TEN-YEAR PLAN FOR DECONTAMINATION AND DECOMMISSIONING FOR MOUND LABORATORY

Sam S. Freeman

June 30, 1977

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MONSANTO RESEARCH CORPORATION

A Subsidiary of Monsanto Company

MOUND LABORATORY

Miamisburg, Ohio

45342

operated for

UNITED STATES ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

U. S. Government Contract No. EY-76-C-04-0053

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MOUND LABORATORY

Operated for the United States Energy
Research and Development Administration

June 30, 1977

Mr. Jose A. Chacon, Area Manager
U. S. Energy Research and Development Administration
Dayton Area Office
P. O. Box 66
Miamisburg, Ohio 45342

Dear Mr. Chacon:

Planning for Decontamination and Decommissioning
Letter of December 8, 1976, H. E. Roser to J. A. Chacon*

As I indicated in my letter to you, dated January 25, 1977, we are submitting our short and long range plans for decontamination and decommissioning projects at Mound Laboratory.

All projects are listed, including those that have been submitted in the form of Proposals (189's) and a Line Item for FY 1978 and FY 1979. The projects extend into the planning period of FY 1980 through FY 1989.

The projects are identified by site location, by building and by programs. The descriptions, level of decontamination and costs are by project, but they are also subdivided for purposes of prioritization and year of funding.

The projects for the removal of contaminated soil, as previously identified in Mound's "Radioactive Waste Management Site Plan" are not included at this time. These projects, which will be added at a later date, are discussed in the body of this report.

If you require any additional information regarding this plan, please advise.

Very truly yours,

Hilliard L. Williams
Director, Engineering

HLW:pg

*See Appendix

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Monsanto Research Corporation

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(513) 866-7444

a subsidiary of Monsanto Company

MOUND LAB DECOMMISSIONING AND DECONTAMINATION PROJECTS

PRIORITIES AND COSTS

Project	Costs in Thousands												Total	
	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989		
1. SM Building Demolition		790	2,030	2,450	5,260	4,270							14,800	1
2. PP Building (NRA Labs)	3,222	2,403	945	630									7,200	2
3. Building 41 and Trans. Lines				1,260	2,160	990							4,410	3
4. R Building (NRA Labs)		1,260	1,890	955									4,105	4
5. R-159				750									750	5
6. SW-8		130											130	6
7. SW-12, 13			685										685	7
8. SW 150, 152									800				800	8
9. SW 240							765						765	9
10. WD 5			75										75	10
11. WD 10, 13, 14, 15				305									305	11
12. WD 9, 110				445									445	12
13. SD Plant							1,160						1,160	13
14. Site Survey			585										585	14
Total By FY	3,222	4,583	6,210	6,795	7,420	5,260	1,925		800				36,215	

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All projects are listed, including those that have been submitted in the form of Proposals (189's) and a Line Item for FY 1978 and FY 1979. The projects extend into the planning period of FY 1980 through FY 1989.

The projects are identified by site location, by building and by programs. The descriptions, level of decontamination and costs are by project, but they are also subdivided for purposes of prioritization and year of funding.

The projects for the removal of contaminated soil, as previously identified in Mound's "Radioactive Waste Management Site Plan" are not included at this time. These projects, which will be added at a later date, are discussed in the body of this report.

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Very truly yours,

Hilliard L. Williams
Director, Engineering

HLW:pg

*See Appendix

-2-

Summary

The ten-year plan for decontamination and decommissioning for Mound Laboratory consists of 14 projects including three which are identified as starting prior to FY 1980 but extend into the period FY 1980 through FY 1989. The total cost of \$36,215,000 in FY 1979 dollars, as shown on the following chart, does not include the cost of the removal of contaminated soil identified in Mound's "Radioactive Waste Management Site Plan." There is insufficient information at this time to make an estimate of this cost. However, by early FY 1981, the data necessary to make an estimate will be available from the site survey, and the ten-year plan can then be amended to include the cost for removal of the contaminated soil.

The ten-year plan will also provide usable space for future programs in the Plutonium Processing (PP), Research (R), Semi-Works (SW), and Waste Disposal (WD) Buildings as follows:

PP - 284 linear feet of glove box (more significant
than area)
R - 3700 sq ft
SW - 3400 sq ft
WD - 4300 sq ft

The schedule as shown is the probable chronological priority.

