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ENVIRONMENTAL RESTORATION PROJECT

A Department of Energy
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General

Site and Watershed Aggregation and Prioritization

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1.0 INTRODUCTION

In 1998, the senior managers of the Department of Energy (DOE) Albuquerque Operations Office (DOE-AL), the DOE Los Alamos Area Office (DOE-LAAO), and the Los Alamos National Laboratory (the Laboratory) Environmental Restoration (ER) Project created a strategic "roadmap" for completing the ER Project. The ER Project was initiated in 1989 pursuant to the requirements of the Resource Conservation and Recovery Act (RCRA) corrective-action process. The goal of the strategic roadmap exercise was to expedite corrective actions at the Laboratory by incorporating "lessons learned" during the first 12 years of the ER Project. A single preferred strategy for completing the project was identified (LANL 1998, 62755).

The preferred strategy significantly changed the ER Project's approach to conducting the corrective-action process. Rather than focusing on over 1,000 individual sites [called Potential Release Sites (PRSs) or Areas of Concern (AOCs)] distributed over some 43 square miles, the ER Project is now planning and implementing work on groups of sites, called aggregates, collocated in proximity to each other. This aggregation goes beyond the "consolidation" of some sites previously done to simplify the annual reporting requirements specified in the Laboratory's Hazardous Waste Facility permit that the New Mexico Environmental Department (NMED) issued to implement the Hazardous and Solid Waste Act (HSWA).

Once aggregation was accomplished, the ER Project worked with the DOE and NMED to prioritize corrective-action activities among aggregates. Once aggregates were prioritized, the ER Project produced the Life-Cycle Baseline (ER Project 1999, 64035), which was approved by the DOE. This report documents how the ER Project grouped sites into aggregates as a more efficient approach to characterizing the type(s), amount(s) and distribution(s) of contamination, then prioritized the aggregates to complete the corrective-action process.

2.0 SITE AGGREGATION PROCESS

The ER Project decided to aggregate to gain efficiencies in the corrective-action program that the Project implemented. The aggregation process built upon the success of the PRS consolidation agreements made with the NMED.

The aggregation process began by dividing the Laboratory property into eight major watersheds, each consisting of mesas, drainages from mesas, and the major canyon into which the drainages converge. The main canyon in each watershed and the drainages that feed into it were combined as eight canyon aggregates, one for each watershed. Each canyon aggregate is further subdivided into sections called "reaches." Then, PRSs on mesas and hillsides emptying into a common drainage or reach within a watershed were grouped into site aggregates.

Site aggregates are potential sources of contamination into canyon aggregates by means of surface water transport, and canyon aggregates may be affected by more than one site aggregate. To ensure that cumulative impacts of all potentially coalescing releases from site aggregates within each canyon aggregate would be addressed in the corrective action process, we considered the characteristics of the contaminants and the contaminated area that might affect contaminant transport, fate, and exposure. To maximize integration, consistency, and efficiency with the land-transfer and environmental monitoring and surveillance programs at the Laboratory, we adjusted the boundaries of site aggregates to fit within defined land-transfer parcels, and (where possible) to include existing surface-water monitoring stations.

The process resulted in 27 site aggregates and 8 canyon aggregates, shown in Figure 2.0-1.

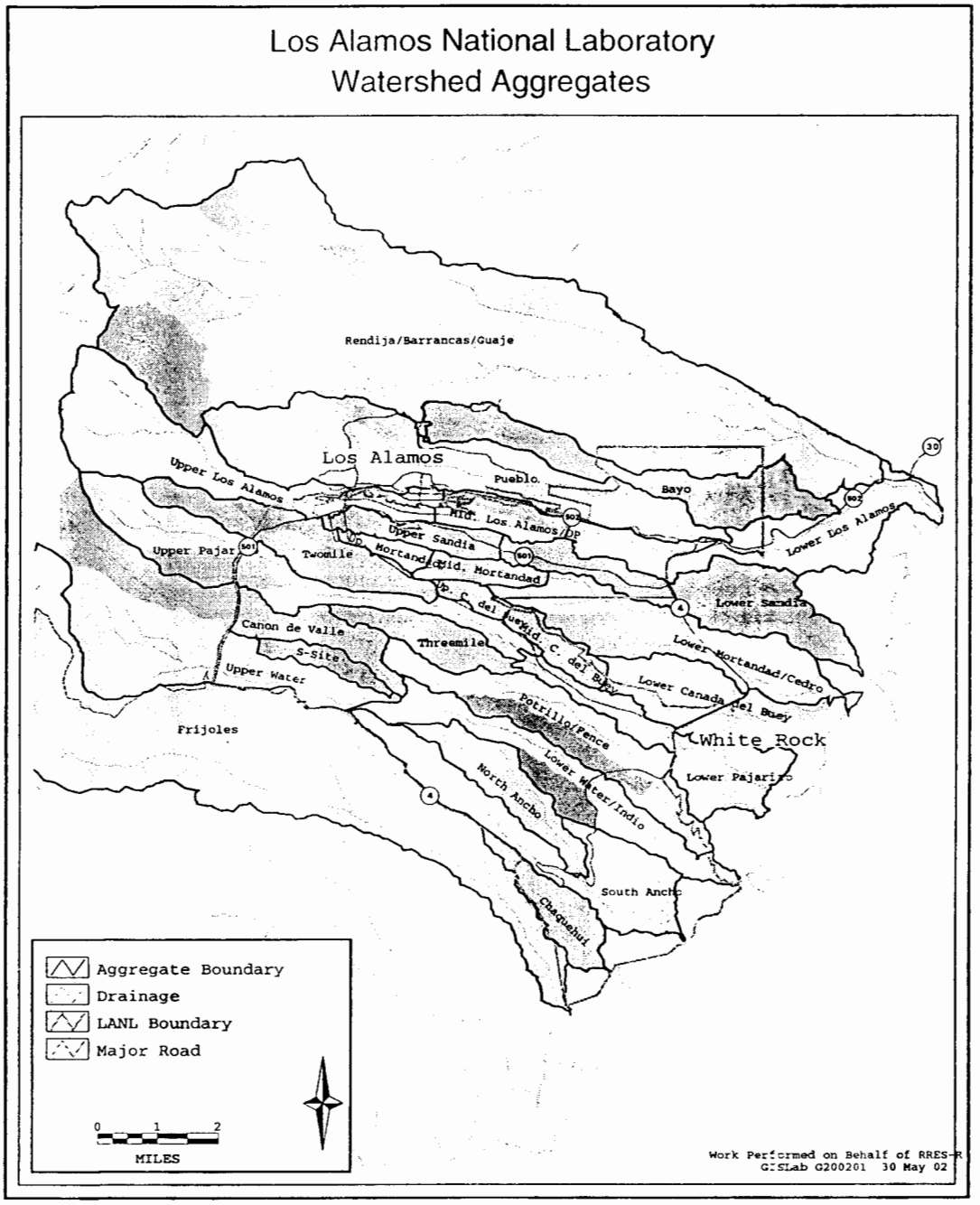

Figure 2.0-1. Map of watershed aggregates

3.0 WATERSHED AND AGGREGATE PRIORITIZATION PROCESS

Once aggregates were defined, ER Project managers considered how work should be planned and resources distributed to perform work among aggregates most efficiently, that is, how aggregates should be prioritized. Like the aggregation process, the prioritization process began at the scale of watersheds.

