Nevada Environmental Restoration Project



Corrective Action Decision Document/Closure Report for Corrective Action Unit 561: Waste Disposal Areas Nevada National Security Site, Nevada

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CORRECTIVE ACTION DECISION DOCUMENT/ CLOSURE REPORT FOR CORRECTIVE ACTION UNIT 561: WASTE DISPOSAL AREAS NEVADA NATIONAL SECURITY SITE, NEVADA

U.S. Department of Energy National Nuclear Security Administration Nevada Site Office Las Vegas, Nevada

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CORRECTIVE ACTION DECISION DOCUMENT/CLOSURE REPORT FOR CORRECTIVE ACTION UNIT 561: WASTE DISPOSAL AREAS NEVADA NATIONAL SECURITY SITE, NEVADA

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Environmental Restoration Project

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page i of xxiii

Table of Contents

List o	of Tables of Acrony	ms and At	breviations	x
1.0	Introd	uction		
	1.1 1.2 1.3	Scope.	CR Contents Applicab	
2.0	Correc	ctive Actio	n Investigati	ion Summary 8
	2.1	Investig 2.1.1		ties
			2.1.1.1 2.1.1.2 2.1.1.3 2.1.1.4 2.1.1.5	Geophysical Survey
		2.1.2	Waste D 2.1.2.1 2.1.2.2 2.1.2.3 2.1.2.4 2.1.2.5	ump and Burn Area (CAS 02-08-02)11Radiological Survey12Geophysical Survey12Visual Inspection12Sample Collection12Conceptual Site Model Validation13
		2.1.3	Debris P 2.1.3.1 2.1.3.2 2.1.3.3 2.1.3.4	ile (CAS 03-19-02).14Radiological Survey14Visual Inspection14Sample Collection14Conceptual Site Model Validation15
		2.1.4	Radioact 2.1.4.1 2.1.4.2 2.1.4.3 2.1.4.4 2.1.4.5	ive Gravel Pile (CAS 05-62-01)15Radiological Survey15Visual Inspection15Field Screening16Sample Collection16Conceptual Site Model Validation16
		2.1.5	Radioact 2.1.5.1 2.1.5.2 2.1.5.3	ive Waste Dump (CAS 12-23-09)

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page ii of xxiii

		2.1.5.4	Sample Collection
		2.1.5.5	Conceptual Site Model Validation
	2.1.6	Buried W	Vaste Disposal Site (CAS 22-19-06)
		2.1.6.1	Geophysical Survey
		2.1.6.2	Visual Inspection
		2.1.6.3	Sample Collection
		2.1.6.4	Conceptual Site Model Validation
	2.1.7	Waste Di	sposal Trenches (CAS 23-21-04)
		2.1.7.1	Geophysical Survey
		2.1.7.2	Visual Inspection
		2.1.7.3	Sample Collection
		2.1.7.4	Conceptual Site Model Validation
	2.1.8	Waste Du	imp (CAS 25-08-02)
		2.1.8.1	Radiological Survey
		2.1.8.2	Visual Inspection
		2.1.8.3	Sample Collection
		2.1.8.4	Conceptual Site Model Validation
	2.1.9	Radioacti	ve Waste Dump (CAS 25-23-21)
		2.1.9.1	Radiological Survey
		2.1.9.2	Geophysical Survey
		2.1.9.3	Visual Inspection
		2.1.9.4	Field Screening
		2.1.9.5	Sample Collection
		2.1.9.6	Conceptual Site Model Validation
	2.1.10	•	bon Stains and Trench (CAS 25-25-19)
		2.1.10.1	Radiological Survey
		2.1.10.2	Geophysical Survey
		2.1.10.3	Visual Inspection
		2.1.10.4	Sample Collection
		2.1.10.5	Conceptual Site Model Validation
2.2			
	2.2.1		of Analytical Data
		2.2.1.1	CAS 01-19-01, Waste Dump
		2.2.1.2	CAS 02-08-02, Waste Dump and Burn Area 29
		2.2	.1.2.1 Waste Dump Environmental
			Sample Results
		2.2	.1.2.2 Burn Area Environmental
			Sample Results
		2.2.1.3	CAS 03-19-02, Debris Pile
		2.2.1.4	CAS 05-62-01, Radioactive Gravel Pile 30
		2.2.1.5	CAS 12-23-09, Radioactive Waste Dump

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page iii of xxiii

	2.3	2.2.1.6 CAS 22-19-06, Buried Waste Disposal Site 33 2.2.1.7 CAS 23-21-04, Waste Disposal Trenches 33 2.2.1.8 CAS 25-08-02, Waste Dump 35 2.2.1.9 CAS 25-23-21, Radioactive Waste Dump 37 2.2.1.10 CAS 25-25-19, Hydrocarbon Stains and Trench 37 2.2.2 Data Assessment Summary 39 Justification for No Further Action 40 2.3.1 Final Action Levels 41			
3.0	Recom	mendation			
4.0	Refere	nces			
1.0	ROTOTO				
Apper	ndix A -	Corrective Action Investigation Results			
A.1.0	Introdu	ction			
	A.1.1 A.1.2	Project Objectives			
A.2.0	Investigation Overview				
	A.2.1 A.2.2 A.2.3	Sample LocationsA-5Investigation ActivitiesA-5A.2.2.1 Radiological SurveysA-6A.2.2.2 Geophysical SurveysA-6A.2.2.3 Field ScreeningA-6A.2.2.4 Surface and Subsurface Soil SamplingA-7A.2.2.5 Waste Characterization SamplingA-7Laboratory Analytical InformationA-8			
	A.2.4	Comparison to Action Levels			
A.3.0	CAS 0	I-19-01, Waste Dump			
	A.3.1	Corrective Action Investigation.A-11A.3.1.1Radiological SurveysA-11A.3.1.2Geophysical SurveysA-11A.3.1.3Visual InspectionsA-11A.3.1.4Sample CollectionA-13A.3.1.5DeviationsA-14			
	A.3.2	Investigation Results			

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page iv of xxiii

	A.3.3 A.3.4	A.3.2.5 A.3.2.6 Nature and	RCRA Metals, Beryllium, and Hexavalent Chromium	. A-17 . A-17 . A-17
A.4.0	CAS 02	-08-02, Was	te Dump and Burn Area	. A-18
	A.4.1	Corrective A	Action Investigation	. A-18
		A.4.1.1	Radiological Surveys	. A-18
			Geophysical Surveys	
		A.4.1.3	Visual Inspections	. A-27
		A.4.1.4	Sample Collection	. A-27
		A.4.1.5	Deviations	. A-30
	A.4.2		on Results	
		A.4.2.1	Volatile Organic Compounds	. A-30
		A.4.2.2	Semivolatile Organic Compounds	. A-31
		A.4.2.3	Total Petroleum Hydrocarbons	. A-31
		A.4.2.4	RCRA Metals, Beryllium, and Hexavalent Chromium	. A-35
			Polychlorinated Biphenyls	
			Dioxins	
			Gamma-Emitting Radionuclides	
	A.4.3	Nature and	Extent of Contamination	. A-35
	A.4.4	Revised Co	nceptual Site Model	. A-41
A.5.0	CAS 03	-19-02, Debi	ris Pile	. A-42
	A.5.1	Corrective A	Action Investigation	. A-42
			Radiological Surveys	
			Visual Inspections	
			Sample Collection	
			Deviations	
	A.5.2	Investigatio	on Results	. A-45
		A.5.2.1	Gamma-Emitting Radionuclides	. A-45
		A.5.2.2	Potential Source Material	. A-46
	A.5.3	Nature and	Extent of Contamination	. A-47
	A.5.4	Revised Co	nceptual Site Model	. A-47
A.6.0	CAS 05	-62-01, Radi	ioactive Gravel Pile	. A-48
	A.6.1	Corrective	Action Investigation	A_48
	11.0.1		Field Screening	
			Radiological Surveys	
			Visual Inspections	

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page v of xxiii

		A.6.1.4	Sample Collection	A-50
		A.6.1.5	Deviations	A-51
	A.6.2	Investigati	on Results	A-51
		A.6.2.1	Gamma-Emitting Radionuclides	A-52
		A.6.2.2	Plutonium and Uranium Isotopes, and Strontium-90	
	A.6.3	Nature and	d Extent of Contamination	A-53
	A.6.4	Revised C	onceptual Site Model	A-53
A.7.0	CAS 12	2-23-09, Rad	dioactive Waste Dump	A-54
	A.7.1	Corrective	Action Investigation	A-54
		A.7.1.1	Radiological Surveys	
		A.7.1.2	Geophysical Surveys	
		A.7.1.3	Visual Inspections	
		A.7.1.4	Sample Collection	
		A.7.1.5	Deviations	
	A.7.2	Investigati	ion Results	
		A.7.2.1	Volatile Organic Compounds	
		A.7.2.2	Semivolatile Organic Compounds	
		A.7.2.3	Total Petroleum Hydrocarbons	
		A.7.2.4	RCRA Metals, Beryllium, and Hexavalent Chromium	
		A.7.2.5	Polychlorinated Biphenyls	
		A.7.2.6	Gamma-Emitting Radionuclides	
	A.7.3	Nature and	d Extent of Contamination	
	A.7.4		onceptual Site Model	
A.8.0	CAS 22	2-19-06, Bu	ried Waste Disposal Site	A-64
	A.8.1	Corrective	Action Investigation	A-64
	111011	A.8.1.1	Geophysical Surveys	
		A.8.1.2	Visual Inspections	
		A.8.1.3	Sample Collection	
		A.8.1.4	Deviations	
	A.8.2		ion Results	
		A.8.2.1	Volatile Organic Compounds	
		A.8.2.2	Semivolatile Organic Compounds	
		A.8.2.3	Total Petroleum Hydrocarbons	
		A.8.2.4	RCRA Metals, Beryllium, and Hexavalent Chromium	
		A.8.2.5	Polychlorinated Biphenyls	
		A.8.2.6	Gamma-Emitting Radionuclides	
	A.8.3		d Extent of Contamination	
	A.8.4		onceptual Site Model.	

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page vi of xxiii

A.9.0	CAS 23	3-21-04, Waste Disposal Trenches	A-71
	A.9.1	Corrective Action Investigation	A-71
		A.9.1.1 Geophysical Surveys	
		A.9.1.2 Visual Inspections	
		A.9.1.3 Sample Collection	
		A.9.1.4 Deviations	
	A.9.2	Investigation Results	
		A.9.2.1 Volatile Organic Compounds	
		A.9.2.2 Semivolatile Organic Compounds	
		A.9.2.3 Total Petroleum Hydrocarbons	A-80
		A.9.2.4 RCRA Metals, Beryllium, and Hexavalent Chromium	A-80
		A.9.2.5 Polychlorinated Biphenyls	
		A.9.2.6 Gamma-Emitting Radionuclides	
	A.9.3	Nature and Extent of Contamination	
	A.9.4	Revised Conceptual Site Model	A-86
A.10.0	CAS 25	5-08-02, Waste Dump	A-87
	A.10.1	Corrective Action Investigation.	A-87
		A.10.1.1 Radiological Surveys	
		A.10.1.2 Visual Inspections	
		A.10.1.3 Sample Collection	
		A.10.1.4 Deviations	A-92
	A.10.2	Investigation Results	A-92
		A.10.2.1 Volatile Organic Compounds	A-93
		A.10.2.2 Semivolatile Organic Compounds	A-93
		A.10.2.3 Total Petroleum Hydrocarbons	A-94
		A.10.2.4 RCRA Metals, Beryllium, and Hexavalent Chromium	A-94
		A.10.2.5 Polychlorinated Biphenyls	A-97
		A.10.2.6 Gamma-Emitting Radionuclides	A-97
	A.10.3	Nature and Extent of Contamination	A-97
	A.10.4	Revised Conceptual Site Model.	A-98
A.11.0	CAS 25	7-23-21, Radioactive Waste Dump	A-99
	A.11.1	Corrective Action Investigation	A-99
		A.11.1.1 Field Screening	A-99
		A.11.1.2 Radiological Surveys	
		A.11.1.3 Geophysical Surveys	A-106
		A.11.1.4 Visual Inspections	
		A.11.1.5 Sample Collection	A-107
		A 11 1.6 Deviations	

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page vii of xxiii

	A.11.2	Investigati	ion Results	A-108
		A.11.2.1	Volatile Organic Compounds	A-109
		A.11.2.2	Semivolatile Organic Compounds	
		A.11.2.3	Total Petroleum Hydrocarbons	A-111
		A.11.2.4	RCRA Metals, Beryllium, and Hexavalent Chromium.	A- 111
		A.11.2.5	Polychlorinated Biphenyls	A-115
		A.11.2.6	Gamma-Emitting Radionuclides	A-115
		A.11.2.7	Potential Source Material	A-118
	A.11.3	Nature and	d Extent of Contamination	A-119
	A.11.4		Conceptual Site Model	
A.12.0	CAS 25	-25-19, Hy	drocarbon Stains and Trench	A-120
	A.12.1	Corrective	e Action Investigation	A-120
		A.12.1.1	Radiological Surveys	A-120
		A.12.1.2	Geophysical Surveys	A-120
		A.12.1.3	Visual Inspections	
		A.12.1.4	Sample Collection	
		A.12.1.5	Deviations	A-126
	A.12.2	Investigati	ion Results	A-126
		A.12.2.1	Volatile Organic Compounds	
		A.12.2.2	Semivolatile Organic Compounds	
		A.12.2.3	Total Petroleum Hydrocarbons	
		A.12.2.4	RCRA Metals, Beryllium, and Hexavalent Chromium.	
		A.12.2.5	Polychlorinated Biphenyls	
		A.12.2.6	Gamma-Emitting Radionuclides	
	A.12.3	Nature and	d Extent of Contamination	
	A.12.4		Conceptual Site Model	
A.13.0	Waste N	Managemen	ıt	A-133
	A.13.1	Waste Min	nimization	A-133
	A.13.2	Waste Ger	neration	A-133
		A.13.2.1	Industrial Waste	A-134
		A.13.2.2	Hydrocarbon-Impacted Waste	A-137
		A.13.2.3	Low-Level Radioactive Waste	
		A.13.2.4	Recyclable Materials	
	A.13.3	Waste Cha	aracterization and Disposal	
		A.13.3.1	CAS 02-08-02, Waste Dump and Burn Area	
		A.13.3.2	CAS 23-21-04, Waste Disposal Trenches	
		A.13.3.3	CAS 25-08-02, Waste Dump	
		A.13.3.4	CAS 25-23-21, Radioactive Waste Dump	
			CAS 25-25-19. Hydrocarbon Stains and Trench	

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page viii of xxiii

A.14.0	Quality	Assurance			
	A.14.1	Data Vali A.14.1.1 A.14.1.2 A.14.1.3	dationA-145Tier I EvaluationA-145Tier II EvaluationA-146Tier III EvaluationA-148		
	A.14.2	_	Samples		
	A.14.3 A.14.4		prepancies		
A.15.0	Summa	ry			
A.16.0	Referen	ices			
Appen	ndix B - I	Data Assess	sment		
B.1.0	Data Assessment				
	B.1.1	Review D B.1.1.1	PQOs and Sampling Design. B-2 Decision I. B-2 B.1.1.1.1 DQO Provisions To Limit		
			False Negative Decision Error		
			False Positive Decision ErrorB-10		
		B.1.1.2	Decision II		
			False Negative Decision Error		
		B.1.1.3	False Positive Decision Error		
	B.1.2		a Preliminary Data Review		
	B.1.3		Test and Identify Key Assumptions		
	B.1.4	B.1.4.1	e Assumptions		
	B.1.5		aclusions from the Data		
	2.1.0	B.1.5.1	Decision Rules for Decision I		
		B.1.5.2	Decision Rules for Decision II		
R 2 0	Referen	ices	R_10		

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page ix of xxiii

Appen	ndix C - F	Risk Assessment
C.1.0	Risk As	sessment
	C.1.1 C.1.2 C.1.3 C.1.4 C.1.5 C.1.6 C.1.7	A. Scenario
	C.1.8 C.1.9	I. Tier 2 and Tier 3 Evaluation
C.2.0	Recomr	mendations
C.3.0	Referen	ces
Appen	ndix D - C	Closure Activity Summary
D.1.0	Closure	Activity Summary
	D.1.1 D.1.2 D.1.3 D.1.4 D.1.5	CAS 02-08-02 Closure ActivitiesD-1CAS 23-21-04 Closure ActivitiesD-4CAS 25-08-02 Closure ActivitiesD-5CAS 25-23-21 Closure ActivitiesD-9CAS 25-25-19 Closure ActivitiesD-12
D.2.0	Referen	ces
Attach	nment D-	1 - Use Restriction
Appen	ndix E - S	ample Location Coordinates
E.1.0	Sample	Location Coordinates
Appen	ndix F - V	Vaste Disposition Documents
Appen	ndix G - N	Nevada Division of Environmental Protection Comments

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page x of xxiii

List of Figures

Number	Title	Page
1-1	Nevada National Security Site.	2
1-2	CAU 561, CAS Location Map	3
A.3-1	Sample Locations at CAS 01-19-01, Waste Dump	A-12
A.3-2	Building Foundation with Red Bricks at CAS 01-19-01, Waste Dump	A-14
A.4-1	Sample Locations at CAS 02-08-02, Waste Dump and Burn Area	A-19
A.4-2	Geophysical Survey Showing Sample Locations at the Burn Area CAS 02-08-02, Waste Dump and Burn Area	A-26
A.4-3	Crushed 30-Gal Grease Drum Discovered in Waste Pile CAS 02-08-02, Waste Dump and Burn Area	A-27
A.5-1	Sample Locations at CAS 03-19-02, Debris Pile	A-43
A.5-2	Sample Location C02 at CAS 03-19-02, Debris Pile	A-44
A.6-1	Sample Locations at CAS 05-62-01, Radioactive Gravel Pile	A-49
A.6-2	Gravel Pile Showing Area of Elevated Radioactivity CAS 05-62-01, Radioactive Gravel Pile	A-51
A.7-1	Sample Locations at CAS 12-23-09, Radioactive Waste Dump	A-55
A.7-2	Sample Location E07 at Soil Mound CAS 12-23-09, Radioactive Waste Dump	A-56
A.8-1	Sample Locations at CAS 22-19-06, Buried Waste Disposal Site	A-66
A.8-2	Metal Conduit Pipe at CAS 22-19-06, Buried Waste Disposal Site	A-67
A.9-1	Sample Locations at CAS 23-21-04, Waste Disposal Trenches	A-72
A.9-2	Debris in Trench 6, Pre-excavation CAS 23-21-04, Waste Disposal Trenches	A-75

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page xi of xxiii

List of Figures (Continued)

Number	Title	Page
A.9-3	Debris in Trench 3, Post-excavation CAS 23-21-04, Waste Disposal Trenches	A-76
A.10-1	Sample Locations at CAS 25-08-02, Waste Dump	A-88
A.10-2	Concrete-like Pile at CAS 25-08-02, Waste Dump	A-91
A.10-3	Batteries and Debris at CAS 25-08-02, Waste Dump	A-91
A.11-1	Location of CAS 25-23-21, Radioactive Waste Dump	A-100
A.11-2	Sample Locations at the Waste Dump CAS 25-23-21, Radioactive Waste Dump	A-101
A.11-3	Sample Locations at the Second Parcel CAS 25-23-21, Radioactive Waste Dump	A-102
A.11-4	Contaminated Pipe Waste Dump CAS 25-23-21, Radioactive Waste Dump	A-105
A.11-5	Biased Sample Location at Second Parcel CAS 25-23-21, Radioactive Waste Dump	A-106
A.12-1	Sample Locations at CAS 25-25-19, Hydrocarbon Stains and Trench	A-121
A.12-2	North Trench Sample Locations CAS 25-25-19, Hydrocarbon Stains and Trench	A-124
A.12-3	Asphalt and Stained Soil in North Trench CAS 25-25-19, Hydrocarbon Stains and Trench	A-125
C.1-1	Risk-Based Corrective Action Decision Process	C-2
D.1-1	CAS 02-08-02, Waste Dump and Burn Area, Area Where Lead Was Removed with Backhoe	D-3

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page xii of xxiii

List of Figures (Continued)

Number	Title	Page
D.1-2	CAS 02-08-02, Waste Dump and Burn Area, Melted Lead Temporarily Staged on Wooden Pallet	D-3
D.1-3	CAS 02-08-02, Waste Dump and Burn Area, Melted Lead Staged and Wrapped on Metal Pallet	D-4
D.1-4	CAS 23-21-04, Waste Disposal Trenches, Debris Removal from Trench 3	D-6
D.1-5	CAS 23-21-04, Waste Disposal Trenches, Front-end Loader Backfilling Trench	D-6
D.1-6	CAS 23-21-04, Waste Disposal Trenches, Trenches 3, 5, and 6 Backfilled	D-7
D.1-7	CAS 25-08-02, Waste Dump, Bulldozed Arsenic-Contaminated Pile and Verification Sample Locations	D-8
D.1-8	CAS 25-08-02, Waste Dump, Debris Piles Being Loaded Out	D-8
D.1-9	CAS 25-08-02, Waste Dump, Debris Piles Removed	D-9
D.1-10	CAS 25-23-21, Radioactive Waste Dump, RMA Soil Piles	. D-10
D.1-11	CAS 25-23-21, Radioactive Waste Dump, Leveling of Soil Piles	. D-11
D.1-12	CAS 25-23-21, Radioactive Waste Dump, Excavation of RMA, Soil Disposed of in Lined Intermodal	. D-11
D.1-13	CAS 25-23-21, Radioactive Waste Dump, Southern RMA Backfilled	. D-12
D.1-14	CAS 25-25-19, Hydrocarbon Stains and Trench, Staged Debris near North Trench	. D-13
D.1-15	CAS 25-25-19, Hydrocarbon Stains and Trench, North Trench Cleared of Debris	D-13

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page xiii of xxiii

List of Tables

Number	Title	Page
2-1	Maximum Detected Sample Results for CAS 01-19-01, Waste Dump	29
2-2	Maximum Detected Sample Results for CAS 02-08-02, Waste Dump and Burn Area	31
2-3	Maximum Detected Sample Results for CAS 03-19-02, Debris Pile	32
2-4	Maximum Detected Sample Results for CAS 05-62-01, Radioactive Gravel Pile	33
2-5	Maximum Detected Sample Results for CAS 12-23-09, Radioactive Waste Dump	34
2-6	Maximum Detected Sample Results for CAS 22-19-06, Buried Waste Disposal Site	35
2-7	Maximum Detected Sample Results for CAS 23-21-04, Waste Disposal Trenches	36
2-8	Maximum Detected Sample Results for CAS 25-08-02, Waste Dump	37
2-9	Maximum Detected Sample Results for CAS 25-23-21, Radioactive Waste Dump	38
2-10	Maximum Detected Sample Results for CAS 25-25-19, Hydrocarbon Stains and Trench	39
A.2-1	CAI Activities Conducted at Each CAS To Meet CAIP Requirements for CAU 561	A-4
A.2-2	Laboratory Analyses and Methods, CAU 561 Investigation Samples	A-8
A.3-1	Samples Collected at CAS 01-19-01, Waste Dump	A-13
A.3-2	Sample Results for TPH-DRO at CAS 01-19-01, Waste Dump	A-16

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page xiv of xxiii

Number	Title	Page
A.3-3	Sample Results for Metals Detected above MDCs at CAS 01-19-01, Waste Dump	A-16
A.3-4	Sample Results for Gamma-Emitting Radionuclides Detected above MDC at CAS 01-19-01, Waste Dump	A-17
A.4-1	Samples Collected at CAS 02-08-02, Waste Dump and Burn Area	A-20
A.4-2	Sample Results for VOCs Detected above MDC at CAS 02-08-02, Waste Dump and Burn Area	A-31
A.4-3	Sample Results for SVOCs Detected above MDCs at CAS 02-08-02, Waste Dump and Burn Area	A-32
A.4-4	Sample Results for TPH-DRO at CAS 02-08-02, Waste Dump and Burn Area	A-34
A.4-5	Sample Results for Metals Detected above MDCs at CAS 02-08-02, Waste Dump and Burn Area	A-36
A.4-6	Sample Results for PCBs Detected above MDCs at CAS 02-08-02, Waste Dump and Burn Area	A-39
A.4-7	Sample Results for Gamma-Emitting Radionuclides Detected above MDCs at CAS 02-08-02, Waste Dump and Burn Area	A-39
A.5-1	Samples Collected at CAS 03-19-02, Debris Pile	A-42
A.5-2	Sample Results for Gamma-Emitting Radionuclides Detected above MDCs at CAS 03-19-02, Debris Pile	A-46
A.5-3	PSM Results Detected above MDCs for CAS 03-19-02, Debris Pile	A-46
A.6-1	Samples Collected at CAS 05-62-01, Radioactive Gravel Pile	A-50
A.6-2	Sample Results for Gamma-Emitting Radionuclides Detected above MDCs at CAS 05-62-01. Radioactive Gravel Pile	A-52

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page xv of xxiii

Number	Title	Page
A.6-3	Sample Results for Isotopes Detected above MDC s at CAS 05-62-01, Radioactive Gravel Pile	A-53
A.7-1	Samples Collected at CAS 12-23-09, Radioactive Waste Dump	A-56
A.7-2	Sample Results for VOCs Detected above MDCs at CAS 12-23-09, Radioactive Waste Dump	A-58
A.7-3	Sample Results for SVOCs Detected above MDC at CAS 12-23-09, Radioactive Waste Dump	A-59
A.7-4	Sample Results for TPH-DRO at CAS 12-23-09, Radioactive Waste Dump	A-60
A.7-5	Sample Results for Metals Detected above MDCs at CAS 12-23-09, Radioactive Waste Dump	A-61
A.7-6	Sample Results for PCBs Detected above MDC at CAS 12-23-09, Radioactive Waste Dump	A-62
A.7-7	Sample Results for Gamma-Emitting Radionuclides Detected above MDCs at CAS 12-23-09, Radioactive Waste Dump	A-63
A.8-1	Samples Collected at CAS 22-19-06, Buried Waste Disposal Site	A-64
A.8-2	Sample Results for TPH-DRO at CAS 22-19-06, Buried Waste Disposal Site	A-69
A.8-3	Sample Results for Metals Detected above MDCs at CAS 22-19-06, Buried Waste Disposal Site	A-69
A.8-4	Sample Results for Gamma-Emitting Radionuclides Detected above MDC at CAS 22-19-06, Buried Waste Disposal Site	A-70
A.9-1	Samples Collected at CAS 23-21-04, Waste Disposal Trenches	A-73
A.9-2	Sample Results for VOCs Detected above MDCs at CAS 23-21-04. Waste Disposal Trenches	A-79

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page xvi of xxiii

Number	Title	Page
A.9-3	Sample Results for SVOCs Detected above MDCs at CAS 23-21-04, Waste Disposal Trenches	A-80
A.9-4	Sample Results for TPH-DRO Detected at CAS 23-21-04, Waste Disposal Trenches	A-81
A.9-5	Sample Results for Metals Detected above MDCs at CAS 23-21-04, Waste Disposal Trenches	A-82
A.9-6	Sample Results for PCBs Detected above MDC at CAS 23-21-04, Waste Disposal Trenches	A-85
A.9-7	Sample Results for Gamma-Emitting Radionuclides Detected above MDCs at CAS 23-21-04, Waste Disposal Trenches	A-85
A.10-1	Samples Collected at CAS 25-08-02, Waste Dump	A-89
A.10-2	Sample Results for VOCs Detected above MDCs at CAS 25-08-02, Waste Dump	A-93
A.10-3	Samples Results for SVOCs Detected above MDCs at CAS 25-08-02, Waste Dump	A-93
A.10-4	Sample Results for TPH-DRO Detected at CAS 25-08-02, Waste Dump	A-94
A.10-5	Sample Results for Metals Detected above MDCs at CAS 25-08-02, Waste Dump	A-95
A.10-6	Samples Results for PCBs Detected above MDC at CAS 25-08-02, Waste Dump	A-97
A.10-7	Sample Results for Gamma-Emitting Radionuclides Detected above MDCs at CAS 25-08-02, Waste Dump	A-98
A.11-1	Samples Collected at CAS 25-23-21, Radioactive Waste Dump	A-103

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page xvii of xxiii

Number	Title	Page
A.11-2	Sample Results for VOCs Detected above MDC at CAS 25-23-21, Radioactive Waste Dump	. A-109
A.11-3	Sample Results for SVOCs Detected above MDCs at CAS 25-23-21, Radioactive Waste Dump	. A-110
A.11-4	Sample Results for TPH-DRO Detected at CAS 25-23-21, Radioactive Waste Dump	. A-111
A.11-5	Sample Results for Metals Detected above MDCs at CAS 25-23-21, Radioactive Waste Dump	. A-112
A.11-6	Sample Results for PCBs Detected above MDCs at CAS 25-23-21, Radioactive Waste Dump	. A-115
A.11-7	Sample Results for Gamma-Emitting Radionuclides Detected above MDCs at CAS 25-23-21, Radioactive Waste Dump	. A-116
A.11-8	PSM Results Detected above MDCs for CAS 25-23-21, Radioactive Waste Dump	. A-118
A.12-1	Samples Collected at CAS 25-25-19, Hydrocarbon Stains and Trench	. A-122
A.12-2	Sample Results for VOCs Detected above MDCs at CAS 25-25-19, Hydrocarbon Stains and Trench	. A-127
A.12-3	Sample Results for SVOCs Detected above MDC at CAS 25-25-19, Hydrocarbon Stains and Trench	. A-127
A.12-4	Sample Results for TPH-DRO Detected at CAS 25-25-19, Hydrocarbon Stains and Trench	. A-128
A.12-5	Sample Results for Metals Detected above MDCs at CAS 25-25-19, Hydrocarbon Stains and Trench	. A-129
A.12-6	Sample Results for PCBs Detected above MDC at CAS 25-25-19, Hydrocarbon Stains and Trench	. A-131

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page xviii of xxiii

Number	Title	Page
A.12-7	Sample Results for Gamma-Emitting Radionuclides Detected above MDCs at CAS 25-25-19, Hydrocarbon Stains and Trench	A-132
A.13-1	CAU 561 Waste Disposal Summary	A-135
A.13-2	Waste Characterization Results at CAS 23-21-04, Waste Disposal Trenches	A-140
A.13-3	Waste Characterization Results at CAS 25-08-02, Waste Dump	A- 141
A.13-4	Waste Characterization Results at CAS 25-23-21, Radioactive Waste Dump	A-142
A.13-5	Waste Characterization Results at CAS 25-25-19, Hydrocarbon Stains and Trench	A- 144
B.1-1	CAU 561 Analyses Performed	. B-4
B.1-2	Analytes Failing Sensitivity Criteria	. B-4
B.1-3	Precision Measurements	. B-5
B.1-4	Accuracy Measurements	. B-6
B.1-5	Rejected Measurements	B-8
B.1-6	Key Assumptions	B-15
C.1-1	Maximum Reported Value for Tier 1 Comparison	C-7
C.1-2	COPCs Detected above PALs.	. C-13
E 1-1	Sample Location Coordinates for CAU 561	F-1

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page xix of xxiii

List of Acronyms and Abbreviations

Ac Actinium

Am Americium

amsl Above mean sea level

ASTM ASTM International

bgs Below ground surface

BOL Bill of lading

BMP Best management practice

CAA Corrective action alternative

CADD Corrective action decision document

CAI Corrective action investigation

CAIP Corrective action investigation plan

CAS Corrective action site

CAU Corrective action unit

CD Certificate of Disposal

CLP Contract Laboratory Program

Co Cobalt

COC Contaminant of concern

COPC Contaminant of potential concern

CR Closure report

Cs Cesium

CSM Conceptual site model

DOE U.S. Department of Energy

dpm/100cm² Disintegrations per minute per 100 square centimeters

DQA Data quality assessment

DQI Data quality indicator

DQO Data quality objective

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page xx of xxiii

List of Acronyms and Abbreviations (Continued)

DRO Diesel-range organics

E-MAD Engine Maintenance, Assembly, and Disassembly

EML Environmental Measurements Laboratory

EPA U.S. Environmental Protection Agency

Eu Europium

FADL Field activity daily log

FAL Final action level

FD Field duplicate

FFACO Federal Facility Agreement and Consent Order

FI Field Instruction

FSL Field-screening level

FSR Field-screening result

ft Foot

gal Gallon

GPS Global Positioning System

HASL Health and Safety Laboratory

HWSU Hazardous waste storage unit

ID Identification

IDW Investigation-derived waste

in. Inch

lb Pound

LCS Laboratory control sample

LLW Low-level waste

LVF Landfill Load Verification Form

m Meter

MDC Minimum detectable concentration

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page xxi of xxiii

List of Acronyms and Abbreviations (Continued)

mg/kg Milligrams per kilogram

mg/L Milligrams per liter

MS Matrix spike

MSD Matrix spike duplicate

mV Millivolt

N/A Not applicable

NAC Nevada Administrative Code

NAD North American Datum

Nb Niobium

NCRP National Council on Radiation Protection and Measurements

NDEP Nevada Division of Environmental Protection

NIOSH National Institute for Occupational Safety and Health

NIST National Institute of Standards and Technology

NNSA/NSO U.S. Department of Energy, National Nuclear Security Administration

Nevada Site Office

NNSS Nevada National Security Site

NSI Native soil interface

PAH Polyaromatic hydrocarbon

PAL Preliminary action level

PB Preparation blank

PCB Polychlorinated biphenyl

pCi/g Picocuries per gram

PID Photoionization detector

POC Performance objective criteria

PPE Personal protective equipment

ppm Parts per million

PSDR Package, Storage, and Disposal Request

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page xxii of xxiii

List of Acronyms and Abbreviations (Continued)

PSM Potential source material

Pu Plutonium

QA Quality assurance

QAPP Quality Assurance Project Plan

QC Quality control

RBCA Risk-based corrective action

RBSL Risk-based screening level

RCP Reactor Control Point

RCRA Resource Conservation and Recovery Act

RMA Radioactive material area

R-MAD Reactor Maintenance, Assembly, and Disassembly

ROTC Record of Technical Change

RPD Relative percent difference

RSL Regional Screening Level

SCL Sample collection log

SDG Sample delivery group

Sr Strontium

SSTL Site-specific target level

SVOC Semivolatile organic compound

TBD To be determined

TCLP Toxicity characteristic leaching procedure

Th Thorium

TPH Total petroleum hydrocarbons

TSCA Toxic Substances Control Act

U Uranium

UCL Upper confidence level

CAU 561 CADD/CR Section: Contents Revision: 0 Date: August 2011 Page xxiii of xxiii

List of Acronyms and Abbreviations (Continued)

UR Use restriction

UTM Universal Transverse Mercator

VOC Volatile organic compound

VSP Visual Sample Plan

yd³ Cubic yard

%R Percent recovery

CAU 561 CADD/CR Executive Summary Revision: 0 Date: August 2011 Page ES-1 of ES-3

Executive Summary

This Corrective Action Decision Document/Closure Report has been prepared for Corrective Action Unit (CAU) 561, Waste Disposal Areas, at the Nevada National Security Site, Nevada, in accordance with the *Federal Facility Agreement and Consent Order* (FFACO). Corrective Action Unit 561 comprises 10 corrective action sites (CASs):

- 01-19-01, Waste Dump
- 02-08-02, Waste Dump and Burn Area
- 03-19-02, Debris Pile
- 05-62-01, Radioactive Gravel Pile
- 12-23-09, Radioactive Waste Dump
- 22-19-06, Buried Waste Disposal Site
- 23-21-04, Waste Disposal Trenches
- 25-08-02, Waste Dump
- 25-23-21, Radioactive Waste Dump
- 25-25-19, Hydrocarbon Stains and Trench

The purpose of this Corrective Action Decision Document/Closure Report is to provide justification and documentation supporting the recommendation for closure of CAU 561 with no further corrective action. To achieve this, corrective action investigation (CAI) activities were performed from August 2, 2010, through June 28, 2011, as set forth in the *Corrective Action Investigation Plan* (CAIP) *for Corrective Action Unit 561: Waste Disposal Areas, Nevada Test Site, Nevada*, and Record of Technical Change No. 1 to the CAIP. The purpose of the CAI was to fulfill the following data needs as defined during the data quality objective (DQO) process:

- Determine whether contaminants of concern (COCs) are present.
- If COCs are present, determine their nature and extent.
- Provide sufficient information and data to complete appropriate corrective actions.

The CAU 561 dataset from the investigation results was evaluated based on the data quality indicator parameters. This evaluation demonstrated the quality and acceptability of the dataset for use in fulfilling the DQO data needs.

CAU 561 CADD/CR Executive Summary Revision: 0 Date: August 2011 Page ES-2 of ES-3

Analytes detected during the CAI were evaluated against final action levels (FALs) established in this document. The following contaminants were determined to be present at concentrations exceeding their corresponding FALs:

- No contamination exceeding FALs was identified at CASs 01-19-01, 03-19-02, 05-62-01, 12-23-09, and 22-19-06.
- The surface and subsurface soil within the burn area at CAS 02-08-02 contains arsenic and lead above the FALs of 23 milligrams per kilogram (mg/kg) and 800 mg/kg, respectively. The surface and subsurface soil within the burn area also contains melted lead slag (potential source material [PSM]). The soil within the waste piles contains polyaromatic hydrocarbons (PAHs) above the FALs. The contamination within the burn area is spread throughout the area, as it was not feasible to remove all the PSM (melted lead), while at the waste piles, the contamination is confined to the piles.
- The surface and subsurface soils within Trenches 3 and 5 at CAS 23-21-04 contain arsenic and polychlorinated biphenyls (PCBs) above the FALs of 23 mg/kg and 0.74 mg/kg, respectively. The soil was removed from both trenches, and the soil that remains at this CAS does not contain contamination exceeding the FALs. Lead bricks and counterweights were also removed, and the soil below these items does not contain contamination that exceeds the FAL for lead.
- The concrete-like material at CAS 25-08-02 contains arsenic above the FAL of 23 mg/kg. This concrete-like material was removed, and the soil that remains at this CAS does not contain contamination exceeding the FALs. Lead-acid batteries were also removed, and the soil below the batteries does not contain contamination that exceeds the FAL for lead.
- The surface soils within the main waste dump at the posted southern radioactive material area (RMA) at CAS 25-23-21 contain cesium (Cs)-137 and PCBs above the FALs of 72.9 picocuries per gram (pCi/g) and 0.74 mg/kg, respectively. The soil was removed from the RMA, and the soil that remains at this CAS does not contain contamination exceeding the FALs.
- The surface and subsurface soils at CAS 25-25-19 do not contain contamination exceeding the FALs. In addition, lead bricks were removed, and the soil below these items does not contain contamination that exceeds the FAL for lead.

The following best management practices were implemented:

- Housekeeping debris at CASs 02-08-02, 23-21-04, 25-08-02, 25-23-21, and 25-25-19 was removed and disposed of.
- The open trenches at CAS 23-21-04 were backfilled.
- The waste piles at CAS 25-08-02 were removed and the area leveled to ground surface.
- The remaining waste piles at the main waste dump at CAS 25-23-21 were leveled to ground surface.

Therefore, the U.S. Department of Energy, National Nuclear Security Administration Nevada Site Office (NNSA/NSO) provides the following recommendations:

- No further action for CASs 01-19-01, 03-19-02, 05-62-01, 12-23-09, and 22-19-06.
- Closure in place with an FFACO use restriction (UR) at CAS 02-08-02 for the remaining PAH-, arsenic-, and lead-contaminated soil, and the melted lead PSM. The UR form and map have been filed in the NNSA/NSO Facility Information Management System, the FFACO database, and the NNSA/NSO CAU/CAS files.
- No further corrective action at CAS 23-21-04, as the lead bricks and counterweights (PSM) have been removed, and the COCs of arsenic and PCBs in soil have been removed.
- No further corrective action at CAS 25-08-02, as the COC of arsenic in soil has been removed, and the lead-acid batteries have been removed.
- No further corrective action at CAS 25-23-21, as the COCs of Cs-137 and PCBs in soil have been removed, and the cast-iron pipes have been removed and disposed of.
- No further corrective action at CAS 25-25-19, as the lead bricks (PSM) been removed.
- A Notice of Completion to the NNSA/NSO is requested from the Nevada Division of Environmental Protection for closure of CAU 561.
- Corrective Action Unit 561 should be moved from Appendix III to Appendix IV of the FFACO.

1.0 Introduction

This Corrective Action Decision Document (CADD)/Closure Report (CR) presents information supporting closure of Corrective Action Unit (CAU) 561, Waste Disposal Areas, Nevada National Security Site (NNSS), Nevada. The implemented corrective actions described in this document are in accordance with the *Federal Facility Agreement and Consent Order* (FFACO) (1996, as amended) that was agreed to by the State of Nevada; U.S. Department of Energy (DOE), Environmental Management; U.S. Department of Defense; and DOE, Legacy Management. The NNSS (formerly the Nevada Test Site) is approximately 65 miles northwest of Las Vegas, Nevada (Figure 1-1).

Corrective Action Unit 561 includes the 10 corrective action sites (CASs) that are shown on Figure 1-2 and listed below:

- 01-19-01, Waste Dump
- 02-08-02, Waste Dump and Burn Area
- 03-19-02, Debris Pile
- 05-62-01, Radioactive Gravel Pile
- 12-23-09, Radioactive Waste Dump
- 22-19-06, Buried Waste Disposal Site
- 23-21-04, Waste Disposal Trenches
- 25-08-02, Waste Dump
- 25-23-21, Radioactive Waste Dump
- 25-25-19, Hydrocarbon Stains and Trench

A detailed discussion of the history of this CAU is presented in the *Corrective Action Investigation Plan for Corrective Action Unit 561: Waste Disposal Areas, Nevada Test Site, Nevada* (NNSA/NSO, 2008). This document provides or references the specific information necessary to support closure of this CAU.

1.1 Purpose

This CADD/CR provides justification why no further corrective action is necessary based on the corrective actions implemented and the results of investigative activities that were conducted in accordance with the CAIP (NNSA/NSO, 2008).

CAU 561 CADD/CR Section: 1.0 Revision: 0 Date: August 2011 Page 2 of 45

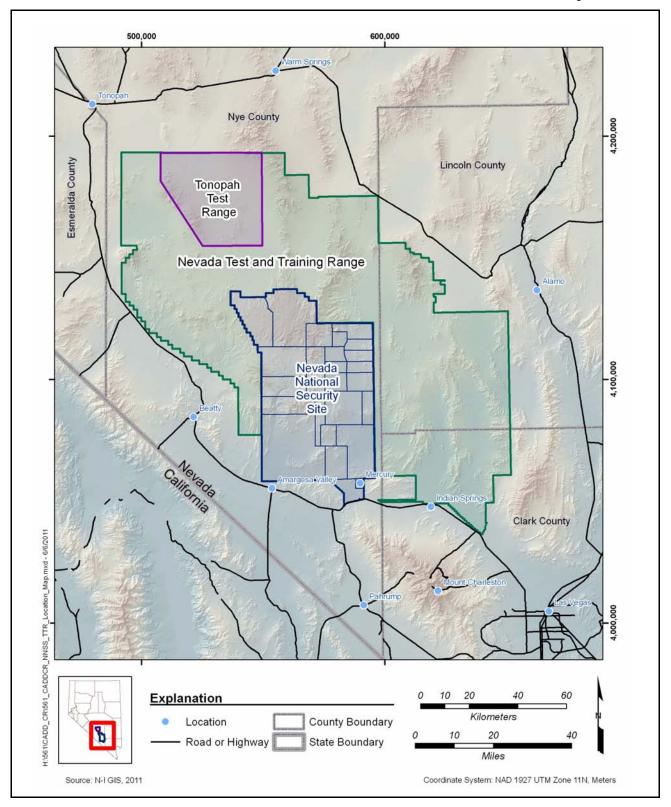


Figure 1-1
Nevada National Security Site

CAU 561 CADD/CR Section: 1.0 Revision: 0 Date: August 2011 Page 3 of 45

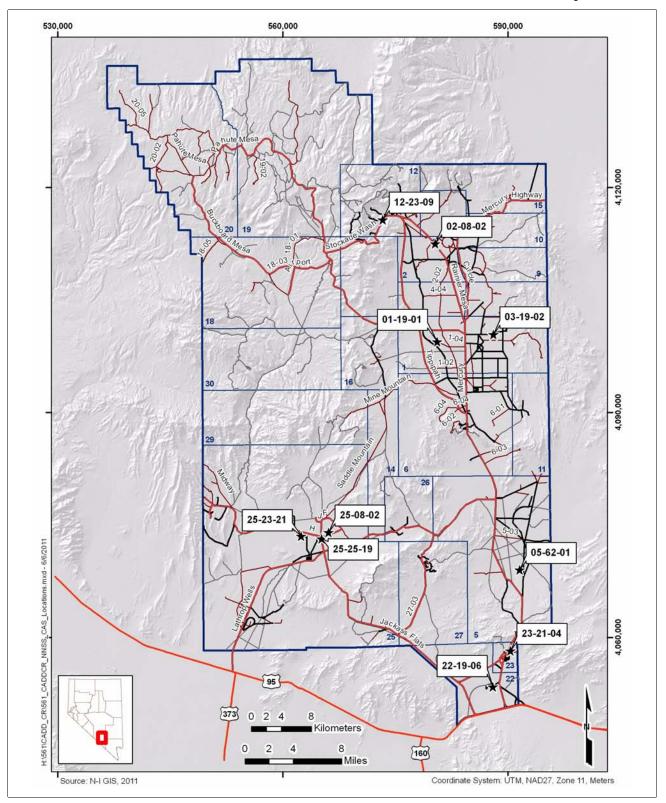


Figure 1-2 CAU 561, CAS Location Map

CAU 561 CADD/CR Section: 1.0 Revision: 0

Date: August 2011 Page 4 of 45

Corrective Action Unit 561, Waste Disposal Areas, comprises 10 inactive sites located in Areas 1, 2, 3, 5, 12, 22, 23, and 25. The 10 CASs within CAU 561 consist of various waste disposal areas, including trenches, piles, and buried dumps. Each CAS is summarized below:

- Corrective Action Site 01-19-01 is located in Area 1 and consists of a fenced area approximately 20 feet (ft) east of Building 1-31-2.e1. The CAS was originally identified as a subsurface waste dump, but a foundation from Building 31.1-b1, constructed for the Apple-2 test, was uncovered during excavation activities. Although there was visible debris on the ground surface consisting of concrete chunks, rebar, wood, and red bricks, the site was eliminated as a waste dump.
- Corrective Action Site 02-08-02 is located in the dry wash southeast of the Area 2 Camp, and consists of a waste dump and burn area. The waste dump contains piles of construction debris, including cables, wires, wooden planks, scrap metal, tires, and a crushed 30-gallon (gal) drum that contained a small amount of grease. The burn area, located northwest of the waste dump, contains scattered nails, scrap metal, pieces of charcoal wood, and melted lead.
- Corrective Action Site 03-19-02 is located in Area 3. It consists of a pile of concrete debris believed to be associated with the Pommard test, which was conducted on March 14, 1968. A large piece of concrete has Trinity glass adhered to its surface. The CAS is posted as a radioactive material area (RMA) and is posted accordingly; however, this site is not fenced.
- Corrective Action Site 05-62-01 consists of a radioactive gravel pile located approximately 1,000 ft west of the Gravel Gertie in Area 5. The pile contains visible concrete and metal debris, which is believed to be from the Gravel Gertie. The CAS is fenced and posted as an RMA.
- Corrective Action Site 12-23-09 is located approximately 150 ft northwest of Stockade Wash Road, just north of the E-Tunnel Road in Area 12. The CAS consists of two separate fenced areas (north and south) and was labeled as a radioactive waste dump on a topographic map; however, interviews with past employees suggest that the site was used as an electricians' laydown yard.
- Corrective Action Site 22-19-06 is located at the southeast end of Camp Desert Rock in Area 22 of the NNSS and consists of buried debris identified by a geophysical survey. Camp Desert Rock has been identified as eligible for inclusion in the National Register of Historic Places (Jones, 2010).
- Corrective Action Site 23-21-04 consists of six potential waste disposal trenches and one potential covered trench located approximately 1,500 ft northeast of Building 23-160 in Area 23. Three of the trenches contained debris (wood, metal, cables/wire, lead bricks and lead counterweights, nails, and bolts). There was also stained soil near two of the trenches.

CAU 561 CADD/CR Section: 1.0

Revision: 0 Date: August 2011 Page 5 of 45

• Corrective Action Site 25-08-02 is located north of G Road between the Reactor Control Point (RCP) and the Reactor Maintenance, Assembly, and Disassembly (R-MAD) complex in Area 25, and consists of a large waste dump. The waste dump consists of piles of construction debris, including concrete, metal, rebar, wood, batteries, 5-gal buckets, an empty cable spool, rusted cans, and pipes.

- Corrective Action Site 25-23-21 consists of a radioactive waste dump located within Topopah Wash, northeast of the Engine Maintenance, Assembly, and Disassembly (E-MAD) Facility in Area 25. A second parcel is upstream from the waste dump parcel within Topopah Wash and extends further upstream north of H Road. The waste dump contains numerous dirt mounds and piles within a posted "Controlled Area," along with miscellaneous piles extending up through Topopah Wash to H Road. Within the waste dump, there are two specific piles posted with "Caution Radioactive Material" signs. The second parcel contains typical waste piles, along with concrete, asphalt, and magnetite piles.
- Corrective Action Site 25-25-19 encompasses approximately 8 acres and is located southeast
 of the intersection of C Road and G Road, across from the RCP, in Area 25. The CAS
 consists of surface soil stains, a tar spill, an asphalt spill, a trench, concrete pads, debris, rock,
 and soil piles.

1.2 Scope

The scope of this CADD/CR is to justify that no further corrective action beyond what is described in this document is required at CAU 561, Waste Disposal Areas. The activities conducted to accomplish this scope included the following:

- Removing surface debris and/or materials to facilitate sampling
- Performing radiological surveys and field screening
- Collecting environmental samples for laboratory analysis
- Collecting samples to define the lateral and vertical extent of the contamination
- Removing potential source material (PSM) where feasible
- Collecting samples to characterize PSM to determine whether contaminants of concern (COCs) could be released to the environment in the future
- Collecting waste samples to characterize potential waste to ensure the proper disposal
- Collecting quality control (QC) samples

CAU 561 CADD/CR Section: 1.0 Revision: 0 Date: August 2011 Page 6 of 45

1.3 CADD/CR Contents

This CADD/CR is divided into the following sections and appendices:

- Section 1.0, "Introduction," summarizes the purpose, scope, and contents of this CADD/CR.
- Section 2.0, "Corrective Action Investigation (CAI) Summary," summarizes the investigation field activities, the results of the investigation, the need for corrective action, and the results of the data quality objective (DQO) assessment.
- Section 3.0, "Recommendation," states why no further corrective action is required.
- Section 4.0, "References," provides a list of all referenced documents used in the preparation of this CADD/CR.
- Appendix A, Corrective Action Investigation Results, provides a description of the project objectives, field investigation and sampling activities, investigation results, waste management, and quality assurance (QA). Sections A.3.0 through A.12.0 provide specific information regarding field activities, sampling methods, and laboratory analytical results from the investigation.
- Appendix B, *Data Assessment*, provides a data quality assessment (DQA) that reconciles DQO assumptions and requirements to the investigation results.
- Appendix C, *Risk Assessment*, presents an evaluation of risk associated with the establishment of final action levels (FALs).
- Appendix D, *Closure Activity Summary*, provides details on the completed closure activities, and includes the required verification activities and supporting documentation.
- Appendix E, *Sample Location Coordinates*, presents the northing and easting coordinates, and the elevation for each sample location.
- Appendix F, *Waste Disposition Documentation*, documents disposal of items and soil removed during closure activities.
- Appendix G, Nevada Division of Environmental Protection (NDEP) Comments, contains NDEP comments on the draft version of this document.

CAU 561 CADD/CR Section: 1.0 Revision: 0 Date: August 2011

Page 7 of 45

1.3.1 Applicable Programmatic Plans and Documents

Investigation activities were performed in accordance with the following documents:

- CAIP for CAU 561, Waste Disposal Areas (NNSA/NSO, 2008)
- Record of Technical Change (ROTC) No. 1 to the CAIP for CAU 561, Waste Disposal Areas (NNSA/NSO, 2010)
- ROTC-1 to Field Instruction (FI) for CAU 561: Waste Disposal Areas (NNES, 2010)
- Industrial Sites Quality Assurance Project Plan (QAPP) (NNSA/NV, 2002)
- FFACO (1996, as amended)

1.3.2 Data Quality Assessment Summary

The CAIP for CAU 561, Waste Disposal Areas (NNSA/NSO, 2008), contains the DQOs as agreed to by stakeholders before the field investigation. The DQO process ensures that the right type, quality, and quantity of data will be available to support the resolution of those decisions with an appropriate level of confidence. A DQA was conducted that evaluated the degree of acceptability and usability of the reported data in the decision-making process. This DQA is presented in Appendix B and summarized in Section 2.2.2. Using both the DQO and DQA processes helps to ensure that DQO decisions are sound and defensible.

Based on this evaluation, the nature and extent of COCs at CAU 561 have been adequately identified to implement the corrective actions. Information generated during the investigation supports the conceptual site model (CSM) assumptions, and the data collected met the DQOs and support their intended use in the decision-making process.

CAU 561 CADD/CR Section: 2.0 Revision: 0

Date: August 2011 Page 8 of 45

2.0 Corrective Action Investigation Summary

The following sections summarize the investigation activities and investigation results, and justify why no further corrective action beyond what is described in this document is needed at CAU 561. Detailed investigation activities and results for individual CAU 561 CASs are presented in Appendix A of this document.

2.1 Investigation Activities

Corrective action investigation activities were performed as set forth in the CAIP (NNSA/NSO, 2008) from August 2, 2010, through June 28, 2011. The purpose of the CAU 561 CAI was to address the decision statements in the project-specific DQOs by performing the following:

- Determining whether COCs are present in the soils associated with each CAS in CAU 561.
- Determining the lateral and vertical extent of identified COCs.
- Ensuring adequate data have been collected to close the sites under NDEP, Resource Conservation and Recovery Act (RCRA), Toxic Substance Control Act, and DOE requirements.

The scope of the CAI included the following activities:

- Performing radiological surveys (i.e., static, scanning, and swipe collection).
- Field screening soil samples for volatile organic compounds (VOCs) and total alpha and beta/gamma radiation.
- Collecting environmental samples for laboratory analyses to determine the presence of COCs and to define the vertical and lateral extent of COCs, if present.
- Collecting QC samples for laboratory analyses to ensure that the data generated from the analysis of investigation samples meet the requirements of the data quality indicators (DQIs).
- Removing PSM and soil containing COCs.

A combination of judgmental and probabilistic sampling schemes were implemented to select sample locations, as outlined in the CAIP (NNSA/NSO, 2008). Judgmental sampling allows the methodical selection of sample locations that target the populations of interest (defined in the DQOs)

Section: 2.0 Revision: 0 Date: August 2011 Page 9 of 45

rather than non-selective random locations. Probabilistic sampling uses random sample locations in the absence of adequate biasing factors to define sitewide contamination characteristics (e.g., average concentrations).

For the judgmental sampling scheme, individual sample results (rather than average concentrations) are used to compare to FALs. Therefore, statistical methods to generate site characteristics (averages) are not necessary. If good prior information is available on the target site of interest, then the sampling may be designed to collect samples only from areas known to have the highest concentration levels on the target site (EPA, 2006). If the observed concentrations from these samples are below the action level, then a decision can be made that the site contains safe levels of the contaminant without the samples being truly representative of the entire area.

The judgmental sampling design was used to confirm the existence of contamination at specific locations and provide information (such as extent of contamination) about specific areas of the site.

Confidence in judgmental sampling scheme decisions was established qualitatively by validating CSM and justifying that sampling locations are the most likely locations to contain a COC, if a COC exists.

For the probabilistic sampling scheme, the average contaminant concentrations at the site in question are used to compare to FALs. The averages from sample analytical results for each constituent are an estimation of the true average contaminant concentrations. Because the average contaminant concentrations from samples is only an estimate of the true (unknown) average, it is uncertain how well the sample averages represent the actual averages. To reduce the probability of making a false negative decision error, the 95th percent upper confidence levels (UCLs) of the respective sample contaminant concentration averages will be used to compare to FALs. Therefore, by definition, there will be a 95 percent probability that the true average concentration is less than the 95th percent UCL of the sample average.

Confidence in probabilistic sampling scheme decisions was established by the validating the CSM, justifying that sampling locations are representative of site conditions, demonstrating that a sufficient number of samples were collected, and demonstrating that contaminant distribution assumptions are valid and appropriate to the statistical test being performed.

CAU 561 CADD/CR Section: 2.0

Revision: 0 Date: August 2011

Page 10 of 45

Waste characterization activities were conducted to gather sufficient information and data to support

waste disposal decisions. Information regarding waste characterization is presented in Appendix A.

The following sections describe specific investigation activities conducted at each CAS. Additional

information regarding the investigation is presented in Appendix A.

2.1.1 Waste Dump (CAS 01-19-01)

The following subsections summarize the activities conducted at CAS 01-19-01.

2.1.1.1 Radiological Survey

A gamma radiological walkover survey was performed during the preliminary assessment within the

fenced area at CAS 01-19-01 to determine whether surface radioactivity was present at the site.

No areas of elevated radioactivity were identified at this CAS.

2.1.1.2 Geophysical Survey

Geophysical surveys were performed in 2004 and identified anomalies suspected to be buried

metallic debris. Based on the survey results, trenches were excavated to access the buried materials.

The buried material was a building foundation, and the geophysical anomalies represented the rebar

in the concrete. Figure A.3-1 shows the location of this sample.

2.1.1.3 Visual Inspection

Visual inspections were conducted of the surface soil within the fenced area for any stained soil or

other biasing factors before excavation. Concrete, rebar, and red bricks were observed on the

surface soil, but there was no visible surface staining. During the excavation of the geophysical

anomalies, the subsurface soil was also inspected for staining and other biasing factors. There was no

waste in the excavation, but instead a concrete foundation with a red brick chimney and charred wood

were identified. Samples 561A001 and 561A004 were collected at the base of the foundation, and

samples 561A002 and 561A003 were collected because of debris and burned wood. Figure A.3-2

shows a typical biased sample location at the base of the building foundation.

CAU 561 CADD/CR Section: 2.0 Revision: 0 Date: August 2011

Page 11 of 45

2.1.1.4 Sample Collection

Decision I environmental sampling activities were conducted in the area of the geophysical anomalies to determine whether there has been a release from what was believed to be a buried waste dump. Subsurface soil samples were collected from the northeast-southwest trench and the northwest-southeast trench in the areas of the geophysical anomalies. In addition to the trenches, numerous potholes were excavated to determine the type of buried material that could be present. Five environmental samples were collected from four locations in the area of the geophysical anomalies; biasing factors were also noted within the area of the geophysical anomalies. Samples 561A001 through 561A004 were collected using excavation methods from a decontaminated backhoe bucket and were collected at various depths based on biasing factors (e.g., debris, burned wood). Decision II samples were not collected at this CAS, as no contaminants of potential concern (COPCs) exceeded the FALs.

2.1.1.5 Conceptual Site Model Validation

A CSM was developed to represent the release mechanisms and potential migration pathways for contaminant releases from waste disposal areas at CAU 561 CASs. The CSM and associated discussion for this CAS are provided in the CAIP (NNSA/NSO, 2008).

The CSM was revised because the excavation activities uncovered the foundation of a building and not a waste dump. The CSM was revised to include potentially contaminated subsurface media from building materials and from burning of wood in fireplaces. The migration pathway and release mechanism information gathered during the CAI were consistent with the revised CSM, and all information gathered during the CAI supports and validates the revised CSM. The CSM assumed that any contaminant migration would be minimal based on the limited infiltration of stormwater (based on low annual precipitation rates and high potential evapotranspiration rates typical of the NNSS environment).

2.1.2 Waste Dump and Burn Area (CAS 02-08-02)

The following subsections summarize the activities conducted at CAS 02-08-02. Two components within the CAS were investigated: the waste dump, which consisted of piles of construction debris, and the burn area.

CAU 561 CADD/CR Section: 2.0

Revision: 0 Date: August 2011 Page 12 of 45

2.1.2.1 Radiological Survey

A gamma walkover survey was performed over the piles and at the burn area at CAS 02-08-02 during the preliminary assessment. No areas of elevated radioactivity were identified.

2.1.2.2 Geophysical Survey

Geophysical surveys were performed at the burn area only, and identified surface and near-surface buried metallic debris (predominantly melted lead, which is considered PSM). Based on the survey results and a visual inspection, soil samples (561B019 through 561B028 at locations B02 through B04 and B21 through B26) were collected from nine locations within the burn area. Figures A.4-1 and A.4-2 show the location of these samples.

2.1.2.3 Visual Inspection

The waste piles were visually inspected for stained soil, debris, or other biasing factors. One pile was observed with stained soil (sample 561B005 through 561B007 at location B18), while at another pile contained a 30-gal crushed grease drum with soil staining (samples 561B013 through 561B015 at location B12). The surface soil within the burn area was inspected for biasing factors. Stained soil resembling burn areas, nails, and melted lead were identified in patches throughout the area. Sample locations B02, B03, B04, and B21 were areas of stained soil and nails. Sample locations B22, B24, and B25 were directly under the melted lead. Figures A.4-1 and A.4-2 show the location of these samples.

2.1.2.4 Sample Collection

Seventy-three environmental samples were collected from 54 locations (location B01 through B54).

Waste Dump

Decision I environmental sampling activities included collecting 16 randomly selected soil samples from inside the waste piles, and two biased surface soil samples downgradient of the waste pile. The randomly selected samples were identified using the Visual Sample Plan (VSP) software (PNNL, 2005). Sample depths at the waste piles ranged from 0.5 to 6 ft into the pile. During random sampling, a 30-gal crushed drum containing a small amount of grease and an area of stained soil was

Section: 2.0 Revision: 0 Date: August 2011

Page 13 of 45

observed. Soil samples (561B013 through 561B015) were collected immediately beneath the drum

and within the pile at depths ranging from 0.5 to 1 ft below ground surface (bgs), 1 to 1.5 ft bgs, and

3 to 3.5 ft bgs. Also, during random sampling, stained soil was observed on the surface of the waste

pile (location B18). Soil samples 561B005 and 561 B006 were collected from 2 to 3 ft, and sample

561B007 was collected from 4 to 5 ft into the pile.

The Decision I analytical results showed that concentrations of various polyaromatic hydrocarbons

(PAHs) in four samples from four locations (sample 561B003 at location B09, sample 561B005 at

location B18, sample 561B013 at location B12, and sample 561B016 at location B11) exceeded the

preliminary action levels (PALs), and it was determined that Decision II sampling was necessary.

Seven Decision II samples (561B039 through 561B045) were collected along the outside perimeter of

the waste dump from 0 to 0.5 ft bgs to delineate the lateral extent of COCs.

Burn Area

At the burn area, Decision I environmental sampling activities included collecting 20 biased surface

and shallow subsurface soil samples (samples 561B017 through 561B029 and 561B032 through

561B038). Biasing factors included stained soil and debris on the surface (nails, melted lead).

Twenty-four Decision II samples were collected to define lateral and vertical extent of contamination,

and analyzed for semivolatile organic compounds (SVOCs) (samples 561B046 through 561B061 and

561B066 through 561B073). Fourteen samples were collected to define lateral and vertical extent of

contamination, and analyzed for metals (samples 561B0058 through 561060, samples 561B062

through 561B065, and 561B067 through 561B073).

2.1.2.5 Conceptual Site Model Validation

A CSM was developed to represent the release mechanisms and potential migration pathways for

contaminant releases at CAU 561 CASs. The CSM and associated discussion for this CAS are

provided in the CAIP (NNSA/NSO, 2008).

The migration pathway and release mechanism information gathered during the CAI were consistent

with the CSM, and all information gathered during the CAI supports and validates the CSM as

presented in the CAIP. The CSM assumed that any contaminant migration would be minimal based

Section: 2.0 Revision: 0 Date: August 2011

Page 14 of 45

on the limited infiltration of stormwater (based on low annual precipitation rates and high potential evapotranspiration rates typical of the NNSS environment).

2.1.3 Debris Pile (CAS 03-19-02)

The following subsections summarize the activities conducted at CAS 03-19-02.

2.1.3.1 Radiological Survey

In 2007, a gamma radiological walkover survey was performed at the site. No areas of elevated radioactivity in the soil were identified; however, two locations on the concrete debris contained fixed radiological readings above background. During the field investigation in 2010, a gamma walkover survey was performed, and only one location on the concrete was identified as having fixed readings above background. The concrete was coated with Trinity glass. Based on the results of the radiological surveys, concrete (561C001) and soil (561C002 and 561C003) samples were collected from this sample location (C01).

2.1.3.2 Visual Inspection

In an attempt to locate the second piece of debris with fixed radiological readings, the debris within the pile and the surface soil was visually inspected for Trinity glass or stained soil. Trinity glass was discovered after a large piece of concrete was overturned during the visual inspection. Sample location C02 (sample 561C004) was established based on these visual inspections (see Figures A.5-1 and A.5-2).

2.1.3.3 Sample Collection

Decision I environmental sampling activities included collecting biased concrete samples on a concrete block, and collecting soil samples beneath two concrete blocks. Four environmental samples were collected from two locations (C01 and C02). A concrete sample was scabbled off the face of the large western concrete block where elevated radiological readings and Trinity glass were observed (sample 561C001). Two surface soil samples (561C002 and 561C003) were collected below this block to verify that no radiological contamination had migrated from the block into the soil. A second sample location (C02) was sited from beneath an overturned concrete block where the

Section: 2.0 Revision: 0 Date: August 2011

Page 15 of 45

visual inspection uncovered a nickel-sized piece of Trinity glass. A surface soil sample (561C004)

was collected near the Trinity glass to verify no migration of radiological contamination from the

Trinity glass.

2.1.3.4 Conceptual Site Model Validation

A CSM was developed to represent the release mechanisms and potential migration pathways for

contaminant releases at CAU 561 CASs. The CSM and associated discussion for this CAS are

provided in the CAIP (NNSA/NSO, 2008).

The migration pathway and release mechanism information gathered during the CAI were consistent

with the CSM, and all information gathered during the CAI supports and validates the CSM as

presented in the CAIP. The CSM assumed that any vertical contaminant migration would be minimal

based on the limited infiltration of stormwater (based on low annual precipitation rates and high

potential evapotranspiration rates typical of the NNSS environment).

2.1.4 Radioactive Gravel Pile (CAS 05-62-01)

The following subsections summarize the activities conducted at CAS 05-62-01.

2.1.4.1 Radiological Survey

In 2006, a gamma radiological walkover survey was performed at CAS 05-62-01. No areas of

elevated radioactivity were identified. During the field investigation, the sample locations within the

gravel pile was scanned to identify the highest radioactivity within the pile for sampling purposes.

Two samples, 561D006 and 561D007 from location D05, were collected from the gravel pile at the

location with the highest radioactivity (see Figures A.6-1 and A.6-2).

2.1.4.2 Visual Inspection

The gravel pile and surrounding soil was visually inspected for biasing factors. It was observed that

there were locations of erosion where the gravel had washed down off the pile; this served as a

biasing factor for collection surface samples 561D001 through 561D005.

CAU 561 CADD/CR Section: 2.0

Revision: 0 Date: August 2011 Page 16 of 45

2.1.4.3 Field Screening

Investigation samples were field screened for alpha and beta/gamma radiation to determine which samples were submitted for analysis. Alpha field-screening levels (FSLs) were exceeded at one sample location within the gravel pile (sample 561D006). Beta/gamma FSLs were exceeded in one surface soil sample (561D003) on the north side of the pile, and within the gravel pile (sample 561D006).

2.1.4.4 Sample Collection

Seven Decision I environmental samples were collected from five locations around and within the gravel pile. Surface soil samples (samples 561D001 through 561D005) were collected from four biased locations around the gravel pile to verify that no radiological contamination had migrated off the pile. Two soil samples were collected from within the pile at one location. One sample (561D006) was collected from 1 to 1.5 ft into the gravel pile, which showed elevated radioactivity within the pile. The second sample (561D007) was collected at the native soil interface (6.5 to 7 ft into pile) to verify that there was no contamination below the gravel pile.

2.1.4.5 Conceptual Site Model Validation

A CSM was developed to represent the release mechanisms and potential migration pathways for contaminant releases at CAU 561 CASs. The CSM and associated discussion for this CAS are provided in the CAIP (NNSA/NSO, 2008).

The migration pathway and release mechanism information gathered during the CAI were consistent with the CSM, and all information gathered during the CAI supports and validates the CSM as presented in the CAIP. The CSM assumed that any vertical contaminant migration would be minimal based on the limited infiltration of stormwater (based on low annual precipitation rates and high potential evapotranspiration rates typical of the NNSS environment).

2.1.5 Radioactive Waste Dump (CAS 12-23-09)

The following subsections summarize the activities conducted at CAS 12-23-09.

CAU 561 CADD/CR Section: 2.0

Revision: 0
Date: August 2011

Page 17 of 45

2.1.5.1 Radiological Survey

A gamma radiological walkover survey was performed in the north fenced area in 2006. The results

of this survey identified an area of radioactivity from 2 to 5 times higher than background levels at a

soil mound near the center of the fenced area. Based on the results of this survey, two soil samples

(561E004 and 561E005 from location E07) were collected within the soil mound (see Figure A.7-1).

In 2008, a gamma walkover survey was performed of the south fenced area; no areas of elevated

radioactivity were identified.

2.1.5.2 Geophysical Survey

Geophysical surveys were performed at this CAS that identified buried metal debris in the area of the

soil mound. This is the same area where the elevated radioactivity was identified. Two soil samples

(561E004 and 561E005) were collected within the soil mound based on the survey results.

2.1.5.3 Visual Inspection

The surface soil within the two fenced areas and the soil mound was inspected for any stained soil or

other biasing factors. No biasing factors were noted.

2.1.5.4 Sample Collection

Eight environmental samples were collected from seven locations. Six sample locations were

established using the VSP software (PNNL, 2005), and two sample locations were sited in the soil

mound, which showed elevated radioactivity. Six samples (561E001 through 561E003, and 561E006

through 561E008) were surface samples (0 to 0.5 ft bgs), while the soil mound was sampled at 1 to

1.5 ft into the mound (samples 561E004 and 561E005).

2.1.5.5 Conceptual Site Model Validation

A CSM was developed to represent the release mechanisms and potential migration pathways for

contaminant releases at CAU 561 CASs. The CSM and associated discussion for this CAS are

provided in the CAIP (NNSA/NSO, 2008).

CAU 561 CADD/CR Section: 2.0 Revision: 0

Date: August 2011 Page 18 of 45

The migration pathway and release mechanism information gathered during the CAI were consistent with the CSM, and all information gathered during the CAI supports and validates the CSM as presented in the CAIP. The CSM assumed that any vertical contaminant migration would be minimal based on the limited infiltration of stormwater (based on low annual precipitation rates and high potential evapotranspiration rates typical of the NNSS environment).

2.1.6 Buried Waste Disposal Site (CAS 22-19-06)

The following subsections summarize the activities conducted at CAS 22-19-06.

2.1.6.1 Geophysical Survey

Geophysical surveys were performed in 2004 and identified buried metallic debris in the area of the disposal trench. Based on the survey results, one northeast-southwest trench was excavated in the area of two geophysical anomalies. The geophysical anomalies were not associated with a buried waste dump, but were instead concrete and metal manhole covers, and a corrugated conduit pipe. Sample locations F01 through F04 were located along the geophysical anomalies (see Figure A.8-1), and five samples (561F001 through 561F005) were collected.

2.1.6.2 Visual Inspection

The surface soil at CAS 22-19-06 was inspected for any stained soil or biasing factors. No stained surface soil was observed, but biasing factors (metal pipe, manhole covers) were observed after excavating in the areas of the geophysical anomalies. Two concrete and metal manhole covers were uncovered during the excavation activities at depths ranging from 1 to 3 ft bgs; samples 561F001 through 561F003 were collected from beneath the manhole covers. A corrugated metal conduit pipe was also uncovered at a depth of 6 ft bgs; samples 561F004 and 561F005 were collected from beneath the conduit pipe. These items are considered to be the source of the geophysical anomalies identified in 2004.

2.1.6.3 Sample Collection

Five Decision I samples were collected from four locations at this CAS. Samples 561F001 and 561F002 were collected from beneath a concrete manhole cover at a depth of 1.5 to 2 ft bgs, and

Section: 2.0 Revision: 0 Date: August 2011

Page 19 of 45

sample 561F003 was collected from 2.5 to 3 ft bgs at the same location. Samples were also

collected from beneath the corrugated conduit pipe; sample 561F004 was collected from a depth of

7 to 7.5 ft bgs, and sample 561F005 was collected from 8 to 8.5 ft bgs.

2.1.6.4 Conceptual Site Model Validation

A CSM was developed to represent the release mechanisms and potential migration pathways for

contaminant releases at CAU 561 CASs. The CSM and associated discussion for this CAS are

provided in the CAIP (NNSA/NSO, 2008).

The migration pathway and release mechanism information gathered during the CAI were consistent

with the CSM, and all information gathered during the CAI supports and validates the CSM as

presented in the CAIP. The CSM assumed that any vertical contaminant migration would be minimal

based on the limited infiltration of stormwater (based on low annual precipitation rates and high

potential evapotranspiration rates typical of the NNSS environment).

2.1.7 Waste Disposal Trenches (CAS 23-21-04)

The following subsections summarize the activities conducted at CAS 23-21-04. Six trenches and

one potential covered trench were investigated.

2.1.7.1 Geophysical Survey

Geophysical surveys were performed in 2006, and no buried metallic debris was identified.

2.1.7.2 Visual Inspection

Before any sampling activities, the trenches were inspected for any stained soil or biasing factors,

such as debris, by excavating potholes in each trench and in the potential covered trench. Potholes

were excavated across the middle of each trench and at the ends of each trench. No biasing factors

were identified in Trenches 1, 2, 4, or at the potential covered trench area; therefore, no samples were

collected from these trenches. The potential covered trench was not a trench, but a natural

depression. Stained soil was observed on the west end of Trench 3, and east of Trench 6; both

locations were sampled (samples 561G004 and 561G003). Trenches 3, 5, and 6 were inspected by

Section: 2.0 Revision: 0 Date: August 2011

Page 20 of 45

excavating potholes; debris was discovered in all three trenches, and samples were collected at these

biasing factors (see Figures A.9-1 through A.9-3).

2.1.7.3 Sample Collection

Forty-one environmental samples were collected from 37 locations near and within Trenches 3, 5,

and 6. No samples were collected from Trenches 1, 2, 4, or the potential covered trench because there

were no biasing factors. A lead brick was identified as PSM and removed from the west end of

Trench 3. Verification soil samples were collected from the underlying soil after removing the PSM.

The analytical results from the lead brick verification samples were less than the corresponding Tier 1

action levels (i.e., PALs).

Two waste characterization samples were collected from locations within Trenches 3 and 5 and

analyzed for toxicity characteristic leaching procedure (TCLP) metals.

Trench 3

Nineteen environmental samples were collected within Trench 3. Decision I sampling activities

included collecting biased soil samples. Biasing factors included stained soil (samples 561G001 and

561G004), debris (samples561G002, 561G005 through 561G007), and a location beneath one lead

brick (561G002).

Four samples were collected to define the extent of contamination (samples 561G015 through

561G018) within the west end of the trench. Four additional samples (561G033 through 561G036)

were collected and analyzed for metals and hexavalent chromium. The samples were collected at the

bottom of the excavation and on the southeast, west, and northeast walls of the excavation. One

verification sample (561G041) was collected from 4.5 to 5 ft bgs.

Four Decision II environmental samples (561G037 through 561G040) were collected to define the

extent of contamination within the east end of the trench. Soil was excavated from the north side of

the trench from an area 7 by 9 by 10 ft deep. Samples were then collected at the bottom of the

excavation (561G037) from 9 to 10 ft bgs, and from the west (561G038), east (561G039), and north

(561G040) walls at a depth of 6 to 7 ft bgs, and analyzed for polychlorinated biphenyls (PCBs).

Date: August 2011 Page 21 of 45

Trench 5

Seventeen environmental samples were collected within Trench 5. Three Decision I biased samples (561G012 through 561G014) were collected at areas of debris within the trench. Five Decision II environmental samples (561G019 through 561G023) were collected to define the extent of contamination. One sample was collected from 1 to 1.5 ft bgs (561G020), and three additional sample locations were selected at distances ranging from approximately 15 to 45 ft laterally in three directions from this location; surface soil samples (561G019, 561G021 through 561G023) were collected from these locations. An area around the location was excavated, and five additional soil samples (561G024 through 561G028) were collected. One sample was collected from the bottom of the excavation (561G024), and four samples (561G025 through 561G028) were collected from the four corners of the excavation, with depths ranging from 2 to 3 ft bgs. Four verification samples were collected—one sample (561G029) from the bottom of the excavation from 5 to 5.5 ft bgs; and one each from the east (561G030), west (561G031), and north (561G032) walls of the excavation—with depths ranging from 3 to 5.5 ft bgs.

Trench 6

Decision I environmental sampling activities at Trench 6 included collecting biased samples at three locations within the trench. Debris (wood and metal) was observed on the surface of the trench, but not within the excavation. Four samples (561G008 through 561G011) were collected from Trench 6. A small soil pile (approximately 8 inches [in.] tall) was observed east of Trench 6. The soil pile was composed of non-native soil and was not considered stained. Some rusty bolts were observed on the soil pile, so sample 561G003 was collected from beneath the bolts.

2.1.7.4 Conceptual Site Model Validation

A CSM was developed to represent the release mechanisms and potential migration pathways for contaminant releases at CAU 561 CASs. The CSM and associated discussion for this CAS are provided in the CAIP (NNSA/NSO, 2008).

The migration pathway and release mechanism information gathered during the CAI were consistent with the CSM, and all information gathered during the CAI supports and validates the CSM as presented in the CAIP. The CSM assumed that any vertical contaminant migration would be minimal

Section: 2.0 Revision: 0 Date: August 2011

Page 22 of 45

based on the limited infiltration of stormwater (based on low annual precipitation rates and high

potential evapotranspiration rates typical of the NNSS environment).

2.1.8 Waste Dump (CAS 25-08-02)

The following subsections summarize the activities conducted at CAS 25-08-02.

2.1.8.1 Radiological Survey

A gamma radiological walkover survey was performed in 2006. No areas of elevated radioactivity

that exceeded background were identified.

2.1.8.2 Visual Inspection

The waste piles at this CAS were inspected for any stained soil or biasing factors. A dark gray

concrete-like material was observed on the southern end of the waste dump at location H03.

A pile of batteries and debris was also observed at location H08 on the east side of the waste dump.

Two outlier piles were observed on the north end (location H16) and south end (location H01) of the

main waste dump. Numerous piles were observed that contained asphalt, concrete, rebar, and other

construction-like material; samples were collected from these piles (see Figures A.10-1

through A.10-3).

2.1.8.3 Sample Collection

Twenty-six judgmental soil samples were collected from 23 locations. Decision I environmental

sampling activities included collecting surface samples at the two outlier piles (samples 561H002 and

561H010), at the pile of concrete-like material (561H001), and at the pile that contained batteries and

debris (sample 561H017). Decision I sampling activities also included collecting randomly located

samples from piles that were identified using the VSP software (PNNL, 2005).

Soil samples were collected at depths ranging from 0 to 4.5 ft within the piles based on biasing

factors, such as debris or stained soil. Several locations were sampled at the native soil interface

(561H002, 561H006, 561H009, and 561H012), while the other locations were sampled within the

piles (561H001, 561H003 through 561H005, 561H007, 561H008, 561H010, 561H011, and 561H013

through 561H017).

Section: 2.0 Revision: 0 Date: August 2011

Page 23 of 45

Four Decision II environmental samples were collected to define the vertical and lateral extent of

contamination. One sample (561H021) was collected from 1.5 to 2 ft bgs within the concrete-like

material pile. Three additional sample locations were selected at distances ranging from

approximately 20 to 50 ft laterally in three directions from the pile; samples 561H018 through H020

were collected from these locations. The concrete-like material was removed and disposed of, and

five verification samples (561H022 through 561H026) were collected at four locations under the pile.

Waste characterization samples were collected from two locations, one within the concrete-like pile

and one from a construction waste pile. Both samples were analyzed for TCLP metals.

2.1.8.4 Conceptual Site Model Validation

A CSM was developed to represent the release mechanisms and potential migration pathways for

contaminant releases at CAU 561 CASs. The CSM and associated discussion for this CAS are

provided in the CAIP (NNSA/NSO, 2008).

The migration pathway and release mechanism information gathered during the CAI were consistent

with the CSM, and all information gathered during the CAI supports and validates the CSM as

presented in the CAIP. The CSM assumed that any vertical contaminant migration would be minimal

based on the limited infiltration of stormwater (based on low annual precipitation rates and high

potential evapotranspiration rates typical of the NNSS environment).

2.1.9 Radioactive Waste Dump (CAS 25-23-21)

The following subsections summarize the activities conducted at CAS 25-23-21. Two components of

this CAS were investigated: the main waste dump and the second parcel (see Figure A.11-1).

2.1.9.1 Radiological Survey

A gamma radiological walkover survey was performed in 2005 at the waste dump. The results of the

survey identified an area (outside the posted RMA) of radioactivity from 2 to 5 times higher than

background. This area was not located during the field activities in 2010.

Section: 2.0 Revision: 0 Date: August 2011 Page 24 of 45

In 2008, partially buried pipes were observed inside the two posted RMAs. The pipes exhibited surface contamination readings above background. Samples 561I030 and 561I033 through 561I0035

2.1.9.2 Geophysical Survey

were collected based on radiological survey of the pipes.

Geophysical surveys were performed at the waste dump but did not identify buried waste. No geophysical surveys were performed at the second parcel.

2.1.9.3 Visual Inspection

The piles at both the main waste dump and at the second parcel were inspected for any stained soil or biasing factors. Of the 17 Decision I samples collected at the main waste dump, 5 biased samples were collected. Biasing factors included the area downgradient in the wash from the main waste dump to investigate potential migration (sample 561I024 at location I31), and the two posted RMAs (samples 561I030 and 561I033 through 561I035 from locations I30, I32, and I33 [see Figure A.11-2]). Of the 18 Decision I samples collected at the second parcel, 7 biased samples were collected. Biasing factors included cement wash-out area (sample 561I003 at location I16); areas were paint cans were identified (sample 561I006 at location I07); black staining on a soil pile (samples 561I009 and 561I010 at location I03); tar paper (561I017 at location I11); a pile of asphalt (561I018 at location I17); and a pile of magnetite (561I007 at location I04 [see Figure A.11-3]).

2.1.9.4 Field Screening

Investigation samples were field screened for alpha and beta/gamma radiation. Sample locations I30, I32, and I33 were selected based on the radiological field screening.

2.1.9.5 Sample Collection

A total of 56 environmental samples (including 4 field duplicates [FDs]) were collected from 49 locations during Decision I and Decision II sampling activities. Decision I environmental sampling activities included collecting biased and probabilistic soil samples at the main waste dump and at the second parcel. Probabilistic sample locations were identified using the VSP software (PNNL, 2005).

Section: 2.0 Revision: 0 Date: August 2011

Page 25 of 45

Main Waste Dump

Seventeen Decision I samples were collected from the main waste dump. Decision I soil samples (561I019 through 561I023, and 561I0025 through 561I035) were collected at depths ranging from 0 to 3.5 ft within the piles. One surface soil sample (561I024) was collected from 0 to 0.5 ft bgs downgradient of the waste dump. Twelve samples were randomly located; these locations were on individual waste piles. Five samples were collected based on biasing factors; three samples were collected at the posted RMA piles, and two samples were collected downgradient of the waste dump to investigate potential migration.

Decision II samples were collected at the main waste dump at the southern RMA and at the northern RMA. At the southern RMA, seven Decision II soil samples were collected (561I036 through 561I041 and 561I046). Four sample locations were selected at distances ranging from approximately 2.5 to 10 ft laterally in four directions from locations on the RMA; surface soil samples (0 to 0.5 ft bgs) were collected. The southern RMA soil pile was removed and disposed of, and verification samples (561I051 through 561I056) were collected at six locations at depths ranging from 0.5 to 1.5 ft bgs.

At the northern RMA, four Decision II soil samples were collected (561I042 through 561I045). Three additional sample locations were selected at distances ranging from approximately 2 to 8 ft laterally in three directions from the pile; surface soil samples (0 to 0.5 ft bgs) were collected. The soil pile was removed and disposed of, and verification samples (561I047 through 561I050) were collected at three locations from 0 to 0.5 ft bgs.

Second Parcel

Eighteen Decision I samples (561I001 through 561I018) were collected from the second parcel. Seven Decision I samples were collected from 0 ft down to 3 ft within the piles. The remaining samples were collected either from the surface (0 to 0.5 ft bgs) or from the shallow subsurface at depths ranging from 1 to 6 ft bgs. Eleven samples were randomly located, while seven samples were based on biasing factors.

Section: 2.0 Revision: 0

Date: August 2011 Page 26 of 45

2.1.9.6 Conceptual Site Model Validation

A CSM was developed to represent the release mechanisms and potential migration pathways for

contaminant releases at CAU 561 CASs. The CSM and associated discussion for this CAS are

provided in the CAIP (NNSA/NSO, 2008).

The migration pathway and release mechanism information gathered during the CAI were consistent

with the CSM, and all information gathered during the CAI supports and validates the CSM as

presented in the CAIP. The CSM assumed that any vertical contaminant migration would be minimal

based on the limited infiltration of stormwater (based on low annual precipitation rates and high

potential evapotranspiration rates typical of the NNSS environment).

2.1.10 Hydrocarbon Stains and Trench (CAS 25-25-19)

The following subsections summarize the activities conducted at CAS 25-25-19. The following

components of this CAS were investigated, based on a visual inspection: (1) north trench,

(2) motor pool area (stained soil), (3) asphalt and tar spills, (4) two soil mounds, and

(5) two lead bricks (see Figure A.12-1).

2.1.10.1 Radiological Survey

A gamma radiological walkover survey of the area was performed at CAS 25-25-19 in 2008.

No areas of elevated radioactivity were identified.

2.1.10.2 Geophysical Survey

Geophysical surveys were performed in 2007 and did not identify buried metallic debris in any areas

of this CAS.

2.1.10.3 Visual Inspection

The visual inspection identified five areas of potential concern: (1) north trench, (2) motor pool area

(stained soil), (3) asphalt and tar spills, (4) two soil mounds, and (5) two lead bricks. The surface soil

within the motor pool area was inspected for any stained soil or biasing factors. Stained surface soil

Section: 2.0 Revision: 0 Date: August 2011

Page 27 of 45

was observed at various locations within the area of the former motor pool; samples 561J001 through

561J004 were collected at these locations.

In the north trench, asphalt was observed at sample location J05 at a depth of 1 to 2 ft bgs. Stained

soil and a diesel/solvent odor were observed at the same location from 5 to 5.5 ft bgs. Stained soil

and asphalt were also observed at sample location J07 from 0 to 3.5 ft bgs, but no samples were

collected at this interval because samples within the asphalt horizon had been collected in potholes at

locations J04, J05, and J06.

In the southern portion of the CAS in a wash exiting the area, two areas were observed to have an

asphalt spill (sample 561J012) and a tar spill (sample 561J013).

Two lead bricks were discovered at locations J14 and J15; the lead bricks were removed, and the soil

beneath the bricks was sampled.

2.1.10.4 Sample Collection

Twenty-two environmental samples were collected from 17 locations within the CAS boundary.

Decision I environmental sampling activities included collecting biased surface soil samples at the

asphalt spill (561J012) and tar spill (561J013), the motor pool area (561J001 through 561J004),

and under the two soil mounds (samples 561J017 and 561J018). Decision I biased subsurface

samples were collected from the north trench (561J005 through 561J011, and 561J023, 561J0024)

and the suspected backfilled east trench (561J015 and 561J016). At the north trench and soil mounds,

samples were collected at various depths based on biasing factors (e.g., stained soil, asphalt).

Surface samples were collected at the tar and asphalt spills and the motor pool area.

Waste characterization samples (561J019 and 561J021) were collected from two locations

(J14 and J15) where two lead bricks were discovered; the soil directly beneath the lead bricks was

sampled and analyzed for TCLP metals. After removal of the soil, two confirmation samples

(561J020 and 561J022) were collected from these locations.

CAU 561 CADD/CR Section: 2.0

Revision: 0 Date: August 2011

Page 28 of 45

2.1.10.5 Conceptual Site Model Validation

A CSM was developed to represent the release mechanisms and potential migration pathways for

contaminant releases at CAU 561 CASs. The CSM and associated discussion for this CAS are

provided in the CAIP (NNSA/NSO, 2008).

The migration pathway and release mechanism information gathered during the CAI were consistent

with the CSM, and all information gathered during the CAI supports and validates the CSM as

presented in the CAIP. The CSM assumed that any vertical contaminant migration would be minimal

based on the limited infiltration of stormwater (based on low annual precipitation rates and high

potential evapotranspiration rates typical of the NNSS environment).

2.2 Results

The data summary provided in Section 2.2.1 defines the magnitude and extent of COCs that were

identified within the CAU 561 CASs. Section 2.2.2 summarizes the DQA as detailed in Appendix B

and demonstrates that the investigation results satisfy the DQO data requirements.

2.2.1 Summary of Analytical Data

Chemical and radiological results for environmental samples collected at each of the CASs are

summarized in Sections 2.2.1.1 through 2.2.1.10. Environmental samples are evaluated against FALs

to determine the presence of COCs and the extent of COC contamination, if present.

