ANDERSEN AIR FORCE BASE, GUAM

HAZARDOUS WASTE MANAGEMENT FACILITY PERMIT

Permit Number: GUS002

EXPLOSIVE ORDNANCE DISPOSAL
OPEN BURN/OPEN DETONATION FACILITY

GUAM ENVIRONMENTAL PROTECTION AGENCY
1973

TODO Y NILALA Y TANO MAN UNO
All LIVING THINGS OF THE EARTH ARE ONE

Guam Environmental Protection Agency
RCRA SUBTITLE C SITE IDENTIFICATION FORM

1. Reason for Submittal (Select only one.)

☐	Obtaining or updating an EPA ID number for an on-going regulated activity that will continue for a period of time. (Includes HSM activity)
☐	Submitting as a component of the Hazardous Waste Report for ________ (Reporting Year)
	☐ Site was a TSD facility and/or generator of > 1,000 kg of hazardous waste, > 1 kg of acute hazardous waste, or > 100 kg of acute hazardous waste spill cleanup in **one or more months of the reporting year** (or State equivalent LQG regulations)
☐	Notifying that regulated activity is no longer occurring at this Site
☐	Obtaining or updating an EPA ID number for conducting Electronic Manifest Broker activities
☑	Submitting a new or revised Part A Form

2. Site EPA ID Number

G	U	6	5	7	1	9	9	9	5	1	9

3. Site Name

Andersen Air Force Base

4. Site Location Address

Street Address: Explosive Ordnance Disposal Range, Tarague Beach		
City, Town, or Village: Yigo		County
State: GU	Country: United States	Zip Code: 96543

5. Site Mailing Address ☐ Same as Location Address

Street Address: 36th Wing, Unit 14003		
City, Town, or Village: Yigo		
State: GU	Country: United States	Zip Code: 96543-4003

6. Site Land Type

☐ Private ☐ County ☐ District ☑ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

7. North American Industry Classification System (NAICS) Code(s) for the Site (at least 5-digit codes)

A. (Primary) 928110	C.
B. 493910	D.

EPA ID Number	G	U	6	5	7	1	9	9	9	5	1	9

OMB# 2050-0024; Expires 05/31/2020

8. Site Contact Information

☐ Same as Location Address

First Name Jeffrey	MI P	Last Name Laitila
Title Chief, Environmental Flight		
Street Address 36 CES/CEV Unit 14007		
City, Town, or Village Yigo		
State GU	Country United States	Zip Code 96543-4007
Email jeffrey.laitila@us.af.mil		
Phone (671) 366-2556	Ext	Fax

9. Legal Owner and Operator of the Site

A. Name of Site's Legal Owner

☐ Same as Location Address

Full Name United States Navy	Date Became Owner (mm/dd/yyyy) 10/1/2009

Owner Type

☐ Private ☐ County ☐ District ☑ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

Street Address 36th Wing, Unit 14003		
City, Town, or Village Yigo		
State GU	Country United States	Zip Code 96543-4003
Email		
Phone 366-3600	Ext	Fax
Comments		

B. Name of Site's Legal Operator

☐ Same as Location Address

Full Name Brigadier General Jeremy T. Sloane	Date Became Operator (mm/dd/yyyy) 7/1/2020

Operator Type

☐ Private ☐ County ☐ District ☑ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

Street Address 36th Wing, Unit 14003		
City, Town, or Village Yigo		
State GU	Country United States	Zip Code 96543-4003
Email jeremy.sloane@us.af.mil		
Phone (671) 366-3600	Ext	Fax
Comments		

