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RYAN FLYNN  
Cabinet Secretary  
BUTCH TONGATE  
Deputy Secretary

**CERTIFIED MAIL – RETURN RECEIPT REQUESTED**

February 18, 2016

Jeff Harrell  
Manager  
U.S. Department of Energy  
P.O. Box 5400, MS-0184  
Albuquerque, NM 87185-5400

Peter B. Davies  
Director,  
Geoscience, Climate & Consequence Effects  
P.O. Box 5800, MS-0701  
Albuquerque, NM 87185

**RE: APPROVAL  
FINAL DECISION ON PROPOSAL TO GRANT CORRECTIVE  
ACTION COMPLETE WITH CONTROLS STATUS FOR MIXED WASTE  
LANDFILL  
SANDIA NATIONAL LABORATORIES, EPA ID# NM5890110518  
HWB-SNL-14-014**

Dear Mr. Harrell and Mr. Davies:

On February 12, 2016, the New Mexico Environment Department (Department) Secretary signed a Final Order granting Corrective Action Complete (CAC) with controls status for the Department of Energy/Sandia Corporation (Permittees) Mixed Waste Landfill (MWL), Solid Waste Management Unit (SWMU) 76. The proposal for CAC status was processed as a Class 3 Permit modification request, submitted by the Permittees on October 17, 2014. The permit that was modified as a result of this action is the Resource Conservation and Recovery Act Facility Operating Permit for Sandia National Laboratories (SNL), renewed January 27, 2015.

On January 12, 2015, the Department issued a notice announcing a 60-day public comment period concerning the proposal to grant CAC with controls status for the MWL. The end of the comment period was later extended from March 17, 2015, to April 13, 2015. At the request of several commenters, a hearing on the CAC proposal was held from July 8 through July 11, 2015.

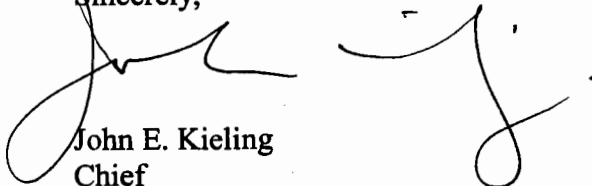
Mr. Harrell and Mr. Davies  
February 18, 2016  
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The decision is effective on March 13, 2016, 30 days after issuance of this notice of final action. The Secretary's decision may be appealed under the provisions of the New Mexico Hazardous Waste Regulations, 20.4.1.901(H) NMAC, and Section 74-4-14 of the New Mexico Hazardous Waste Act.

The Final Order, associated Permit modification, and Response to Comments may be viewed on the Department's webpage at <http://www.nmenv.state.nm.us/hwb/snlperm.html> under the link for *Mixed Waste Landfill*. Enclosed with this letter are the relevant pages related to the approval of the Class 3 permit modification request, which include revised Tables K-1 and K-3, Permit Attachment M, and Figure 3 of Permit Attachment M.

If you have any questions regarding this letter, please contact Mr. Dave Cobrain of my staff at (505) 476-6055.

Sincerely,



John E. Kieling  
Chief  
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB  
L. King, EPA Region 6 (6PD-N)  
J. Cochran, SNL/NM, MS-0719  
D. Rast, DOE/NNSA, MS-0184

File: SNL 2016 and Reading

**PERMIT ATTACHMENT K - SOLID WASTE MANAGEMENT UNITS AND  
AREAS OF CONCERN**

Table K-1 provides the list of solid waste management units (SWMUs) and areas of concern (AOCs) at the Facility for which corrective action is required under the Consent Order; whereas, Table K-2 includes the SWMUs, AOCs, and hazardous waste management units for which corrective action is required under this Permit. Table K-3 provides the list of SWMUs, AOCs, and hazardous waste management units for which corrective action is complete with controls. Table K-4 includes the SWMUs, AOCs, and hazardous waste management units for which corrective action is complete without controls and that do not require monitoring. Attachment J, Tables J-1, J-2, and J-3 include lists of hazardous waste management units at the Facility and their status (*e.g.*, permitted, under post-closure care, closed) of each unit.

<b>TABLE K-1</b> <b>Solid Waste Management Units and Areas of Concern Requiring</b> <b>Corrective Action Under the Consent Order</b>		
<b>SWMU/AOC #</b>	<b>Name or Description</b>	<b>Comments</b>
<b><i>OU 1295</i></b>	<b><i>Septic Tanks and Drainfields</i></b>	
149	Bldg. 9930 Septic System (Coyote Test Field)	
154	Bldg. 9960 Septic System and Seepage Pits (Coyote Test Field)	
<b><i>OU-1306</i></b>	<b><i>TAs-III &amp; V</i></b>	
83	Long Sled Track	
84	Gun Facilities	
240	Short Sled Track	
<b><i>OU-1332</i></b>	<b><i>Foothills Test Area</i></b>	
8	Open Dump (Coyote Canyon Blast Area)	
58	Coyote Canyon Blast Area	
<b><i>OU-1334</i></b>	<b><i>Central Coyote Test Area</i></b>	
68	Old Burn Site	
	<b><i>Miscellaneous Sites</i></b>	
	Tijeras Ground-Water (TAG) Investigation	
	TA-V Ground-Water Investigation	
	Burn Site Ground-Water Investigation	
502	Building 9938 Surface Discharge Site	

<b>TABLE K-2</b> <b>Solid Waste Management Units, Areas of Concern, and</b> <b>Hazardous Waste Management Units</b> <b>Requiring Corrective Action Under this Permit</b>		
<b>SWMU/AOC #</b>	<b>Name or Description</b>	<b>Comments</b>
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved

<b>TABLE K-3</b> <b>Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management</b> <b>Units for which Corrective Action is Complete with Controls</b>		
<b>SWMU/AOC#</b>	<b>Name or Description</b>	<b>Date of CAC Approval</b>
<b><i>OU 1289</i></b>	<b><i>Mixed Waste Landfill</i></b>	
76	Mixed Waste Landfill (TA-III)	2/12/16
<b><i>OU 1295</i></b>	<b><i>Septic Tanks and Drainfields</i></b>	
137	Bldg. 6540/6542 Septic System (TA-III)	02/08
<b><i>OU 1302</i></b>	<b><i>TA-I</i></b>	
96	Storm System Drain	06/06
98	Bldg. 863 (TCA, Photochemical Releases: Silver Catch Boxes)	11/05
187	Septic Tank Piping for POTW	06/06
190	Steam Plant Tank Farm	06/06
226	Old Acid Waste Line	06/06
<b><i>OU 1303</i></b>	<b><i>TA-II</i></b>	
1	Radioactive Waste Landfill	02/08
2	Classified Waste Landfill (TA-II)	06/06
3	Chemical Disposal Pit	02/08
135	Bldg. 906 Drain System (TA-II)	06/06
<b><i>OU 1306</i></b>	<b><i>TAs-3&amp;5</i></b>	
105	Mercury Spill (Bldg. 6536)	12/14
196	Bldg. 6597 Cistern (TA-V)	12/14
<b><i>OU 1307</i></b>	<b><i>Liquid Waste Disposal System</i></b>	
4	LWDS Surface Impoundments	12/14

<b>TABLE K-3</b> <b>Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete with Controls</b>		
<b>SWMU/AOC#</b>	<b>Name or Description</b>	<b>Date of CAC Approval</b>
<b><i>OU 1309</i></b>	<b><i>Tijeras Arroyo</i></b>	
45	Liquid Discharge (behind TA-IV)	02/08
46	Old Acid Waste Line Outfall	12/14
229	Storm Drain System Outfall (for TA-II)	06/06
<b><i>OU 1332</i></b>	<b><i>Foothills Test Area</i></b>	
87	Bldg. 9990 Firing Site	06/06
<b><i>OU 1335</i></b>	<b><i>Southwest Test Area</i></b>	
91	Lead Firing Site (Thunder Range)	12/14
	<b><i>Miscellaneous Sites</i></b>	
1029	Bldg. 6584 North Septic System (TA-III)	06/06
1081	Bldg. 6650 Septic System (TA-III)	02/08
1090	Bldg. 6721 Septic System (TA-III)	12/14

<b>TABLE K-4</b> <b>Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls</b>			
<b>SWMU/AOC#</b>	<b>Name or Description</b>	<b>Date of CAC Approval</b>	<b>Comments</b>
<b>OU 1295</b>	<b>Septic Tanks and Drainfields</b>		
49	Bldg. 9820 Drains (Lurance Canyon)	12/14	
101	Bldg. 9926/9926A Septic System and Seepage Pit (Coyote Test Field)	12/14	
116	Bldg. 9990 Septic System (Coyote Test Field)	12/14	
138	Bldg. 6630 Septic System (TA-III)	12/14	
139	Bldg. 9964 Septic System	12/95	
140	Bldg. 9965 Septic System and Drywell (Thunder Range)	12/14	
141	Bldg. 9967 Septic System	11/01	
142	Bldg. 9970 Septic System	09/00	
143	Bldg. 9972 Septic System	09/00	
144	Bldg. 9980 Septic System	09/00	
145	Bldgs. 9981/9982 Septic System	09/00	
146	Bldg. 9920 Drain System (Coyote Test Field)	02/08	
147	Bldg. 9925 Septic Systems (Coyote Test Field)	12/14	
148	Bldg. 9927 Septic System (Coyote Test Field)	02/08	
150	Bldgs. 9939/ 9939A Septic System and Drainfield (Coyote Test Field)	12/14	
151	Bldg. 9940 Septic System	11/01	
152	Bldg. 9950 Septic System (Coyote Test Field)	02/08	
153	Bldg. 9956 Septic Systems (Coyote Test Field)	02/08	
160	Bldg. 9832 Septic System	11/01	
161	Bldg. 6636 Septic System (TA-III)	12/14	
<b>OU 1300</b>			
211	Bldg. 840, Former UST 840-1 (TA-I)	09/00	
<b>OU 1302</b>	<b>TA-I</b>		
25	Burial Site (South of TA-I)	12/95	
30	PCB Spill (Reclamation Yard)	04/05	
32	Steam Plant Oil Spill	12/95	
33	Motor Pool Oil Spill	04/05	
41	Bldg. 838 Mercury Spill	12/95	
42	Acid Spill, Bldg. 879 Water Treatment Facility	09/00	
73	Hazardous Waste Repackaging and Storage (Bldg. 895)	12/95	
104	PCB Spill	12/95	
186	TCE Dumping south of Bldg. 859	09/00	
192	TA-I Waste Oil Tank	07/00	

<b>TABLE K-4</b> <b>Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls</b>			
<b>SWMU/AOC#</b>	<b>Name or Description</b>	<b>Date of CAC Approval</b>	<b>Comments</b>
276	Former Bldg. 829X Silver Recovery Sump (TA-I)	02/08	
<b>OU 1303</b>	<b>TA-II</b>		
43	Radioactive Material Storage Yard (TA-2)	09/00	
44	Decontamination Site and Uranium Calibration Pits (UCPs)	07/00	
48	Bldg. 904 Septic System and HE Drain System (TA-II)	06/06	
113	Area II Firing Sites	11/01	
114	Explosive Burn Pit	04/05	
136	Bldg. 907 Septic System and HE Drain System (TA-II)	06/06	
159	Bldg. 935 Septic System and Drywell (TA-II)	06/06	
165	Bldg. 901 Septic System (TA-II)	06/06	
166	Bldg. 919 Septic System (TA-II)	06/06	
167	Bldg. 940 Septic System and Seepage Pit (TA-II)	06/06	
<b>OU 1306</b>	<b>TAs-3&amp;5</b>		
18	Concrete Pad	04/05	
26	Burial Site (Western Part of TA-3)	04/05	
31	Electrical Transformer Oil Spill	11/01	
34	Centrifuge Oil Spill	11/01	
35	Vibration Facility Oil Spill (TA-3)	04/05	
36	HERMES Oil Spill	11/01	
37	PROTO Oil Spill	11/01	
51	Bldg. 6924 Pad, Tank, and Pit	11/01	
78	Gas Cylinder Disposal Pit	02/08	
100	Bldg. 6620 Drain/Sump	11/01	
102	Radioactive Disposal Area	11/01	
107	Explosive Test Area (South-East TA-3)	04/05	Also site of CAMU
111	Bldg. 6715 Sump/Drain	11/01	
188	Bldg. 6597 Above Ground Containment Spill Tank	12/95	
241	Storage Yard	04/05	
275	Seepage Pits, TA-V	07/00	
<b>OU 1307</b>	<b>Liquid Waste Disposal System</b>		
5	LWDS Drainfield (TA-V)	12/14	
52	LWDS Holding Tank	12/14	
<b>OU 1309</b>	<b>Tijeras Arroyo</b>		
7	Gas Cylinder Disposal (Arroyo del Coyote)	09/00	Transferred to KAFB in 2000, listed on KAFB Permit

<b>TABLE K-4</b> <b>Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls</b>			
<b>SWMU/AOC#</b>	<b>Name or Description</b>	<b>Date of CAC Approval</b>	<b>Comments</b>
16	Open Dumps (Arroyo del Coyote)	09/00	
23	Disposal Trenches (near Tijeras Arroyo)	07/00	
40	Oil Spill (6000 Igloo Area)	11/97	
50	Old Centrifuge Site (Tijeras Arroyo)	09/00	
77	Oil Surface Impoundment	07/00	
227	Bunker 904 Outfall	06/06	
228A	Centrifuge Dump Site	09/00	
228B	Centrifuge Dump Site	11/01	
230	Storm Drain System Outfall (for TA-4)	04/05	
231	Storm Drain System Outfall (for TA-4)	04/05	
232	Storm Drain System Outfall	04/05	
233	Storm Drain System Outfall	07/12	
234	Storm Drain System Outfall	07/12	
235	Storm Drain System Outfall	09/00	
<b>OU 1332</b>	<b>Foothills Test Area</b>		
15	Trash Pits (Frustration Site)	12/97	
19	TRUPAK Boneyard Storage Area (NW End of Old Aerial Cable)	07/00	
27	Animal Disposal Pit (Coyote Springs)	07/00	
28-1	Mine Shafts	12/97	
28-2	Mine Shafts	12/14	
28-3	Mine Shafts	12/97	
28-4	Mine Shafts	12/97	
28-5	Mine Shafts	12/97	
28-6	Mine Shafts	12/97	
28-7	Mine Shafts	12/97	
28-8	Mine Shafts	12/97	
28-9	Mine Shafts	12/97	
28-10	Mine Shafts	11/01	
66	Boxcar Site	04/05	
67	Frustration Site	11/01	
82	Old Aerial Cable Site	11/01	
277	New Firing Site East of Optical Range	11/01	
<b>OU 1333</b>	<b>Canyons Test Area</b>		
10	Burial Mounds (Bunker Area North of Pendulum Site)	07/00	
12A	Open Arroyo Channel	09/00	
12B	Buried Debris in Graded Area	07/00	
13	LCBS Oil Surface Impoundment (Lurance Canyon Burn Site)	07/00	
59	Pendulum Site	07/00	
60	Bunker Area	11/01	
63-A	Balloon Test Area: Plutonium Dispersal Study Program (PDSP) Site	09/00	
63-B	Balloon/Helicopter Site	07/00	
64	Gun Site (Madera Canyon)	09/00	



<b>TABLE K-4</b> <b>Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls</b>			
<b>SWMU/AOC#</b>	<b>Name or Description</b>	<b>Date of CAC Approval</b>	<b>Comments</b>
65-A	Lurance Canyon Explosive Test Site: Small Debris Mound	09/00	
65-B	Lurance Canyon Explosive Test Site: Primary Detonation Area	09/00	
65-C	Lurance Canyon Explosive Test Site: Secondary Detonation Area	09/00	
65-D	Lurance Canyon Explosive Test Site: Near Field Dispersion Area	09/00	
65-E	Far Field Dispersion Area	07/00	
72	Operation Beaver Site	07/00	
81-A	Catcher Box/Sled Track	11/01	
81-B	Impact Pad	11/01	
81-C	New Aerial Cable Site: Former Burial Location	09/00	
81-D	Northern Cable Area	11/01	
81-E	Gun Impact Area	11/01	
81-F	Scrap Yard	11/01	
92	Pressure Vessel Test Site (Coyote Canyon Blast Area)	12/97	
93	Madera Canyon Rocket Launcher Pads A, B & C	07/00	
94-A	Aboveground Tanks, Lurance Canyon Burn Site	07/00	
94-B	Debris/Soil Mound Area	04/05	
94-C	Bomb Burner Area and Discharge Line	11/01	
94-D	Lurance Canyon Burn Site: Bomb Burner Discharge Pit	09/00	
94-E	Lurance Canyon Burn Site: Small Surface Impoundment	09/00	
94-F	LAARC Discharge Pit	04/05	
94-G	Scrap Yard, Lurance Canyon Burn Site	11/01	
94-H	Fuel Spill at Open Pool Test Area, Lurance Canyon Burn Site	04/05	
225	AEC Storage Facility/Kirtland AFB	12/05/96	Transferred to KAFB in 1996, listed on KAFB Permit
<b>OU 1334</b>	<b>Central Coyote Test Area</b>		
9	Burial/Open Dump (Schoolhouse Mesa)	04/05	
11	Explosive Burial Mounds	09/00	
20	School House Mesa Burn Site	12/95	
21	Metal Scrap (Coyote Springs)	09/00	
22	Storage/Burn (West of DEER)	07/00	
47	Unmanned Seismic Observatory	12/95	
57-A	Workman Site-Firing Site	09/00	
57-B	Workman Site-Target Area	09/00	
61-A	Blast Area	07/00	

<b>TABLE K-4</b> <b>Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls</b>			
<b>SWMU/AOC#</b>	<b>Name or Description</b>	<b>Date of CAC Approval</b>	<b>Comments</b>
61-B	Cratering Area	12/05/96	Transferred to KAFB in 1996, listed on KAFB Permit
61-C	Schoolhouse Mesa Test Site -- Schoolhouse Bldg.	09/00	
62	Greystone Manor Site (Coyote Springs)	12/95	
69	Old Borrow Pit	12/95	
70	Explosives Test Pit (Water Towers)	09/00	
71	Moonlight Shot Area	07/00	
88-A	Firing Site: Ranch House	12/95	
88-B	Firing Site: Instrumentation Pole	09/00	
<b>OU 1335</b>	<b>Southwest Test Area</b>		
6	Gas Cylinder Disposal Pit (Bldg. 9966)	11/01	
6-A	Gas Cylinder Disposal Pit	11/01	
14	Burial Site (Bldg. 9920)	07/00	
17	Scrap Yards/Open Dump (Thunder Range)	07/00	
39	Oil Spill - Solar Facility	11/97	
38	Oil Spills (Bldg. 9920)	07/00	
53	Bldg. 9923 Storage Igloo	11/97	
54	Pickax Site (Thunder Range)	07/00	
55	Red Towers Site (Thunder Range)	09/00	
56	Old Thunderwells (Thunder Range)	07/00	
85	Burial Site (Bldg. 9920)	07/00	
86	Firing Site (Bldg. 9927)	11/01	
89	Shock Tube Site (Thunder Range)	07/00	
90	Beryllium Firing Site (Thunder Range)	09/00	
103	Scrap Yard (Bldg. 9939)	07/00	
108	Firing Site (Bldg. 9940)	07/00	
109	Firing Site (Bldg. 9950)	07/00	
112	Explosive Contaminated Sump (Bldg. 9956)	09/00	
115	Firing Site (Bldg. 9930)	09/00	
117	Trenches (Bldg. 9939)	11/01	
191	EQUUS Red	11/01	
193	Sabotage Test Area	07/00	
194	General Purpose Heat Source Test Area	11/97	
<b>Misc. Sites</b>			
	Building 828, TA-1	04/05	
	TNT Site	04/05	
195	Experimental Test Pit	11/05	
1001	Bldg. 898 Septic System (TA-I)	11/05	
1002	Bldg. 8895/MO 100 Septic System (TA-I)		No Investigation Needed, Active System
1003	Former Bldg. 915/922 Septic System (TA-II)	11/05	

**TABLE K-4**  
**Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management**  
**Units for which Corrective Action is Complete without Controls**

<b>SWMU/AOC#</b>	<b>Name or Description</b>	<b>Date of CAC Approval</b>	<b>Comments</b>
1004	Bldg. 6969 Septic System (Robotic Vehicle Range)	02/08	
1005	Bldg. 6020 Septic System (6000 Igloo Area)		No Investigation Needed, Active System
1006	Bldg. 6741 Septic System (TA-III)	06/06	
1007	Bldg. 6530 Septic System (TA-III)	06/06	
1008	Bldg. 6750 Septic System (TA-III)	11/05	
1009	Bldg. 6620 Internal Sump (TA-III)	11/05	
1010	Bldg. 6530 Septic System (TA-III)	06/06	
1013	Bldg. T-52 and Former Bldg. 6500 South Septic System (TA-V)		Does Not Exist
1014	Former T-12, T-42, and T-43 Septic System (TA-V)	11/05	
1015	Bldg. 6530 Septic System (TA-III)	06/06	
1016	Bldg. 914 Seepage Pit (TA-II)		No Investigation Needed
1017	Bldg. 897X Septic System (TA-I)		Does Not Exist
1020	MO-146, MO-235, and T-40 Septic System (TA-III)	06/06	
1021	Bldg. 859 Drywell (TA-I)		No Investigation Needed
1022	Bldg. 6505A Seepage Pit (TA-III)		No Investigation Needed
1023	Bldg. 6505 Southwest Seepage Pit (TA-III)		No Investigation Needed
1024	MO 242-245 Septic System (TA-III)	06/06	
1025	Bldg. 6501 East Septic System (TA-III)	11/05	
1026	Bldg. 6501 West Septic System (TA-III)	11/05	
1027	Bldg. 6530 Septic System (TA-III)	11/05	
1028	Bldg. 6560 Septic System (TA-III)	06/06	
1030	Bldg. 6587 Septic System (TA-III)	11/05	
1031	Former Bldgs. 6589 and 6600 Septic System (TA-III)	02/08	
1032	Bldg. 6610 Septic System (TA-III)	11/05	
1033	Bldg. 6631 Septic System (TA-III)	11/05	
1034	Bldg. 6710 Septic System (TA-III)	02/08	
1035	Bldg. 6715 Septic System (TA-III)	02/08	
1036	Bldg. 6922 Septic System (TA-III)	02/08	
1037	MO 14, MO 15 Septic System (TA-I)		No Investigation Needed, Active System
1038	MO 154 Drywell (TA-I)		No Investigation Needed
1039	MO 155 Drywell (TA-I)		No Investigation Needed
1040	MO 156 Drywell (TA-I)		No Investigation Needed
1041	T-28 Drywell (TA-I)		No Investigation Needed
1042	T-29 Drywell (TA-I)		No Investigation Needed
1043	T-30 Drywells (TA-I)		No Investigation Needed
1044	T-31 Drywell (TA-I)		No Investigation Needed

