaining. Periodic wipe testing in this area shows no contamination above background levels. Decontamination is therefore not expected to be necessary. However, a final survey will be conducted and documented. Disposal costs of the sealed sources are included in Attachment 1.

Since surveys and decommissioning activities will be performed by the Health Physicist or Health Physics Technician and they have already been trained in radioactive materials handling, no additional training will be necessary.

We would expect planning and preparation for decommissioning of this building to take no more than 0.5 days each (including ancillary time) for the Health Physicist and Health Physics technician.

The initial radiological survey of this building could easily be done in 4 hours by the Health Physics Technician. If you add 50% ancillary time, this would be 6 RECEIVED

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hours. The final radiological survey would then be done by the Health Physicist and Health Physics Technician. This would take 4 hours each for the Health Physicist and Health Physics Technician, including documentation, 6 hours each including 50% ancillary time.

The wipe samples would be counted in-house using a scintillation counter. No charge needs to be added for this as per NUREG CR 1754 Addendum 1.

2. Revise and Provide Additional Justification for the Cost Estimate for the Disposal of Sealed Sources

2.2 Revised Cost Estimate for the Two 6,500 mCi Cs-137 Sources

The estimate for the two 6,500 mCi sources was revised from \$7,000 per source to \$8,960 per source. See Attachment 1.

2.3 Justification for the Estimated Disposal Cost for the 64,000 mCi Cs-137 Source

A letter from Padiation Technology with an estimated cost of disposal for the 64,000 mCi source of Cs-137 is attached. See Attachment 2.

3. Revise the Cost Estimate to Include Costs for Administrative Tasks

The previous cost estimate included \$20,000 in costs for administrative tasks. This was taken from a source detailing the general costs of decommissioning. After reviewing our specific situation in detail, the only administrative costs that we expect to incur are the secretarial costs (for filing of the completed survey reports) listed in Attachment 3.

4. If Necessary, Submit Additional Detail on the Ventilation and Compaction Systems at the Facility

Surveys and wipe tests of existing ventilation systems in 1803 and 1602 Buildings show no contamination above background levels. These buildings do not contain compaction systems. Their ventilation systems consist of laboratory hoods, associated ductwork, fans and exhaust stacks.

5. Plutonium Waste

A decision has been made not to obtain unsealed sources of plutonium. An amendment dated February 4, 1999 removing plutonium from our license was mailed to Mr. Monte Phillips.

If the Cost Estimate Increases, Increase the Coverage Provided by the Self-Guarantee

Attachment 3 contains cost estimates for decommissioning of our facilities.

Charges per type of employee were based on values for Owner/Operator's Staff and in NUREG/CR-1754 Addendum 1, Appendix D, Table D.1. These charges were multiplied by 1.3 to achieve a 30% increase for inflation. The charges per labor type used in our calculations are listed at the bottom of each sheet of Attachment 3.

The total cost per lab was calculated to be \$1,910.79. Therefore, the total cost of decommissioning 27 labs would be \$51,591.20, or \$64,488.99 with the 25% contingency factor.

From Attachment 1, our estimated cost to dispose of our sealed sources is \$212,300. Adding the 25% contingency fee this comes to \$265,375.

Total \$329,863.99

Financial assurance by the Self Guarantee Method, has been submitted to the NRC in the amount of \$825,000. Since estimates of our actual decommissioning costs are less than that amount, we will not be adjusting our current level of financial assurance.

Thank you for your assistance with this matter. If you have any questions please contact me at (517) 636-1440.

Sincerely,

Janet A. Grappin

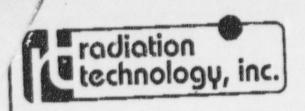
Radiation Safety Officer

The Dow Chemical Company

1803 Building

Midland, Michigan 48674

Isotope	Activity (mCi)	Quantity	Disposal Cost	Total
Cs-137	10	6	\$380.00	\$2,280.00
Cs-137	20	10	\$400.00	\$4,000.00
Cs-137	30	20	\$450.00	\$9,000.00
Cs-137	40	33	\$450.00	\$14,850.00
Cs-137	50	2	\$450.00	\$900.00
Os-137	60	1	\$530.00	\$530.00
Cs-137	70	15	\$530.00	\$7,950.00
Cs-137	80	8	\$530.00	\$4,240.00
Cs-137	90	1	\$530.00	\$530.00
Os-137	100	15	\$530.00	\$7,950.00
Os-137	150	5	\$615.00	\$3,075.00
Os-137	200	20	\$700.00	\$14,000.00
Cs-137	300	4	\$1,205.00	\$4,820.00
Cs-137	400	3	\$1,205.00	\$3,615.00
Cs-137	500	1	\$1,205.00	\$1,205.00
Os-137	700	1	\$1,525.00	\$1,525.00
Ca-137	800	1	\$1,525.00	\$1,525.00
Cs-137	1000	1	\$1,525.00	\$1,525.00
Os-137	1500	1	\$2,240.00	\$2,240.00
Cs-137	2000	1	\$2,240.00	\$2,240.00
Os-137	3000	3	\$3,360.00	\$10,080.00
Os-137	6500	2	\$8,960.00	\$17,920.00
Os-137	64000	1	\$64,000.00	\$64,000.00
Vi-63	5	6	\$175.00	\$1,050.00
Vi-63	8	1	\$175.00	\$175.00
Vi-63	15	33	\$175.00	\$5,775.00
Kr-85	5	5	\$175.00	\$875.00
<r-85< td=""><td>75</td><td>1</td><td>\$310.00</td><td>\$310.00</td></r-85<>	75	1	\$310.00	\$310.00
Kr-85	850	7	\$1,095.00	\$7,665.00
Am-241	20	2	\$1,050.00	\$2,100.00
Am-241	25	1	\$1,315.00	\$1,315.00
Am-241	150	1	\$2,075.00	\$2,075.00
Am-241	200	1	\$2,075.00	\$2,075.00
Cm-244	90	3	\$1,820.00	\$5,460.00
4-3	90	1	\$275.00	\$275.00
4-3	4000	1	\$1,250.00	\$1,250.00
Fe-55	25	1	\$175.00	\$175.00
Fe-55	40	1	\$175.00	\$175.00
Cd-109	2	1	\$175.00	\$175.00
Cd-109	7	1	\$175.00	\$175.00
Assorted	Check sources	20	\$60.00	\$1,200.00
Totals		242	MARKET PRINCIPATION OF THE PRINCIPATION AND ADMINISTRATION OF THE PRINCIPATION OF THE	\$212,300.00
· Oldio			25% contingency	\$53,075.00
			total	\$265,375.00



December 6, 1996

Janet Grar pin, RSO Dow Chet tical USA Building 1803, MIHSC Midland, MI 48674

Dear Janet:

I apologize for taking so long to respond to the questions raised in our recent telephone conversation. It has just been a zoo around here for a couple of weeks.

- 1. Cur transfer price for the 30 mCi Pu-238 source would be \$1,175.00. As you mentioned, shipping sould be a problem if there is no special form certificate available. There may be a couple of alternatives:
 - If you know what device the source was used in (i.e., manufacturer and model member) we may have data to determine the form of the material; for some manufacturers we know what sources they use and who they buy them from.
 - b. If special form cannot be verified, we do have an approved Type B shipping container. We just have never had a need to apply to the NRC for an approved Quality Assurance Program in order to be able to make Type B shipments. We could do this with minimal effort, and may in fact go ahead and do so in case you need assistance with this type of shipment in the future.
- 2. The massfer price for 10 mCi of H-3 would be \$150.00.
- 3. You are correct, the transfer price for a six inch Sr-90, 30 mCi strip source would be \$1,050.00. All these prices will be firm through first quarter 1997.
- 4. My best estimate for transferring the 6/ Curie Cs-137 source would be around \$1000/Ci et present. As you know, however, with the waste disposal situation that exists today, these prices are continually increasing. The Conference of Radiation Control Program Directors periodically publishes lists of companies who may be interested in obtaining used material. Two possible contacts for further information are:

North American Scientific Contact: Mike Cutrer Phone: 818/502-9201; FAX 818/503-0764.

Activity	Supervisor	HP Technician	Technician	Craftsman	Secretar;	Total cost
Planning (days)	0.5	0.5				
Initial Survey (days)		0.75				
Develop Work Plan (days)		0.1				
Subtotal (days)	0.5	1.35				
Total cost	\$186.94	\$310.99				\$497.93
Decommissioning (days)						
Decontaminate hot spots (days)		0.125	0.125			
Package waste (days)		1	1			
Subtotal (days)		1.125	1.125			
Total Cost		\$241.61	\$249.21			\$490.82
Final Radiological Survey (days)		0.5	0.5		0.1	
		\$107.38	\$110.76		\$17.26	\$235.40
Incineration of waste on site (days)		1	1		1	-
Total Cost		\$214.76	\$221.52		\$230.36	\$666.64
Cost per lab to incinerate 1 55 gallo	n fiberpack at on-s	ite incinerator				\$20.00
Total Cost for decommissioning						\$1,910.79
Total Cost for decommissioning						\$51,591.20
Total Cost for decommissioning:	27 labs + 25% Co	ningency				\$64,488.99

Charge-out Rates used in calculations above

Position	Ann. Rate (1988 \$)	Ann. Rate (1998 \$)	Charge-out Rate/day	i
Supervisor	\$71,900.00	\$93,470.00	\$373.88	
Craftsman	\$44,300.00	\$57,590.00	\$230.36	
Technician	\$42,600.00	\$55,380.00	\$221.52	
HP Technician	\$41,300.00	\$53,690.00	\$214.76	
Secretary	\$33,200.00	\$43,160.00	\$172.64	

Activity	Health Physicist	HP Technician	Secretary	Total cost
Planning (days)	0.5	0.5		
Initial Survey (days)		0.75		
Final Radiological Survey (days)	0.75	0.75	0.1	
Subtotal (days)	1.25	2	0.1	
Total Cost	\$467.35	\$429.52	\$17.26	\$914.13

Charge-out Rates used in calculations above

Position	Ann. Rate (1988 \$)	Ann. Rate (1998 \$)	Charge-out Rate/day	
Supervisor	\$71,900.00	\$93,470.00	\$373.88	
Craftsman	\$44,300.00	\$57,590.00	\$230.36	
Technician	\$42,600.00	\$55,380.00	\$221.52	
HP Technician	\$41,300.00	\$53,690.00	\$214.76	
Secretary	\$33,200.00	\$43,160.00	\$172.64	



UNITED STATES NUCLEAR REGULATORY COMMISSION

REGION III 801 WARRENVILLE ROAD LISLE, ILLINOIS 60532-4351

JAN 06 1999

Janet A. Grappin
Radiation Safety Officer
Michigan Industrial Hygiene
Service Center
The Dow Chemical Company
1803 Building
Midland, MI 48674

Dear Ms. Grappin:

We have reviewed your response letter dated September 15, 1998 to our letter dated June 30, 1998 regarding your Decommissioning Funding Plan (DFP) and find that we need additional information, as follows.

The Dow Chemical Company in Midland, Michigan, submitted an explanatory letter and a revised cost estimate in support of a previously submitted financial assurance demonstration. The current submission addresses estimated decommissioning costs of \$325,265 for license 21-00265-06 issued under 10 CFR Part 30, which was previously assured for the sum of two certification amounts totaling \$825,000 (\$750,000 for unsealed isotopes plus \$75,000 for sealed sources).¹

Based on our review of the submission, please modify the submission in the following ways:

- Revise the cost estimate to incorporate the costs of decontaminating the Midland Plant Hazardous Materials Burial Area and the 1138 Building;
- Revise and provide additional justification for the cost estimate for the disposal of sealed sources;
- (3) Revise the cost estimate to include costs for administrative tasks;
- If necessary, submit additional detail on the ventilation and compaction systems at the facility;
- (5) Justify the labor time estimate for packaging and shipping of plutoniumcontaminated waste; and

¹ The licensee's \$20,655,000 self-guarantee also addresses decommissioning costs of \$18,830,000 for license STB-527 issued under 10 CFR Part 40 and \$1,000,000 for license R-108 issued under 10 CFR Part 50.

(6) If the cost estimate increases, increase the coverage provided by the self-guarantee (10 CFR 30.35 and 40.36).

These items are discussed below.

Revise the Cost Estimate to Incorporate the Costs of Decontaminating the Midland Plant Hazardous Materials Burial Area and the 1138 Building

The current submission includes a description of the licensee's Midland Plant Hazardous Materials Burial Area and 1138 Building, but does not include any costs for decontaminating the burial area or the 1138 Building. Although the submission states that the burial area is inactive and that no "routine" operations occur at the area, the submission indicates that the area currently contains a number of radioactive contaminants. In addition, the submission indicates that the 1138 Building "may be used to store sealed radioactive sources." To ensure that the revised cost estimate accurately reflects all costs associated with decommissioning, please incorporate the costs of decontaminating the Midland Plant Hazardous Materials Burial Area and the 1138 Building in your total cost estimate.

2. Revise and Provide Additional Justification for the Cost Estimate for the Disposal of Sealed Sources

In addition, the licensee's reported quantity of Cs-137 sealed sources at 64,000 mCi (one) is multiplied by a unit disposal cost of \$64,000 per source. For Cs-137 activity levels above 8,000 mCi, however, the price table from Radiation Technology, Inc. does not specify a unit disposal cost, and simply states "Quote." The submission does not provide any justification for the \$64,000 unit cost used by the licensee, such as whether this cost is based on a quote from Radiation Technology, Inc.

Please revise your cost estimate for the disposal of sealed sources to incorporate the appropriate unit disposal cost for Cs-137 sealed sources at 6,500 mCi (i.e., \$6,960 per source). Provide justification for the \$64,000 unit disposal cost applied to Cs-137 sealed sources at 64,000 mCi.

3. Revise the Cost Estimate to Include Costs for Administrative Tasks

The licensee's previous cost estimate included \$20,000 in costs (without a contingency allowance) for administrative tasks. In a June 30, 1998, letter to the licensee, NRC asked the licensee to submit additional detail (e.g., labor costs by labor category) on these tasks. The current submission does not provide the requested information. Moreover, the revised cost estimate eliminates the previous \$20,000 estimated cost for administrative tasks without providing any justification for why these tasks have been ornitted. Please revise the cost estimate to include costs for administrative tasks (along with a 25 percent allowance for contingencies), and to provide the information previously requested by NRC (e.g., detail on the administrative tasks required and the labor costs by labor category).

