TA-11

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Date: February 19, 2004
Refer to: ER2004-0083

FEB 2004

Mr. John Young, Corrective Action Project Leader
Permits Management Program
NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building 1
Santa Fe, NM 87505-6303

SUBJECT: SUBMITTAL OF REVISION TO RESPONSE TO NOTICE OF DEFICIENCY (NOD) PHASE III RFI REPORT FOR SOLID WASTE MANAGEMENT UNIT (SWMU) 16-021(c)-99, LOS ALAMOS NATIONAL LABORATORY (LANL), NM0890010515, HWB-LANL-03-011

Dear Mr. Young:

Enclosed are 20 revised tables (indicated in redline strikeout) for the "Response to Notice of Deficiency (NOD) – Phase III RFI for SWMU 16-021(c)-99" that was submitted to the New Mexico Environment Department (NMED) on January 28, 2004. While reviewing the implications of this NOD response for the Corrective Measures Study (CMS) Report for SWMU 16-021(c)-99 that was submitted to NMED in November 2003, Los Alamos National Laboratory (LANL) and Department of Energy (DOE) personnel determined that an error had been made in the risk calculation for chromium presented in the NOD response. This led to an overestimate of carcinogenic risk as presented in Appendix K in Canon de Valle and Martin Spring Canyons.

To summarize, two problems led to this overestimation of carcinogenic risk as presented in Appendix K:

1. Chromium was carried forward into the risk assessments for Cañon de Valle and Martin Spring Canyon in sediment, although no samples exceeded the chromium sediment screening action level of 210 mg/kg.
2. The incorrect oral slope factor for chromium was used in these risk models. The value presented, 42.0, is an inhalation slope factor, rather than the oral slope factor. There is no oral slope factor for chromium.

These chromium issues involve 15 of the 20 tables.

As a result of the above discrepancies a 100% quality assurance review was performed on all screening tables (including those in the main text and Appendix K) and toxicity reference values. As a result, other minor revisions (not affecting the risk assessments) have been made in redline strikeout to these tables.

LANL/DOE apologize for this error. If you have any questions please contact Donald Hickmott at 667-8753 or Lance Woodworth at 665-5820.

Sincerely,

David McInroy, Deputy Project Director
Remediation Services
Los Alamos National Laboratory

Sincerely,

David Gregory, Federal Project Director
Department of Energy
Los Alamos Site Operations

DM/DG/NR/jr

Enclosure: Revision to Response to NOD

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RPF MS M707

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RESPONSE TO NOTICE OF DEFICIENCY (NOD)
FOR THE
PHASE III RCRA FACILITY INVESTIGATION (RFI) REPORT
SOLID WASTE MANAGEMENT UNIT (SWMU) 16-021(c)-99

This submittal is the response by Los Alamos National Laboratory (LANL) to the *"Notice of Deficiency, Phase III RFI Report for Solid Waste Management Unit 16-021(c)-99, Los Alamos National Laboratory (LANL), NM0890010515, HWB-LANL-03-011",* issued by the New Mexico Environment Department (NMED) Hazardous Waste Bureau on December 23, 2003. The Phase III RFI Report, LA-UR-03-5248, was submitted by LANL to NMED in September 2003.

This response is organized similarly to the NMED's NOD. The comments are divided into general and specific categories in Attachment I and Attachment II as presented in the NOD. LANL's original statement from the RFI report text is provided, where applicable, to facilitate review of this response, and the NMED's NOD comments are included verbatim. LANL's response follows each NMED comment.

The majority of the NMED comments contained in the NOD relate to the human health baseline risk analyses performed for Cañon de Valle and the chemicals of potential concern (COPC) concentration comparison for Martin Spring Canyon. Based upon screening and risk methodology revisions requested by the NMED in the NOD and agreed upon by LANL in this NOD response, the risk analyses for Cañon de Valle have been revised. In addition, a baseline risk analysis (as opposed to a maximum concentration comparison) has been performed for Martin Spring Canyon. The revised COPC screening tables and risk analyses are provided in the attached addenda. A summary comparing the results of these risk analyses is provided below in Table 1.

Table 1
Comparison of Risk Analyses

Location	Phase III RFI Report Risk Analyses (September 2003)				
	Cañon de Valle Source Area			Cañon de Valle Alluvial Area	Martin Spring Canyon
Receptor	Environmental Worker	Trail User	Construction Worker	Trail User	Trail User
Total CTE ILCR	9E-07	4E-07	6E-07	2E-07	Not provided
Total RME ILCR	3E-05	9E-06	3E-06	3E-06	Not provided
Total CTE HI	6E-02	3E-02	4E-01	1E-02	Not provided
Total RME HI	5E-01	2E-01	2E+00	1E-01	Not provided
Location	Revised Risk Analyses (This LANL NOD Response; February 2004)				
	Cañon de Valle Source Area			Cañon de Valle Alluvial Area	Martin Spring Canyon
Receptor	Environmental Worker	Trail User	Construction Worker	Trail User	Trail User
Total CTE ILCR	8E-07	4E-07	5E-07	2E-07	1E-07
Total RME ILCR	3E-05	1E-05	4E-06	4E-06	4E-06
Total CTE HI	6E-02	3E-02	3E-01	7E-03	1E-02
Total RME HI	8E-01	3E-01	2E+00	6E-02	1E-01

CTE = Central Tendency Estimate
HI = Hazard Index
ILCR = Incremental Lifetime Cancer Risk
RME = Reasonable Maximum Exposure

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Because the NMED comments focused on the COPC screening methodology, significant revisions to all RFI report text will be required. Where the NMED comments were of limited scope, suggested text revisions have been provided in the LANL response. In cases where the NMED comment affects multiple text passages and/or appendices, LANL will submit the revised text to the NMED pending approval of this NOD response. Some NMED comments have required revisions to existing tables and figures, submittal of new supplemental tables or figures, or submittal of other supplementary documentation (i.e., Ecorisk database version history). These submittals are contained in referenced addenda provided with this NOD

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The following tables are submitted in response to the NMED comments. Tables with revisions are indicated by the word(s) "Revised" or "Revised – February 2004" in the table title. Shading indicates changes from publication in September 2003. The yes/no entry in the "Exceeds Screening Limit" column are in bold if it has changed since publication in September 2003. Changes since last publication in January 2004 are indicated by underlining and side comments.

Table 3.4-2 Screening of Inorganic Chemicals Detected in Cañon de Valle Surface Water Samples

Table 3.4-3 Retained and Eliminated Inorganic Chemicals in Cañon de Valle Surface Water Samples

Table 3.4-5 Screening of Organic Chemicals Detected in Cañon de Valle Surface Water Samples

Table 3.4-6 Retained and Eliminated Organic Chemicals in Cañon de Valle Surface Water Samples

Table 3.4-8 Screening of Tritium in Cañon de Valle Surface Water Samples

Table 3.4-9 Retained and Eliminated Tritium in Cañon de Valle Surface Water Samples

Table 3.4-11 Screening of Inorganic Chemicals Detected in Cañon de Valle Alluvial Groundwater Samples

Table 3.4-12 Retained and Eliminated Inorganic Chemicals in Cañon de Valle Alluvial Groundwater Samples

Table 3.4-14 Screening of Organic Chemicals Detected in Cañon de Valle Alluvial Groundwater Samples

Table 3.4-15 Retained and Eliminated Organic Chemicals in Cañon de Valle Alluvial Groundwater Samples

Table 3.4-17 Screening of Tritium in Cañon de Valle Alluvial Groundwater Samples

Table 3.4-18 Retained and Eliminated Tritium for Cañon de Valle Alluvial Groundwater Samples

Table 3.4-20 Screening of Inorganic Chemicals Detected in Martin Spring Canyon Surface Water Samples

Table 3.4-21 Retained and Eliminated Inorganic Chemicals in Martin Spring Canyon Surface Water Samples

Table 3.4-23 Screening of Organic Chemicals Detected in Martin Spring Canyon Surface Water Samples

Table 3.4-24 Retained and Eliminated Organic Chemicals in Martin Spring Canyon Surface Water Samples

Table 3.4-26 Screening of Inorganic Chemicals Detected in Martin Spring Canyon Alluvial Groundwater Samples

Table 3.4-27 Retained and Eliminated Inorganic Chemicals in Martin Spring Canyon Alluvial Groundwater Samples

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Table 3.4-29	Screening of Organic Chemicals Detected in Martin Spring Canyon Alluvial Groundwater Samples
Table 3.4-30	Retained and Eliminated Organic Chemicals in Martin Spring Canyon Alluvial Groundwater Samples
Table 3.4-32	Screening of Tritium Detected in Martin Spring Canyon Alluvial Groundwater Samples
Table 3.4-33	Retained and Eliminated Tritium in Martin Spring Canyon Alluvial Groundwater Samples
Table 3.4-35	Retained and Eliminated Inorganic Chemicals in Cañon de Valle Alluvial Sediment Samples
Table 3.4-37	Retained and Eliminated Organic Chemicals in Cañon de Valle Alluvial Sediment Samples
Table 3.4-39	Retained and Eliminated Inorganic Chemicals in Martin Spring Canyon Alluvium, Sediment, and Tuff Samples
Table 3.4-41	Retained and Eliminated Organic Chemicals in Martin Spring Canyon Alluvium, Sediment, and Tuff Samples
Table 3.4-44	Table of Retained COPCs for Cañon de Valle and Martin Spring Canyon

Table 3.4-20 (Revised – February 2004)
Screening of Inorganic Chemicals Detected in Martin Spring Canyon Surface Water Samples

Chemical	Sample ID	Sample Concentration (µg/L)			EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Human Health SW Standard (µg/L)	NMWQCC Aquatic Life (Acute) SW Standard (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Aluminum	RE16-99-3062	Max. Detected Value	21,600	(J+)[a]	37,000	36,000	na[b]	750[c]	5000[d,e]	50	**No**
	RE16-01-3134	Max. Undetected Value	216	(U)[f]	37,000	36,000	na	750[c]	5000[d,e]	50	**No**
Antimony	RE16-99-3062	Max. Detected Value	5.3	(J)[g]	15	15	4300	na	na	6	No
	RE16-98-3101	Max. Undetected Value	33	(U)	15	15	4300	na	na	6	Yes
Arsenic	RE16-99-3062	Max. Detected Value	75.1		0.045	0.045	24.2	340	100[h]	10	Yes
	RE16-01-3135	Max. Undetected Value	4.5	(U)	0.045	0.045	24.2	340	100[h]	10	**Yes**
Barium	RE16-99-3062	Max. Detected Value	8560		2600	2600	na	na	1000[h]	2000	Yes
Beryllium	RE16-99-3062	Max. Detected Value	2.3	(J)	73	73	na	130	na	4	No
	RE16-98-3100	Max. Undetected Value	0.5	(U)	73	73	na	130	na	4	No
Boron	RE16-00-3181	Max. Detected Value	2530		3300	7300	na	na	750[d]	na	**No**
Cadmium	RE16-99-3062	Max. Detected Value	1.3	(J)	18	18	na	1740	10[h]	5	No
	RE16-98-3100	Max. Undetected Value	2.6	(U)	18	18	na	1740	10[h]	5	No
Calcium	RE16-00-3180	Max. Detected Value	42,300		na	na	na	na	na	na	na
	RE16-00-3311	Max. Undetected Value	32,600	(U)	na	na	na	na	na	na	na
Chloride	RE16-00-3309	Max. Detected Value	35,800		na	na	na	na	250,000[i]	250,000	No

Table 3.4-20 (Revised – February 2004) (continued)

Chemical	Sample ID	Sample Concentration (µg/L)			EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Human Health SW Standard (µg/L)	NMWQCC Aquatic Life (Acute) SW Standard (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Chromium	RE16-99-3062	Max. Detected Value	25.6		110[j]	110[j]	na	130,000	50[h]	100	No
	RE16-98-3100	Max. Undetected Value	2.7	(U)	110[j]	110[j]	na	130,000	50[h]	100	No
Cobalt	RE16-99-3062	Max. Detected Value	136		730	730	na	na	50[e]	na	**No**
	RE16-98-3100	Max. Undetected Value	2.4	(U)	730	730	na	na	50[e]	na	No
Copper	RE16-99-3062	Max. Detected Value	45.6		1400	1500	na	6960	500[e]	1000	No
	RE16-00-3264	Max. Undetected Value	4.3	(U)	1400	1500	na	6960	500[e]	1000	No
Fluoride	RE16-00-3180	Max. Detected Value	699		2200	2200	na	na	1600[h]	2000	No
	RE16-98-3101	Max. Undetected Value	1000	(U)	2200	2200	na	na	1600[h]	2000	No
Iron	RE16-99-3062	Max. Detected Value	98,800	(J+)	11,000	11,000	na	na	1000[i]	300	Yes
	RE16-01-3134	Max. Undetected Value	159	(U)	11,000	11,000	na	na	1000[i]	300	No
Lead	RE16-99-3062	Max. Detected Value	46.1		15	na	na	-66,600[c,k]	50[h]	15	Yes
	RE16-00-3181	Max. Undetected Value	2.3	(U)	15	na	na	-66,600[c,k]	50[h]	15	No
Magnesium	RE16-00-3180	Max. Detected Value	10,100		na	na	na	na	na	na	na
Manganese	RE16-99-3062	Max. Detected Value	66,800		1700	880	na	na	200[i]	50	Yes
	RE16-98-3101	Max. Undetected Value	3.7	(U)	1700	880	na	na	200[i]	50	No

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Table 3.4-20 (Revised – February 2004) (continued)

Chemical	Sample ID	Sample Concentration (µg/L)			EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Human Health SW Standard (µg/L)	NMWQCC Aquatic Life (Acute) SW Standard (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Mercury	RE16-99-3062	Max. Detected Value	1.1		11	11	na	2.4	0.77[l]	2	**No**
	RE16-01-3059	Max. Undetected Value	0.1	(U)	11	11	na	2.4	0.77[l]	2	No
Nickel	RE16-99-3062	Max. Detected Value	28.9	(J)	730	730	4600	128,000	200[e]	na	No
	RE16-98-3103	Max. Undetected Value	10.8	(U)	730	730	4600	128,000	200[e]	na	No
Nitrate	RE16-99-3060	Max. Detected Value	3300		10,000	10,000	na	na	10,000[h]	10,000	No
	RE16-99-3062	Max. Undetected Value	200	(U)	10,000	10,000	na	na	10,000[h]	10,000	No
Nitrate-Nitrite as N	RE16-98-3101	Max. Detected Value	5600		na	na	na	na	10,000[h]	10,000	No
	RE16-00-3309	Max. Undetected Value	500	(U)	na	na	na	na	10,000[h]	10,000	No
Potassium	RE16-99-3062	Max. Detected Value	9500		na	na	na	na	na	na	na
Selenium	RE16-99-3062	Max. Detected Value	38.3		180	180	11,000	20.0	5[l]	50	**No**
	RE16-00-3181	Max. Undetected Value	4.5	(U)	180	180	11,000	20.0	5[l]	50	No
Silver	RE16-99-3062	Max. Detected Value	5.5	(J)	180	180	na	311,000	50[h]	100	No
	RE16-98-3103	Max. Undetected Value	5	(U)	180	180	na	311,000	50[h]	100	No
Sodium	RE16-00-3309	Max. Detected Value	43,500		na	na	na	na	na	na	na
Sulfate	RE16-00-3309	Max. Detected Value	70,300		na	na	na	na	600,000[i]	250,000	No

Table 3.4-20 (Revised – February 2004) (concluded)

Chemical	Sample ID	Sample Concentration (µg/L)		EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Human Health SW Standard (µg/L)	NMWQCC Aquatic Life (Acute) SW Standard (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Thallium	RE16-00-3264	Max. Detected Value	0.0819 (J)	2.90[m]	2.40	6.3	na	na	2	No
	RE16-99-3062	Max. Undetected Value	45 (U)	2.90[m]	2.40	6.3	na	na	2	Yes
Uranium	RE16-00-3180	Max. Detected Value	8.15	na	7.30	na	na	5000[h]	30	**Yes**
Vanadium	RE16-99-3062	Max. Detected Value	111	37	260	na	na	100[e]	na	Yes
	RE16-00-3264	Max. Undetected Value	3.91 (U)	37	260	na	na	100[e]	na	No
Zinc	RE16-99-3062	Max. Detected Value	183	11,000	11,000	69,000	32,300	10,000[i]	5000	No
	RE16-00-3311	Max. Undetected Value	31.7 (U)	11,000	11,000	69,000	32,300	10,000[i]	5000	No

Sources: 20 NMAC 6.2.3103 "Standards for groundwater of 10,000 mg/l TDS concentration or less," Parts A, B, and C; 20 NMAC 6.4.900 "Standards applicable to attainable or designated uses unless otherwise specified in 20.6.4.101 through 20.6.4.899 NMAC," Parts K, L, and M; EPA 2002, 76871; EPA 2003, 76867.