The PALs for the CAU 561 investigation were determined during the DQO process and are discussed

in Section 3.3 of the CAIP (NNSA/NSO, 2008). The FALs used for determining the presence of

COCs and for evaluating the need for additional corrective action are defined in Section 2.3. Details

about the methods used during this investigation and a comparison of environmental sample results to

the FALs are presented in Appendix A.

2.2.1.1 CAS 01-19-01, Waste Dump

All soil concentrations of the reported constituents were compared to and were less than FALs.

The maximum concentration of each detected contaminant at this CAS is listed in Table 2-1, and

sample locations are shown in Figure A.3-2.

CAU 561 CADD/CR Section: 2.0 Revision: 0 Date: August 2011

Page 29 of 45

Table 2-1 Maximum Detected Sample Results for CAS 01-19-01, Waste Dump

Contaminant	Maximum Result	Sample Number	Depth (ft bgs)	Location	FAL	Units
Ac-228	1.77	561A001	7.5 - 8.0	A01	506.7ª	pCi/g
Arsenic	4.7	561A005	5.5 - 6.0	A04	23	mg/kg
Barium	260	561A005	5.5 - 6.0	A04	190,000	mg/kg
Beryllium	0.69	561A005	5.5 - 6.0	A04	2,000	mg/kg
Cadmium	0.22	561A004	6.0 - 6.5	A03	800	mg/kg
Chromium	6.1	561A005	5.5 - 6.0	A04	N/A ^b	mg/kg
Lead	19	561A003	2.0 - 2.5	A02	800	mg/kg
Selenium	0.51	561A002	2.0 - 2.5	A02	5,100	mg/kg
TPH-DRO	3.2 (J)	561A005	5.5 - 6.0	A04	N/A°	mg/kg

^aFAL for Ac-228 based on Th-232 FAL.

Ac = Actinium

pCi/g = Picocuries per gram

DRO = Diesel-range organics

Th = Thorium

mg/kg = Milligrams per kilogram

TPH = Total petroleum hydrocarbons

N/A = Not applicable

J = Estimated value

2.2.1.2 CAS 02-08-02, Waste Dump and Burn Area

Soil samples were collected from the waste piles within the waste dump and from the burn area to determine the magnitude and extent of site-related contamination.

2.2.1.2.1 Waste Dump Environmental Sample Results

With the exception of the following PAHs—benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(ah)anthracene—all soil concentrations of the reported constituents were compared to and were less than FALs.

From the 12 samples collected during characterization of the waste dump, three samples exceeded the PALs for the PAHs. Because the FALs for these constituents were established as the PALs, the following PAHs—benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(ah)anthracene—are considered to be COCs at the waste dump. Decision II analytical results

^bPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

Per FI ROTC-1 (NNES, 2010), the Nevada Legislative Commission approved new regulations for TPH-DRO; the FAL of 100 mg/kg no longer applies.

Section: 2.0 Revision: 0 Date: August 2011

Page 30 of 45

(see Section A.4.0) indicated that the PAH concentrations were less than FALs, and the extent of

contamination was defined.

2.2.1.2.2 Burn Area Environmental Sample Results

With the exception of lead, arsenic, and PAHs, all soil concentrations of the reported constituents

were compared to and were less than FALs. Because the FALs for lead and arsenic were established

as the PALs, lead and arsenic are considered to be COCs at the burn area.

The PAHs (SVOCs) that were detected at various locations throughout the burn area are considered to

be associated with the asphalt that was identified at depths between 0 and 8 in. bgs. The evaluation of

the SVOC results has shown that the concentration of the SVOCs do not decrease with increasing

distance from the potential sources (burn areas) as would be expected if the burn areas were the

source of the PAHs. Aerial photos of the Area 2 camp from September 1971 (H&N, 1971) were

reviewed and show a road passing through the burn area to the waste dump area, and photos from

October 1986 (Author Unknown, 1986) show buildings located on the burn area. Based on this

information, the PAHs detected in the burn area are considered to originate from the asphalt and are

not considered to be related to the burn area activities. Therefore, the PAHs that exceeded the FALs

are not considered to be site related.

The maximum concentration of each detected COPC at this CAS is listed in Table 2-2, and sample

locations are shown in Figure A.4-1.

2.2.1.3 CAS 03-19-02, Debris Pile

All soil concentrations of the reported constituents were compared to and were less than FALs. The

maximum concentration of each detected contaminant at this CAS is listed in Table 2-3, and sample

locations are shown in Figure A.5-1.

2.2.1.4 CAS 05-62-01. Radioactive Gravel Pile

All soil concentrations of the reported constituents were compared to and were less than FALs. The

maximum concentration of each detected contaminant at this CAS is listed in Table 2-4, and sample

locations are shown in Figure A.6-1.

CAU 561 CADD/CR Section: 2.0 Revision: 0 Date: August 2011 Page 31 of 45

Table 2-2
Maximum Detected Sample Results for CAS 02-08-02, Waste Dump and Burn Area
(Page 1 of 2)

(1 ago 1 of 2)									
Contaminant	Maximum Result	Sample Number	Depth (ft bgs)	Location	Area	FAL	Units		
2-Methylnaphthalene	0.16 (J)	561B050	0.0 - 0.5	B37	Burn Area	4,100	mg/kg		
Ac-228	2.32	561B010	4.0 - 5.0 ft into pile	B15	Waste Dump	506.7ª	pCi/g		
Acenaphthene	0.46 (J)	561B005	2.0 - 3.0 ft into pile	B18	Waste Dump	33,000	mg/kg		
Am-241	1.49 (J)	561B029	0.0 - 0.5	B01	Burn Area	1,503	pCi/g		
Anthracene	2.2	561B005	2.0 - 3.0 ft into pile	B18	Waste Dump	170,000	mg/kg		
Aroclor 1254	0.084	561B017	0.0 - 0.5	B05	Burn Area	0.74	mg/kg		
Aroclor 1260	0.076	561B016	4.0 - 5.0 ft into pile	B11	Waste Dump	0.74	mg/kg		
Arsenic	65	561B021	0.0 - 0.5	B02	Burn Area	23	mg/kg		
Barium	560	561B004	3.0 - 4.0 ft into pile	B10	Waste Dump	190,000	mg/kg		
Benzo(a)anthracene	2.8	561B005	2.0 - 3.0 ft into pile	B18	Waste Dump	2.1	mg/kg		
Benzo(a)pyrene	2.4	561B005	2.0 - 3.0 ft into pile	B18	Waste Dump	0.21	mg/kg		
Benzo(b)fluoranthene	3.7	561B069	0.0 - 0.5	B50	Burn Area	2.1	mg/kg		
Benzo(ghi)perylene	3.4	561B069	0.0 - 0.5	B50	Burn Area	17,000	mg/kg		
Benzo(k)fluoranthene	1.4 (J)	561B069	0.0 - 0.5	B50	Burn Area	21	mg/kg		
Beryllium	0.71	561B013	0.5 - 1.0 ft into pile	B12	Waste Dump	2,000	mg/kg		
Bis(2-ethylhexyl)phthalate	0.26 (J)	561B009	5.0 - 6.0 ft into pile	B16	Waste Dump	120	mg/kg		
Cadmium	0.91	561B028	0.0 - 0.5	B03	Burn Area	800	mg/kg		
Carbazole	0.52	561B005	2.0 - 3.0 ft into pile	B18	Waste Dump	95.8	mg/kg		
Chromium	58	561B028	0.0 - 0.5	B03	Burn Area	N/A ^b	mg/kg		
Hexavalent chromium	1.6 (J)	561B013	0.5 - 1.0 ft into pile	B12	Waste Dump	5.6	mg/kg		
Chrysene	2.8	561B005	2.0 - 3.0 ft into pile	B18	Waste Dump	210	mg/kg		
Cs-137	2.57	561B001	2.0 - 3.0 ft into pile	B07	Waste Dump	72.9	pCi/g		
Di-n-butyl phthalate	3.4	561B005	2.0 - 3.0 ft into pile	B18	Waste Dump	62,000	mg/kg		
Dibenzo(ah)anthracene	1	561B069	0.0 - 0.5	B50	Burn Area	0.21	mg/kg		
Dibenzofuran	0.23 (J)	561B005	2.0 - 3.0 ft into pile	B18	Waste Dump	1,000	mg/kg		
Diethyl phthalate	0.22 (J)	561B052	0.0 - 0.5	B39	Burn Area	490,000	mg/kg		
Fluoranthene	8.2	561B005	2.0 - 3.0 ft into pile	B18	Waste Dump	22,000	mg/kg		
Fluorene	0.55	561B005	2.0 - 3.0 ft into pile	B18	Waste Dump	22,000	mg/kg		

CAU 561 CADD/CR Section: 2.0 Revision: 0 Date: August 2011 Page 32 of 45

Table 2-2
Maximum Detected Sample Results for CAS 02-08-02, Waste Dump and Burn Area
(Page 2 of 2)

Contaminant	Maximum Result	Sample Number	Depth (ft bgs)	Location	Area	FAL	Units
Indeno(1,2,3-cd)pyrene	3.3 (J)	561B069	0.0 - 0.5	B50	Burn Area	2.1	mg/kg
Lead	14,000 (J+)	561B021	0.0 - 0.5	B02	Burn Area	800	mg/kg
Mercury	0.028	561B013	0.5 - 1.0 ft into pile	B12	Waste Dump	34	mg/kg
Methylene chloride	0.015	561B015	3.0 - 3.5 ft into pile	B12	Waste Dump	53	mg/kg
Phenanthrene	7.2	561B005	2.0 - 3.0 ft into pile	B18	Waste Dump	170,000	mg/kg
Pyrene	6.8	561B005	2.0 - 3.0 ft into pile	B18	Waste Dump	17,000	mg/kg
Selenium	0.6	561B073	0.0 - 0.5	B54	Burn Area	5,100	mg/kg
Silver	0.52	561B021	0.0 - 0.5	B02	Burn Area	5,100	mg/kg
Th-234	3.6 (J)	561B010	4.0 - 5.0 ft into pile	B15	Waste Dump	1,423°	pCi/g
TPH-DRO	320	561B013	0.5 - 1.0 ft into pile	B12	Waste Dump	N/A ^d	mg/kg

^aFAL for Ac-228 based on Th-232 FAL.

Am = Americium

Cs = Cesium

U = Uranium

J = Estimated value

J+ = Result is an estimated quantity, but may be biased high.

Bold indicates the values exceeding the FALs.

Table 2-3
Maximum Detected Sample Results for CAS 03-19-02, Debris Pile

Contaminant	Maximum Result	Sample Number	Depth (ft bgs)	Location	FAL	Units
Ac-228	1.94	561C004	0.0 - 0.5	C02	506.7ª	pCi/g
Am-241	2.89 (J)	561C003	0.5 - 1.0	C01	1,503	pCi/g
Cs-137	2.49	561C002	0.5 - 1.0	C01	72.9	pCi/g
Eu-152	0.97 (J)	561C003	0.5 - 1.0	C01	38.2	pCi/g

^aFAL for Ac-228 based on Th-232 FAL.

Eu = Europium

J = Estimated value

^bPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

[°]FAL for Th-234 based on U-238 FAL.

^dPer FI ROTC-1 (NNES, 2010), the Nevada Legislative Commission approved new regulations for TPH-DRO; the FAL of 100 mg/kg no longer applies.

Table 2-4
Maximum Detected Sample Results for CAS 05-62-01, Radioactive Gravel Pile

Contaminant	Maximum Result	Sample Number	Depth (ft bgs)	Location	FAL	Units
Ac-228	1.16	561D002	0.0 - 0.5	D02	506.7ª	pCi/g
Cs-137	0.196	561D001	0.0 - 0.5	D01	72.9	pCi/g
Pu-239/240	0.087	561D001	0.0 - 0.5	D01	2,207	pCi/g
Th-234	206	561D006	1.0 - 1.5 ft into gravel pile	D05	1,423 ^b	pCi/g
U-234	267	561D006	1.0 - 1.5 ft into gravel pile	D05	18,650	pCi/g
U-235	15.3	561D006	1.0 - 1.5 ft into gravel pile	D05	255.2	pCi/g
U-238	630	561D006	1.0 - 1.5 ft into gravel pile	D05	1,423	pCi/g

^aFAL for Ac-228 based on Th-232 FAL.

Pu = Plutonium

2.2.1.5 CAS 12-23-09, Radioactive Waste Dump

All soil concentrations of the reported constituents were compared to and were less than FALs. The maximum concentration of each detected contaminant at this CAS is listed in Table 2-5, and sample locations are shown in Figure A.7-1.

2.2.1.6 CAS 22-19-06, Buried Waste Disposal Site

All soil concentrations of the reported constituents were compared to and were less than FALs. The maximum concentration of each detected contaminant at this CAS is listed in Table 2-6, and sample locations are shown in Figure A.8-1.

2.2.1.7 CAS 23-21-04, Waste Disposal Trenches

After removal of the arsenic-, hexavalent chromium-, and PCB-contaminated soil within Trenches 3 and 5, all soil concentrations of the reported constituents were compared to and were less than FALs. Verification samples were collected after the soil removal and indicate that the concentration of the three constituents are now less than the FALs and no COCs remain in the soil at CAS 23-21-04. Tables A.9-5 and A.9-6 present sample locations, sample depths, and concentrations from the

^bFAL for Th-234 based on U-238 FAL.

Table 2-5
Maximum Detected Sample Results for CAS 12-23-09, Radioactive Waste Dump

Contaminant	Maximum Result	Sample Number	Depth (ft bgs)	Location	FAL	Units
Ac-228	2.47	561E006	0.0 - 0.5	E03	506.7ª	pCi/g
Acetone	0.046 (J)	561E008	0.0 - 0.5	E05	630,000	mg/kg
Am-241	1.23 (J)	561E002	0.0 - 0.5	E01	1,503	pCi/g
Aroclor 1268	0.028 (J)	561E001	0.0 - 0.5	E04	0.74	mg/kg
Arsenic	3.7	561E007	0.0 - 0.5	E06	23	mg/kg
Barium	150	561E006	0.0 - 0.5	E03	190,000	mg/kg
Benzo(a)anthracene	0.086 (J)	561E007	0.0 - 0.5	E06	2.1	mg/kg
Benzo(a)pyrene	0.073 (J)	561E007	0.0 - 0.5	E06	0.21	mg/kg
Benzo(b)fluoranthene	0.16 (J)	561E007	0.0 - 0.5	E06	2.1	mg/kg
Benzo(k)fluoranthene	0.073 (J)	561E007	0.0 - 0.5	E06	21	mg/kg
Beryllium	0.87	561E006	0.0 - 0.5	E03	2,000	mg/kg
Cadmium	0.28	561E008	0.0 - 0.5	E05	800	mg/kg
Chromium	6.3	561E007	0.0 - 0.5	E06	N/A ^b	mg/kg
Hexavalent chromium	0.37 (J-)	561E001	0.0 - 0.5	E04	5.6	mg/kg
Chrysene	0.13 (J)	561E007	0.0 - 0.5	E06	210	mg/kg
Cs-137	8.5	561E005	1.0 - 1.5 ft into soil mound	E07	72.9	pCi/g
Fluoranthene	0.15 (J)	561E007	0.0 - 0.5	E06	22,000	mg/kg
Lead	23	561E002	0.0 - 0.5	E01	800	mg/kg
Mercury	0.052	561E008	0.0 - 0.5	E05	34	mg/kg
P-Isopropyltoluene	0.01	561E008	0.0 - 0.5	E05	11,000	mg/kg
Pyrene	0.13 (J)	561E007	0.0 - 0.5	E06	17,000	mg/kg
Selenium	0.32	561E005	1.0 - 1.5 ft into soil mound	E07	5,100	mg/kg
Toluene	0.0044 (J)	561E007	0.0 - 0.5	E06	45,000	mg/kg
Total xylenes	0.0044 (J)	561E008	0.0 - 0.5	E05	2,700	mg/kg
TPH-DRO	17	561E003	0.0 - 0.5	E02	N/A°	mg/kg

^aFAL for Ac-228 based on Th-232 FAL.

^bPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

[°]Per FI ROTC-1 (NNES, 2010), the Nevada Legislative Commission approved new regulations for TPH-DRO; the FAL of 100 mg/kg no longer applies.

J = Estimated value

J- = Result is an estimated quantity, but may be biased low.

Table 2-6
Maximum Detected Sample Results for CAS 22-19-06, Buried Waste Disposal Site

Contaminant	Maximum Result	Sample Number	Depth (ft bgs)	Location	FAL	Units
Ac-228	0.69	561F004	7.0 - 7.5	F03	506.7ª	pCi/g
Arsenic	6.2	561F004	7.0 - 7.5	F03	23	mg/kg
Barium	89	561F004	7.0 - 7.5	F03	190,000	mg/kg
Barium	89	561F005	8.0 - 8.5	F04	190,000	mg/kg
Cadmium	0.27	561F005	8.0 - 8.5	F04	800	mg/kg
Chromium	5.1 (J)	561F002	1.5 - 2.0	F01	N/A ^b	mg/kg
Lead	17 (J)	561F004	7.0 - 7.5	F03	800	mg/kg
Selenium	0.29	561F001	1.5 - 2.0	F01	5,100	mg/kg
TPH-DRO	11	561F003	2.5 - 3.0	F02	N/A°	mg/kg

^aFAL for Ac-228 based on Th-232 FAL.

J = Estimated value

verification samples. The maximum concentration of each detected contaminant remaining in the soil at this CAS is listed in Table 2-7, and sample locations are shown in Figure A.9-1.

2.2.1.8 CAS 25-08-02, Waste Dump

After removal of the arsenic-contaminated concrete-like material, all soil concentrations of the reported constituents were compared to and were less than FALs. Verification samples were collected after the pile was removed and indicate that the concentration of the arsenic is now less than the FALs and no COCs remain in the soil at CAS 25-08-02. Table A.10-5 presents sample locations, sample depths, and concentrations from the verification samples. The maximum concentration of each detected contaminant remaining in the soil at this CAS is listed in Table 2-8, and sample locations are shown in Figure A.10-1. Because all of the waste piles were removed and disposed of, the maximum detected sample results are from the verification samples only.

^bPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

^ePer FI ROTC-1 (NNES, 2010), the Nevada Legislative Commission approved new regulations for TPH-DRO; the FAL of 100 mg/kg no longer applies.

CAU 561 CADD/CR Section: 2.0 Revision: 0 Date: August 2011 Page 36 of 45

Table 2-7
Maximum Detected Sample Results for CAS 23-21-04, Waste Disposal Trenches

Contaminant	Maximum Result	Sample Number	Depth (ft bgs)	Location	Trench	FAL	Units
Ac-228	1.43	561G003	0.0 - 0.5	G03	6	506.7ª	pCi/g
Acetone	0.062 (J)	561G014	0.0 - 0.5	G13	5	630,000	mg/kg
Am-241	0.53 (J)	561G012	0.5 - 1.0	G11	5	1,503	pCi/g
Aroclor 1260	0.027 (J)	561G005	7.5 - 8.0	G05	3	0.74	mg/kg
Arsenic	18	561G005	7.5 - 8.0	G05	3	23	mg/kg
Barium	190	561G014	0.0 - 0.5	G13	5	190,000	mg/kg
Benzoic acid	1.7	561G005	7.5 - 8.0	G05	3	2,500,000	mg/kg
Beryllium	0.69	561G003	0.0 - 0.5	G03	6	2,000	mg/kg
Bis(2-ethylhexyl)phthalate	3.1 (J)	561G005	7.5 - 8.0	G05	3	120	mg/kg
Cadmium	5.3 (J)	561G003	0.0 - 0.5	G03	6	800	mg/kg
Chromium	8.7	561G003	0.0 - 0.5	G03	6	N/A ^b	mg/kg
Hexavalent chromium	2.4 (J)	561G009	0.0 - 0.5	G09	6	5.6	mg/kg
Cs-137	0.51	561G012	0.5 - 1.0	G11	5	72.9	pCi/g
Di-n-butyl phthalate	0.072 (J)	561G005	7.5 - 8.0	G05	3	62,000	mg/kg
Lead	120(J)	561G011	0.5 - 1.0	G10	6	800	mg/kg
Mercury	0.045	561G014	0.0 - 0.5	G13	5	34	mg/kg
Methylene chloride	0.0049 (J)	561G003	0.0 - 0.5	G03	6	53	mg/kg
Selenium	0.47	561G014	0.0 - 0.5	G13	5	5,100	mg/kg
Toluene	0.0022 (J)	561G009	0.0 - 0.5	G09	6	45,000	mg/kg
Total xylenes	0.0029 (J)	561G011	0.0 - 0.5	G10	6	2,700	mg/kg
TPH-DRO	270	561G006	7.5 - 8.0	G06	3	N/A°	mg/kg

^aFAL for Ac-228 based on Th-232 FAL.

J = Estimated value

^bPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

[°]Per FI ROTC-1 (NNES, 2010), the Nevada Legislative Commission approved new regulations for TPH-DRO; the FAL of 100 mg/kg no longer applies.

Table 2-8
Maximum Detected Sample Results for CAS 25-08-02, Waste Dump

Contaminant	Maximum Result	Sample Number	Depth (ft bgs)	Location	FAL	Units
Arsenic	4.2	561H025	0.0 - 0.5	H22	23	mg/kg
Barium	140	561H025	0.0 - 0.5	H22	190,000	mg/kg
Cadmium	0.071	561H025	0.0 - 0.5	H22	800	mg/kg
Chromium	5.2	561H025	0.0 - 0.5	H22	N/A ^a	mg/kg
Lead	9.4 (J)	561H025	0.0 - 0.5	H22	800	mg/kg
Mercury	0.015 (J)	561H020	0.0 - 0.5	H19	34	mg/kg

^aPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

2.2.1.9 CAS 25-23-21, Radioactive Waste Dump

After removal of the Cs-137- and PCB-contaminated RMA piles, all soil concentrations of the reported constituents were compared to and were less than FALs. Verification samples were collected after these RMA piles were removed and indicate that the concentrations of Cs-137 and PCBs are now less than the FALs and no COCs remain in the soil at CAS 25-23-21. Tables A.11-6 and A.11-7 present sample locations, sample depths, and PCB and Cs-137 concentrations from the verification samples.

Soil concentrations of the reported constituents at the second parcel were compared to and were less than PALs. The maximum concentration of each detected contaminant remaining in the soil at this CAS at both the main waste dump and the second parcel is listed in Table 2-9, and sample locations are shown in Figures A.11-2 and A.11-3.

2.2.1.10 CAS 25-25-19, Hydrocarbon Stains and Trench

All soil concentrations of the reported constituents were compared to and were less than FALs. The maximum concentration of each detected contaminant remaining in the soil at this CAS is listed in Table 2-10, and sample locations are shown in Figure A.12-1. Two lead bricks were removed, and verification samples were collected beneath the bricks. The verification samples indicated that the concentration of lead is now less than the FALs and no COCs remain in the soil at CAS 25-25-19.

J = Estimated value

CAU 561 CADD/CR Section: 2.0 Revision: 0 Date: August 2011 Page 38 of 45

Table 2-9
Maximum Detected Sample Results for CAS 25-23-21, Radioactive Waste Dump

Contaminant	Maximum Result	Sample Number	Depth (ft into pile)	Location	Area	FAL	Units
Ac-228	2.64	5611011	0.0 - 1.0	102	Second Parcel	506.7ª	pCi/g
Aroclor 1254	0.12	5611021	2.5 - 3.0	126	Waste Dump	0.74	mg/kg
Arsenic	16	5611017	0.0 - 0.5 ft bgs	l11	Second Parcel	23	mg/kg
Barium	300	5611017	0.0 - 0.5 ft bgs	l11	Second Parcel	190,000	mg/kg
Beryllium	1.1	5611003	1.0 - 1.5	l16	Second Parcel	2,000	mg/kg
Cadmium	1.5	5611015	2.0 - 2.5	l13	Second Parcel	800	mg/kg
Chromium	44	5611009	0.0 - 0.5	103	Second Parcel	N/A ^b	mg/kg
Hexavalent chromium	0.52 (J-)	5611015	2.0 - 2.5	l13	Second Parcel	5.6	mg/kg
Co-60	1.77	5611034	0.0 - 0.5	130	Waste Dump	18.33	pCi/g
Cs-137	2.85	5611039	0.0 - 0.5	I36	Waste Dump	72.9	pCi/g
Lead	32	5611017	0.0 - 0.5 ft bgs	l11	Second Parcel	800	mg/kg
Mercury	0.1	5611015	2.0 - 2.5	l13	Second Parcel	34	mg/kg
Methylene chloride	0.013	5611009	0.0 - 0.5	103	Second Parcel	53	mg/kg
PCBs (low risk)	0.084	5611015	2.0 - 2.5	l13	Second Parcel	21	mg/kg
Selenium	0.44	5611005	0.0 - 0.5	106	Second Parcel	5,100	mg/kg
Th-234	5.6 (J)	5611011	0.0 - 1.0	102	Second Parcel	1,423°	pCi/g
TPH-DRO	73	5611015	2.0 - 2.5	l13	Second Parcel	N/A ^d	mg/kg
U-235	3.9 (J)	5611033	0.0 - 0.5	130	Waste Dump	255.5	pCi/g

^aFAL for Ac-228 based on Th-232 FAL.

^bPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

 $^{^{\}circ}\text{FAL}$ for Th-234 based on U-238 FAL.

^dPer FI ROTC-1 (NNES, 2010), the Nevada Legislative Commission approved new regulations for TPH-DRO; the FAL of 100 mg/kg no longer applies.

J = Estimated value

J- = Result is an estimated quantity, but may be biased low.

CAU 561 CADD/CR Section: 2.0 Revision: 0 Date: August 2011 Page 39 of 45

Table 2-10

Maximum Detected Sample Results for CAS 25-25-19,
Hydrocarbon Stains and Trench

Contaminant	Maximum Result	Sample Number	Depth (ft bgs)	Location	FAL	Units
2-Butanone	0.011 (J)	561J001	0.0 - 0.5	J01	200,000	mg/kg
Ac-228	2.07	561J006	4.0 - 4.5	J04	506.7ª	pCi/g
Acetone	0.036 (J)	561J002	0.0 - 0.5	J02	630,000	mg/kg
Aroclor 1260	0.5 (J)	561J007	1.0 - 2.0	J05	0.74	mg/kg
Arsenic	3.2	561J001	0.0 - 0.5	J01	23	mg/kg
Barium	200	561J002	0.0 - 0.5	J02	190,000	mg/kg
Beryllium	0.46 (J-)	561J018	0.0 - 1.0	J13	2,000	mg/kg
Bis(2-ethylhexyl)phthalate	0.068 (J)	561J005	0.5 - 1.5	J04	120	mg/kg
Cadmium	0.71	561J020	0.5 - 1.0	J14	800	mg/kg
Chromium	6.3	561J024	6.0 - 6.5	J17	N/A ^b	mg/kg
Lead	420 (J)	561J002	0.0 - 0.5	J02	800	mg/kg
Mercury	0.066	561J010	5.0 - 5.5	J06	34	mg/kg
Selenium	0.36	561J003	0.0 - 0.5	J03	5,100	mg/kg
Silver	0.16	561J020	0.5 - 1.0	J14	5,100	mg/kg
Th-234	3 (J)	561J008	5.0 - 5.5	J05	1,423°	pCi/g
TPH-DRO	1,900	561J008	5.0 - 5.5	J05	N/A ^d	mg/kg

^aFAL for Ac-228 based on Th-232 FAL.

2.2.2 Data Assessment Summary

The DQA process as presented in Appendix B is composed of the following steps:

- Step 1: Review DQOs and Sampling Design.
- Step 2: Conduct a Preliminary Data Review.
- Step 3: Select the Test.
- Step 4: Verify the Assumptions.
- Step 5: Draw Conclusions from the Data.

^bPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

[°]FAL for Th-234 based on U-238 FAL.

^dPer FI ROTC-1 (NNES, 2010), the Nevada Legislative Commission approved new regulations for TPH-DRO; the FAL of 100 mg/kg no longer applies.

J = Estimated value

J- = Result is an estimated quantity, but may be biased low.

Section: 2.0 Revision: 0 Date: August 2011 Page 40 of 45

The results of the DQI evaluation show that precision was the only indicator that did not meet the associated criterion. The only analyte that failed to meet the precision criterion was lead. As presented in Appendix B, there is a negligible potential for this precision deficiency to cause a false negative decision error. All other DQI criteria were met. The DQA determined that information generated during the investigation supports the CSM assumptions, and the data collected support their intended use in the decision-making process. Based on the results of the DQA presented in Appendix B, the DQO requirements have been met.

Sample locations that support the presence and/or extent of contamination at each CAS are shown in Appendix A. Based on the results of the DQA presented in Appendix B, the DQO requirements have been met. The DQA also determined that information generated during the investigation supports the revised CSM assumptions, and the data collected support their intended use in the decision-making process.

2.3 Justification for No Further Action

No further corrective action is justified based on an evaluation of risk to ensure protection of the public and the environment in accordance with *Nevada Administrative Code* (NAC) 445A (NAC, 2008a), feasibility, and cost effectiveness. The decision that no further action is needed was determined from DQO decision statements based on a comparison of the analyte concentrations detected in CAI soil samples to the FALs defined in Section 2.3.1.

No further corrective action is required at CASs 01-19-01, 03-19-02, 05-62-01, 12-23-09, and 22-19-06 because COCs were not identified in sample results. Appendix C presents the evaluation of the risk assessment with the detected constituents and supports the recommendation of no further action.

All COC-impacted soil and PSM at CASs 23-21-04, 25-08-02, 25-23-21, and 25-25-19 was removed during the corrective action activities of clean closure discussed in Appendix D, and final verification sample results did not exceed FALs.

CAU 561 CADD/CR Section: 2.0 Revision: 0 Date: August 2011

Page 41 of 45

As part of a closure in place corrective action for CAS 02-08-02, an FFACO use restriction (UR) was implemented for contaminants identified at concentrations exceeding FALs. The UR will prevent unauthorized intrusive activities.

Best management practices (BMPs) were implemented at several of the CASs. Appendix D provides additional detail on the BMP activities performed at CAU 561 CASs.

2.3.1 Final Action Levels

The CAU 561 FALs are risk-based cleanup goals that, if met, will ensure that each release site will not pose an unacceptable risk to human health and the environment and that conditions at each site are in compliance with all applicable laws and regulations. The risk-based corrective action (RBCA) process used to establish FALs is described in the *Industrial Sites Project Establishment of Final Action Levels* (NNSA/NSO, 2006). This process conforms with NAC Section 445A.227, which lists the requirements for sites with soil contamination (NAC, 2008b). For the evaluation of corrective actions, NAC Section 445A.22705 (NAC, 2008c) requires the use of ASTM International (ASTM) Method E1739 (ASTM, 1995) to "conduct an evaluation of the site, based on the risk it poses to public health and the environment, to determine the necessary remediation standards (i.e., FALs) or to establish that corrective action is not necessary."

This RBCA process defines three tiers (or levels) of evaluation involving increasingly sophisticated analyses:

- Tier 1 evaluation sample results from source areas (highest concentrations) are compared to action levels based on generic (non-site-specific) conditions (i.e., the PALs established in the CAIP [NNSA/NSO, 2008]). The FALs may then be established as the Tier 1 action levels, or the FALs may be calculated using a Tier 2 evaluation.
- Tier 2 evaluation conducted by calculating Tier 2 Site-Specific Target Levels (SSTLs) using site-specific information as inputs to the same or similar methodology used to calculate Tier 1 action levels. The Tier 2 SSTLs are then compared to individual sample results from reasonable points of exposure (as opposed to the source areas as is done in Tier 1) on a point-by-point-basis. Total TPH concentrations will not be used for risk-based decisions under Tier 2 or Tier 3. Rather, the individual chemicals of concern will be compared to the SSTLs.

CAU 561 CADD/CR Section: 2.0 Revision: 0

Date: August 2011 Page 42 of 45

• Tier 3 evaluation – conducted by calculating Tier 3 SSTLs on the basis of more sophisticated risk analyses using methodologies described in Method E1739 that consider site-, pathway-, and receptor-specific parameters.

A Tier 1 evaluation was conducted for all COPCs to determine whether contaminant levels satisfy the criteria for a quick regulatory closure or warrant a more site-specific assessment. This was accomplished by comparing individual source area contaminant concentration results to the Tier 1 action levels (the PALs established in the CAIP [NNSA/NSO, 2008]).

The only constituent detected at CAU 561 for which a PAL was not established was phenanthrene. The surrogate chemical used was anthracene because this surrogate is based on structural similarity. The difference between the two chemicals is the position of the benzene rings. Under the same conditions, these chemicals react similarly. Phenanthrene is more polar and therefore more reactive than anthracene. The FALs for all constituents were established at the PAL concentrations.

CAU 561 CADD/CR Section: 3.0 Revision: 0 Date: August 2011 Page 43 of 45

3.0 Recommendation

No further corrective action beyond what is described in this CADD/CR document is required at CAU 561 based on implementation of the following corrective actions:

- No further action for CASs 01-19-01, 03-19-02, 05-62-01, 12-23-09, and 22-19-06.
- Closure in place with an FFACO UR at CAS 02-08-02 for the lead-, arsenic-, and PAH-impacted soil. An FFACO UR was implemented and filed in the NNSA/NSO Facility Information Management System, the FFACO database, and the NNSA/NSO CAU/CAS files.
- Clean closure for CAS 23-21-04, as the arsenic- and PCB-impacted soil and lead brick and counterweights have been removed.
- Clean closure for CAS 25-08-02, as the arsenic-impacted concrete-like material and lead-acid batteries have been removed.
- Clean closure for CAS 25-23-21, as the PCB- and Cs-137-impacted soil has been removed.
- Clean closure for CAS 25-25-19, as the lead bricks have been removed.

The following BMPs were also conducted:

- At CAS 23-21-04, removed and disposed of housekeeping debris in and around the trenches, and backfilled all open trenches.
- At CAS 25-08-02, removed and disposed of all sanitary waste piles and debris, and leveled the area to ground surface.
- At CAS 25-23-21, the remaining piles at main waste dump were leveled and contoured to the original grade, and housekeeping debris was removed from the second parcel.
- At CAS 25-25-19, removed and disposed of housekeeping debris.

The NNSA/NSO requests that NDEP issue a Notice of Completion for this CAU and approval to move the CAU from Appendix III to Appendix IV of the FFACO.

CAU 561 CADD/CR Section: 4.0 Revision: 0 Date: August 2011 Page 44 of 45

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CAU 561 CADD/CR Section: 4.0 Revision: 0 Date: August 2011 Page 45 of 45

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Appendix A Corrective Action Investigation Results

A.1.0 Introduction

This appendix presents the CAI activities and analytical results for CAU 561. The 10 CASs that make up CAU 561 are located in Areas 1, 2, 3, 5, 12, 22, 23, and 25 of the NNSS (Figure 1-1) and are listed below:

- 01-19-01, Waste Dump
- 02-08-02, Waste Dump and Burn Area
- 03-19-02, Debris Pile
- 05-62-01, Radioactive Gravel Pile
- 12-23-09, Radioactive Waste Dump
- 22-19-06, Buried Waste Disposal Site
- 23-21-04, Waste Disposal Trenches
- 25-08-02, Waste Dump
- 25-23-21, Radioactive Waste Dump
- 25-25-19, Hydrocarbon Stains and Trench

Corrective Action Site 01-19-01 is located in Area 1 and consists of a fenced area approximately 20 ft east of Building 1-31-2.e1. The CAS was originally identified as a subsurface waste dump, but no waste dump was found during the CAI. During excavation activities, a building foundation from Building 31.1-b1, constructed for the Apple-2 test, was uncovered. There was visible debris on the ground surface consisting of concrete chunks, rebar, wood, and red bricks.

Corrective Action Site 02-08-02 is located in the dry wash southeast of the Area 2 Camp, and consists of a waste dump and burn area. The waste dump contains piles of dirt and boulders with scattered debris, including metal cables, wires, wooden planks, tires, sheet metal, and a crushed 30-gal drum which contained a very small amount of grease. A review of historical air photographs show that the material was placed at this location between 1983 and 1985 (NNSA/NSO, 2008). The burn area, located northwest of the waste dump, contains scattered nails, metal, wood, bits of charcoal, and melted lead.

Corrective Action Site 03-19-02 is located in Area 3. It consists of a pile of concrete debris believed to be associated with the Pommard test, which was conducted on March 14, 1968. A large piece of concrete has Trinity glass adhered to its surface. The CAS is surrounded by "Caution Radioactive Material" postings but is not fenced.

CAU 561 CADD/CR

Appendix A Revision: 0 Date: August 2011

Page A-2 of A-156

Corrective Action Site 05-62-01 consists of a radioactive gravel pile located approximately 1,000 ft

west of the Gravel Gertie in Area 5. The pile contains visible concrete and metal debris, which is

believed to be from the Gravel Gertie testing events. The CAS is fenced and posted as an RMA.

Corrective Action Site 12-23-09 is located approximately 150 ft northwest of Stockade Wash Road,

just north of the E-Tunnel Road in Area 12. The CAS consists of two separate fenced areas

(north and south) and was labeled as a radioactive waste dump on a topographic map; however,

interviews with past employees suggest that the site was used as an electricians' laydown yard.

Corrective Action Site 22-19-06 is located at the southeast end of Camp Desert Rock in Area 22 of

the NNSS and consists of buried debris identified by a geophysical survey. Excavation activities

uncovered a manhole cover and a concrete-filled piece of corrugated pipe. Camp Desert Rock has

been identified as eligible for inclusion in the National Register of Historic Places (Jones, 2010).

Corrective Action Site 23-21-04 consists of six potential waste disposal trenches and one potential

covered trench located approximately 1,500 ft northeast of Building 23-160 in Area 23. Three of the

trenches contained debris (wood, metal, cables/wire, lead bricks and lead counterweights, nails and

bolts). There was also stained soil near two of the trenches.

Corrective Action Site 25-08-02 is located north of G Road between the RCP and R-MAD complex

in Area 25, and consists of a large waste dump. The waste dump consists of piles of construction

debris, such as concrete, metal, rebar, wood, batteries, 5-gal buckets, an empty cable spool, rusted

cans, and pipes.

Corrective Action Site 25-23-21 consists of a radioactive waste dump located within Topopah Wash,

northeast of the E-MAD Facility in Area 25. A second parcel is upstream from the waste dump parcel

within Topopah Wash and extends further upstream north of H Road. The waste dump contains

numerous dirt mounds and piles within a posted "Controlled Area," along with miscellaneous piles

extending up through Topopah Wash to H Road. Within the waste dump, there are two specific piles

that are posted with "Caution Radioactive Material" signs. The signs referred to the pieces of

cast-iron pipe that were located on and within the soil piles. The second parcel contains typical waste

piles, along with concrete, asphalt, and magnetite piles.

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CAU 561 CADD/CR

Appendix A Revision: 0 Date: August 2011

Page A-3 of A-156

Corrective Action Site 25-25-19 encompasses approximately 8 acres and is located southeast of the

intersection of C Road and G Road in Area 25, across from the RCP. The CAS consists of surface

soil stains, a tar spill, an asphalt spill, a trench, concrete pads, debris, rock, and soil piles.

Additional information regarding the history of each site, planning, and the scope of the investigation

is presented in the CAU 561 CAIP (NNSA/NSO, 2008).

A.1.1 Project Objectives

The primary objective of the investigation was to provide sufficient information to complete

corrective actions for each CAS in CAU 561 and to support a recommendation for closure of the

CASs in CAU 561. This objective was achieved by identifying the nature and extent of COCs and by

evaluating, selecting, and implementing corrective action alternatives (CAAs).

A.1.2 Content

This appendix describes the investigation and presents the results. The contents of this appendix are

as follows:

Section A.1.0 describes the investigation background, objectives, and content.

• Section A.2.0 provides an investigation overview.

• Sections A.3.0 through A.12.0 provide CAS-specific information regarding the field

activities, sampling methods, and laboratory analytical results from investigation sampling.

• Section A.13.0 summarizes waste management activities.

• Section A.14.0 discusses the QA and QC processes followed and the results of

QA/QC activities.

• Section A.15.0 provides a summary of the investigation results.

• Section A.16.0 lists the cited references.

The complete field documentation and laboratory data—including field activity daily logs (FADLs),

sample collection logs (SCLs), analysis request/chain-of-custody forms, soil sample descriptions,

laboratory certificates of analyses, analytical results, and surveillance results—are retained in project

files as hard copy files or electronic media.

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A.2.0 Investigation Overview

Field investigation and sampling activities for the CAU 561 CAI were conducted from August 2, 2010, through June 28, 2011. Table A.2-1 lists the CAI activities that were conducted at each of the CASs.

Table A.2-1
CAI Activities Conducted at Each CAS To Meet CAIP Requirements for CAU 561

					C	AS				
CAI Activities	10-61-10	02-08-02	03-19-02	05-62-01	12-23-09	22-19-06	23-21-04	25-08-02	25-23-21	25-25-19
Inspected and verified the CAS components identified in the CAIP.	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Performed site walkovers to identified biased sampling locations.	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Conducted scanning radiological walkover surveys (i.e., soil, concrete surfaces, debris) using a handheld detector.			Х	Х					Х	
Collected biased (judgmental) soil samples.	Х	Х	Х	Χ	Χ	Х	Χ	Χ	Χ	Х
Collected randomly located (probabilistic) soil samples.		Х			Х			Х	Х	
Collected soil samples from step-out locations (Decision II) based on the outer boundary sample locations where COCs were detected in Decision I soil samples.		Х					Х	Х	Х	
Field screened samples for alpha and beta/gamma radiation using a hand-held survey instrument.				Х					Х	
Submitted select samples for offsite laboratory analysis.	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Collected GPS coordinates for sample locations and points of interest.	Х	Х	Х	Х	Х	Х	Х	Х	Х	Х
Removed debris for disposal, as BMP.		Х					Х	Х	Х	Х
Removed melted lead, lead bricks/counterweights, and lead-acid batteries for recycle.		Х					Х	Х		Х

GPS = Global Positioning System

-- = Not applicable

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-5 of A-156

The investigation and sampling program was managed in accordance with the requirements set forth in the CAIP (NNSA/NSO, 2008). Samples were collected and documented following the CAIP. Quality control samples (e.g., field blanks, equipment rinsate blanks, trip blanks, and duplicate samples) were collected as required by the Industrial Sites QAPP (NNSA/NV, 2002a) and the CAIP. During field activities, waste minimization practices were followed according to approved procedures, including segregation of waste by waste type.

Except as noted in the following CAS-specific sections, CAU 561 Decision I sampling locations were accessible and sampling activities at planned locations were not restricted. Decision II sample locations were accessible and remained within the anticipated CAS-specific spatial boundaries.

Sections A.2.1 through A.2.4 provide the investigation methodology, site geology and hydrology, and laboratory analytical information.

A.2.1 Sample Locations

Sampling locations were selected based on interpretation of historical aerial photographs, interviews with former and current site employees, information presented in the Preliminary Assessments Site Reference Summary (SNJV, 2006), information obtained during site visits, and site conditions as presented in the CAIP (NNSA/NSO, 2008). Sampling points for each site were selected based on the approach provided in the CAIP. The planned judgmental and random sample locations are presented on figures in the CAIP. Actual environmental sample locations and reasons for deviations from the CAIP plans are shown on the figures and discussed in Sections A.3.0 through A.12.0. Some locations were modified slightly from planned positions due to field conditions and observations. In some cases, field observations and laboratory analytical results determined the need for step-out (Decision II) sampling. All sample locations were staked, labeled, and the survey coordinates recorded using a GPS unit. Appendix E presents these data in a tabular format.

A.2.2 Investigation Activities

The investigation activities performed at CAU 561, listed in Table A.2-1, were consistent with the field investigation activities stipulated in the CAIP (NNSA/NSO, 2008) and the FI ROTC-1 (NNES, 2010). The investigation strategy resulted in the accurate delineation of the nature and extent

of COCs associated with each CAS. The following sections describe the CAU 561-specific investigation activities.

A.2.2.1 Radiological Surveys

Radiological surveys (i.e., scanning) were performed at CASs 03-19-02 and 05-62-01 during the CAI. The surveys were performed to identify the presence, the nature, and the extent of radiological contaminants at activities statistically distinguishable from background activities (more than two times background levels). These radiological surveys were used as biasing factors to locate samples at the two CASs. The radiological surveys were conducted using a handheld plastic scintillation detector in conjunction with a GPS receiver and datalogger.

A.2.2.2 Geophysical Surveys

Geophysical walkover surveys were conducted at some of the CASs during the preliminary assessments as specified in CAIP (NNSA/NSO, 2008). The surveys were reviewed to determine investigation areas and potential sample locations. No additional surveys were required during the CAI effort.

A.2.2.3 Field Screening

Field-screening activities for alpha and beta/gamma radiation were performed as specified in the CAIP (NNSA/NSO, 2008). The CAS-specific sections of this document identify where field screening was conducted and how the FSLs were used to aid in the selection of samples to be submitted for analysis. Field-screening results (FSRs) are recorded on SCLs that are retained in project files.

Samples collected from CASs 22-19-06 and 25-25-19 were screened for VOCs using a Mini-RAE 2000 photoionization detector (PID) due to the possible presence of volatile hydrocarbons in the soil. A Q-RAE Plus Four-Gas Monitor was used to screen soil samples from CASs 25-25-19 and 22-19-06.

A.2.2.4 Surface and Subsurface Soil Sampling

The CASs were investigated by conducting radiological and visual surveys to identify biasing factors, and sampling potential contaminant sources, surface and subsurface soils. Surface soil samples were collected using hand sampling techniques. Subsurface soil samples were collected using a backhoe. The soil samples were field screened at all locations for alpha and beta/gamma radiation. The results were compared against FSLs to guide in the CAS-specific investigations. Samples of various media (e.g., concrete) were collected to support both environmental and waste characterization using scabbling techniques.

Soil samples were collected using "scoop and trowel" (surface hand-grab sampling), a backhoe, and a scabbler (concrete samples). Radiological screening was conducted during sample collection to select sample locations. Labeled sample containers were filled according to the following sequence: VOCs sample containers were filled with soil directly from the sample location or from the decontaminated backhoe bucket, for the CASs specified in the CAIP (NNSA/NSO, 2008). Additional soil was transferred into a an aluminum pan and homogenized. Remaining sample containers were then filled with the homogenized soil. Excess soil was returned to its original location.

Surface soil samples were collected from 0 to 1 ft bgs at biased locations as determined in the field based on the presence of stained soil, PSM, areas with elevated radiological measurements, or other biasing factors as specified in the CAIP. Subsurface soil samples were collected from 1 to 8.5 ft bgs at locations in excavations that showed biasing (e.g., debris, stained soil) factors, and at the native soil interface.

A.2.2.5 Waste Characterization Sampling

Characterization of CAS-specific materials (e.g., lead bricks, concrete, magnetite) and the underlying soil was conducted to support the potential disposal of these items.

Samples were analyzed in accordance with the CAIP (NNSA/NSO, 2008). The specific analyses for each CAS are listed in CAS-specific sections, and the analytical results are compared to the federal limits for hazardous waste, landfill acceptance criteria, and the limits in the NNSS performance objective criteria (POC) (BN, 1995). The POC limits have been established for

NNSS hazardous waste generators to ensure that all hazardous waste being shipped off site contains no "added radioactivity."

Specific waste characterization sampling and analysis was conducted on the following potential waste streams:

- Soil samples from Trenches 3 and 5 at CAS 23-21-04, which were analyzed for TCLP metals.
- Samples of the concrete-like material pile and a pile of typical construction debris at CAS 25-08-02, which were analyzed for TCLP metals.
- Soil samples from all CASs, which were analyzed for TPH-DRO.

A.2.3 Laboratory Analytical Information

Radiological and chemical analyses were performed by Paragon Analytics, Inc., of Fort Collins, Colorado. Dioxin analyses were performed by TestAmerica, of Knoxville, Tennessee. The analytical suites and laboratory analytical methods used to analyze investigation samples are listed in Table A.2-2. Analytical results are reported in this appendix if they were detected above the minimum detectable concentrations (MDCs). The complete laboratory data packages are available in the project files.

Table A.2-2
Laboratory Analyses and Methods, CAU 561 Investigation Samples^a
(Page 1 of 2)

Analysis	Analytical Method ^b
VOCs	Aqueous/Non-aqueous - EPA SW-846 ^c 8260
SVOCs	Aqueous/Non-aqueous - EPA SW-846 ^c 8270
PCBs	Aqueous/Non-aqueous - EPA SW-846 ^c 8082
TPH-DRO	Aqueous/Non-aqueous - EPA SW-846° 8015 Modified
Metals plus beryllium	Aqueous - EPA SW-846 ^c 6010/6020/7470 Non-aqueous - EPA SW-846 ^c 6010/6020/7471
TCLP metals	EPA SW-846° 1311/6010/7470
Hexavalent chromium	EPA SW-846° 7196A
Dioxins	EPA SW-846° 8280A/8290

Table A.2-2 Laboratory Analyses and Methods, CAU 561 Investigation Samples^a (Page 2 of 2)

Analysis	Analytical Method ^b
Isotopic U	Aqueous/Non-aqueous - DOE EML HASL-300 ^d U-02-RC
Isotopic Pu	Aqueous - DOE EML HASL-300 ^d Pu-10-RC Non-aqueous - DOE EML HASL-300 ^d Pu-02-RC
Gamma spectroscopy	Aqueous - EPA 901.1 ^e Non-aqueous - DOE EML HASL-300 ^d , Ga-01-R
Sr-90	Aqueous - EPA 905.0 ^e Non-aqueous - DOE EML HASL-300 ^d Sr-02-RC

^aInvestigation samples include both environmental and waste characterization samples and associated QC samples.

EML = Environmental Measurements Laboratory EPA = U.S. Environmental Protection Agency HASL = Health and Safety Laboratory

NIOSH = National Institute for Occupational Safety and Health

Sr = Strontium

The analytical parameters are CAS-specific and were selected through the application of site process knowledge as described in the CAIP DQOs (NNSA/NSO, 2008). Samples collected during step-out sampling were only analyzed for the COCs that were identified in the original characterization samples.

A.2.4 Comparison to Action Levels

A COC is defined as any contaminant present in environmental media at a concentration exceeding a FAL. A COC may also be defined as a contaminant that, in combination with other like contaminants, is determined to jointly pose an unacceptable risk based on a multiple constituent analysis (NNSA/NSO, 2006).

If COCs are determined to be present, a corrective action must be considered for the CAS. The FALs for the CAU 561 investigation are defined for each CAS in Section 2.3.1. Results that are equal to or greater than FALs are identified by bold text in the CAS-specific results tables (Sections A.3.0 through **A.12.0**).

^bThe most current EPA, DOE, ASTM, NIOSH, or equivalent accepted analytical method may be used.

^cTest Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA, 2009).

^dThe Procedures Manual of the Environmental Measurements Laboratory (DOE, 1997).

^ePrescribed Procedures for Measurement of Radioactivity in Drinking Water (EPA, 1980).

CAU 561 CADD/CR

Appendix A Revision: 0

Date: August 2011 Page A-10 of A-156

The evaluation of the need for corrective action includes the potential for wastes that are present at a

site to cause the future contamination of site environmental media if the wastes were to be released.

To evaluate the potential for waste to result in the introduction of a COC to the surrounding media,

the following conservative assumptions were made:

The containment would fail at some point and the contents would be released to the

surrounding media.

The resulting concentration of contaminants in the surrounding media would be equal to the

concentration of contaminants in the waste.

Any liquid contaminant in the waste exceeding the RCRA toxicity characteristic

concentration can result in a COC's introduction to the surrounding media.

For example, sludge containing a contaminant at concentrations exceeding an equivalent FAL

concentration would be considered to be PSM requiring a corrective action. Waste liquids with

contaminant concentrations exceeding an equivalent toxicity characteristic action level were also

considered to be PSM requiring a corrective action.

Corrective Action Site 01-19-01 is located east of Building 1-31.2e1 in Area 1. It was believed that the CAS consisted of a fenced subsurface waste dump which contained construction debris from a former two-story brick house associated with the Apple II test. Visible surface debris consisted of red bricks, rebar, wood, and concrete chunks. During excavation activities, it was discovered that the area contained the foundation for Building 31.1-b1, along with a stairwell, a part of a red brick chimney and burned wood. This site was determined not to be a waste dump.

A.3.1 Corrective Action Investigation

A total of five characterization samples (including one FD) were collected from four locations at CAS 01-19-01 (Figure A.3-1). The samples were collected at the location of geophysical anomalies. The sample identifications (IDs), locations, types, and analyses are listed in Table A.3-1. The specific CAI activities conducted to satisfy the CAIP requirements at this CAS (NNSA/NSO, 2008) are described in the following sections.

A.3.1.1 Radiological Surveys

A gamma radiological walkover survey was performed during the preliminary assessment within the fenced area at CAS 01-19-01 to identify biased sampling locations. No areas of elevated radioactivity were identified at this CAS, and no samples were collected based on the radiological survey results.

A.3.1.2 Geophysical Surveys

Geophysical surveys were performed in 2004. Based on the survey results, two primary trenches across the anomalies were excavated. Based on the results of the excavation, soil samples were collected from these anomalies at locations A01 through A04 at varying depths as determined by visual screening (Figure A.3-1).

A.3.1.3 Visual Inspections

Visual inspections were conducted of the surface soil within the fenced area for any stained soil or other biasing factors. Concrete, rebar, and red bricks were observed on the surface soil, but there was

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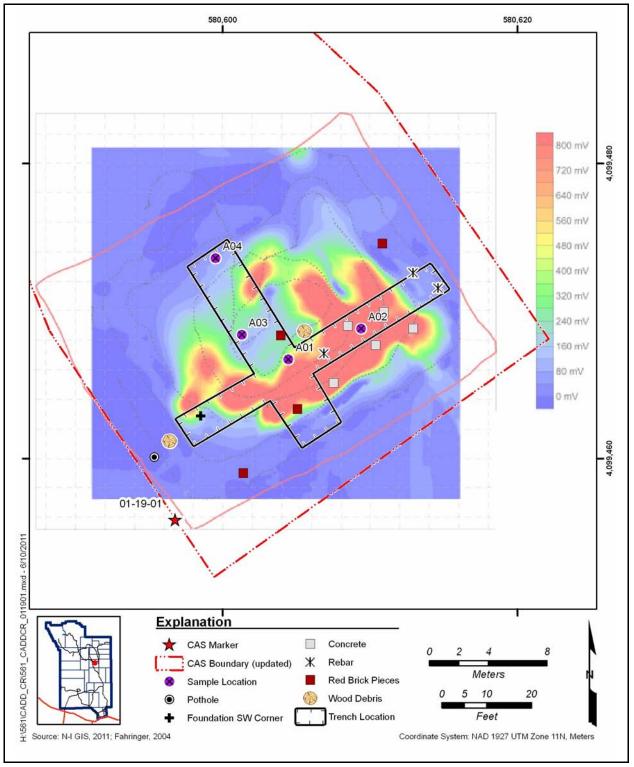


Figure A.3-1 Sample Locations at CAS 01-19-01, Waste Dump

Table A.3-1 Samples Collected at CAS 01-19-01, Waste Dump

Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Beryllium	TPH-DRO	Gamma	Hexavalent Chromium	Metals	PCBs	SVOCs	VOCs
A01	561A001	7.5 - 8.0	Soil	Environmental	Х	Х	Х	Х	Χ	Х	Х	Х
A02	561A002	2.0 - 2.5	Soil	Environmental	Х	Х	Х	Х	Χ	Х	Χ	Х
AUZ	561A003	2.0 - 2.5	Soil	FD of #561A002	Х	Х	Х	Х	Х	Х	Х	Х
A03	561A004	6.0 - 6.5	Soil	Environmental	Х	Х	Х	Х	Χ	Х	Х	Х
A04	561A005	5.5 - 6.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
N/A	561A301	N/A	Water	Trip Blank								Х
N/A	561A302	N/A	Water	Trip Blank								Х
N/A	561A303	N/A	Water	Trip Blank								Х
N/A	561A304	N/A	Water	Field Blank	Χ	Х	Χ	Х	Χ	Х	Х	Х
N/A	561A305	N/A	Water	Equipment Rinsate	Χ	Χ	Χ	Х	Χ	Х	Х	Χ
N/A	561A306	N/A	Water	Trip Blank								Χ

^{-- =} Not required

no visible surface staining. During the excavation, the subsurface soil was also inspected for staining and other biasing factors. There was no waste in the excavation, and the building foundation and red brick chimney were the only anomalies identified. Samples 561A001 and 561A004 were collected at the base of the foundation, samples 561A002 and 561A003 were collected because of debris and burned wood. Figure A.3-2 shows a typical biased sample location at the base of the building foundation.

A.3.1.4 Sample Collection

Decision I environmental sampling activities were conducted in the area of the geophysical anomalies to determine whether there has been a release from what was believed to be a buried waste dump. Subsurface soil samples were collected from the northeast-southwest trench and the northwest-southeast trench in the areas of the geophysical anomalies. In addition to the trenches, numerous potholes were excavated to determine the type of buried material that could be present. Five environmental samples (including one FD) were collected from four locations (location A01



Figure A.3-2
Building Foundation with Red Bricks at CAS 01-19-01, Waste Dump

through A04) in the location of the geophysical anomaly (Figure A.3-1). Samples were collected from depths ranging from 2 to 8 ft bgs. Because the analytical results showed no concentrations of any constituents above PALs, Decision II sampling was not necessary.

A.3.1.5 Deviations

The CSM was revised because the excavation activities uncovered the foundation of a building and not a waste dump. The CSM was revised to include potentially contaminated subsurface media from building materials and from burning of wood in fireplaces. The number of samples was decreased from the CAIP because the site was discovered to be the foundation of a building, instead of a waste dump. The sampling plan fit the new CSM and there were no impacts to the CSM. The analyses were conducted as outlined in the CAIP (NNSA/NSO, 2008).

A.3.2 Investigation Results

The following sections provide analytical results from the samples collected to complete investigation activities. Environmental samples were analyzed for the CAIP-specified COPCs, which included VOCs, SVOCs, TPH-DRO (waste management purposes only), RCRA metals, hexavalent chromium, beryllium, PCBs, and gamma-emitting radionuclides. The analytical parameters and laboratory methods used to analyze the investigation samples are listed in Table A.2-2. Table A.3-1 lists the analytical suite for CAS 01-19-01.

Analytical results from the soil samples with concentrations exceeding MDCs are summarized in the following sections. An evaluation was conducted on all contaminants detected above MDCs by comparing individual concentration or activity results against the FALs. The procedure of establishing the FALs is presented in Appendix C.

A.3.2.1 Volatile Organic Compounds

Volatile organic compounds were not detected at concentrations exceeding the MDCs in soil samples. Therefore, the FALs were established at the corresponding PAL concentrations.

A.3.2.2 Semivolatile Organic Compounds

Semivolatile organic compounds were not detected at concentrations exceeding the MDCs in any of the soil samples collected at CAS 01-19-01. Therefore, the FALs were established at the corresponding PAL concentrations.

A.3.2.3 Total Petroleum Hydrocarbons

Analytical results for TPH-DRO detected in soil samples above MDCs are presented in Table A.3-2. Samples were analyzed for TPH-DRO for waste management purposes only as stated in the FI ROTC-1 (NNES, 2010), and are presented here for completeness of data. Preliminary action levels and FALs have not been established for TPH-DRO. The FALs are established for the individual hazardous constituents of TPH-DRO and are reported with the VOC and SVOC results. Because VOCs or SVOCs were not detected at concentrations exceeding the MDCs in any of the soil samples collected at this CAS, TPH-DRO is not considered to be a site-related contaminant.

Table A.3-2 Sample Results for TPH-DRO at CAS 01-19-01, Waste Dump

Sample Location	Sample Number	Depth (ft bgs)	TPH-DRO
A01	561A001	7.5 - 8.0	1.5 (J)
A02	561A003	2.0 - 2.5	1.6 (J)
A03	561A004	6.0 - 6.5	1.6 (J)
A04	561A005	5.5 - 6.0	3.2 (J)

J = Estimated value

A.3.2.4 RCRA Metals, Beryllium, and Hexavalent Chromium

Analytical results for RCRA metals, beryllium, and hexavalent chromium detected in soil samples above MDCs are presented in Table A.3-3. No metals, beryllium, or hexavalent chromium were detected at concentrations exceeding their PALs and the FALs were established at the corresponding PAL concentrations.

Table A.3-3
Sample Results for Metals Detected above MDCs at CAS 01-19-01, Waste Dump

					CC				
Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Selenium
	FALs		23	190,000	2,000	800	N/Aª	800	5,100
A01	561A001	7.5 - 8.0	3.9	210	0.6	0.21	5.9	11	0.46
A02	561A002	2.0 - 2.5	4.5	170	0.62	0.19	6.1	9.1	0.51
AUZ	561A003	2.0 - 2.5	4.3	240	0.62	0.19	6	19	
A03	561A004	6.0 - 6.5	3.5	210	0.61	0.22	5.9	8.5	
A04	561A005	5.5 - 6.0	4.7	260	0.69	0.21	6.1	9.4	0.44

^aPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

^{-- =} Not detected above MDCs.

A.3.2.5 Polychlorinated Biphenyls

Polychlorinated biphenyls were not detected at concentrations exceeding the MDCs. Therefore, the FALs were established at the corresponding PAL concentrations.

A.3.2.6 Gamma-Emitting Radionuclides

Analytical results for gamma-emitting radionuclides detected in soil samples above MDCs are presented in Table A.3-4. Because gamma-emitting radionuclides were not detected at concentrations exceeding their PALs, the FALs were established at the corresponding PAL concentrations.

Table A.3-4
Sample Results for Gamma-Emitting Radionuclides
Detected above MDC at CAS 01-19-01, Waste Dump

Sample	Sample	Depth	COPC (pCi/g)
Location	Number	(ft bgs)	Ac-228
	FAL		506.7ª
A01	561A001	7.5 - 8.0	1.77
A02	561A002	2.0 - 2.5	1.57
AUZ	561A003	2.0 - 2.5	1.72
A03	561A004	6.0 - 6.5	1.68
A04	561A005	5.5 - 6.0	1.73

^aFAL for Ac-228 based on Th-232 FAL.

A.3.3 Nature and Extent of Contamination

Based on the analytical results for soil samples collected within CAS 01-19-01, there has not been a release of contaminants to the environmental media.

A.3.4 Revised Conceptual Site Model

Because the CAS was discovered to be a building foundation and not a waste dump, the CSM was revised to include contaminated subsurface media from building materials and from burning of wood in fireplaces. After revision of the CSM, the CAIP requirements (NNSA/NSO, 2008) were met at this CAS.

A.4.0 CAS 02-08-02, Waste Dump and Burn Area

Corrective Action Site 02-08-02 is located at the southern end of Area 2 Camp the NNSS. The CAS consists of two components, a burn area as evidenced by melted lead and stained soil, and piles of construction debris and trash throughout the area. The waste dump contains piles of dirt and boulders with scattered construction debris consisting of metal cables, wire, wooden planks, metal, a tire, pipes, sheet metal, and a crushed 30-gal drum containing a small amount of grease. The burn area is located northwest of the waste dump and contains visibly stained surface soil and scattered debris including nails, metal, charred wood, and melted lead on the ground surface.

A.4.1 Corrective Action Investigation

A total of 73 environmental samples (including 4 FDs) were collected from 54 locations during investigation activities at the two components of CAS 02-08-02 (Figure A.4-1). Twenty three samples were collected from the perimeter of the waste dump, two samples were collected downgradient of the waste dump, and 41 samples were collected within the burn area. Seven samples were collected from the northeast and southwest side of the burn area to delineate the extent of lead and PAH contamination. The sample IDs, locations, types, and analyses are listed in Table A.4-1. The specific CAI activities conducted to satisfy the CAIP requirements at this CAS (NNSA/NSO, 2008) are described in the following sections.

A.4.1.1 Radiological Surveys

A gamma walkover survey was performed over the piles and at the burn area at CAS 02-08-02 during the preliminary assessment. No areas of elevated radioactivity were identified.

A.4.1.2 Geophysical Surveys

Geophysical surveys were performed at the burn area only, and identified surface and near-surface buried metallic debris (melted lead). Based on the survey results and a visual inspection of the anomalies, soil samples were collected from locations B02, B03, B04, B05, B21, B22, B24, and B25 (Figures A.4-1 and A.4-2).

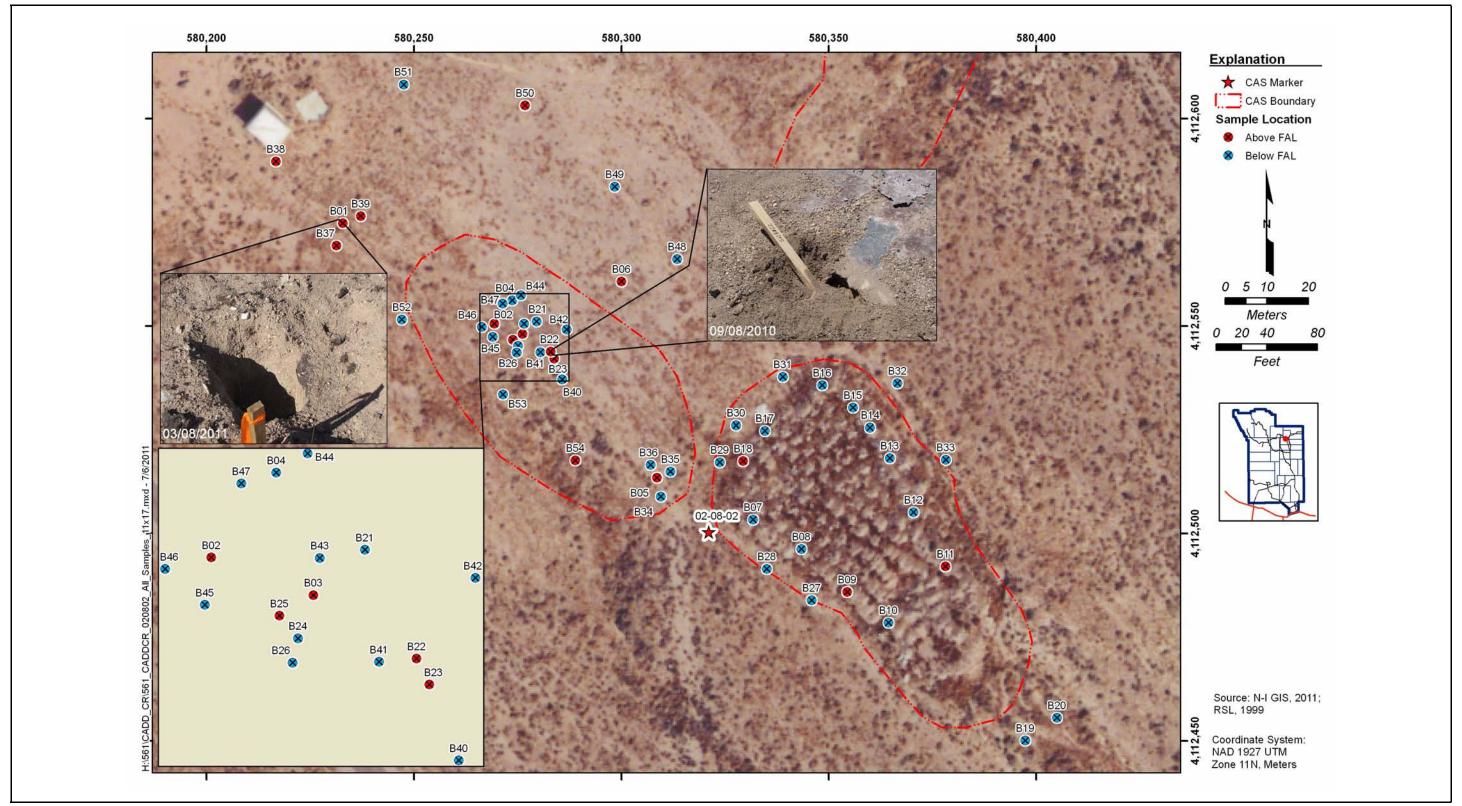


Figure A.4-1
Sample Locations at CAS 02-08-02, Waste Dump and Burn Area

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-20 of A-156

Table A.4-1 Samples Collected at CAS 02-08-02, Waste Dump and Burn Area (Page 1 of 6)

Area	Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Americium	Beryllium	Dioxinsfurans	TPH-DRO	Explosives	Gamma	Gross Alpha/Beta	Hexavalent Chromium	Metals	PCBs	Plutonium	Strontium	SVOCs	Tritium	Uranium	VOCs
		561B029	0.0 - 0.5	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Burn Area	B01	561B032	0.0 - 0.5	Soil	Environmental			Х													
		561B053	1.0 - 1.5	Soil	Environmental											-		Х			
		561B021	0.0 - 0.5	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Burn Area	B02	561B033	0.0 - 0.5	Soil	Environmental			Х													
		561B065	1.0 - 1.5	Soil	Environmental									Х							
		561B028	0.0 - 0.5	Soil	Environmental		Х		Х		Х		Х	Х	Х			Χ			Х
Burn Area	B03	561B034	0.0 - 0.5	Soil	Environmental			Х													
		561B066	1.0 - 1.5	Soil	Environmental													Х			
Burn Area	B04	561B020	0.0 - 0.5	Soil	Environmental		Х		Х		Х		Х	Х	Х			Χ			Х
Duili Alea	B04	561B035	0.0 - 0.5	Soil	Environmental			Х													
Burn Area	B05	561B017	0.0 - 0.5	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Duili Alea	B00	561B049	1.0 - 1.5	Soil	Environmental													Х			
Burn Area	B06	561B018	0.0 - 0.5	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Duili Alea	500	561B036	0.0 - 0.5	Soil	Environmental			Х								-					

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-21 of A-156

Table A.4-1 Samples Collected at CAS 02-08-02, Waste Dump and Burn Area (Page 2 of 6)

Area	Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Americium	Beryllium	Dioxinsfurans	TPH-DRO	Explosives	Gamma	Gross Alpha/Beta	Hexavalent Chromium	Metals	PCBs	Plutonium	Strontium	SVOCs	Tritium	Uranium	VOCs
Waste Dump	B07	561B001	2.0 - 3.0 ft into pile	Soil	Environmental	-	Х		Х		Х	-	Х	Х	Х		-	Х			Х
Waste Dump	B08	561B002	4.0 - 5.0 ft into pile	Soil	Environmental		Х		Х		Х		Х	Х	Х			Χ			Х
Waste Dump	B09	561B003	3.0 - 4.0 ft into pile	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Waste Dump	B10	561B004	3.0 - 4.0 ft into pile	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Waste Dump	B11	561B016	4.0 - 5.0 ft into pile	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Waste Dump		561B013	0.5 - 1.0 ft into pile	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Waste Dump	B12	561B014	1.0 - 1.5 ft into pile	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Waste Dump		561B015	3.0 - 3.5 ft into pile	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Waste Dump	B13	561B012	4.0 - 5.0 ft into pile	Soil	Environmental		Х		Х		Х		Х	Х	Х			Χ			Х
Waste Dump	B14	561B011	4.0 - 5.0 ft into pile	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Waste Dump	B15	561B010	4.0 - 5.0 ft into pile	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Waste Dump	B16	561B009	5.0 - 6.0 ft into pile	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Waste Dump	B17	561B008	4.0 - 5.0 ft into pile	Soil	Environmental		Х		Х		Χ		Х	Χ	Χ			Х			Χ

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-22 of A-156

Table A.4-1 Samples Collected at CAS 02-08-02, Waste Dump and Burn Area (Page 3 of 6)

Area	Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Americium	Beryllium	Dioxinsfurans	TPH-DRO	Explosives	Gamma	Gross Alpha/Beta	Hexavalent Chromium	Metals	PCBs	Plutonium	Strontium	SVOCs	Tritium	Uranium	VOCs
Waste Dump		561B005	2.0 - 3.0 ft into pile	Soil	Environmental		Х		Х		Х	1	Х	X	Х	-		Х	-	1	Х
Waste Dump	B18	561B006	2.0 - 3.0 ft into pile	Soil	FD of #561B005		Х		Х		Х		Х	Х	Х	-		Х			Х
Waste Dump		561B007	4.0 - 5.0 ft into pile	Soil	Environmental		Х		Х		Х		Х	Х	Х	-		Х			Х
Waste Dump	B19	561B030	0.0 - 0.5	Soil	Environmental		Х		Х		Х		Х	Х	Х			Χ			Х
Waste Dump	B20	561B031	0.0 - 0.5	Soil	Environmental		Х		Х		Х		Χ	Х	Χ			Χ			Х
		561B019	0.0 - 0.5	Soil	Environmental		Х		Х		Х		Χ	Х	Χ			Χ			Х
Burn Area	B21	561B037	0.0 - 0.5	Soil	Environmental			Х													
		561B038	0.0 - 0.5	Soil	FD of #561037			Х													
Burn Area	B22	561B024	0.0 - 0.5	Soil	Environmental		Х		Х		Х		Χ	Х	Χ			Χ			Х
Buill Alea	BZZ	561B055	1.0 - 1.5	Soil	Environmental										-			Χ			
		561B025	0.0 - 0.5	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Burn Area	B23	561B026	0.0 - 0.5	Soil	FD of #561B025		Х		Х		Х		Х	Х	Х			Х			Х
		561B061	1.0 - 1.5	Soil	Environmental													Х			
Burn Area	B24	561B023	0.0 - 0.5	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Burn Area	B25	561B022	0.0 - 0.5	Soil	Environmental		Х		Х	-	Χ	ŀ	Х	Χ	Х	1	-	Х			Х

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CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-23 of A-156

Table A.4-1 Samples Collected at CAS 02-08-02, Waste Dump and Burn Area (Page 4 of 6)

Area	Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Americium	Beryllium	Dioxinsfurans	TPH-DRO	Explosives	Gamma	Gross Alpha/Beta	Hexavalent Chromium	Metals	PCBs	Plutonium	Strontium	SVOCs	Tritium	Uranium	VOCs
Burn Area	B26	561B027	0.0 - 0.5	Soil	Environmental		Х		Х		Х		Х	Х	Х			Х			Х
Waste Dump	B27	561B039	0.0 - 0.5	Soil	Environmental													Х			
Waste Dump	B28	561B040	0.0 - 0.5	Soil	Environmental													Х			
Waste Dump	B29	561B041	0.0 - 0.5	Soil	Environmental									-				Х			
Waste Dump	B30	561B042	0.0 - 0.5	Soil	Environmental													Х			
Waste Dump	B31	561B043	0.0 - 0.5	Soil	Environmental													Х			
Waste Dump	B32	561B044	0.0 - 0.5	Soil	Environmental													Х			
Waste Dump	B33	561B045	0.0 - 0.5	Soil	Environmental													Х			
Burn Area	B34	561B046	0.0 - 0.5	Soil	Environmental													Х			
Burn Area	B35	561B047	0.0 - 0.5	Soil	Environmental													Х			
Burn Area	B36	561B048	0.0 - 0.5	Soil	Environmental													Х			
Burn Area	B37	561B050	0.0 - 0.5	Soil	Environmental													Х			
Burn Area	B38	561B051	0.0 - 0.5	Soil	Environmental													Х			
Burn Area	B39	561B052	0.0 - 0.5	Soil	Environmental													Х			
Burn Area	B40	561B056	0.0 - 0.5	Soil	Environmental													Χ			

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-24 of A-156

Table A.4-1 Samples Collected at CAS 02-08-02, Waste Dump and Burn Area (Page 5 of 6)

Area	Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Americium	Beryllium	Dioxinsfurans	TPH-DRO	Explosives	Gamma	Gross Alpha/Beta	Hexavalent Chromium	Metals	PCBs	Plutonium	Strontium	SVOCs	Tritium	Uranium	VOCs
Burn Area	B41	561B054	0.0 - 0.5	Soil	Environmental										-	-	-	Х			
Burn Area	B42	561B057	0.0 - 0.5	Soil	Environmental													Х			
Burn Area	B43	561B059	0.0 - 0.5	Soil	Environmental									Х				Χ			
Burn Area	B43	561B060	0.0 - 0.5	Soil	FD of #561B059									Х	1	-	-	Х			
Burn Area	B44	561B058	0.0 - 0.5	Soil	Environmental									Х				Χ			
Burn Area	B45	561B062	0.0 - 0.5	Soil	Environmental									Х							
Burn Area	B46	561B063	0.0 - 0.5	Soil	Environmental									Х							
Burn Area	B47	561B064	0.0 - 0.5	Soil	Environmental									Х							
Burn Area	B48	561B067	0.0 - 0.5	Soil	Environmental									Х				Х			
Burn Area	B49	561B068	0.0 - 0.5	Soil	Environmental									Х				Х			
Burn Area	B50	561B069	0.0 - 0.5	Soil	Environmental									Х				Х			
Burn Area	B51	561B070	0.0 - 0.5	Soil	Environmental									Х				Х			
Burn Area	B52	561B071	0.0 - 0.5	Soil	Environmental									Х				Х			
Burn Area	B53	561B072	0.0 - 0.5	Soil	Environmental									Х				Х			
Burn Area	B54	561B073	0.0 - 0.5	Soil	Environmental									Χ				Χ			

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-25 of A-156

Table A.4-1 Samples Collected at CAS 02-08-02, Waste Dump and Burn Area

(Page 6 of 6)

Area	Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Americium	Beryllium	Dioxinsfurans	TPH-DRO	Explosives	Gamma	Gross Alpha/Beta	Hexavalent Chromium	Metals	PCBs	Plutonium	Strontium	SVOCs	Tritium	Uranium	VOCs
N/A	N/A	561B301	N/A	Water	Trip Blank										-		-		-		Х
N/A	N/A	561B302	N/A	Water	Trip Blank									-					-		Х
N/A	N/A	561B303	N/A	Water	Trip Blank									-					-		Х
N/A	N/A	561B304	N/A	Water	Equipment Rinsate		Х		Х		Х		Х	Х	Х			Х	-		Х
N/A	N/A	561B305	N/A	Water	Trip Blank																Х
N/A	N/A	561B306	N/A	Water	Trip Blank									-					-		Х
N/A	N/A	561B307	N/A	Water	Field Blank		Х	Х	Х		Х		Х	Х	Х			Х			Х
N/A	N/A	561B308	N/A	Water	Trip Blank																Х
N/A	N/A	561B309	N/A	Water	Source material QC	Χ	Χ		Х	Χ	Х	Χ	Х	Х	Х	Х	Х	Χ	Х	Χ	Х

^{-- =} Not required

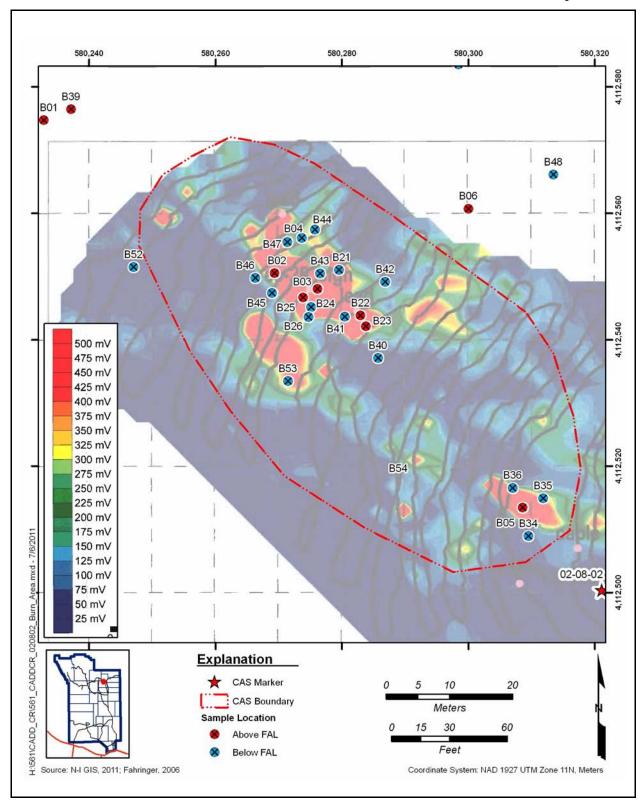


Figure A.4-2
Geophysical Survey Showing Sample Locations at the Burn Area
CAS 02-08-02, Waste Dump and Burn Area

A.4.1.3 Visual Inspections

The waste piles were visually inspected for stained soil, debris, or other biasing factors. One pile (location H18) had stained soil (samples 561B005 through 561B007), while at another pile (location H12) a 30-gal crushed grease drum and soil staining was observed (samples 561B013 through 561B015) (Figure A.4-3). The surface soil within the burn area was inspected for any stained soil or biasing factors. Stained soil, nails, and melted lead were observed at various locations throughout the burn area. Sample locations B02, B03, B04, and B21 were areas of stained soil and nails. Sample locations B22, B24, and B25 were directly under the melted lead.



Figure A.4-3
Crushed 30-Gal Grease Drum Discovered in Waste Pile
CAS 02-08-02, Waste Dump and Burn Area

A.4.1.4 Sample Collection

Seventy-three environmental samples (including four FDs) were collected from 54 locations (locations B01 through B54) to identify and delineate the contamination associated with the waste piles and burn area.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011

Page A-28 of A-156

Waste Dump

Decision I environmental sampling activities included the collection of 16 randomly selected soil samples from 12 locations within the waste piles (locations B07 through B18), and two biased surface soil samples downgradient of the waste pile (locations B19 and B20) (Figure A.4-1). Sample depths at the waste piles ranged from 0.5 to 6 ft into the pile. The randomly selected samples were identified using the VSP software (PNNL, 2005).

Three of the Decision I samples were judgmental based on visual observations at the randomly selected locations B12 and B18. At location B12, a crushed 30-gal drum was observed that contained a small quantity of grease. To determine whether any migration has occurred, two additional samples were collected from this location, (samples 562B014 and 561B015) 1 to 1.5 ft bgs, and 3 to 3.5 ft bgs, respectively. Soil samples collected below the crushed 30-gal grease drum were field screened for VOCs using a Mini-RAE 2000 PID; however, no VOCs were detected.

At randomly selected location B18 stained soil was observed at a depth of 2 to 3 ft bgs into the pile (samples 561B005 and 561 B006). To determine whether any migration had occurred one additional biased sample (561B007) was collected from this location at a depth of 4 to 5 ft bgs into the pile.

The Decision I analytical results showed that concentrations of various PAHs in four samples from four locations (sample 561B003 at location B09, sample 561B005 at location B18, sample 561B013 at location B12, and sample 561B016 at location B11) exceeded the PALs, and it was determined that Decision II sampling was necessary. Seven Decision II surface (0 to 0.56 ft bgs) samples (561B039 through 561B045) were collected along the outside perimeter of the waste dump. All Decision II samples analytical results showed that the PAHs had not migrated from the waste piles.

Burn Area

At the burn area, Decision I environmental sampling activities included the collection of 20 biased surface and shallow subsurface soil samples (samples 561B017 through 561B029 and 561B032 through 561B038) (Figure A.4-1). Biasing factors included stained soil and debris on the surface (nails, melted lead, stained soil). At six locations (B01 through B04, B06, and B21), seven surface samples were collected and analyzed for dioxins, because dioxins are a typical by-product of burning.

CAU 561 CADD/CR

Appendix A Revision: 0 Date: August 2011

Page A-29 of A-156

The analytical results indicated that concentrations of the PAH benzo(a)pyrene exceeded the PAL at five sample locations (locations B01, B03, B05, B22, and B23). The concentration of lead exceeded the PAL in four samples (locations B02, B03, B06, and B25), while the concentration of arsenic exceeded the PAL in one location (B02). Therefore, it was determined that Decision II sampling was necessary for SVOCs and metals.

Decision II samples, to define the extent of lead contamination, were collected from the surface soil at locations B45, B46, B47, and B48. In addition to the surface soil samples, subsurface samples were collected at locations B02 and B03 from 1 to 1.5 ft bgs to determine the vertical extent of the lead contamination. Results indicated that no lead was identified above action levels in the surface soil samples but the lead concentration in the shallow subsurface soil samples at location B02 exceeded the action level. Samples collected from locations B02, B45, B46, and B47 were also used to define the extent of the arsenic contamination. Arsenic was not detected in these samples at concentrations exceeding the PALs.

Samples were also collected from 1 to 1.5 ft bgs and analyzed for SVOCs at locations B01, B05, B22, and B23. Surface soil samples were collected from locations B34 through B42, which were located in triangular patterns around the original sample locations. The results indicated that PAHs were still present in the soil at concentrations above FALs at numerous locations. Seven surface samples were collected around the perimeter of the burn area and analyzed for metals and SVOCs, in an attempt to bound the contamination. The sample results from locations B50 and B54 indicated that PAHs were present in the soil in concentrations that exceeded the action levels.

During Decision II sampling, a layer of asphalt was discovered approximately 0 to 8 in. bgs in numerous locations at the burn area. The PAHs (SVOCs) that were detected at various locations throughout the burn area are considered to be associated with this asphalt. The evaluation of the SVOC results has shown that the concentration of the SVOCs does not decrease with increasing distance from the potential sources (burn areas) as would be expected if the burn areas were the source of the PAHs. Aerial photos of Area 2 camp were also reviewed. The September 1971 aerial photo (H&N, 1971) shows a road passing through the burn area to the waste dump area, and photos from October 1986 (Author Unknown, 1986) show buildings located on the burn area. Based on this

information, the PAHs detected in the burn area are considered to originate from the asphalt and are not considered to be related to the burn area activities.

A.4.1.5 Deviations

There were no deviations to the CAIP (NNSA/NSO, 2008) associated with CAS 02-08-02. Investigation samples were collected as outlined in the CAIP and submitted for laboratory analysis.

A.4.2 Investigation Results

The following sections provide analytical results from the samples collected to complete investigation activities as outlined in the CAIP (NNSA/NSO, 2008). Investigation samples were analyzed for the CAIP-specified COPCs, which included VOCs, SVOCs, TPH-DRO (waste management purposes only), RCRA metals, beryllium, hexavalent chromium, PCBs, and gamma-emitting radionuclides. Dioxin samples were collected only from the surface soil within the burn area. The analytical parameters and laboratory methods used to analyze the investigation samples are listed in Table A.2-2. Table A.4-1 lists the sample-specific analytical suite for CAS 02-08-02.

Analytical results from the soil samples with concentrations exceeding MDCs are summarized in the following sections. An evaluation was conducted on all contaminants detected above MDCs by comparing individual concentration or activity results against the FALs. Establishment of the FALs is presented in Appendix C.

A.4.2.1 Volatile Organic Compounds

The only VOC detected at a concentration exceeding the MDC was methylene chloride at a concentration of 0.015 mg/kg at a depth of 3.0 to 3.5 ft bgs (Table A.4-2). This concentration is well below the PAL of 53 mg/kg. Therefore, the FALs were established at the corresponding PAL.

Table A.4-2 Sample Results for VOCs Detected above MDC at CAS 02-08-02, Waste Dump and Burn Area

Area	Sample	Sample	Depth	COPC (mg/kg)
	Location	Number	(ft bgs)	Methylene Chloride
		FAL	53	
Waste Dump	B12	561B015	3.0 - 3.5 ft into pile	0.015

A.4.2.2 Semivolatile Organic Compounds

Analytical results for SVOCs detected in soil samples above MDCs are presented in Table A.4-3. Sixteen samples were collected from the waste dump and three samples exceeded the PALs for various SVOCs. The FALs were established at the PAL concentrations; therefore, SVOCs are considered a COC at the waste dump. Decision II samples were collected from around the perimeter of the waste dump and showed that the PAH contamination is not migrating from the waste piles.

Numerous soil samples collected from the burn area showed PAHs present in the soil as indicated in Table A.4-3. A layer of asphalt approximately 0 to 8 in. bgs was discovered at various locations throughout the burn area. Aerial photos of the Area 2 camp were reviewed. The aerial photos from September 1971 (H&N, 1971) show a road passing through the burn area to the waste dump area, and photos from October 1986 (Author Unknown, 1986) show buildings located on the burn area. The PAHs in the soil samples that were above action levels are commonly associated with asphalt. Additionally, the analytical results from the Decision II sampling showed the concentrations of PAHs not decreasing with distance from the burn area. Therefore, it has been determined that the presence of PAHs in the soil samples is attributed to the asphalt and is not a release from the burn area.