**TABLE K-4**  
**Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management**  
**Units for which Corrective Action is Complete without Controls**

<b>SWMU/AOC#</b>	<b>Name or Description</b>	<b>Date of CAC Approval</b>	<b>Comments</b>
1045	T-32-2 Drywell (TA-I)		No Investigation Needed
1046	T-44 Drywell (TA-I)		No Investigation Needed
1047	T-45 Drywell (TA-I)		No Investigation Needed
1048	T-46 Drywell (TA-I)		No Investigation Needed
1049	T-47 Drywells (TA-I)		No Investigation Needed
1050	T-48 Drywells (TA-I)		No Investigation Needed
1051	Bldg. 803 Outfall (TA-I)		No Investigation Needed
1052	Bldg. 803 Seepage Pit (TA-I)	02/08	
1053	Bldg. 823 Outfall (TA-I)		No Investigation Needed
1054	Bldg. 823 Drywells (TA-I)		No Investigation Needed
1055	Bldg. 829 Drywell (TA-I)		No Investigation Needed
1056	Bldg. 838 Drywell (TA-I)		No Investigation Needed
1057	Bldg. 839 Drywell (TA-I)		No Investigation Needed
1058	Bldg. 847 Drywell (TA-I)		No Investigation Needed
1059	Bldg. 850 Drywell (TA-I)		No Investigation Needed
1060	Bldg. 857A Drywell (TA-I)		No Investigation Needed
1061	Bldg. 867 Drywells (TA-I)		No Investigation Needed
1062	Bldg. 869 Drywell (TA-I)		No Investigation Needed
1063	Bldg. 882 Drywell (TA-I)		No Investigation Needed
1064	Bldg. 890 Drywells (TA-I)		No Investigation Needed
1065	Bldg. 893 Drywells (TA-I)		No Investigation Needed
1066	Bldg. 894 Drywells (TA-I)		No Investigation Needed
1067	Bldg. 959 Drywell (TA-I)		No Investigation Needed
1068	Bldg. 904E Drywell (TA-II)		No Investigation Needed
1069	Bldgs. 913/913A Septic System (TA-II)		Does Not Exist?
1070	Bldg. 962 Drywells (TA-IV)		No Investigation Needed
1071	Bldg. 986 Drywell (TA-IV)		No Investigation Needed
1072	Bldg. T-52 and Former Bldg. 6500 Septic System (TA-V)	11/05	
1073	Bldg. 6580 Seepage Pit (TA-V)	11/05	
1074	Bldgs. 6581/6582 MO 32/57 Septic System (TA-V)		No Investigation Needed
1075	Bldg. 6582 Septic System (TA-V)		Does Not Exist
1076	Bldg. 6585 Septic System (TA-V)		Does Not Exist
1077	Bldg. 6920 Septic System (TA-III)	11/05	
1078	Bldg. 6640 Septic System (TA-III)	02/08	
1079	Bldg. 6643 Septic System (TA-III)	02/08	
1080	Bldg. 6644 Septic System (TA-III)	02/08	
1082	Bldg. 6620 Septic System (TA-III)	11/05	
1083	Bldg. 6570 Septic System (TA-III)	06/06	
1084	Bldg. 6505 Septic System (TA-III)	02/08	
1085	Bldg. 6520 Septic System (TA-III)		Does Not Exist
1086	Bldg. 6526 Septic System (TA-III)	06/06	
1087	Bldg. 6743 Seepage Pit (TA-III)	02/08	
1088	Bldg. 6736 Septic System (TA-III)		Does Not Exist
1089	Bldg. 6734 Seepage Pit (TA-III)	11/05	

<b>TABLE K-4</b> <b>Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls</b>			
<b>SWMU/AOC#</b>	<b>Name or Description</b>	<b>Date of CAC Approval</b>	<b>Comments</b>
1091	Bldg. 6720 Septic System (TA-III)	11/05	
1092	MO 228-230 Septic System (TA-III)	02/08	
1093	Bldg. 6584 West Septic System (TA-III)	11/05	
1094	Live Fire Range East Septic System (Lurance Canyon)	12/14	
1095	Bldg. 9938 Seepage Pit (Coyote Test Field)	12/14	
1096	Bldg. 6583 Septic System (TA-III)	11/05	
1097	SFER/127/128/130 Septic System (Lurance Canyon) (DOE Facility)		No Investigation Needed
1098	TA-V Plenum Rooms Drywell (TA-V)	02/08	
1099	Bldg. 634 Outfall (TA-I)		No Investigation Needed
1100	Bldg. 814 Outfall (TA-I)		No Investigation Needed
1101	Bldg. 885 Septic System (TA-I)	12/14	
1102	Former Bldg. 889 Septic System (TA-I)	02/08	
1103	Bldg. 6030 Septic System (6000 Igloo Area)		No Investigation Needed, Active System
1104	Bldg. 6595 Seepage Pit (TA-V)	02/08	
1105	Bldg. 6596 Drywell (TA-V)	11/05	
1106	Bldg. 6505 Interior Sump (TA-III)		No Investigation Needed
1107	Bldg. 6526 Drywell (TA-III)		No Investigation Needed
1108	Bldg. 6531 Seepage Pits (TA-III)	06/06	
1109	Bldg. 6530 Seepage Pit (TA-III)		No Investigation Needed
1110	Bldg. 6536 Drain System (TA-III)	06/06	
1111	Bldg. 6720 Seepage Pit (TA-III)	11/05	Site referred to as Bldg. 6720 Drywell (TA-III) in Consent Order
1112	Bldg. 6590 Reactor Sump Drywell (TA-V)	11/05	
1113	Building 6597 Drywell (TA-V)	02/08	
1114	Bldg. 9978 Drywell (Coyote Test Field)	12/14	
1115	Former Offices Septic System (Solar Tower Complex)	07/12	
1116	Bldg. 9981A Seepage Pit (Solar Tower Complex)	12/14	
1117	Bldg. 9982 Drywell (Solar Tower Complex)	12/14	
1118	Bldg. 9966 Drywell (Thunder Range)		No Investigation Needed
1119	Live Fire Range West Septic System (Lurance Canyon) (DOE Facility)		No Investigation Needed, Active System
1120	Bldg. 6595 Seepage Pit (TA-V)	02/08	
LTES-1	Cable Debris Site	12/14	

**PERMIT ATTACHMENT M – LONG-TERM MONITORING AND MAINTENANCE  
PLAN FOR SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN  
GRANTED CORRECTIVE ACTION COMPLETE WITH CONTROLS**

**M.1 INTRODUCTION**

This Long Term Monitoring and Maintenance Plan (LTMMP) addresses measures that the Permittees shall perform to provide protection of human health and the environment from constituents of concern present at various Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) at Sandia National Laboratories/New Mexico (SNL/NM). These SWMUs/AOCs are listed in Permit Attachment K, Table K-3, *Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for Which Corrective Action is Complete with Controls*, and Table M-1 of this Permit Attachment.

The SWMUs/AOCs subject to this LTMMP are located within the fenced boundaries of Kirtland Air Force Base (KAFB).

Measures under this LTMMP include surveillance of site conditions and maintenance of institutional controls. The controls are consistent with the risks presented by the site conditions and constituents of concern at each SWMU/AOC. The controls are implemented in an integrated and layered approach to enhance their effectiveness and reliability, and to provide continued protection in the event that one or more controls become temporarily impaired. Administrative and physical controls at the SWMUs/AOCs subject to this LTMMP include:

- Information management,
- Restrictions on future use,
- Awareness,
- Limited access restrictions as described in this LTMMP, and
- Physical features at some SWMUs/AOCs.

Maintenance of control measures, including routine surveillance, is conducted as necessary to prevent deterioration or failure of controls.

The administrative and physical controls are described in Section 2, the scope and frequency of surveillance and maintenance measures are described in Section 3, and periodic reports of SWMU/AOC status are summarized in Section 4 of this LTMMP. Information about the individual SWMUs/AOCs, controls, and maintenance measures is summarized in Table 1. Except for SWMUs 96 and 187, the SWMU/AOC locations are shown in Figures 1 through 5 of this Permit Attachment. The locations of SWMUs 96 and 187 could not be shown on Figures 1-5 due to their large spatial distribution. Instead, the locations for SWMUs 96 and 187 may be found on maps contained in the Investigation Report for each of these SWMUs.

Monitoring, maintenance, inspection, reporting and administrative and physical controls that shall apply to the Mixed Waste Landfill (SWMU 76) are solely those provided for in the Mixed Waste Landfill Long-Term Monitoring and Maintenance Plan (dated March 2012 and as it may be updated in the future upon approval by the Department).

## **M.2 INSTITUTIONAL CONTROLS**

### **M.2.1 Administrative Controls**

The following information about each SWMU/AOC listed in Table M-1 is maintained at SNL/NM: the SWMU/AOC location, characteristics, constituents of concern, corrective action, current conditions, and restrictions on future use.

The SWMUs/AOCs listed in Table M-1 are not approved for residential land use. Plans for future activities by the Permittees within one-half mile of each SWMU/AOC shall be evaluated to identify aspects that are not consistent with land use requirements for that SWMU/AOC.

### **M.2.2 Physical Controls**

Physical controls that shall be implemented for each SWMU/AOC are listed in Table M-1. Each of the SWMUs/AOCs listed in Table M-1 is located within the fenced boundaries of KAFB. Public access to KAFB is restricted. Additional physical controls at these SWMUs/AOCs consist of one or more of the following:

- Land use restrictions (primarily industrial);
- Warning and information signs posted at each SWMU/AOC where feasible;
- Fences that restrict access to some or all of each SWMU/AOC; and
- Physical features such as subsurface location (e.g., sewer lines).

Where signs are posted at the SWMUs/AOCs, the signs shall include the following information:

- SWMU/AOC number;
- Site-specific instructions; and
- Contact information for further direction.

The specific controls and maintenance measures for each SWMU/AOC are listed in Table M-1.



<b>Table M-1</b> <b>Summary of Institutional Controls for Solid Waste Management Units</b> <b>and Areas of Concern Requiring Controls</b>							
<b>SWMU/ AOC Number</b>	<b>Site Name</b>	<b>Site Data</b>	<b>Land Use</b>	<b>Signs and Postings</b>	<b>SWMU/AO C Inspections</b>	<b>Additional Information</b>	<b>Figure</b>
<b><i>OU 1289 Mixed Waste Landfill</i></b>							
76	Mixed Waste Landfill (TA-III)		Industrial			Controls and other requirements specified in Mixed Waste Landfill Long-Term Monitoring and Maintenance Plan, dated March 2012 (and as the plan may be updated)	3
<b><i>OU 1295 Septic Tanks and Drainfields</i></b>							
137	Bldg. 6540/6542 Septic System (TA-III)	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one each at selected corners of the SWMU	Annual		3
<b><i>OU 1302 TA-I</i></b>							
96	Storm System Drain	Maintained and tracked	Industrial	Not feasible	None	SWMU consists of underground storm drains throughout TA-I. No signs, postings, or inspections are feasible due to SWMU features.	Not shown



**Table M-1**  
**Summary of Institutional Controls for Solid Waste Management Units**  
**and Areas of Concern Requiring Controls**

<b>SWMU/ AOC Number</b>	<b>Site Name</b>	<b>Site Data</b>	<b>Land Use</b>	<b>Signs and Postings</b>	<b>SWMU/AO C Inspections</b>	<b>Additional Information</b>	<b>Figure</b>
98	Building 863 (TCA, Photochemical Releases: Silver Catch Boxes)	Maintained and tracked	Industrial	Not feasible	Annual	SWMU consists of subsurface area located under a building. No signs, postings, or inspections are feasible due to SWMU features.	1
187	Septic Tank Piping for POTW	Maintained and tracked	Industrial	Not feasible	None	SWMU consists of underground sewer lines throughout TA-I. No signs, postings, or inspections are feasible due to SWMU features.	Not shown
190	Steam Plant Tank Farm	Maintained and tracked	Industrial <sup>a</sup>	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		1
226	Old Acid Waste Line	Maintained and tracked	Industrial	Not feasible	None	SWMU consists of underground drain line throughout TA-I, II, and IV. No signs, postings, or inspections are feasible due to SWMU features.	1 and 2

<b>Table M-1</b> <b>Summary of Institutional Controls for Solid Waste Management Units</b> <b>and Areas of Concern Requiring Controls</b>							
<b>SWMU/ AOC Number</b>	<b>Site Name</b>	<b>Site Data</b>	<b>Land Use</b>	<b>Signs and Postings</b>	<b>SWMU/AO C Inspections</b>	<b>Additional Information</b>	<b>Figure</b>
<b><i>OU 1303 TA-II</i></b>							
1	Radioactive Waste Landfill	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one each in selected corners of the SWMU	Annual		2
2	Classified Waste Landfill (TA- II)	Maintained and tracked	Industrial	5 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		2
3	Chemical Disposal Pit	Maintained and tracked	Industrial	Included with SWMU 1	Annual	Located adjacent to SWMU 1.	2
135	Building 906 Drain System	Maintained and tracked	Industrial	1 sign	Annual		2
<b><i>OU 1306 TA III and V</i></b>							
105	Mercury Spill (Bldg. 6536)	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		3

<b>Table M-1</b> <b>Summary of Institutional Controls for Solid Waste Management Units</b> <b>and Areas of Concern Requiring Controls</b>							
<b>SWMU/ AOC Number</b>	<b>Site Name</b>	<b>Site Data</b>	<b>Land Use</b>	<b>Signs and Postings</b>	<b>SWMU/AO C Inspections</b>	<b>Additional Information</b>	<b>Figure</b>
196	Bldg. 6597 Cistern (TA- V)	Maintained and tracked	Industrial	1 sign near the northeast corner of the SWMU	Annual		3
<b><i>OU 1307 Liquid Waste Disposal System</i></b>							
4	LWDS Surface Impoundment s	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		3
<b><i>OU 1309 Tijeras Arroyo</i></b>							
45	Liquid Discharge (Behind TA- IV)	Maintained and tracked	Industrial	5 signs on SWMU perimeter, one in approximately each corner of the SWMU outside of the TA-IV fence	Annual	Western half of the SWMU is located within the TA-IV fenced boundary	2
46	Old Acid Waste Line Outfall	Maintained and tracked	Industrial	4 signs along the TA-IV fence line and 7 signs posted along the south and west perimeter of the SWMU	Annual		2

<b>Table M-1</b> <b>Summary of Institutional Controls for Solid Waste Management Units</b> <b>and Areas of Concern Requiring Controls</b>							
<b>SWMU/ AOC Number</b>	<b>Site Name</b>	<b>Site Data</b>	<b>Land Use</b>	<b>Signs and Postings</b>	<b>SWMU/AO C Inspections</b>	<b>Additional Information</b>	<b>Figure</b>
229	Storm Drain System Outfall (for TA-II)	Maintained and tracked	Industrial	1 sign at the top of the outfall	Annual		2
<b><i>OU 1332 Foothills Test Area</i></b>							
87	Building 9990 Firing Site	Maintained and tracked	Industrial <sup>a</sup>	4 signs, one at the access road and three on the perimeter of the SWMU	Annual		5
<b><i>OU 1335 Southwest Test Area</i></b>							
91	Lead Firing Site (Thunder Range)	Maintained and tracked	Industrial <sup>a</sup>	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		4
<b><i>Miscellaneous Sites</i></b>							
1029	Building 6584 North Septic System (TA- III)	Maintained and tracked	Industrial	3 signs on SWMU perimeter	Annual		3

<b>Table M-1</b> <b>Summary of Institutional Controls for Solid Waste Management Units</b> <b>and Areas of Concern Requiring Controls</b>							
<b>SWMU/ AOC Number</b>	<b>Site Name</b>	<b>Site Data</b>	<b>Land Use</b>	<b>Signs and Postings</b>	<b>SWMU/AO C Inspections</b>	<b>Additional Information</b>	<b>Figure</b>
1081	Building 6650 Septic System (TA-III)	Maintained and tracked	Industrial	3 signs on SWMU perimeter	Annual		3
1090	Bldg. 6721 Septic System (TA-III)	Maintained and tracked	Industrial	1 sign, approximately in the middle of the SWMU	Annual		3

<sup>a</sup> The Permittees have separate documentation with KAFB to maintain institutional controls at this location, however, this documentation does not prohibit KAFB uses of the land.

### **M.3 MAINTENANCE OF INSTITUTIONAL CONTROLS**

#### **M.3.1 Maintenance of Administrative Controls**

Records and information for each SWMU/AOC listed in Table M-1 are maintained in written or electronic form at SNL. The records are kept current and are updated when new information becomes available or is generated. The records include the following:

- Site location and characteristics;
- Site history and corrective action;
- Land use permits or agreements with KAFB;
- Documentation of current site conditions, including information from annual inspections;
- Type of controls;
- Maintenance records;
- Planning information, including restrictions on future activities at the site; and
- Copies of reports previously submitted to the Department.

#### **M.3.2 Maintenance of Physical Controls**

The Permittees shall periodically inspect and maintain the physical controls at the SWMUs/AOCs. Documented annual inspections include reviews of the following, as applicable:

- Condition of the site;
- Evidence of erosion, seepage, or subsidence;
- Evidence of newly-occurring or newly-visible contamination;
- Condition and location of signs;
- Evidence of activities that are not consistent with restrictions in place; and
- Evidence of residential activities adjacent to the given SWMU/AOC that would necessitate additional awareness measures and access restrictions for the site.

Inspection results are evaluated for necessary maintenance, including repair, replacement, or installation. Maintenance will occur on the following schedule (Table M-2) unless weather or other site-specific conditions require a delay.

<b>Table M-2 Maintenance Schedule</b>	
<b>Maintenance Issue</b>	<b>Response Schedule</b>
Erosion, seepage, or subsidence	Evaluate severity and if necessary develop mitigation plan within 120 days  Complete in a timely manner
Newly-occurring or newly-discovered contamination	See Permit Part 8
Signs	Begin to address within 30 days  Complete in a timely manner
Activities that are inconsistent with site restrictions	Begin to address within 30 days  Complete in a timely manner
Awareness measures to address new residential activities adjacent to SWMU/AOC locations	Develop measures within 30 days  Implement measures in a timely manner
Access restrictions to address new residential activities adjacent to SWMU/AOC locations	Develop measures within 60 days  Implement measures in a timely manner

The Permittees shall perform follow-up inspections to verify completion of corrective actions. Follow-up inspections shall occur within 180 days after the actions are completed and may be combined with annual inspections.

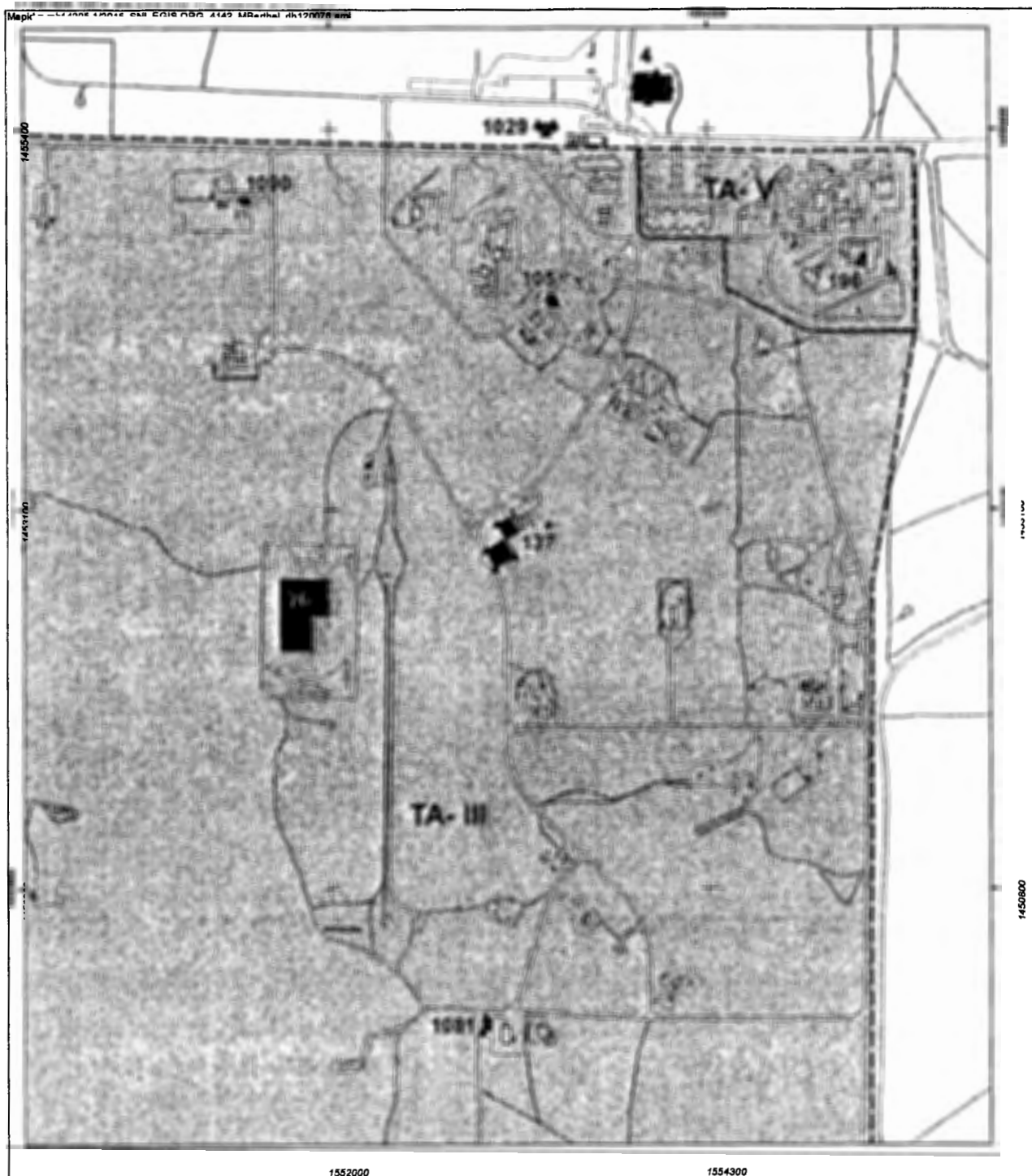
#### **M.4 LTMMP REPORTING REQUIREMENTS**

An annual SWMU/AOC LTMMP report shall be prepared to document the following:

- Annual inspection results;
- Maintenance and repair activities required;
- Status of maintenance and repair activities; and
- Other conditions or events at the site that affect the performance of the controls.