The following criteria, in order of importance, were used to prioritize watersheds:

(1) potentially risk-significant (i.e., toxic, mobile, and/or accessible) quantities of contaminants;
(2) relative aggregate rankings (also reviewed by NMED; NMED 1999, 63673);
(3) existence of land-transfer parcels;
(4) substantial investment in the planning or execution of the corrective-action process; and
(5) presence of operating facilities that are critical to the Laboratory mission.

Table 3.0-1 shows the final ER Project watershed ranking, which is reflected in the ER Project Life-Cycle Baseline (LANL1999, 64035). Table 3.02 summarizes the prioritization of the aggregates within the watershed. Each of the canyons aggregates encompasses the entire canyon within the watershed. Although not prioritized separately by NMED, the ER Project assigned the canyons aggregate the highest priority aggregate within a watershed.

Table 3.0-1
ER Project Watershed Prioritization and Rationale

Watershed Name	Priority	Rationale for Priority Rank
Los Alamos/Pueblo	1	Mobile contaminants; two high-priority aggregates identified by NMED; TA-74 land-transfer parcel; recreational use; and canyons investigations underway
Mortandad	2	Mobile contaminants; one high- and three medium-priority aggregates identified by NMED; White Rock land-transfer parcel; proximity to San Ildefonso land; and recreational use.
Water/ Cañon de Valle	3	Mobile contaminants; one high- and two medium-priority aggregates identified by NMED; and recreational use.
Pajarito	4	Potentially mobile contaminants; three medium-priority aggregates identified by NMED; and recreational accessibility
Sandia	5	Potential contamination; one medium-priority aggregate identified by NMED, stakeholder issues; and recreational accessibility
Ancho	6	Potential contamination; one medium-priority aggregate identified by NMED, stakeholder issues; and recreational accessibility
Chaquehui	7	Potential contamination; one low-priority aggregate identified by NMED and stakeholder issues
Frijoles	8	Recreational accessibility; one low-priority aggregate identified by NMED

Table 3.0-2
Watershed Ranking 7/16/99 (Sorted by ER Aggregate Rank, Including Canyons Aggregates)

Prioritized Watersheds (with NMED)	ER Watershed Rank	Prioritized Aggregates (within Watersheds)	NMED Prioritized Aggregates (3/5/99) [a]	ER Aggregate Rank	Portions of TA Included in Aggregate
LA/Pueblo	1	Canyons	—	1	
LA/Pueblo	1	Middle Los Alamos/ DP	H	2	TA-00, -02, -21, -26, -31, -53, -61, -73
LA/Pueblo	1	Pueblo	H	3	TA-00, -19, -31, -72, -73, -74
Mortandad	2	Canyons	—	4	
Mortandad	2	Middle Mortandad/ Ten-Site	H	5	TA-04, -05, -35, -50, -51, -52, -60, -63
Water/Valle	3	Canyons	—	6	
Water/Valle	3	Cañon de Valle	H	7	TA-08, -9, -13, -14, -15, -16, -37
LA/Pueblo	1	Upper Los Alamos	M	8	TA-00, -01, -02, -03, -30, -32, -41, -43, -61, -62
LA/Pueblo	1	Bayo	M	9	TA-00, -10, -74
Mortandad	2	Upper Mortandad	M	10	TA-3, -35, -42, -48, -55, -59, -60, -64
Pajarito	4	Canyons		11	
Pajarito	4	Lower Pajarito	M	12	TA-12, -18, -27, -36, -54
Mortandad	2	Middle Cañada del Buey	M	13	TA-51, -54
Mortandad	2	Upper Cañada del Buey	M	14	TA-05, -46, -51 –52, -54, -63
Water/Valle	3	S-Site	M	15	TA-11, -13, -16, -25, -37
Water/Valle	3	Potrillo/Fence	M	16	TA-15, -36, -68, -71
Sandia	5	Canyons	—	17	
Sandia	5	Upper Sandia	M	18	TA-03, -05, -53, -60, -61
Pajarito	4	Threemile	M	19	TA-12, -14, -15, -18, -36, -67
Pajarito	4	Upper Pajarito	M	20	TA-08, -09, -14, -15, -18, -22, -36, -40, -46, -51, -54, -66, -67, -69
Ancho	6	Canyons	—	21	
Ancho	6	North Ancho	M	22	TA-33, -39, -49
LA/Pueblo	1	Rendija/Barranca/ Guaje	L	23	TA-00, -01, -45, -74
LA/Pueblo	1	Lower Los Alamos	L	24	TA-00, -53, -72, -73, -74
Mortandad	2	Lower Mortandad/ Cañada del Buey	L	25	TA-36, -54
Mortandad	2	Lower Mortandad/Cedro	L	26	TA-00, -05
Water/Valle	3	Upper Water	L	27	TA-11, -16, -28, -37, -49
Water/Valle	3	Lower Water/Indio	L	28	TA-15, -36, -39, -49, -68, -70, -71
Sandia	5	Lower Sandia	L	29	TA-05, -20, -53, -72
Pajarito	4	Twomile	L	30	TA-03, -06, -07, -22, -40, -48, -50, -55, -58, -59, -62, -63, -64, -66, -69
Ancho	6	South Ancho	L	31	TA-33, -39, -49, -70
Chaquehui	7	Canyons	—	32	
Chaquehui	7	Chaquehui	L	33	TA-33
Frijoles	8	Canyons	—	34	
Frijoles	8	Frijoles	L	35	TA-00, -16, -33, -49, -57

[a] NMED independently ranked the aggregates defined by the ER Project according to a High [H], Medium [M], or Low [L] convention (NMED 1999, 63673)

4.0 AGGREGATE PRIORITIZATION AND DESCRIPTIONS

In the following sections, the watersheds and their associated site and canyon aggregates are discussed in order of priority, from highest to lowest. The basis for the watershed rank with respect to the primary prioritization criteria presented in Section 3.0 is as follows:

- real or perceived risk,
- regulatory interest,
- stakeholder issues,
- programmatic investment, and
- Laboratory mission impact.