[a] (J+) = The chemical is classified "detected," but the reported concentration value is expected to be more uncertain than usual with a potential positive bias.
[b] na = Not available.
[c] Calculated using the minimum hardness determined, 76,000.
[d] NMWQCC Groundwater Standard for Irrigation Use (20 NMAC 6.2.3103).
[e] NMWQCC Surface Water Standard for Livestock Watering (20 NMAC 6.4.900).
[f] (U) = The chemical is classified "undetected."
[g] (J) = The chemical is classified "detected," but the reported concentration value is expected to be more uncertain than usual.
[h] NMWQCC Groundwater Human Health Standards (20 NMAC 6.2.3103).
[i] NMWQCC Groundwater Other Standards for Domestic Water Supply (20 NMAC 6.2.3103).
[j] Denotes Chromium VI value was used.
[k] Negative value is an artifact of hardness correction calculation.
[l] NMWQCC Surface Water Standard for Wildlife Habitat (20 NMAC 6.4.900).
[m] Denotes Thallium Carbonate value was used.

Table 3.4-2 (Revised – February 2004)
Screening of Inorganic Chemicals Detected in Cañon de Valle Surface Water Samples

Chemical	Sample ID	Sample Concentration (µg/L)			EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Human Health SW Standard (µg/L)	NMWQCC Aquatic Life (Acute) SW Standard (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Aluminum	RE16-01-3231	Max. Detected Value	22,700		37,000	36,000	na[a]	750[b]	5000[c,d]	50	**No**
	RE16-01-3132	Max. Undetected Value	589	(U)[e]	37,000	36,000	na	750[b]	5000[c,d]	50	**No**
Antimony	RE16-99-3075	Max. Detected Value	6.4	(J)[f]	15	15	4300	na	na	6	**No**
	RE16-98-3112	Max. Undetected Value	33	(U)	15	15	4300	na	na	6	Yes
Arsenic	RE16-98-3021	Max. Detected Value	8.3	(J)	0.045	0.045	24.2	340[b]	100[g]	10	**Yes**
	RE16-01-3278	Max. Undetected Value	5	(U)	0.045	0.045	24.2	340[b]	100[g]	10	**Yes**
Barium	RE16-01-3072	Max. Detected Value	16,300		2600	2600	na	na	1000[g]	2000	Yes
Beryllium	RE16-00-3141	Max. Detected Value	1.3	(J)	73	73	na	5.3	na	4	No
	RE16-00-3131	Max. Undetected Value	4	(U)	73	73	na	5.3	na	4	No
Boron	RE16-00-3163	Max. Detected Value	69.2	(J)	3300	7300	na	na	750[c]	na	No
	RE16-00-3132	Max. Undetected Value	500	(U)	3300	7300	na	na	750[c]	na	No
Cadmium	RE16-00-3268	Max. Detected Value	1.6	(J)	18	18	na	912[b]	10[g]	5	No
	RE16-00-3316	Max. Undetected Value	5	(U)	18	18	na	912[b]	10[g]	5	No
Calcium	RE16-00-3163	Max. Detected Value	44,300		na	na	na	na	na	na	na
Cesium	RE16-98-3018	Max. Detected Value	800		na	na	na	na	na	na	na
Chloride	RE16-99-3199	Max. Detected Value	39,000		na	na	na	na	250,000[h]	250,000	No

Table 3.4-2 (Revised – February 2004) (continued)

Chemical	Sample ID	Sample Concentration (µg/L)			EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Human Health SW Standard (µg/L)	NMWQCC Aquatic Life (Acute) SW Standard (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Chromium	RE16-99-3047	Max. Detected Value	34.6		110[i]	110[i]	na	130,000[b]	50[g]	100	No
	RE16-98-3020	Max. Undetected Value	5.9	(U)	110[i]	110[i]	na	130,000[b]	50[g]	100	No
Cobalt	RE16-98-3021	Max. Detected Value	12.9	(J)	730	730	na	na	50[c]	na	No
	RE16-00-3131	Max. Undetected Value	20	(U)	730	730	na	na	50[c]	na	No
Copper	RE16-01-3250	Max. Detected Value	75.3		1400	1500	na	6960[b]	500[d]	1000	No
	RE16-01-3152	Max. Undetected Value	15.3	(U)	1400	1500	na	6960[b]	500[d]	1000	No
Fluoride	RE16-00-3163	Max. Detected Value	432		2200	2200	na	na	1600[g]	2000	No
	RE16-98-3107	Max. Undetected Value	1000	(U)	2200	2200	na	na	1600[g]	2000	No
Iron	RE16-98-3021	Max. Detected Value	17,700		11,000	11,000	na	na	1000[h]	300	Yes
	RE16-01-3150	Max. Undetected Value	406	(U)	11,000	11,000	na	na	1000[h]	300	No
Lead	RE16-01-3072	Max. Detected Value	24.1		15	na	-66,600[b,j]	na	50[g]	15	Yes
	RE16-98-3107	Max. Undetected Value	4.2	(U)	15	na	-66,600[b,j]	na	50[g]	15	No
Lithium	RE16-98-3021	Max. Detected Value	25.8		730	730	na	na	na	na	No
Magnesium	RE16-00-3164	Max. Detected Value	9590		na	na	na	na	na	na	na
Manganese	RE16-98-3081	Max. Detected Value	2290		1700	880	na	na	200[h]	50	Yes
	RE16-98-3114	Max. Undetected Value	8.8	(U)	1700	880	na	na	200[h]	50	No

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Table 3.4-2 (Revised – February 2004) (continued)

Chemical	Sample ID	Sample Concentration (µg/L)			EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Human Health SW Standard (µg/L)	NMWQCC Aquatic Life (Acute) SW Standard (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Mercury	RE16-01-3154	Max. DetecteValue	0.97		11	11	na	2.4[b]	0.77[k]	2	**No**
	RE16-01-3080	Max. Undetected Value	1	(U)	11	11	na	2.4[b]	0.77[k]	2	**No**
Molybdenum	RE16-98-3021	Max. Detected Value	6.3	(J)	180	180	na	na	1000[c]	na	No
	RE16-98-3044	Max. Undetected Value	4.9	(U)	180	180	na	na	1000[c]	na	No
Nickel	RE16-01-3231	Max. Detected Value	13.2	(J)	730	730	4600	128,000[b]	200[c]	na	No
	RE16-00-3132	Max. Undetected Value	40	(U)	730	730	4600	128,000[b]	200[c]	na	No
Nitrate	RE16-98-3018	Max. Detected Value	900		10,000	10,000	na	na	10,000[g]	10,000	No
	RE16-98-3020	Max. Undetected Value	200	(U)	10,000	10,000	na	na	10,000[g]	10,000	No
Nitrate-Nitrite as N	RE16-01-3130	Max. Detected Value	49,200		na	na	na	na	10,000	na	Yes
	RE16-00-3313	Max. Undetected Value	1110	(U)	na	na	na	na	10,000	na	No
Perchlorate	RE16-00-3133	Max. Detected Value	17.1		3.70	3.60	na	na	4[l]	na	Yes
	RE16-00-3150	Max. Undetected Value	20	(U)	3.70	3.60	na	na	4[l]	na	Yes
Potassium	RE16-00-3163	Max. Detected Value	11,000		na	na	na	na	na	na	na
	RE16-01-3196	Max. Undetected Value	2330	(U)	na	na	na	na	na	na	na
Selenium	RE16-01-3280	Max. Detected Value	5.33		180	180	11,000	na	5[i]	50	**No**
	RE16-02-45961	Max. Undetected Value	5	(U)	180	180	11,000	na	5[i]	50	No

Table 3.4-2 (Revised – February 2004) (concluded)

Chemical	Sample ID	Sample Concentration (µg/L)			EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Human Health SW Standard (µg/L)	NMWQCC Aquatic Life (Acute) SW Standard (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Silver	RE16-98-3081	Max. Detected Value	1380		180	180	na	311,000[b]	50[g]	100	Yes
	RE16-00-3131	Max. Undetected Value	10	(U)	180	180	na	311,000[b]	50[g]	100	No
Sodium	RE16-00-3208	Max. Detected Value	26,200		na	na	na	na	na	na	na
Strontium	RE16-98-3019	Max. Detected Value	133		22,000	22,000	na	na	na	na	No
Sulfate	RE16-00-3133	Max. Detected Value	31,700		na	na	na	na	600,000[h]	250,000	No
Thallium	RE16-98-3083	Max. Detected Value	5.9	(J)	2.90[m]	2.40	6.3	na	na	2	Yes
	RE16-99-3023	Max. Undetected Value	5.6	(U)	2.90[m]	2.40	6.3	na	na	2	Yes
Uranium	RE16-00-3163	Max. Detected Value	1.91		na	7.30	na	na	5000[g]	30	No
	RE16-98-3044	Max. Undetected Value	126	(U)	na	7.30	na	na	5000[g]	30	Yes
Vanadium	RE16-98-3021	Max. Detected Value	33.1	(J)	37	260	na	na	100[c]	na	No
	RE16-00-3132	Max. Undetected Value	10	(U)	37	260	na	na	100[c]	na	No
Zinc	RE16-02-45961	Max. Detected Value	100		11,000	11,000	69,000	32,300[b]	10,000[h]	5000	No
	RE16-00-3207	Max. Undetected Value	38.1	(U)	11,000	11,000	69,000	32,300[b]	10,000[h]	5000	No

Sources: 20 NMAC 6.2.3103 "Standards for groundwater of 10,000 mg/l TDS concentration or less," Parts A, B, and C; 20 NMAC 6.4.900 "Standards applicable to attainable or designated uses unless otherwise specified in 20.6.4.101 through 20.6.4.899 NMAC," Parts K, L, and M; EPA 2002, 76871; EPA 2003, 76867; and California DHS 2003, 76862.

[a] na = Not available.
[b] Calculated using the minimum hardness determined, 76,000 µg/L.
[c] NMWQCC Surface Water Standard for Livestock Watering (20 NMAC 6.4.900).
[d] NMWQCC Groundwater Standard for Irrigation Use (20 NMAC 6.2.3103).
[e] (U) = The chemical is classified "undetected."
[f] (J) = The chemical is classified "detected," but the reported concentration value is expected to be more uncertain than usual.
[g] NMWQCC Groundwater Human Health Standard (20 NMAC 6.2.3103).
[h] NMWQCC Groundwater Other Standards for Domestic Water Supply (20 NMAC 6.2.3103).
[i] Denotes Chromium VI value was used.
[j] Negative value is an artifact of hardness correction calculation.
[k] NMWQCC Surface Water Standard for Wildlife Habitat (20 NMAC 6.4.900).
[l] California DHS 2003, 76862.
[m] Denotes Thallium Carbonate was used.

Table 3.4-26 (Revised – February 2004)
Screening of Inorganic Chemicals Detected in Martin Spring Canyon Alluvial Groundwater Samples

Chemical	Sample ID	Sample Concentration (µg/L)			EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Aluminum	RE16-00-3280	Max. Detected Value	530,000	(J)[a]	37,000	36,000	5000[b,c]	50	Yes
Antimony	RE16-01-3014	Max. Detected Value	3.6	(J)	15	15	na[d]	6	No
	RE16-01-3013	Max. Undetected Value	3.2	(U)[e]	15	15	na	6	No
Arsenic	RE16-00-3280	Max. Detected Value	132		0.045	0.045	100[f]	10	Yes
	RE16-00-3124	Max. Undetected Value	4	(U)	0.045	0.045	100[f]	10	**Yes**
Barium	RE16-00-3280	Max. Detected Value	38,000	(J)	2600	2600	1000[f]	2000	Yes
Beryllium	RE16-00-3280	Max. Detected Value	78		73	73	na	4	Yes
	RE16-01-3011	Max. Undetected Value	0.22	(U)	73	73	na	4	No
Boron	RE16-00-3302	Max. Detected Value	2250		3300	7300	750[b]	na	No
	RE16-00-3123	Max. Undetected Value	500	(U)	3300	7300	750[b]	na	No
Cadmium	RE16-00-3280	Max. Detected Value	70	(J+)[g]	18	18	10[f]	5	Yes
	RE16-01-3011	Max. Undetected Value	0.92	(U)	18	18	10[f]	5	No
Calcium	RE16-00-3280	Max. Detected Value	130,000	(J)	na	na	na	na	na
Chloride	RE16-01-3045	Max. Detected Value	43,100		na	na	250,000[h]	250,000	No
Chromium	RE16-00-3280	Max. Detected Value	1200		110[i]	110[i]	50[f]	100	Yes
	RE16-01-3174	Max. Undetected Value	4	(U)	110[i]	110[i]	50[f]	100	No

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Table 3.4-26 (Revised – February 2004) (continued)

Chemical	Sample ID	Sample Concentration (µg/L)			EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Cobalt	RE16-00-3199	Max. Detected Value	125		730	730	50[b]	na	**No**
	RE16-00-3280	Max. Undetected Value	380	(U)	730	730	50[b]	na	**No**
Copper	RE16-00-3280	Max. Detected Value	860		1400	1500	500[c]	1000	**No**
	RE16-00-3226	Max. Undetected Value	56.9	(U)	1400	1500	500[c]	1000	No
Fluoride	RE16-00-3199	Max. Detected Value	571		2200	2200	1600[f]	2000	No
Iron	RE16-00-3280	Max. Detected Value	1,100,000	(J-)[j]	11,000	11,000	1000[h]	300	Yes
Lead	RE16-00-3280	Max. Detected Value	995		15	na	50[f]	15	Yes
	RE16-00-3245	Max. Undetected Value	3.53	(U)	15	na	50[f]	15	No
Magnesium	RE16-00-3280	Max. Detected Value	80,000	(J)	na	na	na	na	na
Manganese	RE16-00-3280	Max. Detected Value	37,000	(J)	1700	880	200[h]	50	Yes
Mercury	RE16-00-3280	Max. Detected Value	4.1		11	11	0.77[k]	2	**No**
	RE16-01-3014	Max. Undetected Value	0.34	(U)	11	11	0.77[k]	2	No
Nickel	RE16-00-3280	Max. Detected Value	450		730	730	200[b]	na	**No**
	RE16-00-3124	Max. Undetected Value	40	(U)	730	730	200[b]	na	No
Nitrate-Nitrite as N	RE16-00-3226	Max. Detected Value	1600		na	na	10,000[f]	10,000	No
	RE16-01-3013	Max. Undetected Value	1000	(U)	na	na	10,000[f]	10,000	No

Table 3.4-26 (Revised – February 2004) (continued)

Chemical	Sample ID	Sample Concentration (µg/L)			EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Perchlorate	RE16-00-3123	Max. Detected Value	17		3.70	3.60	4[l]	na	Yes
	RE16-00-3280	Max. Undetected Value	4.16	(U)	3.70	3.60	4[l]	na	Yes
Potassium	RE16-00-3280	Max. Detected Value	82,000	(J)	na	na	na	na	na
Selenium	RE16-00-3280	Max. Detected Value	29.6	(J+)	180	180	5[k]	50	**No**
	RE16-00-3123	Max. Undetected Value	8	(UJ)[m]	180	180	5[k]	50	**No**
Silver	RE16-01-3174	Max. Detected Value	28		180	180	50[f]	100	No
	RE16-00-3280	Max. Undetected Value	160	(U)	180	180	50[f]	100	**No**
Sodium	RE16-01-3045	Max. Detected Value	54,700		na	na	na	na	na
Sulfate	RE16-00-3301	Max. Detected Value	73,900		na	na	600,000[h]	250,000	No
Thallium	RE16-00-3280	Max. Detected Value	6.16		2.90[n]	2.40	na	2	Yes
	RE16-00-3199	Max. Undetected Value	3.8	(U)	2.90[n]	2.40	na	2	Yes
Uranium	RE16-00-3199	Max. Detected Value	20.4		na	7.30	5000[f]	30	**Yes**
Vanadium	RE16-00-3280	Max. Detected Value	1100		37	260	100[c]	na	Yes
	RE16-01-3174	Max. Undetected Value	8.4	(U)	37	260	100[c]	na	No
Zinc	RE16-00-3280	Max. Detected Value	6600		11,000	11,000	10,000[h]	5000	**No**
	RE16-00-3303	Max. Undetected Value	43.9	(U)	11,000	11,000	10,000[h]	5000	No

Table 3.4-26 (Revised – February 2004) (concluded)

Sources: 20 NMAC 6.2.3103 "Standards for groundwater of 10,000 mg/l TDS concentration or less," Parts A, B, and C; 20 NMAC 6.4.900 "Standards applicable to attainable or designated uses unless otherwise specified in 20.6.4.101 through 20.6.4.899 NMAC," Parts K, L, and M; EPA 2002, 76871; EPA 2003, 76867; California DHS 2003, 76862.

