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Informal Report

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**History and Environmental Setting of
LASL Near-Surface Land Disposal Facilities for
Radioactive Wastes (Areas A, B, C, D, E, F, G, and T)**

Appendixes

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APPENDIX A
PHOTOGRAPHS OF DISPOSAL AREAS
(A, B, C, D, E, F, G, and T)

EXPLANATION

LAPL: Los Alamos Photographic Laboratory

CN: Color Negative (photos black and white unless preceded by CN)
First 2 digits of photo number generally indicate year taken

PUB: Public Information Office

USGS: United States Geological Survey

APPENDIX A

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA A</u>			
LAPL 660625		Photo of "Location Plan Materials Disposal Areas".	J. Enders J. Warren
LAPL 732349	3/ 5/73	Parts of Building 12 at TA-21 being put into it.	R. Garde
LAPL 738047 738046	5/24/73	Same building (TA-21-12).	R. Garde
LAPL 738076	6/26/73	Same building (TA-21-12).	R. Garde
PUB 5713-71X		Aerial view Area B, T, A, & V.	W. D. Purtymun
PUB 5713-40X		Aerial view Area B, T, A, & V.	W. D. Purtymun
PUB 5713-39		Aerial view Area B, T, A, & V.	W. D. Purtymun
LAPL 696067 ¹⁸³		South Wall of pit showing soil zone, tuff and joints, 1st layer of waste and access road.	M. A. Rogers
LAPL 696066 ¹⁸³		North Wall of pit showing soil zone, tuff and joints, and 1st layer of waste.	M. A. Rogers
<u>AREA B</u>			
PUB 5713-71		Aerial view Area B, T, A, & V.	W. D. Purtymun
PUB 5713-40		Aerial view Area B, T, A, & V.	W. D. Purtymun
PUB 5713-39		Aerial view Area B, T, A, & V.	W. D. Purtymun
LAPL CN733834	Fall 1973	Looking east from western end.	M. A. Rogers
LAPL CN733835	Fall 1973	Looking west from approx. center line of asphalted part.	M. A. Rogers
LAPL CN733836	Fall 1973	Looking at south fence in asphalted part.	M. A. Rogers
LAPL CN733837	Fall 1973	Alfalfa growing in seam in asphalt.	M. A. Rogers
LAPL CN733838	Fall 1973	Miner's Candle growing in seam in asphalt.	M. A. Rogers
LAPL CN733839	Fall 1973	Clover growing in seam in asphalt.	M. A. Rogers
LAPL CN733840	Fall 1973	Blue Stem growing in seam in asphalt.	M. A. Rogers
LAPL CN733841	Fall 1973	View east from north side gate.	M. A. Rogers
LAPL CN733842	Fall 1973	Hole in asphalt at Stall #26, 42 ft from north fence.	M. A. Rogers
LAPL CN733843	Fall 1973	Part at western end south of asphalt covered portion.	M. A. Rogers
<u>AREA C</u>			
LAPL CN733540	late 1973	Aerial view from east.	J. Enders M. A. Rogers
LAPL CN734448	late 1973	Aerial view from the northwest.	M. A. Rogers C. L. Warner
LAPL CN734449	late 1973	Aerial view from the northeast.	M. A. Rogers
LAPL CN734450	late 1973	Aerial view from the west.	M. A. Rogers
LAPL CN734451	late 1973	Aerial view from the southwest	M. A. Rogers
LAPL CN734452	late 1973	Aerial view west end Area C from the south.	M. A. Rogers
LAPL CN734453	late 1973	Aerial view west end Area C from the southeast.	M. A. Rogers
LAPL CN721290 thru LAPL CN721301	mid 1972	Recovery operation in middle of Pit 4.	J. Warren

APPENDIX A (continued)

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA C (continued)</u>			
LAPL 583494		Pit 6.	J. Enders
LAPL 583497 ²⁶⁹		Pit 6.	J. Enders
LAPL 583498		Pit 6 in background.	J. Enders
LAPL 583500 ²⁶⁹		Pit 6.	J. Enders
LAPL 583502		Pit 6, difference in weathering of packaging materials.	J. Enders
LAPL 583511		Pit 6.	J. Enders
<u>AREA D</u>			
LAPL CN712795		Aerial view from south.	M. A. Rogers
LAPL 22086 ²⁶⁹	4/52	Surface appearance of shaft for TA-33-6, Underground Chamber No. 2.	H. Filip M. A. Rogers
LAPL 22087 ²⁶⁹	4/52	General setup used to dig out shaft.	H. Filip M. A. Rogers
LAPL 22089 ²⁶⁹	4/52	Exterior of door.	H. Filip M. A. Rogers
LAPL 22090 ²⁶⁹ thru LAPL 22093	4/52	Interior of shaft.	H. Filip M. A. Rogers
LAPL 22095 ²⁶⁹	4/52	Interior of shaft.	H. Filip M. A. Rogers
LAPL 22096 ²⁶⁹	4/52	Exterior of door as found.	H. Filip M. A. Rogers
LAPL 22099 ²⁶⁹	4/52	Interior of chamber.	H. Filip M. A. Rogers
LAPL 22100 ²⁶⁹	4/52	Exterior of door after forced.	H. Filip M. A. Rogers
LAPL 22103 ²⁶⁹	4/52	Interior of chamber.	H. Filip M. A. Rogers
LAPL 22106 ²⁶⁹ thru LAPL 22108	4/52	Interior of chamber.	H. Filip M. A. Rogers
LAPL 22156 ²⁶⁹	4/52	Interior of chamber.	H. Filip M. A. Rogers
LAPL 22157 ²⁶⁹	4/52	Distance shot TA-33-6 at moment of firing.	H. Filip M. A. Rogers
LAPL 22158 ²⁶⁹	4/52	Distance shot TA-33-6 after firing.	H. Filip M. A. Rogers
LAPL 22159 ²⁶⁹	4/52	Distance shot TA-33-6 after firing.	H. Filip M. A. Rogers
LAPL 22160 ²⁶⁹	4/52	Interior of chamber.	H. Filip M. A. Rogers
LAPL 22161 ²⁶⁹	4/52	Explosives used to close chamber.	H. Filip M. A. Rogers
LAPL 22162 ²⁶⁹	4/52	Interior of door.	H. Filip M. A. Rogers
LAPL 22163 ²⁶⁹	4/52	Interior of door.	H. Filip M. A. Rogers

AREA A (CONTINUED)

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA D (continued)</u>			
LAPL 22165 ²⁶⁹ thru LAPL 22170	4/52	Interior of chamber.	H. Filip M. A. Rogers
LAPL 22196 ²⁶⁹	4/52	Hole after explosion.	H. Filip M. A. Rogers
LAPL 22197 ²⁶⁹	4/52	Ground cracks after explosion.	H. Filip M. A. Rogers
LAPL 22198 ²⁶⁹	4/52	Hole after explosion.	H. Filip M. A. Rogers
LAPL 22199 ²⁶⁹ thru LAPL 22203	4/52	Debris after explosion.	H. Filip M. A. Rogers
LAPL 22204 ²⁶⁹ thru LAPL 22206	4/52	Hole after explosion.	H. Filip M. A. Rogers
<u>AREA D & E</u>			
LAPL 5713-1		Aerial view Area D & E.	W. D. Purtymun
LAPL 5713-8		Aerial view Area D & E.	W. D. Purtymun
LAPL (no #)		Taken with 35 mm and blowup, aerial photo upper left quarter is Area D.	W. D. Purtymun
<u>AREA F</u>			
NO EXISTING PHOTOS			
<u>AREA G</u>			
PUB71 195-1		Aerial photo from east before Pits 7 and 24 dug.	J. Warren W. D. Purtymun
PUB71 195-4		Aerial photo from south before Pits 7 and 24 dug.	J. Warren W. D. Purtymun
PUB71 195-6		Aerial photo from west before Pits 7 and 24 dug.	J. Warren W. D. Purtymun
LAPL CN752678		Aerial photo from south.	J. Warren
LAPL CN752679		Aerial photo from west.	J. Warren
LAPL CN752680		Aerial photo from north.	J. Warren
PUB 68145-29	4/68	Entrance gate.	M. A. Rogers
PUB 68145-33 thru PUB 68145-35	4/68	Entrance gate.	M. A. Rogers
LAPL CN741295	4/74	Looking south from Pit 6; Pits 7 and 24 open. Pits 17 and 21 closed.	J. Warren
LAPL CN741297	4/74	Looking SE from Pit 6.	J. Warren
LAPL CN741298	4/74	Looking west from Pit 6; Pit 8 closed. Pits 12 and 16 open.	J. Warren
LAPL CN742820	6/74	Indian Ruin 195, Area G, looking east.	J. Warren
LAPL CN742822	6/74	Indian Ruin 195, Area G, looking south.	J. Warren
<u>AREA G, PIT 1</u>			
LAPL 572482		Looking south, Fire in fire pit.	M. A. Rogers J. Enders

APPENDIX A (continued)

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND I

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, PIT 1 (continued)</u>			
LAPL 572483		Looking south.	M. A. Rogers J. Enders
LAPL 583499		Looking south; fire pit still evident.	M. A. Rogers J. Enders J. Warren
LAPL 59415		Looking south; note firebox from old M. Bldg; TA-1 at top of pit on right side.	M. A. Rogers J. Enders J. Warren
LAPL 59416 thru LAPL 59418		Location of C. Blackwell's fall.	M. A. Rogers J. Enders J. Warren
LAPL 59419		Past practice: backing truck to side of pit and unloading from tailgate. Past practice because C. Blackwell fell into pit doing it.	M. A. Rogers J. Enders J. Warren
LAPL 59420		Bird's eye view of where C. Blackwell fell into pit and fractured his leg. Gives a good idea of what trash/fill ratio is in some of the pits.	M. A. Rogers J. Enders
LAPL 59421 thru LAPL 59425		Trash being covered.	M. A. Rogers J. Enders
<u>AREA G, PIT 2</u>			
LAPL 594830 ¹⁶⁰		Infiltration study, South Wall.	W. D. Purtymun
LAPL 594829 ¹⁶⁰		Infiltration study 3000 gal. water tank.	W. D. Purtymun
LAPL 594828 ¹⁶⁰		Infiltration study, "tipping bucket" assembly as shown installed in infiltration pit.	W. D. Purtymun
LAPL 635849	10/23/63	Scaler and neutron moisture probe in moisture access tube to solid waste horizon.	W. D. Purtymun
<u>AREA G, PIT 3</u>			
LAPL 635856	10/23/63	Looking south.	W. D. Purtymun
<u>AREA G, PIT 4</u>			
LAPL 67357 ²⁶⁷	Early 1967	Looking west.	M. A. Rogers J. Warren J. Enders
LAPL 67359	Early 1967	Past practice: drums no longer off-loaded as photo shows.	M. A. Rogers J. Warren J. Enders
LAPL 67360	Early 1967	Off-loading "suspect" building debris.	J. Warren
<u>AREA G, PIT 5</u>			
LAPL 67358 ²⁶⁷		Looking west: center excavation may have been due to "extra money" or "still burning trash".	J. Enders J. Warren

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, PIT 5 (continued)</u>			
PUB 68145-1 thru PUB 68145-10	4/68	Dempster Dumpster in pit.	M. A. Rogers
PUB 68145-11	4/68	Looking east.	M. A. Rogers
PUB 68145-12	4/68	Looking east.	M. A. Rogers
PUB 68145-13	4/68	North Wall between posts 12 & 14.	M. A. Rogers
PUB 68145-17 thru PUB 68145-19	4/68	Looking west along South Wall.	M. A. Rogers
PUB 68145-20	4/68	North Wall between posts 12 & 14.	M. A. Rogers
PUB 68145-21	4/68	Looking east at North Wall.	M. A. Rogers
PUB 68145-25	4/68	Looking north at pit.	M. A. Rogers
PUB 68145-26	4/68	Looking north at pit.	M. A. Rogers
PUB 68145-27	4/68	Looking southeast at pit.	M. A. Rogers
PUB 68145-28	4/68	Looking east between Pits 4 & 5.	M. A. Rogers
PUB 68145-31	4/68	Looking northeast at North Wall.	M. A. Rogers
PUB 68145-32	4/68	Looking northeast at North Wall.	M. A. Rogers
<u>AREA G, PIT 6</u>			
LAPL 7012986 thru LAPL 7013018	3/15/71- 3/16/71	Recovery operation: Container of tritiated chemical compound.	J. Enders
LAPL CN742833	6/74	Looking east at Pit 6 with excavated material from Pit 7 covering it.	J. Warren
<u>AREA G, PIT 7</u>			
LAPL CN733313 thru LAPL CN733326	9/12/73	North Wall of pit.	M. A. Rogers
LAPL CN733327 thru LAPL CN733339	9/13/73	South Wall of pit.	M. A. Rogers
LAPL CN733303	9/12/73	West end of pit showing pond in bottom.	M. A. Rogers
LAPL CN733304	9/12/73	Looking east.	M. A. Rogers
LAPL CN733305	9/12/73	North Wall approx. 357 ft from west end.	M. A. Rogers
LAPL CN733306	9/12/73	North Wall approx. 471 ft from west end.	M. A. Rogers
LAPL CN733307	9/12/73	Closeup of North Wall behind Auger Hole #3 approx. 357 ft from west end of pit.	M. A. Rogers
LAPL CN733308	9/12/73	Looking southwest. Shows area of ponding after Sept 10-11 rains.	M. A. Rogers
LAPL CN733309	9/13/73	Closeup South Wall approx. 268 ft from west end; shows highest ponding level after Sept 10-11 rains.	M. A. Rogers

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, PIT 7 (continued)</u>			
LAPL CN733310	9/13/73	Closeup South Wall; shows mud streak as a result of water movement thru Joint #34 and associated joints approx. 344 ft from west end of pit.	M. A. Rogers
LAPL CN733340	9/13/73	Looking West	M. A. Rogers
LAPL CN733341	9/13/73	Shows water mark along South Wall after Sept. 10-11 rains	M. A. Rogers
LAPL CN733342	9/13/73	Close-up of fracture filling. Joint #52 on South Wall	M. A. Rogers
LAPL CN733343	9/13/73	Open joint, Joint #30 North Wall Ruler rests on jack handle ≈49" long	M. A. Rogers
LAPL CN734182	11/ 8/73	Looking east between Pit 7 and Pit 24	M. A. Rogers
LAPL CN734193	11/ 8/73	Close-up of fracture near soil-bedrock interface.	M. A. Rogers
LAPL CN734194	11/ 8/73	Close-up of weathering in joints #51 South Wall joint plane	M. A. Rogers
LAPL CN734195	11/ 8/73	Weathering phenomenon along horizontal fracture. South Wall between Joints #33 and #34	M. A. Rogers
LAPL CN734196	11/ 8/73	Watermark at base of North Wall near Joint #43. Root sample for 14C dating taken below watermark	M. A. Rogers
LAPL CN74670	1/16/74	View of pipes for neutron moisture probe looking east	M. A. Rogers
LAPL CN74671	1/16/74	View of pipes #4 and #1 for neutron moisture probe on South Wall; Hole #4 is 3' from wall, 256' from west end of pit, and 50' deep. Hole #1 is 3-1/2' from wall, 117' from west end of pit, and 117' deep.	M. A. Rogers
LAPL CN74672	1/16/74	View of pipe for neutron moisture probe, North Wall.	M. A. Rogers
LAPL CN74673	1/16/74	View of pipes #2 and #3 for neutron moisture probe along North Wall; Hole #2 is 3' from wall, 223' from west end of pit, and 50' deep. Hole #3 is 3' from wall, 353' from west end of pit, and 50' deep	M. A. Rogers
LAPL CN74674	1/16/74	View of pipes #2 and #3 for neutron moisture probe along North Wall; Hole #2 is 3' from wall; 223' from west end of pit, and 50' deep. Hole #3 is 3' from wall, 353' from west end of pit, and 50' deep	M. A. Rogers
LAPL CN74675	1/16/74	View of pipes for neutron moisture probe looking West	M. A. Rogers
LAPL CN742821	6/74	Dumpster entering east end of pit	J. Warren
LAPL CN742825	6/74	Dumpster in east end of pit	J. Warren
LAPL CN742836	6/74	Dumpster in east end of pit	J. Warren
LAPL CN755846 thru	10/75	Dumpster off-loading fiber drums in pit	J. Warren
LAPL CN755850			

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, PIT 8</u>			
LAPL CN712272		Virgin	W. D. Purtymun J. Warren M. A. Rogers
LAPL CN721274	4/72	Looking south at drums in pit	J. Enders J. Warren
LAPL CN721275	4/72	South side of drums	J. Enders
LAPL CN721276	4/72	Looking Northwest, shows way drums stacked	J. Enders J. Warren
LAPL CN721277	4/72	North side of drums	J. Enders
LAPL 732541 thru LAPL 732556 ²⁶⁸	2/73	Drums. Done in support of corrosion study. (Detailed labeling of all photos + Memo + photomicrographs, See Margaret Anne Rogers' files)	J. Warren
LAPL CN73808 thru LAPL CN73847 ²⁶⁸	2/73	Drums. Done in support of corrosion study.	J. Warren
LAPL CN733311	9/12/73	Watermark in pit after Sept. 10-11 rains. West Wall	M. A. Rogers
LAPL CN733312	9/12/73	Shows capillary rise from ponded water along West Wall	M. A. Rogers
LAPL CN733344	9/12/73	North end and ramp showing pond, delta, and runnels	M. A. Rogers
LAPL CN74683	1/18/74	Placing access tube for coring tuff on Northwest corner of drums	M. A. Rogers
LAPL CN74684	1/18/74	Placing access tube for coring tuff on Northwest corner of drums	M. A. Rogers
LAPL CN74685	1/18/74	Placing access tube for coring tuff on Northwest corner of drums	M. A. Rogers
LAPL CN74686	1/18/74	Placing monitoring access tubes on Northwest corner of drums. These tubes were bent and buried during filling operation.	M. A. Rogers
LAPL CN74687	1/18/74	Closeup of drill rig augering neutron moisture probe hole.	M. A. Rogers J. Warren
LAPL CN74688	1/18/74	Closeup of base of Northeast corner (of drums) access monitoring tubes. Neutron access tube was connected in place.	M. A. Rogers
LAPL CN74689	1/18/74	View of Zia off-loading filter plenum on Eastside north of drums. Looking south.	M. A. Rogers
LAPL CN74690	1/18/74	View of Zia off-loading filter plenum of Eastside north of drums.	M. A. Rogers
LAPL CN74691	1/18/74	View of Zia off-loading filter plenum on Eastside north of drums.	M. A. Rogers
LAPL CN74692	1/18/74	View of Purtymun's drill rig on North side of drums. Northeast set monitoring access tubes in place.	M. A. Rogers
LAPL CN741069	2/74	Monitoring access tubes in place. Pit being filled with waste.	M. A. Rogers

APPENDIX A (continued)

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, PIT 8 (continued)</u>			
LAPL CN741070	2/74	View of Riggers placing crates into pit North of sludge drums. View is from the Northwest Edge of pit.	M. A. Rogers J. Warren
LAPL CN741071	2/74	View of sampling pipes emplaced at South side of sludge drums. View is from West edge of pit.	M. A. Rogers
LAPL CN741072	2/74	View of sampling pipes emplaced along North side of sludge drums. Bulkhead material (CMR filter plenums) shown at left side of picture. View is from West edge.	M. A. Rogers
LAPL CN742832		Looking South at covered pit with monitoring pipe	J. Warren
LAPL CN742835		Looking North at covered pit with monitoring pipe	J. Warren
LAPL CN744339	11/ 1/74	Looking North between Pits 8 & 9; Compaction of fill over Pit 8 resulted in fractures along pit edge	M. A. Rogers
LAPL CN744340	11/ 1/74	Compaction fracture along Western edge of pit	M. A. Rogers
LAPL CN744341	11/ 1/74	Compaction fracture along Western edge of pit	M. A. Rogers
LAPL CN744342	11/ 1/74	Looking North at compaction fracture along Western edge of pit	M. A. Rogers
<u>AREA G, PIT 9</u>			
LAPL CN742831		Newly dug. Prior to any finishing work to create retrievable storage facility for TRU-waste.	J. Warren
LAPL CN744303 thru LAPL CN744319	10/31/74	West Wall of pit	M. A. Rogers
LAPL CN744320 thru LAPL CN744334	10/31/74	East Wall of pit	M. A. Rogers
LAPL CN744302	10/31/74	Southwest corner	M. A. Rogers
LAPL CN744355	10/31/74	South end	M. A. Rogers
LAPL CN744336	10/31/74	South end	M. A. Rogers
LAPL CN744337	10/31/74	Looking South before asphalt	J. Warren
LAPL CN744338	10/31/74	Looking North before asphalt	J. Warren
LAPL CN744343	10/31/74	Looking South at East Wall	M. A. Rogers
LAPL CN744344	10/31/74	Looking North at West Wall	M. A. Rogers
LAPL CN744345	10/31/74	Looking South at West Wall	M. A. Rogers
LAPL CN744347	11/ 1/74	Looking Northeast at East Wall	J. Warren
LAPL CN744348	11/ 1/74	Looking Northeast at East Wall	J. Warren
LAPL CN744349	11/ 1/74	Looking Southwest at East Wall	J. Warren
LAPL CN744350	11/ 1/74	Looking Southwest at East Wall	J. Warren
LAPL CN744351	11/ 1/74	Looking Northwest at West Wall	J. Warren
LAPL CN744356	11/ 1/74	West Wall. Cross-bedded sand at base of pumice zone at Joint #37.	M. A. Rogers

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, PIT 9 (continued)</u>			
LAPL CN744357	11/ 1/74	East Wall. Joints #38, #39, & #40 with root penetration	M. A. Rogers
LAPL CN744358	11/ 1/ 74	East Wall. Brecciated zone between Joints #38, #39, & #40 believed caused by roots	M. A. Rogers
LAPL CN744359	11/ 1/74	East Wall. Root penetration Joint #48	M. A. Rogers
LAPL CN744360	11/ 1/74	East Wall. Water-laid fracture filling in Joint #62	M. A. Rogers
LAPL CN744361	11/ 1/74	East Wall. Watermarks on fracture face Joint #33	M. A. Rogers
LAPL CN744362	11/ 1/74	West Wall. Caliche along Joint #52	M. A. Rogers
LAPL CN744363	11/ 1/74	West Wall. Root penetration Joint #38	M. A. Rogers
LAPL CN744364	11/ 1/74	West Wall. Joints #12 & #13; Leached pumice fragments near surface Joint #12.	M. A. Rogers
LAPL CN744365	11/ 1/74	West Wall. Clay coating Joints #1 & #2	M. A. Rogers
LAPL CN744366	11/ 1/74	West Wall. Joints #15 & #16	M. A. Rogers
LAPL CN744367	11/ 1/74	West Wall. Leached pumice fragments near surface along Joint #15	M. A. Rogers
LAPL CN744368	11/ 1/74	West Wall. Root penetration Joints #24 & #25	M. A. Rogers
LAPL CN744369	11/ 1/74	West Wall. Joint #37. Hole in pumice zone near surface	M. A. Rogers
LAPL CN744370	11/ 1/74	East Wall. Root penetration Joints #16 & #17	M. A. Rogers
LAPL CN744371	11/ 1/74	East Wall. Joints #31 & #32	M. A. Rogers
LAPL CN744372	11/ 1/74	East Wall. Root penetration Joints #27 & #28	M. A. Rogers
LAPL CN744373	11/ 1/74	East Wall. Watermarks on Joint #33	M. A. Rogers
LAPL CN744374	11/ 1/74	Southeast corner	M. A. Rogers
LAPL CN744375	11/ 1/74	Looking Northeast at Southeast corner	M. A. Rogers
LAPL CN744376	11/ 4/74	Looking South after asphalt	J. Warren
LAPL CN744377	11/ 4/74	Looking North after asphalt	J. Warren
LAPL CN744378	11/ 1/74	West Wall. Joints #24 & #25	M. A. Rogers
LAPL RN74003002	12/74	Placing drums in Cell #1	J. Warren
LAPL RN74003007	12/74	Placing drums in Cell #1	J. Warren
LAPL RN74003012	12/74	Waste temporarily covered in Cell #1. Monitoring pipes in place	J. Warren
LAPL RN74003028	12/74	Drums	J. Warren
LAPL RN74003029	12/74	Placing drums in Cell #1	J. Warren
LAPL RN74003030	12/74	Placing monitoring pipe in drum stack in Cell #1	J. Warren
LAPL RN74003031	12/74	Looking South at waste in Cell #1. Close-up	J. Warren
LAPL RN74003032	12/74	Looking South at waste in Cell #1	J. Warren

APPENDIX A (continued)

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, PIT 9 (continued)</u>			
LAPL RN74003033	12/74	Looking down on waste in Cell #1 from East	J. Warren
LAPL RN74003034	12/74	Looking down on waste in Cell #1 from West	J. Warren
LAPL RN74003035	12/74	Looking down on waste in Cell #1 from West	J. Warren
LAPL RN74003036	12/74	Looking down on waste in Cell #1 from South	J. Warren
LAPL RN74003037	12/74	Crates & drums in Cell #1. Side view	J. Warren
LAPL RN74003038	12/74	Crates in Cell #1. Top view	J. Warren
LAPL RN74003040	12/74	Looking South at waste in Cell #1	J. Warren
LAPL RN74003045	12/74	Top view from South of crates in Cell #1	J. Warren
LAPL RN74003051	12/74	Placing crates in Cell #1	J. Warren
LAPL RN74003052	12/74	Placing crates in Cell #1	J. Warren
LAPL RN74003059	12/74	Placing crates in Cell #1	J. Warren
LAPL CN751583	4/75	Looking down on sumps in North-west corner pit	J. Warren
LAPL CN751584	4/75	Partial covering Cell #1. Monitoring pipe in place.	J. Warren
LAPL CN751585	4/75	Upper part of South sump. North sector	M. A. Rogers
LAPL CN751586	4/75	Upper part South sump. Southwest sector	M. A. Rogers
LAPL CN751587	4/75	Bottom South sump.	M. A. Rogers
LAPL CN751588	4/75	Bottom & lower part South sump. Southeast sector	M. A. Rogers
LAPL CN751589	4/75	Upper part South sump. Southeast sector	M. A. Rogers
LAPL CN751590	4/75	Bottom & lower part South sump. Southeast sector	M. A. Rogers
LAPL CN751591	4/75	Bottom and lower part North sump. East sector	M. A. Rogers
LAPL CN751592	4/75	Lower part North sump. Southeast sector	M. A. Rogers
LAPL CN751593	4/75	Upper part North sump. Southeast sector	M. A. Rogers
LAPL CN751594	4/75	Upper part North sump. West sector	M. A. Rogers
LAPL CN751595	4/75	Bottom and lower part North sump. South sector	M. A. Rogers
LAPL CN751596	4/75	Bottom and Southwest sector North sump	M. A. Rogers
LAPL 754296	4/75	Upper part North sump. Southeast sector	M. A. Rogers
LAPL 754297	4/75	Lower part North sump. East sector	M. A. Rogers
LAPL 754298	4/75	Lower part North sump. Northeast sector	M. A. Rogers
LAPL 754299	4/75	Upper part North sump. Northeast sector	M. A. Rogers