Real or perceived risk was based on known or suspected contamination, contaminant mobility, and the presence of water and/or ecological habitat.

Each watershed subsection contains a table that indicates the absolute priority assigned by the ER Project (the highest priority is assigned number 1 and the lowest priority assigned number 35); each table also gives the relative rank [High (H), Medium (M) or Low (L)] assigned to aggregates by NMED (NMED 1999, 63673). Appendix A contains a table listing the PRSs within each aggregate.

4.1 Los Alamos/Pueblo Watershed Aggregates

The Los Alamos/Pueblo watershed is the highest priority watershed for the ER Project. Investigations of the Los Alamos/Pueblo canyon aggregate are well along, and contamination has been identified. This watershed contains six site aggregates—Bayo, Upper Los Alamos, Middle Los Alamos/DP, Lower Los Alamos, Pueblo, and Rendija/Barrancas/Guaje—and the canyon aggregate. Table 4.1-1 shows the priority of site aggregates within the watershed, the ranking assigned by the NMED, and the rationale for the priority and/or rank.

Table 4.1.1
Los Alamos/Pueblo Watershed Site Aggregate Ranking

Aggregate	ER Project Priority	NMED Rank	Key Sites/Issues
Los Alamos/Pueblo Canyons	1	N/A[a]	Relatively wet canyons and large number of high-priority/rank sources; associated potential for off-site migration
Middle Los Alamos/DP	2	H	MDAs A, B, T, U and V and formerly used nuclear materials processing facilities at TA-21; decommissioned nuclear reactor in canyon
Pueblo	3	H	Ashpile and Airport Voluntary Corrective Measure; airport drainages; Acid Canyon
Upper Los Alamos	8	M	Hillside sources at TA-1
Bayo	9	M	Residual contamination in Bayo Canyon, which is used recreationally
Rendija/Barrancas/Guaje	23	L	No major sites
Lower Los Alamos	24	L	liquid outfall from TA-53 Lagoons (which are themselves in Lower Sandia aggregate); no major sites

[a] N/A=Not applicable; NMED ranked PRS but not canyon aggregates.

4.2 Mortandad Watershed Aggregates

The Mortandad watershed is the second highest priority watershed for the ER Project. Investigations have identified contamination from historical releases from one or more of the six site aggregates in the watershed. The six site aggregates in the Mortandad watershed are Lower Cañada del Buey, Lower Mortandad/Cedro, Middle Cañada del Buey, Middle Mortandad/Ten Site, Upper Cañada del Buey, and Upper Mortandad. Table 4.2-1 shows the priority of site aggregates within the watershed, the ranking assigned by the NMED, and the rationale for the priority and/or rank.

Table 4.2-1
Mortandad Watershed Site Aggregate Ranking

Aggregate	ER Project Priority	NMED Rank	Key Sites/Issues
Mortandad Canyons	4	N/A[a]	Relatively wet canyons and sediment traps, and associated potential for offsite migration
Middle Mortandad/Ten-Site	5	H	Liquid waste treatment outfall and MDA C at TA-50; PRSs at TA-35
Upper Mortandad	10	M	Potential contaminant sources at TA-35, TA-48, and TA-55
Middle Cañada del Buey	13	M	PRSs at TA-54
Upper Cañada del Buey	14	M	PRSs at TA-46
Lower Cañada del Buey	25	L	No major sites
Lower Mortandad/Cedro	26	L	No major sites

[a] N/A=Not applicable NMED ranked PRS but not canyon aggregates.

4.3 Water/Cañon de Valle Watershed Aggregates

The Water/Cañon de Valle watershed is the third-highest priority watershed for the ER Project and includes five site aggregates—Cañon de Valle, Upper Water, Lower Water/Indio, Potrillo/Fence, and S-Site—and the canyon aggregate. Table 4.3-1 shows the priority of site aggregates within the watershed, the ranking assigned by the NMED, and the rationale for the priority and/or rank.

Table 4.3-1
Water/Cañon de Valle Site Watershed Aggregate Ranking

Aggregate	ER Project Priority	NMED Rank	Key Sites/Issues
Water/Canon de Valle Canyons	6	N/A[a]	Relatively wet watershed; liquid discharges containing high explosives residue into canyon; high explosives detected in regional aquifer in well R-25
Cañon de Valle	7	H	260 Outfall, MDA R, Fish Ladder site, MDA P and MDA Z; burning grounds at TA-16;
S-Site	15	M	PRSs containing high-explosives residue
Potrillo/Fence	16	M	PRSs containing high-explosives residue
Upper Water	27	L	No major sites
Lower Water/Indio	28	L	No major sites

[a] N/A=Not applicable; NMED ranked PRS but not canyon aggregates.

4.4 Pajarito Watershed Aggregates

The Pajarito watershed is the fourth-highest priority watershed for the ER Project, and it contains four site aggregates—Upper Pajarito, Lower Pajarito, Threemile, Twomile—and the Pajarito Canyon aggregate. Table 4.4-1 shows the priority of site aggregates within the watershed, the ranking assigned by the NMED, and the rationale for the priority and/or rank.

Table 4.4-1
Pajarito Watershed Site Aggregate Ranking

Aggregate	ER Project Priority	NMED Rank	Key Sites/Issues
Pajarito Canyons	11	N/A[a]	Some relatively wet canyon reaches
Upper Pajarito	20	M	Liquid releases of high-explosive residues
Threemile	19	M	High-explosive residues from firing site at R44
Lower Pajarito	12	M	PRSs at nuclear facilities at TA-18 and TA-54; MDAs G and L at TA-54
Twomile	30	L	No major sites

[a] N/A=Not applicable; NMED ranked PRS but not canyon aggregates.

4.5 Sandia Watershed Aggregates

The Sandia watershed is the fifth-highest priority watershed for the ER Project, with two site aggregates—Upper Sandia and Lower Sandia—draining into the Sandia canyon aggregate. Table 4.5-1 shows the priority of site aggregates within the watershed, the ranking assigned by the NMED, and the rationale for the priority and/or rank.