[a] (J) = The chemical is classified "detected," but the reported concentration value is expected to be more uncertain than usual.

[b] NMWQCC Groundwater Standard for Irrigation Use (20 NMAC 6.2.3103).

[c] NMWQCC Surface Water Standard for Livestock Watering (20 NMAC 6.4.900).

[d] na = Not available.

[e] (U) = The chemical is classified "undetected."

[f] NMWQCC Groundwater Human Health Standard (20 NMAC 6.2.3103).

[g] (J+) = The chemical is classified "detected," but the reported concentration value is expected to be more uncertain than usual with a potential positive bias.

[h] NMWQCC Groundwater Other Standards for Domestic Water Supply (20 NMAC 6.2.3103).

[i] Denotes Chromium VI value was used.

[j] (J-) = The chemical is classified "detected," but the reported concentration value is expected to be more uncertain than usual with a potential negative bias.

[k] NMWQCC Surface Water Standard for Wildlife Habitat (20 NMAC 6.4.900).

[l] California DHS 2003, 76862.

[m] (UJ) = The chemical is classified "undetected" with an expectation that the reported result is more uncertain than usual.

[n] Denotes Thallium Carbonate value was used.

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PHASE III RFI REPORT
SWMU 16-021(c)-99

The following tables are submitted in response to the NMED comments. Tables with revisions are indicated by the word(s) "Revised" or "Revised – February 2004" in the table title. Shading indicates changes from publication in September 2003. The yes/no entry in the "Exceeds Screening Limit" column are in bold if it has changed since publication in September 2003. Changes since last publication in January 2004 are indicated by underlining and side comments.

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Supplemental Table 4.1 (Revised – February 2004)
Screening of Inorganic Chemicals Detected in Spring Samples

Chemical	Sample Identification	Sample Concentration (µg/L)		Maximum Background Concentration (µg/L)	Maximum Exceeds Background Concentration	EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Human Health SW Standard (µg/L)	NMWQCC Aquatic Life (Acute) SW Standard (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Aluminum	RE16-01-3235	Max. Detected Value	17,100	1,400	Yes	37,000	36,000	na[a]	750[b]	5000[c,d]	50	No
	RE16-01-3033	Max. Undetected Value	400 (U)[e]	<200e	Yes	37,000	36,000	na	750[b]	5000[a,b]	50	No
Antimony	RE16-01-3041	Max. Detected Value	4.7 (J)[f]	0	Yes	15	15	4300	na	na	6	No
	RE16-98-3039	Max. Undetected Value	20 (U)	<100	No	15	15	4300	na	na	6	Yes
Arsenic	RE16-01-3257	Max. Detected Value	10.1	0	Yes	0.045	0.045	24.2	340[b]	100[g]	10	Yes
	RE16-02-45252	Max. Undetected Value	5 (U)	<50	No	0.045	0.045	24.2	340[b]	100[f]	10	Yes
Barium	RE16-00-3203	Max. Detected Value	1310	100	Yes	2600	2600	na	na	1000[f]	2000	No
Beryllium	RE16-01-3184	Max. Detected Value	1.4 (J)	n/a	n/a	73	73	na	130[b]	na	4	No
	RE16-98-3039	Max. Undetected Value	4 (U)	<10	No	73	73	na	130[b]	na	4	No
Boron	RE16-01-3329	Max. Detected Value	2840	730	Yes	3300	7300	na	na	750[a]	na[h]	No
	RE16-00-3127	Max. Undetected Value	500 (U)	<100	Yes	3300	7300	na	na	750[a]	na	No
Cadmium	RE16-00-3260	Max. Detected Value	2.3 (J+)[h]	3	No	18	18	na	1740[b]	10[f]	5	No
	RE16-98-3039	Max. Undetected Value	5 (U)	<30	No	18	18	na	1740[b]	10[f]	5	No
Calcium	RE16-00-3000	Max. Detected Value	44,000	21,000	Yes	na	na	na	na	na	na	na

Supplemental Table 4.1 (Revised – February 2004) (continued)

Chemical	Sample Identification	Sample Concentration (µg/L)		Maximum Background Concentration (µg/L)	Maximum Exceeds Background Concentration	EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Human Health SW Standard (µg/L)	NMWQCC Aquatic Life (Acute) SW Standard (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Cesium	RE16-98-3012	Max. Detected Value	500	6	Yes	na	na	na	na	na	na	na
	RE16-98-3016	Max. Undetected Value	500 (U)	<5	Yes	na	na	na	na	na	na	na
Chloride	RE16-00-3000	Max. Detected Value	32,000	8,000	Yes	na	na	na	na	250,000[i]	250,000	No
Chromium	RE16-99-3042	Max. Detected Value	32.7	11	Yes	110[j]	110[j]	na	130,000[b]	50[f]	100	No
	RE16-98-3039	Max. Undetected Value	10 (U)	<30	No	110[j]	110[j]	na	130,000[b]	50[f]	100	No
Cobalt	RE16-00-3283	Max. Detected Value	11 (J)	59	No	730	730	na	na	50[a]	na	No
	RE16-98-3039	Max. Undetected Value	20 (U)	<60	No	730	730	na	na	50[a]	na	No
Copper	RE16-01-3257	Max. Detected Value	43.1	30	Yes	1400	1500	na	6960[b]	500[b]	1000	No
	RE16-98-3039	Max. Undetected Value	20 (U)	<40	No	1400	1500	na	6960[b]	500[b]	1000	No
Cyanide (Total)	RE16-98-3041	Max. Detected Value	3.2 (J)	na	n/a	6.2[o]	6.2[o]	220,000	22	5.2[k]	200	No
	RE16-98-3038	Max. Undetected Value	13 (U)	na	n/a	6.2[o]	6.2[o]	220,000	22	5.2[k]	200	Yes
Fluoride	RE16-00-3000	Max. Detected Value	890	300	Yes	2200	2200	na	na	1600[f]	2000	No
	RE16-01-3037	Max. Undetected Value	14 (U)	<500	No	2200	2200	na	na	1600[f]	2000	No
Iron	RE16-00-3203	Max. Detected Value	10,200	4,170	Yes	11,000	11,000	na	na	1000[i]	300	No
	RE16-98-3073	Max. Undetected Value	293 (U)	<100	Yes	11,000	11,000	na	na	1000[i]	300	No

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Supplemental Table 4.1 (Revised – February 2004) (continued)

Chemical	Sample Identification	Sample Concentration (µg/L)		Maximum Background Concentration (µg/L)	Maximum Exceeds Background Concentration	EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Human Health SW Standard (µg/L)	NMWQCC Aquatic Life (Acute) SW Standard (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Lead	RE16-00-3203	Max. Detected Value	20.2	460	No	15	na	na	-66,600[b,l]	50[f]	15	Yes
	RE16-00-3002	Max. Undetected Value	2 (U)	<20	No	15	na	na	-66,600[b,l]	50[f]	15	No
Lithium	RE16-98-3063	Max. Detected Value	9.4 (J)	50	No	730	730	na	na	na	na	No
Magnesium	RE16-01-3329	Max. Detected Value	10,000	4,860	Yes	na	na	na	na	na	na	na
	RE16-98-3038	Max. Undetected Value	6800 (U)	n/a	n/a	na	na	na	na	na	na	na
Manganese	RE16-00-3203	Max. Detected Value	1080	70	Yes	1700	880	na	na	200[i]	50	No
	RE16-98-3039	Max. Undetected Value	10 (U)	<20	No	1700	880	na	na	200[i]	50	No
Mercury	RE16-01-3186	Max. Detected Value	1	n/a	n/a	11	11	na	2.4[b]	0.77[j]	2	No
	RE16-02-45252	Max. Undetected Value	0.2 (U)	<100	No	11	11	na	2.4[b]	0.77[j]	2	No
Molybdenum	RE16-98-3039	Max. Detected Value	6.4 (J)	9	No	180	180	na	na	1000[a]	na	No
	RE16-98-3041	Max. Undetected Value	4.9 (U)	<100	No	180	180	na	na	1000[a]	na	No
Nickel	RE16-00-3203	Max. Detected Value	18.6	20	No	730	730	4600	128,000[b]	200[a]	na	No
	RE16-00-3125	Max. Undetected Value	40 (U)	<20	Yes	730	730	4600	128,000[b]	200[a]	na	No
Nitrate	RE16-98-3063	Max. Detected Value	4400	1,550	Yes	10,000	10,000	na	na	10,000[f]	10,000	No
Nitrate-Nitrite as N	RE16-00-3282	Max. Detected Value	3,800,000	76,000	Yes	na	na	na	na	10,000[f]	10,000	Yes
	RE16-01-3021	Max. Undetected Value	1000 (U)	n/a	n/a	na	na	na	na	10,000[f]	10,000	No

Supplemental Table 4.1 (Revised – February 2004) (continued)

Chemical	Sample Identification	Sample Concentration (µg/L)		Maximum Background Concentration (µg/L)	Maximum Exceeds Background Concentration	EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Human Health SW Standard (µg/L)	NMWQCC Aquatic Life (Acute) SW Standard (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Perchlorate	RE16-00-3145	Max. Detected Value	17.5	NA	n/a	3.70	3.60	na	na	4[m]	na	Yes
	RE16-01-3090	Max. Undetected Value	958 (U)	NA	n/a	3.70	3.60	na	na	4[k]	na	Yes
Potassium	RE16-01-3090	Max. Detected Value	12,400 (J)	9,000	Yes	na	na	na	na	na	na	na
	RE16-01-3186	Max. Undetected Value	2330 (U)	n/a	n/a	na	na	na	na	na	na	na
Rubidium	RE16-98-3012	Max. Detected Value	7000	10	Yes	na	na	na	na	na	na	na
	RE16-98-3016	Max. Undetected Value	500 (U)	<100	Yes	na	na	na	na	na	na	na
Selenium	RE16-00-3282	Max. Detected Value	14.4 (J+)	n/a	n/a	180	180	11,000	na	5[j]	50	No
	RE16-01-3329	Max. Undetected Value	5 (U)	<100	No	180	180	11,000	na	5[j]	50	No
Silver	RE16-00-3246	Max. Detected Value	4.5 (J)	n/a	n/a	180	180	na	na	50[f]	100	No
	RE16-98-3039	Max. Undetected Value	10 (U)	<30	No	180	180	na	na	50[f]	100	No
Sodium	RE16-01-3329	Max. Detected Value	50,200	14,000	Yes	na	na	na	na	na	na	na
Strontium	RE16-98-3068	Max. Detected Value	158	110	Yes	22,000	22,000	na	na	na	na	No
Sulfate	RE16-00-3000	Max. Detected Value	32,000	66,000	No	na	na	na	na	600,000[i]	250,000	No
Thallium	RE16-00-3000	Max. Detected Value	7.1 (J)	1	Yes	2.90[n]	2.40	6.3	na	na	2	Yes
	RE16-98-3013	Max. Undetected Value	7.6 (U)	<100	No	2.90[n]	2.40	6.3	na	na	2	Yes

Supplemental Table 4.1 (Revised – February 2004) (concluded)

Chemical	Sample Identification	Sample Concentration (µg/L)		Maximum Background Concentration (µg/L)	Maximum Exceeds Background Concentration	EPA Region 6 Tap Water Screening Level (µg/L)	EPA Region 9 Tap Water PRG (µg/L)	NMWQCC Human Health SW Standard (µg/L)	NMWQCC Aquatic Life (Acute) SW Standard (µg/L)	NMWQCC Standard (µg/L)	EPA MCL (µg/L)	Exceeds Screening Limit
Uranium	RE16-98-3063	Max. Detected Value	60	5	Yes	na	7.30	na	na	5000[f]	30	Yes
	RE16-98-3039	Max. Undetected Value	126 (U)	<100	Yes	na	7.30	na	na	5000[f]	30	Yes
Vanadium	RE16-00-3246	Max. Detected Value	29	70	No	37	260	na	na	100[b]	na	No
	RE16-00-3125	Max. Undetected Value	10 (U)	<20	No	37	260	na	na	100[b]	na	No
Zinc	RE16-01-3255	Max. Detected Value	74.1	130	No	11,000	11,000	69,000	32,400[b]	10,000[i]	5000	No
	RE16-01-3035	Max. Undetected Value	41 (U)	<500	No	11,000	11,000	69,000	32,400[b]	10,000[i]	5000	No

Sources: 20 NMAC 6.2.3103 "Standards for groundwater of 10,000 mg/l TDS concentration or less," Parts A, B, and C; 20 NMAC 6.4.900 "Standards applicable to attainable or designated uses unless otherwise specified in 20.6.4.101 through 20.6.4.899 NMAC," Parts K, L, and M; EPA 2002, 76871; EPA 2003, 76867; and California DHS 2003, 76862.

[a] na = Not available.
[b] Calculated using the minimum hardness determined, 76,000.
[c] NMWQCC Groundwater Standard for Irrigation Use (20 NMAC 6.2.3103).
[d] NMWQCC Surface Water Standard for Livestock Watering (20 NMAC 6.4.900).
[e] (U) = The chemical is classified "undetected."
[f] (J) = The chemical is classified "detected," but the reported concentration value is expected to be more uncertain than usual.
[g] NMWQCC Groundwater Human Health Standard (20 NMAC 6.2.3103).
[h] (J+) = The chemical is classified "detected," but the reported concentration value is expected to be more uncertain than usual with a potential positive bias.
[i] NMWQCC Groundwater Other Standards for Domestic Water Supply (20 NMAC 6.2.3103).
[j] Denotes Chromium VI value was used.
[k] NMWQCC Surface Water Standard for Wildlife Habitat (20 NMAC 6.4.900).
[l] Negative value is an artifact of hardness correction calculation.
[m] 2003 California DHS Action Level.
[n] Denotes Thallium Carbonate was used.
[o] Denotes Hydrogen Cyanide was used.

Table 4.4-31 (Revised – February 2004)
Table of Retained COPCs for SWMU 16-021(c)-99 Subsurface System

Chemicals Retained as COPCs for SWMU 16-021(c)-99 Subsurface System	Water		
	Springs (see Tables 4.4-3, 4.4-6, and 4.4-9)	90s Line Pond (see Tables 4.4-12, 4.4-15, and 4.4-18)	Intermediate-Depth Perched Aquifer (see Tables 4.4-24, 4.4-27, and 4.4-30)
Inorganic Chemicals			
Aluminum	—[a]	●[b]	●
Antimony	●	●	●
Arsenic	●	●	●
Barium	—	●	—
Beryllium	—	—	—
Boron	—	—	—
Cadmium	—	—	—
Cesium	●	NA[c]	NA
Chromium	—	●	●
Cobalt	—	—	●
Copper	—	—	●
Cyanide (Total)	●	NA	NA
Iron	—	●	●
Lead	●	●	●
Manganese	—	●	●
Mercury	—	—	—
Nickel	—	—	●
Nitrate-Nitrite as N	●	—	—
Perchlorate	●	—	—
Rubidium	●	NA	NA
Selenium	—	—	●
Silver	—	—	●
Thallium	●	●	●
Uranium	●	●	●
Vanadium	—	●	●
Zinc	—	—	●
Organic Chemicals and HE			
Dichlorobenzene [1,4-]	●	—	—
Dichloroethane[1,2]	—	—	●
Dinitrobenzene[1,3-]	●	—	—
Methylene Chloride	—	—	●
Nitrobenzene	●	—	—
RDX	●	●	●
Tetrachloroethene	●	—	●
Trichloroethene	●	—	●
Trinitrotoluene[2,4,6-]	●	—	●

[a] — = Chemical was analyzed for but eliminated as a COPC for this alluvial system component.
[b] ● = Chemical retained as a COPC for this alluvial system component.
[c] NA = Not analyzed.