If Necessary, Submit Additional Detail on the Ventilation and Compaction Systems at the Facility

In a letter dated June 30, 1998, NRC asked the licensee to submit a description of the ventilation and compaction systems at the facility, including the level of contamination present in these systems. In response to this request, the current submission states the following:

The ventilation and compaction systems in 1701 building have been decommissioned. Extensive surveys and wipe tests show no radioactive contamination above background levels in these systems.

Although the licensee's response adequately addresses the ventilation and compaction systems in the 1701 Building, it does not provide any information on ventilation and compaction systems located in other buildings at the facility. Therefore, if other buildings at the facility contain ventilation and compaction systems, please submit details on these systems, including a description of the systems and the level of contamination present in them.

5. Justify the Labor Time Estimate for Packaging and Shipping of Plutonium-Contaminated Waste

The current submission indicates that one container of plutonium-contaminated waste will be packaged and shipped to the National Institute of Standards and Technology (NIST). The submission estimates the total cost of this activity to be \$260, based on 4 hours of labor for a health physics technician (along with a shipping cost of \$100 and a 25 percent contingency). The licensee's previous cost estimate, however, included a cost of \$2,000 for this activity, based on 20 hours of labor. The current submission does not explain the reduction in labor time from 20 hours to 4 hours, and states only that the current estimate of 4 hours is "extremely conservative." In addition, the submission does not indicate whether NIST will accept the waste, or whether the licensee will be required to incur any costs for its disposal. To ensure that the revised cost estimate adequately accounts for all decommissioning costs, please justify your labor time estimate for packaging and shipping of plutonium-contaminated waste, and

explain whether NIST will charge a fee for accepting the waste.

 If the Cost Estimate Increases, Increase the Coverage Provided by the Self-Guarantee (10 CFR 30.35 and 40.36)

10 CFR 30.35 and 40.36 require licensees to obtain financial assurance for the full cost of decommissioning their facilities. Although the previously submitted self-guarantee is in an amount at least equal to the full amount of the licensee's current decommissioning cost estimate, the issues raised above (i.e., in Items 1 through 5) suggest that the current cost estimate may be significantly low. Therefore, to ensure that the amount of financial assurance provided is adequate, please increase the financial assurance coverage provided as necessary if the cost estimate increases.

Finally, all documents submitted to the NRC must be originally signed duplicates, as recommended in *Regulatory Guide 3.66*. Unless the documents have been properly signed, NRC cannot be certain that the financial assurance mechanism is enforceable.

We will continue our review of your request upon receipt of this information. Please reply in duplicate, within 30 days, and refer to Control Number 300237.

If you have any questions or require clarification on any of the information stated above, you may contact us at (630) 829-9887.

Sincerely,

Original signed by Charles F. Gill Materials Licensing Branch

License No. 21-00265-06 Docket No. 030-04783

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UNITED STATES NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

Jucis M. By Koda

December 14, 1998

MEMORANDUM TO: Charles Gill

Materials Licensing Section Division of Radiation Safety

Region III

FROM:

Louis M. Bykoski, Sr. Project Manager

Facilities Decommissioning Section

Low-Level Waste and Decommissioning

Projects Branch

Division of Waste Management, NMSS

SUBJECT:

THE OFFICE OF THE GENERAL COUNSEL AND CONTRACTOR

COMMENTS ON NON-STANDARD FINANCIAL ASSURANCE

SUBMITTAL

Our contractor, ICF Incorporated, and the Office of the General Counsel (OGC) have reviewed and provided comments on the DOW Chemical financial assurance submittal sent to us for review.

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

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

Attachments: As stated

CONTACT: L. Bykoski, NMSS

(301) 415-6754 S. Lewis, OGC (301 415-1684

> RECEIVED DEC 1 8 1998 REGION III

LIST OF INSTRUCTIONS

DOW Chemical Company

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

- 1. ICF comment 1 through 6 plus last paragraph.
- 2. All OGC comments.
- 3. All other comments and discussions are for reviewer information.

MEMO TO: Louis M. Bykoski, NMSS

FROM:

OGC

RE:

REVIEW OF NONSTANDARD SUBMITTALS

DOW CHEMICAL COMPANY

NO COMMENTS

MEMO TO: Louis M. Bykoski, NMSS

FROM:

OGC

RE:

REVIEW OF NONSTANDARD SUBMITTALS

DOW CHEMICAL COMPANY

0

NO COMMENTS



ICF Incorporated 9300 Lee Highway Fairfax, VA 22031-1207 703/934-3000 Fax 703/934-3740

November 18, 1998

To:

Dr. Lou Bykoski, NMSS/NRC

From:

Tom Uden, Matt Borick, and John Collier, ICF Incorporated

Subject:

Review of Decommissioning Funding Plan and Self-Guarantee/Financial Test

Submitted by The Dow Chemical Company

The Dow Chemical Company in Midland, Michigan, submitted an explanatory letter and a revised cost estimate in support of a previously submitted financial assurance demonstration. The current submission addresses estimated decommissioning costs of \$325,265 for license 21-00265-06 issued under 10 CFR Part 30, which was previously assured for the sum of two certification amounts totaling \$825,000 (\$750,000 for unsealed isotopes plus \$75,000 for sealed sources).

Upon review of the submission, ICF recommends that the licensee modify the submission in the following ways:

- Revise the cost estimate to incorporate the costs of decontaminating the Midland Plant Hazardous Materials Burial Area and the 1138 Building;
- (2) Revise and provide additional justification for the cost estimate for the disposal of sealed sources;
- (3) Revise the cost estimate to include costs for administrative tasks;
- (4) If necessary, submit additional detail on the ventilation and compaction systems at the facility;
- (5) Justify the labor time estimate for packaging and shipping of plutoniumcontaminated waste; and

¹ ICF reviewed five previous submissions from the licensee and reported recommendations to NRC in Liemoranda dated November 6, 1990, June 25, 1992, May 28, 1996, January 14, 1998, and May 15, 1998.

² The licensee's \$20,655,000 self-guarantee also addresses decommissioning costs of \$18,830,000 for license STB-527 issued under 10 CFR Part 40 and \$1,000,000 for license R-108 issued under 10 CFR Part 50. (See Other Issues b and c.)

(6) If the cost estimate increases, increase the coverage provided by the senguarantee (10 CFR 30.35 and 40.36).

These recommendations and other issues are discussed below.

(1) Revise the Cost Estimate to Incorporate the Costs of Decontaminating the Midland Plant Hazardous Materials Burial Area and the 1138 Building

The current submission includes a description of the licensee's Midland Plant Hazardous Materials Burial Area and 1138 Building, but does not include any costs for decontaminating the burial area or the 1138 Building. Although the submission states that the burial area is inactive and that no "routine" operations occur at the area, the submission indicates that the area currently contains a number of radioactive contaminants. In addition, the submission indicates that the 1138 Building "may be used to store sealed radioactive sources." To ensure that the revised cost estimate accurately reflects all costs associated with decommissioning, ICF recommends that the licensee incorporate the costs of decontaminating the Midland Plant Hazardous Materials Burial Area and the 1138 Building in its total cost estimate.

(2) Revise and Provide Additional Justification for the Cost Estimate for the Disposal of Sealed Sources

The submission includes a table listing the licensee's inventory of sealed sources along with the estimated disposal costs for each of these sources. In the table, disposal costs are calculated by multiplying the quantity of sealed sources at a given level of activity by the unit disposal costs, which are taken from a table of prices provided by Radiation Technology, Inc. The licensee's reported quantity of Cs-137 sealed sources at 6,500 mCi (two) is multiplied by a unit disposal cost of \$7,000 per source. Based on the prices from Radiation Technology, Inc., however, it appears that the correct unit cost should be \$8,960 per source. Multiplying the quantity of Cs-137 sealed sources at 6,500 mCi by this higher unit disposal cost would increase the licensee's total cost estimate by approximately \$5,000 (after accounting for a 25 percent contingency).

In addition, the licensee's reported quantity of Cs-137 sealed sources at 64,000 mCi (one) is multiplied by a unit disposal cost of \$64,000 per source. For Cs-137 activity levels above 8,000 mCi, however, the price table from Radiation Technology, Inc. does not specify a unit disposal cost, and simply states "Quote." The submission does not provide any justification for the \$64,000 unit cost used by the licensee, such as whether this cost is based on a quote from Radiation Technology, Inc.

ICF recommends that the licensee revise its cost estimate for the disposal of sealed sources to incorporate the appropriate unit disposal cost for Cs-137 sealed sources at 6,500 mCi

(i.e., \$8,960 per source). ICF also recommends that the licensee provide justification for the \$64,000 unit disposal cost applied to Cs-137 sealed sources at 64,000 mCi.

(3) Revise the Cost Estimate to Include Costs for Administrative Tasks

The licensee's previous cost estimate included \$20,000 in costs (without a contingency allowance) for administrative tasks. In a June 30, 1998, letter to the licensee, NRC asked the licensee to submit additional detail (e.g., labor costs by labor category) on these tasks. The current submission does not provide the requested information. Moreover, the revised cost estimate eliminates the previous \$20,000 estimated cost for administrative tasks without providing any justification for why these tasks have been omitted. ICF recommends that the licensee revise the cost estimate to include costs for administrative tasks (along with a 25 percent allowance for contingencies), and to provide the information previously requested by NRC (e.g., detail on the administrative tasks required and the labor costs by labor category).

(4) If Necessary, Submit Additional Detail on the Ventilation and Compaction Systems at the Facility

In a letter dated June 30, 1998, NRC asked the licensee to submit a description of the ventilation and compaction systems at the facility, including the level of contamination present in these systems. In response to this request, the current submission states the following:

The ventilation and compaction systems in 1701 building have been decommissioned. Extensive surveys and wipe tests show no radioactive contamination above background levels in these systems.

Although the licensee's response adequately addresses the ventilation and compaction systems in the 1701 Building, it does not provide any information on ventilation and compaction systems located in other buildings at the facility. Therefore, if other buildings at the facility contain ventilation and compaction systems, ICF recommends that the licensee submit details on these systems, including a description of the systems and the level of contamination present in them.

(5) Justify the Labor Time Estimate for Packaging and Shipping of Plutonium-Contaminated Waste

The current submission indicates that one container of plutonium-contaminated waste will be packaged and shipped to the National Institute of Standards and Technology (NIST). The submission estimates the total cost of this activity to be \$260, based on 4 hours of labor for a health physics technician (along with a shipping cost of \$100 and a 25 percent contingency). The licensee's previous cost estimate, however, included a cost of \$2,000 for this activity, based on 20 hours of labor. The current submission does not explain the reduction in labor time from 20 hours to 4 hours, and states only that the current estimate of 4 hours is "extremely conservative." In addition, the submission does not indicate whether NIST will accept the waste, or whether the

licensee will be required to incur any costs for its disposal. To ensure that the revised cost estimate adequately accounts for all decommissioning costs, ICF recommends that the licensee justify its labor time estimate for packaging and shipping of plutonium-contaminated waste, and explain whether NIST will charge a fee for accepting the waste.

(6) If the Cost Estimate Increases, Increase the Coverage Provided by the Self-Guarantee (10 CFR 30.35 and 40.36)

10 CFR 30.35 and 40.36 require licensees to obtain financial assurance for the full cost of decommissioning their facilities. Although the previously submitted self-guarantee is in an amount at least equal to the full amount of the licensee's current decommissioning cost estimate, the issue3 raised above (i.e., in Recommendations 1 through 5) suggest that the current cost estimate may be significantly low. Therefore, to ensure that the amount of financial assurance provided is adequate, ICF recommends that the licensee increase the financial assurance coverage provided as necessary if the cost estimate increases.

Other Issues

In addition to the issues raised above, the following issues are noteworthy:

In response to a February 9, 1998, letter from NRC requesting additional detail regarding the licensee's facility, the licensee's previous submission (dated March 5, 1998) included a description of a typical laboratory and stated that less than 27 such laboratories are currently in operation. The submission also stated that these laboratories are wipe tested every month, that greater than 99 percent of the tests show no detectable contamination, and that areas showing contamination are immediately decontaminated and retested until contamination is reduced below the license limits. Based on this information, the licensee estimated that the quantity and dimensions of the contaminated facility components are zero. In an earlier submission (dated September 18, 1997), however, the licensee noted that some equipment (e.g., fume hoods) may be contaminated.

The licensee's current decommissioning cost estimate is based on the assumption that, at the time of decommissioning, laboratory contamination levels will be comparable to those that existed at the time of the March 5, 1998, submission (as evidenced by results of the wipe tests). If NRC does not wish to accept this assumption as a basis for the decommissioning cost estimate, then revisions to the cost estimate would be needed. If significant decontamination of the 27 laboratories is required, then the cost estimate could increase by approximately \$3.7 million (based on the description of a typical laboratory provided by the licensee and the cost estimating tables in NUREG/CR-1754, Addendum 1).

(b) The decommissioning cost estimate for license STB-527 and the self-guarantee agreement (both previously reviewed by ICF in 1996) contained several deficiencies.

However, the current submission does not revise either the licensee's cost estimate for license STB-527 or the self-guarantee, nor does it indicate whether these deficiencies have been addressed by the licensee. Consequently, the recommendations noted in ICF's memorandum dated May 28, 1996, may still apply.

(c) A previous submission from the licensee included a November 11, 1991, letter from the licensee to NRC indicating that license R-108 was issued under 10 CFR Part 50. Although Part 50 licensees are required to decommission their facilities, the decommissioning requirements applicable to Part 50 licensees (including financial assurance requirements) are different from the requirements for licensees under Parts 30, 40, 70, and 72. ICF has not evaluated the licensee's compliance with the requirements of 10 CFR Part 50.