Table 4.5-1
Sandia Watershed Site Aggregate Ranking

Aggregate	ER Project Priority	NMED Rank	Key Sites/Issues
Sandia Canyons	17	N/A[a]	Contains wetlands at head of watershed
Upper Sandia	18	M	Contamination from industrial-site PRSs at TA-3
Lower Sandia	29	L	No major sites

[a] N/A=Not applicable; NMED ranked PRS but not canyon aggregates.

4.6 Ancho Watershed Aggregates

The Ancho watershed is the sixth-highest priority watershed for the ER Project. The Ancho watershed contains two site aggregates—North Ancho and South Ancho—and the Ancho canyon aggregate. Table 4.6-1 shows the priority of site aggregates within the watershed, the ranking assigned by the NMED, and the rationale for the priority and/or rank.

Table 4.6-1
Ancho Watershed Site Aggregate Ranking

Aggregate	ER Project Priority	NMED Rank	Key Sites/Issues
Ancho Canyons	21	N/A	
North Ancho	22	M	Known and potential releases from formerly-used firing sites; MDA Y
South Ancho	31	L	No major sites

[a] N/A=Not applicable; NMED ranked PRS but not canyon aggregates.

4.7 Chaquehui Watershed Aggregates

The Chaquehui watershed is the second-lowest priority watershed for the ER Project, containing only a single site aggregate (Chaquehui), which was prioritized at number 33 by the ER Project and ranked Low by the NMED, largely because exposure to potential contaminants was unlikely given the relative inaccessibility of the watershed.

4.8 Frijoles Watershed Aggregates

The Frijoles watershed is the lowest priority watershed (priority rank number 8) for the ER Project. While the watershed is used extensively for recreation and overlaps with the Bandelier National Monument, its single site aggregate (Frijoles) poses very little threat in terms of contamination. The Frijoles site aggregate was prioritized at number 35 by the ER Project and ranked Low by the NMED.

5.0 REFERENCES

LANL (Los Alamos National Laboratory), May 22, 1998. "Hydrogeologic Workplan," Los Alamos National Laboratory report, Los Alamos, New Mexico. (LANL 1998, 59599)

LANL (Los Alamos National Laboratory), December 16, 1998. "Environmental Restoration Project FY2000 Life-Cycle Baseline, Los Alamos National Laboratory report LA-CP-00-274, Los Alamos, New Mexico. (LANL 1999, 64035)

LANL (Los Alamos National Laboratory, December 18, 1998. "1999 Environmental Restoration Project Roadmap," Los Alamos National Laboratory Report, Los Alamos, New Mexico. (LANL 1998, 62755)

LANL (Los Alamos National Laboratory), March 2000. "Integrated Technical Strategy Document, Revision 8," Los Alamos National Laboratory report LA-UR-00-1336, Los Alamos, New Mexico. (LANL 2000, 66802)

NMED (New Mexico Environment Department), March 23, 1999. "HRMB Recommendations Concerning the Proposed Watershed and Aggregate Prioritization, Los Alamos National Laboratory, NM 0890010515 (Project Tracker No. C671) with attached copies of "Portions of Watersheds with Suggested Aggregate Boundary Changes," HRMB (Hazardous and Radioactive Materials Bureau) letter to T. Taylor (DOE ER Program Manager) and J. Browne (LANL Director) from R.S. Dinwiddie (NMED-HRMB), Santa Fe, New Mexico. (NMED 1999, 63673)

Appendix A

Potential Release Sites within Aggregates

Ancho Watershed Aggregates							
Watershed Aggregate	PRSs in Watershed Aggregate					Major Remedial Action Sites	Major MDAs
North Ancho	39-001(a) 39-001(b)-00 39-002(a) 39-002(b) 39-002(c) 39-002(d) 39-002(e)	)-002(f) 39-002(g)* 39-003* 39-004(a) 39-004(b 39-004(c) 39-004(d)	39-004(e) 39-005 39-006(a) 39-006(b)* 39-007(a) 39-007(b)* 39-007(c)*	39-007(d)* 39-007(e)* 39-009* 39-010 49-001(a)-00 49-002 49-003	49-005(b)* 49-006 49-008(a) 49-008(c) 49-008(d) 49-009	MDA Y Firing Sites	MDA AB
South Ancho	33-003(a)-99 33-004(c)	33-004(k) 33-004(l)*	33-006(b)-00 33-010(b)	33-010(d) 49-007(b)*	49-008(b) C-33-002	MDA D	None
Ancho Canyons	C-00-018					None	None

Chaquehui Watershed Aggregates							
Watershed Aggregate	PRSs in Watershed Aggregate					Major Corrective Action Sites	Major MDAs
Chaquehui	33-001(a)-99 33-002(a)-99 33-004(a)-00 33-004(b) 33-004(d) 33-004(e)*	33-004(f)* 33-004(g)-00 33-004(j)-00 33-004(m) 33-004(n)* 33-005(a)-00	33-008(c) 33-009 33-010(e) 33-010(g) 33-011(b) 33-011(e)	33-012(a) 33-012(b)* 33-012(c)* 33-012(d)* 33-013 33-016	C-33-001 C-33-003	None	None
Chaquehui Canyons	00-019					)ne	None

Frijoles Watershed Aggregates							
Watershed Aggregate	PRSs in Watershed Aggregate					Major Corrective Action Sites	Major MDAs
Frijoles	57-001(a) 57-001(b) 57-001(c) 57-002	57-003 57-004(a) 57-004(b)	57-005* 57-006 57-007	C-00-036(a) C-00-036(b C-00-036(c)	C-00-036(d) C-00-037 C-00-038	None	None
Frijoles Canyons	None					None	None