10. Type of Regulated Waste Activity (at your site)
Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities

☑ Y ☐ N	1. Generator of Hazardous Waste—If "Yes", mark only one of the following—a, b, c		
	☑	a. LQG	-Generates, in any calendar month (includes quantities imported by importer site) 100 kg/mo (220 lbs/mo) or more of non-acute hazardous waste; or - Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lb/mo) of acute hazardous waste; or - Generates, in any calendar month or accumulates at any time, more than 50 kg /mo (110 lb /mo) of acute hazardous spill cleanup material.
	☐	b. SQG	50 to less than 100 kg/mo (110 -219 lbs/mo) of non-acute hazardous waste and no more than 1 kg (2.2 lb) of acute hazardous waste and no more than 100 kg (220 lb) of any acute hazardous spill cleanup material.
	☐	c. VSQG	Less than 50 kg/mo (110 lbs/mo) of non-acute hazardous waste.
If "Yes" above, indicate other generator activities in 2 and 3, as applicable.			
☐ Y ☑ N	2. Short-Term Generator (generates from a short-term or one-time event and not from on-going processes). If "Yes", provide an explanation in the Comments section.		
☐ Y ☑ N	3. Mixed Waste (hazardous and radioactive) Generator		
☑ Y ☐ N	4. Treater, Storer or Disposer of Hazardous Waste—Note: A hazardous waste Part B permit is required for these activities.		
☐ Y ☑ N	5. Receives Hazardous Waste from Off-site		
☐ Y ☑ N	6. Recycler of Hazardous Waste		
	☐	a. Recycler who stores prior to recycling	
	☐	b. Recycler who does not store prior to recycling	
☐ Y ☑ N	7. Exempt Boiler and/or Industrial Furnace—If "Yes", mark all that apply.		
	☐	a. Small Quantity On-site Burner Exemption	
	☐	b. Smelting, Melting, and Refining Furnace Exemption	

B. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g. D001, D003, F007, U112). Use an additional page if more spaces are needed.

D003						

~~**C. Waste Codes for State Regulated (non-Federal) Hazardous Wastes.** Please list the waste codes of the State hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.~~ **NOT APPLICABLE IN GUAM**

11. Additional Regulated Waste Activities (NOTE: Refer to your State regulations to determine if a separate permit is required.)

A. Other Waste Activities

☐ Y ☑ N		1. Transporter of Hazardous Waste—If "Yes", mark all that apply.
	☐	a. Transporter
	☐	b. Transfer Facility (at your site)
☐ Y ☑ N		2. Underground Injection Control
☐ Y ☑ N		3. United States Importer of Hazardous Waste
☐ Y ☑ N		4. Recognized Trader—If "Yes", mark all that apply.
	☐	a. Importer
	☐	b. Exporter
☐ Y ☑ N		5. Importer/Exporter of Spent Lead-Acid Batteries (SLABs) under 40 CFR 266 Subpart G—If "Yes", mark all that apply.
	☐	a. Importer
	☐	b. Exporter

B. Universal Waste Activities

☐ Y ☑ N		1. Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more) - If "Yes" mark all that apply. Note: Refer to your State regulations to determine what is regulated.
	☐	a. Batteries
	☐	b. Pesticides
	☐	c. Mercury containing equipment
	☐	d. Lamps
	☐	e. Other (specify) ____________
	☐	f. Other (specify) ____________
	☐	g. Other (specify) ____________
☐ Y ☑ N		2. Destination Facility for Universal Waste Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities

☐ Y ☑ N		1. Used Oil Transporter—If "Yes", mark all that apply.
	☐	a. Transporter
	☐	b. Transfer Facility (at your site)
☐ Y ☑ N		2. Used Oil Processor and/or Re-refiner—If "Yes", mark all that apply.
	☐	a. Processor
	☐	b. Re-refiner
☐ Y ☑ N		3. Off-Specification Used Oil Burner
☐ Y ☑ N		4. Used Oil Fuel Marketer—If "Yes", mark all that apply.
	☐	a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner
	☐	b. Marketer Who First Claims the Used Oil Meets the Specifications

~~12. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR 262 Subpart K.~~ NOT APPLICABLE IN GUAM