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PHASE III RFI REPORT
SWMU 16-021(c)-99

The following tables are submitted in response to the NMED comments. Tables with revisions are indicated by the word(s) "Revised" or "Revised – February 2004" in the table title. Revisions are also indicated by shading in the following tables: K-1, K-3, K-4, K-7, K-8 and 3. The yes/no entry in the "Chemical Retained as a COPC?" column are in bold if it has changed since publication in September 2003. Changes since last publication in January 2004 are indicated by underlining and side comments.

Table K-1	Comparison of Chemical Concentrations versus SALs Source Area
Table K-3	Comparison of Chemical Concentrations versus SALs for Sediment at the Cañon de Valle
Table K-4	Comparison of Chemical Concentrations versus Water Quality Criteria for Surface Water at the Cañon de Valle
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Table K-8	Toxicity Factors for COPCs in the SWMU 16-021(c)-99
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Table K-9b	HI for Potential Inhalation Exposure of Environmental Workers to Fugitive Dust at the Source Area
Table K-10a	ILCR for Potential Ingestion Exposure of Environmental Workers to Surface Soil at the Source Area
Table K-10b	HI for Potential Ingestion Exposure of Environmental Workers to Surface Soil at the Source Area
Table K-11a	ILCR for Potential Dermal Exposure of Environmental Workers to Surface Soil at the Source Area
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Table K-12a	ILCR to Environmental Workers From Potential Exposure to Surface Soil Source Area
Table K-12b	Noncancer Hazard to Environmental Workers From Potential Exposure to Surface Soil Source
Table K-13a	ILCR for Potential Inhalation Exposure of Trail Users to Fugitive Dust at the Source Area
Table K-13b	HI for Potential Inhalation Exposure of Trail Users to Fugitive Dust at the Source Area

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Table K-15a	ILCR for Potential Dermal Exposure of Worker Trail Users to Surface Soil at the Source Area
Table K-15b	HI for Potential Dermal Exposure of Worker Trail Users to Surface Soil at the Source Area
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Table K-17a	ILCR for Potential Inhalation Exposure of Construction Workers to Fugitive Dust at the Source Area
Table K-17b	HI for Potential Inhalation Exposure of Construction Workers to Fugitive Dust at the Source Area
Table K-18a	ILCR for Potential Ingestion Exposure of Construction Workers to Surface Soil at the Source Area
Table K-18b	HI for Potential Ingestion Exposure of Construction Workers Surface Soil at the Source Area
Table K-19a	ILCR for Potential Dermal Exposure of Construction Workers to Surface Soil at the Source Area
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Table K-20b	Noncancer Hazard to Construction Workers from Potential Exposure to Surface Soil Source Area
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Table K-21b	HI for Potential Ingestion Exposure of Trail Users to Sediment at the Cañon de Valle Alluvial Area
Table K-22a	ILCR for Potential Dermal Contact Exposure of Trail Users to Sediment at the Cañon de Valle Alluvial Area
Table K-22b	HI for Potential Dermal Contact Exposure of Trail Users to Sediment at the Cañon de Valle Alluvial Area
Table K-23a	ILCR for Potential Inhalation Exposure of Trail Users to Sediment at the Cañon de Valle Alluvial Area
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Addendum to Appendix K, Attachment

Table 2	Comparison of Chemical Concentrations versus SALs for Sediment at the Martin Springs Canyon
Table 3	Comparison of Chemical Concentrations versus Water Quality Standards for Surface Water at Martin Springs Canyon
Table 4	Comparison of COPCs in Sediment at the Cañon de Valle and Martin Spring Areas
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Sup.Table K-1b	Noncancer Hazard to Trail User from Potential Exposure to Sediment and Surface Water Martin Spring Canyon

Table 2 (Revised – February 2004)
Comparison of Chemical Concentrations versus SALs for Sediment at the Martin Springs Canyon, SWMU 16-021(c)-99
Los Alamos National Laboratory, Los Alamos, New Mexico

Chemical Name	Number of Detections	Number of Nondetections	Sample Value (mg/kg)[a]		Location ID	Sample ID	SAL (mg/kg)	0.1 SAL (mg/kg)	Number of Detections Above Screening Limit	Number of Nondetections Above Screening Limit	Chemical Retained as a COPC[b]?
Aluminum	21	0	Max. Detected Value	17,000	16-06600	RE16-00-0358	74,000	7400	21	na[c]	**Yes**
Amino-2,6-dinitrotoluene[4-]	6	15	Max. Detected Value	0.36	16-06599	RE16-00-0357	61	6.1	0	0	No
			Max. Undetected Value	0.35 (U)[d]	16-06605	RE16-00-0364					
Amino-4,6-dinitrotoluene[2-]	10	11	Max. Detected Value	0.37	16-06599	RE16-00-0357	61	6.1	0	0	No
			Max. Undetected Value	0.28 (U)	16-06603	RE16-00-0361					
Arsenic	21	0	Max. Detected Value	10	16-06600	RE16-00-0358	0.39	---	21	na	**Yes**
Barium	21	0	Max. Detected Value	1700 (J-)[e]	16-06602	RE16-00-0360	5200	520	7	na	**Yes**
Benzo(a)anthracene	4	2	Max. Detected Value	0.31 (J-)	16-06596	RE16-00-0354	0.62	---	4	0	**Yes**
			Max. Undetected Value	0.065 (U)	16-06603	RE16-00-0361					
Benzo(a)pyrene	4	2	Max. Detected Value	0.39 (J)[f]	16-06596	RE16-00-0354	0.062	---	0	0	No
			Max. Undetected Value	0.058 (UJ)[g]	16-06603	RE16-00-0361					
Benzo(b)fluoranthene	4	2	Max. Detected Value	0.43 (J)	16-06596	RE16-00-0354	0.62	---	0	0	No
			Max. Undetected Value	0.063 (U)	16-06603	RE16-00-0361					

Table 2 (Revised – February 2004) (continued)

Chemical Name	Number of Detections	Number of Nondetections	Sample Value (mg/kg)[a]		Location ID	Sample ID	SAL (mg/kg)	0.1 SAL (mg/kg)	Number of Detections Above Screening Limit	Number of Nondetections Above Screening Limit	Chemical Retained as a COPC[b]?
Benzo(g,h,i)perylene	3	3	Max. Detected Value	0.15 (J)	16-06596	RE16-00-0354	1800	180	0	0	No
			Max. Undetected Value	0.082 (U)	16-06603	RE16-00-0361					
Benzo(k)fluoranthene	3	3	Max. Detected Value	0.37 (J)	16-06596	RE16-00-0354	6.2	---	0	0	No
			Max. Undetected Value	0.076 (U)	16-06603	RE16-00-0361					
Benzoic Acid	2	4	Max. Detected Value	0.044 (J)	16-06593	RE16-00-0372	100,000	10,000	0	0	No
			Max. Undetected Value	0.044 (UJ)	16-06606	RE16-00-0365					
Beryllium	21	0	Max. Detected Value	1	16-06600	RE16-00-0358	150	15	0	na	No
Bis(2-ethylhexyl)phthalate	1	5	Max. Detected Value	0.041 (J)	16-06593	RE16-00-0371	35	---	0	0	No
			Max. Undetected Value	0.089 (U)	16-06603	RE16-00-0361					
Boron	19	2	Max. Detected Value	43	16-06603	RE16-00-0361	5500	550	0	0	No
			Max. Undetected Value	0.077 (U)	16-06598	RE16-00-0356					
Cadmium	21	0	Max. Detected Value	1	16-06600	RE16-00-0358	70	7	0	na	No
Chromium	21	0	Max. Detected Value	30	16-06600	RE16-00-0358	210	---	0	na	No
Chrysene	3	3	Max. Detected Value	0.37 (J-)	16-06596	RE16-00-0354	61	---	0	0	No
			Max. Undetected Value	0.091 (U)	16-06603	RE16-00-0361					

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Table 2 (Revised – February 2004) (continued)

Chemical Name	Number of Detections	Number of Nondetections	Sample Value (mg/kg)[a]		Location ID	Sample ID	SAL (mg/kg)	0.1 SAL (mg/kg)	Number of Detections Above Screening Limit	Number of Nondetections Above Screening Limit	Chemical Retained as a COPC[b]?
Cobalt	21	0	Max. Detected Value	5.8	16-06601	RE16-00-0359	4500	450	0	na	No
Copper	21	0	Max. Detected Value	100 (J-)	16-06600	RE16-00-0358	2800	280	0	na	No
Fluoranthene	3	3	Max. Detected Value	0.69 (J-)	16-06596	RE16-00-0354	2300	230	0	0	No
			Max. Undetected Value	0.063 (U)	16-06603	RE16-00-0361					
Indeno(1,2,3-cd)pyrene	3	3	Max. Detected Value	0.16 (J)	16-06596	RE16-00-0354	0.62	---	0	0	No
			Max. Undetected Value	0.081 (UJ)	16-06606	RE16-00-0365					
Lead	21	0	Max. Detected Value	120	16-06602	RE16-00-0360	400	40	7	na	**Yes**
Manganese	4	0	Max. Detected Value	870 (J-)	16-06600	RE16-00-0358	7800	780	1	na	**Yes**
Mercury	21	0	Max. Detected Value	2.3	16-06598	RE16-00-0356	~~23.0~~	~~2.3~~	~~1~~	na	**Yes**
Nickel	21	0	Max. Detected Value	9	16-06600	RE16-00-0358	1500	150	0	na	No
Phenanthrene	3	3	Max. Detected Value	0.4 (J-)	16-06596	RE16-00-0354	1800	180	0	0	No
			Max. Undetected Value	0.098 (U)	16-06603	RE16-00-0361					
Pyrene	4	2	Max. Detected Value	0.89 (J-)	16-06596	RE16-00-0354	1800	180	0	0	No
			Max. Undetected Value	0.068 (U)	16-06603	RE16-00-0361					

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Table 2 (Revised – February 2004) (concluded)

Chemical Name	Number of Detections	Number of Nondetections	Sample Value (mg/kg)[a]		Location ID	Sample ID	SAL (mg/kg)	0.1 SAL (mg/kg)	Number of Detections Above Screening Limit	Number of Nondetections Above Screening Limit	Chemical Retained as a COPC[b]?
RDX[h]	4	17	Max. Detected Value	0.92	16-06606	RE16-00-0365	4.4	---	0	0	No
			Max. Undetected Value	0.33 (U)	16-06597	RE16-00-0355					
Selenium	21	0	Max. Detected Value	1.58	16-06600	RE16-00-0358	380	38	0	na	No
Silver	21	0	Max. Detected Value	2.2	16-06600	RE16-00-0358	380	38	0	na	No
Thallium	21	0	Max. Detected Value	0.318 (J+)[i]	16-06600	RE16-00-0358	6.1	0.61	0	na	No
TNT[j]	8	13	Max. Detected Value	1	16-06600	RE16-00-0358	31	3.1	0	0	No
			Max. Undetected Value	0.35 (U)	16-06605	RE16-00-0364					
Uranium	6	0	Max. Detected Value	1.79	16-06593	RE16-00-0371	16	1.6	1	na	**Yes**
Vanadium	21	0	Max. Detected Value	36	16-06600	RE16-00-0358	530	53	0	na	No
Zinc	21	0	Max. Detected Value	180	16-06600	RE16-00-0358	23,000	2300	0	na	No

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The hierarchy of the sources for the SALs is:
NMED 2000, 68554.
EPA 2002, 76867.
EPA 2002, 76866.
LANL 1998, 59891

[a] (mg/kg) = Milligrams per kilogram.
[b] COPC = Chemical of potential concern.
[c] na = Not applicable.
[d] (U) = The chemical is classified "not detected."
[e] (J-) = The chemical is classified "detected," but the reported concentration value is expected to be more uncertain than usual with a potential negative bias.
[f] (J) = The chemical is classified "detected," but the reported concentration value is expected to be more uncertain than usual.
[g] (UJ) = The chemical is classified "not detected" with an expectation that the reported result is more uncertain than usual.
[h] RDX = Cyclotrimethylenetrinitramine.
[I] (J+) = The chemical is classified "detected," but the reported concentration value is expected to be more uncertain than usual with a potential positive bias.
[j] TNT =Trinitrotoluene [2,4,6-].

Table 4 (Revised – February 2004)
Comparison of COPCs in Sediment at the Cañon de Valle and Martin Spring Areas, SWMU 16-021(c)-99
Los Alamos National Laboratory, Los Alamos, New Mexico

Analyte	Number of Analyses		Mean Concentration (mg/kg)		95% UCL (mg/kg)		Maximum Concentration (mg/kg)	
	Cañon de Valle	Martin Springs	Cañon de Valle	Martin Springs	Cañon de Valle	Martin Springs	Cañon de Valle	Martin Springs
Aluminum	89	21	6,260	**10,938**	7,919	**12,998**	21,710	17,000
Antimony	89	Not a COPC	1.29	Not a COPC	2.33	Not a COPC	11.0 (2.6)	Not a COPC
Arsenic	88	21	2.19	**4.76**	2.32	**7.00**	4.20	**10.0**
Barium	89	21	5,183	416	8,758	851	40,300	1700
Lead	89	21	29.1	**39.2**	35.0	**73.9**	163	120
Manganese	88	4	354	**415**	467	**645**	1,600	870
Mercury	Not a COPC	21	Not a COPC	0.55	Not a COPC	1.23	Not a COPC	2.30
Silver	89	Not a COPC	7.85	Not a COPC	10.6	Not a COPC	167	Not a COPC
Thallium	89	Not a COPC	0.51	Not a COPC	0.75	Not a COPC	3.60	Not a COPC
Uranium	21	6	2.07	1.27	2.41	1.69	3.91	1.79
Zinc	Not a COPC	21	Not a COPC	54.5	Not a COPC	95.9	Not a COPC	180
Benzo(a)pyrene	43	6	0.32	0.11	0.45	0.30	0.70 (0.26)	0.39
Dinitrobenzene[1,3-]	89	Not a COPC	0.14	Not a COPC	0.26	Not a COPC	2.50	Not a COPC
Hexachlorobenzene	42	Not a COPC	0.35	Not a COPC	0.44	Not a COPC	0.70	Not a COPC
Indeno(1,2,3-cd)pyrene	42	Not a COPC	0.32	Not a COPC	0.44	Not a COPC	0.70	Not a COPC

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Table 4 (Revised – February 2004) (concluded)

Analyte	Number of Analyses		Mean Concentration (mg/kg)		95% UCL (mg/kg)		Maximum Concentration (mg/kg)	
	Cañon de Valle	Martin Springs	Cañon de Valle	Martin Springs	Cañon de Valle	Martin Springs	Cañon de Valle	Martin Springs
Nitrobenzene	122	Not a COPC	0.21	Not a COPC	0.32	Not a COPC	2.60	Not a COPC
RDX	89	Not a COPC	1.26	Not a COPC	3.38	Not a COPC	42.0	Not a COPC
TNT	89	Not a COPC	0.20	Not a COPC	0.34	Not a COPC	2.50	Not a COPC

(#) = maximum value shown is based upon a non-detected value. Number in parentheses is the maximum detected value.
Note: Bold indicates Martin Spring value exceeds Cañon de Valle value.