*** PRS status is administratively complete**

Los Alamos/Pueblo Watershed Aggregates							
Watershed Aggregate	**PRSs in Watershed Aggregate**					**Major Corrective Action Sites**	**Major MDAs**
Rendija/Barrancas/Guaje	00-011(a) 00-011(c) 00-011(e)	00-015 00-016* 00-024*	00-025* 00-028(a)-00 00-029(c)	C-00-020 C-00-041		None	None
Bayo	00-008* 00-011(d)	00-026* 10-001(a)-99	10-001(e)* 10-002(a)-99	10-004(a) 10-006	10-009 C-10-001	Bayo Canyon	None
Pueblo	00-018(a) 00-018(b) 00-019 00-030(c) 00-030(d) 00-030(eN)	00-030(eS) 00-030(f) 00-030(g) 00-030(h) 00-030(j) 00-030(k)*	00-030(n) 00-030(o) 00-030(p) 00-030(q) 00-034(a)* 00-039	00-040* 19-001-99 31-001 45-001-00 73-001(a)-99 73-001(b)-99	73-002-99 73-004(c) C-00-043 C-19-001 C-31-001*	Ashpile VCM	None
Upper Los Alamos	00-003-99 00-017 00-030(i) 00-031(a)* 00-031(b) 00-032 00-034(b)* 00-035(a)* 01-001(a)-99 01-001(h)* 01-001(i)* 01-001(j)* 01-001(k)* 01-001(l)* 01-001(m)	01-001(n)* 01-001(p)* 01-001(q)* 01-001(r)* 01-001(v)* 01-001(w)* 01-003(c)* 01-003(d) 01-006(f)* 01-006(i)* 01-006(j)* 01-006(k)* 01-006(l)* 01-006(m)* 01-006(q)*	01-006(r)* 01-006(s)* 01-006(t)* 01-007(g)* 01-007(k)* 01-007(n) 01-007(p) 3-001(m)* 03-008(a)* 03-009(b)* 03-009(j) 03-038(a)-00 03-055(c) 03-055(d)* 30-001*	32-001 32-002(a) 32-002(b) 32-003 32-004 41-001 41-002(a)-99 41-003 41-004* 43-001(a1) 43-001(a2) 43-001(b1)* 43-001(b2) 43-002 43-003*	43-004* 43-005* 61-004(b)* 61-007 C-00-042 C-02-001 C-32-001* C-41-001* C-41-002* C-41-003* C-41-004 C-41-005* C-43-001	None	None

Los Alamos/Pueblo Watershed Aggregates (continued)							
Watershed Aggregate	**PRSs in Watershed Aggregate**					**Major Corrective Action Sites**	**Major MDAs**
Middle Los Alamos/DP	00-010(a)*	02-008(c)	21-017(a)-99	21-027(d)-99	C-21-016*	TA-21, 21-011(k)	MDA A
	00-010(b)*	02-009(d)	21-018(a)-99	21-028(b)*	C-21-017*	TA-21, DP West Structures DP	MDA B
	00-027	02-009(e)	21-021-99	21-028(c)	C-21-020*	Road Tract	MDA T
	00-030(a)	02-010	21-022(b)-99	21-028(d)*	C-21-021*	TA-21, 21-024(l)-99	MDA U
	00-030(b)-00	02-011(a)	21-022(f)	21-028(e)*	C-21-018*	TA-21, 21-026(a)-99	MDA V
	00-033(a)	02-011(b)	21-022(h)-99	21-029	C-21-019*	TA-02, Omega West-Reactor	
	02-002*	02-011(c)	21-023(a)-99	26-001	C-21-022		
	02-003(a)	02-011(d)	21-024(a)	26-002(a)	C-21-023		
	02-003(b)	02-011(e)	21-024(b)	26-002(b)	C-21-024		
	02-003(c)	02-012	21-024(c)	26-003	C-21-025		
	02-003(d)	02-013*	21-024(d)	53-011(b)*	C-21-026*		
	02-003(e)	21-002(b)	21-024(e)	53-012(a)*	C-21-027		
	02-004(a)	21-003-99	21-024(f)	53-012(b)*	C-21-029		
	02-004(b)	21-004(b)-99	21-024(g)	53-012(c)*	C-21-030*		
	02-004(c)	21-005*	21-024(h)	73-005-99	C-21-031		
	02-004(d)	21-006(c)-99	21-024(i)	C-21-001	C-21-032		
	02-004(e)	21-006(e)-99	21-024(j)	C-21-002*	C-21-033		
	02-004(f)	21-008	21-024(k)	C-21-003	C-21-034		
	02-004(g)	21-009	21-024(l)-99	C-21-004	C-21-035		
	02-005	21-011(b)	21-024(m)	C-21-005	C-21-036		
	02-006(a)	21-011(k)	21-024(n)	C-21-006	C-21-037		
	02-006(b)	21-012(a)*	21-024(o)	C-21-007	C-53-017*		
	02-006(c)	21-012(b)	21-025(a)*	C-21-008	C-73-001*		
	02-006(d)	21-013(c)	21-025(b)*	C-21-010*	C-73-002*		
	02-006(e)	21-013(d)-99	21-026(a)-99	C-21-011*	C-73-003*		
	02-007-00	21-014	21-027(a)	C-21-013*	C-73-004*		
	02-008(a)	21-015	21-027(b)*	C-21-014*			
	02-008(b)*	21-016(a)-99	21-027(c)	C-21-015			
Lower Los Alamos	00-029(a)	02-001	21-030	53-009		None	None
	00-029(b)	21-002(a)	53-008				
Los Alamos/Pueblo Canyons	C-00-001	C-00-003	C-00-005	C-00-021		South Fork Acid Canyon	None
	C-00-002	C-00-004	C-00-006				

Mortandad Watershed Aggregates							
Watershed Aggregate	**PRSs in Watershed Aggregate**					**Major Corrective Action Sites**	**Major MDAs**
Upper Mortandad	03-001(h)*	03-014(w)	03-058*	48-006*	55-007*	None	None
	03-001(j)*	03-014(x)	35-004(o)*	48-007(a)-00	55-008		
	03-001(y)*	03-025(a)*	35-013(a)	48-007(b)	55-009		
	03-003(e)*	03-026(a)	35-016(g)	48-007(c)	55-010*		
	03-003(i)*	03-026(c)	35-016(h)	48-007(e)*	55-011(a)*		
	03-004(a)*	03-030*	42-001(a)-99	48-007(f)	55-011(b)*		
	03-004(b)*	03-031	42-004	48-008*	55-011(c)*		
	03-004(c)	03-034(a)	48-001	48-009*	55-011(d)*		
	03-004(d)	03-034(b)	48-002(a)	48-011	55-011(e)*		
	03-004(e)*	03-041*	48-002(b)	55-001*	55-012*		
	03-004(f)*	03-048*	48-002(c)*	55-002(a)*	55-013(a)*		
	03-007	03-049(b)-00	48-002(d)*	55-002(b)*	55-013(b)*		
	03-009(c)*	03-049(d)*	48-002(e)	55-002(c)*	C-03-006		
	03-009(e)*	03-049(e)	48-003	55-003*	C-03-007*		
	03-009(h)*	03-050(b)	48-004(a)-99	55-004*	C-03-012*		
	03-010(b)*	03-054(e)	48-004(d)*	55-005*	C-60-002*		
	03-012(a)*	03-056(e)*	48-005	55-006*			