Criteria for Developing the Plan

1. The guidelines for establishing the level of decontamination and decommissioning are those supplied in H. E. Roser's memorandum of December 8, 1976 (see Appendix).
2. The method of determining the final average contamination level of soil after decontamination is by core sampling and laboratory analysis to determine quantities on a grid of the contaminated area. The mass of soil used in the calculation of concentration will include the mass of the compacted back fill. Localized pockets of high levels of contamination will be removed even if the average contamination calculates to less than 11 pico Ci/g of soil.
3. The level of decontamination of the laboratories is "extensive" in all cases as it is not feasible, at this time, to assume the equipment and glove boxes can be

MOUND LAB DECOMMISSIONING AND DECONTAMINATION PROJECTS

PRIORITIES AND COSTS

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5. R-159				750									750 5
6. SW-8		130											130 6
7. SW-12, 13			685										685 7
8. SW 150, 152									800				800 8
9. SW 240							765						765 9
10. WD 5			75										75 10
11. WD 10, 13, 14, 15				305									305 11
12. WD 9, 110				445									445 12
13. SD Plant							1,160						1,160 13
14. Site Survey			585										585 14
Total By FY	3,222	4,583	6,210	6,795	7,420	5,260	1,925		800				36,215

utilized for future programs. However, as plans are developed to utilize these laboratories, due consideration will be given to the possibility of reducing the level of decontamination.

4. Prioritization is based upon the logic for phasing out the functions, need for the decontaminated facilities, the leveling of the funding and availability of resources over the ten-year period.
5. Funding is indicated for those projects where guidance has been received. Funding for all other projects is indicated as indeterminate.
6. Site projects for the removal of contaminated soil are incomplete due to insufficient information on previously identified contaminated areas. Therefore, a project has been added to obtain the information necessary to estimate the cost of decontaminating the soil. When the information is available, the ten-year plan will have to be amended to incorporate these previously identified areas or any other areas identified by the survey.

Project Description, Justification and Funding

1. Special Metallurgical (SM) Building

a) Description

This project will remove the Special Metallurgical (SM) Building at Mound Laboratory which is contaminated with Plutonium-238. This 23,000 square-foot structure (see Figure 1) is comprised of an open contaminated area of 13,500 sq ft (the "Ball Room") and an uncontaminated area of 9,500 sq ft. The uncontaminated area includes offices, the existing Plutonium Processing (PP) area change room, laboratories, maintenance shops, and building services. In addition, contaminated support areas will be removed including underground "low risk" waste tanks, the Redrumming and Repackaging (R & R) Building (324 sq ft), the ventilation exhaust stack and contaminated earth under and in the near vicinity to the structures.

To accomplish this removal, Building 36 nearby must be refurbished to provide office space for personnel displaced from the SM Building. A new main exhaust fan and short stack must be installed for the PP Building so that the exhaust stack and fan can be removed. Utility services that are presently routed through the SM Building must also be redistributed.

In support of the actual removal effort existing technology related to contamination survey and fixing techniques, structural dismantling and packaging methods, and transportation and disposal methods will be improved. Potential personnel and environmental exposures will also be analyzed. The new disposal packages that are anticipated to be developed, designed and fabricated to support the removal project will require Government approvals, as will their associated transportation and disposal methods.

b) Justification

The hazards associated with the continued existence of the SM Building are unacceptable, because Energy Research and Development Administration (ERDA), Monsanto Research Corporation (MRC) and members of the general public are not deriving any benefits from the contaminated portion of the SM Building. The existence of the SM Building is inconsistent with the philosophy of "as low as practicable" (ALAP) and the intent of Executive Order 11752, "Prevention, Control, and Abatement of Air and Water Pollution at Federal Facilities." It will also eliminate the need for continuing maintenance and surveillance.

c) Funding

This project was initially to be funded as a Line Item, but on instructions from ERDA, a Schedule 189 C was submitted on March 28, 1977.

References: Letter of transmission D. L. Balsmeyer to J. A. Chacon dated March 28, 1977.