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Chromium	89	21	6.51	**10.5**	8.77	**17.1**	

Table K-1 (Revised – February 2004)
Comparison of Chemical Concentrations versus SALs SWMU 16-021(c)-99 Source Area
Los Alamos National Laboratory, Los Alamos, New Mexico

Analyte	Surrogate Compound[a]	Location ID	Sample ID	Maximum Concentration (mg/kg)	Data Qualifier	Media Code[b]	Sample Depth (ft)	SAL (mg/kg)	0.1 SAL[c] (mg/kg)	Number of Detected Values Above Screening	Chemical Retained as a COPC?
Metals											
Aluminum		16-06403	RE16-00-0047	52,000		QBT3	5.00-5.50	74,000	7400	8	**Yes**
Arsenic		16-06411	RE16-00-0044	9.3		ALLH	3.00-3.50	0.39	NA	20	**Yes**
Barium		16-06420	RE16-00-0043	8200		ALLH	1.50-2.00	5200	520	19	**Yes**
Beryllium		16-06403	RE16-00-0047	4.4		QBT3	5.00-5.50	150	15	0	No
Chromium		16-06403	RE16-00-0047	17		QBT3	5.00-5.50	210	NA	0	No
Cobalt		16-06411	RE16-00-0044	8.3	(J)	ALLH	3.00-3.50	4500	450	0	No
Copper		16-06403	RE16-00-0047	17	(J)	QBT3	5.00-5.50	2800	280	0	No
Iron		16-06403	RE16-00-0047	25,000		QBT3	5.00-5.00	23,000	2300	20	**Yes**
Lead		16-06403	RE16-00-0047	32		QBT3	5.00-5.50	400	40	0	No
Manganese		16-06416	RE16-00-0041	1200	(J-)	ALLH	0.00-0.50	7800	780	1	**Yes**
Nickel		16-06403	RE16-00-0047	20		QBT3	5.00-5.50	1500	150	0	No
Selenium		16-06403	RE16-00-0047	1.41		QBT3	5.00-5.50	380	38	0	No
Silver		16-06388	RE16-00-0035	2.1		ALLH	0.00-0.50	380	38	0	No
Thallium		16-06416	RE16-00-0041	0.87	(UJ)	ALLH	0.00-0.50	6.1	0.61	1	**Yes**

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Table K-1 (Revised – February 2004) (continued)

Analyte	Surrogate Compound[a]	Location ID	Sample ID	Maximum Concentration (mg/kg)	Data Qualifier	Media Code[b]	Sample Depth (ft)	SAL (mg/kg)	0.1 SAL[c] (mg/kg)	Number of Detected Values Above Screening	Chemical Retained as a COPC?
Uranium		16-06416	RE16-00-0041	3.12	(J-)	ALLH	0.00-0.50	16	1.6	5	**Yes**
Vanadium		16-06411	RE16-00-0044	37		ALLH	3.00-3.50	530	53	0	No
Zinc		16-06403	RE16-00-0047	84	(J-)	QBT3	5.00-5.50	23,000	2300	0	No
Organic Chemicals											
Amino-2,6-dinitrotoluene[4-]	2,6 DNT	16-06402	RE16-00-0046	2.2	(J+)	QBT3	2.00-3.50	61	6.1	0	No
Amino-4,6-dinitrotoluene[2-]	2,6 DNT	16-06403	RE16-01-0038	0.945		ALLH	1.60-2.00	61	6.1	0	No
Anthracene		16-06379	RE16-00-0037	0.26	(J)	QBT3	2.00-2.50	16,000	1600	0	No
Aroclor-1254[d]		16-06378	RE16-01-0039	0.041	(J)	ALLH	2.00-2.60	0.22	NA	0	No
Aroclor-1260[d]		16-06378	RE16-01-0039	0.043		ALLH	2.00-2.60	0.22	NA	0	No
Benzoic Acid		16-06419	RE16-00-0042	0.022	(J)	ALLH	0.25-0.75	100,000	10,000	0	No
Bis(2-ethylhexyl)phthalate		16-06405	RE16-00-0040	0.79		ALLH	6.00-6.50	35	NA	0	No
Butanone[2-]		16-06390	RE16-00-0039	0.0075	(J)	ALLH	2.00-2.50	37,000	3700	0	No
Di-n-butylphthalate		16-06409	RE16-00-0045	0.086	(J)	ALLH	0.50-1.00	6100	610	0	No
Dinitrotoluene[2,4-]		16-06405	RE16-00-0040	0.33	(J)	ALLH	6.00-6.50	120	12	0	No
Dinitrotoluene[2,6-]		16-06379	RE16-00-0037	0.066	(J)	QBT3	2.00-2.50	61	6.1	0	No
HMX		16-06409	RE16-00-0045	2000		ALLH	0.50-1.00	3100	310	8	**Yes**
Isopropyltoluene[4-]		16-06390	RE16-00-0039	0.0013	(J)	ALLH	2.00-2.50	370	37	0	No

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Table K-1 (Revised – February 2004) (concluded)

Analyte	Surrogate Compound[a]	Location ID	Sample ID	Maximum Concentration (mg/kg)	Data Qualifier	Media Code[b]	Sample Depth (ft)	SAL (mg/kg)	0.1 SAL[c] (mg/kg)	Number of Detected Values Above Screening	Chemical Retained as a COPC?
Methylene Chloride		16-06385	RE16-00-0036	0.0013	(J)	ALLH	0.00-0.50	65	NA	0	No
Naphthalene		16-06416	RE16-00-0041	0.052	(J)	ALLH	0.00-0.50	53	5.3	0	No
RDX		16-06379	RE16-00-0037	1200		QBT3	2.00-2.50	4.4	NA	10	**Yes**
Tetryl		16-06402	RE16-00-0046	0.98	(J+)	QBT3	2.00-3.50	610	61	0	No
Toluene		16-06390	RE16-00-0039	0.0019	(J)	ALLH	2.00-2.50	180	18	0	No
Trichlorobenzene[1,2,4-]		16-06405	RE16-00-0040	0.4	(J)	ALLH	6.00-6.50	520	52	0	No
Trichlorofluoromethane		16-06388	RE16-00-0035	0.018		ALLH	0.00-0.50	390	39	0	No
Trinitrobenzene[1,3,5-]		16-06403	RE16-01-0038	0.216		ALLH	1.60-2.00	1800	180	0	No
TNT		16-06379	RE16-00-0037	330		QBT3	2.00-2.50	31	3.1	8	**Yes**

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The hierarchy of the sources for the SALs is:

NMED 2000, 68554.

EPA 2002, 76866.

EPA 2002, 76867.

[a] No screening value is available. Screening level for surrogate compound shown is used.

[b] Medium code definitions are as follows: ALLH = All soil types QBT3 = Unit 3 of the Tshirege member of the Bandelier tuff.

[c] Adjusted screening level = 1/10th of the screening level for noncarcinogens.

[d] Screening level is for total aroclors, not for individual aroclors-1254 and -1260.

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NA = Analyte is a carcinogen and therefore 1/10th of the screening action level is not used.

(J) = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for this analysis.

(J-) = The analyte was positively identified, and the result is likely to be biased low.

(J+) = The analyte was positively identified, and the result is likely to be biased high.

(UJ) = The analyte was not positively identified in the sample and the associated value is an estimate of the sample specific detection limit.

Table K-3 (Revised – February 2004)
Comparison of Chemical Concentrations versus SALs for Sediment at the Cañon de Valle, SWMU 16-021(c)-99
Los Alamos National Laboratory, Los Alamos, New Mexico

Chemical Name	Number of Detections	Number of Nondetections	Sample Value (mg/kg)		Location ID	Sample ID	SAL (mg/kg)	0.1 SAL[a] (mg/kg)	Number of Detections Above Screening Limit	Number of Nondetections Above Screening Limit	Chemical Retained as a COPC?
Acetone	1	10	Max. Detected Value	0.048 (J)	16-02682	0316-97-0470	1600	160	0	0	No
			Max. Undetected Value	0.072 (U)	16-01002	AAB1610					
Aluminum[b]	89	0	Max. Detected Value	21,710	16-06710	RE16-02-45989	74,000	7400	22	na	**Yes**
Amino-2,6-dinitrotoluene[4-]	33	32	Max. Detected Value	1.6	16-06127	RE16-99-0097	61	6.1	0	0	No
			Max. Undetected Value	5 (U)	16-06125	RE16-99-0093					
Amino-4,6-dinitrotoluene[2-]	26	39	Max. Detected Value	1.3	16-06127	RE16-99-0097	61	6.1	0	0	No
			Max. Undetected Value	5 (U)	16-06125	RE16-99-0093					
Amino-x,6-dinitrotoluene[x-]	3	15	Max. Detected Value	0.79	16-02685	0316-97-0473	61	6.1	0	0	No
			Max. Undetected Value	2.5 (U)	16-02687	0316-97-0475					
Antimony[c]	12	77	Max. Detected Value	2.6 (J)	16-06133	RE16-99-0107	30	3	0	12	**Yes**
			Max. Undetected Value	22 (U)	16-02671	0316-97-0441					
Arsenic[c]	67	21	Max. Detected Value	4.2 (J-)	16-02671	0316-97-0441	0.39	---	67	21	**Yes**
			Max. Undetected Value	4.7 (U)	16-02778	0816-96-0090					

Table K-3 (Revised – February 2004) (continued)

Chemical Name	Number of Detections	Number of Nondetections	Sample Value (mg/kg)			Location ID	Sample ID	SAL (mg/kg)	0.1 SAL[a] (mg/kg)	Number of Detections Above Screening Limit	Number of Nondetections Above Screening Limit	Chemical Retained as a COPC?
Barium[c]	89	0	Max. Detected Value	40,300	(J)	16-02757	0816-96-0068	5200	520	68	na	**Yes**
Benzo(a)pyrene[b]	1	42	Max. Detected Value	0.258		16-02762	RE16-02-46399	0.062	---	~~1~~	34	**Yes**
			Max. Undetected Value	1.4	(U)	16-02761	0816-96-0072					
Benzoic Acid	5	38	Max. Detected Value	0.904	(J)	16-02762	RE16-02-46399	100,000	10,000	0	0	No
			Max. Undetected Value	13	(U)	16-02757	0816-96-0068					
Beryllium	30	59	Max. Detected Value	1.3	(J)	16-06125	RE16-99-0094	150	15	0	0	No
			Max. Undetected Value	1.1	(U)	16-02778	0816-96-0090					
Bis(2-ethylhexyl) phthalate	12	31	Max. Detected Value	0.74	(J)	16-02778	0816-96-0090	35	---	0	0	No
			Max. Undetected Value	1.4	(U)	16-02761	0816-96-0072					
Boron	17	27	Max. Detected Value	10.6	(J)	16-06124	RE16-99-0092	5500	550	0	0	No
			Max. Undetected Value	7.18	(U)	16-02766	RE16-02-46400					
Cadmium	25	64	Max. Detected Value	1.98		16-02777	RE16-02-46404	70	7	0	0	No
			Max. Undetected Value	0.718	(U)	16-02766	RE16-02-46400					
Cesium-137[d]	8	13	Max. Detected Value	0.421		16-02763	0816-96-0074	5.3	---	~~0~~	~~0~~	No
			Max. Undetected Value	0.07	(U)	16-02758	0816-96-0069					

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Table K-3 (Revised – February 2004) (continued)

Chemical Name	Number of Detections	Number of Nondetections	Sample Value (mg/kg)		Location ID	Sample ID	SAL (mg/kg)	0.1 SAL[a] (mg/kg)	Number of Detections Above Screening Limit	Number of Nondetections Above Screening Limit	Chemical Retained as a COPC?
Chromium[c]	87	2	Max. Detected Value	33.1	16-06133	RE16-99-0107	210	---	0	0	No
			Max. Undetected Value	3.6 (U)	16-02672	0316-97-0442					
Cobalt	86	2	Max. Detected Value	23.9	16-02687	0316-97-0475	4500	450	0	0	No
			Max. Undetected Value	1.4 (U)	16-02681	0316-97-0459					
Copper	86	2	Max. Detected Value	232	16-02777	RE16-02-46404	2800	280	0	0	No
			Max. Undetected Value	6 (U)	16-02672	0316-97-0442					
Cyanide (total)	2	36	Max. Detected Value	1.9 (J-)	16-02670	0316-97-0440	1200	120	0	0	No
			Max. Undetected Value	2.1 (UJ)	16-02771	0816-96-0083					
Dichlorodifluoromethane	3	8	Max. Detected Value	0.005 (J)	16-02687	0316-97-0475	90	9	0	0	No
			Max. Undetected Value	0.026 (U)	16-01002	AAB1610					
Diethylphthalate	4	39	Max. Detected Value	0.47 (J)	16-02773	0816-96-0085	49,000	4900	0	0	No
			Max. Undetected Value	1.4 (U)	16-02761	0816-96-0072					
Di-n-butylphthalate	21	21	Max. Detected Value	3.9	16-02761	0816-96-0072	6100	610	0	0	No
			Max. Undetected Value	1 (U)	16-02759	0816-96-0070					

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Table K-3 (Revised – February 2004) (continued)

Chemical Name	Number of Detections	Number of Nondetections	Sample Value (mg/kg)		Location ID	Sample ID	SAL (mg/kg)	0.1 SAL[a] (mg/kg)	Number of Detections Above Screening Limit	Number of Nondetections Above Screening Limit	Chemical Retained as a COPC?
Dinitrobenzene[1,3-][e]	1	88	Max. Detected Value	0.25	16-02680	0316-97-0458	6.1	0.61	0	8	**Yes**
			Max. Undetected Value	5 (U)	16-06125	RE16-99-0093					
Fluoranthene	3	39	Max. Detected Value	0.06 (J)	16-06123	RE16-00-0117	2300	230	0	0	No
			Max. Undetected Value	1.4 (U)	16-02761	0816-96-0072					
Hexachlorobenzene[b]	1	41	Max. Detected Value	0.076 (J)	16-02762	RE16-02-46399	0.3	0.03	1	41	**Yes**
			Max. Undetected Value	1.4 (U)	16-02761	0816-96-0072					
HMX	49	40	Max. Detected Value	290	16-06125	RE16-99-0093	3100	310	0	0	No
			Max. Undetected Value	5.5 (U)	16-01002	AAB1610					
Indeno(1,2,3-cd)pyrene[b]	1	41	Max. Detected Value	0.385	16-02762	RE16-02-46399	0.62	0.062	1	33	**Yes**
			Max. Undetected Value	1.4 (U)	16-02761	0816-96-0072					
Isopropyltoluene[4-]	1	11	Max. Detected Value	0.059	16-02682	0316-97-0470	370	37	0	0	No
			Max. Undetected Value	0.013 (U)	16-01002	AAB1610					
Lead[c]	89	0	Max. Detected Value	163 (J)	16-02770	RE16-02-46402	400	40	20	na	**Yes**
Manganese[c]	88	0	Max. Detected Value	1600	16-01005	AAB1613	7800	780	5	na	**Yes**

Table K-3 (Revised – February 2004) (continued)

Chemical Name	Number of Detections	Number of Nondetections	Sample Value (mg/kg)		Location ID	Sample ID	SAL (mg/kg)	0.1 SAL[a] (mg/kg)	Number of Detections Above Screening Limit	Number of Nondetections Above Screening Limit	Chemical Retained as a COPC?
Mercury	54	35	Max. Detected Value	0.39	16-02771	0816-96-0083	23	2.3	0	0	No
			Max. Undetected Value	0.22 (U)	16-02671	0316-97-0441					
Nickel	85	4	Max. Detected Value	67.5 (J-)	16-02756	0816-96-0067	1500	150	0	0	No
			Max. Undetected Value	2.8 (U)	16-02681	0316-97-0459					
Nitrate - Nitrite (as N)	5	15	Max. Detected Value	7.7	16-02756	0816-96-0067	6100	610	0	0	No
			Max. Undetected Value	0.5 (U)	16-02765	0816-96-0076					
Nitrobenzene[c]	3	119	Max. Detected Value	0.25	16-02680	0316-97-0458	17	1.7	0	1	**Yes**
			Max. Undetected Value	5.2 (U)	16-06125	RE16-99-0093					
Pyrene	4	38	Max. Detected Value	0.07 (J)	16-02762	RE16-02-46399	1800	180	0	0	No
			Max. Undetected Value	1.4 (U)	16-02761	0816-96-0072					
RDX[c]	38	51	Max. Detected Value	42	16-02687	0316-97-0475	4.4	---	4	1	**Yes**
			Max. Undetected Value	20 (U)	16-06125	RE16-99-0093					
Selenium	21	68	Max. Detected Value	3	16-01002	AAB1610	380	38	0	0	No
			Max. Undetected Value	2.2 (UJ)	16-02671	0316-97-0441					

Table K-3 (Revised – February 2004) (continued)

Chemical Name	Number of Detections	Number of Nondetections	Sample Value (mg/kg)		Location ID	Sample ID	SAL (mg/kg)	0.1 SAL[a] (mg/kg)	Number of Detections Above Screening Limit	Number of Nondetections Above Screening Limit	Chemical Retained as a COPC?
Silver[c]	64	25	Max. Detected Value	167	16-06709	RE16-01-3275	380	38	3	0	**Yes**
			Max. Undetected Value	4.4 (U)	16-02671	0316-97-0441					
Thallium[c]	23	66	Max. Detected Value	3.6	16-02760	0816-96-0071	6.1	0.61	8	49	**Yes**
			Max. Undetected Value	1.4 (U)	16-06131	RE16-99-0104					
Toluene	4	8	Max. Detected Value	0.036 (J)	16-02687	0316-97-0475	180	18	0	0	No
			Max. Undetected Value	0.013 (U)	16-01002	AAB1610					
Trichloro-1,2,2-trifluoroethane[1,1,2-]	1	11	Max. Detected Value	0.003 (J)	16-02685	0316-97-0473	5600	560	0	0	No
			Max. Undetected Value	0.013 (U)	16-01002	AAB1610					
Trichlorofluoromethane	2	10	Max. Detected Value	0.003 (J)	16-02683	0316-97-0471	390	39	0	0	No
			Max. Undetected Value	0.026 (U)	16-01002	AAB1610					
TNT[c]	27	62	Max. Detected Value	1.1	16-02683	0316-97-0471	31	3.1	0	1	**Yes**
			Max. Undetected Value	5 (U)	16-06125	RE16-99-0093					
Uranium[e]	21	0	Max. Detected Value	3.91 (J-)	16-02778	0816-96-0090	16	1.6	17	na	**Yes**
Vanadium	89	0	Max. Detected Value	33.7	16-06710	RE16-02-45989	530	53	0	na	No
Zinc	89	0	Max. Detected Value	259	16-06133	RE16-99-0107	23,000	2300	0	na	No

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Table K-3 (Revised – February 2004) (concluded)

The hierarchy of the sources for the SALs is:

NMED 2000, 68554.
EPA 2002, 76867.
EPA 2002, 76866.
LANL 1998, 59891.
LANL 2001, 69683.1.