APPENDIX A (continued)

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, PIT 9 (continued)</u>			
LAPL 754300	4/75	Upper part North sump, Northwest sector	M. A. Rogers
LAPL 754301	4/75	Bottom and lower part North sump. Northwest sector	M. A. Rogers
LAPL 754302	4/75	Bottom & lower part North sump. Southwest sector.	M. A. Rogers
LAPL 754303	4/75	Upper part North sump. Southwest sector	M. A. Rogers
LAPL 754304	4/75	Upper part North sump. Southeast sector	M. A. Rogers
LAPL 754305	4/75	Bottom and lower part North sump. South sector	M. A. Rogers
LAPL 754306	4/75	Bottom and lower part North sump. East sector	M. A. Rogers
LAPL 754307	4/75	Southwest sector South sump	M. A. Rogers
LAPL 754308	4/75	Southeast sector South sump	M. A. Rogers
LAPL 754309	4/75	Northeast sector South sump	M. A. Rogers
LAPL 754310	4/75	Northwest sector South sump	M. A. Rogers
LAPL 754311	4/75	Bottom South sump	M. A. Rogers
LAPL 754312	4/75	Bottom South sump	M. A. Rogers
LAPL 754313	4/75	Upper part South sump. Southwest sector	M. A. Rogers
LAPL 754314	4/75	Lower part South sump. Southwest sector	M. A. Rogers
LAPL 754315	4/75	Looking Northwest at sumps in bottom Northwest corner of pit	M. A. Rogers
LAPL 754316	4/75	Looking Southwest at sumps	M. A. Rogers
LAPL 754317	4/75	Bottom and lower part South sump. East sector	M. A. Rogers
LAPL 754318	4/75	East sector South sump	M. A. Rogers
LAPL 754319	4/75	Looking Northwest at sumps	M. A. Rogers
LAPL CN755851		Looking South at first waste in Cell #2	J. Warren
LAPL CN755852		Looking Southwest, Cell #1 covered. Cell #2 begun	J. Warren
<u>AREA G, PIT 12</u>			
LAPL CN712274		Virgin	W. D. Purtymun J. Warren M. A. Rogers
LAPL CN751301 thru LAPL CN751326	4/21/75	East Wall of pit with bottom layer waste in place	M. A. Rogers
LAPL CN751327 thru LAPL CN751348	4/21/75	West Wall of pit with bottom layer waste in place	M. A. Rogers
LAPL CN742841	mid 1974	Looking South	J. Warren
LAPL CN751577	6/75	Looking Southwest end before bottom layer waste covered	J. Warren

APPENDIX A (continued)

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, PIT 12 (continued)</u>			
LAPL CN751578	6/75	Looking North before bottom layer waste covered	J. Warren
LAPL CN751579	6/75	Looking Northwest before bottom layer waste covered	J. Warren
LAPL CN751580	6/75	Looking Northeast before bottom layer waste covered	J. Warren
LAPL CN751581	6/75	Looking Southwest before bottom layer waste covered	J. Warren
LAPL CN755853	Fall 1975	Looking Northwest bottom layer waste covered 2nd layer waste begun	J. Warren
<u>AREA G, PIT 16</u>			
LAPL CN712276		Virgin	W. D. Purtymun J. Warren M. A. Rogers
<u>AREA G, PIT 17</u>			
LAPL CN712278		Virgin	W. D. Purtymun J. Warren M. A. Rogers
LAPL CN712280		Shot of wall	J. Enders W. D. Purtymun J. Warren
<u>AREA G, PIT 20</u>			
LAPL CN754559 LAPL 759847	8/ 7/75	South Wall from North	M. A. Rogers
LAPL CN754560 LAPL 759848	8/ 7/75	South Wall from North	M. A. Rogers
LAPL CN754561 LAPL 759849	8/ 7/75	South Wall from South	M. A. Rogers
LAPL CN754562 LAPL 759850	8/ 7/75	Looking Northwest	M. A. Rogers
LAPL CN754563 LAPL 759851	8/ 7/75	Looking Southeast	M. A. Rogers
LAPL CN754564 LAPL 759852	8/ 7/75	North Wall from South	M. A. Rogers
LAPL CN754565 LAPL 759853	8/ 7/75	North Wall from South	M. A. Rogers
LAPL CN754566 LAPL 759854	8/ 7/75	Looking Southeast	M. A. Rogers
LAPL CN754567 thru LAPL CN754585	8/ 7/75	North Wall of pit	M. A. Rogers
LAPL 759855 thru LAPL 759873	8/ 7/75	North Wall of pit	M. A. Rogers
LAPL CN754586 thru LAPL CN754605	8/ 7/75	South Wall of pit	M. A. Rogers
LAPL 759874 thru LAPL 759893	8/ 7/75	South Wall of pit	M. A. Rogers

APPENDIX A (continued)

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, PIT 21</u>			
LAPL CN712282		Virgin	W. D. Purtymun J. Warren M. A. Rogers
LAPL 734854	4/ 2/73	Parts of building (TA-21-12)	R. Garde
LAPL 742834	mid 1974	Almost full	J. Warren
<u>AREA G, PIT 22</u>			
LAPL CN761028	1/14/76	North Wall Northwest end	M. A. Rogers
LAPL CN761029	1/14/76	North Wall North ramp	M. A. Rogers
LAPL CN761030	1/14/76	North Wall near South ramp	M. A. Rogers
LAPL CN761031	1/14/76	North Wall mid pit	M. A. Rogers
LAPL CN761032	1/14/76	Looking Northwest	M. A. Rogers
LAPL CN761033	1/14/76	Looking Southeast	M. A. Rogers
LAPL CN761034	1/14/76	South ramp	M. A. Rogers
LAPL CN761035	1/14/76	North Wall from North	M. A. Rogers
LAPL CN761036	1/14/76	North Wall from South	M. A. Rogers
LAPL CN761037	1/14/76	South Wall Southeast end	M. A. Rogers
LAPL CN761038	1/14/76	South Wall from North	M. A. Rogers
LAPL CN761039	1/14/76	South Wall Northwest end	M. A. Rogers
LAPL CN761040	1/14/76	South Wall mid pit	M. A. Rogers
LAPL CN761041	1/14/76	South Wall mid pit	M. A. Rogers
LAPL CN761042	1/14/76	South Wall South ramp	M. A. Rogers
LAPL CN761043	1/14/76	South Wall from South	M. A. Rogers
LAPL CN761044	1/14/76	Oblique. North Wall from North	M. A. Rogers
LAPL CN761045	1/14/76	Close-up. North Wall North ramp	M. A. Rogers
LAPL CN761046	1/14/76	Close-up. North Wall North ramp	M. A. Rogers
LAPL CN761047	1/14/76	Close-up. North Wall North ramp	M. A. Rogers
LAPL CN761048	1/14/76	North Wall of pit	M. A. Rogers
thru LAPL CN761066			
LAPL CN761067	1/14/76	South Wall of pit	M. A. Rogers
thru LAPL CN761084			
<u>AREA G, PIT 24</u>			
LAPL CN734138	11/ 8/73	North Wall of pit	M. A. Rogers
thru LAPL CN734153			
LAPL CN734154	11/ 8/73	South Wall of pit	M. A. Rogers
thru LAPL CN734167			
LAPL CN734168	11/ 8/73	Looking Northwest. Pit 7 in in background.	M. A. Rogers
LAPL CN734169	11/ 8/73	Looking west	M. A. Rogers J. Warren
LAPL CN734170	11/ 8/73	East ramp. Clay swelling out of joint perpendicular to Joint #73 - Joint #3.	M. A. Rogers

APPENDIX A (continued)

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, PIT 24 (continued)</u>			
LAPL CN734171	11/ 8/73	East Ramp. Weathering halo along a joint.	M. A. Rogers
LAPL CN734172	11/ 8/73	East Ramp. Intersection Joint and another joint.	M. A. Rogers
LAPL CN734173	11/ 8/73	North Wall. Layered effect of material filling Joint #66.	M. A. Rogers
LAPL CN734174	11/ 8/73	North Wall. Desiccation cracks in material fill Joint #70a.	M. A. Rogers
LAPL CN734175	11/ 8/73	North Wall. Material filling Joint #70a.	M. A. Rogers
LAPL CN734176	11/ 8/73	North Wall. Closeup watermark between Joints #64 and #65a neither of which show in photo.	M. A. Rogers
LAPL CN734177	11/ 8/73	North Wall. Closeup watermark between Joints #65a and #65 neither of which show in photo.	M. A. Rogers
LAPL CN734178	11/ 8/73	North Wall. Closeup completely altered pumice fragment and other weathering effects along Joints #8 and #8a.	M. A. Rogers
LAPL CN734179	11/ 8/73	North Wall. Closeup watermark which is bounded by Joint #65 on the east.	M. A. Rogers
LAPL CN734180	11/ 8/73	North Wall. Looking obliquely at Joint #70a.	M. A. Rogers
LAPL CN734181	11/ 8/73	North Wall. Closeup to show luster of clay particles forming watermark.	M. A. Rogers
LAPL CN734182	11/ 8/73	Looking East between Pit 7 and Pit 24.	M. A. Rogers
LAPL CN734183	11/ 8/73	North Wall. Closeup of fracture filling along Joint #37.	M. A. Rogers
LAPL CN734184	11/ 8/73	Looking obliquely at North Wall. Shows pinkish mound-shaped weathering phenomenon at base of wall.	M. A. Rogers
LAPL CN734185	11/ 8/73	North Wall between Joints #41 and #42. Closeup Rock hammer rests on contact between pinkish tuff and normal unweathered tuff.	M. A. Rogers
LAPL CN734186	11/ 8/73	South Wall. Joint #74 fracture filling shows gradation from weathered to slightly weathered material.	M. A. Rogers
LAPL CN734187	11/ 8/73	South Wall. Closeup Joints #26, #28 and #29 with hole in face of Joint #28.	M. A. Rogers
LAPL CN734188	11/ 8/73	South Wall. Roots which grew in the tuff between Joints #35 and #36. They did not grow in a joint plane.	M. A. Rogers
LAPL CN734189	11/ 8/73	South Wall. Closeup watermark on Joint #65.	M. A. Rogers

APPENDIX A (continued)

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, PIT 24 (continued)</u>			
LAPL CN734190	11/ 8/73	Alteration rim on pumice fragment near Joint #39.	M. A. Rogers
LAPL CN734191	11/ 8/73	South Wall. Closeup of hole along Joint #67 through which water has flowed.	M. A. Rogers
LAPL CN734192	11/ 8/73	South Wall. Closeup of hole along Joint #67 through which water has flowed.	M. A. Rogers
LAPL CN73676	1/16/74	View of pipe looking east.	M. A. Rogers
LAPL CN73677	1/16/74	View of pipe for neutron moisture probe, North Wall.	M. A. Rogers J. Warren
LAPL CN74678	1/16/74	View of pipe looking west.	M. A. Rogers J. Warren
<u>AREA G, SHAFTS</u>			
LAPL 67852		Truck backing into position to unload transport cask into shaft. Metal flanged hole cover to keep truck from caving in sides of shaft.	J. Enders
LAPL 67851		Truck positioned over disposal shaft (probably Shaft 2). About to pull drawer so waste can fall in hole.	J. Enders
LAPL 67853		Closeup shows bottom movable drawer on transport cask open.	
PUB 68145-22 thru PUB 68145-24	4/68	Disposal in Shaft 6	M. A. Rogers
PUB 68145-30	4/68	Shafts 22 and 23	M. A. Rogers
LAPL CN692569	3/13/70	Shaft 34, Southwest Wall at about 15' showing pumice zone above moderately welded tuff.	W. D. Purtymun
LAPL CN692573	3/13/70	Shaft 34. Looking down hole from ~25'.	W. D. Purtymun
LAPL CN692568	3/13/73	Shaft 34. Northwest Wall showing joint in moderately welded tuff, ~25'.	W. D. Purtymun
LAPL CN692567	3/13/73	Shaft 34. Northwest Wall below pumice zone, showing blocks of tuff out of wall along joints about 20'.	W. D. Purtymun
LAPL CN692571	3/13/70	Shaft 34. West Wall at about 20' showing joints in moderately welded tuff.	W. D. Purtymun
LAPL CN692566	3/13/70	Shaft 34. Northwest Wall below pumice zone showing blocks of tuff out of wall along joints, about 15'.	W. D. Purtymun
LAPL CN692572	3/13/70	Shaft 34. West Wall at about 20' showing joints in moderately welded tuff.	W. D. Purtymun
LAPL CN692570	3/13/70	Shaft 34. West Wall at about 15', showing pumice zone above moderately welded tuff.	W. D. Purtymun

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, SHAFTS (continued)</u>			
LAPL CN702255 thru LAPL CN702265		Proofs, shafts, probably 39 Area G	W. D. Purtymun
LAPL CN702247 thru LAPL CN702254		Proofs, shafts, probably 39 Area G	W. D. Purtymun
LAPL CN702249 CN702250 CN702251 CN702253 CN702255 CN702256 CN702257 CN702259 CN702260 CN702261 CN702262 CN702263 CN702264		Are identifiable as Shaft 39 which shows up on <u>Zia Logs as Shaft 49</u> . The shaft dimensions are 6' diam., 61' deep.	
LAPL CN734299	11/21/73	Plugging Shaft 58.	J. Enders
LAPL CN734300	11/21/73 thru 11/27/73	C. O. Martinez plugging Shaft 58.	J. Enders
LAPL CN734301	11/21/73 thru 11/27/73	C. O. Martinez plugging Shaft 75, Shafts 72, 73, 74 freshly plugged.	J. Enders J. Warren
LAPL CN734302	11/21/73 thru 11/27/73	Closeup of C. O. Martinez plugging the shaft.	J. Enders
LAPL CN734303	11/21/73 thru 11/27/73	C. O. Martinez plugging Shaft 75 looking west.	J. Enders
LAPL CN734304	11/21/73 thru 11/27/73	Closeup C. O. Martinez plugging the shaft.	J. Enders
LAPL CN734305	11/21/73 thru 11/27/73	Observing concrete dumped into Shaft 39.	J. Enders
LAPL CN734306	11/21/73 thru 11/27/73	C. O. Martinez plugging Shaft 39.	J. Enders
LAPL CN734307	11/21/73 thru 11/27/73	Concrete being dumped into Shaft 72.	J. Enders J. Warren
LAPL CN734308	11/21/73 thru 11/27/73	Concrete being dumped into Shaft 39.	J. Enders J. Warren
<u>AREA G, ²³⁸Pu STORAGE FACILITY</u>			
LAPL CN74679	1/18/74	Looking South augering holes at South end of Trench A.	M. A. Rogers
LAPL CN74680	1/18/74	Zia augering holes in Trench A	
LAPL CN74681	1/18/74	South end, Trench A augering holes for casks.	M. A. Rogers

APPENDIX A (continued)

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA G, ²³⁸Pu STORAGE FACILITY</u>			
LAPL CN74682	1/18/74	South end, Trench A augering holes for casks.	M. A. Rogers
LAPL CN741073	2/74	View looking North. Trench A. Drilled holes show staggered arrangement for casks (to be set into holes). Caving of holes primarily due to joints in the tuff.	M. A. Rogers
LAPL CN741074	2/74	Closeup view of 2' deep, 3' diam holes drilled in bottom of Trench A.	M. A. Rogers
LAPL CN741075	2/74	View of West side of wall, Trench A caliche and soil horizon shown.	M. A. Rogers
LAPL CN741302	3/74	Casks being placed in Trench A	J. Warren
LAPL CN741303	3/74	Casks being placed in Trench A	J. Warren
LAPL CN741304	3/74	Closeup. Casks being placed in Trench A.	J. Warren
LAPL CN741305	3/74	Shoveling crushed tuff around casks in Trench A.	J. Warren
LAPL CN741076	3/74	Zia riggers loading casks with 30-gal drums (C. O. Martinez, H-8) Trench A.	M. A. Rogers
LAPL CN741077	3/74	Zia riggers loading casks with 30-gal drums. Trench A, (C. O. Martinez recording drum #'s).	M. A. Rogers
LAPL CN741078	3/74	30-gal drum being lowered into casks. Casks sealed with plastic cement. Trench A.	M. A. Rogers
LAPL CN741079	3/74	Zia laborers and rigger placing lid on concrete cask. Zia riggers loading casks with 30-gal drums (C. O. Martinez, H-8) Trench A.	M. A. Rogers
LAPL CN741306	3/74	Filled casks in Trench A.	J. Warren M. A. Rogers
LAPL CN742826	6/74	Trench A covered except for Array A-1. Trench B open.	J. Warren
LAPL CN742827	6/74	Trench B open with monitoring pipe in place. Trench A filled and covered over.	J. Warren
LAPL CN744283	11/74	Trench A. Casks in Array A-1 sealed with monitoring in place.	J. Warren
LAPL CN744289	11/74	Trench A, Array A-1. Monitoring tubes being installed in Cask #5.	J. Warren
LAPL CN744290	11/74	Trench A, Array A-1. Monitoring tubes being installed in Cask #5.	J. Warren
LAPL CN744297	11/74	Trench A. Casks in Array A-1 covered by metal sheeting prior to being covered with crushed tuff.	J. Warren

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA T</u>			
LAPL CN59-311		Closeup series of photos of caisson 30' deep, 6' wide, and 12' long dug about 6' north-northeast of the eastern quarter of Absorption Bed 1, Area T for study to determine if waste products moved with water. ¹¹	W. D. Purtymun
LAPL CN59-312			
LAPL CN59-313			
LAPL CN59-314			
LAPL CN59-315			
LAPL CN59-316			
LAPL CN59-317			
LAPL CN59-318			
LAPL CN59-325			
LAPL CN59-327			
LAPL CN59-328			
LAPL CN59-329			
LAPL CN59-342			
LAPL CN59-343			
LAPL CN59-344			
LAPL 594772			
LAPL 595219 ¹¹			
LAPL 5713		Aerial view, Area B, T, A, V	W. D. Purtymun
LAPL 5713-40		Aerial view, Area B, T, A, V	W. D. Purtymun
LAPL 5713-39		Aerial view, Area B, T, A, V	W. D. Purtymun
<u>AREA T, SHAFT 22 (60' deep, 8' diam)</u>			
LAPL CN701620	4/ 6/70	North Wall showing contact between 2 units of tuff ~10'.	W. D. Purtymun
LAPL CN701622	4/ 6/70	North Wall showing few pumice fragments and hairline joint at about 30'.	W. D. Purtymun
LAPL CN701624	4/ 6/70		W. D. Purtymun
LAPL CN701627	4/ 6/70	South Wall showing large clay filled joint at about 15'.	W. D. Purtymun
LAPL CN701628	4/ 6/70	South Wall showing large clay filled joint extending thru 2 units of tuff ~10'.	W. D. Purtymun
LAPL CN701633	4/ 6/70	Rotary bucket rig used to drill shafts.	
LAPL CN701634	4/ 6/70	Southwest Wall showing near vertical joint at about 20'.	W. D. Purtymun
LAPL CN701638	4/ 6/70	View from top of shaft, looking South showing contact between 2 joints and tuff and clay-filled joints.	W. D. Purtymun
LAPL CN701639	4/ 6/70	East Wall showing termination of joint at 55'.	W. D. Purtymun
LAPL CN701642	4/ 6/70	East Wall showing large white pumice fragments in tuff, few closed minor joints ~45'.	W. D. Purtymun
LAPL CN701423	3/13/70	South Wall showing joint filled with concrete sludge, depth 29-32'.	W. D. Purtymun
LAPL CN701424	3/13/70	West Wall channel cut along joint in moderately welded tuff filled with reworked sediments at about 25'. Note: large tuff boulder in reworked sediments.	W. D. Purtymun

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
LAPL CN701425	3/13/70	West Wall showing reworked sediments cobbles and boulders, depth ~28'.	W. D. Purtymun
LAPL CN701426	3/13/70	East Wall showing reworked sediments and boulders beneath light pinkish pumiceous tuff.	W. D. Purtymun
LAPL CN701427	3/13/70	South Wall showing North 5° East striking joint filled with concrete sludge squeezed from adjacent hole beneath reworked sediments. Joint extends from about 29-36'.	W. D. Purtymun
LAPL CN701428	3/13/70	East Wall showing non- to moderately-welded tuff underlain by reworked sediments and boulders.	W. D. Purtymun
LAPL CN701429	3/13/70	North Wall showing reworked sediments, cobbles and boulders overlying moderately welded tuff with near vertical joint ~29'.	W. D. Purtymun
LAPL CN701430	3/13/70	South Wall showing termination of concrete filled joint at about 36'.	W. D. Purtymun
LAPL CN701431	3/13/70	South Wall showing joint filled with concrete sludge beneath reworked sediments.	W. D. Purtymun
LAPL CN701432	3/13/70	South Wall looking up hole showing concrete filled joint in moderately welded tuff.	W. D. Purtymun
LAPL 704506 thru LAPL 704514	3/13/70	Tar coating the shaft.	W. D. Purtymun
<u>AREA T, SHAFT 32 (18' deep, 8' diam)</u>			
LAPL CN701621	4/ 6/70	West Wall at about 10'.	W. D. Purtymun
LAPL CN701623	4/ 6/70	North Wall showing closed joints in brown non- to moderately-welded tuff.	W. D. Purtymun
LAPL CN701625	4/ 6/70		W. D. Purtymun
LAPL CN701626	4/ 6/70	South Wall showing closed joints in brown, non- to moderately-welded tuff.	W. D. Purtymun
LAPL CN701629	4/ 6/70	Northeast Wall at about 8'.	W. D. Purtymun
LAPL CN701630	4/ 6/70	Shows two stages: 4' hole, 8' reamed.	W. D. Purtymun
LAPL CN701631	4/ 6/70	Being coated with asphalt.	W. D. Purtymun
LAPL CN701632	4/ 6/70	Southeast Wall at about 8'.	W. D. Purtymun
LAPL CN701635	4/ 6/70	North Wall at about 10'.	W. D. Purtymun
LAPL CN701636	4/ 6/70	North Wall of shaft showing about 2' of fill material overlying tuff.	W. D. Purtymun
LAPL CN701637	4/ 6/70	Southwest Wall at about 8'.	W. D. Purtymun
LAPL CN701640	4/ 6/70	At 10', showing latite inclusion (gray) in tuff.	W. D. Purtymun
LAPL CN701641	4/ 6/70	View to Southeast down shaft.	W. D. Purtymun

PHOTOGRAPHS OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T

<u>PHOTOGRAPH #</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>IN WHOSE POSSESSION</u>
<u>AREA T, RETRIEVABLE WASTE STORAGE AREA</u>			
LAPL CN745720	12/16/74	Looking Southeast	M. A. Rogers
LAPL CN745721	12/16/74	Looking Northwest	M. A. Rogers
LAPL CN745722	12/16/74	Looking at North Wall from West	M. A. Rogers
LAPL CN745723	12/16/74	Looking at eastern part South Wall	M. A. Rogers
LAPL CN745724	12/16/74	Looking at mid part South Wall	M. A. Rogers
LAPL CN745725	12/16/74	Looking at western end South Wall	M. A. Rogers
LAPL CN745726 thru	12/16/74	North Wall of pit	M. A. Rogers
LAPL CN745736			
LAPL CN745737 thru	12/16/74	East Wall of pit	M. A. Rogers
LAPL CN745739			
LAPL CN745740 thru	12/16/74	South Wall of pit	M. A. Rogers
LAPL CN745749			
LAPL CN745750	12/16/74	West end South Wall from South-east	M. A. Rogers
LAPL CN745751	12/16/74	X-bedding and boulder bed in Northeast corner of pit	M. A. Rogers
LAPL CN745752	12/16/74	Northeast corner of pit	M. A. Rogers
LAPL CN745753	12/16/74	Layered pumice of South Wall	M. A. Rogers
LAPL CN745754	12/16/74	Oblique. Layered pumice South Wall	M. A. Rogers
LAPL CN745755	12/16/74	Closeup. Boulder bed Northeast corner.	M. A. Rogers
LAPL CN745756	12/16/74	South Wall. Jointing in tuff near contact between tuff and layered pumice.	M. A. Rogers
LAPL CN745757	12/16/74	South Wall. Displacement in layered pumice.	M. A. Rogers
LAPL CN745758	12/16/74	Layered pumice South Wall	M. A. Rogers
LAPL CN745759	12/16/74	South Wall. Contact between layered pumice and tuff.	M. A. Rogers
LAPL CN745760 thru	12/16/74	South Wall. Contact between layered pumice and tuff.	M. A. Rogers
LAPL CN745764			

APPENDIX B (continued)

SLIDES OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T
and
MISCELLANEOUS LOCAL GEOLOGICAL INFORMATION

<u>SLIDE #</u>	<u>DATE</u>	<u>DESCRIPTION</u>
<u>AREA F</u>		
No slides exist		
<u>AREA G</u>		
LAPL CN752679	4/74	Aerial view
LAPL CN741295	4/74	Looking South from Pit 6, Pits 7 and 24 open; Pits 17 and 21 closed
LAPL CN741296	4/74	Looking Southwest from Pit 6
LAPL CN741297	4/74	Looking Southeast from Pit 6
LAPL CN741298	4/74	Looking West from Pit 6. Pit 8 closed; Pits 12 and 16 open.
LAPL CN742820	6/74	Indian Ruin 195, Looking East
LAPL CN742822	6/74	Indian Ruin 195, Looking South
<u>AREA G, PIT 1</u> (See photographs for descriptions of these)		
LAPL 583499 L		
LAPL 59424 L		
LAPL 59423 L		
LAPL 59422 L		
LAPL 59421 L		
LAPL 59421		
<u>AREA G, PIT 2</u>		
LAPL 626849 L		Pouring cement into drums before tritiated water (glass vial) inserted.
LAPL 626848 L		
LAPL 626846 L		South Wall, with drums containing tritium waste lined up.
LAPL 626845 L		South Wall, with drums containing tritium waste lined up.
11 Color	10/63	#12 neutron scattering probe counting crushed tuff seal on solid waste disposal pit. Corresponds to photo LAPL 635849 Pit 2, Area G.
<u>AREA G, PIT 3</u>		
No slides exist		
<u>AREA G, PIT 4</u> (See photographs for descriptions of these)		
LAPL 67360 L		
LAPL 67359 L		
LAPL 67357 L		

APPENDIX B (continued)

SLIDES OF DISPOSAL AREAS A, B, C, D, E, F, G, AND TandMISCELLANEOUS LOCAL GEOLOGICAL INFORMATION

<u>SLIDE #</u>	<u>DATE</u>	<u>DESCRIPTION</u>
<u>AREA G, PIT 5</u>		
10 Polaroids - L		Excavation on Pit 5
LAPL 67358 L		See photograph 67358
LAPL 67358		
<u>AREA G, PIT 6</u>		
LAPL CN742833		Looking East at Pit 6 with excavated material from Pit 7 covering it
<u>AREA G, PIT 7</u>		
LAPL CN733303 L	9/12/73	See photograph CN733303
LAPL CN733304 L	9/12/73	See photograph CN733304
LAPL CN733305 L	9/12/73	See photograph CN733305
LAPL CN733305		
LAPL CN733306 L	9/12/73	See photograph CN733307
LAPL CN733307	9/12/73	See photograph CN733307
LAPL CN733309 L	9/13/73	See photograph CN733309
LAPL CN733310 L	9/13/73	See photograph CN733310
LAPL CN733321 L	9/12/73	See photograph CN733321
LAPL CN733332 L	9/13/73	See photograph CN733332
LAPL CN733334 L	9/13/74	See photograph CN733334
LAPL CN733338 L	9/13/73	See photograph CN733338
LAPL CN733341 L	9/13/73	See photograph CN733341
LAPL CN733342 L	9/13/74	See photograph CN733342
LAPL CN733343 L	9/13/73	See photograph CN733343
LAPL CN734193 L	11/ 8/73	See photograph CN734193
LAPL CN734194 L	11/ 8/73	See photograph CN734194
LAPL CN734195 L	11/ 8/73	See photograph CN734195
LAPL CN734196 L	11/ 8/73	See photograph CN734196
LAPL CN74670	1/16/74	View of pipe for neutron moisture probe looking east.
LAPL CN74671	1/16/74	View of pipes #4 and #1 for neutron moisture probe on South Wall. Hole #1 is 3 1/2' from wall, 117' from west end of pit and 117' deep. Hole #4 is 3' from wall, 256' from west end of pit and 50' deep.
LAPL CN74672	1/16/74	View of pipe #2 for neutron moisture probe, North Wall.
LAPL CN74673	1/16/74	View of pipes #2 and #4 for neutron moisture probe along north wall. Hole #2 is 3' from wall, 223' from west end of pit and 50' deep. Hole #3 is 3' from wall, 353' from west end of pit, and 50' deep.