Schedule 189 C 77-03-127 dated March 1, 1977.

2. PP Building

a) Description

Two hundred eighty four linear feet of glove boxes with contents and the support facilities in Laboratories A-1, A-2, B-1, C-1, C-2, C-3, C-4, F-2, F-3 and F-4 will be removed and the rooms restored (extensive decontamination). Glove Box 601 in F-1 will also be removed (see Figure 2).

b) Justification

Based on current Division of Nuclear Research and Application (NRA) program guidance, the NRA recovery area on the second floor of PP Building became inactive in FY 1975, and additional portions will become inactive in late FY 1977. It is less hazardous to remove the contaminated equipment than it is to continue to provide maintenance and surveillance. The PP Building will retain the capability to process fuel and to encapsulate the milliwatt generator. It will also retain analytical facilities to support this program plus all building and process services.

c) Funding

Based upon the concept that the last building user budgets for final decontamination, this project will be funded by NRA.

3. Building 41 and Alpha Waste Transfer Lines

a) Description

This project will remove the waste pump station (Building 41) and the two underground polypropylene line pipe lines that connect to it from the Plutonium Processing and the Waste Disposal Buildings (see Figure 3). Contaminated earth under and near the building and lines will also be removed.

b) Justification

When the transfer lines began to show signs of deterioration and became unreliable and difficult to maintain, a Waste Solidification Facility for drumming wastes was

constructed at the PP Building. The higher activity alpha liquid waste line was abandoned. The low risk alpha waste will be transferred by tank truck on completion of the loading and unloading stations (a FY 1976 GPP Project). This will permit the abandonment of the entire transfer system from PP to WD. Continuing surveillance of the system is difficult, and its complete removal will eliminate potential leaks to the environment.

c) Funding

Based upon the concept that the last building user budgets for final decontamination, this project will be funded by NRA.

4. R Building (NRA Labs)

a) Description

Two hundred fifteen linear feet of glove boxes with contents and supporting facilities in Laboratories R-120, R-217, R-130, R-131, R-145 and R-147 will be removed and the labs restored (extensive decontamination) (see Figure 4).

b) Justification

Based on current NRA program guidance, these laboratories, where activities such as process development, process engineering, particle coating, vacuum hot pressing of Pu-Mo-Cermet (PMC) and Pressed Plutonium Oxide (PPO) fuel forms, metallography and excapsulation were conducted, will become inactive in FY 1977. It is less hazardous to remove the contaminated equipment than it is to continue to provide maintenance and surveillance. The space is also valuable for potential future programs.

c) Funding

Based upon the concept that the last building user budgets for final decontamination, this project will be funded by NRA.

FIGURE 4

MINNESOTA MINING & SMELTING AND ROYALTY COMPANY MINNESOTA MIN. CO.	
R-BUILDING FIRST FLOOR PLAN	
DESIGNED BY LARKIN	DATE 10-30-65
CHECKED BY G.D.	DATE 11-1-65
APPROVED BY G.D.	DATE 11-1-65
DWG NO. 3-

PROJECT #4

PROJECT #5

JUNE 1 1 1
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33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112
113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128
129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176
177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192
193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208
209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224
225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256
257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272
273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304
305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336
337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352
353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368
369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384
385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400
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465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
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513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528
529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544
545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576
577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592
593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608
609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624
625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656
657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672
673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688
689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704
705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736
737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752
753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768
769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784
785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816

5. R Building (Lab R-159)

a) Description

This large laboratory (~1150 sq ft) has undergone a number of changes in programs. The current work is being performed in existing glove boxes and fume hoods at the south and north ends of the lab. All of the facilities in between consisting of approximately 43 linear feet of glove box, fume hoods, associated equipment, and two inert atmosphere recirculating systems, are to be completely removed (extensive decommissioning) (see Figure 4).

b) Justification

Based on present program guidance, there is no apparent need for the inactive equipment, either now or in the future. Removal of this contaminated equipment reduces the potential hazard of release to the environment. It will also provide space for future programs.

c) Funding

To be determined.