☐ ~~Y~~ ☐ N		~~A. Opting into or currently operating under 40 CFR 262 Subpart K for the management of hazardous wastes in laboratories—If "Yes", mark all that apply. Note: See the item-by-item instructions for definitions of types of eligible academic entities.~~
	☐	~~1. College or University~~
	☐	~~2. Teaching Hospital that is owned by or has a formal written affiliation with a college or university~~
	☐	~~3. Non-profit Institute that is owned by or has a formal written affiliation with a college or univer-~~
☐ ~~Y~~ ☐ N		~~B. Withdrawing from 40 CFR 262 Subpart K for the management of hazardous wastes in laboratories.~~

~~13. Episodic Generation~~ NOT APPLICABLE IN GUAM

☐ ~~Y~~ ☐ N	~~Are you an SQG or VSQG generating hazardous waste from a planned or unplanned episodic event, lasting no more than 60 days, that moves you to a higher generator category. If "Yes", you must fill out the Addendum for Episodic Generator.~~

~~14. LQG Consolidation of VSQG Hazardous Waste~~ NOT APPLICABLE IN GUAM

☐ ~~Y~~ ☐ N	~~Are you an LQG notifying of consolidating VSQG Hazardous Waste Under the Control of the Same Person pursuant to 40 CFR 262.17(f)? If "Yes", you must fill out the Addendum for LQG Consolidation of VSQGs hazardous waste.~~

~~15. Notification of LQG Site Closure for a Central Accumulation Area (CAA) (optional) OR Entire Facility (required)~~ NOT APPLICABLE IN GUAM

☐ ~~Y~~ ☐ N	~~LQG Site Closure of a Central Accumulation Area (CAA) or Entire Facility.~~
	~~A.~~ ☐ ~~Central Accumulation Area (CAA) or~~ ☐ ~~Entire Facility~~
	~~B. Expected closure date: ____________ mm/dd/yyyy~~
	~~C. Requesting new closure date: ____________ mm/dd/yyyy~~
	~~D. Date closed : ____________ mm/dd/yyyy~~ ☐ ~~1. In compliance with the closure performance standards 40 CFR 262.17(a)(8)~~ ☐ ~~2. Not in compliance with the closure performance standards 40 CFR 262.17(a)(8)~~

~~16. Notification of Hazardous Secondary Material (HSM) Activity~~ NOT APPLICABLE IN GUAM

☐ ~~Y~~ ☐ N	~~A. Are you notifying under 40 CFR 260.42 that you will begin managing, are managing, or will stop managing hazardous secondary material under 40 CFR 260.30, 40 CFR 261.4(a)(23), (24), or (27)? If "Yes", you must fill out the Addendum to the Site Identification Form for Managing Hazardous Secondary Material.~~
☐ ~~Y~~ ☐ N	~~B. Are you notifying under 40 CFR 260.43(a)(4)(iii) that the product of your recycling process has levels of hazardous constituents that are not comparable to or unable to be compared to a legitimate product or intermediate but that the recycling is still legitimate? If "Yes", you may provide explanation in Comments section. You must also document that your recycling is still legitimate and maintain that documentation on site.~~

17. Electronic Manifest Broker

☐ Y ☑ N	Are you notifying as a person, as defined in 40 CFR 260.10, electing to use the EPA electronic manifest system to obtain, complete, and transmit an electronic manifest under a contractual relationship with a hazardous waste generator?