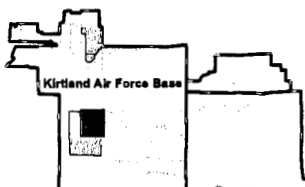
The report shall include all SWMUs/AOCs listed in the Permit Table M-1. The annual report for each calendar year shall be submitted to the Department by March 31 of the following year.





### Legend

- ▲ Sign Location
- SWMU with Controls
- ▤ SNL Tech Area
- Building / Structure
- Road



New Mexico State Plane Central Zones, 1983  
1988 North American Vertical Datum

**Figure 3**  
**Solid Waste Management Units -**  
**Corrective Action Complete with**  
**Controls, Tech Areas III and V,**  
**January 2015**

0 260 520 1,000  
Scale in Feet  
0 80 120 240  
Scale in Meters



Sandia National Laboratories, New Mexico  
Environmental Geographic Information System



**New Mexico Environment Department  
Response to Public Comments on  
Sandia National Laboratories Mixed Waste Landfill  
Proposal for Corrective Action Complete with Controls  
February 2016**

On January 12, 2015, the New Mexico Environment Department (NMED or the Department) issued a notice announcing a 60-day public comment period concerning the proposal to grant Corrective Action Complete (CAC) with controls status for the Sandia National Laboratories (SNL or Sandia) Mixed Waste Landfill (MWL). The end of the comment period was later extended from March 17, 2015, to April 13, 2015. A public hearing on the CAC proposal was conducted at the Anderson-Abruzzo International Balloon Museum in Albuquerque from July 8 to July 11, 2015. In addition to written comment received earlier, written and verbal public comments were also provided at the July 2015 hearing on the CAC proposal. Subsequent to the hearing, the Department Secretary has issued a final order on February 12, 2016 approving CAC with controls status for the MWL. This document is the NMED's response to comments on this matter, required by 20.4.1.901.A(9) NMAC.

. . Many of the comments received were previously addressed in NMED's responses concerning other documents related to the MWL, such as the *Long-Term Monitoring and Maintenance Plan for the Mixed Waste Landfill* (LTMMP), *Mixed Waste Landfill Corrective Measures Implementation Plan* (CMI Plan), *Mixed Waste Landfill Corrective Measures Implementation Report* (CMI Report), and the *Sampling and Analysis Plan for Soil Gas Volatile Organic Compounds, Tritium, and Radon at the Mixed Waste Landfill* (SV SAP), and the *Permit Modification for Corrective Measures* (referred to as the CMS in this document). See NMED's Hazardous Waste Bureau's web page at <http://www.nmenv.state.nm.us/HWB/snlperm.html> for links to NMED's responses on these documents. Although it is not required, the Department has responded in this document to comments found to be inapplicable to the CAC proposal. .

Table 1 of this document lists the members of the public who commented on the CAC proposal. Table 2 summarizes the comments and contains the NMED's responses thereto.

**Table 1: List of Public Commenters on CAC Proposal**

<b>Commenter ID</b>	<b>Date of Letter, E-mail or Comment</b>	<b>Commenter (and Association, if Applicable)</b>
KK	January 28, 2015	Maggie Taylor
LL	February 3, 2015	Diego Manrique
MM	January 30, 2015	Lara Moore
NN	February 1, 2015	Dorothy Garnand
OO	January 29, 2015	Anne Housekeeper
PP	February 9, 2015	Tracy Jordan
QQ	January 31, 2015	Fidel Ramirez
RR	February 2, 2015	Brooks Walch
SS	January 30, 2015	Hope Kitts, Ph.D.
TT	February 2, 2015	Merna Brostoff
UU	February 9, 2015	Derek Werner, Ph.D.
VV	January 31, 2015	Clifton Bain
WW	January 30, 2015	Kate Graham
XX	February 11, 2015	John Shaski
YY	February 7, 2015	Shannyn Sollitt
ZZ	January 12, 2015	Marcia Walton
AAA	January 30, 2015	Sonia Dickey
BBB	February 3, 2015	Kendra Reardon
CCC	January 30, 2015	Lorraine Marnell, Ph.D.
DDD	February 2, 2015	Jamie Phillips
EEE	February 9, 2015	Susan Solari
FFF	February 10, 2015	Rick Fisher
GGG	February 2, 2015	Russell Pyle
HHH	February 2, 2015	Valerie Roybal
III	January 31, 2015	Kim Gordon
JJJ	January 31, 2015	Marian Frear
KKK	February 2, 2015	Sara Henderson
LLL	February 2, 2015	Jade McLellan
MMM	February 4, 2015	Tema Milstein
NNN	February 9, 2015	Eileen Lee

OOO	February 3, 2015	Jennifer Szpak
PPP	February 1, 2015	Kersti Tyson
QQQ	January 21, 2015	Steve Hecht
RRR	February 25, 2015	Dominic Gonzalez
SSS	February 9, 2015	Linda Stokas
TTT	February 8, 2015	Ben Wasserott
UUU	February 2, 2015	Jeff Nelson
VVV	February 1, 2015	Chris Duvall
WWW	February 4, 2015	Elena Mitchel
XXX	February 11, 2015	Dee Rice
YYY	February 4, 2015	Adam Woods
ZZZ	January 31, 2015	Javier Ortega
AAAA	February 3, 2015	Sam Peterson
CCCC	March 5, 2015	Craig and Barbara Stewart
DDDD	March 3, 2015	Elaine Shannon
EEEE	March 10, 2015	David McCoy of Citizen Action New Mexico, ANSWER Coalition, St. Andrew Presbyterian, Nancy Kilpatrick of Social Justice Council First Unitarian, Albuquerque Mennonite Church, Fair Heights NA, Sylviana Diaz-Douville of Grey Panthers of Albuquerque, Judith Kidd of Albuquerque Center for Peace and Justice, Janet Greenwald of Citizens for Alternatives to Radioactive Dumping, Susan Schuurman of Coalition to Stop \$30 Billion, Sally-Alice Thompson of Move to Amend, Frank Murphy of Trinity House Catholic Worker, Robert Allen of ABQ Hours, New Mexico Faith Coalition for Immigrant Justice, Jewish Voice for Peace – Albuquerque Chapter, Jewel Hall of Dr. Martin Luther King Jr. Memorial Center, Veterans for Peace, Maureen Wright of UNA-USA Albuquerque Chapter, Planes of the Southwest, Parkland Hills Neighborhood Association, Rose Gardner of Alliance for Environmental Strategies, Robin Seydel of La Montanita Coop, David Barbour, Esq. Of David Barbour and Associates Law Office, Robert Aly of Available Media, Inc., Barbara Mantano of Daniel/Jacobson, NA, Charlie Christian, Laura Eisner of Book Case Used Books, Dale Pease of Gallery One, Eric Nuttal, Robert Gilkeson, Javier Benavidez of Southwest Organizing Project (list only includes the names of individuals and organizations that were legible).
LLLL	April 13, 2015	Eric Nuttall, Ph.D.
MMMM	April 13, 2015	David McCoy, Citizen Action New Mexico; Joni Arends, Concerned Citizens for Nuclear Safety; and Robert Gilkeson
NNNN	April 13, 2015	Robert Gilkeson
OOOO	July 8 and 11, 2015	Willard Hunter (verbal and written comment at hearing)
PPPP	July 8, 2015	Dario Rodriguez (verbal comment at hearing)
QQQQ	July 8 and July 10, 2015	Susan Rodriguez (verbal and written comment at hearing)
RRRR	July 8, 2015	Karen Bonime (verbal comment at hearing)
SSSS	July 8, 2015	Floy Barrett (verbal comment at hearing)

TTTT	July 8, 2015	Michelle Meaders (verbal comment at hearing)
UUUU	July 8, 9, and 11, 2015	Jim McKay (verbal comment at hearing)
VVVV	July 8, 2015	Robert Aly (verbal comment at hearing)
WWWW	July 8 and 9, 2015	Simon Polakowski (verbal comment at hearing)
XXXX	July 8, 2015	Eileen Shaughnessy (verbal comment at hearing)
YYYY	July 8, 2015	Ellen Raimer (verbal and written comment at hearing)
ZZZZ	July 8, 2015	Curtis Miller (verbal comment at hearing)
AAAAA	July 8, 2015	Sylvia Diaz-Douville (verbal comment at hearing)
BBBBB	July 8, 2015	Robin Seydel (verbal comment at hearing)
CCCCC	July 8, 2015	Janet Greenwald, Citizens for Alternatives to Radioactive Dumping (verbal comment at hearing)
DDDDD	July 9, 2015	Carol Benson (verbal comment at hearing)
EEEEE	July 9, 2015	Meredith Bunting (verbal comment at hearing)
FFFFF	July 8, 2015	Sally Gallosa (written comment at hearing)
GGGGG	July 8, 2015	R. Carlos Caballero (written comment at hearing)

**Table 2: Summaries of Public Comments and NMED Responses Regarding Proposal to Grant Corrective Action Complete with Controls (CAC) Status for the Sandia National Laboratories Mixed Waste Landfill (MWL)**

<b>Commenter ID</b>	<b>Topic Area</b>	<b>Summary of Public Comment</b>	<b>NMED Response Number</b>	<b>NMED Response</b>
KK, PP, QQ, SS, TT, UU, VV, XX, YY, ZZ, AAA, BBB, DDD, EEE, FFF, HHH, JJJ, LLL, MMM, NNN, OOO, PPP, QQQ, RRR, SSS, UUU, VVV, WWW, XXX, ZZZ, CCCC, DDDD, EEEE, MMMM	Request for Public Hearing	<p>Commenters stated that a public hearing should be held. In several cases, the commenters did not give a reason why a hearing should be held. Other commenters stated that a hearing was needed because of their concern over air and water quality, and releases of contaminants. Several commenters stated that a hearing should be held because the wastes in the landfill needed to be removed and properly disposed of.</p> <p>Additionally, a few commenters stated that a hearing should be held because the Permittees and the NMED have lied to the public, and that hearing was needed for NMED to be ethical and accountable.</p>	R1	<p>As required under the New Mexico Hazardous Waste Management Regulations at 20.4.1.901.A(4) NMAC, the NMED contacted members of the public that requested a hearing, and provided them an opportunity to participate in discussions with the NMED and the Permittees. Most of those that requested a hearing did not participate in the discussions. Additionally, the discussions did not resolve opposition to the proposal to grant Corrective Action Complete (CAC) with controls status for the Mixed Waste Landfill (MWL). Thus, a hearing was granted in response to public concern. The hearing was held at the Anderson-Abruzzo International Balloon Museum in Albuquerque from July 8 to July 11, 2015.</p> <p>See Responses R9, R13, and R64 of this document regarding releases to air and groundwater, and Response R2 concerning excavation of the MWL.</p> <p>NMED has not provided false information to the public. The agency has made every effort to provide accurate information about the MWL and to explain its decisions.</p>
KK, MM, NN, OO, PP, QQ, SS, TT, UU, VV, WW, XX, YY,	Excavation and Denial of Corrective Action Complete	Commenters stated that the MWL should be excavated, and Corrective Action Complete status should not be granted for the MWL. Some further indicated that the waste should	R2	<p>Remedy selection, in particular excavation, has been addressed previously by the NMED in Responses R1(A), R35, R36, and R42 for the LTMMP; Responses R2 and R9 for the CMI Plan; Responses 1, 2, and 3 for the CMI Report; and Responses R25, R52, R55, R58, R61, R62, R64, R69, and R70 of the CMS.</p> <p>The NMED held a public hearing in December, 2004 which</p>

<p>ZZ, AAA, BBB, CCC, DDD, EEE, FFF, GGG, HHH, III, JJJ, LLL, MMM, NNN, OOO, PPP, QQQ, RRR, SSS, TTT, UUU, VVV, WWW, XXX, YYY, ZZZ, AAAA, CCCC, EEEE, LLLL, MMMM, NNNN, OOOO, PPPP, RRRR, SSSS, TTTT, UUUU, VVVV, XXXX, YYYY, AAAAA, BBBBB, DDDDD, EEEE</p>		<p>be placed into storage or another landfill. One commenter stated that the landfill's unlined pits are dangerous to the city and the country. Thousands of people live within 4 miles of the MWL at Mesa del Sol and the Four Hills area.</p>		<p>lasted four days, for the purpose of remedy selection. Considerable effort and thought was made to select the remedy most appropriate for the MWL, which included consideration of public comment and technical testimony provided by the various parties to the hearing. The final decision to construct the cover with bio-intrusion layer and conduct long-term monitoring of the MWL, along with other requirements, was made by the Department Secretary in his Final Order dated May 26, 2005.</p> <p>As discussed in previous responses to public comment, the landfill cover will maintain a low and thus acceptable level of risk to the public, workers, and the environment, is a proven reliable and effective technology, and will further reduce waste mobility. The cover will prevent wastes from endangering human health, ground water, and the environment by minimizing the infiltration and percolation of moisture into the landfill, by preventing the intrusion of small animals into waste, and by shielding people, workers, and the environment from harmful radiation. No comments were received that provide any credible scientific evidence that the remedy is not protective of human health and the environment.</p> <p>Furthermore, the feasibility of excavation and the effectiveness of the now-constructed cover will be reevaluated in the future in the 5-year reviews required by the Secretary's Final Order of May 2005. The first reevaluation is due in 2019. The delay between remedy selection and when the first reevaluation report is due is discussed in Response R39 of this document.</p> <p>The MWL, in its current condition with the cover installed, does not pose a significant threat to human health or the environment. Landfills that do not pose unacceptable risk are not normally excavated to remove their contents. Even if an unexpected release occurs in the future (which should be detected by monitoring under the LTMMMP), the best decision to mitigate the hazard of the release may not involve excavation of the landfill.</p> <p>The radiation hazard of the landfill exceeds that of the chemical</p>
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LLLL		<p>A commenter stated that the MWL should be excavated because 270,000 gallons of water was added to (Trench D) of the landfill. Storm events have also contributed moisture to the landfill.</p>	R3	<p>risk and poses the most significant hazard. The cover installed on the MWL has reduced radiation levels measured on the surface to background conditions. Thus, radiation levels of the buried contents of the landfill do not pose a significant threat to human health or the environment, provided the wastes remain buried.</p> <p>Additionally, removal of waste from the landfill generates new waste, which has legal implications under the Resource Conservation and Recovery Act (RCRA) and the New Mexico Hazardous Waste Act (HWA) on how the waste would need to be stored, inspected, treated, disposed of and otherwise managed. These include requirements that would likely cause workers to be exposed to radiation hazards after the landfill had been excavated. Given that the landfill is does not pose unacceptable risk, there is no rational justification to warrant exposing workers to the radiation hazards of the landfill's contents by excavating the landfill and subsequently managing the waste.</p> <p>Monitoring well MWL-MW4 was installed next to Trench D, where the 270,000 gallons of reactor coolant water was placed. Subsurface soil samples collected during well installation indicated that only low levels of contaminants (tritium) were released. The groundwater directly beneath the trench does not contain detectable levels of tritium.</p> <p>As shown by the RCRA Facility Investigation (RFI), the effect of the wastewater on the landfill contents was negligible, and the moisture has dissipated over time and can no longer cause further contaminant migration. The RFI also demonstrated that only minor levels of contaminants have been released from the MWL in the past regardless of the amount of moisture that may have infiltrated into the landfill in the past. The new landfill cover is superior to that of the old cover and is predicted to significantly limit infiltration of moisture from future storm events.</p>
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LLLL, MMMM		<p>Commenters stated that the cover cannot last for any reasonable period of time as protection against radioactive and hazardous wastes disposed of in the landfill. . A commenter stated that the cover offers no real protection for the long term because erosion will cause its integrity to be compromised. . Furthermore, there are no design or long-term maintenance provisions to protect the cover from complete erosion.</p>	R4	<p>As noted previously by the NMED in Responses 13 and 15 for the CMI Report, the landfill is expected to last 1000 years without maintenance. Additionally, although NMED can't predict the future, NMED must assume that the federal government will exist longer than the next 1000 years, and will do whatever is necessary to protect human health and the environment, including maintaining the landfill cover.</p> <p>The cover averages 4.12 feet thick (or 1255.8 mm, which is in addition to the 1.25-foot thickness of the bio-barrier, and up to 3 additional feet of subgrade). At an average erosion rate of 1 mm per year, the cover would last more than 1000 years even if no maintenance was performed to replace soil eroded from the cover.</p> <p>Additionally, the cover was designed to minimize maintenance. The landfill cover is graded to reduce the erosion capability of water flowing over the cover's surface. The cover is also vegetated to accomplish the same effect; vegetation will also transpire moisture back into the atmosphere. Run-on water is diverted around the landfill using ditches.</p> <p>Contrary to the comment, the LTMMP contains provisions that require inspection of the cover and repair of the cover as necessary.</p>
LLLL		<p>A commenter stated that the Consortium for Environmental Education and Technology Development (WERC) panel felt strongly that the uncertainty of the contents of the MWL could eventually lead to the requirement (or choice) to excavate the MWL. Furthermore, in their meetings with SNL engineers at Citizen</p>	R5	<p>The WERC findings were discussed at the 2004 hearing for remedy selection for the MWL, and were included in the Administrative Record for that proceeding. However, the WERC panel did not provide technical testimony at the hearing. The Permittees recommended at the hearing that the cover and monitoring should be the final remedy for the MWL, although excavation was assessed as part of the Corrective Measures Study. As indicated in Response R2 of this document, NMED made the final remedy decision to construct the cover (plus biobarrier) and conduct monitoring, which was made in part in consideration of the short term unacceptable risk to workers if the</p>



<p>LLLL, MMMM, RRRR, TTTT, UUUU</p>		<p>Advisory Board (now defunct) meetings, these engineers demonstrated their intent that the MWL would be excavated.</p> <p>Commenters stated that the MWL can be safely excavated now through implementation of robotic techniques. Delay of excavation will lead to continued degrading of containers, entry of moisture into the landfill, and release of wastes. This will complicate retrieval of wastes and increase the cost of excavation. There are locations in New Mexico, Utah, and Nevada that can receive the wastes.</p>	<p>R6</p>	<p>landfill was excavated (due to the radiation hazard). In addition, there have been no releases from the MWL that pose unacceptable risk to human health and the environment, and such releases are not expected to occur in the future (taking into consideration waste types and characteristics, known releases, geologic and climatic conditions, the anticipated performance of the cover, and in light of monitoring for releases is to be conducted in the future).</p> <p>This matter has been addressed, in part, previously by the NMED in Response R42 for the LTMMMP. The NMED believes that the radiological hazard of waste buried in the MWL exceeds the chemical hazard. The risk assessment prepared under the MWL Corrective Measures Study predicts that the radiological risk to workers would be unacceptable if an excavation alternative was selected. Robotic equipment and site controls could limit radiation exposure to workers and the public if the landfill was to be excavated. Although robotic technology exists, there is no compelling reason to excavate the landfill, which, in its current condition, does not pose unacceptable risk to the environment or human health under an industrial land use scenario, which is the foreseeable future land use for the site.</p> <p>Given the nature of the wastes in the inventory, the degradation of containers will likely have little impact on contaminant releases, as the majority of the wastes disposed of in the MWL were in solid form (see also Response R47 of this document). Additionally, the cover will limit infiltration of moisture into the landfill. Thus, if the landfill were to be excavated in the future, most waste items would not be any more difficult to excavate if their container, if any, was degraded in part or in whole.</p> <p>Excavation of waste would generate a new waste and would only be the first step in the "cradle to grave" management of the waste. NMED questions whether there is robotic technology that can be applied to store, inspect, declassify or demilitarize, sample, treat,</p>
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				<p>and otherwise manage wastes in a safe manner and a manner compliant with law. RCRA has stringent requirements for all aspects of hazardous (mixed) waste management, which will likely require considerable human interaction with wastes (with potential for exposure to radiation hazards), and imposes time limits related to treatment and disposal of mixed and hazardous wastes.</p> <p>There are no operational and permitted disposal locations in New Mexico for mixed or hazardous waste. . Some, but probably not all, wastes could potentially be disposed of in landfills in Utah and Nevada. However, some wastes in the MWL, if excavated now, would pose a radiation hazard to the public while being transported to disposal facilities. . Mixed waste that does not meet the treatment standards for disposal would have to be treated, and treatment capacity for mixed waste is significantly limited compared to nonradioactive hazardous waste.</p>
MMMM, NNNN		<p>Commenters, advocating for excavation of the landfill, opined that the RCRA Facility Investigation (RFI) should be re-opened. . One commenter indicated that a new risk assessment needs to be prepared for the landfill. . One indicated that non-disclosure and mishandling of high level waste and nuclear weapons related waste is the basis for re-opening the RFI.</p>	R7	<p>There is no justification for re-opening the RCRA Facility Investigation. . The landfill has been adequately characterized to support remedy selection, as was demonstrated in the 2004 hearing. . Also, because no additional site characterization data are needed, a revision to the risk assessment is not necessary.</p> <p>See also Responses R68-R70 of this document concerning risk assessment, and Responses R55 and R56 of this document regarding high level waste.</p>
MMMM, NNNN		<p>Commenters stated that excavation of the most dangerous and long-lived</p>	R8	<p>This matter has been addressed, in part, previously by the NMED in Response 22 for the CMI Report and R60 for the CMS. . The NMED generally does not have authority to regulate radioactive</p>