Finally, NRC should ensure that documents submitted by the licensee are originally signed duplicates, as recommended in *Regulatory Guide 3.66* "Standard Format and Content of Financial Assurance Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, 70, and 72," June 1990. Unless the documents have been properly signed, NRC cannot be certain that the financial assurance mechanism is enforceable. Because ICF does not possess the original submission, we cannot verify compliance with this requirement.

attachments

REVIEW OF DECOMMISSIONING FUNDING PLAN (DFP)

Name of company or institution:	The Dow C	hemical	Compa	any
Number of licenses and applicable regulations:	_1	10 CFF	R Part	30 (21-00265-06)
	of Manager and Conferences	10 CFF	R Part	40
	-	10 CFF	R Part	70
		10 CFF	R Part	72
Isotopes handled and possession limits				
(specify units):	Na22, Pu238		Bldg.	1602, 2 Ci
	C14, H3		Bldg.	677, <90 lbs.
	С14, Н3		Bldg.	1701, 8 Ci
	C14, H3		Bldg.	703, 8 Ci
				-
Total cost estimate for licenses listed above:	\$ _325,265_			

General comments on DFP:

CHECKLIST FOR REVIEWING DECOMMISSIONING FUNDING PLANS (DFPs)

QUESTIONS

COMMENTS

(1)	Does the licensee provide supporting documentation for its cost estimates? _X Yes No	
(2)	Does the licensee use the Appendix F "Cost Estimating Tables?" Yes _X_ No	Only uses Appendix F format for surveys, planning, decontamination and packaging, and incineration. This cleanup is only for selected laboratory surface hot-spots.
(3)	Does the cost estimate include the following major cost elements?	(i)Planning and preparation for decontamination activities at the site are estimated in the Attachment 3 spreadsheet detail to include only 0.5 days each for a supervisor and HP
(i)	Planning and Preparation? _X Yes No	technician. (ii)Only minor hot-spots at the 27 laboratories are accounted for in the
(ii)	Decontamination and/or Dismantling of Radioactive Facility Components? _XYes No	decontamination costs. Also, the cost estimate does not include decontamination costs for The Midland Plant Hazardous Materials Burial Area and the 1138 Building.
(iii)	Packaging, Shipping, and Disposal of Radioactive Wastes? X Yes No	(iii) One 55-gallon fibre pack of waste is assumed to be generated at each laboratory, with a mass of 200 lbs. No details are given for these estimates.
(iv)	Restoration of Contaminated Areas on Facility Grounds?	(iv) The Midland Plant Hazardous Materials Burial Area has a surface area of 1,100 square meters and a
	Yes _X_ NoNA	volume of 3,300 cubic meters, according to the submittal. No decontamination/remediation of this
(v)	Final Radiation Survey?	area is mentioned in the submittal.
	_XYesNo	(vi) No stabilization or surveillance is mentioned in the cost estimate.
	Site Stabilization, Long-Term Surveillance?	
	Yes _X_ NoNA	

CHECKLIST FOR REVIEWING DFP: (continued)

QUESTIONS

COMMENTS

(4)	Is the total cost estimate
	reasonable for the type(s)
	and size(s) of facility
	licensed?

Yes No

_X__ Not Sure

See item (3) above for uncertainties in the cost estimate.

As stated above, laboratory decontamination as estimated by the licensee only includes hot-spot remediation. If decontamination of fume hoods, ventilation systems, sinks, and other associated laboratory equipment is required, the cost of clean-up for the 27 laboratories could increase approx mately \$3.7 million. The licensee does not clearly document why associated laboratory equipment will remain uncontaminated throughout the operational life of the facility.

No estimate is given for decontamination of the 1138 Building, which stores sealed source materials (item 1.4, submittal).

No estimate using NUREG/CR-1754 is presented justifying the cost of plutonium-contaminated waste disposal (item 1.9, submittal).

Costs for administrative tasks have been removed from the estimate.

CHECKLIST FOR REVIEWING DFPs (continued)

QUESTIONS

COMMENTS

(5)	Are the cost estimates for	See item (3) above.
	individual facility activities and/or components reasonable? Yes NoX Not Sure	Additionally, the largest cost component of the estimate is sealed source disposal. The licensee presents a detailed inventory of sealed sources in Attachment 1 of the submittal. Two irregularities were noted in this cost estimate:
		(1) For disposal of Cs-137 at 6,500 mCi, the unit cost should be \$8,960 per source, not \$7,000 per source (per vendor quote).
		(2) For disposal of Cs-137 at 64,000 mCi, the unit cost was listed as \$64,000 per source. The vendor information indicates that a customized quote would be required for this higher activity level. Based on the price information provided, a unit cost of \$71,680 per source seems more reasonable than \$64,000 per source.
-	THE PROPERTY OF A PROPERTY OF A PROPERTY WHEN A WHITE AND A PROPERTY OF	The state of the s
(6)		See (5) above.
(6)	Do the computations seem correct? Yes _X_ No	See (5) above. Additionally, labor rate errors in Attachment 3, detailing the decontamination of a laboratory, were previously documented by ICF in a 5/15/98 review. Further review of this laboratory decontamination analysis indicate that using the licensee's methodology, the correct value of a single laboratory clean-up should be approximately \$1840, not \$1911.
(7)	correct?	Additionally, labor rate errors in Attachment 3, detailing the decontamination of a laboratory, were previously documented by ICF in a 5/15/98 review. Further review of this laboratory decontamination analysis indicate that using the licensee's methodology, the correct value of a single laboratory clean-up should be approximately \$1840, not

CHECKLIST FOR REVIEWING DFPs (continued)

QUESTIONS

COMMENTS

(8)	Does the licensee include a contingency factor in the cost estimate? _X Yes No	25%
(9)	Does the licensee provide a description of the methods that will be used to adjust the decommissioning cost estimate periodically over the life of the facility? _X Yes No	Item 6 on page 4 of the submittal details an adequate cost adjustment methodology.



UNITED STATES NUCLEAR REGULATORY COMMISSION

REGION III 801 WARRENVILLE ROAD LISLE, ILLINOIS 60532-4351

OCT 0 1 1998

MEMORANDUM TO:

Dr. Louis Bykoski, Project Officer

Facilities Decommissioning Section

Low-Level Waste and Decommissioning Projects Branch Division of Waste Management, Office of Nuclear Material

Safety and Safeguards

FROM:

Monte P. Phillips, Chief

Original signed by

Materials Licensing Branch

Division of Nuclear Materials Safety, Region III

SUBJECT:

REQUEST FOR ASSISTANCE IN PROCESSING AND REVIEW

OF NONSTANDARD FINANCIAL ASSURANCE SUBMITTALS

RELATED TO THE DECOMMISSIONING RULE

Attached for your review is one financial assurance submittal from a Region III licensee. The licensee is The Dow Chemical Company, License No. 21-00265-06. It has submitted a response dated September 15, 1998 (attached) to our deficiency letter dated June 30, 1998 (attached) regarding its Decommissioning Funding Plan (DFP) which requires contractor review.

Region III licensing and inspection staff consider the licensee representation of its facility use, contamination and waste generated reasonable. We also previously sent you a current copy of the license to assist you in your review of the licensee's DFP.

We appreciate your efforts in resolving these issues. If you have any questions please contact Charles Gill of my staff at (630) 829-9814.

License No. 21-00265-06 Docket No. 030-04783

Attachments: as stated

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September 15, 1998

Charles Gill
Nuclear Materials Licensing Branch
USNRC, Region III
801 Warrenville Road
Lisle, Illinois 60532-4351

Dear Mr. Gill:

This letter contains the additional information you requested in your letter dated June 30, 1998 with the control number: 300237.

1. Additional Detail to Support the Cost Estimate

1.1 Description of the Midland Plant Hazardous Materials Burial Area

1.1.1 Activities That Occur in Area

This is an inactive radioactive waste burial area. The area is fenced and no routine operations are carried out here.

1.1.2 Radioactive Contaminants and Levels

Radioactive Contaminant	1998 Activity (mCi)
Cobalt 60	2.4
Tritium	200
Carbon 14	340
Mixed Fission Products	10
Strontium 90	4.4
Radium 226	3
Uranium 238	3
Thorium 232	0.5
Samarium 147	5

1.1.3 Surface Area and Volume

The surface area of the burial area is estimated to be: 1100 square meters. The volume of the burial area is estimated to be: 3300 cubic meters.

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REGION III

SEP 1 8 1998

1.1.4 Migration of Contamination to Groundwater

No migration of contamination to groundwater is suspected. A groundwater collection system is in place near the burial area. Tests of this water have not found radioactivity above background levels.

1.2 Number of Radioactive Materials Laboratories in 1701 Building

1701 Building has been completely decommissioned. There are currently no radioactive materials laboratories in this building.

1.3 Ventilation and Compact 1 Systems in 1701 Building

The ventilation and compaction systems in 1701 building have been decommissioned. Extensive surveys and wipe tests show no radioactive contamination above background levels in these systems.

1.4 Description of Sealed Source and Waste Storage Areas

The entire area of 1138 Building may be used to store sealed radioactive sources. This is a one story building of concrete block construction with a concrete floor. The dimensions of the building are approximately 10 meters by 14 meters.

1365 Building has been decommissioned. Extensive surveys and wipe tests show no radioactive contamination above background levels in this area.

1.5 Description of 703 Building

Inside 703 Building there is a rotary kiln and a pack room. Wipe tests in the pack room have shown no levels of radioactive contamination above background. Currently only carbon-14 and tritium containing wastes are incinerated. When these wastes are incinerated, the C-14 is released through the exhaust system as CO₂. The tritium is collected in the incinerator quench water, which is disposed of through an on site waste water treatment facility. Neither of these systems is expected to be contaminated because of the high volumes of quench water and exhaust air compared to the small amounts of C-14 and tritium that are incinerated.

1.6 Sealed Source Inventory Details

The spreadsheet in Attachment 1 contains information on our current inventory of radioactive sealed sources including isotope, activity, number of each type of source and the disposal cost.

1.7 Sealed Source Disposal Costs, Supporting Information

Attachment 2 is a price quote for transfer of the types of sources listed in section 1.6 above.

1.8 Thorium and Plutonium Waste

Our thorium waste was disposed of through a waste broker in July 1998.

The plutonium waste will consist of typical laboratory trash (contaminated paper, plastic and glass). This waste will be packaged in a DOT 17H metal drum (or other DOT acceptable container) and shipped to NIST. An extremely conservative estimate to package the material would be 0.5 days of time by the HP Technician (\$108). Shipping by truck to NIST, one package \$100. Total: \$208. Adding 25% = \$260.

2. Additional Detail for Labor Cost Estimates

Because of the nature of our operations as described above, decommissioning of our facility will consist of: an initial radiological survey, small amounts of very localized decontamination, a final radiological survey and disposal of waste.

Since surveys and decommissioning activities will be performed by the Health Physicist, Health Physics Technician or lab technician and they have already been trained in radioactive materials handling, no additional training will be necessary.

We would expect planning and preparation for decommissioning of these labs to take no more than 0.5 days each for the Health Physicist and Health Physics technician.

The initial radiological survey could easily be done in 4 hours per lab by the Health Physics Technician. If you add 50% ancillary time, this would be 6 hours per lab. The final radiological survey could then be done by the Health Physicist and Health Physics Technician in 8 hours per lab, or 4 hours each for the Health Physicist and Health Physics Technician, including documentation.

The wipe samples would be counted in-house using a scintillation counter. No charge needs to be added for this as per NUREG CR 1754 Addendum 1.

Any small amounts of contamination found could be decontaminated using a spray cleaner and paper towels by the technician in an hour per lab or 2 hours per lab if you add 50% ancillary time and round up.

3. Costs of Planning and Preparing for Decommissioning.

Because of the limited nature of our operations, a detailed decommissioning plan and accumulating and purchasing necessary equipment (wipe test materials, cleaners, paper towels and disposal containers) would not take more than one day of the Health Physicist's and Health Physics Technician's time per lab (0.5 day each).

4. Costs of Purchasing and Disposing of Equipment and Supplies for Decommissioning

No supplies will need to be purchased. It is estimated that a total of one 55 gallon fiberpack of waste, including decommissioning equipment, will be accumulated for each decommissioned lab. These fiberpacks will be incinerated on site at a cost of \$0.10 per pound with the maximum weight of a fiberpack being 200 pounds (\$20/pack)

5. Credit Taken for Salvage Value

No credit has been taken for salvage value.

Adjusting Cost Estimates and Associated Funding Levels over the Life of the Facility

Cost estimates and associated funding levels will be adjusted for inflation and changes in facility conditions and changes in expected decommissioning procedures. Adjustments to cost estimates will be made at the time of license renewal and when the amount/types of materials used and/or expected decommissioning procedures change significantly.

7. Incorporation of a Contingency Factor into the Total Decommissioning Cost Estimate

A contingency factor of 25% will be incorporated into decommissioning funding estimates.

8. The Cost Estimate

Attachment 3 contains a cost estimate for d commissioning of one of our laboratories.

Charges per type of employee were based on values for Owner/Operator's Staff found in NUREG/CR-1754 Addendum 1, Appendix D, Table D.1. These charges were multiplied by 1.3 to achieve a 30% increase for inflation. The charges per

labor type used in our calculations are listed at the bottom of the Table in Attachment 3.

The total cost per lab was calculated to be \$1,912. Therefore the total cost of decommissioning 27 labs would be \$51,624 or \$64,530 with the 25% contingency factor. The original cost estimate for decommissioning these labs, submitted in our letter dated September 22, 1997, was \$91,000 (items 2, 3 and 4 of section 5-Funding).

From Attachment 1 our estimated costs to dispose of our sealed sources is \$208,380. Adding the 25% contingency fee this comes to \$260,475.

From Section 1.8 the estimated cost for disposal of the plutonium waste, including the 25% contingency fee is \$260.

Total \$325,265

Since this calculation resulted in an amount less than the original estimate, we will not be adjusting our current level of financial assurance.

Thank you for your assistance with this matter. If you have any questions please contact me at (517) 636-1440.