6. SW Building (SW 8)

a) Description

The old solids recovery line of approximately 40 linear feet of glove box and supporting equipment will be removed and the lab restored (extensive decontamination) (see Figure 5).

b) Justification

A new recovery laboratory is under construction in R 107 with greater capabilities than the existing line which it will replace. Also, the space is needed for installation of equipment for the Line Item, "Tritium Liquid Waste Recovery System."

c) Funding

A Line Item has been submitted for the FY 1979 budget

MONSANTO RESEARCH CORPORATION
800 AND LEXINGTON
ST. LOUIS, MO 63165

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1ST FLOOR

OWG CLASSIFICATION

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entitled, "Tritium Liquid Waste Recovery System."
It includes the cost of the extensive decontamination
of this obsolete recovery facility to allow for the
installation of the new Line Item.

7. SW Building (SW 12 and SW 13)

a) Description

About 36 linear feet of glove box line and supporting
equipment on the west side of SW 13 will be removed
and that part of the lab restored (extensive decon-
tamination).~

The recirculating inert atmosphere system on the
west side of SW 12 which services the obsolete glove
box line will be removed and the room restored
(extensive decontamination) (see Figure 5).

b) Justification

Based upon current program guidance, this equipment
is no longer required. It is less hazardous to re-
move this contaminated equipment than it is to con-
tinue to provide maintenance and surveillance. It
is also prime space which could be used for some
future program.

c) Funding

To be determined.

8. SW Building (SW 150 and 152)

a) Description

All of the equipment in SW 150 and 152 consisting of
~100 linear feet of glove boxes, fume hoods, 500 ton
press, and support facilities will be removed and the
rooms restored (extensive decontamination) (see Figure
5).

b) Justification

Based upon current program guidance, this laboratory
will not be required to support process development.

The anticipated level of support can be handled in SW 142. This contaminated equipment will be difficult to maintain and keep under surveillance so it would be less hazardous to remove it completely. The space will also be useful for some future program.

c) Funding

To be determined.

9. SW Building (SW 240)

a) Description

This lab and all of the glove boxes and supporting equipment will be extensively decontaminated (see Figure 6).

b) Justification

Based upon current program guidance, this laboratory will not be required beyond FY 1982. It is less hazardous to remove this equipment than it is to continue to provide maintenance and surveillance. It is also prime space which could be used for some future program.

c) Funding

To be determined.

10. Waste Disposal Building (WD 5)

a) Description

The centrifuge, sludge mixer and associated equipment, and services in this room will be removed and the room restored (extensive decontamination) (see Figure 7).

b) Justification

The waste disposal process has been modified with a large reduction in sludge volume. Also, the sludge contains a high percentage of hydroxide as a result of increasing the pH and is not easily dewatered by centrifugation. Therefore, this equipment for reducing

-5-

- PROJECT 10
- PROJECT 11
- PROJECT 12

0 8 16 24
SCALE IN FEET

FIGURE 7

MINIMUM REQUIREMENTS FOR INFORMATION
WILL NOT BE RELEVANT
IN A RELEVANT CASE

WD BASEMENT

DESIGNER	F. MORRIS	DATE	8-24-66
CHECKED		DATE	
APPROVED		DATE	
PROJECT	768	DATE	1/16
SCALE	1" = 1'-0"		
DWG NO.	3		

CLASSIFICATION
SECRET

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the volume of sludge by centrifugation is no longer required. The level of contamination is quite low, and the removal of the equipment will provide space for other low level activities in the field of waste management.

c) Funding

To be determined.

11. WD Building (WD 10, 13, 14, 15)

a) Description

Redrumming equipment, evaporators, tanks, and associated equipment in these rooms will be removed and the rooms restored (extensive decontamination) (see Figure 7).

b) Justification

Drumming of high level wastes from the PP Building was done in this area but no longer required as the high level waste is now being drummed in the new Waste Solidification Facility at the PP Building. Removal of this contaminated equipment will eliminate the hazard of potential low level release of radioactivity to the environment. The space is also valuable for some future programs in waste management.

c) Funding

To be determined.

