Tables

Table 1. Approximate Volume of Waste for Each Area

Area	Soil and Waste Material (yd^3)	Building Materials (yd^3)
Mine Camp (Subarea 1)	600	200
Mill Area(Subarea 2)	5,600	100
Upper Workings (Subarea 3)	5,000	0
Lower Workings (Subarea 4)	Unknown	0
Phillips Canyon Workings (Subarea 5)	17,500	0
Total Volume	**28,700**	**300**

Notes:
AOC = Area of Concern
yd^3 = cubic yards

Table 2. Sensitive Species Potentially Present in the Vicinity of the Phillips Asbestos Mine Site

Common Name	Federal Status	State of Arizona Status
Desert Sucker (*Catostomus clarki*)[1]	Species of Concern	None
Sonora Sucker (*Catostomus insignis*) [1]	Species of Concern	Wildlife of Special Concern
Razorback Sucker (*Xyrauchen Texanus*), critical habitat[2]	Endangered	Endangered
Roundtail Chub (*Gila robusta*) [1]	Threatened	Wildlife of Special Concern
Golden Eagle (*Aquila chrysaetos*)	Bald and Golden Eagle Protection Act	None
Bald Eagle (*Haliaeetus leucocephalus*)	Bald and Golden Eagle Protection Act	None
Common Black-Hawk (*Buteogallus anthracinus*)	Sensitive	Wildlife of Special Concern

Notes:

1. Appropriate habitat not available at the site; however, these species are present downstream of the site and may therefore be affected by site conditions.

2. Critical habitat in Arizona includes "the Salt River and its 100 year flood plain from State Route 77 bridge to Roosevelt Diversion Dam" (Arizona Game and Fish Department, 2002. "Razorback Sucker," unpublished abstract compiled and edited by the Heritage Data Management System, Phoenix, AZ).

Source: Arizona Department of Fish and Game, 2012. "Environmental Review On-Line Tool." Available Online at: <http://www.azgfd.com/hgis/>.

Table 3. Asbestos Results for Activity-Based and Ambient Air Samples

Sample Name	Date	Total Structures	str/cc
Subarea 1			
PA-MC-AA-01	6/16/2012	0	<0.0054
PA-MC-AA-02	6/16/2012	0	<0.0058
PA-MC-AA-03	6/16/2012	0	<0.0057
PA-MC-AM-01	6/16/2012	0	<0.0111
PA-MC-AM-02	6/16/2012	0	<0.0108
PA-MC-AM-03	*6/16/2012*	*1*	*<0.0166*
PA-MC-AM-04	6/16/2012	0	<0.0114
Subarea 2			
PA-MA-AA-01	6/17/2012	0	<0.0057
PA-MA-AA-02	6/17/2012	0	<0.0057
PA-MA-AM-01	6/17/2012	**8**	**0.0288**
PA-MA-AM-02	6/17/2012	**11**	**0.0385**
PA-MA-AM-03	6/17/2012	0	<0.0111
PA-MA-AM-04	6/17/2012	3	<0.0279
PA-MA-AM-05	6/17/2012	**5**	**0.018**
Subarea 3			
PA-UW-AA-01	6/18/2012	0	<0.0054
PA-UW-AA-02	6/18/2012	0	<0.0057
PA-UW-AM-01	*6/18/2012*	*2*	*<0.0227*
PA-UW-AM-02	6/18/2012	0	<0.0108
PA-UW-AM-03	*6/18/2012*	*1*	*<0.0171*
PA-UW-AM-04	6/18/2012	5	**0.0175**
PA-UW-AM-05	6/18/2012	0	<0.0108
ATV Route 1			
PA-ATV1-AA-01	6/17/2012	0	<0.0057
PA-ATV1-AA-02	6/17/2012	0	<0.0057
PA-ATV1-AA-03	6/17/2012	0	<0.0057
PA-ATV1-AA-04	6/17/2012	0	<0.0057
PA-ATV1-AA-05	*6/17/2012*	*1*	*<0.0090*
PA-ATV1-AA-06	6/17/2012	0	<0.0057
PA-ATV1-AM-01	6/17/2012	0	<0.0105
PA-ATV1-AM-02	6/17/2012	0	<0.0108
PA-ATV1-AM-03[a]	6/17/2012	0	<0.1668
PA-ATV1-AM-04[a]	*6/17/2012*	*1*	*<0.3664*