		<p>radioactive wastes is needed to reduce risks to human health. One commenter further states that DOE does not have a strategy to ensure protection of human health and the environment long into the future. Institutional controls will be required for thousands of years. Furthermore, in accordance with 40 CFR § 264.100 (e)(3), corrective action must be initiated and completed within a reasonable time period considering the extent of contamination. Because institutional controls must be maintained for thousands of years, corrective action will essentially never be completed.</p>	<p>waste or the radioactive component of mixed waste at a U. S. Department of Energy facility, such as SNL.</p> <p>The landfill cover provides adequate shielding of the radiation hazards of the landfill. Radiation levels at the surface of the landfill are at background levels and do not pose unacceptable risk to human health or the environment. If these wastes were to be excavated, the radiation hazard they exhibit will not disappear. The wastes will still be radioactive for millennia whether they are moved to another landfill or are kept in storage (the latter is problematic as regulations limit the amount of time that hazardous and mixed waste can remain in storage, so storage is not a long term solution).</p> <p>NMED agrees that much of the waste in the MWL contains radionuclides that exhibit long half-lives, and these wastes will continue to be radioactive for thousands of years to come. However, most of these wastes are not highly radioactive. Regardless, no matter their half-life, or level of radioactivity, so long as the wastes remain buried, they do not pose unacceptable risk to human health or the environment.</p> <p>NMED must assume that the federal government will exist and can be held accountable for the MWL far into the future. It is likely that RCRA or some successor statute will be available in the future to ensure protection of human health and the environment.</p> <p>Furthermore, radionuclides are not regulated under 40 CFR § 264.100 (e)(3), and the MWL is not subject to this regulatory requirement. Corrective action is completed once the Permittees have fulfilled adequately all requirements for remedy implementation under the May 2005 Final Order and the final state of the landfill is protective of human health and the environment. Provided that long term monitoring does not detect a significant release, corrective action for the site will remain complete. Long-term monitoring and maintenance under the</p>
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<p>LL, QQ, XX, DDD, GGG, JJJ, KKK, LLL, UUU, AAAA, MMMM, NNNN, OOOO, PPPP, XXXX, BBBBB</p> <p>MMMM, NNNN</p>	Groundwater	<p>Several commenters made a general statement that groundwater beneath the MWL has become contaminated due to releases from the landfill. One commenter stated that at the 2004 hearing, SNL and the NMED untruthfully represented that there was no evidence of groundwater contamination.</p> <p>Commenters stated that the groundwater contained elevated concentrations of cadmium, chromium, nickel, and nitrate, and PCE contamination.</p>	<p>R9</p> <p>R10</p>	<p>Alleged groundwater contamination has been addressed previously by the NMED in Responses R1, R9, R32(A), R32(T), R33, and R34 for the LTMMP; Response R2 for the CMI Plan; Responses 2, 6, 7, 8, 12, 17, 24, 25, 27, and 29 for the CMI Report; R20 for the SV SAP; and Responses R43, R66, and R72 of the CMS.</p> <p>The NMED and SNL did not misrepresent facts about groundwater at the 2004 hearing.</p> <p>The MWL is not a source of groundwater contamination as demonstrated by two decades of groundwater monitoring and as shown by subsurface soil and soil gas data obtained during the RCRA Facility Investigation.</p> <p>Groundwater has not been contaminated by the MWL (see Response R9 of this document). Soil and soil gas data indicate that groundwater is unlikely to become contaminated due to releases from the MWL. The elevated nickel and chromium levels observed in groundwater samples from certain older wells are the result of the corrosion of their stainless-steel well screens. More recently elevated nickel and chromium concentrations in water samples from well MWL-MW4 were caused by corrosion of the dedicated sampling pump and associated equipment (which is now been refurbished or removed). Groundwater cannot become contaminated unless the vadose zone is first contaminated. Sampling and analysis of subsurface soil in the vadose zone demonstrates conclusively that there has been no release of</p>

<p>MMMM</p>		<p>A commenter stated that nickel contamination in ground-water samples collected from monitoring well MWL-MW1 is contamination from nickel-bearing wastes buried in the MWL. The commenter also stated that the concentrations of nickel in groundwater at MWL-MW1 exceed the EPA MCL for drinking water standards.</p>	<p>R11</p>	<p>chromium or nickel from the MWL. Water samples collected from the new wells installed in 2008 demonstrate that nickel and chromium occur at background levels in the groundwater. The same is true for cadmium.</p> <p>Nitrate occurs in groundwater at the MWL at concentrations of about 5 mg/L, which slightly exceeds the background level of 4 mg/L for the Kirtland Air Force Base area. The U.S. Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL) and New Mexico Water Quality Control Commission (NMWQCC) standards are both set at 10 mg/L. Thus, nitrate in the groundwater at the MWL does not exceed the EPA or WQCC standards. Furthermore, there is no evidence of a nitrate source in the landfill, and the slightly elevated levels of nitrate in the groundwater may have come from a nearby septic system(s), albeit the source is unknown.</p> <p>Tetrachloroethene (PCE) occurs in the highest concentrations in soil vapor compared to other volatile organic compounds (VOCs) detected in subsurface soil gas at the MWL. PCE is considered to have the most potential of any VOC at the MWL to reach groundwater at detectable levels. However, the concentrations of PCE in the soil gas are too low to contaminate groundwater at concentrations that would exceed the MCL (0.005 mg/L) for PCE. Sampling results from the deep soil-vapor monitoring wells recently installed at the landfill support this conclusion.</p> <p>Well MWL-MW1 has been abandoned and is not part of the MWL well network under the LTMMP. As addressed previously by the NMED in Responses R9(A) and R32(C) for the LTMMP, and Responses 7 and 12 for the CMI Report, and as indicated above in Response R10 of this document, the elevated nickel levels observed in groundwater samples obtained from well MWL-MW1 were derived from the corrosion of its stainless-steel screen.</p>
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<p>KKK</p> <p>KK, MM, NN, SS, TT, WW, YY, BBB, CCC, EEE, HHH, OOO, PPP, QQQ, RRR, SSS, TTT, WWW, EEEE, LLLL, RRRR, UUUU, AAAAA, EEEE</p>		<p>NMED claimed that the high levels of nickel were from corrosion of the well screen. Nickel was disposed of in the MWL and is the source of the contamination.</p> <p>A commenter asked if there was nuclear waste in the groundwater.</p> <p>Several commenters expressed a general concern that the MWL poses a future threat to groundwater.</p>	<p>R12</p> <p>R13</p>	<p>Nickel-bearing wastes were undoubtedly disposed of in the landfill. However, analytical results for soil samples show that nickel contamination does not occur in subsurface soil in the vadose zone, which indicates that groundwater beneath the MWL cannot be contaminated with nickel.</p> <p>The only radionuclides detected in groundwater at the MWL are those that occur naturally, and they occur at background levels. There is no nuclear waste or constituents therefrom in the groundwater.</p> <p>The concern over future groundwater contamination has been addressed previously by the NMED in Responses R1, R8 (F), R9(A), R32, and R33 for the LTMMP; Responses R1, R2, R5, R9, R17, R27, R29, and R38 for the CMI Plan; Responses 2, 12, and 17 for the CMI Report; R20 for the SV SAP, and Responses R30, R61, and R66 of the CMS.</p> <p>Site investigations have identified and characterized the most significant, and the most and least mobile contaminants in and surrounding the landfill. The cover, because of its ability to limit the intrusion of moisture into the landfill and because it will preclude contact between waste and human and other environmental receptors, will ensure that human health and the environment (including groundwater) are protected from the relatively immobile contaminants (those that migrate in an aqueous phase, which are most of the contaminants in the landfill). The most mobile contaminants (those that migrate in the vapor phase) do not occur at levels released into the environment that pose a significant risk to groundwater (or other environmental media).</p>
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<p>MMMM</p>		<p>A commenter stated that SNL should be required to establish a compliance monitoring program. Additionally, compliance monitoring should be imposed because of exceedances of EPA MCLs for metals and in soil gas. Compliance monitoring is required due to new evidence of groundwater contamination.</p>	<p>R14</p>	<p>The LTMMP will ensure that migration of contaminants will be detected so that remedial actions can be taken if contaminant levels indicate a potential unacceptable risk to the groundwater or other environmental media. While NMED does not expect such a release to occur, the LTMMP provides for additional remedial action should it become necessary to correct a problem that arises in the future.</p> <p>This matter has been previously addressed in part by the NMED in Response R10(Y) for the LTMMP. The MWL is not subject to compliance monitoring program under 40 CFR § 264.99 because the MWL is a solid waste management unit (SWMU). To be even more specific, as a SWMU, the MWL is not subject to the groundwater monitoring regulations at 20.4.1.500 NMAC incorporating 40 C.F.R. §§ 264.91-264.100.</p> <p>However, groundwater monitoring will be conducted under the LTMMP to ensure protection of human health and the environment. The monitoring is similar to that for compliance monitoring at 40 CFR § 264.99. The groundwater monitoring under the LTMMP is being conducted to ensure that if contaminants reach groundwater, further action is taken to protect human health and the environment.</p> <p>There are no metals that occur in concentrations in groundwater at the MWL that exceed an EPA Maximum Contaminant Limit (MCL), except in cases where groundwater was contaminated due to corrosion of stainless steel well or pump components (which has been mitigated). The MWL has not released metals that have reached or are expected to reach groundwater.</p> <p>MCLs do not apply to soil gas contaminant concentrations. However, analysis of VOC vapors indicates that they occur at concentrations at the MWL that are too low to cause groundwater contamination in excess of a water quality standard.</p>
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MMMM		A commenter stated that plutonium can travel to groundwater in colloidal form.	R15	<p>Additionally, there is no new (or old) evidence that the MWL has caused groundwater contamination. See also Response R10 of this document.</p> <p>This matter has been previously addressed in part by the NMED in Responses R9 and R38 for the CMS. Plutonium is not a hazardous waste or hazardous constituent. The NMED generally has no authority to regulate radioactive waste or the radioactive component of mixed waste at a U. S. Department of Energy facility, such as SNL.</p> <p>According to the inventory of waste contained in the landfill, the MWL contains plutonium-bearing waste. However, the total mass of plutonium disposed in the landfill is believed to be small. Analytical laboratory results for subsurface soil and groundwater samples demonstrate that there has been no release of plutonium from the MWL.</p> <p>Plutonium will only migrate in the presence of sufficient water. Because percolation of water through the landfill will be significantly limited by the cover, and because there is only a small amount of plutonium in the landfill, plutonium will not migrate nearly 500 feet to groundwater because of insufficient water and because of the effects of dilution and adsorption.</p>
MMMM		A commenter stated that CAC should not be granted because of the failure to install groundwater monitoring wells in the vadose zone.	R16	<p>Groundwater monitoring wells cannot be installed in the vadose zone. Wells must be screened at or below the water table to enable groundwater from the saturated portion of the aquifer to flow into the well.</p>
LLLL, MMMM, NNNN, UUUU	Groundwater monitoring wells	Commenters stated generally that the groundwater monitoring wells at the MWL (past and present) are inadequate, or defective, and do not provide	R17	<p>NMED disagrees that the past and current groundwater monitoring networks were inadequate. Wells at the MWL provide reliable data to assess groundwater quality and hydraulic head. Furthermore, NMED did not provide incorrect testimony at the 2004 hearing concerning the wells at the MWL.</p>



		<p>reliable and representative groundwater samples. One commenter stated that NMED and SNL provided incorrect testimony at the 2004 hearing that the wells were reliable. Commenters stated that the Fate and Transport Model (FTM) for the MWL relied on unreliable data from the defective groundwater well network. One commenter added that the FTM did not include the analytical data from the wells that show groundwater is contaminated with cadmium, chromium, nickel, and nitrate, and that the FTM excluded computer modeling results that identified that the groundwater is probably contaminated with tetrachloroethene (PCE).</p>	<p>Many issues concerning the adequacy of groundwater monitoring wells at the MWL were addressed previously and extensively by the NMED in Responses R10, R18, and R32 for the LTMMP; Responses R29, R38, R39, R40, R42, R44, R46, R47, R48, R49, R50, R52, R53, R54 and R56 for the CMI Plan; and Responses 4, 6, 7, 8, 11, 17, 25, 26, and 28 for the CMI Report.</p> <p>As addressed previously by the NMED in Response 17 for the CMI Report and Response R29 for the CMI Plan, the NMED believes that groundwater data obtained from the older, now abandoned monitoring wells (MWL-BW1, MWL-MW2, and MWL-MW3) at the Mixed Waste Landfill (MWL) were reliable and representative of formation water quality as discussed in the 2006 NMED report:  <i>Evaluation of the Representativeness and Reliability of Groundwater Monitoring Well Data, Mixed Waste Landfill, Sandia National Laboratories.</i></p> <p>The oldest wells at the landfill (MWL-BW1, MWL-MW1, MWL-MW2, and MWL-MW3) have been plugged and abandoned, and are not now part of the well network under the LTMMP.</p> <p>The newest wells at the landfill (MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9) make up the monitoring well network under the LTMMP. These wells, installed in 2008, are adequate for groundwater monitoring at the MWL, in terms of their construction, the drilling method employed to install them, their location, and their screened intervals. Older wells MWL-MW5 and MWL-MW6 are being retained for future use, should there be a need for them. The oldest well remaining at the landfill, MWL-MW4, will be used for measuring water levels and could be used to collect water samples in the future, if the need arises.</p> <p>Concerning comments about the FTM, groundwater is not contaminated (see Response R9 of this document). The Fate and Transport Model (FTM) did not rely on groundwater data from</p>
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<p>MMMM, NNNN, UUUU</p>		<p>Commenters stated that the NMED and EPA deliberately withheld EPA documents demonstrating the MWL wells were defective. One commenter stated that NMED pushed extremely hard for EPA Region 6 not to even question the past results or the viability of past results. A commenter claimed that the 2007 EPA report confirmed problems with MWL wells, including that wells were placed at the wrong locations, drilled with improper methods (mud rotary), are improperly sampled for groundwater, have corroded well screens and long well screens that hide detection of groundwater contamination, allow for cross-contamination of different strata, and point to a</p>	<p>R18</p>	<p>any wells. The main purpose of the model was to predict the probability of the most significant waste and waste constituents <i>to reach</i> groundwater at a concentration that would exceed a water quality standard. It did not and was not intended to predict the fate and transport of contaminants once they <i>had migrated</i> to groundwater. The fate and transport of PCE was specifically addressed by the FTM, as PCE is the most significant of the VOCs that have been released from the landfill based on concentration levels. As indicated by conservative modeling, the FTM predicts only a small probability (1%) that PCE will reach groundwater at a concentration exceeding its water quality standard.</p> <p>The EPA Region 6 “report” referred to by the commenter begun as an attachment to a 2007 email to the NMED and presented various issues concerning what later became an unfinished draft report on MWL groundwater monitoring wells (that was eventually provided to the commenter by the EPA Office of Inspector General as a draft report). It was intended via the aforementioned email to set up a meeting between the EPA and the NMED to resolve technical differences regarding MWL wells.</p> <p>NMED did not withhold the draft report. The NMED received a copy (approximately 10 versions) of the last version of the draft report after it had been released to the commenter.</p> <p>NMED also did not withhold the 2007 email and so-called earliest version of the “report”. The commenter was provided this information when first requested. The rest of the discussion below concerns what NMED believes represents the last attempt by EPA to reach a final position regarding the adequacy of MWL wells.</p> <p>As indicated previously in Response R2 for the LTMMP, the NMED did not, nor could it, pressure EPA management to produce an evaluation of the MWL groundwater monitoring well network that agreed with NMED’s position. The OIG report</p>
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		<p>need for wells west, south and north of the MWL. Furthermore the report states there is a need for more a more sensitive minimum detectable activity for tritium, and that there is an inappropriate analysis of groundwater flow rate based on flawed pumping tests and insufficient monitoring of the vadose zone for early detection of releases. Samples from MW4 are diluted due to mixing of groundwater from the lower and upper zones of the well. Groundwater samples from well MW2 are of no value because the well is located cross gradient to the direction of groundwater flow.</p>	<p>states: "We found that one Oversight Review team member felt the team was pushed to agree with NMED's position regarding the MWL monitoring wells." NMED has no basis upon which to evaluate the veracity of this claim, or whether the perception of one anonymous EPA team member was justified. In any case, nothing in the OIG report alleges any improper actions or undue influence on the part of NMED, rather the report makes findings regarding purported shortcomings in EPA's internal processes, over which NMED has no control.</p> <p>In the single meeting held between EPA and NMED technical staff concerning their review of groundwater monitoring at the MWL, EPA was told by the NMED Hazardous Waste Bureau Chief that EPA should state whatever positions it held with regard to any aspect of groundwater monitoring at the MWL. NMED defends its own positions as necessary.</p> <p>As addressed previously by the NMED in Responses R2 and R32 for the LTMMP, none of the older wells at the MWL, which were evaluated by the EPA technical team and include MWL-BW1, MWL-MW1, MWL-MW2, MWL-MW3, MWL-MW4, MWL-MW5 and MWL-MW6, are part of the monitoring well network under the LTMMP (except MWL-MW4 will be used for water level measurements).</p> <p>NMED was provided information, including multiple versions of the draft report, indicating that the EPA technical team involved in the review of the groundwater monitoring network had not reached consensus on many issues. This lack of consensus is evident by nearly four dozen e-mails and at least ten versions of the draft document generated over a period of roughly nine months. Further evidence is found in the last draft of the document, dated December 12, 2007, in which 11 of the 19 major issues discussed by EPA in the draft report are denoted as issues where EPA should "[c]ontinue further discussion with NMED". Especially for these 11 issues, it seems apparent that the EPA technical team had not reached consensus, and was concerned</p>
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			<p>about whether their draft conclusions were correct. Their concern was justified, as some of EPA's draft conclusions are erroneous. Had EPA finalized their report based on a more complete review of the facts, they likely would have agreed with NMED on all or nearly all of the 19 issues.</p> <p>Of the eight remaining issues, the draft report suggests that EPA would have agreed with the NMED on seven of the issues, and had no position on the other. More specifically, the draft report suggests EPA would have agreed with the NMED that:</p> <ol style="list-style-type: none"><li>1. Only one background well is needed and it should be located in the alluvial fan strata, the uppermost aquifer;</li><li>2. No wells are needed within the MWL at hot spots due to the landfill's small size (2.6 acres);</li><li>3. Additional wells are not needed in the deeper Ancestral Rio Grande strata;</li><li>4. The source of chromium and nickel in wells MWL-MW1 and MWL-MW3 is likely corrosion of the stainless steel screens in these wells;</li><li>5. The original background well, MWL-BW1, provided reliable and representative water samples even though the well was cross-gradient;</li><li>6. MWL-MW3 should be replaced because of the corrosion of its well screen and dropping water levels; and</li><li>7. Well MWL-MW6 should be maintained for the purpose of water level measurements.</li></ol> <p>The draft EPA report concludes, in part, "[b]ased on our review, we have determined that NMED's overall actions and decisions for administration of the authorized program have been technically sound and consistent with applicable RCRA requirements. We have also found no evidence to indicate that the MWL poses an imminent or substantial danger to citizens or groundwater supply."</p> <p>NMED also notes that the scope of the EPA's review as presented in the draft report did not include a review of subsurface drilling</p>
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				<p>data and other data concerning releases of contaminants to the vadose zone. These data show that no releases of contaminants have occurred at the MWL that pose unacceptable risk to human health or the environment. NMED considers this to be a significant omission in their review effort in that the EPA team likely would have agreed with the NMED on most, if not all, of the 11 issues for which the team could not reach consensus.</p> <p>With regard to the issue that wells were placed at the wrong locations (with respect to groundwater flow direction and other factors), see Responses R19, R23, R24, R27-R33 of this document. With regard to wells drilled with improper methods (mud rotary), see Response R34 of this document. With regard to wells that have corroded well screens, see also Responses R10, R11 and 31 of this document. Concerning wells with long screens, see Response R22 of this document. Concerning improper sampling, see Response R20 of this document. Regarding cross-contamination of different strata, see Response R33 of this document. Regarding a need for wells to be located on the western, southern, and northern boundaries of the landfill, see Response R19 of this document. Concerning the reliability and representativeness of groundwater data, see Response R17 and R34 of this document.</p> <p>Concerning the need for a more sensitive detection limit for tritium, the NMED disagrees. As indicated in Response R10(N) for the LTMMP, the minimum detectable activity (MDA) of the current method used for tritium analysis lies well below any level that would pose unacceptable risk to human health or the environment.</p> <p>Concerning inappropriate analysis of groundwater flow rate based on flawed pumping tests, as indicated in Response R32(T) for the LTMMP, more accurate estimates of groundwater velocity are not needed because there is no groundwater contamination present at the landfill.</p>
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<p>MMMM, NNNN</p>		<p>Commenters stated that in 2007 EPA Region 6 informed the NMED by email of the need for additional monitoring wells to be placed in both the northern and southern sections of the MWL.</p>	<p>R19</p>	<p>Concerning the issue that there is insufficient monitoring of the vadose zone for early detection of releases, EPA did not evaluate the LTMMP. As indicated in Response R8(B) for the LTMMP, any soil-gas plume at the MWL with concentrations high enough to pose an unacceptable risk to human health or the environment would spread laterally and would be detected by the deployment of a relatively small number of soil-vapor monitoring wells. NMED believes that the soil-gas wells installed at the MWL are adequate to detect a soil-gas plume that would pose a threat to human health or the environment.</p> <p>Regarding dilution of water samples from MW4, dilution will not occur via mixing of groundwater between the upper and lower screened intervals as a packer is installed in the well casing to separate the two zones.</p> <p>Regarding the comment that well MWL-MW2 was cross-gradient to the direction of groundwater flow, this issue was addressed previously by the NMED in Responses R32(B) and R32(O) for the LTMMP. Well MWL-MW2 is not part of the monitoring well network under the LTMMP. MWL-MW2 was installed under EPA's oversight of the MWL, and has since been replaced with a well located near the western boundary of the landfill, which is situated more ideally with respect to the direction of groundwater flow. Contamination has not been detected in water samples collected from MWL-MW2 or the well that replaced it.</p> <p>The EPA email concerns what ultimately became several versions of a draft EPA Report (see Response R18 of this document), which does not necessarily represent the final position of the EPA. This matter has been addressed previously by the NMED in its Responses R10(J) and R10(FF) for the LTMMP.</p> <p>Groundwater monitoring wells do not need to be installed along the northern and southern boundaries of the landfill, as there is a significant westerly component to the direction that groundwater</p>
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<p>MMMM NNNN</p>		<p>Commenters stated that wells are being purged dry with water samples collected later. The water obtained in this manner becomes aerated, with loss of volatile organic compounds (VOCs) and other contaminants that could be present in the water. A commenter stated that reports in the Administrative Record document that water levels are too low at wells MWL-MW8 and MWL-MW9 to collect reliable and representative samples, and the wells purge dry causing samples to be aerated and VOCs to be lost.</p>	<p>R20</p>	<p>flows. The 2008 wells, located on the western side of the landfill, are adequately located to monitor groundwater at the MWL.</p> <p>NMED previously addressed this issue concerning low yield wells (wells that purge dry) in Responses R38 for the CMI Plan and Response 28 for the CMI Report.</p> <p>Unless a well cannot recover, there normally is no need to replace wells because they purge dry.</p> <p>There are no regulations or guidance stating that low yield wells are unacceptable. It is a standard EPA procedure to purge low yield wells dry, and then to collect water samples from them as soon as possible after they have sufficiently recovered. Additionally, the pumping and sampling procedures employed by the Permittees are appropriate, and in fact are a necessity given the natural conditions that exist at the MWL. Some of the wells at the MWL are low yield wells because the saturated sediments that they intercept have low hydraulic conductivity (Ksat – Ksat is a physical property that essentially is a measure of how easily groundwater can flow through the aquifer). The NMED and EPA both recognize that low yield wells exist and that, in some instances, ideal sampling conditions cannot be obtained. Because low yield wells are a reality, and contamination is not always located in high Ksat zones, the sampling of low yield wells is not prohibited by regulation, and procedures for sampling them are found in EPA guidance.</p> <p>Groundwater at MWL low yield wells is sampled following the EPA guidance. It is standard operating procedure to purge low wells dry, then collect water samples as soon as possible after they have sufficiently recharged. Because EPA guidance was followed, samples from the low yield wells are considered to be reliable and representative with respect to this matter.</p> <p>The concern over aerated water samples is overstated, as the</p>
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LLLL		A commenter stated that they had recently become aware of defective groundwater monitoring practices that were occurring at the MWL, and that this problem was occurring prior to review by the Consortium for Environmental Education and Technology Development (WERC) panel. The WERC panel did not review the reliability of groundwater monitoring data.	R21	<p>appreciable time needed for the wells to recover after being purged dry is conclusive proof that flow into the wells is not turbulent. Thus, VOCs and other constituents are not lost during recharge.</p> <p>The LTMMP contains provisions in Appendix F to conduct low flow sampling and well purging. The plan is considered adequate for the conditions encountered at the landfill and substantially meets EPA guidance for sampling. Concerning low water levels at MWL-MW8 and MWL-MW9, see Responses R23 and R24 of this document.</p> <p>NMED previously addressed this issue in Response 24 for the CMI Report. The groundwater monitoring wells at the MWL are not defective. See Response 17 of this document.</p> <p>NMED had no control over what the WERC panel wanted to cover in their review of the MWL. The WERC panel had the opportunity to examine all of the information that was available to the NMED at the time, including groundwater and vadose-zone data, well construction information, and sampling methods. NMED provided WERC all of the information the panel requested.</p>
MMMM, NNNN		Commenters stated that the well screens of the newest wells (2008 wells) were 30 feet long, which is too long. One commenter stated that the Consent Order prohibits screen lengths in excess of 15 ft (with an additional 5 feet of screen	R22	<p>NMED previously addressed this issue in Responses R10(I) for the LTMMP and 25 for the CMI Report. For wells screened across the water table, NMED normally allows well screens to be no more than 20 feet long, with 5 feet of screen located above the water table and 15 feet below. In other words, a standing column of water in the well no more than 15 feet in length above the bottom of the screen would be acceptable. However, at the MWL, NMED approved the use of longer screens to allow for increased well life given that the water table beneath the MWL was</p>