12. WD Building (WD 9, 101)

a) Description

The two clariflocculators extending from Room 9 into Room 101 above will be removed with all associated pumps and piping (extensive decontamination). The rooms will be restored including filling the openings in the slab between floors (see Figures 7 and 8).

b) Justification

Two major changes have taken place in the past few

-E

PROJECT 12

SCALE IN FEET
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FIGURE 8

MINIMUMS REGULATORY COMPLIANCE			
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WD BUILDING
1ST FLOOR PLAN

DESIGNED BY	DATE	BY	APP.
8-23-66			
768			
1/16" = 1'-0"			
DWG NO. 3-			

CLASSIFICATION	REVISION
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years rendering the two small clariflocculators excess. First, Polonium 210 is no longer processed at Mound Lab making it unnecessary to treat the Pu-238 in separate facilities. Secondly, a determined effort at good waste management has reduced the volume of waste generated to the point where the capacity of the two large clariflocculators in WD 101 is more than adequate.

c) Funding

To be determined.

13. Sanitary Sewage Septic Tank and Drying Beds (See Figure 9)

a) Description

The contaminated septic tank and the influent tank and associated equipment will be demolished (totally removed) and the area backfilled with clean earth. The adjoining drying bed with an area of about 1150 sq ft will be removed to a depth of about 3 ft to an average contamination level of 11 pico Ci/g. As an alternate, the influent tank might be decontaminated by wet sand blasting and the concrete tank entombed.

b) Justification

The old sanitary sewage treatment plant has been replaced by a new treatment plant and has been abandoned. It is contaminated with Pu-238, and removal of the system and drying beds will eliminate the potential low level hazard of contaminating the environment. It will also eliminate the need for maintenance and surveillance.

c) Funding

To be determined.

14. Site - Isolated Contaminated Areas (See Figure 9)

a) Description

A comprehensive program will be instituted for core sampling and analysis of previously identified sites

FIGURE 9

MONSANTO RESEARCH CORPORATION
MOORE LABORATORY
MIAMI, FL 33142

PROJECT 14 SITE SURVEY	
SITE PLAN	
HOT BASIN BURIAL AREA	
DATE: 10/1/77	SCALE: 1" = 200'
DRAWN BY: SA-C-2281	CHECKED BY: SA-C-2281

THIS MAP IS A REPRODUCTION OF THE ORIGINAL MAP AND IS NOT TO BE USED FOR ANY OTHER PURPOSE.

to accurately establish boundaries and depths of the contamination. Also, a comprehensive contamination survey of the entire site will be made to ascertain if there are contaminated areas not yet identified.

b) Justification

At present there is insufficient information to accurately determine the extent and quantity of previously identified contaminated soil that would have to be removed to meet the new guidelines of 11 pico Ci/g of soil.

Also, since only suspected areas were sampled for contamination in the past, there is no assurance that all contaminated areas have been identified.

c) Funding

Funding for this survey is to be determined. The information derived from the surveys will provide the basis for estimating the cost to remove all contaminated soil from the site. It would then be necessary to amend the 10-year plan to incorporate these costs.

Priorities and Costs

The first four projects of the plan have been previously submitted in some form such as a Proposal (189) or Line Item. The costs and schedule indicated on the chart for these projects are taken from the respective submissions.

The balance of the projects are new with the costs in FY 1979 dollars, including the appropriate share of plant burden.

The schedule for these projects is based upon the phasing out of the functions and potential need for the facilities. The result, as noted in the chart, is a range of \$5 1/4 million to 7 1/2 million per year through FY 1983. The period of FY 1984 through FY 1989 can then be reserved for the projects concerned with removal of contaminated soil which will be added later. This is feasible since the contamination is quite stable.

APPENDIX A

REFERENCE LETTER,
PLANNING FOR DECONTAMINATION AND DECOMMISSIONING,
H. E. ROSER TO J. A. CHACON
DECEMBER 8, 1976

UNITED STATES
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
ALBUQUERQUE OPERATIONS OFFICE
P.O. BOX 5400
ALBUQUERQUE, NEW MEXICO 87115

DEC 8 1976

K. R. Braziel, Area Manager, LAAO
J. A. Chacon, Area Manager, DAO
W. M. Lamb, Area Manager, RFAO
R. R. Malone, Area Manager, SAO

PLANNING FOR DECONTAMINATION AND DECOMMISSIONING

In May, you participated in the development of an ALO list of radioactively contaminated surplus ERDA facilities. However, since this list was restricted to only entire buildings or structures that would be surplus to the identifiable needs of any ERDA programs for the next five years, it by definition excluded some additional potential decontamination or decommissioning concerns. For example, the list excluded land areas, building portions, and buildings which would become programmatically inactive but not necessarily surplus. Therefore, in order to more completely develop the decontamination and decommissioning picture, I have decided to initiate more comprehensive decontamination and decommissioning planning. The plans are to encompass your current site for a ten-year period and identify decontamination and decommissioning projects, project alternatives, and priorities.