Table 3. Asbestos Results for Activity-Based and Ambient Air Samples *(continued)*

Sample Name	Date	Total Structures	str/cc
ATV Route 2			
PA-ATV2-AA-01	6/18/2012	0	<0.0057
PA-ATV2-AA-02	6/18/2012	0	<0.0057
PA-ATV2-AA-03	6/18/2012	0	<0.0057
PA-ATV2-AA-04	6/18/2012	0	<0.0057
PA-ATV2-AA-05	6/18/2012	0	<0.0057
PA-ATV2-AM-01	6/18/2012	0	<0.0108
PA-ATV2-AM-02	*6/18/2012*	*2*	*<0.0233*
PA-ATV2-AM-03	6/18/2012	0	<0.0108
PA-ATV2-AM-04[a]	6/18/2012	0	<0.1570
PA-ATV2-AM-05	6/18/2012	0	<0.0111
Background			
PA-BG-AA-01	6/19/2012	0	<0.0057
PA-BG-AA-02	6/19/2012	0	<0.0057
PA-BG-AM-01	6/19/2012	0	<0.0114
PA-BG-AM-02	*6/19/2012*	*1*	*<0.0175*
PA-BG-AM-03	6/19/2012	0	<0.0111
PA-BG-AM-04	6/19/2012	0	<0.0117
Media Blank			
PA-BC-AA-01	6/20/2012	0	<20.90010[b]

Notes:

Sample PA-ATV2-AA-06 was not collected because of a pump failure in the field.

Ambient air samples are designated with "AA" in the sample identification number.

Activity-based air samples are designated with "AM" in the sample identification number.

Results designated as "nondetect" are reported to the limit of detection, which is based on the number of fibers observed and the analytical sensitivity time of 2.9 as specified in the analytical method.

a = filters had a non-uniform deposition or were overloaded with particulates; samples were analyzed using ISO Method 13794, which is an indirect method. Under ISO Method 13794, the particulate is removed from the original filter into a solution, which is then transferred to a secondary filter and analyzed

b = measured in structures per millimeter

Bold = detection of asbestos above reporting limit

Italic = detection of asbestos below reporting limit

ATV = all-terrain vehicle

ISO = International Organization for Standardization

str/cc = structures per cubic centimeter

< = Result was reported to the limit of detection, which is based on the number of fibers observed and the analytical sensitivity times 2.9 as specified in the analytical method.

Table 4. Asbestos Results for Soil, Waste and Sediment Samples

Sample Name	Date	Percent Asbestos
	ATV Route 1 Soil	
PA-ATV1-SS-01	6/15/2012	**0.75**
PA-ATV1-SS-02	6/15/2012	<0.25
PA-ATV1-SS-03	6/15/2012	<0.25
PA-ATV1-SS-04	6/15/2012	<0.25
PA-ATV1-SS-05	6/15/2012	**1**
PA-ATV1-SS-06	6/15/2012	<0.25
PA-ATV1-SS-07	6/15/2012	<0.25
	ATV Route 2 Soil	
PA-ATV2-SS-01	6/15/2012	<0.25
PA-ATV2-SS-02	6/16/2012	<0.25
PA-ATV2-SS-03	6/16/2012	<0.25
PA-ATV2-SS-04	6/16/2012	<0.25
PA-ATV2-SS-05	6/16/2012	<0.25
PA-ATV2-SS-06	6/16/2012	<0.25
PA-ATV2-SS-07	6/16/2012	<0.25
PA-ATV2-SS-08	6/16/2012	<0.25
PA-ATV2-SS-09	6/16/2012	<0.25
PA-ATV2-SS-10	6/16/2012	<0.25
PA-ATV2-SS-11	6/16/2012	<0.25
PA-ATV2-SS-12	6/16/2012	<0.25
	Subarea 1 Soil	
PA-MC-SS-01	6/16/2012	**0.25**
PA-MC-SS-02	6/16/2012	<0.25
PA-MC-SS-03	6/16/2012	<0.25
PA-MC-SS-04	6/16/2012	**0.25**
PA-MC-SS-05	6/16/2012	**1**
	Subarea 2 Soil	
PA-MA-SS-01	6/17/2012	**1.25**
PA-MA-SS-02	6/17/2012	**5.75**
PA-MA-SS-03	6/17/2012	**9.5**
PA-MA-SS-04	6/17/2012	<0.25
PA-MA-SS-05	6/17/2012	**0.5**