Sincerely,

Yanet A. Grappin

Radiation Safety Officer

The Dow Chemical Company

1803 Building

Midland, Michigan 48674

Isotope	Activity (mCi)	Quantity	Disposal Cost	Total
Cs-137	10	6	\$380.00	\$2,280.00
Cs-137	20	10	\$400.00	\$4,000.00
Cs-137	30	20	\$450.00	\$9,000.00
Cs-137	40	33	\$450.00	\$14,850.00
Cs-137	50	2	\$450.00	\$900.00
Cs-137	60	1	\$530.00	\$530.00
Cs-137	70	15	\$530.00	\$7,950.00
Cs-137	80	8	\$530.00	\$4,240.00
Cs-137	90	1	\$530.00	\$530.00
Cs-137	100	15	\$530.00	\$7,950.00
Cs-137	150	5	\$615.00	\$3,075.00
Cs-137	200	20	\$700.00	\$14,000.00
Cs-137	300	4	\$1,205.00	\$4,820.00
Cs-137	400	3	\$1,205.00	\$3,615.00
Cs-137	500	1	\$1,205.00	\$1,205.00
Cs-137	700	1	\$1,525.00	\$1,525.00
Cs-137	800	1	\$1,525.00	\$1,525.00
Cs-137	1000	1	\$1,525.00	\$1,525.00
Os-137	1500	1	\$2,240.00	\$2,240.00
Cs-137	2000	1	\$2,240.00	\$2,240.00
Cs-137	3000	3	\$3,360.00	\$10,080.00
Cs-137	6500	2	\$7,000.00	\$14,000.00
Cs-137	64000	1	\$64,000.00	\$64,000.00
Ni-63	5	6	\$175.00	\$1,050.00
Ni-63	8	1	\$175.00	\$175.00
Ni-63	15	33	\$175.00	\$5,775.00
Kr-85	5	5	\$175.00	\$875.00
Kr-85	75	1	\$310.00	\$310.00
Kr-05	850	7	\$1,095.00	\$7,665.00
Am-241	20	2	\$1,050.00	\$2,100.00
Am-241	25	1	\$1,315.00	\$1,315.00
Am-241	150	1	\$2,075.00	\$2,075.00
Am-241	200	1	\$2,075.00	\$2,075.00
Cm-244	90	3	\$1,820.00	\$5,460.00
4-3	90	1	\$275.00	\$275.00
H-3	4000	1	\$1,250.00	\$1,250.00
Fe-55	25	1	\$175.00	\$175.00
Fe-55	40	1	\$175.00	\$175.00
Cd-109	2	1	\$175.00	\$175.00
Cd-109	7	1	\$175.00	\$175.00
Assorted	Check sources	20	\$60.00	\$1,200.00
Totals		242	AND THE RESIDENCE OF THE PROPERTY OF THE PROPE	\$208,380.00

Attachment 2

RADIATION TECHNOLOGY, INC. P. O. Box 27637 Austin, TX 78755 (512) 346-7608 (512) 795-8718 (Fax)

TO: Janet Grappin, RSO

COMPANY: Dow Chemical

MIHSC, Building 1803 Midland, MI 48674

PHONE: 517/636-1440 F.AX: 517/638-9975

FROM: Doris Bryan DATE: 8/12/98

Total Pages (Including Cover):

2

Janet, the attached sheet contains the prices you requested for the transfer of selected radioactive material effective August 1, 1998.

Give me a call if you need any additional information.

Confidentiality Notice:

This message is intended only for the use of the individual or entity to which it is addressed and may contain information that is privileged, confidential, and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, or the employee or agent responsible for delivering this message to the intended recipient, you are hereby not. In that any dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone and return the original message to us at the above address via the U.S. Postal Service.

Date: 08/12/98

Cs-137 & Co-6 Point Sources

PAR THE PROPERTY OF THE PARTY O				
Activity mCi	Price			
10	\$380.00			
20	400.00			
50	450.00			
100	530.00			
150	615.00			
200	700.00			
500	1,205.00			
1000	1,525.00			
2600	2,240.00			
3000	3,360.00			
4000	4,480.00			
5000	5,600.00			
6000	6,720.00			
8000	8,960.00			
>8000	Quote			

Am-241; Pu-238; Cm-244; Cf-252

Activity mCi	Price
20	1050.00
30	1,315.00
50	1,580.00
100	1,820.00
200	2,075.00

Kr-85

W1-05					
Activity mCi	Price				
10	\$175.00				
100	310.00				
500	645.00				
1000	1,095.00				

Miscellaneous Isotopes

Isotope	Activity mCi	Price
Cd-109	≤ 50	\$175.00
Fe-55	≤ 50	175.00
Fe-55	100	250.00
Fe-55	Any annular	Base + 30%
Ni-63	S 15	175.00
H-3	90	275.00
H-3	4000	1,250.00

Check sources & reference sources \$60,00 each Smoke detectors <1 µCi Am-241 \$30.00 each All strip sources Call for quote

Activity	Supervisor	HP Technician	Technician	Craftsman	Secretary	Total cost
Planning (days)	0.5	0.5				1
Initial Survey (days)		0.75				
Develop Work Plan (days)		0.1				
Subtotal (days)	0.5	1.35				
Total cost	\$186.94	\$310.99				\$497.93
Decommissioning (days)						
Decontaminate hot spots (days)		0.125	0.125			
Package waste (days)		1	1			
Subtotal (days)		1.125	1.125			
Total Cost		\$241.61	\$249.21			\$490.82
Final Radiological Survey (days)		0.5	0.5		0.1	
		\$107.38	\$110.76		\$17.26	\$235.40
Incineration of waste on site (days)		1 1	1		1	
Total Cost		\$214.76	\$221.52		\$230.36	\$666.64
Cost per lab to incinerate 1 55 gallor	n fiberpack at on-s	ite incinerator				\$20.00
Total Cost for decommissioning e	each lab					\$1,910.79

Charge-out Rates used in calculations above

Position	Ann. Rate (1988 \$)	Ann. Rate (1998 \$)	Charge-out Rate/day	
Supervisor	\$71,900.00	\$93,470.00	\$373.88	
Craftsman	\$44,300.00	\$57,590.00	\$230.36	
Technician	\$42,600.00	\$55,380.00	\$221.52	
HP Technician	\$41,300.00	\$53,690.00	\$214.76	
Secretary	\$33,200.00	\$43,160.00	\$172.64	



UNITED STATES NUCLEAR REGULATORY COMMISSION

REGION III 801 WARRENVILLE ROAD LISLE, IL! INOIS 60532-4351

JUN 3 0 1998

Janet A. Grappin
Radiation Safety Officer
Michigan Industrial Hygiene
Service Center
The Dow Onemical Company
1803 Building
Midland, MI 48674

Dear Ms. Grappin:

We have reviewed your response letter dated March 5, 1995, to our letter dated February 9, 1998, regarding your Decommissioning Funding Plan and find that we need additional information, as follows.

 Submit Additional Detail to Support the Cost Estimate (Regulatory Guide 3.66, Appendix F, and NUREG/CR-1754, Addendum 1, Appendices A, C, and E)

In a letter dated February 9, 1998, NRC asked the licensee to submit additional detail about its facility, including the quantity and dimensions of the contaminated facility components and the areas of the contaminated surfaces. In response to this request, the current submission includes the description of a typical laboratory. However, the submission does not include the following information:

- A description of the Midland Plant Hazardous Materials burial area, including the activities that occur in this area, the radioactive contaminant(s) present, the levels of contamination, the surface area and volume of contaminated material, and the migration of contamination to groundwater;
- The number of laboratories in the 1701 Building that deal with radioactive materials:
- A description of the ventilation and compaction systems, and the level of contamination therein;
- A description of the sealed source storage area in the 1138 Building and the radioactive waste storage area in the 1365 Building;
- Description of the 703 Building used for incineration of radioactive materials, including the contaminated components present in the building;

- Details about the sealed source inventory, including the number of sources corresponding to each source element and their associated activity;
- Supporting information on the \$250,000 cost estimate for the disposal of sealed sources;
- A detailed breakdown of thorium- and plutonium-contaminated waste disposal costs by type of activity (i.e., packaging, shipping, and disposal) and by labor category (where applicable);
- Details on the costs of packaging containers; and
- Details on administrative tasks (including details on labor costs by labor category) included in the cost estimate.

In order to allow an adequate evaluation of the estimated decommissioning costs and to ensure that the cost estimate includes all applicable costs of decommissioning (including costs for decommissioning the Midland Plant Hazardous Materials burial area, the ventilation and compaction systems, the sealed source storage area in the 1138 Building. the radioactive waste storage area in the 1365 Building, and the 703 Building, if needed). please revise your cost estimate to include the information identified above. In providing this information, you should use the cost estimating tables in Appendix F of NRC's Regulatory Guide 3.66 "Standard Format and Content of Financial Assurance Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, 70, and 72," June 1990. Also, please use the tables found in Appendices A, C, and E of NUREG/CR-1754, Addendum 1, to help estimate your decommissioning costs. The tables estimate the number of person-days required, the cost of equipment and supplies, and the quantity of waste generated in decontaminating individual facility components (e.g., individual time, cost, and waste generation estimates for decontaminating floors, ceilings, walls, fume hoods, glove boxes, and ductwork, and decommissioning an underground drain line, a ground surface, and a tailings pile).

Incorporate a 25 Percent Contingency Factor into the Total Cost Estimate (NUREG/ CR-1754, Addendum 1)

In response to NRC's request to include a contingency factor of 25 percent in the total decommissioning cost estimate, the current submission states that "A contingency factor of 25% will be incorporated into decommissioning funding estimates." Although a 25 percent contingency factor has clearly been applied to the costs of planning and preparation, decontamination, packaging and incineration of waste, and a final radiation survey, the submission includes no indication that you have applied the contingency factor to other components of the total cost estimate (i.e., disposal of sealed sources, management of thorium- and plutonium-contaminated waste, and administrative tasks). Applying the 25 percent contingency factor to these components of the estimate would raise the total estimate by approximately \$81,300.

Although you have provided financial assurance for license 21-00265-06 in an amount that exceeds the \$389,730 cost estimate by over \$400,000, please incorporate a contingency factor of 25 percent into the total decommissioning cost estimate, as called for in NUREG/CR-1754, Addendum 1. Otherwise, you may later be able to reduce the amount of its financial assurance to a lesser, inadequate amount (i.e., the current cost estimate of \$389,730).

If the Cost Estimate Increases, Increase the Coverage Provided by the Self-Guarantee (10 CFR 30.35 and 40.36)

10 CFR 30.35 and 40.36 require licensees to obtain financial assurance for the full cost of decommissioning their facilities. Although the previously submitted self-guarantee is in an amount at least equal to the full amount of your current decommissioning cost estimate, the issues raised above (i.e., in Items 1 and 2) suggest that the current cost estimate may be significantly low. Therefore, to ensure that the amount of financial assurance provided is adequate, please increase the financial assurance coverage provided if the cost estimate increases.

Finally, all documents submitted to the NRC must be originally signed duplicates, as recommended in *Regulatory Guide 3.66*. Unless the documents have been properly signed, NRC cannot be certain that the financial assurance mechanism is enforceable.

We will continue our review of your request upon receipt of this information. Please reply in duplicate, within 30 days, and refer to Control Number 300237.

 $^{\rm tf}$ you have any questions or require clarification on any of the information stated above, you may contact vs at (630) 829-9887.

Sincerely,

Original signed by Charles F. Gill Materials Licensing Branch

License No. 21-00265-06 Docket No. 030-04783

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	DNMS/RIII	C	DNMS/RIII		
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DATE	6 130/98		***************************************		

OFFICIAL RECORD COPY



UNITED STATES NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0007

June 11, 1998

MEMORANDUM TO:

Charles Gill

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

FROM:

Louis M. Bykoski

Facilities Decommissioning Section

Low-Level Waste and Decommissioning

Projects Branch

Division of Waste Management, NMSS

SUBJECT:

THE OFFICE OF THE GENERAL COUNSEL AND

CONTRACTOR COMMENTS ON NON-STANDARD FINANCIAL

ASSURANCE SUBMITTAL

Our contractor, ICF Incorporated, and the Office of the General Counsel (OGC) have reviewed and provided comments on the Dow Chemical Company, non-standard financial assurance submittal sent to us for review.

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

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

Attachments: As stated

CONTACT: L. Bykoski, NMSS

301-415-6754

Stephen Lewis, OGC

301-415-1684

RECEIVED JUN 1 8 1998 REGION III

LIST OF INSTRUCTIONS

()

Dow Chemical Company

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

- 1. ICF comments 1 through 3, plus last paragraph.
- 2. All OGC comments.

0

All other comments and discussions are for reviewer information.

MEMO TO: Louis M. Bykoski, NMSS

FROM: OGC

RE:

REVIEW OF NONSTANDARD SUBMITTALS

DOW CHEMICAL

OGC has no objections to ICF's recommendations



CONSULTING GROUP

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

May 15, 1998

To:

Dr. Lou Bykoski, NMSS/NRC

From:

Kamal Singh, Matt Borick, and John Collier, ICF Incorporated

Subject:

Review of Decommissioning Funding Plan and Self-Guarantee/Financial Test

Submitted by The Dow Chemical C mpany

The Dow Chemical Company in Midland, Michigan, submitted additional materials (i.e., an explanatory letter and a revised cost estimate) in support of a previously submitted financial assurance demonstration, which included a decommissioning funding plan (DFP), a cost estimate, and a self-guarantee in the amount of \$10,655,000 (see Other Issue a). The current submission addresses decommissioning costs of \$389,730 for license 21-00265-06 issued under 10 CFR Part 30, which was previously assured for the sum of two certification amounts totaling \$825,000 (\$750,000 for unsealed isotopes plus \$75,000 for sealed sources). Upon review of the submission, ICF recommends that NRC require the licensee to modify the submission in the following ways:

- (1) Submit additional detail to support the cost estimate (*Regulatory Guide* 3.66, Appendix F, and NUREG/CR-1754, Addendum 1, Appendices A, C, and E);
- (2) Incorporate a 25 percent contingency factor into the total cost estimate (NUREG/CR-1754, Addendum 1); and
- (3) If the cost estimate increases, increase the coverage provided by the self-guarantee (10 CFR 30.35 and 40.36).

These recommendations and other issues are discussed below.

¹ ICF reviewed four previous submissions from the licensee and reported recommendations to NRC in memoranda dated November 6, 1990, June 25, 1992, May 28, 1996, and January 14, 1998.

² The licensee's self-guarantee also addresses decommissioning costs of \$18,830,000 for license STB-527 issued under 10 CFR Part 40 and \$1,000,000 for license R-108 issued under 10 CFR Part 50. (See Other Issues a and b.)

(1) Submit Additional Detail to Support the Cost Estimate (Regulatory Guide 3.66, Appendix F, and NUREG/CR-1754, Addendum 1, Appendices A, C, and E)

In a letter dated February 9, 1998, NRC asked the licensee to submit additional detail about its facility, including the quantity and dimensions of the contaminated facility components and the areas of the contaminated surfaces. In response to this request, the current submission includes the description of a typical laboratory. However, the submission does not include the following information:

- A description of the Midland Plant Hazardous Materials burial area, including the activities that occur in this area, the radioactive contaminant(s) present, the levels of contamination, the surface area and volume of contaminated material, and the migration of contamination to groundwater;
- The number of laboratories in the 1701 Building that deal with radioactive materials;
- A description of the ventilation and compaction systems, and the level of contamination therein:
- A description of the sealed source storage area in the 1138 Building and the radioactive waste storage area in the 1365 Building;
- Description of the 703 Building used for incineration of radioactive materials, including the contaminated components present in the building;
- Details about the sealed source inventory, including the number of sources corresponding to each source element and their associated activity;
- Supporting information on the \$250,000 cost estimate for the disposal of sealed sources;
- A detailed breakdown of thorium- and plutonium-contaminated waste disposal costs by type of activity (i.e., packaging, shipping, and disposal) and by labor category (where applicable);
- Details on the costs of packaging containers; and
- Details on administrative tasks (including details on labor costs by labor category) included in the cost estimate.