--- = Chemical is a carcinogen, therefore 0.1 SAL is not used.

[a] Adjusted screening level = 1/10th of the screening level for noncarcinogens.

[b] COPC was detected in Post-1998 data only.

[c] COPC was detected in both Pre-and Post-1998 data.

[d] Analyte is radionuclide and all values are in pCi/g.

[e] COPC was detected in Pre-1998 data only.

(J) = The chemical is classified as "detected," but the reported concentration value is expected to be more uncertain than usual.

(J-) = The chemical is classified as "detected," but the reported concentration value is expected to be more uncertain than usual with a potential negative bias.

(U) = The chemical is classified as "undetected" or "not detected."

(UJ) = The chemical is classified as "undetected" with an expectation that the reported result is more uncertain than usual.

Table K-6 (Revised – February 2004)
Source Term and Exposure Point Concentrations of COPCs in Sediment and Surface Water at the Cañon de Valle, SWMU 16-021(c)-99
Los Alamos National Laboratory, Los Alamos, New Mexico

Sediment (mg/kg)			Air (mg/m^3)[a]		Surface Water (mg/L)		
Chemical (COPC)	Mean (CTE)	95% UCL (RME)	Mean (CTE)	95% UCL (RME)	Chemical (COPC)	Mean (CTE)	95% UCL (RME)
Antimony	1.29	2.33	9.80E-10	1.77E-09	Americium-241[b,c]	0.00334	0.00432
Arsenic	2.19	2.32	1.66E-09	1.76E-09	Amino-2,6-dinitrotoluene[4-]	0.00392	0.00682
Barium	5183	8758	3.94E-06	6.66E-06	Amino-4,6-dinitrotoluene[2-]	0.00351	0.00608
Benzo(a)pyrene	0.32	0.45	2.43E-10	3.42E-10	Arsenic	0.0019	0.00303
Dinitrobenzene[1,3-]	0.14	0.26	1.06E-10	1.98E-10	Barium	2.065	2.862
Hexachlorobenzene	0.35	0.44	2.66E-10	3.34E-10	Bis(2-ethylhexyl)phthalate	0.00473	0.0056
Indeno(1,2,3-cd)pyrene	0.32	0.44	2.43E-10	3.34E-10	Bromomethane	0.00435	0.00461
Lead	29.1	35	2.21E-08	2.66E-08	Cesium	0.4	0.7
Manganese	354	467	2.69E-07	3.55E-07	Chloromethane	0.00469	0.00613
Nitrobenzene	0.21	0.32	1.60E-10	2.43E-10	Dichloroethane[1,2-]	0.00233	0.00282
RDX	1.26	3.38	9.57E-10	2.57E-09	Dinitro-2-methylphenol[4,6-]	0.0246	0.0285
Silver	7.85	10.6	5.97E-09	8.05E-09	Dinitrobenzene[1,3-]	0.0007	0.0014
Thallium	0.51	0.75	3.88E-10	5.70E-10	Dinitrotoluene[2,6-]	0.00196	0.00301
TNT	0.2	0.34	1.52E-10	2.58E-10	DNX	0.00032	0.00057
Uranium	2.07	2.41	1.57E-09	1.83E-09	Iron	1.172	1.659
					Lead	0.00233	0.00379
					Manganese	0.106	0.174
					Methylene chloride	0.0026	0.00353
					MNX	0.00029	0.00047
					Naphthalene	0.00396	0.00457
					Nitrate-Nitrite as N	35.592	185.892
					Nitrobenzene	0.00295	0.00448
					Nitrotoluene[4-]	0.00293	0.00524
					Perchlorate	0.00326	0.00481
					RDX	0.0824	0.127
					Rubidium	0.367	0.6
					Ruthenium-106[b,c]	0.00854	0.0204
					Silver	0.00252	0.00451
					Tetrachloroethene	0.00224	0.00252
					Thallium	0.00126	0.00159
					TNT	0.00119	0.00233
					Trichloroethene	0.00226	0.00253
					Uranium	0.00669	0.0142

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a Values estimated by dividing sediment concentration by the PEF = 1.316E+09 m^3/kg and represent exposure point concentrations for the inhalation pathway (EPA 2002, 76866).
b Concentrations for this analyte are in pCi/L.
c Statistical analysis calculation is based on positive activities only.

Table K-8 (Revised – February 2004)
Toxicity Factors for COPCs in the SWMU 16-021(c)-99
Los Alamos National Laboratory, Los Alamos, New Mexico

COPC	CAS #	Class	Ref[a]	SF_o $(mg/kg/d)^{-1}$	Ref[a]	SF_i $(mg/kg/d)^{-1}$	Ref[a]	RfD_o (mg/kg/d)	Ref[a]	RfD_i (mg/kg/d)	Ref[a]	PC cm/hr	Ref[a]	ABSd (unitless)	Ref[a]
Aluminum	7429-90-5	---	I	---	---	---	†	1.00E+00	NCEA	---	†	1.00E-03	EPA 2001	0.00E+00	EPA9
Amino-2,6-dinitrotoluene, 4-	19406-51-0	B2	2,6-DNT Used as Surrogate	6.80E-01	2,6-DNT Used as Surrogate	---	†	1.00E-03	H	---	†	2.10E-03	EPA 2001	1.00E-01	NM
Amino-4,6-dinitrotoluene, 2-	35572-78-2	B2	2,6-DNT Used as Surrogate	6.80E-01	2,6-DNT Used as Surrogate	---	†	1.00E-03	H	---	†	2.10E-03	EPA 2001	1.00E-01	NM
Antimony	7440-36-0	---	I	---	---	NE	---	4.00E-04	I	NE	---	1.00E-03	EPA 2001	0.00E+00	EPA9
Arsenic	7440-38-2	A	I	1.50E+00	I	1.50E+01	I	3.00E-04	I	NE	---	1.00E-03	EPA 2001	0.00E+00	EPA9
Barium	7440-39-3	D	I	---	---	---	---	7.00E-02	I	1.40E-04	H	1.00E-03	EPA 2001	0.00E+00	EPA9
Benzo-a-pyrene	50-32-8	B2	I	7.30E+00	I	---	†	---	---	---	†	7.00E-01	EPA 2001	1.30E-01	NM
Bis(2-ethylhexyl) phthalate	117-81-7	B2	I	1.40E-02	I	---	†	2.00E-02	I	---	†	2.50E-02	EPA 2001	1.00E-01	NM
Bromomethane	74-83-9	D	I	---	---	---	---	1.40E-03	I	5.00E-03	I	1.00E-03	EPA 2001	1.00E-01	NM
Cadmium	7440-43-9	B1	I	---	---	---	†	1.00E-03	I	---	†	1.00E-03	EPA 2001	0.00E+00	EPA9
Cesium	7440-46-2	---	---	---	---	---	†	---	---	---	†	1.00E-03	EPA 2001	0.00E+00	EPA9
Chloromethane	74-87-3	D	I	1.30E-02	H	---	†	---	---	---	†	3.30E-03	EPA 2001	1.00E-01	NM
Cyanide	57-12-5	D	I	---	---	---	†	2.00E-02	I	---	†	1.00E-03	EPA 2001	0.00E+00	EPA9
Dichloroethane, 1,2-	107-06-2	B2	I	9.10E-02	I	---	†	3.00E-02	NCEA	---	†	4.20E-03	EPA 2001	1.00E-01	NM
Dinitrobenzene, 1,3-	99-65-0	D	I	---	---	---	†	1.00E-04	I	---	†	1.00E-03	EPA 2001	1.00E-01	NM
Dinitro-2-methylphenol, 4,6-	534-52-1	---	---	---	---	---	†	---	---	---	†	1.00E-03	EPA 2001	1.00E-01	NM
Dinitrotoluene, 2,6-	606-20-2	B2	I	6.80E-01	I (for mixed isomers)	---	†	1.00E-03	H	---	†	2.10E-03	EPA 2001	1.00E-01	NM
DNX	na	C	RDX Used as Surrogate	1.10E-01	I	1.10E-01	r	3.00E-03	I	3.00E-03	I	1.00E-03	EPA 2001	1.00E-01	NM
Hexachlorobenzene	118-74-1	B2	I	1.60E+00	I	---	†	8.00E-04	I	---	†	1.30E-01	EPA 2001	1.00E-01	NM
HMX	2691-41-0	D	I	---	---	---	---	5.00E-02	I	5.00E-02	EPA6	1.00E-03	EPA 2001	1.00E-01	NM
Indeno(1,2,3-cd)pyrene	193-39-5	B2	I	7.30E-01	NCEA	3.10E-01	NCEA	3.00E-02	NCEA	3.00E-02	r	1.00E+00	EPA 2001	1.30E-01	NM
Iron	7439-89-6	---	---	---	---	---	---	3.00E-01	EPA6	---	---	1.00E-03	EPA 2001	0.00E+00	EPA9
Lead (inorganic)	7439-92-1	---	---	---	---	NE	---	---	---	NE	---	1.00E-03	EPA 2001	0.00E+00	EPA9
Manganese	7439-96-5	D	I	---	---	NE	---	1.40E-01	I	1.40E-05	I	1.00E-03	EPA 2001	0.00E+00	EPA9
Mercury	7439-97-6	D	I	---	---	---	†	3.00E-04	I	---	†	1.00E-03	EPA 2001	0.00E+00	EPA9
Methylene chloride	75-09-2	B2	I	7.50E-03	I	---	†	6.00E-02	I	---	†	3.50E-03	EPA 2001	1.00E-01	NM

Deleted: Chromium[b] ... [6]

Table K-8 (Revised – February 2004) (concluded)

COPC	CAS #	Class	Ref[a]	SF_o $(mg/kg/d)^{-1}$	Ref[a]	SF_i $(mg/kg/d)^{-1}$	Ref[a]	RfD_o (mg/kg/d)	Ref[a]	RfD_i (mg/kg/d)	Ref[a]	PC cm/hr	Ref[a]	ABSd (unitless)	Ref[a]
MNX	na	C	RDX Used as Surrogate	1.10E-01	I	1.10E-01	r	3.00E-03	I	3.00E-03	I	1.00E-03	EPA 2001	1.00E-01	NM
Naphthalene	91-20-3	C	I	---	---	---	---	2.00E-02	I	3.00E-03	I	1.00E-03	EPA 2001	1.00E-01	NM
Nitrate	14797-55-8	---	I	---	---	---	†	1.60E+00	I	---	†	1.00E-03	EPA 2001	0.00E+00	EPA9
Nitrobenzene	98-95-3	D	I	---	---	---	†	5.00E-04	I	---	†	1.00E-03	EPA 2001	1.00E-01	NM
Nitrotoluene, 3-	99-99-0	---	---	---	---	---	†	1.00E-02	H	---	†	1.00E-03	EPA 2001	1.00E-01	NM
Nitrotoluene, 4-	88-72-2	---	---	---	---	---	†	1.00E-02	H	---	†	1.00E-03	EPA 2001	1.00E-01	NM
Perchlorate	na	---	---	---	---	---	†	1.00E-04	I	---	†	1.00E-03	EPA 2001	0.00E+00	EPA9
RDX	121-82-4	C	I	1.10E-01	I	1.10E-01	r	3.00E-03	I	3.00E-03	I	1.00E-03	EPA 2001	1.00E-01	NM
Rubidium	7440-17-7	---	---	---	---	---	†	---	---	---	†	1.00E-03	EPA 2001	0.00E+00	EPA9
Selenium	7782-49-2	D	I	---	---	---	†	5.00E-03	I	---	†	1.00E-03	EPA 2001	0.00E+00	EPA9
Silver	744-22-4	D	I	---	---	---	†	5.00E-03	I	---	†	6.00E-04	EPA 2001	0.00E+00	EPA9
Tetrachloroethene	127-18-4	---	I	5.40E-01	EPA6	2.10E-02	EPA6	1.00E-02	I	1.10E-01	EPA6	1.00E-03	EPA 2001	1.00E-01	NM
Thallium	7791-12-0	D	I	---	---	NE	---	8.00E-05	I	NE	---	1.00E-03	EPA 2001	0.00E+00	EPA9
TNT	118-96-7	C	I	3.00E-02	I	3.00E-02	r	5.00E-04	I	5.00E-04	I	5.00E-02	EPA 2001	1.00E-01	NM
Trichloroethene	79-01-6	---	I	4.00E-01	EPA6	4.00E-01	EPA6	3.00E-04	EPA6	1.10E-02	EPA6	1.00E-03	EPA 2001	1.00E-01	NM
Uranium (soluble salts)	7440-61-1	---	I	---	---	NE	---	3.00E-03	I	NE	---	1.00E-03	EPA 2001	0.00E+00	EPA9

Note: The hierarchy of the sources for the toxicity factors is: EPA Integrated Risk Information System; EPA Region 6 Human Health Medium-Specific Screening Levels; HEAST.

[a]Reference (Ref):

EPA 2001= Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment (EPA/540/R/99/055, September 2001).

EPA6 = EPA 2002, 76867.

EPA9 = EPA 2002, 76866.

I = IRIS (EPA 2003, 76870).

H = HEAST (EPA 1997, 58968).

NCEA = National Center for Environmental Assessment, Office of Research and Development.

NM = NMED 2000, 68554.

r = Route-to-route extrapolation as done in NMED 2000, 68554.

† = Inhalation pathway not evaluated for COPC.

PC = Dermal probability constant.

ABSd = Dermal absorption factor.

na = Not available.

Deleted: [b]Modeled as Total Chromium.¶

Table K-21a (Revised – February 2004)
ILCR for Potential Ingestion Exposure of Trail Users to Sediment at the Cañon de Valle Alluvial Area, SWMU 16-021(c)-99
Los Alamos National Laboratory, Los Alamos, New Mexico

Carcinogenic Effects								
Chemical Name	Concentration in Sediment (mg/kg)[a]		SF_o 1/(mg/kg/d)	Weight of Evidence	Intake Dose (mg/kg/d)		ILCR	
	CTE	RME			CTE	RME	CTE	RME
Antimony	1.29E+00	2.33E+00	---	---	2.03E-09	8.14E-08	0.00E+00	0.00E+00
Arsenic	2.19E+00	2.32E+00	1.50E+00	A	3.44E-09	8.11E-08	5.17E-09	1.22E-07
Barium	5.18E+03	8.76E+03	---	D	8.15E-06	3.06E-04	0.00E+00	0.00E+00
Lead	2.91E+01	3.50E+01	---	---	4.58E-08	1.22E-06	0.00E+00	0.00E+00
Manganese	3.54E+02	4.67E+02	---	D	5.57E-07	1.63E-05	0.00E+00	0.00E+00
Silver	7.85E+00	1.06E+01	---	D	1.23E-08	3.70E-07	0.00E+00	0.00E+00
Thallium	5.10E-01	7.50E-01	---	D	8.02E-10	2.62E-08	0.00E+00	0.00E+00
Uranium	2.07E+00	2.41E+00	---	---	3.26E-09	8.42E-08	0.00E+00	0.00E+00
Benzo(a)pyrene	3.20E-01	4.50E-01	7.30E+00	B2	5.03E-10	1.57E-08	3.67E-09	1.15E-07
Dinitrobenzene[1,3-]	1.40E-01	2.60E-01	---	D	2.20E-10	9.09E-09	0.00E+00	0.00E+00
Hexachlorobenzene	3.50E-01	4.40E-01	1.60E+00	B2	5.50E-10	1.54E-08	8.81E-10	2.46E-08
Indeno(1,2,3-cd)pyrene	3.20E-01	4.40E-01	7.30E-01	B2	5.03E-10	1.54E-08	3.67E-10	1.12E-08
Nitrobenzene	2.10E-01	3.20E-01	---	D	3.30E-10	1.12E-08	0.00E+00	0.00E+00
RDX	1.26E+00	3.38E+00	1.10E-01	C	1.98E-09	1.18E-07	2.18E-10	1.30E-08
TNT	2.00E-01	3.40E-01	3.00E-02	C	3.15E-10	1.19E-08	9.44E-12	3.56E-10
						Total Pathway Cancer Risk	1.03E-08	2.86E-07

[a] Values reported as undetected (U-qualified, Table K-6) were replaced by a concentration equal to 1/2 of the reported detection limit.