**APPENDIX B
SLIDES OF DISPOSAL AREAS
(A, B, C, D, E, F, G, AND T)**

**and
MISCELLANEOUS LOCAL GEOLOGICAL INFORMATION**

EXPLANATION

LAPL: Los Alamos Photographic Laboratory

CN: Color Negative
First 2 digits of slide number generally indicate year taken

L: After number means lantern-size (3-1/4" × 4") slide

USGS: United States Geological Survey

APPENDIX B

SLIDES OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T
and
MISCELLANEOUS LOCAL GEOLOGICAL INFORMATION

<u>SLIDE #</u>	<u>DATE</u>	<u>DESCRIPTION</u>
LAPL 660625 L		Location plan, materials disposal areas.
LAPL 741540 L		Location plan, materials disposal areas.
LAPL 741540		
<u>AREA A</u>		
No slides exist		
<u>AREA B</u> (See photographs for descriptions of these)		
LAPL CN733834 thru LAPL CN733843	Fall 1973	
<u>AREA C</u>		
LAPL CN733540	late 1973	Aerial view from East
LAPL CN734448	late 1973	Aerial view from Northwest
LAPL CN734449	late 1973	Aerial view from Northeast
LAPL CN734450	late 1973	Aerial view from West
LAPL CN734451	late 1973	Aerial view from Southwest
LAPL CN734452	late 1973	Aerial view West end Area C from South
LAPL CN734453	late 1973	Aerial view West end Area C from Southeast
LAPL 16540 L		Pit 5, off-loading
LAPL 583494 L		Pit 6, dumpster unloading
LAPL 583496 L		Pit 6, dumpster unloading
LAPL 583497 L		Pit 6, dumpster unloading
LAPL 583498 L		Gates, Pit 6, in background
LAPL 583500 L		Pit 6, see photograph 583500
28 Color	May 1972	Recovery operation in middle Pit 4
<u>AREA C, SHAFTS</u>		
LAPL 592205 L		Disposal in shafts between Pits 1 and 2 using Dural Cup
LAPL 592206 L		Disposal in shafts between Pits 1 and 2 using Dural Cup
LAPL 592207 L		Disposal in shafts between Pits 1 and 2 using Dural Cup
<u>AREA D</u>		
CN712795		Aerial view from South
<u>AREA E</u>		
No slides exist		
37 Color	9/68	Slide #9, #8 of canyon north Area D

APPENDIX B (continued)

SLIDES OF DISPOSAL AREAS A, B, C, D, E, F, G, AND TandMISCELLANEOUS LOCAL GEOLOGICAL INFORMATION

<u>SLIDE #</u>	<u>DATE</u>	<u>DESCRIPTION</u>
LAPL CN74674	1/16/74	Moisture neutron probe pipe #3 against North Wall.
LAPL CN74675	1/16/74	View of pipes for neutron moisture probe looking West.
LAPL CN742836	6/74	Dumpster in east end of pit
LAPL CN755846	10/75	See photograph CN755846
LAPL CN755848	10/75	See photograph CN755848
LAPL CN755850	10/75	See photograph CN755850
<u>AREA G, PIT 8</u>		
LAPL CN721274 L		Sludge drums looking south
LAPL CN721275 L		Sludge drums looking north
LAPL CN721277 L		Sludge drums looking south
LAPL CN721276 L		Sludge drums looking north
LAPL CN733311 L	9/13/73	See photograph CN733311
LAPL CN733312 L	9/13/73	See photograph CN733312
LAPL CN733344	9/12/73	See photograph CN733344
LAPL CN74683	1/18/74	Placing access tube for coring tuff on northwest corner of drums.
LAPL CN74684	1/18/74	Placing access tube for coring tuff on northwest corner of drums.
LAPL CN74685	1/18/74	Placing access tube for coring tuff on northwest corner of drums.
LAPL CN74686	1/18/74	Placing monitoring access tubes on northwest corner of drums. These tubes were bent and buried during filling operation.
LAPL CN74687	1/18/74	Closeup of drill rig augering neutron moisture probe hole.
LAPL CN74688	1/18/74	Closeup of base of northeast corner (of drums) access monitoring tubes. Neutron access tube was cemented in place.
LAPL CN74689	1/18/74	View of Zia, off-loading filter plenum east side north of drums looking south.
LAPL CN74690	1/18/74	View of Zia off-loading filter plenum on east side north of drums.
LAPL CN74691	1/18/74	View of Zia off-loading filter plenum on east side north of drums.
LAPL CN74692	1/18/74	View of Purtymun's drill rig on North side of drums.
LAPL CN741070	2/74	View of Riggers placing crates into pit North of sludge drums. View is from the Northwest edge of pit.

APPENDIX B (continued)

SLIDES OF DISPOSAL AREAS A, B, C, D, E, F, G, AND TandMISCELLANEOUS LOCAL GEOLOGICAL INFORMATION

<u>SLIDE #</u>	<u>DATE</u>	<u>DESCRIPTION</u>
LAPL CN741071	2/74	View of sampling pipes emplaced at South side of sludge drums. View is from West edge of pit.
LAPL CN741072	2/74	View of sampling pipes emplaced along North side of sludge drums. Bulkhead material (CMR filter plenums) shown at left side of picture. View is from West edge.
LAPL CN 742832		Looking South at covered pit with monitoring pipe.
LAPL CN742835		Looking North at covered pit with monitoring pipe.
<u>AREA G, PIT 9</u>		
LAPL CN742829		Looking South. Newly dug
LAPL CN742931		Looking South. Newly dug
LAPL CN744337	10/31/74	Looking South. South end now vertical.
LAPL CN744347	11/ 1/74	Looking Northeast at East Wall
LAPL CN744349	11/ 1/74	Looking Southwest at East Wall
LAPL CN744350	11/ 1/74	Looking Southwest at East Wall
LAPL CN744351	11/ 1/74	Looking Northwest at West Wall
LAPL RN740012	12/74	Waste temporarily covered in Cell #1. Monitoring pipes in place.
LAPL RN740038	12/74	Crates in Cell #1. Top view
LAPL RN740045	12/74	Top view from South of crates in Cell #1
LAPL RN740051	12/74	Placing crates in Cell #1
LAPL RN740052	12/74	Placing crates in Cell #1
LAPL RN740059	12/74	Placing crates in Cell #1
LAPL CN755851		Looking South at first waste in Cell #2
<u>AREA G, PIT 12</u>		
LAPL CN742828	mid 1974	Looking South
LAPL CN742841	mid 1974	Looking South
<u>AREA G, PIT 21</u>		
LAPL 7311952		Foundation (TA-21-12) being placed in pit.
LAPL CN742834	mid 1974	Almost full
<u>AREA G, PIT 24</u>		
LAPL CN734150 L	11/ 8/73	See photograph CN734150
LAPL CN734151 L	11/ 8/73	See photograph CN734151
LAPL CN734157 L	11/ 8/73	See photograph CN734157
LAPL CN734157		

APPENDIX B (continued)

SLIDES OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T
and
MISCELLANEOUS LOCAL GEOLOGICAL INFORMATION

<u>SLIDE #</u>	<u>DATE</u>	<u>DESCRIPTION</u>
LAPL CN734158 L	11/ 8/73	See photograph CN734158
LAPL CN734161 L	11/ 8/73	See photograph CN734161
LAPL CN734163 L	11/ 8/73	See photograph CN734163
LAPL CN734168	11/ 8/73	See photograph CN734168
LAPL CN734169 L	11/ 8/73	See photograph CN734169
LAPL CN734169		
LAPL CN734170 L	11/ 8/73	See photograph CN734170
LAPL CN734171 L	11/ 8/73	See photograph CN734171
LAPL CN734172 L	11/ 8/73	See photograph CN734172
LAPL CN734173 L	11/ 8/73	See photograph CN734173
LAPL CN734173	11/ 8/73	
LAPL CN734174 L	11/ 8/73	See photograph CN734174
<u>AREA G, PIT 24</u>		
LAPL CN734175 L	11/ 8/73	See photograph CN734175
LAPL CN734176 L	11/ 8/73	See photograph CN734176
LAPL CN734177 L	11/ 8/73	See photograph CN734177
LAPL CN734178 L	11/ 8/73	See photograph CN734178
LAPL CN734179 L	11/ 8/73	See photograph CN734179
LAPL CN734179		
LAPL CN734180 L	11/ 8/73	See photograph CN734180
LAPL CN734181 L	11/ 8/73	See photograph CN734181
LAPL CN734182 L	11/ 8/73	See photograph CN734182
LAPL CN734182		
LAPL CN734184 L	11/ 8/73	See photograph CN734184
LAPL CN734185 L	11/ 8/73	See photograph CN734185
LAPL CN734186 L	11/ 8/73	See photograph CN734186
LAPL CN734187 L	11/ 8/73	See photograph CN734187
LAPL CN734188 L	11/ 8/73	See photograph CN734188
LAPL CN734188		
LAPL CN734189 L	11/ 8/73	See photograph CN734189
LAPL CN734189		
LAPL CN734190 L	11/ 8/73	See photograph CN734190
LAPL CN734192 L	11/ 8/73	See photograph CN734192
LAPL CN734192		
LAPL CN74676	1/16/74	View of monitoring pipe looking east.
LAPL CN74677	1/16/74	View of monitoring pipe for neutron moisture probe, North Wall.
LAPL CN74678	11/16/74	View of monitoring pipe looking west

APPENDIX B (continued)

SLIDES OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T
and
MISCELLANEOUS LOCAL GEOLOGICAL INFORMATION

<u>SLIDE #</u>	<u>DATE</u>	<u>DESCRIPTION</u>
<u>AREA G, ²³⁸Pu STORAGE FACILITY</u>		
LAPL CN74679	1/18/74	Looking South, augering holes at South end of trench.
LAPL CN74680	1/18/74	Zia augering holes
LAPL CN74681	1/18/74	South end, augering holes for casks.
LAPL CN74682	1/18/74	South end, augering holes for casks.
LAPL CN741073	2/74	View looking North. Drilled holes show staggered arrangement for casks (to be set into holes). Caving of holes primarily due to joints in the tuff.
LAPL CN741074	2/74	Closeup view of 2' deep, 3' diam holes drilled in bottom of trench.
LAPL CN741075	2/74	View of West side of wall, caliche and soil horizon shown.
LAPL CN741302	3/74	Casks being placed in Trench A
LAPL CN741303	3/74	Casks being placed in Trench A
LAPL CN741304	3/74	Closeup. Casks being placed in Trench A
LAPL CN741305	3/74	Shoveling crushed tuff around casks in Trench A.
LAPL CN741076	3/74	Lowering drum into cask in Trench A.
LAPL CN741077	3/74	Lowering drum into cask in Trench A. (C. O. Martinez recording drum #'s).
LAPL CN741078	3/74	30-gal drum being lowered into cask. Casks sealed with plastic cement.
LAPL CN741079	3/74	Zia laborers and rigger placing lid on concrete cask. Zia riggers loading casks with 30-gal drums.
LAPL CN741306	3/74	Filled casks in Trench A
LAPL CN742826	6/74	Trench A covered except for Array A-1. Trench B open.
LAPL CN742827	6/74	Trench B open with monitoring pipe in place. Trench A filled and covered over
LAPL CN744283	11/74	Trench A. Casks in Array A-1 sealed with monitoring in place.
LAPL CN744289	11/74	Trench A. Array A-1. Monitoring tubes being installed in Cask #5.
LAPL CN744290	11/74	Trench A, Array A-1. Monitoring tubes being installed in Cask #5.

APPENDIX B (continued)

SLIDES OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T
and
MISCELLANEOUS LOCAL GEOLOGICAL INFORMATION

<u>SLIDE #</u>	<u>DATE</u>	<u>DESCRIPTION</u>
<u>AREA T</u>		
LAPL CN701630	4/ 6/70	Shows 2 stages: 4 hole, 8' reamed. Shaft 32
LAPL CN701631	4/ 6/70	Coating inside of shaft with tar
LAPL CN701633	4/ 6/70	Rotary bucket rig augering Shaft 22
9 B & W ¹⁶⁰		a. Sketch showing details of infiltration pit. Ten Site
	9/21/59	b. Sketch showing movement of water beneath infiltration pit. Ten Site.
	9/29/59	c. Soil moisture curves showing relation of water content to the size of pores in samples of tuff-laundry Pit (Area V) and Old Road location.
9 B & W ¹⁶⁰ (continued)		d. Idealized drawing showing area penetrated by horizontal holes DPW Site (Area T). Face of South Wall shown.
		e. Plan view of infiltration at end surrounding Area Mesita del Buey (Area G, Pit 2).
		f. Quantity of water removed from Bandelier tuff with 2 different porous cups: Hydrologic Lab.
		g. General range of activity in water samples collected in Acid and Pueblo Canyons 1958-59. Activity in water samples collected in Acid and Pueblo Canyons on 7/14 and 7/15/59.
		h. General range of activity in soil samples collected in Acid and Pueblo Canyons, 1968-59 (c/m/dry gram). Activity in soil samples collected in Acid and Pueblo Canyons Nov-Dec 1958, after a spill (c/m/dry gram).
		i. Activity in soil samples collected in Mortandad Canyon 1956-68 (c/m/dry gram).
7 Color #12	3/60	Relief map of east side of Jemez Mts.
#14	3/60	Relief map of Jemez Mts.
#15	3/60	Relief map of Jemez Mts.
#16	3/60	Relief map of east side Jemez Mts.
#17	3/60	Relief map of east side Jemez Mts.
#19	3/60	Relief map of east flank Valles Caldera.
#20	3/60	Relief map of east flank Valles Caldera.

APPENDIX B (continued)
SLIDES OF DISPOSAL AREAS A, B, C, D, E, F, G, AND T
and
MISCELLANEOUS LOCAL GEOLOGICAL INFORMATION

<u>SLIDE #</u>	<u>DATE</u>	<u>DESCRIPTION</u>
LAPL 612364 L		"Los Alamos Environs" shows USGS-LASL River sampling points.
LAPL 612365 L		"Environmental Monitoring Program Los Alamos, NM" map water sampling points.
12 Color #34	1/64	"Showing general stratigraphic relations of main map units in Los Alamos area".
#35	1/64	Geologic map Los Alamos area.
#36	1/64	"Probable stages of development of Rio Grande Depression and Jemez Mts. volcanic series (Generalized)".
#37	1/64	X-Section, W-E, Jemez Mts. to Sangre de Cristo Mts.
#38	1/64	Appears to be same as #35
8 B & W (metal rimmed)		<ul style="list-style-type: none"> a. Geologic map - appears to be same map as #35 above. b. Stratigraphic chart - appears to be same map as #35 above. c. Closeup of "b". d. X-Section from Jemez Mts to Rio Grande. e. Los Alamos area drainage map. f. Los Alamos area water table map. g. Los Alamos well field map.
LAPL CN712786		Aerial view, Pajarito Plateau from South
LAPL CN712802		Aerial view, Pajarito Plateau and Sierra de los Valles from Northeast
17 Color	3/72	Aerial shots Los Alamos area.
17 Color	4/73	Water Sampling.
18 Color	3/72	Aerial Shots
19 Color	3/72	Aerial Shots
21 Color	3/72	Aerial Shots
LAPL CN731948		Los Alamos and DP Canyons geologic map.
LAPL CN731947		Mortandad Canyon geologic map
LAPL 755721		Conceptual hydrologic cross section of the Los Alamos area.

APPENDIX C
ENGINEERING DRAWINGS FOR DISPOSAL AREAS
A, B, C, D, E, F, G, AND T

APPENDIX C
ENGINEERING DRAWINGS

<u>NUMBER</u>	<u>DATE</u>	<u>TITLE</u>
<u>AREA A</u>		
ENG-C 2076	1/24/45	Installation No. "1" Tank Site
ENG-C-2077	1/24/45	Installation No. "1" Tank Site
ENG-C-2078	1/24/45	Installation No. "1" Tank Site
ENG-C-2213	5/30/45	Sanitary Sewers and Drains
ENG-C-2337	8/45	Sanitary Sewers
ENG-C-2338	8/22/45	Special Sewers
ENG-C 8412	6/30/48	TA-21, Chain Link Fencing
ENG-C 8415	9/15/48	TA-21, Water Line for Fire Protection
ENG-C 8427	10/11/48	Fence & Area Floodlighting TA-21
ENG-C 8431	no date	TA-21 Water Line for Fire Protection
ENG-R 185	6/7/56	Materials Waste Pit "A" TA-21
ENG-R 3640	no date	Materials Disposal Areas, Area "A", DP-Site, TA-21
ENG-SK 6250	1/10/69	Room Exhaust System Mods, Phase A, Materials Disposal Area
ENG- 1266	12/22/70	Materials Disposal Areas, Area "A", DP-Site, TA-21
ENG-21-31, Sheet 2	5/24/74	Materials Disposal Areas, Area "A", TA-21
ENG-R 4457	6/4/74	Materials Disposal Areas, Area "A", DP Site, TA-21
no number	3/10/76	Waste Disposal Locations, TA-21, Areas "A" and "T" (H-7 Liquid Waste Engineering Section)
ENG-R 4457	3/24/76 (revised)	Materials Disposal Areas, Area "A", DP Site, T.. 21
<u>AREA B</u>		
ENG-R 186	6/7/56	Materials Waste Pit, Area "B", TA-21
ENG-C 26147	11/27/63	DP Site Area, TA-0
ENG-C 3641	no date	Materials Disposal Areas, Area "B", DP Road, TA-0
ENG-R 1265	12/22/70	Materials Disposal Areas, Area "B", DP Road, TA-0
ENG-R 4458	6/4/74	Materials Disposal Areas, Area "B", DP Road, TA-0

APPENDIX C (Continued)

<u>NUMBER</u>	<u>DATE</u>	<u>TITLE</u>
<u>AREA C</u>		
ENG-R 187	6/7/56	Materials Waste Pit, Area "C", TA-0
ENG-R 104	6/7/56	Pit Number 5, Materials Waste Pit, Area "C", TA-0
no number	no date	Pit Number 6, Area "C"
ENG-R 117	4/10/62	Materials Waste Pits, Location Materials Waste Shafts Area "C", TA-0
ENG-R 3642	no date	Materials Disposal Areas, Area "C", Pajarito Road, TA-0
ENG-R 1264	12/22/70	Materials Disposal Areas, Area "C", Pajarito Road, TA-0
ENG-R 4459	6/4/74	Materials Disposal Areas, Area "C", Pajarito Road, TA-0
ENG-R 4459	4/12/76 (revised)	Materials Disposal Areas, Area "C", Pajarito Road, TA-0
<u>AREA D</u>		
ENG-R 188	6/7/56	Materials Waste Pits, Area "D", TA-33
ENG-R 3643	no date	Materials Disposal Areas, Area "D", HP Site, TA-33
ENG-R 4460	6/4/74	Materials Disposal Areas, Area "D", HP Site, TA-33
<u>AREA E</u>		
ENG-R 189	6/7/56	Materials Waste Pit, Area "E", TA-33
ENG-R 3644	no date	Materials Disposal Areas, Area "E", HP Site, TA-33
ENG-R 4461	6/4/74	Materials Disposal Areas, Area "E", HP Site, TA-33
<u>AREA F</u>		
ENG-R 190	6/7/56	Materials Waste Pit, Area "F", TA-6
ENG-R 3645	no date	Materials Disposal Areas, Area "F", TM Site, TA-6
ENG-R 4462	6/4/74	Materials Disposal Areas, Area "F", TM Site, TA-6
<u>AREA G</u>		
ENG-C-18462	2/26/57	Materials Waste Pits Master Plan and Topography Mesita del Buey

APPENDIX C (Continued)

<u>NUMBER</u>	<u>DATE</u>	<u>TITLE</u>
<u>AREA G (Contd)</u>		
ENG-R 1634	2/20/57	Materials Waste Pits Topography East Area Mesita del Buey TA-O
ENG-R 1635	2/20/57	Materials Waste Pits Topography East Area Mesita del Buey TA-O
ENG-R 1636	2/20/57	Materials Waste Pits Topography East Area Mesita del Buey TA-O
ENG-R 1637	2/20/57	Materials Waste Pits Topography East Area Mesita del Buey TA-O
ENG-R 1638	2/20/57	Materials Waste Pits Topography East Area Mesita del Buey TA-O
ENG-R 1639	2/20/57	Materials Waste Pits Topography East Area Mesita del Buey TA-O
ENG-C 18463	2/26/57	Materials Waste Pits Standard Specifications Mesita del Buey TA-O
ENG-R 3646	no date	Materials Disposal Areas, Area "G" Mesita del Buey TA-O
ENG-R 3637	no date	Materials Disposal Areas Standard Pit Specifications TA-O
ENG-R 3638	no date	Materials Disposal Areas Shaft Covers
ENG-R 3639	no date	No title. Shaft Layout
ENG-C 25699	7/27/65	Materials Disposal Areas FY 66 Areas "G", "H" and "J" Pit No. 5 Area "G" Mesita del Buey TA-O
ENG-C 25700	7/27/65	Materials Disposal Areas FY 66 Areas "G", "H" and "J" Area "G" Shafts Mesita del Buey TA-O
ENG-C 25703	7/27/65	Materials Disposal Areas Standard Pit Specifications TA-O
ENG-C 36152	9/3/68	New Contaminated Waste Disposal Pit - Area "G"
ENG-R 3332	12/5/69	Materials Disposal Area, Area "G", Mesita del Buey TA-54
ENG-R 1262	12/22/70	New Contaminated Waste Disposal Pit - Area "G"

APPENDIX C (Continued)

<u>NUMBER</u>	<u>DATE</u>	<u>TITLE</u>
<u>AREA G (Contd)</u>		
ENG-R 1263	12/22/70	Materials Disposal Areas, Area "G" Mesita del Buey TA-0
ENG-54-1	3/5/71	Materials Disposal Areas Area "G" Pits 8-23
ENG-54-3	8/5/71	Materials Disposal Areas, Area "G" Pit Sections Pit No. 17 TA-54
ENG-54-4	9/24/71	Materials Disposal Areas, Area "G" Pit Sections Pit No. 21 TA-54
ENG-54-5	10/18/71	Materials Disposal Areas, Area "G" Pit Sections Pit No. 8 TA-54
ENG-54-6	10/18/71	Materials Disposal Areas, Area "G" Pit Sections Pit No. 12 TA-54
ENG-54-7	10/19/71	Materials Disposal Areas, Area "G" Pit Sections Pit No. 16 TA-54
ENG-R 2505	2/10/72	Structure Location Plan TA-54 Waste Disposal Site
ENG-54-8	3/14/72	Materials Disposal Area, Area "G" Pit Elevations TA-54
ENG-C 42212	10/29/73	Retrievable Storage of 238 Contaminated Waste, Area "G"; Civil - Plans and Details Mesita del Buey TA-54
ENG-54-11	12/28/73	Materials Disposal Areas, Area "G" Pit Sections Pit No. 7 TA-54
ENG-54-12, Sheet 1	9/6/74	Materials Disposal Areas, Area "G" Pit Sections Pit No. 7 TA-54
ENG-54-10	1/8/74	Materials Disposal Areas, Area "G" Pit Sections Pit No. 24 TA-54
ENG-54-12, Sheet 2	9/6/74	Materials Disposal Areas, Area "G" Pit Sections Pit No. 24 TA-54
ENG-54-15	1/9/74	Materials Disposal Areas (Buried Material Reference Points) Area "G" TA-54
ENG-54-13 (2 sheets)	11/4/74	Materials Disposal Areas, Area "G" Pit Sections Pit No. 9 TA-54
ENG-54-14	11/5/74	Materials Disposal Areas Area "G" Pit Sections Pits 8 & 9 TA-54
ENG-R 4463	6/4/74	Materials Disposal Areas Area "G" Mesita del Buey TA-54
ENG-R 4464	6/4/74	Materials Disposal Areas Area "G" Mesita del Buey TA-54

APPENDIX C (Continued)

<u>NUMBER</u>	<u>DATE</u>	<u>TITLE</u>
<u>AREA G (Contd)</u>		
ENG-54-16 (2 sheets)	2/21/75	Materials Disposal Areas Area "G" Pit Sections Pit No. 1 TA-54
ENG-54-17 (2 sheets)	2/21/75	Materials Disposal Areas Area "G" Pit Sections Pit No. 2 TA-54
ENG-54-21 (2 sheets)	1/8/76	Materials Disposal Areas, Area "G" Pit Sections Pit No. 3 TA-54
no number	1/14/76	Surface profile W to E at right angles to Pit 3 including canyon
ENG-R 4463	1/28/76 (revised)	Materials Disposal Areas Area "G" Mesita del Buey TA-54
ENG-R-4464	1/27/76 (revised)	Materials Disposal Areas Area "G" Mesita del Buey TA-54
ENG-54-23	6/10/76	Horizontal Monitoring, Area "G" TA-54
<u>AREA T</u>		
ENG-C 2217	6/13/45	Waste Disposal Facilities Bldgs. 2, 3, 4 & 5
ENG-C 2337	8/45	Sanitary Sewers
ENG-C 2338	8/22/45	Special Sewers
ENG-C 8412	6/30/48	TA-21, Chain Link Fencing
ENG-C 8415	9/15/48	TA-21, Water Line for Fire Protection
ENG-C 8427	10/11/48	Fence & Area Floodlighting TA-21
ENG-C 8431	no date	TA-21, Water Line for Fire Protection
ENG-C 8436	9/27/49	DPW Waste Treatment Building, DPW-35
ENG-C 8437	9/27/49	DPW Waste Treatment Building, DPW-35, Electrical Layout & Details
ENG-C 8439	5/1/51	Plot Plan and Influent Holding Tanks (DPW 110), (DPW-111) Additional Facilities TA-21, Waste Treatment Plant (DPW-35)
ENG-C 2563	4/15/52	Contaminated Waste Drainage System
ENG-C 2564	4/15/52	Contaminated Waste Drainage System
ENG-R 185	6/7/56	Materials Waste Pit Area "A", TA-21
ENG-R 1852		
ENG-R 1853		
ENG-C 35571	7/31/68	Contaminated Waste Disposal, Area "T" TA-21

APPENDIX C (Continued)

<u>NUMBER</u>	<u>DATE</u>	<u>TITLE</u>
<u>AREA T (Contd)</u>		
ENG-C 35572	7/31/68	Contaminated Waste Disposal, Area T, TA-21
ENG-R 3561	6/1/70	Materials Disposal Area, Area "T", DP Site, TA-21
ENG-21-30	5/15/74	Material Waste Area, Area "T", TA-21
ENG-21-31	5/15/74	Materials Disposal Areas, Area "T", TA-21
ENG-R 4475	6/4/74	Materials Disposal Areas, Area "T", DP Site, TA-21
ENG-21-33 (2 sheets)	12/31/74	Material Disposal Area, Area "T" Pit Sections
ENG-21-34	1/15/76	Materials Disposal Areas, Area "T", TA-21
no number	3/10/76	Waste Disposal Locations, TA-21, Areas "A" and "T" (H-7 Liquid Waste Engineering Section)
ENG-R 4475	3/25/76 (revised)	Materials Disposal Areas, Area "T", TA-21

APPENDIX D

LASL RADIOACTIVE SOLID WASTE MANAGEMENT POLICY

OFFICE MEMORANDUM

TO : Distribution

DATE: May 13, 1974

FROM : George L. Voelz, M.D., Health Division Leader

SUBJECT : LASL SOLID WASTE MANAGEMENT POLICY AND PRACTICES

SYMBOL : H8-74-104

Attached is initial information reflecting updated management of solid radioactive waste materials at the Los Alamos Scientific Laboratory. Additional guidance from Group H-8, the group responsible for the Laboratory Solid Waste Management Operations, will be forthcoming as the LASL waste handling policies and procedures are further developed. Your cooperation and assistance in adjusting practices to meet operational waste management requirements are solicited.