In order to allow an adequate evaluation of the estimated decommissioning costs and to ensure that the cost estimate includes all applicable costs of decommissioning (including costs for decommissioning the Midland Plant Hazardous Materials burial area, the ventilation and compaction systems, the sealed source storage area in the 1139 Building, the radioactive waste storage area in the 1365 Building, and the 703 Building, if needed), ICF recommends that NRC require the licensee to revise its cost estimate to include the include the include the include above. In providing this information, the licensee should use the cost estimating tables in Appendix F of NRC's Regulatory Guide 3.66 "Standard Format and Content of Financial Assurance Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, 70, and 72," June 1990. ICF also recommends that the licensee use the tables found in Appendices A, C, and E of NUREG/CR-1754, Addendum 1, to help estimate its decommissioning costs.³ The tables estimate the number of per on-days required, the cost of equipment and supplies, and the quantity of waste generated in decontaminating individual facility components (e.g., individual time, cost, and waste generation estimates for decontaminating floors, ceilings, walls, fume hoods, glove boxes, and ductwork, and decommissioning an underground drain line, a ground surface, and a tailings pile).

(2) Incorporate a 25 Percent Contingency Factor into the Total Cost Estimate (NUREG/CR-1754, Addendum 1)

In response to NRC's resuest to include a contingency factor of 25 percent in the total decommissioning cost estimate, the current submission states that "A contingency factor of 25% will be incorporated into decommissioning funding estimates." Although a 25 percent contingency factor has clearly been applied to the costs of planning and preparation, decontamination, packaging and incineration of waste, and a final radiation survey, the submission includes no indication that the licensee has applied the contingency factor to other components of the total cost estimate (i.e., disposal of sealed sources, management of thorium-and plutonium-contaminated waste, and administrative tasks). Applying the 25 percent contingency factor to these components of the estimate would raise the total estimate by approximately \$81,300.

Although the licensee has provided financial assurance for license 21-00265-06 in an amount that exceeds the \$389,730 cost estimate by over \$400,000, ICF recommends that NRC require the licensee to incorporate a contingency factor of 25 percent into the total decommissioning cost estimate, as called for in NUREG/CR-1754, Addendum 1.4 Otherwise, the license may later be able to reduce the amount of its financial assurance to a lesser, inadequate amount (i.e., the current cost estimate of \$389,730).

³ NUREG/CR 1754, Addendum 1, <u>Technology</u>, <u>Safety and Costs of Decommissioning</u> <u>Reference Non-Fuel-Cycle Nuclear Facilities: Compendium of Current Information</u>, Pacific Northwest Laboratory, October 1989.

⁴ Ibid.

(3) If the Cost Estimate Increases, Increase the Coverage Provided by the Self-Guarantee (10 CFR 30.35 and 40.36)

10 CFR 30.35 and 40.36 require licensees to obtain financial assurance for the full cost of decommissioning their facilities. Although the previously submitted self-guarantee is in an amount at least equal to the full amount of the licensee's current decommissioning cost estimate, the issues raised above (i.e., in Recommendations 1 and 2) suggest that the current cost estimate may be significantly low. Therefore, to ensure that the amount of financial assurance provided is adequate, ICF recommends that NRC require the licensee to increase the financial assurance coverage provided if the cost estimate increases.

Other Issues

In addition to the issues raised above, the following issues are noteworthy:

- (a) The decommissioning cost estimate for license STB-527 and the self-guarantee agreement (both previously reviewed by ICF in 1996) contained several deficiencies. However, the current submission does not revise either the licensee's cost estimate for license STB-527 or the self-guarantee, nor does it indicate whether these deficiencies have been addressed by the licensee. Consequently, the recommendations noted in ICF's memorandum dated May 28, 1996, may still apply.
- (b) A previous submission from the licensee included a November 11, 199%, letter from the licensee to NRC indicating that license R-108 was issued under 10 CFR Part 50. Although Part 50 licensees are required to decommission their facilities, the decommissioning requirements applicable to Part 50 licensees (including financial assurance requirements) are different from the requirements for licensees under Parts 30, 40, 70, and 72. ICF has not evaluated the licensee's compliance with the requirements of 10 CFR Part 50.
- In response to NRC's request for additional detail regarding the licensee's facility, the submission includes a description of a typical laboratory and states that less than 27 such laboratories are currently in operation. The submission also states that these laboratories are wipe tested every month, that greater than 99 percent of the tests show no detectable contamination, and that areas showing contamination are immediately decontaminated and retested until contamination is reduced below the license limits. Based on this information, the licensee estimates that the quantity and dimensions of the contaminated facility components are zero. In its previous submission (dated September 18, 1997), however, the licensee noted that some equipment (e.g., fume hoods) may be contaminated.

The licensee's current decommissioning cost estimate is based on the assumption that, at the time of decommissioning, contamination levels will be comparable to those that

currently exist (as evidenced by results of current wipe tests). If NRC does not wish to accept this assumption as a basis for the decommissioning cost estimate, then revisions to the cost estimate would be required. If significant decontamination of the 27 laboratories is required, then the cost estimate could increase by approximately \$3.7 million (based on the description of a typical laboratory provided by the licensee and the cost estimating tables in NUREG/CR-1754, Addendum 1).

(d) The licensee's cost estimate assumes that one 55 gallon drum of plutonium-contaminated waste will be shipped to the National Institute of Standards and Technology (NIST). The estimate includes packaging and shipping costs for this waste but does not include any disposal costs. ICF has not evaluated whether NIST will accept this waste, or whether the licensee would be required to incur any costs for its disposal.

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

attachments

REVIEW OF DECOMMISSIONING PUNDING PLAN (DFP)

Name of company or institution:	Dow Chemical Company
Number of licenses and applicable regulations:	1 10 CFR Part 30 (21-00265-06) 10 CFR Part 40
	10 CFR Part 70 10 CFR Part 72
Isotopes handled and possession limits (specify units):	22 Na, 238 pu 1602 BLDG. (3 LABS) 2Ci, ≤ Im(14 C 3 H 1803 BLDG. (20 LABS) 8Ci Th 677 BLDG. (2 LABS) ≤ 90 lbs 14 C, 3 H 1701 BLDG. (? LABS) 8 Ci 14 C, 3 H 703 BLDG. (INCINERATION) 8Ci
1138 and 1365 buildings used for storage	
Total cost estimate for licenses listed above:	s 389,730

General comments on DPP:

CHECKLIST FOR REVIEWING DECOMMISSIONING FUNDING PLANS (DFF's)

QUESTIONS

COMMENTS

(1)	Does the licensee provide supporting documentation for its cost estimates? Yes No	
(2)	Does the licensee use the Appendix F "Cost Estimating Tables?" Yes No	Licensee uses Appendix F tables only for the following activities: planning & preparation, decontomination, final survey, fackaging and incineration of waste.
(3)	Does the cost estimate include the following major cost elements?	
(i)	Planning and Preparation? YesNo	
(ii)	Decontamination and/or Dismantling of Radioactive Facility Components?	-Licensee states that "the quantity and dimensions of contaminated facility components are zero." Thus, the licensee suggests that only "small amounts of carry localized decontamination"
(111)	Packaging, Shipping, and Disposal of Radioactive Wastes?	with the neguros.
	✓ Yes No	No basis provided for the waste quantity estimated or the disposal rate. No basis for the estimate of disposal
(iv)	Restoration of Contaminated Areas on Facility Grounds?	no basis for the estimate of disposal cost of 300 sealed sources.
	Yes NoNA	fast estimate does not include restoration of Midland Plant hazarday
(v)	Final Radiation Survey?	materials kerrial area.
	Yes No	
(vi)	Site Stabilization, Long-Term Surveillance?	Licensee does not mention this.
	Yes NONA	

(4) Is the total cost estima reasonable for the type(and size(s) of facility licensed? Yes No	
(5) Are the cost estimates for individual facility activities and/or componereasonable? Yes No No Not Sure	Need more actus.

CHECKLIST FOR REVIEWING DFP's (continued)

QUESTIONS

COMMENTS

(6)	Do the computations seem correct? Yes No	1.35 was of work by the HP Technician me multiplied by the salary for a craftsman (which exceeds the salary for an HP Technician). I clay of work by the Secretary is multiplied by the salary of a craftsman (which exceeds the salary for a Secretary).
(7)	Does the licensee take credit for the potential salvage value of recovered materials or decontaminated equipment? Yes No	
(8)	Does the licensee include a contingency factor in the cost estimate? Yes No	Licensee states that "a contingency factor of 25% will be incorporated into decommissioning funding estimates." However, the cost estimate does not include a 25% contingency.
(9)	Does the licensee provide a description of the methods that will be used to adjust the decommissioning cost estimate periodically over the life of the facility? YesNo	Cost estimates and associated funding levels will be adjusted for inflation and changes in facility conditions and changes in expected decommissioning procedures. Adjustments to cost estimates will be made at the time of license renewal and when the amount/tops of materials used and/or
		Change eignificantly.

CMD:	2160 R 108				
DOCKET: 030-0411 LIC: 21-00265-06	NAME: The Down Chemical Company				
PARTY ISSUING MECHANISM: NAME: Down Chamach Company ADDR1: Environmental Services ADDR2: 1261 Building (1803 Building CITY: Midland STATE: mi ZIP: 48674	ASSUR TYPE : ? CERT ? (DFP) MECH TYPE : SI MECH AMOUNT: \$20,655,000 APPROVED? DATE: FXPIRES ? DATE: Until Come, Held ACTION (A=ADD C=CHG D=DELETE):				
PARTY ISSUING MECHANISM: NAME: ADDR1: ADDR2: CITY: STATE: ZIP:	ASSUR TYPE : ? CERT ? DFP MECH TYPE : MECH AMOUNT: APPROVED? DATE: EXPIRES ? DATE: ACTION (A=ADD C=CHG D=DELETE):				
	** 000 000 **				

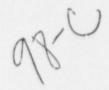
CMD:

VALID MECHANISM TYPE CODES AND THEIR MEANINGS:

MECH TYPE	DESCRIPTION
TR	TRUST FUND
ES	ESCROW ACCOUNT
CD	CERTIFICATE OF DEPOSIT
GF	GOVERNMENT FUND
GS	DEPOSIT OF GOVERNMENT SECURTIES
SB	SURETY BOND
LT	LETTER OF CREDIT
LN	LINE OF CREDIT
PG	PARENT COMPANY GUARANTEE
SI	STATEMENT OF INTENT
SG	SELF GUARANTEE

PRESS RETURN KEY FOR FINANCIAL ASSURANCE SCREEN:

MAR 1 9 1998



MEMORANDUM TO: Dr. Louis Bykoski, Project Officer

Facilities Decommissioning Section

Low-Level Waste and Decommissioning Projects Branch Division of Waste Management, Office of Nuclear Material

Safety and Safeguard

FROM: Monte P. Phillips, Chief

Nuclear Materials Licensing Branch

Division of Nuclear Materials Safety, Region III

SUBJECT: REQUEST FOR ASSISTANCE IN PROCESSING AND REVIEW

OF NONSTANDARD FINANCIAL ASSURANCE SUBMITTALS

RELATE TO THE DECOMMISSIONING RULE

Attached for your review is one nancial assurance submittal from a Region III licensee. The licensee is The Dow Chemical Company, License No. 21-00265-06. The licensee has submitted a response letter dated March 5, 1998 (enclosed) to our letter dated February 9, 1998 (enclosed) regarding its Decommissioning Funding Plan (DFP) which requires contractor review.

Region III licensing and inspection staff consider the licensee representation of its facility use, contamination and waste generated reasonable. We also previously sent you a current copy of the license to assist you in your review of the licensee's DFP.

We appreciate your efforts in resolving these issues. If you have any questions please contact Charles F. Gill of my staff at (630) 829-9814.

License No. 21-00265-06 Docket No. 030-04783

Attachments: 1. NRC ltr dtd 02/09/98

2. Licensee Itr dtd 03/05/98

CONTACT: Charles F. Gill

(630) 829-9814

DOCUMENT NAME: M:\03004783.FA8

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OFFICE	RIII	RIII	
NAME	CFGILL:jaw(Cb)	MPPHILLIPS Jay	
DATE	03/17/98	03/1798	



March 5, 1998

Charles Gill
Nuclear Materials Licensing Branch
USNRC, Region III
801 Warrenville Road
Lisle, Illinois 60532-4351

Dear Mr. Gill:

This letter contains the additional information you requested in your letter dated February 9, 1998 with the control number: 300237.

1. Additional Detail to Support the Cost Estimate

We currently have less than 27 radioactive materials labs (the number in the original estimate for decommissioning). These are all low level labs as described in Appendix 5 of our letter dated July 7, 1997 which is referenced in amendment number 63 of our License.

The average laboratory at this facility is 15 meters by 10 meters and contains, 15 meters of lab benches, two fume hoods and one sink. These labs are wipe tested each month to check for potential contamination. These wipe tests are conducted on the floors, sinks, benchtops, hoods etc. More than 99% of these wipe tests show no detectable contamination. Areas that show small amounts of contamination are immediately decontaminated and retested until no contamination above our license limits is detected.

Therefore, the quantity and dimensions of contaminated facility components are zero.

2. Additional Detail for Labor Cost Estimates

Because of the nature of our operations as described above, decommissioning of our facility will consist of: an initial radiological survey, small amounts of very localized decontamination, a final radiological survey and disposal of waste.

Since surveys and decommissioning activities will be performed by the Health Physicist, Health Physics Technician or lab technician and they have already been trained in radioactive materials handling, no additional training will be necessary.

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We would expect planning and preparation for decommissioning of these labs to take no more than 0.5 days each for the Health Physicist and Health Physics technician.

The initial radiological survey could easily be done in 4 nours per lab by the Health Physics Technician. If you add 50% ancillary time, this would be 6 hours per lab. The final radiological survey could then be done by the Health Physicist and Health Physics Technician in 8 hours per lab, or 4 hours each for the Health Physicist and Health Physics Technician, including documentation.

The wipe samples would be counted in-house using a scintillation counter. No charge needs to be added for this as per NUREG CR 1754 Addendum 1

Any small amounts of contamination found could be decontaminated using a spray cleaner and paper towels by the technician in an hour per lab or 2 hours per lab if you add 50% ancillary time and round up.

3. Costs of Planning and Preparing for Decommissioning.

Because of the limited nature of our operations, a detailed decommissioning plan and accumulating and purchasing necessary equipment (wipe test materials, cleaners, paper towels and disposal containers) would not take more than one day of the Health Physicist's and Health Physics Technician's time per lab (0.5 day each).