<p>MMMM, NNNN</p>		<p>allowed above the water table). The long screens promote dilution of contamination at the water table, making the well unable to detect contamination. A commenter stated that reports in the Administrative Record document that wells MWL-MW4, MWL-MW5, MWL-MW6, MWL-MW7, MWL-MW8, and MWL-MW9 are useless to detect groundwater contamination because the well screens are too long (30 feet).</p> <p>Commenters stated that the newest wells (2008 wells) were screened 20 feet too deep to detect contamination. A commenter stated that reports in the Administrative Record document that wells MWL-MW4, MWL-MW5, MWL-MW6, MWL-MW7, MWL-MW8, and MWL-MW9 are</p>	<p>R23</p>	<p>dropping about 0.8 feet/year, and taking into consideration that monitoring for the last two decades demonstrates that releases from the landfill have not caused groundwater contamination. In this case, a standing column of water of 25 feet would be acceptable.</p> <p>Notwithstanding the above, water levels encountered in the 2008 wells are lower than expected. As indicated in Response 25 for the CMI Report, as-built conditions of the newest wells at the MWL indicate that the height of the water column above the bottom of the screen interval of each well is actually smaller than the intended 25 feet. Based on water level measurements obtained in October 2011, the water column height is 4.65, 4.02, and 3.4 feet for MWL-MW7, MWL-MW8, and MWL-MW9, respectively. Thus, the saturated screen intervals for all three downgradient wells are actually less than 15 feet. The wells are expected to go dry sooner than originally anticipated because of the dropping water table. NMED believes that the 2008 wells are adequate for their intended purposes (to provide water level measurements and reliable and representative water samples).</p> <p>Contrary to the comment, nothing in the Consent Order prohibits screen lengths in excess of 15 feet.</p> <p>The wells are screened across the water table, as they should be to monitor the first occurrence of groundwater beneath the MWL. The 2008 wells are adequate for their intended purposes (to provide water level measurements and reliable and representative water samples).</p>
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MMMM, NNNN		<p>useless because the water levels are 20 feet too deep to detect groundwater contamination at the water table</p> <p>Commenters stated that water levels in wells MWL-MW8 and MWL-MW9 are too low to collect representative water samples. One commenter further stated that according to a SNL/DOE Report, at least 4 feet of water column above the bottom of the well screen is required to purge and sample a well.</p>	R24	<p>Concerning the comment about a requirement for at least 4 feet of water column above the bottom of a well screen, there is no such requirement in any regulation or in guidance. For any given well, as long as formation water can enter the well screen, the groundwater may be sampled. This is the case for wells MWL-MW8 and MWL-MW9; the wells provide reliable and representative water samples.</p>
NNNN		<p>A commenter stated that the well network under the LTMMP consists of 6 wells (MWL-MW4 through MWL-MW9, inclusive).</p>	R25	<p>The groundwater monitoring well network under the LTMMP consists of 4 wells (which are MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9). Well MWL-MW4 (upper screen zone) will be used only for water level measurements. Wells MWL-MW5 and MWL-MW6 are being retained should there be a need for them in the future, but they are not part of the well network under the LTMMP.</p>
NNNN		<p>A commenter stated that a 1991 DOE Tiger team Assessment Report concluded for the MWL that "The number and placement of wells at the MWL is not sufficient to characterize the effect of the MWL on groundwater (p. 3-59)." Furthermore, a 1991 report by</p>	R26	<p>NMED previously addressed the issue in Response 6 for the CMI Report. The wells that existed at the MWL in 1991 have been abandoned.</p> <p>The commenters cite old, out-of-date reports and other documents. Additional groundwater monitoring wells have been installed at the MWL since these reports and other documents were prepared by the NMED, Los Alamos National Laboratory, EPA, and the U. S. Department of Energy Tiger Team. The horizontal component of groundwater flow beneath the MWL</p>

		<p>Los Alamos National Laboratory (LANL) indicated that there was only one downgradient and no upgradient well at the MWL, which does not meet RCRA monitoring criteria.</p>		<p>is approximately west. The wells completed on the west boundary of the MWL, installed in 2008, are appropriately located in consideration of the groundwater flow direction. The original background well (MWL-BW1), installed in 1989 and located cross-gradient at a distance of approximately 450 feet from the landfill, yielded groundwater samples that showed no evidence of contamination from the landfill. Thus, the original background well was adequate to serve its intended purpose, it yielded water samples representative of background conditions. MWL-BW1 has since been abandoned, and replaced with well MWL-BW2, which is located east of the landfill.</p>
NNNN		<p>A commenter stated that a 1998 NMED Notice of Deficiency (NOD) indicated that the top of the screen for well MWL-MW4 is located 22 feet below the water table, and because of the vertical gradient, the well cannot be used to provide the elevation of the water table. The well is also of no value for detecting groundwater contamination at the water table, if any contamination exists.</p>	R27	<p>NMED previously addressed this issue in Response R10(DD) for the LTMMP. Well MWL-MW4 is constructed with two screened intervals, which are separated by blank casing, and internal to the casing, via a packer. Under the LTMMP it will be used for water level measurements, but not for the collection of groundwater samples. The upper screened interval of MWL-MW4 is similar to those of the 2008 wells. The water table has dropped in elevation since the well was installed. It is therefore now acceptable to use water level measurements from the upper screen interval of MWL-MW4 to construct water table maps.</p>
NNNN		<p>A commenter stated that a 2007 EPA report recommended that well MWL-MW4 be abandoned, and replaced with a new well located close to the northern side of the landfill.</p>	R28	<p>The draft EPA report (see Response R18 of this document) states that further discussion was needed with NMED with respect to this issue. EPA was concerned that waters within the two aquifers (defined by the EPA as alluvial fan and ancestral Rio Grande strata) could be mixing if the packer in the well did not seal properly, that the well may not be screened at the water table, and that because of its position within the landfill, the well cannot be used to indicate horizontal movement of contamination.</p>

NNNN		<p>A commenter stated that the deep water levels in wells MWL-MW7, MWL-MW8, and MWL-MW9 are caused by their 30-foot long screens that were installed such that the bottom of the screens were placed in sediments of medium hydraulic conductivity compared to the sediments with low hydraulic conductivity that extend from the water table to 20 feet below the water table.</p>	R29	<p>However, the alluvial fan and ancestral Rio Grande strata are hydraulically connected. Because the units are hydraulically connected, there is nothing preventing the mixing of groundwater between the units. Because the groundwater has not been contaminated by the MWL, any mixing of the groundwater is not a concern.</p> <p>The upper screened interval of MWL-MW4 is similar to the screened intervals of the 2008 wells. It is therefore acceptable to use water level measurements from the upper screened interval of MWL-MW4 to construct water table maps. The well has other value in that it can provide information on hydraulic head and water quality distribution with depth. The meaning of EPA's statement that the well cannot be used to indicate horizontal movement of contamination is not entirely clear, thus NMED cannot respond to this statement other than to say that groundwater has not been contaminated by the MWL.</p> <p>Groundwater does not flow north at the MWL. Thus, there is no reason to replace MWL-MW4 with a well located on the northern boundary of the landfill.</p> <p>The hydraulic conductivity of the sediments encountered by the well screens does not control the magnitude of the total head (water level) measured at wells MWL-MW7, MWL-MW8, and MWL-MW9, or any other wells.</p>
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NNNN		<p>A commenter states that water trickles downward through the filter pack and mixes with water entering the screen from deeper in the saturated zone, causing the water to become aerated and diluted (attached to his comment, he supplies a figure using MWL-MW9 as an example to illustrate his point).</p>	R30	<p>Because the well screens span the water table, the process described by the commenter is physically impossible and cannot occur. Water that enters the filter pack will flow through the screen into the well such that the water level in the well will match that of the water table. Thus, water levels measured in wells MWL-MW7, MWL-MW8, and MWL-MW9 may be properly used to construct water table maps. Furthermore, the wells will provide water samples that are reliable and representative of water quality conditions as there are no conditions present that would cause dilution or aeration of water samples.</p>
NNNN		<p>A commenter referenced a draft 2007 EPA report that states that sampling groundwater from a new well or borehole near MWL-MW1 would provide conclusive proof concerning the presence of elevated nickel in the well was from the landfill or the from corrosion of the well's screen.</p>	R31	<p>NMED previously addressed this issue in Responses R9 and R32(C) for the LTMMP, and 7 and 12 for the CMI Report. A new well is not needed. Subsurface soil sampling demonstrates that nickel has not been released from the landfill. The elevated nickel seen in water samples from MWL-MW1 were a result of corrosion of its stainless steel well screen. See Response R11 of this document.</p>
NNNN		<p>A commenter stated that the wells at the MWL cannot be used to determine the water table elevation across the site.</p>	R32	<p>Well MWL-MW1 has been abandoned. The newest monitoring wells at the MWL (installed in 2008) are constructed with polyvinyl chloride (PVC) screens. The PVC screens do not contain nickel. Nickel has been detected in water samples obtained from these new wells only at background levels, confirming that nickel is not a groundwater contaminant.</p> <p>NMED previously addressed the issue in Responses R10(C) for the LTMMP and 4 for the CMI Report.</p> <p>Because the wells are screened across the water table, the wells provide for adequate data to map the water table.</p>

NNNN		<p>A commenter stated that Wells MWL-MW7, MWL-MW8, and MWL-MW9 are not allowed under the Consent Order because the wells are screened across hydraulically separated units, which could cause mixing of groundwater and cross-contamination.</p>	R33	<p>NMED previously addressed the issue in Responses R32(A) for the LTMMP.</p> <p>Wells MWL-MW7, MWL-MW8, and MWL-MW9 are all completed in alluvial fan sediments. Alluvial fan sediments overlie ancestral Rio Grande strata at the MWL; both units are hydraulically connected. Because the units are hydraulically connected, there is nothing preventing the mixing of groundwater between the two units. However, because the groundwater has not been contaminated by the MWL, any mixing of groundwater is not a concern.</p>
NNNN		<p>A commenter stated that the wells were improperly drilled using the mud rotary method.</p>	R34	<p>NMED previously addressed this issue in Responses R32(P) for the LTMMP, 8 and 17 for the CMI Report, and R29, R39, R49, and R50 for the CMI Plan.</p> <p>Only some of the older wells installed at the MWL were completed using the mud rotary drilling method. These wells, which are now abandoned, are not part of the groundwater monitoring network under the LTMMP. All of the groundwater monitoring wells installed in 2008 (MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9), and which now make up the network under the LTMMP, were completed using the air rotary casing hammer (ARCH) method. The ARCH method is widely considered to be one of the best methods with which to install groundwater monitoring wells.</p> <p>Although wells drilled by the mud rotary method can yield representative groundwater samples if the wells are properly developed, the NMED discourages the use of the mud rotary drilling method to install monitoring wells. Regardless, NMED determined that the older, now-abandoned, wells at the MWL that were installed using the mud rotary method provided reliable and representative groundwater samples as discussed in the 2006</p>

				<p>NMED report: <i>Evaluation of the Representativeness and Reliability of Groundwater Monitoring Well Data, Mixed Waste Landfill, Sandia National Laboratories.</i></p> <p>Although the NMED discourages the use of the mud rotary method, the installation of wells using this method is not prohibited. What matters most is that well development creates an effective filter pack, corrects damage to the formation caused by drilling, removes fine particles from the formation near the borehole, and restores water quality.</p>
MMMM	Permit	<p>A commenter indicated that the MWL was not covered under a permit. The commenter further indicated a belief that the operation of the MWL, not being covered under a permit, was illegal. A commenter stated that SNL should have obtained RCRA closure or post-closure permits.</p> <p>The commenter stated that Corrective Action Complete status does not meet criteria required for closure and post-closure care under 40 CFR § 264.111-112. The commenter also states that the MWL cannot meet the closure performance standards under 40 CFR § 264.111.</p>	R35	<p>NMED previously addressed this issue in part in Response 30 for the CMI Report.</p> <p>A hazardous waste operating permit does not exist and has never existed for the MWL. That the MWL is not a permitted hazardous waste management unit has been addressed previously by the NMED in Response R13(C) for the LTMMP; Response R39 for the CMI Plan; and Responses 5, 19, and 30 for the CMI Report.</p> <p>The MWL is a solid waste management unit (SWMU) subject to the cleanup authority under 40 CFR § 264.101 (and the SNL Consent Order and the May 2005 Final Order). As a SWMU (and as is the case for all SWMUs at the Facility), the MWL is tracked in the RCRA permit for the Facility. The RCRA permit is for treatment and storage, but not for disposal, of hazardous and mixed waste.</p> <p>EPA designated the MWL as a SWMU. Because the MWL was not a permitted hazardous waste management unit, it is not subject to the closure and post-closure care requirements under 40 CFR Part 264 Subpart G.</p> <p>However, the LTMMP will eventually become a part of SNL's Hazardous Waste Operating Permit and will specify the long-term controls for the landfill. The LTMMP contains the same technical</p>

WWWW		A commenter stated it was not clear who would be responsible if something goes wrong. They also submitted information stating that the federal government had lied to and suppressed information from reaching the public that nuclear testing in Nevada had exposed the public to harmful radiation. Furthermore, it was alleged that scientists working for the government lied or stayed silent about the hazards of nuclear testing in order to keep their jobs.	R36	<p>requirements for monitoring, inspection, and maintenance that would normally be included in a post-closure care permit for a landfill.</p> <p>Disposal of mixed waste was terminated before New Mexico was authorized to regulate mixed waste (July 25, 1990), and also before Congress clarified that EPA and the States had the authority under the Federal Facility Compliance Act (October 6, 1992) to fully regulate mixed waste, including the authority to levy penalties. Thus, no illegal activity happened as a result of the MWL operation.</p> <p>As indicated in Section III.F of the Consent Order, the U. S. Department of Energy and Sandia Corporation, as Respondents, are responsible to meet the appropriate corrective action requirements for the MWL under RCRA.</p> <p>NMED oversees corrective action at the MWL, including conducting periodic collection and analysis of split groundwater samples. The Department has not encountered any information to suggest that the Permittees have provided false information.</p>
KK, PP, QQ, SS, TT, UU, VV, XX, ZZ, AAA, BBB, CCC, DDD, EEE, FFF, GGG, HHH,	Deny Certificate of Completion	Commenters stated that the NMED should deny a Certificate of Completion for the MWL.	R37	<p>The commenters appear to be confused between the meaning of the terms "certificate of completion" versus "corrective action complete". The NMED believes that the commenters intended to request that CAC status for the MWL be denied.</p> <p>The Certificate of Completion has already been issued for the MWL (it was issued on October 8, 2014). However, the issuance of a Certificate of Completion does not grant CAC status for the</p>



JJJ, LLL, MMM, NNN, OOO, PPP, QQQ, SSS, UUU, VVV, WWW, XXX, ZZZ,				MWL. The only way CAC status can be obtained is through a Class 3 permit modification request, which is subject to public comment and opportunity for a public hearing. The proposal that CAC with controls status be granted for the MWL is being properly processed as a Class 3 permit modification request as required by the regulations.
LLLL, MMMM, OOOO, RRRR, UUUU, XXXX, YYYYY, QQQQ, FFFFF, GGGGG	Explosion risk from Metallic (Elemental) Sodium	Commenters stated that there is a possible risk of explosion due to metallic sodium in canisters that are buried in the MWL. Such an explosion could send nuclear debris into the air. One commenter stated that metallic sodium caused a fire at the West Lake Landfill in Missouri and that the fire was getting close to a landfill containing high level waste. The commenter stated that the same situation could happen at the MWL. The commenter submitted an article concerning the West Lake and Bridgeton Landfills in Missouri, where EPA is being requested to relocate citizens due to the fire at the Bridgeton site and its alleged future impact to the West Lake Landfill. They also submitted a second article that discusses wastes generated from nuclear weapons testing that are buried at the Runit Dome (a landfill) in the Marshall Islands and the fear that rising sea levels could cause the release of	R38	<p>As NMED stated previously in Response R1 for the CMS, metallic sodium can react violently when mixed with water. If sodium is present in the canisters, provided that the canisters remain buried and are not exposed to water beyond typical soil moisture contents, chemical reaction of the sodium, will not proceed at a rate that will threaten human health or the environment.</p> <p>As an example that an explosion is unlikely, metallic sodium residue was present in large concrete crucibles which were buried in soil at SNL SWMU 117, located at the Large Melt Facility. Fifteen tests, each utilizing 220-440 lbs of sodium were conducted at the facility to study reactor safety concerns. Sodium residue in the crucibles disposed of in the small landfill at SWMU 117 was in direct contact with soil for likely many years before the crucibles were excavated. Upon being excavated, it was found that the metallic sodium had not reacted explosively as a result of being directly exposed to soil moisture. There simply was not enough moisture in the soil to react the sodium metal residue in a substantial manner, much less in any explosive manner.</p> <p>Corrective action sites must be evaluated on an individual basis to assess risk, because in general, conditions at any given site are often different from other sites, including sites that may be located closely near to or adjacent to other sites. The West Lake/Bridgeton landfills and the Runit Dome are not exceptions to this rule as climatic and other conditions at these sites are dissimilar to those found at the MWL. Regardless, the NMED has the authority to reopen sites for corrective action should a remedy</p>