GLV:LJJ:mar

Attachment

Distribution: Master Division, Department and Group
Leaders

OFFICE MEMORANDUM

TO : Distribution

DATE: May 13, 1974

FROM : LaMar Johnson, H-8 Group Leader 

SUBJECT : INFORMATION ON SOLID RADIOACTIVE WASTE MANAGEMENT AT LASL

SYMBOL : H8-WM-57

The enclosed information on solid waste management at LASL is intended to implement Director's Office Memorandum No. 48 - Radioactive Solid Waste Management Policy issued September 27, 1973. The objective of the Policy is to improve the control of radioactive waste materials at LASL.

A revised AEC Manual Chapter 0511 - Radioactive Waste Management was issued September 19, 1973. This Manual Chapter states AEC policy and criteria with regard to the management of AEC-generated radioactive waste. The following is a summary of specific requirements of the Manual Chapter:

1. Technical and administrative efforts should be directed toward:
 - a. a marked reduction in the gross volume of radioactive solid waste generated
 - b. a marked reduction in the amount of radioactivity in such waste.
2. Volume reduction technology, such as compaction and incineration shall be adapted for use with radioactive solid waste and placed in operation wherever practical.
3. AEC-generated solid waste contaminated with transuranic isotopes at an activity concentration greater than ten nanocuries per gram (10 nCi/g) shall receive special handling. Transuranic isotopes include ^{233}U (with its daughter isotopes), plutonium and transplutonium isotopes except ^{238}Pu and ^{241}Pu . Plutonium 238 and ^{241}Pu contaminated wastes are to be included when so indicated by ^{239}Pu impurities (>10 nCi/g), or when required by local policy. (The LASL has established an interim local policy that ^{238}Pu waste at activity concentrations above 100 nCi/g must receive the special handling indicated.) Special handling requirements for this waste include the following:
 - a. it shall be segregated from other radioactively contaminated solid waste
 - b. combustible and noncombustible transuranic wastes shall be packaged separately

TO: Distribution

2

DATE: May 13, 1974

- c. it shall be packaged and stored under conditions that it can be readily retrieved in an intact, contamination-free condition after 20 years in storage
 - d. the waste package shall be suitably labeled so that the waste contained can be identified by cross reference to permanent records.
4. Waste materials contaminated with transuranic isotopes at activity concentrations below 10 nCi/g (below 100 nCi/g for ^{238}Pu) will continue to be handled as in the past.

Individuals or groups wishing complete copies of AECM-0511 should contact the Waste Management Section of Group H-8.

In order for H-Division to meet these directives, it is necessary for the Waste Management Section to establish guidelines for their operations. Moreover, the Waste Management Section is prepared to assist operating units of the Laboratory in establishing necessary standard operating procedures for waste management.

Attached are the interim guidelines that the Waste Management Section of Group H-8 will be using. This introductory information is an initial effort in deriving methods of operation under the LASL Policy. As the LASL solid radioactive waste management policies and procedures are formulated and revised, additional information will be submitted by the Waste Management Section. Specific problems of Laboratory operating units in the area of solid radioactive waste management should be brought to the attention of the Waste Management Section. Comments and suggestions on the attached interim guidelines are requested and should be forwarded directly to LaMar Johnson, H-8 group leader.

LJJ:jb

Distribution: Master Division, Department and Group Leaders

GROUP H-8 SOLID RADIOACTIVE WASTE MANAGEMENT GUIDELINES

I. Responsibilities for solid radioactive waste management.

- A. Radioactive waste management operations including solid waste burial and retrievable storage are the responsibility of Group H-8.

Group Leader: LaMar Johnson
OHL Building, MS 490
Phone: 5021

- B. Questions concerning waste disposal practices and special waste disposal problems should be directed to the Waste Management Section of Group H-8.

Alternate Grp. Leader: Keith J. Schiager
CMR Building, MS 737
Phone: 5862

1. John L. Warren is in direct charge of the burial ground and storage area operations.

Location: CMR Building, MS 737
Phone 5862, Room 1217

2. Questions concerning routine disposal practices should, as in past practice, be directed to John Enders.

Location: CMR Building, MS 737
Phone: 6095, Room 1221

II. Establishment of standard operating procedures.

The Laboratory Policy calls for the establishment of Standard Operating Procedures (SOP) in the implementation of the Policy, such procedures to be established by the Laboratory unit having the operational responsibility. These procedures should include all steps from the initial generation of the waste, segregation procedures necessary, types of containers, methods of shipment, and procedures for special problems.

1. Group H-1 will serve as an immediate interface between the Waste Management Section and the Operating Groups. The H-1 Group Leader will have responsibility for the approval of such procedures from the standpoint of radiation safety.
2. Group H-8 will be the approving authority for waste management aspects of procedures relating to waste characteristics, packaging and subsequent waste handling within H-Division
3. H-1 will coordinate SOP review and approval.

III. Waste Categories

Four categories of LASL-generated solid waste have been identified and are segregated according to their actual or potential content of radioactive materials.

- A. Materials for which there is assurance that no radioactive materials are present are taken by the Zia Company to the sanitary landfill operated by Los Alamos County.
- B. Wastes which are, or are judged to be, contaminated with radioactive isotopes other than the transuranics, and/or with transuranic activity concentrations less than 10 nCi/g (100 nCi/g for ^{238}Pu) do not require storage for later retrieval. These wastes are buried in the LASL burial ground at Mesita del Buey (TA-54).
- C. Wastes which are contaminated, or judged to be contaminated with transuranic elements to levels greater than 10 nCi/g (100 nCi/g for ^{238}Pu) require retrievable storage.
 - 1. The volume of waste over which the 10 nCi/g can be averaged is taken to be the volume of waste package (container) in which a measurement or estimate is made.
 - 2. Procedures shall be estimated to accomplish segregations of small batches of waste material so that the retrievable portions can be handled separately.
 - 3. Highly contaminated wastes shall not be deliberately diluted to circumvent this criterion.
- D. Individual batches of wastes which contain unusual levels or types of radioactive and/or chemical contaminants are to be handled on an individual basis.

IV. Waste Packaging

A. Solid radioactive waste disposed of nonretrievably

All radioactive solid wastes which are to be disposed of nonretrievably shall be provided with appropriate packaging by the originator.

1. Room-type trash should be packaged in cardboard boxes and/or plastic bags.
2. Transuranic contaminated chemical treatment sludge that is <10 nCi/g (<100 nCi/g ^{238}Pu) should be packaged in a minimum .127 mm (5 mil) plastic bag, sealed in a 210-liter (55-gallon) drum.
3. Larger and/or heavier wastes require more substantial packaging such as wooden crates. The Waste Management Section can advise with regard to packaging this type of waste.
4. In those instances where all contamination is fully contained within the waste material, no additional packaging may be required. The Waste Management Section should be consulted in this matter.

B. Solid transuranic waste stored retrievably

1. Wastes which are to be sent to retrievable storage should be packaged, by the originator, in white painted 210-liter DOT 17C (55-gallon) drums containing a 2.29 mm (90 mil) high density polyethylene liner. Both the drums and liners are available from LASL Chemical Stock (SM-31).

DOT 17C 210-liter drum - Stock #LG 1103/West Dock
2.29 mm liner - Stock #LG 3738/West Dock

2. There are locations and situations at LASL where the 210-liter (55-gallon) drum cannot be used because of space limitations and/or waste form. The packaging other than with the 210-liter (55-gallon) drums should be made by agreement between the waste originator and the Waste Management Section of H-8

V. Radioactive Waste Package Labeling

All packages of radioactive solid waste destined for disposal or storage must be clearly labeled as containing radioactive material. Tape and signs appropriate for this purpose are obtainable through LASL Safety Stock (SM-30).

A. Package Labeling Requirements

1. "CAUTION RADIOACTIVE WASTE" tape (Stock Number CM-3263/BG-38) should be used to mark all boxes and bags of waste to be disposed of by burial.
2. All drums containing waste, whether designated for burial or retrievable storage should have attached a "RADIOACTIVE MATERIAL" tag (Form 743) properly filled out.
3. Crates that contain retrievable transuranic waste must have attached a 15.2 cm by 15.2 cm (6"x6") aluminum tag, properly filled out. These tags can be obtained through LASL Safety Stock.
4. All crates containing waste designated for nonretrievable disposal should have affixed the above stated aluminum tag.
5. All retrievable transuranic solid waste packages are to have a serially numbered identification tag permanently attached. These tags will be provided by the H-8 Waste Management Section. The tag number for each package is to be recorded as the reference to the permanent records for that package.
6. Other specific markings and package labeling requirements are required of different waste types. These package marking requirements are to be found in existing LASL Waste Management SOP's.

B. Responsibility for Labeling

1. The individual packaging the waste is responsible for obtaining the required labeling material and for labeling and marking the package properly.
2. The H-1 representative of the area where the package originates is responsible for checking waste packages for compliance with the labeling requirements.
3. The Waste Management facility operator assigned to the solid radioactive waste disposal area will check packages as they are off-loaded at the area to assure that proper labeling and other markings are present.

VI. Records Requirements for Radioactive Solid Waste

In order for the Waste Management Section to maintain the required records system for waste disposal, a LASL Solid Radioactive Waste Disposal Permit will be required with each waste item or shipment, as indicated.

1. For radioactive solid wastes to be disposed of nonretrievably, a properly completed Disposal Permit must accompany each consignment.
2. For transuranic solid waste to be stored retrievably, a properly completed Disposal Permit must accompany each package.

VII. Special Waste Lots

Special lots of materials such as were described under Section III. D. shall require special notification and handling. When such materials are encountered, the following information should be forwarded to the Waste Management Section of H-8 in the form of a memo which will serve as a part of the record.

- a. Number, size and nature of containers
- b. Waste matrix materials in each container
- c. Identify and give the quantity of each radioisotope in each container
- d. Condition of the container
- e. Copy of authorization, by responsible organization to dispose as waste by burial/storage.

The Waste Management Section will review the information, assure any special review and requirements for criticality safety and/or retrievable storage, assess the overall impact of the storage or disposal method to assure that safety will be maintained, and then, implement disposal.

VIII. Waste Volume Reduction

Efforts should be made by LASL Operating Groups in coordination with the Waste Management Section to reduce the volume of radioactive solid waste that is generated. To minimize the quantities of radioactive waste sent to burial, it is suggested that SOP's and physical separation should, wherever feasible, be used as means to delineate work areas which are noncontaminated. Wastes from such areas can be sent to a sanitary landfill rather than to the radioactive solid waste disposal area. Such procedures should specify the controls which are to be exerted by the operating supervision to assure that materials or objects contaminated with radioactivity are not inadvertently placed in the clean disposal containers or dumpsters. These controls should be enforced to assure that the risk of disposing of a contaminated object or material to a noncontaminated landfill is minimal.

OFFICE MEMORANDUM

TO : Streamline Division and Group Leader Listing DATE September 27, 1973

FROM : R. E. Schreiber

SUBJECT : DIRECTOR'S OFFICE MEMORANDUM NO. 48
RADIOACTIVE SOLID WASTE MANAGEMENT POLICY

SYMBOL : DIR

MAIL STOP

- A. It is the policy of the Los Alamos Scientific Laboratory to manage radioactive solid wastes in a manner to minimize adverse effects to man and his environment and to provide reasonable assurance that this objective is accomplished. The solid waste management programs and operations will be consistent with the directives and policies of the AEC. Specific items in the Laboratory policy include:
1. The quantities of radioactive materials buried shall be reduced to a minimum consistent with economics, technology, and safety.
 2. The problems associated with waste having unusual properties, configurations, or quantities of radioactive materials, shall be investigated before storage or disposal of the waste is accomplished. The rationale for the action and the safety of the proposed method of handling shall be documented.
 3. All technically and economically practical measures shall be taken to minimize the volumes of radioactive solid wastes placed in burial grounds or retrievable storage.
 4. The quantities of transuranic elements placed into retrievable storage or burial grounds shall be reduced to the technically and economically practical minimum.
- B. To implement this policy, the following administrative responsibilities are assigned:
1. H Division shall be responsible for operating the waste disposal and retrievable storage facilities and for the routine transportation operations for radioactive solid waste at LASL.
 2. H Division shall provide criteria for the packaging and subsequent handling of the waste.
 3. The Divisions and Departments of the Laboratory that generate solid waste shall be responsible for minimizing the quantities generated and for packaging.

4. Nonroutine packaging, handling, or transportation problems should be identified by operational units in sufficient time to permit advance planning. Proposed solutions, including funding considerations, for such unusual problems shall be the responsibility of the waste generating unit of the Laboratory and shall be reviewed and approved by H Division prior to implementation.
5. Standard Operating Procedures (SOP) for all routine operations and for all operations involved in nonroutine problems shall be established by the unit of the Laboratory with operational responsibility in accordance with existing requirements of the Laboratory.
6. H Division shall conduct an annual audit of the Laboratory's overall solid waste management operations to evaluate the Laboratory program against established criteria, standards, and policies.
7. The Laboratory Radioactive Waste Management Committee shall be responsible for maintaining cognizance of all Laboratory activities in waste management, serving as an advisory group in operational matters, and providing the Director's Office with recommendations as appropriate.

C. The membership of the Laboratory Radioactive Waste Management Committee is:

J. W. Healy, Chairman	C. J. Umbarger
H. S. Jordan, Secretary	D. R. Smith
W. J. Maranan	V. J. Stephens
R. J. Bard	



R. E. Schreiber
Acting Director

APPENDIX E
USGS AND LASL GUIDELINES FOR PIT CONSTRUCTION



IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Ground Water Branch
P.O. Box 4217
Albuquerque, New Mexico
June 30, 1965

Mr. Salvatore E. Russo
Chief, Engineering 3
Los Alamos Scientific Laboratory
Los Alamos, New Mexico

Dear Sir:

The following guidelines are proposed for the construction of pits for the disposal of solid radioactive wastes on Mesita del Huey, Los Alamos County, New Mexico. These guidelines were formed during a meeting held at Los Alamos on June 23, 1965 with the following people in attendance.

Salvatore Russo, Eng. 3; Ben Williams, Eng. 3; Dean Meyers, H-1; William Kennedy, H-6; and C. W. Christenson, H-7 of the Los Alamos Scientific Laboratory; and Dr. C. V. Eacis, F. C. Koopman and William D. Purtyman of the U.S. Geological Survey.

Construction

- 1) Pits constructed with a minimum distance of 50 feet from canyon rim.
- 2) Pits constructed no deeper than adjacent canyon floor.
- 3) Pits constructed with long dimension parallel (as near as possible) to surface topographic contours.
- 4) Large open joints filled with seal material (tuff removed from pit during construction).
- 5) Drainage should be maintained on open pits so that runoff from precipitation on the mesa does not enter the pit while it is being filled.
- 6) Size and shape of pit are not important.
- 7) Bottom of the pit does not need to be level.

Burial of wastes

- 1) Burial of wastes in layers (ie. layer of waste and a layer of tuff) should be continued.
- 2) Wastes are to be buried in the confines of the natural tuff. If the soil zone is exceptionally thick this would be an unusual condition and would show instability in that immediate area. The wastes should be buried below the soil zone within the tuff.

Mr. Salvatore E. Russo
Page 2

Surface seal of pits

- 1) Pits can be filled with wastes to within 2 feet of the land surface.
- 2) Seal material (tuff) overlying the wastes should range in thickness from 6 to 8 feet.
- 3) The surface of the seal material over the pit should be slightly rounded.
- 4) Adequate drainage provided to remove runoff from precipitation on the mesa.
- 5) Drainage ways are to be located so that they do not cross the surface of a sealed pit.
- 6) Consideration should be given to the planting of native vegetation on the surface of sealed pits.

As an additional thought - A suggestion by Dr. Theis not discussed at the meeting.

It may be necessary to have periodic inspections of the sealed and finished pits to determine any unusual settling or gullyng. It is thought that the times of inspection for instability and indications of adjustment of the surface to a natural condition will be shortly after the season of the highest rainfall. It may be necessary to have biannual inspections.

The above information is intended for a guide only. It is hoped that it is specific enough for the continued safe-storage of waste program but general enough to permit future changes that may have to be made.

Sincerely yours,

F. C. Koopman
Acting District Chief

OFFICE MEMORANDUM

TO : Distribution

DATE: April 24, 1975

FROM : LaMar J. Johnson, H-8 Group Leader 

SUBJECT : SOLID RADIOACTIVE WASTE DISPOSAL GUIDELINES

SYMBOL : H8-WM-461

MAIL STOP: 490

Attached is a copy of solid radioactive waste disposal guidelines presently in use by the LASL for the construction and use of solid radioactive waste disposal facilities at the Laboratory. The guidelines were arrived at through consideration of previous recommendations, as well as current thinking on requirements for safe and effective disposal of radioactive waste.

It is recognized that in some instances previous practice did not conform with these guidelines. Programs have been initiated to conform with these guidelines in matters relating to the appearance or condition of the burial site. Questions related to the location or burial mode of previously disposed waste are presently incorporated within a research program of the Waste Management Section which will evaluate the short and long term adequacy of the burial sites.

These guidelines are considered to be in final form. Should you feel that any significant considerations have not been included, please contact us.

LJJ:TKK:mar

Attachment as stated.

Distribution:

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GUIDELINES FOR CONSTRUCTION AND USE
OF SOLID WASTE DISPOSAL FACILITIES

I. Administration

It shall be the responsibility of the individual in charge of the Solid Waste Management Operations to insure compliance of the following recommendations and procedures in the guidelines for construction and use of solid waste disposal facilities.

II. Site Selection Criteria (General)

- A. The geohydrology of the site will require evaluation in order to design the site in a manner to minimize the impact on surface and ground water (U.S.G.S. Water Supply Paper 1753, LA-4660-MS, LA-5286-MS).
- B. Locations containing archaeological sites will require investigations. Evaluation of Federal land containing archeological sites is required by four Congressional Acts and a Presidential Order. A report has been prepared describing all archaeological sites on LASL property. This includes maps and archaeological evaluation of sites.
- C. The ecology of the area will be considered in site selection. Consideration shall be given to leaving strips of natural vegetation between pits as wind-breaks to reduce wind erosion of the disturbed surfaces and to make rehabilitation more realistic. Plant and animal communities that are classified as rare or endangered will be preserved and protected as specified in "The Endangered Species Act of 1973" (50 CFR-Part 17).

III. Pit Locations and Layout

- A. Topographic contour maps shall be prepared or available at contour intervals of five feet or less, which describe the topography prior to ground breaking or clearing of area.
- B. The layout of the pits shall be with the long dimension more or less parallel to the topographic contours to obtain maximum utilization.
- C. The location of the "spill point" (the lowest elevation of the rock surface along the edge of the pit) shall be a minimum of 50 feet from the canyon rim (break in topographic slope). This is illustrated in Fig. 1. The canyon "rim" will be identified on the area topographic map. Disposal shafts shall be located no closer than 50 feet from the adjacent canyon rim.

- D. Access roads to pit sites shall be carefully laid out to avoid traversing archeological sites and maintain adequate drainage.
- E. Vegetation and topsoil in areas between pit edges and mesa rims, and on one side of each pit shall be left in the natural state as nearly as possible. (See Fig. 2.)
- F. If archaeological sites are in a potential disposal site location, construction must be proceeded by the following:
 - 1. Evaluation of the site for antiquity value by a qualified archaeologist.
 - 2. Archaeological salvage of the site under supervision of a qualified archaeologist.
 - 3. A report of the findings and deposition of the artifacts in a suitable repository.

IV. Construction

- A. Pits and shafts shall be constructed no deeper than adjacent canyon floors that contain or may contain saturated zones.
- B. Horizontal dimensions and shape of pits and shafts are not restricted.
- C. The floors of the pits do not need to be horizontal.
- D. The slope on pit walls shall be approximately 1 to 4.
- E. Minimum distance between pits shall be 15 ft at land surface.
- F. Crushed tuff 0.5 to 1 ft deep shall be compacted on floor of the pit before emplacement of wastes.
- G. Open joints and fractures in pit walls, access ramps, and floors that are open two inches or more shall be filled with sealing material. (Example: mixture of bentonite (dry) and crushed tuff or cement (dry) and crushed tuff).
- H. Appropriate measures shall be taken to insure containment of material within disposal shafts, for example, an asphalt coating on the walls of tritium disposal shafts. Prior to its use, a shaft shall be inspected to insure absence of significant open joints or fractures. If any are present they shall be sealed to the best degree possible with appropriate material, similar to that recommended for the purpose in pits.

- I. Drainage shall be constructed and maintained so that surface runoff does not enter the pits or shafts.
- J. Topsoil shall be stockpiled for use in rehabilitation of the pit seal. Topsoil shall be stockpiled in such a manner as to minimize erosion.
- K. Tuff removed during construction of the pits shall be separately stockpiled in the same manner as the topsoil. It shall not be stockpiled on top of rehabilitated or undisturbed areas.
- L. Roads shall be planned so that vehicles or equipment do not transverse rehabilitated areas. Dust control shall be employed to minimize resuspension.
- M. Prior to excavation of a pit or shaft, notification shall be provided to a LASL geologist responsible for waste site monitoring. At the discretion of the geologist, material samples may be collected during construction. Following excavation of a pit or shaft, it shall be surveyed and recorded on a map of the waste disposal area. In addition, for pits, an engineering drawing showing lengthwise profiles, i.e. the walls and centerline, and crosswise profiles at significant breaks in bottom slope and at every 100 foot length, will be prepared. At the time of the survey the location of the first and last reference posts (for waste disposal record purposes) shall be established and recorded on the engineering drawing of the pit profiles.
- N. Before a pit is placed in use, a qualified geologist from LASL shall inspect and approve its use. The geologist shall prepare a description of the pit, including such things as location and orientation of fractures, position of flow boundaries in the tuff, plant root locations, etc.

V. Burial of Wastes

- A. The wastes buried in pits shall be placed in layers and covered with an approximate 0.5 ft layer of compacted crushed tuff.
- B. Combustible and wind dispersable wastes shall be covered by the end of the day of delivery.
- C. Pits and shafts shall be filled with wastes to a minimum depth of 3 feet below the "spill point" (lowest point on pit rim, Fig. 1).

- D. Documentation shall be made of origin of shipment, type, identity and amount of radionuclides in wastes placed in the pit and shafts. Records shall include location within the pit of each shipment of waste received.

VI. Final Cover of the Wastes

- A. The final cover of a pit shall be crushed tuff overlain by topsoil.
- B. The final cover of a pit shall be a minimum of 2 ft above the original land-surface at the edge of the pit and will extend beyond the edges of the pit at least 3 ft.
- C. The final cover of a shaft shall be non-contaminated cement, a minimum of 3 ft thick, slightly rounded, and extending about 0.5 ft above land surface.
- D. The surface of the final pit or shaft cover shall be slightly rounded to allow surface drainage without excessive erosion.
- E. Provisions shall be made to control runoff in the disposal area to minimize infiltration and erosion of the final cover of pits or shafts.
- F. Bench marks shall be placed at the corners of each pit and in the final pour of seal cement in the shafts. The bench marks (at least 12 inches in diameter) shall be set into the bed rock and extend through the final cover at the corners of each pit. The bench mark will be a single pour of cement with a standard brass cap which will contain Engineering data (cap number, LASL Coordinates, and elevation and Disposal Data (Radioactive Waste Pit numbers and location; e.g. Radioactive Waste Pit 24 SW Corner, or Radioactive Waste Shaft number). These bench marks are to be tied into the disposal and engineering records so that if materials are to be retrieved, they can be found with a minimum of effort and disturbance to the final cover.

VII. Rehabilitation and Revegetation

- A. As noted in Section V E, native vegetation will be left in areas between pits.
- B. Turf-forming grasses and bunch grasses will be planted in the final cover to prevent wind and sheet wash erosion.

VIII. Monitoring Systems

- A. Established "green belts" adjacent to pits and shafts as well as grasses of the final cover will be monitored to determine if uptake of radionuclides occur.

- B. Background data to determine radionuclide concentration in and adjacent to pits should be collected prior to disposal of wastes.
- C. Monitoring holes and access casing should be operational prior to placing of wastes in pits.
- D. The area shall be inspected on an annual basis to determine the condition of final cover. Significant changes in the cover due to settling or erosion shall be corrected.