4. Costs of Purchasing and Disposing of Equipment and Supplies for Decommissioning

No supplies will need to be purchased. It is estimated that a total of one 55 gallon fiberpack of waste, including decommissioning equipment, will be accumulated for each decommissioned lab. These fiberpacks will be incinerated on site at a cost of \$0.10 per pound with the maximum weight of a fiberpack being 200 pounds (\$20/pack)

5. Credit Taken for Salvage Value

No credit has been taken for salvage value.

6. Adjusting Cost Estimates and Associated Funding Levels over the Life of the Facility

Cost estimates and associated funding levels will be adjusted for inflation and changes in facility conditions and changes in expected decommissioning procedures. Adjustments to cost estimates will be made at the time of license

renewal and when the amount/types of materials used and/or expected decommissioning procedures change significantly.

7. Incorporation of a Contingency Factor into the Total Decommissioning Cost Estimate

A contingency factor of 25% will be incorporated into decommissioning funding estimates.

8. The Cost Estimate

Table 1 on the following page contains a cost estimate for decommissioning of one of our laboratories.

Charges per type of employee were based on values for Owner/Operator's Staff found in NUREG/CR-1754 Addendum 1, Appendix D, Table D.1. These charges were multiplied by 1.3 to achieve a 30% increase for inflation. The charges per labor type used in our calculations are listed at the bottom of Table 1 on the following page of this letter.

The total cost per lab was calculated to be \$1,912. Therefore the total cost of decommissioning 27 labs would be \$51,624 or \$64,530 with the 25% contingency factor. The original cost estimate for decommissioning these labs, submitted in our letter dated September 22, 1997, was \$91,000 (items 2, 3 and 4 of section 5-Funding).

Since this calculation resulted in an amount less than the original estimate, we will not be adjusting our current level of financial assurance.

Thank you for your assistance with this matter. If you have any questions please contact me at (517) 636-1440.

Sincerely,

Janet A. Grappin

Radiation Safety Officer

The Dow Chemical Company

1803 Building

Midland, Michigan 48674

Table 1 Decommissioning Costs

Activity	Supervisor	HP Technician	Technician	Craftsman	Secretary	Total cost
Planning	0.5	0.5				
Initial Survey		0.75				
Develop Work Plan		0.1				
Subtotal	0.5	1.35				
total cost	\$186.94	\$310.99				\$497.93
Decommissioning						
Decontaminate hot spots		0.125	0.125			
Package waste		1	1			
Subtotal		1.125	1.125			
		\$241.61	\$249.21			\$490.82
Final Radiological Survey		0.5	0.5		0.1	
		\$107.38	\$110.76		\$17.26	\$235.40
ncineration of waste cn site		1	1		1	-
		\$214.76	\$221.52		\$230.36	\$666.64
Cost per lab to incinerate 1 55 gallon fiberpack at on-site incinerator					\$20.00	
Total Cost for decommissioning	each lab					\$1,910.79

Charge-out Rates used in calculations above

Position	Ann. Rate (1988 \$)	Ann. Rate (1998 \$)	Charge-out Rate/day	
Supervisor	\$71,900.00	\$93,470.00	\$373.88	
Craftsman	\$44,300.00	\$57,590.00	\$230.36	
Technician	\$42,600.00	\$55,380.00	\$221.52	
HP Technician	\$41,300.00	\$53,690.00	\$214.76	
Secretary	\$33,200.00	\$43,160.00	\$172.64	

Janet A. Grappin
Radiation Safety Officer
Michigan Industrial Hygiene
Service Center
The Dow Chemical Company
1803 Building
Midland, MI 48674

Dear Ms. Grappin:

We have reviewed your letter, dated September 22, 1997, requesting approval of your Decommissioning Funding Plan. Please provide the following additional information:

 Submit Additional Detail to Support the Cost Estimate (Regulatory Guide 3.66, Appendix F, and NUREG/CR-1754, Addendum 1, Appendices A and E)

Your submission provides an outline of the work required to decommission your facility and describes the quantity of radioactive waste that potentially could be generated at the facility. The submission also includes a decommissioning cost estimate that identifies cost subtotals for disposal of sealed isotopes, packaging and incineration of loose isotopes, decontamination of the laboratories, a final radiation survey, administrative work, and packaging, shipping, and disposal of radioactive waste.1 The cost estimate does not include sufficient detail, however, to allow an adequate evaluation of these subtotals or of the total cost estimate. In particular, the submission does not provide a detailed description of the facility, including the quantity and dimensions of contaminated facility components (e.g., hot cells, glove boxes, fume hoods, laboratory benches, ductwork, sinks and drains) and the surface areas of contaminated walls, floors, and ceilings, as called for in Appendix F of Regulatory Guide 3.66 "Standard Format and Content of Financial Assurance Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, 70, and 72," June 1990. For this reason, we are unable to evaluate whether you have included reasonable cost estimates for all major decommissioning activities in your overall decommissioning cost estimate.

We assume that you will not need to restore contaminated areas on facility grounds, stabilize the site, or perform long-term surveillance to properly decommission your facility because you did not identify the need to conduct such activities in your decommissioning funding plan.

Please use or adapt the "Cost Estimating Tables" in Appendix F of Regulatory Guide 3.66, in conjunction with tables found in Appendices A and E of NUREG/CR-1754, Addendum 1, to demonstrate that it has provided sufficient detail and reasonable cost estimates for all major decommissioning activities.²

Submit Additional Detail for Labor Cost Estimates (Regulatory Guide 3.66, Appendix F, and NUREG/CR-1754, Addendum 1)

You calculate the labor cost for each decommissioning task by multiplying the estimated time required to complete the task by an estimated labor rate (in dollars per hour) for that task. However, the estimated time required and labor rate for each task are not broken down by labor category, as called for in Appendix F of Regulatory Guide 3.66. NUREG/CR-1754, Addendum 1, provides tables for estimating the labor hours needed to decontaminate individual facility components of a reference laboratory utilizing labeled compounds, and also provides the salaries for decommissioning staff by labor category (e.g., supervisor, technician, laborer).

Please submit additional detail for your labor cost estimates. In particular, provide the estimated time required by labor category for each decommissioning task, along with an estimated labor rate for each labor category. Please use the tables in NUREG/CR-1754, Addendum 1, to estimate the labor costs for decontaminating individual laboratory components, or justify alternative tables.³

3. Account for the Costs of Planning and Preparing for Decommissioning (Regulatory Guide 3.66, page 1-9)

Regulatory Guide 3.66, page 1-9, calls for decommissioning cost estimates to include the costs of all planning and preparation activities, such as preparing a detailed decommissioning plan, preparing other state and/or local documentation, developing work plans, performing staff training, and procuring special equipment. The cost estimate you submitted does not clearly account for these costs. NUREG/CR-1754, Addendum 1, estimates that it would require more than 60 person-days for planning and preparation of each of six reference laboratories for decommissioning; adding these costs to the decommissioning cost estimate would increase the estimate by over \$16,500.4 Please account for the costs of planning and preparing for decommissioning.

NUREG/CR-1754, Addendum 1, <u>Technology</u>, <u>Safety and Costs of Decommissioning</u> <u>Reference Non-Fuel-Cycle Nuclear Facilities</u>: <u>Compendium of Current Information</u>, Pacific Northwest Laboratory, October 1989. (See Appendices A and E.)

³ Ibid.

⁴ Ibid. Costs have been adjusted from 1988 dollars to 1997 dollars using an inflation adjustment factor of approximately 1.30 (112.2/86.1, based on GDP implicit price deflators as reported in *Economic Indicators*, September 1997).

4. Account for the Costs of Purchasing and Disposing of Equipment and Supplies for Decommissioning (Regulatory Guide 3.66, pages 1-9 and 1-10)

Your cost estimate does not include the cost of purchasing and disposing of equipment and supplies for decommissioning efforts. Equipment and supplies (including personal protective equipment, brushes, etc.) are regularly used during decontamination procedures. In addition, the equipment and supplies may need to be disposed of as radioactive waste after use. According to *Regulatory Guide 3.66*, pages 1-9 and 1-10, a decommissioning cost estimate should include the cost of equipment and supplies required during decommissioning. NUREG/CR-1754, Addendum 1, estimates that equipment and supplies needed to decontaminate a reference laboratory (see Table 2.4 on page 2.7) account for at least \$17,200 (i.e., purchase costs), plus any associated disposal costs.⁵ Please include in your cost estimate the cost of purchasing and disposing of equipment and supplies to be used during decommissioning.

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

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

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

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

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

The cost estimate you submitted does not explicitly allow for contingencies. Regulatory Guide 3.66, page 1-10, recommends that a contingency factor be included in the

^{5 !}bid. Costs have been adjusted to 1997 dollars.

decommissioning cost estimate. A contingency factor helps ensure coverage for unexpected circumstances that could increase decommissioning costs. NUREG/ CR-1754 uses a contingency factor of 25 percent in its cost estimates for each of six reference laboratories.⁶ Please incorporate a contingency factor of at least 25 percent into your decommissioning cost estimate.

8. If the Cost Estimate Increases, Increase the Coverage Provided by the Self-Guarantee (10 CFR 30.35 and 40.36)

10 CFR 30.35 and 40.36 require licensees to obtain financial assurance for the full cost of decommissioning their facilities. Although the previously-submitted self-guarantee is in an amount at least equal to the full amount of your current decommissioning cost estimate, the issues raised above (i.e., in Items No. 1 through 7) suggest that the current cost estimate may be significantly low. Therefore, to ensure that the amount of financial assurance provided is adequate, please increase the financial assurance coverage provided if the cost estimate increases.

Finally, all documents submitted to the NRC must be originally signed duplicates, as recommended in Regulatory Guide 3.66. Unless the documents have been properly signed. NRC cannot be certain that the financial issuance mechanism is enforceable.

We will continue of your submission upon receipt of the requested information. Please reply in duplicate, within 30 days, and refer to Control Number 300237.

If you have any questions or require clarification on any of the information stated above, you may contact us at (630) 829-9887.

> Sincerely. Original Signed By Charles F. Gill Nuclear Material Licensing Branch

License No. 21-00265-06 Docket No. 030-04783

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

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UNITED STATES NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

February 2, 1998

MEMORANDUM TO:

Charles Gill

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

FROM:

Louis M. Bykoski Jaw. Bykorki Facilities Decommissioning Section Low-Level Waste and Decommissioning

Projects Branch

Division of Waste Management, NMSS

SUBJECT:

THE OFFICE OF THE GENERAL COUNSEL AND CONTRACTOR

COMMENTS ON NON-STANDARD FINANCIAL ASSURANCE.

SUBMITTAL

Our contractor, ICF Incorporated, and the Office of the General Counsel (OGC) have reviewed and provided comments on the Dow Chemical Company nonstandard financial assurance submittal sent to us for review

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

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

Attachments: As stated

CONTACT: Louis M. Bykoski, NMSS/DWM

(301) 415-6754 Stephen Lewis, OGC (301 415-1684

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LIST OF INSTRUCTIONS

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

- 1. ICF comments 1 through 8 plus last paragraph.
- 2. All OGC comments.

All other comments and discussions are for reviewer information.

MEMO TO:

Louis M. Bykoski, NMSS

FROM:

OGC

RE:

REVIEW OF NONSTANDARD SUBMITTALS

SUBJECT:

ICF REVIEW: DECOMMISSIONING FUNDING PLAN OF DOW CHEMICAL

in response to your memorandum dated January 16, 1998 (attached), OGC has reviewed the ICF recommendations on the decommissioning funding plan provided by Dow Chemical Company for its 10 C.F.R. Part 30 license renewal. We have no comments.



ICF Incorporated 9300 Lee Highway Fairfax, VA 22031-1207 703/934-3000 Fax 703/934-3740

January 14, 1998

To:

Dr. Lou Bykoski, NMSS/NRC

From:

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

Subject:

Review of Decommissioning Funding Plan and Self-Guarantee/Financial Test

Submitted by The Dow Chemical Company

The Dow Chemical Company in Midland, Michigan, submitted a decommissioning funding plan (DFP), using a self-guarantee, for license 21-00265-06 issued under 10 CFR Part 30. The submission addresses decommissioning costs of \$416.200 for license 21-00265-06, which was previously assured for the sum of two pertification amounts totaling \$825,000 (\$750,000 for unsealed isotopes plus \$75,000 for sealed sources). A self-guarantee (addressing decommissioning costs not only for license 21-00265-06 but also for license STB-527 issued under 10 CFR Part 40 and license R-108 issued under 10 CFR Part 50) in the amount of \$20,655,000 was included in the licensee's previous submission. (See Other Issues a and b.)

Upon review of the submission, ICF recommends that NRC require the licensee to modify the submission in the following ways:

- Submit additional detail to support the cost estimate (Regulatory Guide 3.66, Appendix F, and NUREG/CR-1754, Addendum 1, Appendices A and E);
- (2) Submit additional detail for labor cost estimates (Regulatory Guide 3.66, Appendix F, and NUREG/CR-1754, Addendum 1);
- (3) Account for the costs of planning and preparing for decommissioning (Regulatory Guide 3.66, page 1-9);
- (4) Account for the costs of purchasing and disposing of equipment and supplies for decommissioning (*Regulatory Guide 3.66*, pages 1-9 and 1-10);
- (5) Clarify that no credit was taken for salvage value (Regulatory Guide 3.66, page 1-10);

¹ ICF reviewed three previous submissions from the licensee and reported recommendations to NRC in memoranda dated November 6, 1990, June 25, 1992, and May 28, 1996.

- (6) Describe the means to be used for adjusting cost estimates and associated funding levels over the life of the facility (10 CFR 30.35(e));
- (7) Incorporate a contingency factor into the total decommissioning cost estimate (*Regulatory Guide 3.66*, page 1-10, and NUREG/CR-1754, Addendum 1); and
- (8) If the cost estimate increases, increase the coverage provided by the self-guarantee (10 CFR 30.35 and 40.36).

These recommendations and other issues are discussed below.

(1) Submit Additional Detail to Support the Cost Estimate (Regulatory Guide 3.66, Appendix F, and NUREG/CR-1754, Addendum 1, Appendices A and E)

The submission provides an outline of the work required to decommission the licensee's facility and describes the quantity of radioactive waste that potentially could be generated at the facility. The submission also includes a decommissioning cost estimate that identifies cost subtotals for disposal of sealed isotopes, packaging and incineration of loose isotopes, decontamination of the laboratories, a final radiation survey, administrative work, and packaging, shipping, and disposal of radioactive waste.² The cost estimate does not include sufficient detail, however, to allow an adequate evaluation of these subtotals or of the total cost estimate. In particular, the submission does not provide a detailed description of the facility, including the quantity and dimensions of contaminated facility components (e.g., hot cells, glove boxes, fume hoods, laboratory benches, ductwork, sinks and drains) and the surface areas of contaminated walls, floors, and ceilings, as called for in Appendix F of *Regulatory Guide 3.66* "Standard Format and Content of Financial Assurance Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, 70, and 72," June 1990. For this reason, ICF is unable to evaluate whether the licensee has included reasonable cost estimates for all major decommissioning activities in its overall decommissioning cost estimate.