Table 4. Asbestos Results for Soil, Waste, and Sediment Samples *(continued)*

Sample Name	Date	Percent Asbestos
	Subarea 3 Soil	
PA-UW-SS-01	6/18/2012	<0.25
PA-UW-SS-02	6/18/2012	<0.25
PA-UW-SS-03	6/18/2012	<0.25
PA-UW-SS-04	6/18/2012	<0.25
PA-UW-SS-05	6/18/2012	**0.5**
PA-UW-SS-06	6/18/2012	**0.25**
	Subarea 3 Waste Rock	
PA-UW-WP-07	6/18/2012	**13.75**
PA-UW-WP-08	6/18/2012	**2.25**
PA-UW-WP-09	6/18/2012	**5**
	Subarea 5 Waste Rock	
PA-PC-WP-01	6/19/2012	**0.25**
	Background Soil	
PA-BG-SS-01	6/19/2012	<0.25
PA-BG-SS-02	6/19/2012	<0.25
PA-BG-SS-03	6/19/2012	<0.25
PA-BG-SS-04	6/19/2012	<0.25
	Background Sediment	
PA-MT-SD-01	6/15/2012	<0.25
PA-PT-SD-01	6/19/2012	<0.25
PA-UT-SD-01	6/16/2012	<0.25

Notes:
ATV = all-terrain vehicle
Bold = detected concentration of asbestos
< = not detected at a concentration less than the reporting limit

Table 5. Screening of Metals and TPH Results for Soil and Waste Samples

Sample ID No.	Date Collected	Description	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Magnesium	Manganese	Mercury	Nickel	Selenium	Uranium	Zinc	TPH (C10-C32)[a]
PA-ATV1-SS-01	06/15/12	ATV Route 1	<5.0	83	<0.50	30	26	47	10	47,000	360	<0.10	43	<5.0	0.29	69	NA
PA-ATV2-SS-01	06/15/12	ATV Route 2	<5.0	98	<0.50	62	32	53	10	9,100	560	<0.10	46	<5.0	<0.25	62	NA
PA-MC-SS-01	06/16/12	Subarea 1 Soil	9.7	73	0.90	72	34	56	93	15000	530	<0.11	43	<5.0	0.28	340	400
PA-MA-SS-01	06/17/12	Subarea 2 Soil	9.5	37	<0.50	17	7.9	19	7.4	150,000	400	<0.10	13	<5.0	2.3	190	NA
PA-UW-WP-08	06/18/12	Subarea 3 Waste Pile	5.1	60	<0.50	7.3	4.2	15	<5.0	120,000	630	<0.10	3.5	<5.0	0.80	15	NA
PA-UW-SS-01	06/18/12	Subarea 3 Soil	<5.0	35	<0.50	16	29	67	<5.0	9,300	310	<0.10	33	<5.0	<0.25	47	NA
PA-PC-WP-01	06/19/12	Subarea 5 Waste Pile	5.7	64	<0.50	20	16	27	9.1	43,000	320	<0.10	24	<5.0	0.29	66	NA
		Background	7.2	130	<0.50	35	18	23	9.9	4,000	520	<0.10	23	<5.0	0.34	40	NA
		Retained as COPC	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**	**Yes**	**Yes**
Human Health Criteria and COC Determination																	
		Arizona Non-Residential SRL	10	170,000	510	4,500	13,000	41,000	800	NA	32,000	310	20,000	5,100	200	310,000	18,000
		BLM Soil RMC for Camper	20	NA	70	NA	NA	5,000	1,000	NA	19,000	40	2,700	700	NA	40,000	NA
		BLM Soil RMC for ATV Driver	300	NA	950	NA	NA	70,000	1,000	NA	250,000	550	38,000	9,600	NA	550,000	NA
		COC for Human Health?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Ecological Criteria and COC Determination																	
		BLM Soil Ecological Criteria (Deer mouse)	230	NA	7	NA	NA	640	142	NA	NA	2	NA	NA	NA	419	NA
		BLM Soil Ecological Criteria (Median)	275	NA	3	NA	NA	136	125	NA	NA	8	NA	NA	NA	307	NA
		EPA Ecological SSL (vole)	170	3,200	73	380	2,100	1,100	1,200	NA	5,300	NA	340	2.7	NA	6,800	NA
		EPA Ecological SSL (avian carnivore)	1,100	NA	630	780	1,300	1,600	510	NA	65,000	NA	2,800	83	NA	30,000	NA
		COC for Ecological Receptors?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Notes: All values listed in milligrams per kilogram

All samples represent three-point composites, except for sample PA-PC-WP-01 from Phillips Canyon Workings, which is a two-point composite sample.