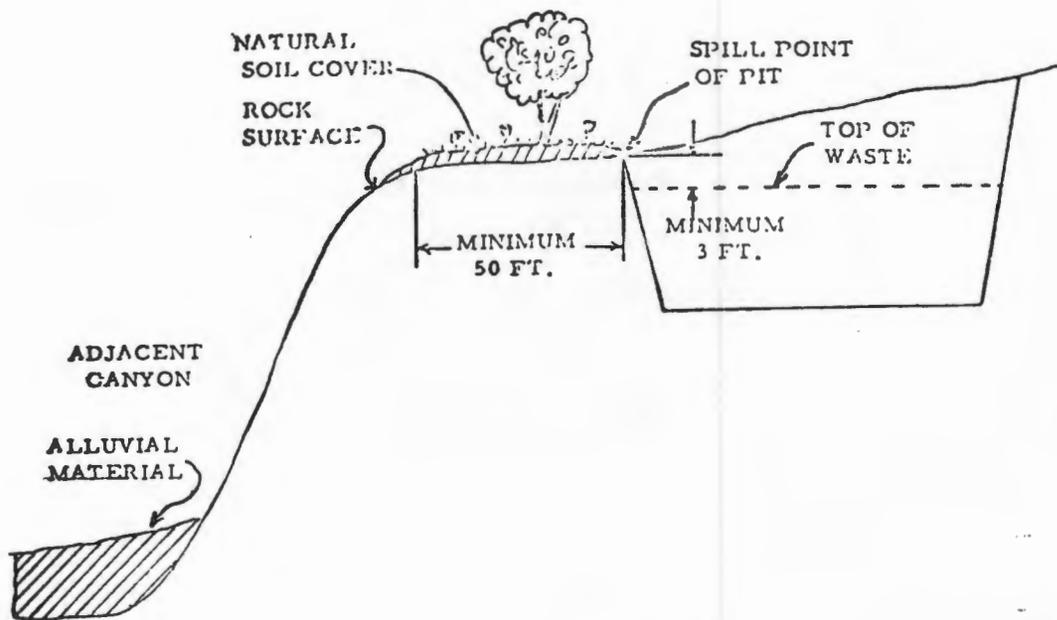


Figure 1. Cross-section showing details of pit location and placement of wastes

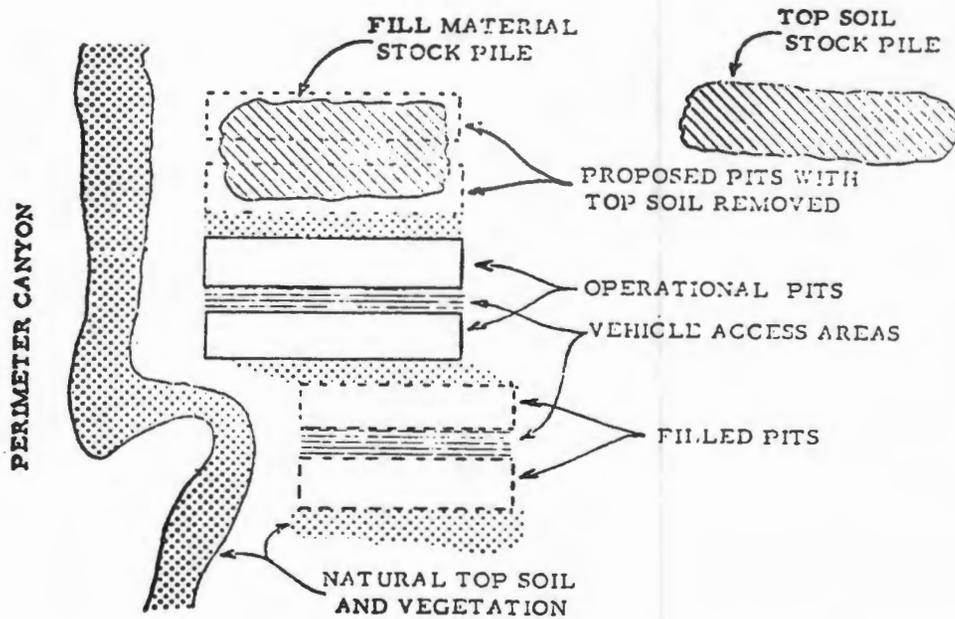


Figure 2. Suggested layout of disposal pits, stockpile areas and biotic sanctuaries.

APPENDIX F

Current Waste Disposal Practices for Routine and Non-Routine Waste

All solid waste generated in all designated contaminated areas is disposed of in the radioactive disposal area of the Laboratory. Since August 1972 Laboratory generated wastes taken to Area G, TA-54, have been segregated according to their radioactive contaminants and radioactive level before being placed in disposal pits, disposal shafts or storage facilities. Waste contaminated with transuranic radionuclides at concentrations above 10 nCi/g for ^{239}Pu , ^{241}Am , and ^{235}U or above 100 nCi/g for ^{238}Pu are placed in 20 year retrievable storage per AECM 0511. These wastes constitute about 10% of the Laboratory total. Waste contaminated with transuranic radionuclides at concentrations less than 10 nCi/g for ^{239}Pu , ^{241}Am , and ^{235}U or less than 100 nCi/g for ^{238}Pu ; with uranium; with fission products; with induced activities; and with tritium are not required to be stored retrievably; however, where possible they are segregated prior to disposal.

PACKAGING

In general, the LASL packaging policy for solid radioactive waste is that wastes must be packed so they will not contaminate transport containers or contaminate or irradiate personnel during transport. When necessary, special cases are checked to assure that Department of Transportation (DOT) regulations are met. After disposal, packaging is not expected to remain intact with the exception of that for retrievable transuranic wastes and tritium wastes. Packaging guidelines are listed in current waste disposal operating procedures.

Routine Non-Retrieveable Transuranic Waste

Routine non-retrievable transuranic (TRU) waste consists mainly of laboratory generated trash such as cheesecloth, paper, gloves, metal, glassware, and other small laboratory items. Most of this waste type is generated at the CMR Building, TA-3, and at DP-West, TA-21.

In the CMR building laboratories this waste is placed in plastic-lined, 0.06 m³ (2 ft³) cardboard boxes held in metal fireproof containers or in plastic-lined, metal, flip-top cans. The small plastic bags from the flip-top cans are removed when filled, sealed with masking tape, and deposited in the 0.06 m³ (2 ft³) cardboard boxes. Waste packages are marked with tape reading "Caution — Radioactive Waste". They are also marked combustible or noncombustible and with the room and wing number and the date. Before the packages are loaded into a Dempster Dumpster labeled "Radioactive Waste Only" they may be monitored by a Health Physics Surveyor.

At DP-West this waste is collected in plastic-lined, 0.06 m³ (2 ft³) cardboard boxes held in 115 l (30 gal) drums. When full, the boxes are taped shut and monitored with the Multienergy Gamma Assay System (MEGAS) (which permits monitoring of the x-ray and low energy gamma ray region for the sub-10 nCi/g activity levels) before being placed in marked Dempster Dumpsters (see Fig. APF-1).

The other major source of routine non-retrievable TRU waste is the product of liquid radioactive waste treatment. De-watered sludge from the Liquid Waste Treatment Plant at TA-50 is batch assayed to determine whether it is retrievable or non-retrievable. If non-retrievable, the material is packaged in 7 mil plastic-lined 210 l (55 gal) mild steel (weatherpack fiber after March 1976) drums which are loaded onto a skip-type Dempster Dumpster for transport to Area G. At the TA-21 Liquid Waste Treatment Plant batch assay also segregates non-retrievable from retrievable waste. Non-retrievable waste, which is about 3-5% of the total Laboratory waste volume, is mixed with cement to form a paste which is pumped down shafts augered in the tuff at Area T.



Fig. APF-1.

Development of prototype of Multi Energy Gamma Assay System (MEGAS) used for assay for 2 ft³ cardboard boxes of low-density laboratory trash. MEGAS is capable of detecting TRU-contamination at <1 nCi/g of waste.

Routine Retrievable Transuranic Waste

Routine retrievable TRU waste is generated at a rate of 280-420 m³/yr (10 000-15 000 ft³/yr) mostly at DP-West, TA-21; the CMR Building, TA-3; and the Liquid Waste Treatment Plants, TA-21 and TA-50. This waste consists of ²³⁹Pu (weapons grade) contaminated residues and trash, ²³⁸Pu (weapons grade) contaminated residues and trash, ²³⁹Pu contaminated residues and trash, some of which were once shipped to the Savannah River Plant as "scrap", and ²³⁹Pu/²⁴¹Am cement paste and de-watered sludge produced as a result of liquid waste treatment. Most of this waste (by volume and activity levels) comes from gloveboxes, hoods, and equipment in processing and research and development areas.

Much of this waste is packaged in Department of Transportation (DOT) 17C 210 L (55 gal) drums. Generally, the drums are lined with several layers of 5-10 mil plastic. In the case of drums used to hold de-watered sludge and absorbed oil, a 90 mil high-density crosslinked polyethylene liner is used. All drums are sprayed with Texaco Rust Proof CPD-L immediately prior to storage.

Items too bulky to be placed in drums are packaged in fiberglass-coated wooden crates. Size of crates used has varied from 1.2 m × 1.2 m × 2.4 m (4 ft × 4 ft × 8 ft) to 1.5 m × 2.4 m × 9.1 m (5 ft × 8 ft × 30 ft). The fire-retardant fiberglass coating on the crates is approximately 0.32 cm (1/8 in.) thick.

In the processing and recovery areas at DP-West, retrievable TRU waste from the glovebox lines is placed in a 12 mil polyvinyl chloride (PVC) tubing and sealed at both ends by wire and tape before it is cut off. The PVC packages are put in 10 mil polyethylene (PE) bag-lined 210 ℓ drums. All drums are then assayed on a boron trifluoride (BF₃) assay system which has a sensitivity of about 0.1 g/drum (see Fig. APF-2).

Retrievable TRU cement paste from the Liquid Waste Treatment Plant at TA-21 (TA-21-257), which is about 3-5% of the total Laboratory waste volume, is pumped into 76.2 cm (30 in.) diameter, 6.1 m (20 ft) long corrugated metal pipes. Each pipe has a 0.6 m (2 ft) "cold" concrete plug at both ends.

Routine Low-Level Beta-Gamma Waste

Routine low-level beta-gamma waste in the CMR Building is packaged similarly to routine non-retrievable TRU waste. The filled cardboard boxes are monitored by a Health Physics Surveyor to assure the radiation level on the outside of the packages does not exceed 5 R/hr.

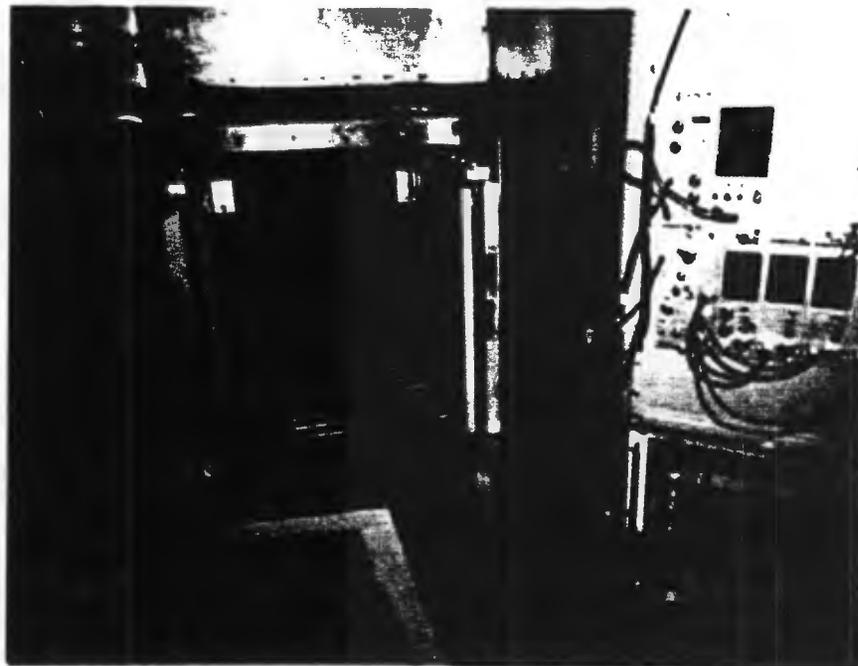


Fig. APF-2.

BF₃ (boron trifluoride) coincidence neutron counter used for detection of TRU-contamination in process waste from Pu-recovery operations at TA-21, DP-West (CMB-11 operated).

Routine High-Level Beta-Gamma Waste

Routine high-level beta-gamma waste from the hot cells of Wing 9, CMR Building, is packaged in 3.8 *l* (1 gal) metal cans placed in a plastic cannister. The level of activity of each cannister is read at a distance of 1 meter and at contact. Two cannisters are then loaded into the plastic-bag-lined, lead transport container (see Fig. APF-3). The plastic bag is used only to insure that the cannisters do not hang when the transport container's trap-door is opened.

Routine Tritium Waste

Routine tritium waste, 5-30 m³/yr (175-1060 ft³/yr), is packaged in asphalt-lined 115 or 210 *l* drums. Where significantly large quantities of tritium are contained, the waste is packaged in a 115-*l* drum which then is sealed inside of an asphalt coated 210-*l* drum. For very high-tritium content wastes, the waste-containing 115-*l* drum is encased in asphalt in a 210-*l* drum.

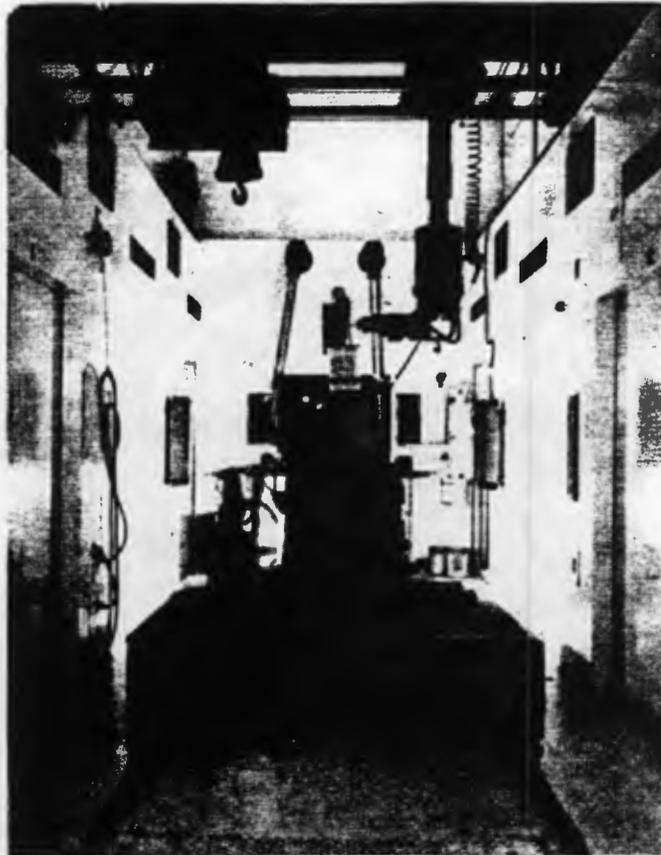


Fig. APF-3.

Loading of a transport cask with an 8 l package of high beta-gamma active waste from the group CMB-14 hot cell in Wing 9, CMR building.

Other Routine Wastes

Other routine wastes are: (1) contaminated oil (several m³/yr) which is sorbed onto vermiculite and packaged in 115 or 210 l drums, (2) contaminated chemicals which are neutralized and/or sorbed onto some neutral material and packaged in metal containers filled with sorbent material, (3) contaminated animal tissue, roughly 2.8 m³ (100 ft³)/yr, from the laboratories in the HRL Building, and (4) contaminated classified material which amounts to 4.2-5.6 m³/yr (150-200 ft³/yr).

Non-Routine Wastes

Non-routine wastes such as large pieces of laboratory equipment and machinery and wastes generated during facility renovation and decommissioning projects may or may not be packaged depending upon the level of contamination or whether the contamination is contained. The decision to package is made by Group H-1 and Group H-7. Materials which pose packaging problems are handled on an individual basis, e.g., filter plenums from the CMR Building which were not packaged but had all openings sealed with metal flanges.

TRANSPORTATION

Transportation of radioactive waste is carried out under guidelines set up in standard operating procedures. Dempster Dumpsters [3.1 or 7.7 m³ (4 or 10 yd³) capacity], dump trucks, flat-bed trucks, and pickup trucks are used as transport vehicles.

Dempster Dumpsters are used to transport approximately 50% of the routine laboratory waste. Dumpsters are emptied when full. Dumpster deliveries are accepted twice a week at Area G. Regular Dempster Dumpsters transport non-retrievable transuranic waste from the CMR Building (TA-3), DP-West (TA-21), TA-35, TA-43, TA-48, and TA-50; and also low-level beta-gamma waste from the CMR Building. "Skip-Type" Dempster Dumpsters can carry nine 210 l (55 gal) drums per trip. This type of dumpster may be used to carry: (1) sludge drums of non-retrievable or retrievable transuranic waste from the Liquid Waste Treatment Plant at TA-50, (2) drums of depleted uranium chips and turnings from the Shops Department area, (3) retrievable transuranic waste from the CMR Building and DP-West, (4) tritium waste, (5) contaminated oil, and (6) contaminated chemicals.

High-level beta-gamma waste from the CMR Building is transported in a lead transport container chained to a specially designed flat-bed truck (see Fig. APF-4).

Routine escort of transport vehicles is provided for depleted uranium chips and turnings because of the possibility of fire and for classified contaminated material. Radio-equipped H-7 vehicles which have communication on the H-Division, Zia Company, fire department and police department networks provide the escort. Supply and Property (SP-2 Group) personnel also escort classified contaminated material since they must prepare the proper documentation for its disposal.

DISPOSAL

Pits, shafts and trenches are used for burial and storage of wastes. Pits are approximately 7.3 m (24 ft) deep and vary in length from 122-183 m (400-600 ft) and in width from 7.6-30 m (25-100 ft). Shafts vary in diameter from 0.6-2.4 m (2-8 ft) and in depth from 7.6-18 m (25-60 ft). Trenches are shallow, approximately 3.7 m (12 ft) wide and as long as 81 m (265 ft).

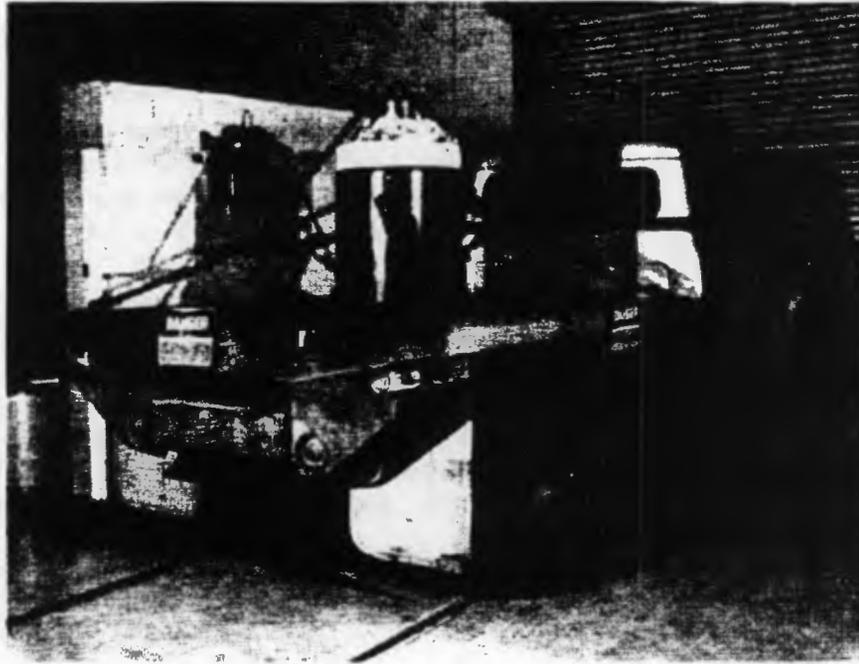


Fig. APF-4.

Transport cask loaded with high beta-gamma waste mounted on truck in preparation for waste delivery to Area G shafts.

Pits

There are designated pits for non-retrievable TRU waste, non-retrievable uranium waste and lower level* beta-gamma (which contains no TRU) waste, and retrievable TRU waste. The pits used for the first two waste categories differ in construction, waste covering operations, and monitoring activities from the pit used for the last waste category.

The retrievable TRU waste is stacked in a 7.6 m (25 ft) deep pit 122 m (400 ft) long and 9 m (30 ft) wide. The bottom of the pit is graded and asphalt paved and curbed to promote drainage away from the wastes. Any moisture moving on the asphalt surface drains into sumps at one end of the pit where it is sampled for contamination and if necessary, is removed to the liquid waste treatment plant.

Waste materials are stacked within the curbing to a height of about 2 m (6 ft) below the ground surface for a pit length of about 17 m (55 ft). The waste stack is then covered with 20 mil nylon-reinforced vinyl sheeting. Plywood underlays the nylon-reinforced plastic on top of the waste stack. A 2 m (6 ft) layer of crushed tuff is the final covering for the waste stack. The 1 m of crushed tuff between waste stacks provides a firebreak.

Pits for non-retrievable TRU waste and non-retrievable uranium and lower-level beta-gamma waste have no special grading or paving. Dempster Dumpsters and other transport are unloaded by driving the

*Less than 5 R/hr at contact.

truck* into the pits. Combustible waste materials are covered with approximately 15 cm (6 in.) of crushed tuff the day they are placed in a pit. Waste is layered in the pits with the last layer at least 1 m (3 ft) below the ground surface. Two m (6 ft) of crushed tuff is mounded over this last layer. Neutron moisture probe access holes in the pits allow monitoring of moisture movement in the pit fill and in the tuff.

"Sensitive material," e.g., tape from C-Division, is disposed of in the uranium and lower level beta-gamma pit. Any material in this category is considered unsuitable for disposal in the county sanitary landfill.

Shafts

Shafts are used for reduction of personnel exposure to external radiation, for better isolation, for better containment, and for more secure disposal of some waste materials. Shafts are filled to within 1.5 m (5 ft) of the ground surface. Then 0.6 m (2 ft) of crushed tuff is placed in them followed by a 1 m (3 ft) thick cement cap.

After waste is placed in a shaft a ground-level measurement with a beta-gamma survey meter is made. Crushed tuff is shoveled into the shaft until a reading of 100 m R/hr, at ground level, is reached. If the ground-level reading cannot be reduced to 100 m R/hr, the shaft is posted with a high-level radiation warning sign. A ground-level reading of 500 m R/hr is not tolerated. There is a limit of 500 g/shaft of fissile material.

Unlined shafts 0.6 m (2 ft) and 0.9 m (3 ft) in diameter and 7.6 m (25 ft) deep receive contaminated animal tissue, contaminated classified material, contaminated chemicals, and high-level beta-gamma waste. Animal tissue is placed in the shafts to isolate it from scavengers. Shaft disposal is preferred for contaminated classified material because if it were placed in a pit, immediate covering with 1 m (3 ft) of crushed tuff or physical surveillance until covering took place would be required. Contaminated chemicals are placed in shafts for better isolation from other waste materials. Shaft disposal for higher level (greater than 5 R/hr at contact) beta-gamma waste is for personnel safety. The lead transport container truck backs directly over a shaft. The trapdoor is opened remotely allowing the waste canisters to fall through the truck bed into the shaft (see Fig. APF-5).

Extremely high-level fission product waste (which could also contain plutonium) is placed by means of the lead transport container truck in 0.3 m (1 ft) cement-lined shafts 0.3 m (1 ft) in diameter and 7.6 m (25 ft) deep. The 0.3 m (1 ft) cement lining is provided primarily for added containment of fission product activities. Cement-lined shafts of the same type have also been used for disposal of extremely large quantities of tritium contaminated waste which were sealed in the shafts with asphalt.

Shafts 1.8 m (6 ft) in diameter and 18 m (60 ft) deep have been used for disposal of contaminated oil and tritium waste. The shafts for tritium waste have, until May 1976, been asphalt coated; however, recent investigation has shown this not to be as beneficial as hoped for in the containment of the tritium. Waste drums are lowered, not dropped, into these shafts. They are also used for non-retrievable TRU waste (mixed with cement) from the TA-21 Liquid Waste Treatment Plant as are 2.4 m (8 ft) diameter, 18 m (60 ft) deep shafts.

Trenches

Trenches are used for retrievable storage of ^{238}Pu waste. A large quantity of high gamma-active ^{238}Pu waste is planned to be placed in this storage. Much of the ^{238}Pu waste prior to 1973 was sent to Savannah River Plant as scrap for storage. A separate retrievable storage facility was considered necessary for this waste because it has higher levels of penetrating radiation and significant nuclear heating and radiolytic gas formation from the ^{238}Pu .

*The truck is monitored by H-7 personnel after it has dumped its waste.



*Fig. APF-5.
Lead transport container truck backing over shaft.*

Twenty casks in 2 rows are placed in the trenches so that the casks are 1 m (3 ft) below the ground surface and are separated from each other by approximately 0.3 m (1 ft) of crushed tuff. Each array of twenty casks is separated from the next array by 1.5 m (5 ft) of crushed tuff.

The casks, 0.6 m (2 ft) (inside) diameter and 2 m (6 ft) high, are reinforced concrete with 7.6 cm (3 in.) thick side walls and 15.2 cm (6 in.) thick bottoms. Each cask holds two 115 l (30 gal) steel drums with a maximum of 40 g ^{238}Pu /drum or 200 g ^{238}U /drum.

When an array has been filled, corrugated, galvanized, metal sheeting is placed over the cask lids to facilitate recovery by preventing crushed tuff from filling the spaces around the lids. Then a 1 m (3 ft) thick layer of crushed tuff is used to cover the array.

Monitoring of the retrievable storage trenches is by array. At each end of an array access tubes are inserted beneath the metal sheeting for air sampling. At one end of an array access tubes are inserted beneath the metal sheeting for air sampling. At one end of an array a neutron moisture probe access tube is placed. Casks adjacent to this access tube have temperature sensors placed on the outside wall near the base of the cask and inside a waste drum within the cask.

In Array 1 of Trench A four waste drums and the four casks in which they are implaced have had copper tubes connected to them (that extend above the surface) in order to determine the amounts and types of radiolytic gases formed and their diffusion rate out of the drums, and into the casks. It may be

possible to determine the radiolytic gas diffusion rate out of the casks and into the airspace surrounding the cask lids. The same monitoring set-up has been done for two waste drums in two casks in Array 5 of Trench B.

RECORDS

All waste taken to Area G is recorded on a LASL Radioactive Solid Waste Disposal Record Form (see Fig. APF-6). This form requires the signatures of the waste generator, H-1 area representative, group leader (as necessary) and H-7 waste management representative. It records waste volume, waste radioactive content in either grams or curies, waste matrix, waste generator, and waste disposal location and date. This information is computer stored.

Prior to the disposal of capital equipment, a group fills out a Form (252-R), Condemnation and Disposal of Classified and/or Contaminated Government Property. The Form records the item description, its serial and government property number, the group to whom it is charged, and the monitoring results of the Health Physics Surveyor. The Health Physics area representative indicates on the Form how the item should be disposed. The Form is then sent to the Health Physics group office for certification. After certification the Form is mailed to the ERDA Fiscal Management and Property Office where it is counter-signed. Then the Form is sent to the H-7 Waste Management Group. Upon receipt of the Form, H-7 personnel call at the site where the item is located, verify the property number(s) on the Form, pick up the material and take it to the disposal area. The ERDA Fiscal Management and Property Office has the right to witness actual disposal and H-7 Waste Management always calls the ERDA office prior to pending disposals. After the disposal has been completed and the Form is signed by H-7 Waste Management, it is forwarded to SP-2 Group Office where the individual copies of this Form are returned to the people entitled to them. After completion of the Property disposal operation, the H-7 area representative will make an entry in an LA Notebook of this disposal operation which includes the item's description, serial number, and property number, its disposal location, the serial number of the Form (252-R), and the serial number of the LASL Radioactive Solid Waste Disposal Form, and signs and dates the disposal. Frequently, H-7 Waste Management is asked to verify the disposal of a government property numbered item.