--- = Toxicity value not available or not applicable.

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Table K-21b (Revised – February 2004)
HI for Potential Ingestion Exposure of Trail Users to Sediment at the Cañon de Valle Alluvial Area
SWMU 16-021(c)-99 Los Alamos National Laboratory, Los Alamos, New Mexico

Non-Carcinogenic Effects							
Chemical Name	Concentration in Sediment (mg/kg)[a]		Oral RfD_o (mg/kg/d)	Intake Dose (mg/kg/d)		HQ	
	CTE	RME		CTE	RME	CTE	RME
Antimony	1.29E+00	2.33E+00	4.00E-04	1.58E-08	1.26E-07	3.94E-05	3.16E-04
Arsenic	2.19E+00	2.32E+00	3.00E-04	2.68E-08	2.14E-07	8.93E-05	7.14E-04
Barium	5.18E+03	8.76E+03	7.00E-02	6.34E-05	5.07E-04	9.06E-04	7.24E-03
Lead	2.91E+01	3.50E+01	---	3.56E-07	2.85E-06	0.00E+00	0.00E+00
Manganese	3.54E+02	4.67E+02	1.40E-01	4.33E-06	3.46E-05	3.09E-05	2.47E-04
Silver	7.85E+00	1.06E+01	5.00E-03	9.60E-08	7.68E-07	1.92E-05	1.54E-04
Thallium	5.10E-01	7.50E-01	8.00E-05	6.24E-09	4.99E-08	7.80E-05	6.24E-04
Uranium	2.07E+00	2.41E+00	3.00E-03	2.53E-08	2.03E-07	8.44E-06	6.75E-05
Benzo(a)pyrene	3.20E-01	4.50E-01	---	3.91E-09	3.13E-08	0.00E+00	0.00E+00
Dinitrobenzene[1,3-]	1.40E-01	2.60E-01	1.00E-04	1.71E-09	1.37E-08	1.71E-05	1.37E-04
Hexachlorobenzene	3.50E-01	4.40E-01	8.00E-04	4.28E-09	3.42E-08	5.35E-06	4.28E-05
Indeno(1,2,3-cd)pyrene	3.20E-01	4.40E-01	3.00E-02	3.91E-09	3.13E-08	1.30E-07	1.04E-06
Nitrobenzene	2.10E-01	3.20E-01	5.00E-04	2.57E-09	2.05E-08	5.14E-06	4.11E-05
RDX	1.26E+00	3.38E+00	3.00E-03	1.54E-08	1.23E-07	5.14E-06	4.11E-05
TNT	2.00E-01	3.40E-01	5.00E-04	2.45E-09	1.96E-08	4.89E-06	3.91E-05
					Total Pathway Hazard Index	1.21E-03	9.67E-03

[a] Values reported as undetected (U-qualified, Table K-6) were replaced by a concentration equal to 1/2 of the reported detection limit.

--- = Toxicity value not available or not applicable.

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Table K-22a (Revised – February 2004)
ILCR for Potential Dermal Contact Exposure of Trail Users to Sediment at the Cañon de Valle Alluvial Area, SWMU 16-021(c)-99
Los Alamos National Laboratory, Los Alamos, New Mexico

Carcinogenic Effects

Chemical Name	Concentration in Sediment (mg/kg)[a]		SF_o 1/(mg/kg/d)	ABS (unitless)	Weight of Evidence	DAD (mg/kg/d)		ILCR	
	CTE	RME				CTE	RME	CTE	RME
Antimony	1.29E+00	2.33E+00	---	0.00E+00	---	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	2.19E+00	2.32E+00	1.50E+00	0.00E+00	A	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	5.18E+03	8.76E+03	---	0.00E+00	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	2.91E+01	3.50E+01	---	0.00E+00	---	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	3.54E+02	4.67E+02	---	0.00E+00	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Silver	7.85E+00	1.06E+01	---	0.00E+00	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Thallium	5.10E-01	7.50E-01	---	0.00E+00	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Uranium	2.07E+00	2.41E+00	---	0.00E+00	---	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	3.20E-01	4.50E-01	7.30E+00	1.30E-01	B2	8.37E-09	1.08E-07	6.11E-08	7.88E-07
Dinitrobenzene[1,3-]	1.40E-01	2.60E-01	---	1.00E-01	D	2.82E-09	4.80E-08	0.00E+00	0.00E+00
Hexachlorobenzene	3.50E-01	4.40E-01	1.60E+00	1.00E-01	B2	7.05E-09	8.12E-08	1.13E-08	1.30E-07
Indeno(1,2,3-cd)pyrene	3.20E-01	4.40E-01	7.30E-01	1.30E-01	B2	8.37E-09	1.06E-07	6.11E-09	7.70E-08
Nitrobenzene	2.10E-01	3.20E-01	---	1.00E-01	D	4.23E-09	5.90E-08	0.00E+00	0.00E+00
RDX	1.26E+00	3.38E+00	1.10E-01	1.00E-01	C	2.54E-08	6.24E-07	2.79E-09	6.86E-08
TNT	2.00E-01	3.40E-01	3.00E-02	1.00E-01	C	4.03E-09	6.27E-08	1.21E-10	1.88E-09
							Total Pathway Cancer Risk	8.14E-08	1.07E-06

a Values reported as undetected (U-qualified, Table K-6) were replaced by a concentration equal to 1/2 of the reported detection limit.

--- = Toxicity value not available or not applicable.

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Table K-22b (Revised – February 2004)
HI for Potential Dermal Contact Exposure of Trail Users to Sediment at the Cañon de Valle Alluvial Area,
SWMU 16-021(c)-99 Los Alamos National Laboratory, Los Alamos, New Mexico

Non-Carcinogenic Effects								
Chemical Name	Concentration in Sediment (mg/kg)[a]		RfD_o (mg/kg/d)	ABS (unitless)	DAD (mg/kg/d)		HQ	
	CTE	RME			CTE	RME	CTE	RME
Antimony	1.29E+00	2.33E+00	4.00E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	2.19E+00	2.32E+00	3.00E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	5.18E+03	8.76E+03	7.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	2.91E+01	3.50E+01	---	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	3.54E+02	4.67E+02	1.40E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Silver	7.85E+00	1.06E+01	5.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Thallium	5.10E-01	7.50E-01	8.00E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Uranium	2.07E+00	2.41E+00	3.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	3.20E-01	4.50E-01	---	1.30E-01	6.51E-08	3.02E-07	0.00E+00	0.00E+00
Dinitrobenzene[1,3-]	1.40E-01	2.60E-01	1.00E-04	1.00E-01	2.19E-08	1.34E-07	2.19E-04	1.34E-03
Hexachlorobenzene	3.50E-01	4.40E-01	8.00E-04	1.00E-01	5.48E-08	2.27E-07	6.85E-05	2.84E-04
Indeno(1,2,3-cd)pyrene	3.20E-01	4.40E-01	3.00E-02	1.30E-01	6.51E-08	2.96E-07	2.17E-06	9.85E-06
Nitrobenzene	2.10E-01	3.20E-01	5.00E-04	1.00E-01	3.29E-08	1.65E-07	6.58E-05	3.31E-04
RDX	1.26E+00	3.38E+00	3.00E-03	1.00E-01	1.97E-07	1.75E-06	6.58E-05	5.82E-04
TNT	2.00E-01	3.40E-01	5.00E-04	1.00E-01	3.13E-08	1.76E-07	6.26E-05	3.51E-04
						Total Pathway Hazard Index	4.84E-04	2.90E-03

[a] Values reported as undetected (U-qualified, Table K-6) were replaced by a concentration equal to 1/2 of the reported detection limit.

--- = Toxicity value not available or not applicable.

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Table K-23a (Revised – February 2004)
ILCR for Potential Inhalation Exposure of Trail Users to Sediment at the Cañon de Valle Alluvial Area, SWMU 16-021(c)-99 Los Alamos National Laboratory, Los Alamos, New Mexico

Carcinogenic Effects								
Chemical Name	Air Concentration (mg/m^3)[a]		SF_i 1/(mg/kg/d)	Weight of Evidence	Intake Dose (mg/kg/d)		ILCR	
	CTE	RME			CTE	RME	CTE	RME
Antimony	9.80E-10	1.77E-09	NE	---	2.47E-13	7.92E-12	0.00E+00	0.00E+00
Arsenic	1.66E-09	1.76E-09	1.50E+01	A	4.19E-13	7.89E-12	6.28E-12	1.18E-10
Barium	3.94E-06	6.66E-06	---	D	9.91E-10	2.98E-08	0.00E+00	0.00E+00
Lead	2.21E-08	2.66E-08	NE	---	5.56E-12	1.19E-10	0.00E+00	0.00E+00
Manganese	2.69E-07	3.55E-07	NE	D	6.77E-11	1.59E-09	0.00E+00	0.00E+00
Silver	5.97E-09	8.05E-09	---	D	1.50E-12	3.60E-11	0.00E+00	0.00E+00
Thallium	3.88E-10	5.70E-10	NE	D	9.75E-14	2.55E-12	0.00E+00	0.00E+00
Uranium	1.57E-09	1.83E-09	NE	---	3.96E-13	8.19E-12	0.00E+00	0.00E+00
Benzo(a)pyrene	2.43E-10	3.42E-10	---	B2	6.12E-14	1.53E-12	0.00E+00	0.00E+00
Dinitrobenzene[1,3-]	1.06E-10	1.98E-10	---	D	2.68E-14	8.84E-13	0.00E+00	0.00E+00
Hexachlorobenzene	2.66E-10	3.34E-10	---	B2	6.69E-14	1.50E-12	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	2.43E-10	3.34E-10	3.10E-01	B2	6.12E-14	1.50E-12	1.90E-14	4.64E-13
Nitrobenzene	1.60E-10	2.43E-10	---	D	4.02E-14	1.09E-12	0.00E+00	0.00E+00
RDX	9.57E-10	2.57E-09	1.10E-01	C	2.41E-13	1.15E-11	2.65E-14	1.26E-12
TNT	1.52E-10	2.58E-10	3.00E-02	C	3.82E-14	1.16E-12	1.15E-15	3.47E-14
						Total Pathway Cancer Risk	6.33E-12	1.20E-10

NE = Not established.
[a] Values reported as undetected in soil (U-qualified, Table K-6) were replaced by a concentration equal to 1/2 of the reported detection limit.
--- = Toxicity value not available or not applicable.

Deleted: Chromium ... [11]

Table K-23b (Revised – February 2004)
HI for Potential Inhalation Exposure of Trail Users to Sediment at the Cañon de Valle Alluvial Area
SWMU 16-021(c)-99 Los Alamos National Laboratory, Los Alamos, New Mexico

Non-Carcinogenic Effects							
Chemical Name	Air Concentration (mg/m^3)[a]		RfD_i, (mg/kg/d)	Intake Dose (mg/kg/d)		HQ	
	CTE	RME		CTE	RME	CTE	RME
Antimony	9.80E-10	1.77E-09	NE	1.92E-12	2.22E-11	0.00E+00	0.00E+00
Arsenic	1.66E-09	1.76E-09	NE	3.26E-12	2.21E-11	0.00E+00	0.00E+00
Barium	3.94E-06	6.66E-06	1.40E-04	7.71E-09	8.34E-08	5.51E-05	5.95E-04
Lead	2.21E-08	2.66E-08	NE	4.33E-11	3.33E-10	0.00E+00	0.00E+00
Manganese	2.69E-07	3.55E-07	1.40E-05	5.26E-10	4.44E-09	3.76E-05	3.17E-04
Silver	5.97E-09	8.05E-09	---	1.17E-11	1.01E-10	0.00E+00	0.00E+00
Thallium	3.88E-10	5.70E-10	NE	7.58E-13	7.14E-12	0.00E+00	0.00E+00
Uranium	1.57E-09	1.83E-09	NE	3.08E-12	2.29E-11	0.00E+00	0.00E+00
Benzo(a)pyrene	2.43E-10	3.42E-10	---	4.76E-13	4.28E-12	0.00E+00	0.00E+00
Dinitrobenzene[1,3-]	1.06E-10	1.98E-10	---	2.08E-13	2.47E-12	0.00E+00	0.00E+00
Hexachlorobenzene	2.66E-10	3.34E-10	---	5.20E-13	4.19E-12	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	2.43E-10	3.34E-10	3.00E-02	4.76E-13	4.19E-12	1.59E-11	1.40E-10
Nitrobenzene	1.60E-10	2.43E-10	---	3.12E-13	3.05E-12	0.00E+00	0.00E+00
RDX	9.57E-10	2.57E-09	3.00E-03	1.87E-12	3.22E-11	6.25E-10	1.07E-08
TNT	1.52E-10	2.58E-10	5.00E-04	2.97E-13	3.24E-12	5.95E-10	6.47E-09
					Total Pathway Hazard Index	9.27E-05	9.13E-04

NE = Not established.
[a] Values reported as undetected in soil (U-qualified, Table K-6) were replaced by a concentration equal to 1/2 of the reported detection limit.
--- = Toxicity value not available or not applicable.

Deleted: Chromium ... [12]

Table K-26a (Revised – February 2004)
ILCR to Trail User from Potential Exposure to Sediment and Surface Water
SWMU 16-021(c)-99 Cañon de Valle Alluvial Area, Los Alamos National Laboratory, Los Alamos, New Mexico

Chemical	Sediment Ingestion Cancer Risk (ILCR)		Sediment Dermal Cancer Risk (ILCR)		Sediment Inhalation Cancer Risk (ILCR)		Surface Water Ingestion Cancer Risk (ILCR)		Surface Water Dermal Cancer Risk (ILCR)	
	CTE	RME	CTE	RME	CTE	RME	CTE	RME	CTE	RME
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	†	†	†	†
Arsenic	5.17E-09	1.22E-07	0.00E+00	0.00E+00	6.28E-12	1.18E-10	8.96E-09	3.18E-07	1.43E-09	4.19E-08
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cesium	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rubidium	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Silver	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Thallium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Uranium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Amino-2,6-dinitrotoluene[4-]	†	†	†	†	†	†	8.38E-09	3.24E-07	2.82E-09	8.98E-08
Amino-4,6-dinitrotoluene[2-]	†	†	†	†	†	†	7.51E-09	2.89E-07	2.52E-09	8.01E-08
Benzo(a)pyrene	3.67E-09	1.15E-07	6.11E-08	7.88E-07	0.00E+00	0.00E+00	†	†	†	†

Deleted: Chromium ... [13]

Table K-26a (Revised – February 2004) (continued)

Chemical	Sediment Ingestion Cancer Risk (ILCR)		Sediment Dermal Cancer Risk (ILCR)		Sediment Inhalation Cancer Risk (ILCR)		Surface Water Ingestion Cancer Risk (ILCR)		Surface Water Dermal Cancer Risk (ILCR)	
	CTE	RME	CTE	RME	CTE	RME	CTE	RME	CTE	RME
Bis(2-ethylhexyl)phthalate	†	†	†	†	†	†	2.08E-10	5.48E-09	8.33E-10	1.81E-08
Bromomethane	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloromethane	†	†	†	†	†	†	1.92E-10	5.57E-09	1.01E-10	2.43E-09
Dichloroethane[1,2-]	†	†	†	†	†	†	6.67E-10	1.79E-08	4.48E-10	9.94E-09
Dinitro-2-methylphenol[4,6-]	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dinitrobenzene[1,3-]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dinitrotoluene[2,6-]	†	†	†	†	†	†	4.19E-09	1.43E-07	1.41E-09	3.97E-08
DNX	†	†	†	†	†	†	1.11E-10	4.38E-09	1.77E-11	5.78E-10
Hexachlorobenzene	8.81E-10	2.46E-08	1.13E-08	1.30E-07	0.00E+00	0.00E+00	†	†	†	†
Indeno(1,2,3-cd)pyrene	3.67E-10	1.12E-08	6.11E-09	7.70E-08	1.90E-14	4.64E-13	†	†	†	†
Methylene chloride	†	†	†	†	†	†	6.13E-11	1.85E-09	3.43E-11	8.55E-10
MNX	†	†	†	†	†	†	1.00E-10	3.61E-09	1.61E-11	4.77E-10
Naphthalene	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrate-Nitrite as N	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrobenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrotoluene[4-]	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table K-26a (Revised – February 2004) (concluded)

Chemical	Sediment Ingestion Cancer Risk (ILCR)		Sediment Dermal Cancer Risk (ILCR)		Sediment Inhalation Cancer Risk (ILCR)		Surface Water Ingestion Cancer Risk (ILCR)		Surface Water Dermal Cancer Risk (ILCR)	
	CTE	RME	CTE	RME	CTE	RME	CTE	RME	CTE	RME
Perchlorate	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RDX	2.18E-10	1.30E-08	2.79E-09	6.86E-08	2.65E-14	1.26E-12	2.85E-08	9.76E-07	4.56E-09	1.29E-07
Tetrachloroethene	†	†	†	†	†	†	3.80E-09	9.51E-08	6.09E-10	1.26E-08
Trichloroethene	†	†	†	†	†	†	2.84E-09	7.07E-08	4.55E-10	9.34E-09
TNT	9.44E-12	3.56E-10	1.21E-10	1.88E-09	1.15E-15	3.47E-14	1.12E-10	4.89E-09	8.98E-10	3.22E-08
Total Pathway ILCR	1.03E-08	2.86E-07	8.14E-08	1.07E-06	6.33E-12	1.20E-10	6.57E-08	2.26E-06	1.62E-08	4.67E-07
Total CTE ILCR for All Pathways and All Media[a]	2E-07									
Total RME ILCR for All Pathways and All Media[a]	4E-06									

[a] Total ILCR reported to one significant figure.