Complete laboratory reports, including data qualifiers, are presented in Appendix C.

a = TPH (C10-C32) is sum of TPH-diesel (C10-22) and TPH-oil range organics (C22-C32)

ATV = all-terrain vehicle

BLM = Bureau of Land Management

COC = chemical of concern

COPC = chemical of potential concern

EPA = U.S. Environmental Protection Agency

NA = not analyzed/not available

SRL = soil remediation level

SSL = soil screening level

TPH = total petroleum hydrocarbons

< = nondetect at concentration less than reporting limit

Table 6. Screening of Metals Results for Sediment Samples

Sample ID No.	Date Collected	Description	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Magnesium	Manganese	Mercury	Nickel	Selenium	Uranium	Zinc
PA-MT-SD-01	6/15/2012	Mill Tributary sediment sample	<5.0	93	<0.50	69	24	27	6.9	5,800	410	<0.10	33	<5.0	<0.25	40
PA-PT-SD-01	6/19/12	Phillips Canyon Tributary sediment sample	<5.0	80	<0.50	18	17	24	<5.0	5,100	270	<0.10	20	<5.0	<0.25	30
		Background	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
		Retained as COPC	No	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No	**Yes**	No	No	**Yes**
Human Health Criteria and COC Determination																
		Arizona Non-Residential SRL	10	170,000	510	4,500	13,000	41,000	800	NA	32,000	310	20,000	5,100	200	310,000
		BLM Sediment RMC for Camper	46	NA	155	NA	NA	5,745	1,000	NA	21,679	46	3,094	774	NA	46,455
		COC for Human Health?	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Ecological Criteria and COC Determination																
		BLM Soil Ecological Criteria (Deer mouse)	230	NA	7	NA	NA	640	142	NA	NA	2	NA	NA	NA	419
		BLM Soil Ecological Criteria (Median)	275	NA	3	NA	NA	136	125	NA	NA	8	NA	NA	NA	307
		EPA Ecological SSL (vole)	170	3,200	73	380	2,100	1,100	1,200	NA	5,300	NA	340	2.7	NA	6,800
		EPA Ecological SSL (avian carnivore)	1,100	NA	630	780	1,300	1,600	510	NA	65,000	NA	2,800	83	NA	30,000
		COC for Ecological Receptors?	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Notes: All values listed in milligrams per kilogram

All samples represent three-point composites

BLM = Bureau of Land Management

COC = chemical of concern

COPC = chemical of potential concern

EPA = U.S. Environmental Protection Agency

NA = not available

NE = not established

SRL = soil remediation level

SSL = soil screen level

TPH = total petroleum hydrocarbons

< = nondetect at concentration less than the reporting limit

Table 7. Screening of Asbestos, Metals and TPH Results for Water Samples

Sample ID No.	Date Collected	Description	Asbestos (MFL)	Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Lead (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Uranium (mg/L)	Zinc (mg/L)	TPH (C10-C32)[a] (mg/L)
PA-MC-GW-01	06/17/12	Subarea 1 groundwater well sample	<0.97	<0.10	0.014	<0.0010	<0.010	<0.040	<0.010	<0.015	0.18	<0.00020	<0.010	<0.10	<0.0010	<0.050	<0.10
PA-MC-GW-01	06/17/12	Subarea 1 groundwater well sample (Dissolved)	NA	<0.10	0.051	<0.0010	<0.010	<0.040	<0.010	<0.015	0.18	<0.00020	<0.010	<0.10	<0.0010	<0.050	NA
PA-MT-SW-01	06/17/12	Subarea 2 Tributary surfacewater sample	<24[b]	<0.10	0.13	<0.0010	<0.010	<0.040	0.011	<0.015	0.37	<0.00020	<0.010	<0.10	0.0020	<0.050	NA
PA-MT-SW-01	06/17/12	Subarea 2 Tributary surface water sample (Dissolved)	NA	<0.10	0.015	<0.0010	<0.010	<0.040	<0.010	<0.015	0.065	<0.00020	<0.010	<0.10	0.0020	<0.050	NA
		Background	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
		Retained as a COPC?	No	No	**Yes**	No	No	No	**Yes**	No	**Yes**	No	No	No	No	No	**Yes**
Human Health Criteria and COC Determination																	
		EPA Region 9 Regional Screening Level for Tap Water	7[c]	0.000045	2.9	0.0069	NA	0.0047	0.62	NA	0.32	NA	0.30	0.078	0.047	4.7	NA
		BLM Groundwater RMC Screening Criteria for Camper	--	0.0001	NA	0.002	NA	NA	0.137	0.015	0.018	0.001	0.074	0.018	NA	1.106	NA
		BLM Groundwater RMC Screening Criteria for Worker	--	0.0007	NA	0.004	NA	NA	0.287	0.015	0.039	0.002	0.155	0.039	NA	2.323	NA
		COC for Human Health?	--	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Ecological Criteria and COC Determination																	
		EPA Freshwater Aquatic Life Acute Exposure	--	0.340	NA	0.002	0.570	NA	0.013	0.065	NA	0.0014	0.470	NA	NA	0.120	NA
		EPA Freshwater Aquatic Life Chronic Exposure	--	0.150	NA	0.00025	0.074	NA	0.009	0.0025	NA	0.00077	0.052	0.005	NA	0.120	NA
		COC for Ecological Receptors?	--	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Notes:

Complete laboratory reports, including data qualifiers, are presented in Appendix C

a = TPH (C10-C32) is sum of TPH-diesel (C10-22) and TPH-oil range organics (C22-C32).

b = Reporting limit exceeds screening criteria because excessive particulate matter was present in the sample.

c = EPA Maximum Contaminant Level for Drinking Water.

BLM = Bureau of Land Management

COC = chemical of concern

COPC = chemical of potential concern

EPA = U.S. Environmental Protection Agency

MFL = million fibers per liter

mg/L = milligrams per liter

NA = not available

NE = not established

RMC = risk management criteria

TPH = total petroleum hydrocarbons

< = nondetect at concentrations less than the reporting limit

Table 8. Risk Screening of Asbestos Results for Air Samples with Detectable Concentrations

Sample ID No.	Date Collected	Asbestos (str/cc)	TWF	IUR	Risk
Subarea 2 Activity-Based Air Samples					
PA-MA-AM-01	06/17/12	0.0288	0.018	0.094	4.9×10^{-7}
PA-MA-AM-02	06/17/12	0.0385	0.018	0.094	6.5×10^{-7}
PA-MA-AM-05	06/17/12	0.0180	0.018	0.094	3.0×10^{-7}
Subarea 3 Activity-Based Air Samples					
PA-UW-AM-04	06/18/12	0.0175	0.018	0.10	3.2×10^{-7}

Notes:

IUR = inhalation Unit Risk in str/cc[1]

str/cc = structures per cubic centimeter

TWF = time weighting factor

Table 1. Potential Federal Chemical-Specific ARARs

Table 9. Potential Federal Chemical-Specific ARARs

Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Framework for Investigating Asbestos-Contaminated Superfund Sites				
Establishes procedures for the evaluation of sites contaminated by asbestos	Potentially contaminated soil or asbestos source material	Non-promulgated guidance developed by EPA (EPA, 2008)[a]	To be considered	Provides a framework for the investigation and characterization of sites with potential asbestos contamination.

Notes: Based on the risk-based screening conducted in Section 4 of this EE/CA, asbestos was the only COC retained. No other contaminants have been identified at the site; therefore, no other federal or state promulgated chemical-specific ARARs have been evaluated. Naturally occurring asbestos and asbestos in soil are not specifically regulated by the federal government. No cleanup action levels or screening criteria are promulgated for asbestos.

a = Guidance document available online at http://epa.gov/superfund/health/contaminants/asbestos/pdfs/framework_asbestos_guidance.pdf