Pajarito Watershed Aggregates							
Watershed Aggregate	**PRSs in Watershed Aggregate**					**Major Corrective Action Sites**	**Major MDAs**
Upper Pajarito	08-001(a)	08-011(b)	09-008(a)*	40-004	C-08-011*	MDA M	None
	08-001(b)	09-001(a)-99	09-008(b)-99	40-006(a)	C-08-012*		
	08-002	09-001(c)	09-009	40-006(b)	C-08-013*		
	08-003(a)-00	09-001(d)	09-010(a)	40-006(c)	C-08-014		
	8-003(b)*	09-002	09-010(b)	40-007(a)	C-08-015*		
	8-003(c)*	09-003(a)-99	09-010(c)*	40-007(b)	C-08-016*		
	08-004(c)	09-003(c)*	09-011(a)*	40-007(c)	C-08-017*		
	08-005	09-003(d)	09-011(b)*	40-007(d)	C-08-019*		
	08-006(a)	09-003(f)*	09-011(c)	40-008*	C-08-020*		
	08-006(b)*	09-003(g)	09-012	40-009	C-09-001		
	08-007*	09-003(h)	09-013	40-010	C-09-002*		
	08-008(a)*	09-003(i)	09-014	54-004	C-09-003*		
	08-008(b)*	09-004(a)-99	09-015*	54-005	C-09-004*		
	08-008(d)*	09-004(g)	09-016*	C-08-001*	C-09-006*		
	08-009(b)*	09-004(o)	22-001*	C-08-002*	C-09-007*		
	08-009(c)	09-005(b)*	22-011	C-08-003*	C-09-008*		
	08-009(d)	09-005(c)*	22-014(c)*	C-08-004*	C-09-009*		
	08-009(e)	09-005(e)*	22-015(c)	C-08-005*	C-09-010*		
	08-009(f)	09-005(f)*	22-015(d)-99	C-08-006*	C-09-011*		
	08-010(a)*	09-005(g)	40-001(c)	C-08-007*	C-12-003		
	08-010(b)*	09-005(h)*	40-002(b)*	C-08-008*	C-18-002*		
	08-010(c)*	09-006	40-003(a)	C-08-009*	C-40-001*		
	08-011(a)*	09-007*	40-003(b)	C-08-010			

Pajarito Watershed Aggregates (continued)							
Watershed Aggregate	**PRSs in Watershed Aggregate**					**Major Corrective Action Sites**	**Major MDAs**
Lower Pajarito	18-001(a)-00	18-005(a)	18-010(f)	54-007(d)	54-015(e)	TA-18	MDA G
	18-001(c)-00	18-006*	18-011	54-008*	54-015(f)		MDA H
	18-002(a)	18-008*	18-012(a)	54-009	54-015(g)*		MDA L
	18-002(b)	18-009(a)	18-012(c)	54-010*	54-015(h)*		
	18-002(c)	18-009(b)*	18-012(d)*	54-012(a)	54-015(i)*		
	18-003(a)-00	18-009(c)*	18-013	54-012(b)	54-015(j)		
	18-003(c)	18-009(d)*	27-001*	54-013(a)*	54-016(a) *		
	18-003(d)	18-009(e)*	27-002	54-013(b)-99	54-016(b)		
	18-003(e)	18-010(a)*	27-003	54-014(a)	54-021		
	18-003(f)	18-010(b)	27-004*	54-015(a)	54-022*		
	18-003(g)	18-010(c)	54-007(a)	54-015(b)	C-18-001*		
	18-003(h)	18-010(d)	54-007(b)*	54-015(c)	C-18-003		
	18-004(a)-00	18-010(e)	54-007(c)-99	54-015(d)			
Twomile	03-001(a)*	03-011	03-047(k)*	06-003(h)	40-001(b)	MDA F	None
	03-001(b)*	03-013(g)*	03-050(a)-00	06-004*	40-002(a)*	MDA Q	
	03-001(c)*	03-013(h)*	03-050(e)*	06-006	40-002(c)*		
	03-001(e)	03-014(a2)	03-051(a)*	06-007(a)-99	40-005		
	03-001(g)*	03-014(t)	03-051(b)*	06-007(f)	40-007(e)		
	03-001(k)	03-014(z)	03-051(d)*	06-007(g)	59-001*		
	03-001(l)*	03-016(a)*	03-052(a)-00	07-001(a)-99	59-002*		
	03-001(s)*	03-018*	03-054(a)-00	07-003(c)*	59-003*		
	03-001(t)*	03-019*	03-055(a)	07-003(d)*	59-004		
	03-001(u)*	03-022	03-055(b)*	22-003(a)*	64-001*		
	03-001(w)*	03-025(b)	03-056(f)*	22-003(b)*	69-001		
	03-002(d)*	03-025(c)	03-056(g)*	22-003(c)*	69-002(a)*		
	03-003(a)	03-026(d)	03-056(j)*	22-003(d)*	69-002(b)*		
	03-003(b)	03-033	03-056(m)*	22-003(e)*	C-03-003*		
	03-003(h)*	03-038(e)*	06-001(a)	22-003(f)*	C-03-008*		
	03-003(j)*	03-038(f)	06-001(b)	22-003(g)*	C-03-010*		
	03-003(k)*	03-039(c)*	06-002-00	22-010(a)	C-03-019*		
	03-003(l)	03-040(a)*	06-003(a)-99	22-013*	C-03-021*		
	03-003(p)	03-042	06-003(b)*	22-014(a)	C-06-001		
	03-009(d)	03-043(c)	06-003(d)	22-014(b)	C-50-001		
	03-009(f)*	03-043(i)*	06-003(e)	22-015(a)	C-59-001*		
	03-009(g)*	03-044(b)*	06-003(f)	22-015(b)			
	03-010(a)	03-047(j)*	06-003(g)-00*	40-001(a)*			

Pajarito Watershed Aggregates (continued)							
Watershed Aggregate	**PRSs in Watershed Aggregate**					**Major Corrective Action Sites**	**Major MDAs**
Threemile	12-001(a)-99 12-003* 12-004(a) 12-004(b) 15-004(a) 15-004(d) 15-004(e)*	15-005(c) 15-006(b) 15-006(c)-99 15-006(d)-99 15-007(c)-00 15-009(b) 15-009(c)	15-009(d)* 15-009(h) 15-010(b) 15-014(f)* 15-014(h) 15-014(m)* 18-007*	36-002 36-003(a) 36-003(d)* C-12-001 C-12-002 C-12-004 C-12-006*	C-14-006 C-15-003* C-15-009* C-36-003	R44 firing site	None
Pajarito Canyons	C-00-010	C-00-011	C-00-012			None	None