		111,000 cubic yards of radioactive waste to the Pacific Ocean and land adjacent to the landfill.		fail to be protective of human health and the environment with respect to hazardous wastes and constituents.
SSS, LLLL, MMMM, NNNN, UUUU	5-year Re- evaluations	Commenters stated that SNL has failed to comply with the May 26, 2005 Final Order to perform five-year excavation reports for the MWL. Several commenters stated that the Permittees should conduct the first 5-year re-evaluation now. One commenter stated that the NMED should not interfere with the lawsuit regarding the 5 year re-evaluations. One commenter stated that the Consortium for Environmental Education and Technology Development (WERC) intended for SNL to come up with an excavation plan during each five year review. A commenter stated that the Albuquerque Bernalillo County Water Protection Advisory Board has requested that the 5-year reviews be conducted now. One commenter stated that the public was repeatedly assured that the feasibility of excavation would be reviewed every 5 years.	R39	<p>This issue has been previously addressed by the NMED (see R3 for the LTMMP).</p> <p>The May 2005 Final Order requires that for every 5-year reevaluation that the feasibility of excavation be evaluated. This requirement is based principally on the WERC's report on the MWL, which was discussed at the 2004 hearing for remedy selection.</p> <p>While the NMED values the opinions of the Albuquerque Bernalillo County Water Protection Advisory Board and other members of the public, the first 5-year re-evaluation cannot be conducted now in a meaningful manner as discussed below.</p> <p>The first 5-year re-evaluation is due January 2019. The first re-evaluation could not be completed in any meaningful way without data that are to be collected under the provisions of the LTMMP. The LTMMP was approved January 8, 2014, after considerable public input was considered by the Department. The delay of nine years between issuance of the May 2005 Order and approval of the LTMMP was longer than expected because of lawsuits filed against the Department concerning the selected remedy and because the Department provided for much more public participation than is normal (and as directed by the May 2005 Order) to implement the remedy for the MWL. The delay was beyond the control of the Permittees, thus to initiate an enforcement action against them would be unfair, arbitrary, and capricious.</p> <p>NMED was sued over the approval of the LTMMP and its alleged link with the 5-year reevaluations, and thus, could not stay neutral with respect to the law suit. The law suit has run its course. The New Mexico Court of Appeals found in favor of the Department.</p>

MMMM		A commenter stated that the May 2005 Final Order was a modification of the Permittees' hazardous waste permit at the time, and that they had to request, but did not request, via a Class 3 permit modification approval to delay the first 5-year period.	R40	<p>The plaintiff later filed a petition of certiorari with the New Mexico Supreme Court. The Supreme Court denied the petition on May 19, 2015.</p> <p>The May 2005 Final Order is not a modification of the hazardous waste permit that existed in 2005. The Order is a stand-alone legal instrument, which in part, required modification of the permit that was in effect at the time (which was done to include the remedy that was selected for the MWL via a Class 3 permit modification).</p> <p>The NMED, through its interpretation of the Final Order, directed the Permittees that the first 5-year period to be evaluated would start upon approval of the LTMP. See also Response 39 of this document.</p>
DDD, YYYY	Lack of transparency	Commenters suggested that the corrective action process for the MWL needed transparency.	R41	<p>An alleged lack of transparency has been addressed previously by the NMED in Response 19 for the CMI Report.</p> <p>The Department frequently meets with facility representatives as necessary to negotiate corrective action activities at their facilities. This is a normal and necessary practice that applies to corrective action being conducted at many locations throughout New Mexico. The end results of such meetings, including those related to the MWL, are documented in work plans, reports, or other documents that are available for public inspection. Such documents prepared for the MWL since remedy selection are posted on the NMED's web site for the convenience of public inspection and as directed by the May 2005 Final Order. Older documents related to the MWL are also available for review upon written request.</p>
OO, YY, TTT, ZZZ, MMMM	Permittees violate environmental regulations and laws	Commenters allege that the Permittees handling of the MWL violates environmental regulations and laws.	R42	<p>The commenter did not specify what regulation(s) they allege the Permittees have violated with respect to corrective action requirements for the MWL. Regardless, the Permittees are in compliance with the applicable laws and regulations for</p>

MMMM		A commenter stated that SNL has failed to comply with groundwater monitoring requirements for the MWL as a "regulated unit" that received hazardous waste after July 26, 1982.	R43	<p>corrective action under RCRA, the New Mexico Hazardous Waste Act, and the New Hazardous Waste Management Regulations.</p> <p>This issue was previously addressed by the NMED in Response R39 for the CMI Plan, Response 30 for the CMI Report, and Responses R4 and R6 for the SV SAP. The MWL is not a regulated unit, and thus, is not subject to the regulations at 20.4.1.500 NMAC incorporating 40 C.F.R. §§ 264.91–264.100. The MWL is a SWMU subject to corrective action pursuant to 20.4.1.500 NMAC incorporating 40 C.F.R. § 264.101.</p>
MMMM		A commenter stated that the Permittees do not comply with RCRA pursuant to DOE Order 5820.2A.	R44	<p>This issue was previously addressed by the NMED in Response R6 for the SV SAP. The NMED does not enforce DOE Orders. The Permittees are not now and have never been in violation of RCRA regulations with respect to the MWL.</p>
MMMM		A commenter stated that the Permittees are in violation of 40 CFR §§ 265.74, 265.73(b)(1), and 265.73(b)(2) for their incomplete waste inventory.	R45	<p>The Permittees are not in violation of the regulations cited by the commenter, which apply to an interim status hazardous waste management unit. The MWL is not an interim status (or permitted) hazardous waste management unit.</p> <p>Records for corrective action, including for the MWL, are required to be maintained pursuant to 40 CFR § 264.73(b)(6) and Permit Section 2.14.2 of the SNL Operating Permit for Hazardous and Mixed Waste Treatment and Storage (January 2015). These records are being maintained by the Permittees. There is no requirement that a complete inventory must be produced for the MWL, as generally, inventories (complete or not) for old landfills do not exist.</p>
RR, UU, BBB, FFF, III, KKK, WWW,	MWL is a threat to the community	Several commenters stated that the MWL threatens the health of people. One commenter stated that if the MWL was safe, SNL	R46	<p>The MWL does not threaten human health of any workers at SNL or any people living in Albuquerque or other communities.</p> <p>An office building cannot be constructed over the MWL because</p>

LLLL, MMMM, SSSS, WWWW, CCCCC		and NMED should build offices on the landfill and drink the water from a well at the landfill.		<p>the cover cannot be disturbed. However, corrective action completed at the MWL provides an acceptable level of risk under an industrial land use scenario. If it was possible to construct an office building over the MWL without disturbing the function of the cover, the level of risk to workers in the building would be considered acceptable.</p> <p>The groundwater is not contaminated at the MWL, and thus, could be consumed provided all applicable requirements of the Safe Drinking Water Act are met.</p>
UU, LLLL, MMMM, NNNN, OOOO, SSSS, TTTT, XXXX, CCCCC, UUUU	MWL inventory	<p>Commenters made general statements that the inventory was inadequate and incomplete. One commenter states that the RTMD sheets do not fully describe the wastes that were contained in the plastic bags, poly bags, plastic bottles, cardboard boxes, and cans. One commenter stated that unknown amounts and types of waste are in the classified area of the MWL. A commenter stated that the application for CAC status does not address the full inventory of what was actually disposed of at the MWL, thus, the cover cannot be considered adequate to protect public health and safety and the environment. A commenter stated that SNL personnel at the hearing have not read all disposal records, so they do not know what is in the landfill.</p>	R47	<p>These issues surrounding the MWL inventory have been previously addressed by the NMED (see R5, R6, R8, R9, R13, R18, and R75 for the CMS).</p> <p>The Permittees have produced a non-classified version of the inventory for wastes buried in the pits in the classified portion of the MWL and for wastes buried in the trenches in the unclassified portion. This version of the inventory was submitted as supplemental information to the Phase 2 RCRA Facility Investigation Report, and is available for public inspection.</p> <p>NMED believes that the inventory for the MWL is not complete, but is likely reasonably representative of the landfill contents. For most old landfills, no inventory is available. All records have been reviewed by the Permittees to prepare the unclassified inventory. No significant improvements of the MWL inventory can likely be made without excavating the landfill.</p> <p>Given that there is some uncertainty with the inventory, monitoring of the landfill is prudent to ensure that any unexpected release is detected, should any occur. The LTMMP contains provisions for monitoring various environmental media at the MWL to ensure that unexpected releases are detected, if any occur.</p> <p>The SNL witnesses at the hearing did not compile the unclassified inventory prepared for the landfill, and thus, have not personally</p>

MMMM		A commenter stated that some information on disposal sheets has been redacted, and security classification of waste streams is shown on the sheets.	R48	reviewed all records for the MWL.
LLLL, MMMM		Commenters stated there are 20 tons of depleted uranium in the MWL that can be transported to groundwater. They also stated that 119 drums of plutonium-bearing wastes were placed into the landfill. Plutonium and uranium exhibit a half life of 24,000 and millions of years, respectively.	R49	<p>Records were classified because the tests or processes that generated the wastes were classified projects related to national security. NMED assumes that some information was redacted because it remains classified. NMED DOE Oversight Bureau personnel, with proper security clearance, have been allowed access to classified waste disposal records in order to compare the records to the unclassified inventory. Based on this review, Bureau personnel concluded that the unclassified version of the inventory was reasonably representative of the landfill's contents.</p> <p>This issue was previously addressed in part by the NMED in Response R33 for the LTMMP. NMED agrees that there are tons of depleted uranium in the landfill and that plutonium and uranium have long half lives. However, uranium and plutonium will not migrate in the absence of sufficient moisture. The cover will minimize the infiltration and percolation of water through the cover and waste, precluding the transport of uranium and plutonium to groundwater.</p> <p>The actual amount of plutonium in the MWL is small (estimated to be few grams), including the total amount of plutonium in the wastes contained in the 119 drums. In addition to the lack of sufficient moisture, the total plutonium source is so small that it will not migrate nearly 500 feet to groundwater because of dilution and adsorption.</p>
LLLL		A commenter stated that the types of chemical and radioactive wastes at the MWL are found at other sites at SNL, like the Chemical Waste Landfill. The MWL was the disposal facility for chemical wastes from 1959 to 1962.	R50	Samples of environmental media, including surface and subsurface soil, soil gas, and groundwater were analyzed for a wide variety of chemical and radiological contaminants as part of the RCRA Facility Investigation. All potential contaminants were investigated to determine what radiological and chemical constituents have been released into the environment. None of the releases detected poses an unacceptable risk to human health or

MMMM		A commenter stated that the NMED review of wastes contained in the MWL did not address the multiple fission products disposed of in the landfill.	R51	the environment.  The unclassified inventory shows that wastes bearing multiple fission products (MFPs) were disposed of in the MWL. Thus, NMED is aware that MFPs are present in the landfill. Although NMED does not generally have the authority to regulate radionuclides, the MFPs were considered during remedy selection. The MFPs are metals, and will migrate according to their chemical properties, not their radiological properties. Being metals, they are not mobile under conditions where little moisture is available to facilitate their migration. The cover installed over the MWL will limit the amount of moisture that can infiltrate the cover and percolate through the waste, precluding migration of the MFPs to groundwater. The cover also provides adequate shielding from the radioactive hazards of the landfill, including that of the MFPs.
EEEE		A commenter stated that they had heard that the MWL contained enough toxic material that it could kill all life on earth.	R52	NMED believes that the most dangerous wastes in the landfill are those exhibiting high levels of radioactivity. However, the landfill cover provides sufficient shielding from the radiological hazards of the landfill to ensure protection of human health and the environment. That the MWL contains enough toxic material that it could kill all life on earth appears to be an exaggeration of the actual hazard of the MWL, which mostly contains waste bearing low levels of radioactivity.
OOOO		A Commenter stated that the contents of the MWL were disposed of carelessly in the landfill, often times by just throwing waste into the trenches.	R53	NMED has seen a few photographs showing that wastes were at least sometimes, and likely routinely, disposed of in the landfill in a haphazard manner. This was a typical practice at old landfills, such as the MWL. However, such a manner of disposal has no effect on site characterization and remedy selection and implementation.
EEEE, LLLL, MMMM, QQQQ,	2014 Soil Vapor data	Commenters stated that the 2014 soil vapor data released at the public meeting show that many volatile organic compounds	R54	The 2014 soil vapor data essentially show similar low concentrations of volatile organic compounds (VOCs) that were reported in the Phase 2 RCRA Facility Investigation (RFI) Report. As shown by data in the RFI Report, low levels of VOCs

RRRR, YYYY, DDDDD, EEEE, FFFF, GGGGG		(VOCs) have been released from the MWL. Commenters stated that contamination has escaped the landfill and traveled at least 400 feet beneath the MWL, posing a threat to groundwater. Some commenters indicated that characterization of soil vapor should be extended deeper to the water table. One commenter stated that VOC levels increase with depth.		<p>occur below the trenches and pits at the MWL and are not a significant threat to groundwater. The 2014 data, from sample locations deeper in the vadose zone and at depths of up to 400 feet, confirm that the VOCs released from the MWL are not a significant threat to groundwater.</p> <p>There is no compelling reason to extend soil-vapor monitoring to the water table. If necessary, in the future, soil vapor samples can be pulled from the unsaturated portions of the groundwater monitoring well screens. However, given the lack of conclusive evidence of groundwater contamination, it is unlikely that higher, more significant concentrations of VOCs exist just above the water table (about 490 feet depth) or below a depth of 400 feet which would be capable of causing groundwater contamination in excess of a water quality standard.</p> <p>Data do not show conclusively an increasing trend (the concentrations are similar with depth in the new vapor monitoring wells) and certainly not a significant trend. Soil vapor data obtained from depths of 10 and 30 feet as part of the RCRA Facility Investigation conducted in the 1990's indicate that the highest concentrations of VOCs occur adjacent to and immediately below the waste in the landfill, as would be expected.</p>
UU, EEE, RRR, ZZZ, LLLL, MMMM, OOOO, PPPP, QQQQ, RRRR, UUUU, XXXX, YYYY, DDDDD	High Level Waste (HLW)	Commenters are concerned that high level waste has been disposed of in the MWL. One commenter stated that radioactive waste in the MWL is from the Nevada Test Site, Three-Mile Island, Kwajalein atomic bomb tests, Kirtland Air Force Base, and commercial reactor melt down tests. Another commenter presented considerable information about reactor fuel experiments	R55	<p>Regarding high level waste, the commenters are referring to reactor fuel pins used in various experiments conducted at SNL. This issue has been addressed previously by the NMED in Responses R10 and R23 of the CMS. The NMED does not know whether SNL provided information related to nuclear reactor experiments to the WERC panel. As discussed below, such information would not have been particularly relevant. Furthermore, the high level waste issue was discussed at the 2004 hearing for remedy selection.</p> <p>The NMED DOE Oversight Bureau investigated this matter in 2003, and determined that the fuel pins used in the experiments were not disposed of in the MWL, but are instead in storage. See</p>



		<p>conducted at SNL, including the use of sodium metal in some of the tests. Several commenters stated that SNL did not present information on HLW to the review panel convened for the Consortium for Environmental Education and Technology Development (WERC) and at the 2004 hearing on remedy selection. One commenter stated that high radiation levels found at Pits 35, 36, and SP-4 can only be explained by the presence of HLW in the landfill. One commenter stated that the radionuclides in the MWL require deep underground disposal to protect human health and the environment.</p>	<p>the NMED DOE OB report "Nuclear Fuel Assessment Project Summary", dated June 30, 2003, available at <a href="http://www.nmenv.state.nm.us/DOE_Oversight/pubs.htm#snl">http://www.nmenv.state.nm.us/DOE_Oversight/pubs.htm#snl</a>. The NMED has not seen any documents that conclusively prove that fuel pin samples were disposed of in the MWL. Wastes from the reactor experiments are disposed of in the MWL, including fuel pin cladding, cuttings from slicing cladding/fuel pin samples, and small amounts of fuel that was volatilized and coated inner containers used in the experiments.</p> <p>Four outer canisters used in the reactor experiments are known to have been disposed of in the MWL, and there may be others. For the four known examples, the fuel samples located within inner canisters were not in the outer canisters when the latter were disposed of in the MWL. The outer canisters were activated (became radioactive) during the course of the experiments, but are not classified as high level waste because the canisters are not irradiated reactor fuel or were generated from the reprocessing of spent nuclear fuel.</p> <p>Even if samples of fuel pins were disposed of in the landfill, the NMED does not have the authority to require the Permittees to remove them, and the vast majority of radioactive waste would still be low level waste. Additionally, the fuel pins, if present in the landfill, would not be expected to threaten human health or the environment, which calls into question why exposing workers needlessly to a radiation hazard would be warranted in order to excavate and manage the fuel pins. The fuel pins are made of uranium or mixed oxide fuel containing uranium and plutonium. Irradiated fuel pins will also contain MFPs. Even if the fuel pin samples were disposed of in the MWL, there are tons of uranium already known to be in the landfill (in the form of depleted uranium). The small amount of plutonium in mixed oxide fuel would be in addition to the small amount of plutonium already known to be in the landfill. If the fuel pins were disposed of in the landfill, the somewhat larger amounts of uranium and plutonium would not pose a threat to human health or the environment.</p>
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<p>MMMM, OOOO</p>		<p>Commenters stated that thousands of pages of documents recording disposal of wastes generated by nuclear weapons testing and nuclear experiments were not disclosed to the WERC panel and at the 2004 hearing on remedy selection. Also nuclear experiments and associated high level wastes were not disclosed in the Fact Sheet issued to the public for the CAC proposal.</p>	<p>R56</p>	<p>As shown by the example of an activated pipe discussed in the preceding paragraph, high radiation levels (at Pits 35, 36, and SP-4) do not necessarily prove that HLW has been disposed of in the MWL.</p> <p>See Response R38 of this document concerning sodium. The SNL Facility is a DOE facility and engages in research involving the use of nuclear materials. It is obvious from the unclassified inventory that radioactive substances were disposed of in the MWL, including radioactive wastes generated from nuclear weapons testing and nuclear experiments. The unclassified inventory was prepared for two main reasons: 1) to produce an unclassified version of the landfill's contents in a manner that could be reviewed by the public and non-cleared NMED employees, and 2) to summarize the thousands of disposal sheets.</p> <p>That the WERC panel relied on the unclassified inventory (which is reasonable) and chose not to pursue detailed waste records amounting to thousands of pages was the panel's choice.</p> <p>The unclassified inventory was discussed at the 2004 hearing on remedy selection, and is adequate for remedy selection (see Response R47 of this document). The 2004 hearing encompassed 4 days of testimony, including that on the topic of the adequacy of the unclassified inventory. The hearing could not have been completed in a reasonable time period if thousands of pages of disposal records were reviewed at the hearing on a page by page basis.</p> <p>Although the inventory of the landfill was important for the purpose of remedy selection (which was completed in 2005), it is not particularly relevant for the completion of remedy implementation. This is why the NMED did not extensively discuss the MWL inventory in the Fact Sheet. However, the</p>
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<p>MMMM</p>		<p>A commenter stated that the Permittees claim that irradiation of cobalt-bearing stainless steel accounts for high radioactivity levels of waste disposed of in the MWL. However, the use of cobalt has long been disallowed for use at nuclear reactors; the high levels are from irradiation of experimental packages used for nuclear melt down studies.</p>	<p>R57</p>	<p>NMED did indicate that the MWL contained radioactive substances in the Fact Sheet, specifically stating:</p> <p>“SNL is located within the boundaries of Kirtland Air Force Base, south of and adjacent to Albuquerque in Bernalillo County, New Mexico. SNL is a multi-purpose engineering and science laboratory which designs components for the nation's nuclear weapons, designs and tests conventional military weapons, performs a wide variety of energy research and development projects, and works on assignments that respond to national security threats. As a result of its testing and research activities, SNL generates solid, hazardous, radioactive, and mixed hazardous and radioactive wastes. The MWL was opened as the "T A-3 low-level radioactive waste dump" in March 1959. Low-level radioactive waste and mixed radioactive and chemical waste from SNL research facilities and off-site generators were disposed of in the landfill from March 1959 to December 1988.”</p> <p>See also Response R55 of this document regarding high level waste. Details concerning how the nuclear reactor experiments were carried out and the conclusions of the experiments are of little, if any, relevance to the CAC proposal.</p> <p>NMED is not aware of when cobalt was disallowed for use in nuclear reactors, assuming this is an accurate statement. Furthermore, DOE facilities are generally exempt from NRC regulations, and the experimental reactors at SNL are not commercial reactors. The irradiation of stainless steel can generate radioisotopes of cobalt (such as Co-60), causing the steel to become highly radioactive. Without doubt, wastes containing Co-60 are present in the MWL. However, the process that generated the Co-60 is not relevant.</p> <p>Additionally, other elements in steel can also become activated upon irradiation.</p> <p>Wastes are present in the MWL that are highly radioactive.</p>
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MMMM		A commenter stated that the Permittees did not disclose their nuclear experiments because they wanted to hide their illegal disposal of HLW in the MWL.	R58	<p>Measurements indicating that a highly radioactive substance is present do not mean that the substance constitutes high level waste.</p> <p>Regardless, the cover provides adequate protection (shielding) of human health and the environment from all radioactive hazards in the landfill.</p> <p>There is no conclusive evidence that HLW has been disposed of in the MWL (see also Response R55 of this document).</p>
MMMM		A commenter stated that during the December 2004 hearing on remedy selection and up to the present, SNL failed to report the presence of High Level mixed waste in the landfill.	R59	<p>Contrary to the comment, testimony was presented in the 2004 hearing concerning whether high level waste had been disposed of in the MWL. See Response R55 of this document.</p>
MMMM		A commenter stated that the disposal of high level wastes required a license from the NRC.	R60	<p>It is NMED's understanding that the Nuclear Regulatory Commission (NRC) does not have any jurisdiction in this matter.</p> <p>See also Response R55 of this document concerning high level waste.</p>
UUUU		A commenter stated that the "real definition" of high level waste should be the danger to the environment or people from contact with the waste.	R61	<p>NMED does not have the authority to regulate high level waste. However, the category of high level waste, as presented at the hearing by SNL witnesses, does take into account the hazards to human health and the environment.</p>