18. Comments (include item number for each comment)

19. Certification I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. **Note: For the RCRA Hazardous Waste Part A permit Application, all owners and operators must sign (see 40 CFR 270.10(b) and 270.11).**

Signature of legal owner, operator or authorized representative	Date (mm/dd/yyyy)
Jeremy Sloane	MAY 17 2021
Printed Name (First, Middle Initial Last) **Jeremy T. Sloane**	Title **Commander, 36th Wing**
Email **jeremy.sloane@us.af.mil**	

Signature of legal owner, operator or authorized representative	Date (mm/dd/yyyy)
Printed Name (First, Middle Initial Last)	Title
Email	

United States Environmental Protection Agency

HAZARDOUS WASTE PERMIT PART A FORM

1. Facility Permit Contact

First Name	Jeffrey	MI	P	Last Name	Laitila
Title	Chief, Environmental Flight				
Email	jeffrey.laitila@us.af.mil				
Phone	(671) 366-2556	Ext		Fax	

2. Facility Permit Contact Mailing Address

Street Address	36 CES/CEV Unit 14007, Building 18001, Arc Light Boulevard				
City, Town, or Village	Yigo				
State	GU	Country	United States	Zip Code	96543-4007

3. Facility Existence Date (mm/dd/yyyy)

10/30/1980

4. Other Environmental Permits

A. Permit Type	B. Permit Number	C. Description
		See attached sheets for list of permits.

5. Nature of Business

6. Process Codes and Design Capacities

Line Number		A. Process Code			B. Process Design Capacity (1) Amount	(2) Unit of Measure	C. Process Total Number of Units	D. Unit Name
		X	0	1	0.05	N	001	
		X	0	1	0.30	N	001	

7. Description of Hazardous Wastes (Enter codes for Items 7.A, 7.C and 7.D(1))

Line No.		A. EPA Hazardous Waste No.				B. Estimated Annual Qty of Waste	C. Unit of Measure	D. Processes (1) Process Codes									(2) Process Description (If code is not entered in 7.D1))
	1	D	0	0	3	5000	P	X	0	1							Open Burn
	2	D	0	0	3	30,000	P	X	0	1							Open Detonation

8. Map

Attach to this application a topographical map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all spring, rivers, and other surface water bodies in this map area. See instructions for precise requirements.

9. Facility Drawing

All existing facilities must include a scale drawing of the facility. See instructions for more detail.

10. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, and disposal areas; and sites of future storage, treatment, or disposal areas. See instructions for more detail.

11. Comments

Section 8, 9, and 10 are attached in Part B of this application.