A.4.2.3 Total Petroleum Hydrocarbons

Analytical results for TPH-DRO detected in soil samples above MDCs are presented in Table A.4-4. Samples were analyzed for TPH-DRO for waste management purposes only, as stated in the FI ROTC-1 (NNES, 2010), and are presented here for completeness of data. Preliminary action levels and FALs have not been established for TPH-DRO. The FALs are established for the individual hazardous constituents of TPH-DRO and are reported with the VOC and SVOC results. Because

Table A.4-3 Sample Results for SVOCs Detected above MDCs at CAS 02-08-02, Waste Dump and Burn Area (Page 1 of 2)

											age i oi		COPCs	(mg/kg)									
Area	Sample Location	Sample Number	Depth (ft bgs)	2-Methyinaphthalene	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Carbazole	Chrysene	Dibenzo(ah)anthracene	Dibenzofuran	Diethyl phthalate	Di-n-butyl phthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
		FALs		4,100	33,000	170,000	2.1	0.21	2.1	17,000	21	120	95.8	210	0.21	1,000	490,000	62,000	22,000	22,000	2.1	170,000	17,000
Burn Area	B01	561B029	0.0 - 0.5				0.25 (J)	0.32	0.52	0.47	0.28 (J)			0.29 (J)	0.1 (J)			0.8	0.61		0.44	0.35	0.86
Burn Area	B02	561B021	0.0 - 0.5				0.13 (J)	0.12 (J)	0.21 (J)	0.17 (J)	0.12 (J)			0.14 (J)				0.61	0.35		0.13 (J)	0.26 (J)	0.47
Burn Area	B03	561B028	0.0 - 0.5				0.22 (J)	0.23	0.35 (J)	0.28 (J)	0.19 (J)			0.25 (J)				0.85	0.6		0.25 (J)	0.37 (J)	0.69
Burn Area	B05	561B017	0.0 - 0.5			0.1 (J)	0.39	0.42	0.65	0.44	0.31 (J)		0.13 (J)	0.38	0.11 (J)			1.8	0.95		0.42	0.8	1.1
Burn Area	B06	561B018	0.0 - 0.5															0.086 (J)					0.1 (J)
Waste Dump	B09	561B003	3.0 - 4.0 ft into pile	0.15 (J)	0.12 (J)	0.21 (J)	0.33 (J)	0.27	0.38	0.16 (J)	0.17 (J)	0.13 (J)	0.13 (J)	0.34 (J)		0.15 (J)		1.2	1	0.14 (J)	0.18 (J)	1.1	0.75
Waste Dump	B10	561B004	3.0 - 4.0 ft into pile				0.17 (J)	0.17 (J)	0.31 (J)	0.13 (J)	0.091 (J)			0.21 (J)				0.74	0.48		0.14 (J)	0.33 (J)	0.39
Waste Dump	B11	561B016	4.0 - 5.0 ft into pile			0.1 (J)	0.28 (J)	0.28	0.47	0.12 (J)	0.18 (J)		0.076 (J)	0.33 (J)				0.92	0.73		0.15 (J)	0.57	0.61
Waste Dump	B13	561B012	4.0 - 5.0 ft into pile					0.074 (J)	0.12 (J)	0.077 (J)				0.084 (J)				0.12 (J)	0.12 (J)		0.079 (J)		0.1 (J)
Waste Dump	B15	561B010	4.0 - 5.0 ft into pile															0.18 (J)	0.14 (J)			0.13 (J)	0.11 (J)
Waste Dump	B16	561B009	5.0 - 6.0 ft into pile									0.26 (J)											
Waste Dump	B17	561B008	4.0 - 5.0 ft into pile					0.078 (J)	0.16 (J)	0.17 (J)	0.1 (J)			0.084 (J)				0.12 (J)	0.12 (J)		0.17 (J)		0.11 (J)
		561B005	2.0 - 3.0 ft into pile	0.1 (J)	0.46 (J)	2.2	2.8	2.4	3	1.2	1.4		0.52	2.8	0.37 (J)	0.23 (J)		3.4	8.2	0.55	1.4	7.2	6.8
Waste Dump	B18	561B006	2.0 - 3.0 ft into pile				0.13 (J)	0.15 (J)	0.28 (J)	0.2 (J)	0.098 (J)			0.17 (J)				0.2 (J)	0.26 (J)		0.2 (J)	0.13 (J)	0.25 (J)
		561B007	4.0 - 5.0 ft into pile				0.1 (J)	0.14 (J)	0.27 (J)	0.21 (J)	0.11 (J)			0.15 (J)				0.2 (J)	0.2 (J)		0.21 (J)	0.099 (J)	0.19 (J)
Waste Dump	B19	561B030	0.0 - 0.5						0.069 (J)														0.07 (J)
Waste Dump	B20	561B031	0.0 - 0.5				0.21 (J)	0.17 (J)	0.27 (J)	0.13 (J)	0.11 (J)			0.23 (J)				0.47	0.53		0.12 (J)	0.45	0.42
Burn Area	B22	561B024	0.0 - 0.5			0.12 (J)	0.45	0.42	0.63	0.47	0.23 (J)		0.098 (J)	0.39	0.12 (J)			0.96	1		0.43	0.6	1.1
Burn Area	B23	561B025	0.0 - 0.5				0.098 (J)	0.11 (J)	0.17 (J)	0.11 (J)				0.1 (J)				0.27 (J)	0.22 (J)		0.098 (J)	0.19 (J)	
2471104		561B026	0.0 - 0.5				0.3 (J)	0.3	0.44	0.22 (J)	0.14 (J)			0.3 (J)				0.25 (J)	0.49		0.2 (J)	0.21 (J)	0.59
Burn Area	B24	561B023	0.0 - 0.5						0.081 (J)									0.1 (J)	0.085 (J)			0.086 (J)	0.12 (J)
Burn Area	B25	561B022	0.0 - 0.5					0.078 (J)	0.12 (J)	0.079 (J)								0.13 (J)	0.14 (J)			0.098 (J)	0.15 (J)
Burn Area	B26	561B027	0.0 - 0.5															0.14 (J)	0.071 (J)				0.086 (J)
Waste Dump	B27	561B039	0.0 - 0.5															0.19 (J)	0.12 (J)				0.096 (J)

Table A.4-3 Sample Results for SVOCs Detected above MDCs at CAS 02-08-02, Waste Dump and Burn Area (Page 2 of 2)

													COPCs	s (mg/kg)									
Area	Sample Location	Sample Number	Depth (ft bgs)	2-Methylnaphthalene	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Carbazole	Chrysene	Dibenzo(ah)anthracene	Dibenzofuran	Diethyl phthalate	Di-n-butyl phthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
		FALs		4,100	33,000	170,000	2.1	0.21	2.1	17,000	21	120	95.8	210	0.21	1,000	490,000	62,000	22,000	22,000	2.1	170,000	17,000
Waste Dump	B28	561B040	0.0 - 0.5		-		0.083 (J)	0.093 (J)	0.17 (J)	0.083 (J)	0.07 (J)			0.1 (J)				0.44	0.27 (J)		0.072 (J)	0.15 (J)	0.22 (J)
Waste Dump	B29	561B041	0.0 - 0.5		-				0.081 (J)									0.17 (J)	0.11 (J)				0.08 (J)
Waste Dump	B30	561B042	0.0 - 0.5				0.071 (J)	0.084 (J)	0.16 (J)	0.089 (J)				0.075 (J)				0.26 (J)	0.17 (J)		0.077 (J)	0.088 (J)	0.17 (J)
Waste Dump	B31	561B043	0.0 - 0.5				0.12 (J)	0.16 (J)	0.35 (J)	0.21 (J)	0.11 (J)			0.13 (J)				0.42	0.29 (J)		0.17 (J)	0.13 (J)	0.3 (J)
Waste Dump	B32	561B044	0.0 - 0.5				0.19 (J)	0.2 (J)	0.32 (J)	0.16 (J)	0.11 (J)	0.11 (J)		0.19 (J)				0.9	0.55		0.14 (J)	0.36	0.63 (J)
Waste Dump	B33	561B045	0.0 - 0.5						0.11 (J)			0.17 (J)						0.18 (J)	0.13 (J)			0.076 (J)	0.14 (J)
Burn Area	B34	561B046	0.0 - 0.5						0.099 (J)									0.25 (J)	0.16 (J)			0.097 (J)	0.13 (J)
Burn Area	B36	561B048	0.0 - 0.5				0.13 (J)	0.14 (J)	0.24 (J)	0.15 (J)	0.1 (J)			0.13 (J)				0.44	0.4		0.12 (J)	0.25 (J)	0.37
Burn Area	B37	561B050	0.0 - 0.5	0.16 (J)	0.19 (J)	0.27 (J)	0.66	0.68 (J)	0.96 (J)	0.82 (J)	0.41 (J)		0.29 (J)	0.69	0.21 (J)	0.1 (J)		2.8	1.8	0.15 (J)	0.83 (J)	1.8	3.4 (J)
Burn Area	B38	561B051	0.0 - 0.5			0.12 (J)	0.5	0.54	0.9	0.21 (J)	0.4		0.11 (J)	0.54				2.5	1.5		0.22 (J)	0.89	1.3
Burn Area	B39	561B052	0.0 - 0.5				0.23 (J)	0.33 (J)	0.7 (J)	0.98 (J)	0.32 (J)			0.21 (J)			0.22 (J)	0.65	0.34 (J)		0.7 (J)	0.19 (J)	0.44 (J)
Burn Area	B40	561B056	0.0 - 0.5				0.1 (J)	0.12 (J)	0.29 (J)	0.097 (J)	0.08 (J)			0.11 (J)				0.37	0.31 (J)		0.073 (J)	0.13 (J)	0.27 (J)
Burn Area	B41	561B054	0.0 - 0.5						0.089 (J)			0.13 (J)						0.34 (J)	0.19 (J)			0.17 (J)	0.15 (J)
Burn Area	B44	561B058	0.0 - 0.5															0.32 (J)	0.14 (J)			0.1 (J)	0.11 (J)
Burn Area	B48	561B067	0.0 - 0.5				0.15 (J)	0.13 (J)	0.19 (J)	0.2 (J)	0.09 (J)			0.16 (J)	0.17 (J)			1	0.49		0.27 (J)	0.42	0.41
Burn Area	B50	561B069	0.0 - 0.5			0.31 (J)	0.77	1.8 (J)	3.7	3.4	1.4 (J)		0.16 (J)	0.52 (J)	1			1.5	1.2		3.3 (J)	0.33 (J)	2.1
Burn Area	B51	561B070	0.0 - 0.5															0.12 (J)			0.14 (J)		
Burn Area	B52	561B071	0.0 - 0.5				0.19 (J)	0.2 (J)	0.33 (J)	0.16 (J)	0.11 (J)			0.22 (J)	0.17 (J)			0.88	0.63		0.26 (J)	0.32 (J)	0.48
Burn Area	B53	561B072	0.0 - 0.5				0.1 (J)	0.13 (J)	0.22 (J)	0.17 (J)	0.12 (J)			0.11 (J)	0.17 (J)			0.37	0.23 (J)		0.26 (J)	0.097 (J)	0.18 (J)
Burn Area	B54	561B073	0.0 - 0.5		1		0.28 (J)	0.26	0.45	0.23 (J)	0.17 (J)			0.29 (J)	0.19 (J)			0.39	0.64		0.32 (J)	0.2 (J)	0.54

J = Estimated value

Bold indicates the values exceeding the FALs.

^{-- =} Not detected above MDCs.

Table A.4-4
Sample Results for TPH-DRO at CAS 02-08-02, Waste Dump and Burn Area

Area	Sample Location	Sample Number	Depth (ft bgs)	TPH-DRO (mg/kg)
Burn Area	B01	561B029	0.0 - 0.5	25
Burn Area	B02	561B021	0.0 - 0.5	5.1 (J)
Burn Area	B03	561B028	0.0 - 0.5	9.4
Burn Area	B05	561B017	0.0 - 0.5	12
Burn Area	B06	561B018	0.0 - 0.5	3.1 (J)
Waste Dump	B07	561B001	2.0 - 3.0 ft into pile	4.4 (J)
Waste Dump	B08	561B002	4.0 - 5.0 ft into pile	1.8 (J)
Waste Dump	B09	561B003	3.0 - 4.0 ft into pile	7.3
Waste Dump	B10	561B004	3.0 - 4.0 ft into pile	11
Waste Dump	B11	561B016	4.0 - 5.0 ft into pile	17
Waste Dump		561B015	3.0 - 3.5 ft into pile	5.8
Waste Dump	B12	561B014	1.0 - 1.5 ft into pile	9.2
Waste Dump		561B013	0.5 - 1.0 ft into pile	320
Waste Dump	B13	561B012	4.0 - 5.0 ft into pile	2.1 (J)
Waste Dump	B14	561B011	4.0 - 5.0 ft into pile	5.5
Waste Dump	B15	561B010	4.0 - 5.0 ft into pile	7.7
Waste Dump	B16	561B009	5.0 - 6.0 ft into pile	8.5
Waste Dump	B17	561B008	4.0 - 5.0 ft into pile	9.7
		561B005	2.0 - 3.0 ft into pile	11
Waste Dump	B18	561B006	2.0 - 3.0 ft into pile	18
		561B007	4.0 - 5.0	16
Waste Dump	B19	561B030	0.0 - 0.5	4.7 (J)
Waste Dump	B20	561B031	0.0 - 0.5	6
Burn Area	B22	561B024	0.0 - 0.5	9.4
Burn Area	B23	561B025	0.0 - 0.5	2.7 (J)
Duili Alea	623	561B026	0.0 - 0.5	5.3
Burn Area	B24	561B023	0.0 - 0.5	2.9 (J)
Burn Area	B25	561B022	0.0 - 0.5	2.2 (J)
Burn Area	B26	561B027	0.0 - 0.5	1.5 (J)

J = Estimated value

VOCs or SVOCs were not detected at concentrations exceeding the MDCs in any of the soil samples

collected at this CAS, TPH-DRO is not considered to be a site-related contaminant.

A.4.2.4 RCRA Metals, Beryllium, and Hexavalent Chromium

Analytical results for RCRA metals, beryllium, and hexavalent chromium detected in soil samples

above MDCs are presented in Table A.4-5. Of the samples collected at the burn area, five samples

exceeded the PAL (800 mg/kg) for lead with concentrations above PALs ranging from 1,200 to

14,000 mg/kg. Arsenic was detected in sample 561B021 (collected at the burn area) at a

concentration of 65 mg/kg, which exceeds the PAL of 23 mg/kg. Therefore, lead and arsenic are

considered COCs at this CAS.

A.4.2.5 Polychlorinated Biphenyls

Analytical results for PCBs detected in soil samples above MDCs are presented in Table A.4-6.

No PCBs were detected at concentrations exceeding their PALs. The FALs were established at

the corresponding PAL concentrations.

A.4.2.6 Dioxins

Dioxins were not detected at concentration exceeding the MDCs. Therefore, the FALs were

established at the corresponding PALs.

A.4.2.7 Gamma-Emitting Radionuclides

Analytical results for gamma-emitting radionuclides detected in soil samples above MDCs are

presented in Table A.4-7. No gamma-emitting radionuclides were detected at concentrations

exceeding their PALs; therefore, FALs were established at the corresponding PALs.

A.4.3 Nature and Extent of Contamination

Based on the analytical results for soil samples collected within CAS 02-08-02, the only COCs that

were identified within the waste dump were various PAHs, with lead and arsenic being identified at

the burn area. Decision II sampling around the perimeter of the waste dump indicated that the PAHs

were not migrating out of the piles. The melted lead which could not be removed from the site is

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CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-36 of A-156

Table A.4-5
Sample Results for Metals Detected above MDCs at CAS 02-08-02, Waste Dump and Burn Area (Page 1 of 3)

								COPCs (mg/kg)				
Area	Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Lead	Mercury	Selenium	Silver
	ı	FALs		23	190,000	2,000	800	N/Aª	5.6	800	34	5,100	5,100
Burn Area	B01	561B029	0.0 - 0.5	1.8	120	0.58	0.56	3.8		22 (J+)			
Burn Area	B02	561B021	0.0 - 0.5	65	120	0.67	0.78	48	0.34 (J-)	14,000 (J+)			0.52
Buill Alea	B02	561B065	1.0 - 1.5	13	84		0.083	5.2		2,800 (J)	0.0054 (J-)		
Burn Area	B03	561B028	0.0 - 0.5	4.8	370	0.5 (J-)	0.91	58		1,200 (J+)			
Burn Area	B04	561B020	0.0 - 0.5	2	260	0.68		6.9		170 (J+)			
Burn Area	B05	561B017	0.0 - 0.5	2	110	0.53		5		59 (J+)			
Burn Area	B06	561B018	0.0 - 0.5	2	110	0.47 (J-)		7.5		2,000 (J+)			
Waste Dump	B07	561B001	2.0 - 3.0 ft into pile	2.4	96	0.61	0.11	3.3		9.5 (J)	0.017		
Waste Dump	B08	561B002	4.0 - 5.0 ft into pile	2.4	100	0.67	0.11	3.9		8.7 (J)	0.016		
Waste Dump	B09	561B003	3.0 - 4.0 ft into pile	2.1	110	0.58	0.15	13		11 (J)	0.014		
Waste Dump	B10	561B004	3.0 - 4.0 ft into pile	2.3	560	0.6	0.19	4		16 (J)	0.02		
Waste Dump	B11	561B016	4.0 - 5.0 ft into pile	1.8	170	0.59	0.26	3.5		42 (J)	0.018		
		561B013	0.5 - 1.0 ft into pile	2.6	100	0.71	0.095	4.8	1.6 (J)	17 (J)	0.028		
Waste Dump	B12	561B014	1.0 - 1.5 ft into pile	2.2	96	0.67	0.18	3.3		9.6 (J)	0.015		
		561B015	3.0 - 3.5 ft into pile	2.5	96	0.69	0.11	4.1		9.8 (J)	0.02		
Waste Dump	B13	561B012	4.0 - 5.0 ft into pile	2.6	100	0.67	0.1	3.7		9.2 (J)	0.016	-	
Waste Dump	B14	561B011	4.0 - 5.0 ft into pile	2.4	130	0.64	0.11	3.5		22 (J)	0.016		

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-37 of A-156

Table A.4-5
Sample Results for Metals Detected above MDCs at CAS 02-08-02, Waste Dump and Burn Area (Page 2 of 3)

								COPCs (mg/kg)				
Area	Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Lead	Mercury	Selenium	Silver
	ı	FALs		23	190,000	2,000	800	N/Aª	5.6	800	34	5,100	5,100
Waste Dump	B15	561B010	4.0 - 5.0 ft into pile	2.5	99	0.65	0.22	3.4		13 (J)	0.026		
Waste Dump	B16	561B009	5.0 - 6.0 ft into pile	2.2	97	0.65	0.068	3.2		9.5 (J)	0.018		
Waste Dump	B17	561B008	4.0 - 5.0 ft into pile	2.2	110	0.62	0.098	3.7	0.79 (J)	13 (J)	0.015		
		561B005	2.0 - 3.0 ft into pile	2.3	99	0.59	0.14	7.6		27 (J)	0.016		
Waste Dump	B18	561B006	2.0 - 3.0 ft into pile	2.4	97	0.6	0.15	5.5		22 (J)	0.015		
	•	561B007	4.0 - 5.0 ft into pile	2.7	100	0.61	0.22	7.2		64 (J)	0.015		
Waste Dump	B19	561B030	0.0 - 0.5	2.1	150	0.58		2.8		12 (J+)			
Waste Dump	B20	561B031	0.0 - 0.5	2.1	150	0.55		2.7		12 (J+)			
Burn Area	B21	561B019	0.0 - 0.5	3.2	140	0.62	0.56	35		190 (J+)			
Burn Area	B22	561B024	0.0 - 0.5	2.3	110	0.59		4.9		320 (J+)			
Burn Area	B23	561B025	0.0 - 0.5	2.5	150	0.57		3.7		78 (J+)			
Burn Area	D23	561B026	0.0 - 0.5	2.1	140	0.54 (J-)		4.2		90 (J+)			
Burn Area	B24	561B023	0.0 - 0.5	3.3	99	0.63		4.4		260 (J+)			
Burn Area	B25	561B022	0.0 - 0.5	5.3	120	0.67		6.3		1,600 (J+)			
Burn Area	B26	561B027	0.0 - 0.5	2.8	120	0.68		3.6		40 (J+)			
Burn Area	B43	561B059	0.0 - 0.5	3	110		0.17	7.6		19 (J)	0.0053 (J-)		
Burn Area	D43	561B060	0.0 - 0.5	2.2	95		0.12	3.7		21 (J)	0.0053 (J-)		

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-38 of A-156

Table A.4-5
Sample Results for Metals Detected above MDCs at CAS 02-08-02, Waste Dump and Burn Area (Page 3 of 3)

								COPCs (mg/kg)				
Area	Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Lead	Mercury	Selenium	Silver
	ı	FALs		23	190,000	2,000	800	N/Aª	5.6	800	34	5,100	5,100
Burn Area	B44	561B058	0.0 - 0.5	2.3	110		0.18	4.5		24 (J)	0.0053 (J-)		
Burn Area	B45	561B062	0.0 - 0.5	1.7	130		0.11	3		34 (J)	0.0034 (J-)		
Burn Area	B46	561B063	0.0 - 0.5	1.4	99		0.14	2.5		19 (J)	0.0051 (J-)		
Burn Area	B47	561B064	0.0 - 0.5	2.6	120		0.14	3.5		30 (J)	0.0018 (J-)		
Burn Area	B48	561B067	0.0 - 0.5	2.2	88		0.14 (J-)	4.5		10 (J)	0.018 (J-)		
Burn Area	B49	561B068	0.0 - 0.5	2.3	88		0.058 (J-)	3.7		10 (J)	0.0018 (J-)		
Burn Area	B50	561B069	0.0 - 0.5	2.8	130		0.14 (J-)	4.2		13 (J)			
Burn Area	B51	561B070	0.0 - 0.5	2 (J+)	96		0.12 (J-)	3.9		9.5 (J)	0.0054 (J-)		
Burn Area	B52	561B071	0.0 - 0.5	3	170		0.13 (J-)	3		17 (J)			
Burn Area	B53	561B072	0.0 - 0.5	1.4 (J+)	150		0.072 (J-)	2.3		9.9 (J)			
Burn Area	B54	561B073	0.0 - 0.5	2.5	110		0.16 (J-)	6.7		19 (J)		0.6	

^aPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

Bold indicates the values exceeding the FALs.

J = Estimated value

J+ = Result is an estimated quantity, but may be biased high.

J- = Result is an estimated quantity, but may be biased low.

^{-- =} Not detected above MDCs.

Table A.4-6 Sample Results for PCBs Detected above MDCs at CAS 02-08-02, Waste Dump and Burn Area

Area	Sample	Sample	Depth	COPCs (mg/kg)			
Alea	Location	Number	(ft bgs)	Aroclor 1254	Aroclor 1260		
	F	ALs		0.74	0.74		
Burn Area	B01	561B029	0.0 - 0.5		0.022 (J)		
Burn Area	B05	561B017	0.0 - 0.5	0.084			
Waste Dump	B10	561B004	3.0 - 4.0 ft into pile		0.016 (J)		
Waste Dump	B11	561B016	4.0 - 5.0 ft into pile		0.076		
Burn Area	B22	561B024	0.0 - 0.5	0.046			

J = Estimated value

Table A.4-7
Sample Results for Gamma-Emitting Radionuclides
Detected above MDCs at CAS 02-08-02, Waste Dump and Burn Area
(Page 1 of 2)

Area	Sample	Sample	Depth		COPCs	(pCi/g)	
Alea	Location	Number	(ft bgs)	Ac-228	Am-241	Cs-137	Th-234
	F	ALs		506.7 ^a	1,503	72.9	1,423 ^b
Burn Area	B01	561B029	0.0 - 0.5	0.94	1.49 (J)	1.9 (J)	
Burn Area	B02	561B021	0.0 - 0.5	1.91		0.571 (J)	
Burn Area	B03	561B028	0.0 - 0.5	1.8		0.37 (J)	
Burn Area	B04	561B020	0.0 - 0.5	2.12			3.3 (J)
Burn Area	B05	561B017	0.0 - 0.5	1.63		1.2 (J)	2.47 (J)
Burn Area	B06	561B018	0.0 - 0.5	1.84		1.38 (J)	2.43 (J)
Waste Dump	B07	561B001	2.0 - 3.0 ft into pile	2.29	1.33 (J)	2.57	
Waste Dump	B08	561B002	4.0 - 5.0 ft into pile	2.04		2.24	3.1 (J)
Waste Dump	B09	561B003	3.0 - 4.0 ft into pile	1.88		1.24	
Waste Dump	B10	561B004	3.0 - 4.0 ft into pile	1.87		1.49	
Waste Dump	B11	561B016	4.0 - 5.0 ft into pile	1.91		1.07	2.53 (J)

^{-- =} Not detected above MDCs.

Table A.4-7 Sample Results for Gamma-Emitting Radionuclides Detected above MDCs at CAS 02-08-02, Waste Dump and Burn Area

(Page 2 of 2)

Area	Sample	Sample	Depth		COPCs	(pCi/g)	
Alea	Location	Number	(ft bgs)	Ac-228	Am-241	Cs-137	Th-234
	F	ALs		506.7ª	1,503	72.9	1,423 ^b
		561B013	0.5 - 1.0 ft into pile	2.07		0.63	3.1 (J)
Waste Dump	B12	561B014	1.0 - 1.5 ft into pile	2.09		1.67	2.7
		561B015	3.0 - 3.5 ft into pile	2.16		1.54	2.55 (J)
Waste Dump	B13	561B012	4.0 - 5.0 ft into pile	2.14		0.169	2.23 (J)
Waste Dump	B14	561B011	4.0 - 5.0 ft into pile	2.19		1.17	2.58 (J)
Waste Dump	B15	561B010	4.0 - 5.0 ft into pile	2.32		0.87	3.6 (J)
Waste Dump	B16	561B009	5.0 - 6.0 ft into pile	2.13		1.5	
Waste Dump	B17	561B008	4.0 - 5.0 ft into pile	2.07		1.11	
		561B005	2.0 - 3.0 ft into pile	2.18		0.63	2.5
Waste Dump	B18	561B006	2.0 - 3.0 ft into pile	2.19		1.04	2.32 (J)
		561B007	4.0 - 5.0 ft into pile	2.11		1.85	
Waste Dump	B19	561B030	0.0 - 0.5	1.88		0.3 (J)	
Waste Dump	B20	561B031	0.0 - 0.5	1.85		0.223 (J)	
Burn Area	B21	561B019	0.0 - 0.5	1.95			
Burn Area	B22	561B024	0.0 - 0.5	1.97		0.537 (J)	2.4 (J)
Burn Area	B23	561B025	0.0 - 0.5	2.07		0.266 (J)	
Burn Area	DZS	561B026	0.0 - 0.5	1.87		0.31 (J)	
Burn Area	B24	561B023	0.0 - 0.5	1.93		0.247 (J)	2.54 (J)
Burn Area	B25	561B022	0.0 - 0.5	2.13		0.8 (J)	2.77 (J)
Burn Area	B26	561B027	0.0 - 0.5	2.12		0.73 (J)	

^aFAL for Ac-228 based on the Th-232 FAL.

^bFAL for Th-234 based on U-238 FAL.

J = Estimated value

^{-- =} Not detected above MDCs.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-41 of A-156

considered PSM. The PAHs (SVOCs) associated with several samples in the burn area are attributed to asphalt located throughout the area, and are not considered to originate from releases associated with burn area activities. The asphalt was discovered throughout the area at depths ranging from 0 to 8 in. bgs. Aerial photos from September 1971 (H&N, 1971) show a road passing through the burn area to the waste dump area, and photos from October 1986 (Author Unknown, 1986) show buildings located on the burn area. Based on this information, the PAHs detected in the burn area are considered to originate from the asphalt and are not considered to be related to the burn area activities.

A.4.4 Revised Conceptual Site Model

The CAIP requirements (NNSA/NSO, 2008) were met at this CAS. Because the PAHs reported at this CAS within the burn area were attributed to the presence of asphalt, no revisions were necessary to the CSM.

A.5.0 CAS 03-19-02, Debris Pile

Corrective Action Site 03-19-02 is located in the north-central portion of Area 3 of the NNSS. The CAS consists of a surface debris pile containing large pieces of rebar, concrete, and steel, and is believed to be associated with the Pommard test. There are "Caution Radioactive Material" postings placed around the debris pile, but no fencing.

A.5.1 Corrective Action Investigation

A total of four characterization samples (including one FD) were collected during investigation activities at CAS 03-19-02 (Figure A.5-1). The sample IDs, locations, types, and analyses are listed in Table A.5-1. The specific CAI activities conducted to satisfy the CAIP requirements at this CAS (NNSA/NSO, 2008) are described in the following sections.

Table A.5-1
Samples Collected at CAS 03-19-02, Debris Pile

Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Gamma
	561C001	N/A	Solid	PSM	Х
C01	561C002	0.5 - 1.0	Soil	Environmental	Х
	561C003	0.5 - 1.0	Soil	FD of #561C002	Х
C02	561C004	0.0 - 0.5	Soil	Environmental	Х
N/A	561C301	N/A	Water	Field Blank	Х

A.5.1.1 Radiological Surveys

In 2007, a gamma radiological walkover survey was performed at the site. No areas of elevated radioactivity in the soil were identified; however, two locations on the concrete debris contained fixed readings above background. During the field investigation in 2010, a gamma walkover survey was performed and only one location on the concrete was identified as having fixed readings above background; the concrete was coated with Trinity glass. Based on the results of the radiological surveys, concrete (561C001) and soil (561C002 and 561C003) samples were collected from this sample location (C01) (Figure A.5-1).

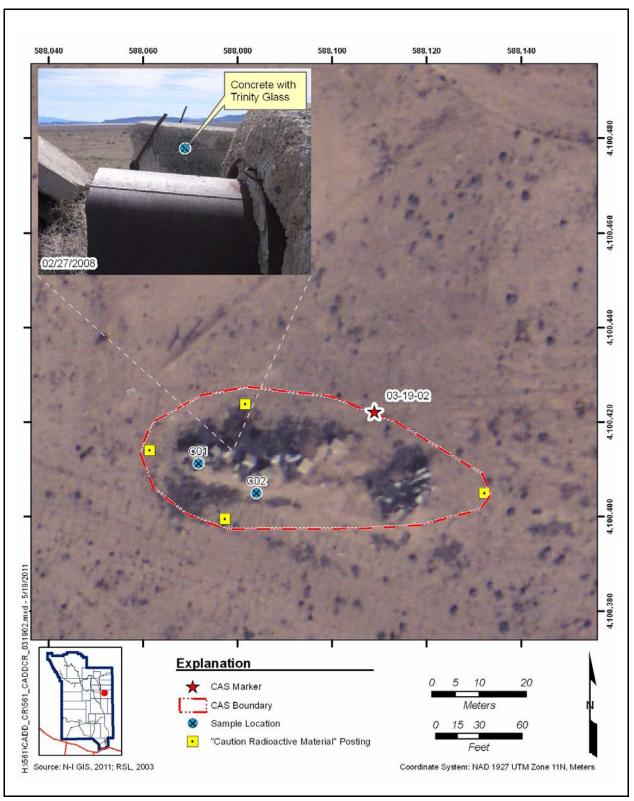


Figure A.5-1 Sample Locations at CAS 03-19-02, Debris Pile

A.5.1.2 Visual Inspections

The debris within the pile and the surface soil was visually inspected for Trinity glass or stained soil. Because the radiological survey could not identify the second location of concrete with fixed readings, two pieces of concrete were moved and/or overturned to inspect the concrete and soil underneath. Trinity glass was discovered after one of these pieces of concrete was overturned. Sample location C02 (sample 561C004) was based on these visual inspections (Figure A.5-2).



Figure A.5-2
Sample Location C02 at CAS 03-19-02, Debris Pile

A.5.1.3 Sample Collection

Decision I environmental sampling activities included the collection of biased concrete samples on the western concrete block, and collection of soil samples beneath two concrete blocks (Figure A.5-1). Four environmental samples were collected from two locations (C01 and C02). A concrete sample was scabbled off a large concrete block where Trinity glass was and elevated radiological readings were observed (sample 561C001) to determine whether the concrete was PSM. Two surface soil samples (561C002 and 561C003) were collected below this block to verify that no

radiological contamination had migrated from the block into the soil. A second sample location was sited from beneath an overturned concrete block where a nickel-sized piece of Trinity glass was discovered. A surface soil sample (561C004) was collected near the Trinity glass to verify that there was no migration of radiological contamination from the Trinity glass. The soil samples were collected using the scoop and trowel hand sampling method at depths of 0 to 1 ft bgs. Because the analytical results showed no concentrations of any constituents above PALs, Decision II sampling was not necessary. No waste characterization samples were collected.

A.5.1.4 Deviations

The CAIP stated that two PSM (concrete) samples and two biased surface samples from beneath the PSM locations were to be collected. Because no other elevated readings were discovered on the concrete slabs, there was a deviation in the number of samples collected at this CAS. Instead of collecting two PSM samples and the corresponding soil samples, one PSM sample and the corresponding soil sample was collected.

A.5.2 Investigation Results

The following sections provide analytical results from the samples collected to complete investigation activities as outlined in the CAIP (NNSA/NSO, 2008). Investigation samples were analyzed for the CAIP-specified COPCs, which included only gamma-emitting radionuclides. The analytical parameters and laboratory methods used to analyze the investigation samples are listed in Table A.2-2. Table A.5-1 lists the sample-specific analytical suite for CAS 03-19-02.

Analytical results from the soil samples with concentrations exceeding MDCs are summarized in the following sections. An evaluation was conducted on all contaminants detected above MDCs by comparing individual concentration or activity results against the FALs. Establishment of the FALs is presented in Appendix C.

A.5.2.1 Gamma-Emitting Radionuclides

Analytical results for gamma-emitting radionuclides detected in soil samples above MDCs are presented in Table A.5-2. No gamma-emitting radionuclides were detected at concentrations exceeding their PALs. The FALs were established at the PAL concentrations.

Table A.5-2
Sample Results for Gamma-Emitting Radionuclides
Detected above MDCs at CAS 03-19-02, Debris Pile

Sample	Sample	Depth	COPCs (pCi/g)							
Location	Number	(ft bgs)	Ac-228	Am-241	Cs-137	Eu-152				
	FALs		506.7ª	1,503	72.9	38.2				
C01	561C002	0.5 - 1.0	1.69	2.49 (J)	2.49	0.79 (J)				
001	561C003	0.5 - 1.0	1.61	2.89 (J)	2.03	0.97 (J)				
C02	561C004	0.0 - 0.5	1.94		0.72					

^aFAL for Ac-228 based on Th-232 FAL.

A.5.2.2 Potential Source Material

Analytical results for PSM samples collected that were detected above MDCs are presented in Table A.5-3. Media sampled included one of the concrete slabs coated with Trinity glass. The concrete sample contained concentrations of Am-241, Co-60, Cs-137, Eu-152, and Eu-154.

Table A.5-3
PSM Results Detected above MDCs for CAS 03-19-02, Debris Pile

Sample Location	Sample Number	Sample Matrix	Parameter	Result	PSM Criteria	Unit
			Am-241	7.4 (J)	1,503	
		•	Co-60	0.88	18.33	
C01	561C001	Solid	Cs-137	42.1	72.9	pCi/g
		•	Eu-152	72 (J)	38.62	
			Eu-154	2.86 (J)	35.7	

J = Estimated value

Bold indicates the values exceeding the FALs.

J = Estimated value

^{-- =} Not detected above MDCs.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-47 of A-156

A.5.3 Nature and Extent of Contamination

Based on the analytical results for soil samples collected within CAS 03-19-02, there has not been a release of contaminants to the environmental media. The analytical results from the concrete slab identified Eu-152 concentrations that exceeded the PSM criteria; therefore, the concrete slab is considered PSM. But soil sampling directly below this slab indicated that no contaminants had migrated from the concrete slab into the soil.

A.5.4 Revised Conceptual Site Model

The CAIP requirements (NNSA/NSO, 2008) were met at this CAS, and no revisions were necessary to the CSM.

A.6.0 CAS 05-62-01, Radioactive Gravel Pile

Corrective Action Site 05-62-01 consists of a radioactive gravel pile with debris located approximately 1,000 ft west of the Gravel Gertie in Area 5 of the NNSS. The gravel pile contains what is believed to be concrete and metal debris from the Gravel Gertie experiments and other atmospheric testing activities in Area 5. The CAS is located within a double-strand yellow rope fence with "Caution Radioactive Material" postings.

A.6.1 Corrective Action Investigation

A total of seven characterization samples (including one FD) were collected during investigation activities at CAS 05-62-01 (Figure A.6-1). The sample IDs, locations, types, and analyses are listed in Table A.6-1. The specific CAI activities conducted to satisfy the CAIP requirements at this CAS (NNSA/NSO, 2008) are described in the following sections.

A.6.1.1 Field Screening

Investigation samples were field screened for alpha and beta/gamma radiation. Alpha FSLs were exceeded at sample location D05 (sample 516D006) from 1 to 1.5 ft within the gravel pile. Beta/gamma FSLs were exceeded in one surface soil sample (location D02, sample 561D003) and within the gravel pile (location D05, ample 516D006). The beta/gamma FSR at location D05 was 15,700 disintegrations per minute per 100 square centimeters (dpm/100 cm²).

A.6.1.2 Radiological Surveys

In 2006, a gamma radiological walkover survey was performed at CAS 05-62-01. No areas of elevated radioactivity were identified. During the field investigation, the sample locations within the gravel pile was surveyed to identify the highest radioactivity within the pile for sampling purposes. Two samples 561D006 and 561D007 were collected from the gravel pile at location with the highest radioactivity (Figure A.6-1).

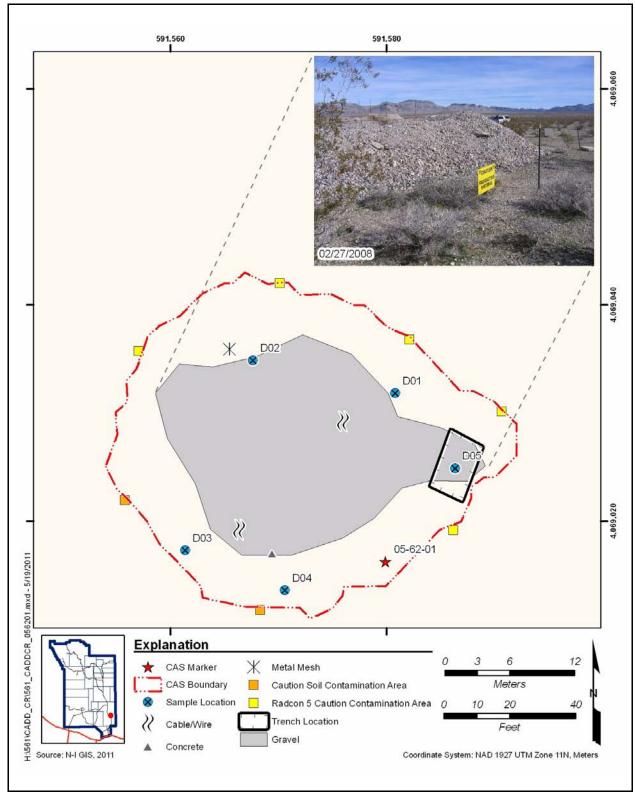


Figure A.6-1 Sample Locations at CAS 05-62-01, Radioactive Gravel Pile

Table A.6-1
Samples Collected at CAS 05-62-01, Radioactive Gravel Pile

Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Gamma	Plutonium	Strontium	Uranium
D01	561D001	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х
D02	561D002	0.0 - 0.5	Soil	Environmental	Χ	Х	Х	Х
002	561D003	0.0 - 0.5	Soil	FD of #561D002	Χ	Х	Х	Х
D03	561D004	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х
D04	561D005	0.0 - 0.5	Soil	Environmental	Χ	Х	Х	Х
D05	561D006	1.0 - 1.5 ft into gravel pile	Soil	Environmental	Χ	Х	Х	Х
D03	561D007	6.5 - 7.0 ft into gravel pile	Soil	Environmental	Х	Х	Х	Х
N/A	561D301	N/A	Water	Field Blank	Χ	Х	Х	Х
N/A	561D302	N/A	Water	Equipment Rinsate	Χ	Χ	Χ	Х

A.6.1.3 Visual Inspections

The gravel pile and surrounding soil was visually inspected for biasing factors. There was no soil staining or other obvious biasing factors. It was observed that there were locations of erosion where the gravel had washed down off the pile. Surface samples were biased to these locations (D01 through D04).

A.6.1.4 Sample Collection

Decision I environmental sampling activities included the collection of biased surface soil samples from around the gravel pile and a biased sample from within the pile at an area of the highest elevated radioactivity. A sample was also collected at the native soil interface below the sample location in the gravel pile (Figures A.6-1 and A.6-2).

Seven environmental samples (including one FD) were collected from five locations (location D01 through D05). Surface soil samples were collected from four locations around the gravel pile to verify that no radiological contamination had migrated off the pile. Two soil samples were collected from within the pile at one location. One sample was collected from 1 to 1.5 ft into the gravel pile which showed elevated radioactivity within the pile. The second sample was collected at the native



Figure A.6-2
Gravel Pile Showing Area of Elevated Radioactivity
CAS 05-62-01, Radioactive Gravel Pile

soil interface (6.5 to 7 ft into pile) to verify that there was no contamination below the gravel pile. Because the analytical results showed no concentrations of any constituents above PALs, Decision II sampling was not necessary. No waste characterization samples were collected.

A.6.1.5 Deviations

There were no deviations to the CAIP (NNSA/NSO, 2008) associated with CAS 05-62-01. Investigation samples were collected as outlined in the CAIP and submitted for laboratory analysis.

A.6.2 Investigation Results

The following sections provide analytical results from the samples collected to complete investigation activities as outlined in the CAIP (NNSA/NSO, 2008). Investigation samples were analyzed for the CAIP-specified COPCs, which included gamma-emitting radionuclides, isotopic Pu, isotopic U, and Sr-90. The analytical parameters and laboratory methods used to analyze the

investigation samples are listed in Table A.2-2. Table A.6-1 lists the sample-specific analytical suite for CAS 05-62-01.

Analytical results from the soil samples with concentrations exceeding MDCs are summarized in the following sections. An evaluation was conducted on all contaminants detected above MDCs by comparing individual concentration or activity results against the FALs. Establishment of the FALs is presented in Appendix C.

A.6.2.1 Gamma-Emitting Radionuclides

Analytical results for gamma-emitting radionuclides detected in soil samples above MDCs are presented in Table A.6-2. No gamma-emitting radionuclides were detected at concentrations exceeding their PALs. The FALs were established at the PAL concentrations.

Table A.6-2
Sample Results for Gamma-Emitting Radionuclides
Detected above MDCs at CAS 05-62-01, Radioactive Gravel Pile

Sample	Sample	Depth	COPCs (pCi/g)						
Location	Number	(ft bgs)	Ac-228	Cs-137	Th-234				
	F	ALs	506.7ª	72.9	1,423 ^b				
D01	561D001	0.0 - 0.5	0.46	0.196					
D02	561D002	0.0 - 0.5	1.16						
D02	561D003	0.0 - 0.5	1.03						
D03	561D004	0.0 - 0.5	0.76	0.76					
D04	561D005	0.0 - 0.5			4.09				
D05	561D006 1.0 - 1.5 ft in		0.38		206				
200	561D007	6.5 - 7.0 ft into gravel pile	0.73		4.75				

^aFAL for Ac-228 based on the Th-232 FAL.

^bFAL for Th-234 based on U-238 FAL.

^{-- =} Not detected above MDCs.

A.6.2.2 Plutonium and Uranium Isotopes, and Strontium-90

Analytical results for the Pu and U isotopes and Sr-90 in soil samples collected at this CAS that were detected above MDCs are presented in Table A.6-3. Because Sr-90 was not detected above the MDC, the results are not included in the table.

Table A.6-3
Sample Results for Isotopes
Detected above MDCs at CAS 05-62-01, Radioactive Gravel Pile

Sample	Sample	Depth		COPCs (pCi/g)							
Location	Number	(ft bgs)	Pu-239/240	U-234	U-235	U-238					
	F.	ALs	2,207	18,650	255.5	1,423					
D01	561D001	0.0 - 0.5	0.087	1.01	0.046	1.69					
D02	561D002	0.0 - 0.5		0.65		0.74					
D02	561D003	0.0 - 0.5		0.6		0.72					
D03	561D004	0.0 - 0.5		0.62		0.96					
D04	561D005	0.0 - 0.5		1.74	0.077	3.14					
D05	561D006 1.0 - 1.5 ft into gravel pile			267	15.3	630					
D05	561D007	6.5 - 7.0 ft into gravel pile		4.22	0.267	9.2					

^{-- =} Not detected above MDCs.

A.6.3 Nature and Extent of Contamination

Based on the analytical results for soil samples collected at CAS 05-62-01, there has not been a release of contaminants to the surrounding environmental media.

A.6.4 Revised Conceptual Site Model

The CAIP requirements (NNSA/NSO, 2008) were met at this CAS, and no revisions were necessary to the CSM.

A.7.0 CAS 12-23-09, Radioactive Waste Dump

Corrective Action Site 12-23-09 is located northwest of Stockade Wash Road, just north of E-Tunnel Road in Area 12 of the NNSS. The CAS consists of two rectangular fenced areas ("north" and "south"). There is a soil mound and a boulder pile located in the northern fenced area. The soil mound has been identified as an area with elevated radioactivity. The site was labeled as a radioactive waste dump on a topographic map; however, it is believed to be an electricians' laydown yard based on interviews with current and past NNSS employees.

A.7.1 Corrective Action Investigation

A total of eight characterization samples (including one FD) were collected during investigation activities at CAS 12-23-09 (Figure A.7-1). The sample IDs, locations, types, and analyses are listed in Table A.7-1. The specific CAI activities conducted to satisfy the CAIP requirements at this CAS (NNSA/NSO, 2008) are described in the following sections.

A.7.1.1 Radiological Surveys

A gamma radiological walkover survey was performed of the north fenced area in 2006. The survey results identified an area of radioactivity from 2 to 5 times higher than background levels at the soil mound. Based on the results of this survey, two soil samples (561E004 and 561E005) were collected at location E07 (Figure A.7-2). In 2008, a gamma walkover survey was performed of the south fenced area; no areas of elevated radioactivity were identified.

A.7.1.2 Geophysical Surveys

Geophysical surveys were performed at this CAS which identified buried metal debris in the area of the soil mound. This is the same area where the elevated radioactivity was identified. The soil mound was investigated using a shovel, and two soil samples (561E004 and 561E005) were collected within the soil mound based on the survey results.

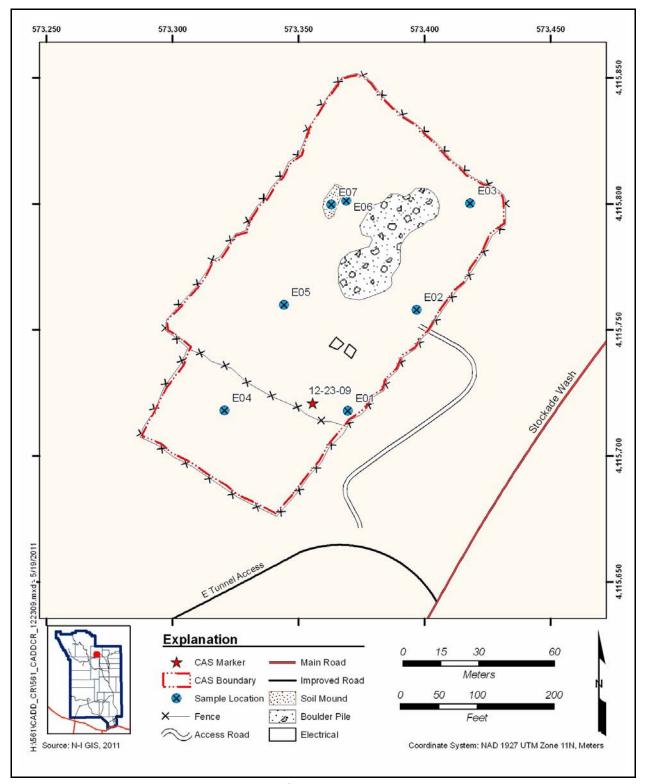


Figure A.7-1
Sample Locations at CAS 12-23-09, Radioactive Waste Dump

Table A.7-1
Samples Collected at CAS 12-23-09, Radioactive Waste Dump

Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Beryllium	TPH-DRO	Gamma	Hexavalent Chromium	Metals	PCBs	SVOCs	VOCs
E01	561E002	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Χ	Х	Х	Х
E02	561E003	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Χ	Х	Х	Х
E03	561E006	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Χ	Х	Х	Χ
E04	561E001	0.0 - 0.5	Soil	Environmental	Χ	Χ	Х	Х	Χ	Х	Х	Χ
E05	561E008	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Χ	Х	Х	Χ
E06	561E007	0.0 - 0.5	Soil	Environmental	Х	Χ	Х	Х	Χ	Х	Х	Χ
E07	561E004	1.0 - 1.5 ft into soil mound	Soil	Environmental	Х	Х	Χ	Х	Χ	Х	Х	Χ
	561E005	1.0 - 1.5 ft into soil mound	Soil	FD of #561E004	Х	Х	Х	Х	Χ	Х	Х	Χ
N/A	561E301	N/A	Water	Trip Blank								Χ
N/A	561E302	N/A	Water	Trip Blank								Χ
N/A	561E303	N/A	Water	Field Blank	Х	Х	Χ	Х	Χ	Х	Х	Χ

^{-- =} Not required

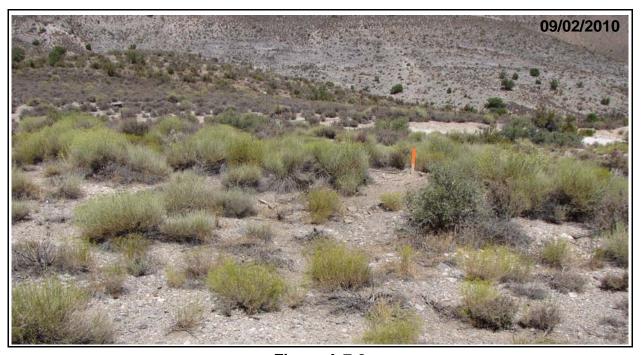


Figure A.7-2
Sample Location E07 at Soil Mound CAS 12-23-09, Radioactive Waste Dump

A.7.1.3 Visual Inspections

The surface soil within the two fenced areas and the soil mound was inspected for any stained soil or other biasing factors. No biasing factors were noted.

A.7.1.4 Sample Collection

Decision I environmental sampling activities included the collection of randomly selected soil samples from the north and south fenced area and biased soil samples from the soil mound in the northwest portion of the fenced area (Figure A.7-1). Eight environmental samples (including one FD) were collected from seven locations (location E01 through E07). Six sample locations were located using VSP software, and one sample location was sited in the soil mound, which showed elevated radioactivity. The six samples were surface samples (0 to 0.5 ft bgs), while the soil mound was sampled at 1 to 1.5 ft into the mound. The soil mound was sampled by digging into the mound with a clean shovel, then collecting the sample using disposable scoops. Because the analytical results showed no concentrations of any constituents above PALs, Decision II sampling was not necessary. No waste characterization samples were required or collected.

A.7.1.5 Deviations

There were no deviations to the CAIP (NNSA/NSO, 2008) associated with CAS 12-23-09. Investigation samples were collected as outlined in the CAIP and submitted for laboratory analysis.

A.7.2 Investigation Results

The following sections provide analytical results from the samples collected to complete investigation activities as outlined in the CAIP (NNSA/NSO, 2008). Investigation samples were analyzed for the CAIP-specified COPCs, which included VOCs, SVOCs, TPH-DRO (waste management purposes only), RCRA metals, beryllium, hexavalent chromium, PCBs, and gamma-emitting radionuclides. The analytical parameters and laboratory methods used to analyze the investigation samples are listed in Table A.2-2. Table A.7-1 lists the sample-specific analytical suite for CAS 12-23-09.

Analytical results from the soil samples with concentrations exceeding MDCs are summarized in the following sections. An evaluation was conducted on all contaminants detected above MDCs by comparing individual concentration or activity results against the FALs. Establishment of the FALs is presented in Appendix C.

A.7.2.1 Volatile Organic Compounds

Analytical results for VOCs detected in soil samples above MDCs are presented in Table A.7-2. No VOCs were detected at concentrations exceeding their respective PALs. The FALs were established at the corresponding PAL concentrations.

Table A.7-2
Sample Results for VOCs Detected above MDCs at CAS 12-23-09, Radioactive Waste Dump

Sample	Sample	Depth		COPCs (mg/kg)								
Location	Number	(ft bgs)	Acetone	P-Isopropyltoluene	Toluene	Total Xylenes						
FALs		630,000	11,000	45,000	2,700							
E01	561E002	0.0 - 0.5			0.0027 (J)	0.0029 (J)						
E02	561E003	0.0 - 0.5	0.014 (J)		0.0024 (J)	0.0018 (J)						
E03	561E006	0.0 - 0.5			0.0024 (J)	0.0034 (J)						
E04	561E001	0.0 - 0.5	0.039 (J)		0.002 (J)	0.0029 (J)						
E05	561E008	0.0 - 0.5	0.046 (J)	0.01	0.0037 (J)	0.0044 (J)						
E06	561E007	0.0 - 0.5	0.017 (J)		0.0044 (J)	0.0037 (J)						

J = Estimated value

A.7.2.2 Semivolatile Organic Compounds

Analytical results for SVOCs detected in soil samples above MDCs are presented in Table A.7-3. No SVOCs were detected at concentrations exceeding the respective PALs. The FALs were established at the corresponding PAL concentrations.

^{-- =} Not detected above MDCs.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-59 of A-156

Table A.7-3
Sample Results for SVOCs Detected above MDC at CAS 12-23-09, Radioactive Waste Dump

			COPCs (mg/kg)										
Sample Location	Sample Number			Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Pyrene				
	FALs		2.1	0.21	2.1	21	210	22,000	17,000				
E06	561E007	0.0 - 0.5	0.086 (J)	0.073 (J)	0.16 (J)	0.073 (J)	0.13 (J)	0.15 (J)	0.13 (J)				
E07	561E005	1.0 - 1.5 ft into soil mound	0.081 (J)		0.11 (J)		0.088 (J)	0.087 (J)	0.084 (J)				

J = Estimated value

^{-- =} Not detected above MDC.

A.7.2.3 Total Petroleum Hydrocarbons

Analytical results for TPH-DRO detected in soil samples above MDCs are presented in Table A.7-4. Samples were analyzed for TPH-DRO for waste management purposes only as stated in the FI ROTC-1 (NNES, 2010), and are presented here for completeness of data. Preliminary action levels and FALs have not been established for TPH-DRO. The FALs are established for the individual hazardous constituents of TPH-DRO and are reported with the VOC and SVOC results. Because VOCs or SVOCs were not detected at concentrations exceeding the MDCs in any of the soil samples collected at this CAS, TPH-DRO is not considered to be a site-related contaminant.

Table A.7-4
Sample Results for TPH-DRO at CAS 12-23-09, Radioactive Waste Dump

Sample Location	Sample Number	·			
E01	561E002	0.0 - 0.5	2.3 (J)		
E02	561E003	0.0 - 0.5	17		
E03	561E006	0.0 - 0.5	4.5 (J)		
E04	561E001	0.0 - 0.5	2.8 (J)		
E05	561E008	0.0 - 0.5	4.6		
E06	561E007	0.0 - 0.5	4.8		
E07	561E004	1.0 - 1.5 ft into soil mound	2.7 (J)		
207	561E005	1.0 - 1.5 ft into soil mound	2.7 (J)		

J = Estimated value

A.7.2.4 RCRA Metals, Beryllium, and Hexavalent Chromium

Analytical results for RCRA metals, beryllium, and hexavalent chromium detected in soil samples above MDCs are presented in Table A.7-5. No RCRA metals, beryllium, or hexavalent chromium were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-61 of A-156

Table A.7-5
Sample Results for Metals Detected above MDCs at CAS 12-23-09, Radioactive Waste Dump

						CC	PCs (mg/l	(g)			
Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Lead	Mercury	Selenium
	F.	ALs	23	190,000	2,000	800	N/Aª	5.6	800	34	5,100
E01	561E002	0.0 - 0.5	3.2	140	0.79	0.14	5.8	0.14 (J-)	23		
E02	561E003	0.0 - 0.5	3.2	120	0.76	0.16	5.4		15		
E03	561E006	0.0 - 0.5	3.6	150	0.87	0.14	6.1	0.14 (J-)	13		
E04	561E001	0.0 - 0.5	2.8	120	0.78	0.081	2.9	0.37 (J-)	9.6		
E05	561E008	0.0 - 0.5	3.6	82	0.55	0.28	6	0.14 (J-)	12	0.052	
E06	561E007	0.0 - 0.5	3.7	89	0.61	0.2	6.3	0.26 (J-)	10	0.037	
E07	561E004	1.0 - 1.5 ft into soil mound	3.3	77		0.19	5	0.14 (J-)	11	0.042	
	561E005	1.0 - 1.5 ft into soil mound	3.3	120	0.77	0.2	5.5	0.14 (J-)	15	0.043	0.32

^aPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

J- = Result is an estimated quantity, but may be biased low.

^{-- =} Not detected above MDCs.

A.7.2.5 Polychlorinated Biphenyls

Analytical results for PCBs detected in soil samples above MDCs are presented in Table A.7-6. No PCBs were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

Table A.7-6
Sample Results for PCBs Detected above MDC at CAS 12-23-09, Radioactive Waste Dump

Sample	Sample	Depth	COPC (mg/kg)					
Location	Number	(ft bgs)	Aroclor 1268					
	FAL		0.74					
E04	561E001	0.0 - 0.5	0.028 (J)					

J = Estimated value

A.7.2.6 Gamma-Emitting Radionuclides

Analytical results for gamma-emitting radionuclides detected in soil samples above MDCs are presented in Table A.7-7. No gamma-emitting radionuclides were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

A.7.3 Nature and Extent of Contamination

Based on the analytical results for soil samples collected within CAS 12-23-09, there has not been a release of contaminants to the environmental media.

A.7.4 Revised Conceptual Site Model

The CAIP requirements (NNSA/NSO, 2008) were met at this CAS, and no revisions were necessary to the CSM.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-63 of A-156

Table A.7-7
Sample Results for Gamma-Emitting Radionuclides
Detected above MDCs at CAS 12-23-09, Radioactive Waste Dump

Sample	Sample	Depth	COPCs (pCi/g)						
Location	Number	(ft bgs)	Ac-228	Am-241	Cs-137				
	F.A	ALs	506.7 ^a	1,503	72.9				
E01	561E002	0.0 - 0.5	1.87	1.23 (J)	6.06				
E02	561E003	0.0 - 0.5	1.93		6.36				
E03	561E006	0.0 - 0.5	2.47		3.52				
E04	561E001	0.0 - 0.5	2.26						
E05	561E008	0.0 - 0.5	0.84		5.81				
E06	561E007	0.0 - 0.5	1.01		0.36				
E07	561E004 1.0 - 1.5 ft into soil mo		0.81		8.07				
207	561E005	1.0 - 1.5 ft into soil mound	0.72		8.5				

^aFAL for Ac-228 based on the Th-232 FAL.

J = Estimated value

^{-- =} Not detected above MDCs.

A.8.0 CAS 22-19-06, Buried Waste Disposal Site

Corrective Action Site 22-19-06 is located at the southeast end of Camp Desert Rock in Area 22 of the NNSS and consists of a suspected waste dump with buried debris as identified by a geophysical survey. Excavation activities uncovered two manhole covers and a concrete-filled piece of corrugated pipe. Camp Desert Rock has been identified as eligible for inclusion in the National Register of Historic Places (Jones, 2010).

A.8.1 Corrective Action Investigation

A total of five characterization samples (including one FD) were collected during investigation activities at CAS 22-19-06 (Figure A.8-1). The sample IDs, locations, types, and analyses are listed in Table A.8-1. The specific CAI activities conducted to satisfy the CAIP requirements at this CAS (NNSA/NSO, 2008) are described in the following sections.

Table A.8-1
Samples Collected at CAS 22-19-06, Buried Waste Disposal Site

Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Beryllium	TPH-DRO	Gamma	Hexavalent Chromium	Metals	PCBs	SVOCs	VOCs
F01	561F001	1.5 - 2.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
101	561F002	1.5 - 2.0	Soil	FD of #561F001	Х	Х	Χ	Х	Х	Χ	Χ	Х
F02	561F003	2.5 - 3.0	Soil	Environmental	Χ	Х	Χ	Х	Χ	Χ	Χ	Х
F03	561F004	7.0 - 7.5	Soil	Environmental	Χ	Х	Χ	Х	Х	Х	Х	Х
F04	561F005	8.0 - 8.5	Soil	Environmental	Х	Х	Χ	Х	Χ	Χ	Χ	Х
N/A	561F301	N/A	Water	Trip Blank								Х
N/A	561F302	N/A	Water	Trip Blank								Х
N/A	561F303	N/A	Water	Trip Blank								Х
N/A	561F304	N/A	Water	Field Blank	Х	Х	Χ	Х	Х	Х	Х	Х
N/A	561F305	N/A	Water	Equipment Rinsate	Χ	Χ	Χ	Χ	Х	Χ	Х	Х

^{-- =} Not required

A.8.1.1 Geophysical Surveys

Geophysical surveys were performed in 2004 and identified buried metallic debris in the area of the disposal trench (Figure A.8-1). The geophysical anomaly was investigated by trenching through the center of the anomaly. Sample locations F01 through F04 were located along the geophysical anomalies, and five samples (561F001 through 561F005) were collected.

A.8.1.2 Visual Inspections

The surface soil at CAS 22-19-06 was inspected for any stained soil or biasing factors. No biasing factors or stained surface soil was observed. During excavation activities, the subsurface soil was also inspected for staining and other biasing factors; none were found. Two concrete and metal manhole covers were uncovered during the excavation activities at depths ranging from 1 to 3 ft bgs; samples 561F001 through 561F003 were collected from beneath the manhole covers. A corrugated metal conduit pipe was also uncovered at a depth of 6 ft bgs; samples 561F004 and 561F005 were collected from beneath the conduit pipe (Figure A.8-2).

A.8.1.3 Sample Collection

Decision I environmental sampling activities included the collection of biased subsurface soil samples (Figure A.8-1) at this CAS. Environmental samples were collected from the subsurface soil to determine whether there has been a release from what was believed to be a buried waste dump. One northeast-southwest trench was excavated in the area of two geophysical anomalies. The geophysical anomalies were not associated with a buried waste dump, but were instead concrete and metal manhole covers, and a corrugated conduit pipe.

Five environmental samples were collected from four locations (location F01 through F04) in the locations of the geophysical anomaly. Samples 561F001 and 561F002 were collected from beneath a concrete manhole cover at a depth of 1.5 to 2 ft bgs, and sample 561F003 was collected from 2.5 to 3 ft bgs at the same location. Samples were also collected from beneath the corrugated conduit pipe; sample 561F004 was collected from a depth of 7 to 7.5 ft bgs and sample 561F005 was collected from 8 to 8.5 ft bgs.Because the analytical results showed no concentrations of any constituents above PALs, Decision II sampling was not necessary. No waste characterization samples were required or collected.

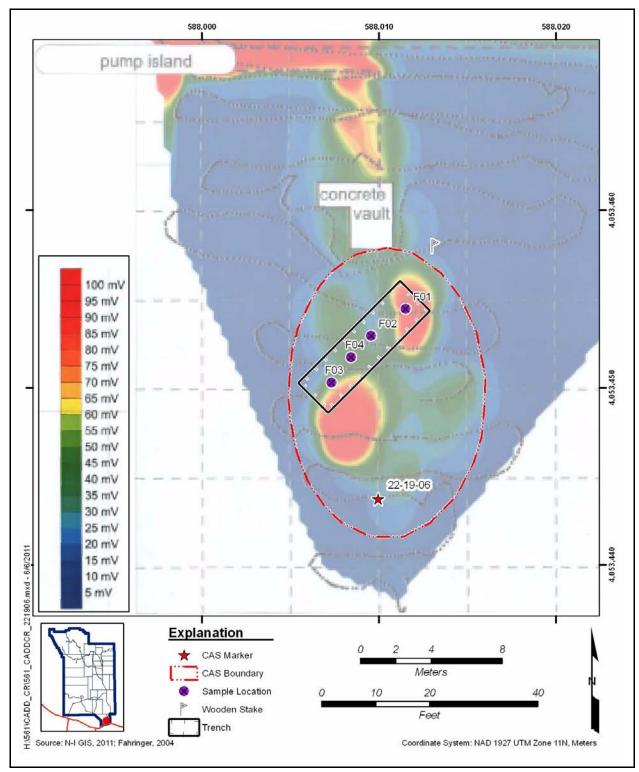


Figure A.8-1 Sample Locations at CAS 22-19-06, Buried Waste Disposal Site



Figure A.8-2
Metal Conduit Pipe at CAS 22-19-06, Buried Waste Disposal Site

Samples collected from this CAS were screened for VOCs using a Mini-RAE 2000 PID due to the possible presence of volatile hydrocarbons in the soil. No VOCs were detected at this CAS. A Q-RAE Plus Four-Gas Monitor was used to screen soil samples as well; all readings were 0 parts per million (ppm) or 0 percent, except for the oxygen gas (O_2) , which was within the acceptable range.

A.8.1.4 Deviations

There were no deviations to the CAIP (NNSA/NSO, 2008) associated with CAS 22-19-06. Investigation samples were collected as outlined in the CAIP and submitted for laboratory analysis.

A.8.2 Investigation Results

The following sections provide analytical results from the samples collected to complete investigation activities as outlined in the CAIP (NNSA/NSO, 2008). Investigation samples were analyzed for the CAIP-specified COPCs, which included VOCs, SVOCs, TPH-DRO

CAU 561 CADD/CR Appendix A

Revision: 0
Date: August 2011
Page A-68 of A-156

(waste management purposes only), RCRA metals, hexavalent chromium, beryllium, PCBs, and gamma-emitting radionuclides. The analytical parameters and laboratory methods used to analyze the investigation samples are listed in Table A.2-2. Table A.8-1 lists the sample-specific analytical suite for CAS 22-19-06.

Analytical results from the soil samples with concentrations exceeding MDCs are summarized in the following sections. An evaluation was conducted on all contaminants detected above MDCs by comparing individual concentration or activity results against the FALs. Establishment of the FALs is presented in Appendix C.

A.8.2.1 Volatile Organic Compounds

No VOCs were detected in soil samples above MDCs. Therefore, the FALs were established at the corresponding PAL concentrations.

A.8.2.2 Semivolatile Organic Compounds

No SVOCs were detected in soil samples above MDCs. Therefore, the FALs were established at the corresponding PAL concentrations.

A.8.2.3 Total Petroleum Hydrocarbons

Analytical results for TPH-DRO detected in soil samples above MDCs are presented in Table A.8-2. Samples were analyzed for TPH-DRO for waste management purposes only as stated in the FI ROTC-1 (NNES, 2010), and are presented here for completeness of data. Preliminary action levels and FALs have not been established for TPH-DRO. The FALs are established for the individual hazardous constituents of TPH-DRO and are reported with the VOC and SVOC results. Because VOCs or SVOCs were not detected at concentrations exceeding the MDCs in any of the soil samples collected at this CAS, TPH-DRO is not considered to be a site-related contaminant.

Table A.8-2 Sample Results for TPH-DRO at CAS 22-19-06, Buried Waste Disposal Site

Sample Location	Sample Number	Depth (ft bgs)	TPH-DRO (mg/kg)
F01	561F001	1.5 - 2.0	2.3 (J)
FOI	561F002	1.5 - 2.0	2.1 (J)
F02	561F003	2.5 - 3.0	11
F03	561F004	7.0 - 7.5	7.3
F04	F04 561F005		11

J = Estimated value

A.8.2.4 RCRA Metals, Beryllium, and Hexavalent Chromium

Analytical results for RCRA metals, beryllium, and hexavalent chromium detected in soil samples above MDCs are presented in Table A.8-3. No RCRA metals, beryllium, or hexavalent chromium were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

Table A.8-3
Sample Results for Metals Detected above MDCs at CAS 22-19-06, Buried Waste Disposal Site

			COPCs (mg/kg)									
Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Cadmium	Chromium	Lead	Selenium				
	FALs		23	190,000	800	N/Aª	800	5,100				
F01	561F001	1.5 - 2.0	5.5	78	0.1	4.6 (J)	7 (J)	0.29				
101	561F002	1.5 - 2.0	5.6	81	0.1	5.1 (J)	7.6 (J)					
F02	561F003	2.5 - 3.0	5.9	79	0.096	5.1 (J)	6.8 (J)					
F03	561F004	7.0 - 7.5	6.2	89	0.14	5.1 (J)	17 (J)					
F04	561F005	8.0 - 8.5	5.7	89	0.27	4.8 (J)	14 (J)					

^aPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

J = Estimated value

^{-- =} Not detected above MDCs.

A.8.2.5 Polychlorinated Biphenyls

No PCBs were detected in soil samples above MDCs. Therefore, the FALs were established at the corresponding PAL concentrations.

A.8.2.6 Gamma-Emitting Radionuclides

Analytical results for gamma-emitting radionuclides detected in soil samples above MDCs are presented in Table A.8-4. The only gamma-emitting radionuclide detected in soil samples above the MDC was Ac-228, with values ranging from 0.47 to 0.69 pCi/g. These values are below the FAL of 5 pCi/g. No other gamma-emitting radionuclides were detected at concentrations exceeding their PALs. Therefore, the FALs were established at the corresponding PAL concentrations.

Table A.8-4
Sample Results for Gamma-Emitting Radionuclides Detected above MDC at CAS 22-19-06, Buried Waste Disposal Site

Sample	Sample	Depth	COPC (pCi/g)
Location	Number	(ft bgs)	Ac-228
	FAL		506.7ª
F01	561F001	1.5 - 2.0	0.61
101	561F002	1.5 - 2.0	0.66
F02	561F003	2.5 - 3.0	0.51
F03	561F004	7.0 - 7.5	0.69
F04	561F005	8.0 - 8.5	0.47

^aFAL for Ac-228 based on the Th-232 FAL.

A.8.3 Nature and Extent of Contamination

Based on the analytical results for soil samples collected within CAS 22-19-06, there has not been a release of contaminants to the environmental media.

A.8.4 Revised Conceptual Site Model

The CAIP requirements (NNSA/NSO, 2008) were met at this CAS, and no revisions were necessary to the CSM.

A.9.0 CAS 23-21-04, Waste Disposal Trenches

Corrective Action Site 23-21-04 consists of six open trenches and one potential covered trench located approximately 1,500 ft northeast of Building 23-160 in Area 23 of the NNSS. Three of the trenches contained debris (wood, metal, cables/wire, lead bricks and counterweights, aerosol cans, nails and bolts, a drill bit, machine parts, and engine parts) and stained soil. Lead bricks and lead counterweights were discovered on the west end of Trench 3 and on the west end of Trenches 5 and 6. The other three trenches were empty, and the potential covered trench was not a trench, but a natural depression.

A.9.1 Corrective Action Investigation

A total of 41 characterization samples (including two FDs) were collected from 37 locations during investigation activities at CAS 23-21-04 (Figure A.9-1). The sample IDs, locations, types, and analyses are listed in Table A.9-1. The specific CAI activities conducted to satisfy the CAIP requirements at this CAS (NNSA/NSO, 2008) are described in the following sections. As a BMP, the six trenches and potential covered trench were backfilled, and housekeeping debris was removed and disposed of after the CAI was completed.

A.9.1.1 Geophysical Surveys

Geophysical surveys were performed in 2006, and no buried waste was identified from these surveys.

A.9.1.2 Visual Inspections

The trenches were inspected for any stained soil or other biasing factors, such as debris, by excavating potholes and transects in each trench and in the potential covered trench. Potholes and transects were excavated across the middle of the trench and at the ends of the trench. No biasing factors were identified in Trenches 1, 2, 4, or at the potential covered trench area; therefore, no samples were collected from these trenches. Stained soil was observed on the west end of Trench 3, and east of Trench 6; both locations were sampled (samples 561G004 and 561G003). Trenches 3, 4, and 6 were inspected by excavating potholes; debris was discovered in all three trenches and samples were collected at the biasing factor location. A lead brick was discovered on

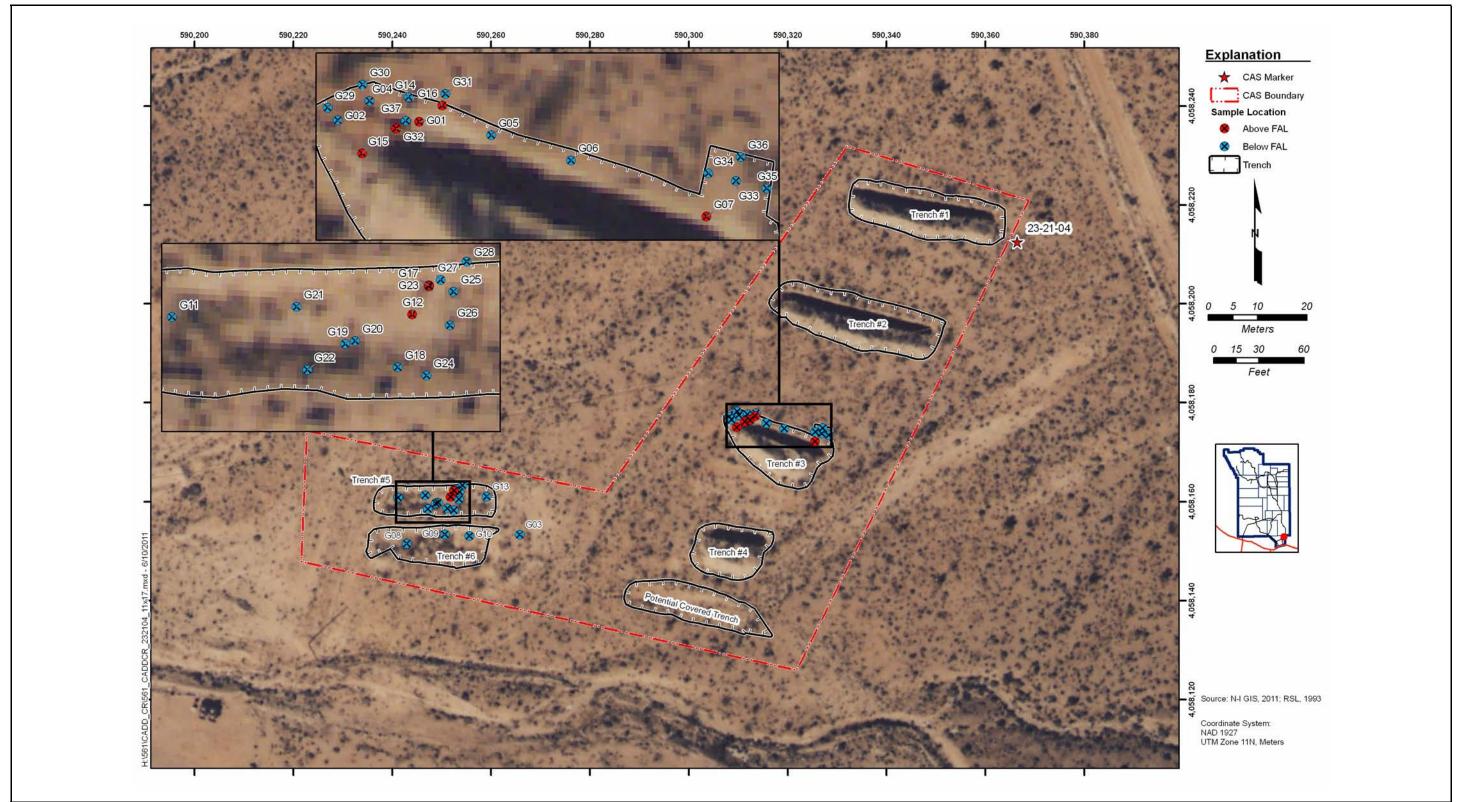


Figure A.9-1
Sample Locations at CAS 23-21-04, Waste Disposal Trenches

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-73 of A-156

Table A.9-1 Samples Collected at CAS 23-21-04, Waste Disposal Trenches (Page 1 of 2)

Trench	Sample Location	Sample Number	Depth (ft bgs)	Matrix	Matrix Purpose		TPH-DRO	Gamma	Hexavalent Chromium	Metals	PCBs	SVOCs	TCLP Metals	VOCs
		561G001	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Χ		Х
3	G01	561G018	1.0 - 1.5	Soil	Environmental					Х				
		561G501	0.0 - 0.5	Soil	Waste Management								Х	
3	G02	561G002	0.0 - 0.5	Soil	Environmental	Х				Х				
6	G03	561G003	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
3	G04	561G004	1.0 - 1.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
3	G05	561G005	7.5 - 8.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
3	G06	561G006	7.5 - 8.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
3	G07	561G007	7.5 - 8.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
6	G08	561G008	1.5 - 2.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
6	G09	561G009	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
6	G10	561G010	0.5 - 1.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
	Gio	561G011	0.5 - 1.0	Soil	FD of #561G010	Х	Х	Х	Х	Х	Х	Х		Х
5	G11	561G012	0.5 - 1.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
		561G013	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
5	G12	561G020	1.0 - 1.5	Soil	Environmental					Х				
		561G502	0.0 - 0.5	Soil	Waste Management								Х	
5	G13	561G014	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
3	G14	561G015	0.0 - 0.5	Soil	Environmental					Х				
3	G15	561G016	0.0 - 0.5	Soil	Environmental					Х				
3	G16	561G017	0.0 - 0.5	Soil	Environmental					Х				
5	G17	561G019	0.0 - 0.5	Soil	Environmental					Х				
5	G18	561G021	0.0 - 0.5	Soil	Environmental					Х				
5	G19	561G022	0.0 - 0.5	Soil	Environmental					Х				
	019	561G023	0.0 - 0.5	Soil	FD of #561G022					Х				

Table A.9-1 Samples Collected at CAS 23-21-04, Waste Disposal Trenches

(Page 2 of 2)

Trench	Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Beryllium	TPH-DRO	Gamma	Hexavalent Chromium	Metals	PCBs	SNOCs	TCLP Metals	VOCs
5	G20	561G024	1.5 - 2.0	Soil	Environmental					Х				
5	G21	561G025	2.0 - 2.5	Soil	Environmental					Х				
5	G22	561G026	2.5 - 3.0	Soil	Environmental					Х				
5	G23	561G027	2.5 - 3.0	Soil	Environmental					Х				
5	G24	561G028	2.0 - 2.5	Soil	Environmental					Х				
5	G25	561G029	5.0 - 5.5	Soil	Environmental					Х				
5	G26	561G030	3.0 - 3.5	Soil	Environmental					Х				
5	G27	561G031	5.0 - 5.5	Soil	Environmental					Х				
5	G28	561G032	3.0 - 3.5	Soil	Environmental					Х				
3	G29	561G033	3.0 - 3.5	Soil	Environmental				Х	Х				
3	G30	561G034	3.0 - 3.5	Soil	Environmental				Х	Х				
3	G31	561G035	3.0 - 3.5	Soil	Environmental				Х	Х				
3	G32	561G036	3.0 - 3.5	Soil	Environmental				Х	Х				
3	G33	561G037	9.0 - 10.0	Soil	Environmental						Х			
3	G34	561G038	6.0 - 7.0	Soil	Environmental						Х			
3	G35	561G039	6.0 - 7.0	Soil	Environmental						Х			
3	G36	561G040	6.0 - 7.0	Soil	Environmental						Х			
3	G37	561G041	4.5 - 5.0	Soil	Environmental				Х	Х				
N/A	N/A	561G301	N/A	Water	Trip Blank									Х
N/A	N/A	561G302	N/A	Water	Trip Blank									Х
N/A	N/A	561G303	N/A	Water	Trip Blank									Х
N/A	N/A	561G304	N/A	Water	Trip Blank									Х
N/A	N/A	561G305	N/A	Water	Trip Blank									Х
N/A	N/A	561G306	N/A	Water	Field Blank	Х	Х	Х	Х	Х	Х	Х		Х
N/A	N/A	561G307	N/A	Water	Equipment Rinsate	Х	Х	Х	Х	Х	Х	Х		Х

^{-- =} Not required

the west end of Trench 3, and lead counterweights were found on the west end of Trench 6. Figures A.9-2 and A.9-3 show trenches with debris before and after excavation.



Figure A.9-2
Debris in Trench 6, Pre-excavation CAS 23-21-04, Waste Disposal Trenches

A.9.1.3 Sample Collection

Forty-one environmental samples (including two FDs) were collected from 37 locations (locations G01 through G37) near and within Trenches 3, 5, and 6. No samples were collected from Trenches 1, 2, 4, or the potential covered trench because the potholing activities did not identify any potential contamination.



Figure A.9-3
Debris in Trench 3, Post-excavation CAS 23-21-04, Waste Disposal Trenches

Two waste characterization samples (see Section A.13.0) were collected from locations G01 (Trench 3) and G12 (Trench 5) and analyzed for TCLP metals, because the arsenic concentrations exceeded the action levels.

Trench 3

Nineteen environmental samples were collected within Trench 3. Decision I sampling activities included the collection of six biased soil samples. Biasing factors included stained soil (samples 561G001 and 561G004), debris (samples561G002, 561G005 through 561G007), and a location beneath one lead brick (561G002). The Decision I analytical results showed that the west end of the trench had arsenic and hexavalent chromium contamination (locations G01 and G04), and the east end of the trench had PCB contamination (location G07) at concentrations exceeding the PALs.

CAU 561 CADD/CR

Appendix A Revision: 0 Date: August 2011

Page A-77 of A-156

The determination was made that the arsenic and hexavalent chromium contaminated soil would be removed to allow for a clean closure of this site. During the soil removal activities samples were collected to define the vertical and lateral extent of the contamination. After the soil excavation was completed to a depth of 4.5 ft bgs, confirmation samples were collected from the sides and bottom of

the excavation (561GG033, 561G034, 561G035, and 561G041). Analytical results demonstrated that

all the arsenic and hexavalent chromium had been removed from the area around Trench 3.

Because PCBs were identified in sample 561G007 from location G07, four Decision II environmental samples were collected to define the extent of the PCB contamination. Consistent with the decision to clean close this CAS, soil was excavated from the north side of the trench from an area 7 by 9 by 10 ft deep. Samples were then collected at the bottom of the excavation from 9 to 10 ft bgs, and from the north, east, and west walls at a depth of 6 to 7 ft bgs, and analyzed for PCBs. The sample results indicated that PCB-contaminated soil had been removed from the trench.

A lead brick was identified as PSM and removed from the west end of Trench 3 (location G02). A verification soil sample (561G002) was collected from the underlying soil after removing the PSM. The analytical results from the lead brick verification sample demonstrated that there was no residual lead contamination remaining in the soil.

Trench 5

Seventeen total environmental samples were collected within Trench 5. Three Decision I biased samples (561G012 through 561G014) were collected at areas of debris within the trench. The analytical results demonstrated that arsenic was present in the soil within and adjacent to the trench at concentrations exceeding PALs. Based on the Decision I analytical results and the desire to clean close this CAS, Decision II sampling was initiated to define the vertical and horizontal extent of the arsenic contamination and remove the contaminate soil associated with Trench 5. During the excavation operation, confirmation samples were periodically collected to determine whether all the contaminated soil had been removed. When the excavation was completed soil from an area measuring approximately 30 by 16 by 5 ft was removed and disposed of. Confirmation samples (561G029, 561G30, 561G031, and 561G032) collected from the sides and bottom of the excavation confirmed that the arsenic contaminated soil had been removed.

Date: August 2011 Page A-78 of A-156

Trench 6

Decision I environmental sampling activities at Trench 6 included the collection of biased samples at three locations within the trench. Debris (wood and metal) was observed on the surface of the trench, but not within the excavation. Four samples (561G008 through 561G011) were collected from Trench 6. A small soil pile (approximately 8 in. tall) was observed east of Trench 6. The soil pile was composed of was non-native soil that showed no staining. Some rusty bolts were observed on the soil pile, so sample 561G003 was collected from beneath the bolts. Decision II samples were not collected from this trench because no COCs were identified during the characterization activities.

A.9.1.4 Deviations

There were no deviations to the CAIP (NNSA/NSO, 2008) associated with CAS 23-21-04. Investigation samples were collected as outlined in the CAIP and submitted for laboratory analysis.

A.9.2 Investigation Results

The following sections provide analytical results from the samples collected to complete investigation activities as outlined in the CAIP (NNSA/NSO, 2008). Investigation samples were analyzed for the CAIP-specified COPCs, which included VOCs, SVOCs, TPH-DRO (waste management purposes only), RCRA metals, hexavalent chromium, beryllium, PCBs, and gamma-emitting radionuclides. The analytical parameters and laboratory methods used to analyze the investigation samples are listed in Table A.2-2. Table A.9-1 lists the sample-specific analytical suite for CAS 23-21-04.

Analytical results from the soil samples with concentrations exceeding MDCs are summarized in the following sections. An evaluation was conducted on all contaminants detected above MDCs by comparing individual concentration or activity results against the FALs. Establishment of the FALs is presented in Appendix C.

A.9.2.1 Volatile Organic Compounds

Analytical results for VOCs detected in soil samples above MDCs are presented in Table A.9-2. No VOCs were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

Table A.9-2
Sample Results for VOCs Detected above MDCs at CAS 23-21-04, Waste Disposal Trenches

	Sample	Sample	Depth		COPCs	(mg/kg)	
Trench	Location	Number	(ft bgs)	Acetone	Methylene Chloride	Toluene	Total Xylenes
	FA	Ls		630,000	53	45,000	2,700
3	G01	561G001	0 - 0.5		0.0044 (J)		
6	G03	561G003	0 - 0.5		0.0049 (J)		
3	G04	561G004	1 - 1.5		0.0022 (J)		
3	G05	561G005	7.5 - 8.0		0.0022 (J)		
3	G06	561G006	7.5 - 8.0		0.0018 (J)		
3	G07	561G007	7.5 - 8.0		0.0032 (J)		
6	G08	561G008	1.5 - 2.0	0.014 (J)	0.0024 (J)		
6	G09	561G009	0 - 0.5		0.0038 (J)	0.0022 (J)	0.0024 (J)
6	G10	561G010	0.5 - 1.0		0.0017 (J)		
0	G 10	561G011	0.5 - 1.0		0.0027 (J)	0.0021 (J)	0.0029 (J)
5	G11	561G012	0.5 - 1.0		0.0024 (J)		
5	G12	561G013	0 - 0.5		0.0039 (J)	0.0053	0.0044 (J)
5	G13	561G014	0 - 0.5	0.062 (J)	0.0034 (J)		

J = Estimated value

A.9.2.2 Semivolatile Organic Compounds

Analytical results for SVOCs detected in soil samples above MDCs are presented in Table A.9-3. No SVOCs were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

^{-- =} Not detected above MDCs.

Table A.9-3
Sample Results for SVOCs Detected above MDCs at CAS 23-21-04, Waste Disposal Trenches

				C	COPCs (mg/kg	1)
Trench	Sample Location	Sample Number	Depth (ft bgs)	Benzoic Acid	Bis(2-ethylhexyl)phthalate	Di-n-butyl Phthalate
	FA	Ls		2,500,000	120	62,000
3	G05	561G005	7.5 - 8.0	1.7	3.1 (J)	0.072 (J)
3	G06	561G006	7.5 - 8.0		0.14 (J)	

J = Estimated value

A.9.2.3 Total Petroleum Hydrocarbons

Analytical results for TPH-DRO detected in soil samples above MDCs are presented in Table A.9-4. Samples were analyzed for TPH-DRO for waste management purposes only as stated in the FI ROTC-1 (NNES, 2010), and are presented here for completeness of data. Preliminary action levels and FALs have not been established for TPH-DRO. The FALs are established for the individual hazardous constituents of TPH-DRO and are reported with the VOC and SVOC results. Because VOCs or SVOCs were not detected at concentrations exceeding the MDCs in any of the soil samples collected at this CAS, TPH-DRO is not considered to be a site-related contaminant.

A.9.2.4 RCRA Metals, Beryllium, and Hexavalent Chromium

Analytical results for RCRA metals, beryllium, and hexavalent chromium detected in soil samples above MDCs are presented in Table A.9-5.

Of the 39 samples collected at the waste disposal trenches, eight samples exceeded the PAL (23 mg/kg) for arsenic with concentrations ranging from 25 to 2,000 mg/kg. The FALs were

^{-- =} Not detected above MDCs.

Table A.9-4
Sample Results for TPH-DRO Detected at CAS 23-21-04, Waste Disposal Trenches

Trench	Sample Location	Sample Number	Depth (ft bgs)	TPH-DRO (mg/kg)
6	G03	561G003	0.0 - 0.5	81
3	G05	561G005	7.5 - 8.0	160
3	G06	561G006	7.5 - 8.0	270
6	G09	561G009	0.0 - 0.5	42
6	G10	561G010	0.5 - 1.0	96
	010	561G011	0.5 - 1.0	110
5	G11	561G012	0.5 - 1.0	19
5	G12	561G013	0.0 - 0.5	170

established at the PAL concentrations; therefore, arsenic is considered a COC at this CAS. One sample exceeded the PAL of 5.6 mg/kg for hexavalent chromium with a concentration of 18 mg/kg. The FAL was established at the PAL concentration; therefore hexavalent chromium is considered a COC. However, the decision was made to clean close the site and all contaminated soil was removed. Confirmation samples collected from the side and bottom of the excavation confirm the effective removal.

A.9.2.5 Polychlorinated Biphenyls

Analytical results for PCBs detected in soil samples above MDCs are presented in Table A.9-6. Aroclor 1248 was detected at one location within the trenches at a concentration exceeding the PAL of 0.74 mg/kg. The FALs were established at the corresponding PAL concentrations. The soil from the G07 location was excavated and resampled. The verification sample results (561G029, 561G030, 561G031, and 561G032) indicated that the PCB-contaminated soil had been removed from the trench.