Sandia Watershed Aggregates							
Watershed Aggregate	**PRSs in Watershed Aggregate**					**Major Corrective Action Sites**	**Major MDAs**
Upper Sandia	03-001(d)* 03-001(f)* 03-001(i) 03-001(n)* 03-001(o)* 03-001(p)* 03-001(q)* 03-001(r)* 03-001(v)* 03-001(x)* 03-002(a)* 03-002(b)* 03-002(c) 03-003(c) 03-003(d)* 03-003(f)* 03-003(g)* 03-003(m)* 03-003(n)* 03-003(o)* 03-006* 03-008(b)* 03-009(a)-00 03-009(i) 03-010(c)* 03-010(d)*	03-012(b)-00 03-013(a)-00 03-013(b) 03-013(c)* 03-013(d)* 03-013(e)* 03-013(f)* 03-014(a)-99 03-014(r) 03-014(s) 03-014(v) 03-014(y) 03-015-00 03-016(b)* 03-016(c)* 03-016(d)* 03-016(e)* 03-016(f)* 03-020(a)* 03-020(b) 03-021 03-023* 03-024* 03-026(b)* 03-027 03-032*	03-035(a) * 03-035(b)* 03-036(b) 03-036(e)* 03-036(f)* 03-036(g)* 03-036(h)* 03-036(i)* 03-036(j)* 03-037 03-038(c)* 03-038(d)* 03-039(a)* 03-039(b)* 03-039(d)* 03-039(e)* 03-040(b)* 03-043(a)* 03-043(e)* 03-043(f)* 03-043(g)* 03-044(a)* 03-045(a) 03-045(d)* 03-045(e) 03-045(f)	03-045(h)-00 03-045(i)* 03-046 03-047(a)* 03-047(b)* 03-047(c)* 03-047(d) 03-047(e)* 03-047(f)* 03-047(g)* 03-047(h)* 03-047(i)* 03-049(c)* 03-050(c) 03-051(c) 03-052(b) 03-052(c)* 03-052(d)* 03-054(c) 03-056(a) 03-056(b)* 03-056(c) 03-056(h)* 03-056(i)* 03-056(k) 03-056(l)	03-056(n)* 03-057* 03-059-00 60-001(a)* 60-001(b)* 60-001(c)* 60-001(d)* 60-002 60-003* 60-004(a)* 60-004(b) 60-004(d) 60-004(f) 60-005(b)* 60-006(a) 60-006(c)* 60-007(a) 60-007(b) 61-001* 61-002 61-003* 61-004(a)* 61-004(c) 61-005 61-006 C-03-001*	None	None

Sandia Watershed Aggregates (continued)							
Watershed Aggregate	**PRSs in Watershed Aggregate**					**Major Corrective Action Sites**	**Major MDAs**
Upper Sandia (continued)	C-03-002 *	C-03-011*	C-03-018*	C-60-003*			
	C-03-004*	C-03-015*	C-03-020	C-60-004*			
	C-03-005*	C-03-016	C-03-022*	C-61-001*			
	C-03-009*	C-03-017*	C-60-001*	C-61-002*			
Lower Sandia	20-001(a)	53-001(g)	53-006(f)	53-015	C-53-008*	TA-53 surface impoundments	None
	20-001(b)-00	53-001(h)*	53-007(a)	72-001	C-53-009*		
	20-001(c)-00	53-001(i)*	53-007(b)*	72-002*	C-53-010*		
	20-002(d)	53-001(j)*	53-010	72-003(a)*	C-53-011*		
	20-003(a)	53-001(k)*	53-011(a)*	72-003(b)*	C-53-012*		
	20-003(b)	53-001(l)*	53-011(c)*	C-20-001*	C-53-013*		
	20-003(d)*	53-001(m)*	53-011(d)*	C-20-002	C-53-014*		
	20-004	53-001(n)*	53-011(e)*	C-20-003	C-53-015*		
	20-005	53-001(o)*	53-012(d)*	C-53-001	C-53-016*		
	53-001(a)	53-002(a)-99	53-012(e)	C-53-002*	C-53-018*		
	53-001(b)	53-003*	53-012(f)*	C-53-003*	C-53-019*		
	53-001(c)	53-004*	53-012(g)*	C-53-004*			
	53-001(d)*	53-005	3-012(h)*	C-53-005*			
	53-001(e)	53-006(b)-99	53-013	C-53-006*			
	53-001(f)*	53-006(d)-99	53-014	C-53-007*			
Sandia Canyons	C-00-007					None	None

Water/Cañon de Valle Watershed Aggregates							
Watershed Aggregate	PRSs in Watershed Aggregate					Major Corrective Action Sites	Major MDAs
Cañon de Valle	08-004(d)	15-009(f)-00	16-010(g)*	16-024(f)*	16-030(e)	MDA P	None
	08-008(c)*	15-009(i)	16-010(h)-99	16-024(g)*	16-030(f)	MDA R	
	13-004	15-012(a)*	16-012(a)*	16-024(h)	16-031(b)	MDA Z	
	14-001(a)*	15-014(a)-00	16-012(a2)*	16-024(u)	16-031(h)	260 Outfall	
	14-001(b)*	15-014(g)	16-012(b)*	16-024(v)	16-033(e)	TA-16 Sump	
	14-001(c)*	16-001(a)-99	16-012(c)*	16-025(a)	16-033(f)*	K-Site	
	14-001(d)*	16-003(h)-99	16-012(d)*	16-025(b)	16-033(g)*	TA-16 Burning Grounds	
	14-001(e)*	16-003(i)	16-012(e)*	16-025(c)*	16-033(h)*	Fish Ladder Site	
	14-001(g)	16-003(j)	16-012(f)*	16-025(d2)	16-034(b)-99		
	14-002(a)-99	16-003(n)-99	16-012(g)*	16-025(e2)	16-034(h)		
	14-002(c)-99	16-003(o)	16-012(h)*	16-025(f2)	16-034(i)		
	14-003	16-005(b)*	16-012(n)*	16-026(g)	16-034(j)		
	14-004(a)*	16-005(f)*	16-012(o)*	16-026(g2)	16-034(k)		
	14-004(b)*	16-005(i)*	16-012(p)*	16-026(h)	16-037*		
	14-004(c)*	16-005(n)	16-012(z)*	16-026(i)	C-08-018*		
	14-005	16-006(a)	16-016(b)	16-026(i2)*	C-14-001		
	14-006	16-006(b)*	16-016(c)-99	16-026(j)	C-14-002*		
	14-007	16-007(a)-99	16-016(d)	16-026(k)	C-14-003		
	14-008*	16-007(b)*	16-017(g)-99	16-026(l)-00	C-15-010		
	15-004(g)-00	16-008(a)-99	16-017(i)-99	16-026(r)	C-16-001*		
	15-004(i)	16-008(b)*	16-018	16-027(a)*	C-16-002		
	15-005(a)*	16-009(a)	16-019	16-027(b)*	C-16-003*		
	15-005(d)*	16-010(b)	16-020	16-028(a)	C-16-008*		
	15-007(b)	16-010(c)	16-021(c)-99	16-029(h2)-99	C-16-009*		
	15-008(d)	16-010(d)	16-023(a)*	16-029(j)-99	C-16-010*		
	15-008(e)*	16-010(e)	16-024(b)	16-029(q)-99	C-16-011		
	15-009(a)-00	16-010(f)	16-024(c)*	16-030(c)	C-16-012*		
	C-16-013*	C-16-018*	C-16-042*	C-16-053*	C-16-070*		
	C-16-014*	C-16-023*	C-16-043*	C-16-054*	C-16-072*		
	C-16-015*	C-16-036*	C-16-044*	C-16-055*			
	C-16-016*	C-16-038*	C-16-051*	C-16-061*			
	C-16-017*	C-16-041*	C-16-052*	C-16-066*			