ARAR = applicable or relevant and appropriate requirement

COC = chemical of concern

EE/CA = Engineering Evaluation/Cost Analysis

EPA = U.S. Environmental Protection Agency

Table 10. Potential Federal Location-Specific ARARs

Location	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Endangered Species Act of 1973					
Habitat upon which endangered species or threatened species depend	Federal agencies may not jeopardize the continued existence of any listed species or cause the destruction or adverse modification of critical habitat.	Determination of effect upon endangered or threatened species or its habitat; critical habitat upon which endangered species or threatened species depend.	16 USC §§ 1531–1543	Not Applicable	Although this act is relevant, it is not appropriate, thus it is not considered an ARAR because no federally listed species or designated habitat is known to be present at or adjacent to the site. Compliance with this act will be required if any federally listed species or suitable habitat is identified at the site.
Bald and Golden Eagle Protection Act					
Habitat upon which Bald or Golden Eagles depend	Requires the protection of Bald and Golden Eagles and their habitat from any disturbance that interferes with or interrupts normal breeding, feeding, or sheltering habitats and causes injury, death, or nest abandonment.	Determination of effect upon Bald or Golden Eagles or their habitat; critical habitat upon which they depend.	16 USC §§ 668–668c	Applicable	The Arizona Game and Fish Department indicates that both Bald and Golden Eagles may be present within 3 miles of the site. This act may not be appropriate (thus not an ARAR) if a determination is made that no Bald or Golden Eagles or designated habitat is present at or adjacent to the site.

Table 10. Potential Federal Location-Specific ARARs *(continued)*

Location	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
			Migratory Bird Treaty Act of 1972		
Migratory bird area	Protects almost all species of native migratory birds in the U.S. from unregulated "take."	Presence of migratory birds.	16 USC §§ 703–715	Applicable	The Common Black-Hawk, which is protected under the Migratory Bird Treaty has been identified as having habitat within 3 miles of the site. The potential exists for the Common Black-Hawk to inhabit the site. This act may not be appropriate (thus not an ARAR) if a determination is made that no Common Black Hawk or designated habitat is present at or adjacent to the site.
			National Historic Preservation Act of 1966, as Amended		
Federal land	Establishes a program for the preservation of historic federal properties within the U.S.	Property included in or eligible for the National Register of Historic Places.	16 USC § 470 36 CFR 800	Relevant and appropriate	To date, no historical or archaeological resources have been identified at the site. Compliance with this act will be required if archaeological resources are identified. If any removal action would cause irreparable loss or destruction of significant scientific, prehistoric, historical, or archaeological data, it will be necessary to follow the procedures in the statute to provide for data recovery and preservation activities.

Table 10. Potential Federal Location-Specific ARARs *(continued)*

Location	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Archaeological and Historic Preservation Act					
Federal land	Establishes procedures to provide for preservation of historical and archaeological data that might be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program.	Federal construction project or federally licensed activity or program.	16 USC §§ 469–469(c)(1) 40 CFR § 6.301(c)	Applicable	Applicable if removal activities occur in areas previously undisturbed where the potential exists to affect archaeological or historical resources.
Archaeological Resources Protection Act of 1979, as Amended					
Federal land	Prohibits unauthorized excavation, removal, damage, alteration, or defacement of archaeological resources located on public lands unless such action is conducted pursuant to a permit.	Archaeological resources on federal land.	Public Law No. 96-95 16 USC § 470aa–470mm	Applicable	Archaeological resources are potentially present in several areas of Subarea 1 (see Figure 3, areas of special archaeological concern).

Notes:

ARAR = applicable or relevant and appropriate requirement

CFR = Code of Federal Regulations

USC = United States Code

§ = Section

Table 11. Potential Federal Action-Specific ARARs

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Clean Water Act, as Amended					
Construction activities	Construction that disturbs at least 1 acre must use best management practices to control stormwater discharges.	Construction activities at least 1 acre in size.	33 USC, Chapter 26, §§ 1251–1387 Clean Water Act §402 40 CFR §§ 122.44(k)(2) and (4)	Applicable	Applicable to alternatives that will disturb more than 1 acre.
Clean Air Act National Emissions Standard for Hazardous Air Pollutants					
Construction activities	The CAA requires the enforcement of regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health.	The presence of hazardous asbestos in materials that may be disturbed by construction activities.	40 CFR Parts 61 and 63, Subpart M	Applicable	Asbestos is a hazardous air pollutant present at the site that will be disturbed during implementation of a removal action.
Construction activities	Provides specific standards for inactive waste disposal sites for asbestos mills and manufacturing and fabricating operations. Includes requirements for covering asbestos-containing waste material, engineering controls to limit site access, and signage.	Potential air emissions from the disturbance of asbestos mill tailings or the demolition of buildings containing asbestos.	40 CFR § 61.151	Applicable	The site is a former asbestos mill and as such may be subject to the requirements of this regulation. .