A.9.2.6 Gamma-Emitting Radionuclides

Analytical results for gamma-emitting radionuclides detected in soil samples above MDCs are presented in Table A.9-7. No gamma-emitting radionuclides were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-82 of A-156

Table A.9-5
Sample Results for Metals Detected above MDCs at CAS 23-21-04, Waste Disposal Trenches
(Page 1 of 3)

							С	OPCs (mg/l	kg)			
Trench	Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Lead	Mercury	Selenium
	FALs			23	190,000	2,000	800	N/Aª	5.6	800	34	5,100
3	G01	561G001	0.0 - 0.5	2,000	610	1 (J-)	3.4 (J)	35	18 (J)	190 (J)	1.9	
3	GUI	561G018	1.0 - 1.5	53	190		0.38 (J-)	8.2		21 (J)	0.1	
3	G02	561G002	0.0 - 0.5	12	150	0.7	0.65 (J)	16		68 (J)		
6	G03	561G003	0.0 - 0.5	4.7	140	0.69	5.3 (J)	8.7		43 (J)		
3	G04	561G004	1.0 - 1.5	23	160	0.73	0.24 (J)	9		19 (J)	0.065	0.29
3	G05	561G005	7.5 - 8.0	18	180	0.52	1.9 (J)	9.5		23 (J)	0.051	
3	G06	561G006	7.5 - 8.0	5.2	58	0.31 (J-)	0.12 (J)	3.8		7 (J)		
3	G07	561G007	7.5 - 8.0	5.6	98	0.54	0.2 (J)	8.5		19 (J)	0.044	
6	G08	561G008	1.5 - 2.0	6.3	44		0.12 (J)	3.2		4.4 (J)		
6	G09	561G009	0.0 - 0.5	5.3	84		1 (J)	5.4	2.4 (J-)	21 (J)		
6	G10	561G010	0.5 - 1.0	4.3	95		0.31 (J)	6.1		35 (J)		
	010	561G011	0.5 - 1.0	4.5	100		0.32 (J)	6.1	0.5 (J-)	120 (J)		
5	G11	561G012	0.5 - 1.0	10	120		0.45 (J)	6.6		59 (J)	0.047	
5	G12	561G013	0.0 - 0.5	61	150		2.2 (J)	6.5		150 (J)	0.058	
3	G12	561G020	1.0 - 1.5	6	45		0.095 (J-)	2.6		8.9 (J)	0.0055 (J-)	
5	G13	561G014	0.0 - 0.5	4.3	190	0.52	0.37 (J)	7.9		31 (J)	0.045	0.47

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-83 of A-156

Table A.9-5
Sample Results for Metals Detected above MDCs at CAS 23-21-04, Waste Disposal Trenches (Page 2 of 3)

							С	OPCs (mg/	kg)			
Trench	Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Lead	Mercury	Selenium
	F	ALs		23	190,000	2,000	800	N/Aª	5.6	800	34	5,100
3	G14	561G015	0.0 - 0.5	6.2	120		0.19 (J-)	7.5		9.8 (J)	0.02 (J-)	
3	G15	561G016	0.0 - 0.5	25	110		0.35 (J-)	11		110 (J)	0.032 (J-)	
3	G16	561G017	0.0 - 0.5	41	120		0.36 (J-)	8.7		17 (J)	0.039	
5	G17	561G019	0.0 - 0.5	68	120		0.71	6.5		30 (J)	0.059	
5	G18	561G021	0.0 - 0.5	4	99		0.26 (J-)	6		17 (J)	0.022 (J-)	
5	G19	561G022	0.0 - 0.5	18	75		0.65	3.4		58 (J)	0.0086 (J-)	
3	Gia	561G023	0.0 - 0.5	23	80		0.67	4		58 (J)	0.015 (J-)	
5	G20	561G024	1.5 - 2.0	16	65		0.49 (J-)	3.3		23	0.02 (J-)	
5	G21	561G025	2.0 - 2.5	6.4	26		0.083 (J-)	2.1		3.4		
5	G22	561G026	2.5 - 3.0	7.7	110		0.15 (J-)	4.5		6.9	0.0019 (J-)	
5	G23	561G027	2.5 - 3.0	36	110		0.49 (J-)	7.5		17	0.093	
5	G24	561G028	2.0 - 2.5	7.8	51		0.077 (J-)	2.3		3.7		
5	G25	561G029	5.0 - 5.5	9.7	55		0.068 (J-)	2.9		3.7	0.0093 (J-)	
5	G26	561G030	3.0 - 3.5	9.1	31		0.11 (J-)	1.9		2.9		
5	G27	561G031	5.0 - 5.5	7.3	64		0.15 (J-)	2.9		6.2	0.0097 (J-)	
5	G28	561G032	3.0 - 3.5	7.4	53		0.075 (J-)	2.6		3.7	0.009 (J-)	

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-84 of A-156

Table A.9-5
Sample Results for Metals Detected above MDCs at CAS 23-21-04, Waste Disposal Trenches
(Page 3 of 3)

							С	OPCs (mg/l	kg)			
Trench	Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Lead	Mercury	Selenium
FALs		23	190,000	2,000	800	N/Aª	5.6	800	34	5,100		
3	G29	561G033	3.0 - 3.5	5	60		0.05 (J-)	3.1		4.6	0.014 (J-)	
3	G30	561G034	3.0 - 3.5	12	62		0.064 (J-)	3.5		6.8	0.03 (J-)	
3	G31	561G035	3.0 - 3.5	3.7	58			2.5		2.7	0.02 (J-)	
3	G32	561G036	3.0 - 3.5	120	130		0.53 (J-)	7.3		30	0.13	
3	G37	561G041	4.5 - 5.0	4.8	58 (J)		0.26 (J-)	3.6		7.7 (J)	0.012	

^aPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

Bold indicates the values exceeding the FALs.

J = Estimated value

J- = Result is an estimated quantity, but may be biased low.

^{-- =} Not detected above MDCs.

Table A.9-6 Sample Results for PCBs Detected above MDCs at CAS 23-21-04, Waste Disposal Trenches

Trench	Sample	Sample	Sample Depth COPCs (mg/kg)		
liench	Location	Number	(ft bgs)	Aroclor 1248	Aroclor 1260
	FA	Ls	0.74	0.74	
3	G05	561G005	7.5 - 8.0		0.027 (J)
3	G07	561G007	7.5 - 8.0	4.3 (J)	
5	G12	561G013	0.0 - 0.5		0.019 (J)

J = Estimated value

Bold indicates the values exceeding the FALs.

Table A.9-7
Sample Results for Gamma-Emitting Radionuclides
Detected above MDCs at CAS 23-21-04, Waste Disposal Trenches

Trench	Sample	Sample	·					
rrench	Location	Number	(ft bgs)	Ac-228	Am-241	Cs-137		
	FA	Ls		506.7 ^a 1,503 72				
3	G01	561G001	0.0 - 0.5	1.96				
6	G03	561G003	0.0 - 0.5	1.43		0.257		
3	G04	561G004	1.0 - 1.5	1.09				
3	G05	561G005	7.5 - 8.0	1				
3	G06	561G006	7.5 - 8.0			0.134		
3	G07	561G007	7.5 - 8.0		0.35 (J)	0.58		
6	G10	561G010	0.5 - 1.0	0.69		0.167		
5	G11	561G012	0.5 - 1.0	0.76	0.53 (J)	0.51		
5	G12	561G013	0.0 - 0.5	0.76		0.62		
5	G13	561G014	0.0 - 0.5	1.37				

^aFAL for Ac-228 based on Th-232 FAL.

^{-- =} Not detected above MDCs.

J = Estimated value

^{-- =} Not detected above MDCs.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-86 of A-156

A.9.3 Nature and Extent of Contamination

Based on the analytical results for soil samples collected within CAS 23-21-04, the only COCs that were identified were PCBs, arsenic, and hexavalent chromium. The PCBs were located on the east end of Trench 3, arsenic and hexavalent chromium were located on the west end of Trench 3, and arsenic was located in the middle of Trench 5. Soil from the trenches was excavated and verification samples were collected. The verification sampling indicated that the extent of contamination was within the trenches and immediately outside the trench walls, and that the excavating of the soil was successful in removing all the contaminated soil.

A.9.4 Revised Conceptual Site Model

The CAIP requirements (NNSA/NSO, 2008) were met at this CAS, and no revisions were necessary to the CSM.

A.10.0 CAS 25-08-02, Waste Dump

Corrective Action Site 25-08-02 is located north of G Road between the RCP and R-MAD complex in Area 25 of the NNSS, and consists of a large waste dump. The waste dump consists of piles of dirt, rock, and construction debris, such as concrete, metal, rebar, wood, batteries, 5-gal buckets, an empty cable spool, rusted cans, and pipes. One pile appeared to be composed of dark gray concrete-like material.

A.10.1 Corrective Action Investigation

A total of 26 characterization samples (including two FDs) were collected during investigation activities at CAS 25-08-02 (Figure A.10-1). The sample IDs, locations, types, and analyses are listed in Table A.10-1. The specific CAI activities conducted to satisfy the CAIP requirements at this CAS (NNSA/NSO, 2008) are described in the following sections.

A.10.1.1 Radiological Surveys

A gamma radiological walkover survey was performed in 2006. No areas of elevated radioactivity were identified because measured levels from this CAS area were not distinguishable from background levels.

A.10.1.2 Visual Inspections

The waste piles at this CAS were inspected for any stained soil or biasing factors. A dark gray concrete-like material was observed on the southern end of the waste dump at location H03 (Figure A.10-2). A pile of batteries and debris was also observed at location H08 (Figure A.10-3). Two outlier piles were observed on the north (location H16) and south end (location H01) of the main waste dump. Samples were collected from these biased locations. Numerous piles were observed that contained asphalt, concrete, rebar and other construction-like material.

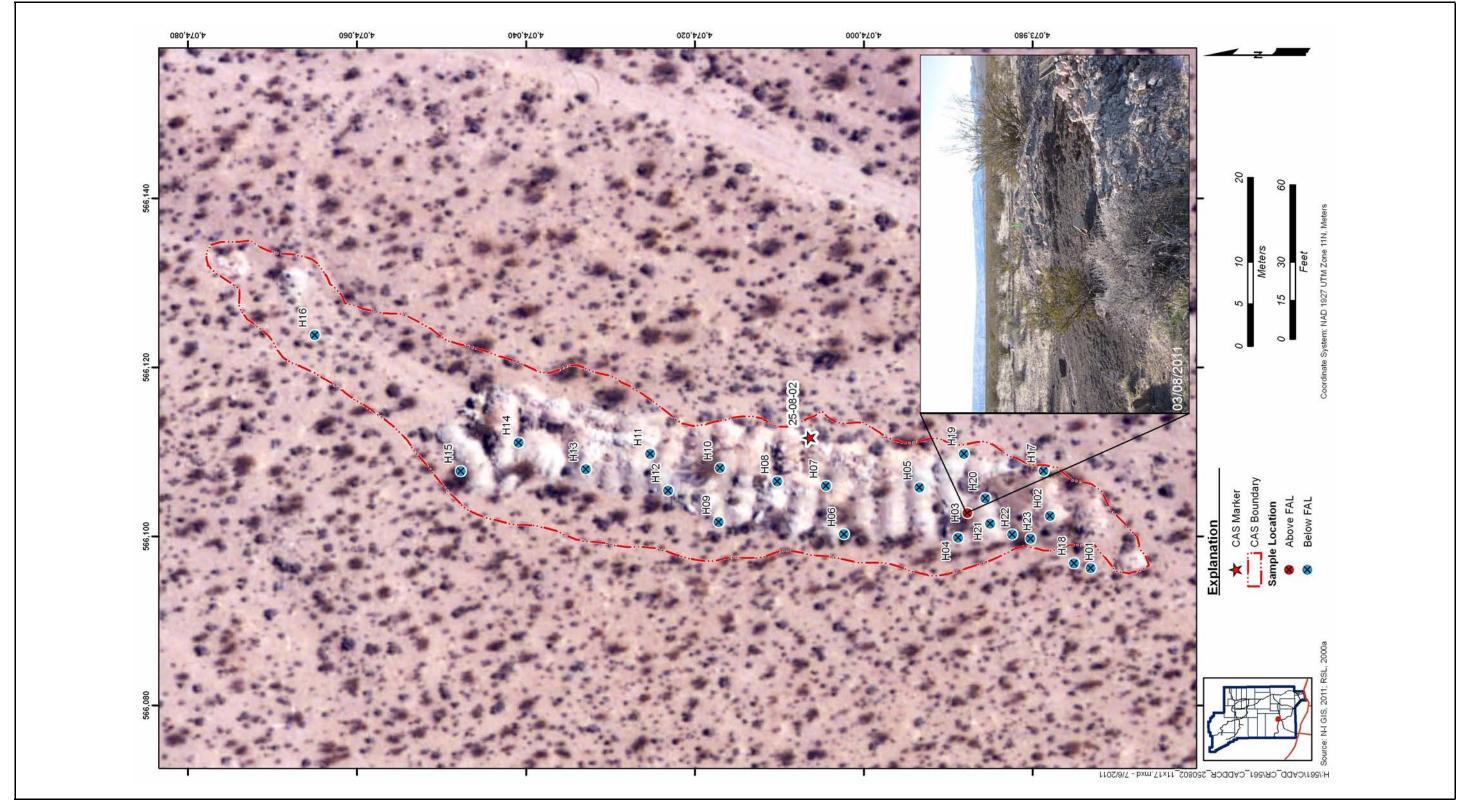


Figure A.10-1 Sample Locations at CAS 25-08-02, Waste Dump

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-89 of A-156

Table A.10-1 Samples Collected at CAS 25-08-02, Waste Dump (Page 1 of 2)

Sample Location	Sample Number	Depth (ft into pile)	Matrix	Purpose	Beryllium	TPH-DRO	Gamma	Hexavalent Chromium	Metals	PCBs	SVOCs	TCLP Metals	VOCs
H01	561H002	0.0 - 0.5	Soil	Environmental	Х	Х	Χ	Х	Х	Х	Χ		Х
H02	561H003	1.0 - 1.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
	561H001	0.0 - 0.5	Soil	Environmental	Х	Х	Χ	Х	Х	Х	Х		Х
H03	561H021	1.5 - 2.0	Soil	Environmental					Х				
	561H501	0.0 - 0.5	Soil	Waste Management								Х	
H04	561H005	2.0 - 2.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
H05	561H006	4.0 - 4.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
H06	561H004	1.0 - 1.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Χ
H07	561H009	2.0 - 2.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Χ
H08	561H017	0.0 - 1.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Χ
H09	561H011	2.0 - 2.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
H10	561H012	2.5 - 3.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
H11	561H007	0.0 - 0.5	Soil	Environmental	Х	Х	Χ	Х	Х	Х	Х		Х
1111	561H008	0.0 - 0.5	Soil	FD of #561H007	Х	Х	Х	Х	Х	Х	Х		Х
H12	561H013	2.5 - 3.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
H13	561H014	3.0 - 3.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
H14	561H015	2.5 - 3.0	Soil	Environmental	Х	Х	Χ	Х	Х	Х	Х		Х
1114	561H502	0.0 - 0.5	Soil	Waste Management								Х	
H15	561H016	2.0 - 2.5	Soil	Environmental	Х	Х	Χ	Х	Х	Х	Х		Х
H16	561H010	1.0 - 1.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
H17	561H018	0.0 - 0.5 ft bgs	Soil	Environmental					Х				
H18	561H019	0.0 - 0.5 ft bgs	Soil	Environmental					Х				
H19	561H020	0.0 - 0.5 ft bgs	Soil	Environmental					Х				
H20	561H022	0.0 - 0.5 ft bgs	Soil	Environmental					Х				
1120	561H023	0.0 - 0.5 ft bgs	Soil	FD of #561H022					Х				
H21	561H024	0.0 - 0.5 ft bgs	Soil	Environmental					Х				

Table A.10-1 Samples Collected at CAS 25-08-02, Waste Dump (Page 2 of 2)

Sample Location	Sample Number	Depth (ft into pile)	Matrix	Purpose		TPH-DRO	Gamma	Hexavalent Chromium	Metals	PCBs	SVOCS	TCLP Metals	VOCs
H22	561H025	0.0 - 0.5 ft bgs	Soil	Environmental					Х				
H23	561H026	0.0 - 0.5 ft bgs	Soil	Environmental					Х				
N/A	561H301	N/A	Water	Trip Blank									Х
N/A	561H302	N/A	Water	Trip Blank									Х
N/A	561H303	N/A	Water	Trip Blank									Х
N/A	561H304	N/A	Water	Trip Blank									Х
N/A	561H305	N/A	Water	Trip Blank									Х
N/A	561H306	N/A	Water	Field Blank	Х	Χ	Х	Х	Х	Х	Х		Х
N/A	561H307	N/A	Water	Equipment Rinsate	Χ	Χ	Χ	Χ	Х	Х	Х		Х

^{-- =} Not required

A.10.1.3 Sample Collection

Twenty-six judgmental and probabilistic environmental samples were collected from the 23 locations (location H01 through H23) shown in Figure A.10-1. Decision I environmental sampling activities included the collection of biased surface samples at the two outlier piles (locations H01 and H16), the concrete-like material (location H03), and at the pile which contained batteries and debris (location H08). Decision I sampling activities also included collecting samples from piles which were identified using the VSP software (PNNL, 2005).

Soil samples were collected from a decontaminated backhoe bucket at depths ranging from 0 to 4.5 ft within the piles. Some samples within piles were collected by excavating into the pile with a shovel, then collecting the sample using disposable scoops and pans. Several locations were sampled at the NSI (locations H01, H05, H07, and H10), while the other locations were sampled within the piles.



Figure A.10-2 Concrete-like Pile at CAS 25-08-02, Waste Dump



Figure A.10-3
Batteries and Debris at CAS 25-08-02, Waste Dump

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-92 of A-156

The Decision I analytical results showed that the concentration of arsenic in one sample 561H001 from location H03 (collected within the concrete-like material) exceeded the PAL and it was determined that Decision II sampling was necessary. Four Decision II environmental samples were collected to define the extent of contamination. One sample (561H021) was collected from 1.5 to 2 ft bgs within the concrete-like material pile. Three additional sample locations (H17 through H19) were selected at distances ranging from approximately 20 to 50 ft laterally in three directions from location H03. The concrete-like material was removed and disposed of, and verification samples were collected at four locations (H20 through H23) under the pile.

Waste characterization samples were collected from locations H03 and H14. At location H03, samples were collected from the concrete-like material because of arsenic concentrations that exceeded the action levels, while at location H14, samples were collected from the waste pile due to mercury concentrations that exceeded the action levels. Both samples were analyzed for TCLP metals.

A.10.1.4 Deviations

There were no deviations to the CAIP (NNSA/NSO, 2008) associated with CAS 25-08-02. Investigation samples were collected as outlined in the CAIP and submitted for laboratory analysis.

A.10.2 Investigation Results

The following sections provide analytical results from the samples collected to complete investigation activities as outlined in the CAIP (NNSA/NSO, 2008). Investigation samples were analyzed for the CAIP-specified COPCs, which included VOCs, SVOCs, TPH-DRO (waste management purposes only), RCRA metals, hexavalent chromium, beryllium, PCBs, and gamma-emitting radionuclides. The analytical parameters and laboratory methods used to analyze the investigation samples are listed in Table A.2-2. Table A.10-1 lists the sample-specific analytical suite for CAS 25-08-02.

Analytical results from the soil samples with concentrations exceeding MDCs are summarized in the following sections. An evaluation was conducted on all contaminants detected above MDCs by

comparing individual concentration or activity results against the FALs. Establishment of the FALs is presented in Appendix C.

A.10.2.1 Volatile Organic Compounds

Analytical results for VOCs detected in soil samples above MDCs are presented in Table A.10-2. No VOCs were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

Table A.10-2
Sample Results for VOCs Detected above MDCs at CAS 25-08-02, Waste Dump

Sample	Sample	Depth	COPCs (mg/kg)					
Location	Number	(ft into pile)	2-Butanone	Acetone				
	FALs		200,000	630,000				
H03	561H001	0.0 - 0.5	-	0.0086 (J)				
H11	561H007	0.0 - 0.5	0.017 (J)	0.051 (J)				
1111	561H008	0.0 - 0.5	0.019 (J)	0.072 (J)				

J = Estimated value

A.10.2.2 Semivolatile Organic Compounds

Analytical results for SVOCs detected in soil samples above MDCs are presented in Table A.10-3. No SVOCs were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

Table A.10-3
Samples Results for SVOCs Detected above MDCs at CAS 25-08-02, Waste Dump

Sample	Sample	Depth	COPC	s (mg/kg)	
Location	ocation Number (ft into		Bis(2-ethylhexyl)phthalate	Phenanthrene	Pyrene
	FALs		120	170,000	17,000
H08	561H017	0 - 1.0	0.29 (J)		0.088 (J)
H11	561H007	0 - 0.5	0.4 (J)	0.41 (J)	
1111	561H008	0 - 0.5		0.51 (J)	

J = Estimated value

^{-- =} Not detected above MDCs.

^{-- =} Not detected above MDCs.

A.10.2.3 Total Petroleum Hydrocarbons

Analytical results for TPH-DRO detected in soil samples above MDCs are presented in Table A.10-4. Samples were analyzed for TPH-DRO for waste management purposes only as stated in the FI ROTC-1 (NNES, 2010), and are presented here for completeness of data. Preliminary action levels and FALs have not been established for TPH-DRO. The FALs are established for the individual hazardous constituents of TPH-DRO and are reported with the VOC and SVOC results. Because VOCs or SVOCs were not detected at concentrations exceeding the MDCs in any of the soil samples collected at this CAS, TPH-DRO is not considered to be a site-related contaminant.

Table A.10-4
Sample Results for TPH-DRO Detected at CAS 25-08-02, Waste Dump

Sample Location	Sample Number	Depth (ft into pile)	TPH-DRO (mg/kg)
H02	561H003	1.0 - 1.5	8.3
H08	561H017	0.0 - 1.0	96
H11	561H007	0.0 - 0.5	770 (J)
	561H008	0.0 - 0.5	920 (J)
H14	561H015	2.5 - 3.0	11
H15	561H016	2.0 - 2.5	8.6

J = Estimated value

A.10.2.4 RCRA Metals, Beryllium, and Hexavalent Chromium

Analytical results for RCRA metals, beryllium, and hexavalent chromium detected in soil samples above MDCs are presented in Table A.10-5. Of the 17 Decision I samples collected at the waste dump piles, one sample collected at location H03 (within the concrete-like material pile) exceeded the PAL (23 mg/kg) for arsenic with a concentration of 510 mg/kg. The FALs were established at the PAL concentrations; therefore, arsenic is considered a COC at this CAS. During Decision II sampling, a second sample (561H021) was collected within the concrete-like pile; the arsenic concentration in this sample was 60 mg/kg, which also exceeded the FAL.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-95 of A-156

Table A.10-5
Sample Results for Metals Detected above MDCs at CAS 25-08-02, Waste Dump
(Page 1 of 2)

						C	OPCs (mg/k	(g)			
Sample Location	Sample Number	Depth (ft into pile)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Lead	Mercury	Selenium
	FALs		23	190,000	2,000	800	N/Aª	5.6	800	34	5,100
H01	561H002	0.0 - 0.5	2.6	120 (J)		0.049	4.3		7	0.0095 (J-)	
H02	561H003	1.0 - 1.5	2.5	110 (J)		0.19	4.8		8.7	0.2	
H03	561H001	0.0 - 0.5	510	190 (J)		1.6	7.5		320	0.79	
поз	561H021	1.5 - 2.0	60	120		0.15 (J-)	3.5		23	0.033 (J-)	
H04	561H005	2.0 - 2.5	3	110 (J)		0.076	5.6		7.2	0.014 (J-)	
H05	561H006	4.0 - 4.5	1.8	120 (J)		0.075	4.4		6.3	0.013 (J-)	
H06	561H004	1.0 - 1.5	3.2	120 (J)		0.095	6.2	0.16 (J-)	9.5	0.015 (J-)	
H07	561H009	2.0 - 2.5	2.3	120 (J)		0.12	4.5		7.2	0.024 (J-)	
H08	561H017	0.0 - 1.0	2.7	100 (J)		3.3	7.7		21	0.034	0.6
H09	561H011	2.0 - 2.5	2.1	89 (J)		0.048	3.9		4.9	0.0095 (J-)	
H10	561H012	2.5 - 3.0	1.8	110 (J)		0.05	4.9		6.1	0.0083 (J-)	
H11	561H007	0.0 - 0.5	4.1	210 (J)	0.55	0.28	5.7		16	0.025 (J-)	0.48
1111	561H008	0.0 - 0.5	4	380 (J)	0.52	0.22	5.6		9.8	0.015 (J-)	0.78
H12	561H013	2.5 - 3.0	2	100 (J)		0.082	3.8		5.9	0.011 (J-)	
H13	561H014	3.0 - 3.5	2.6	95 (J)		0.069	5.8	0.28 (J-)	5.2	0.017 (J-)	
H14	561H015	2.5 - 3.0	2.9	120 (J)		1.3	10		20	20	

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-96 of A-156

Table A.10-5
Sample Results for Metals Detected above MDCs at CAS 25-08-02, Waste Dump
(Page 2 of 2)

						C	OPCs (mg/k	g)			
Sample Location	Sample Number	Depth (ft into pile)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Lead	Mercury	Selenium
	FALs		23	190,000	2,000	800	N/Aª	5.6	800	34	5,100
H15	561H016	2.0 - 2.5	2.2	110 (J)		0.098	4.7		6.8	0.0086 (J-)	
H16	561H010	1.0 - 1.5	2.9	100 (J)		0.073	5.5		7.2	0.012 (J-)	
H17	561H018	0.0 - 0.5 ft bgs	1.4	71		0.062 (J-)	2.9		4.9	0.014 (J-)	
H18	561H019	0.0 - 0.5 ft bgs	2.2	88		0.046 (J-)	3.6		6.4	0.01 (J-)	
H19	561H020	0.0 - 0.5 ft bgs	2.2	92		0.069 (J-)	3.6		6.2	0.015 (J-)	
H20	561H022	0.0 - 0.5 ft bgs	1.9	93		0.06	3.7		9.1 (J)		
1120	561H023	0.0 - 0.5 ft bgs	1.7	74		0.055	4.6		5.5 (J)		
H21	561H024	0.0 - 0.5 ft bgs	2.3	83		0.069	3.8		5.3 (J)		
H22	561H025	0.0 - 0.5 ft bgs	4.2	140	-	0.071	5.2	1	9.4 (J)		
H23	561H026	0.0 - 0.5 ft bgs	3	99		0.067	4.5	-	5.8 (J)		

^aPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

Bold indicates the values exceeding the FALs.

J = Estimated value

J- = Result is an estimated quantity, but may be biased low.

^{-- =} Not detected above MDCs.

A.10.2.5 Polychlorinated Biphenyls

Analytical results for PCBs detected in soil samples above MDCs are presented in Table A.10-6. No PCBs were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

Table A.10-6
Samples Results for PCBs Detected above MDC at CAS 25-08-02, Waste Dump

Sample	Sample	Depth	COPC (mg/kg)
Location	Number	(ft into pile)	Aroclor 1260
	FAL		0.74
H02	561H003	1.0 - 1.5	0.015 (J)
H04	561H005	2.0 - 2.5	0.02 (J)
H08	561H017	0.0 - 1.0	0.011 (J)
H14	561H015	2.5 - 3.0	0.12

J = Estimated value

A.10.2.6 Gamma-Emitting Radionuclides

Analytical results for gamma-emitting radionuclides detected in soil samples above MDCs are presented in Table A.10-7. No gamma-emitting radionuclides were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

A.10.3 Nature and Extent of Contamination

Based on the analytical results for soil samples collected within CAS 25-08-02, the only COC that was identified is the arsenic located within the pile of the concrete-like material. Verification samples were collected once the concrete-like material was removed and the lateral and vertical extent of contamination was defined by the Decision II samples with results less than the FAL. The environmental sample results showed that the contamination in the concrete-like pile has not been released to the underlying soil. As shown by samples collected from other waste piles, the arsenic was limited to the concrete-like material. No other COCs were identified at this CAS.

Table A.10-7
Sample Results for Gamma-Emitting Radionuclides
Detected above MDCs at CAS 25-08-02, Waste Dump

Sample	Sample	Depth	COPCs	(pCi/g)
Location	Number	(ft into pile)	Ac-228	Cs-137
	FALs	•	506.7ª	72.9
H01	561H002	0.0- 0.5	1.8	
H02	561H003	1.0 - 1.5	2	
H03	561H001	0.0- 0.5	0.67	0.259
H04	561H005	2.0 - 2.5	1.61	
H05	561H006	4.0 - 4.5	2.06	
H06	561H004	1.0 - 1.5	1.54	
H07	561H009	2.0 - 2.5	1.7	
H08	561H017	0.0 - 1.0	1.88	
H09	561H011	2.0 - 2.5	1.82	
H10	561H012	2.5 - 3.0	1.78	
1144	561H007	0.0- 0.5	1.69	
H11	561H008	0.0- 0.5	1.71	
H12	561H013	2.5 - 3.0	1.78	
H13	561H014	3.0 - 3.5	1.5	
H14	561H015	2.5 - 3.0	1.72	
H15	561H016	2.0 - 2.5	1.46	
H16	561H010	1.0 - 1.5	1.94	

^aFAL for Ac-228 based on Th-232 FAL.

A.10.4 Revised Conceptual Site Model

The CAIP requirements (NNSA/NSO, 2008) were met at this CAS, and no revisions were necessary to the CSM.

^{-- =} Not detected above MDCs.

A.11.0 CAS 25-23-21, Radioactive Waste Dump

Corrective Action Site 25-23-21 consists of a radioactive waste dump located northeast of the E-MAD Facility in Area 25 of the NNSS within Topopah Wash. A second parcel is upstream from the waste dump and is located within Topopah Wash extending north of H Road. Figure A.11-1 shows the location of the two parcels in relation to each other and surrounding roads. The main waste dump contains numerous dirt mounds and piles within a posted "Controlled Area," along with miscellaneous piles extending up through Topopah Wash to H Road. Within the main waste dump, there are two specific piles that are posted with "Caution Radioactive Material" signs. The signs referred to the pieces of cast-iron pipe located within the soil piles. The second parcel contains waste piles, along with concrete, asphalt, and magnetite piles.

A.11.1 Corrective Action Investigation

A total of 56 characterization samples (including 4 FDs) were collected during investigation activities at CAS 25-23-21. Figure A.11-2 shows the sample locations at the main waste dump and Figure A.11-3 shows sample locations at the second parcel. The sample IDs, locations, types, and analyses are listed in Table A.11-1. The specific CAI activities conducted to satisfy the CAIP requirements at this CAS (NNSA/NSO, 2008) are described in the following sections.

A.11.1.1 Field Screening

Investigation samples were field screened for alpha and beta/gamma radiation. Sample locations I30, I32, and I33 were selected based on the radiological field screening. Beta/gamma FSRs exceeded the FSLs at these sample locations.

A.11.1.2 Radiological Surveys

A gamma radiological walkover survey was performed in 2005 at the waste dump. The results of the survey identified an area (outside the posted RMA) of radioactivity from 2 to 5 times higher than background. This area was not found during the field activities in 2010.

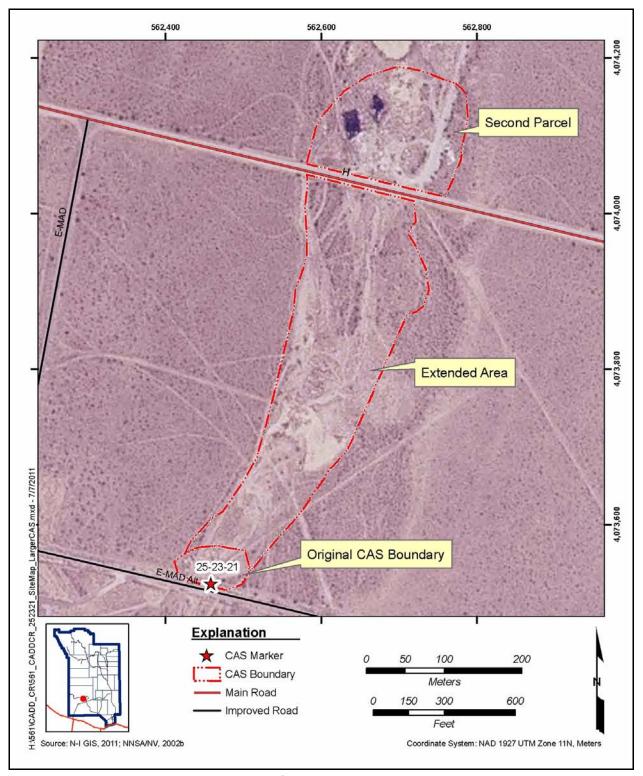


Figure A.11-1 Location of CAS 25-23-21, Radioactive Waste Dump

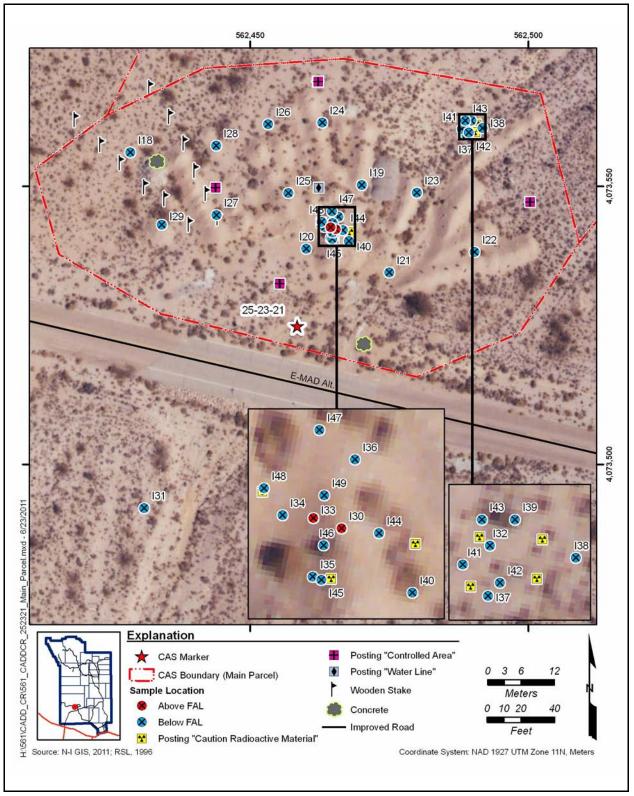


Figure A.11-2
Sample Locations at the Waste Dump CAS 25-23-21, Radioactive Waste Dump

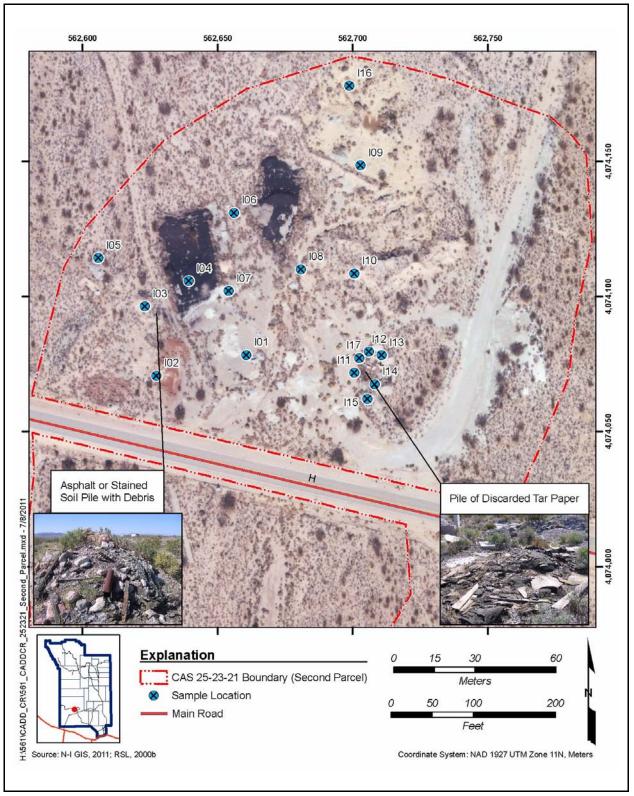


Figure A.11-3
Sample Locations at the Second Parcel CAS 25-23-21, Radioactive Waste Dump

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-103 of A-156

Table A.11-1 Samples Collected at CAS 25-23-21, Radioactive Waste Dump (Page 1 of 3)

Area	Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Beryllium	TPH-DRO	Gamma	Hexavalent Chromium	Metals	PCBs	SVOCs	VOCs
Second Parcel	I01	5611012	0.0 - 1.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	102	5611011	0.0 - 1.0 ft into pile	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	103	5611009	0.0 - 0.5 ft into pile	Soil	Environmental	Х	Х	Х	Х	Χ	Х	Х	Х
Second Farcer	103	5611010	0.0 - 0.5 ft into pile	Soil	FD of #561I009	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	104	5611007	0.0 - 0.5 ft into pile	Solid	PSM	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	105	5611008	1.0 - 1.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	106	5611005	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	107	5611006	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	108	5611004	2.5 - 3.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	109	5611002	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	l10	5611001	5.0 - 6.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	l11	5611017	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	l12	5611016	1.0 - 2.0 ft into pile	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	l13	5611015	2.0 - 2.5 ft into pile	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	l14	5611014	2.0 - 3.0 ft into pile	Soil	Environmental	Х	Х	Χ	Х	Х	Х	Х	Х
Second Parcel	l15	5611013	2.0 - 3.0 ft into pile	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	I16	5611003	1.0 - 1.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Second Parcel	l17	5611018	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Waste Dump	l18	5611019	2.5 - 3.0 ft into pile	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Waste Dump	l19	5611027	2.5 - 3.0 ft into pile	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Waste Dump	120	5611029	2.5 - 3.0 ft into pile	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Waste Dump	l21	5611031	2.5 - 3.0 ft into pile	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Waste Dump	122	5611032	3.0 - 3.5 ft into pile	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Waste Dump	123	5611028	2.5 - 3.0 ft into pile	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Waste Dump	124	5611022	1.5 - 2.0 ft into pile	Soil	Environmental	Х	Х	Χ	Х	Х	Х	Х	Х
Waste Dump	125	5611026	1.5 - 2.0 ft into pile	Soil	Environmental	Х	Х	Χ	Х	Х	Х	Х	Х
Waste Dump	126	5611021	2.5 - 3.0 ft into pile	Soil	Environmental	Х	Х	Х	Х	Χ	Х	Х	Х
Waste Dump	127	5611025	2.0 - 2.5 ft into pile	Soil	Environmental	Х	Х	Χ	Х	Х	Х	Χ	Х
Waste Dump	128	5611020	2.5 - 3.0 ft into pile	Soil	Environmental	Х	Х	Χ	Х	Х	Х	Х	Х
Waste Dump	129	5611023	3.0 - 3.5 ft into pile	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-104 of A-156

Table A.11-1 Samples Collected at CAS 25-23-21, Radioactive Waste Dump (Page 2 of 3)

Area	Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Beryllium	TPH-DRO	Gamma	Hexavalent Chromium	Metals	PCBs	SVOCs	VOCs
		5611033	0.0 - 0.5 ft into pile	Soil	Environmental	Х	Х	Х	Х	Χ	Х	Х	Χ
Waste Dump	130	5611034	0.0 - 0.5 ft into pile	Soil	FD of #561I033	Х	Х	Х	Х	Х	Х	Х	Х
		5611040	1.0 - 1.5 ft into pile	Soil	Environmental			Х			Х		
Waste Dump	l31	5611024	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Χ
Waste Dump	132	5611030	0.0 - 0.5 ft into pile	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Χ
Waste Dump	132	5611045	1.0 - 1.5 ft into pile	Soil	Environmental			Х					
Waste Dump	133	5611035	0.0 - 0.5 ft into pile	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х	Х
Waste Dump	133	5611041	1.0 - 1.5 ft into pile	Soil	Environmental			Х			Х		
Waste Dump	134	5611036	0.0 - 0.5	Soil	Environmental			Х			Х		
waste Dump	134	5611037	0.0 - 0.5	Soil	FD of #561I036			Х			Х		
Waste Dump	135	5611038	0.0 - 0.5	Soil	Environmental			Х			Х		
Waste Dump	136	5611039	0.0 - 0.5	Soil	Environmental			Х			Х		
Waste Dump	137	5611042	0.0 - 0.5	Soil	Environmental			Х					
Waste Dump	138	5611043	0.0 - 0.5	Soil	Environmental			Х					
Waste Dump	139	5611044	0.0 - 0.5	Soil	Environmental			Х					
Waste Dump	140	5611046	0.0 - 0.5	Soil	Environmental			Х			Х		
Waste Dump	l41	5611047	0.0 - 0.5	Soil	Environmental			Х					
Waste Dump	142	5611048	0.0 - 0.5	Soil	Environmental			Х					
Waste Dump	142	5611049	0.0 - 0.5	Soil	FD of #561I048			Х					
Waste Dump	143	5611050	0.0 - 0.5	Soil	Environmental			Х					
Waste Dump	144	5611051	0.5 - 1.0	Soil	Environmental			Х			Х		
Waste Dump	145	5611052	0.5 - 1.0	Soil	Environmental			Х			Х		
Waste Dump	146	5611053	1.0 - 1.3	Soil	Environmental			Х			Х		
Waste Dump	147	5611054	0.5 - 1.0	Soil	Environmental			Х					
Waste Dump	148	5611055	0.5 - 1.0	Soil	Environmental			Х					
Waste Dump	149	5611056	1.0 - 1.3	Soil	Environmental			Х					
N/A	N/A	5611301	N/A	Water	Trip Blank								Х
N/A	N/A	5611302	N/A	Water	Trip Blank								Х
N/A	N/A	5611303	N/A	Water	Trip Blank								Х
N/A	N/A	5611304	N/A	Water	Trip Blank								Х

Table A.11-1
Samples Collected at CAS 25-23-21, Radioactive Waste Dump
(Page 3 of 3)

Area	Sample Location	Sample Number	Depth (ft bgs)	Matrix	Purpose	Beryllium	TPH-DRO	Gamma	Hexavalent Chromium	Metals	PCBs	SVOCs	VOCs
N/A	N/A	5611305	N/A	Water	Trip Blank								Х
N/A	N/A	5611306	N/A	Water	Trip Blank								Х
N/A	N/A	5611307	N/A	Water	Trip Blank								Х
N/A	N/A	5611308	N/A	Water	Trip Blank								Х
N/A	N/A	5611309	N/A	Water	Equipment Rinsate	Х	Х	Х	Х	Χ	Х	Х	Х
N/A	N/A	5611310	N/A	Water	Field Blank	Χ	Χ	Χ	Х	Χ	Х	Х	Х

^{-- =} Not required

In 2008, partially buried pipes were observed inside the two posted RMAs (Figure A.11-4). The pipes exhibited surface contamination readings above background. No other radiological surveys were conducted.



Figure A.11-4
Contaminated Pipe Waste Dump CAS 25-23-21, Radioactive Waste Dump

A.11.1.3 Geophysical Surveys

Geophysical surveys were performed at the waste dump but did not identify buried metallic debris. No geophysical surveys were performed at the second parcel.

A.11.1.4 Visual Inspections

The piles at both the main waste dump and at the second parcel were inspected for any stained soil or biasing factors. Of the 17 samples collected at the main waste dump, 5 biased samples were collected. Biasing factors included the area downgradient in the wash from the main waste dump (sample 5611024), and the two RMAs (samples 5611030, 5611033 through 5611035). Of the 18 samples collected at the second parcel, 6 biased samples were collected. Biasing factors included cement wash-out area (sample 5611003), areas where paint cans had been discovered (sample 5611006), black staining on a soil pile (samples 5611009 and 5611010), tar paper (5611017), and a pile of asphalt (5611018) (Figure A.11-5).



Figure A.11-5
Biased Sample Location at Second Parcel CAS 25-23-21, Radioactive Waste Dump

A.11.1.5 Sample Collection

A total of 56 environmental samples were collected from 49 locations (location I01 through I49) during Decision I and Decision II sampling activities (Figures A.11-2 and A.11-3). Decision I environmental sampling activities included the collection of biased and probabilistic soil samples at the main waste dump and at the second parcel. Probabilistic sample locations were identified using the VSP software (PNNL, 2005).

Waste Dump

Seventeen Decision I samples were collected from the main waste dump. Decision I soil samples (561I019 through 561I023, and 561I0025 through 561I035) were collected at depths ranging from 0 to 3.5 ft within the piles. One surface soil sample was collected from 0 to 0.5 ft bgs downgradient of the waste dump.

Decision I results showed that two piles in the main waste dump were contaminated with PCBs and Cs-137 (locations I30, I32, and I33). At the southern RMA, seven Decision II soil samples (561I036 through 561I041 and 561I046) were collected to define the extent of the PCB and Cs-137 contamination. Four additional sample locations (I34 through I36 and I) were selected at distances ranging from approximately 2.5 to 10 ft laterally in three directions from locations I30 and I33; surface soil samples (0 to 0.5 ft bgs) were collected. The soil pile was removed and disposed of, and verification samples (561I051 through 561I056) were collected at six locations (I44 through I49) at depths ranging from 0.5 to 1.5 ft bgs.

Cesium-137 concentrations below the PAL were identified at the northern RMA at location I32, which was below the contaminated pipe. Four additional soil samples (561I042 through 561I045) were collected from the pile to verify that no contamination from the pipe had migrated into the soil. Three additional sample locations (I37 through I39) were selected at distances ranging from approximately 2 to 8 ft laterally in three directions from location I32; surface soil samples (0 to 0.5 ft bgs) were collected. The soil pile was removed and disposed of, and verification samples (561I047 through 561I050) were collected at three locations from 0 to 0.5 ft bgs.

CAU 561 CADD/CR Appendix A

Revision: 0 Date: August 2011

Page A-108 of A-156

Second Parcel

Eighteen Decision I samples (561I001 through 561I018) were collected from the second parcel. Seven Decision I samples were collected from 0 to 3 ft within the piles, while the remaining samples were collected either from the surface (0 to 0.5 ft bgs) or from the shallow subsurface at depths ranging from 1 to 6 ft bgs. Surface samples were collected using hand sampling techniques with disposable scoops, while the shallow subsurface samples were collected from a decontaminated backhoe bucket. Decision II samples were not collected from the second parcel because no COCs were identified during the characterization activities.

No waste characterization samples were collected from either the waste dump or second parcel at this CAS.

A.11.1.6 Deviations

There were no deviations to the CAIP (NNSA/NSO, 2008) associated with CAS 25-23-21. Investigation samples were collected as outlined in the CAIP and submitted for laboratory analysis.

A.11.2 Investigation Results

The following sections provide analytical results from the samples collected to complete investigation activities as outlined in the CAIP (NNSA/NSO, 2008). Investigation samples were analyzed for the CAIP-specified COPCs, which included VOCs, SVOCs, TPH-DRO (waste management purposes only) RCRA metals, hexavalent chromium, beryllium, PCBs, and gamma-emitting radionuclides. The analytical parameters and laboratory methods used to analyze the investigation samples are listed in Table A.2-2. Table A.11-1 lists the sample-specific analytical suite for CAS 25-23-21.

Analytical results from the soil samples with concentrations exceeding MDCs are summarized in the following sections. An evaluation was conducted on all contaminants detected above MDCs by comparing individual concentration or activity results against the FALs. Establishment of the FALs is presented in Appendix C.

A.11.2.1 Volatile Organic Compounds

Analytical results for VOCs detected in soil samples above MDCs are presented in Table A.11-2. No VOCs were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

Table A.11-2
Sample Results for VOCs Detected above MDC at CAS 25-23-21, Radioactive Waste Dump

Araa	Sample	Sample	Depth	COPC (mg/kg)
Area	Location	Number	(ft bgs)	Methylene Chloride
		FAL		53
Second Parcel	l01	5611012	0.0 - 1.0	0.011
Second Parcel	102	5611011	0.0 - 1.0	0.0089
Second Parcel	103	5611009	0.0 - 0.5 ft into pile	0.013
Second Parcel	103	5611010	0.0 - 0.5 ft into pile	0.011
Second Parcel	105	5611008	1.0 - 1.5	0.0089
Second Parcel	106	5611005	0.0 - 0.5	0.0089
Second Parcel	107	5611006	0.0 - 0.5	0.012
Second Parcel	108	5611004	2.5 - 3.0	0.008
Second Parcel	109	5611002	0.0 - 0.5	0.012
Second Parcel	l10	5611001	5.0 - 6.0	0.0075
Second Parcel	l12	5611016	1.0 - 2.0 ft into pile	0.011
Second Parcel	l13	5611015	2.0 - 2.5 ft into pile	0.01
Second Parcel	l14	5611014	2.0 - 3.0 ft into pile	0.0095
Second Parcel	l15	5611013	2.0 - 3.0 ft into pile	0.0096
Second Parcel	l16	5611003	1.0 - 1.5	0.0079
Second Parcel	l17	5611018	0.0 - 0.5	0.0022 (J)

J = Estimated value

A.11.2.2 Semivolatile Organic Compounds

Analytical results for SVOCs detected in soil samples above MDCs are presented in Table A.11-3. No SVOCs were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-110 of A-156

Table A.11-3
Sample Results for SVOCs Detected above MDCs at CAS 25-23-21, Radioactive Waste Dump

									COPCs	(mg/kg)					
Area	Sample Location	Sample Number	Depth (ft bgs)	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Chrysene	Di-n-butyl Phthalate	Fluoranthene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene
	FALs	3		2.1	0.21	2.1	17,000	21	120	210	62,000	22,000	2.1	170,000	17,000
Waste Dump	130	5611033	0.0 - 0.5	0.2 (J)	0.15 (J)	0.44	0.19 (J)	0.13 (J)	0.22 (J)	0.3 (J)	0.17 (J)	0.88	0.17 (J)	0.78	0.93
vvasie bump	130	5611034	0.0 - 0.5	0.19 (J)	0.17 (J)	0.44	0.18 (J)	0.15 (J)	0.33 (J)	0.29 (J)	0.17 (J)	0.88	0.18 (J)	0.85	0.93
Waste Dump	133	5611035	0.0 - 0.5								0.14 (J)				

J = Estimated value

^{-- =} Not detected above MDCs.

A.11.2.3 Total Petroleum Hydrocarbons

Analytical results for TPH-DRO detected in soil samples above MDCs are presented in Table A.11-4. Samples were analyzed for TPH-DRO for waste management purposes only as stated in the FI ROTC-1 (NNES, 2010), and are presented here for completeness of data. Preliminary action levels and FALs have not been established for TPH-DRO. The FALs are established for the individual hazardous constituents of TPH-DRO and are reported with the VOC and SVOC results. Because VOCs or SVOCs were not detected at concentrations exceeding the MDCs in any of the soil samples collected at this CAS, TPH-DRO is not considered to be a site-related contaminant.

Table A.11-4
Sample Results for TPH-DRO Detected at CAS 25-23-21, Radioactive Waste Dump

Area	Sample Location	Sample Number	Depth (ft bgs)	TPH-DRO (mg/kg)
Second Parcel	102	5611011	0.0 - 1.0 ft into pile	1.8 (J)
Second Parcel	106	5611005	0.0 - 0.5	18
Second Parcel	107	5611006	0.0 - 0.5	2.3 (J)
Second Parcel	108	5611004	2.5 - 3.0	6.8
Second Parcel	109	5611002	0.0 - 0.5	1.6 (J)
Second Parcel	I10	5611001	5.0 - 6.0	1.4 (J)
Second Parcel	I11	5611017	0.0 - 0.5	35 (J)
Second Parcel	l12	5611016	1.0 - 2.0 ft into pile	5.3
Second Parcel	l13	5611015	2.0 - 2.5 ft into pile	73
Second Parcel	l14	5611014	2.0 - 3.0 ft into pile	4.1 (J)
Second Parcel	l15	5611013	2.0 - 3.0 ft into pile	4.9 (J)
Second Parcel	l17	5611018	0.0 - 0.5	57
Woote Dump	120	5611033	0.0 - 0.5 ft into pile	7.7 (J)
Waste Dump	130	5611034	0.0 - 0.5 ft into pile	10 (J)

J = Estimated value

A.11.2.4 RCRA Metals, Beryllium, and Hexavalent Chromium

Analytical results for RCRA metals, beryllium, and hexavalent chromium detected in soil samples above MDCs are presented in Table A.11-5. No metals were detected at concentrations exceeding their PALs; therefore, the FALs were established at the corresponding PAL concentrations.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-112 of A-156

Table A.11-5
Sample Results for Metals Detected above MDCs at CAS 25-23-21, Radioactive Waste Dump
(Page 1 of 3)

							(COPCs (mg/kg)				
Area	Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Lead	Mercury	Selenium	Silver
	FA	Ls		23	190,000	2,000	800	N/Aª	5.6	800	34	5,100	5,100
Second Parcel	l01	5611012	0.0 - 1.0	4	73		0.12 (J-)	4.7		5.8			
Second Parcel	102	5611011	0.0 - 1.0 ft into pile	5.2	86		0.035 (J-)	3.5		1.9			
Second Parcel	103	5611009	0.0 - 0.5 ft into pile		38 (J-)	0.41 (J-)	0.2 (J-)	44		6.3 (J-)			
Second Farcer	103	5611010	0.0 - 0.5 ft into pile		63	0.46 (J-)		40		6.4			
Second Parcel	105	5611008	1.0 - 1.5	4.8	87		0.15 (J-)	6.3		8.3			
Second Parcel	106	5611005	0.0 - 0.5	4.5	140		0.16 (J-)	5.5		16		0.44	
Second Parcel	107	5611006	0.0 - 0.5	2.7	51		0.055 (J-)	4.1		3.9			
Second Parcel	108	5611004	2.5 - 3.0	3.9	100		0.14 (J-)	5.2	0.16 (J-)	7.1			
Second Parcel	109	5611002	0.0 - 0.5	12	160	0.97	0.56	20		20	0.087		
Second Parcel	I10	5611001	5.0 - 6.0	4.6	110	0.5	0.2 (J-)	6.9		7.3			
Second Parcel	l11	5611017	0.0 - 0.5	16	300		0.2 (J-)	7.4		32	0.046		
Second Parcel	l12	5611016	1.0 - 2.0 ft into pile	3.4	85		0.14 (J-)	8.7	0.15 (J-)	9.4			
Second Parcel	l13	5611015	2.0- 2.5 ft into pile	3.3	78		1.5	12	0.52 (J-)	24	0.1		
Second Parcel	l14	5611014	2.0 - 3.0 ft into pile	4.1	110		0.13 (J-)	5.8		7.7	0.039		
Second Parcel	l15	5611013	2.0 - 3.0 ft into pile	3.9	130		0.098 (J-)	4.8		14			
Second Parcel	l16	5611003	1.0 - 1.5	9.3	160	1.1	0.5 (J-)	16		16	0.068	-	

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-113 of A-156

Table A.11-5
Sample Results for Metals Detected above MDCs at CAS 25-23-21, Radioactive Waste Dump
(Page 2 of 3)

							(COPCs (mg/kg)				
Area	Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Lead	Mercury	Selenium	Silver
	FA	Ls		23	190,000	2,000	800	N/Aª	5.6	800	34	5,100	5,100
Second Parcel	l17	5611018	0.0 - 0.5	4.4	170	0.52	0.23 (J-)	7.8		15		0.27	
Waste Dump	l18	5611019	2.5 - 3.0 ft into pile	2.4	89		0.097	3.6		5.7			
Waste Dump	l19	5611027	2.5 - 3.0 ft into pile	1.7 (J-)	71		0.077	3.1		4.5			
Waste Dump	120	5611029	2.5 - 3.0 ft into pile	2.2	98		0.11	3.2		4.4			
Waste Dump	l21	5611031	2.5 - 3.0 ft into pile	2.3	110		0.097	3.2		4.8			
Waste Dump	122	5611032	3.0 - 3.5 ft into pile	1.5 (J-)	100		0.082	2.8		4.2			
Waste Dump	123	5611028	2.5 - 3.0 ft into pile	1.6 (J-)	120		0.049	2.2		3.9			
Waste Dump	124	5611022	1.5 - 2.0 ft into pile	2.3	60		0.049	3.4		4.8			
Waste Dump	125	5611026	1.5 - 2.0 ft into pile	1.9 (J-)	74		0.081	3.3		4.4			
Waste Dump	126	5611021	2.5 - 3.0 ft into pile	2.3	69		0.088	3.9		6.6			
Waste Dump	127	5611025	2.0 - 2.5 ft into pile	1.9 (J-)	100		0.085	3.4		5.4			
Waste Dump	128	5611020	2.5 - 3.0 ft into pile	1.8 (J-)	88		0.099	3.1		4.8			
Waste Dump	129	5611023	3.0 - 3.5 ft into pile	1.4 (J-)	63		0.069	2.9		4.5			
Waste Dump	130	5611033	0.0 - 0.5 ft into pile	1.6 (J-)	100		0.74	6.5		17			0.21
Waste Dump	150	5611034	0.0 - 0.5 ft into pile	2.3	91		0.32	7.2		28		0.3	0.16
Waste Dump	l31	5611024	0.0 - 0.5	2.4	68		0.11	4.2		4.8			

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-114 of A-156

Table A.11-5
Sample Results for Metals Detected above MDCs at CAS 25-23-21, Radioactive Waste Dump
(Page 3 of 3)

				COPCs (mg/kg)									
Area	Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Hexavalent Chromium	Lead	Mercury	Selenium	Silver
	FA	Ls		23	190,000	2,000	800	N/Aª	5.6	800	34	5,100	5,100
Waste Dump	132	5611030	0.0 - 0.5 ft into pile	2.7	66		0.15	4.3		5.4			
Waste Dump	133	5611035	0.0 - 0.5 ft into pile	2.1	90		0.098	3.5		7.7			

^aPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

J- = Result is an estimated quantity, but may be biased low.

^{-- =} Not detected above MDCs.

A.11.2.5 Polychlorinated Biphenyls

Analytical results for PCBs detected in soil samples above MDCs are presented in Table A.11-6. One sample (and its FD) exceeded the PAL (0.74 mg/kg) for Aroclor 1206 with a concentration of 1.2 mg/kg. The FD had a concentration above the PAL of 2.9 mg/kg. The FALs were established at the PAL concentrations; therefore, Aroclor 1260 is considered a COC at this CAS.

Table A.11-6
Sample Results for PCBs Detected above
MDCs at CAS 25-23-21, Radioactive Waste Dump

Area	Sample	Sample	Depth		COPCs (mg/kg	g)
Alea	Location	Number	(ft into pile)	Aroclor 1254	Aroclor 1260	PCBs (low risk)
	F	ALs		0.74	0.74	21
Second Parcel	l13	5611015	2.0 - 2.5		0.034 (J)	0.084
Waste Dump	126	5611021	2.5 - 3.0	0.12		
		5611033	0.0 - 0.5		1.2 (J)	
Waste Dump	130	5611034	0.0 - 0.5		2.9 (J)	
		5611040	1.0 - 1.5	0.014 (J)		
Waste Dump	l32	5611030	0.0 - 0.5		0.013 (J)	
Waste Dump	133	5611035	0.0 - 0.5		0.018 (J)	
Waste Dump	I46	5611053	1.0 - 1.3 ft bgs	0.0064 (J)		

J = Estimated value

Bold indicates the values exceeding the FALs.

A.11.2.6 Gamma-Emitting Radionuclides

Analytical results for gamma-emitting radionuclides detected in soil samples above MDCs are presented in Table A.11-7. At the southern RMA (Figure A.11-1), three samples had elevated Cs-137 results that exceeded the PAL (72.9 pCi/g) with concentrations ranging from 152 to 392 pCi/g. The FALs were established at the PAL concentrations; therefore, Cs-137 is considered a COC at this CAS.

^{-- =} Not detected above MDCs.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-116 of A-156

Table A.11-7 Sample Results for Gamma-Emitting Radionuclides Detected above MDCs at CAS 25-23-21, Radioactive Waste Dump

(Page	1	of	3)

Area	Sample	Sample	Depth			COPCs	(pCi/g)		
Alea	Location	Number	(ft bgs)	Ac-228	Co-60	Cs-137	Nb-94	Th-234	U-235
	F	ALs		506.7ª	18.33	72.9	96.53	1,423 ^b	255.5
Second Parcel	I01	5611012	0.0 - 1.0	0.63					
Second Parcel	102	5611011	0.0 - 1.0 ft into pile	2.64				5.6 (J)	
Second Parcel	103	5611009	0.0 - 0.5 ft into pile	0.75					
Second Faicer	103	5611010	0.0 - 0.5 ft into pile	0.69					
Second Parcel	105	5611008	1.0 - 1.5	1.4					
Second Parcel	106	5611005	0.0 - 0.5	1.62				2.4	
Second Parcel	107	5611006	0.0 - 0.5	0.92					
Second Parcel	108	5611004	2.5 - 3.0	1.64					
Second Parcel	109	5611002	0.0 - 0.5	1.85		0.305		2.59 (J)	
Second Parcel	l10	5611001	5.0 - 6.0	1.93				2.71	
Second Parcel	l11	5611017	0.0 - 0.5	1.24		0.132			
Second Parcel	l12	5611016	1.0 - 2.0 ft into pile	1.28		0.129			
Second Parcel	l13	5611015	2.0 - 2.5 ft into pile	0.86					
Second Parcel	l14	5611014	2.0 - 3.0 ft into pile	1.66				1.85	
Second Parcel	l15	5611013	2.0 - 3.0 ft into pile	1.55				2.43	
Second Parcel	l16	5611003	1.0 - 1.5	1.88		0.307		3.4 (J)	
Second Parcel	l17	5611018	0.0 - 0.5	1.36		0.142			
Waste Dump	l18	5611019	2.5 - 3.0 ft into pile	1.36					
Waste Dump	l19	5611027	2.5 - 3.0 ft into pile	1.24					
Waste Dump	120	5611029	2.5 - 3.0 ft into pile	1.42					
Waste Dump	l21	5611031	2.5 - 3.0 ft into pile	1.37					
Waste Dump	122	5611032	3.0 - 3.5 ft into pile	1.59					
Waste Dump	123	5611028	2.5 - 3.0 ft into pile	1.5					
Waste Dump	124	5611022	1.5 - 2.0 ft into pile	1.19					
Waste Dump	125	5611026	1.5 - 2.0 ft into pile	1.22					
Waste Dump	126	5611021	2.5 - 3.0 ft into pile	1.29					

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-117 of A-156

Table A.11-7 Sample Results for Gamma-Emitting Radionuclides Detected above MDCs at CAS 25-23-21, Radioactive Waste Dump (Page 2 of 3)

Area	Sample	Sample	Depth			COPCs	(pCi/g)		
Alea	Location	Number	(ft bgs)	Ac-228	Co-60	Cs-137	Nb-94	Th-234	U-235
	F	ALs		506.7ª	18.33	72.9	96.53	1,423 ^b	255.5
Waste Dump	127	5611025	2.0 - 2.5 ft into pile	1.57				2.45 (J)	
Waste Dump	128	5611020	2.5 - 3.0 ft into pile	1.29					
Waste Dump	129	5611023	3.0 - 3.5 ft into pile	1.56					
		5611033	0.0 - 0.5 ft into pile	1.5	1.64	392	2.86		3.9 (J)
Waste Dump	130	5611034	0.0 - 0.5 ft into pile	1.14	1.77	224	3.26		
		5611040	1.0 - 1.5 ft into pile	1.51		0.92			
Waste Dump	l31	5611024	0.0 - 0.5	1.47					
Waste Dump	132	5611030	0.0 - 0.5 ft into pile	1.37		15.6			
Waste Dump	102	5611045	1.0 - 1.5 ft into pile	1.33					
Waste Dump	133	5611035	0.0 - 0.5 ft into pile	1.26		152	0.233		1.73
Waste Dump	155	5611041	1.0 - 1.5 ft into pile	1.37					
Waste Dump	134	5611036	0.0 - 0.5	1.22		0.189			
Waste Dump	104	5611037	0.0 - 0.5	1.34		0.177			
Waste Dump	135	5611038	0.0 - 0.5	1.43					
Waste Dump	136	5611039	0.0 - 0.5	1.42		2.85			
Waste Dump	137	5611042	0.0 - 0.5	1.34					
Waste Dump	138	5611043	0.0 - 0.5	1.65					
Waste Dump	139	5611044	0.0 - 0.5	1.32					
Waste Dump	140	5611046	0.0 - 0.5	1.6					
Waste Dump	I41	5611047	0.0 - 0.5	2.02					
Waste Dump	142	5611048	0.0 - 0.5	1.67					
vvaste Dump	172	5611049	0.0 - 0.5	1.84	-		-		
Waste Dump	143	5611050	0.0 - 0.5	1.87					
Waste Dump	144	5611051	0.5 - 1.0	1.74					
Waste Dump	145	5611052	0.5 - 1.0	1.65					
Waste Dump	I46	5611053	1.0 - 1.3	1.8					

Table A.11-7 Sample Results for Gamma-Emitting Radionuclides Detected above MDCs at CAS 25-23-21, Radioactive Waste Dump

(Page 3 of 3)

Area	Sample	Sample	Depth			COPCs (pCi/g)				
Alea	Location	Number	(ft bgs)	Ac-228	Co-60	Cs-137	Nb-94	Th-234	U-235	
	F	ALs		506.7ª	18.33	72.9	96.53	1,423 ^b	255.5	
Waste Dump	147	5611054	0.5 - 1.0	1.41			-			
Waste Dump	148	5611055	0.5 - 1.0	1.2						
Waste Dump	149	5611056	1.0 - 1.3	1.47						

^aFAL for Ac-228 based on Th-232 FAL.

Co = Cobalt

Nb = Niobium

J = Estimated value

-- = Not detected above MDCs.

Bold indicates the values exceeding the FALs.

A.11.2.7 Potential Source Material

Analytical results for PSM samples collected at this CAS that were detected in soil samples above MDCs are presented in Table A.11-8. The PSM was a pile of finely ground magnetite.

Table A.11-8
PSM Results Detected above MDCs for CAS 25-23-21, Radioactive Waste Dump

Area	Sample Location	Sample Number	Sample Matrix	Parameter	Result	PSM Criteria	Unit
				Hexavalent chromium	0.51 (J-)	5.6	
Second Parcel	104	5611007	Solid	Chromium	140	N/Aª	mg/kg
Second Faicer	104	3011007	Solid	Acetone	0.011 (J)	630,000	ilig/kg
		Methylene chloride	0.011	53			

^aPer FI-ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

^bFAL for Th-234 based on U-238 FAL.

J = Estimated value

J- = Result is an estimated quantity, but may be biased low.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-119 of A-156

A.11.3 Nature and Extent of Contamination

Based on the analytical results for soil samples collected within CAS 25-23-21, the only COCs that were identified are Cs-137 and PCBs located within the southern RMA at the main waste dump portion of the CAS. The Cs-137 was associated with the contaminated pipes that were laying on top of the soil in the RMA. The contaminated pipes from the northern and southern RMAs were wrapped in plastic and disposed of as low-level waste (LLW), thereby removing all of the Cs-137 and PCB contaminated soil from this CAS. The soil from the RMA piles were also disposed of as LLW. Soil samples collected from the piles after removal of the pipes showed that the Cs-137 and PCB contamination was limited to the top 0 to 1.5 ft into the piles; the PCBs and Cs-137 did not migrate any further than 1.5 ft into the piles.

A.11.4 Revised Conceptual Site Model

The CAIP requirements (NNSA/NSO, 2008) were met at this CAS, and no revisions were necessary to the CSM.

A.12.0 CAS 25-25-19, Hydrocarbon Stains and Trench

Corrective Action Site 25-25-19 consists of several components, including surface soil stains, tar and asphalt spills, trenches, concrete pads, debris, and rock and soil piles. The CAS encompasses approximately 8 acres and is located southeast of the intersection of C Road and G Road, and southwest of the RCP in Area 25 of the NNSS.

A.12.1 Corrective Action Investigation

A total of 22 characterization samples (including 1 FD) were collected during investigation activities at CAS 25-25-19 (Figure A.12-1). The sample IDs, locations, types, and analyses are listed in Table A.12-1. The specific CAI activities conducted to satisfy the CAIP requirements at this CAS (NNSA/NSO, 2008) are described in the following sections.

A.12.1.1 Radiological Surveys

A gamma radiological walkover survey of the area was performed at CAS 25-25-19 in 2008. No areas of elevated radioactivity were identified because measured levels from this CAS area were not distinguishable from background levels.

A.12.1.2 Geophysical Surveys

Geophysical surveys were performed in 2007 and did not identify subsurface metallic debris in any areas of this CAS.

A.12.1.3 Visual Inspections

The surface soil within the motor pool area was inspected for any stained soil or biasing factors. Stained surface soil was observed at sample locations J01, J02 and J03 at the motor pool area, and samples 561J001 through 561J004 were collected at these locations. In the north trench, asphalt was observed at sample location J05 at a depth of 1 to 2 ft bgs. Stained soil and a diesel/solvent odor were observed at the same location (J05) from 5 to 5.5 ft bgs (Figures A.12-2 and A.12-3). Stained soil and asphalt were also observed at sample location J07 from 0 to 3.5 ft bgs, but no samples were collected at this interval because samples within the asphalt horizon had been collected in potholes at locations

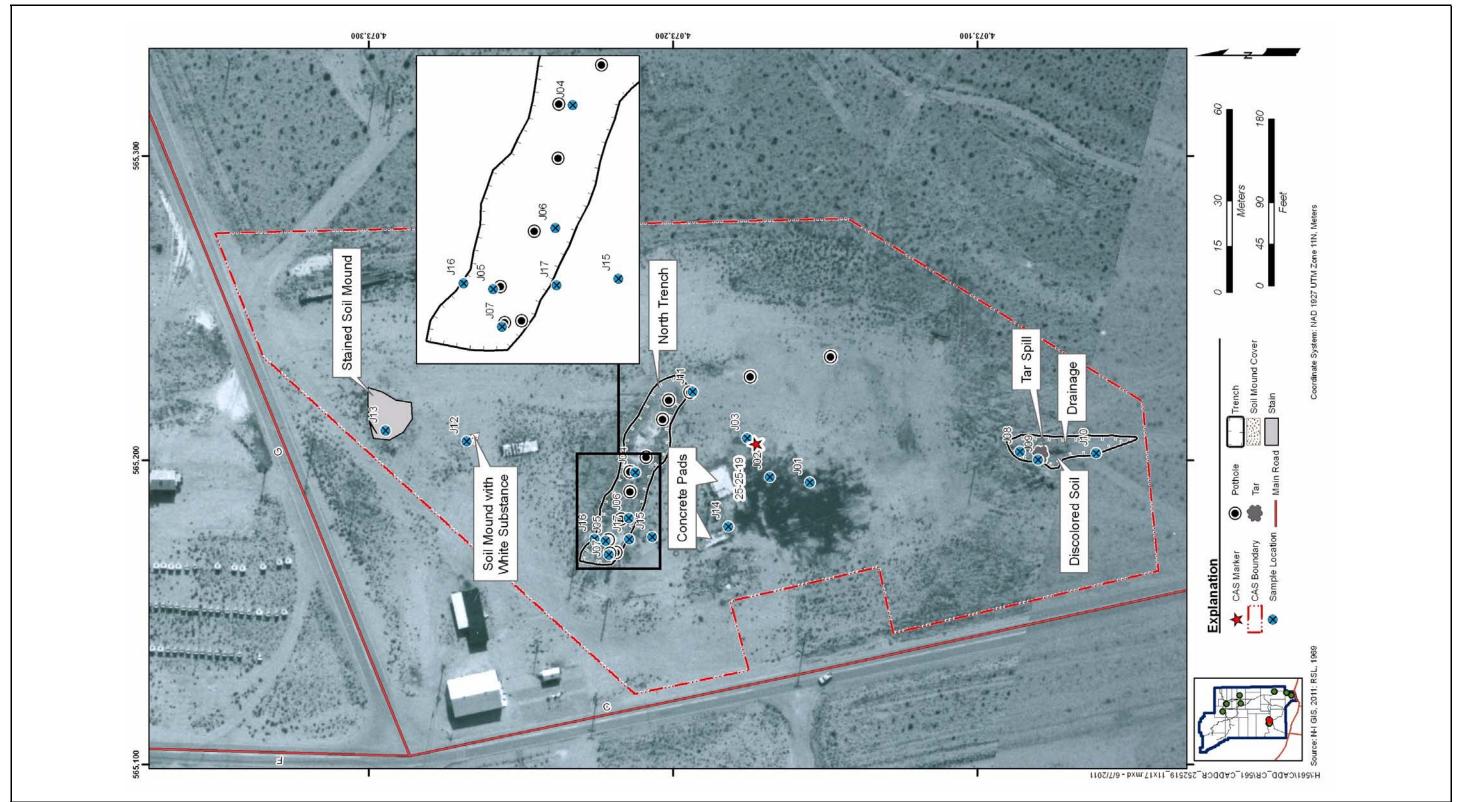


Figure A.12-1
Sample Locations at CAS 25-25-19, Hydrocarbon Stains and Trench

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-122 of A-156

Table A.12-1 Samples Collected at CAS 25-25-19, Hydrocarbon Stains and Trench (Page 1 of 2)

Sample Location	Sample Number	Depth ft bgs)	Matrix	Purpose	Beryllium	TPH-DRO	Gamma	Hexavalent Chromium	Metals	PCBs	SVOCs	TCLP Metals	VOCs
J01	561J001	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
J02	561J002	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Χ	Х	Х		Х
J03	561J003	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
303	561J004	0.0 - 0.5	Soil	FD of #561J003	Х	Х	Х	Х	Х	Х	Х		Х
J04	561J005	0.5 - 1.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
304	561J006	4.0 - 4.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
	561J007	1.0 - 2.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
J05	561J008	5.0 - 5.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
	561J009	7.0 - 7.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
J06	561J010	5.0 - 5.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
J07	561J011	5.0 - 5.5	Soil	Environmental	Х	Х	Х	Х	Χ	Х	Х		Х
J08	561J012	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Χ	Х	Х		Х
J09	561J013	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
J10	561J014	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
J11	561J015	5.5 - 6.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
311	561J016	1.0 - 2.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
J12	561J017	0.0 - 0.5	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
J13	561J018	0.0 - 1.0	Soil	Environmental	Х	Х	Х	Х	Х	Х	Х		Х
14.4	561J019	0.0 - 0.5	Soil	Waste Management	Х				Х			Х	
J14	561J020	0.5 - 1.0	Soil	Environmental	Х				Х				
14.5	561J021	0.0 - 0.5	Soil	Waste Management	Х				Х			Х	
J15	561J022	0.5 - 1.0	Soil	Environmental	Х				Х				
J16	561J023	6.0 - 6.5	Soil	Environmental	Х	Х	Х	Х	Х	Χ	Χ		Х
J17	561J024	6.0 - 6.5	Soil	Environmental	Х	Х	Χ	Х	Х	Χ	Χ		Х
N/A	561J301	N/A	Water	Trip Blank									Х
N/A	561J302	N/A	Water	Trip Blank									Х
N/A	561J303	N/A	Water	Trip Blank									Х

Table A.12-1
Samples Collected at CAS 25-25-19, Hydrocarbon Stains and Trench
(Page 2 of 2)

Sample Location	Sample Number	Depth ft bgs)	Matrix	Purpose	Beryllium	TPH-DRO	Gamma	Hexavalent Chromium	Metals	PCBs	SVOCs	TCLP Metals	VOCs
N/A	561J304	N/A	Water	Trip Blank									Х
N/A	561J305	N/A	Water	Trip Blank									Х
N/A	561J306	N/A	Water	Trip Blank									Х
N/A	561J307	N/A	Water	Field Blank	Х	Х	Х	Х	Х	Х	Х		Х
N/A	561J308	N/A	Water	Equipment Rinsate	Х	Χ	Χ	Χ	Χ	Χ	Χ		Х

^{-- =} Not required

J04, J05, and J06. In the southern portion of the CAS, two sample locations were observed to have an asphalt spill (sample 561J012) and a tar spill (sample 561J013). Two lead bricks were discovered at locations J14 and J15, one lead brick was also found near the north trench. The bricks were removed, and the soil directly in contact with the bricks was removed and sampled for waste characterization. Verification samples were then collected at 0.5 to 1 ft bgs to confirm that any lead-contaminated soil had been removed.

A.12.1.4 Sample Collection

Twenty-two environmental samples (including one FD) were collected from 17 locations (locations J01 through J17). Decision I environmental sampling activities included the collection of biased surface soil samples at the asphalt spill (561J012) and tar spill (561J013), the motor pool area (561J001 through 561J004), and under the two soil mounds (samples 561J017 and 561J018). Decision I biased subsurface samples were collected from the north trench (561J005 through 561J011, and 561J023, 561J0024) and the suspected backfilled east trench (561J015 and 561J016). At the north trench and soil mounds, samples were collected at various depths based on biasing factors (e.g., stained soil, asphalt). Surface samples were collected at the tar and asphalt spills and the motor pool area. Because the analytical results showed no concentrations of any constituents above PALs, Decision II sampling was not necessary.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-124 of A-156

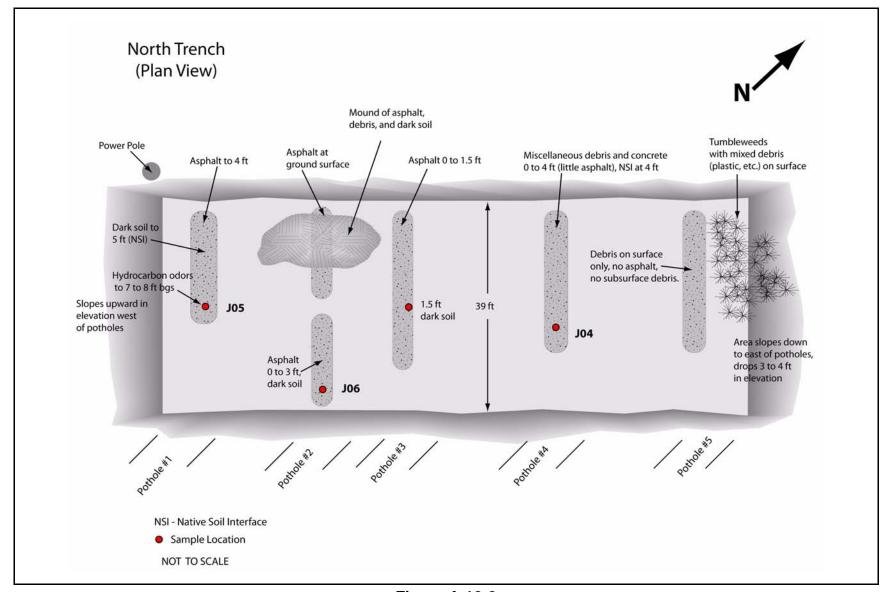


Figure A.12-2
North Trench Sample Locations CAS 25-25-19, Hydrocarbon Stains and Trench

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Figure A.12-3
Asphalt and Stained Soil in North Trench
CAS 25-25-19, Hydrocarbon Stains and Trench

Samples collected from this CAS were screened for VOCs using a Mini-RAE 2000 PID due to the possible presence of volatile hydrocarbons in the soil. No VOCs were detected at this CAS. A Q-RAE Plus Four-Gas Monitor was used to screen soil samples as well; all readings were 0 ppm or 0 percent, except for the O_2 , which was within the acceptable range.

Lead bricks were identified as PSM and removed from locations J14 and J15. Waste characterization samples (561J019 and 561J021) were collected from two locations (J14 and J15) which represented two lead bricks; the soil directly beneath the lead bricks was sampled and analyzed for TCLP metals. After removal of the soil, two confirmation samples (561J020 and 561J022) were collected from these locations. The analytical results from the lead brick verification samples were less than the corresponding Tier 1 action levels (i.e., PALs).

CAU 561 CADD/CR Appendix A

Revision: 0

Date: August 2011 Page A-126 of A-156

A.12.1.5 Deviations

The only deviation to the CAIP (NNSA/NSO, 2008) associated with CAS 25-25-19 was that the

suspected backfilled east trench was not a trench, but instead a natural depression with native soil.

Only one sample was collected from this area, instead of the stated minimum of four samples.

Investigation samples were collected as outlined in the CAIP and submitted for laboratory analysis.

A.12.2 Investigation Results

The following sections provide analytical results from the samples collected to complete

investigation activities as outlined in the CAIP (NNSA/NSO, 2008). Investigation samples were

analyzed for the CAIP-specified COPCs, which included VOCs, SVOCs, TPH-DRO

(waste management purposes only) RCRA metals, hexavalent chromium, beryllium, PCBs, and

gamma-emitting radionuclides. The analytical parameters and laboratory methods used to analyze

the investigation samples are listed in Table A.2-2. Table A.12-1 lists the sample-specific analytical

suite for CAS 25-25-19.

Analytical results from the soil samples with concentrations exceeding MDCs are summarized in the

following sections. An evaluation was conducted on all contaminants detected above MDCs by

comparing individual concentration or activity results against the FALs. Establishment of the FALs is

presented in Appendix C.

A.12.2.1 Volatile Organic Compounds

Analytical results for VOCs detected in soil samples above MDCs are presented in Table A.12-2.

No VOCs were detected at concentrations exceeding their PALs. The FALs were established at the

corresponding PAL concentrations.

A.12.2.2 Semivolatile Organic Compounds

Analytical results for SVOCs detected in soil samples above MDCs are presented in Table A.12-3.

No SVOCs were detected at concentrations exceeding their PALs. The FALs were established at the

corresponding PAL concentrations.

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Table A.12-2
Sample Results for VOCs Detected above MDCs at CAS 25-25-19, Hydrocarbon Stains and Trench

Sample	Sample	Depth	COPCs (mg/kg)				
Location	Number	(ft bgs) 2-Butanone 200,000	Acetone				
	FALs		200,000	630,000			
J01	561J001	0.0 - 0.5	0.011 (J)	0.029 (J)			
J02	561J002	0.0 - 0.5	0.011 (J)	0.036 (J)			
J08	561J012	0.0 - 0.5	0.0091 (J)	0.023 (J)			

J = Estimated value

Table A.12-3
Sample Results for SVOCs Detected above
MDC at CAS 25-25-19, Hydrocarbon Stains and Trench

Sample	Sample	Depth	COPC (mg/kg)
Location	Number	(ft bgs)	Bis(2-ethylhexyl)phthalate
	FAL		120
J04	561J005	0.5 - 1.5	0.068 (J)

J = Estimated value

A.12.2.3 Total Petroleum Hydrocarbons

Analytical results for TPH-DRO detected in soil samples above MDCs are presented in Table A.12-4. Samples were analyzed for TPH-DRO for waste management purposes only as stated in the FI ROTC-1 (NNES, 2010), and are presented here for completeness of data. Preliminary action levels and FALs have not been established for TPH-DRO. The FALs are established for the individual hazardous constituents of TPH-DRO and are reported with the VOC and SVOC results. Because VOCs or SVOCs were not detected at concentrations exceeding the MDCs in any of the soil samples collected at this CAS, TPH-DRO is not considered to be a site-related contaminant.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-128 of A-156

Table A.12-4
Sample Results for TPH-DRO Detected at CAS 25-25-19, Hydrocarbon Stains and Trench

Sample Location	Sample Number	Depth (ft bgs)	TPH-DRO (mg/kg)
J01	561J001	0.0 - 0.5	54
J02	561J002	0.0 - 0.5	140
J03	561J003	0.0 - 0.5	160
303	561J004	0.0 - 0.5	78
J04	561J005	0.5 - 1.5	22
	561J007	1.0 - 2.0	730
J05	561J008	5.0 - 5.5	1,900
	561J009	7.0 - 7.5	850
J07	561J011	5.0 - 5.5	67
J08	561J012	0.0 - 0.5	23
J09	561J013	0.0 - 0.5	21
J17	561J024	6.0 - 6.5	14

A.12.2.4 RCRA Metals, Beryllium, and Hexavalent Chromium

Analytical results for RCRA metals, beryllium, and hexavalent chromium detected in soil samples above MDCs are presented in Table A.12-5. No metals were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

A.12.2.5 Polychlorinated Biphenyls

Analytical results for PCBs detected in soil samples above MDCs are presented in Table A.12-6. No PCBs were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

A.12.2.6 Gamma-Emitting Radionuclides

Analytical results for gamma-emitting radionuclides detected in soil samples above MDCs are presented in Table A.12-7. No gamma-emitting radionuclides were detected at concentrations exceeding their PALs. The FALs were established at the corresponding PAL concentrations.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-129 of A-156

Table A.12-5
Sample Results for Metals Detected above MDCs at CAS 25-25-19, Hydrocarbon Stains and Trench (Page 1 of 2)

						CC	PCs (mg/	kg)			
Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
	FALs		23	190,000	2,000	800	N/A ^a	800	34	5,100	5,100
J01	561J001	0.0 - 0.5	3.2	160	0.37 (J-)	0.15	4.7	330 (J)			
J02	561J002	0.0 - 0.5	2.9	200	0.37 (J-)	0.31	5.5	420 (J)			
J03	561J003	0.0 - 0.5	2.8	110	0.32 (J-)	0.27	5	43 (J)	0.0023 (J-)	0.36	
303	561J004	0.0 - 0.5	2.8	120	0.33 (J-)	0.22	5	37 (J)	0.0022 (J-)		
J04	561J005	0.5 - 1.5	2.8	91	0.28 (J-)	0.2	4.4	15 (J)	0.013 (J-)		
304	561J006	4.0 - 4.5	1.5	70	0.25 (J-)	0.045	1.8	4.4 (J)	0.022 (J-)		
	561J007	1.0 - 2.0	2	110	0.34 (J-)	0.043	4.6	20 (J)	0.029 (J-)		
J05	561J008	5.0 - 5.5	1.7	96	0.33 (J-)		2.2	4.8 (J)	0.058		
	561J009	7.0 - 7.5	2.3	130	0.4 (J-)	0.086	3	6.2 (J)	0.028 (J-)		
J06	561J010	5.0 - 5.5	1.9	110	0.37 (J-)		2.6	5 (J)	0.066		
J07	561J011	5.0 - 5.5	1.9	110	0.35 (J-)	0.047	2.5	8.3 (J)	0.015 (J-)		
J08	561J012	0.0 - 0.5	2.2	79	0.3 (J-)	0.12	3.2	24 (J)	0.0034 (J-)		
J09	561J013	0.0 - 0.5	2	76	0.3 (J-)	0.072	3.4	17 (J)	0.0023 (J-)		
J10	561J014	0.0 - 0.5	2.1	89	0.31 (J-)	0.1	3.5	13 (J)	0.0055 (J-)		
J11	561J015	5.5 - 6.0	1.8	68	0.31 (J-)	0.044	2.3	4.6 (J)	0.024 (J-)		
311	561J016	1.0 - 2.0	2.1	96	0.35 (J-)	0.073	3	8.4 (J)	0.012 (J-)	-	

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-130 of A-156

Table A.12-5
Sample Results for Metals Detected above MDCs at CAS 25-25-19, Hydrocarbon Stains and Trench (Page 2 of 2)

						CC	PCs (mg/	kg)			
Sample Location	Sample Number	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
	FALs		23	190,000	2,000	800	N/Aª	800	34	5,100	5,100
J12	561J017	0.0 - 0.5	2.8	110	0.44 (J-)	0.12	4.5	6.8 (J)	0.01 (J-)		
J13	561J018	0.0 - 1.0	2.6	130	0.46 (J-)	0.053	4.1	6.9 (J)	0.005 (J-)		
J14	561J020	0.5 - 1.0	2.4	130	0.33 (J-)	0.71	4.5	100 (J)	0.03 (J-)		0.16
J15	561J022	0.5 - 1.0	2.9	100	0.41 (J-)	0.19	4.4	84 (J)	0.013 (J-)		
J16	561J023	6.0 - 6.5	1.4	120 (J)		0.04	2.1	3.4	0.021 (J-)		
J17	561J024	6.0 - 6.5	2.9	140 (J)		0.23	6.3	20	0.044		

^aPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

J = Estimated value

J- = Result is an estimated quantity, but may be biased low.

^{-- =} Not detected above MDCs.

Table A.12-6
Sample Results for PCBs Detected above
MDC at CAS 25-25-19, Hydrocarbon Stains and Trench

Sample	Sample	Depth	COPC (mg/kg)
Location	Number	(ft bgs)	Aroclor 1260
	FAL		0.74
J01	561J001	0.0 - 0.5	0.014 (J)
J02	561J002	0.0 - 0.5	0.095
J03	561J003	0.0 - 0.5	0.032 (J)
303	561J004	0.0 - 0.5	0.018 (J)
J04	561J005	0.5 - 1.5	0.25 (J)
	561J007	1.0 - 2.0	0.5 (J)
J05	561J008	5.0 - 5.5	0.023 (J)
	561J009	7.0 - 7.5	0.061 (J)
J07	561J011	5.0 - 5.5	0.016 (J)
J08	561J012	0.0 - 0.5	0.015 (J)
J17	561J024	6.0 - 6.5	0.1

J = Estimated value

A.12.3 Nature and Extent of Contamination

Based on the analytical results for soil samples collected within CAS 25-25-19, there has not been a release of contaminants to the environmental media.

A.12.4 Revised Conceptual Site Model

The CAIP requirements (NNSA/NSO, 2008) were met at this CAS, and no revisions were necessary to the CSM.

Table A.12-7
Sample Results for Gamma-Emitting Radionuclides Detected above MDCs at CAS 25-25-19, Hydrocarbon Stains and Trench

Sample	Sample	Depth	COPCs	s (pCi/g)
Location	Number	(ft bgs)	Ac-228	Th-234
	FALs		506.7ª	1,423 ^b
J01	561J001	0.0 - 0.5	1.77	
J02	561J002	0.0 - 0.5	1.69	
J03	561J003	0.0 - 0.5	1.49	
303	561J004	0.0 - 0.5	1.45	
J04	561J005	0.5 - 1.5	1.9	
304	561J006	4.0 - 4.5	2.07	
	561J007	1.0 - 2.0	1.56	
J05	561J008	5.0 - 5.5	1.75	3 (J)
	561J009	7.0 - 7.5	1.9	2.73 (J)
J06	561J010	5.0 - 5.5	1.95	
J07	561J011	5.0 - 5.5	1.92	
J08	561J012	0.0 - 0.5	1.47	
J09	561J013	0.0 - 0.5	1.63	
J10	561J014	0.0 - 0.5	1.64	
J11	561J015	5.5 - 6.0	1.85	
311	561J016	1.0 - 2.0	1.94	
J12	561J017	0.0 - 0.5	1.7	
J13	561J018	0.0 - 1.0	1.74	
J16	561J023	6.0 - 6.5	1.53	
J17	561J024	6.0 - 6.5	1.7	

^aFAL for Ac-228 based on the Th-232 FAL.

^bFAL for Th-234 based on the U-238 FAL.

J = Estimated value

^{-- =} Not detected above MDCs.