ICF recommends that the NRC require the licensee to use or adapt the "Cost Estimating Tables" in Appendix F of Regulatory Guide 3.66, in conjunction with tables found in

² ICF assumes that the licensee will not need to restore contaminated areas on facility grounds, stabilize the site, or perform long-term surveillance to properly decommission its facility because the licensee did not identify the need to conduct such activities in its decommissioning funding plan.

Appendices A and E of NUREG/CR-1754, Addendum 1, to demonstrate that it has provided sufficient detail and reasonable cost estimates for all major decommissioning activities.³

(2) Submit Additional Detail for Labor Cost Estimates (Regulatory Guide 3.66, Appendix F, and NUREG/CR-1754, Addendum 1)

The licensee calculates the labor cost for each decommissioning task by multiplying the estimated time required to complete the task by an estimated labor rate (in dollars per hour) for that task. However, the estimated time required and labor rate for each task are not broken down by labor category, as called for in Appendix F of *Regulatory Guide 3.66*. NUREG/CR-1754, Addendum 1, provides tables for estimating the labor hours needed to decontaminate individual facility components of a reference laboratory utilizing labeled compounds, and also provides the salaries for decommissioning staff by labor category (e.g., supervisor, technician, laborer).

ICF recommends that NRC require the licensee to submit additional detail for its labor cost estimates. In particular, the licensee should provide the estimated time required by labor category for each decommissioning task, along with an estimated labor rate for each labor category. ICF also recommends that the licensee use the tables in NUREG/CR-1754, Addendum 1, to estimate the labor costs for decommendating individual laboratory components.

(3) Account for the Costs of Planning and Preparing for Decommissioning (Regulatory Guide 3.66, page 1-9)

Regulatory Guide 3.66, page 1-9, calls for decommissioning cost estimates to include the costs of all planning and preparation at lities, such as preparing a detailed decommissioning plan, preparing other state and/or local documentation, developing work plans, performing staff training, and procuring special equipment. The cost estimate submitted by the licensee does not clearly account for these costs. NUREG/CR-1754, Addendum 1, estimates that it would require more than 60 person-days for planning and preparation of each of six reference laboratories for decommissioning; adding these costs to the decommissioning cost estimate would increase the estimate by over \$16,500.5 ICF recommends that NRC require the licensee to account for the costs of planning and preparing for decommissioning.

³ NUREG/CR-1754, Addendum 1, <u>Technology</u>, <u>Safety and Costs of Decommissioning</u>
<u>Reference Non-Fuel-Cycle Nuclear Facilities: Compendium of Currer Information</u>, Pacific Northwest Laboratory, October 1989. (See Appendices A and E.)

⁴ Ibid.

⁵ Ibid. Costs have been adjusted from 1988 dollars to 1997 dollars using an inflation adjustment factor of approximately 1.30 (112.2/86.1, based on GDP implicit price deflators as reported in *Economic Indicators*, September 1997).

(4) Account for the Costs of Purchasing and Disposing of Equipment and Supplies for Decommissioning (Regulatory Guide 3.66, pages 1-9 and 1-10)

The cost estimate does not include the cost of purchasing and disposing of equipment and supplies for decommissioning efforts. Equipment and supplies (including personal protective equipment, brushes, etc.) are regularly used during decontamination procedures. In addition, the equipment and supplies may need to be disposed of as radioactive waste after use. According to Regulatory Guide 3.66, pages 1-9 and 1-10, a decommissioning cost estimate should include the cost of equipment and supplies required during decommissioning. NUREG/CR-1754, Addendum 1, estimates that equipment and supplies needed to decontaminate a reference laboratory (see Table 2.4 on page 2.7) account for at least \$17,200 (i.e., purchase costs), plus any associated disposal costs. ICF recommends that NRC require the licensee to include in its cost estimate the cost of purchasing and disposing of equipment and supplies to be used during decommissioning.

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

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

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

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

⁶ Ibid. Costs have been adjusted to 1997 dollars.

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

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

(8) If the Cost Estimate Increases, Increase the Coverage Provided by the Self-Guarantee (10 CFk 30.35 and 40.36)

10 CFR 30.35 and 40.36 require licensees to obtain financial assurance for the full cost of decommissioning their facilities. Although the previously-submitted self-guarantee is in an amount at least equal to the full amount of the licensee's current decommissioning cost estimate, the issues raised above (i.e., in Recommendations 1 through 7) suggest that the current cost estimate may be significantly low. Therefore, to ensure that the amount of financial assurance provided is adequate, ICF recommends that NRC require the licensee to increase the financial assurance coverage provided if the cost estimate increases.

Other Issues

In addition to the issues raised above, the following issues are noteworthy:

- (a) The decommissioning cost estimate for license STB-527 and the self-guarantee agreement (both previously reviewed by ICF in 1996) contained several deficiencies. However, the current submission does not revise either the licensee's cost estimate for license STB-527 or the self-guarantee, nor does it indicate whether these deficiencies nave been addressed by the licensee. Consequently, the recommendations noted in ICF's memorandum dated May 28, 1996, may still apply.
- (b) A previous submission from the licensee included a November 11, 1991, letter from the licensee to NRC indicating that license R-108 was issued under 10 CFR Part 50. Although Part 50 licensees are required to decommission their facilities, the decommissioning requirements applicable to Part 50 licensees (including financial assurance requirements) are different from the requirements for licensees under Parts 30, 40, 70, and 72. ICF has not evaluated the licensee's compliance with the requirements of 10 CFR Part 50.

⁷ Ibid.

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

attachments

REVIEW OF DECOMMISSIONING FUNDING PLAN (DFP)

Name of company or instit	The Dow Chemist (1803 Building, Midle	Company, License No. 21-00265-0
Number of licenses and applicable regulations:	1 10 CFF	Part 30 (21-00265-06)
	10 CFF	Part 40
	10 CFF	Part 70
	10 CFR	Part 72
Isotopes handled and possession limits		
(specify units):	Building 1602: Na-22, Pu-238	ZCi, & IMCi
6	L. King 1701 C-14, H-3	8 C:
0	3. W 1863 C-14, H-3	80.
6	3. Iding 713 (-14, 14-3	80:
	w. Iding 677 Train	<u> = 90 165</u>
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1138 and 1365 Buildings used for storage		MATERIAL PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE P
Total cost estimate for licenses listed above:	\$ 416,200	

General comments on DFP:

CHECKLIST FOR REVIEWING DECOMMISSIONING FUNDING PLANS (DFP's)

QUESTIONS

COMMENTS

(1)	Does the licensee provide supporting documentation for its cost estimates? YesNo	
(2)	Does the licensee use the Appendix F "Cost Estimating Tables?" Yes No	
(3)	Does the cost estimate include the following major cost lements?	
(±)	Planning and Preparation? Yes No	
(11)	Decentamination and/or Dismantling of Radioactive Facility Components?	COST OF DISMANTLING OF RADIOACTIVE FACILITY COMPONENTS NOT INCLUDED.
	✓ Yes No	
(111)	Packaging, Shipping, and Disposal of Radioactive Wastes?	
	✓ Yes No	
(iv)	Restoration of Contaminated Areas on Facility Grounds?	LICENSEE DOES NOT MENTION
	Yes NoNA	
(v)	Final Radiation Survey?	
	Yes No	
(vi)	Site Stabilization, Long-Term Surveillance?	LICENSEE DOES NOT MENTION
	Yes V No NA	THIS,

CEECKLIST FOR REVIEWING DFP's (continued)

QUESTIONS

COMMENTS

(4) Is the total cost estimate reasonable for the type(s) and size(s) of facility licensed? Yes No Not Sure	LICENSEE DOES NOT PROVIDE ENOUGH INFORMATION
(5) Are the cost estimates for individual facility activities and/or components reasonable? Yes No Not Sure	LICENSEE DOES NOT PROVIDE ENOUGH INFORMATION.

CEECKLIST FOR REVIEWING DFP's (continued)

QUESTIONS

COMMENTS

(6)	Do the computations seem correct? Yes No	
(7)	Does the licensee take credit for the potential salvage value of recovered materials or decontaminated equipment?	LICENSEE DOES NOT MENTION THIS
(8)	Does the licensee include a contingency factor in the cost estimate? Yes No	LICENSEE DOES NOT USE A CONTINGENCY FACTOR IN THE COST ESTIMATE.
(9)	Does the licensee provide a description of the methods that will be used to adjust the decommissioning cost estimate periodically over the life of the facility? Yes No	

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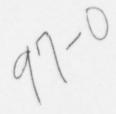
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MEMORANDUM TO:

Dr. Louis Bykoski, Project Officer

Materials Decommissioning Section

Low-Level Waste and Decommissioning Projects Branch Division of Waste Management, Office of Nuclear Material

Safety and Safeguard

FROM:

Cassandra F. Frazier, Acting Chief Nuclear Materials Licensing Branch

Division of Nuclear Materials Safety, Region III

SUBJECT:

REQUEST FOR ASSISTANCE IN PROCESSING AND REVIEW

OF NONSTANDARD FINANCIAL ASSURANCE SUBMITTALS

RELATED TO THE DECOMMISSIONING RULE

Enclosed for your review is one financial assurance submittal from a Region III licensee. The licensee is The Dow Chemical Company, License No. 21-00265-06. They have submitted a Decommissioning Funding Plan (DFP) dated September 22, 1997 (enclosed) which requires contractor review.

Region III licensing and inspection staff consider the licensee representation of its facility use. contamination and waste generated reasonable. We are also enclosing a current copy of the license to assist you in your review of the licensee's DFP.

We appreciate your efforts in resolving these issues. If you have any questions please contact Charles F. Gill of my staff at (630) 829-9814.

License No. 21-00265-06

Docket No. 030-04783

Attachment: 1. DFP dtd 09/22/97

2. License No. 21-00265-06, Amendment No. 63

Contact:

Charles F. Gill (630) 829-9814

DOCUMENT NAME: M:\03004783.TR7

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	DNMS/RIII	DNMS/RIII			
NAME	CFGill:brt (CM)	CFFrazier Juny	, derman		
DATE	10/ 14 /97	10/15 /97			



September 22, 1997

Charles Gill
Health Physicist
Nuclear Materials Licensing Branch
USNRC, Region III
801 Warrenville Road
Lisle, Illinois 60532-4351

Dear Mr. Gill:

I have enclosed an updated copy of our Decommissioning Funding Plan. I have added information regarding decommissioning of areas using thorium and plutonium.

21-00265.06

If you have any questions please contact me at (517) 636-1440.

Samet A. Grappin

Sincerely,

Radiation Safety Officer

Michigan Industrial Hygiene Service Center

The Dow Chemical Company

1803 Building

Midland, Michigan 48674

SEP 2 9 1997 REGION III

Pm 9-26-97

300237

Decommissioning Funding Plan

9/18/97

GENERAL INFORMATION

License Number:

21-00265-06

Licensee's Name:

The Dow Chemical Company

Address:

1803 Building,

Midland, MI 48674

2. DESCRIPTION OF PLANNED DECOMMISSIONING ACTIVITIES

2.1 Decommissioning Objective, Activities and Tasks

- 2.1.1 The objective of decommissioning is to properly dispose of radioactive materials covered by NRC License Number 21-00265-06 such that remaining amounts of radioactive materials do not exceed those levels specified in "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material", USNRC. Radioactive warning signs and labels will also be disposed of or defaced.
 - Properly dispose of all sealed sources through transfer to an authorized licensee.
 - Incinerate C-14 and H-3 wastes according to conditions in License.
 - Properly dispose of all other long lived isotopes (half life greater than 120 days) through transfer to authorized licensees.
 - Thoroughly survey laboratories and areas where radioactive materials have been used or stored (including ventilation and compaction systems) for contamination, following established written procedures.
 - Decontaminate, according to established written procedures all areas, where contamination levels above guidelines are found.
 - 6. Perform a thorough final survey.
 - Dispose of all radioactive waste created during decontamination activities by transfer to an authorized licensee or incineration.

2.12 Description

The activities listed above will be performed and documented for all areas where radioactive materials have been used or stored. Byproduct materials are currently used in the following buildings: 1602 Building - 3 labs, 1803 Building - 20 labs, several hundred sealed sources are located throughout the Michigan Division and the Research area, radioactive materials are incinerated in 703 Building, and small amounts of radioactive materials were buried at the Midland plant.

Thorium will be used in 677 Building in 2 laboratories. Plutonium, up to 1 mCi in loose form, will be used in the 3 labs that are currently approved for use of radioactive material in 1602 Building.

Little or no residual contamination is expected in any of the lab areas, plant areas or the incinerator. Potential for accidents during this decommissioning is very low. The most likely type of accident would be a small spill of radioactive material during clean up. This type of accident would be handled according to established written procedures.

2.1.3 Procedures

Decontamination, surveys and emergency response will be conducted according to the written procedures for these activities established for the use of radioactive materials.

2.2 Decommissioning Organization and Responsibilities

The decommissioning activities will be overseen by the RSO and the Radiation Safety Committee. Decommissioning activities will be performed by the Health Physics staff and Authorized Users and other Dow employees. Contract workers may be used to perform some demolition related tasks such as removing equipment such as funce hoods that can not be decontaminated.

2.3 Training

The RSO. Authorized Users and other Dow employees involved in the decommissioning will receive training as specified Dow's written Radiation Safety Program. Contractors will receive the same training as Dow ancillary employees.

3. DESCRIPTION OF METHODS USED FOR PROTECTION OF OCCUPATIONAL AND PUBLIC HEALTH AND SAFETY

3.1 Facility Radiological History Information

The following historical information will be reviewed and dealt with during the decommissioning:

Locations of use of radioactive materials:

- Currently 1602, 1701, 1803, 703, Midland Plant Hazardous Materials burial area
- Thorium will be used in 677 Building in 2 laboratories.
- The plutonium, up to 1 mCi in loose form, will be used in the 3 labs that are currently approved for use of radioactive material in 1602 Building.