Table 11. Potential Federal Action-Specific ARARs *(continued)*

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Magnuson-Stevens Fishery Conservation and Management Act of 1976, as Amended					
Fishery under management	Provides for conservation and management of specified fisheries within specified fishery conservation zones.	Presence of managed fisheries	16 USC §§ 1801–1882	Relevant and appropriate	Site actions must evaluate potential adverse effects or harm to any managed fisheries downstream from the site. To date, surface water at the site has not been identified as a medium of concern.
Native American Graves Protection and Repatriation Act					
Excavation and ground disturbance	Requires that Native American graves not be disturbed and that, if discovered, excavation and ground disturbance will be stopped.	Excavation and ground-disturbing activities	25 USC§3001 et seq. 43 CFR Part 10	Relevant and appropriate	Protects Native American graves from desecration through the removal and trafficking of human remains and cultural items. If such protected items are inadvertently discovered during excavation, the excavation must cease and the affiliated tribes must be notified and consulted. Applies to ground-disturbing activities such as soil grading and removal.
American Indian Religious Freedom Act					
Excavation and ground disturbance	Protects traditional religious rights and cultural practices of Native Americans, including access to sacred sites, freedom to worship, and use and possession of objects considered sacred.	Excavation and ground-disturbing activities	42 USC§1996 et seq.	Relevant and appropriate	This act requires that excavation and soil grading have no negative impact on the free practice of religion by Native American groups. If sacred sites are discovered in the course of soil disturbances, work will be stopped and appropriate notifications made.

Table 11. Potential Federal Action-Specific ARARs *(continued)*

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments
Corrective Action Management Units and Temporary Units Regulations					
Construction of onsite CAMU for waste consolidation and repository	These regulations allow for the designation and creation of a CAMU for the onsite consolidation of contaminated soil and debris.	Construction of an onsite repository for contaminated materials must meet designation requirements outlined in 40 CFR § 264.552(c)	40 CFR Part 264, Subpart S and 40 CFR § 264.552(c)	Relevant and appropriate	These rule may apply if an onsite repository is constructed to contain excavated mine waste piles, demolished building material, and mining equipment.
Hazardous Materials Transportation Act					
Off-site disposal	Requires special training and handling of materials designated as hazardous	Transportation of a materials identified as hazardous	49 CFR Parts 171-177 and 40 CFR Part 263	Potentially Applicable	Sets standards that apply to the transport of hazardous waste. Transportation of asbestos waste is covered under Parts 171 and 172; requires waste containment and shipping papers.
RCRA Subtitle C – Hazardous Waste Management					
Offsite disposal	Specifies hazardous waste identification, management, and disposal requirements.	If mine waste and soil are disposed of off site	42 USC § 6901 40 CFR Parts 260–279	Potentially Applicable	If off-site disposal is part of the selected alternative TCLP analysis will be conducted to determine if leachable components are present in waste material.
RCRA Subtitle D – Managing Municipal and Solid Waste					
Offsite disposal	Establishes guidelines for the management of nonhazardous solid waste.	If mine waste, soil, and building demolition material and mining equipment are disposed of off site	42 USC § 6901 40 CFR Parts 257 and 258	Potentially Applicable	Applicable if mine waste, soil, demolished building material, and other debris considered nonhazardous waste is hauled off site.

Notes:
ARARs = applicable or relevant and appropriate requirements
CAA = Clean Air Act
CAMU = Corrective Action Management Unit
CFR = Code of Federal Regulations
RCRA = Resource Conservation and Recovery Act
USC = United States Code
§ = Section

Table 12. Potential State Action-Specific ARARs

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments and Compliance Measures
Arizona Mined Land Reclamation Statute and Regulations					
Site cleanup	Mined Land Reclamation – Public Safety Standards: Reclamation activities at mining units shall be designed to reduce hazards to the public.	Mining site	AAC § R11-2-601	Relevant and appropriate	Requirements related to the site's physical condition are not considered relevant for environmental cleanup under CERCLA, but are appropriate for any final action taken to reclaim the site.
Site restoration	Soil Conservation: Prior to disturbing soil in an area expected to be revegetated, soil as reasonably available from the area to support the stated revegetation will be conserved.	Mining site	ARS § 27-974	Relevant and appropriate	Onsite soil will be conserved to the maximum extent practical to regrade and revegetate the site.
Site cleanup	Mined Land Reclamation: Erosion Control and Topographic Contouring – Mining units shall be reclaimed to a stable condition for erosion and seismic activity. Grading and other topographic contour methods shall be conducted, as necessary, to establish final land forms, which are stable under static and dynamic conditions as certified by a qualified engineer considering seismic conditions and safety.	Mining site	AAC § R11-2-602	Relevant and appropriate	Regrading and recontouring is included in the alternatives.