Every pit and shaft has an identification sign and pits also have numbered reference posts along a side so that location of waste materials can be recorded by pit number, layer number and reference post number.

The pit and trenches for retrievable storage also have identification signs. Waste packages placed in these facilities are serially numbered. In the case of the trenches each drum placed in a cask is numbered and the cask has a permanent plastic identification tag attached to its lid. The permanent plastic identification tag is attached to the waste package stored in the pit. Waste is located in the trench by trench designation and cask location number; waste is located in the pit by layer and reference post number.

All structures within Area G are recorded on engineering survey maps. Covered pits, shafts, and trenches, even when their outlines become obscured by re-vegetation, can be located by their identification signs and engineering survey maps.

ACCESS TO AREA G

Area G is a restricted area. Access is limited to those who are accompanied by an H-7 Waste Management representative. The access gate to the disposal area is kept locked except when that representative is present in the area. Security patrols Mesita del Buey and checks the access gate padlock twice during each of the three eight-hour shifts. H-7 Waste Management would be contacted if Security found the gate unlocked. Since issuance of access gate padlock keys has been severely restricted, there have been few incidences when the gate was left unlocked.

STANDARD OPERATING PROCEDURES

The following SOPs related to health physics and personnel safety can be obtained from H-7 Waste Management:

1. TA-54. Area G, Health Physics Procedures.
2. Use of Dempster Dumpster Containers for Hauling Solid Radioactive Waste to the Disposal Pits.
3. Use of Skip-Type Dempster Dumpster Containers for Hauling Drums Filled with Radioactive Material to Area G, TA-54.
4. Radiological Safety During Covering Operations at the Disposal Pits.
5. Use of Disposal Shafts for Solid Radioactive Waste Disposal.
6. Radiological Safety During Emplacement of 30-Gallon ²³⁸Pu Waste Drums Into Storage Casks at Area G, TA-54.
7. Firefighting at the Solid Radioactive Waste Disposal Area.
8. Truck Drivers in Case of Fire While Transporting Radioactive Waste to the Burial Ground.
9. Standard Operating Procedure Building 257 Waste Treatment Plant.
10. Standard Operating Procedure TA-50 Waste Treatment Plant.
11. Standard Operating Procedure for Disposal of Retrievable and Nonretrievable Cement Paste in Area T, TA-21-257.
12. Standard Operating Procedure for Transfer of Waste from the General's Tanks, Area A, to TA 21-257.

INSTRUCTIONS

Usage

A "LASL Radioactive Solid Waste Disposal Record Form" is required for all radioactive solid waste buried or retrievably stored at the Laboratory. A properly completed Form is needed for each shipment of waste for burial and for each package of retrievable transuranic waste.

General Instructions

- (1) Do not use more than the allotted spaces on the form.
- (2) Data recorded must be printed and legible. The letter "O" should be printed "Ø" to differentiate it from the number zero.
- (3) Positions of decimal points should be noted and followed in all pertaining entries.
- (4) Additional notations as hyphens, slashes, etc. should not be used in entries other than in the two requesting additional information, #6 and #11.
- (5) Use of the zero (0) on the form should be limited only to these entries requiring that numeric designation. The (0) should not be used just to fill in blank spaces on the form.
- (6) Special effort should be made to identify the AMOUNT and ERROR ON AMOUNT entries for each radionuclide identified as present in the waste.
- (7) Where variations in waste package sizes do not allow recording all data on one Form, additional Forms should be used.
- (8) Completed Forms should where possible accompany the waste to the disposal/storage area where they are to be given to the Group H-8 Waste Management Representative. Otherwise, the completed Forms should be mailed to H-8 Waste Management, M.S. 737.
- (9) Each completed Form must be signed by the Waste Generator.
- (10) Each Form requires the signature of an Area H-1 Health Physics Monitor indicating the package or shipment is safe to handle and transport.
- (11) All questions concerning the proper completion of this Form should be made to the Waste Management Section of Group H-8, phone 6695 or 5862.

Specific Instructions

<u>Section</u>	<u>Instruction</u>
5 - Waste Code	All waste needs identification by a three (3) digit description code. Useable codes and descriptions are given in "Waste Disposal Record Form-Attachment I".
6 - Waste Description and 11- Additional Description of Packaging and Packaging Materials	Any non-routine characteristic or special properties of the waste and/or packaging should be described here. Spaces also may be used by the waste generator to provide other necessary data for his or others records. Examples of other information are PN numbers, C & D Form numbers, etc.
9 - Package Radiation	If radiation levels exceed that which can be listed, leave blank and record data in the Section 11 "Additional Description ---" entry. Signs indicating >(greater than) or <(less than) <u>may not</u> be used. Any fractional number should be rounded up to the nearest whole unit.
12- Radionuclide Content (a) Nuclide	Where the waste disposal involves a write-off of accountable materials, or disposal of accountable materials previously written off, the contaminant (s) should be listed by identifying first the element, followed by the "SS Material Type Code," eg. Pu52; U12; U38, etc. Where the waste disposal does not involve an accountable amount of SS-Type Materials, all isotopes should be listed as illustrated: Pu239; U235; MAP (Mixed Activation Products); MFP (Mixed Fission Products); H3; etc. In all cases where more than one contaminant is identifiable, <u>each should be listed</u> (with all appropriate data) on a separate line in section #12. Where more than four(4) entries are required to list contaminants, additional unnumbered Forms should be used for the completion of the Section #12 data.
(b) Amount/Error on Amount	Note that the <u>Amount</u> and <u>Error</u> values are in E-format, with + or - signs required where indicated. Appropriate <u>units</u> need to be identified.

Distribution:

Original - H-8 Waste Management, accompanies waste to disposal/storage area
Copy - Waste Generator

ATTACHMENT II

WASTE DISPOSAL RECORD FORM
 U.S. ATOMIC ENERGY COMMISSION
 SS MATERIAL TYPE CODE

Type Code	Type Description	Type Code	Type Description
	<u>Uranium - Depleted in U-235</u>		<u>Plutonium 242</u>
10	- Total	40	- Total
11	- <0.21% U-235	41	- 20% - 60%
12	- 0.21 to 0.24% U-235	42	- > 60%
13	- >0.24 to <0.26% U-235	44	Americium 241
14	- 0.26 to <0.28% U-235	45	Americium 243
15	- 0.28 to <0.31% U-235	46	Curium 246
16	- 0.31 to <0.50% U-235	47	Berkelium 249
17	- 0.50 to <0.60% U-235	48	Californium 252
18	- 0.60 to <0.711% U-235		
	<u>Uranium - Enriched in U-235</u>		<u>Plutonium 239</u>
20	- Total	50	- Total
21	- >0.711% to <0.90% U-235	51	- <4.00% Pu-240
22	- 0.90 to <1.15% U-235	52	- 4.00 to < 7.00% Pu-240
23	- 1.15 to <1.60% U-235	53	- 7.00 to <10.00% Pu-240
24	- 1.60 to <2.00% U-235	54	- 10.00 to <13.00% Pu-240
25	- 2.00 to <2.60% U-235	55	- 13.00 to <16.00% Pu-240
26	- 2.60 to <2.90% U-235	56	- 16.00 to <20.00% Pu-240
27	- 2.90 to <3.10% U-235	57	- 20.00 and above of Pu-240
28	- 3.10 to <3.40% U-235		<u>Uranium - Enriched in U-233</u>
29	- 3.40 to <3.90% U-235	70	- Total
30	- 3.90 to <4.10% U-235	71	- <5 ppm U-232
31	- 4.10 to <5.00% U-235	72	- 5 to <50 ppm U-232
32	- 5.00 to <10.00% U-235	73	- 50 ppm and above of U-232
33	- 10.00 to <20.00% U-235		
34	- 20.00 to <35.00% U-235	81	Normal U - Total (0.711%)
35	- 35.00 to <45.00% U-235	82	Np-237 - Total
36	- 45.00 to <80.00% U-235	83	Pu-238 - Total
37	- 80.00 to <92.00% U-235		
38	- 92.00 to <94.00% U-235	88	Thorium - Total
39	- 94.00 and above U-235	89	U in Cascade - Total

LASL WASTE CODES

ATTACHMENT I

WASTE DISPOSAL RECORD FORM

<u>Code</u>	<u>Waste Material Description</u>	<u>Code</u>	<u>Waste Material Description</u>
A 10	Graphite	A 50	Metal Crucibles, scrap, dies
A 15	Mixed Cellulosics	A 51	Precious Metals
A 16	Plastic Materials	A 52	Other scrap metals
A 17	Rubber Materials	A 55	Filter Media
A 18	Mixed Paper, Plastic, Rubber, etc.	A 56	Filter Media Residue
A 19	Mixed Combustible/Noncombustible trash	A 60	Other Combustibles
A 20	Hydrocarbon Oils	A 61	Other Noncombustibles
A 21	Silicon Base Oils	A 65	Animal Tissue
A 25	Leached Process Residues	A 70	Chemical Wastes
A 30	PN Equipment	A 71	Be
A 31	Non-PN Equipment	A 72	Hg
A 35	Combustible Building Debris	A 75	Chemical Treatment Sludge
A 36	Noncombustible Building Debris	A 76	Cement Paste
A 40	Combustible Hot-Cell Waste	A 80	Sources
A 41	Noncombustible Hot-Cell Waste	A 85	Firing Point Residues
A 45	Uranium Chips, Turnings	A 90	Contaminated Soil
A 46	Skull and Oxide	A 95	Glass
		A 99	Unidentified Material

Revised 8/13/74

APPENDIX G
RECORDS OF DISPOSALS TO AREA G SHAFTS

EXPLANATION OF APPENDIX G

Appendix G is primarily based upon LA Notebook 12442. The units used here are the same as those used in LA Notebook 12442. Individuals who helped characterize waste listed in Appendix G are:

Earnest Anderson, H-DO	John W. Enders, H-7
Henry Aranda, H-1	William John Smith, H-8
Willie Atencio, H-1	Franklin Miley, CMB-11
Carl W. Buckland, Jr., H-1	Francis Joseph Fitzgibbon, CMB-14
Earl James Cox, H-1	Larned B. (Larry) Asprey, CNC-3
Morris Engelke, Sr., H-1	W. Stanley Hall, L-DOT
John Galimore, Jr., H-1	Myron G. Silbert, P-3
Robert D. Geoffrion, H-1	H. C. (Chip) Britt, P-9
Glenn W. Neely, H-1	Nelson (Bill) Jarmie, P-9
Ronald G. Stafford, H-1	Dwight S. Clayton, SP-2
C. (Conard) W. Christenson, H-7	Bennie E. Duran, SP-2

Terms used in Appendix G are:

Ci → curie	UHTREX → Ultra High Temperature Reactor Experiment
Contam. → contaminated	Vac. → vacuum
D-38 → depleted uranium	Ag → Silver
EBR → Experimental Breeder Reactor	Al → Aluminum
EBR-II → Experimental Breeder Reactor II	Am → Americium
Equip. → equipment	As → Arsenic
Exh. → exhaust	Au → Gold
FP → fission products	B → Boron
GETR → General Electric Test Reactor	Ba → Barium
^3H → tritium	Be → Beryllium
Irr. → irradiated	Bi → Bismuth
LAMPRE → Los Alamos Molten Plutonium Reactor Experiment	C → Carbon
LAPRE-II → Los Alamos Power Reactor Experiment II	Ce → Cerium
μ → micro = 10^{-6}	Cf → Californium
m → milli = 10^{-3}	Cl → Chlorine
Misc. → miscellaneous	Cm → Curium
Neut. → neutralized	Co → Cobalt
NRDS → Nuclear Rocket Development Station	Cr → Chromium
OWREX → Omega West Reactor Experiment	Cs → Cesium
PeeWee → part of Rover Program	Cu → Copper
Phoebus → Nuclear Rocket Propulsion Reactor Test	Eu → Europium
PN → property number	F → Fluorine
PTC → plasma thermocouple	Fe → Iron
RaLa → radioactive lanthanum	H → Hydrogen
Rover → reactor program	He → Helium
Soln. → solution	Hg → Mercury
SS → stainless steel	Ho → Holmium
	I → Iodine
	Kr → Krypton

La → Lanthanum
Li → Lithium
Mn → Manganese
N → Nitrogen
Na → Sodium
Ni → Nickel
Np → Neptunium
O → Oxygen
P → Phosphorus
Pa → Protactinium
Pm → Promethium
Po → Polonium
Pr → Praseodymium
Pt → Platinum

Pu → Plutonium
Ra → Radium
Sc → Scandium
Sr → Strontium
Ta → Tantalum
Th → Thorium
Tl → Thallium
Tm → Thulium
U → Uranium
V → Vanadium
W → Tungsten
Yb → Ytterbium
Zn → Zinc
Zr → Zirconium

3-504V

APPENDIX G

Area G - Shaft 1

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
4/21/66	Pu contam. Irr. Na loop							1								
5/6/66	Books														2	
7/22/66	Fuel element end boxes			2												
8/2/66	⁹⁰ Sr waste	1														
8/2/66	Cell filters	2	<1													
8/4/66	²⁴¹ Am							0.01								
8/10/66	Irr. Ta					1	3									
8/15/66	Cell trash	2														
8/15/66	Cell trash	2	2													
8/21/66	Irr. metal	2														
8/23/66	Documents														1	
8/24/66	⁹⁰ Sr waste	2	1													
8/24/66	Pu trash		1					1								
8/25/66	Irr. Pu waste		2.5					2								
8/26/66	³ H waste + ²² Na									1						
8/30/66	⁶⁰ Co waste					2										
9/6/66	D-38											0.5				
9/14/66	²³⁷ Np foil							0.1	0.199							
9/14/66	Irr. Pu							0.1	>1							
9/14/66	End boxes			1												
9/16/66	Pu,Ce,Co waste		1.5					2								
9/19/66	Irr. steel			0.1												
9/22/66	⁶⁰ Co					0.1	4									
9/22/66	¹³⁷ Ce					0.1	0.5									
9/26/66	Po sources					0.1										
9/27/66	Irr. Pu		150					2								
9/27/66	²² Na							1								
10/5/66	Pu contam. ³ H waste									0.4						

APPENDIX G

Area G - Shaft 1 (continued)

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
10/7/66	Cell waste	2	<1													
10/25/66	Irr. metal			1	<1											
10/27/66	Irr. metal	1	<1													
10/31/66	Pu contam. Na holding tanks							2								
11/1/66	Contam. Pu disk							1								
11/2/66	D-38 + Th											3				
11/2/66	Activated film					1										
11/7/66	Cell filter	3	<1													
11/8/66	Irr. Al			0.2	<1											
11/9/66	³ H waste									3	150					
11/9/66	³ H waste									1						
11/16/66	End boxes			1												
11/18/66	³ H waste									1						
12/5/66	Irr. metal	5														
12/15/66	³ H contam. glass									0.1						
1/9/67	³ H contam. oil									0.1						
1/9/67	D-38												1			
1/13/67	End boxes			1												
1/18/67	⁶⁰ Co source							0.1	2							
1/20/67	²³⁵ U metal											4	254			

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft #2 (continued)

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
4/17/67	²³⁵ U + FP waste		<1									2	1			
4/24/67	H-1 record books															1
5/10/67	Metal slugs ²³⁸ U											0.1				
5/15/67	⁵⁷ Co,La waste			0.1	1											
6/9/67	Pu,Np,D-38 foils							0.1								
6/12/67	²³⁸ U chips											1				
6/13/67	Radioactive material											1				

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft #3

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
4/21/66	Pu contam. Na loop							1								
1/31/67	Pu contam. Na		200					2								
1/31/67	Irr. metal	2														
1/31/67	Pu contam. Na		8					2								
2/2/67	Unloaded fuel elements	1														
3/30/67	²³⁹ Pu contam. squibbs							1	146							
4/12/67	Irr. thermo-couple			0.1	0.8											
4/12/67	Pu contam. metal							6								
5/11/67	Irr. metal	2	2													
5/31/67	²³⁹ Pu contam. metal							6								
7/20/67	¹⁰ B-lined neutron tube			1												
7/21/67	D-38											1				
8/4/67	Neutron generators									6						
8/15/67	Irr. Ta					0.01	0.5									
8/23/67	Cell waste ²³⁵ U + FP	0.04	5													
8/25/67	Cell waste ²³⁵ U + FP	1.5														
8/28/67	D-38											1.5				
8/29/67	Irr. metal	1.5														
10/16/67	U contam. Ni slugs											0.1				
10/26/67	Old sources															0.1
11/1/67	D-38 + ²³⁵ U											1.5	46			
11/9/67	Irr. metal	0.05	0.01													

Shaft = 2 ft diam · 25 ft deep - unlined.

Area C - Shaft #4

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
4/5/67	Control rods			4	6											
5/31/67	²³⁹ Pu contam. metal							2								
6/1/67	U contam. metal											3				
6/7/67	Pu & Ta cell trash		1					1								
6/14/67	Animal tissue	1														
6/16/67	²³⁸ Pu waste							1								
6/21/67	Pu contam. cell waste		1					1								
6/26/67	²³⁸ U samples											2				
6/26/67	²³⁸ U samples											1				
7/19/67	⁶⁰ Co, ¹³⁷ Cs, ²³⁵ U & ²³³ U sources		1									2	<0.1			
7/26/67	Pu, U, Cm, Np & Th sources		<1					1	105 m ²³⁹ Pu 2.97 m ²⁴⁰ Pu 50 μ ²⁴¹ Pu 6 m ²³⁷ Np 2.9 μg ²⁴⁴ Cm			272 m ²³³ U 1.26 m ²³⁴ U 1.5 m ²³⁶ U		0.57 m ²³⁰ Th		
7/31/67	Animal tissue	1														
8/4/67	Neutron generators									20						
8/11/67	²³⁹ Pu contam. ²³⁵ U											0.5	465			
9/14/67	End boxes			1	1											
9/29/67	Cell trash							1								
10/5/67	Cell filters	0.5														
1/2/68	D-38											2				

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft #5

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
6/7/67	Pu contam. Na loop							1								
8/7/67	Cell trash							2	0.5							
8/10/67	End boxes			2												
8/29/67	Irr. metal	3														
10/2/67	²³⁵ U											1	31.7			
10/25/67	²³⁸ U contam. metal											3				
10/30/67	Sample elements		10									1				
10/37/67	Sample elements		10									1				
11/1/67	Sample elements		5									1				
11/27/67	D-38											1				
11/29/67	²³⁵ U contam. BF ₃ chambers											2	<0.001			
11/29/67	²³⁹ Pu foils							3	<0.001							
12/7/67	D-38											1.5				
12/7/67	Alpha source														0.1	
12/11/67	³ H waste										0.1					
12/14/67	²³⁵ U waste											0.1				
1/18/68	³ H contam. equip.										2					
1/22/68	D-38											2				
1/23/68	⁵⁷ Co lab waste						1									
1/26/68	³ H glassware										2					

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft #6

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
6/7/67	Pu contam. Na loop							1								
9/12/67	D-38											1				
10/25/67	²³⁵ U samples											4	460			
1/18/68	²³⁵ U residues											4	472			
2/5/68	³ H contam. vacuum pump									2.5						
2/6/68	Be contam. vacuum pump oil											2				
2/7/68	Cell waste							1.5								
2/8/68	³ H "trap"									2	300					
3/4/68	D-38												0.5			
3/7/68	Animal tissue	2														

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 7

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Co	Ft ³	g	Ft ³	g	Ci
6/7/67	Irr. metal 239Pu							1								
2/9/68	Graphite stringer			1												
2/12/68	Be contam. oil												1			
2/12/68	32P waste					0.5										
2/15/68	End boxes			2												
2/15/68	235U contam. P ₂ O ₅												1			
2/16/68	3H waste									0.1						
2/26/68	Irr. metal			0.1												
3/7/68	Animal tissue	3														
3/25/68	Irr. metal + Na waste			3												
3/29/68	D-38												2			
4/2/68	Animal tissue	1														
4/3/68	Ta, Pu waste material							4								
4/18/68	235U + 238U waste												1			
4/22/68	Irr. metal	2														
4/23/68	End boxes			1												
5/6/68	OWREX waste	2	10										2			
5/7/68	D-38												2			
5/8/68	PTC waste		0.011										2	0.8065		
5/8/68	PTC waste		9										2			
5/8/68	235U, 233U, 239Pu, 252Cf sources		0.07					1	0.03							
5/13/68	Th + U waste												2			
	U waste									3						
													1			

Area G - Shaft 7 (continued)

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
5/23/68	³ H contam. pump									2	5200					
6/24/68	²³⁰ Th, ²³² Th, ²³⁵ U, ²³⁸ U, Pu sources							1								
6/24/68	³ H waste									1						
7/10/68	D-38											2				
7/15/68	U contam. metal											1				
7/15/68	Fuel pins											1	1.5			
7/23/68	²³⁸ Pu foils							1	2.3 m							
7/31/68	D-38											2				
7/31/68	³ H waste									2						
9/6/68	D-38											1				
9/6/68	D-38											1				
9/19/68	³ H waste									2						

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 8

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
4/22/68	²³⁵ U residue											12	396			
5/14/68	Irr. Al			1												
5/14/68	Be contam. waste	4														
5/20/68	Irr. metal			3												
5/24/68	Phoebus 1-B hardware			1												
7/1/68	End boxes			1	1											
8/9/68	²³⁵ U waste											2				
8/13/68	End boxes			1	1											
8/14/68	²³² U contam. equipment											2				
8/26/68	²³⁵ U contam. graphite											2				
9/11/68	²³⁹ Pu cell waste + FP							1								
9/12/68	End boxes			1	1											
9/19/68	³ H lab waste									2						
9/22/68	Hot cell waste	2						2								
10/1/68	Animal tissue	2														
10/8/68	Animal tissue	30														
10/8/68	Animal tissue	10														
10/10/68	Al containers	1														
11/25/68	Th waste													1	150	
12/2/68	²³⁵ U, ²³⁹ Pu waste							6								
12/3/68	²³⁵ U cell waste											1				
12/5/68	²³⁵ U cell waste											1				
12/9/68	Pu cell waste							2								
12/11/68	Pu cell waste							2								
12/17/68	FP waste	6						6								
1/7/69	D-38											0.2				
1/14/69	Metal canisters							0.4								
1/15/69	Be + ²³⁸ U contam. solvents											2				

Shaft = 2 ft diam x 25 ft deep - unlined.

Area C - Shaft 9

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic	Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci		Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
6/17/68	Hot cell waste	2													
10/17/68	EBR-II waste	9													
10/31/69	⁶⁰ Co					1									
12/19/68	End boxes			1											
12/23/68	³ H waste								2						
12/31/68	Irr. Al + graphite			0.5	5.0										
1/3/69	²³⁹ Pu cell waste							6							
1/6/69	²³⁹ Pu cell waste							2							
1/8/69	²³⁹ Pu cell waste							4							
1/28/69	⁶⁰ Co, ¹³⁴ Cs, ¹³⁷ Cs, ¹⁵² Eu, ²³¹ Pa, ⁶⁵ Zn, ²³⁹ Pu, ²⁴⁰ Pu, ²⁴¹ Pu, ²³³ U, ²³⁵ U, ²³⁸ U sources		0.613					3	8.268 m ²³⁹ Pu 0.002 m ²⁴¹ Pu 0.577 m ²⁴⁰ Pu		18.3 m ²³⁵ U 0.332 m ²³⁸ U 0.1315 m ²³³ U				
1/29/69	²³⁹ Pu cell waste							3							
1/29/69	End boxes			1											
2/6/69	²³⁹ Pu cell waste							2							
2/11/69	Thermocouple			0.1											
2/12/69	²³⁹ Pu cell waste							3							
2/24/69	²³⁹ Pu cell waste							2							
2/26/69	Fuel elements										22				
3/18/69	Fuel elements			1											
4/3/69	Animal tissue	3													
4/9/69	Unloaded graphite	2													

Shaft = 2 ft diam x 25 ft deep - unlined.

Area C - Shaft 10

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
2/26/69	Fuel elements											12				
3/7/69	D-38 waste											2				
3/7/69	Animal tissue	8														
3/27/69	²³⁵ U waste											4	127			
4/9/69	PeeWee graphite rods	2														
4/10/69	²³⁹ Pu cell waste							2								
4/11/69	²³⁹ Pu cell waste		<1					3								
4/15/69	²³⁹ Pu cell waste							2								
4/16/69	²³⁵ U contam. chemical											5	1			
5/8/69	D-38											2				
5/8/69	Po-Be neutron source			0.5												
5/12/69	D-38 waste											1				
5/14/69	³ H lab waste									0.5						
5/20/69	Pu contam. Ag							0.5								9 098.9 (Ag) 17.9 (Ag 82%) 41 (Ag 71.9%)
5/23/69	He container									3						
7/8/69	U acid solution											0.5				
7/16/69	²³⁸ U chips											1				
7/25/69	Be contam. metal											2				
8/12/69	³ H contam. U											1				
8/12/69	³ H contam. glassware									1						
8/25/69	³ H contam. lab. waste									1						

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 11

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
1/30/67	²³⁸ U contam. waste											1.5				
2/3/67	³ H contam. waste									3						
4/17/69	Pu cell waste							2								
4/18/69	PeeWee unloaded graphite	2														
4/18/69	PeeWee unloaded graphite	2														
4/18/69	PeeWee SS support rods	2														
4/21/69	Animal tissue	4														
4/21/69	Pu, U sample vials							3	2							
4/22/69	Pu cell waste							2								
4/22/69	PeeWee FP waste	2														
4/22/69	PeeWee FP waste	2														
5/1/69	Irr. ²³⁵ U sample											0.01	230			
5/1/69	Irr. ²³⁵ U cell waste											2				
5/2/69	Irr. ²³⁵ U cell waste											2				
5/9/69	Irr. graphite rods	1														
5/9/69	Irr. SS rod	0.5														
5/19/69	End boxes			1												
5/23/69	Animal tissue	3														
6/2/69	Thermocouple + Cr			0.5												
6/18/69	PeeWee end rods + Pu waste							3								
6/20/69	PeeWee FP trash	2														
6/24/69	Thermocouples	0.5														
6/24/69	Cell filters	2														
6/25/69	²³⁵ U residues											5	221			
7/1/69	End boxes			1		1										
7/2/69	Rover waste	2	1													

Area G - Shaft 11 (continued)

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
7/15/69	²³⁵ U waste												2			
8/6/69	PeeWee hardware	1														
8/12/69	³ H glassware									1						
8/15/69	Sample holders			1	<1											
8/28/69	Graphite rods	4														
9/3/69	End boxes			1												
9/8/69	Irr. graphite	4														
9/11/69	U hydride & tritide												1			
9/11/69	Pu contam. Na							1								
9/15/69	D-38												0.5			
9/16/69	³ H waste									2						
11/11/69	⁵⁷ Fe + ⁶⁰ Co waste			1												

Shaft = 3 ft diam x 25 ft deep - unlined.