A.13.0 Waste Management

The following sections describe the waste management activities and types of waste generated and disposed of during the corrective action investigation and remediation activities at CAU 561. Waste management areas were established and managed as specified in the CAIP (NNSA/NSO, 2008). Waste characterization was completed in accordance with Navarro-Intera, LLC, procedures, which are consistent with the federal and state regulations. Waste disposal was completed in accordance with federal and state regulations, DOE directives, and waste acceptance criteria for the applicable disposal facility.

A.13.1 Waste Minimization

In an effort to reduce the amount of waste generated, waste minimization techniques were integrated into the field activities and waste was segregated to the greatest extent possible. Controls were in place to minimize the use of hazardous materials and the unnecessary generation of hazardous and/or mixed waste during field activities. Decontamination activities were planned and executed to minimize the volume of rinsate generated. Approximately 3,900 pounds (lb) of lead was recovered during the CAU 561 CAI. This material meets the recyclable material acceptance criteria of the TOXCO Materials Management Center, located in Oak Ridge, Tennessee, and will be reused as high-energy shielding blocks within the DOE or U.S. commercial nuclear industry.

A.13.2 Waste Generation

The waste types listed below were generated during CAU 561 CAI and remediation activities:

- Solid and liquid industrial waste
- Hydrocarbon-impacted waste
- Low-level radioactive waste
- Recyclable materials

For regulated waste, the amount, type, and source of the waste placed into each waste container were recorded in the waste container logbooks that are maintained in the project files. Waste characterization and disposal was based on process knowledge, radiological survey data, and analytical data, as applicable. The disposal documentation for each waste shipment made at

CAU 561 CADD/CR Appendix A Revision: 0

Date: August 2011 Page A-134 of A-156

CAU 561 is included in Appendix F. A summary of the waste streams generated—including the waste type, waste volumes, and disposal path—is provided in Table A.13-1.

A.13.2.1 Industrial Waste

Industrial waste is described as solid waste generated during remediation activities that meet the permit requirements and waste acceptance criteria of the Area 9 U10c industrial landfill. Industrial waste generated at CAU 561 included remediated soil and housekeeping debris. Solid industrial waste generated during remediation activities at CAU 561 was characterized using field observations, process knowledge, analytical results and/or radiological FSRs and disposed of at the Area 9 U10c industrial landfill.

Industrial waste generated during the CAU 561 field investigations was segregated into the following waste streams:

- Solid IDW includes debris such as plastic sheeting, glass/plastic sample jars, disposable personal protective equipment (PPE), unused soil samples, sampling scoops, aluminum foil, and bowls.
- Liquid IDW includes decontamination rinsate.

Solid IDW generated during investigation activities was characterized using field observations, process knowledge, analytical results and/or radiological FSRs. The IDW that was determined to be non-hazardous and met the total allowable residual surface contamination values listed in Table 4-2 of the *Nevada Test Site Radiological Control Manual* (NNSA/NSO, 2010b) was characterized as industrial waste. The IDW industrial waste was bagged, marked, and placed in the roll-off located at Building 23-153 for disposal at the Area 9 U10c industrial landfill. The IDW that did not meet the release limits of Table 4-2 was managed as low-level radioactive waste as described in Section A.13.2.3.

Liquid IDW was generated during decontamination activities at several CAS locations. The decontamination activities included high-pressure washing of heavy equipment on a lined secondary containment pad and were completed in accordance with Standards-Based Management System procedures. Although decontamination rinsate was generated, the small volumes of rinsate generated evaporated before the rinsate could be collected for disposal.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-135 of A-156

Table A.13-1 CAU 561 Waste Disposal Summary

(Page 1 of 2)

Number No. 50	Container	Waste	,	Waste Characte	rization			Waste Disp	osition	
	Number	Description	Hazardous	Hydrocarbon	TSCA	Radioactive	Waste Volume	Disposal Pathway	Disposal Date	Disposal Document ^a
02-08-02	561B01	IDW - PPE	Nonhazardous	No	No	Nonradioactive	10 gal	Area 9 U10c Industrial Landfill	06/02/2011	LVF
	561B02	Lead	Not waste	No	No	Nonradioactive	3,320 lb	Recycle - TOXCO	TBD	BOL
	561G01	Lead	Not waste	No	No	Nonradioactive	526 lb	Recycle - TOXCO	TBD	BOL
23-21-04	561G02	Bulk Soil and Debris	Nonhazardous	Yes	No	Nonradioactive	92,480 lb	Area 9 U10c Industrial Landfill	03/24/2011 – 04/26/2011	LVF
	561G03	Bulk Soil and Debris	Nonhazardous	Yes	No	Nonradioactive	154,320 lb	Area 9 U10c Industrial Landfill	05/16/2011 – L	LVF
	561H01	Lead Batteries	Nonhazardous	No	No	Nonradioactive	8 each	Recycle - TOXCO	TBD	BOL
25-08-02	561H02	Bulk Soil and Debris	Nonhazardous	No	No	Nonradioactive	1,622,630 lb	Area 9 U10c Industrial Landfill	05/19/2011 – 05/26/2011	LVF
	561101	Bulk Debris	Nonhazardous	Yes	No ^b	Nonradioactive	33,920 lb	Area 9 U10c Industrial Landfill	05/31/2011	LVF
25-23-21	561102	LLW - Bulk Soil	Nonhazardous	20 yd ³ intermodal container	No	Radioactive LLW	31,650 lb	Area 5 RWMC	06/07/2011	CD
	561103	LLW - Bulk Soil	Nonhazardous	20 yd³ intermodal container	No	Radioactive LLW	35,520 lb	Area 5 RWMC	06/07/2011	CD

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-136 of A-156

Table A.13-1 CAU 561 Waste Disposal Summary

(Page 2 of 2)

CAS	Container	Waste		Waste Characte	rization			Waste Disp	osition	
Number	Number	Description	Hazardous	Hydrocarbon	TSCA	Radioactive	Waste Volume	Disposal Pathway	Disposal Date	Disposal Document ^a
	561J01	Soil	Nonhazardous	No	No	Nonradioactive	20 lb	Returned to sample location	05/17/2011	N/A
25-25-19	561J02	Lead	Not waste	No	No	Nonradioactive	52 lb	Recycle - TOXCO	TBD	BOL
	561J03	Bulk Soil and Debris	Nonhazardous	Yes	No ^b	Nonradioactive	31,380 lb	Area 9 U10c Industrial Landfill	05/31/2011	LVF

Notes:

BOL = Bill of lading
CD = Certificate of Disposal
HWSU = Hazardous Waste Storage Unit
IDW = Industrial-derived waste
LVF = Landfill Load Verification Form

PSDR = Package, Storage, and Disposal Request RWMC = Radioactive Waste Management Complex TBD = To be determined TSCA = Toxic Substances Control Act yd³ = Cubic yard

^aCopies of waste disposal documents are located in Appendix F of this document.

^bWaste characterized as non-PCB contaminated but waste may include PCB bulk product waste.

A.13.2.2 Hydrocarbon-Impacted Waste

Hydrocarbon-impacted waste is defined as media or debris that is contaminated with petroleum products such as gasoline, hydrocarbon lubricants, hydraulic fluids, kerosene, diesel fuel, and/or jet fuel that exceeds NAC regulatory limits of 100 mg/kg (NAC 445A.2272, "Contamination of Soil: Establishment of Action Levels" [NAC, 2008]). Hydrocarbon-impacted waste generated at CAU 561 was characterized using analytical results and radiological FSRs and was disposed of in accordance with the permit requirements and waste acceptance criteria of the Area 9 U10c industrial landfill.

A.13.2.3 Low-Level Radioactive Waste

Low-level radioactive waste is defined as a solid, liquid, or gaseous material that contains radioactive nuclides regulated under the "Atomic Energy Act of 1954," as amended (USC, 2006), and is of negligible economic value considering the cost of recovery. Radioactive waste not classified as high-level waste, spent nuclear fuel, transuranic waste, or by-product material (as defined in Section 11e.[2] of the Atomic Energy Act, or mixed waste as specified in DOE Order 435.1 [DOE, 1999]) is considered to be LLW. Low-level waste generated at CAU 561 was characterized using analytical results and process knowledge. The LLW was disposed of at the Area 5 RWMC in accordance with NNSS Waste Acceptance Criteria (NNSA/NSO, 2010a) and the conditions of NNSS Waste Profile Number LITN0000000006, Revision 14 (Di Sanza, 2011).

A.13.2.4 Recyclable Materials

Recyclable materials generated at CAU 561 included elemental lead (e.g., lead bricks, counterweights, and slag) and lead-acid batteries. The lead was characterized using process knowledge and radiological survey results. The lead materials meet the recyclable material acceptance criteria of the TOXCO Materials Management Center in Oak Ridge, Tennessee, for reuse as nuclear shielding within the DOE or U.S. commercial nuclear industry.

Page A-138 of A-156

Sections A.13.3.1 through A.13.3.5 describe the waste disposal activities completed at each CAS. No waste was generated or managed at CASs 01-19-01, 03-19-02, 05-62-01, 12-23-09, or 22-19-06. The following sections include a description of waste management samples collected during the investigation activities and used for waste characterization. The analytical suite was tailored to characterize the waste for disposal and to support recommended actions. Results were reviewed against federal and state regulations, DOE directives/policies/guidance and waste acceptance criteria for NNSS disposal facilities. Complete results (including nondetect results) for all samples are maintained in project files.

A.13.3.1 CAS 02-08-02, Waste Dump and Burn Area

Investigation activities at CAS 02-08-02 generated the following waste types:

- Recyclable lead material
- IDW solid
- Industrial waste PPE, miscellaneous debris and one empty metal drum

One pallet of recyclable lead material, weighing approximately 3,300 lb was recovered during remediation activities at CAS 02-08-02. The lead was characterized using process knowledge and radiological survey results. The pallet of lead was issued container number 561B02 for tracking purposes. The lead material will be recycled at the TOXCO Materials Management Center in Oak Ridge, Tennessee.

The PPE generated during the lead handling activities was containerized in drum number 561B01. The solid IDW was characterized using process knowledge and the results of industrial hygiene samples. The IDW was characterized as non-hazardous and non-radioactive and placed in the roll-off located at Building 23-153 for final disposal at the Area 9 U10c industrial landfill. No waste characterization samples were collected at CAS 02-08-02.

Waste disposal at CAS 02-08-02 also included miscellaneous housekeeping debris and one empty drum collected and disposed of as a BMP. The debris and empty drum were inspected and surveyed for radiological contamination. The debris and empty drum were characterized as nonhazardous and nonradioactive and transferred to the roll-off located at Building 23-153 for final disposal at the Area 9 U10c industrial landfill.

A.13.3.2 CAS 23-21-04, Waste Disposal Trenches

Investigation activities at CAS 23-21-04 generated the following waste types:

- Recyclable lead material including one 10-gal drum containing one lead brick and five lead
 counterweights. The lead was characterized using process knowledge and radiological
 survey results. The lead was issued container tracking number 561G01 for tracking
 purposes. The lead material will be recycled at the TOXCO Materials Management Center in
 Oak Ridge, Tennessee.
- Industrial waste included soil and debris excavated from Trenches 3 and 5 at CAS 23-21-04. A total of 92,480 lb of housekeeping debris and soil was excavated from Trench 5 and disposed of using container tracking number 561G02. A total of 154,320 lb of debris and soil was excavated from Trench 3 and disposed of using container tracking number 561G03. The waste was characterized using field observations, process knowledge, analytical results and radiological FSRs.

A total of 17 investigation samples and two waste management samples collected during the investigation activities were used to characterize the industrial waste generated at CAS 23-21-04. The two waste management samples were collected at sample locations G01 and G12 and analyzed for TCLP metals to verify that the metal constituents did not exceed the RCRA regulatory limits. The analytical results for both the investigation and waste management samples were reviewed to determine a recommended waste disposal path for the industrial waste generated. The sample locations and analytical results used for waste characterization are shown in Table A.13-2. Several sample locations at CAS 23-21-04 exceeded the NAC established action levels of 100 mg/kg for hydrocarbons (NAC, 2008). The industrial waste generated at CAS 23-21-04 was characterized as nonhazardous, nonradioactive, and hydrocarbon-impacted waste. The waste was disposed of at the Area 9 U10c industrial landfill.

A.13.3.3 CAS 25-08-02, Waste Dump

Investigation activities at CAS 25-08-02 generated the following waste types:

• Recyclable lead material consisted of eight lead-acid batteries. The batteries were characterized using process knowledge and radiological survey results. The batteries were packaged into container tracking number 561H01. The lead material will be recycled at the TOXCO Materials Management Center in Oak Ridge, Tennessee.

Table A.13-2
Waste Characterization Results at CAS 23-21-04, Waste Disposal Trenches

Sample Location	Sample Number	Waste Container Number	Sample Matrix	Parameter	Regulatory Criteria	Result	Units
G01 (Trench 3)	561G501	561G03	Soil	Arsenic	5	0.15 (J+)	mg/L
				Chromium		0.04 (J-)	
G05 (Trench 3)	561G005			TPH-DRO	100	160	mg/kg
G06 (Trench 3)	561G006					270	
G12 (Trench 5)	561G013	561G02				170	
	561G502	561G03		Cadmium	1	0.005 (J-)	mg/L
				Lead	5	0.039 (J-)	

mg/L = Milligrams per liter

Remediation activities at CAS 25-08-02 generated a total of 1,622,630 lb of industrial waste, including soil and housekeeping debris excavated and disposed of using container tracking number 561H02. The waste was characterized using field observations, process knowledge, analytical results, and radiological FSRs.

A total of 16 investigation samples and two waste management samples collected during the investigation activities were used to characterize the industrial waste generated at CAS 25-08-02. Waste management sample 561H501 was collected at sample location H03 and analyzed for TCLP metals to verify that the metals constituents did not exceed the RCRA regulatory limits. Waste management sample 561H502 was collected at sample location H14 and analyzed for TCLP mercury verify that mercury did not exceed the RCRA regulatory limits (Table A.13-3). The analytical results for both investigation and waste management samples were reviewed to determine a recommended waste disposal path for the industrial waste generated. There were no analytical results that exceeded RCRA regulatory requirements or the waste acceptance criteria for the Area 9 U10c industrial landfill. Sample number 561H007 exceeded the NAC established action levels for hydrocarbon-impacted waste (NAC, 2008); however, the elevated hydrocarbon results were attributed to the asphalt content at this sample location. There were also some miscellaneous debris items (e.g., wire sheathing, painted concrete) that were characterized as potentially containing PCB bulk product waste. The industrial waste generated at CAS 25-08-02 was characterized as

J+ = Result is an estimated quantity, but may be biased high.

J- = Result is an estimated quantity, but may be biased low.

Table A.13-3
Waste Characterization Results at CAS 25-08-02, Waste Dump

Sample Location	Sample Number	Waste Container Number	Sample Matrix	Parameter	Regulatory Criteria	Result	Units
H03	561H501	561H02	Soil	Arsenic	5	0.26	mg/L
H14	561H502	3011102	5011	Mercury	0.2	0.028 (J)	mg/L

J = Estimated value

nonhazardous, nonradioactive, and non-hydrocarbon-impacted that contains PCB bulk product waste. The waste met the waste acceptance criteria of the Area 9 U10c industrial landfill and was disposed of at the Area 9 industrial landfill.

A.13.3.4 CAS 25-23-21, Radioactive Waste Dump

Investigation activities at CAS 25-23-21 generated the following waste types:

- Industrial waste
- Low-level radioactive waste

Remediation activities at CAS 25-23-21 generated a total of 33,920 lb of industrial waste consisting of soil and debris excavated and disposed of using container tracking number 561J03. The waste was characterized using field observations, process knowledge, analytical results and radiological FSRs.

A total of six investigation samples collected during the investigation activities were used to characterize the industrial waste generated at CAS 25-23-21. The analytical results were reviewed to determine a recommended waste disposal path for the industrial waste generated. There were no analytical results that exceeded RCRA regulatory requirements or the waste acceptance criteria for the Area 9 U10c industrial landfill. Several of the debris items including the plastic wire sheathing, tar paper, and roofing shingles were characterized as containing PCB bulk product waste and hydrocarbons. Therefore, the industrial waste generated at CAS 25-23-21 was characterized as nonhazardous, nonradioactive waste that is hydrocarbon-impacted and contains PCB bulk product waste. The waste was disposed of at the Area 9 U10c industrial landfill.

Remediation activities at CAS 25-23-21 generated a total of 62,170 lb of LLW consisting of remediated soil excavated from two radiologically posted areas. The waste was packaged into

two intermodal bulk containers and issued container tracking numbers 561I02 and 561I03. The waste was characterized using analytical results and radiological FSRs.

A total of four samples collected during the investigation activities were used to characterize the LLW generated at CAS 25-23-21. The analytical results were reviewed to determine a recommended waste disposal path for the waste generated. There were no analytical results that exceeded RCRA regulatory limits, TSCA PCB regulatory limits, or the NAC established action levels for hydrocarbon-impacted waste requirements. Therefore, the waste was characterized as nonhazardous, non-hydrocarbon-impacted, and non-PCB contaminated waste. The results of the radiochemical analysis exceeded the waste acceptance criteria for the Area 9 U10c industrial landfill. Therefore, the waste was characterized as LLW. The sample locations and analytical results exceeding waste characterization are shown in Table A.13-4. The waste was disposed of at the Area 5 RWMC.

Waste disposal at CAS 25-23-21 also included two pieces of cast-iron pipes that were identified during investigation activities. The pipes were characterized as low-level radioactive surface contaminated objects based on radiological FSRs. The LLW piping was wrapped in plastic, transferred, and consolidated into container number 566007. Container 566007 will be shipped to the Area 5 RWMC for direct disposal when filled to capacity.

Table A.13-4
Waste Characterization Results at CAS 25-23-21, Radioactive Waste Dump

Sample Location	Sample Number	Waste Container Number	Sample Matrix	Parameter	Regulatory Criteria	Result	Units
			Co-60	Co-60		1.77 (G)	
130	5611033	561102	561I02 561I03 Soil	Cs-137	100	392	nCi/a
(RMA)	(RMA) 5611034 ^a	561103		Nb-94	100	3.26 (G)	pCi/g
				U-235		3.9 (G)	

^aSample number 5611004 is an FD of sample number 5611033

G = Sample density differs by more than 15% of laboratory control sample (LCS) density.

A.13.3.5 CAS 25-25-19, Hydrocarbon Stains and Trench

Investigation activities at CAS 25-25-19 generated the following waste types:

- Recyclable lead material including one, 10-gal drum containing two lead bricks. The lead
 was characterized using process knowledge and radiological survey results. The drum of lead
 was issued container tracking number 561J02. The lead material will be recycled at the
 TOXCO Materials Management Center in Oak Ridge, Tennessee.
- Industrial waste, including soil and debris excavated from CAS 25-25-19. A total of 31,380 lb of housekeeping debris and soil was removed for disposal using container tracking number 561J03. The waste was characterized using field observations, process knowledge, analytical results, and radiological FSRs.

A total of 11 samples collected during the investigation activities were used to characterize the industrial waste generated at CAS 25-25-19. The analytical results were reviewed to determine a recommended waste disposal path for the industrial waste generated. There were no analytical results that exceeded RCRA regulatory limits or TSCA PCB regulatory limits. The results of the radiochemical analysis indicated no radionuclides exceeded the waste acceptance criteria of the Area 9 U10c industrial landfill. Three sample locations at CAS 25-25-19 exceeded the NAC established action levels for hydrocarbons (NAC, 2008). Sample results used for waste characterization are shown in Table A.13-5. The industrial waste generated at CAS 25-25-19 was characterized as nonhazardous, nonradioactive, non-PCB contaminated, and hydrocarbon-impacted waste. The waste was disposed of at the Area 9 U10c industrial landfill.

Waste disposal at CAS 25-25-19 also included one drum of soil remediated from beneath the lead bricks. The soil was placed into drum number 561J01 for tracking purposes. The solid IDW was characterized using analytical results of sample numbers 561J019 and 561J021. The analytical results indicated that there were no results that exceeded RCRA regulatory limits, TSCA PCB regulatory limits, or the NAC established action levels for hydrocarbon-impacted soil. The results of the radiochemical analysis indicate that there were no radionuclides in this soil. Therefore, the waste was characterized as nonradioactive, nonhazardous, non-hydrocarbon-impacted, and non-PCB contaminated industrial solid waste; and the soil was returned to the original sample location.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-144 of A-156

Table A.13-5
Waste Characterization Results at CAS 25-25-19, Hydrocarbon Stains and Trench

Sample Location	Sample Number	Waste Container Number	Sample Matrix	Parameter	Regulatory Criteria	Result	Units		
	561J007					730			
J05	561J008			TPH-DRO	100	1,900	mg/kg		
	561J009					850			
		561J03	Soil	Barium	100	3.7 (J)			
J14	561J019	301303	3011		00	Cadmium	1	0.013	
				Lead	5	0.96 (J)	mg/L		
J15	561J021			Barium	100	8.1 (J)			
313	3013021			Lead	5	1.9 (J)			

J = Estimated value

A.14.0 Quality Assurance

This section contains a summary of QA/QC measures implemented during the sampling and analysis activities conducted in support of the CAU 561 CAI. The following sections discuss the data validation process, QC samples, and nonconformances. A detailed evaluation of the DQIs is presented in Appendix B.

Laboratory analyses were conducted for samples used in the decision-making process to provide a quantitative measurement of any COPCs present. Rigorous QA/QC was implemented for all laboratory samples, including documentation, verification and validation of analytical results, and affirmation of DQI requirements related to laboratory analysis. Detailed information regarding the QA program is contained in the Industrial Sites QAPP (NNSA/NV, 2002a).

A.14.1 Data Validation

Data validation was performed in accordance with the Industrial Sites QAPP and approved protocols and procedures. All laboratory data from samples collected and analyzed for CAU 561 were evaluated for data quality in a tiered process and are presented in Sections A.14.1.1 through A.14.1.3. Data were reviewed to ensure that samples were appropriately processed and analyzed, and the results were evaluated using validation criteria. Documentation of the data qualifications resulting from these reviews is retained in project files as a hard copy and electronic media.

All of the data analyzed as part of this investigation were subjected to Tier II evaluations. A Tier III evaluation was performed on approximately 5 percent of the data analyzed.

A.14.1.1 Tier I Evaluation

Tier I evaluation for chemical and radiochemical analysis examines, but is not limited to, the following:

- Sample count/type consistent with chain of custody.
- Analysis count/type consistent with chain of custody.
- Correct sample matrix.
- Significant problems and/or nonconformances stated in cover letter or case narrative.
- Completeness of certificates of analysis.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-146 of A-156

- Completeness of Contract Laboratory Program (CLP) or CLP-like packages.
- Completeness of signatures, dates, and times on chain of custody.
- Condition-upon-receipt variance form included.
- Requested analyses performed on all samples.
- Date received/analyzed given for each sample.
- Correct concentration units indicated.
- Electronic data transfer supplied.
- Results reported for field and laboratory QC samples.
- Whether or not the deliverable met the overall objectives of the project.

A.14.1.2 Tier II Evaluation

Tier II evaluation for chemical analysis examines, but is not limited to, the following:

- Correct detection limits achieved.
- Sample date, preparation date, and analysis date for each sample.
- Holding time criteria met.
- Quality control batch association for each sample.
- Cooler temperature upon receipt.
- Sample pH for aqueous samples, as required.
- Detection limits properly adjusted for dilution, as required.
- Blank contamination evaluated and applied to sample results/qualifiers.
- Matrix spike (MS)/matrix spike duplicate (MSD) percent recoveries (%R) and relative percent differences (RPDs) evaluated and qualifiers applied to laboratory results, as necessary.
- Field duplicate RPDs evaluated using professional judgment and qualifiers applied to laboratory results, as necessary.
- Laboratory duplicate RPDs evaluated and qualifiers applied to laboratory results, as necessary.
- Surrogate %R evaluated and qualifiers applied to laboratory results, as necessary.
- Laboratory control sample %R evaluated and qualifiers applied to laboratory results, as necessary.

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-147 of A-156

- Initial and continuing calibration evaluated and qualifiers applied to laboratory results, as necessary.
- Internal standard evaluation.
- Mass spectrometer tuning criteria.
- Organic compound quantitation.
- Inductively coupled plasma interference check sample evaluation.
- Graphite furnace atomic absorption QC.
- Inductively coupled plasma serial dilution effects.
- Recalculation of 10 percent of laboratory results from raw data.

Tier II evaluation for radiochemical analysis examines, but is not limited to, the following:

- Correct detection limits achieved.
- Blank contamination evaluated and, if significant, qualifiers are applied to sample results.
- Certificate of Analysis consistent with data package documentation.
- Quality control sample results (duplicates, LCSs, laboratory blanks) evaluated and used to determine laboratory result qualifiers.
- Sample results, uncertainty, and MDC evaluated.
- Detector system calibrated with National Institute of Standards and Technology (NIST)traceable sources.
- Calibration sources preparation was documented, demonstrating proper preparation and appropriateness for sample matrix, emission energies, and concentrations.
- Detector system response to daily or weekly background and calibration checks for peak energy, peak centroid, peak full-width half-maximum, and peak efficiency, depending on the detection system.
- Tracers NIST-traceable, appropriate for the analysis performed, and recoveries that met QC requirements.

- Documentation of all QC sample preparation complete and properly performed.
- Spectra lines, photon emissions, particle energies, peak areas, and background peak areas support the identified radionuclide and its concentration.

A.14.1.3 Tier III Evaluation

The Tier III review is an independent examination of the Tier II evaluation. A Tier III review of 5 percent of the sample analytical data was performed by Analytical Quality Associates, of Albuquerque, New Mexico. Tier II and Tier III results were compared and where differences are noted, data were reviewed and changes were made accordingly. This review included the following additional evaluations:

Review:

- case narrative, chain of custody, and sample receipt forms,
- lab qualifiers (applied appropriately),
- method of analyses performed as dictated by the chain of custody,
- raw data, including chromatograms, instrument printouts, preparation logs, and analytical logs,
- manual integrations to determine whether the response is appropriate, and
- data package for completeness.
- Determine sample results qualifiers through the evaluation of (but not limited to):
 - tracers and QC sample results (e.g., duplicates, LCSs, blanks, MSs) evaluated and used to determine sample results qualifiers,
 - sample preservation, sample preparation/extraction and run logs, sample storage, and holding time,
 - instrument and detector tuning,
 - initial and continuing calibrations,
 - calibration verification (initial, continuing, second source),

CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-149 of A-156

- retention times,
- second column and/or second detector confirmation,
- mass spectra interpretation,
- interference check samples and serial dilutions,
- post-digestion spikes and method of standard additions, and
- breakdown evaluations.
- Perform calculation checks of:
 - at least one analyte per QC sample and its recovery,
 - at least one analyte per initial calibration curve, continuing calibration verification, and second source recovery, and
 - at least one analyte per sample that contains positive results (hits); radiochemical results only require calculation checks on activity concentrations (not error).
- Verify that target compound detects identified in the raw data are reported on the results form.
- Document any anomalies for the laboratory to clarify or rectify. The contractor should be notified of any anomalies.

A.14.2 Field QC Samples

Field QC samples consisted of 38 trip blanks, 8 equipment rinsate blanks, 10 field blanks, 1 source blank, 18 FLQCs, and 18 FDs collected and submitted for analysis by the laboratory analytical methods shown in Table A.2-2. The QC samples were assigned individual sample numbers and sent to the laboratory "blind." Additional samples were selected by the laboratory to be analyzed as laboratory duplicates.

Field blanks, source blanks, and equipment rinsates were analyzed for the applicable parameters listed in Table A.2-2 and trip blanks were analyzed for VOCs only.

During the CAI, 18 FDs were sent as blind samples to the laboratory to be analyzed for the investigation parameters listed in Table A.2-2. For these samples, the duplicate results precision

(i.e., RPDs between the environmental sample results and their corresponding FD sample results)

were evaluated.

A.14.2.1 Laboratory QC Samples

Analysis of QC preparation blanks (PBs) was performed on each sample delivery group (SDG) for

inorganics. Analysis for surrogate spikes and method blanks was performed on each SDG for

organics. Initial and continuing calibration and LCSs were performed for each SDG. The results of

these analyses were used to qualify associated environmental sample results. Documentation of data

qualifications resulting from the application of these guidelines is retained in project files as both hard

copy and electronic media.

The laboratory included a PB, LCS, and a laboratory duplicate sample with each batch of field

samples analyzed for radionuclides.

A.14.3 Field Discrepancies

There were eight field discrepancies identified for the CAI. Four discrepancies involved paperwork

issues (e.g., omitting the purchase order number and sample team members, omitting to note that

samples were relinquished to secure storage). One discrepancy involved not indicating on the COC

which sample was designated for a full-lab QC, although it was noted on the sample collection log

and the laboratory was notified by e-mail. One discrepancy was noted between the COC and bottle

labels; the lab was notified that the bottle labels were correct and the COC was corrected. The last

two discrepancies involved sample shipments. One of two 16-ounce sample jars was received by the

laboratory broken, but the soil was contained within shipping baggie and the unbroken jar was used

for the analysis. None of these discrepancies affected the validity or completeness of sample results.

A.14.4 Laboratory Nonconformances

Laboratory nonconformances are generally due to inconsistencies in the analytical instrumentation

operation, sample preparations, extractions, missed holding times, and fluctuations in internal

standard and calibration results. These laboratory nonconformances have been accounted for and

resolved during the data qualification process.

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A.15.0 Summary

Organic, inorganic and radionuclide contaminants detected in environmental samples during the CAI were evaluated against FALs to determine the nature and extent of COCs for CAU 561. Assessment of the data generated from investigation activities are presented in the following subsections for each CAS.

CAS 01-19-01, Waste Dump

Based on the observations made, the geophysical and radiological surveys previously conducted, and the analytical results of the environmental samples collected at this CAS, no contamination at concentrations exceeding FALs has been released to the soil at this CAS. Therefore, no further action is required at this CAS.

CAS 02-08-02, Waste Dump and Burn Area

Based on analytical results for soil samples collected at this CAS, PAHs benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, and dibenzo(ah)anthrancene are present at concentrations exceeding FALs in four of the waste piles. Polyaromatic hydrocarbon concentrations exceeding FALs are also present in surface and shallow surface soil in the burn area, but the PAHs are attributed to industrial asphalt paving that was present throughout the entire Area 2 camp and are not considered to originate from a release associated with activities at this CAS. Based on the presence of PAH contamination at the waste piles, and the melted lead observed at the burn area, a corrective action is required. The CAA of closure in place with an FFACO UR was implemented at this CAS.

CAS 03-19-02, Debris Pile

Based on the observations made, the radiological surveys previously conducted, and the analytical results of the environmental samples collected at this CAS, no contamination at concentrations exceeding FALs has been released to the soil at this CAS. Therefore, the corrective action of no further action was selected for this CAS.

CAU 561 CADD/CR Appendix A

Revision: 0 Date: August 2011 Page A-152 of A-156

CAS 05-62-01, Radioactive Gravel Pile

Based on the observations made, the radiological surveys previously conducted, and the analytical results of the environmental samples collected at this CAS, no contamination at concentrations exceeding FALs has been released to the soil at this CAS. Therefore, no further action is required at this CAS.

CAS 12-23-09, Radioactive Waste Dump

Based on the observations made, the geophysical and radiological surveys previously conducted, and the analytical results of the environmental samples collected at this CAS, no contamination at concentrations exceeding FALs has been released to the soil at this CAS. Therefore, no further action is required at this CAS.

CAS 22-19-06, Buried Waste Disposal Site

Based on the observations made, the geophysical surveys previously conducted, and the analytical results of the environmental samples collected at this CAS, no contamination at concentrations exceeding FALs has been released to the soil at this CAS. Therefore, no further action is required at this CAS.

CAS 23-21-04, Waste Disposal Trenches

Based on analytical results for soil samples collected at this CAS, arsenic, hexavalent chromium, and PCB contamination at concentrations exceeding FALs have been released to the surface and subsurface soil within Trench 3, while arsenic contamination at concentrations exceeding FALs was released to the soil within Trench 5. Based on the presence of COCs, a corrective action is required. The corrective action of clean closure was implemented at this site. All PCB, arsenic and hexavalent chromium contaminated soil was removed from Trenches 3 and 5 as evidenced from the verification samples. The soil and debris within the trenches was disposed of at the industrial waste landfill. Lead brick and lead counterweights present at this site were removed for recycling. Verification samples showed that no lead concentrations in remaining soil exceed FALs. As a BMP, all trenches were backfilled with clean soil, and debris from in and around the trenches was removed and disposed of. No further corrective actions are required for this site.

CAS 25-08-02, Waste Dump

Based on analytical results for soil samples collected at this CAS, arsenic contamination at concentrations exceeding FALs was not released to the surface soil beneath the concrete-like material, although the contamination did exist within the material. Based on the presence of a COC, a corrective action is required. The corrective action of clean closure was implemented at this CAS. The arsenic-contaminated concrete-like material was removed and disposed of at the industrial waste landfill. Lead-acid batteries present at this site were removed for recycling. Verification samples showed that no lead concentrations in remaining soil exceed FALs. As a BMP, the remaining piles of soil, asphalt, and construction debris were removed and disposed of, and the area was back dragged level with the ground surface. No further corrective actions are required for this site.

CAS 25-23-21, Radioactive Waste Dump

Based on analytical results for soil samples collected at this CAS, Cs-137 and PCB contamination at concentrations exceeding FALs has been released to the surface and shallow subsurface soil within the pile at the southern RMA at the main waste dump site. At the second parcel, no contamination was released from any of the piles. Based on the presence of COCs at the main waste dump, a corrective action is required. The corrective action of clean closure was implemented at this site. Contaminated pipes observed within the northern and southern RMAs were removed and disposed of as LLW. The RMAs were removed and also disposed of as LLW. As BMPs, the remaining piles at the main waste dump near the road were leveled to ground surface, and debris at the second parcel was picked up and disposed of as industrial waste. No further corrective actions are required for this site.

CAS 25-25-19, Hydrocarbon Stains and Trench

Based on analytical results of the environmental samples collected at this CAS, no contamination at concentrations exceeding FALs has been released to the soil at this CAS. However, lead bricks were present at this site and were removed under the corrective action of clean closure. Verification samples showed that no lead concentrations in remaining soil exceed FALs. Therefore, no further corrective action is required at this CAS. As a BMP, the hydrocarbon-burdened soil and some debris was removed and disposed of at the U10c industrial landfill.

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CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-155 of A-156

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CAU 561 CADD/CR Appendix A Revision: 0 Date: August 2011 Page A-156 of A-156

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Appendix B Data Assessment

CAU 561 CADD/CR

Appendix B Revision: 0

Date: August 2011 Page B-1 of B-19

B.1.0 Data Assessment

The DQA process is the scientific evaluation of the actual investigation results to determine whether

the DQO criteria established in the CAU 561 CAIP (NNSA/NSO, 2008) were met and whether DQO

decisions can be resolved at the desired level of confidence. The DQO process ensures that the right

type, quality, and quantity of data will be available to support the resolution of those decisions at an

appropriate level of confidence. Using both the DQO and DQA processes help to ensure that DQO

decisions are sound and defensible.

The DQA involves five steps that begin with a review of the DQOs and end with an answer to the

DQO decisions. The five steps are briefly summarized as follows:

Step 1: Review DQOs and Sampling Design – Review the DQO Process to provide context for

analyzing the data. State the primary statistical hypotheses; confirm the limits on decision errors for

committing false negative (Type I) or false positive (Type II) decision errors; and review any special

features, potential problems, or deviations to the sampling design.

Step 2: Conduct a Preliminary Data Review – Perform a preliminary data review by reviewing QA

reports and inspecting the data both numerically and graphically, validating and verifying the data to

ensure that the measurement systems performed in accordance with the criteria specified, and using

the validated dataset to determine whether the quality of the data is satisfactory.

Step 3: Select the Test – Select the test based on the population of interest, population parameter,

and hypotheses. Identify the key underlying assumptions that could cause a change in one of the

DOO decisions.

Step 4: Verify the Assumptions – Perform tests of assumptions. If data are missing or are censored,

determine the impact on DQO decision error.

Step 5: Draw Conclusions from the Data – Perform the calculations required for the test.

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CAU 561 CADD/CR Appendix B

Revision: 0
Date: August 2011

Page B-2 of B-19

B.1.1 Review DQOs and Sampling Design

This section contains a review of the DQO process presented in Appendix A of the CAIP

(NNSA/NSO, 2008). The DQO decisions are presented with the DQO provisions to limit false

negative or false positive decision errors. Special features, potential problems, or any deviations to

the sampling design are also presented.

B.1.1.1 Decision I

The Decision I statement as presented in the CAIP (NNSA/NSO, 2008) is as follows: "Is any

contaminant of potential concern (COPC) present in environmental media at a concentration

exceeding its corresponding final action level (FAL)?"

Decision I Rules

• If the population parameter of any COPC in a target population exceeds the FAL for that

COPC, then that COPC is identified as a COC.

• If a COC is detected, then the Decision II statement must be resolved.

• If COCs are not identified, then the investigation is complete.

B.1.1.1.1 DQO Provisions To Limit False Negative Decision Error

A false negative decision error (where consequences are more severe) was controlled by meeting the

following criteria:

1. Having a high degree of confidence that locations selected will identify COCs if present

anywhere within the CAS.

2. Having a high degree of confidence that analyses conducted will be sufficient to detect any

COCs present in the samples.

3. Having a high degree of confidence that the dataset is of sufficient quality and completeness.

UNCONTROLLED When Printed

CAU 561 CADD/CR Appendix B Revision: 0 Date: August 2011 Page B-3 of B-19

Criterion 1

The following methods (stipulated in the CAU 561 DQOs [NNSA/NSO, 2008]) were used in selecting sample locations.

- 1. Sample locations associated with radiation survey and FSRs were selected by analyzing samples for alpha and beta/gamma emitting radionuclides using a hand-held NE Technology Electra.
- 2. Selection of sample locations identified during geophysical surveys that indicated subsurface metallic debris was accomplished by trenching through the anomalies to visually identify the buried debris and potentially impacted soil.
- 3. Sample locations at CASs 02-08-02, 12-23-09, 25-08-02, and 25-23-21 were predetermined using the VSP software (PNNL, 2005).
- 4. Selection of sampling locations associated with surface and subsurface staining, odors, presence of debris, and other items was accomplished by visual field observations.
- 5. Selection of sampling locations associated with professional judgment based on acceptable knowledge was accomplished by the following:
 - Source and location of release
 - Chemical nature and fate properties
 - Physical transport pathways and properties
 - Transport/hydrologic drivers

Criterion 2

Samples were analyzed using the analytical methods listed in Tables 3-4 and 3-5 of the CAIP (NNSA/NSO, 2008) and for the chemical and radiological parameters listed in Section A.3.2.2 of the CAIP. Table B.1-1 provides a reconciliation of analyses and planned analytical program.

Samples were submitted for all of the analytical methods specified in the analytical program specified in Section 3.4 of the CAIP.

Sample results were assessed against the acceptance criterion for the DQI of sensitivity as defined in the Industrial Sites QAPP (NNSA/NV, 2002). The sensitivity acceptance criterion defined in the CAIP is that analytical detection limits will be less than the corresponding action level (NNSA/NSO, 2008). This criterion was not achieved for the analytical results listed in Table B.1-2.

Table B.1-1 CAU 561 Analyses Performed

CAS	Beryllium	Dioxins	TPH-DRO	Gamma	Hexavalent Chromium	Metals	PCBs	Isotopic Pu	Sr-90	SVOCs	Isotopic U	VOCs
01-19-01	RS		S	RS	RS	RS	RS			RS		RS
02-08-02	RS	RSª	S	RS	RS	RS	RS			RS		RS
03-19-02				RS								
05-62-01				RS				RS	RS		RS	
12-23-09	RS		S	RS	RS	RS	RS			RS		RS
22-19-06	RS		S	RS	RS	RS	RS			RS		RS
23-21-04	RS		S	RS	RS	RS	RS			RS		RS
25-08-02	RS		S	RS	RS	RS	RS			RS		RS
25-23-21	RS		S	RS	RS	RS	RS			RS		RS
25-25-19	RS		S	RS	RS	RS	RS			RS		RS

^aBurn Area only

RS = Required and submitted

S = Submitted but not required

Table B.1-2
Analytes Failing Sensitivity Criteria

Constituent	CAS	MDC (mg/kg)	FAL (mg/kg)
Benzo(a)pyrene		0.27	0.21
Dibenzo(ah)anthracene		0.27	0.21
n-Nitroso di-n-propylamine	25-08-02	0.27	0.25
Benzo(a)pyrene	25-00-02	0.25	0.21
Dibenzo(ah)anthracene		0.25	0.21
n-Nitroso di-n-propylamine		0.25	0.25

Results not meeting the sensitivity acceptance criterion will not be used in making DQO decisions and will therefore be considered as rejected data. The impact on DQO decisions is addressed in the assessment of completeness.

^{-- =} Not required and not submitted

Criterion 3

To satisfy the third criterion, the entire dataset, as well as individual sample results, were assessed against the acceptance criteria for the DQIs of precision, accuracy, comparability, completeness, and representativeness, as defined in the Industrial Sites QAPP (NNSA/NV, 2002). The DQI acceptance criteria are presented in Table 6-1 of the CAIP (NNSA/NSO, 2008). As presented in Tables B.1-3 through B.1-5, these criteria were met for each the DQIs.

Precision

Precision was evaluated as described in Section 6.2 of the CAIP (NNSA/NSO, 2008). Table B.1-3 provides the chemical and radiological precision analysis results for all constituents that were qualified for precision. The chemical analytes qualified for precision were cadmium and lead. The only radionuclide qualified for precision was Cs-137.

Table B.1-3
Precision Measurements

Contaminant	Analysis	Number of Measurements Qualified	Number of Measurements Performed	Percent within Criteria
Cadmium	Metals	14	182	92.3076
Cs-137	Gamma	15	164	90.8536
Lead	Metals	49	182	73.0769

As shown in Table B.1-3, the precision rate for cadmium and Cs-137 were above the CAIP acceptance criterion of 80 percent. The precision rate for lead of 73 percent can be attributed to the nature of the melted lead distributed throughout the soil as solid particles resulting in a non-homogenous distribution throughout the soil samples. For the samples qualified for precision, more than half were located at CAS 02-08-02 where melted lead was observed. As the precision rates for all other constituents meet the acceptance criteria for precision, the dataset is determined to be acceptable for the DQI of precision.

<u>Accuracy</u>

Accuracy was evaluated as described in Section 6.2 of the CAIP (NNSA/NSO, 2008). Table B.1-4 provides the chemical accuracy analysis results for all constituents qualified for accuracy. Accuracy rates are above the CAIP criterion of 80 percent, except for hexavalent chromium, which has a rate of 58.7 percent. Because the stability of hexavalent chromium is governed by the redox potential of the matrix, spiked failures do not necessarily imply failed laboratory performance. The LCS recoveries were in control, demonstrating acceptable method performance. There were no radiological data qualified for accuracy. As the accuracy rate for all other constituents exceed the acceptance criteria for accuracy, the dataset is determined to be acceptable for the DQI of accuracy.

Table B.1-4
Accuracy Measurements
(Page 1 of 2)

Contaminant	Number of Measurements Qualified	Number of Measurements Performed	Percent within Criteria
2,3,4,6-Tetrachlorophenol	1	164	99.4
2,4,5-Trichlorophenol	1	164	99.4
2,4,6-Trichlorophenol	1	164	99.4
2,4-Dimethylphenol	1	164	99.4
2-Chlorophenol	1	164	99.4
2-Methylphenol	1	164	99.4
2-Nitrophenol	1	164	99.4
3-Methylphenol	1	164	99.4
4-Nitrophenol	1	164	99.4
Benzoic acid	1	164	99.4
Benzyl alcohol	1	164	99.4
Pentachlorophenol	1	164	99.4
Phenol	1	164	99.4
TPH-DRO	1	133	99.2
1,1-Dichloroethene	2	133	98.5
2-Butanone	2	133	98.5
Acetone	2	133	98.5
Benzene	2	133	98.5

Table B.1-4
Accuracy Measurements

(Page 2 of 2)

Contaminant	Number of Measurements Qualified	Number of Measurements Performed	Percent within Criteria
Toluene	3	133	97.7
Chlorobenzene	4	133	97
Trichloroethene	4	133	97
Cadmium	14	182	92.3
Lead	33	182	81.9
Hexavalent chromium	57	138	58.7

<u>Representativeness</u>

The DQO process as identified in Appendix A of the CAIP (NNSA/NSO, 2008) was used to address sampling and analytical requirements for CAU 561. During this process, appropriate locations were selected that enabled the samples collected to be representative of the population parameters identified in the DQO (the most likely locations to contain contamination and locations that bound COCs). The sampling locations identified in the Criterion 1 discussion meet this criterion. Therefore, the analytical data acquired during the CAU 561 CAI are considered representative of the population parameters.

Comparability

Field sampling, as described in the CAIP (NNSA/NSO, 2008), was performed and documented in accordance with approved procedures that are comparable to standard industry practices. Approved analytical methods and procedures per DOE were used to analyze, report, and validate the data. These are comparable to other methods used not only in industry and government practices, but most importantly are comparable to other investigations conducted for the NNSS. Therefore, project datasets are considered comparable to other datasets generated using these same standardized DOE procedures, thereby meeting DQO requirements.

Also, standard, approved field and analytical methods ensured that data were appropriate for comparison to the investigation action levels specified in the CAIP.

Completeness

The CAIP (NNSA/NSO, 2008) defines acceptable criteria for completeness to be that the dataset is sufficiently complete to be able to make the DQO decisions. This is initially evaluated as 80 percent of CAS-specific non-critical analytes identified in the CAIP having valid results and 100 percent of critical analytes (including Decision II samples) having valid results. Critical chemical analytes for CAU 561 are identified as lead at CASs 02-08-02, 23-21-04, and 25-08-02. Critical radiological analytes are identified as gamma-emitters and isotopic U at CASs 03-19-02, 05-62-01, and 25-23-21.

Rejected data (either qualified as rejected or data that failed the criterion of sensitivity) were not used in the resolution of DQO decisions and are not counted toward meeting the completeness acceptance criterion. Table B.1-5 provides the rejected data for the site. The VOC 1,4-dioxane fell below the completeness criteria of 80 percent as indicated in Table 6-1 of the CAIP. This constituent has not been detected at the NNSS; as a result, there is no reason to suspect the presence of 1,4-dioxane at any of the CAU 561 CASs. Therefore, the absence of usable results for 1,4-dioxane does not preclude the resolution of the DQO decisions. The dataset for CAU 561 has met the general completeness criteria as sufficient information is available to make the DQO decisions. The DQI criteria of 100 percent for targeted contaminants were met.

Table B.1-5
Rejected Measurements
(Page 1 of 3)

Constituent	Analysis	Number of Measurements Qualified	Number of Measurements Performed	Percent within Criteria
2,3,4,6-Tetrachlorophenol	SVOCs	1	164	99.4
2,4,5-Trichlorophenol	SVOCs	1	164	99.4
2,4,6-Trichlorophenol	SVOCs	1	164	99.4
2,4-Dimethylphenol	SVOCs	1	164	99.4
2-Chlorophenol	SVOCs	1	164	99.4
2-Methylphenol	SVOCs	1	164	99.4
2-Nitrophenol	SVOCs	1	164	99.4
3-Methylphenol	SVOCs	1	164	99.4
4-Nitrophenol	SVOCs	1	164	99.4
Benzoic acid	SVOCs	1	164	99.4

CAU 561 CADD/CR Appendix B Revision: 0
Date: August 2011
Page B-9 of B-19

Table B.1-5 Rejected Measurements (Page 2 of 3)

Constituent	Analysis	Number of Measurements Qualified	Number of Measurements Performed	Percent within Criteria
Benzyl alcohol	SVOCs	1	164	99.4
Pentachlorophenol	SVOCs	1	164	99.4
Phenol	SVOCs	1	164	99.4
1,1,2,2-Tetrachloroethane	VOCs	1	133	99.2
1,2,4-Trichlorobenzene	VOCs	1	133	99.2
1,2,4-Trimethylbenzene	VOCs	1	133	99.2
1,2-Dibromo-3-chloropropane	VOCs	1	133	99.2
1,2-Dichlorobenzene	VOCs	1	133	99.2
1,3,5-Trimethylbenzene	VOCs	1	133	99.2
1,3-Dichlorobenzene	VOCs	1	133	99.2
1,4-Dichlorobenzene	VOCs	1	133	99.2
2-Chlorotoluene	VOCs	1	133	99.2
n-Butylbenzene	VOCs	1	133	99.2
n-Propylbenzene	VOCs	1	133	99.2
p-Isopropyltoluene	VOCs	1	133	99.2
sec-Butylbenzene	VOCs	1	133	99.2
tert-Butylbenzene	VOCs	1	133	99.2
Benzo(a)pyrene	SVOCs	3	164	98.2
Benzo(b)fluoranthene	SVOCs	3	164	98.2
Benzo(ghi)perylene	SVOCs	3	164	98.2
Benzo(k)fluoranthene	SVOCs	3	164	98.2
Bis(2-ethylhexyl)phthalate	SVOCs	3	164	98.2
Dibenzo(ah)anthracene	SVOCs	3	164	98.2
Indeno(1,2,3-cd)pyrene	SVOCs	3	164	98.2
Benzo(a)anthracene	SVOCs	4	164	97.6
Butyl benzyl phthalate	SVOCs	4	164	97.6
Chrysene	SVOCs	4	164	97.6

Table B.1-5 Rejected Measurements

(Page 3 of 3)

Constituent	Analysis	Number of Measurements Qualified	Number of Measurements Performed	Percent within Criteria
Di-n-octyl phthalate	SVOCs	4	164	97.6
Pyrene	SVOCs	4	164	97.6
1,4-Dioxane	VOCs	74	133	44.4

B.1.1.1.2 DQO Provisions To Limit False Positive Decision Error

The false positive decision error was controlled by assessing the potential for false positive analytical results. Quality assurance/QC samples such as field blanks, trip blanks, LCSs, and method blanks were used to determine whether a false positive analytical result may have occurred. This provision is evaluated during the validation process, and appropriate qualifications are applied to the data results when applicable. Proper decontamination of sampling equipment and the use of certified clean sampling equipment and containers also minimized the potential for cross contamination that could lead to a false positive analytical result.

B.1.1.2 Decision II

Decision II as presented in the CAIP (NNSA/NSO, 2008) is as follows: "If a COC is present, is sufficient information available to evaluate appropriate CAAs?" Sufficient information is defined to include the following:

- Identifying the volume of media containing any COC bounded by analytical sample results in lateral and vertical directions.
- The information needed to determine potential remedial waste types.

Decision Rules

- If the observed concentration of any COC in a Decision II sample exceeds the FAL, then additional samples will be collected to complete the determination of the extent.
- If observed COC concentrations in a sample from all bounding directions are less than the FAL/PALs, then the decision will be that the extent of contamination has been defined in the lateral and/or vertical direction.
- If wastes are to be generated as part of a corrective action, samples will be collected to sufficiently characterize the potential wastes.

<u>Population Parameters</u> – The population parameters for Decision II data will be the observed concentration of each unbounded COC in any sample or the observed concentration of each sample used to characterize the potential waste streams.

B.1.1.2.1 DQO Provisions To Limit False Negative Decision Error

A false negative decision error (where consequences are more severe) is controlled by meeting the following criteria:

- 1. Having a high degree of confidence that the sample locations selected will identify the extent of the COCs.
- 2. Having a high degree of confidence that analyses conducted will be sufficient to detect any COCs present in the samples.
- 3. Having a high degree of confidence that the dataset is of sufficient quality and completeness.
- 4. Having a high degree of confidence that the potential waste streams are characterized.

Criterion 1

In general, soil sample results demonstrated that the vertical and lateral extent of COCs were defined. Areas within four CASs (02-08-02, 23-21-04, 25-08-02, and 25-23-21) were identified as requiring further delineation of COCs based on Decision I sample results. The sample locations with results above FALs are shown in Figures A.4-1, A.9-1, A.10-1, and A.11-2 for those CASs requiring Decision II sample collection.

CAU 561 CADD/CR

Appendix B Revision: 0

Date: August 2011 Page B-12 of B-19

At CAS 02-08-02, Decision II samples were collected from the outside perimeter of the waste piles to

define the lateral extent of the PAH contamination. Sample results indicated that the lateral extent of

COC contamination was defined by these step-out sample locations. Within the burn area at

CAS 02-08-02, Decision II step-out samples were collected from numerous locations within the burn

area. Sample results showed that PAH contamination was widespread throughout the Area 2 due to

the presence of asphalt. Aerial photos of the Area 2 camp from September 1971 (H&N, 1971) show

a road passing through the burn area to the waste dump area, and photos from October 1986

(Author Unknown, 1986) show buildings located on the burn area. Based on this information, the

PAHs detected in the burn area are considered to originate from the asphalt and are not considered to

be related to the burn area activities.

Within the burn area at CAS 02-08-02, Decision II samples were collected from locations B02 and

B03 to define the lateral extent of lead and arsenic contamination. Samples results indicated that the

arsenic had not migrated vertically or laterally from that location. Sample results indicated that lead

had not migrated laterally, but the vertical extent sample showed a lead concentration the exceeded

the FAL. The extent samples indicated that arsenic and lead had not migrated from the burn area and

the lateral extent of metals contamination was defined by these samples.

Verification samples were collected from CAS 23-21-04 following the removal corrective actions.

The verification samples demonstrated that the COCs have been removed from this site, and that the

vertical and lateral extent of contamination was defined for the COCs at both trenches based on these

step-out sample locations.

For the COC (arsenic) identified within the concrete-like material pile at CAS 25-08-02, Decision II

sampling consisted of collecting three samples laterally from the pile. One sample was collected

within the pile to define the vertical extent of contamination in the pile. The sample results from the

lateral samples defined the lateral extent of COC contamination. The concrete-like pile was removed

and disposed of, and five verification samples were collected from under the concrete-like material.

Soil sample results demonstrated the vertical extent of contamination was defined.

For the COCs identified within the southern RMA soil pile at the main waste dump at CAS 25-23-21

(Cs-137 and PCBs), Decision II sampling consisted of collecting five lateral samples and two vertical

samples. Six verification samples were collected from the southern RMA, while four verification

UNCONTROLLED When Printed

CAU 561 CADD/CR

Appendix B Revision: 0 Date: August 2011

Page B-13 of B-19

samples were collected from the northern RMA following the removal corrective actions. Soil

sample results demonstrated the vertical and lateral extent of COC contamination was defined.

Criterion 2

Samples were analyzed for the COCs present at the corresponding CASs:

• CAS 02-08-02 – PAHs [benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, and dibenzo(ah)anthrancene] within the waste dump; lead, arsenic, and PAHs [benzo(a)pyrene,

benzo(b)fluoranthene, dibenzo(ah)anthracene, and ideno(1,2,3-cd)pyrene]

• CAS 23-21-04 – Arsenic and PCBs

• CAS 25-08-02 – Arsenic

• CAS 25-23-21 – Cs-137 and PCBs

The second criterion for extent (sensitivity) was accomplished for all analyses, except for the PAHs

benzo(a)pyrene, dibenzo(ah)anthracene, and n-nitro di-n-propylamine from CAS 25-08-02, as

demonstrated in Tables B.1-2 and B.1-3.

Criterion 3

To satisfy the third criterion for extent, the entire dataset, as well as individual sample results, were

assessed against the DQIs of precision, accuracy, comparability, completeness, and

representativeness, as defined in the Industrial Sites QAPP (NNSA/NV, 2002). The DQI discussion

is presented under Criterion 3 for Decision I.

B.1.1.2.2 DQO Provisions To Limit False Positive Decision Error

The false positive decision error was controlled by assessing the potential for false positive analytical

results. Quality assurance/QC samples such as field blanks, trip blanks, LCSs, and method blanks

were used to determine whether a false positive analytical result may have occurred. Of 94 QA/QC

samples submitted, no false positive analytical results were detected.

Proper decontamination of sampling equipment and the use of certified clean sampling equipment

and containers also minimized the potential for cross contamination that could lead to a false positive

analytical result.

UNCONTROLLED When Printed

CAU 561 CADD/CR Appendix B

Revision: 0 Date: August 2011 Page B-14 of B-19

B.1.1.3 Sampling Design

The CAIP (NNSA/NSO, 2008) made the following commitments for sampling:

1. Random sampling will be conducted at the waste dump area at CAS 02-08-02; within the north and south fenced areas at CAS 12-23-09, at CAS 25-08-02; and at the main waste dump and the second parcel at CAS 25-23-21.

<u>Result:</u> At the random sample locations designated by the VSP software (PNNL, 2005), soil samples were collected and analyzed for the appropriate COPCs. Where designated sample locations did not fall on a waste pile, the nearest pile was selected.

2. Judgmental sample locations will have soil samples collected beneath and/or adjacent to stained soil, melted metal, in trenches that display a waste profile, and at other biasing factors.

<u>Result</u>: All sample locations were selected as the most likely to contain contaminants. Radiological and visual surveys were conducted of the trenches, excavations, and waste piles and soil samples were collected adjacent to and from beneath any debris, metal, or stained

B.1.2 Conduct a Preliminary Data Review

A preliminary data review was conducted by reviewing QA reports and inspecting the data. The contract analytical laboratories generate a QA nonconformance report when data quality does not meet contractual requirements. All data received from the analytical laboratories met contractual requirements, and a QA nonconformance report was not generated. Data were validated and verified to ensure that the measurement systems performed in accordance with the criteria specified. The validated dataset quality was found to be satisfactory.

B.1.3 Select the Test and Identify Key Assumptions

The test for resolving DQO Decisions for probabilistic sampling was the comparison of the 95 percent UCL of the average analyte result from each CAS to the corresponding FAL. The test for making DQO Decisions for judgmental sampling was the comparison of all COC analyte results from each bounding sample to the corresponding FALs.

The key assumptions that could impact a DOO decision are listed in Table B.1-6.

Table B.1-6 Key Assumptions

Exposure Scenario	Site workers are only exposed to COCs through oral ingestion, inhalation, external exposure to radiation, or dermal contact (by absorption) of COCs absorbed onto the soils. Exposure to contamination is limited to industrial site workers, construction/remediation workers, and military personnel conducting training.
Affected Media	Surface soil, shallow subsurface soil, and potentially perched (shallow) groundwater. Debris, such as concrete, steel, and wood
Location of Contamination/Release Points	Surface and subsurface soil at or near location(s) of stored waste/materials.
Transport Mechanisms	Percolation of precipitation through subsurface media serves as the major driving force for migration of contaminants. Surface water runoff may provide for the transportation of some contaminants within or outside the CAS footprints.
Preferential Pathways	Vertical transport expected to dominate over lateral transport due to small surface gradients, except in washes.
Lateral and Vertical Extent of Contamination	Contamination, if present, is expected to be contiguous to the release points. Concentrations are expected to decrease with distance and depth from the source. Groundwater contamination is not expected. Lateral and vertical extent of COC contamination is assumed to be within the spatial boundaries.
Groundwater Impacts	None. Deep groundwater contamination is not a concern. Contaminants migrating to regional aquifers are not considered.
Future Land Use	Nonresidential.
Other DQO Assumptions	Contamination may be present in the soils adjacent to a feature due to run-off or intended use (e.g., decontamination pad).

B.1.4 Verify the Assumptions

The results of the investigation support the key assumptions identified in the CAU 561 DQOs (NNSA/NSO, 2008) and Table B.1-6 except as listed below:

- Exception: The lateral and vertical extent of the PAH contamination within the burn area did not decrease with distance from the source for CAS 02-08-02. The PAHs (SVOCs) that were detected at various locations throughout the burn area are considered to be associated with the asphalt that was identified at depths between 0 and 8 in bgs. The evaluation of the SVOC result has shown that the concentration of the SVOCs do not decrease with increasing distance from the potential sources (burn areas) as would be expected if the burn areas were the source of the PAHs. Aerial photos of the Area 2 camp from September 1971 (H&N, 1971) show a road passing through the burn area to the waste dump area, and photos from October 1986 (Author Unknown, 1986) show buildings located on the burn area. Based on this information, the PAHs detected in the burn area are considered to originate from the asphalt and are not considered to be related to the burn area activities.
- <u>Impact</u>: No impact to the CSM.

CAU 561 CADD/CR Appendix B Revision: 0 Date: August 2011 Page B-16 of B-19

- Exception: An assumption was made during the DQO process that a buried waste dump may exist at CAS 01-19-01. During the CAI excavation activities, a building foundation, including a stairwell and chimney with burned wood, was discovered instead of a waste dump. Adequate samples were collected from the areas near the basement walls and the chimney to verify that there was no subsurface contamination from the building materials.
- <u>Impact:</u> The CSM was revised to account for any potential contamination associated with the building materials used in the basement.

All data collected during the CAI supported CSMs with the exceptions noted in this section. These exceptions did not invalidate the CSMs presented in the CAIP (NNSA/NSO, 2008), although the CSM for CAS 01-19-01 necessitated a revision.

B.1.4.1 Other DQO Commitments

The CAIP (NNSA/NSO, 2008) made the following commitments for sampling:

1. Resolution of the Decision I associated with the probability sampling design requires determining, with a specific degree of confidence, whether the true average contaminant concentrations at the site in question exceed their corresponding FALs. The conservative estimate of the true contaminant concentration averages will be calculated as the 95 percent UCLs of the respective sample contaminant concentration averages. By definition, there will be a 95 percent probability that the true average concentration is less than the 95 percent UCL of the sample average. The calculation and comparison of UCLs to FALs will be conducted for all significant COPCs. A significant COPC is defined as any contaminant detected in any sample from the CAS at a concentration exceeding its corresponding PAL.

Result: Probabilistic sampling occurred at CASs 02-08-02 (at the waste dump only), 12-23-09, 25-08-02, and 25-23-21. Calculation of the 95 percent UCL was not necessary at these CASs for the following reasons:

- CAS 02-08-02: The only significant COPCs were the PAHs at the waste dump. The 95 percent UCL was not calculated for CAS 02-08-02 for PAHs because an FFACO UR will be implemented at this site.
- CAS 12-23-09: There were no COPCs exceeding PALs; therefore, the calculation of the 95 percent UCL was not necessary.
- CAS 25-08-02: Although the sample results indicated that arsenic exceeded the PAL, the arsenic-contaminated material was removed through corrective actions. Therefore, the calculation of the 95 UCL was not necessary.

CAU 561 CADD/CR Appendix B Revision: 0 Date: August 2011 Page B-17 of B-19

- CAS 25-23-21: The sample results indicated that there were no COPCs exceeding PALs from the probabilistic sample locations which were determined by the VSP software (PNNL, 2005). Therefore, the calculation of the 95 percent UCL was not necessary.
- 2. Decision II sampling will consist of defining the extent of contamination where COCs have been confirmed at the Decision I locations. If COCs extend beyond Decision I locations, then additional Decision II samples will be collected from step-out locations. A clean sample (i.e., COCs are less than PALs) collected from the Decision I and II sample locations will define the vertical and lateral extent of contamination at the respective locations. A minimum of one analytical result less than the PAL from the vertical direction will be required to define the depth of COC contamination, and the lateral extent of contamination will be defined by sample analysis.

<u>Result</u>: The vertical and lateral extent of contamination was defined at all CASs, except at CAS 02-08-02 where a vertical sample analyzed for lead indicated that the concentration exceeded the FAL. An FFACO UR will be implemented at this site.

B.1.5 Draw Conclusions from the Data

This section resolves the two DQO decisions for each of the CAU 561 CASs.

B.1.5.1 Decision Rules for Decision I

<u>Decision Rule</u>: If the concentration of any COPC in a target population exceeds the FAL for that COPC during the initial investigation, then that COPC is identified as a COC and Decision II sampling will be conducted.

<u>Result</u>: The following COCs were identified in the following CASs and require corrective action and Decision II sampling to define the extent:

- CAS 02-08-02 PAHs [benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, and dibenzo(ah)anthrancene] within the waste dump; lead, arsenic, and PAHs [benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(ah)anthracene, and ideno(1,2,3-cd)pyrene] within the burn area; lead as PSM within the burn area
- CAS 23-21-04 Arsenic, hexavalent chromium, and PCBs, lead bricks and counterweights as PSM
- CAS 25-08-02 Arsenic, lead-acid batteries at PSM

CAU 561 CADD/CR Appendix B

Revision: 0 Date: August 2011 Page B-18 of B-19

• CAS 25-23-21 – Cs-137 and PCBs

• CAS 25-25-19 – Lead as PSM

<u>Decision Rule</u>: If all COPC concentrations are less than the corresponding FALs, then the decision will be no further action.

<u>Result</u>: No COCs were identified in samples collected from CASs 01-19-01, 03-19-02, 05-62-01, 12-23-09, and 22-19-06. No further action was identified as the corrective action for these CASs.

B.1.5.2 Decision Rules for Decision II

<u>Decision Rule</u>: If the observed concentration of any COC in a Decision II sample exceeds the FALs, then additional samples will be collected to complete the determination of the extent.

<u>Result</u>: Samples to define extent were collected from CASs 02-08-02, 23-21-04, 25-08-02, 25-23-21, and 25-25-19.

<u>Decision Rule</u>: If all observed COC population parameters are less than the FALs, then the decision will be that the extent of contamination has been defined in the lateral and/or vertical direction.

<u>Result</u>: The vertical and lateral extent of contamination at CASs 02-08-02 (waste dump), 23-21-04, 25-08-02, 25-23-21, and 25-25-19 were defined.

B.2.0 References

Author Unknown. 1986. Aerial photograph 017 showing Area 2 Annex, 6 October. Mercury, NV.

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- Holmes & Narver, Inc. 1971. Aerial photograph Roll #73, Frame #012 showing Area 2 Camp, 3 September. Mercury, NV.
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- U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office. 2002. *Industrial Sites Quality Assurance Project Plan, Nevada Test Site, Nevada*, Rev. 3, DOE/NV--372. Las Vegas, NV.
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Appendix C Risk Assessment

C.1.0 Risk Assessment

The RBCA process used to establish FALs is described in the *Industrial Sites Project Establishment* of Final Action Levels (NNSA/NSO, 2006). This process conforms with NAC Section 445A.227, which lists the requirements for sites with soil contamination (NAC, 2008a). For the evaluation of corrective actions, NAC Section 445A.22705 (NAC, 2008b) requires the use of ASTM Method E1739 (ASTM, 1995) to "conduct an evaluation of the site, based on the risk it poses to public health and the environment, to determine the necessary remediation standards (i.e., FALs) or to establish that corrective action is not necessary."

The evaluation of the need for corrective action will include the potential for wastes that are present at a site to cause the future contamination of site environmental media if the wastes were to be released.

This section contains documentation of the RBCA process used to establish FALs described in the *Industrial Sites Project Establishment of Final Action Levels* (NNSA/NSO, 2006). This process defines three tiers (or levels) to establish FALs used to evaluate DQO decisions:

- Tier 1 sample results from source areas (highest concentrations) compared to risk-based screening levels (RBSLs) (i.e., PALs) based on generic (non-site-specific) conditions.
- Tier 2 sample results from exposure points compared to SSTLs calculated using site-specific inputs and Tier 1 formulas.
- Tier 3 sample results from exposure points compared to SSTLs and points of compliance calculated using chemical fate/transport and probabilistic modeling.

The RBCA decision process stipulated in the *Industrial Sites Project Establishment of Final Action Levels* (NNSA/NSO, 2006) is summarized in Figure C.1-1.

C.1.1 A. Scenario

Corrective Action Unit 561, Waste Disposal Areas, comprises the following 10 CASs within Areas 1, 2, 3, 5, 12, 22, 23, and 25 of the NNSS:

- 01-19-01, Waste Dump
- 02-08-02, Waste Dump and Burn Area

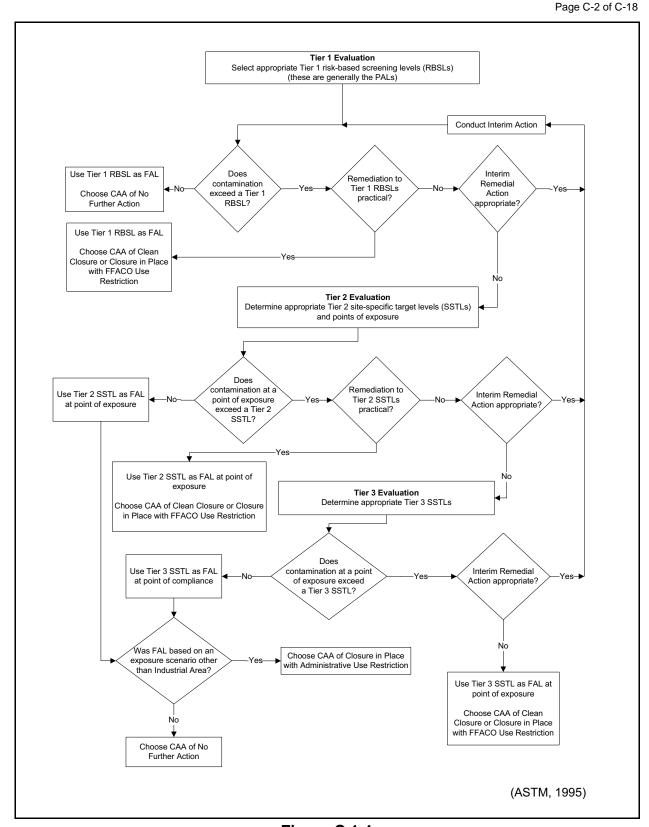


Figure C.1-1
Risk-Based Corrective Action Decision Process

CAU 561 CADD/CR Appendix C Revision: 0 Date: August 2011 Page C-3 of C-18

- 03-19-02, Debris Pile
- 05-62-01, Radioactive Gravel Pile
- 12-23-09, Radioactive Waste Dump
- 22-19-06, Buried Waste Disposal Site
- 23-21-04, Waste Disposal Trenches
- 25-08-02, Waste Dump
- 25-23-21, Radioactive Waste Dump
- 25-25-19, Hydrocarbon Stains and Trench

Corrective Action Site 01-19-01 is located in Area 1 of the NNSS and consists of a fenced area approximately 20 ft east of Building 1-31-2.e1. The CAS was originally identified as a subsurface waste dump, but no waste dump was found during the CAI. During excavation activities, a building basement from Building 31.1-b1, constructed for the Apple-2 test, was uncovered. There was visible debris on the ground surface consisting of concrete chunks, rebar, wood, and red bricks.

Corrective Action Site 02-08-02 is located in the dry wash southeast of the Area 2 Camp of the NNSS, and consists of a waste dump and burn area. The waste dump contains piles of dirt and boulders with scattered debris, including metal cables, wires, wooden planks, tires, sheet metal, and a crushed 30-gal drum that contained a very small amount of grease. A review of historical air photographs show that the material was placed at this location between 1983 and 1985 (NNSA/NSO, 2008). The burn area, located northwest of the waste dump, contains scattered nails, metal, wood, bits of charcoal, and melted lead.

Corrective Action Site 03-19-02 is located in Area 3 of the NNSS. It consists of a pile of concrete debris believed to be associated with the Pommard test, which was conducted on March 14, 1968. A large piece of concrete has Trinity glass adhered to its surface. The CAS is surrounded by "Caution Radioactive Material" postings but is not fenced.

Corrective Action Site 05-62-01 consists of a radioactive gravel pile located approximately 1,000 ft west of the Gravel Gertie in Area 5 of the NNSS. The pile contains concrete and metal debris, which is believed to be from the Gravel Gertie testing activities. The CAS is surrounded by a fence with "Caution Radioactive Material" postings.

Corrective Action Site 12-23-09 is located approximately 150 ft northwest of Stockade Wash Road, just north of the E-Tunnel Road in Area 12 of the NNSS. The CAS consists of two separate fenced

Appendix C Revision: 0

Date: August 2011 Page C-4 of C-18

areas (north and south) and was labeled as a radioactive waste dump on a topographic map; however,

interviews with past employees suggest that the site was used as an electricians' laydown yard.

Corrective Action Site 22-19-06 is located at the southeast end of Camp Desert Rock in Area 22 of

the NNSS and consists of buried debris identified by a geophysical survey. Excavation activities

uncovered a manhole cover and a concrete-filled piece of corrugated pipe. Camp Desert Rock has

been identified as eligible for inclusion in the National Register of Historic Places (Jones, 2010).

Corrective Action Site 23-21-04 consists of six potential waste disposal trenches and one potential

covered trench located approximately 1,500 ft northeast of Building 23-160 in Area 23 of the NNSS.

Three of the trenches contained debris (wood, metal, cables/wire, lead bricks, nails, and bolts). There

was also stained soil near two of the trenches.

Corrective Action Site 25-08-02 is located north of G Road between the RCP and R-MAD complex

in Area 25 of the NNSS, and consists of a large waste dump. The waste dump consists of piles of

construction debris, such as concrete, metal, rebar, wood, lead-acid batteries, 5-gal buckets, an empty

cable spool, rusted cans, and pipes.

Corrective Action Site 25-23-21 consists of a radioactive waste dump located within Topopah Wash,

northeast of the E-MAD Facility in Area 25 of the NNSS. A second parcel is upstream from the

waste dump parcel within Topopah Wash and extends further upstream north of H Road. The waste

dump contains numerous dirt mounds and piles within a posted "Controlled Area," along with

miscellaneous piles extending up through Topopah Wash to H Road. Within the waste dump, there

are two specific piles that are posted with "Caution Radioactive Material" signs. The second parcel

contains waste piles typical of construction debris, along with concrete, asphalt, and magnetite piles.

Corrective Action Site 25-25-19 encompasses approximately 8 acres and is located southeast of the

intersection of C Road and G Road in Area 25. The CAS consists of surface soil stains, a tar spill, an

asphalt spill, a trench, concrete pads, debris, rock, and soil piles.

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CAU 561 CADD/CR Appendix C

Revision: 0 Date: August 2011 Page C-5 of C-18

C.1.2 B. Site Assessment

The CAI at CAS 01-19-01, Waste Dump, involved visual inspections for biasing factors through excavation and soil sampling within the excavations. The CAI results indicate that no COC concentrations in soil samples were detected above the PALs.

The CAI at CAS 02-08-02, Waste Dump and Burn Area, involved visual inspections for biasing factors on waste piles and on surface soil. The CAI also involved judgmental surface soil sampling and probabilistic sampling within the waste piles. Lead and arsenic were identified as COCs at the burn area. Polyaromatic hydrocarbons were identified as COCs at the waste dump and are limited to the waste piles. Lead bricks were removed from the CAS and samples were collected below the bricks. Samples from under the bricks indicate that there is no migration of lead into the soil.

The CAI at CAS 03-19-02, Debris Pile, involved visual inspections for biasing factors, radiological surveys, biased surface soil sampling and sampling of a concrete slab. The CAI results indicate that no COC concentrations in soil samples were detected above the PALs.

The CAI at CAS 05-62-01, Radioactive Gravel Pile, involved visual inspections for biasing factors on the gravel pile and on the surface soil around the pile, and a radiological survey of the gravel pile. The CAI also involved biased surface soil sampling around the perimeter of the gravel pile and within the gravel pile. The CAI results indicate that no COC concentrations in soil samples were detected above the PALs.

The CAI at CAS 12-23-09, Radioactive Waste Dump, involved visual inspections for biasing factors on a soil mound and on the surface soil. The CAI also involved probabilistic surface soil sampling, and biased sampling within the soil mound. The CAI results indicate that no COC concentrations in soil samples were detected above the PALs.

The CAI at CAS 22-19-06, Buried Waste Disposal Site, involved visual inspections for biasing factors through excavation and biased soil sampling within the excavations. The CAI results indicate that no COC concentrations in soil samples were detected above the PALs.

The CAI at CAS 23-21-04, Waste Disposal Trenches, involved visual inspections for biasing factors on surface soil and within the trenches, and biased soil sampling. Arsenic, hexavalent chromium, and

Appendix C Revision: 0 Date: August 2011

Page C-6 of C-18

PCBs were identified as COCs within Trench 3, and arsenic was identified as a COC within Trench 5.

No COCs were identified in the remaining four trenches or within the potential covered trench. The

COCs are limited to the individual trenches and sampling has confirmed there is no migration of the

contaminants from the trenches.

The CAI at CAS 25-08-02, Waste Dump, involved visual inspections for biasing factors on waste

piles and on surface soil, and biased surface soil sampling and probabilistic sampling within the waste

piles. Arsenic was identified as a COC in one pile of concrete-like material. The COC is limited to

the concrete-like pile. Lead-acid batteries were removed from the CAS, and samples were collected

below the batteries. Samples from beneath the batteries indicate that there is no migration of lead into

the soil.

The CAI at CAS 25-23-21, Radioactive Waste Dump, involved visual inspections for biasing factors

on waste piles and on the surface soil, and biased surface soil sampling and probabilistic sampling

within the waste piles. Cesium-137 and PCBs were identified as COCs within one RMA waste pile

and are limited to the pile.

The CAI at CAS 25-25-19, Hydrocarbon Stains and Trench, involved visual inspections for biasing

factors on gravel and soil piles, on the surface soil, and in excavations. The CAI also involved biased

surface soil sampling, shallow subsurface soil sampling within the excavations, and sampling within

the gravel/soil piles. The CAI results indicate that no COC concentrations in soil samples were

detected above the PALs. Two lead bricks were removed from the CAS and samples were collected

below the bricks. Samples from under the bricks indicate that there is no migration of lead into

the soil.

The maximum concentration of contaminant identified at each CAS, and their corresponding PALs

are presented in Table C.1-1.

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CAU 561 CADD/CR Appendix C Revision: 0 Date: August 2011 Page C-7 of C-18

Table C.1-1 Maximum Reported Value for Tier 1 Comparison

(Page 1 of 4)

			Maximum Reported Value									
Parameter	PALs	Unit	01-19-01	02-08-02	03-19-02	05-62-01	12-23-09	22-19-06	23-21-04	25-08-02	25-23-21	25-25-19
2-Butanone	200,000	mg/kg	-							0.019 (J)		0.011 (J)
2-Methylnaphthalene	4,100	mg/kg		0.16 (J)								
Ac-228	506.7ª	pCi/g	1.77	2.32	1.94	1.16	2.47	0.69	1.96	2.06	2.64	2.07
Acenaphthene	33,000	mg/kg		0.46 (J)								
Acetone	630,000	mg/kg					0.046 (J)		0.062 (J)	0.072 (J)		0.036 (J)
Am-241	1,503	pCi/g		1.49 (J)	2.89 (J)		1.23 (J)		0.53 (J)			
Anthracene	170,000	mg/kg		2.2								
Aroclor 1248	0.74	mg/kg							4.3 (J)			
Aroclor 1254	0.74	mg/kg		0.084							0.12	
Aroclor 1260	0.74	mg/kg		0.076					0.027 (J)	0.12	2.9 (J)	0.5 (J)
Aroclor 1268	0.74	mg/kg					0.028 (J)					
Arsenic	23	mg/kg	4.7	65			3.7	6.2	2,000	510	16	3.2
Barium	190,000	mg/kg	260	560			150	89	610	380 (J)	300	200
Benzo(a)anthracene	2.1	mg/kg		2.8			0.086 (J)				0.2 (J)	
Benzo(a)pyrene	0.21	mg/kg		2.4			0.073 (J)				0.17 (J)	
Benzo(b)fluoranthene	2.1	mg/kg		3.7			0.16 (J)				0.44	
Benzo(ghi)perylene	17,000	mg/kg		3.4							0.19 (J)	
Benzo(k)fluoranthene	21	mg/kg		1.4 (J)			0.073 (J)				0.15 (J)	

CAU 561 CADD/CR Appendix C Revision: 0 Date: August 2011 Page C-8 of C-18

Table C.1-1 Maximum Reported Value for Tier 1 Comparison

(Page 2 of 4)

			Maximum Reported Value									
Parameter	PALs	Unit	01-19-01	02-08-02	03-19-02	05-62-01	12-23-09	22-19-06	23-21-04	25-08-02	25-23-21	25-25-19
Benzoic acid	2,500,000	mg/kg							1.7			
Beryllium	2,000	mg/kg	0.69	0.71			0.87		1 (J-)	0.55	1.1	0.46 (J-)
Bis(2-ethylhexyl)phthalate	120	mg/kg		0.26 (J)					3.1 (J)	0.4 (J)	0.33 (J)	0.068 (J)
Cadmium	800	mg/kg	0.22	0.91			0.28	0.27	5.3 (J)	3.3	1.5	0.71
Carbazole	95.8	mg/kg		0.52								
Chromium	N/A ^b	mg/kg	6.1	58			6.3	5.1 (J)	35	10	44	6.3
Hexavalent chromium	5.6	mg/kg		1.6 (J)			0.37 (J-)		18 (J)	0.28 (J-)	0.52 (J-)	
Chrysene	210	mg/kg		2.8			0.13 (J)				0.3 (J)	
Co-60	18.33	pCi/g									1.77	
Cs-137	72.9	pCi/g		2.57	2.49	0.196	8.5		0.62	0.259	392	
Di-n-butyl phthalate	62,000	mg/kg		3.4					0.072 (J)		0.17 (J)	
Dibenzo(ah)anthracene	0.21	mg/kg		1								
Dibenzofuran	1,000	mg/kg		0.23 (J)								
Diethyl phthalate	490,000	mg/kg		0.22 (J)								
Eu-152	38.2	pCi/g			0.97 (J)							
Fluoranthene	22,000	mg/kg		8.2			0.15 (J)				0.88	
Fluorene	22,000	mg/kg		0.55								
Indeno(1,2,3-cd)pyrene	2.1	mg/kg		3.3 (J)							0.18 (J)	

CAU 561 CADD/CR Appendix C Revision: 0 Date: August 2011 Page C-9 of C-18

Table C.1-1 Maximum Reported Value for Tier 1 Comparison

(Page 3 of 4)

			Maximum Reported Value									
Parameter	PALs	Unit	01-19-01	02-08-02	03-19-02	05-62-01	12-23-09	22-19-06	23-21-04	25-08-02	25-23-21	25-25-19
Lead	800	mg/kg	19	14,000 (J+)			23	17 (J)	190 (J)	320	32	420 (J)
Mercury	34	mg/kg		0.028			0.052		1.9	20	0.1	0.066
Methylene chloride	53	mg/kg		0.015					0.0049 (J)		0.013	
Nb-94	96.53	pCi/g									3.26	
PCBs (low risk)	21	mg/kg									0.084	
Phenanthrene	170,000	mg/kg		7.2						0.51 (J)	0.85	
p-isopropyltoluene	11,000	mg/kg					0.01					
Pu-239/240	2,207	pCi/g				0.087						
Pyrene	17,000	mg/kg		6.8			0.13 (J)			0.088 (J)	0.93	
Selenium	5,100	mg/kg	0.51	0.6			0.32	0.29	0.47	0.78	0.44	0.36
Silver	5,100	mg/kg		0.52							0.21	0.16
Th-234	1,423°	pCi/g		3.6 (J)		206					5.6 (J)	3 (J)
Toluene	45,000	mg/kg					0.0044 (J)		0.0053			

CAU 561 CADD/CR Appendix C Revision: 0 Date: August 2011 Page C-10 of C-18

Table C.1-1 Maximum Reported Value for Tier 1 Comparison

(Page 4 of 4)

				Maximum Reported Value								
Parameter	PALs	Unit	01-19-01	02-08-02	03-19-02	05-62-01	12-23-09	22-19-06	23-21-04	25-08-02	25-23-21	25-25-19
Total xylenes	2,700	mg/kg					0.0044 (J)		0.0044 (J)			
TPH-DRO	N/A ^d	mg/kg	3.2 (J)	320			17	11	270	920 (J)	73	1,900
U-234	18,650	pCi/g				267						
U-235	255.5	pCi/g				15.3					3.9 (J)	
U-238	1,423	pCi/g		-		630						

^aFAL for Ac-228 based on Th-232 FAL.

J = Estimated value

- J+ = Result is an estimated quantity, but may be biased high.
- J- = Result is an estimated quantity, but may be biased low.
- -- = Not detected above PALs.

^bPer FI ROTC-1 (NNES, 2010), there are no longer screening levels for total chromium.

[°]FAL for Th-234 based on U-238 FAL.

^dPer FI ROTC-1 (NNES, 2010), the Nevada Legislative Commission approved new regulations for the TPH-DRO; the FAL of 100 mg/kg no longer applies.

C.1.3 C. Site Classification and Initial Response Action

The four major site classifications listed in Table 3 of the ASTM Standard are (1) immediate threat to human health, safety, and the environment; (2) short-term (0 to 2 years) threat to human health, safety, and the environment; (3) long-term (greater than 2 years) threat to human health, safety, or the environment; and (4) no demonstrated long-term threats.

Based on the CAI, none of the CASs present an immediate threat to human health, safety, and the environment; therefore, no interim response actions are necessary at these sites. Based on this information, five CASs (01-19-01, 03-19-02, 05-62-01, 12-23-09, and 22-19-06) are determined to be Classification 4 sites as defined by ASTM Method E1739 (ASTM, 1995) and pose no demonstrated near- or long-term threats. At CASs 02-08-02, 23-21-04, 25-08-02, 25-23-21, and 25-25-19, COCs were identified that may pose long-term threats to human health, safety, or the environment and have been determined to be Classification 3 sites as defined by ASTM Method E1739.

C.1.4 D. Development of Tier 1 Lookup Table of RBSLs

Tier 1 action levels have been defined as the PALs established during the DQO process. The PALs are a tabulation of chemical-specific (but not site-specific) screening levels based on the type of media (soil) and potential exposure scenarios (industrial). These are very conservative estimates of risk, are preliminary in nature, and are used as action levels for site screening purposes. Although the PALs are not intended to be used as FALs, a FAL may be defined as the Tier 1 action level (i.e., PAL) value if individual contaminant analytical results are below the corresponding Tier 1 action level value. The FAL may also be established as the Tier 1 action level value if individual contaminant analytical results exceed the corresponding Tier 1 action level value and implementing a corrective action based on the FAL is practical. The PALs are defined as follows:

- The EPA Region 9 Risk-Based Regional Screening Levels (RSLs) for Industrial Soils (EPA, 2011).
- Background concentrations for RCRA metals will be evaluated when natural background
 exceeds the PAL, as is often the case with arsenic. Background is considered the mean plus
 two times the standard deviation of the mean based on data published in Mineral and Energy
 Resource Assessment of the Nellis Air Force Range (NBMG, 1998; Moore, 1999).

CAU 561 CADD/CR Appendix C Revision: 0 Date: August 2011 Page C-12 of C-18

- For COPCs without established RSLs, a protocol similar to EPA Region 9 will be used to establish an action level; otherwise, an established RSL from another EPA region may be chosen.
- The PALs for radioactive contaminants are based on the National Council on Radiation Protection and Measurements (NCRP) Report No. 129 recommended screening limits for construction, commercial, industrial land-use scenarios (NCRP, 1999) scaled to 25-millirem-per-year dose constraint (Appenzeller-Wing, 2004) and the generic guidelines for residual concentration of radionuclides in DOE Order 5400.5 (DOE, 1993).

The PALs were developed based on an industrial area scenario. Because the CAU 561 CASs are not assigned work stations and are considered to be in remote work or occasional use areas, the use of the industrial area scenario PALs is conservative. The Tier 1 lookup table is defined as the PAL concentrations or activities defined in the CAIP (NNSA/NSO, 2008).

C.1.5 E. Exposure Pathway Evaluation

For all contaminants at the CASs not listed in Table C.1-1, contamination does not exceed the corresponding RBSLs and the FALs were established at the RBSL concentrations. For all contaminants at the CASs listed in Table C.1-1, it was determined by NNSA/NSO that remediation to the RBSLs is feasible and appropriate. Therefore, the FALs for these contaminants were also established at the RBSL concentrations and corrective actions will be required.

C.1.6 F. Comparison of Site Conditions with Tier 1 RBSLs

All analytical results from CAU 561 samples were less than corresponding Tier 1 action levels (i.e., PALs) except for those listed in Table C.1-2.

C.1.7 G. Evaluation of Tier 1 Results

For all contaminants at CASs not listed in Table C.1-2, the FALs were established as the Tier 1 RBSLs. It was determined that no further action is required for these contaminants at these CASs.

The FALs for arsenic and PCBs at CAS 23-21-04, for arsenic at CAS 25-08-02, and for Cs-137 and PCBs at CAS 25-23-21 were also established as the Tier 1 RBSLs. It was determined that corrective action is practical for the contaminants at these CASs. Therefore, a correction action has been completed for these sites.

Table C.1-2
COPCs Detected above PALs

CAS	Arsenic	Hexavalent Chromium	Lead	PCB-1248	PCB-1260	Cs-137	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene
02-08-02	Х		Х				Х	Х	Х	Х	Х
23-21-04	Х	Х		Х							
25-08-02	Х										
25-23-21					Х	Х					

^{-- =} Not applicable

It was determined by NNSA/NSO that remediation for lead and arsenic within the burn area and for PAHs within the waste piles at CAS 02-08-02 was not practical. Therefore, an FFACO UR will be implemented at this CAS.

C.1.8 H. Tier 1 Remedial Action Evaluation

CAS 02-08-02

At CAS 02-08-02, the lead, arsenic, and PAH contamination is not practical or technically feasible to remediate to FALs due to the widespread and discontinuous nature of contamination (e.g., melted lead on and below ground surface). Therefore, a corrective action of closure in place with a FFACO UR was implemented.

CASs 23-21-04, 25-08-02, and 25-23-21

A corrective action of clean closure was implemented for the arsenic, hexavalent chromium, PCBs, and Cs-137 contamination at these CASs that removed all contamination exceeding FALs.