Table 12. Potential State Action Specific ARARs *(continued)*

Action	Requirement	Prerequisite	Citation	Preliminary ARAR Determination	Comments and Compliance Measures
Arizona Mined Land Reclamation Statute and Regulations					
Site restoration	Revegetation: Where surface disturbances result in compaction of soil, ripping, discing, or other means shall be used in revegetated areas to reduce compaction and establish a suitable root zone. Revegetation shall be conducted to establish plant species to support the post-mining use. Vegetation shall be planted during a favorable season. Soil stabilization or irrigation measures may be used.	Mining site	AAC § R11-2-701-702	Relevant and appropriate	Revegetation shall occur in an appropriate manner.
Site restoration	Redistribution of Soil: Before redistribution of soil, the regraded land shall be treated if necessary to reduce the potential for slippage of the redistributed material or to enhance root penetration. Soil and other materials shall be redistributed in a manner that prevents excessive compaction and achieves a thickness consistent with approved post-mining use.	Mining site	AAC § R11-2-704	Relevant and appropriate	Regrading shall occur in an appropriate manner.

Notes:

AAC = Arizona Administrative Code

ARAR = applicable or relevant and appropriate requirement

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

§ = Section

Table 13. Screening of Potential General Response Actions and Technologies

Response Action	Technology and Process	Description	Screening Summary
1. No Action	None	None	Retained; required by CERCLA
2. Institutional Controls	▪ Legal and administrative mechanisms	▪ Closure order	Retained because: ▪ Protective of human health ▪ Effective, easily implementable
3. In-Situ Treatment	▪ In-situ mixing with binders ▪ Biologic treatment	▪ In-drum mixing with binding agents is used as a small-batch treatment for asbestos ▪ "Bioweathering" using fungi or lichen has been tested at the laboratory scale, but not used full scale	Not retained because: ▪ Small-batch mixing not practical ▪ Bioweathering not proven effective outside of laboratory; requires containerizing bio treatment so nonnative species are not introduced to the site
4. Engineering Controls	▪ Install signs at the site to warn of potential dangers and announce area closure ▪ Install fencing ▪ Road blocks ▪ Engineered repository or soil cap ▪ Close open adits ▪ Erosion controls	▪ Block roads to contaminated areas ▪ Install fences around accessible hazardous areas ▪ Excavate source material for placement in onsite repository ▪ Consolidate waste material in place ▪ Construct soil cap over repositories ▪ Seal adit openings or secure adits with bat closures	Retained because: ▪ Protective of human health and the environment ▪ Effective, easily implementable ▪ Meets RAOs
5. Offsite Disposal	▪ Remove source materials for disposal off site	▪ Excavate source materials ▪ Load source materials into dump trucks and transport to an offsite disposal facility	Retained because: ▪ Protective of human health and the environment ▪ Effective, easily implementable ▪ Meets RAOs

Notes: RAOs = remedial action objectives

Table 14. Comparative Analysis of Removal Action Alternatives

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional and Engineering Controls	Alternative 3A Excavation and Onsite Encapsulation of Source Materials from Subareas 1, 2, and 3	Alternative 3B Excavation and Onsite Encapsulation of Source Materials from Subareas 1 and 3, and Consolidation of Soil and Waste Materials and Cap In Place at Subarea 2	Alternative 4 Excavation and Offsite Disposal of Source Materials from Subareas 1, 2, and 3
Effectiveness	**Qualitative Ranking**				
Protection of Human Health and Environment	No	No	Yes	Yes	Yes
Compliance with ARARs and TBCs	NA	No	Yes	Yes	Yes
Long-Term Effectiveness	Low	Low	Moderate	Moderate	High
Short-Term Effectiveness	Low	Low	High	High	High
Achieves RAOs	No	No	Yes	Yes	Yes
Reduction of Toxicity, Mobility, and Volume through Treatment	Low	Low	Low	Low	Low
Implementability	**Qualitative Ranking**				
Technical Feasibility	High	High	High	High	Moderate
Administrative Feasibility	High	High	High	High	High
Availability of Services or Materials	NA	High	High	High	Moderate
Community and Regulatory Agency Acceptance	Low	Low	High	High	Moderate