† = Analyte is not a risk driver for this media.

Deleted: 4.40E-07

Deleted: 1.32E-05

Deleted: 6E

Deleted: 2E-05

Table K-26b (Revised – February 2004)
Noncancer Hazard to Trail User from Potential Exposure to Sediment and Surface Water
SWMU 16-021(c)-99 Cañon de Valle Alluvial Area, Los Alamos National Laboratory, Los Alamos, New Mexico

Chemical	Sediment Ingestion HQ		Sediment Dermal HQ		Sediment Inhalation HQ		Surface Water Ingestion HQ		Surface Water Dermal HQ	
	CTE	RME	CTE	RME	CTE	RME	CTE	RME	CTE	RME
Antimony	3.94E-05	3.16E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	†	†	†	†
Arsenic	8.93E-05	7.14E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-04	1.24E-03	2.48E-05	2.61E-04
Barium	9.06E-04	7.24E-03	0.00E+00	0.00E+00	5.51E-05	5.95E-04	7.22E-04	5.77E-03	1.15E-04	1.06E-03
Cesium	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	†	†	†	†	†	†	9.56E-05	7.65E-04	1.53E-05	1.43E-04
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	3.09E-05	2.47E-04	0.00E+00	0.00E+00	3.76E-05	3.17E-04	1.85E-05	1.48E-04	2.96E-06	3.21E-05
Rubidium	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Silver	1.92E-05	1.54E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.23E-05	9.86E-05	1.18E-06	1.40E-05
Thallium	7.80E-05	6.24E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.85E-04	3.08E-03	6.16E-05	5.13E-04
Uranium	8.44E-06	6.75E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.45E-05	4.36E-04	8.73E-06	1.22E-04
Amino-2,6-dinitrotoluene[4-]	†	†	†	†	†	†	9.59E-05	7.67E-04	3.22E-05	3.70E-04
Amino-4,6-dinitrotoluene[2-]	†	†	†	†	†	†	8.59E-05	6.87E-04	2.88E-05	3.30E-04
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	†	†	†	†
Bis(2-ethylhexyl)phthalate	†	†	†	†	†	†	5.79E-06	4.63E-05	2.31E-05	1.81E-04

Deleted: Chromium ... [14]

Table K-26b (Revised – February 2004) (continued)

Chemical	Sediment Ingestion HQ		Sediment Dermal HQ		Sediment Inhalation HQ		Surface Water Ingestion HQ		Surface Water Dermal HQ	
	CTE	RME	CTE	RME	CTE	RME	CTE	RME	CTE	RME
Bromomethane	†	†	†	†	†	†	7.60E-05	6.08E-04	1.22E-05	8.51E-05
Chloromethane	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dichloroethane[1,2-]	†	†	†	†	†	†	1.90E-06	1.52E-05	1.28E-06	1.02E-05
Dinitro-2-methylphenol[4,6-]	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dinitrobenzene[1,3-]	1.71E-05	1.37E-04	2.19E-04	1.34E-03	0.00E+00	0.00E+00	1.71E-04	1.37E-03	2.74E-05	3.62E-04
Dinitrotoluene[2,6-]	†	†	†	†	†	†	4.79E-05	3.84E-04	1.61E-05	1.63E-04
DNX	†	†	†	†	†	†	2.61E-06	2.09E-05	4.17E-07	4.91E-06
Hexachlorobenzene	5.35E-06	4.28E-05	6.85E-05	2.84E-04	0.00E+00	0.00E+00	†	†	†	†
Indeno(1,2,3-cd)pyrene	1.30E-07	1.04E-06	2.17E-06	9.85E-06	1.59E-11	1.40E-10	†	†	†	†
Methylene chloride	†	†	†	†	†	†	1.06E-06	8.48E-06	5.94E-07	5.32E-06
MNX	†	†	†	†	†	†	2.36E-06	1.89E-05	3.78E-07	4.05E-06
Naphthalene	†	†	†	†	†	†	4.84E-06	3.87E-05	7.75E-07	5.90E-06
Nitrate-Nitrite as N	†	†	†	†	†	†	5.44E-04	4.35E-03	8.71E-05	3.00E-03
Nitrobenzene	5.14E-06	4.11E-05	6.58E-05	3.31E-04	0.00E+00	0.00E+00	1.44E-04	1.15E-03	2.31E-05	2.31E-04
Nitrotoluene[4-]	†	†	†	†	†	†	7.17E-06	5.73E-05	1.15E-06	1.35E-05
Perchlorate	†	†	†	†	†	†	7.97E-04	6.38E-03	1.28E-04	1.24E-03
RDX	5.14E-06	4.11E-05	6.58E-05	5.82E-04	6.25E-10	1.07E-08	6.72E-04	5.38E-03	1.08E-04	1.09E-03
Tetrachloroethene	†	†	†	†	†	†	5.48E-06	4.38E-05	8.77E-07	6.51E-06

Table K-26b (Revised – February 2004) (concluded)

Chemical	Sediment Ingestion HQ		Sediment Dermal HQ		Sediment Inhalation HQ		Surface Water Ingestion HQ		Surface Water Dermal HQ	
	CTE	RME	CTE	RME	CTE	RME	CTE	RME	CTE	RME
Trichloroethene	†	†	†	†	†	†	1.84E-04	1.47E-03	2.95E-05	2.18E-04
TNT	4.89E-06	3.91E-05	6.26E-05	3.51E-04	5.95E-10	6.47E-09	5.82E-05	4.66E-04	4.66E-04	6.02E-03
Pathway HI	1.21E-03	9.67E-03	4.84E-04	2.90E-03	9.27E-05	9.13E-04	4.35E-03	3.48E-02	1.22E-03	1.55E-02
Total CTE HI for All Pathways and All Media[a]	7E-03									
Total RME HI for All Pathways and All Media[a]	6E-02									

[a] Total ILCR reported to one significant figure.

† = Analyte is not a risk driver for this media.

Page 34: [1] Deleted **Lara Beasley** **2/13/2004 9:24:00 AM**

Chromium

Page 34: [2] Deleted **Lara Beasley** **2/13/2004 9:25:00 AM**

6.51

Page 34: [3] Deleted **Lara Beasley** **2/13/2004 9:25:00 AM**

8.77

Page 34: [4] Deleted **Lara Beasley** **2/13/2004 9:25:00 AM**

4.95E-09

Page 34: [5] Deleted **Lara Beasley** **2/13/2004 9:25:00 AM**

6.66E-09

Page 35: [6] Deleted **Lara Beasley** **2/13/2004 9:25:00 AM**

Chromium[b]	7440-47-3	D	I	4.20E+01	EPA6

Page 37: [7] Deleted **Lara Beasley** **2/13/2004 9:27:00 AM**

Chromium	6.51E+00	8.77E+00	4.20E+01	D	1.02E-08	3.06E-07

Page 38: [8] Deleted **Lara Beasley** **2/13/2004 9:28:00 AM**

Chromium	6.51E+00	8.77E+00	1.50E+00	7.96E-08	6.37E-07	

Page 39: [9] Deleted **Lara Beasley** **2/13/2004 9:28:00 AM**

Chromium	6.51E+00	8.77E+00	4.20E+01	0.00E+00	D	0.00E+00	0.00E+00

Page 40: [10] Deleted **Lara Beasley** **2/13/2004 9:28:00 AM**

Chromium	6.51E+00	8.77E+00	1.50E+00	0.00E+00	0.00E+00	0.00E+00

Page 41: [11] Deleted **Lara Beasley** **2/13/2004 9:28:00 AM**

Chromium	4.95E-09	6.66E-09	NE	D	1.24E-12	2.98E-11

Page 42: [12] Deleted **Lara Beasley** **2/13/2004 9:29:00 AM**

Chromium	4.95E-09	6.66E-09	NE	9.68E-12	8.35E-11	

Page 43: [13] Deleted **Lara Beasley** **2/13/2004 9:29:00 AM**

Chromium	4.30E-07	1.29E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	†	†

Page 46: [14] Deleted **Lara Beasley** **2/13/2004 9:30:00 AM**

Chromium	5.31E-08	4.25E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	†	†

Supplemental Table K-1a (Revised – February 2004)
ILCR to Trail User from Potential Exposure to Sediment and Surface Water
SWMU 16-021(c)-99 Martin Spring Canyon, Los Alamos National Laboratory, Los Alamos, New Mexico

Chemical	Sediment Ingestion Cancer Risk (ILCR)		Sediment Dermal Cancer Risk (ILCR)		Sediment Inhalation Cancer Risk (ILCR)		Surface Water Ingestion Cancer Risk (ILCR)		Surface Water Dermal Cancer Risk (ILCR)	
	CTE	RME	CTE	RME	CTE	RME	CTE	RME	CTE	RME
Aluminum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	†	†	†	†
Arsenic	1.12E-08	3.67E-07	0.00E+00	0.00E+00	1.37E-11	3.57E-10	1.69E-08	1.07E-06	2.70E-09	1.41E-07
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cesium	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	†	†	†	†
Rubidium	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Thallium	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Uranium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene	1.26E-09	7.65E-08	2.10E-08	5.25E-07	0.00E+00	0.00E+00	†	†	†	†
Dinitrobenzene[1,3-]	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nitrate-Nitrite as N	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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Supplemental Table K-1a (Revised – February 2004) (concluded)

Chemical	Sediment Ingestion Cancer Risk (ILCR)		Sediment Dermal Cancer Risk (ILCR)		Sediment Inhalation Cancer Risk (ILCR)		Surface Water Ingestion Cancer Risk (ILCR)		Surface Water Dermal Cancer Risk (ILCR)	
	CTE	RME	CTE	RME	CTE	RME	CTE	RME	CTE	RME
Nitrobenzene	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Perchlorate	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RDX	†	†	†	†	†	†	4.32E-08	1.31E-06	6.92E-09	1.74E-07
Tetrachloroethene	†	†	†	†	†	†	3.12E-09	8.30E-08	5.00E-10	1.10E-08
Trichloroethene	†	†	†	†	†	†	2.25E-09	5.95E-08	3.60E-10	7.86E-09
TNT	†	†	†	†	†	†	9.15E-11	4.45E-09	7.32E-10	2.93E-08
Total Pathway ILCR	1.25E-08	4.43E-07	2.10E-08	5.25E-07	1.37E-11	3.57E-10	6.56E-08	2.53E-06	1.12E-08	3.63E-07
Total CTE ILCR for All Pathways and All Media[a]	1E-07									
Total RME ILCR for All Pathways and All Media[a]	4E-06									

[a] Total ILCR reported to one significant figure.
† = Analyte is not a risk driver for this media.

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Supplemental Table K-1b (Revised – February 2004)
Noncancer Hazard to Trail User from Potential Exposure to Sediment and Surface Water
SWMU 16-021(c)-99 Martin Spring Canyon, Los Alamos National Laboratory, Los Alamos, New Mexico

Chemical	Sediment Ingestion HQ		Sediment Dermal HQ		Sediment Inhalation HQ		Surface Water Ingestion HQ		Surface Water Dermal HQ	
	CTE	RME	CTE	RME	CTE	RME	CTE	RME	CTE	RME
Aluminum	1.34E-04	1.07E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	†	†	†	†
Arsenic	1.94E-04	1.55E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.92E-04	2.34E-03	4.67E-05	8.78E-04
Barium	7.27E-05	5.81E-04	0.00E+00	0.00E+00	4.42E-06	5.79E-05	1.36E-04	1.09E-03	2.18E-05	4.18E-04
Cesium	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iron	†	†	†	†	†	†	2.70E-04	2.16E-03	4.33E-05	9.18E-04
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	3.63E-05	2.90E-04	0.00E+00	0.00E+00	4.41E-05	4.38E-04	2.52E-04	2.02E-03	4.04E-05	1.36E-03
Mercury	2.24E-05	1.79E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	†	†	†	†
Rubidium	†	†	†	†	†	†	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Thallium	†	†	†	†	†	†	4.89E-04	3.91E-03	7.83E-05	1.18E-03
Uranium	5.18E-06	4.14E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.81E-05	7.05E-04	1.41E-05	2.32E-04
Vanadium	†	†	†	†	†	†	2.15E-04	1.72E-03	3.43E-05	4.80E-04
Benzo(a)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	†	†	†	†
Dinitrobenzene[1,3-]	†	†	†	†	†	†	2.05E-04	1.64E-03	3.29E-05	4.88E-04
Nitrate-Nitrite as N	†	†	†	†	†	†	2.48E-03	1.99E-02	3.97E-04	1.05E-02
Nitrobenzene	†	†	†	†	†	†	3.94E-04	3.15E-03	6.30E-05	1.08E-03
Perchlorate	†	†	†	†	†	†	4.16E-03	3.33E-02	6.65E-04	2.02E-02

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Supplemental Table K-1b (Revised – February 2004) (concluded)

Chemical	Sediment Ingestion HQ		Sediment Dermal HQ		Sediment Inhalation HQ		Surface Water Ingestion HQ		Surface Water Dermal HQ	
	CTE	RME	CTE	RME	CTE	RME	CTE	RME	CTE	RME
RDX	†	†	†	†	†	†	1.02E-03	8.15E-03	0.00E+00	0.00E+00
Tetrachloroethene	†	†	†	†	†	†	4.50E-06	3.60E-05	7.20E-07	5.68E-06
Trichloroethene	†	†	†	†	†	†	1.46E-04	1.17E-03	0.00E+00	0.00E+00
TNT	†	†	†	†	†	†	4.75E-05	3.80E-04	3.80E-04	5.48E-03
Pathway HI	4.64E-04	3.72E-03	0.00E+00	0.00E+00	4.85E-05	4.96E-04	1.02E-02	8.16E-02	1.82E-03	4.32E-02
Total CTE HI for All Pathways and All Media[a]	1E-02									
Total RME HI for All Pathways and All Media[a]	1E-01									

[a] Total ILCR reported to one significant figure.
† = Analyte is not a risk driver for this media.

Page 1: [1] Deleted **Lara Beasley** **2/13/2004 9:59:00 AM**

Chromium	6.93E-07	2.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	†	

Page 3: [2] Deleted **Lara Beasley** **2/13/2004 10:22:00 AM**

Chromium	8.56E-08	6.85E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	†	