Appendix C Revision: 0

Date: August 2011 Page C-14 of C-18

CASs 23-21-04 and 25-25-19

At CASs 23-21-04 and 25-25-19, lead bricks were discovered. The lead bricks and soil immediately

below the bricks were removed. Confirmation samples were collected to verify that lead had not

migrated from the bricks into the soil. This corrective action was implemented to remediate the site

to FALs.

CASs 25-08-02

At CAS 25-08-02, lead-acid batteries were discovered. The lead-acid batteries were removed and

confirmation samples were collected to verify that lead had not migrated from the bricks into the soil.

This corrective action was implemented to remediate the site to FALs.

C.1.9 I. Tier 2 and Tier 3 Evaluation

As all contaminant FALs were established at Tier 1 RBSLs, a Tier 2 or Tier 3 evaluation was not

considered necessary.

C.2.0 Recommendations

As all of the site contaminant concentrations in soils from the analysis of CAU 561 samples at CASs 01-19-01, 03-19-02, 05-62-01, 12-23-09, and 22-19-06 were less than the corresponding FALs, it was determined that contamination at these locations does not pose a significant risk to human health or the environment and, therefore, do not warrant corrective actions.

As lead and arsenic were identified at the burn area, and PAHs were identified at the waste dump above the corresponding FALs (Tier 1 RBSL) at CAS 02-08-02, it was determined that lead, arsenic, and PAHs are COCs and contamination at this CAS warrants corrective action. The PAHs at the burn area are not considered COCs as they are attributed to industrial asphalt paving discovered within area. A corrective action recommendation of closure in place with an FFACO UR will be protective of human health, safety, and the environment. The UR is included in Appendix D. This does not preclude the consideration for other additional protective measures that may be implemented as BMPs (e.g., removing the melted lead for recycling).

As arsenic, hexavalent chromium, and PCBs were identified above the corresponding FALs (Tier 1 RBSL) at CAS 23-21-04, it was determined that arsenic, hexavalent chromium, and PCBs are COCs and contamination at this CAS warrants corrective action. A corrective action recommendation of clean closure will be protective of human health, safety, and the environment. This does not preclude the consideration for other additional measures that may be implemented as BMPs (e.g., disposing of debris, backfilling the trenches).

Arsenic was identified above the corresponding FALs (Tier 1 RBSL) at CAS 25-08-02; therefore, it was determined that arsenic is a COC and contamination at this CAS warrants corrective action. A corrective action recommendation of clean closure will be protective of human health, safety, and the environment. This does not preclude the consideration for other additional measures that may be implemented as BMPs (e.g., removing and disposing of the waste piles).

Cesium-137 and PCBs were identified above the corresponding FALs (Tier 1 RBSL) at CAS 25-23-21; therefore, it was determined that Cs-137 and PCBs are COCs and contamination at this CAS warrants corrective action. A corrective action recommendation of clean closure will be

Appendix C Revision: 0 Date: August 2011

Page C-16 of C-18

protective of human health, safety, and the environment. This does not preclude the consideration for

other additional measures that may be implemented as BMPs (e.g., removing and disposing of waste

piles, disposing of debris).

At CAS 25-25-19, site contaminant concentrations in soils from the analysis of samples were less

than the corresponding FALs; therefore, it was determined that contamination at these locations does

not pose a significant risk to human health or the environment and therefore, do not warrant

corrective actions. However, corrective actions (i.e., removal) were conducted at two locations where

two lead bricks were discovered. This does not preclude the consideration for other additional

measures that may be implemented as BMPs (e.g., disposing of debris).

C.3.0 References

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CAU 561 CADD/CR Appendix C Revision: 0 Date: August 2011 Page C-18 of C-18

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Appendix D Closure Activity Summary

D.1.0 Closure Activity Summary

The following sections document closure activities and BMPs conducted from February 8 through June 28, 2011. Corrective actions and BMPs were completed at the following CASs:

- 02-08-02, Waste Dump and Burn Area
- 23-21-04, Waste Disposal Trenches
- 25-08-02, Waste Dump
- 25-23-21, Radioactive Waste Dump
- 25-25-19, Hydrocarbon Stains and Trench

The remaining CASs within CAU 561 have been shown not to have released contamination to the environment; they did not require further action and are not discussed in this appendix. The following sections provide the supporting documentation (e.g., photos and analytical results) to verify the completion of closure activities. Analytical results from Decision I, Decision II, and verification samples are presented in Appendix A under the specific CAS narration. Details regarding waste characterization, waste volumes, and final disposition are presented in Section A.13.0. Load verification forms and manifests are included in Appendix F of this report; copies are also available for review in the CAU 561 project files.

D.1.1 CAS 02-08-02 Closure Activities

The recommended closure alternative for CAS 02-08-02 is closure in place with a UR. Because of the large volume of material within the waste piles and problems associated with the removal of the fine particles of lead from the burn area, clean closure was not considered feasible. A UR has been applied to surface and subsurface disturbances between 0 to 5 ft bgs at the burn area, and to disturbances within the waste piles to a depth of 5 ft bgs at the waste dump. Attachment D-1 of this appendix provides the details of the UR and a figure of the UR boundary's GPS coordinates. The UR is an FFACO UR; therefore, onsite postings (signs) and physical barriers (fencing) are necessary, and periodic inspections are required. Two BMPs were implemented at this CAS: (1) the melted lead was removed as PSM and consolidated for recycling, and (2) non-hazardous debris from the waste piles was picked up and disposed of.

Appendix D Revision: 0

Date: August 2011 Page D-2 of D-14

Closure activities conducted at this CAS to support the corrective action of closure in place and

implementation of the UR included removing as much of the melted lead from the burn area as

possible. A backhoe was used to rake across the ground to unearth any large pieces of melted lead up

to 6 in. beneath the soil. To avoid destroying large areas of vegetation by this process, a geophysical

survey was conducted of the area, and pin flags were placed on the anomalies. The anomalies were

then investigated using shovels to a depth of 6 in. Any melted lead discovered from 0 to 6 in. bgs

was staged for recycling off site. Approximately 3,320 lb of melted lead was picked up from the

burn area.

Decision II soil samples were collected from the waste dump (PAHs) and from the burn area

(arsenic, lead, and PAHs) to characterize the lateral and vertical extent of contamination. The

Decision II samples collected along the perimeter of the waste dump indicate that the PAH

contamination has not migrated from the waste piles into the surrounding soil.

Decision II samples from the burn area collected near location B02 indicated that the arsenic and lead

had not migrated from this location. Because the extent of the PSM (melted lead) could not be

ascertained, nor could it be guaranteed that all the melted lead could be removed, it was decided to

place a UR around the CAS.

During Decision II sampling at the burn area, asphalt was discovered in various locations at depths

up to 8 in. bgs. Aerial photos of the Area 2 camp from September 1971 (H&N, 1971) were reviewed

and show a road passing through the burn area to the waste dump area, and photos from October 1986

(Author Unknown, 1986) show buildings located on the burn area. Based on this information, the

PAHs detected in the burn area are considered to originate from the asphalt and are not considered to

be related to the burn area activities.

Figures D.1-1 through D.1-3 document closure activities at this CAS.

Attachment D-1 provides details of the UR and a figure of the UR boundary.

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Figure D.1-1 CAS 02-08-02, Waste Dump and Burn Area, Area Where Lead Was Removed with Backhoe



Figure D.1-2
CAS 02-08-02, Waste Dump and Burn Area,
Melted Lead Temporarily Staged on Wooden Pallet



Figure D.1-3
CAS 02-08-02, Waste Dump and Burn Area,
Melted Lead Staged and Wrapped on Metal Pallet

D.1.2 CAS 23-21-04 Closure Activities

The corrective action of clean closure for this CAS consisted of removing arsenic-, hexavalent chromium-, and PCB-contaminated soil from Trench 3; and removing arsenic-contaminated soil from Trench 5. Corrective actions also included removing a lead brick and counterweights for recycling. As BMPs, debris in and around all of the trenches was disposed of at the U10c industrial waste landfill (Table A.13-1), and all open trenches were backfilled with clean soil and the surrounding area leveled.

Trench 3

Closure activities for the PCB-contaminated soil on the east end of the trench (location G07) were initiated by overexcavating the soil and collecting four verification soil samples. The analysis of the Decision I soil sample showed PCBs to present at a concentration of 4.3 mg/kg. One sample was collected from the bottom of the excavation, and one sample was collected from each of the three excavation walls (north, east, and west). The verification samples (561G037 through 561G040)

Appendix D Revision: 0 Date: August 2011

Page D-5 of D-14

collected after the PCB-contaminated soil was excavated did not detect PCBs in concentrations above

the FALs.

The determination was made that the arsenic- and hexavalent chromium-contaminated soil would be

removed to allow for a clean closure of this site. During the soil removal activities, samples were

collected to define the vertical and lateral extent of the contamination. After the soil excavation was

completed to a depth of 4.5 ft bgs, confirmation samples were collected from the sides and bottom of

the excavation (561G033, 561G034, 561G035, and 561G041). Analytical result demonstrated that

all the arsenic- and hexavalent chromium-contaminated soil had been removed from the area around

Trench 3.

Trench 5

The Decision I analytical results demonstrated that arsenic was present in the soil within and adjacent

to the trench at concentrations exceeding PAL (61 mg/kg). Based on the Decision I analytical results

and the desire to clean close this CAS, Decision II sampling was initiated to define the vertical and

horizontal extent of the arsenic contamination and to remove the contaminate soil associated with

Trench 5. During the excavation, confirmation samples were periodically collected to determine

whether all the contaminated soil had been removed. When the excavation was completed, soil from

an area measuring approximately 30 by 16 by 5 ft was removed and disposed of. Confirmation

samples (561G029, 561G030, 561G031, and 561G032) collected from the sides and bottom of the

excavation confirmed that the arsenic contaminated soil had been removed.

The corrective actions at Trenches 3 and 5 were accomplished by removing the contaminated soil

using a backhoe and excavator. Approximately 45 yd³ of soil was removed from both trenches,

placed in 20-yard roll-off bins, and disposed of as industrial waste. The analytical results of the

verification sample as presented in Section A.9.0 support the closure of this CAS. Figures D.1-4

through D.1-6 document closure activities at this CAS.

D.1.3 CAS 25-08-02 Closure Activities

The corrective action of clean closure for this site consisted of removing the lead-acid batteries and

arsenic contaminated concrete-like material. The lead-acid batteries were recycled and the

arsenic-contaminated soil was disposed of as industrial waste at the U10C industrial waste landfill

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Figure D.1-4 CAS 23-21-04, Waste Disposal Trenches, Debris Removal from Trench 3



Figure D.1-5
CAS 23-21-04, Waste Disposal Trenches, Front-end Loader Backfilling Trench



Figure D.1-6
CAS 23-21-04, Waste Disposal Trenches, Trenches 3, 5, and 6 Backfilled

(Table A.13-1). As a BMP, the remaining waste piles were removed and disposed of as industrial waste at the U10c landfill. Approximately 720 yd³ of material was removed from the CAS.

The analysis of the Decision I sample from the center of the concrete-like material and a second sample from deeper in the pile showed that arsenic was present at concentrations exceeding the FALs, 510 mg/kg and 60 mg/kg, respectively. Because Decision II samples collected laterally from the pile showed that arsenic has not migrated laterally or vertically and the arsenic contamination was limited to the concrete-like material, clean closure was selected as the appropriate CAA.

After the lead-acid batteries and arsenic-contaminated material had been removed, four verification samples were collected from the soil beneath the pile. The verification samples did not detect arsenic at concentrations that exceeded the FALs. The analytical results of the verification samples support the clean closure of this CAS as presented in Section A.10.0. Figures D.1-7 through D.1-9 document closure activities at this CAS.



Figure D.1-7
CAS 25-08-02, Waste Dump, Bulldozed Arsenic-Contaminated
Pile and Verification Sample Locations



Figure D.1-8 CAS 25-08-02, Waste Dump, Debris Piles Being Loaded Out



Figure D.1-9
CAS 25-08-02, Waste Dump, Debris Piles Removed

D.1.4 CAS 25-23-21 Closure Activities

The corrective action of clean closure for CAS 25-23-21 consisted of removing two pieces of cast-iron pipe and the underlying soil from two RMAs in the main waste dump. Both the pipes and soil were disposed of as low-level radioactive waste. As BMPs, the remaining piles at the main waste dump were leveled and contoured to original grade. As a BMP, at the second parcel, approximately 9 yd³ of debris and tar paper were removed and disposed of at the U10c industrial waste landfill. No Decision II samples were required at the second parcel because the analytical results showed no concentrations of any constituents above PALs.

Closure activities at the southern RMA were initiated by collecting four Decision II surface soil samples (including one FD) in a triangular pattern around the RMA soil pile. Two samples were also collected within the pile at depths of 1 to 1.5 ft at the same locations (I30 and I33) as Decision I samples. The analysis of the Decision I sample from within the pile at location I30 (0 to 0.5 ft) showed PCBs to be present at a concentration of 1.2 mg/kg, and Cs-137 at a concentration of 392 pCi/g. The Decision I sample (561I035) from location I33 (within the pile from 0 to 0.5 ft) showed a Cs-137 concentration of 152 pCi/L. The three Decision II samples showed that the PCBs

and Cs-137 had not migrated into the soil surrounding the RMA pile. After the southern RMA pile was removed using a backhoe, six verification samples were collected from the soil beneath the pile. The verification samples did not detect PCBs or Cs-137 in concentrations above the FALs.

Because of the presence of the contaminated pipe on the northern RMA soil pile, the same approach was used to sample the pile, even though the Cs-137 concentration was below the PAL. Four Decision II surface soil samples (0 to 0.5 ft bgs) were collected around the northern RMA soil pile. One sample was also collected within the pile at depths of 1 to 1.5 ft at the same location (I32) as the Decision I sample. The analysis of the Decision I sample from within the pile at location I32 (0 to 0.5 ft) showed Cs-137 at a concentration of 15.6 pCi/g. The four Decision II samples showed that Cs-137 had not migrated into the soil surrounding the RMA. After the northern RMA pile was removed, four verification samples were collected from the soil beneath the pile. The verification samples confirmed that the Cs-137-contaminated soil had been removed.

The analytical results of the verification sample, as presented in Section A.11.0, support the closure of this CAS. Figures D.1-10 through D.1-13 document closure activities at this CAS.



Figure D.1-10
CAS 25-23-21, Radioactive Waste Dump, RMA Soil Piles



Figure D.1-11 CAS 25-23-21, Radioactive Waste Dump, Leveling of Soil Piles



Figure D.1-12
CAS 25-23-21, Radioactive Waste Dump,
Excavation of RMA, Soil Disposed of in Lined Intermodal



Figure D.1-13 CAS 25-23-21, Radioactive Waste Dump, Southern RMA Backfilled

D.1.5 CAS 25-25-19 Closure Activities

No Decision II soil samples were collected because the analytical results showed no concentrations of any constituents above PALs. Two lead bricks were discovered, and as a corrective action, were removed and the soil beneath them sampled. The soil sample results indicated that no lead had leached into the soil from the bricks. As a BMP, the lead bricks will be recycled. Another BMP implemented at the site included disposing of approximately 9 yd³ of debris from the north trench (e.g., asphalt and trash). This debris was disposed of at the U10c industrial waste landfill (Table A.13-1). The north trench was actually a natural depression and was not backfilled, but the east side was sloped to conform to the land surface. Figures D.1-14 and D.1-15 show the staged debris and the north trench after debris removal.



Figure D.1-14
CAS 25-25-19, Hydrocarbon Stains and Trench, Staged Debris near North Trench



Figure D.1-15
CAS 25-25-19, Hydrocarbon Stains and Trench, North Trench Cleared of Debris

D.2.0 References

Author Unknown. 1986. Aerial photograph 017 showing Area 2 Annex, 6 October. Mercury, NV. H&N, see Holmes & Narver, Inc.

Holmes & Narver, Inc. 1971. Aerial photograph Roll #73, Frame #012 showing Area 2 Camp, 3 September. Mercury, NV.

Attachment D-1

Use Restriction

(4 Pages)

Use Restriction Information

CAU Number/Description: CAU 561, Waste Disposal Areas

Applicable CAS Number/Description: 02-08-02, Waste Dump and Burn Area

Contact (Federal Sub-Project Director/Sub-Project): Kevin Cabble

FFACO Use Restriction Physical Description:

Surveyed Area (UTM, Zone 11, NAD 27, meters):

UR Points	Northing	Easting
Southeast	4,112,449.6	580,429.1
Southwest	4,112,424.9	580,401.6
Northwest	4,112,589.9	580,212.9
Northeast	4,112,623.8	580,242.2
East	4,112,552.1	580,356.4

Depth: 0 ft to 5 ft below ground surface at the burn area, up to 5 ft below ground surface within the waste dump

Survey Source (GPS, GIS, etc.): GPS

Basis for FFACO UR(s):

Summary Statement: This FFACO UR was implemented as part of a closure in place corrective action to restrict site activities that may expose workers to site contamination. This FFACO UR is for surface and shallow subsurface disturbances between 0 ft and 5 feet below ground surface at the burn area, and for disturbances within the waste piles to a depth of 5 feet below ground surface. Lead and arsenic is contained within the burn area at concentrations listed in the table below. Polyaromatic hydrocarbons (PAHs) concentrations contained within the waste piles are listed in the table below.

Contaminants Table:

Maximum Concentration of Contaminants for CAU <u>561</u> CAS <u>02-08-02</u> , Waste Dump and Burn Area									
Constituent	Maximum Concentration	Action Level	Units						
Lead	14,000	800	mg/kg						
Arsenic	65	23	mg/kg						
Benzo(a)anthracene	2.8	2.1	mg/kg						
Benzo(a)pyrene	2.4	0.21	mg/kg						
Benzo(b)fluoranthene	3.7	2.1	mg/kg						
Dibenzo(ah)anthracene	1	0.21	mg/kg						
Indeno(1,2,3-cd)pyrene	3.3	2.1	mg/kg						

Site Controls: _Post UR warning signs at SE, SW, NW, NE, and E recorded points. Plus, on west side of UR, three signs will be placed every 200 ft between the SW and NW corner. On the east side of the UR, one sign will be place 200 feet between the NE and E corner, and one sign will be placed 200 feet between the E and SE corner. A total of 10 signs will be posted at the site.

Note: Effective upon acceptance of closure documents by NDEP

Use Restriction Information

Administrative Use Restriction Physical Description*:

Surveyed Area	(UTM, Zone 11	, NAD 27	, meters)):
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	Northing		asting
		•	
epth:			
urvey Source (GPS, GIS, etc.):			
Coordinates for the Administrative Use Re	estriction exclude the area defined by the FFAC	O Use Restriction coordinates.	
Basis for Administrative UR(s):			
Summary Statement: No adm	inistrative UR, FFACO UR only		
Contaminants Table:			
	Maximum Concentration of Contamina	nts for CAU XXX	
	CAS XX-XX-XX, Title		
Constituent		Action Level	Units
	CAS XX-XX, Title	Action Level	Units
	CAS XX-XX, Title	Action Level	Units
	CAS XX-XX, Title	Action Level	Units

UR Maintenance Requirements (applies to both FFACO and Administrative UR(s) if Administrative UR exists):

Description: This UR must be entered into the NNSA/NSO Facility Information Management System (FIMS), the FFACO database, and the NNSA/NSO CAU/CAS files.

Inspection/Maintenance Frequency: Annual post-closure visual inspections will be conducted to ensure postings are in place, intact, and legible, and that there is no evidence of subsurface intrusion or disturbances between 0 and 5 ft bgs at the burn area, and within the waste piles to a depth of 5 ft at the waste dump.

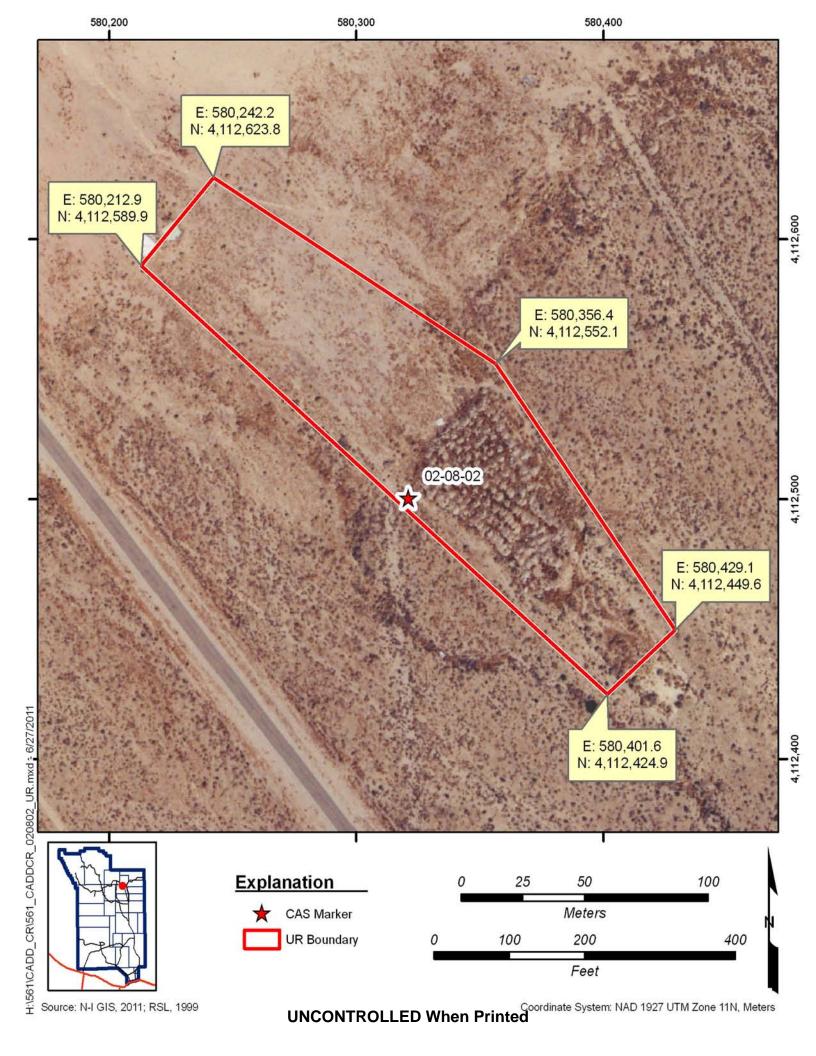
Note: Effective upon acceptance of closure documents by NDEP

Use Restriction Information

The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU CR or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: Personnel are restricted from performing work in this location that would disturb the surface and subsurface soil (e.g., digging or scrapping of soil). Permissible activities include short duration activities such as site visits, maintenance of signs, or surveys (radiological walkover or geophysical).

Submitted By:	/s/	Kevin Cabble	Date:	P-	9-11	/
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Appendix E Sample Location Coordinates

E.1.0 Sample Location Coordinates

Sample location coordinates were collected during the CAI using a GPS instrument. These coordinates identify the CAU 561 Decision I and II sampling locations (easting and northing positions) and ground surface elevations at CAU 561.

Sample locations are shown on Figures A.3-1, A.4-1, A.5-1, A.6-1, A.7-1, A.8-1, A.9-1, A.10-1, A.11-2, A.11-3, and A.12-1, while the corresponding coordinates for all CAS sample locations are listed in Table E.1-1.

Table E.1-1
Sample Location Coordinates for CAU 561
(Page 1 of 8)

[-			
Northing ^a	Easting ^a	Elevation (m amsl)	Sample Location
	CAS 01-19-01	, Waste Dump	
4,099,466.70	580,604.50	1248.9	A01
4,099,468.80	580,609.40	1247	A02
4,099,468.40	580,601.30	1248.7	A03
4,099,473.60	580,599.50	1249.4	A04
	CAS 02-08-02, Waste	Dump and Burn Area	
4,112,574.80	580,232.80	1338.9	B01
4,112,550.50	580,269.40	1338.6	B02
4,112,548.00	580,276.10	1338.8	B03
4,112,556.10	580,273.70	1338.8	B04
4,112,513.40	580,308.60	1338.2	B05
4,112,560.70	580,300.00	1337.9	B06
4,112,503.30	580,331.80	1337.4	B07
4,112,496.20	580,343.40	1337	B08
4,112,485.80	580,354.40	1337.2	B09
4,112,478.50	580,364.40	1337	B10
4,112,492.00	580,378.10	1337.3	B11
4,112,505.10	580,370.50	1336.7	B12
4,112,518.10	580,364.70	1337.3	B13

CAU 561 CADD/CR Appendix E Revision: 0 Date: August 2011 Page E-2 of E-8

Table E.1-1 Sample Location Coordinates for CAU 561

(Page 2 of 8)

Northing ^a	Easting ^a	Elevation (m amsl)	Sample Location
4,112,525.50	580,359.90	1337.3	B14
4,112,530.30	580,355.80	1337.9	B15
4,112,535.70	580,348.40	1338.3	B16
4,112,524.70	580,334.60	1338.3	B17
4,112,517.40	580,329.30	1338.3	B18
4,112,450.00	580,397.40	1333.3	B19
4,112,455.50	580,405.00	1333.7	B20
4,112,551.00	580,279.50	1338.7	B21
4,112,543.80	580,282.90	1338.6	B22
4,112,542.10	580,283.80	1338.5	B23
4,112,545.20	580,275.10	1338.6	B24
4,112,546.70	580,273.90	1338.6	B25
4,112,543.60	580,274.70	1338.6	B26
4,112,483.90	580,345.90	1334.8	B27
4,112,491.50	580,335.10	1334.9	B28
4,112,517.20	580,323.70	1335.2	B29
4,112,526.00	580,327.70	1335	B30
4,112,537.70	580,338.90	1335.9	B31
4,112,536.20	580,366.60	1334.9	B32
4,112,517.80	580,378.20	1333.6	B33
4,112,508.90	580,309.50	1335.8	B34
4,112,514.90	580,311.80	1336.2	B35
4,112,516.50	580,307.00	1335.9	B36
4,112,569.40	580,231.30	1338.9	B37
4,112,589.70	580,216.70	1338	B38
4,112,576.50	580,237.20	1339.1	B39
4,112,537.10	580,285.70	1336.8	B40
4,112,543.60	580,280.50	1338.2	B41

CAU 561 CADD/CR Appendix E Revision: 0 Date: August 2011 Page E-3 of E-8

Table E.1-1 Sample Location Coordinates for CAU 561

(Page 3 of 8)

Northing ^a	Easting ^a	Elevation (m amsl)	Sample Location
4,112,549.20	580,286.80	1336.1	B42
4,112,550.50	580,276.50	1336.3	B43
4,112,557.40	580,275.70	1337	B44
4,112,547.40	580,268.90	1336.4	B45
4,112,549.80	580,266.30	1336.9	B46
4,112,555.40	580,271.30	1336.5	B47
4,112,566.10	580,313.40	1337.7	B48
4,112,583.60	580,298.40	1338.6	B49
4,112,603.20	580,276.80	1338.3	B50
4,112,608.20	580,247.50	1339.1	B51
4,112,551.50	580,247.00	1338.1	B52
4,112,533.40	580,271.50	1336.9	B53
4,112,517.60	580,288.90	1337.1	B54
	CAS 03-19-02	2, Debris Pile	
4,100,411.20	588,071.80	1211.7	C01
4,100,404.90	588,084.00	1211	C02
	CAS 05-62-01, Rad	ioactive Gravel Pile	
4,069,031.80	591,580.80	930.4	D01
4,069,034.90	591,567.60	931.8	D02
4,069,017.30	591,561.40	930.4	D03
4,069,013.60	591,570.60	931.6	D04
4,069,024.90	591,586.30	930.3	D05
	CAS 12-23-09, Radio	pactive Waste Dump	
4,115,717.90	573,369.70	1669.1	E01
4,115,758.00	573,396.90	1669.4	E02
4,115,800.20	573,418.20	1662.9	E03
4,115,718.10	573,320.80	1675.4	E04
4,115,760.00	573,344.30	1666.9	E05

CAU 561 CADD/CR Appendix E Revision: 0 Date: August 2011 Page E-4 of E-8

Table E.1-1 **Sample Location Coordinates for CAU 561**

(Page 4 of 8)

Northing ^a	Easting ^a	Elevation (m amsl)	Sample Location
4,115,801.20	573,369.10	1664.7	E06
4,115,799.70	573,363.10	1665.6	E07
	CAS 22-19-06, Buried	l Waste Disposal Site	
4,053,454.40	588,011.50	981.6	F01
4,053,452.90	588,009.60	980.9	F02
4,053,450.30	588,007.30	980.5	F03
4,053,451.70	588,008.40	980.8	F04
	CAS 23-21-04, Waste	e Disposal Trenches	
4,058,176.50	590,312.40	1157.7	G01
4,058,176.60	590,308.60	1156.3	G02
4,058,153.30	590,265.80	1153.3	G03
4,058,177.50	590,310.10	1156.8	G04
4,058,175.90	590,315.70	1156.2	G05
4,058,174.70	590,319.30	1156.9	G06
4,058,172.20	590,325.50	1158	G07
4,058,151.50	590,242.90	1151.9	G08
4,058,153.40	590,250.60	1153.8	G09
4,058,153.00	590,255.70	1153.8	G10
4,058,160.90	590,241.20	1154.2	G11
4,058,161.00	590,251.80	1154.6	G12
4,058,161.00	590,259.10	1154.2	G13
4,058,177.60	590,311.90	1156.8	G14
4,058,175.10	590,309.80	1157	G15
4,058,177.30	590,313.40	1156.1	G16
4,058,162.20	590,252.50	1151.4	G17
4,058,158.60	590,251.20	1153.6	G18
4,058,159.70	590,248.80	1152.4	G19
4,058,159.80	590,249.30	1173.6	G20

CAU 561 CADD/CR Appendix E Revision: 0 Date: August 2011 Page E-5 of E-8

Table E.1-1 Sample Location Coordinates for CAU 561

(Page 5 of 8)

Northing ^a	Easting ^a	Elevation (m amsl)	Sample Location
4,058,161.30	590,246.70	1174.6	G21
4,058,158.50	590,247.20	1174.6	G22
4,058,162.20	590,252.50	1175.2	G23
4,058,158.30	590,252.40	1177	G24
4,058,162.00	590,253.60	1174.4	G25
4,058,160.50	590,253.50	1173.6	G26
4,058,162.50	590,253.10	1174.9	G27
4,058,163.30	590,254.20	1175.2	G28
4,058,177.20	590,308.20	1178.3	G29
4,058,178.20	590,309.80	1178.1	G30
4,058,177.80	590,313.60	1178.7	G31
4,058,176.20	590,311.30	1179.1	G32
4,058,173.80	590,326.90	1158	G33
4,058,174.10	590,325.60	1158	G34
4,058,173.50	590,328.30	1158	G35
4,058,174.90	590,327.10	1158	G36
4,058,176.60	590,311.80	1176.6	G37
	CAS 25-08-02	, Waste Dump	
4,073,973.10	566,096.20	1093.1	H01
4,073,977.90	566,102.40	1093.3	H02
4,073,987.70	566,102.80	1093.8	H03
4,073,988.80	566,099.90	1094.2	H04
4,073,993.40	566,105.80	1094	H05
4,074,002.40	566,100.30	1094.5	H06
4,074,004.50	566,106.00	1094.4	H07
4,074,010.20	566,106.50	1094.5	H08
4,074,017.20	566,101.70	1094.4	H09
4,074,017.00	566,108.10	1094.7	H10

CAU 561 CADD/CR Appendix E Revision: 0 Date: August 2011 Page E-6 of E-8

Table E.1-1 Sample Location Coordinates for CAU 561

(Page 6 of 8)

Northing ^a	Easting ^a	Elevation (m amsl)	Sample Location
4,074,025.30	566,109.80	1094.7	H11
4,074,023.20	566,105.40	1095.2	H12
4,074,032.90	566,108.00	1095.2	H13
4,074,040.90	566,111.10	1094.9	H14
4,074,047.70	566,107.70	1095.1	H15
4,074,065.00	566,123.80	1095.6	H16
4,073,978.70	566,107.80	1093.7	H17
4,073,975.10	566,096.80	1093	H18
4,073,988.10	566,109.80	1092.7	H19
4,073,985.60	566,104.50	1089.3	H20
4,073,985.00	566,101.50	1088.2	H21
4,073,982.40	566,100.20	1088	H22
4,073,980.20	566,099.70	1088.1	H23
	CAS 25-23-21, Radio	pactive Waste Dump	
4,074,078.40	562,660.70	1066.2	l01
4,074,070.70	562,627.40	1066.5	102
4,074,096.40	562,623.10	1065.5	103
4,074,105.70	562,639.40	1065.2	104
4,074,114.30	562,605.90	1064.2	105
4,074,131.00	562,656.20	1065.2	106
4,074,102.10	562,654.10	1065	107
4,074,110.10	562,680.90	1067.2	108
4,074,148.60	562,702.90	1066.9	109
4,074,108.60	562,700.60	1068.4	l10
4,074,071.80	562,700.70	1062.7	l11
4,074,079.60	562,706.20	1062.1	l12
4,074,078.30	562,710.70	1062.7	l13
4,074,067.60	562,708.20	1062.7	l14

CAU 561 CADD/CR Appendix E Revision: 0 Date: August 2011 Page E-7 of E-8

Table E.1-1 Sample Location Coordinates for CAU 561 (Page 7 of 8)

Northing ^a	Easting ^a	Elevation (m amsl)	Sample Location
4,074,062.10	562,705.50	1063.2	l15
4,074,178.00	562,698.90	1067.2	I16
4,074,077.30	562,702.50	1061.7	l17
4,073,556.10	562,428.50	1051.9	l18
4,073,550.20	562,470.00	1051.1	l19
4,073,538.80	562,460.10	1051	120
4,073,534.50	562,475.00	1051.4	l21
4,073,538.20	562,490.30	1052	122
4,073,548.80	562,479.90	1051.7	123
4,073,561.50	562,462.90	1051.4	124
4,073,548.80	562,456.90	1051.4	125
4,073,561.20	562,453.20	1051.8	126
4,073,544.80	562,443.90	1051.2	127
4,073,557.30	562,443.90	1051.9	128
4,073,543.10	562,434.10	1051.6	129
4,073,542.20	562,465.40	1050.8	130
4,073,492.10	562,430.90	1047.6	l31
4,073,560.90	562,488.90	1051.2	132
4,073,542.60	562,464.40	1050.5	133
4,073,542.70	562,463.40	1048.9	134
4,073,540.60	562,464.40	1049.6	135
4,073,544.50	562,465.80	1049.2	136
4,073,559.20	562,488.80	1046.8	137
4,073,560.50	562,491.80	1049.1	138
4,073,561.80	562,489.70	1048.9	139
4,073,540.10	562,467.70	1048.4	140
4,073,560.30	562,488.00	1048.2	I41
4,073,559.70	562,489.20	1048	142

Table E.1-1 Sample Location Coordinates for CAU 561

(Page 8 of 8)

Northing ^a	Easting ^a	Elevation (m amsl)	Sample Location
4,073,561.80	562,488.60	1048	143
4,073,542.10	562,466.60	1046.2	144
4,073,540.50	562,464.70	1046.1	I45
4,073,541.70	562,464.80	1049.4	I46
4,073,545.50	562,464.60	1048.3	147
4,073,543.60	562,462.80	1048.6	I48
4,073,543.30	562,464.80	1046.6	149
	CAS 25-25-19, Hydroca	rbon Stains and Trench	
4,073,155.00	565,192.70	1070.9	J01
4,073,168.20	565,194.50	1072.4	J02
4,073,175.60	565,207.30	1072.3	J03
4,073,212.40	565,196.00	1073	J04
4,073,222.10	565,173.60	1072.1	J05
4,073,214.50	565,181.00	1072.9	J06
4,073,221.00	565,169.00	1072.5	J07
4,073,086.00	565,202.90	1070.3	J08
4,073,080.00	565,200.20	1070	J09
4,073,060.90	565,202.30	1068.9	J10
4,073,193.50	565,222.60	1073.1	J11
4,073,267.80	565,206.20	1073.8	J12
4,073,294.40	565,209.80	1074.6	J13
4,073,181.80	565,178.30	1072.2	J14
4,073,206.80	565,174.80	1072.5	J15
4,073,225.70	565,174.30	1072.7	J16
4,073,214.30	565,174.00	1072.4	J17

^aUniversal Transverse Mercator (UTM) Zone 11, North American Datum (NAD) 1927 (U.S. Western)

amsl = Above mean sea level

m = Meter

Appendix F Waste Disposition Documents

(92 Pages)

NSTec
Form
FRM-0918

08/23/06 Rev. 0

Page 1 of 2 SWO USE (Select One) AREA 6 $\boxtimes 9$ LANDFILL For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898. REQUIRED: WASTE GERERATOR INFORMATION (This form is for rolloffs, dump trucks, and other onsite disposal of materials.) Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241) Phone Number: (a)5-2124; (c)496-0150 Location / Origin: CAU 561; CAS 23-21-04 Bulk Debris and soil for disposal using tracking number 561G03 Waste Category: (check one) ☐ Commercial Waste Type: □ NTS ☐ Putrescrible ☑ FFACO-onsite ☐ WAC Exception (check one) ☐ Non-Putrescible Asbestos Containing Material ☐ FFACO-offsite Pollution Prevention Category: (check one) ☐ Historic DOE/NV M Environmental management ☐ Defense Projects YMP Pollution Prevention Category: (check one) ☑ Clean-Up ☐ Routine Method of Characterization: (check one) Sampling & Analysis Process Knowledge Contents Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory NTS landfills: levels, and Medical wastes (needles, sharps, bloody clothing). Additional Prohibited Waste Sewage Sludge, Animal carcasses, Wet garbage (food waste); and Friable asbestos at the Area 9 U10C Landfill: REQUIRED: WASTE CONTENTS ALLOWABLE WASTES Check all allowable wastes that are contained within this load: NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol. Acceptable waste at any NTS landfill; ☑ Paper Rocks / unaltered geologic materials Empty containers ☐ Asphalt ☑ Metal Mood M Soil ☐ Rubber (excluding tires) ☑ Plastic Demolition debris ☑ Wire ☐ Cable ☑ Cloth □ Insulation (non-Asbestosform) Manufactured Items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.) □ Cement & concrete Additional waste accepted at the Area 23 Mercury Landfill: Office Waste ☐ Food Waste Animal Carcasses ☐ Asbestos ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: Additional waste accepted at the Area 9 U10c Landfill: ☐ Non-friable asbestos ☐ Drained automobiles and military vehicles ☐ Solid fractions from sand/oil/water ☐ Light ballasts (contact SWO) ☐ Drained fuel filters (gas & diesel) ☐ Deconned Underground and Above **Ground Tanks** Additional waste accepted at the Area 6 Hydrocarbon Landfill: Septic sludge □ Rags ☐ Drained fuel filters (gas & diesel) Crushed non-teme plated oil filters ☐ Plants Soll ☐ Sludge from sand/oil/water separators PCBs below 50 parts per million REQUIRED: WASTE GENERATOR SIGNATURE (if initialed, no radiological clearance is necessary.) The above mentioned waste was generated outside of a Controlled Waste Managemen Radiological Survey Release for Weste Disposal d knowledge, does not contain radiological materials. Tile contellier/load meets the ciller a for To the best of my knowledge, the waste described above contains only those material added man-made radioactiv site. I have verified this through the waste characterization method identified above a This container/load m prohibited and allowable waste items. Lhave confacted Property Management and ha Radcon Manual Tablo 4.7 release This container/load is exempt from due to process knowledge and origin is approved for disposal in the landfill. Print Name: Mark Heser GNATURE: /s/ Signature on File /s/ Mark Heser Signature: Date: 4-25-11 here. Onsite use only. Note: "Food waste, office trash and animal carcasses do not require a radiological clearance. Freon-containing appliances must have signed removal certification statement with Load Verification." SWO USE ONLY 6/27/11 Load Weight (net from scale or estimate): /s/ Signature on File Signature of Certifier:

NSTec	
Form	
FRM-091	18

08/23/06 Rev. 0

Forwaste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898. Forwaste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898. Forwaste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898. Forwaste Characterization, and the service of the contact of the
Waste Generator: Mark Heser (NI, WO)(MIS - NSF167) (Fax 5-2241)
Waste Generator: Mark Heser (NI, WO)(MIS - NSF187) (Fas, and other onsite disposal of materials.) Waste Generator: Mark Heser (NI, WO)(MIS - NSF187) (Fas, 52241)
Location / Origin: CAU 561; CAS 23-21-04 Bulk Debris and soil for disposal using tracking number 581603 Waste Type: NTS Commercial Mindustrial Mindustrial FRACO-onsite MAC Exception Master Type: NTS Putrescrible FRACO-onsite MAC Exception Master Type: NTS Putrescrible FRACO-onsite Mistoric DOE/N Mon-Putrescible Asbestos Containing Material FRACO-onsite Mistoric DOE/N Mon-Putrescible Mistoric DOE/N Mistoric DOE/N Mon-Putrescible Mistoric DOE/N Mistoric D
Waste Category: (check one)
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Waste Type: NTS
MAC Exception Mac Exceptio
Poliution Prevention Category: (check one)
Method of Characterization: (check one)
Prothibited Waste at all three NTS landfills: Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulato levels, and Medicial wastes (needles, sharps, bloody clothing). Sewage Sludge, Animal carcasses, Wet garbage (frood waste); and Friable asbestos REQUIRED: WASTE CONTENTS ALLOWABLE WASTES Check all allowable wastes that are contained within this load: coolants, such as: gasoline (no benzene, leady); jet fuel; diesel fuel; tubricants and hydraulics; kerosene; asphaltic coolants, such as: gasoline (no benzene, leady); jet fuel; diesel fuel; tubricants and hydraulics; kerosene; asphaltic Acceptable waste at any NTS landfill: Asphalt Wetal Wood Soil Rubber (excluding tires) Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.) Asphalt Waste accepted at the Area 23 Mercury Landfill: Non-friable asbestos Priable Non-Friable (contact SWO) if regulated load) Light ballasts (contact SWO) Other Capined fuel filters (gas & diesel) Crushed non-teme plated oil filters Poeroned Underground and Above Ground Tanks REQUIRED: WASTE CONTENTS ALLOWABLE WASTES Asphalt Wetal Wood Soil Rubber (excluding tires) Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.) Asbestos Friable Non-Friable (contact SWO) if regulated load) Asbestos Friable Non-Friable (contact SWO) if regulated load) Asphalt Waste accepted at the Area 23 Mercury Landfill: Non-friable asbestos Priable Rubber (contact SWO) in regulated load) Light ballasts (contact SWO) Other Capined fuel filters (gas & diesel) Deconned Underground and Above Ground Tanks Capined fuel filters (gas & diesel) Crushed non-teme plated oil filters Poeroned of Order on and Order o
NTS landfills: Nadioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulato levels, and Medical wastes (needles, sharps, bloody clothing). Sewage Sludge, Animal carcasses, Wet garbage (food waste); and Friable asbestos **REQUIRED: WASTE CONTENTS ALLOWABLE WASTES** Chack all allowable wastes that are contained within this load: Coolants, such as: gasoline (no benzane, lead); left fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic coolants, such as: gasoline (no benzane, lead); left fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon: and ethylene glycol. Asphalt
Sewage Sludge, Animal carcasses, Wet garbage (food waste); and Friable asbestos **REQUIRED: WASTE CONTENTS ALLOWABLE WASTES** **Check all allowable wastes that are contained within this load: **coolants, such as: gasoline (no benzene, tead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic **coolants, such as: gasoline (no benzene, tead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic **coolants, such as: gasoline (no benzene, tead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic **coolants, such as: gasoline (no benzene, tead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic **coolants, such as: gasoline (no benzene, tead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic **Coolants, such as: gasoline (no benzene, tead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic **Coolants, such as: gasoline (no benzene, tead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic **Coolants, such as: gasoline (no benzene, tead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic **Coolants, such as: gasoline (no benzene, tead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic **Coolants, such as: gasoline fuel fuel fuel fuel fuel fuel fuel fue
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Check all allowable wastes that are contained within this load: coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic acceptable waste at any NTS landfill: Asphalt
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Asbestos Friable Non-Friable (contact SWO) if regulated load) Quantity: Animal Carcasses Animal
Asbestos Friable Non-Friable (contact SWO if regulated load) Frood Waste Animal Carcasses Inditional waste accepted at the Area 9 U10c Landfill: Solid fractions from sand/oll/water Non-friable asbestos Drained automobiles and military vehicles Solid fractions from sand/oll/water Deconned Underground and Above Ground Tanks Deconned Underground and Above Ground Tanks
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Non-friable asbestos
Light ballasts (contact SWO)
Hydrocarbons (contact SWO) Other Ground Tanks Iditional waste accepted at the Area 6 Hydrocarbon Landfill: Septic sludge Rags Drained fuel filters (gas & diesel) Crushed non-teme plated oil filters Plants Soil Sludge from sand/oil/water separators PCBs below 50 parts per million REQUIRED: WASTE GENERATOR SIGNATURE It initialed, no radiological clearance is necessary.) In above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my wholedge, does not contain radiological materials. It have verified this through the waste described above contains only those materials in the landfill. It have contacted Property Management and Suddedmans. It have contacted Property Management and Suddedmans. It have mark Heser
Septic sludge Rags Drained fuel filters (gas & diesel) Crushed non-teme plated oil filters Plants Soil Sludge from sand/oil/water separators PCBs below 50 parts per million REQUIRED: WASTE GENERATOR SIGNATURE itals: (If initialed, no radiological clearance is necessary.) above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my whedge, does not contain radiological materials. It have verified this through the waste described above contains only those materials Paddogled Soiley fleets to type a peroved for disposal in the landfill.
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Plants Soil Sludge from sand/oil/water separators PCBs below 50 parts per million REQUIRED: WASTE GENERATOR SIGNATURE tials: (If initialed, no radiological clearance is necessary.) above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my wiledge, does not contain radiological materials. The best of my knowledge, the waste described above contains only those materials and allowable waste Items. I have contacted Property Management and Padicion and States of Management and Padicion and States of Management and Mark Heser. This container/load ments the cross to state of the sadded ments the cross to sadded ments the c
REQUIRED: WASTE GENERATOR SIGNATURE (if initialed, no radiological clearance is necessary.) above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my wiledge, does not contain radiological materials. The best of my knowledge, the waste described above contains only those materials and allowable waste the waste characterization method identified above proved for disposal in the landfill. This container/load method intentions and the landfill. This container/load method intentions and the landfill.
above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my byledge, does not contain radiological materials. The best of my knowledge, the waste described above contains only those materials through the waste characterization method identified about the best of my knowledge, the waste characterization method identified about the waste characterization method identified about the waste items. I have contacted Property Management and Mark Heser
above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my wiedge, does not contain radiological materials. The best of my knowledge, the waste described above contains only those many haddy only a sorrest of the waste characterization method identified about the waste items. I have contacted Property Management and Milk Container/load method in the landfill. This container/load method in the landfill.
I have verified this through the waste characterization method identified abordinated and allowable waste items. I have contacted Property Management and provided in the landfill. I have contacted Property Management and the landfill. I have contacted Property Management and the landfill.
I have verified this through the waste characterization method identified abordinated and allowable waste items. I have contacted Property Management and provided in the landfill. I have contacted Property Management and the landfill. I have contacted Property Management and the landfill.
I have verified this through the waste characterization method identified abordinated and allowable waste items. I have contacted Property Management and provided in the landfill. I have contacted Property Management and the landfill. I have contacted Property Management and the landfill.
peroved for disposal in the landfill. Name: Mark Heser
Name: Mark Heser
Name: Mark Heser
Tilla containe in a containe i
Date: 4-27-// Date: 4-27-//
The state of the s
must have signed removal certification statement with Load Verification." Gue to brogges knowledge and origin.
Weight (net from scale or estimate): 36,960 signature of Certifler: /s/ Signature on File

16866

NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

SWO USE (Select One) AREA	23	76	⊠ 9	SZ LANDEN I
For waste characterization, appro		contact Solid	Naste Operation /S	LANDFILL
KEQUI	KEU: WASTE GERER	ATOR INFOR	MATION	
(I nis form is for ro	lloffs, dump trucks, and d	other onsite di	sposal of materials	.)
waste Generator: Mark Heser (NI, WO)(M	/S - NSF167) (Fax 5-224	1 1)	Phone Number:	(o)5-2124: (c)496-0150
Location / Origin: CAU 561; CAS 23-21-04	Bulk Debris and soil for	or disposal usi	no tracking number	561C03
Waste Category: (check one)	☐ Commercial		Industrial	301903
Waste Type: NTS	☐ Putrescrible			
(check one)	Ashestos Containie		FFACO-onsite FFACO-offsite	☐ WAC Exception
Pollution Prevention Category: (check one)	X Environmental man		Defense Project	☐ Historic DOE/NV s ☐ YMP
Pollution Prevention Category: (check one)			Routine	5. L. 11VIC
Method of Characterization: (check-one)	Sampling & Analysi			dge 🛛 Contents
Prohibited Waste at all three Radioactive NTS landfills: Radioactive levels, and N	waste; RCRA waste; Ha	72rdoue weet	or Eron limites DO	Bs above TSCA regulatory
Additional Prohibited Waste	Transfer (Ficedias,	, snarps, block	ly clothing).	
at the Area 9 U10C Landfill: Sewage Sluc	dge, Animal carcasses, \	Net garbage (food waste); and F	riable asbestos
REQUIRED	: WASTE CONTENTS	ALLOWARIE	WACTED	
NOTE: Waste disposal at the Area 6 Hudron	owable wastes that are o	contained with	in this load:	
coolants, such as: dasoline (no hear	even lead): let first attended	come into cor	ntact with petroleun	n hydrocarbons or
leas-t-bt-				kerosene; asphaltic
Apphali Materia	Paper Rocks	s / unaltered g	eologic materials	
7 01-41- 17	Soil Rubbi	er (excluding t	ires)	□ Demolition debris
Manufactured items: (swamp coolers, furn	Cloth Insula	ition (non-Asb	estosform)	☑ Cement & concrete
Additional waste accepted at the Area 23 M	ercury Landfille	onic compone		,
Asbestos Friable Non-Fr	lable (contact SWO if reg	Office Waste		☐ Animal Carcasses
idditional waste accepted at the Area 9 U1	Oc Landfill-	gained load)	Quantity:	
☐ Non-triable asbestos ☐ Drained a	automobiles and military	vehicles []	Solid fractions from	
- Light valiable (contact SWO) Drained f	uel filters (gas & diesel)			
Hydrocarbons (contact SWO) Other		u	Deconned Underg Ground Tanks	round and Above
dditional waste accepted at the Area 6 Hyd	irocarbon Landfill:			
Drain Studge	ined fuel filters (gas & die	esel)	☐ Crushed non-	-teme plated oil filters
Sluc	ige from sand/oil/water s	engratore	DOD- Late	50 parts per million
itials: (it initials a second	RED: WASTE GENERA	TOR SIGNAT	URE	
itials: (if initialed, no radiological cle	parance is necessary.)		82	
ie above mentioned waste was generated ou lowledge, does not contain radiological mate	tside of a Controlled Wa	iste Managem	ent Area (CWMA) a	and to the best of
				10 min
the best of my knowledge, the waste descri e. I have verified this through the waste cha	oed above contains only	those materi	als that are allowed	d for disperal at this
onibited and allowable waste items I have a	racterization method ide	ntified abov	Redicionical	y Release for Wasters sposak
approved for disposal in the landfill.	outdoor roperty mana	gement and	《公司》(1910日) 2015年 1915年 191	A STATE OF THE PARTY OF THE PAR
nt Name: _Mark Heser		W	Andeg mai	liner/lood meem the chiesia for 1-made /ad/oactive material
gnature: /s/ Mark Heser		13	In 3 conte	mor/load meets the priteria fate
	Date:	4-29-11	Hadcon Mi This conta	inual Table 4.2 release limits
te: "Food waste, office tresh and animal care must have signed removal certification sta	asses do not require a m	adiological @	Service Control of the Control of th	eas keckledge and ording
O USE ONLY			SIGNATURE: /s/ Si	gnature on File
ad Weight (pet from scale or estimate):		/// 🛎		THE PARTY OF THE P
data g estimate): //	Signature o	f Certifier:	/s/ Signatur	e on File
**************************************			-0	//

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Form	
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Rev. 0 Page 1 of 2

SWO USE (Select		□ 23	6	⊠ 9	⊠ LANDFILL
For waste cha	aracterization, approv	al, and/or assistance,	contact Solid	Waste Operation (SV	NO) at 5-7898.
	REQUIR	RED: WASTE GEREF offs, dump trucks, and	RATOR INFOR	MATION	
		3 - NSF167) (Fax 5-22			(o)5-2124; (c)496-0150
Location / Origin: CAU	561; CAS 23-21-04	Bulk Debris and soil	for disposal usi		
Waste Category: (check	one)	☐ Commercial		☑ Industrial	
Waste Type: N	rs	☐ Putrescrible		FFACO-onsite	☐ WAC Exception
	n-Putrescible	☐ Asbestos Contain		☐ FFACO-offsite	☐ Historic DOE/NV
Pollution Prevention Ca	tegory: (check one)	Environmental ma		Defense Projects	***************************************
Pollution Prevention Ca	tegory: (check one)	☑ Clean-Up		Routine	
Method of Characterizat	tion: (check one)	Sampling & Analy		Process Knowled	ge X Contents
Prohibited Waste at all t NTS landfills:	three Radioactive v		lazardous wast	e: Free liquids PCB	s above TSCA regulatory
Additional Prohibited W at the Area 9 U10C Land	acto	ge, Animal carcasses.			iable asbestos
NOTE: Waste disposal a coolants, such as petroleum hydroc	Check all allo t the Area 6 Hydroca	sne, lead), let mer die	contained with	hin this load:	hydrocarbons or kerosene; asphaltic
Acceptable waste at any			ke / unaltored	geologic materials	SI 5
☐ Asphalt ☒ Metal	☑ Wood ☑		ber (excluding		Empty containers
☑ Plastic ☑ Wire	☐ Cable		ilation (non-Ast		Demoition debris
Manufactured items: (etronic compon	onte DDE atal	□ Cement & concrete □
Additional waste accept	ed at the Area 23 M		Office Waste		[] Asimal Carana
Asbestos Friat		able (contact SWO if			☐ Animal Carcasses
Additional waste accept				additity.	
☐ Non-friable asbestos		utomobiles and milita	ovyobiolog []	Solid fractions from	a acadiattita
Light ballasts (contact s	SWO) Drained for	uel filters (nas & diese	i) veriloles 🖂		
Hydrocarbons (contact	SWO) Other	/340 G UICSC	"/ [Deconned Undergate Ground Tanks	oung and Above
Additional waste accepte		Ironarkon I		GIOUIG TANKS	
☐ Septic sludge ☐	Rags 🔲 Drai	ned fuel filters (gas &			
					teme plated oil filters
— L		lge from sand/oil/wate	separators	PCBs below	50 parts per million
nitials: (if initialed		earance is necessary		IUKE	
The above mentioned was	te was generated ou	feide of a Controlled	Nacta II		
nowledge, does not cont	ain radiological mate	rials.	waste Manager		and to the hest of my
				Radiological Sun	vey Release for Waste Disposa
To the best of my knowled site. I have verified this th	rough the waste cha	racterization method	identified show	This cont	ainer/load meets the criteria fo
nombiten and allowable A	vaste items. I have c	ontacted Property Ma	nagement and	added ma	an-made radioactive material
s approved for disposal in	the landfill.		The state of the s	Radcon N	ainer/load meets the criteria fo fanual Table 4.2 release limits.
rint Name: Mark Heser				This cont	ainer/load is exempt from sup-
Signature: /s/ Mark	Heser	Da	ite: 4-27-11	SIGNATURE: /S/ M	ike Van Dillen DATE:5
lote: "Food waste, office must have signed re	trash and animal card	casses do not require tatement with Load Ve	a radiological c	learance, Freon-coi	ntaining appliances
WO USE ONLY	1	7200	ancauon.		/
	1		-17-11	lal Dan D	lightord
oad Weight (net from scal	e or estimate):	Signatur	e of Certifier:	/s/ Don B	ickiord _

NSTec Form FRM-0918

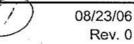
NTS LANDFILL LOAD VERIFICATION

SWO USE (Select One) AREA 23		Page
For waste characterization, approval, and/or assistance, contact Sol	⊠ 9	☐ LANDFILL
REQUIRED: MARTE	id Waste Operation (S	WO) at 5-7809
I ruis form is for rolloffs, dump trucks, and the	DRMATION	
Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241)	disposal of materials.	.)
Location / Origin: CAU 561: CAS 23 21 04 D. II D.	Phone Number:	(o)5-2124; (c)496-0150
	Ising tracking number	F64 CD2
	M Indiana	561G03
Putroscrible	☑ Industrial	
1 NOD-District		☐ WAC Exception
Pollution Prevention Category: (check one)	☐ FFACO-offsite	Historic DOE/N
Pollution Prevention Category: (check one) Environmental management Method of Characterization: (check one) Sampling & Application	☐ Defense Projects☐ Routine	☐ YMP
Prohibited Waste at all three Community Sampling & Analysis	Noune Process	
ATE I In Hiller Radioactive weets DCDA	ster Free lieutide See	ge 🛛 Contents
Additional Prohibited Waste Additional Prohibited Waste	ody clothing)	s above TSCA regulatory
at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses. Wet garbage	,	
- The gardage	(rood waste); and Fri	able asbestos
WASTE CONTENTS AT A CONTENTS		
petroleum hydrocarbon; and ethylene glycol. Acceptable waste at any NTS	ontact with petroleum	hydrocarbons or
Acceptable waste at any NTC I	and riyaradiles, Ki	erosene; asphaltic
☐ Asphalt ☐ Metal ☐ Want ☐ Faper ☐ Rocks / unaltered	geologic materials	
Za Flastic IXI Wire T	tirael	 ☑ Empty containers ☑ Demolition debris
Manufactured items: (swamp cools)	pestosform)	Cement & concrete
Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic componed Additional waste accepted at the Area 23 Mercury Landfill: Office Waste	ents, PPE, etc.)	S coment & concrete
Asbestos Friable Non-Frieble Office Waste		☐ Animal Carcasses
Additional waste accepted at the Area 9 U10c Landfill:	Quantity:	- Annual Carcasses
Light ballasts (contact swo)	Solid fractions from s	iand/oil/water
	Deconned Undergrou	and and At
Additional waste accepted at the A	Ground Tanks	and and Above
Additional waste accepted at the Area 6 Hydrocarbon Landfill:		
Plants Urained fuel filters (gas & diese)	Crushed non to	no alai i una
RECURSES MASSES Separators	PCBs below 50	ne plated oil filters
REQUIRED: WASTE GENERATOR SIGNAT	URE	parts per million
in radiological clearance is necessary		
The abude mentioned	Total and the second se	ON HOLDING THE REAL PROPERTY.
nowledge, does not contain radiological materials.	RGT Initials	y Release for Waste Disposa
the best of my knowled	CALL STATE OF THE	
by I have described at the waste described at the second a	This conta	iner/load maste to
te. I have verified this through the waste described above contains only those material	This conta	iner/load meets the criteria for- i-maderadioactive material
te. I have verified this through the waste described above contains only those materia ohibited and allowable waste items. I have contacted Property Management and approved for disposal in the landful.	ma line contai	ney/loan meets the
approved for disposal in the landfill.	Radcon Ma	nexication meets the criteria to nexicat meets the criteria to nual Table 4.2 release limits.
approved for disposal in the landfill. In Name: Mark Heser	Radcon Ma This contail	ney/load masts the criteria to nual Table 4.2 release limits. nual Table 4.2 release limits. ner/load is exempt from surv
int Name: Mark Heser Mark Heser Mark Heser Mark Heser Mark Heser	Radcom Ma This contain due to proce	neyload maets the criteria to nual Table 4.2 ralease illuita. nual Table 4.2 ralease illuita. ner/load is exempt from surv pasknows in a constitution origin. pature on File
int Name: Mark Heser Mark Heser Mark Heser Mark Heser Mark Heser	Radcom Ma This contain due to proce	neyload maets the criteria to nual Table 4.2 ralease illuita. nual Table 4.2 ralease illuita. ner/load is exempt from surv pasknows in a constitution origin. pature on File
int Name: Mark Heser Mark Heser Mark Heser Mark Heser Mark Heser	Radcom Ma This contain due to proce	neyload maets the criteria to nual Table 4.2 ralease illuita. nual Table 4.2 ralease illuita. ner/load is exempt from surv pasknows in a constitution origin. pature on File
int Name: Mark Heser Japanere: /s/ Mark Hes	Radcon Ma This contai duelg proce SIGNATURE: /s/ Sig here. Onsite rance. Freon-containi	nevitari meteral inevitari met
int Name: Mark Heser Japanere: /s/ Mark Hes	Radcon Ma This contai duelg proce SIGNATURE: /s/ Sig here. Onsite rance. Freon-containi	nevitari meteral inevitari met
te: "Food waste, office trash and animal carcasses do not require a radiological clear must have signed removal certification statement with Load Verification."	Radcon Ma This contai duelg proce SIGNATURE: /s/ Sig here. Onsite rance. Freon-containi	nevitari meteral inevitari met
int Name: Mark Heser Janature: /s/ Mark Heser January in Food waste, office trash and animal carcasses do not require a radiological clear must have signed removal certification statement with Load Verification." Journal of the standard animal carcasses do not require a radiological clear must have signed removal certification statement with Load Verification." Journal of the standard animal carcasses do not require a radiological clear must have signed removal certification statement with Load Verification." Journal of the standard animal carcasses do not require a radiological clear must have signed removal certification statement with Load Verification." Journal of the standard animal carcasses do not require a radiological clear must have signed removal certification statement with Load Verification." Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not	Radcon Ma This contai duelg proce SIGNATURE: /s/ Sig here. Onsite rance. Freon-containi	nevitari meteral inevitari met
int Name: Mark Heser Janature: /s/ Mark Heser January in Food waste, office trash and animal carcasses do not require a radiological clear must have signed removal certification statement with Load Verification." Journal of the standard animal carcasses do not require a radiological clear must have signed removal certification statement with Load Verification." Journal of the standard animal carcasses do not require a radiological clear must have signed removal certification statement with Load Verification." Journal of the standard animal carcasses do not require a radiological clear must have signed removal certification statement with Load Verification." Journal of the standard animal carcasses do not require a radiological clear must have signed removal certification statement with Load Verification." Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not require a radiological clear Journal of the standard animal carcasses do not	Radcon Ma This contai duelg proce SIGNATURE: /s/ Sig here. Onsite rance. Freon-containi	nevitari meteral inevitari met
int Name: Mark Heser Japanere: /s/ Mark Hes	Radcon Ma This contai duelg proce SIGNATURE: /s/ Sig here. Onsite rance. Freon-containi	nevitari meteral inevitari met

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Form	
FRM-0918	

SWO USE (Se	elect One)	AREA		23	☐ 6		⊠ 9	□ LANDFILL
For wa	ste characteriz	zation, appro	val, and/or a	assistance, c	ontact Sol	id Wast	e Operation (SV	VO) at 5-7898.
1,700,000	(This fo			TE GERERA rucks, and o			TON al of materials.)	
Waste Generator:	Mark Heser	(NI, WO)(M/	S - NSF167) (Fax 5-224	1)	P	hone Number:	(o)5-2124; (c)496-0150
Location / Origin:	CAU 561; C	AS 23-21-04	Bulk soil fo	r disposal us	ing trackir	ng numb	per 561G02	
Waste Category:	(check one)		☐ Comm	ercial		⊠ ir	ndustrial	
Waste Type:	☐ NTS		☐ Putreso	crible		⊠F	FACO-onsite	☐ WAC Exception
(check one)	☐ Non-Putre	scible	☐ Asbest	os Containin	g Material	□F	FACO-offsite	☐ Historic DOE/NV
Pollution Prevent	ion Category:	(check one)	☑ Enviror	mental man	agement		efense Projects	☐ YMP
Pollution Prevent	ion Category:	: (check one)		Uр		□R	outine	***************************************
Method of Charac	:terization: (ch	neck one)	Sampli	ng & Analysi	s	⊠ P	rocess Knowled	ge 🛛 Contents
Prohibited Waste NTS landfills:	at all three	Radioactive v levels, and M	waste; RCR ledical wast	A waste; Ha tes (needles,	zardous w sharps, b	aste; F	ree liquids, PCB lothing).	s above TSCA regulatory
Additional Prohib at the Area 9 U100		Sewage Sluc	dge, Animal	carcasses, V	Vet garbaç	ge (food	d waste); and Fr	iable asbestos
NOTE: Waste disp	posal at the Are	Check all alle ea 6 Hydroca	owable was arbon Landfi	Il must have	contained come into	within the	his load: t with petroleum	hydrocarbons or
coolants, s	such as: gaso hydrocarbon; a	line (no benz	ene, lead);	jet fuel; diese	el fuel; lubi	ricants	and hydraulics; I	kerosene; asphaltic
Acceptable waste			Paper	⊠ Rocks	s / unalter	ed geol	ogic materials	☐ Empty containers
			⊠ Soil		er (excludi			☐ Demolition debris
			Cloth		ation (non-	-	A 1/2	☐ Cement & concrete
☐ Manufactured if	tems: (swamp	coolers, furn						
Additional waste a					Office Wa		Food Waste	☐ Animal Carcasses
	Friable			ct SWO if re		100	Quantity:	☐ Allillai Calcasses
Additional waste a	accepted at th				•••••			
Non-friable asb	574	☐ Drained			vehicles	□ So	lid fractions from	n sand/oil/water
Light ballasts (c						1 <u>1</u>	•	round and Above
			ido: ilitoro (g	راعد ما مادعدا			ound Tanks	round and Above
							ound ranks	***************************************
Additional waste a Septic sludge	Rags				□ :		7 0	
☐ Plants	☐ Kays			ers (gas & d	A CONTRACTOR OF THE PARTY OF TH			-teme plated oil filters
rants	<u> </u>			nd/oil/water TE GENERA			PCBs below	50 parts per million
Initials: (if in	nitialed, no ra					NATUR	(E	
The above mention	ed waste was	generated or	ıtsida of a C	Controlled W	acto Mana	aamani	Aren (CININA)	
knowledge, does no	ot contain radi	iological mat	erials.	ond oned w	aște Maria	gemen		
							RCT Initials	urvey Release for Waste Disp
To the best of my k site. I have verified	nowleage, the	waste descr	ibed above	contains on	y those m	ateria		ontainer/load meets the crite
prohibited and allow	wable waste it	ems. I have o	contacted P	roperty Man	agement a	nd ha		man-made radioactive mater ontainer/load meets the crite
s approved for disp	posal in the lar	ndfill.						n Manual Table 4.2 release li
Print Name: Mark	Heser	,					This co	ontainer/load/is exempt from
	s/ Mark H	eser		 Date	e: <u>4-11</u>	-11	10 100 100	orocals knowledge and origin. Signature on File DATE
Note: "Food waste, must have si	office trash ar gned removal	nd animal car	casses do r	not require a	radiologica	100	ance. Freon-co	ntaining appliances
SWO USE ONLY				./	1.			
_oad Weight (net fro	om scale or es	timate). 7	8540	9 Signatura	of Continu	1	s/ Signa	ture on File

NSTec	
Form	
FRM-0918	



Rev. 0 Page 1 of 2

SWO USE (Select One) AREA	23	6	⊠ 9	∠ LANDFILL
For waste characterization, approval, a				O) at 5-7898.
REQUIRED: (This form is for rolloffs,	WASTE GERERA dump trucks, and ot			
Waste Generator: Mark Heser (NI, WO)(M/S - N	ISF167) (Fax 5-2241)	Phone Number:(o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 23-21-04 Bulk	soil for disposal usi	ng tracking nu	mber 561G02	
Waste Category: (check one)	Commercial		Industrial	***************************************
	Putrescrible	por la sancia di la	FFACO-onsite	☐ WAC Exception
	Asbestos Containing		FFACO-offsite	☐ Historic DOE/NV
	Environmental mana Clean-Up		Defense Projects Routine	☐ YMP
	Sampling & Analysis		Process Knowledge	re 🕅 Contents
				s above TSCA regulatory
NTS landfills: levels, and Medic	cal wastes (needles,			
Additional Prohibited Waste at the Area 9 U10C Landfill: Sewage Sludge,	Animal carcasses, V	Vet garbage (fo	ood waste); and Fri	able asbestos
	, lead); jet fuel; diese	contained within	n this load: act with petroleum	
		/ unaltered ge	ologic materials	☐ Empty containers
	oil 🔲 Rubbe	er (excluding tir	res)	□ Demolition debris
		tion (non-Asbe	105 ST	☐ Cement & concrete
Manufactured items: (swamp coolers, furniture			*************************	
Additional waste accepted at the Area 23 Mercial Asbestos Friable Non-Friable	e (contact SWO if reg	Office Waste gulated load)	☐ Food Waste Quantity:	☐ Animal Carcasses
Additional waste accepted at the Area 9 U10c L Non-friable asbestos	mobiles and military	. 🗆	Solid fractions from Deconned Undergr Ground Tanks	90.00 TOTAL STREET AND
Additional waste accepted at the Area 6 Hydro				
<u></u>	fuel filters (gas & di			teme plated oil filters
	from sand/oil/water: : WASTE GENERA			50 parts per million
nitials: (if initialed, no radiological clears			OKE	
he above mentioned waste was generated outsid	le of a Controlled Wa	aste Managem	er	l
nowledge, does not contain radiological material	s.		Radiological S	urvey Release for Waste Dispos
o the best of my knowledge, the waste described ite. I have verified this through the waste character rohibited and allowable waste items. I have contained approved for disposal in the landfill.	terization method id	entified above	a added This co	ontainer/load meets the criteria man-made radioactive material ontainer/load meets the criteria n Manual Table 4.2 release limit
Print Name: Mark Heser /	404 (2000) 10		due to	ontainer/load is exempt from sur process knowledge and origin.
Signature: /s/ Mark Heser	Date	: 4-14.11	SIGNATURE: /S/	Mike Van Dillen DATE: 4
Note: "Food waste, office trash and animal carcase must have signed removal certification state	ses do not require a	radiological cle	earance. Freon-cor	ntaining appliances
SWO USE ONLY	11/29			27. 100000
oad Weight (net from scale or estimate): 23	200 Signature	of Certifier:	s/ Signatu	re on File

NSTec	
Form	
FRM-091	

SWO USE (Select One) AREA 23 6	⊠ 9 ⊠ LANDFILL			
For waste characterization, approval, and/or assistance, contact Soli				
REQUIRED: WASTE GERERATOR INFO (This form is for rolloffs, dump trucks, and other onsite	The Control of the Co			
Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241)	Phone Number: (o)5-2124; (c)496-0150			
Location / Origin: CAU 561; CAS 23-21-04 Bulk soil for disposal using tracking	ng number 561G02			
Waste Category: (check one)				
Waste Type: NTS Putrescrible				
(check one) Non-Putrescible Asbestos Containing Material				
Pollution Prevention Category: (check one)	☐ Defense Projects ☐ YMP			
Pollution Prevention Category: (check one)	Routine			
Method of Characterization: (check one) ☐ Sampling & Analysis Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous w	☑ Process Knowledge ☑ Contents			
NTS landfills: levels, and Medical wastes (needles, sharps, b				
Additional Prohibited Waste at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garba				
REQUIRED: WASTE CONTENTS ALLOWAL Check all allowable wastes that are contained NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lub petroleum hydrocarbon; and ethylene glycol.	within this load: contact with petroleum hydrocarbons or ricants and hydraulics; kerosene; asphaltic			
Acceptable waste at any NTS landfill: Paper Rocks / unaltered Rock	Asbestosform)			
Additional waste accepted at the Area 23 Mercury Landfill: Office Wa				
Additional waste accepted at the Area 9 U10c Landfill: Non-friable asbestos				
Additional waste accepted at the Area 6 Hydrocarbon Landfill: Septic sludge Rags Drained fuel filters (gas & diesel) Sludge from sand/oil/water separators				
REQUIRED: WASTE GENERATOR SIG	NATURE			
The above mentioned waste was generated outside of a Controlled Waste Mana knowledge, does not contain radiological materials.	Radiological Survey Release for Waste Disposa			
To the best of my knowledge, the waste described above contains only those magnetic. I have verified this through the waste characterization method identified a prohibited and allowable waste items. I have contacted Property Management as approved for disposal in the landfill. Print Name: Mark Heser	bove : and hat This container/load meets the criteria to Radcon Manual Table 4.2 release timits This container/load is exempt from sur due to process kingwedge/and origin.			
10/ Mark Hoper	SIGNATURE: /s/ Signature on File DATE:			
Note: "Food waste, office trash and animal carcasses do not require a radiological clearance. Freon-containing appliances must have signed removal certification statement with Load Verification."				
SWO USE ONLY Load Weight (net from scale or estimate): 30740 Signature of Certifier: /s/ Signature on File				
Load Weight (net from scale or estimate): 30 770 Signature of Certifie	er: 151 Signature on File			

NSTec Form FRM-0918

08/23/06

Rev. 0

NTS LANDFILL LOAD VERIFICATION

Page 1 of 2

SWO USE (Sele	ct One)	AREA	23	6	⊠ 9	⊠ LANDFILL
		on, approval, ar			Waste Operation (SV	
			WASTE GERER			. 0, 0.0 7 0.00.
	(This form				disposal of materials.)	/E
Waste Generator: Ma	ark Heser (NI,	WO)(M/S - NS	F167) (Fax 5-22	41)	Phone Number:	(o)5-2124; (c)496-0150
Location / Origin: CA	AU 561; CAS	25-23-21 & 25-	25-19 Bulk Debi	ris and soil fo	r disposal using tracki	ng number 561J03
Waste Category: (chec	ck one)	. 🗆 0	ommercial	200.00	☑ Industrial	
Waste Type:	NTS	☐ P	utrescrible	***************************************		☐ WAC Exception
(check one)	Non-Putrescit	ole 🗆 A	sbestos Containi	ng Material	☐ FFACO-offsite	☐ Historic DOE/NV
Pollution Prevention (Category: (ch		nvironmental ma		☐ Defense Projects	
Pollution Prevention (*********	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	lean-Up		Routine	
Method of Characteriz			ampling & Analys	sis	Process Knowled	ge 🕅 Contents
Prohibited Waste at a	***************************************			***************************************		s above TSCA regulatory
NTS landfills:		els, and Medica	wastes (needles	s, sharps, blo	ody clothing).	s above 150A regulatory
Additional Prohibited	COL	race Studge A	imal agracaca	Mot carbon	/food wests) d Fri	-bltt-
at the Area 9 U10C La	indfill:	rage Sludge, Al	iiiiai carcasses,	wet garbage	e (food waste); and Fri	able asbestos
	RE	QUIRED: WAS	STE CONTENTS	ALLOWAB	LE WASTES	
NOTE: Wasta diamonal	Che	eck all allowable	wastes that are	contained w	ithin this load:	
NOTE: Waste disposal	st the Alea o	(no henzene k	andfill must have	e come into o	contact with petroleum cants and hydraulics; I	hydrocarbons or
petroleum hydro	ocarbon; and	ethylene alycol		sei iuei, iupiii	ans and hydraulics; i	terosene; aspnaitic
Acceptable waste at a				ks / unaltered	l geologic materials	
Asphalt Meta	al ⊠ Wo	*** **********************************		ber (excludin		Demolition debris
☑ Plastic ☑ Wire	☐ Cal		-	58	sbestosform)	☐ Cement & concrete
Manufactured items	: (swamp coo					M Cement & concrete
Additional waste acce				Office Wast	***************************************	D Animal Carrage
☐ Asbestos ☐ Fr		(18) (18) (18) (18) (18) (18) (18) (18)	contact SWO if r			☐ Animal Carcasses
					y Quartity.	
Additional waste acce					7 0 5 16 11 1	
Non-friable asbestos			obiles and militar	5. 9.6	Solid fractions fron	
Light ballasts (contact		Drained fuel filt	ers (gas & diesel),	Deconned Underg	round and Above
	act SWO) 🔟	Other PCB	Julk Produ	ct waste	C Ground Tanks	
Additional waste acce	pted at the A	rea 6 Hydroca	bon Landfill:			
Septic sludge	Rags	☐ Drained for	uel filters (gas &	diesel)	☐ Crushed non-	teme plated oil filters
☐ Plants ☐	Soil	☐ Sludge fro	om sand/oil/water	separators		0 parts per million
		REQUIRED:	WASTE GENER	ATOR SIGN	ATURE	
nitials: (if initial	led, no radiol	ogical clearan	ce is necessary	,		
(11 11111111111111111111111111111111111	,	ogioui oiouiun	oc io necessary	-,		1
The above mentioned w	aste was gen	erated outside	of a Controlled V	Vaste Manag		
knowledge, does not co	ntain radiolog	jical materials.		(1)	Radiological Surve	ey Release for Waste Disposal
To the best of my knowl	ledge, the was	te described a	pove contains or	ly those ma		iner/load meets the criteria for
site. I have verified this	through the v	vaste character	ization method i	dentified abo	added ma	n-made radioactive material
prohibited and allowable	e waste items	. I have contac	ted Property Mar	nagement an	d This conta	iner/load meets the criteria for
s approved for disposal	i in the landfil	<u>ī</u> .	•		This conta	anual Table 4.2 release limits. iner/load is exempt from surve
Print Name: Mark Hese	er ,	24G p. 6299/055		13	due to prog	ess/knowledge/and origin.
1 1 5 4		ser	<u></u>		SIGNATURE: /S/ Signature:	gnature on File DATE: 5/3/
			1,2,0	te: <u>5-3-11</u>		V BN-0646 (1
Note: "Food waste, offic	e trash and a	nimal carcasses	do not require a	radiological	clearance. Freon-cor	ntaining appliances
must have signed	removal certi	ilication stateme		· · · · · · · · · · · · · · · · · · ·		20
SWO USE ONLY			5/2	1/11		
oad Weight (net from so	cale or estima	te): _3/3	Signature	of Certifiers	/s/ Don B	ickford

(3)

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Form
FRM-0918

NTS LANDFILL LOAD VERIFICATION

SWO USE (Select One) AREA 23 6	⊠ 9 ⊠ LANDFILL
For waste characterization, approval, and/or assistance, contact Solid V	Vaste Operation (SWO) at 5-7898.
REQUIRED: WASTE GERERATOR INFORM (This form is for rolloffs, dump trucks, and other onsite dis	
Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241)	Phone Number: (o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-23-21 & 25-25-19 Bulk Debris and soil for c	disposal using tracking number 561J03
Waste Category: (check one)	Industrial
Waste Type: ☐ NTS ☐ Putrescrible ☐	FFACO-onsite WAC Exception
	FFACO-offsite Historic DOE/NV
Pollution Prevention Category: (check one)	
Pollution Prevention Category: (check one)	
	Process Knowledge Contents
Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous waste NTS landfills: Redioactive waste; RCRA waste; Hazardous waste levels, and Medical wastes (needles, sharps, blood	e; Free liquids, PCBs above TSCA regulatory
Additional Prohibited Waste at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garbage (Secretaria de la composición del composición de la composición del composición de la composición del composición de la composición del composición de la composición del composición del composición del composición del composición
REQUIRED: WASTE CONTENTS ALLOWABLE Check all allowable wastes that are contained with NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into cor coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubrical petroleum hydrocarbon; and ethylene glycol.	nin this load:
Acceptable waste at any NTS landfill: Paper Rocks / unaltered g	eologic materials
Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components)	
Additional waste accepted at the Area 23 Mercury Landfill: Office Waste Asbestos Friable Non-Friable (contact SWO if regulated load)	☐ Food Waste ☐ Animal Carcasses
	Quantity:
Additional waste accepted at the Area 9 U10c Landfill: Non-friable asbestos Drained automobiles and military vehicles	0-846 # 6 ###
	Solid fractions from sand/oil/water
☐ Light ballasts (contact SWO) ☐ Drained fuel filters (gas & diesel) ☐	Deconned Underground and Above
M Hydrocarbons (contact SWO) M Other PCB Bulk Product Waste	Ground Tanks
Additional waste accepted at the Area 6 Hydrocarbon Landfill:	
☐ Septic sludge ☐ Rags ☐ Drained fuel filters (gas & diesel)	☐ Crushed non-teme plated oil filters
☐ Plants ☐ Soil ☐ Sludge from sand/oil/water separators	☐ PCBs below 50 parts per million
REQUIRED: WASTE GENERATOR SIGNAT	TURE
Initials: (if initialed, no radiological clearance is necessary.)	
The above mentioned waste was generated outside of a Controlled Waste Managen knowledge, does not contain radiological materials.	nent Area (CWMA) and to the best of my
To the best of my knowledge, the waste described above contains only those mater site. I have verified this through the waste characterization method identified above prohibited and allowable waste items. I have contacted Property Management and is approved for disposal in the landfill.	and a review of the above-mentioned
	Radiological Survey Release for Waste Disposal
Print Name: Mark Heser	RCT Initials
Signature: /s/ Mark Heser Date: 5/31/11	This container/load meets the criteria for radded man-made radioactive material
Note: "Food waste, office trash and animal carcasses do not require a radiological must have signed removal certification statement with Load Verification."	This container/load meets the criteria for Radcon Manual Table 4.2 release limits. This container/load is exempt from survey
SWO USE ONLY	due to process knowledge and origin.
oad Weight (net from scale or estimate): 33920 Signature of Certifier:	SIGNATURE: /s/ Mike Van Dillen DATE:5-3
Signature of Certifier:	BN-0646 (1

Certificate of Disposal

This is to certify that the Waste Stream No. LITN-000000006, Revision 14, shipment number ITL11006, with container numbers 561103 was shipped and received at the Nevada National Security Site Radioactive Waste Management Complex in Area 5 for disposal as stated below.

Mark Heser	NI	Waste Coordinator
Shipped by	Organization	Title
/s/ Mark Heser	e e e e e e e e e e e e e e e e e e e	6 - 2 - 11 Date
E. TAKA HASTIV Received by	Organization	SCIONIST Title
/s/ Signature on File Signature		Φ2 - Jun - 2011 Date

Certificate of Disposal

This is to certify that the Waste Stream No. LITN-00000006, Revision 14, shipment number ITL11003, with container numbers 561102 was shipped and received at the Nevada National Security Site Radioactive Waste Management Complex in Area 5 for disposal as stated below.

Mark Heser	NI	Waste Coordinator
Shipped by	Organization	Title
/s/ Mark Heser Signature		6-2-11 Date
E) TAKA-HITSU Received by	Organization	SCIENTIS!
/s/ Signature on File		(12-Jun - 1011

NSTec	
Form	
FRM-091	8

SWO USE (Selec	t One)	AREA		23	□6		⊠ 9	\boxtimes	LAND	FILL
For waste ch	haracteriza		al, and/o	r assistant	ce, contact Soli	d Was	ste Operation (SWO)	at 5-7898	
		REQUIR	ED: WA	STE GER	ERATOR INFO	RMA	TION ·			
	(This fo	rm is for rollo	offs, dum	p trucks, a	nd other onsite					
- 1986 T. 198	99 99 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	(NI, WO)(M/S					Phone Number			496-0150
Location / Origin: CA	U 561; CA	\S 25-08-02	Bulk Det	oris and so	il for disposal u	ising t	racking numbe	r 561H	02	
Waste Category: (chec	k one)		☐ Com	mercial			Industrial			
Waste Type:	NTS		☐ Putro	escrible		_	FFACO-onsite			Exception
(check one)	Non-Putres	scible	☐ Asbe	estos Cont	alning Material		FFACO-offsite			ric DOE/NV
Pollution Prevention (Category:	(check one)			management		Defense Proje	cts	☐ YMP	
Pollution Prevention (Category:	(check one)	□ Clea	n-Up			Routine			
Method of Characteriz	cation: (ch	eck one)		pling & Ar			Process Know			
Prohibited Waste at al NTS landfills:	il three	Radioactive values	waste; Ri ledical w	CRA waste astes (nee	e; Hazardous w edles, sharps, b	aste; loody	Free liquids, P clothing).	CBs al	ove TSC	:A regulatory
Additional Prohibited at the Area 9 U10C La	Waste				ses, Wet garba			Friabl	e asbesto	s "
		REQUIRE	: WAST	E CONTE	NTS ALLOWA	BLE V	WASTES	_		
List Manual Consumption Consuming Consumption Consumption		Check all all	lowable v	vastes that	t are contained	within	this load:		Jan ac -b c -	
NOTE: Waste disposa coolants, such	at the Are	ea 6 Hydroca	arbon La	ndfill must	have come into	cont	act with petrole	um hy	arocarbor sene: as	ohaltic
coolants, such petroleum hydr				u); jet tuel;	dieser ruer; rub	nicant	a and rigurating	Jo, Kell	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	p. 101110
Acceptable waste at a			⊠ Pape	r 🛛	Rocks / unalter	ed ge	ologic material	s D	Empty	containers
Asphalt			Soil		Rubber (exclud			Σ	Demoli	ition debris
☑ Plastic ☑ Wire	_		⊠ Cloth		Insulation (non	0.7		. 2	Cemen	t & concrete
Manufactured items	10.70 mm	SC (1990) (2019) (1990)	 -		전혀하다가 하는 맛이 그리겠다고 그래요?					
Additional waste acce					☐ Office W		☐ Food Was	ste [Anima	Carcasses
☐ Asbestos ☐ F					O if regulated lo		Quantity:			
Additional waste acco										
Non-friable asbesto					nilitary vehicles		Solid fractions	from s	and/oil/wa	ater
				rs (gas & d		- 10 To 100	Deconned Und			
☐ Light ballasts (conta ☐ Hydrocarbons (cont		17. 00	i idei iiitei	is (gas a c	nescry	_	Ground Tanks			
					F					
Additional waste acco						-	☐ Crushed	non-te	me plated	d oil filters
	Rags			•	as & diesel) /water separato	re	☐ PCBs be			
☐ Plants [Soil				ENERATOR SI			.511 00	Fa. 10 Pol	
						J, ,	-			
Initials: (if initia	aled, no ra	adiological	clearanc	e is neces	ssary.)					
The above mentioned knowledge, does not d	waste was contain rac	generated of diological ma	outside o aterials.	f a Contro	lled Waste Mar	nagem	Radiologic		y Release	for Waste Disp
To the best of my know	uladas 4L	o wasto de-	oribad ab	ove cent-	ine only these	mater	RCT Initials	is conta	iner/load m	neets the criteri
site. I have verified this	is through	the waste c	haracteri	zation me	thod identified	above	e ad	ded mai	r-made rad	lioactive materia
prohibited and allowat	ble waste i	items. <u>I have</u>	e contact	ed Proper	ty Managemen	t and	h I Th			neets the criteri
is approved for dispos	al in the l	andfill.		*3			Th	is conta	iner/load is	4.2 release lim
Print Name: Mark He	ser	1			Sys. Mad.		du	e to prod	essimowie	dgg and origin.
Signature: /S/		k Hes	ser		Date: 4/11	/11	SIGNATURE	/s/ S	gnature or	File DATE:
Note: "Food waste, of must have sign	fice trash a	and animal o	arcasses n stateme	do not re	quire a radiolog ad Verification.	ical cl	learance. Fred	n-cont	aining ap	pliances <i>į</i>
SWO USE ONLY	.~		112	24-						
			15	200	5/19/1	l ::	/s/ Do	n B	ickfo	ord

(4)

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NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2

SWO USE (Sele	ct One)	AREA	т Г	23	6		⊠ 9	⊠ LANDFILL
For waste of	characterizat	ion, approv	al, and/	or assistant	ce, contact Soli	d Waste	Operation (SV	VO) at 5-7898.
. 5, 7,400		REQUIR	ED: W	ASTE GER	ERATOR INFO	DRMATI	ON	
19	(This for	m is for rollo	ffs, dun	np trucks, a	nd other onsite			
the second secon	lark Heser (N						months and Si	(o)5-2124; (c)496-0150
Location / Origin: C	AU 561; CA	S 25-08-02	Bulk De	bris and so	il for disposal u	ising trad	cking number :	361HUZ
Waste Category: (che	ck one)		☐ Cor	mmercial			dustrial	
Waste Type:	NTS		☐ Put	rescrible			ACO-onsite	. WAC Exception
(check one)	Non-Putres				aining Material		ACO-offsite	☐ Historic DOE/NV
Pollution Prevention	Category: (management		efense Projects	s YMP
Pollution Prevention						_	outine	
Method of Character				mpling & Ar				dge 🛛 Contents
Prohibited Waste at a NTS landfills:	all three R	adioactive vels, and M	waste; F ledical v	RCRA wast wastes (nee	e; Hazardous w edles, sharps, b	raste; Fr loody cl	ee liquids, PCI othing).	Bs above TSCA regulatory
Additional Prohibited at the Area 9 U10C L		ewage Sluc	lge, Ani	mal carcas	ses, Wet garba	ge (food	waste); and F	riable asbestos
					NTS ALLOWA			
No. 14	(Check all all	owable	wastes tha	t are contained	within th	nis load:	m bydrocarbons or
NOTE: Waste dispos	al at the Are	a 6 Hydroca ne (no henz	ene le	andilli must ad): iet fuel:	nave come into	ricants :	and hydraulics:	; kerosene; asphaltic
petroleum hyd	drocarbon; a	nd ethylene	glycol.	ady, jot race	diosor radi, rad	mounto c		
Acceptable waste at			⊠ Pap	er 🛛	Rocks / unalter	red geolo	ogic materials	
🛛 Asphalt 🖾 Me	tal 🛛	Wood	⊠ Soil		Rubber (exclud	ting tires	i)	Demolition debris
☑ Plastic ☑ Win	re 🗆	Cable		h 🛛	Insulation (non	-Asbesto	osform)	
Manufactured item	ns: (swamp o	coolers, furn	iture, ru	ugs, carpet,	electronic com	ponents	, PPE, etc.)	**************************************
Additional waste acc	cepted at the	e Area 23 N	fercury	Landfill:	☐ Office W	aste [Food Waste	Animal Carcasses
☐ Asbestos ☐	Friable	☐ Non-F	riable (d	contact SW	O if regulated lo	oad) (Quantity:	
Additional waste acc	cepted at th	e Area 9 U	Oc Lan	dfill:				
⋈ Non-friable asbes	San and a construction and the same part of				nilitary vehicles	☐ Sc	olid fractions fro	om sand/oil/water
Light ballasts (con				ers (gas & d			econned Under	rground and Above
						_ Gr	round Tanks	
Additional waste acc								
☐ Septic sludge	Rags				as & diesel)		Crushed no	on-teme plated oil filters
☐ Plants	☐ Soil				water separato	rs I	PCBs below	w 50 parts per million
	<u> </u>				NERATOR SI		RE	
Initials: (if init	tiolog no ro	4						
initials: (ir init	pareu, no ra	uiologicai (Jealall	CE IS HECE	ssary.j			
The above mentioned					lled Waste Mar	nageme		Survey Release for Waste Dispo
knowledge, does not	contain radi	ological ma	iterials.				RCT Initials	Survey Release for Waste Dispo
To the best of my kno	owledge, the	waste desc	ribed a	bove conta	ins only those	materia	This	container/load meets the criterla
site. I have verified to	his through	the waste c	naracte	rization me	thod identified	above \$		ed man-made radioactive materia container/load meets the criteria
prohibited and allowated is approved for disposed for dis			contac	ted Proper	ty Managemen	t and ha	Rad	con Manual Table 4.2 release limi
is approved to dispo	vaar iii tiile la	gain.			•	i	— This	s container/load is exempt from so to process knowledge and origin.
Print Name: Mark H						, ;	SIGNATURE	/s/ Mike Van Dillen DATE:
Signature: /S/ N	Mark He	eser			Date: 5/17	111	OIGNATURE:	BN-0
Note: "Food waste, o	office trash a	nd animal c	arcasse	es do not re		ical clea	rance. Freon-	containing appliances
	-							
Load Weight (net from	~)		,	~	5/19/11	.1.	e/ Don	Rickford
Load Weight (net from	n/scale of es	stimate): 💆	15,4	60 Sig	gnature of Certi	fier: ×/	al Dûlî	DICKIOIO

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FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06

Rev. 0

Page 1 of 2

SWO USE (Select One)	AREA	23	☐ 6	⊠ 9	\square	LANDFILL
For waste characterizati	on, approval, and/		contact Solid	d Waste Operation (SWO) at	5-7898
(1) The second of the second o	REQUIRED: W	ASTE GERER	ATOR INFO	RMATION		0.7000.
				disposal of material	s.)	
	, WO)(M/S - NSF1			Phone Number	: (o)5-21	124; (c)496-0150
Location / Origin: CAU 561; CAS	25-08-02 Bulk De	bris and soil fo	r disposal us	sing tracking numbe	r 561H02	
Waste Category: (check one)	☐ Con	nmercial	78 - 788 A			
Waste Type: NTS		escrible				WAC Exception
(check one) Non-Putrescil		estos Containir	ng Material	☐ FFACO-offsite		Historic DOE/NV
Pollution Prevention Category: (ch	eck one) 🛛 Envi	ronmental mar	nagement	☐ Defense Projec	ts 🔲	YMP
Pollution Prevention Category: (ch				☐ Routine		
Method of Characterization: (check	one) 🛚 Sam	pling & Analys	is	Process Knowle	edge 🛛	Contents
Prohibited Waste at all three Rac	lioactive waste; Ro els, and Medical wa	CRA waste; Ha	zardous was	ste; Free liquids, PC	Bs above	e TSCA regulatory
Additional Prohibited Wasto				900 HTD (3
at the Area 9 U10C Landfill: Sew	age Sludge, Anim	al carcasses, \	Net garbage	(food waste); and I	riable as	sbestos
RE	QUIRED: WASTE	CONTENTS	ALLOWABI	E WASTES	33 00 00	
Che	ock all allowable w	actor that are	a - m d - 1 1 1			x**
NOTE: Waste disposal at the Area 6 coolants, such as: gasoline	(no benzene lead	Of the land of the control of the co	come into c	ontact with petroleu	m hydrod	arbons or
the state of the s	CUITIEILE GIVEOI.	,, jet idel, diese	er ruer; rubric	ants and hydraulics	; keroser	e; asphaltic
cceptable waste at any NTS landf	ill: 🛛 Paper	⊠ Rocks	s / unaltered	geologic materials	⊠ F	mpty containers
Asphalt Metal Wo	od 🛛 Soil	Rubb	er (excluding	tires)		emolition debris
Plastic Wire Cab		⊠ Insula	tion (non-As	hestosform)		ement & concrete
Manufactured items: (swamp cool	ers, furniture, rugs	, carpet, electr	onic compor	ents PPF etc.)		ement & concrete
dditional waste accepted at the Ar	rea 23 Mercury La		Office Waste			
	Non-Friable (con		ulated load	Quantity:	. L. AI	nimal Carcasses
dditional waste accepted at the Ar				Quantity,		
	Drained automobile		vehicles [Solid fractions fro		.116
Light ballasts (contact SWO)	Orained fuel filters	(nas & diesel)				
Hydrocarbons (contact SWO)	Other 1 shipment	of HC soil & D			ground a	nd Above
dditional waste accepted at the Ar			7	Ground Tanks		
Septic sludge Rags	Drained fuel f	itors (see 9 di				
Plants	Sludge from s	mers (gas & di	esei)	☐ Crushed nor		
	☐ Sludge from s REQUIRED: WAS	STE GENERA	eparators	PCBs below	50 parts	per million
•			I OK SIGNA	IURE		
itials: (if initialed, no radiolo	gical clearance is	s necessary.)		8		
e above mentioned waste was gene owledge, does not contain radiologi	rated outside of a	Controlled Wa	ste Manager	nent Area (CIAIREA)	and 4a 4b	
owledge, does not contain radiologi	cal materials.		oto munugoi	nent Alea (CVIIIA)	anu to tri	e best of my
the best of my knowledge, the wast	e described above	contains and				
e. I have verified this through the wa	aste characterizati	on mothod ide	ntified about	Radiological Surv	ey Release	for Waste Disposal
minited and allowable waste items.	I have contacted I	Property Manag	gement and	RCT Initials		
approved for disposal in the landfill.				added ma	iner/load : n-made rai	meets the criteria for dioactive material
nt Name: Mark Heser				This conta	iner/load	neets the criteria for
nature: /s/ Mark Hese	r		rlal.	Radcon M	anual Tabl	e 4.2 release limits. s exempt from surve
			5/17/11	due to prod	ess knowle	edge and origin.
te: "Food waste, office trash and ani must have signed removal certific	mai carcasses do	not require a ra	diological	signature: /s/ Mi		
O LICE ONLY	1900					BN-0646 (1
d Weight (net from scale or estimate	24/	5/23/11				- 1
a vveight (net from scale or estimate	1: 56.660	Signature of	f Certifier:	/s/ Don Bi	ckfor	d

Shipment 3 of 41

	Waste Category Definitions
Commercial Waste:	Office waste, putrescible waste
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).
	Waste Types Definitions
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste
Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989
	Pollution Prevention Category Definitions
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.
	Radiological Limitations
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".
Area 6 and Area 9 Landfills:	See permit limits.



NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

SWO USE (Select One	e) AREA	23	6	⊠ 9	□ LANDFILL
For waste characte		and/or assistance	, contact Solid		SWO) at 5-7898
37.00	REQUIRED:	WASTE GEREI	RATOR INFO	RMATION	
(This	form is for rolloffs,	dump trucks, and	d other onsite o	disposal of material	s.)
	er (NI, WO)(M/S - N				: (o)5-2124; (c)496-0150
	CAS 25-08-02 Bulk	Debris and soil f	or disposal us	ing tracking numbe	r 561H02
Waste Category: (check one)		Commercial			
Waste Type: NTS		Putrescrible			☐ WAC Exception
(check one) Non-Put				☐ FFACO-offsite	☐ Historic DOE/NV
Pollution Prevention Categor		Environmental ma	anagement	Defense Project	ts YMP
Pollution Prevention Categor	******************			☐ Routine.	
Method of Characterization: (Sampling & Analy	sis	Process Knowle	edge 🛛 Contents
Prohibited Waste at all three NTS landfills:	Radioactive waste levels, and Medica	e; RCRA waste; H al wastes (needle	lazardous was s, sharps, bloc	ste; Free liquids, Po ody clothing).	Bs above TSCA regulatory
Additional Prohibited Waste at the Area 9 U10C Landfill:	Sewage Sludge, A	Animal carcasses,	Wet garbage	(food waste); and I	riable asbestos
	REQUIRED: WA	STE CONTENTS	ALLOWABL	E WASTES	
NOTE: Waste disposal at the A	Check all allowab	ie wastes that are Landfill must hav	e contained wit	hin this load:	m hydronosha
coolants, such as. gas	oline (no benzene, i	lead): let fuel: die:	sel fuel; lubrica	ants and hydraulics	m nydrocarbons or kerosene: asphaltic
petroleum nydrocarbon;	and ethylene glyco) . 			, Korosono, asprianto
Acceptable waste at any NTS			ks / unaltered	geologic materials	
	Wood ⊠ So		ber (excluding	· · · · · · · · · · · · · · · · · · ·	□ Demolition debris
12.1.15	Cable 🛛 Clo		lation (non-As	bestosform)	□ Cement & concrete
Manufactured items: (swamp	coolers, furniture,	rugs, carpet, elec	tronic compon	ents, PPE, etc.)	
Additional waste accepted at t ☐ Asbestos ☐ Friable		ry Landfill: (contact SWO if re			Animal Carcasses
Additional waste accepted at t					
Non-friable asbestos	☐ Drained autom		v vehicles	Solid fractions fro	m sand/oil/water
Light ballasts (contact SWO)	☐ Drained fuel fill	ters (gas & diesel)		ground and Above
Hydrocarbons (contact SWO)	Other 1 shipm	nent of HC soil &	Debris	Ground Tanks	ground and Above
additional waste accepted at the		The second of th			
☐ Septic sludge ☐ Rags		uel filters (gas & o	_	Crushed no	n tomo plated all filters
Plants		om sand/oil/water			n-teme plated oil filters o 50 parts per million
		WASTE GENER	ATOR SIGNA	TURF	50 parts per million
nitials: (if initialed, no ra	idiological clearan			, 0,1,2	
he above mentioned waste was nowledge, does not contain rad	generated outside iological materials.	of a Controlled W	aste Manager	nent Area (CWMA)	and to the best of my
n the hest of my knowledge: 45-					
the best of my knowledge, the	waste described a	pove contains on	ly those mate	Radiological Surv	ey Release for Waste Disposal
onibited and allowable waste it	ems. I have contac	ted Property Man	agement and	1 X Initials	
approved for disposal in the la	ndfill.				ainer/load meets the criteria for r n-made radioactive material
int Name: Mark Heser				inis conta	siner/load meets the critoria for
gnature: /s/ Mark H	eser	Date	e: 5/17/11	This conta	anual Table 4.2 release limits.
ote: "Food waste, office trash ar must have signed removal	nd animal carcasses certification stateme	s do not require a ent with Load Veri	radiological	SIGNATURE: /s/ Mile	se Van Dillen DATE: 5-23-
WO USE ONLY		ا ما ا			BN-p646 (10/
ad Weight (net from scale or es	timate): 3464	Signature	of Certifier:	/s/ Don Bic	kford

	Waste Category Definitions
Commercial Waste:	Office waste, putrescible waste
industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).
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Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.
	Radiological Limitations
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".
Area 6 and Area 9 Landfills:	See permit limits.



NSTec Form

FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2

SWO USE (Select One) AREA 23 6	
For waste characterization, approval, and/or assistance, contact Soli	d Waste Operation (SWO) at 5-7898.
REQUIRED: WASTE GERERATOR INFO	DRMATION
(This form is for rolloffs, dump trucks, and other onsite Waste Generator: Mark Heser (NLWO)(M/S - NSE167) (Eav. 5-2241)	10 /5
(10) (1 ax 3-2241)	Phone Number: (o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal un	sing tracking number 561H02
Waste Category: (check one)	☑ Industrial
Waste Type: NTS Putrescrible	☐ FFACO-onsite ☐ WAC Exception
check one) Non-Putrescible Asbestos Containing Material	☐ FFACO-offsite ☐ Historic DOE/NV
Pollution Prevention Category: (check one)	☐ Defense Projects ☐ YMP
Pollution Prevention Category: (check one) Clean-Up	Routine
Method of Characterization: (check one) Sampling & Analysis Prohibited Waste at all three Radioactive waste: RCRA waste: Hazardous wa	☑ Process Knowledge ☑ Contents
Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous wastes landfills: Radioactive waste; RCRA waste; Hazardous wastes (needles, sharps, blo	ste; Free liquids, PCBs above TSCA regulatory
Additional Prohibited Waste at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garbage	2000000 2 2000 200000000000000000000000
REQUIRED: WASTE CONTENTS ALLOWAB	
Check all allowable wastes that are contained w	ithin this local.
OTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into a	contact with notroloum hydrogenha
coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubric petroleum hydrocarbon; and ethylene glycol.	cants and hydraulics; kerosene; asphaltic
cceptable waste at any NTS landfill: Paper Rocks / unaltered	geologic materials
Asphalt Metal Wood Soil Rubber (excluding	
☐ Plastic ☑ Wire ☐ Cable ☑ Cloth ☑ Insulation (non-As	sbestosform) X Cement & concrete
Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic compo	nents, PPE, etc.)
dditional waste accepted at the Area 23 Mercury Landfill: Office Waste	e ☐ Food Waste ☐ Animal Carcasses
Asbestos Friable Non-Friable (contact SWO if regulated load) Quantity:
dditional waste accepted at the Area 9 U10c Landfill:	
Non-friable asbestos	Solid fractions from sand/oil/water
Light ballasts (contact SWO) Drained fuel filters (gas & diesel)	Deconned Underground and Above
Hydrocarbons (contact SWO) Other 1 shipment of HC soil & Debris	Ground Tanks
dditional waste accepted at the Area 6 Hydrocarbon Landfill:	
Septic sludge Rags Drained fuel filters (gas & diesel) Plants Soil Sludge from sand/oil/water separators	Crushed non-teme plated oil filters
Plants Soil Sludge from sand/oil/water separators REQUIRED: WASTE GENERATOR SIGNA	PCBs below 50 parts per million
MICCOLOG APPLICATION OF THE STATE OF THE STA	ATURE
tials: (if initialed, no radiological clearance is necessary.)	
e above mentioned waste was generated outside of a Controlled Waste Manage owledge, does not contain radiological materials.	ment Area (CWMA) and to the best of my
a dia 1900 mengadan darah dara	l
the best of my knowledge, the waste described above contains only those materials. I have verified this through the waste characterization method identified above.	
midited and allowable waste items. I have contacted Property Management and	Radiological Survey Release for Waste Disposal
pproved for disposal in the landfill.	RCT Initials This container/load meets the criteria for
nt Name: Mark Heser	added man-made radioactive material This container/load meets the criteria for
nature: /s/ Mark Heser Date: 5/17/11	Radcon Manual Table 4.2 release limits. This container/load is exempt from survey
te: "Food waste, office trash and animal carcasses do not require a radiological of	due to process/knowledge and origin.
must have signed removal certification statement with Load Verification."	SIGNATURE: 15/ IVIIRE VAIT DITE! DATE: 3-6)
C 25 mm 5/23/11	/s/ Don Bickford

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Shipment 5 of 41

Waste Category Definitions								
Commercial Waste:	Office waste, putrescible waste							
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).							
Waste Types Definitions								
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.							
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste							
Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).							
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.							
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.							
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).							
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfil permits, and has been given approval from the NDEP for disposal into an NTS landfill.							
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989.							
	Pollution Prevention Category Definitions							
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).							
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.							
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.							
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.							
Radiological Limitations								
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".							
Area 6 and Area 9 Landfills:	See permit limits.							

NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0 Page **1** of **2**

SWO USE (Select One) AREA 23 \boxtimes 9 6 LANDFILL For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898. REQUIRED: WASTE GERERATOR INFORMATION (This form is for rolloffs, dump trucks, and other onsite disposal of materials.) Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241) Phone Number: (o)5-2124; (c)496-0150 CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal using tracking number 561H02 Location / Origin: Waste Category: (check one) ☐ Commercial Waste Type: ☐ NTS ☐ Putrescrible ☐ WAC Exception (check one) ☐ Non-Putrescible ☐ Asbestos Containing Material ☐ FFACO-offsite ☐ Historic DOE/NV Pollution Prevention Category: (check one) □ Defense Projects ☐ YMP Pollution Prevention Category: (check one) ☑ Clean-Up ☐ Routine Method of Characterization: (check one) Sampling & Analysis □ Process Knowledge □ Contents Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory NTS landfills: levels, and Medical wastes (needles, sharps, bloody clothing). Additional Prohibited Waste Sewage Sludge, Animal carcasses, Wet garbage (food waste); and Friable asbestos at the Area 9 U10C Landfill: REQUIRED: WASTE CONTENTS ALLOWABLE WASTES Check all allowable wastes that are contained within this load: NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol. Acceptable waste at any NTS landfill: Paper Rocks / unaltered geologic materials Empty containers Asphalt Metai Mood X ⊠ Soil ☐ Rubber (excluding tires) Demolition debris □ Plastic Wire ☐ Cable □ Cloth □ Cement & concrete Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.) Additional waste accepted at the Area 23 Mercury Landfill: ☐ Office Waste ☐ Food Waste ☐ Animal Carcasses ☐ Asbestos ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: Additional waste accepted at the Area 9 U10c Landfill: ☐ Drained automobiles and military vehicles ☐ Solid fractions from sand/oil/water ☐ Light ballasts (contact SWO) ☐ Drained fuel filters (gas & diesel) ☐ Deconned Underground and Above ☑ Hydrocarbons (contact SWO) ☐ Other 1 shipment of HC soil & Debris Ground Tanks Additional waste accepted at the Area 6 Hydrocarbon Landfill: ☐ Septic sludge ☐ Rags ☐ Drained fuel filters (gas & diesel) □ Crushed non-teme plated oil filters ☐ Plants ☐ Soil ☐ Sludge from sand/oil/water separators ☐ PCBs below 50 parts per million REQUIRED: WASTE GENERATOR SIGNATURE (if initialed, no radiological clearance is necessary.) The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials. To the best of my knowledge, the waste described above contains only those mate site. I have verified this through the waste characterization method identified above Radiological Survey Release for Waste Disposal prohibited and allowable waste items. I have contacted Property Management and RCT Initials This container/load meets the criteria for no is approved for disposal in the landfill. added man-made radioactive material This container/load meets the criteria for Print Name: Mark Heser Radcon Manual Table 4.2 release limits. /s/ Mark Heser This container/load is exempt from survey Signature: Date: 5/17/11 due to process knowledge and origin. Note: "Food waste, office trash and animal carcasses do not require a radiological SIGNATURE: /s/ Mike Van Dillen DATE:5-23 must have signed removal certification statement with Load Verification." BN-0646 (10/05) SWO USE ONLY

UNCONTROLLED When Printed

Load Weight (net from scale or estimate): 14700 Signature of Certifier: 4/S/ Don Bickford

Shipment 6 of 41

	Waste Category Definitions				
Commercial Waste:	Office waste, putrescible waste				
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).				
	Waste Types Definitions				
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test S boundaries. Waste that does not meet another waste type definition listed below.				
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste				
Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).				
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.				
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.				
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).				
WAC exception	waste that does not meet the waste acceptance criteria, as defined within the current NTS landfi permits, and has been given approval from the NDEP for disposal into an NTS landfill.				
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989				
	Pollution Prevention Category Definitions				
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).				
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.				
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.				
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.				
	Radiological Limitations				
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".				
Area 6 and Area 9 Landfills:	See permit limits.				

NSTec	
Form	
EPM_004	0

SWO USE (Select On	e) AREA	□ 23	6	⊠ 9	⊠ LANDFILL		
For waste characte	erization, approva	al, and/or assistance	e, contact Solid	Waste Operation (SWO) at 5-7898.		
For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898. REQUIRED: WASTE GERERATOR INFORMATION (This form is for rolloffs, dump trucks, and other onsite disposal of materials.)							
		- NSF167) (Fax 5-2			: (o)5-2124; (c)496-0150		
	CAS 25-08-02 E	Bulk Debris and soil	for disposal us	sing tracking number			
Waste Category: (check one)		Commercial					
Waste Type: NTS		Putrescrible			. ☐ WAC Exception		
(check one) Non-Pu	POR CONTROL OF THE PROPERTY OF THE PARTY OF	Asbestos Contain	ning Material		☐ Historic DOE/NV		
Pollution Prevention Categor	y: (check one)	Environmental m	anagement	☐ Defense Projec			
Pollution Prevention Categor	y: (check one)	Clean-Up		Routine			
Method of Characterization:		Sampling & Analy	/sis	☑ Process Knowle	edge 🛛 Contents		
Prohibited Waste at all three NTS landfills:	Radioactive wa levels, and Me	este; RCRA waste; l dical wastes (needle	Hazardous was	ste: Free liquids, PC	Bs above TSCA regulatory		
Additional Prohibited Waste at the Area 9 U10C Landfill:	Sewage Sludge	e, Animal carcasses	, Wet garbage	(food waste); and F	riable asbestos		
	REQUIRED:	WASTE CONTENT	S ALLOWABL	E WASTES			
NOTE: Waste disposal at the A	Check all allow	able wastes that are	e contained wi	thin this load:			
NOTE: Waste disposal at the A coolants, such as: gas	soline (no benzer	e. lead): iet fuel: die	e come into c	ontact with petroleu	m hydrocarbons or		
petroleum nyurocarbon	, and emylene gr	ycol.		ants and mydraulics	, kerosene, aspnaltic		
Acceptable waste at any NTS	(S)	Paper 🛛 Roc	ks / unaltered	geologic materials			
	- SC (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	Soil Rub	ber (excluding		□ Demolition debris		
25 Page 100		Cloth 🛛 Insu	lation (non-As	bestosform)	□ Cement & concrete		
Manufactured items: (swam	p coolers, furnitu	re, rugs, carpet, elec	ctronic compor	nents, PPE, etc.)			
Additional waste accepted at Asbestos Friable	the Area 23 Mer	cury Landfili:	Office Waste	Food Waste	☐ Animal Carcasses		
		ele (contact SWO if	egulated load	Quantity:			
Additional waste accepted at to Non-friable asbestos			20000000 a				
	☐ Drained aut	omobiles and militar	ry vehicles L	Solid fractions fro			
Light ballasts (contact SWO)	☐ Drained fue	l filters (gas & diese	l) [Deconned Under	ground and Above		
Hydrocarbons (contact SWO)			Debris	Ground Tanks			
Additional waste accepted at t							
Septic sludge Rags		ed fuel filters (gas &		☐ Crushed nor	n-teme plated oil filters		
Plants Soil	☐ Sludge	from sand/oil/wate	r separators	☐ PCBs below	50 parts per million		
	REQUIRE	D: WASTE GENER	ATOR SIGNA	TURE			
nitials: (if initialed, no ra	adiological clear	rance is necessary	.)				
he above mentioned waste was nowledge, does not contain rad	generated outsi liological materia	de of a Controlled V ls.	Vaste Manager	ment Area (CWMA)	and to the best of my		
o the hest of my knowledge the	Summate deservi	4.1	G6 226 P				
o the best of my knowledge, the te. I have verified this through cohibited and allowable wasto it	the waste charac	d above contains or	nly those mate	rials that are allowed	ed for disposal at this		
emoned and anomable waste in	ems. I nave con	tacted Property Mar	nagement and	e and a review of the	ne above-mentioned		
approved for disposal in the la	<u>ndfill</u> .						
rint Name: Mark Heser				RCT Initials	y Release for Waste Disposal		
gnature: _/s/ Mark Hes	ser	Dat	e: 5/17/11	This conta	iner/load meets the criteria for no n-made radioactive material		
ote: "Food waste, office trash a	nd animal carcae			1000 7000	iner/load meets the criteria for		
must have signed removal	certification state	ement with Load Ver	ification."		anual Table 4.2 release limits. iner/load is exempt from survey		
WO USE ONLY				due to prod	ess knowledge and origin.		
ad Weight (net from scale or es	timatal 366	5/23	10	SIGNATURE: /S/ MI	ke Van Dillen DATE: 523.		
and it origin (thet mont scale of es	umate): 55 67	Signature	of Certifier:	80 RISA	BN-0646 (10)		

Waste Category Definitions				
Commercial Waste:	Office waste, putrescible waste			
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).			
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NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.			
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste			
Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).			
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.			
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.			
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).			
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.			
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989			
	Pollution Prevention Category Definitions			
Environmental Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).				
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.			
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.			
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.			
	Radiological Limitations			
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".			
Area 6 and Area 9 Landfills:	See permit limits.			

(6)

NSTec	
Form	

FRM-0918

NTS LANDFILL LOAD VERIFICATION

SWO USE (Select One) AREA 23 6	
For waste characterization, approval, and/or assistance, contact So	lid Waste Operation (SWO) at 5-7898.
REQUIRED: WASTE GERERATOR INF (This form is for rolloffs, dump trucks, and other onsite	ORMATION e disposal of materials)
Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241)	
	Phone Number: (o)5-2124; (c)496-0150
The state of the s	
	☑ Industrial
Check one)	
Pollution Prevention Category: (check one) Clean-Up	☐ Defense Projects ☐ YMP ☐ Routine
Method of Characterization: (check one) Sampling & Analysis	☑ Process Knowledge ☑ Contents
Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous wastes levels, and Medical wastes (needles, sharps, bl	aste: Free liquids, PCBs above TSCA regulator
Additional Prohibited Waste Sewage Sludge, Animal carcasses, Wet garbage the Area 9 U10C Landfill:	e (food waste); and Friable asbestos
REQUIRED: WASTE CONTENTS ALLOWAE	BLE WASTES
Check all allowable wastes that are contained wastes that are contained wastes that are contained wastes that are contained wastes waste disposal at the Area 6 Hydrocarbon Landfill must have come into	contact with noteclasses business at a second
Addition and an addition the next lead the title discontinuity	cants and hydraulics; kerosene; asphaltic
pourocarron, and entylene glycol.	
Asphalt Metal Wood Soil Rubber (excluding Asphalt Soil Rubber	
Plastic Wire Cable Cloth Insulation (non-A	
Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic compo	Asbestosform)
dditional waste accepted at the Area 23 Mercury Landfill: Office Was	
Asbestos Friable Non-Friable (contact SWO if regulated loa	d) Quantity:
dditional waste accepted at the Area 9 U10c Landfill:	
Non-friable asbestos	☐ Solid fractions from sand/oil/water
Light ballasts (contact SWO) Drained fuel filters (gas & diesel)	Deconned Underground and Above
Hydrocarbons (contact SWO) Other 1 shipment of HC soil & Debris	Ground Tanks
dditional waste accepted at the Area 6 Hydrocarbon Landfill:	
Septic sludge Rags Drained fuel filters (gas & diesel) Plants Soil Sludge from sand/oil/water separators	☐ Crushed non-teme plated oil filters
Plants Soil Sludge from sand/oil/water separators REQUIRED: WASTE GENERATOR SIGN	PCBs below 50 parts per million
300 -	ATURE
(********************************	
e above mentioned waste was generated outside of a Controlled Waste Manago owledge, does not contain radiological materials.	ement Area (CWMA) and to the best of my
the best of my knowledge, the waste described above contains only those made. I have verified this through the waste characterization method identified about the contacted Brown to th	
phibited and allowable waste items. I have contacted Property Management and approved for disposal in the landfill.	Radiological Survey Release for Waste Disposa
nt Name: Mark Heser	RCT Initials
nature: /s/ Mark Heser Date: 5/17/11	added man-made radioactive material This container/load meets the criteria for
e: "Food waste, office trash and animal carcasses do not require a radiological must have signed removal certification statement with Load Verification."	
O LISE ONLY	SIGNATURE: /S/ Mike Van Dillen DATE: 5-2
d Weight (not from sould be settington) 37, 160 5/23/11	- CALLED ON LES OF

Waste Category Definitions						
Commercial Waste:	Office waste, putrescible waste					
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).					
	Waste Types Definitions					
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.					
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste					
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Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.					
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.					
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).					
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.					
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989.					
	Pollution Prevention Category Definitions					
Environmental Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).						
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.					
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.					
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.					
	Radiological Limitations					
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".					
Area 6 and Area 9 Landfills:	See permit limits.					

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FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2

SWO USE (Select One)	AREA	23	6	⊠ 9	□ LANDFILL
For waste characteriza	tion, approval, and/o	r assistance, con	tact Solid V	/aste Operation (S	WO) at 5-7898.
	REQUIRED: WA	STE GERERAT	OR INFORM	MATION	
	m is for rolloffs, dump		er onsite dis		12
	NI, WO)(M/S - NSF16	80 T - PERON			(o)5-2124; (c)496-0150
	S 25-08-02 Bulk Deb	ris and soil for di	sposal using	tracking number	561H02
Vaste Category: (check one)	☐ Com	mercial		Industrial	
Vaste Type: NTS		escrible		FFACO-onsite	☐ WAC Exception
check one)		stos Containing N		FFACO-offsite	☐ Historic DOE/NV
ollution Prevention Category: (ollution Prevention Category: (onmental manage	ement		☐ YMP
ethod of Characterization: (che	***************************************	oling & Analysis		. 10 011110	······
			doue weets	Process Knowled	ge 🛛 Contents
TS landfills: le	vels, and Medical wa	stes (needles, sh	arps, blood	; Pree liquias, PCE / clothina).	s above TSCA regulatory
dditional Prohibited Waste	ewage Sludge, Anima		Charles and Charles	(2) 2 (2) (2) (2) (2) (2) (3) (3) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	iable ashestos
	REQUIRED: WASTE				
C	heck all allowable wa	stes that are con	tained within	n thin load.	
OTE: Waste disposal at the Area	6 Hydrocarbon Land	Ifili must have cor	me into cont	act with notroloum	hydrocarbons or
coolants, such as: gasolin petroleum hydrocarbon; an	e mo benzene, leadi:	; jet fuel; diesel fu	el; lubrican	ts and hydraulics; I	kerosene; asphaltic
ceptable waste at any NTS land	dfill: 🛛 Paper	⊠ Rocks / L	naltered or	ologic materials	
Asphalt Metal W			excluding ti		Demolition debris
Plastic ⊠ Wire □ C			(non-Asbe	stosform)	☐ Cement & concrete
Manufactured items: (swamp co	olers, furniture, rugs,	carpet, electronic	componer	its, PPE, etc.)	
Iditional waste accepted at the	Area 23 Mercury La	ndfill: 🔲 Offi	ce Waste	☐ Food Waste	☐ Animal Carcasses
	☐ Non-Friable (conta		ited load)	Quantity:	\$495-98 \$CC09809831
ditional waste accepted at the					
Non-friable asbestos	Drained automobile		icles 🗆 🤄	Solid fractions from	sand/oil/water
Light ballasts (contact SWO)		gas & diesel)		Deconned Undergr	ound and Above
Hydrocarbons (contact SWO)			is (Fround Tanks	
ditional waste accepted at the A Septic sludge Rags					
Septic sludge Rags		ters (gas & diese			teme plated oil filters
3011	REQUIRED: WAS	and/oil/water sepa	arators	PCBs below 5	0 parts per million
ials: (if initialed, no radio	880		K SIGNATE	IKE	
ials: (if initialed, no radio	logical clearance is	necessary.)			
above mentioned waste was ger wledge, does not contain radiolo	erated outside of a (Controlled Waste	Manageme	nt Area (CWMA) ar	nd to the best of my
	*1				5
he best of my knowledge, the wa I have verified this through the					
The and the stable made itellis	• I nave contacten P	roperty Managen	ent and ha	or the verified that this	above-mentioned s material/equipment
proved for disposal in the landfi	<u>ll</u> .				y Release for Waste Disposal
Name: Mark Heser		<u> </u>		RCT Initials	
ature: /s/, Mark Hes	er	Date: 5/	12/0		iner/load meets the criteria for -made radioactive material
e: "Food waste, office trash and a				This conta	iner/load meets the criteria for
must have signed removal cert	ification statement wi	th Load Verification	logical ci		nual Table 4.2 release limits. iner/load is exempt from surve
USE ONLY				due to proc	ess knowledge and origin.
d Weight (net from scale or estima	to: 19 12 -	5/23/11	[SIGNATURE: /S/ MI	ke Van Dillen DATE
The spire (net not) scale or estima	iej. ///001)	_ Signature of Ce	ertifier:	/s/ Don Ri	Ckford BN-0646 (1

Waste Category Definitions					
Commercial Waste:	Office waste, putrescible waste				
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).				
	Waste Types Definitions				
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.				
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FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.				
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WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.				
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989				
	Pollution Prevention Category Definitions				
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).				
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.				
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.				
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.				
	Radiological Limitations				
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".				
Area 6 and Area 9 Landfills:	See permit limits.				



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Form ·	

FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06

Rev. 0. Page **1** of **2**

SWO USE (Select One) AREA 23 6 89	⊠ LANDFILL
For waste characterization, approval, and/or assistance, contact Solid Waste Operation (S	SWO) at 5-7898.
REQUIRED: WASTE GERERATOR INFORMATION	
(This form is for rolloffs, dump trucks, and other onsite disposal of materials Waste Generator: Mark Heser (NI, WO)(M/S - NSE167) (Fax 5-2241) Dhone Number	
Phone Number:	(o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal using tracking number	561H02
Waste Category: (check one) ☐ Commercial ☐ Industrial	
Waste Type: ☐ NTS ☐ Putrescrible ☐ Putrescrible ☐ FFACO-onsite	☐ WAC Exception
Aspestos Containing Material FFACO-offsite	☐ Historic DOE/NV
Pollution Prevention Category: (check one) Environmental management Defense Project	
Pollution Prevention Category: (check one) ☐ Clean-Up ☐ Routine Method of Characterization: (check one) ☐ Sampling & Analysis ☐ Process Knowle	
Method of Characterization: (check one) Sampling & Analysis Process Knowle	dge 🛛 Contents
Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCI levels, and Medical wastes (needles, sharps, bloody clothing).	Bs above TSCA regulatory
Additional Prohibited Waste at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garbage (food waste); and F	riable asbestos
REQUIRED: WASTE CONTENTS ALLOWABLE WASTES	
Check all allowable wasten that are contained within the	
The waste disposal at the Area o Hydrocarbon I andfill must have come into contest with a state of the second state of the sec	hydrocarbons or
coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; petroleum hydrocarbon; and ethylene glycol.	kerosene; asphaltic
Acceptable waste at any NTS landfill: Paper Rocks / unaltered geologic materials	
Asphalt Metal Wood Soil Rubber (excluding tires)	Demolition debris
☑ Plastic ☑ Wire ☐ Cable ☑ Cloth ☒ Insulation (non-Ashestosform)	☑ Cement & concrete
Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)	
Additional waste accepted at the Area 23 Mercury Landfill: Office Waste Food Waste Asbestos Friable Non-Friable (contact SWO if regulated lead)	☐ Animal Carcasses
Quantity:	<u> </u>
Additional waste accepted at the Area 9 U10c Landfill: Non-friable asbestos Drained automobiles and military vehicles. Solid fractions from	
7 Light helicate (\$100 B C C C C C C C C C C C C C C C C C C
Hydrocarbona (and a duo) Tou	round and Above
dditional waste accorded at the Area C. U. days of the C. soil & Debris Ground Tanks	
dditional waste accepted at the Area 6 Hydrocarbon Landfill: Septic sludge Rags Drained fuel filters (gas & diesel) Crushed non-	8 Ast
7 Plants Gas & diesel) Crushed non-	teme plated oil filters
REQUIRED: WASTE GENERATOR SIGNATURE	50 parts per million
itials: (if initialed, no radiological clearance is necessary.)	
140	1.
ne above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) a lowledge, does not contain radiological materials.	nd to the best of my
the best of my knowledge, the waste described above contains only those mate. Radiological Support	
e. I have verified this through the waste characterization method identified about the	Release for Waste Disposal
approved for disposal in the landfill	ner/load meets the criteria for n
nt Name: Mark Hoser This contain	er/load mosts (
Date: 5/17/11 due to proces	er/load is exempt from survey
must have signed removal certification statement with Load Verification."	Van Dillen DATE:5-24-1
VO USE ONLY	BN-0646 (10/0
ad Weight (net from scale or estimate): 4/600 Signature of Certifier /s/ Don Bio	ckford

UNCONTROLLED When Printed

Shipment 10 of 41

Waste Category Definitions				
Commercial Waste:	Office waste, putrescible waste			
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Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989.			
	Pollution Prevention Category Definitions			
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).			
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	Radiological Limitations			
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".			
Area 6 and Area 9 Landfills:	See permit limits.			

(31)

NSTec Form

SWO USE ONLY

Load Weight (net from scale or estimate): 46,280

FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06

Rev. 0 Page **1** of **2**

For w	Select One					⊠ 9	\boxtimes	LANDFILL
	vaste characte	rization, appr	oval, and/or ass	istance, contact S	olid W	'aste Operation (SWO) a	t 5-7898.
1	(This	REQU form is for ro	IRED: WASTE Moffs, dump true	GERERATOR IN cks, and other ons	FORM	IATION posal of material	s.)	
Waste Generator			I/S - NSF167) (F				0.01-50.01	124; (c)496-0150
Location / Origin:	CAU 561;	CAS 25-08-0	2 Bulk Debris ar	nd soil for disposa	l using			
Waste Category	: (check one)	89 - 2 8/8/	☐ Commerci		Ø			
Waste Type:	☐ NTS		☐ Putrescrib	le	Ø	FFACO-onsite	Г] WAC Exception
(check one)	☐ Non-Put		☐ Asbestos	Containing Materi			· F	Historic DOE/NV
Pollution Preven				ental managemen		Defense Project	ts F	YMP
Pollution Preven						Routine		
Method of Chara			Sampling 8	& Analysis	×	Process Knowle	edge 🗵	Contents
Prohibited Waste NTS landfills:	e at all three	Radioactive	waste; RCRA w	aste; Hazardous	waste:	Free liquids, PC	Bs abov	e TSCA regulatory
Additional Prohil		ieveis, and i	viedicai wastes	needles, snarps,	bloody	clothing).		
at the Area 9 U10	C Landfill:	Sewage Slu	dge, Animal car	casses, Wet garba	age (fo	od waste); and I	riable a	sbestos
		REQUIRE	D: WASTE CON	TENTS ALLOWA	BIF	NASTES	-	
NOTE: West all		Check all all	lowable wastes	that are contained		Alain Innet		
NOTE: Waste dis	posal at the A	rea 6 Hydroca	arbon Landfill m	ust have come int	o cont	act with notrolou	m hydro	carbons or
occidino,	hydrocarbon;		cene. leadh: lei il	uel; diesel fuel; lul	oricant	s and hydraulics	; kerose	ne; asphaltic
Acceptable waste	e at any NTS			A Pocks / unalto				
	Carrier College		7	Rocks / unalte				mpty containers
	Wire							emolition debris
Manufactured		coolers furn	ituro rugo coro	Insulation (non	-Asbes	stostorm)	⊠ c	cement & concrete
Additional waste	accepted at 4		iture, rugs, carp		ponen	ts, PPE, etc.)		
	accepted at t	NA Aras ya M	orcum I andfill				-	
☐ Asbestos Γ	Triable				aste	☐ Food Waste		nimal Carcasses
Asbestos [] Friable	☐ Non-Fr	iable (contact S	: ☐ Office Wa WO if regulated lo	aste		A	nimal Carcasses
Asbestos [Friable	☐ Non-Fr he Area 9 U1	iable (contact S	WO if regulated lo	aste ad)	Food Waste Quantity:		
☐ Asbestos ☐ Additional waste a X Non-friable asb	Friable accepted at the	□ Non-Fr he Area 9 U1 □ Drained	iable (contact Since Contact S	WO if regulated lo	aste ad)	Food Waste	m sand/	oil/water
☐ Asbestos ☐ Additional waste and Additional waste and Additional waste asbest of the Additional waste and Addit	Friable accepted at to bestos contact SWO)	□ Non-Fr he Area 9 U1 □ Drained a □ Drained b	iable (contact S 0c Landfill: automobiles and fuel filters (gas 8	WO if regulated lo	aste ad)	Food Waste Quantity:	m sand/	oil/water
☐ Asbestos ☐ Additional waste a Non-friable asb ☐ Light ballasts (c ☐ Hydrocarbons (Friable accepted at the pestos contact SWO) (contact SWO)	Non-Fr he Area 9 U1 Drained a Drained a Other 1	iable (contact S Oc Landfill: automobiles and uel filters (gas & shipment of HC	WO if regulated lo	aste (ad)	Food Waste	m sand/	oil/water
Asbestos Additional waste a Non-friable asb Light ballasts (c Hydrocarbons (☐ Friable accepted at the pestos contact SWO) (contact SWO) accepted at the	Non-Fr he Area 9 U1 Drained a Drained a Other 1 he Area 6 Hyde	iable (contact S Oc Landfill: automobiles and fuel filters (gas 8 shipment of HC drocarbon Land	WO if regulated lo	aste (ad)	Food Waste Quantity: colid fractions fro deconned Under	m sand/	oil/water
Asbestos Additional waste and Non-friable asb Light ballasts (comparison) Hydrocarbons (comparison) Additional waste and Septic sludge	☐ Friable accepted at the pestos contact SWO) (contact SWO) accepted at the ☐ Rags	Non-Fr he Area 9 U1 Drained a Drained f Other 1 he Area 6 Hyd	iable (contact S Oc Landfill: automobiles and fuel filters (gas 8 shipment of HO drocarbon Land ined fuel filters (MO if regulated lo	aste (ad)	Food Waster Quantity: Solid fractions frouder Ground Tanks	om sand/ ground a	oil/water and Above
Asbestos Additional waste and Non-friable asb Light ballasts (comparison) Hydrocarbons (comparison) Additional waste and Septic sludge	☐ Friable accepted at the pestos contact SWO) (contact SWO) accepted at the	Non-Fr he Area 9 U1 Drained a Drained f Other 1 he Area 6 Hyd Slud	iable (contact S Oc Landfill: automobiles and fuel filters (gas 8 shipment of HC drocarbon Land ined fuel filters (dge from sand/o	military vehicles diesel) soil & Debris dfill: gas & diesel) il/water separator	aste (ad)	☐ Food Waster Quantity: Solid fractions frouder Fround Tanks ☐ Crushed not ☐ PCBs below	ground a	oil/water and Above
☐ Asbestos ☐ Additional waste a Non-friable asb ☐ Light ballasts (c ☐ Hydrocarbons (c ☐ Additional waste a ☐ Septic sludge	☐ Friable accepted at the pestos contact SWO) (contact SWO) accepted at the ☐ Rags	Non-Fr he Area 9 U1 Drained a Drained f Other 1 he Area 6 Hyd Slud	iable (contact S Oc Landfill: automobiles and fuel filters (gas 8 shipment of HC drocarbon Land ined fuel filters (dge from sand/o	MO if regulated lo	aste (ad)	☐ Food Waster Quantity: Solid fractions frouder Fround Tanks ☐ Crushed not ☐ PCBs below	ground a	oil/water and Above
Asbestos Additional waste and Non-friable asburgers in Light ballasts (compared by the Additional waste and Septic sludge Plants	☐ Friable accepted at the pestos contact SWO) (contact SWO) accepted at the ☐ Rags ☐ Soil	Non-Fr he Area 9 U1 Drained a Drained a Other 1 ne Area 6 Hyd Sluce REQUIF	iable (contact S' Oc Landfill: automobiles and fuel filters (gas 8 shipment of HC drocarbon Land ined fuel filters (dge from sand/o RED: WASTE G	MO if regulated lo	aste (ad)	☐ Food Waster Quantity: Solid fractions frouder Fround Tanks ☐ Crushed not ☐ PCBs below	ground a	oil/water and Above
Asbestos Additional waste and Non-friable asburgers in Light ballasts (compared by the Additional waste and Septic sludge in Plants Additional waste and Septic sludge in Plants in Light ballasts in Light ball	☐ Friable accepted at the pestos contact SWO) (contact SWO) accepted at the ☐ Rags ☐ Soil	Non-Frine Area 9 U1 Drained a Drained a Other 1 Drained fine Area 6 Hyder Sluce REQUIF	iable (contact S' Oc Landfill: automobiles and fuel filters (gas 8 shipment of HC drocarbon Land ined fuel filters (dge from sand/o RED: WASTE G earance is nece	I military vehicles diesel) Soil & Debris Cifili: Gas & diesel) Idynater separator SENERATOR SIG	aste ad) S G NATU	☐ Food Waster Quantity: Solid fractions frouder Fround Tanks ☐ Crushed not ☐ PCBs below	ground a	oil/water and Above
Asbestos Additional waste and Non-friable asb Light ballasts (or Mydrocarbons (or Mydrocar	☐ Friable accepted at the pestos contact SWO) (contact SWO) accepted at the ☐ Rags ☐ Soil mitialed, no railed waste was	Non-Fr he Area 9 U1 Drained a Drained a Other 1 ne Area 6 Hyd Slud REQUIF diological cla	iable (contact S' Oc Landfill: automobiles and fuel filters (gas 8 shipment of HC drocarbon Land ined fuel filters (dge from sand/o RED: WASTE G earance is nece	I military vehicles diesel) Soil & Debris Cifili: Gas & diesel) Idynater separator SENERATOR SIG	gc	☐ Food Waste Quantity: colid fractions from the conned Under the country of the	om sand/ ground a n-teme p	oil/water and Above plated oil filters s per million
Asbestos Additional waste and Non-friable asb Light ballasts (or Mydrocarbons (or Mydrocar	☐ Friable accepted at the pestos contact SWO) (contact SWO) accepted at the ☐ Rags ☐ Soil mitialed, no railed waste was on contain radio	Non-Frine Area 9 U1 Drained a Drained a Other 1 Dra Area 6 Hyde Slude REQUIF	iable (contact S' Oc Landfill: automobiles and fuel filters (gas 8 shipment of HC drocarbon Land ined fuel filters (dge from sand/o RED: WASTE G earance is nece tside of a Controvials.	WO if regulated lo	ste ead) S S S NATU	☐ Food Waster Quantity: colid fractions from econned Under cround Tanks ☐ Crushed nor ☐ PCBs below RE	om sand/ ground a n-teme p	oil/water and Above
Asbestos Additional waste at Non-friable asb Light ballasts (of Mydrocarbons (of Mydrocar	☐ Friable accepted at the pestos contact SWO) (contact SWO) accepted at the ☐ Rags ☐ Soil mitialed, no rated waste was of contain radionowledge, the	Non-Fr he Area 9 U1 Drained a Drained a Other 1 he Area 6 Hyd Sluce REQUIF diological classes generated out ological mater	iable (contact S Oc Landfill: automobiles and fuel filters (gas 8 shipment of HC drocarbon Land ined fuel filters (dge from sand/o earance is nece tside of a Control erials.	I military vehicles diesel) Soil & Debris dfill: gas & diesel) il/water separators EENERATOR SIG	ste ead) S G NATU	☐ Food Waster Quantity: colid fractions frouder cround Tanks ☐ Crushed not ☐ PCBs below RE Radiological Surver RCT Initials	ground and n-teme p	oil/water and Above plated oil filters s per million
Asbestos Additional waste and Non-friable asb Light ballasts (or Moditional waste and Non-friable asb Hydrocarbons (or Moditional waste and Non-friable all Moditional waste and Non-friable above mentional waste and North Nowledge, does not the best of my knowledge, does not the best of my knowledge.	☐ Friable accepted at the pestos contact SWO) (contact SWO) accepted at the ☐ Rags ☐ Soil nitialed, no rated waste was of contain radional radio	Non-Fr he Area 9 U1 Drained a Drained a Other 1 he Area 6 Hyd Sluce REQUIF diological cla generated ou ological mate	iable (contact S' Oc Landfill: automobiles and fuel filters (gas & shipment of HC drocarbon Land ined fuel filters (dge from sand/o RED: WASTE G earance is nece tside of a Control rials.	WO if regulated lo	ste ead) S G NATU	☐ Food Waster Quantity: colid fractions from the conned Under Ground Tanks ☐ Crushed not ☐ PCBs below RE Radiological Surver RCT Initials This contaged added main	ground and terms of the service of t	oil/water and Above plated oil filters s per million e for Waste Disposal meets the criteria for no
Asbestos Additional waste and	☐ Friable accepted at the pestos contact SWO) (contact SWO) accepted at the ☐ Rags ☐ Soil mitialed, no rated waste was not contain radion radion to waste it waste waste it waste it waste it waste it waste it waste wa	Non-Fr he Area 9 U1 Drained a Drained a Other 1 he Area 6 Hyd Sluce REQUIF diological cla generated ou ological mate waste descri the waste cha	iable (contact S' Oc Landfill: automobiles and fuel filters (gas & shipment of HC drocarbon Land ined fuel filters (dge from sand/o RED: WASTE G earance is nece tside of a Control rials.	WO if regulated lo	ste ead) S G NATU	☐ Food Waster Quantity: colid fractions froud the conned Under cround Tanks ☐ Crushed note ☐ PCBs below RE Radiological Surver RCT Initials	om sand/ ground a n-teme p 50 parts	oil/water and Above plated oil filters s per million e for Waste Disposal meets the criteria for notioactive material meets the criteria for
Asbestos Additional waste: Non-friable asb Light ballasts (comparison of the best of my known best of my k	Friable accepted at the sestos contact SWO) (contact SWO) accepted at the Rags Soil nitialed, no rated waste was of contain radionowledge, the this through the bosal in the largeston.	Non-Fr he Area 9 U1 Drained a Drained a Other 1 he Area 6 Hyd Sluce REQUIF diological cla generated ou ological mate waste descri the waste cha	iable (contact S' Oc Landfill: automobiles and fuel filters (gas & shipment of HC drocarbon Land ined fuel filters (dge from sand/o RED: WASTE G earance is nece tside of a Control rials.	WO if regulated lo	ste ead) S G NATU	□ Food Waster Quantity: colid fractions froud the conned Under cround Tanks □ Crushed not PCBs below RE Radiological Surver RCT Initials ↑ This conta added mat This conta Radcon M	om sand/ ground a n-teme p 50 parts y Release tiner/load n-made ra tiner/load anual Tab	oil/water and Above plated oil filters s per million e for Waste Disposal meets the criteria for no
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Asbestos Additional waste and Additional waste. I have verified rohibited and Allow approved for disparint Name: Mark I	Friable accepted at the sestos contact SWO) (contact SWO) accepted at the Rags Soil nitialed, no rated waste was of contain radionowledge, the this through the bosal in the largeston.	Non-Frine Area 9 U1 Drained a Drained a Other 1 Drained a Drained a Drained a Drained a Sluce REQUIF diological classification waste describe waste challens. I have condfill.	iable (contact S' Oc Landfill: automobiles and fuel filters (gas & shipment of HC drocarbon Land ined fuel filters (dge from sand/o RED: WASTE G earance is nece tside of a Control rials.	WO if regulated lo	grante	Food Waster Quantity: Colid fractions from Deconned Under County Tanks Crushed not PCBs below RE Radiological Surver RCT Initials This contant Added man This contant Radcon M This contant Gue to proceed	ery Release siner/load an-made radiner/load anual Tab	oil/water and Above plated oil filters s per million e for Waste Disposal meets the criteria for noticity of the criteria for noticity of the criteria for noticity of the description

月6₁280 S/24/11 Signature of Certifier: /s/ Don Bickford

Shipment 11 of 41

Waste Category Definitions					
Commercial Waste:	Office waste, putrescible waste				
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Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".				
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FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2

SWO USE (S	elect One	AREA		23	□ 6	_	⊠ 9	\triangleright	LANDFILL
For wa	ste characte	rization, appro	oval, and/o	or assistan	ice, contact	Solid	Waste Operation	(SWO)	at 5-7898
		REQUI	RED: WA	ISTE GEF	RERATOR	NFOR	MATION isposal of mater	9790	
Waste Generator:	Mark Hese	er (NI, WO)(M	/S - NSF1	67) (Fax 5	-2241)		Phone Numb	er: (o)5	-2124; (c)496-0150
Location / Origin:	CAU 561;	CAS 25-08-02	2 Bulk Det	oris and so	oil for dispos	sal usir	ng tracking numi	ber 561F	102
Waste Category:			☐ Com	mercial		0	☑ Industrial		
	☐ NTS		☐ Putre				FFACO-onsi		☐ WAC Exception
	☐ Non-Put		☐ Asbe	stos Cont	aining Mate	**********	FFACO-offsit		☐ Historic DOE/NV
Pollution Prevent Pollution Prevent	on Category	(check one)			manageme		Defense Proj	ects	☐ YMP
Method of Charac	terization:	(check one)					Routine		
Prohibited Waste	at all three	Radioactive	Wasto: BC	oling & An	alysis		Process Know	wledge	○ Contents
NTS landfills: Additional Prohibi		icveis, and iv	iculcal wa	istes (need	oles, snarps	s, Dlood	dy clothing).		ove TSCA regulatory
at the Area 9 U100	Landfill:						food waste); an	d Friable	asbestos
		REQUIRED Check all all	: WASTE	CONTEN	TS ALLON	VABLE	WASTES		
NOTE: Waste disp	osal at the A	rea 6 Hydroca	irbon Land	ifill must h	ave come i	nto cor	stact with notrol	eum hvd	rocarbons or
ooolanto, o	uon as. gast	AILLE (LIO DELIZ	ene. leadi	; jet fuel; c	diesel fuel; I	ubrica	nts and hydrauli	cs; keros	sene; asphaltic
Acceptable waste	y di ocai boli,	and ethylene	giycol. Paper						
Asphalt A		F.,	Soil Soil		ubber (excl		eologic materia	100000	Empty containers
☑ Plastic ☑ V			Cloth		sulation (no				Demolition debris
Manufactured ite				caroet el	lectronic co	mnone	estosiorm)	X	Cement & concrete
Additional waste a	ccepted at the	ne Area 23 M	ercury La	ndfill:	☐ Office V	Vaste	Food Was	te 🗇	Animal Carcasses
	Friable	☐ Non-Fri	able (cont	act SWO	if regulated	load)	Quantity:		
Additional waste a	cepted at the	ne Area 9 U10	c Landfil	l:	••••				
Non-friable asbe		☐ Drained a	utomobile	s and mili	tary vehicle:	s \square	Solid fractions	from san	d/oil/water
☐ Light ballasts (contact SWO) ☐ Drained fuel filters (gas & diesel) ☐ Deconned Underground and Above ☐ Hydrocarbons (contact SWO) ☐ Other 1 shipment of HC soil & Debris ☐ Ground Tanks									
A Hydrocarbons (co	ontact SWO)	U Other 1	shipment	of HC soil	& Debris		Ground Tanks		
Additional waste ad	cepted at th					•			
Septic sludge	Rags			iters (gas		M 8	☐ Crushed r	on-teme	plated oil filters
Plants	Soil	Slud	ge from s	and/oil/wa	ter separato	ors	☐ PCBs belo		
					RATOR SI	GNAT	URE		
		diological cle							
he above mentioned nowledge, does not	waste was g	generated out ological mate	side of a (Controlled	Waste Mar	nage [Radiological Su	vey Relea	se for Waste Disposal
o the hest of my kno	wladaa tha						RCT Initials This cor	tainer/les	d meets the criteria for r
o the best of my kno te. I have verified the	us inrouan t	ne waste char	'acterizati	on mother	identified.	-4- 1	added n	an-made	radioactive material
ombited and allows	ible waste ite	ms. I have co	ontacted P	roperty M	anagement	an	This cor	tainer/loa	d meets the criteria for
approved for dispo	sal in the lan	dfill.	9			_1	This con	tainer/loa	able 4.2 release limits. d is exempt from survey
rint Name: Mark He	eser ,						due to p	ocess kno	wledge and origin.
gnature: /s/ N	lark He	eser		. D	ate: 5/17	/11 L	SIGNATURE: /S/	viike Va	Dillen DATE: 5-2%
ote: "Food waste, of must have sign	ffice trash and ed removal o	d animal carca	asses do r	not require	a radiologic		arance. Freon-	containin	
WO USE ONLY		- Incomon die	- SHOTE W		J.,				
oad Weight (net from	scale or esti	mate): <u>'</u>	9.40	5/2 Signatu	アイル re of Certific	er:, /	s/ Don E	Bickfo	ord

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Shipment 12 of 41

	Waste Category Definitions
Commercial Waste:	Office waste, putrescible waste
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	Radiological Limitations
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".
Area 6 and Area 9 Landfills:	See permit limits.

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NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

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SWO USE (Select One		□ 23	□ 6	⊠ 9	
For waste characte	rization, approva	il, and/or assistan	ice, contact Sol	id Waste Operation	(SWO) at 5-7898.
1	REQUIRE	D: WASTE GER	RERATOR INFO	ORMATION disposal of materia	6 N 10 10 10 10 10 10 10 10 10 10 10 10 10
		- NSF167) (Fax 5			r: <u>(o)5-2124; (c)496-0150</u>
Location / Origin: CAU 561;	CAS 25-08-02 B	ulk Debris and so	oil for disposal t	ising tracking number	er 561H02
Waste Category: (check one)	_	Commercial			
Waste Type: ☐ NTS		Putrescrible			T MAC Evention
(check one) Non-Puti		Asbestos Cont	aining Material	☐ FFACO-offsite	- · · · · · · · · · · · · · · · · · · ·
Pollution Prevention Category	y: (check one)	Environmental	management	☐ Defense Project	
Pollution Prevention Category	y: (check one)	Clean-Up		Routine	OLS TIME
Method of Characterization: (c	check one)	Sampling & An	alysis	***************************************	ledge 🛛 Contents
Prohibited Waste at all three NTS landfills:	Radioactive wa	ste; RCRA waste	: Hazardous wa	ste: Free liquids Po	CBs above TSCA regulatory
Additional Prohibited Waste		dical wastes (need		70-7 (40-000) 10-14-10-10-10-10- 10-10 -10-1	¥!
at the Area 9 U10C Landfill:	Sewage Sludge	, Animal carcass	es, Wet garbag	e (food waste); and	Friable asbestos
	REQUIRED: V	VASTE CONTEN	TS ALLOWAR	I F WASTES	
NOTE: Waste disposal at the Al	rea 6 Hydrocarbo	able wastes that a	are contained w	vithin this load:	
guot	CIBIC CHO DELIZERI	e lead) let mer d	ilesel fuel: lubri	contact with petrolet	im hydrocarbons or
	ALIA CHIMICHE UIV	coi.		carns and flydraulics	s, kerosene; aspnaitic
Acceptable waste at any NTS I	40	Paper 🛛 R	ocks / unaltered	d geologic materials	
	Wood 🛛	Soil R	ubber (excludin	g tires)	□ Demolition debris
	Cable 🛛	Cloth 🛛 In	sulation (non-A	sbestosform)	
Manufactured items: (swamp	coolers, furniture	e, rugs, carpet, el	ectronic compo	nents, PPE, etc.)	
Additional waste accepted at to Asbestos Friable	he Area 23 Merc	cury Landfill: le (contact SWO i	Office Wast	e Food Waste	Animal Carcasses
Additional waste accepted at the	no Aroa 9 1110ο	l ondfill		d) Quantity:	
Non-friable asbestos ■ Non-friable				Torrit " .	*
Light ballasts (contact SWO)	Drained auto	omobiles and milit	ary vehicles L		om sand/oil/water
∐ Hydrocarbons (contact SWO)	Other 1 shi	inters (gas & dies	iei) ·		ground and Above
			& Debris	Ground Tanks	
Additional waste accepted at the Septic sludge Rags	le Area 6 Hydro	carbon Landfill:			
Plants Soil	☐ Drained	d fuel filters (gas	& diesel)		n-teme plated oil filters
301		from sand/oil/wat	er separators	PCBs below	v 50 parts per million
dial-		: WASTE GENE		ATURE	
nitials: (if initialed, no ra	diological clear	ance is necessar	ry.)		
he above mentioned waste was	generated outsid	e of a Controlled	Wests Manager		Į.
nowledge, does not contain radi	ological material	s.	waste manage	Radiological Surv	rey Release for Waste Disposal
the best of tot		2X		RCT Initials	
the best of my knowledge, the te. I have verified this through t	waste described	above contains	only those mate	This cont	ainer/load meets the criteria for an-made radioactive material
ombited and anowable waste ite	ems. I have conta	acted Property M	anagement and	This cont	ainer/load meets the criteria for
approved for disposal in the lan	idfill.		- Assometic and	Radcon N	Manual Table 4.2 release limits.
int Name: Mark Heser				due to pro	ainer/load is exempt from surve ocess knowledge and origin.
gnature: /s/ Mark He	eser	D	ate: 5/17/11	SIGNATURE: /S/	Mike Van Dillen DATE: 5-21
ote: "Food waste, office trash and must have signed removal of	d animal carcass	es do not require	a radiological c	clearance. Freon-co	
VO USE ONLY	o uncadon stater	HOLL MILLI FOSO A	arification."		**************************************
			24/11		

UNCONTROLLED When Printed Shipment 13 of 41

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Area 6 and Area 9 Landfills:	See permit limits.				



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FRM-0918

NTS LANDFILL LOAD VERIFICATION

SWO USE (Select One) AREA 23 6 89 KANDFILL	7
For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898.	┪
REQUIRED: WASTE GERERATOR INFORMATION (This form is for rolloffs, dump trucks, and other onsite disposal of materials.)	7
Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241) Phone Number: (o)5-2124; (c)496-0150	ı
Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal using tracking number 561H02	İ
Waste Category: (check one) ☐ Commercial ☐ Industrial	┨
Waste Type: ☐ NTS ☐ Putrescrible ☐ FFACO-onsite ☐ WAC Exception	1
(check one) Non-Putrescible Asbestos Containing Material FFACO-offsite Historic DOF/NI	
Pollution Prevention Category: (check one)	
Pollution Prevention Category: (check one)	_
Method of Characterization: (check one) ☒ Sampling & Analysis ☒ Process Knowledge ☒ Contents	1
NTS landfills: Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory levels, and Medical wastes (needles, sharps, bloody clothing)	y
Additional Prohibited Waste at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garbage (food waste); and Friable asbestos	I
REQUIRED: WASTE CONTENTS ALLOWABLE WASTES	1
Check all allowable wastes that are contained within this load:	ł
NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic	ı
	L
Acceptable waste at any NTS landfill: Acceptable waste at any NTS landfill waste	1
☑ Plastic ☑ Wire ☐ Cable ☑ Cloth ☑ Insulation (non-Ashestosform) ☑ Coment & coment	L
Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.)	1
Additional waste accepted at the Area 23 Mercury Landfill: Office Waste Food Waste Apimal Carrasses	ł
☐ Asbestos ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity:	
Additional waste accepted at the Area 9 U10c Landfill:	l
☐ Light ballasts (contact SWO) ☐ Drained fuel filters (gas & diesel) ☐ Deconned Underground and Above	
Hydrocarbons (contact SWO) Other 1 shipment of HC soil & Debris Ground Tanks	
Additional waste accepted at the Area 6 Hydrocarbon Landfill:	
Sontia studes December	
Diente Crushed non-terme plated oil filters	
☐ Sludge from sand/oil/water separators ☐ PCBs below 50 parts per million REQUIRED: WASTE GENERATOR SIGNATURE	
nitials: (if initialed, no radiological clearance is necessary.)	92 3
he above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my nowledge, does not contain radiological materials.	
to the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this ite. I have verified this through the waste characterization method identified above and a review of the above-mentioned robibited and allowable waste items. I have contacted Property Management and have verified that the landfill.	
Radiological Survey Release for Waste Disposal	
rint Name: Mark Heser RCT Initials RCT Initials This container/load meets the criteria for residual to the container of the container of the criterial for residual to the container of the criterial for residual to the criterial for residua	10
ignature: /s/ Mark Heser Date: 5/17/11 Date: 5/17/11 Date: 5/17/11	
ote: "Food waste, office trash and animal carcasses do not require a radiological must have signed removal certification statement with lead Verification." Radcon Manual Table 4.2 release limits. This container/load is exempt from survey	,
NO USE ONLY	_11
pad Weight (net from/scale of estimate): 37 800 Signature of Certifier: /s/ Don Bickford Signature of Certifier: Signature of Certifier: /s/ Don Bickford Signature of Certifier: Signatur	_

	Waste Category Definitions
Commercial Waste:	Office waste, putrescible waste
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).
	Waste Types Definitions
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste
Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989
	Pollution Prevention Category Definitions
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.
	Radiological Limitations
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".
Area 6 and Area 9 Landfills:	See permit limits.



NSTec Form

FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2

SWO USE (Select One) AREA 23 6	⊠9 ⊠ LANDFILL
For waste characterization, approval, and/or assistance, contact Solid	d Waste Operation (SWO) at 5-7898.
REQUIRED: WASTE GERERATOR INFO	RMATION
(This form is for rolloffs, dump trucks, and other onsite	disposal of materials.)
Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241)	Phone Number: (o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal us	sing tracking number 561H02
Waste Category: (check one)	
Waste Type: NTS Putrescrible	
(check one)	☐ FFACO-offsite ☐ Historic DOE/NV
Pollution Prevention Category: (check one)	☐ Defense Projects ☐ YMP
Pollution Prevention Category: (check one) Clean-Up	Routine
Method of Characterization: (check one) Sampling & Analysis	☑ Process Knowledge ☑ Contents
Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous waste; NTS landfills: levels, and Medical wastes (needles, sharps, block and the control of the cont	ste; Free liquids, PCBs above TSCA regulatory
Additional Prohibited Waste at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garbage	
REQUIRED: WASTE CONTENTS ALLOWABL	
Check all allowable wastes that are contained with	AL in Alifa to 1
• Waste disposal at the Area b Hydrocarbon I andfill must have come into or	ontact with material and built at
coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubrica petroleum hydrocarbon; and ethylene glycol.	ants and hydraulics; kerosene; asphaltic
Acceptable waste at any NTS landfill: Paper Rocks / unaltered	geologic materials Empty containers
Asphalt 🛛 Metal 🖾 Wood 🖾 Soil 🔲 Rubber (excluding	
☑ Plastic ☑ Wire ☐ Cable ☑ Cloth ☒ insulation (non-As	hestosform)
Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic component	nents, PPE, etc.)
additional waste accepted at the Area 23 Mercury Landfill:	Food Waste
	Quantity:
dditional waste accepted at the Area 9 U10c Landfill:	
	Solid fractions from sand/oil/water
Light ballasts (contact SWO) Drained fuel filters (gas & diesel)	Deconned Underground and Above
Hydrocarbons (contact SWO) Other 1 shipment of HC soil & Debris	Ground Tanks
dditional waste accepted at the Area 6 Hydrocarbon Landfill: Septic sludge Rags Drained fuel filters (gas & diesel)	
	Crushed non-teme plated oil filters
Plants Soil Sludge from sand/oil/water separators REQUIRED: WASTE GENERATOR SIGNA	PCBs below 50 parts per million
10 T	TORE
(********************************	· · · · · · · · · · · · · · · · · · ·
e above mentioned waste was generated outside of a Controlled Waste Managen owledge, does not contain radiological materials.	nent Area (CWMA) and to the best of my
the best of my knowledge, the waste described above contains only those mate	
e. I have verified this through the waste characterization method identified above	Radiological Survey Release for Waste Disposal
phibited and allowable waste items. I have contacted Property Management and approved for disposal in the landfill.	RCT Initials This container/load meets the criteria for
nt Name: Mark Heser	added man-made radioactive material This container/load meets the criteria for
nature: /s/ Mark Heser Date: 5/17/11	Radcon Manual Table 4.2 release limits. This container/load is exempt from survey
te: "Food waste, office trash and animal carcasses do not require a radiological must have signed removal certification statement with Load Verification."	due to process knowledge and origin. SIGNATURE: /s/ Mike Van Dillen DATE: 5-24
O USE ONLY	BN-0646 (1
ad Weight (net from scale or estimate): 42,820 Signature of Certifier:	/s/ Don Bickford
TIMO DE LO COMPONIO DE LA COMPONIO DEL COMPONIO DE LA COMPONIO DEL COMPONIO DE LA COMPONIO DEL COMPONIO DE LA COMPONIO DEL COMPONIO DE LA COMPONIO DELICA DEL COMPONIO DE LA COMPONIO DE L	NILLY VII

	Waste Category Definitions				
Commercial Waste:	Office waste, putrescible waste				
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).				
· · · · · · · · · · · · · · · · · · ·	Waste Types Definitions				
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.				
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste				
Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).				
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.				
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.				
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).				
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.				
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989.				
	Pollution Prevention Category Definitions				
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).				
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.				
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.				
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.				
	Radiological Limitations				
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".				
Area 6 and Area 9 Landfills:	See permit limits.				



NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0 Page 1 of 2

SWO USE (Select One) AREA	23	6	⊠ 9	□ LANDFILL
For waste characterization, appro	val, and/or assistance,	contact Solid V	Vaste Operation (S	WO) at 5-7898.
REQUI	RED: WASTE GERER loffs, dump trucks, and	ATOR INFORM	MATION	
Waste Generator: Mark Heser (NI, WO)(M/				(o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-08-02	Mile 1976 - Chirocol - John Colo - Library Colores			
Waste Category: (check one)	☐ Commercial		Industrial	
Waste Type: NTS	☐ Putrescrible		FFACO-onsite	☐ WAC Exception
(check one) Non-Putrescible	☐ Asbestos Containi			☐ Historic DOE/NV
	Environmental mai	nagement 🗌	Defense Projects	
	☑ Clean-Up			
Method of Characterization: (check one)	Sampling & Analys	is 🛛	Process Knowled	ge 🛛 Contents
Prohibited Waste at all three NTS landfills: Radioactive v levels, and M Additional Prohibited Waste	waste; RCRA waste; Ha ledical wastes (needles	azardous waste , sharps, blood	; Free liquids, PCB y clothing).	s above TSCA regulatory
at the Area 9 U10C Landfill: Sewage Slud	ge, Animal carcasses,			iable asbestos
Check all allo	: WASTE CONTENTS owable wastes that are	contained with:	n Hala land	
Waste disposal at the Area 6 Hydrocal	rbon Landfill must have	come into cont	ant with natralaum	hydrocarbone or
occiains, such as. yasuline (no penze	sne, lean): let tilel, diec	el fuel; lubrican	ts and hydraulics: I	kerosene; asphaltic
Political Try droud borr, and edivicile	grycor.			
			ologic materials	Empty containers
		er (excluding tir		Demolition debris
Manufactured items: (swamp coolers, furnit	Cloth Insula	ation (non-Asbe	stosform)	□ Cement & concrete
Additional waste accepted at the Area 23 Me				
☐ Asbestos ☐ Friable ☐ Non-Fria	able (contact SWO if re	Office Waste gulated load)	☐ Food Waste Quantity:	☐ Animal Carcasses
Additional waste accepted at the Area 9 U10				
Non-friable asbestos ☐ Drained at	utomobiles and military	vehicles	Solid fractions from	sand/oil/water
Light ballasts (contact SWO) Drained fu	el filters (gas & diesel)		Deconned Undergr	ound and Above
∐ Hydrocarbons (contact SWO) ☐ Other 1 s		Debris	Ground Tanks	2 March 200
Additional waste accepted at the Area 6 Hyd	rocarbon Landfill:			
	ned fuel filters (gas & di	esel)	☐ Crushed non-	teme plated oil filters
☐ Plants ☐ Soil ☐ Slude	ge from sand/oil/water s	separators	PCBs below 5	0 parts per million
REQUIRE	ED: WASTE GENERA	TOR SIGNATU	IRE	
nitials: (if initialed, no radiological cle	arance is necessary.)	(4)		ů.
		138	5.1.	35 St.
he above mentioned waste was generated outs nowledge, does not contain radiological mater	aide of a Controlled Wa	iste Manageme	nt Area (CWMA) ai	nd to the best of my
			2 1	
o the best of my knowledge, the waste describ-	ed above contains only	those material	Is that are allowed	for disposal at this
rohibited and allowable waste items. I have co				Release for Waste Disposal
approved for disposal in the landfill.		gementanu	. Williams	
rint Name: Mark Heser			auded man-	ner/load meets the criteria for no made radioactive material
gnature: /s/ Mark Heser	Date:	5/17/11	Radcon Mar	er/load meets the criteria for
ote: "Food waste, office trash and animal carca must have signed removal certification sta	isses do not require a r	adiological	due to proces	er/load is exempt from survey
NO USE ONLY	. 1	Cation.	IGNATURL./S/ IVIIK	e Van Dillen DATE: 5-24-/
ad Weight (net from scale or estimate): 40.8	60 5/24/1	of Certifie.	s/ Don Bio	kford BN-0646 (10/0)

UNCONTROLLED When Printed Shipment 16 of 41

	Waste Category Definitions
Commercial Waste:	Office waste, putrescible waste
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).
	Waste Types Definitions
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste
Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989.
	Pollution Prevention Category Definitions
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.
	Radiological Limitations
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".
Area 6 and Area 9 Landfills:	See permit limits.

(11)

NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

SWO USE (Select One) AREA 23 6	⊠9 ⊠ LANDFILL
For waste characterization, approval, and/or assistance, contact Solid	d Waste Operation (SWO) at 5-7898
REQUIRED: WASTE GERERATOR INFO (This form is for rolloffs, dump trucks, and other onsite	RMATION
Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241)	Phone Number: (o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal us	sing tracking number 561H02
Waste Category: (check one)	⊠ Industrial
Waste Type: ☐ NTS ☐ Putrescrible	☑ FFACO-onsite ☐ WAC Exception
(check one) Non-Putrescible Asbestos Containing Material	☐ FFACO-offsite ☐ Historic DOE/NV
Pollution Prevention Category: (check one)	☐ Defense Projects ☐ YMP
Pollution Prevention Category: (check one) Clean-Up	Routine
Method of Characterization: (check one) Sampling & Analysis	☑ Process Knowledge ☑ Contents
NTS landfills: Radioactive waste; RCRA waste; Hazardous wastes and Medical wastes (needles, sharps, blo	ste: Free liquids, PCRs above TSCA regulaters
at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garbage	e (food waste); and Friable asbestos
REQUIRED: WASTE CONTENTS ALLOWABLE	LE WASTES
Check all allowable wastes that are contained with NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into coolants, such as: gaspline (no horzone lead) into fact, in the land of	contract with a standard but I
delice, each as, gasoline the perizene, lead it let their diesel trial, hibrid	ants and hydraulics; kerosene; asphaltic
A	
Acceptable waste at any NTS landfill: Paper Rocks / unaltered Asphalt Metal Wood Soil Rubber (excluding	geologic materials
N District A	tires) Demolition debris
— David M Justialian Inon-Ad	sbestosform) Cement & concrete
Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic compor	
Additional waste accepted at the Area 23 Mercury Landfill: Office Waste Asbestos Friable Non-Friable (contact SWO if regulated load)	
Additional waste accepted at the Area 9 U10c Landfill:	
Nan filation to the same of th	Solid fractions from sand/oil/water
	Ground Tanks
Additional waste accepted at the Area 6 Hydrocarbon Landfill:	
☐ Septic sludge ☐ Rags ☐ Drained fuel filters (gas & diesel)	☐ Crushed non-teme plated oil filters
☐ Plants ☐ Soil ☐ Sludge from sand/oil/water separators	PCBs below 50 parts per million
REQUIRED: WASTE GENERATOR SIGNA	TURE
nitials: (if initialed, no radiological clearance is necessary.)	**************************************
—— , indicate is necessary.	
he above mentioned waste was generated outside of a Controlled Waste Manager nowledge, does not contain radiological materials.	ment Area (CWMA) and to the best of my
o the best of my knowledge, the waste described above contains only those mate	rials that are allowed for disposal at this
ohibited and allowable waste items. I have contacted Property Management and	
approved for disposal in the landfill.	Radiological Survey Release for Waste Disposal
int Name: Mark Heser	RCT Initials Miv This container/load meets the criteria for no
gnature: /s Mark Heser Date: 5/17/11	added man-made radioactive material This container/load meets the criteria for
ote: "Food waste, office trash and animal carcasses do not require a radiological must have signed removal certification statement with Load Verification."	Radcon Manual Table 4.2 release limits. This container/load is exempt from survey.
VO USE ONLY	due to process knowledge and origin.
ad Weight (1947) signature of Certifier:	SIGNATURE: /s/ Mike Van Dillen DATE: 5-24-1

Waste Category Definitions			
Commercial Waste:	Office waste, putrescible waste		
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).		
	Waste Types Definitions		
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.		
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste		
Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).		
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.		
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.		
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).		
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.		
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989		
	Pollution Prevention Category Definitions		
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).		
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.		
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.		
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.		
	Radiological Limitations		
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".		
Area 6 and Area 9 Landfills:	See permit limits.		

(12)

NSTec. Form

FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0 Page 1 of 2

SWO USE (Select One) AREA 23 \boxtimes 9 6 LANDFILL For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898. REQUIRED: WASTE GERERATOR INFORMATION (This form is for rolloffs, dump trucks, and other onsite disposal of materials.) Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241) Phone Number: (o)5-2124; (c)496-0150 CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal using tracking number 561H02 Location / Origin: Waste Category: (check one) ☐ Commercial Waste Type: ☐ NTS ☐ Putrescrible ☐ WAC Exception (check one) ☐ Non-Putrescible ☐ Asbestos Containing Material ☐ FFACO-offsite ☐ Historic DOE/NV Pollution Prevention Category: (check one) ⊠ Environmental management Defense Projects YMP Pollution Prevention Category: (check one) Routine Method of Characterization: (check one) Sampling & Analysis Process Knowledge Contents Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory NTS landfills: levels, and Medical wastes (needles, sharps, bloody clothing). Additional Prohibited Waste Sewage Sludge, Animal carcasses, Wet garbage (food waste); and Friable asbestos at the Area 9 U10C Landfill: REQUIRED: WASTE CONTENTS ALLOWABLE WASTES Check all allowable wastes that are contained within this load: NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol. Acceptable waste at any NTS landfill: □ Paper Rocks / unaltered geologic materials Asphalt ⊠ Soil Rubber (excluding tires) □ Demolition debris ☑ Plastic Wire ☐ Cable ☑ Cloth □ Cement & concrete Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.) Additional waste accepted at the Area 23 Mercury Landfill: ☐ Office Waste ☐ Food Waste ☐ Animal Carcasses ☐ Asbestos ☐ Friable Non-Friable (contact SWO if regulated load) Quantity: Additional waste accepted at the Area 9 U10c Landfill: ☐ Drained automobiles and military vehicles ☐ Solid fractions from sand/oil/water ☐ Light ballasts (contact SWO) ☐ Drained fuel filters (gas & diesel) ☐ Deconned Underground and Above ☐ Hydrocarbons (contact SWO) ☐ Other 1 shipment of HC soil & Debris Ground Tanks Additional waste accepted at the Area 6 Hydrocarbon Landfill: ☐ Septic sludge ☐ Rags ☐ Drained fuel filters (gas & diesel) ☐ Crushed non-teme plated oil filters ☐ Plants ☐ Soil ☐ Sludge from sand/oil/water separators PCBs below 50 parts per million REQUIRED: WASTE GENERATOR SIGNATURE Initials: (if initialed, no radiological clearance is necessary.) The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials. To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified abov prohibited and allowable waste items. I have contacted Property Management and Radiological Survey Release for Waste Disposal is approved for disposal in the landfill. RCT Initials This container/load meets the criteria for no Print Name: Mark Heser added man-made radioactive material /s/ Mark Heser This container/load meets the criteria for Signature: Radcon Manual Table 4.2 release limits. Note: "Food waste, office trash and animal carcasses do not require a radiological This container/load is exempt from survey must have signed removal certification statement with Load Verification." due to process knowledge and origin. SIGNATURE: /S/ Mike Van Dillen DATE: 5-24. SWO USE ONLY Load Weight (net from scale or estimate): Signature of Certifier: /S/ Signature on File

Waste Category Definitions		
Commercial Waste:	Office waste, putrescible waste	
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).	
	Waste Types Definitions	
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.	
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste	
Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).	
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.	
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.	
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).	
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.	
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989	
	Pollution Prevention Category Definitions	
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).	
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.	
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.	
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.	
	Radiological Limitations	
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".	
Area 6 and Area 9 Landfills:	See permit limits.	

NSTec	
Form	
FRM-091	8

SWO USE (Select One) AREA 23 6	⊠9 ⊠ LANDFILL
For waste characterization, approval, and/or assistance, contact	Solid Waste Operation (SWO) at 5-7898
REQUIRED: WASTE GERERATOR II	NEODMATION
(This form is for rolloffs, dump trucks, and other on	site disposal of materials.)
Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241)	Phone Number: (o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for dispose	al using tracking number 561H02
Waste Category: (check one)	
Waste Type: NTS Putrescrible	
(check one) Non-Putrescible Asbestos Containing Mater	
Pollution Prevention Category: (check one) Environmental management	
Pollution Prevention Category: (check one) Clean-Up	nt
Method of Characterization: (check one) Sampling & Analysis	Ø December 1 57 0
Prohibited Waste at all three Radioactive waste; RCRA waste: Hazardous	waste: Free liquide DCPs share TOOA
in the modical wastes meeties, sharps	bloody clothing).
Additional Prohibited Waste at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garb	page (food waste); and Frieble sebastes
	and the second s
REQUIRED: WASTE CONTENTS ALLOW. Check all allowable wastes that are contained.	
Table disposal at the Area o Hydrocarbon I andfill must have some in	4m
	bricants and hydraulics; kerosene; asphaltic
Acceptable and a series of the	
Acabelt M Market	ered geologic materials 🛛 Empty containers
Aspiralt	- I - I - I - I - I - I - I - I - I - I
Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic com	n-Asbestosform)
dutional waste accepted at the Area 23 Mercury Landfill: Office W	
Asbestos Friable Non-Friable (contact SWO if regulated to	aste
Additional waste accepted at the Area 9 U10c Landfill:	cacy Guaritty.
Non-friable asbestos Drained automobiles and military vehicles	☐ Solid fractions from sand/oil/water
☐ Light ballasts (contact SWO) ☐ Drained fuel filters (gas & diesel)	Deconned Underground and Above
Hydrocarbons (contact SWO) Other 1 shipment of HC soil & Debris	Ground Tanks
dditional waste accepted at the Area 6 Hydrocarbon Landfill:	
Septic sludge Rags Drained fuel filters (gas & diesel)	☐ Crushed non-teme plated oil filters
Plants	S PCBs below 50 parts per million
REQUIRED: WASTE GENERATOR SIG	SNATURE
itials: (if initialed, no radiological clearance is necessary.)	* , F
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ohibited and allowable waste items. I have contacted Property Management	Radiological Survey Release for Waste Disposal
approved for disposal in the landfill.	RCT Initials
nt Name: Mark Heser	added man-made radioactive material
gnature: /s/ Mark Heser	This container/load meets the criteria for
Date: 5// + //	Radcon Manual Table 4.2 release limits. This container/load is exempt from survey
te: "Food waste, office trash and animal carcasses do not require a radiological must have signed removal certification statement with Load Verification."	due to process knowledge and origin.
O USE ONLY	SIGNATURE: /S/ Mike Van Dillendate: 5.27
od Weight (not for C) 1 29 2112 5/24/11	and the second s
ad Weight (net from scale of estimate): 39340 Signature of Certifie	: /s/ Signature on File

Waste Category Definitions		
Commercial Waste:	Office waste, putrescible waste	
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).	
	Waste Types Definitions	
NTS:	Waste generated from construction, demolition, and/or routine activitiés within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.	
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste	
Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).	
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.	
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.	
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).	
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.	
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989.	
Pollution Prevention Category Definitions		
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).	
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.	
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.	
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.	
	Radiological Limitations	
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".	
Area 6 and Area 9 Landfills:	See permit limits.	



NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

SWO USE (Select One) AREA 23 6	⊠9 ⊠ LANDFILL
For waste characterization, approval, and/or assistance, contact So	lid Waste Operation (SWO) at 5-7898.
REQUIRED: WASTE GERERATOR INF (This form is for rolloffs, dump trucks, and other onsite	ORMATION e disposal of materials.)
Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241)	Phone Number: (o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal	
Waste Category: (check one)	
Waste Type: NTS Putrescrible	☐ FFACO-onsite ☐ WAC Exception
(check one) Non-Putrescible Asbestos Containing Material	☐ FFACO-offsite ☐ Historic DOE/NV
Pollution Prevention Category: (check one) 🛛 Environmental management	☐ Defense Projects ☐ YMP
Pollution Prevention Category: (check one) Clean-Up	☐ Routine
Method of Characterization: (check one) Sampling & Analysis	□ Process Knowledge □ Contents.
Prohibited Waste at all three NTS landfills: Radioactive waste; RCRA waste; Hazardous w levels, and Medical wastes (needles, sharps, bl	aste; Free liquids, PCBs above TSCA regulatory loody clothing).
Additional Prohibited Waste at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garbage	ge (food waste); and Friable asbestos
REQUIRED: WASTE CONTENTS ALLOWAE Check all allowable wastes that are contained wastes that are	within this load:
Acceptable waste at any NTS landfill: 🛛 Paper 🔲 Rocks / unaltere	ed geologic materials
🛛 Asphalt 🖾 Metal 🖾 Wood 🖾 Soil 🔲 Rubber (excludir	
☑ Plastic ☑ Wire ☐ Cable ☑ Cloth ☑ Insulation (non-A	Asbestosform) Cement & concrete
Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic compo	onents, PPE, etc.)
Additional waste accepted at the Area 23 Mercury Landfill:	
Additional waste accepted at the Area 9 U10c Landfill:	
Non-friable asbestos	☐ Solid fractions from sand/oil/water
☐ Light ballasts (contact SWO) ☐ Drained fuel filters (gas & diesel)	☐ Deconned Underground and Above
Hydrocarbons (contact SWO) Other 1 shipment of HC soil & Debris	Ground Tanks
dditional waste accepted at the Area 6 Hydrocarbon Landfill:	
☐ Septic sludge ☐ Rags ☐ Drained fuel filters (gas & diesel)	☐ Crushed non-teme plated oil filters
Plants Soil Sludge from sand/oil/water separators	☐ PCBs below 50 parts per million
REQUIRED: WASTE GENERATOR SIGN	IATURE
nitials: (if initialed, no radiological clearance is necessary.)	
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o the best of my knowledge, the waste described above contains only those mate. I have verified this through the waste characterization method identified aborohibited and allowable waste items. I have contacted Property Management an	
approved for disposal in the landfill.	Radiological Survey Release for Waste Disposal RCT Initials
int Name: Mark Heser	This container/load meets the criteria for no
gnature: /s/ Mark Heser Date: 5/17/11	added man-made radioactive material This container/load meets the criteria for Radcon Manual Table 4.2 release limits.
ote: "Food waste, office trash and animal carcasses do not require a radiological must have signed removal certification statement with Load Verification."	This container/load is exempt from survey due to process knowledge and origin.
NO USE ONLY	SIGNATURE: /S/ Mike Van Dillen DATE: 5-24.
ad Weight (net from scale or estimate): 40,060 Signature of Certifier:	/s/ Signature on File

Waste Category Definitions		
Commercial Waste:	Office waste, putrescible waste	
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Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989.	
	Pollution Prevention Category Definitions	
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).	
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.	
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.	
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.	
	Radiological Limitations	
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".	
Area 6 and Area 9 Landfills:	See permit limits.	

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NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2

SWO USE (Select One) AREA 23 6 \boxtimes 9 LANDFILL For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898. REQUIRED: WASTE GERERATOR INFORMATION (This form is for rolloffs, dump trucks, and other onsite disposal of materials.) Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241) Phone Number: (o)5-2124; (c)496-0150 Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal using tracking number 561H02 Waste Category: (check one) ☐ Commercial Waste Type: ☐ NTS Putrescrible □ WAC Exception (check one) ☐ Non-Putrescible Asbestos Containing Material FFACO-offsite ☐ Historic DOE/NV Pollution Prevention Category: (check one) Environmental management ☐ Defense Projects YMP Pollution Prevention Category: (check one) Routine Method of Characterization: (check one) Sampling & Analysis ☑ Process Knowledge ☑ Contents Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory NTS landfills: levels, and Medical wastes (needles, sharps, bloody clothing). Additional Prohibited Waste Sewage Sludge, Animal carcasses, Wet garbage (food waste); and Friable asbestos at the Area 9 U10C Landfill: REQUIRED: WASTE CONTENTS ALLOWABLE WASTES Check all allowable wastes that are contained within this load: NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol. Acceptable waste at any NTS landfill: ☑ Paper Rocks / unaltered geologic materials ₩ood Soil Soil ☐ Rubber (excluding tires) □ Demolition debris ☑ Plastic Wire ☐ Cable Insulation (non-Asbestosform) □ Cement & concrete Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.) Additional waste accepted at the Area 23 Mercury Landfill: ☐ Office Waste ☐ Food Waste ☐ Animal Carcasses ☐ Asbestos ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: Additional waste accepted at the Area 9 U10c Landfill: ☐ Drained automobiles and military vehicles ☐ Solid fractions from sand/oil/water ☐ Light ballasts (contact SWO) ☐ Drained fuel filters (gas & diesel) ☐ Deconned Underground and Above Ground Tanks Additional waste accepted at the Area 6 Hydrocarbon Landfill: ☐ Septic sludge ☐ Rags □ Drained fuel filters (gas & diesel) Crushed non-teme plated oil filters ☐ Plants ☐ Soil ☐ Sludge from sand/oil/water separators PCBs below 50 parts per million REQUIRED: WASTE GENERATOR SIGNATURE (if initialed, no radiological clearance is necessary.) The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials. To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified abov prohibited and allowable waste items. I have contacted Property Management and Radiological Survey Release for Waste Disposal is approved for disposal in the landfill. RCT Initials This container/load meets the criteria for no Print Name: Mark Heser added man-made radioactive material This container/load meets the criteria for /s/ Mark Heser Signature: Radcon Manual Table 4.2 release limits. This container/load is exempt from survey Note: "Food waste, office trash and animal carcasses do not require a radiological c due to process knowledge and origin. must have signed removal certification statement with Load Verification." SIGNATURE. /S/ Mike Van DillenDATE: 5-25-1 SWO USE ONLY BN-0646 (10/05)

Shipment ZI of 41

Signature of Certifier:

Ls/ Don Bickford

Load Weight (net from scale or estimate):

Waste Category Definitions		
Commercial Waste:	Office waste, putrescible waste	
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).	
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Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989	
Pollution Prevention Category Definitions		
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Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.	
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	Radiological Limitations	
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".	
Area 6 and Area 9 Landfills:	See permit limits.	