Area G - Shaft 12

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
7/29/66	³ H contam. glassware									2						
5/16/69	²³⁵ U residues											18	288			
6/16/69	Pu cell waste		30					1								
7/2/69	Rover waste	6	1													
8/20/69	²³⁵ U residues											10	357			
8/26/69	Irr. sample holders			2												
9/8/69	Irr. graphite PeeWee	4														
9/9/69	Cell waste	2														
9/10/69	Cell waste	4														
9/16/69	Al sample holders			1	5											
9/22/69	Animal tissue	2														
9/24/69	³ H waste									1	5					
10/2/69	End boxes			1												
10/8/69	³ H containers									3	9.5					
10/8/69	³ H cylinder									1	4.5					
10/29/69	Irr. SS tube			1												
11/4/69	²⁴³ Cm, ²⁴⁴ Cm, ²⁴³ Am							0.5	0.1 (²⁴³ Am)							
11/13/69	End boxes			1												
11/17/69	³ H waste									2						
12/1/69	Irr. SS tube							1								
1/15/70	End boxes			1	1											
2/4/70	Old targets + actinides							1								
2/17/70	ThO ₂														2	
2/20/70	Pu lab waste							4	0.001							
2/25/70	Pt contam. lab. glassware														2	
2/26/70	Lab waste							5	<0.01							

Area G - Shaft 12 (continued)

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>
3/4/70	240Pu							2	0.148							
3/9/70	D-38												2			

Shaft = 3 ft diam × 25 ft deep - unlined.

Area G - Shaft 13 (continued)

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>
2/13/70	Pu contam. waste		0.01					1								
2/20/70	SS metal with Be			12												
3/3/70	²³⁹ Pu contam. trash		12					0.5								
3/3/70	Ra source													2		0.100
3/5/70	End boxes			1	0.1											
3/9/70	Metallographic samples		3.5					2	4							
3/18/70	D-38 with ³ H									3	0.00087					
3/18/70	Hot cell waste		5									3	396			
3/18/70	Hot cell waste		8									3				
3/19/70	Hot cell waste		1									2				
3/19/70	Hot cell waste		3									2				
4/22/70	³ H lab waste									1						
5/7/70	⁶⁰ Co source					0.1	2.2									
5/21/70	Old records														2	
5/22/70	Reactor parts			6												
5/25/70	Fuel elements											12				

Shaft = 3 ft diam × 25 ft deep - unlined.

Area G - Shaft 14

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
9/21/67	Ce waste					0.8										
5/8/68	Neut. acids + NaOH		0.525									2	0.221			
5/8/68	Neut. acids + NaOH		5.4									2	14.7			
5/14/68	²³⁵ U solution in vermiculite											3	0.002			
10/8/68	²³⁵ U solution in vermiculite											2				
10/8/68	²³⁵ U solution in vermiculite											2				
10/9/68	²³⁵ U solution in vermiculite											2				
10/9/68	²³⁵ U solution in vermiculite											2				
11/13/68	²³⁵ U solution in vermiculite											2	0.2			
12/2/68	Pu contam. ²³⁵ U solution in vermiculite							1								
8/6/69	²³⁵ U precipitate in vermiculite											4	0.5			
9/10/69	Neut. solution HCl + ²³⁵ U											4	0.56			

Shaft = 1 ft diam x 25 ft deep - concrete lined.

Area G - Shaft 15

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic	Tritium		Uranium		Other				
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci		Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
11/25/69	³ H in H ₃ PO ₄								4	17 500							
6/16/70	Hot cell waste		4									0.8					

Shaft = 1 ft diam × 25 ft deep - concrete lined.

Area G - Shaft 16

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic	Tritium		Uranium		Other				
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci		Ft ³	g	Ft ³	Ci	Ft ³	g	Ci		
11/25/69	³ H								4	17 500							

Shaft - 1 ft diam × 25 ft deep - concrete lined.

Area G - Shaft 17

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic	Tritium		Uranium		Other				
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci		Ft ³	g	Ft ³	Ci	Ft ³	g	Ci		
3/30/70	³ H pump								3	20 244							
7/9/70	Neut. acids											1	0.1429				
7/10/70	²³⁵ U neut. acid											0.2	0.05				
8/13/70	²²⁶ Ra contam. Pt scrap															0.01	671.7 g (Pt)
9/28/70	²³⁵ U in Na		0.12									0.8					
9/29/70	²³⁵ U in Na		400									0.4	0.1				
10/27/72	¹⁴⁷ Pm, ²⁰⁷ Bi, ¹³⁷ Cs, ⁶⁵ Zn, ⁵⁷ Co, ²³⁵ U		0.142									1	0.001				
10/27/72	⁹⁰ Sr, ¹⁵²⁻¹⁵⁴ Eu, ²³⁶ U		0.142					1					0.009				
10/27/72	²⁴¹ Am, ²³⁵ U, ²² Na, ²⁴ Na, NaI, Pr, ²³⁸ U, ²³⁹ Pu		0.142					1	0.202								
12/7/72	irr. ²³³ U metal		3.9									1	418				

Area G - Shaft 17 (continued)

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
3/24/71	Fuel residues		0.33					0.2	2.9				10.6			
12/2/74	Cell waste		0.01					2								

Shaft = 1 ft diam × 25 ft deep - concrete lined.

Area G - Shaft 18

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
7/13/70	Neut. Na		22										0.4			
10/26/70	Neut. Na		0.1										2			
11/25/70	Neut. Na			3	30											
3/10/71	²³⁸ Pu contam. Pt scrap							0.01	0.014							372.6 g (Pt)
6/10/71	Neut. Na		16					0.2								
11/16/71	Neut. Na		35										0.5			
10/17/72	¹³⁷ Cs + ¹⁴⁰ Ba	1	0.004													
10/17/72	¹³⁷ Cs	2	0.003													
10/17/72	⁶⁰ Co					2	0.05									
2/9/73	Mineral oil	0.6	0.6													
3/2/73	Mineral oil		10 μ Ci					0.9								

Shaft = 1 ft diam × 25 ft deep - concrete lined.

Area G - Shaft 19

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
10/21/71	²³⁵ U residue											1	10.97			
5/3/73	²³⁹ Pu solution in vermiculite		0.3					9								
1/16/74	²³⁹ Pu solution in vermiculite							1								
4/4/74	Reacted Na, ²³⁹ Pu + FP		0.05					6.5								
4/26/74	Sorbed Dowanol, ²³⁹ Pu		<0.1					5	<0.1							

Shaft = 1 ft diam × 25 ft deep - concrete lined.

Area G - Shaft 20

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
5/29/74	Dowanol in vermiculite (²³⁹ Pu)		<0.1					1.5								
12/2/74	Sorbed ²³⁹ Pu solution		0.01					5								
6/12/75	Ethanol in vermiculite (²³⁹ Pu, ²³⁵ U)		0.005					0.2								
6/12/75	Sorbed liquids (²³⁹ Pu, ²³⁵ U)		0.015					0.9								

Shaft = 1 ft diam × 25 ft deep - concrete lined.

Area G - Shaft 21*

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>		<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>

Shaft = 1 ft diam x 25 ft deep - concrete lined.

*Not in use as of 7/14/76.

Area G - Shaft 22*

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>		<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>

Shaft = 1 ft diam x 25 ft deep - concrete lined.

*Not in use as of 7/14/76.

Area C - Shaft 23*

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>	<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>

Shaft = 1 ft diam x 25 ft deep - concrete lined.

*Not in use as of 7/10/76.

Area G - Shaft 24

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
9/3/69	²³⁵ U (52%)											0.5	311			
9/3/69	Pu swipes							0.5								
10/31/69	Irr. control rods			1												
5/22/70	Animal tissue	8														
5/22/70	Old records															1
6/1/70	Animal tissue	2														
6/1/70	Animal tissue	2														
6/1/70	Old records															0.01
6/1/70	U residues											4				
6/1/70	D-38											5				
6/1/70	D-38											0.1				
6/18/70	Irr. SS pipe			2												
6/23/70	Irr. thermocouple			1	2							1				
6/23/70	²³⁵ U residue											4	186			
10/1/70	Unloaded fuel elements	8														
10/14/70	End boxes			1	0.4											
10/16/70	Pu contam. metal				0.0665				3							
10/29/70	⁹⁵ Zr, ¹⁴⁴ Ce, ¹³⁴ Cs, ¹³⁷ Cs	0.01														
12/8/70	Irr. Cu tube				0.01											

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 26

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
12/10/69	²³⁵ U fuel element chips		1									0.5	<10			
4/15/70	²³⁵ U + D-38											2	100			
4/15/70	Fuel elements	10														
4/29/70	Irr. SS tube															
4/29/70	Na, ¹³⁷ Cs, Pu contam. pipe		0.01					1								
5/1/70	¹³⁷ Cs, ⁹⁰ Sr sources + rat bones	0.01	0.001													
5/4/70	Hot cell trash		1									4	2			
5/5/70	Hot cell trash		0.015									0.8	3			
5/5/70	D-38 contam. metal											21				
5/6/70	²³⁵ U hot cell trash		0.5									0.2				
5/12/70	²³⁵ U + ²⁴² Pu		0.12					0.1	0.03							
5/14/70	D-38 contam. metal											0.4				
5/20/70	Old sources													8	40	
6/2/70	⁹⁰ Sr waste	0.01	<0.1													
6/23/70	²³⁵ U residue											8	137			

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 25

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
9/29/69	D-38 & ²³⁵ U(3%)											4	100			
12/8/69	²³⁸ Pu contam. Pt							0.5								357.8(Pt)
1/6/70	²³³ U foil											0.5	0.002			
3/23/70	Irr. SS tube			1	5											
3/25/70	End boxes			1	0.24											
4/1/70	Fuel elements, ²³⁵ U + FP											1	2			
4/1/70	Fuel elements ²³⁵ U + FP											1	3			
4/6/70	³ H lab waste									1						
4/6/70	D-38											1				
4/6/70	²³⁵ U residue											6	216			
4/7/70	Hot cell trash															
6/10/70	U residue											0.01	1			
6/10/70	Th waste															0.01
6/23/70	²³⁵ U residue											8	149			
10/5/70	Irr. SS			4												
11/25/70	End boxes			1	0.45											
11/25/70	Irr. steel			2												
2/1/71	U contam. metal											2				
2/16/71	²³⁵ U contam. metal											9				

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 28

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
6/23/70	Hot cell waste	0.2	65													
6/29/70	Hot cell waste	0.2	79													
7/1/70	Irr. sample holders			1	14											
7/13/70	GETR hardware	0.2	115													
7/17/70	²³⁵ U residues										12	266				
7/21/70	LA Notebooks															16

Shaft - 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 27

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
5/6/70	Irr. material		0.01					4								
5/14/70	D-38 contam. metal											5				
5/22/70	²³⁵ U, ²³⁹ Pu reactor fuel		5					0.2	3.4							
5/22/70	U, Pu, Co, Ce lab waste		0.2					0.1	11							
5/22/70	²³⁹ Pu hot cell waste		32					0.2								
5/25/70	²³⁹ Pu, ²³⁵ U hot cell waste		22					0.4	57.9							
5/27/70	²³⁹ Pu + FP		0.7					0.4	1							
5/28/70	Irr. Al			0.1												
6/1/70	Manipulator booties	1	0.1													
6/4/70	Hot cell waste		35					0.2	21							
6/30/70	Th waste															0.01
8/20/70	Th waste															0.01
8/25/70	End boxes			1	0.2											

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 31

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic	Tritium		Uranium		Other			
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
9/24/70	²³⁵ U residue										6	141				
10/1/70	²³⁵ U & ²³⁸ U residue		0.001								9	8				
10/20/70	D-38										1.2					
11/13/70	²³⁵ U residue + D-38										3	8				
1/28/71	D-38		4.3								22					
2/16/71	²³⁵ U lab waste										6					

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 29

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
7/9/70	Thermocouple waste		19									2				
7/15/70	²³⁵ U Thermocouple waste		2.5									0.2	2.4			
7/22/70	²³⁹ Pu residue		0.002					3								
7/29/70	²³⁵ U residue											12	281			
7/29/70	²³⁵ U cell filter (charcoal)		1.5									0.2				
7/29/70	²³⁵ U hot cell waste		2									0.2				
8/14/70	Animal tissue	6														
10/9/70	Enriched UC ₂ waste											0.01				
1/20/71	Contam. Li							0.01								

Shaft = 2 ft diam × 25 ft deep - unlined.

Area G - Shaft 30

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
7/28/70	²³⁹ Pu hot cell waste		40.8					0.2								
8/14/70	Animal Tissue	4														
8/24/70	Irr. SS pipe			0.1	<0.1											
9/8/70	²³⁹ Pu hot cell trash		2					0.2								
9/8/70	²³⁹ Pu hot cell trash		4.5					0.2								
9/15/70	²³⁹ Pu hot cell trash		23.9					0.8	5							
9/16/70	²³⁹ Pu hot cell trash		0.33					0.1	0.53							
10/13/70	Irr. Al			2	0.4											
2/16/71	²³⁵ U contam. metal											2				
2/26/70	End boxes			1	0.4											

Shaft = 2 ft diam × 25 ft deep - unlined.

Area G - Shaft 33

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
10/23/70	²³⁹ Pu hot cell waste		5					0.2								
10/26/70	²³⁹ Pu hot cell waste		0.9					0.2								
10/26/70	²³⁹ Pu hot cell waste		2.8					0.2								
10/26/70	²³⁹ Pu metallographic samples		30.6					0.2	25							
10/28/70	²³⁹ Pu hot cell waste		2.15					0.2								
10/30/70	²³⁹ Pu hot cell waste		1.3					0.2								
11/2/70	²³⁹ Pu hot cell waste		4					0.2	45							
11/17/70	²³⁸ Pu lab waste		0.058					4	0.3(²³⁸ Pu)							
12/10/70	Hot cell waste		12.5													
12/10/70	²³⁹ Pu hot cell waste		5					2				2	12.5			
1/14/71	²³⁹ Pu residue							0.6	0.005							
1/15/71	Hot cell waste		0.85					0.2	1				1			
1/19/71	Irr. SS with ²³⁹ Pu							0.6	<0.001							
1/19/71	²³⁹ Pu hot cell waste		8					0.4	2							
1/26/71	Hot cell waste		6.85					0.2	4				5			
1/28/71	Hot cell waste		0.3					0.1	2.6				8.4			
1/29/71	²³⁹ Pu contam. metal		0.02 μ Ci					3								

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 32

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
5/27/70	LAPRE-II lines and valves							6	0.1							
8/11/70	Irr. SS tubing			4												
5/10/71	D-38		0.0001									0.26				
5/10/71	²³² Th													0.26	0.0002	
5/11/71	Lab waste											6				
5/14/71	Th													1	0.01	
5/14/71	Be waste									1.5						
5/17/71	D-38 + ²³⁵ U residue		0.01									3	11			
5/21/71	End boxes			1		0.56										
5/24/71	Be ₂ O ₃											3				
5/27/71	Animal tissue							3								
6/1/71	¹⁷⁰ Tm													0.01	2	
6/10/71	Hot cell waste		0.1					0.2	1							
6/15/71	Cryogenic pump		0.1					0.1								
6/17/71	Hot cell waste		0.01					0.1								
10/7/71	²³⁹ Pu contam. D-38		0.003					3								
10/18/71	ThO ₂ lab waste													0.02		

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 36

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other			
		<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>g</u>	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>g</u>	<u>Ft</u> ³	<u>g</u>	<u>Ci</u>	
6/9/70	LAPRE-11 tank																63

Shaft - 3 ft diam x 40 ft deep - unlined.

Area G - Shaft 34

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
2/3/70	235 _U + 239 _U contam. oil											161.02				
2/3/70	Oil from SM-30											73.6				
6/22/70	Ra source														7.36	
6/22/70	Contam. oil														14.72	
8/12/70	Contam. oil														125.12	
5/11/71	Contam. oil (SM-30)											102.04				
5/24/71	Contam. oil											7.36				
9/24/71	U contam. oil (SM-66)											213.44				
2/24/72	U contam. oil (SM-30)											51				
3/21/72	U contam. oil (SM-39)											153.9				
4/19/72	U contam. oil (SM-39)											22				

Shaft = 6 ft diam x 60 ft deep - unlined.

Area G - Shaft 35

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
9/7/71	UHTREX filter	4														
10/21/71	FP	5.3	<0.1													
1/13/72	239 _{Pu} contam. metal		0.039					29								

Shaft = 3 ft diam x 40 ft deep - unlined.

Area G - Shaft 38

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>
6/9/70	LAPRE-II tank												63			
2/1/74	Rover reactor parts		<1										3			

Shaft = 3 ft diam x 40 ft deep - unlined.

Area G - Shaft 37

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other			
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci	
6/9/70	LAPRE-11 tank																63

Area G - Shaft 39 (continued)

FF-DIV

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
5/10/73	³ H contam. oil									8	0.1					
5/14/73	UT ₃ , UH ₃ , UD ₃									1						
5/21/73	³ H lab waste									0.1						
7/26/73	³ H lab waste									1	5					
8/13/73	³ H contam. metal									1	0.002					
10/26/73	³ H contam. pump and oil									1						

Shaft = 6 ft diam × 60 ft deep - unlined.

Area G - Shaft 40

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
3/5/71	Animal tissue							3								
3/5/71	²³⁸ U oxide		0.054										3			
3/10/71	D-38 metal												2			
3/24/71	Fuel elements + end boxes			1	0.4											
3/24/71	Fission chamber	0.01	20													
4/16/71	Animal tissue							12								
4/22/71	Be contam. lab trash							3								
4/22/71	Contam. metal							2								
4/26/71	²¹⁰ Po source					1.5	0.08									
5/6/71	⁶⁰ Co, ⁵⁴ Mn sources			0.01	0.001											

Shaft = 2 ft diam × 25 ft deep - unlined.

Area G - Shaft 39

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
8/11/70	Na + Pu LAMPRE parts							15								
11/30/70	Be + steel			15	0.002											
12/28/70	³ H waste									3	572					
2/1/71	³ H waste									1.5	91					
2/1/71	³ H waste									1.5	6344					
2/1/71	³ H waste									2						
6/1/71	Pu contam. Na loops							4								
6/7/71	Be + Hg			3	0.025											
6/16/71	³ H lab waste									0.1	1					
9/24/71	³ H lab waste									2						
11/8/71	Irr. SS pipe			3												
4/4/72	³ H contam. blower									2						
11/2/72	³ H contam. glassware									12	250					
11/15/72	³ H contam. Cu tubing									2	0.001					
11/27/72	³ H contam. pumps									88	110					
11/27/72	³ H contam. pumps, etc.									144	40					
12/13/72	³ H contam. D-38									8	39					
12/13/72	³ H contam. D ₂									16	1560					
12/21/72	³ H contam. lab equip.									8	<1			91.9 (Au)		
2/27/73	³ H contam. metal									168						
3/2/73	³ H contam. glassware									8	10					
4/3/73	³ H waste									2	100					
4/30/73	³ H contam. pumps									16						
5/7/73	³ H lab waste									1						

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Area G - Shaft 42

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
1/16/71	Hot cell waste		8					0.2	1							
3/16/71	Hot cell waste		38					0.2								
3/16/71	Manipulator booties		0.3					0.2								
7/12/71	Animal tissue							2								
9/24/71	¹⁸² Ta + scrap			0.01	0.01											
10/7/71	Animal tissue							14								
10/8/71	End boxes			1	0.032											
11/3/71	²³⁵ U contam. graphite											5				
11/4/71	Animal tissue							14								
12/15/71	U contam. metal											14				
3/17/72	D-38 contam. graphite											2	50(D-38)			
3/27/72	Sample holder			0.1												
8/31/72	Animal tissue							2								
10/25/72	End boxes			1	0.4											

Shaft = 2 ft diam × 25 ft deep - unlined.

Area G - Shaft 41

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
3/12/71	²³⁵ U (93%) residue		0.409									27	240			
4/1/71	Irr. SS wire			0.01		0.002										
6/15/71	Animal tissue							4								
6/17/71	⁶⁰ Co + ⁵⁴ Mn lab waste			0.1		0.001										
6/22/71	³ H contam. lab waste									2	10					
6/23/71	End boxes			1		0.4										
6/28/71	Irr. SS + B			0.2		20										
7/1/71	Animal tissue							8								
7/1/71	D-38											4				
7/12/71	Animal tissue							1								
7/22/71	²³⁵ U (10%) residues											2	33.8			
7/30/71	Animal tissue							10								
10/7/71	Anion resin		0.001									2				
11/1/71	H ₂ F ₂ contam. Hg														0.02	
11/3/71	²³⁵ U contam. graphite											8				
8/31/72	Animal tissue							2								

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 43 (continued)

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
6/26/72	Contam. Pt							0.2								52.9 (Pt)
8/3/72	Animal tissue							2								

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 44

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
8/25/71	Contam. metal			8												
9/1/71	D-38 + ²³⁵ U											2	666(²³⁸ U) 74(²³⁵ U)			
9/20/71	Hot cell waste		12					1								
9/20/71	Metallographic samples		14.7									1	11			
9/22/71	²³⁹ Pu contam. vermiculite		<1					6								
12/30/71	Hot cell waste		9.3					0.5	81							
1/6/72	Hot cell waste		3.5					0.5	11.4							
1/6/72	Animal tissue							16								
1/13/72	D-38		0.003									3				
1/13/72	²³⁵ U metal											1	28			
3/17/72	D-38 + graphite											4	50(D-38)			
3/20/72	D-38 + graphite											12				
3/21/72	Irr. D-38		0.5									0.1				
4/4/72	Animal tissue							4								
6/13/72	²⁴⁴ Cm		0.06					0.1								
8/3/72	Animal tissue							2								
8/3/72	U contam. metal											0.1				

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 43

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
7/1/71	Animal tissue							1								
7/1/71	Th															3
7/26/71	²³⁸ U scrap		0.00096									2	2900			(²³⁸ U)
8/2/71	²³⁵ U (93%) residue		0.000195									1	116			
11/4/71	Animal tissue							2								
11/15/71	Activated metal			0.01												
12/15/71	U contam. metal											16				
1/19/72	⁶⁰ Co + ¹⁷⁵ Yb lab trash			1	0.01											
1/24/72	²³⁹ Pu, ²⁴¹ Pu, ²⁴² Pu, ²⁴³ Pu, ²⁴³ Am, ²³³ U, ²³⁶ U, ¹⁶⁶ Ho, ⁶⁰ Co, ¹³⁷ Cs sources		0.521					0.02	3 m ²³⁹ Pu 6.53 m ²⁴¹ Pu				6.52	m		
1/25/72	²³⁹ Pu waste		0.69					0.5	2							
1/26/72	²³⁸ U metal											0.1				
1/26/72	²³⁹ Pu contam. with ³ H							0.1	>11μ		7					
1/26/72	End boxes			0.1	0.4											
2/9/72	Hot cell trash		0.6									1.5	15			
2/11/72	Old foils										1					
2/25/72	D-38											6				
3/3/72	D-38											0.1				
3/7/72	Hot cell trash		2.6					0.5	2							
3/7/72	⁸⁵ Kr													2		0.01
3/15/72	³ H contam. glassware									0.1						
3/15/72	²³⁵ U powder		0.005									0.02	81.7			
3/17/72	D-38 contam. graphite											6	50(D-38)			
6/26/72	²³⁸ Pu source		0.001					0.2	17μ							

Area C - Shaft 45

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
9/7/71	Lab waste (²⁰³ Hg)					2										
9/8/71	D-38 + Be												1			
9/8/71	³ H lab trash									2						
9/8/71	²³⁵ U residue		122μ Ci										2	58		
9/8/71	²³⁸ U residue		820μ Ci										2			
9/16/71	Irr. metal			0.01												
9/16/71	End boxes			1	0.032											
10/21/71	²³⁵ U waste		28										2			
11/9/71	Irr. SS + neut. Na			0.2	20											
3/21/72	²³⁵ U + ²³⁹ Pu waste		11.2					0.5	64.8							
3/23/72	²³⁹ Pu waste		1.3					0.5	2							
3/23/72	End boxes			1	0.04											
4/3/72	Pu contam. steel							24.3					0.017			
4/3/72	Pu contam. steel							26.4					0.02			
3/28/72	²⁵² Cf residue		<1					2								
6/20/72	D-38												0.1			
8/23/72	U lab waste		1μ Ci										3	0.025(²³⁵ U)		

Shaft = 2 ft diam × 25 ft deep - unlined.

Area G - Shaft 46

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
4/4/72	Contam. detectors													0.25		0.003
4/4/72	Animal tissue							16								
4/4/72	²⁵² Cf, ²³⁹ Pu, ²³⁵ U, ²³⁸ U		0.2					0.5	0.26							
4/24/72	Irr. Cu				0.1											
5/2/72	²³⁹ Pu contam. steel		1.6					15								
5/8/72	²³⁸ Pu + ²³⁹ Pu lab waste		0.01					0.1	0.5(²³⁹ Pu) 0.031(²³⁸ Pu)							
5/9/72	²³⁹ Pu + ²⁴⁰ Pu foils		62μ Ci					0.1	0.0041							
5/9/72	²⁴¹ Am foil		1.74μ Ci					0.2								
5/16/72	End boxes			1		0.5										
6/5/72	²³⁵ U waste											5				
8/29/72	TI + NI crystals															0.1

Shaft - 2 ft diam × 25 ft deep - unlined.

Area G - Shaft 47

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
4/6/72	Irr. steel			3		0.0025										
4/6/72	²⁵² Cf residue		1.6					4	0.003(²⁵² Cf)							
4/18/72	Hot cell waste		0.1					0.3	3							
6/15/72	Animal tissue							8								
6/19/72	Fuel + waste material		5.5						2.125				6.87			
7/5/72	²³⁵ U contam. metal											8				
7/13/72	Contam. steel		<0.001									9				

Shaft - 2 ft diam × 25 ft deep - unlined.