Types of operations performed in these locations:

- 1602, several sealed sources Na-22, Pu-238, low level lab analytical work such as gamma spectroscopy also work with up to 1 mCi loose pu-238.
- 1701, mCi quantities of C-14 and H-3, tracer studies and animal studies.
- 1803, mCi quantities of C-14 and H-3, tracer studies and animal studies.
- 703 up to 25 mCi of C-14 or H-3 incinerated per day
- 677 research using small quantities of thorium

Typical radiation and contamination levels:

- 1602 Building < 1 mR/hr and < 50 dpm/100 cm²
- 1701 Building < 1 mR/hr and < 50 dpm/100 cm²
- 1803 Building < 1 mR/hr and < 50 dpm/100 cm²
- 703 Building < 1 mR/hr and < 50 dpm/100 cm²
- 677 Building < 1 mR/hr and < 50 dpm/100 cm²

Ventilation systems for labs in 677, 1602, 1701 and 1803 may be contaminated.

3.2 Ensuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA)

See ALARA Program in Appendix 10.

3.3 Health Physics Program

The Health Physics staff will audit all areas decommissioned by Authorized Users. The Radiation Safety Committee will review all Health Physics audits

Radiation surveys in areas where general and high energy beta emitters were used will be performed using Victoreen Model 450 ion chamber survey meters or equivalent meters. Contamination surveys in areas where gamma and high energy beta emitters were used will be performed using a Ludlum Model 3 survey meter with a model 44-9 pancake probe or a Ludlum Model 3-98 meter with a 44-3 probe (scintillation probe) or equivalent. Wipe tests using dry cotton swabs analyzed by scintillation counter will be used to measure removable contamination levels.

Survey meters will be calibrated as described in Dow's written Radiation Safety Program.

Radiation field surveys will not be performed in areas where only C-14 and/or H-3 were used. Wipe tests using dry cotton swabs analyzed by scintillation counter will be used to measure removable contamination levels.

Personal and area monitoring will be performed as described in the written Radiation Safety Program.

3.4 Contractor Personnel

Contractors will follow the same policies and procedures as Dow Employees.

3.5 Radioactive Waste Management

Sealed sources removed from plant areas will be stored in a locked sealed source storage area, currently 1138 Building, until transfer to an authorized licensee.

Loose isotope wastes and contaminated wastes produced during decontamination activities will be stored in the radioactive waste storage area, currently 1365 building, until they can be disposed of or incinerated.

Thorium wastes and contaminated wastes produced during decontamination activities will be stored in the radioactive waste storage area, currently 1365 building, until they can be disposed of through shipment to an authorized licensee.

Plutonium wastes and contaminated wastes produced during decontamination activities will be stored in the radioactive waste storage area, currently 1365 building, until they can be disposed of through shipment to an authorized licensee.

Projected generation of radwaste:

- Approximately 300 sealed sources will be disposed of through transfer to an authorized licensee.
- An estimated 4, 55 gallon drums of thorium contaminated waste will be disposed of through transfer to an authorized licensee.
- Approximately 1, 55 gallon drum of plutonium contaminated waste will be returned to NIST.
- Approximately 1000 mCi of C-14 will probably need to be incinerated according to existing license conditions.
- Approximately 100 mCi of H-3 will probably need to be incinerated according to existing license conditions.
- An estimated 20, 55 gallon drums of slightly contaminated (C-14 and/orH-3) may be produced during decommissioning. This will also be incinerated according to conditions in the existing license.
- Any isotopes requiring decay in storage will be stored at 1365 building until they have decayed sufficiently to be incinerated.

4. PLANNED FINAL RADIATION SURVEY

All areas listed in section 3.1 will be surveyed. The final survey will include contamination surveys using a GM counter with a pancake probe or a scintillation counter of all areas where gamma or high energy beta emitting radioactive materials were used or stored. Wipe testing of these areas and areas where low energy beta emitters were used will be performed using dry cotton swabs analyzed by liquid scintillation. The above mentioned surveys will also be performed in areas such as floors, computer keyboards, desks, benchtops and doors of labs where radioactive materials were used or stored.

Release criteria will be "Acceptable Surface Contamination Levels" as specified in "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use of Termination of Licenses for Byproduct, Source, or Special Nuclear Materials". USNRC, August 1987.

Final survey data will be compiled in a final survey report which will be reviewed by the Radiation Safety Committee.

5. FUNDING

The following is a detailed cost estimate for decommissioning:

	Description	Estimated Time Required	Rate	Cost
1	 Disposal of ~ 300 sealed sources Move sources to storage area Disposal of sealed sources based on 1995 disposal costs 	0.2 workyears	28/hour	\$11,200 \$250,000
	 Health Physics support 	0.2 workyear	100/hour	\$40,000
2	Packaging and incinerating loose isotopes	100 hrs	100/hr	\$10,000
3	Decontamination of 27 labs by authorized users or HP Staff	20hrs/lab	100/hr	\$54,000
4	Final survey by RSO and HP Technologist of 27 labs	10 hrs/lab	100/hr	\$27,000
5	Packaging, shipping and disposal of 4 drums thorium contaminated waste ~50 lb/drum		10/lb	\$2,000
6	Packaging and shipping of one 55 gallon drum of plutonium contaminated waste to NIST	20 hrs	100/hr	\$2,000
7	Administrative Total	0.2 workyears	50/hour	\$20,000 \$416,200.00

Financial assurance, by the self guarantee method has been submitted to the NRC for the amount of \$825,000.

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(7-94)			

U.S. NUCLEAR REGULATORY COMMISSION

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MATERIALS LICENSE

Amendment No. 63

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.

In accordance with application dated

October 10, 1994 3. License Number 21-00265-06 is renewed in its entirety to read as follows:

4. Expiration Date September 30, 2007

5. Docket or 030-04783 Reference No.

Licensee

- 1. The Dow Chemical Company H&ES, Industrial Hygiene Laboratory
- 1803 Building Midland, MI 48674
- 6. Byproduct, Source, and/or Special Nuclear Material
 - A. Any byproduct material with Atomic Numbers between 1-83, inclusive
- 7. Chemical and/or Physical Form
- A. Any

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- B. Any byproduct material with Atoric Numbers 3-84. inclusive
- C. Hydrogen-3

- B. Sealed or foil sources (which have been evaluated and registered with the NRC or an Agreement State)
- C. Sealed sources (which have been evaluated and registered with the NRC or an Agreement State)

- 8. Maximum Amount that Licensee May Possess at Any One Time Under This License
- Not to exceed 2 curies per radionuclide, 50 curies total. except as noted below:

Hydrogen-3 8 curies Carbon-14 8 curies Iodine-125 5 curies

- No single source to exceed 8 curies. 400 curies total
- C. No single source to exceed 10 curies. 50 curies total

MATERIALCIACING		PAGE 2 OF 7 PAG License i umber 21-00265-06 Docket or Reference Number 030-04783				
				Ате	ndment	No. 63
6.	Byproduct, source, and/or special nuclear material	7.	Chemical and/ physical form		8.	Maximum amount that licensee may possess at any one time under this license
	D. Krypton-85	D.	Sealed source (which have be evaluated and registered wi NRC or an Agr State)	een th the	D.	No single source to exceed 2 curies, 20 curies total
	E. Curium-244	Ε.	Sealed source (which have b evaluated and registered wi NRC or an Agr State)	een th the	Ε.	No single source to exceed 1.5 curies. 10 curies total
	F. Americium-241	F.	Sealed source (which have be evaluated and registered wi NRC or an Agra State)	een th the	F.	No single source to exceed 10 curies, 50 curies total
	G. Plutonium-238	G.	Sealed source (Amersham Cor Model Nos. PP PPC.A1)	D.	G.	No single source to exceed 30 millicuries, 90 millicuries total
	H. Cesium-137	Н.	Sealed source (Industrial Re Laboratories : 2)		Н.	144 curies
	I. Iron-55	I.	Sealed source (Amersham Cor Model No. IEC	0.	Ι.	No single source to exceed 45 millicuries, 180 millicuries total
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NRC FORM 374A (7-94)	U.F SCLE	AR REGULATORY COMMISSION	License Number	PAGE	3	OF	7	PAG
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special nuc	source, and/or lear material	7. Chemical and/ physical form		8.	lice at a	mum amensee many one r this	ay po	osse e
J. Cadmium	-109	J. Sealed source (Amersham Cor No. CUC.D1)		J.	exce mill	ingle ed 5 icurie	s.	
K. Plutoni	um-238	K. Any		Κ.		to exc		
L. Thorium		L. Any		L.	Not	to exce	eed 9	90
9. Authorize	ed Use:							
meraamig	To be used in sou	d development as defi	ave been ev	aluato	d and	t nomin	+	,
	in accordance wit	in Agreement State or th the statements, re ication dated Septem	in Dow Cher	mical,	Inc	nunta	m da	vic
G. For use i	n Telesec Model X-	200 x-ray fluorescen	ce analyzer	for s	ample	analy	sis.	
	ed in an Eberline m	odel 1000 instrument						
I. and J. For Anal	use in Texas Nucle yzer for metal all	ear Corporation Model oy analysis.	9200 Series	s meta	llurg	jist X-	ray	
K. For use i	n a cooperative re ology (NIST) to pr	search effort with toduce low specific a	he National ctivity alph	Insti na emi	tute tting	of Sta stand	ndar	ds
L. For resea	rch and developmen	t of a thorium conta	ining cataly	yst.				
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- To be used for research and development as defined in 10 CFR Part 30, Section 30.4, including animal studies.
- B. through F. To be used in source housings which have been evaluated and registered with the NRC or an Agreement State or in Dow Chemical, Inc. custom devices in accordance with the statements, representations and procedures contained in application dated September 11, 1984.
- For use in Telesec Model X-200 x-ray fluorescence analyzer for sample analysis. G.
- To be used in an Eberline model 1000 instrument calibrator for instrument H. calibration.
- I. and J. For use in Texas Nuclear Corporation Model 9200 Series metallurgist X-ray Analyzer for metal alloy analysis.
- For use in a cooperative research effort with the National Institute of Standards K. and Technology (NIST) to produce low specific activity alpha emitting standards.
- For research and development of a thorium containing catalyst.



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	MATERIALS LICENSE	License Number 21	-00265-0	6			
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		Ame	endment	No. 6	53		

CONDITIONS

- 10. Licensed material shall be used only at the licensee's facilities located at Dow Agricultural Products Research Center, Midland, Michigan, Central Research Campus, Midland, Michigan, H&ES, 1803 Building, Midland, Michigan, Dow Michigan Division, Midland, Michigan, and Michigan Division, 4668 Wilder Road, Bay City, Michigan.
- 11. A. Licensed material shall only be used by, or under the supervision of, individuals designated by the Radiation Safety Committee, Stanley L. Dombrowski, Chairperson. The licensee shall maintain records of individuals designated as users for 3 years after the individual's last use of licensed material.
 - B. Licensed material authorized for use in Item 9.I and J. above, may be stored at the licensee's facilities located in 1015 Building and may be used at temporary job sites of the licensee anywhere in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material.
 - C. The Radiation Safety Officer for this license is Janet Grappin.
- 12. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as specified by the certificate of registration referred to in 10 CFR 32.210.
 - B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.
 - C. In the absence of a certificate from a transferor indicating that a leak test has been made within 6 months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.
 - D. Sealed sources need not be leak tested if:

- (i) they contain only hydrogen-3; or
- (ii) they contain only a radioactive gas; or
- (iii) the half-life of the isotope is 30 days or less; or

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12.D (Continued)

- (iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or
- (v) they are not designed to emit alpha particles, 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 or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.
- E. The leak test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(b)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region III, 801 Warrenville Road, Lisle, Illinois 60532-4351, ATTN: Chief, Nuclear Materials Safety Branch. The report shall specify the source involved, the test results, and corrective action taken.
- F. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the Commission or an Agreement State to perform such services.
- 13. Licensed material shall not be used in or on human beings.

- 14. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
- 15. The licensee is authorized to hold radioactive material with a physical half-life of less than 65 days for decay-in-storage before disposal in ordinary trash provided:
 - A. Radioactive waste to be disposed of in this manner shall be held for decay a minimum of 10 half-lives.
 - B. Before disposal as ordinary trash, byproduct material shall be surveyed at the container surface with the appropriate meter 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.



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		Ame	endment I	No. 6	53		

15. (Continued)

- C. The licensee is authorized to hold radioactive material with a physical halflife of less than 90 days (as described in letter dated July 7, 1997) for decay-in-storage before disposal in ordinary trash provided:
 - (i) Radioactive waste to be disposed of in this manner shall be held for decay a minimum of 10 half-lives.
 - (ii) Before disposal as ordinary trash, radioactive waste shall be surveyed (as described in letter dated July 7, 1997) to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated, unless incinerated.
- 16. The licensee is authorized to transport licensed material only in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
- 17. Experimental animals, or the products from experimental animals, that have been administered licensed materials shall not be used for human consumption.
- 18. A. Pursuant to 10 CFR 20.1302 and 10 CFR 20.2002, the licensee is authorized to dispose of licensed material by incineration provided the gaseous effluent from incineration does not exceed the limits specified for air in Appendix B, Table II, 10 CFR Part 20.
 - B. Pursuant to 10 CFR 20.2002, the licensee may dispose of incinerator ash containing radioactive materials with Atomic Nos. 1-83, other than those isotopes listed below, as ordinary waste in a landfill, provided the concentrations of the isotopes, expressed in \(\mu\)Ci per gram of ash, at the time of disposal, do not exceed the numerical values listed in Table II, Column 2, 10 CFR 20, Appendix B. Isotopes not included are hydrogen-3, carbon-14, aluminum-26, chlorine-36, silver-108m, niobium-94, iodine-129, technetium-99, and thallium-204, for which the concentrations must not exceed 10 percent of the values listed in Table II, Column 2, 10 CFR Part 20, Appendix B.
 - C. This license does not authorize the commercial incineration of byproduct, source or special nuclear material. However, the licensee is authorized to incinerate byproduct material waste from the Dow Chemical Company divisions and subsidiaries (as described in letter dated July 7, 1997).



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	MATERIALCIACENCE	License Numo.	265-06				
		Docket or Reference Number 030 - 04783 Amendment No. 63					

- 19. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material to quantities below the limits specified in 10 CFR 30.72 which require consideration of the need for an emergency plan for responding to a release of licensed material.
- 20. 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. Application dated October 6, 1995; and
 - B. Letter dated July 7, 1997 (excluding Appendix No. 6 and Tab No. 8, Storage of Radioaccive Material, of Appendix No. 9)

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date SEP 0 8 1997

Nuclear Materials Licensing Branch, Region III

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