Water/Cañon de Valle Watershed Aggregates (continued)							
Watershed Aggregate	**PRSs in Watershed Aggregate**					**Major Corrective Action Sites**	**Major MDAs**
Upper Water	11-001(c)	16-012(y)*	16-024(r)*	16-029(e)-99	C-16-022*	None	None
	11-009	16-015(a)	16-024(s)	16-029(g)-99	C-16-024*		
	11-010(a)*	16-015(b)	16-024(t)	16-029(v)-99	C-16-027*		
	16-001(d)	16-016(a)	16-025(c2)	16-029(y)-99	C-16-028		
	16-003(a)	16-016(e)	16-025(g2)*	16-029(z)-99	C-16-029*		
	16-003(b)	16-016(f)	16-025(h2)	16-031(a)	C-16-030		
	16-003(c)-99	16-016(g)	16-025(w)	16-031(e)	C-16-031		
	16-003(l)-99	16-017(j)-99	16-025(y)-99	16-031(f)	C-16-032*		
	16-003(m)-99	16-017(k)-99	16-026(a2)	16-031(g)*	C-16-033*		
	16-003(q)*	16-017(l)-99	16-026(b2)-00	16-032(b)*	C-16-034*		
	16-005(a)	16-017(m)-99	16-026(c2)	16-032(d)*	C-16-035*		
	16-005(h)	16-017(n)-99	16-026(d2)	16-032(e)*	C-16-037*		
	16-005(k)	16-017(o)-99	16-026(e2)	16-033(a)	C-16-039*		
	16-005(l)	16-021(b)*	16-026(f2)	16-033(b)	C-16-040*		
	16-005(o)*	16-022(a)*	16-026(q)-99	16-033(c)*	C-16-045*		
	16-006(c)-00	16-022(b)	16-026(s)	16-033(d)*	C-16-046*		
	16-006(f)*	16-023(b)	16-026(t)	16-033(i)*	C-16-047*		
	16-006(i)*	16-024(i)	16-026(u)	16-033(j)*	C-16-048*		
	16-012(s)*	16-024(j)	16-026(x)	16-033(k)	C-16-058*		
	16-012(t)*	16-024(k)	16-026(y)	37-001*	C-16-069		
	16-012(u)*	16-024(l)	16-027(c)*	C-16-004*	C-16-071*		
	16-012(v)*	16-024(o)	16-027(d)*	C-16-019*	C-16-073		
	16-012(w)*	16-024(p)*	16-028(b)	C-16-020*			
	16-012(x)*	16-024(q)	16-029(b2)-99	C-16-021*			
S-Site	11-001(b)	11-011(d)	16-012(m)*	16-029(c2)-99	C-16-049*	Martin Aggregate MDA S	None
	11-003(a)*	11-012(a)*	16-012(q)*	16-029(f)	C-16-050*		
	11-003(b)	11-012(b)	16-012(r)*	16-029(h)-99	C-16-056*		
	11-004(a)-99	11-012(c)	16-013-99	16-029(x)-99	C-16-057*		
	11-005(a)	11-012(d)	16-017(p)-99	16-030(a)	C-16-059*		
	11-005(b)	13-001-99	16-017(w)-99	16-030(b)	C-16-060		
	11-005(c)	13-003(a)-99	16-024(a)	16-034(g)*	C-16-062		
	11-006(a)-99	16-003(d)-99	16-024(m)	16-034(m)	C-16-063		
	11-007*	16-004(a)-99	16-024(n)	16-034(n)	C-16-075		
	11-008*	16-012(i)*	16-026(b)-99	25-001*	C-25-001*		
	11-010(b)*	16-012(j)*	16-026(f)	C-11-002			
	11-011(a)-00	16-012(k)*	16-026(j2)	C-11-003*			
	11-011(c)*	16-012(l)*	16-026(z)	C-16-007*			

Water/Cañon de Valle Watershed Aggregates (continued)							
Watershed Aggregate	**PRSs in Watershed Aggregate**					**Major Corrective Action Sites**	**Major MDAs**
Lower Water/Indio	15-001 15-004(h) 15-009(g)	15-010(c) 15-013(a)* 15-014(d)*	15-014(e) * 15-014(l) 49-004	49-005(a) 49-007(a)* C-15-011		None	None
Potrillo/Fence	15-002-00 15-003-00 15-004(b)-99 15-004(f)-99 15-005(b) 15-006(e)* 15-008(f) 15-009(e)	15-009(j)* 15-010(a) 15-012(b)* 15-013(b)* 15-014(c)* 36-001 36-003(b) 36-003(c)*	36-004(b) 36-004(c) 36-004(d) 36-004(e) 36-004(f)* 36-005 36-006-99 36-007(a)*	36-007(b)* 36-007(c)* 36-007(d)* 36-007(e)* 36-007(f)* 36-008 C-15-004 C-15-005	C-15-006 C-15-012* C-15-013 C-36-001* C-36-002* C-36-006(e)	EF Site MDA N MDA AA	
Water/Cañon de Valle Canyons	C-00-013	C-00-014	C-00-015	C-00-016	C-00-017	None	None