The following two general types of projects are to be included in the plans:

Type One Projects - Decontamination

The following three general levels are recognized:

- Readiness - initial clean-up; reactivation anticipated
- Stand-by - non-fixed contamination removed
- Extensive - internals removed

Type Two Projects - Decommissioning

Three levels are also recognized; they are:

- Partial decontamination and entombment
- Complete decontamination and release for other use
- Demolition

Attachment 1 contains additional guidelines for the Type One and Type Two Projects.

Multiple Addressees

- 2 -

It should be noted that the above projects are to exclude equipment which is removed from continuing operations. Furthermore, the clean-up of off-site areas is also to be excluded. The off-site areas may be added at a later date as a supplement to these initial plans.

The planning period for decontamination and decommissioning projects is to be ten years, FY 1980 thru FY 1989. Projects identified for decontamination and/or decommissioning in this period are to be based on your interpretations of available programmatic guidance regarding foreseeable utilization.

Your decontamination and decommissioning plans should contain brief descriptions of and justifications for the identified projects. The projects identified should be listed in a priority ranking with cost estimates in FY 1979 dollars and the type of funding indicated. Furthermore, since the Type One and Two projects of your priority plan will be based on only one of the above levels of decontamination or decommissioning, if applicable, for each of these projects, alternative levels of decontamination and decommissioning are to be also identified and estimated.

In conclusion, I realize that this request will require considerable effort on your part. However, I do believe that such projects cannot be routinely deferred and that they are a necessary portion of the short-range as well as long-range site management.

In order to allow ALO time for an evaluation of the projects regarding possible inclusion in the FY 1980 budget, please transmit your site plans by July 15, 1977.

Herman E. Roser
Manager

PRC:SKS (620-76)

Enclosure:
Guidance for Type Two and Three
Projects

cc: Maj. Gen. J. K. Bratton, USA, Director, DMA, HQ (w/encl)
Martin B. Biles, Director, Div. of Safety, Standards, and
Compliance, HQ (w/encl)

ATTACHMENT 1

Additional Guidelines for Type One and Two Projects

The following guidelines provide a set of limits to be used for planning purposes in the preparation of the AL 10-year Master Plan for Decontamination and Decommissioning. However, we must emphasize that in all instances, the As Low As Practicable (ALAP) radiation exposure principal should be used.

1. ERDA 0524 concentration guides and exposure criteria provide adequate guidelines for personnel on-site and off-site for either an operating or an inactivated facility. Additionally, 0524 would also be applicable during the actual decontamination and demolition operations associated with decommissioning a facility.
2. For the release of radioactively contaminated equipment, material, personal gear, etc., for uncontrolled use, the provisions of ERDA 109-45.50 should be followed. In summary these limits are:
 - (a) 2000 disintegrations per minute (dpm) per 100 cm² total for other than transuranium alpha emitters, 200 dpm per 100 cm² removable;
 - (b) 100 dpm per 100 cm² total for transuranium alpha emitters,* 20 dpm per 100 cm² removable;
 - (c) 0.1 millirad per hour for items of property known to have been in contact with strontium 90, calcium 45, zirconium 95, bismuth 210, or radium 226, measured at one centimeter through not more than a 7 milligram per square centimeter (7mg/cm²) absorbing material;
 - (d) 0.3 millirad per hour for beta and/or gamma emitters other than those listed in (3) above, measured at one centimeter through not more than a 7 milligram per square centimeter (7mg/cm²) absorbing material.
3. For the removal of soil for site decontamination, we suggest a value of 11 picocuries per gram of soil for transuranic radionuclides be used.