Area G - Shaft 48

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
6/19/72	Fuel + waste material		3.5						2.125				6.87			
7/11/72	End boxes			1	0.4											
7/11/72	²³⁹ Pu contam. Ag		1μ Ci					0.01								
7/14/72	Hot cell trash		0.1					0.5	2							
7/14/72	Hot cell trash		1.1					5	2							
7/27/72	Irr. Al			0.1	0.8											
8/2/72	Irr. SS			1	0.2											
8/8/72	Pu contam. steel		0.8					0.1								
8/8/72	Irr. metal			1	10											
8/10/72	Irr. SS			1	0.2			1								
8/17/72	Hot cell trash		1.1					3	2							
8/25/72	D-38											3	166.5(D-38)			
8/31/72	Animal tissue							2								
9/20/72	⁶⁰ Co lab waste					0.1	1μ Ci									
10/5/72	Hot cell waste		1.1					1	0.1(²³⁹ Pu)							

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 49

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
6/15/72	Animal tissue							3								
8/25/72	D-38											6	166.5(D-38)			
8/31/72	Animal tissue							4								
9/5/72	²³⁹ Pu + ²³⁵ U		0.1					1	10(Pu)							
9/5/72	Hot cell trash		1.1					2	0.75(Pu)							
9/11/72	²³⁹ Pu contam. steel		0.002					4								
9/15/72	⁹⁰ Sr lab waste					0.1	0.007									
9/28/72	Irr. metal			1												

Shaft - 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 50

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic Ft ³ g	Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci		Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
6/13/74	³ H contam. metal								16	300					
7/17/74	³ H ₂ O								8	1					
8/1/74	³ H trash								8	50					
9/12/74	Vacuum pumps (³ H contam.)								9	200					
10/4/74	Cu beam stop 7 ^{Be} , 22 ^{Na} , 46 ^{Sc} , 48 ^V , 56,57,58,60 ^{Co} , 51 ^{Cr} , 52,54 ^{Mn} 59 ^{Fe} , 56 ^{Ni} , 65 ^{Zn}			1.3	1.5										
11/6/74	³ H counting vials								16						
12/3/74	Pump oil (³ H contam.)								0.9	0.1					
12/5/74	³ H vials								16	0.01					
12/11/74	Lapping machine		0.1					1							
12/11/74	Lapping machine		0.1					1							
1/10/75	Oil (³ H contam.)								0.4						
1/17/75	³ H vials								8	0.01					
1/22/75	³ H vials								8						
1/29/75	Lab waste (³ H contam.)								8						
2/7/75	Sorbed ³ H & ³ H ₂ O								32	1					
2/27/75	Lab waste								2	0.001					
3/10/75	³ H contam. organics								8	593					
4/9/75	³ H contam. equipment								8	6500					
5/13/75	³ H contam. tools								24	1000					
5/27/75	Xylene count. solution								16						
5/28/75	PN items (³ H contam.)								40	300					

Area G - Shaft 50 (continued)

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
6/3/75	PN items (³ H contam.)									24						
6/4/75	PN items (³ H contam.)									8	200					
6/4/75	Oil (³ H contam.)									8	210					
6/4/75	PN items (³ H contam.)									16	300					
6/4/75	Molecular sieve trap (³ H contam.)									16	3000					
6/19/75	Metal scrap (³ H contam.)									32	1175					
6/19/75	³ H counting vials									8						
6/25/75	Glassware (³ H contam.)									8						
6/25/75	Counting vials									24						
7/2/75	Equipment parts (³ H contam.)									24	6500					
7/2/75	Vacuum pump & lab waste (³ H contam.)									8	500					
7/29/75	Pu & PN items (³ H contam.)							8				0.02 μ Ci				
7/30/75	³ H contam. D-38									25			10.5 μ (D-38)			
7/30/75	³ H contam. oil									0.1	5 μ Ci		5 μ Ci			
8/20/75	³ H targets									1	50					
8/22/75	³ H targets									1	20					
8/27/75	PN items									8	100					
8/27/75	Metal scrap									8	100					
9/29/75	³ H solution									12	0.005					
10/22/75	³ H lab waste									8	200					
12/10/75	³ H counting vials									16						

Area G - Shaft 50 (continued)

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>		<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>
12/23/75	Tape															70
1/13/76	Cu scrap (³ H contam.)										8	17 000				
1/16/76	²³⁸ Pu, ²³⁹ Pu, ²⁴¹ Am, ²³⁵ U							8	0.00196(²³⁸ Pu) 0.1135(²³⁹ Pu)							
1/26/76	³ H counting vials										24					
1/29/76	³ H										8					
1/29/76	PN items (³ H contam.)										8	2				
2/11/76	³ H										8					
2/17/76	³ H										8	3500				
2/20/76	Counting vials (³ H contam.)										8					

Shaft = 6 ft diam × 60 ft deep - unlined.

Area G - Shaft 51 (continued)

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
9/8/75	²³⁹ Pu sources							2.6	8.2							
9/8/75	Cell waste		1.7					0.2	11.5				68.5			
10/2/75	²⁵² Cf target							0.1	88.1nCi(²⁵² Cf)							

Shaft = 2 ft diam × 25 ft deep - unlined.

Area G - Shaft 52

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
9/8/75	²³⁹ Pu, ²³⁵ U cell waste		0.775					0.2	2.5(²³⁹ Pu)				10(²³⁵ U)			
9/10/75	²³⁹ Pu, ²³⁵ U cell waste		1.25					0.2								
9/15/75	²³² U foil											0.1	0.01(²³² U)			
9/24/75	Cell waste		2.75					0.2								
9/24/75	Cell waste		7					0.2								
10/3/75	Cell waste + ⁶⁰ Co	0.2	0.03				0.015(⁶⁰ Co)									
10/28/75	Cell waste							0.1								
10/28/75	Cell waste		1					0.1								
11/1/75	Cell waste		1					0.2								
11/10/75	Irr. metal + Bi			4	4											
11/10/75	²³⁹ Pu, ²³⁵ U cell waste		0.031					0.2								
11/12/75	Cell waste		3					0.2								

Shaft - 2 ft diam × 25 ft deep - unlined.

Area G - Shaft 53

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>
11/20/75	²³⁹ Pu + ²³⁵ U							3	12				38			
11/20/75	²³³ U contam. metal											3	2			
12/4/75	²³⁵ U + ²³⁹ Pu							0.2								
12/12/75	Cell waste		30					0.2	11.5				74			
12/12/75	²³⁹ Pu, ²³⁵ U cell waste		7					0.2	5.5				17			
12/30/75	Cell waste		6					0.2								
12/30/75	Cell waste		4					0.2								
2/6/76	²³⁹ Pu + ²³⁵ U cell waste		0.3					0.2								
2/6/76	²³⁹ Pu + ²³⁵ U cell waste		0.1					0.2								
2/9/76	²³⁹ Pu + ²³⁵ U cell waste		1.5					0.2								

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 54

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>		<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 55

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>		<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>

Shaft = 2 ft diam - 25 ft deep - unlined.

Area G - Shaft 56

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>		<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>

Shaft - 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 57

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>		<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>

Shaft = 2 ft diam · 25 ft deep - unlined.

Area G - Shaft 58

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
		7/21/72	Control rods			2	230									
9/14/72	²³⁹ Pu contam. hot cell waste		0.3						<0.1							
10/5/72	Hot cell waste							1								
10/31/72	Hot cell waste		0.3					1	0.1							
11/6/72	Hot cell waste		0.2					1								
11/6/72	Hot cell waste		2					1	0.1							
1/12/73	Be ₂ O ₃															4
2/7/73	D-38		0.0031									10				6.9 Kg (D-38)
2/7/73	D-38 contam. graphite											20				
2/8/73	Metal shapes											12				
2/12/73	D-38 metal		9.918μ Ci									18				
3/29/73	²³⁵ U residue		0.008									6				111(²³⁵ U)
5/31/73	²³⁵ U residue		75.6μ Ci									6				36(²³⁵ U)
6/20/73	²³⁵ U contam. graphite											1				
7/20/73	U contam. metal											3				
9/18/73	D-38 metal + Be											2				

Shaft = 3 ft diam x 25 ft deep - unlined.

Area G - Shaft 59

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>
2/14/73	D-38 contam. metal												12			
8/7/73	Steel parts & tools						24									
12/7/73	³ H contam. lab waste									5	50					
12/14/73	³ H contam. oil									2						
1/11/74	³ H contam. lab equipment									8						
1/24/74	Vacuum pump									8	0.02					
3/15/74	³ H contam. lab equipment									32	1300					
4/5/74	Accelerator targets									3	8					
5/2/74	Vacuum pump oil (³ H contam.)									12	<0.1					
5/17/74	Cryopump									3						
5/17/74	Lab waste (³ H)									2.5	950					
5/30/74	Contam. metal						10.5									

Shaft = 6 ft diam x 60 ft deep - unlined.

Area G - Shaft 60

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
12/11/72	Contam. oil											104				
2/27/73	Contam. oil															272
7/12/73	Ba, Pu, ³ H contam. oil							96								
9/13/73	Contam. oil							0.1								
1/21/74	²³⁵ U contam. oil											2				
1/28/74	U contam. oil											24				
4/19/74	Contam. oil							1								
6/5/74	Contam. oil	136														
7/2/74	Contam. oil											160				
7/8/74	Contam. oil											232				
7/16/74	²³⁸ Pu contam. oil							0.5								
8/8/74	Contam. oil		0.04					16								
8/16/74	Contam. oil							6								
9/13/74	²³⁵ U + ²³⁸ U contam. oil											0.6				
9/27/74	²³⁹ Pu + ³ H contam. oil							0.4								
10/11/74	Contam. oil							0.6								
11/6/74	Contam. oil											2				
12/11/74	Contam. oil	72														
12/16/74	Contam. oil with ²³⁹ Pu, ²³⁵ U + FP							40								

Shaft = 6 ft diam x 60 ft deep - unlined.

Area G - Shaft 61

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
6/25/73	Animal tissue							8	0.0001							
6/29/73	Irr. Cu pipe	2	5													
7/20/73	Be metal														3	
7/25/73	Be waste (³ H contam.)									8	276					
9/14/73	Animal tissue							11								
9/28/73	Be metal															
10/15/73	Animal tissue							12								
11/2/73	U contam. metal												3			
11/13/73	Animal tissue							16								
11/13/73	Fission foils (²³⁷ Np, ²³¹ Np)							0.5	3.9(²³¹ Np)							
11/21/73	ThO ₂													3	4.3kg	
11/26/73	³ H ₂ O									14	1					
12/7/73	Animal tissue							20								
1/22/74	Animal tissue							16								
1/24/74	Contam. metal									9	0.02					
1/28/74	²³⁸ U contam. metal												12			
2/8/74	Animal tissue							6								

Shaft = 3 ft diam x 25 ft deep - unlined.

Area G - Shaft 62

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
4/8/74	Animal tissue + ²³⁸ Pu							10								
7/17/74	Be														5	
9/27/74	Animal tissue (²³⁸ Pu + ³² P)							12								
11/18/74	Be														8	
11/21/74	Clothing							0.5								
12/12/74	Animal tissue + ²³⁸ Pu							12								
12/26/74	Animal tissue							4								
1/8/75	Animal tissue + ²³⁸ Pu, ³² P							7								
2/3/75	Animal tissue + ²³⁸ Pu							4								
2/20/75	Animal tissue							8								
4/16/75	Animal tissue							12								
5/30/75	Animal tissue							8								
7/7/75	Animal tissue							9								
11/3/75	Animal tissue							10								
11/20/75	Animal tissue + ²³⁸ Pu							10								
1/5/76	Animal tissue							12								
2/20/76	Animal tissue							9								

Shaft = 3 ft diam x 25 ft deep - unlined.

Area G - Shaft 63

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic Ft ³ g	Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci		Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
1/19/76	Residues										16	235			
1/19/76	D-38 metal + Li										12	3 (238)			

Shaft = 3 ft diam x 25 ft deep - unlined.

Area G - Shaft 64

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>		<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>
1/29/76	D-38											7.8	38 000			
													D-38			

Shaft = 3 ft diam x 25 ft deep - unlined.

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Area G - Shaft 65

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>		<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>

Area G - Shaft 66

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>		<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>

Area G - Shaft 67

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>		<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>

Area C - Shaft 68

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>		<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>

Area G - Shaft 69

<u>Date</u>	<u>Waste Identification</u>	<u>Mixed Fission Products</u>		<u>Mixed Activation Products</u>		<u>Activation Products</u>		<u>Transuranic</u>		<u>Tritium</u>		<u>Uranium</u>		<u>Other</u>		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>

Area G - Shaft 70

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>
1/10/75	Contam. oil							7								
1/29/75	Contam. oil							72								
1/29/75	Contam. oil							24								
5/8/75	Contam. metal							26								
5/12/75	D-38 Contam. oil											32				
6/12/75	Contam. oil											72				
6/18/75	Contam. oil											24				
7/8/75	Contam. oil							352								
8/4/75	²³⁹ Pu in vermiculite							80								
8/21/75	Contam. oil							72								
9/2/75	²³⁵ U solvent (sorbed)											1.3				
9/2/75	Th metal														2	
12/12/75	Contam. oil									8	0.0003					
1/23/76	²³⁹ Pu Contam. oil							8								
2/17/76	²³⁹ Pu tank sludge							8								
2/24/76	²³⁹ Pu + ²³⁵ U contam. oil							72								

Area G - Shaft 72

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
11/6/72	Hot cell waste		3									2	5			
11/15/72	Irr. SS plating		2					1								
11/15/72	Irr. SS plating		2					1								
11/29/72	Irr. SS plating + FP		2					0.1								
12/1/72	Hot cell waste		0.1					1	0.2(Pu)							
12/8/72	Hot cell waste		0.12									0.2	0.11(²³⁵ U)			
12/15/72	²³⁸ Pu source							0.1	4.25μ(²³⁸ Pu)							
12/19/72	Old sources		13μ Ci									0.2	0.006(²³⁵ U)			
12/21/72	²³³ U, ²³⁴ U, ²³⁵ U, ²³⁶ U, ²³⁸ U, ²³⁹ Pu ²⁴⁰ Pu, ²⁴² Pu, ²⁴³ Am, ⁹⁰ Sr, ²³⁰ Th, ²³² Th, ⁶⁰ Co, ²³⁷ Np, ²⁵² Cf		1μ Ci (⁹⁰ Sr) <0.001 (⁶⁰ Co)					8	0.004(²³⁹ Pu) 0.0212(²⁴⁰ Pu) 0.0082(²⁴² Pu) 0.067(²³⁷ Np)				0.02(²³⁵ U) 0.002(²³³ U) 0.02(²³⁴ U) 0.002(²³⁶ U) 75(²³⁸ U)		825μ(²³⁰ Th) 38(²³² Th)	
12/21/72	²³⁹ Pu hot cell trash		11					1	0.1(²³⁹ Pu)							
12/21/72	²³⁹ Pu hot cell trash		26					2	0.1(²³⁹ Pu)							
12/21/72	²⁰³ Hg, ²⁴¹ Am, ⁹⁰ Sr, ²³⁹ Pu, ¹⁴⁷ Pm, ²³⁸ U, ⁶⁵ Zn, ¹⁴¹ Ce		0.05					8	0.003(²³⁹ Pu)							
1/2/73	Animal tissue							14								
1/2/73	²³⁸ U contam. Hg and As		9.48μ Ci									1	1μ(²³⁸ U)			
1/4/73	²³⁵ U residue		30μ Ci									2	15			
1/5/73	Hot cell trash		6					2	0.1(²³⁹ Pu)							
1/9/73	Hot cell trash		2					2	1.5(²³⁹ Pu)							
1/9/73	Hot cell trash		1					2	1.5(²³⁹ Pu)							
1/10/73	²³⁹ Pu hot cell trash		2					2	0.1(²³⁹ Pu)							
1/12/73	End boxes			1		0.4										
1/19/73	²³⁵ U residue		21μ Ci									1	10(²³⁵ U)			
1/23/73	Fuel elements		0.0076									6				

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Area G - Shaft 72 (continued)

Date	Waste Identification	Mixed Fission Products		Mixed Activation Products		Activation Products		Transuranic		Tritium		Uranium		Other		
		<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	g	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	g	<u>Ft</u> ³	g	<u>Ci</u>
2/9/73	²³⁹ Pu hot cell trash							2								
3/1/73	²³⁹ Pu, ²³³ U, ²³⁵ U ²³⁸ U, ²³⁷ Np, ²² Na							1					0.4(²³⁵ U)			

Shaft = 2 ft diam × 25 ft deep - unlined.

Area G - Shaft 73

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
1/19/73	Hot cell trash		8.7					2	8				18			
1/23/73	Fuel elements		0.0076									4				
1/26/73	²³⁹ Pu waste		1.5					2	1							
1/26/73	²³⁹ Pu waste		1					2	0.1							
2/1/73	PTC waste		8									2	6.7			
2/1/73	PTC waste		43									2	40			
2/1/73	Hot cell waste		0.12					1	0.1							
2/7/73	Irr. metal			0.1	0.01											
2/7/73	End boxes			0.1	0.185											
2/13/73	²³⁹ Pu waste		1					2	0.1							
2/14/73	Hot cell waste		0.06					2	0.1							
2/14/73	Hot cell waste		0.15					2	0.1							
2/15/73	Hot cell waste		10					2	10				30			
2/20/73	Hot cell waste		0.5					2	0.1							
2/21/73	Hot cell waste		3					2	0.1							
3/1/73	Handling tools			1	0.001											
3/2/73	Hot cell trash		2					2	0.2							
3/2/73	Hot cell trash		3.5					2	0.1							
3/2/73	Cell waste		3.5					2	0.1							
3/2/73	Contam. metal	2	50													
3/6/73	Hot cell trash		6									3	0.1			
3/7/73	Hot cell trash		1.5					2	0.1							
3/8/73	Hot cell trash		1.5					2	1.2							

Shaft - 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 74

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>Ci</u>	<u>Ft³</u>	<u>g</u>	<u>Ft³</u>	<u>g</u>	<u>Ci</u>
3/8/73	UF ₆ gas cylinder											2				
3/13/73	Hot cell trash		0.6									2	0.1			
3/15/73	Hot cell trash		3.5					2	0.1							
3/16/73	²³⁵ U waste		3									1	0.1			
3/16/73	²³⁹ Pu waste		1.5					2	0.1							
3/19/73	²³⁹ Pu waste		18					2	20							
3/19/73	²³⁵ U waste		11									1	0.1			
3/23/73	²³⁹ Pu waste		1					2	0.1							
3/29/73	Animal tissue							10								
4/3/73	²³⁹ Pu waste		5.5					2	0.1							
4/5/73	Pu contam. chemicals							1								
4/5/73	²³⁹ Pu waste		5.7					2	0.1							
4/5/73	²³⁹ Pu waste		5					2	3.5							
4/5/73	²³⁹ Pu waste		8.6					2	0.1							
4/10/73	Irr. graphite			2		12										
4/16/73	Hot cell filter		6.5					2	0.5							
4/16/74	²³⁹ Pu waste		5.7					3	0.1				0.3(²³⁵ U)			
4/17/73	²³⁹ Pu waste		0.6					2	0.1				0.3(²³⁵ U)			
4/19/73	Fuel elements		0.246									0.1				
4/19/73	Sample element holder			2		0.31										
4/20/73	Sample holder			2		1										
4/20/73	Sample holder			2		31										
4/20/73	²³⁹ Pu waste		6					2	0.1							
4/20/73	²³⁹ Pu waste		2.6					2	0.1							
4/23/73	Irr. SS hardware		8					1								
4/23/73	²³⁹ Pu waste		12					2	0.1							
4/24/73	Contam. metal		0.001									1.5	16(²³⁵ U)			
4/26/73	²³⁵ U waste		2.5									2	9			
4/30/73	²³⁹ Pu + ²³⁵ U waste		5.5						0.1				50(²³⁵ U)			

Area G - Shaft 74 (continued)

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
4/30/73	²³⁵ U waste		1.5									2	18(²³⁵ U)			
5/1/73	U contam. ²⁴² Pu							0.3	0.5(²⁴² Pu)				73			
5/3/73	²³⁹ Pu contam. SS		2.5					1								
5/8/73	²³⁹ Pu waste		12					2	0.1							
5/11/73	²³⁹ Pu waste		8					2	0.1							
5/30/73	²³⁸ U residue		0.0015									0.1				
5/30/73	²³⁹ Pu waste		20					2	5							
5/30/73	²³⁹ Pu waste		0.9					2	0.1							

Shaft - 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 75

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
5/31/73	²³⁵ U residue											3	18			
5/31/73	Animal tissue							10								
6/20/73	Hot cell waste		3.5					2	1.8				5.8			
6/20/73	²³⁹ Pu waste		3.5					2	0.1							
6/21/73	Hot cell waste		8					2	0.7				2.9			
6/29/73	²³⁹ Pu waste		12					2	7							
6/29/73	²³⁹ Pu contam. SS		14					2								
7/9/73	Hot cell filter		10					2	4							
7/12/73	²⁴ Na source					0.5	0.4									
7/13/73	²³⁹ Pu waste		1					2	0.1							
7/23/73	Animal tissue							12								
7/27/73	Contam. swipes		0.4									1				
8/1/73	²⁴⁴ Cm waste		0.003					0.4								
8/7/73	End boxes			1	0.4											
8/16/73	²³⁹ Pu manipulator booties		1					1	0.1							
8/16/73	Hot cell waste		3.5					1	2							
8/22/73	Sample holder			1	0.002											
8/22/73	Hot cell trash		1					2	0.1							
8/27/73	Hot cell trash		6					2	0.1							
8/30/73	End boxes			0.1	0.3											
9/4/73	Hot cell trash		1					2	0.1(Pu)							
9/4/73	Hot cell trash		3.5					2	0.1(Pu)							
9/14/73	¹⁸² Ta					0.1	60									
9/21/73	Hot cell trash		1.7					2	0.1							
9/21/73	Hot cell trash		1.5					2	0.1							
10/3/73	Hot cell trash		11					2	12							
10/12/73	Hot cell trash		2					1	0.2							

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 76

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	g	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	g	<u>Ft</u> ³	g	<u>Ci</u>
10/25/73	Hot cell trash		1					2	0.1(²³⁹ Pu)							
10/26/73	²³⁵ U residue		0.1									0.5	20			
10/29/73	Hot cell trash		3					2	3(Pu)							
10/31/73	Hot cell trash		4					2	0.2							
11/2/73	Irr. SS		3					2								
11/2/73	Irr. SS		3					2								
11/2/73	Irr. SS		3					2								
11/9/73	Hot cell trash		1					2	0.1							
11/15/73	²³⁹ Pu waste		2					2	0.2							
11/30/73	Hot cell trash		3					2	0.2							
12/3/73	D-38											1.5				
12/17/73	Hot cell trash		13					2	15							
12/18/73	ThO ₂														1	
12/18/73	D-38											1				
12/20/73	Hot cell trash		4					2	0.2							
1/17/74	Hot cell trash		5.8					2	0.2							
1/21/74	U, AmO ₂ , CfO ₂		0.33					1								
1/25/74	Irr. ²³⁹ Pu and ²³⁵ U fuel		65					2	2.8				7.2			
1/25/74	²³⁸ U contam. metal											1				
1/31/74	Hot cell trash		3.8					1	0.2							
2/1/74	²³⁹ Pu hot cell trash		4.4					2	0.1							
2/1/74	²³⁹ Pu hot cell trash		3.7					2	0.1							
2/4/74	²⁴¹ Am, ²³⁹ Pu, ⁶³ Ni, ²¹⁰ Po, ⁷ Be, ²³⁴ U old foils							1	1(²³⁹ Pu)+0.6(²⁴¹ Am)				7(²³⁴ U)			
2/7/74	²³⁷ Np	0.2						0.1	0.1(Np)							
2/11/74	Hot cell trash		2					2	0.1							
2/11/74	Hot cell trash		4					2	0.2							

Area G - Shaft 76 (continued)

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
3/4/74	²³⁵ U + ²³⁹ Pu waste		0.4					2								
3/11/74	Animal tissue							14								
3/13/74	²³⁵ U + ²³⁹ Pu waste		2					2	<0.1				<0.1			
3/22/74	²³⁹ Pu waste		0.1					1	<0.1							
4/3/74	Irr. hardware	3	6.4													
4/3/74	Irr. hardware	2	6													
4/3/74	Irr. hardware	3	1.1													
4/3/74	Irr. hardware	2	0.21													
4/4/74	Irr. hardware	3	0.63													

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 78 (continued)

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	g	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	g	<u>Ft</u> ³	g	<u>Ci</u>
9/12/74	Cell waste + 239Pu		5.5					2								
9/12/74	Cell waste + 239Pu		0.2					2								
9/12/74	Old Po sources					1						1				
9/24/74	Cell waste		0.05					0.2								
9/24/74	Cell waste		0.007					0.2								
9/26/74	Cell waste		0.002					0.2								
9/26/74	Cell hardware	0.5	0.2													
10/1/74	LiH disk														1.5	
12/3/74	Reactor waste	3	1													
1/22/75	Cell waste		0.7					0.3								
1/23/75	Cell waste		0.9					0.3								
1/27/75	252Cf foil							0.1	2 ng(Cf)							
2/3/75	252Cf foil		0.001					0.1								
2/11/75	Cell waste		2.4					2	0.915			3.66				
2/12/75	Cell waste		2					2.9	0.915			3.66				
2/14/75	Cell waste		0.2					2								
2/14/75	Cell waste		1.45					2	4			1				
2/18/75	Cell waste		1					2								
2/18/75	Cell waste		1.3					2								
2/18/75	Cell waste		0.7					2								
2/21/75	Cell waste		7					2								
3/6/75	U metal											3	2.5			

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 79

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		Ft ³	Ci	Ft ³	Ci	Ft ³	Ci	Ft ³	g	Ft ³	Ci	Ft ³	g	Ft ³	g	Ci
10/8/74	Hot cell waste		7					2	11				39			
10/10/74	Hot cell waste		0.7					0.2								
10/22/74	Hot cell waste		1					2								
10/23/74	Irr. U + Pu		30					1	74				286			
10/31/74	Hot cell waste		0.8					2								
11/6/74	Animal tissue + 238Pu							2								
11/13/74	Cell waste		1.3					2								
11/15/74	Cell waste		7					2	12(Pu)				45(U)			
11/15/74	Cell waste		0.7					2	1.3(Pu)				5(U)			
11/15/74	Cell waste		0.77					2	2.6(Pu)				10(U)			
11/25/74	Cell waste		0.95					2	1.3(Pu)				5(U)			
11/26/74	Cell waste		0.75					2	20(Pu)							
11/27/74	Irr. metal			4	5											
12/2/74	Irr. metal		15					2								
12/2/74	Irr. metal		5					2								
12/3/74	Cell waste	2	5													
12/4/74	239Pu + 235U cell waste		3					2								
12/4/74	239Pu + 235U cell waste		1					2								
12/12/74	Personal clothing															1
12/31/74	Cell waste		78.5					0.5	11				44			
12/31/74	Cell waste		65					0.2								
2/4/75	Cell waste		1.1					2	9.15				3.6			
4/16/75	Be															5
5/29/75	D-38															
5/29/75	60Co							1	0.001				1	226(D-38)		
12/4/75	36Cl							0.02								
12/9/75	234U source															
12/16/75	90Sr sources	0.1	0.044										0.1	0.005(234U)		

Shaft = 2 ft diam x 25 ft deep - unlined.

Area G - Shaft 80

Date	Waste Identification	blue Mixed Fission Products		green Mixed Activation Products		yellow Activation Products		Transuranic		Tritium		Uranium		Other		
		<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>g</u>	<u>Ft</u> ³	<u>Ci</u>	<u>Ft</u> ³	<u>g</u>	<u>Ft</u> ³	<u>g</u>	<u>Ci</u>
6/3/75	Old sources 60Co, 137Cs, 244Cm, 14C	0.00285(60Co)	0.005(137Cs)					11.7		0.0022(244Cm)						
6/11/75	U samples												14			
6/24/75	D-38 metal											1	28(D-38)			
7/15/75	Silver alloys (239Pu + 235U contam.)							0.1								
8/4/75	210Po contam. metal			1												
8/15/75	Animal tissue (239Pu, 32P)							8								
8/15/75	239Pu contam. metal scrap							2								
2/17/76	ThO ₂													3	30 000(Th)	

Shaft = 2 ft diam x 25 ft deep - unlined.

APPENDIX H
AREA C SHAFTS
(to be added at a later date)