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08/23/06 Rev. 0

Page 1 of 2

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Office Waste ☐ Food Waste Animal Carcasses ☐ Asbestos ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: Additional waste accepted at the Area 9 U10c Landfill: ■ Non-friable asbestos ☐ Drained automobiles and military vehicles ☐ Solid fractions from sand/oil/water ☐ Light ballasts (contact SWO) ☐ Drained fuel filters (gas & diesel) ☐ Deconned Underground and Above **Ground Tanks** Additional waste accepted at the Area 6 Hydrocarbon Landfill: ☐ Septic sludge ☐ Rags ☐ Drained fuel filters (gas & diesel) ☐ Crushed non-teme plated oil filters Plants ☐ Sludge from sand/oil/water separators ☐ PCBs below 50 parts per million REQUIRED: WASTE GENERATOR SIGNATURE (if initialed, no radiological clearance is necessary.) The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials. To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified above and a review of the above-mentioned prohibited and allowable waste items. I have contacted Property Management and is approved for disposal in the landfill. Radiological Survey Release for Waste Disposal RCT Initials Print Name: Mark Heser This container/load meets the criteria for no Signature: /s/ Mark Heser added man-made radioactive material Date: 5/17/11 This container/load meets the criteria for Note: "Food waste, office trash and animal carcasses do not require a radiological ci Radcon Manual Table 4.2 release limits. This container/load is exempt from survey must have signed removal certification statement with Load Verification." due to process knowledge and origin. SWO USE ONLY SIGNATURE. /S/ Mike Van Dillen DATE: 5.2(-/ BN-0646 (10/05) Load Weight (net from scale or estimate): /s/ Don Bickford Signature of Certifier:

Shipment 22 of 41

Waste Category Definitions		
Commercial Waste:	Office waste, putrescible waste	
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).	
	Waste Types Definitions	
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.	
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste	
Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).	
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.	
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.	
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).	
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.	
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989.	
	Pollution Prevention Category Definitions	
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).	
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.	
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.	
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.	
Radiological Limitations		
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".	
Area 6 and Area 9 Landfills:	See permit limits.	

(3)



NSTec Form

FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0 Page **1** of **2**

SWO USE (Select One) AREA 23 6	⊠9 ⊠ LANDFILL
For waste characterization, approval, and/or assistance, contact Solid	Waste Operation (SWO) at 5-7898.
REQUIRED: WASTE GERERATOR INFO	RMATION
(This form is for rolloffs, dump trucks, and other onsite of Waste Generator: Mark Heser (NL WO)(M/S - NSE167) (Fax 5-2241)	20.000
	Phone Number: (o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal us	ing tracking number 561H02
Waste Category: (check one)	☑ Industrial
Waste Type: NTS Putrescrible	☑ FFACO-onsite ☐ WAC Exception
(check one)	☐ FFACO-offsite ☐ Historic DOE/NV
Pollution Prevention Category: (check one)	☐ Defense Projects ☐ YMP
Mothod of Characterists	Routine
Prohibited Waste at all three Radioactive works RCRA	☑ Process Knowledge ☑ Contents
Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous waste; NTS landfills: levels, and Medical wastes (needles, sharps, block and Medical wastes)	ste; Free liquids, PCBs above TSCA regulatory
Additional Prohibited Wasto	
at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garbage	the control of the co
REQUIRED: WASTE CONTENTS ALLOWABL	E WASTES
NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into co	optoot with tust tust
and the state of t	ants and hydraulics; kerosene; asphaltic
A	
N Acabatt State of the state of	
M Blastia B Williams	
☑ Plastic ☑ Wire ☐ Cable ☑ Cloth ☑ Insulation (non-Asi Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic componing to the componing t	bestosform) Cement & concrete
Additional waste accepted at the Area 23 Mercury Landfill:	
Additional waste accepted at the Area 9 U10c Landfill:	Quantity:
V Non-fright and the	Solid fractions from sand/oil/water
I light hollowto for a lightness T - 1	Deconned Underground and Above
	Ground Tanks
Additional waste accepted at the Area 6 Hydrocarbon Landfill:	
☐ Septic sludge ☐ Rags ☐ Drained fuel filters (gas & diesel)	☐ Crushed non-teme plated oil filters
☐ Plants ☐ Soil ☐ Sludge from sand/oil/water separators	PCBs below 50 parts per million
REQUIRED: WASTE GENERATOR SIGNAT	TURE
nitials: (if initialed, no radiological clearance is necessary.)	9 9
he above mentioned waste was generated outside of a Controlled Waste Managem nowledge, does not contain radiological materials.	nent Area (CWMA) and to the best of my
the best of my knowledge, the weste described at	
o the best of my knowledge, the waste described above contains only those mater te. I have verified this through the waste characterization method identified above rohibited and allowable waste items. I have contacted Branch M.	rials that are allowed for disposal at this
ohibited and allowable waste items. I have contacted Property Management and approved for disposal in the landfill.	Radiological Survey Release for Waste Disposal
int Name: Mark Heser	RCT Initials This container/load meets the criteria for no
gnature: /s/ Mark Heser Date: 5/17/11	added man-made radioactive material This container/load meets the criteria for
ote: "Food waste, office trash and animal carcasses do not require a radiological c	Radcon Manual Table 4.2 release limits. This container/load is exempt from survey
must have signed removal certification statement with Load Verification."	due to process knowledge and origin.
VO USE ONLY	SIGNATURE: /S/ Mike Van Dillen DATE: 5-25-
ad Weight (net from scale or estimate): 46, 1202 Signature of Certifier:	/s/ Don Rickford

Shipment 23 of 41

	Waste Category Definitions
Commercial Waste:	Office waste, putrescible waste
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	Radiological Limitations
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".
Area 6 and Area 9 Landfills:	See permit limits.

(4)

NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2

SWO USE (S	elect One	AREA		23	☐ 6	-2002	⊠ 9	X I	ANDF	LL
For wa	ste characteri	zation, appro	oval, and/or	assistance,	contact Solid	d Was	te Operation (S	WO) at	5-7898.	
a ²		REQUI	RED: WAS	STE GERER	ATOR INFO	RMAT	TION sal of materials.			
Waste Generator:				7) (Fax 5-224			hone Number:		24; (c)496	-0150
Location / Origin:	CAU 561; C	AS 25-08-02	2 Bulk Debri	is and soil for	disposal us		acking number			
Waste Category:			☐ Comm	nercial		⊠ Ir	ndustrial			
Waste Type:	☐ NTS		☐ Putres			⊠ F	FACO-onsite		WAC Exc	eption
(check one)	☐ Non-Putre			tos Containir		□F	FACO-offsite		Historic D	OE/NV
Pollution Preventi				nmental man	agement		efense Projects		YMP	
Pollution Preventi	********						outine			
Method of Charac				ing & Analysi	S	⊠ P	rocess Knowled	ige 🛛	Contents	
Prohibited Waste NTS landfills:		Radioactive levels, and N	waste; RCF fedical was	RA waste; Ha tes (needles,	zardous wa sharps, blo	ste; Frody cl	ee liquids, PCE othing).	s above	TSCA re	gulatory
Additional Prohibi at the Area 9 U100	ted Waste Landfill:						waste); and Fr	iable as	bestos	
NOTE: Waste disp coolants, s	osal at the Are uch as: gasol	Check all alle a 6 Hydroca line (no benz	owable was arbon Landfi ene: lead):	CONTENTS a tes that are dill must have jet fuel; diese	contained wi	ithin th	ie load:	hydroc	arbons or	ic
penoleum	iyurocarbon, a	ina etnylene	giycoi.							
Acceptable waste	100		☑ Paper				gic materials		npty conta	
☑ Asprialt ☑ N	10 -0 7		Soil		er (excluding	- ,		0 - 0	emolition d	0.520
A100			Cloth	insula 🔀	tion (non-As	sbesto	sform)	⊠ Ce	ement & co	oncrete
Manufactured ite Additional waste a	spented at the	A 22 M	ture, rugs, o							
-	Friable		70	ct SWO if req	Office Waste gulated load		Food Waste uantity:	☐ Ar	imal Carc	asses
Additional waste a		e Area 9 U1	Oc Landfill:				•••••••••••••••••••••••••••••••••••••••			
Non-friable asbe	100	Drained a	automobiles	and military	vehicles [☐ Soli	d fractions from	sand/o	il/water	ŀ
Light ballasts (co	ntact SWO)	☐ Drained f	uel filters (g	as & diesel)	. С] Dec	onned Undergr	ound ar	nd Above	
Hydrocarbons (c	ontact SWO) [Other 1	shipment o	f HC soil & D	ebris		und Tanks			1
dditional waste ad	cepted at the	Area 6 Hyd	rocarbon l	Landfill:		***************************************				
Septic sludge	☐ Rags	☐ Drai	ined fuel filt	ers (gas & die	esel)		Crushed non-	teme pl	ated oil filt	ers
Plants	☐ Soil	☐ Sluc	ge from sa	nd/oil/water s	eparators		PCBs below 5			
		REQUIR	RED: WAS	TE GENERA	TOR SIGNA	ATURE				
nitials: (if ini	tialed, no rad	liological cle	earance is	necessary.)						
he above mentioned nowledge, does not	d waste was g contain radio	enerated our	tside of a C rials.	ontrolled Wa	ste Manage	ment A	Area (CWMA) a	nd to th	e best of r	ny
the best of my knote. I have verified to ohibited and allowa	ms unougn m	ie waste cha	racterizatio	n method ide	ntified abov	has av	a review of the	above-	mentioned	d I
approved for dispo	sal in the land	dfill.	omusicu FI	operty mana	gement and		dictorical Supra			
int Name: Mark H	eser ;			<u> </u>		I RC	diological Survey T Initials \(\frac{1}{\sqrt{L}}\) This contain			55 75
gnature: <u>/s/ N</u>	lark He	s <u>er</u>		Date:	5/17/11		added man- This contain	made rac	lioactive ma	terial
ote: "Food waste, o must have sign	ffice trash and red removal co	animal carc	asses do no atement wit	ot require a ra h Load Verifi	adiological cation."	_	Radcon Man This contain due to proces	ual Table er/load is	4.2 release	límits. m survev
VO USE ONLY			2,000	61-11	, 1	SIGN	ATURE: /S/ Mike			3 37400 33
ad Weight (net from	scale ør estir	nate): 4/	,480	Signature of	f Certifier:		/s/ Don F			BN-0646 (10/

	Waste Category Definitions					
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	Radiological Limitations					
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".					
Area 6 and Area 9 Landfills:	See permit limits.					

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NSTec	
Form	
FRM-0019	c

NTS LANDFILL LOAD VERIFICATION

08/23/06

Rev. 0 Page **1** of **2**

SWO USE (Select One) AREA 23 6	⊠ 9	∠ LANDFILL
For waste characterization, approval, and/or assistance, contact Solid	d Waste Operation (SWO) at 5-7898.
REQUIRED: WASTE GERERATOR INFO	RMATION	No the state of th
(This form is for rolloffs, dump trucks, and other onsite	disposal of material	s.)
Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241)	Phone Number	: (o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal us	sing tracking numbe	r 561H02
Waste Category: (check one)		1 30 11 102
Waste Type: NTS Putrescrible	☑ Industrial	
, La		☐ WAC Exception
Asbestos Containing Material	☐ FFACO-offsite	☐ Historic DOE/NV
Pollution Prevention Category: (check one)	Defense Project	ts YMP
Method of Characterization (de la	Routine	***************************************
Prohibited Waste at all three Radioactive waste: PCDA waste Idea	Process Knowle	edge 🛛 Contents
Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous wastes levels, and Medical wastes (needles, sharps, block)	ste; Free liquids, PC	Bs above TSCA regulatory
Additional Prohibited Waste	Services appropriately and the	
t the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garbage	(food waste); and f	riable asbestos
REQUIRED: WASTE CONTENTS ALLOWARD	FWASTES	
LINECK OIL OLLOWOOD WOOD A that to the		
or c. Waste disposal at the Area o Hydrocarbon I andfill must have some into a		m hydrocarbons or
coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubrica petroleum hydrocarbon; and ethylene glycol.	ants and hydraulics	; kerosene; asphaltic
and carylene divide.		
A Acabelt Market Day	geologic materials	
Z District Z Con Z Rubber (excluding		Demolition debris
Plastic Wire	spestosform)	□ Cement & concrete
dditional waste accepted at the Area 23 Mercury Landfill:		
		☐ Animal Carcasses
Thoract Sayo if regulated load)	Quantity:	
dditional waste accepted at the Area 9 U10c Landfill: Non-friable asbestos	- W. Co William 1	······································
	Solid fractions fro	m sand/oil/water
Light ballasts (contact SWO) Drained fuel filters (gas & diesel)	Deconned Under	ground and Above
Hydrocarbons (contact SWO) Other 1 shipment of HC soil & Debris	Ground Tanks	
dditional waste accepted at the Area 6 Hydrocarbon Landfill:		
Septic sludge Rags Drained fuel filters (gas & diesel)	☐ Crushed nor	-teme plated oil filters
Plants	PCBs below	50 parts per million
REQUIRED: WASTE GENERATOR SIGNA	TURE	oo para per mililon
tials: (if initialed, no radiological clearance is necessary.)		
e above mentioned waste was generated outside of a Controlled Waste Managen owledge, does not contain radiological materials.	1 	
materials.	Radiological Sur	vey Release for Waste Disposal
the best of my knowledge, the waste described above contains only those mate	Initials	
indee verified this through the waste characterization method identified at	and dead and	ainer/load meets the criteria for nn-made radioactive material
hibited and allowable waste items. I have contacted Property Management and approved for disposal in the landfill.	This cont	ainer/load meets the criteria for
	Radcon'N	lanual Table 4.2 release limits
nt Name: Mark Heser	due to pro	ainer/load is exempt from surve
nature: /s/ Mark Heser Date: 5/12/u	SIGNATURE /S/ M	ike Van Dillen DATE: 5-2
54.0. 3/11/11		
e: "Food waste, office trash and animal carcasses do not require a radiological clement have signed removal certification statement with lead Verification."	earance Freen-cor	staining appliances I
must have signed removal certification statement with Load Verification."		training appliances

960 Signature of Certifier: 1st Signature on File CONTROLLED When Printed

Shipment 25 of 41

Load Weight (net from scale or estimate): 45

Waste Category Definitions					
Commercial Waste:	Office waste, putrescible waste				
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).				
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NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2

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Waste Category: (check one)	× I	ndustrial	
Waste Type: NTS Putrescrible	<u>⊠</u>	FACO-onsite	☐ WAC Exception
(check one) Non-Putrescible Asbestos Containing Mate	erial 🔲 F	FACO-offsite	☐ Historic DOE/NV
Pollution Prevention Category: (check one) Environmental manageme	ent 🔲 [Defense Projects	s YMP
Pollution Prevention Category: (check one) Clean-Up		Routine	
Method of Characterization: (check one) Sampling & Analysis	⊠ F	Process Knowled	dge 🛛 Contents
Prohibited Waste at all three NTS landfills: Radioactive waste; RCRA waste; Hazardou levels, and Medical wastes (needles, sharps Additional Prohibited Waste	ıs waste; F s, bloody o	ree liquids, PCE clothing).	Bs above TSCA regulatory
at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet gar		Y	riable asbestos
REQUIRED: WASTE CONTENTS ALLOV Check all allowable wastes that are contained.	WABLE W	ASTES	
NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come i	into contac	t with petroleum	hydrocarbons or
coolains, such as: gasoline (no benzene, lead); let fuel: diesel fuel:	lubricants	and hydraulics;	kerosene; asphaltic
percieum nydrocarbon, and etnylene glycol.			
Acceptable waste at any NTS landfill:			Empty containers
☑ Plastic ☑ Wire ☐ Cable ☑ Cloth ☑ Insulation (no			Demolition debris
Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic co	mnonente	DDE etc.)	□ Cement & concrete
Additional waste accepted at the Area 23 Mercury Landfill:		Food Waste	
☐ Asbestos ☐ Friable ☐ Non-Friable (contact SWO if regulated		Quantity:	☐ Animal Carcasses
Additional waste accepted at the Area 9 U10c Landfill:			
Non-friable asbestos	e □ So	lid fractions from	n sand/oil/water
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Hydrocarbons (contact SWO) Other 1 shipment of HC soil & Debris		ound Tanks	Tourid and Above
additional waste accepted at the Area 6 Hydrocarbon Landfill:			
☐ Septic sludge ☐ Rags ☐ Drained fuel filters (gas & diesel)		7 Crushed non-	teme plated oil filters
Plants Soil Sludge from sand/oil/water separate			50 parts per million
REQUIRED: WASTE GENERATOR S	IGNATUR	E	part part minion
nitials: (if initialed, no radiological clearance is necessary.)	51		
he above mentioned waste was generated outside of a Controlled Waste Ma nowledge, does not contain radiological materials.	nagement	Area (CWMA) a	ınd to the best of my
o the best of my knowledge, the waste described above contains only those		<u></u>	
te. I have verified this through the waste characterization method identified only in the control of the contro	abo R	ICT initials	y Release for Waste Disposal
approved for disposal in the landfill.		This contai	iner/load meets the criteria for -made radioactive material
rint Name: Mark Heser	ł _	This contain	ner/load meets the criteria for
gnature: /s/ Mark Heser Date: 5//7	<u>/11</u> -	Radcon Ma This contain	nual Table 4.2 release limits. ner/load is exempt from surve
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NO LISE ONLY			BN-0646 (
5/25/11	fier: /s/	Signatu	re on File

· .	Waste Category Definitions				
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FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.				
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).				
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.				
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989.				
	Pollution Prevention Category Definitions				
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).				
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.				
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.				
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.				
	Radiological Limitations				
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".				
Area 6 and Area 9 Landfills:	See permit limits.				



NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2

SWO USE (Select One) AREA 23 6	
For waste characterization, approval, and/or assistance, contact Solid	d Waste Operation (SWO) at 5-7898.
REQUIRED: WASTE GERERATOR INFO	RMATION
(This form is for rolloffs, dump trucks, and other onsite Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241)	
(101) (1 dx 0-2241)	Phone Number: (o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal us	sing tracking number 561H02
Waste Category: (check one)	☑ Industrial
Waste Type: NTS Putrescrible	☑ FFACO-onsite ☐ WAC Exception
	☐ FFACO-offsite ☐ Historic DOE/NV
	☐ Defense Projects ☐ YMP
Mothod of Characteristics (1)	Routine
1 3	☑ Process Knowledge ☑ Contents
Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous wastes (needles, sharps, block three levels, and Medical wastes (needles, sharps, block three levels).	ste; Free liquids, PCBs above TSCA regulatory
Additional Prohibited Waste at the Area 9 U10C Landfili: Sewage Sludge, Animal carcasses, Wet garbage	NAME AND ADDRESS OF THE PARTY O
REQUIRED: WASTE CONTENTS ALLOWABL	
Check all allowable wastes that are contained!	14L :- 4L !- ! !
••• Waste disposal at the Area b Hydrocarbon Landfill must have come into or	contact with potential to the
coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubrica petroleum hydrocarbon; and ethylene glycol.	cants and hydraulics; kerosene; asphaltic
Acceptable waste at any NTS landfill: Paper Rocks / unaltered	geologic materials Empty containers
Asphalt 🗵 Metal 🗎 Wood 🖾 Soil 🔲 Rubber (excluding	g tires) 🛛 Demolition debris
☑ Plastic ☑ Wire ☐ Cable ☑ Cloth ☑ Insulation (non-As	shestosform)
Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic compor	
dditional waste accepted at the Area 23 Mercury Landfill: Office Waste Asbestos Friable Non-Friable (contact SWO if regulated least)	_ / william Carcasses
Asbestos Friable Non-Friable (contact SWO if regulated load) dditional waste accepted at the Area 9 U10c Landfill:) Quantity:
Non-frieble and a firm of the	7 0-146-16
Light ballasts (contact SWO) Drained fuel filters (gas & diesel)	Solid fractions from sand/oil/water
Hydrocarbons (contact SWO) Other 1 shipment of HC soil & Debris	Deconned Underground and Above Ground Tanks
dditional waste accepted at the Area 6 Hydrocarbon Landfill:	Glouid Talks
Septic sludge Rags Drained fuel filters (gas & diesel)	☐ Crushed non-teme plated oil filters
Plants Soil Sludge from sand/oil/water separators	PCBs below 50 parts per million
REQUIRED: WASTE GENERATOR SIGNA	TURE
itials: (if initialed, no radiological clearance is necessary.)	
e above mentioned waste was generated outside of a Controlled Waste Managen owledge, does not contain radiological materials.	ment Area (CWMA) and to the best of my
the best of my knowledge, the waste described above contains only those matere. I have verified this through the waste characterization method identified above by the contains only those materials.	
Shibited and allowable waste items. I have contacted Properly Management and	Radiological Survey Release for Waste Disposal
approved for disposal in the landfill.	This container/load meets the criteria for
nt Name: Mark Heser	added man-made radioactive material This container/load meets the criteria for
nature: /s/ Mark Heser Date: 5/17/11	Radcon Manual Table 4.2 release limits.
te: "Food waste, office trash and animal carcasses do not require a radiological c	This container/load is exempt from survey due to process knowledge and origin.
must have signed removal certification statement with Load Verification."	SIGNATURE /S/ Mike Van Dillen DATE: 525
O USE ONLY	BN-0646 (10
ad Weight (net from scale or estimate): 46 460 Signature of Certifier:	/s/ R. Everett

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Shinment 27 of 41

	Waste Category Definitions				
Commercial Waste:	Office waste, putrescible waste				
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).				
	Waste Types Definitions				
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Si boundaries. Waste that does not meet another waste type definition listed below.				
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste				
Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).				
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.				
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FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).				
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.				
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989				
	Pollution Prevention Category Definitions				
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).				
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.				
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.				
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.				
	Radiological Limitations				
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".				
Area 6 and Area 9	See permit limits.				



NSTec Form . FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2 SWO USE (Select One) AREA 23 6 \boxtimes 9 LANDFILL For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898. REQUIRED: WASTE GERERATOR INFORMATION (This form is for rolloffs, dump trucks, and other onsite disposal of materials.) Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241) Phone Number: (o)5-2124; (c)496-0150 CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal using tracking number 561H02 Location / Origin: Waste Category: (check one) ☐ Commercial Waste Type: ☐ NTS ☐ Putrescrible ▼ FFACO-onsite ☐ WAC Exception (check one) ☐ Non-Putrescible ☐ Asbestos Containing Material ☐ FFACO-offsite Historic DOE/NV Pollution Prevention Category: (check one) ☐ Defense Projects YMP Pollution Prevention Category: (check one) ☐ Routine Method of Characterization: (check one) Sampling & Analysis Process Knowledge Contents Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory NTS landfills: levels, and Medical wastes (needles, sharps, bloody clothing). Additional Prohibited Waste Sewage Sludge, Animal carcasses, Wet garbage (food waste); and Friable asbestos at the Area 9 U10C Landfill: REQUIRED: WASTE CONTENTS ALLOWABLE WASTES Check all allowable wastes that are contained within this load: NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol. Acceptable waste at any NTS landfill: ☑ Paper Rocks / unaltered geologic materials Soil Soil ☐ Rubber (excluding tires) Demolition debris ☑ Wire ☐ Cable ☑ Cloth □ Cement & concrete Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.) Additional waste accepted at the Area 23 Mercury Landfill: ☐ Office Waste ☐ Food Waste ☐ Animal Carcasses ☐ Asbestos ☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: Additional waste accepted at the Area 9 U10c Landfill: Non-friable asbestos ☐ Drained automobiles and military vehicles ☐ Solid fractions from sand/oil/water ☐ Light ballasts (contact SWO) ☐ Drained fuel filters (gas & diesel) ☐ Deconned Underground and Above ☐ Hydrocarbons (contact SWO) ☐ Other 1 shipment of HC soil & Debris Ground Tanks Additional waste accepted at the Area 6 Hydrocarbon Landfill: ☐ Septic sludge ☐ Drained fuel filters (gas & diesel) ☐ Rags ☐ Crushed non-teme plated oil filters ☐ Plants Soil S ☐ Sludge from sand/oil/water separators ☐ PCBs below 50 parts per million REQUIRED: WASTE GENERATOR SIGNATURE (if initialed, no radiological clearance is necessary.) The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials. To the best of my knowledge, the waste described above contains only those materials that are allowed for disposal at this site. I have verified this through the waste characterization method identified above and a review of the above prohibited and allowable waste items. I have contacted Property Management and Radiological Survey Release for Waste Disposal is approved for disposal in the landfill. RCT Initials This container/load meets the criteria for no Print Name: Mark Heser added man-made radioactive material /s/ Mark Heser This container/load meets the criteria for Signature: Date: 5/17/11 Radcon Manual Table 4.2 release limits. Note: "Food waste, office trash and animal carcasses do not require a radiological c This container/load is exempt from survey must have signed removal certification statement with Load Verification.' SIGNATURE: /S/ Mike Van Dillen DATE: 5-25 SWO USE ONLY

Load Weight (net from scale or estimate): 48, 100

∟verett

	Waste Category Definitions				
Commercial Waste:	Office waste, putrescible waste				
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).				
	Waste Types Definitions				
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test S boundaries. Waste that does not meet another waste type definition listed below.				
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FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).				
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.				
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989				
	Pollution Prevention Category Definitions				
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).				
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.				
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.				
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.				
	Radiological Limitations				
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".				
Area 6 and Area 9 Landfills:	See permit limits.				



NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2

SWO USE (Select One) AR	EA 🗌 23	☐ 6	⊠ 9	□ LANDFILL
For waste characterization, a	pproval, and/or assistance	, contact Solid V	Vaste Operation (SV	VO) at 5-7898.
RE	QUIRED: WASTE GEREI or rolloffs, dump trucks, and	RATOR INFORM	MATION	
))(M/S - NSF167) (Fax 5-2:			
	8-02 Bulk Debris and soil f			(o)5-2124; (c)496-0150 61H02
Vaste Category: (check one)	☐ Commercial		Industrial	
Vaste Type: NTS	☐ Putrescrible		FFACO-onsite	T WAC Evention
check one) Non-Putrescible	☐ Asbestos Contain	200		☐ WAC Exception
ollution Prevention Category: (check o		***************************************		☐ Historic DOE/NV
ollution Prevention Category: (check or			Routine	☐ YMP
lethod of Characterization: (check one)		veie 🖂	Process Knowledg	To M Contents
rohibited Waste at all three Radioact		lazardous waste	· Free liquids PCR	s above TSCA regulatory
revers, ar	nd Medical wastes (needle	s, sharps, blood	y clothing).	s above 150A regulatory
dditional Prohibited Waste the Area 9 U10C Landfill:	Sludge, Animal carcasses	, Wet garbage (f	ood waste); and Fria	able asbestos
REQUI	RED: WASTE CONTENTS	S ALLOWABLE	WASTES	
Check at OTF: Waste disposal at the Area 6 Hyd	Il allowable wastes that are	contained withi	n this load:	
OTE: Waste disposal at the Area 6 Hyd coolants, such as: gasoline (no b	enzene lead): jet fuel: die	e come into con	tact with petroleum	hydrocarbons or
petroleum hydrocarbon; and ethyle	ene glycol.	sor idei, idbiican	is and hydraulics, k	eroserie, aspiratiic
cceptable waste at any NTS landfill:	☑ Paper ☑ Roc	ks / unaltered ge	eologic materials	
Asphalt Metal Wood		ber (excluding ti		□ Demolition debris
Plastic Wire Cable		lation (non-Asbe		□ Cement & concrete
Manufactured items: (swamp coolers, t	furniture, rugs, carpet, elec	tronic componer	nts, PPE, etc.)	
ditional waste accepted at the Area 2		Office Waste	☐ Food Waste	☐ Animal Carcasses
Asbestos Friable Nor	n-Friable (contact SWO if r		Quantity:	
ditional waste accepted at the Area 9				
	ed automobiles and militar	v vehicles	Solid fractions from	sand/oil/water
	ed fuel filters (gas & diese	67:17(17E) : (2도로 사용하다 1985) : - (1985) [1 - 1	Deconned Undergro	
Hydrocarbons (contact SWO) Other			Ground Tanks	ound and Above
dditional waste accepted at the Area 6				
	Drained fuel filters (gas &		Поль	
	Sludge from sand/oil/water			eme plated oil filters
	OUIRED: WASTE GENER		PCBs below 5	0 parts per million
tials: (if initialed, no radiologica			JKE	
	15	53		
e above mentioned waste was generated owledge, does not contain radiological n	naterials.	Vaste Manageme	ent Area (CWMA) an	nd to the best of my
			42	
the best of my knowledge, the waste de-	scribed above contains or	ly those mate		Poloace for Waste Disposal
 I have verified this through the waste 	characterization method is	dentified aboy	Radiological Survey	Release for Waste Disposal
e. I have verified this through the waste phibited and allowable waste items. I have	characterization method is	dentified aboy	RCT Initials	load meets the criteria for
e. I have verified this through the waste ohibited and allowable waste items. I have approved for disposal in the landfill.	characterization method is	dentified aboy	RCT Initials This contai added man	ner/load meets the criteria for -made radioactive material
e. I have verified this through the waste ohibited and allowable waste items. I have approved for disposal in the landfill.	characterization method is	dentified aboy	RCT Initials This contai added man This contai	ner/load meets the criteria for i-made radioactive material iner/load meets the criteria for
e. I have verified this through the waste oblibited and allowable waste items. I have approved for disposal in the landfill. nt Name: Mark Heser	characterization method in ve contacted Property Mar	dentified aboy	RCT Initials This contai added man This contai Radcon Ma	ner/load meets the criteria for i-made radioactive material iner/load meets the criteria for anual Table 4.2 release limits iner/load is exempt from surve
te: "Food waste, office trash and animal	characterization method in the contacted Property Mar	dentified above the second sec	RCT Initials This contai added man This contai Radcon Ma	ner/load meets the criteria for i-made radioactive material iner/load meets the criteria for
e. I have verified this through the waste phibited and allowable waste items. I have perfectly the landfill. Int Name: Mark Heser , mature: /S/ Mark Heser	characterization method in the contacted Property Mar	dentified above the second sec	RCT Initials This contai added man This contai Radcon Ma	ner/load meets the criteria for imade radioactive material iner/load meets the criteria for anual Table 4.2 release limits. iner/load is exempt from surveyess knowledge and origin.

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Shipment 29 of 41

	Waste Category Definitions				
Commercial Waste:	Office waste, putrescible waste				
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).				
-	Waste Types Definitions				
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.				
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FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).				
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Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989.				
	Pollution Prevention Category Definitions				
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).				
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.				
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	Radiological Limitations				
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".				
Area 6 and Area 9 Landfills:	See permit limits.				

NSTec Form

FRM-0918

Load Weight (net from scale)or estimate):

12

08/23/06

Rev. 0

Page 1 of 2

NTS LANDFILL LOAD VERIFICATION

SWO USE (S	elect On	e) AREA		23	□ 6	×.	9	\boxtimes	LANDFILL
For wa	ste characte	erization, appr	oval, and/or	assistance,	contact Sol	lid Waste Op		/O) at	5-7898.
3		REQU	IRED: WAS	TE GEREF	RATOR INF	ORMATION		-	
Waste Generator:		s form is for ro					19606 199		
		er (NI, WO)(N							24; (c)496-0150
Location / Origin:	CAU 561;	CAS 25-08-0	2 Bulk Debri	s and soil fo	or disposal u	using tracking	number 56	31H02	
Waste Category:	(check one)		☐ Comm	ercial			ial		
	□ NTS		☐ Putres	crible		☑ FFACC)-onsite		WAC Exception
	☐ Non-Put		☐ Asbest	os Contain	ing Material				Historic DOE/NV
Pollution Preventi	on Categor	y: (check one)			nagement	☐ Defens	e Projects		YMP
Pollution Preventi	on Categor	y: (check one)				☐ Routine			
Method of Charac Prohibited Waste						☑ Process	s Knowledg	e 🏻	Contents
NTS landfills:	at all three		waste; RCR Medical wast	A waste; H	azardous wa	aste; Free liq oody clothing	uids, PCBs	above	TSCA regulatory
Additional Prohibi	ted Waste						7.		
at the Area 9 U100	Landfill:	Sewage Slu	dge, Animal	carcasses,	Wet garbag	e (food waste	e); and Fria	ble as	bestos
		REQUIRE	D: WASTE C	ONTENTS	ALLOWAE	LE WASTES	3		
NOTE: Waste disne	nsal at the A	Check all all	lowable wast	tes that are	contained w	vithin this load	d:		ii.
NOTE: Waste dispersion coolants, se	ucii as. yas	omie tho benz	zene. leani: i	et fuel: dies	el fuel: lubri	contact with p	petroleum h	ydroc	arbons or
Ponoicum	yar ocarbon,	and culylene	glycol.		ici idei, ideii	canto and ny	draulics, Ke	rosen	e; aspnaitic
cceptable waste			Paper			d geologic ma	aterials	⊠ Er	npty containers
Asphalt 🖾 N	200 miles		Soil .		er (excludin				emolition debris
Plastic W W		Cable [⊠ Cloth	⊠ insul	ation (non-A	sbestosform) •	⊠ Ce	ement & concrete
Manufactured ite Additional waste a	ins; (swam	coolers, turn	iture, rugs, c						
	Friable				Office Was		d Waste	☐ Ar	nimal Carcasses
			iable (contac	ST SWO IF FE	guiated load	d) Quantity	y:		
Additional waste ac Non-friable asbe	stos				[T1 0-114			
Light ballasts (co		☐ Drained	automobiles	and military	venicles L		tions from s	1000	MARKET STATE OF THE STATE OF TH
Hydrocarbons (co	ontact SWO)	Other 1	shipment of	HC soil & I) Dobrio		d Undergro	und ar	nd Above
dditional waste ac					Depuis	Ground Ta	апкs 		
] Septic sludge	Rags	□ Dra	ined fuel filte	.anomi: ers (nos & d	iosol\	П с			
] Plants	☐ Sóil		dge from san				snea non-te s below 50		ated oil filters
		REQUIR	RED: WAST	E GENERA	TOR SIGN	ATURE	s delow 30	parts	per million
itials: (if init	tialed, no ra	diological cl							
						1			
ne above mentioned rowledge, does not	Maste was	generated ou	tside of a Co	entrolled Wa	aste Manage	ement Area (0	CWMA) and	to th	e best of my
	oomaiii raa	lological mate	ilais.		9	10			
the best of my kno	wiedge, the	waste descri	bed above co	ontains onl	y those mat	Radiolog	ical Survey F	Release	for Waste Disposal
e. I have verified the ohibited and allowa	bie waste it	ems. I have c	racterization ontacted Pro	method id	entified abo	RCT Initia	als '		
approved for dispo	sal in the la	ndfill.		,, mant	-goment and	i i i	dded man-m	ade ra	meets the criteria for dioactive material
nt Name: Mark He	eser ,					Т.	his containe	r/load	meets the criteria for
	lark He	eser		Date	5/17/11	1 7	his containe	r/load	le 4.2 release limits. is exempt from surve
te: "Food waste, of	fice trash ar	d animal care	asses do no				ue to proces: =, /s/ Mike	s knjewi e Van	edge and origin. Dillen date::/25
must have sign	ed removal	certification st	atement with	Load Verif	aulological (ication."	SIGNATUR	1140		BN-0646 (
O USE ONLY					,				

5/z5/11
42400 Signature of Certifier: /s/ Signature on File
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	Waste Category Definitions				
Commercial Waste:	Office waste, putrescible waste				
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).				
	Waste Types Definitions				
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.				
Non-Putrescible:	Waste that is not directly associated with construction or demolition activities, such as office waste				
Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).				
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.				
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.				
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).				
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.				
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989				
	Pollution Prevention Category Definitions				
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).				
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.				
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.				
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.				
	Radiological Limitations				
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".				
Area 6 and Area 9 Landfills:	See permit limits.				



NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2

SWO USE (Select One) AREA 23 6	⊠9 ⊠ LANDFILL
For waste characterization, approval, and/or assistance, contact Solid	Waste Operation (SWO) at 5-7898.
REQUIRED: WASTE GERERATOR INFO	RMATION
(This form is for rolloffs, dump trucks, and other onsite	disposal of materials.)
Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241)	Phone Number: (o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal us	sing tracking number 561H02
Waste Category: (check one)	☑ Industrial
Woods Times	☐ FFACO-onsite ☐ WAC Exception
(check one)	
Pollution Prevention Category: (check one)	☐ Defense Projects ☐ YMP
	☐ Routine
Method of Characterization: (check one) Sampling & Analysis	☑ Process Knowledge ☑ Contents
Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous wastes Institution and Medical wastes (needles, sharps, block prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous wastes (needles, sharps, block prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous wastes at all three Radioactive waste; RCRA waste; Hazardous wastes at all three Radioactive waste; RCRA waste; Hazardous wastes at all three Radioactive waste; RCRA waste; Hazardous wastes at all three Radioactive waste; RCRA waste; Hazardous wastes at all three Radioactive waste; RCRA waste; Hazardous wastes at all three Radioactive waste; RCRA waste; Hazardous wastes at all three Radioactive waste; RCRA waste; Hazardous wastes at all three Radioactive w	ste; Free liquids, PCBs above TSCA regulatory ody clothing).
Additional Prohibited Waste at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet garbage	30
REQUIRED: WASTE CONTENTS ALLOWABL	E WASTES
Check all allowable wastes that are contained with MOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into coolants, such as: geseling the house plants and the Area 6 Hydrocarbon Landfill must have come into coolants.	thin this load:
coolaits, such as, gasoline (no benzene, lead); let fuel; diesel fuel; lubric;	ants and hydraulics; kerosene; asphaltic
potroidan hydrocarbon, and entylene glycol.	
Acceptable waste at any NTS landfill: Paper Rocks / unaltered Asphalt Metal Wood Soil Rubber (excluding	
Z Disertis	
☑ Plastic ☑ Wire ☐ Cable ☑ Cloth ☑ Insulation (non-As ☑ Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic compon	bestosform)
dditional waste accepted at the Area 23 Mercury Landfill:	
Asbestos Friable Non-Friable (contact SWO if regulated load)	
dditional waste accepted at the Area 9 U10c Landfill:	Quality.
7 N = (1.1)	Solid fractions from sand/oil/water
Light ballasts (contact SWO) Drained fuel filters (gas & diesel)	Deconned Underground and Above
Hydrocarbons (contact SWO) Other 1 shipment of HC soil & Debris	Ground Tanks
dditional waste accepted at the Area 6 Hydrocarbon Landfill:	
Septic sludge Rags Drained fuel filters (gas & diesel)	Crushed non-teme plated oil filters
Plants ☐ Soil ☐ Sludge from sand/oil/water separators	PCBs below 50 parts per million
REQUIRED: WASTE GENERATOR SIGNA	TURE
itials: (if initialed, no radiological clearance is necessary.)	İ
e above mentioned waste was generated outside of a Controlled Waste Managen	
owledge, does not contain radiological materials.	nent Area (CWMA) and to the best of my
the best of my knowledge, the waste described above contains only those mate	Radiological Survey Release for Waste Disposal
e. I have verified this through the waste characterization method identified about	RCT Initials
phibited and allowable waste items. I have contacted Property Management and approved for disposal in the landfill.	This container/load meets the criteria for r
	This container/load meets the criteria for
nt Name: Mark Heser	Radcon Manual Table 4.2 release limits.
nature: /s/ Mark Heser Date: 5/17/11	This container/load is exempt from survey due to process knowledge and origin.
te: "Food waste, office trash and animal carcasses do not require a radiological of	SIGNATURE: /S/ Mike Van Dillen DATE: 5-15-
must have signed removal certification statement with Load Verification."	BN-0646 (10
O USE ONLY 5/25/11	
ad Weight (net from scale or estimate): 34920 Signature of Certifier:	/s/ Signature on File

Shipment 31 of 41

Waste Category Definitions				
Commercial Waste:	Office waste, putrescible waste			
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).			
	Waste Types Definitions			
NTS:	Waste generated from construction, demolition, and/or routine activities within the Nevada Test Site boundaries. Waste that does not meet another waste type definition listed below.			
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Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.			
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.			
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).			
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.			
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989.			
	Pollution Prevention Category Definitions			
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).			
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.			
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.			
Clean-up:	Clean-up/stabilization waste generated from one-time operations. Waste generated from: environmental restoration projects-, decontamination and decommissioning/ transition operations-, and TSCA regulated wastes. Clean-up/stabilization activities may span several years. The waste is a direct result of past operations and activities, rather than a current process. Newly generated wastes produced during clean-up operations (usually resulting from common activities such as handling, sampling, treatment, repackaging, shipping, etc.) are considered clean-up waste.			
	Radiological Limitations			
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".			
Area 6 and Area 9 Landfills:	See permit limits.			

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Form

FRM-0918

NTS LANDFILL LOAD VERIFICATION

SWO USE (Select		· · · · · · · · · · · · · · · · · · ·	23	☐ 6	⊠ 9	⊠ LANDFILL
For waste cha	aracterization, ap	proval, and/o	r assistance	, contact Soli	d Waste Operation (S	SWO) at 5-7898.
	REQ	NUIRED: WA	STE GERE	RATOR INFO	RMATION	
Mosts Cossession 14 4					disposal of materials	.)
	Heser (NI, WO)		College Colleg		Phone Number:	(o)5-2124; (c)496-0150
Location / Origin: CAU	561; CAS 25-08	-02 Bulk Deb	ris and soil f	or disposal us	sing tracking number	561H02
Waste Category: (check of		☐ Comr				
Waste Type: NT	S	☐ Putre		·		D WAC Freezie
(check one) No	n-Putrescible			ing Material	FFACO-offsite	WAC Exception
Pollution Prevention Cat	egory: (check on		onmental ma		☐ Defense Project	☐ Historic DOE/NV s ☐ YMP
Pollution Prevention Cat	egory: (check on	e) 🛛 Clean		anagomon.	☐ Routine	S LI TIVIP
Method of Characterizat	ion: (check one)	⊠ Samp	ling & Analy	sis	Process Knowle	dae M Contenta
Prohibited Waste at all ti	ree Radioactiv	ve waste; RC	RA waste: H	lazardous wa	ste: Free liquids PC	Bs above TSCA regulatory
	icveis, and	d Medical was	stes (needle	s, sharps, blo	ody clothing).	Do above 150A regulatory
Additional Prohibited Wa at the Area 9 U10C Land	eta				(food waste); and F	d.11.
it the Area 9 010C Land						nable asbestos
	REQUIR	ED: WASTE	CONTENTS	ALLOWABI	LE WASTES	
IOTE: Waste disposal at	the Area 6 Hydro	carbon Land	fill must hav	e come into c	ithin this load:	budenest and
occidente, outlines.	gasonine (no pe	nzene. leadi:	jet fuel; die	sel fuel; lubric	ants and hydraulics;	kerosene: asphaltic
Potroidalli Ilyaroda	ibon, and edityles	ie glycol.				
cceptable waste at any Asphalt Metal		□ Paper			geologic materials	
Asphalt ⊠ Metal Plastic ⊠ Wire	⊠ Wood	⊠ Soil		ber (excluding		Demolition debris
	☐ Cable	⊠ Cloth	⊠ Insu	lation (non-As	sbestosform)	
Manufactured items: (s	wamp coolers, tu	rniture, rugs,	carpet, elec	tronic compoi		
dditional waste accepte Asbestos Friable	a at the Area 23	Mercury Lar	ndfill:	Office Waste		☐ Animal Carcasses
		Friable (conta		egulated load) Quantity:	
dditional waste accepted					_	
Non-friable asbestos	☐ Draine	d automobiles	and militar		Solid fractions from	
Light ballasts (contact SV	VO) Draine	d fuel filters (g	jas & diesel) [Deconned Underg	round and Above
Hydrocarbons (contact S				Debris	Ground Tanks	
dditional waste accepted						
] Septic sludge ☐ R:] Plants ☐ So		rained fuel fill	ers (gas & c	liesel)	☐ Crushed non	teme plated oil filters
Plants S		ludge from sa	nd/oil/water	separators	PCBs below	50 parts per million
4. 1		IRED: WAS			TURE	
tials: (if initialed,	no radiological	clearance is	necessary.) .		ı
e above mentioned waste	was generated	outside of a C	Ontrolled 18	anta W		
owledge, does not contain	n radiological ma	iterials.	ond oned w	aste manager	ment Area (CVVMA) a	nd to the best of my
the hest of my knowledge	. 45					
the best of my knowledge e. I have verified this thro	www.cie waste ci	lacacterizatio	n mothod id	antitiod show		
minited and allowable wa	ste items. I have	contacted P	operty Man	agement and	Radiological Surv	ey Release for Waste Disposal
approved for disposal in t	he landfill.				I RCT Initials	ainer/load meets the criteria fo
nt Name: Mark Heser	,				added ma	n-made radioactive material
nature: /s/ Mark	Heser			1	This cont	ainer/load meets the criteria for
				: 5/17/11	This cont	ianual Table 4.2 release limits. ainer/load is exempt from surv
te: "Food waste, office tra	sh and animal ca	rcasses do n	ot require a	radiological c	due to pro	cess knowledge and origin.
must have signed rem	oval certification	statement wit	h Load Veri	fication."	SIGNATURE: /S/ N	like Van Dillenbate: 5년
O USE ONLY	1.	20 80	che	/11		BN-0646
ad Weight (net from scale)	or estimate): 13	,320	Signature	of Certifier /	s/ Signature	e on File
		CONTRO)	hen Prim	or originatur	3 311 110
		nipment				803 - 80.3
	-5(" Lucas	.J.A. (21 41		

	Waste Category Definitions
Commercial Waste:	Office waste, putrescible waste
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).
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FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.
FFACO-offsite:	Waste generated, outside of the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent order (e.g., CNTA, TTR, NLV, and some UGTA project locations).
WAC exception	Waste that does not meet the waste acceptance criteria, as defined within the current NTS landfill permits, and has been given approval from the NDEP for disposal into an NTS landfill.
Historic DOE/NV	Waste generated from historical releases associated with the DOE/NV Waste Management Project Office (precursor to the Yucca Mountain Project Office), which occurred prior to November 30, 1989.
	Pollution Prevention Category Definitions
Environmental Management:	Waste generated from an Environmental Management project (e.g., waste generated from Environmental Restoration or International Technologies projects).
Industrial Waste:	Defense Projects: Waste generated from Defense Projects (e.g., waste generated from DTRA, LANL, Sandia, and/or any other non-Environmental Management directed project.
Routine:	Routine operations waste generated from: any type of production, analytical, and/or research and development laboratory operation; "work-for-others," and/or any periodic and recurring work that is considered on-going processes, are also considered routine operations.
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	Radiological Limitations
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".
Area 6 and Area 9 Landfills:	See permit limits.

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FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06

Page 1 of 2

Rev. 0

SWO USE (Select One) AREA 23 6 \boxtimes 9 LANDFILL For waste characterization, approval, and/or assistance, contact Solid Waste Operation (SWO) at 5-7898. REQUIRED: WASTE GERERATOR INFORMATION (This form is for rolloffs, dump trucks, and other onsite disposal of materials.) Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241) Phone Number: (o)5-2124; (c)496-0150 Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for disposal using tracking number 561H02 Waste Category: (check one) ☐ Commercial Waste Type: □ NTS ☐ Putrescrible ☐ WAC Exception (check one) ☐ Non-Putrescible ☐ Asbestos Containing Material ☐ FFACO-offsite ☐ Historic DOE/NV Pollution Prevention Category: (check one) ☐ Defense Projects YMP Pollution Prevention Category: (check one) ☑ Clean-Up ☐ Routine Method of Characterization: (check one) Sampling & Analysis Process Knowledge Contents Prohibited Waste at all three Radioactive waste; RCRA waste; Hazardous waste; Free liquids, PCBs above TSCA regulatory NTS landfills: levels, and Medical wastes (needles, sharps, bloody clothing). Additional Prohibited Waste Sewage Sludge, Animal carcasses, Wet garbage (food waste); and Friable asbestos at the Area 9 U10C Landfill: REQUIRED: WASTE CONTENTS ALLOWABLE WASTES Check all allowable wastes that are contained within this load: NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have come into contact with petroleum hydrocarbons or coolants, such as: gasoline (no benzene, lead); jet fuel; diesel fuel; lubricants and hydraulics; kerosene; asphaltic petroleum hydrocarbon; and ethylene glycol. Acceptable waste at any NTS landfill: Paper Rocks / unaltered geologic materials ☑ Wood Soil Soil Rubber (excluding tires) □ Demolition debris □ Plastic ☑ Wire ☐ Cable ☑ Cloth □ Cement & concrete Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic components, PPE, etc.) Additional waste accepted at the Area 23 Mercury Landfill: ☐ Office Waste ☐ Food Waste Animal Carcasses ☐ Asbestos -☐ Friable ☐ Non-Friable (contact SWO if regulated load) Quantity: Additional waste accepted at the Area 9 U10c Landfill: Non-friable asbestos ☐ Drained automobiles and military vehicles ☐ Solid fractions from sand/oil/water Light ballasts (contact SWO) Drained fuel filters (gas & diesel) ☐ Deconned Underground and Above Ground Tanks Additional waste accepted at the Area 6 Hydrocarbon Landfill: ☐ Septic sludge ☐ Rags ☐ Drained fuel filters (gas & diesel) Crushed non-teme plated oil filters ☐ Plants ☐ Soil ☐ Sludge from sand/oil/water separators ☐ PCBs below 50 parts per million REQUIRED: WASTE GENERATOR SIGNATURE (if initialed, no radiological clearance is necessary.) The above mentioned waste was generated outside of a Controlled Waste Management Area (CWMA) and to the best of my knowledge, does not contain radiological materials. To the best of my knowledge, the waste described above contains only those mater site. I have verified this through the waste characterization method identified above Radiological Survey Release for Waste Disposal prohibited and allowable waste items. I have contacted Property Management and **RCT** Initials is approved for disposal in the landfill. MV This container/load meets the criteria for no added man-made radioactive material. Print Name: Mark Heser This container/load meets the criteria for Radcon Manual Table 4.2 release limits. Signature: /s/. Mark Heser This container/load is exempt from survey Date: 5/17 due to process knowledge and origin. Note: "Food waste, office trash and animal carcasses do not require a radiological of SIGNATURE: /s/ Mike Van Dillen DATE: 5 must have signed removal certification statement with Load Verification." SWO USE ONLY

Shipment 33 of 41

Signature of Certifier:

/s/ Don Bickford

Load Weight (net from scale of estimate):

	Waste Category Definitions					
Commercial Waste:	Office waste, putrescible waste					
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).					
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	Radiological Limitations					
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".					
Area 6 and Area 9 Landfills:	See permit limits.					

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NSTec
Form
FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2

SWO USE (S				23	<u></u> 6		⊠ 9	\boxtimes	LANDFILL
For wa	iste characte	rization, appro	oval, and/or	assistance	e, contact Soi	id W	aste Operation (S	SWO) a	at 5-7898.
	(This	form is for ro	lloffs. dump	trucks an	RATOR INFO	ORM.	ATION oosal of materials	.)	
Waste Generator:		er (NI, WO)(M				uisp			
Location / Origin:						_	Phone Number:	(0)5-2	2124; (c)496-0150
	CAU 301,	CAS 25-08-02			for disposal u	ısing	tracking number	561H0)2
Waste Category:			☐ Comm			\boxtimes	Industrial		
Waste Type: (check one)	☐ NTS		☐ Putres				FFACO-onsite		☐ WAC Exception
***************************************	☐ Non-Put		☐ Asbes	tos Contair	ning Material		FFACO-offsite		Historic DOE/NV
Pollution Prevent Pollution Prevent	on Categor	y: (check one)	⊠ Enviro	nmental m	anagement	****	Defense Project	s [] YMP
Method of Charac	terization:	y. (check one)		~***			Routine	····	***************************************
Prohibited Waste	at all three	Radinactive	waste: BCE	ing & Analy	/SIS	M	Process Knowle	dge 🛭	Contents ve TSCA regulatory
NTS landfills:		levels, and N	Masie, RCr Medical was	tes (needle	tazardous wa es. sharps, bla	aste; nodv	Free liquids, PC	Bs abo	ve TSCA regulatory
Additional Prohibi	ted Waste								Z
t the Area 9 U100	: Landfill:						od waste); and F	riable a	asbestos
		REQUIRED	: WASTE	CONTENT	S ALLOWAB	LEV	VASTES		
IOTE: Waste disc	osal at the A	Check all all	owable was	tes that are	contained w	vithin	this load:		N/
OTE: Waste disp coolants, s	uch as: gase	oline (no henz	ene lead).	ill must hav	e come into	conta	ect with petroleur and hydraulics;	n hydro	ocarbons or
	, ar oddi boii,	and entrylene	glycol.	jet idei, die	ser ruer; rubri	cants	and hydraulics;	kerose	ene; asphaltic
cceptable waste	at any NTS I		Paper	⊠ Roc	ks / unaltered	d nec	ologic materials	Ø	Emphy containers
Asphalt 🛛 N	Metal 🛛		Soil	☐ Rub	ber (excludin	a goo	nogio materiais		Empty containers Demolition debris
Plastic 🛛 V	Vire		Cloth		lation (non-A				before, and soft with an action of
Manufactured ite	ems: (swamp	coolers, furni	ture, ruas, a	carnet elec	tronic compo	nont	s DDE etc.)	\boxtimes	Cement & concrete
dditional waste a	ccepted at t	he Area 23 M	ercury Lan		Office Wast		Food Waste		·
Asbestos	Friable				egulated load	47	Quantity:		Animal Carcasses
dditional waste a	ccepted at ti					<u></u>	Quantity.		
Non-friable asbe									
Light ballasts (co		☐ Drained a	ulululubiles	and militar	To the second		olid fractions from		
Hydrocarbons (co	ontact SIMOI	Other 1	uei illiers (g	as & diesei) L		econned Underg	round	and Above
					Debris	G	round Tanks		0
dditional waste ad Septic sludge	cepted at th	e Area 6 Hyd	irocarbon I	andfill:	□ . <u> </u>	21 256			
Plants	☐ Rags.		ned fuel filte			[Crushed non-	teme p	olated oil filters
r lants	☐ Soil	☐ Sluc	ige from sar	nd/oil/water	separators	[PCBs below	50 part	s per million
Table 1981		•			ATOR SIGN	ATUI	RE		
tials: (if ini	tialed, no ra	diological cle	earance is r	necessary.)		ь		•
e above mentioner	d wasto was	managatad			2		20		
e above mentioned owledge, does not	contain radi	ological mate	iside of a Co rials.	ontrolled W	aste Manage	men	t Area (CWMA) a	nd to t	the best of my
15. 46									
the best of my kno	wledge, the	waste describ	ed above o	ontains on	ly those mate	er [Radiological Sun	au Data	
e. I have verified the	ils tilrough t	ne waste char	racterization	nethod id	dentified above	v. [RCT initials	ey Kele	ase for Waste Disposa
pproved for dispo	sal in the lar	dfill.	Jillacteu Fi	operty man	agement and	<u>- </u>	MV This cont	ainer/loa	ad meets the criteria fo
nt Name: Mark U						- 1	added ma	n-made	radioactive material
nt Name: Mark He					920	1.	Radcon M	anual T	ad meets the criteria fo able 4.2 release limits.
nature: /s/ N	<u>lark He</u>	eser	93348	Date	e: 5/17/11		This conta	iner/loa	d is exempt from sun
e: "Food waste, of	N		asses do so				que to pro	cess kno	wledge and origin.
must have sign	ed removal o	ertification sta	asses uo no atement with	n require a	radiological (S	GNATURE. /S/ Mi	ке va	DATE: Sa
O USE ONLY				Load Vell	. /	- y 010		1577-07	BN-0646
		44	2//0	5/26	/11				[
d Weight (net from	scale or esti	imate): 77	340	Signature	of Certifier:	ISI	_Signatu	re o	n File
377 - 762-		UNC	ONTRO	LLED V	Vhen Prin	ted			

Shipment 34 of 41

	Waste Category Definitions					
Commercial Waste:	Office waste, putrescible waste					
Industrial Waste:	Waste generated from activities associated with the fabrication or demolition of on-site structures. Solid waste derived from industrial manufacturing processes (i.e., construction and demolition waste).					
	Waste Types Definitions					
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Putrescible:	Waste that will decompose, decay, and become putrid (i.e. food waste and animal carcasses).					
Asbestos Containing Material:	Waste that contains asbestos. Regulated asbestos (friable) will not be accepted without a shipping paper.					
FFACO-onsite:	Waste generated, within the NTS boundaries, from activities directed by the Federal Facilities Agreement and Consent Order.					
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	Radiological Limitations					
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".					
Area 6 and Area 9 Landfills:	See permit limits.					



NSTec Form

FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06

Rev. 0

Page 1 of 2

SWO USE (Select On			23	6	⊠ 9		
For waste characte	erization, appr	oval, and/or	assistance, co	ntact Solid	Waste Operation (SWO) at 5-7898.	
A STATE OF THE STA	REQU	IRED: WAS	TE GERERAT	OR INFO	RMATION		
					disposal of material	s.)	100
	er (NI, WO)(M				Phone Number	(o)5-2124; (c)496-01	50
Location / Origin: CAU 561;	CAS 25-08-0	2 Bulk Debris	s and soil for d	isposal us	ing tracking number	561H02	_
Waste Category: (check one)		☐ Comme		Notice to the second		0011102	_
Waste Type: NTS		☐ Putreso			Industrial		
(check one)	trescible			Material		☐ WAC Except	
Pollution Prevention Categor		⊠ Enviror	mental manag	ivialenai		☐ Historic DOE	/NV
Pollution Prevention Categor	y: (check one)	⊠ Clean-I	In		Defense Projec	ts	
Method of Characterization: (check one)		ng & Analysis		Routine	4- 57 0	
Prohibited Waste at all three	Radioactive	waste: RCR	A waste: Haza	rdous was	to: Froe liquide DC	edge 🛛 Contents	
	levels, and N	ledical wast	es (needles, si	harps, bloc	ie, Free liquias, PC idv clothina).	Bs above TSCA regula	atory
Additional Prohibited Waste							
at the Area 9 U10C Landfill:					(food waste); and F	riable asbestos	- 1
	REQUIRED	: WASTE C	ONTENTS AL	LOWABL	E WASTES		
OTE: Waste disposal at the A	cneck all all	owable wast	es that are cor	ntained with	hin this load:	4	
The state of the s		cie. eau i	et fuel: diesel f	me into co	ntact with petroleur	n hydrocarbons or	ı
	Cita Cultylollo	glycol.	(40), 0,000()	aci, idonica	into and hydraulics;	kerosene; aspnaitic	
cceptable waste at any NTS	_	Paper	⊠ Rocks /	unaltered (geologic materials		rs
		Soil	Rubber	(excluding	tires)	□ Demolition debri	
	Cable	Cloth		n (non-Ash	actocform)	☑ Cement & concr	2000000
Manufactured items: (swamp	coolers, furni	ture, rugs, ca	arpet, electron	ic compon	ents, PPE, etc.)		
duttional waste accepted at t	he Area 23 M	ercury Land	Ifili: 🗌 Off	ice Waste	☐ Food Waste	☐ Animal Carcass	 es
Asbestos Friable	☐ Non-Fri	able (contac	t SWO if regul	ated load)	Quantity:		
dditional waste accepted at t	he Area 9 U10	c Landfill:					
Non-friable asbestos	☐ Drained a	utomobiles a	and military ve	hicles	Solid fractions from	m sand/oil/water	
Light ballasts (contact SWO)	□ Drained for	uel filters (ga	s & diesel)		Deconned Underg		
Hydrocarbons (contact SWO)	Other 1	shipment of	HC soil & Deb	ris	Ground Tanks	, , , , , , , , , , , , , , , , , , , ,	
dditional waste accepted at the	ne Area 6 Hyd	rocarbon L	andfill:				
Septic sludge	☐ Drai	ned fuel filter	rs (gas & diese	el)	Crushed non	-teme plated oil filters	
Plants	☐ Slud	ge from san	d/oil/water sep	arators	PCBs below	50 parts per million	- 1
	REQUIR	ED: WAST	GENERATO	R SIGNAT	TURE	oo parts per minion	-
tials: (if initialed, no ra							- 1
					G.		
e above mentioned waste was owledge, does not contain radi	generated out	side of a Co	ntrolled Waste	Managem	ent Area (CWMA) a	and to the best of my	
	-iogioui matei	iuis.					
the best of my knowledge, the	waste describ	ed above co	ntains only th	ose mater	als that are allowe	d for disposal at this	-1
e. I have verified this through to phibited and allowable waste it							
approved for disposal in the lar	ndfill.	macieu Più	perty manager	nent and	RCT Initials	vey Release for Waste Dis	posal
nt Name: Mark Heser		•			MV This con	tainer/load meets the crite	ria for
					added m	an-made radioactive mater	riai
nature: /s/ Mark He	ser	9	Date: 5	117/11	Radcon	tainer/load meets the criter Manual Table 4.2 release li	ria for mits
te: "Food waste, office trash an	d animal carca	asses do not	require a radio	ological of	This conf	ainer/load is exempt from	surve
must have signed removal (certification sta	tement with	Load Verificat	ion."	SIGNATURE: /c/ N/	ocess knowledge and origin.	- 4
O USE ONLY			1-11	1	SIGNATURE: /S/ IV	like Van Dillen DATE	
d Weight (net from scale or est	imato): 46 O	an	5/26/1		s/ Signatu		-0646 (
a cigin ther nonnecals of est	illiate): 72 &		Signature of C	ertifier: /	o/ Signatu	I C OII FIIC	

	Waste Category Definitions					
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	Radiological Limitations					
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".					
Area 6 and Area 9 Landfills:	See permit limits.					



NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

	REA	23	☐ 6	⊠ 9	□ LANDFILL
For waste characterization,	approval, and	or assistance,	contact Solid	Waste Operation (SI	WO) at 5-7898.
R	EQUIRED: W	'ASTE GERER	ATOR INFOR	RMATION lisposal of materials.,	
Vaste Generator: Mark Heser (NI, W					(o)5-2124; (c)496-0150
ocation / Origin: CAU 561; CAS 25				ng tracking number s	
/aste Category: (check one)	☐ Cor	nmercial		⊠ Industrial	
/aste Type: NTS	☐ Puti	rescrible		FFACO-onsite	☐ WAC Exception
heck one)	☐ Asb	estos Containir		FFACO-offsite	☐ Historic DOE/NV
Ilution Prevention Category: (check	one) X Env	ironmental mar		Defense Projects	
Ollution Prevention Category: (check	one) 🛛 Clea	an-Up]	Routine	
ethod of Characterization: (check one		pling & Analys		Process Knowled	ge 🛛 Contents
icveis,	ctive waste; R and Medical w	CRA waste; Ha astes (needles,	zardous was sharps, bloo	te; Free liquids, PCB dy clothing).	s above TSCA regulatory
Iditional Prohibited Waste the Area 9 U10C Landfill:	e Sludge, Anin	nal carcasses, \	Wet garbage	(food waste); and Fri	iable asbestos
OTE: Waste disposal at the Area 6 Hy coolants, such as: gasoline (no petroleum hydrocarbon; and eth	<i>all allowable w</i> drocarbon Lar benzene, lead	E CONTENTS a rastes that are of adfill must have d); jet fuel; diese	come into co	hin this load:	hydrocarbons or kerosene; asphaltic
ceptable waste at any NTS landfill:	□ Paper	⊠ Rocks	s / unaltered g	geologic materials	
Asphalt Metal Wood	Soil		er (excluding		□ Demolition debris
Plastic Wire Cable	· 🛛 Cloth		tion (non-Ast	estosform)	□ Cement & concrete
Manufactured items: (swamp coolers	, furniture, rug	s, carpet, electr	onic compone	ents, PPE, etc.)	
ditional waste accepted at the Area Asbestos Friable N			Office Waste		☐ Animal Carcasses
		ntact SWO if reg	gulated load)	Quantity:	
ditional waste accepted at the Area				***************************************	
Non-friable asbestos	ned automobil	es and military	vehicles \square	Solid fractions from	
Light ballasts (contact SWO) Drai	ned fuel filters	(gas & diesel)		Deconned Undergr	ound and Above
Hydrocarbons (contact SWO) Oth			ebris	Ground Tanks	
litional waste accepted at the Area	6 Hydrocarbo	n Landfill:			
Septic sludge Rags		filters (gas & die		☐ Crushed non-t	teme plated oil filters
Plants Soil	Sludge from	sand/oil/water s	eparators	PCBs below 5	0 parts per million
als: (if initialed, no radiologic		STE GENERA s necessary.)	TOR SIGNAT	TURE	
			36 36 (10000)		1
above mentioned waste was generate vledge, does not contain radiological	materials.	Controlled Wa	ste Managem	ent Area (CWMA) ar	nd to the best of my
ne best of my knowledge, the waste d	escribed abov	e contains only	those materi	a'- *Ent are allowed	for disposal at this
the wast	e Characterizat	on method ide	ntition above	Radiological Su	You Day
ibited and allowable waste items. I h proved for disposal in the landfill.	ave contacted	Property Mana	gement and h	RCT Initials	vey Release for Waste Dispos
Name: Mark Heser			(F)	This con	tainer/load meets the criteria f
ature: /s/ Mark Heser		Date:	5/17/11	Radcon M	lanual Transfer the criteria for
 "Food waste, office trash and anima must have signed removal certification 	carcasses do	not require a ra	adiological cle	don- 4.	ainer/load is exempt from survicess knowledge and origin. ke Van Dillen DATE: 5-2
USE ONLY		. /	/11		Vall Dillen DATE:5-2
Weight (not from hools	Ha 1 cm	5/26	///		BN-0646
Weight (net from scale of estimate):	10 680	Signature o	t Certifier: /	/s/ Don Bicl	NIUIU I

	Waste Category Definitions
Commercial Waste:	Office waste, putrescible waste
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	Radiological Limitations
Area 23 Landfili:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".
Area 6 and Area 9 Landfills:	See permit limits.



NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

08/23/06 Rev. 0

Page 1 of 2

SWO USE (Select One) AREA 23] 6	⊠ 9	⊠ LANDFILL
For waste characterization, approval, and/or assistance, conta	act Solid V	Vaste Operation (SI	
REQUIRED: WASTE GERERATO	R INFORM	MATION	
(This form is for rolloffs, dump trucks, and other	r onsite dis	sposal of materials.,)
Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-2241)	2000 E	Phone Number:	(o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil for dis	posal using	g tracking number 5	561H02
Waste Category: (check one)		Industrial	
Waste Type: NTS Putrescrible		FFACO-onsite	☐ WAC Exception
(check one)		FFACO-offsite	☐ Historic DOE/NV
Poliution Prevention Category: (check one) 🛛 Environmental manage			
Pollution Prevention Category: (check one) Clean-Up		Routine	
Method of Characterization: (check one) Sampling & Analysis		Process Knowled	ge 🛛 Contents
Prohibited Waste at all three Radioactive waste; RCRA waste; Hazard levels, and Medical wastes (needles, sha	dous waste	: Free liquids PCB	s above TSCA regulatory
Additional Prohibited Waste of the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Wet			iable asbestos
REQUIRED: WASTE CONTENTS ALL	OWABLE	WASTES	
Check all allowable wastes that are conta	ained withi	n this load:	100 E
OTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have comcoolants, such as: gasoline (no benzene, lead); jet fuel; diesel fue	el: Into con	tact with petroleum	hydrocarbons or
petroleum nydrocarbon; and etnylene glycol.	oi, idonodii	is and hydraulics, i	keroserie, asprialitic
		eologic materials	☑ Empty containers
Asphalt ⊠ Metal ⊠ Wood ⊠ Soil ☐ Rubber (e			□ Demolition debris
Plastic ☑ Wire ☐ Cable ☑ Cloth ☒ Insulation	(non-Asbe	estosform)	□ Cement & concrete □
Manufactured items: (swamp coolers, furniture, rugs, carpet, electronic			
	ce Waste	☐ Food Waste	☐ Animal Carcasses
	ted load)	Quantity:	
dditional waste accepted at the Area 9 U10c Landfill: Non-friable asbestos	_		,
=		Solid fractions from	
Light ballasts (contact SWO) Drained fuel filters (gas & diesel) Hydrocarbons (contact SWO) Other 1 shipment of HC soil & Debris		Deconned Undergr	ound and Above
	<u>s</u> (Ground Tanks	
Iditional waste accepted at the Area 6 Hydrocarbon Landfill:			
			teme plated oil filters
Plants Soil Sludge from sand/oil/water sepa REQUIRED: WASTE GENERATOR	RICMATI	PCBs below 5	0 parts per million
tials: (if initialed, no radiological clearance is necessary.)	K SIGNAT	JKC	
200 Q NALAU		Company of the compan	
e above mentioned waste was generated outside of a Controlled Waste I owledge, does not contain radiological materials.	Manageme	nt Area (CWMA) a	nd to the best of my
the best of my knowledge, the waste described above contains only tho	se materia	is that are allowed	for disposal at this
. I have verified this through the waste characterization method identifi	avode hoi		
phibited and allowable waste items. I have contacted Property Managem approved for disposal in the landfill.	ent and f	RCT Initials	ey Release for Waste Disposal
THE SECOND SECON	9	This conta	ainer/load meets the criteria for
nt Name: Mark Heser			n-made radioactive material ainer/load meets the criteria for
nature: /s/ Mark Heser Date: 5//	17/11	Radcon M	lanual Table 4.2 release limits.
te: "Food waste, office trash and animal carcasses do not require a radiol must have signed removal certification statement with Load Verification	logical clr	due to pro	ainer/load is exempt from surve cess knowledge and origin. ike Van Dillen _{DATE:} 5 &
O USE ONLY		SIGNATURE: 15/, IVI	/BN-0646
ad Weight (net from scale or estimate): 44,660 Signature of Ce	ertifier:	s/ Don B	

Waste Category Definitions						
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NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

SWO USE (S	Select One	e) AREA		23	☐ 6		⊠ 9	\boxtimes	LANDFILL	
For wa	aste characte	rization, appr	oval, and/or	assistance,	contact Soli	id Was	te Operation (S			
		REQU	IRED: WAS	TE GERER	RATOR INFO	DRMA	TION sal of materials.	V	201 201	
Waste Generator:	Mark Hese	er (NI, WO)(N	/S - NSF16	7) (Fax 5-22	41)	F	hone Number:	(o)5-21	24; (c)496-01	50
Location / Origin:	CAU 561;	CAS 25-08-0	2 Bulk Debri	s and soil fo	or disposal u		acking number			
Waste Category:			☐ Comm	ercial		⊠ li	ndustrial			
Waste Type: (check one)	☐ NTS		☐ Putres				FACO-onsite		WAC Except	•
	☐ Non-Put					~~~~~	FACO-offsite		Historic DOE	/NV
Pollution Prevent	tion Categor	y: (check one)		nmental ma	nagement		efense Project	s . 🗆	YMP	
Pollution Prevent Method of Charac					···		outine			
				ng & Analys		⊠ P	rocess Knowled	dge 🛛	Contents	
Prohibited Waste NTS landfills: Additional Prohib		levels, and	waste; RCF Medical was	tes (needles	azardous wa s, sharps, blo	aste; F body c	ree liquids, PCI lothing).	Bs above	e TSCA regula	itory
at the Area 9 U10				100000			waste); and F	riable as	sbestos	
		REQUIRE:	D: WASTE (CONTENTS	ALLOWABI contained w	LE W	ASTES	36 2 =		
NOTE: Waste disp	posal at the A	rea 6 Hydroc	arbon Landfi	Il must have	come into o	contac	t with netroleum	hydron	arhone or	- 1
Coolains, s	such as. gas	oline (no beri	zene, lead}:	et fuel; dies	sel fuel; lubric	cants a	and hydraulics;	kerosen	e: asphaltic	- 1
penoieum	nyurucarbon,	and ethylene	glycol.							
Acceptable waste		[C] [C] [C] [C] [C] [C] [C] [C] [C] [C]	⊠ Paper				gic materials	⊠ E	mpty container	rs
			⊠ Soil		per (excluding			⊠ D	emolition debr	is
			⊠ Cloth		ation (non-A	sbesto	sform)	⊠ C	ement & concr	ete
Manufactured it	tems: (swamp	coolers, furr	iture, rugs, o				PPE, etc.)			
Additional waste a ☐ Asbestos ☐	accepted at t Friable				Office Waste egulated load		Food Waste tuantity:	☐ Ai	nimal Carcass	es
Additional waste a	accepted at t	he Area 9 U1	0c Landfill:							
Non-friable asb	estos	□ Drained	automobiles	and military	vehicles [☐ Sol	id fractions from	n sand/o	oil/water	
Light ballasts (co	ontact SWO)	☐ Drained	fuel filters (g	as & diesel)	. г		conned Underg			- 1
Hydrocarbons (d	contact SWO)	Other 1	shipment of	f HC soil & [Debris		und Tanks	round d	10715010	
Additional waste a	***************************************				П					
☐ Septic sludge	☐ Rags		ined fuel filt		liesel)		Crushed non	tome n	ated oil filters	- 1
Plants	☐ Soil		dge from sa			F	PCBs below			
		REQUI	RED: WAS	E GENERA	ATOR SIGNA	ATUR	E	oo paits	per million	
nitials: (if in	itialed, no ra								*	
he above mentione nowledge, does no	ed waste was t contain rad	generated ou	itside of a Cerials.	ontrolled W	aste Manage	ement.	Area (CWMA) a	nd to th	e best of my	
o the best of my kn	owledge, the	waste descr	bed above o	ontains onl	y those mate	erials t	that are allower	for dis	posal at this	
te. I have verified to rohibited and allow	uns unough	the waste cha	tracterization	n method id	entified above	١	of the	above-	-mentioned	
approved for disp	osal in the la	ndfill.	ontacted F1	operty mana	agement and	R	adiological Surve	y Release	for Waste Disp	lead
rint Name: Mark H	leser ,					1-	This contain	ner/load i	meets the criteria	a for no
gnature: /S/	Mark He	eser		Date	: 5/17/11	1 -	This contain	orlland.	materia	91
ote: "Food waste, o must have sig	office trash ar	nd animal car	casses do no	ot require a	radiological	-	This contain	er/load is	exempt from su	its.
WO USE ONLY				-/-	///	SIGN	ATURE:/s/ Mike	Van [Dillen DATE:	-26-1
ad Weight (net fror	scale or es	timate): _ 4	7.260	Signature	of Certifier:		Don Bicl			46 (10/0

Waste Category Definitions					
Commercial Waste:	Office waste, putrescible waste				
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	Radiological Limitations				
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".				
Area 6 and Area 9 Landfills:	See permit limits.				

NSTec Form

FRM-0918

NTS LANDFILL LOAD VERIFICATION

SWO USE (S	Select One) ARE	A [23		6	⊠ 9	X	LANDFILL	
For wa	aste character	rization, app	roval, and/o	r assistance	, contac	t Solid V	Vaste Operation (S	WO) at	5-7898.	
		REQU	JIRED: WA	STE GERE	RATOR	INFORM	MATION posal of materials.	- AS -	100	
Waste Generator:			0.55	67) (Fax 5-2			Phone Number:		124: (c)496-015	n
Location / Origin:	CAU 561;	CAS 25-08-0	02 Bulk Deb	ris and soil	for dispo	sal using	tracking number			_
Waste Category:	(check one)			mercial			Industrial			\dashv
Waste Type:	□ NTS	1.	100000	scrible			FFACO-onsite		WAC Exception	on n
(check one) Pollution Prevent	☐ Non-Putr			stos Contair		***********	FFACO-offsite		Historic DOE/I	٧V
Pollution Prevent				onmental ma	anageme		Defense Projects	<u> </u>	YMP	
Method of Charac			***************************************	ling & Analy		******	Routine Process Knowled	too M	Contacts	
		Radioactive	waste; RC	RA waste; F stes (needle	lazardou	ıs waste	: Free liquids PCF	ige 🔼 is abov	e TSCA regulate	ory
Additional Prohib at the Area 9 U10			•				y clothing). ood waste); and Fr	iable a	sbestos	
	o Lunami.			CONTENTS	22-1 - Deck - 01-10					4
IOTE: W1- "		Check all a	llowable wa	stee that are	contain	and within	n thin land.		est.	
coolants	osaí at the Ar	ea 6 Hydrod	carbon Land	Ifill must hav	e come	into con	act with notroloum	hydrod	carbons or	- 1
Potroiduiti	nyurocarbon,	and ethilien	e glycol.	, jet ruer; die	ser ruer;	lubrican	ts and hydraulics;	keroser	ne; asphaltic	ı
cceptable waste	at any NTS I	andfill:	□ Paper	⊠ Roc	ks / una	Itered ge	ologic materials	×Ε	mpty containers	
		Wood	⊠ Soil	☐ Rub	ber (exc	luding ti	res)		emolition debris	
	Wire		☑ Cloth	Insu	lation (n	on-Asbe	stosform)	⊠ c	ement & concre	te
Manufactured it dditional waste a	ems: (swamp	coolers, fur	niture, rugs,							
	Friable			act SWO if r	Office '		☐ Food Waste		nimal Carcasses	5
dditional waste a							Quantity:			
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Light ballasts (co	ontact SWO)	☐ Drained	fuel filters (gas & diesel)		Deconned Undergr			1
Hydrocarbons (d	contact SWO)	Other _	1 shipment	of HC soil &	Debris		Ground Tanks	ounu a	IIId Above	1
dditional waste a					П					-1
Septic sludge	☐ Rags			Iters (gas &	diesel)	-	☐ Crushed non-	teme n	lated oil filters	1
Plants	Soil	☐ Sit	dge from sa	and/oil/water	separat	tors	PCBs below 5	i0 parts	per million	
		REQUI	RED: WAS	TE GENER	ATOR S	IGNATU	IRE			7
tials: (if in	itialed, no ra	diological c	learance is	necessary	.)		g 645 B		*	1
e above mentione owledge, does no	d waste was	generated o	utside of a	Controlled W	Vaste Ma	ınageme	nt Area (CWMA) a	nd to th	ne best of my	
				l i						
the best of my kn	lowledge, the this through t	waste desci	ibed above	contains on	ly those	materia	is that are allowed	for dis	sposal at this	1
min with with the	anic maste ite	mo, I mave	contacted P	roperty Man	agemen	t and . F	and a review of the	_	<u> </u>	1
approved for dispo	osal in the lan	<u>dfill</u> .					Radiological Surve	y Releas	se for Waste Dispos	sal
nt Name: Mark H	leser						M/ This contai	ner/load	meets the criteria	for n
nature: /s/ Ma	ark Hese	er		. Date	e: <i>5/17</i>	10	added man	-made ra	adioactive material meets the criteria	
te: "Food waste, o			raccor do -				Radcon Ma	nual Tab	le 4.2 release limit	•
must have sign	ned removal c	ertification s	tatement w	ith Load Veri	radiolog	23	que to proce	ess know	is exempt from su ledge and origin.	
O USE ONLY	_			1		- 8	GIGNATURE:/S/ Mik	e Van	Dillen DATE:	121-
d Weight (net from	n scale or esti	mate):	8500	Signature	of Certif	fier /s	/ Don Bicks	ard	BN-08	-
<u> </u>	1			_ oignature	OI COIL	101. 70	DICKY	yıα	, // /	100

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	Radiological Limitations
Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".
Area 6 and Area 9 Landfills:	See permit limits.

768

NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

SWO USE (Select One) AREA 23	□ 6	∠ LANDFILL
For waste characterization, approval, and/or assistance,	contact Solid Waste Operati	ion (SWO) at 5-7898.
REQUIRED: WASTE GERER. (This form is for rolloffs, dump trucks, and		erials.)
Waste Generator: Mark Heser (NI, WO)(M/S - NSF167) (Fax 5-224	1) Phone Nur	mber: (o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 25-08-02 Bulk Debris and soil fo	disposal using tracking nu	mber 561H02
Waste Category: (check one)		
Waste Type: NTS Putrescrible		site
(check one) Non-Putrescible Asbestos Containir		
Pollution Prevention Category: (check one) 🗵 Environmental mar		
Pollution Prevention Category: (check one) 🗵 Clean-Up	Routine	
Method of Characterization: (check one) Sampling & Analys		nowledge X Contents
Prohibited Waste at all three Radioactive waste; RCRA waste; Ha levels, and Medical wastes (needles	zardous waste; Free liquids sharps, bloody clothing).	, PCBs above TSCA regulatory
Additional Prohibited Waste at the Area 9 U10C Landfill: Sewage Sludge, Animal carcasses, Victoria and Company Compan	15 10 15 175.0	and Friable asbestos
REQUIRED: WASTE CONTENTS	ALLOWABLE WASTES	
Check all allowable wastes that are	contained within this load:	8
NOTE: Waste disposal at the Area 6 Hydrocarbon Landfill must have	come into contact with petr	oleum hydrocarbons or
coolants, such as: gasoline (no benzene, lead); jet fuel; diese petroleum hydrocarbon; and ethylene glycol.	i fuel; lubricants and hydrai	ulics; kerosene; asphaltic
	s / unaltered geologic mater	ials Empty containers
	er (excluding tires)	Demolition debris
7 DI " M " M " — — — —	tion (non-Asbestosform)	□ Cement & concrete
Manufactured items: (swamp coolers, furniture, rugs, carpet, electr	onic components, PPE, etc.	.)
1 1040	Office Waste Food W	
Asbestos Friable Non-Friable (contact SWO if re		
Additional waste accepted at the Area 9 U10c Landfill:		
Non-friable asbestos ☐ Drained automobiles and military	vehicles	s from sand/oil/water
Light ballasts (contact SWO) Drained fuel filters (gas & diesel)		nderground and Above
Hydrocarbons (contact SWO) Other 1 shipment of HC soil & D	ebris Ground Tank	
dditional waste accepted at the Area 6 Hydrocarbon Landfill:	T Ordina Paris.	5
Septic sludge Rags Drained fuel filters (gas & di	Crusho	f non-tone plated - 1 6th
Plants Soil Sludge from sand/oil/water		d non-teme plated oil filters
REQUIRED: WASTE GENERA	TOR SIGNATURE	elow 50 parts per million
Marine and Automatical Control and Automatical Control and Automatical Control	TON GIGHATONE	1.
itials: (if initialed, no radiological clearance is necessary.)		
he above mentioned waste was generated outside of a Controlled Wa	ste Management Area (CW)	MA) and to the hest of my
nowledge, does not contain radiological materials.		my and to the best of my
the best of my knowledge, the waste described above contains only	those materia	
te. I have verified this through the waste characterization method ide	ntified above Radiologic	cal Survey Release for Waste Disposa
onibited and allowable waste items. I have contacted Property Mana	dementanon i w	
approved for disposal in the landfill.	ad	ils container/load meets the criteria fo ded man-made radioactive material
int Name: Mark Heser	1.11	is container/load monto the aut
gnature: /s/ Mark Heser Date:	5/12/11 Thi	s container/load is average limits.
ote: "Food waste, office trash and animal carcasses do not require a n	adiological che SIGNATURE	e to process knowledge and origin. S/ Mike Van Dillen DATE:5-2
must have signed removal certification statement with Load Verifi NO USE ONLY	cation."	BN-0646
- 6/7/	5/11	1
ad Weight (net from scale or estimate): 3 9 760 Signature of	f Certifier: /s/ Sign	ature on File

524-0741

NSTec Form FRM-0918

NTS LANDFILL LOAD VERIFICATION

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Area 23 Landfill:	See "Performance Objective for Certification of Non-Radioactive Hazardous Waste".
Area 6 and Area 9 Landfills:	See permit limits.

NSTec
Form
FRM-0918

SWO USE (Select One)	REA 23	□ 6) LANDFILL
For waste characterization	, approval, and/or assistance	, contact Solid Waste Op	
(This form i	REQUIRED: WASTE GEREI s for rolloffs, dump trucks, and	RATOR INFORMATION I other onsite disposal of	materials.)
Ri .	NO)(M/S - NSF167) (Fax 5-22		Number: (o)5-2124; (c)496-0150
Location / Origin: CAU 561; CAS 2	5-08-02 Bulk Debris and soil f		
Waste Category: (check one)	☐ Commercial		ial
Waste Type: NTS	☐ Putrescrible	☐ FFACC)-onsite
(check one) Non-Putrescible		ing Material FFACC	
Pollution Prevention Category: (chec		nagement Defens	
Pollution Prevention Category: (chec		☐ Routine)
Method of Characterization: (check o	ne) 🛛 Sampling & Analy	sis 🛛 Proces	s Knowledge Contents
ievėls	active waste; RCRA waste; F , and Medical wastes (needle	azardous waste: Free lig	uids PCBs above TSCA regulatory
Additional Prohibited Waste	ge Sludge, Animal carcasses,	THE SECOND PARTY AND ADDRESS OF THE SECOND	Maria
Chec NOTE: Waste disposal at the Area 6 H coolants, such as: gasoline (r petroleum hydrocarbon; and et	io benzene, lead); let fuel: die:	contained within this loa	d:
Acceptable waste at any NTS landfill		ks / unaltered geologic m	aterials
Asphalt Metal Wood		ber (excluding tires)	☐ Demolition debris
☑ Plastic ☑ Wire ☐ Cable		lation (non-Asbestosform	
Manufactured items: (swamp coole	rs, furniture, rugs, carpet, elec	tronic components. PPE	etc.)
Additional waste accepted at the Are		Office Waste Foo	d Waste
Additional waste accepted at the Are			
Non-friable asbestos	ained automobiles and militar ained fuel filters (gas & diesel) Deconne	tions from sand/oil/water d Underground and Above anks
dditional waste accepted at the Are		П	
	☐ Drained fuel filters (gas & d	diesel) Crus	shed non-teme plated oil filters
	☐ Sludge from sand/oil/water		ds below 50 parts per million
	REQUIRED: WASTE GENER	ATOR SIGNATURE	os below 50 parts per militori
CONTROL OF THE PARTY OF THE PAR	ical clearance is necessary.		F.
he above mentioned waste was genera nowledge, does not contain radiologic	ated outside of a Controlled Wall materials.	/aste Management Area (CWMA) and to the best of my
the best of my knowledge, the waste te. I have verified this through the war ohibited and allowable waste items. I approved for disposal in the landfill.	ste characterization method in	lentified above and a roy	ious of the above mentioned
	4	Radiolo	gical Survey Release for Waste Disposal
int Name: Mark Heser		RCT Init	ials
gnature: <u>/s/ Mark Hese</u> i	Date	='/. = /	This container/load meets the criteria for no added man-made radioactive material
ote: "Food waste, office trash and anim must have signed removal certification."	nal carcasses do not require a	radiological c	This container/load meets the criteria for Radcon Manual Table 4.2 release limits.
VO USE ONLY	i i i i i i i i i i i i i i i i i i i		This container/load is exempt from survey due to process knowledge and origin.
ad Weight (net from scale or estimate)	:40,420 Signature	6/11 SIGNATUR	RE: /s/ Mike Van Dillen DATE: 5 16
	- Julian Olymortan	- /e/ Sic	mature on File BN-0646 (10/0

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Area 6 and Area 9 Landfills:	See permit limits.

Appendix G

Nevada Division of Environmental Protection Comments

(1 Page)

NEVADA ENVIRONMENTAL RESTORATION PROJECT DOCUMENT REVIEW SHEET

1. Document Title/Number:		Draft Corrective Action Decision Document/Closure Report for Corrective Action Unit 561: Waste Disposal Areas, Nevada National Security Site, Nevada		2. Document Date:	7/11/2011	
3. Revision Number	:	0		4. Originator/Organization:	Navarro-INTERA	
5. Responsible NNSA/NSO Federal Sub-Project Director:		Kevin J. Cabble	Kevin J. Cabble			
7. Review Criteria:		Full				
8. Reviewer/Organiz	zation/Phone No	Ted Zaferatos and Jeff MacDougall, NDEP, 486-2850 ext. 234 a	nd 231 9. Reviewer's Signature:			
10. Comment Number/Location	11. Type*	12. Comment	13. Comment Response		14. Accept	
1.) Executive Summary, Page ES-2, 1st Bulleted Item at Top of Page	Mandatory	CAS 03-19-02 is listed twice in the first line. The second mention of the CAS should be to 05-62-01.	The second mention of CAS 03-19-02 has been changed to "05-62-01." The sentence now reads "No contamination exceeding FALs was identified at CASs 01-19-01, 03-19-02, 05-62-01, 12-23-09, and 22-16-06."			
2.) Executive Summary, Page ES-3, 1st Item Item in the 2nd Set of Bulleted Items, Mid-Page	Mandatory	CAS 03-19-02 is again listed twice. The second mention of CAS 03-19-02 should be to 05-62-01.	The second mention of CAS 03-19-02 has been changed to "05-62-01." The sentence now reads "No further action for CASs 011-19-01, 03-19-02, 05-62-01, 12-23-09, and 22-19-06."			

CAU 561 CADD/CR Distribution Revision: 0 Date: August 2011 Page 1 of 1

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