*The ratio of removable to total contamination and the 100 dpm/100 cm² for transuranic radionuclides was adopted from ANSI N328 (draft).

4. The extent to which a facility/equipment/material to be retained under ERDA control would have to be decontaminated to be placed into an inactive status would depend upon several factors: the Radioisotope(s) involved, the length of the inactive period, projected future production effort and the time required to get back into production, the type of facility, etc. Each facility or item must be evaluated on a case-by-case basis, and the approach chosen consistent with the provisions of ERDA 0524 and ALAP. The following example which was prepared by Mound Laboratory shows steps that might be undertaken to place a facility into various degrees of inactive status.

Mound Laboratory Example

- A. Readiness: A condition which will permit full operation of a laboratory within a short period of time (one calendar quarter or less) after notification and with a minimum expenditure of funds. All operating equipment will remain in place and routine maintenance will be performed. No wipeable contamination would exist in the laboratory areas, which is the case today. However, the average wipe level in the high risk areas, such as access corridors and building system equipment areas, would be reduced to 2200 disintegrations per minute per 100 cm² (dpm/100cm²).

This Readiness condition applies to the physical plant only. Unless a commitment is also made to hold trained personnel, the staff will be decimated by layoff and transfer. A return to full operation presupposes the immediate availability of a nucleus of trained personnel. Loss of staff nucleus would lengthen operational readiness requirement from one quarter to one full year.

Operations to achieve this state are:

1. General cleaning of readily accessible areas and surfaces within gloveboxes, access corridors and laboratory areas.
2. Flushing of process lines and vessels.
3. Changing of all glovebox gloves and filters.
4. Disposing of scrap and waste materials resulting from clean-up activities.
5. Servicing of operating equipment. This will include frequent operation of in-line processing equipment to assure its operability at all times.
6. All major building support equipment will be kept operating. The major building support equipment

includes the house vacuum, corrosive vapor, process chill water and building ventilation systems. The emergency power systems will be maintained and checked to assure operability at all times.

7. Changing of all inert atmosphere boxes to an air supply to minimize procurement costs of inert gases.
8. Changing of appropriate building exhaust filters for areas to be placed in state-of-readiness.

This condition may be maintained for a period of time not to exceed three (3) years. By the end of this three-year period, this readiness condition will be reevaluated for one of the following options:

- a. The areas to be put back into operation.
- b. The areas be partially decontaminated (stand-by).
- c. The areas be extensively decontaminated.
- d. The areas be decommissioned.

B. Partial Decontamination (stand-by): A condition which will permit full operation of a laboratory within a moderate period of time (within one year or less) after notification and with a reasonable expenditure of funds. The average wipe levels in the high risk areas would be reduced to 220 dpm/100 cm². Again, laboratory areas still exist because gloveboxes would be in place. Therefore, the laboratory areas would be left with no wipeable contamination, as they are today.

Operations required to achieve this stand-by condition include those operations stated in the above readiness state, plus the following:

1. More thorough cleaning of the gloveboxes, including all glovebox wells.
2. Removal of all degradable materials and equipment from gloveboxes and support equipment. This includes materials and equipment that would not normally be expected to remain operational for the duration of the stand-by condition. This degradable equipment would include electric motors, valves and glass components as examples.
3. Changing of all glovebox gaskets, both front and rear. The required building ventilation system and Health

Physics monitoring equipment will be maintained and serviced, in order to maintain radiological control of the facility. In addition, the emergency power systems will be maintained and checked to assure operability at all times.

The state of partial decontamination (stand-by) may be maintained as long as the radiological safety of the environment is assured.

- C. Extensive Decontamination: Extensive decontamination includes the removal of gloveboxes and contaminated services and an intensive decontamination of the facility. Since complete decontamination would require removal of the entire structure, the facility will be left "tainted;" i.e., small amounts of residual contamination would remain. This residual contamination will be sealed and the facility would remain under control and negative pressure to protect personnel and the environment.

The final exposed average contamination levels in the facility after this decontamination will be:

- a. Wipe - 22 d/m/100 cm²
- b. Direct - 3000 d/m/60 cm²
- c. External radiation - less than 1 mr/hr at surface.

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