OOOO		A commenter stated that wastes generated from nuclear reactor experiments are high level wastes. In particular, the commenter believes that fuel element ends that were cut off of experimental packages irradiated in a reactor must be high level waste.	R62	As testified to by SNL witnesses at the hearing, not all radioactive or mixed waste generated as a result of nuclear reactor experiments would be considered a high level waste. Diminutive amounts of nuclear material which may adhere to other objects (such as a fuel element end) are not classified as high level waste.
OOOO		A commenter states that if there isn't much highly radioactive waste in the landfill, then why is it too dangerous to excavate the landfill?	R63	Some low level waste buried in the landfill exhibits high levels of radioactivity, and, as shown by the risk assessment for the MWL prepared for the Corrective Measures Study, would pose an unacceptable risk to workers should the landfill be excavated. Low level waste is a "catch-all" category, and is waste that is not high level, transuranic, or mill tailings. One should note that there is no upper limit to the level of radioactivity that a low level waste may possess. Thus, low level wastes can be highly radioactive and dangerous due to their radioactive properties.
TT, WW, LLL, SSS, PPPP	Air	Commenters state that the MWL has impacted or threatens air quality.	R64	<p>Air quality has been addressed previously by the NMED in Response R73 of the CMS. The cover, constructed of clean soil, prevents wastes in the MWL from coming into contact with the atmosphere, with the exception of a few constituents that migrate as vapor (tritium, radon, and VOCs).</p> <p>Air quality data provided in the Phase 2 RFI Report and separate reports of radon emissions indicate that there is no air contamination originating from the MWL that poses a threat to human health.</p> <p>Additionally, air quality sampling conducted by the NMED DOE Oversight Bureau at the MWL, and at three background stations, did not detect any air contamination posing a threat to human health.</p>
SS, XX,	Soil	Commenters state that the MWL	R65	Levels of contaminants in soil have been addressed previously by

LLL, SSS, PPPP		has impacted or threatens soil.		<p>the NMED in Responses R9(B), R31, and R33 for the LTMMP; Responses R3, R29, R38, and R59 for the CMI Plan; Responses 7, 9 and 21 for the CMI Report; and Responses R19, R43, R44, R66, and R74 of the CMS.</p> <p>Low levels of tritium, radon, VOCs (including PCE and TCE), and cadmium are found in subsurface soil. However, the levels of these contaminants are sufficiently low that they do not pose unacceptable risk to human health or the environment.</p>
LLLL, MMMM, NNNN, RRRR, ZZZZ	Containers in the landfill will degrade	Commenters stated that all the containers buried in the landfill are subject to rust and decay and release of their contents. One commenter stated that collapse of containers can be a source for subsidence of the dirt cover.	R66	<p>This issue was addressed previously by the NMED in Response 24 for the CMS, Response R43 for the LTMMP, Response R22 for the SV SAP, and R13 of the CMI Plan.</p> <p>NMED believes that many of the steel containers within the MWL have rusted or will eventually rust. Containers made of wood, paper, cardboard, and plastic will also degrade. Any contaminants within the containers could migrate from the landfill if conditions are appropriate. However, this does not necessarily mean that a release would pose an unacceptable risk to human health or the environment. It also does not mean that the landfill would need to be excavated to mitigate a release.</p> <p>Furthermore, should containers containing wastes corrode, decay, collapse or break, the cover addresses routes of exposure from the MWL:</p> <ol style="list-style-type: none"> <li>Direct dermal or inhalation contact with most contaminants in the landfill is prevented by the cover.</li> <li>Leaching of most contaminants that could be released to the soil is prevented by the cover not allowing precipitation to contact wastes.</li> <li>The thickness of the cover will function as a shield against the hazards of radioactive decay.</li> </ol> <p>Due to the uncertainty associated with the inventory, NMED recognizes that continued monitoring is prudent to ensure protection of human health and the environment. Monitoring will be conducted under the LTMMP to identify any unexpected</p>

				<p>releases, should any occur.</p> <p>Lastly, should significant cover subsidence occur, it will be repaired as provided for under the LTMMMP.</p>
MMMM, NNNN, RRRR	Inadequacy of past disposal and maintenance	<p>Commenters stated that the poorly managed disposal and maintenance practices at the MWL allowed a large amount of water to enter the buried wastes. For example, 270,000 gallons of reactor waste water from the ACRR was disposed of in Trench D. A uranium chip fire occurred at the MWL, and required 5,000 gallons of water to extinguish the fire. Precipitation and uncontrolled surface-water flows onto the MWL for decades introduced a large and unknown amount of water into the buried wastes.</p>	R67	<p>NMED agrees that the cited incidents are examples of poor management in the past. However, the landfill is now inactive and similar practices will not be allowed (nor could they occur, as the trenches and pits are now under the new cover). Furthermore, the new landfill cover is designed and constructed such that overland flow is diverted away from the landfill, and the surface of the cover graded to drain excess water from the cover. These design elements will be inspected and maintained in the future as provided for in the LTMMMP.</p> <p>The 270,000 gallons of reactor coolant water and water used to extinguish fires has dissipated by now and will not cause contaminant migration. See also Response R3 of this document.</p>
MMMM, NNNN	Risk assessment	<p>Commenters stated that the risk assessment for the MWL did not consider a pathway to groundwater.</p>	R68	<p>This issue was addressed previously by the NMED in Response 2 for the CMI Report. A risk assessment for the MWL was presented as part of the Phase 2 RCRA Facility Investigation Report. An additional risk assessment was prepared as part of the MWL Corrective Measures Study.</p> <p>The comment is incorrect. The risk assessment reported in the Phase 2 RFI Report considered groundwater.</p> <p>Both the newly installed (2008) wells and the now-abandoned older wells at the MWL have yielded water samples demonstrating that the landfill has not caused groundwater contamination. Furthermore, vadose-zone investigations completed since 2004 have yielded results that are consistent with data obtained during the RCRA Facility Investigation (RFI) completed in 1996 and continue to indicate that groundwater is</p>



MMMM		A commenter stated that the risk assessment performed as part of the Corrective Measures Study (CMS) did not consider long-term risk to the public and the environment.	R69	<p>unlikely to become contaminated. Because groundwater is not and is unlikely to become contaminated, a complete pathway to receptors does not exist and will not likely exist via the groundwater pathway.</p> <p>The risk assessment for the CMS considered both long-term and short-term risks to the public. The risk assessment prepared for the Phase 2 RFI Report also evaluated long-term risk to human health and the environment.</p>
MMMM		A commenter stated that based on NODs issued by the NMED in the late 1990's, because site characterization was inadequate, the risk assessment might not be valid and institutional controls would be required.	R70	<p>As demonstrated in the 2004 hearing on remedy selection, site characterization was deemed adequate for remedy selection. The risk assessments prepared for the MWL are adequate and are based on adequate site characterization.</p> <p>Institutional controls are provided for in the LTMMP. Such controls are normally required for landfills that remain in place.</p> <p>See also Response R68 of this document.</p>
MMMM, NNNN, PPPP	MWL should be classified as a Regulated Unit and subject to closure and post closure regulations applicable to hazardous waste management units	Commenters stated that the MWL was misclassified as a Solid Waste Management Unit (SWMU). Because the MWL received hazardous wastes after July 26, 1982, the MWL is a "regulated unit." Because the MWL is a regulated unit, the Permittees must abide by the groundwater monitoring regulations at 40 CFR §§ 264.91-100, instead of 40 CFR §	R71	<p>As previously addressed by the NMED in Response R13 for the LTMMP, Response R39 for the CMI Plan, and Response 30 for the CMI Report, the MWL is regulated as a Solid Waste Management Unit (SWMU) subject to corrective action pursuant to 20.4.1.500 NMAC incorporating 40 CFR§ 264.101. The requirements for a regulated unit do not apply to the MWL.</p> <p>The Permittees did not submit a Part A Permit or Part B Permit Application because they chose not to obtain a permit to operate the MWL as a hazardous (mixed) waste management unit. The MWL was not operated under interim status. Instead, the MWL was deactivated, and the unit later declared a SWMU by the EPA.</p>

MMMM		<p>264.101. The LTMMMP fails to impose groundwater monitoring requirements for a regulated unit. Furthermore, the commenters stated that a Part A Permit and Part B Permit Application were not submitted for the MWL, and that the landfill lost interim status and was operated illegally. The commenter also stated that as a regulated unit the Permittees were required to obtain a post-closure permit and submit a closure plan or a post-closure application to meet the requirements of 40 CFR §§ 265.110-120 and § 265.310. One commenter stated that at least one upgradient and three downgradient wells are required at the point of compliance pursuant to the regulations at 40 CFR §§ 264.91-100.</p> <p>A commenter stated that a 1997 Notice of Deficiency (NOD) issued by the NMED stated that the MWL is required to close under 40 CFR Part 265 Subparts G and N, citing 40 CFR § 270.1(c). A time extension letter issued by the NMED on March</p>	R72	<p>The MWL was not illegally operated under federal regulations or State law. See also Response R35 of this document.</p> <p>As previously indicated in Response R10(Y) for the LTMMMP, and at Response R14 of this document, the MWL is not subject to the requirements for a compliance groundwater monitoring program for a regulated unit under 40 CFR § 264.99. The MWL is also not subject to other groundwater monitoring requirements for regulated units under 40 CFR §§ 264.91-100. However, groundwater monitoring will be conducted under the LTMMMP to detect a release of a contaminant to groundwater, should any unexpected release occur. The LTMMMP provides for groundwater monitoring that is similar with respect to the technical requirements for regulated units subject to compliance monitoring.</p> <p>Because the MWL was not operated as a hazardous waste management unit under RCRA, the Permittees are not required to submit a closure plan or post-closure application, and are not required to obtain a post-closure permit under the regulations cited by the commenter.</p> <p>As a matter of correction, the commenter was in error when he stated that regulations require at least one upgradient and three downgradient wells. Rather, the regulations cited (which don't apply to the MWL) require a "sufficient number" of wells (see 40 CFR § 264.97(a)).</p> <p>For a time, the NMED considered taking the position that the MWL should be closed as a RCRA regulated unit based on waste disposal continuing to 1988. However, based on further review, NMED later determined that the MWL was correctly classified as a SWMU by the EPA. The regulations cited by the commenter at 40 CFR Part 265 subparts G and N apply to interim status hazardous waste management units. The MWL is not an interim status hazardous waste management unit, so the cited regulations</p>
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		17, 1988 (sic, should be 1998) allowed for submittal of a closure plan and post-closure permit application by September 13, 1998. Furthermore, in a memorandum dated April 17, 1998, the DOE acknowledged that the NMED at that time has taken the position that the MWL should be closed as a RCRA regulated unit based primarily on waste disposal continuing to 1988.		<p>in the comment do not apply to the MWL.</p> <p>Had the MWL been closed and subject to a post-closure permit as a regulated unit, there would have been considerably less opportunity for public input. The landfill simply would have been closed after construction of the cover and monitoring systems, and would be undergoing post-closure care, with but only one opportunity for public input on a proposed closure plan and post-closure care permit. In contrast, as a SWMU, the public was given the opportunity to comment on four major implementation steps to complete corrective action: the CMI Plan, the CMI Report, the SV SAP, and the LTMMP. The CAC proposal provides yet another opportunity for the public to participate.</p>
MMMM, NNNN	Definition of Landfill	Commenters stated that the MWL is misnamed as a landfill because it lacks protective features such as a liner and leachate collection to legally qualify as a landfill. Another stated that the required engineered features of RCRA landfill, including liners and leachate collection system were not installed.	R73	<p>The regulations at 40 CFR § 260.10 define a landfill as “a disposal facility or part of a facility where hazardous waste is placed in or on land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a corrective action management unit.” Based on this definition, the MWL is a landfill. The definition does not refer to protective features such as a liner or leachate collection system.</p> <p>Because the MWL is a SWMU, and not a hazardous waste management unit, the MWL is not subject to any design requirements under RCRA for new or replacement landfills or landfill cells.</p> <p>Corrective action regulations do not provide prescriptive requirements such as technical specifications for a landfill cover. Corrective action does require that all remedial measures and corrective actions protect human health and the environment given the intended future use of the site and maintain that protection over time. Therefore, the more detailed RCRA operating unit regulations are often used as guidance for corrective actions, even though the MWL is not subject to these regulations. The primary objective of a final cover system is to:</p> <ol style="list-style-type: none"> <li>a. separate the buried waste/contaminated materials from</li> </ol>

				<p>the surface;</p> <ul style="list-style-type: none"><li>b. restrict infiltration of precipitation so as to minimize the formation of leachate by minimizing the contact of water with waste; and</li><li>c. minimize the need for further MWL maintenance to ensure protection over time.</li></ul> <p>The hazardous waste landfill regulations (referred to as Subtitle C requirements) do not provide prescriptive cover designs. Instead, Subtitle C establishes performance standards for final cover systems as part of closure and post-closure care (see 40 CFR § 264.310). EPA did develop a technical guidance document for design of Subtitle C covers entitled <i>Final Covers on Hazardous Waste Landfills and Surface Impoundments</i>, EPA/530-SW-89-047, July 1989. However, RCRA Subtitle C regulations also allow alternative designs that consider site-specific conditions including climate and the nature of the waste as long as the alternative design also meets the intent of the regulations, to protect human health and the environment (see 40 CFR § 264.301(b)). Approval of alternative cover designs is allowed provided they are protective of human health and the environment and meet the closure and post-closure care performance standards at 40 CFR § 264.310.</p> <p>Notwithstanding the discussion in the above paragraph, and as mentioned previously, the MWL is a SWMU subject to corrective action and is not subject to the regulations at 40 CFR §§ 264.301 and 264.310. Instead, these regulations are used as guidance under the corrective action program with the intent of developing a cover design that will be protective of human health and the environment for the long term.</p> <p>An alternative cover was proposed by SNL for the MWL consisting of a thick layer of native soil. The design relied upon soil thickness and evapotranspiration to provide long-term performance and stability. Considering conditions at the MWL, it is not necessary to construct a conventional RCRA cover to</p>
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				<p>ensure protection of human health and the environment. It was successfully demonstrated by performance modeling that based on the average precipitation in Albuquerque, New Mexico, the cover design for the MWL is adequately protective. Thus, a RCRA compliant cover was constructed consisting of a compacted subgrade, a rock biointrusion layer and thin soil cover, a compacted native soil layer, and a topsoil layer.</p> <p>The MWL Corrective Measures Implementation Report, dated January 2010 documents that the evapotranspirative cover was constructed in accordance with the requirements, specifications, and design drawings presented in the November 2005 MWL Corrective Measures Implementation Plan. The thickness of the cover components in most instances exceeded the required thickness.</p> <p>The current evapotranspirative cover allows for moisture to be stored and then returned to the atmosphere by evaporation. Also, the soil serves as a moisture reservoir for plants, which extract the stored water from the soil during the growing season and return it to the atmosphere. The cover is designed to prevent precipitation from reaching the wastes beneath the cover.</p> <p>See also Responses R2 and R79-R84 of this document as to adequacy of the cover. Monitoring under the LTMMP will ensure that the cover is functioning as intended.</p>
LLLL, NNNN	Denial of Long-Term Monitoring and Maintenance Plan	Commenters support denial of the MWL Long-Term Monitoring and Maintenance Plan (LTMMP). One commenter stated that the LTMMP is inadequate as a basis for CAC status. He stated further that the LTMMP does not address a need for a monitoring well at the north boundary of the landfill, MWL-MW1 should be replaced to monitor for nickel, and that	R74	<p>The comment is not timely. The Long-Term Monitoring and Maintenance Plan was approved January 8, 2014, after consideration of public comment.</p> <p>The LTMMP is adequate and provides for robust monitoring of groundwater, the vadose zone, and other environmental media, as well as inspection and maintenance/repair of the monitoring systems, landfill cover, drainage and security systems, and reporting to the NMED. Additionally, the achievement of CAC status is not based solely on the LTMMP. In reaching a determination that CAC status was appropriate for the MWL, the NMED considered many data regarding remedy selection (e.g.</p>

		soil vapor monitoring was done only to a depth of 50 feet despite evidence of increasing levels of tritium and solvents (VOCs).		<p>see Response R5 of this document) and corrective measures implementation (e.g. design and construction of the cover and monitoring systems).</p> <p>Well MWL-MW1, now abandoned, was located near the northeastern corner of the landfill. Because groundwater does not flow to the north, and because nickel has not been released from the landfill, there is no need to replace well MWL-MW1. See also Response R11 of this document.</p> <p>There is no evidence that tritium and VOC concentrations were increasing with depth based on subsurface soil sampling (for tritium and VOCs) and active soil-gas sampling (for VOCs). Recent sampling results from deep soil-gas monitoring wells confirm that VOC concentrations are low and do not threaten groundwater. See also Response R77 of this document.</p>
LLLL, MMMM	Uranium Fires	Commenters stated that CAC should not be granted because uranium fires have occurred in the past at the MWL.	R75	Uranium fires have occurred at the MWL when the pits containing uranium waste (chiefly depleted uranium) were open. These pits have since been filled and are now buried under the new cover. Thus, uranium fires will not occur at the MWL in the future.
LLLL	Airplane Crash	A commenter stated that that CAC should not be granted because the landfill would pose a threat if an aircraft with aviation gas crashes into the landfill.	R76	According to the Permittees, the March 1996 Environmental Restoration Project Environmental Assessment evaluated the risk of an airplane crash at SNL (see Appendix D of the report). The probability of this event (categorized as an "abnormal event") is very low, with a range of "1 in 10 million" (10E-7) to "1 in 100 million" (10E-8). While the MWL was not one of the sites specifically addressed, the results of the assessment imply that the chances of a plane crash at the MWL are also very low.
LLLL, NNNN	Levels of tritium have increased	Commenters stated that the levels of tritium released from the MWL are 10 times higher than previously reported. One commenter indicated that this has been caused by breakdown of containers and the enormous amount of tritium placed into	R77	<p>This issue has been previously addressed by the NMED in Response R31 for the LTMMP and Response 9 for the CMI Report. The NMED generally does not have the authority to regulate tritium, a radioactive substance.</p> <p>Some soil samples collected in 2008 exhibited tritium levels that were higher than those observed in 1995 because they were collected closer to the disposal areas containing tritium sources</p>

		the landfill. Furthermore, these higher values for tritium indicate that the fate and transport model for the MWL is unreliable. Another commenter stated that NMED cancelled monitoring for tritium in the vadose zone under the LTMMP.		<p>than those collected in 1996. The tritium levels detected in 2008 do not indicate that a new release of tritium has occurred, and more importantly, do not represent a threat to human health or the environment.</p> <p>The vadose zone is not sampled for tritium. Tritium migrates in soil moisture (both in liquid and vapor form). There is insufficient moisture in soil-gas to monitor for tritium in the vadose zone. However, under the LTMMP, groundwater and surface soil will be monitored for tritium.</p>
LLLL, MMMM, NNNN	Inadequate moisture monitoring	Commenters stated that the moisture monitoring system is inadequate because the access tubes for the neutron probe were not placed below the pits and trenches. A commenter stated that monitoring for moisture breaking through the cover and migrating to waste was inadequate. One commenter stated that NMED required correction of the moisture monitoring system, but this was not done, making the LTMMP deficient.	R78	<p>NMED addressed the issue concerning the position of the neutron probe access tubes in Response R7 for the LTMMP.</p> <p>The October 10, 2008 Notice of Deficiency issued for the MWL CMI Plan noted that the existing deep soil moisture monitoring system could not be effectively used to measure the breakthrough of moisture through the landfill cover. However, after additional consideration, taking into account the depth of soil moisture measurements and soil properties, NMED revised its earlier opinion. Under the LTMMP, soil moisture measurements will be made at 1-foot intervals from 4 to 25 feet (then 5-foot increments to total depth of the access tube (200 linear feet)). Because the soil properties (specifically grain size and hydraulic conductivity) of the cover are similar to those of soil adjacent to the landfill, soil moisture measurements taken at 4-5 feet depth in the monitoring system would be reasonably representative of moisture migrating through the cover.</p>
LLLL, MMMM, NNNN,	Cover Design Inadequate	Commenters stated that the cover was improperly designed because it lacks an impermeable	R79	Performance modeling predicts little moisture will break through the fine-grain soil cover that has been installed over the MWL. The cover design is adequate to protect human health, the

<p>OOOO, UUUU, ZZZZ, AAAAA, DDDDD, UUUU</p>		<p>liner to carry moisture to the sides of the MWL. The cover will break down within a 50-year time span due to “many well-known physical and biological factors”. Covers constructed of soil are known to “accelerate volatile organic compounds to groundwater”. A commenter stated that the cover is not suitable for protecting groundwater. Another commenter stated that the waste in the MWL was marginally maintained and unprotected.</p>		<p>environment, and groundwater (see also Responses R2 and 80-84 of this document.</p> <p>If not maintained, any constructed feature will “break down” and deteriorate. The LTMMMP requires monitoring, inspection, maintenance, repair, reporting, and physical and institutional control (IC) of the MWL and cover. The monitoring required under the LTMMMP will ensure that the cover is functioning as intended.</p> <p>Because the commenter did not specify what the “many well-known physical and biological factors” are that degrade covers, NMED cannot respond in detail. However, erosion would be the most likely cause of cover degradation. Under the LTMMMP, erosion of the cover is to be repaired.</p> <p>With regard to the statement that covers constructed of soil “accelerate volatile organic compounds to groundwater”, the comment does not make sense. The VOCs that have been released into the environment occur below the cover. Thus VOC vapors that would migrate towards groundwater do not have to travel through the cover to reach groundwater. However, the observed VOC concentrations are sufficiently low that they do not pose a threat to groundwater.</p>
<p>MMMM, NNNN, RRRR, AAAAA, DDDDD</p>		<p>Commenters stated that the cover, constructed of soil, will not prevent the vertical and horizontal entry of moisture into the landfill and wastes contained within it. There is not an impermeable membrane beneath the cover to carry moisture away to the sides of the landfill.</p>	<p>R80</p>	<p>Performance modeling predicts that the cover will be adequate to prevent excessive moisture from migrating through the cover and into the waste. Furthermore, the landfill surface has been graded to maximize surface water runoff. Ditches have been constructed to divert surface water run-on further reducing potential infiltration. The current evapotranspirative cover allows for moisture to be stored and then returned to the atmosphere by evaporation. The soil also serves as a moisture reservoir for plants, which extract the stored water from the soil during the</p>



MMMM		A commenter stated that a vegetation "layer" is not an appropriate closure action and appears to be a violation of federal regulations. It will do nothing to prevent moisture already in the landfill from migrating deeper. It has also required additional watering beyond natural precipitation. It will not prevent microorganisms and burrowing animals from reaching and spreading waste.	R81	<p>growing season and return it to the atmosphere via transpiration. Thus, in the case of the MWL, a liner (barrier) layer to carry moisture via a leachate collection system to the sides of the landfill was not needed as part of the cover design in order to adequately protect human health and the environment.</p> <p>Vegetation is an important component of the MWL cover, as well as covers for essentially all landfills. Vegetation removes moisture (within reach of roots) through transpiration, and helps considerably to reduce erosion of a cover's surface, minimizing maintenance.</p> <p>Vegetation growing on a landfill cover is not a violation of federal law. Supplemental watering at the MWL was conducted to establish the native vegetation growing on the cover; the additional water was necessary due to drought conditions which prevailed at the time the cover was installed. Supplemental watering will only be applied to the cover as necessary to establish and maintain adequate vegetation during drought conditions.</p> <p>No cover will prevent microorganisms from migrating through soil. Such life forms are abundant everywhere.</p> <p>The bio-barrier will prevent burrowing animals from reaching waste. As an added precaution, the LTMMP contains provisions for inspecting the cover and taking action as necessary if burrowing animals are found to be present at the landfill.</p>
MMMM, NNNN, OOOO, RRRR, AAAAA, DDDDD		Commenters stated that CAC status should not be granted because there is not an engineered barrier and leachate collection system beneath the landfill. One commenter stated	R82	Performance modeling indicates that little moisture will penetrate the cover. Thus, in the case of the MWL, the lack of an engineered barrier (liner) and leachate collection system under the landfill or landfill cover will not preclude protection of human health and the environment. As provided for under the LTMMP, the landfill performance will be evaluated through inspection and

<p>MMMM, NNNN</p>		<p>that the 2006 TechLaw Report revealed a need for an impermeable liner beneath the cover.</p> <p>Commenters stated that the cover does not meet RCRA requirements. One commenter stated that by today's standards for landfills, the MWL could not qualify for a permit under RCRA, as the landfill is not constructed with a liner, leachate detection and collection systems, or engineered cover.</p>	<p>R83</p>	<p>monitoring. Should the cover fail to perform as expected to protect human health and the environment for any reason, the NMED has the authority to require modifications of the remedy or implementation of a new remedy based on the new information..</p> <p>The TechLaw Report, which was actually a draft set of comments prepared for the Fate and Transport Model, did not conclude that a liner beneath the cover was needed. Instead, it suggested that the biointrusion layer could be designed with a geosynthetic drain to carry moisture to beyond the sides of the landfill (see also Response R80 of this document). TechLaw was tasked by the NMED to review the Fate and Transport Model (FTM) found in Appendix E of the CMI Plan, not the design of the cover. Thus, the TechLaw representative, who did not review the cover design in any detail, could not have commented on the adequacy of the design of the cover in any credible manner.</p> <p>Contrary to the comment, the cover is an engineered cover and is designed to reduce the infiltration of moisture into the landfill contents (see Response R73 of this document).</p> <p>Because the MWL is a SWMU, and not a hazardous waste management unit, the MWL is not subject to any design requirements under RCRA for new or replacement landfills or landfill cells. Although not subject to the regulations under 40 CFR §§ 264.111 and 264.310, the cover design meets the closure performance standards under 40 CFR §§ 264.111 (a and b) and 264.310(a). Performance modeling indicates that little moisture will penetrate the cover. Thus, in the case of the MWL, the lack of liner and leachate detection and collection systems will not preclude protection of human health and the environment. Monitoring of the groundwater in the future under the LTMMMP will ensure that the cover is performing as expected.</p>
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MMMM		A commenter stated that subsidence, the “bathtub” effect, climate change, and vapor phase transport are not adequately considered for the design of the cover.	R84	<p>The “bathtub” effect was considered during design. The cover was designed to prevent this phenomenon from occurring by ensuring the underlying soils and cover soils had similar hydraulic conductivity.</p> <p>Should significant cover subsidence occur, it will be repaired as provided for under the LTMMP. Landfill performance will be evaluated through inspection and monitoring. Should the cover fail to perform as expected to protect human health and the environment because of the effects of climate change, or for any other reason, the NMED has the authority to require modifications of the remedy or implementation of a new remedy based on the new information.</p> <p>The cover will not prevent vapor phase transportation of contaminants. However, the RCRA Facility investigation shows that the levels of vapor-phase contaminants released from the landfill are low and do not pose unacceptable risk to human health and the environment. Monitoring under the LTMMP will ensure that any unexpected releases that occur in the future are identified, if any should occur.</p>
UUUU		<p>A commenter stated that a SNL witness referring to the bio-barrier as constructed with interlocking rock was an overstatement, and it would not seal the MWL.</p> <p>The commenter also stated that a percolation study should have been conducted over a period of 30 to 90 days.</p>	R85	<p>The bio-barrier was constructed of angular, interlocking rock as described by the SNL witness. However, the purpose of the bio-barrier is to prevent burrowing animals from penetrating the cover and becoming directly exposed to waste. The bio-barrier is not intended to be a barrier layer with the purpose of sealing the landfill from percolating moisture.</p> <p>Infiltration/percolation studies were completed on land immediately adjacent to the MWL. Results were reported as part of the Phase 2 RCRA Facility Investigation for the MWL.</p>
OOOO		A commenter stated that safety factor for the cover design with	R86	The commenters calculations are not based properly on average yearly rainfall, thus the conclusion reached by the commenter

		respect to average yearly rainfall was less than two instead of nine.		regarding safety factor is incorrect.
MMMM	Toluene	A commenter stated that laboratory sampling error regarding toluene detections is impugned because toluene was disposed of in the landfill.	R87	Sampling and analysis errors can occur even though toluene was a waste disposed of in the MWL. Levels of toluene vapor are low, indicating that it is unlikely that toluene is a groundwater contaminant at the MWL. In the recent series of low level detections of toluene in groundwater in MWL-MW4, the source of toluene was identified as the packer assembly installed in the well, not the MWL. The lack of conclusive toluene detections in groundwater samples collected from MWL wells since 2010, and the lack of any toluene detections since 2013, indicates that toluene is not a groundwater contaminant at the MWL.
MMMM	Wastes are being released from the MWL	A commenter stated that wastes are already escaping from the MWL and no corrective measure has been done to prevent the releases. The releases must be removed or remediated. NMED has been recalcitrant to order the Permittees to meet the requirements to remediate the releases.	R88	The releases identified under the RCRA Facility Investigation are minor and do not pose unacceptable risk. Thus, there is no compelling reason to remediate these minor releases. There are no regulations that require the remediation or removal of contamination that does not pose unacceptable risk to human health or the environment.
MMMM		A commenter stated that tritium, heavy metals, solvents, and cesium have been released from the MWL.	R89	There is no evidence that cesium has been released from the MWL. Tritium, solvents (several volatile organic compounds such as PCE and TCE) and a heavy metal (cadmium) have been released from the landfill. These releases, identified under the RCRA Facility Investigation, are minor and do not pose unacceptable risk to human health or the environment.

NNNN		A commenter stated that the RCRA Facility Investigation (RFI) showed that there was a large release of hazardous waste to the vadose zone and groundwater. The commenter further states that a 1998 NMED NOD indicated that the presence of metal contaminants at depths in excess of 100 feet indicate that liquid wastes were disposed of in the landfill, and that groundwater monitoring for metals was required.	R90	<p>The RFI showed exactly the opposite of what is stated by the commenter. Releases from the MWL were minor and do not pose unacceptable risk to human health or the environment. Groundwater is not contaminated (see Response R9 of this document).</p> <p>Based on supplemental information received as a result of issuance of the 1998 NOD, NMED was convinced that no significant releases of metals had occurred at the MWL, and that it was unlikely that metals released from the MWL would ever contaminate groundwater. Nonetheless, as a precaution, groundwater is monitored for selected metals under the LTMMP.</p>
MMMM	Trigger Levels	A commenter stated that trigger levels do not prevent releases. NMED is allowing the Permittees to take ineffectual steps that do not provide protection of human health and the environment, and simply waits for the worst to happen. The commenter quotes a TechLaw comment on the LTMMP that expresses a concern over the process to follow for evaluation of data against trigger levels.	R91	<p>Trigger levels are intended to provide an early warning should an unexpected release of contaminants occur at the MWL. They were not characterized by NMED as being a method to prevent releases.</p> <p>The evaluation process that was commented on by TechLaw was changed in what became the approved version of the LTMMP (what is now Section 5.1 of the approved LTMMP).</p> <p>Under the LTMMP, an exceedance of a trigger level directs the Permittees to take actions to verify the exceedance of the trigger level. If the trigger level has been exceeded, the Permittees must collect additional data and report the data to the NMED to determine what additional actions must be taken, if any. This process under the LTMMP is effective in protecting human health and the environment.</p>
MMMM	Monitoring of loss of cover integrity	A commenter stated that there is inadequate monitoring to ensure that cover integrity is maintained.	R92	The LTMMP requires monitoring, inspection, maintenance, repair, reporting, and physical and institutional control (IC) of the MWL and cover. Particularly, the LTMMP contains provisions for inspecting the cover for erosion, adequate vegetation coverage, and biotic impacts to ensure cover integrity is maintained. See Table 4.6-1 of the LTMMP. Maintenance will be performed to prevent deterioration or failure of the cover. If

				needed, repairs will be made to restore conditions to original specifications.
MMMM	2006 TechLaw Report	A commenter stated that the 2006 TechLaw, Inc. report author (a contractor for NMED) raised concerns that compliance monitoring was needed at the MWL due to releases at the MWL and exceedances of EPA MCLs for soil gas and heavy metals. The TechLaw report was withheld from CANM until 2009, and CANM incorporates all concerns for the cover raised in the report.	R93	<p>The “2006 TechLaw Report” did not state that compliance monitoring was needed at the MWL. It also did not discuss releases and exceedances of EPA MCLs for soil gas and heavy metals (note that EPA MCLs do not apply to soil gas).</p> <p>As indicated previously by the NMED in Response 13 for the CMI Report, a representative of TechLaw, in their comment #5, expressed concern whether the cover was designed to last 1000 years or more, and opined that it was unlikely that the U. S. Government can or will maintain the integrity of the cover for 1000 years. TechLaw was tasked by the NMED to review the Fate and Transport Model (FTM) found in Appendix E of the CMI Plan, not the design of the cover. Thus, the TechLaw representative, who did not review the cover design in any detail, could not have commented on the adequacy of the design of the cover in any credible manner. See also Response R14 of this document.</p> <p>The TechLaw report also presented a concern about monitoring moisture breakthrough of the cover. See Response R78 of this document concerning this issue.</p>
NNNN	EPA letter concluding MWL not a hazard to public	A commenter stated that he and Citizen Action New Mexico received a letter from EPA concluding that the MWL does not present a hazard to the public. However this conclusion was rejected by the EPA Office of Inspector General (OIG) in its report of April 14, 2010.	R94	<p>NMED would agree that the MWL does not present a hazard to the public.</p> <p>The EPA OIG does not have the expertise to overturn a technical opinion of the EPA. Thus, NMED questions the commenter’s implication that the OIG concluded that the MWL poses a threat to the public.</p>
NNNN, UUUU, OOOO	Fate and Transport Model	Commenters stated that the Fate and Transport Model (FTM) showed groundwater is	R95	NMED addressed this issue, in part, in Responses 29 for the CMI Report and R20 for the SV SAP.

		<p>contaminated. He claimed the authors of the FTM (Ho and others, 2007) identified cadmium and uranium as potential groundwater contaminants at the MWL, and that PCE was a groundwater contaminant. The commenter also stated that the 2006 TechLaw Report revealed the FTM was inadequate. A commenter stated that he did not believe the results of the FTM. Another commenter stated that the model was called a “black box” by TechLaw, and no one seems to understand the model except its creator.</p>		<p>A model cannot prove the existence of groundwater contamination. Only sampling and analysis can conclusively show the existence of, or lack of, groundwater contamination.</p> <p>Ho and others (2007) identified uranium and cadmium as contaminants to be modeled. That they were modeled as potential contaminants does not mean that they are groundwater contaminants. Sampling and analysis show that cadmium and uranium are not groundwater contaminants at the MWL.</p> <p>Ho and others (2007) did not find that PCE is a groundwater contaminant at the MWL. The Fate and Transport Model predicts that PCE (the primary volatile organic compound at the MWL) has only a small (1%) chance of contaminating groundwater to a level that would exceed the drinking water standard for PCE. This result is based on PCE concentrations of up to ten times those actually detected at the MWL and conservative assumptions that maximize the rate of migration of PCE. Additionally, NMED notes that the commenter quotes Ho and others (2007) as stating “So far, no detectable amounts of PCE have been found in the groundwater at the MWL”.</p> <p>The “2006 TechLaw Report”, which consisted of draft comments on the FTM, asked that additional detail be provided regarding the modeling methods (codes) used, data quality objectives, quality assurance, details regarding specific inputs and outputs for modeling runs, sensitivities of input parameters, and bias. Without these details, the model could not be fully evaluated thus, it was referred to as a “black box” by TechLaw. The Permittees addressed the issues to the satisfaction of the TechLaw reviewer and the NMED in their response to the 2006 NOD submitted on January 19, 2007.</p>
OOOO, DDDDD	Emergency Evacuation Plan	<p>Commenters stated that they had not seen any kind of emergency plan distributed by SNL or the City of Albuquerque. If something happens at the MWL,</p>	R96	<p>Provided the landfill contents remain buried, NMED is not aware of any condition at the MWL that could potentially cause an emergency of such magnitude that it would require evacuation of any school on or near Kirtland Air Force Base, or require evacuation of anyone living in a residence near the Base.</p>

		they question how people are expected to get out of the city. A commenter stated that there needed to be an evacuation plan, especially for schools on and near Kirtland Air Force Base.		
PPPP, XXXX, WWWW	Uncertainty	Commenters stated that many things are known and not known about the MWL. In particular, we don't know how much high level waste is in the landfill, or how much is already in our soil and air. One commenter stated that predictions can be wrong. They further submitted information citing Angeka Creager, history of science professor, Princeton University, that Chairman of the U.S. Atomic Energy Commission, Lewis Straus predicted that nuclear power would produce energy too cheap to meter, and that nuclear science related advances would end famines, lengthen human life, and bring peace.	R97	<p>See Response R55 of this document concerning high level waste.</p> <p>There is always uncertainty associated with site characterization, and sometimes predictions are wrong -- even those made with the best of intentions. However, based on professional judgment, the NMED believes that sufficient information exists for the MWL to support the remedy chosen by the Department, and that the landfill in its current state (with cover installed) does not pose unacceptable risk to human health and the environment under an industrial land use scenario.</p> <p>Should the remedy fail to be protective in the future with respect to hazardous waste or constituents, the Department has the authority to reopen the site and require whatever additional corrective action is needed.</p>
RRRR	Models versus Empirical Data	A commenter stated that empirical data are superior to models.	R98	NMED agrees with the comment. The LTMMP requires the acquisition of empirical data, such as groundwater monitoring data, to ensure protection of human health and the environment.
TTTT	PCBs	A commenter stated that there are 50,000 gallons of polychlorinated biphenyls (PCBs) disposed of in the MWL, which is scary, and should be excavated.	R99	The unclassified inventory does not support or lead logically to any conclusion that thousands of gallons of PCBs have been disposed of in the MWL. The 50,000 gallons referenced by the commenter actually represents an estimate of the amount of wastes in the MWL that are mostly only contaminated with PCBs and is not pure PCB product. As PCBs are relatively immobile in the absence of sufficient moisture, it is unlikely that PCBs will



				reach the groundwater beneath the MWL. Thus, the presence of PCBs in the landfill under the conditions at the site does not provide sufficient justification to require excavation of the landfill.
OOOO	Security	A commenter is concerned that terrorists could place explosives onto the landfill, with an explosion releasing wastes into the air.	R100	While this scenario may be plausible, it is unlikely that such an action could be successfully carried out given the high level of security present at SNL, in addition to that employed by the military on lands surrounding Technical Area 3 where the MWL is located. More than likely, a terrorist organization would select a softer target if the goal was to create an explosion that would mimic a dirty bomb (i.e. - a bomb that releases radioactive material as a means to incite terror against the populace).
YYYY	Sandia Corporation is a Temporary Contractor	A commenter stated that Sandia Corporation is a temporary contractor and will not be concerned about the permanent effects on our water supply or public lands.	R101	Regardless of whether Sandia Corporation is its operating contractor, or whether it even maintains such a contractor in the future, the U. S. Department of Energy, as owner, will continue to be responsible for the MWL.  Sandia Corporation and the U. S. Department of Energy have completed corrective action at the MWL in manner compliant with the regulations. The NMED expects them to continue to meet their obligations in the future, and can take measures to enforce the regulations should they be violated. That they have completed corrective action at the MWL and at many other sites suggests they are concerned about the protection of water and land at SNL, and the Department has no reason to believe otherwise.
ZZZZ	CAC Ends Scrutiny of MWL	A commenter stated that SNL wants CAC status for the MWL so that there is less scrutiny of their work.	R102	The granting of CAC status does not end NMED oversight of the MWL, nor for the public to obtain information and comment on the status of the MWL. The controls to be implemented at the MWL are enforceable under the Permit. Annual reports of long term monitoring and maintenance are required, as well as 5-year reevaluations of the performance of the remedy and the feasibility of excavation.
AAAAA	Environmental Justice	A commenter stated that the MWL is an environmental justice issue.	R103	There are no communities threatened by the MWL, so the Department does not believe that the MWL represents an environmental justice issue.
CCCCC	Community	A commenter stated that they	R104	The Community Relations Plan required under Section 1.18 of the

	Relations Plan	had not seen a community relations plan required by the SNL Permit, and has not been contacted. It is not right and there are environmental justice mandates that apply.		SNL Permit was not due at the time this comment was made. It has since been timely submitted to the NMED. NMED is currently preparing a public notice to solicit comments on the plan.
CCCCC	Remediate Releases	A commenter stated that her organization believes that contamination should be remediated before it reaches groundwater, regardless of trigger levels or exceedance of regulatory standards.	R105	Under the corrective action provisions of RCRA, there is no regulatory requirement to remediate releases that do not pose unacceptable risk or that do not exceed regulatory standards. The trigger levels under the LTMMP were developed to be conservative and to provide early warning if releases from the MWL were to unexpectedly increase by a significant amount.
DDDDD	Trigger Process to Slow	A commenter stated that there was too much time between when something exceeded a trigger level and when a response would happen should there be an emergency.	R106	Provided the landfill contents remain buried, NMED is not aware of any condition at the MWL that could potentially cause an imminent threat to human health or the environment. Under a more likely, but unexpected, scenario of a significant contaminant release from the MWL that poses a hazard from long term exposure, the NMED believes that the time needed to report and verify such a release, assess the release, and if necessary, initiate remediation is reasonable given the time it takes to plan, collect and analyze samples, and execute all other investigation activities. Thus a modification of the trigger evaluation process under Section 5.1 of the LTMMP is not necessary to ensure protection of human health and the environment.
OOOO	Obstruction of Public Opposition to CAC Status	A commenter stated that the NMED and SNL filed motions to prevent Citizen Action New Mexico and Dr. Eric Nuttall from presenting testimony and witnesses at the hearing to “muzzle” public opposition to the corrective action complete proposal.	R107	<p>The NMED filed motions to strike testimony in cases where hearing procedures intended to promote fairness were violated, resulting in prejudice to other parties. Regardless, the hearing officer allowed the testimonies of Citizen Action New Mexico and Dr. Eric Nuttall to be entered into the record.</p> <p>The Permittees filed motions to strike certain testimonies in cases where issues had already been decided in the past (e.g. remedy selection), or where issues fell outside of NMED’s authority (e.g. authority over radionuclides). The intent of their motions was to expedite the hearing by limiting the scope to matters actually relevant to the CAC determination. Regardless, the hearing</p>

				officer allowed the testimonies of Citizen Action New Mexico and Dr. Eric Nuttall to be entered into the record.
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