A. Facility Type (Enter Code)	B. Permit Number	C. Description
UIC for Disposal of Storm Water Runoff	U1907116	DW-AF1
UIC for Disposal of Storm Water Runoff	U1907117	DW-AF2
UIC for Disposal of Storm Water Runoff	U1907118	DW-AF3
UIC for Disposal of Storm Water Runoff	U1907119	DW-AF4
UIC for Disposal of Storm Water Runoff	U1907120	DW-AF5
UIC for Disposal of Storm Water Runoff	U1907121	DW-AF6
UIC for Disposal of Storm Water Runoff	U1907122	DW-AF7
UIC for Disposal of Storm Water Runoff	U1907123	DW-AF8
UIC for Disposal of Storm Water Runoff	U1907124	DW-AF9
UIC for Disposal of Storm Water Runoff	U1907125	DW-AF10
UIC for Disposal of Storm Water Runoff	U1907126	DW-AF11
UIC for Disposal of Storm Water Runoff	U1907127	DW-AF12
UIC for Disposal of Storm Water Runoff	U1907128	DW-AF15
UIC for Disposal of Storm Water Runoff	U1907129	DW-AF16
UIC for Disposal of Storm Water Runoff	U1907130	DW-AF17
UIC for Disposal of Storm Water Runoff	U1907131	DW-AF18
UIC for Disposal of Storm Water Runoff	U1907132	DW-AF19
UIC for Disposal of Storm Water Runoff	U1907133	DW-AF20
UIC for Disposal of Storm Water Runoff	U1907134	DW-AF21
UIC for Disposal of Storm Water Runoff	U1907135	DW-AF22
UIC for Disposal of Storm Water Runoff	U1907136	DW-AF23
UIC for Disposal of Storm Water Runoff	U1907137	DW-AF24
UIC for Disposal of Storm Water Runoff	U1907138	DW-AF25
UIC for Disposal of Storm Water Runoff	U1907139	DW-AF26
UIC for Disposal of Storm Water Runoff	U1907140	DW-AF28
UIC for Disposal of Storm Water Runoff	U1907141	DW-AF29
UIC for Disposal of Storm Water Runoff	U1907142	DW-AF30
UIC for Disposal of Storm Water Runoff	U1907143	DW-AF31
UIC for Disposal of Storm Water Runoff	U1907144	DW-AF32
UIC for Disposal of Storm Water Runoff	U1907145	DW-AF33
UIC for Disposal of Storm Water Runoff	U1907146	DW-AF34
UIC for Disposal of Storm Water Runoff	U1907147	DW-AF35
UIC for Disposal of Storm Water Runoff	U1907148	DW-AF36
UIC for Disposal of Storm Water Runoff	U1907149	DW-AF37
UIC for Disposal of Storm Water Runoff	U1907150	DW-AF38
UIC for Disposal of Storm Water Runoff	U1907151	DW-AF40
UIC for Disposal of Storm Water Runoff	U1907152	DW-AF41
UIC for Disposal of Storm Water Runoff	U1907153	DW-AF42
UIC for Disposal of Storm Water Runoff	U1907154	DW-AF43
UIC for Disposal of Storm Water Runoff	U1907155	DW-AF44
UIC for Disposal of Storm Water Runoff	U1907156	DW-AF45
UIC for Disposal of Storm Water Runoff	U1907157	DW-AF46
UIC for Disposal of Storm Water Runoff	U1907158	DW-AF47
UIC for Disposal of Storm Water Runoff	U1907159	DW-AF48
UIC for Disposal of Storm Water Runoff	U1907160	DW-AF49
UIC for Disposal of Storm Water Runoff	U1907161	DW-AF50
UIC for Disposal of Storm Water Runoff	U1907162	DW-AF51

A. Facility Type (Enter Code)	B. Permit Number	C. Description
UIC for Disposal of Storm Water Runoff	U1907163	DW-AF52
UIC for Disposal of Storm Water Runoff	U1907164	DW-AF56
UIC for Disposal of Storm Water Runoff	U1907165	DW-AF56A
UIC for Disposal of Storm Water Runoff	U1907166	DW-AF57
UIC for Disposal of Storm Water Runoff	U1907167	DW-AF58
UIC for Disposal of Storm Water Runoff	U1907168	DW-AF59
UIC for Disposal of Storm Water Runoff	U1907169	DW-AF60
UIC for Disposal of Storm Water Runoff	U1907170	DW-AF61
UIC for Disposal of Storm Water Runoff	U1907171	DW-AF62
UIC for Disposal of Storm Water Runoff	U1907172	DW-AF63
UIC for Disposal of Storm Water Runoff	U1907173	DW-AF64
UIC for Disposal of Storm Water Runoff	U1907174	DW-AF65
UIC for Disposal of Storm Water Runoff	U1907175	DW-AF68
UIC for Disposal of Storm Water Runoff	U1907176	DW-AF69
UIC for Disposal of Storm Water Runoff	U1907177	DW-AF70
UIC for Disposal of Storm Water Runoff	U1907178	DW-AF71
UIC for Disposal of Storm Water Runoff	U1907179	DW-AF72
UIC for Disposal of Storm Water Runoff	U1907180	DW-AF73
UIC for Disposal of Storm Water Runoff	U1907181	DW-AF74
UIC for Disposal of Storm Water Runoff	U1907182	DW-AF74A
UIC for Disposal of Storm Water Runoff	U1907183	DW-AF75
UIC for Disposal of Storm Water Runoff	U1907184	DW-AF76
UIC for Disposal of Storm Water Runoff	U1907185	DW-AF77
UIC for Disposal of Storm Water Runoff	U1907186	DW-AF78
UIC for Disposal of Storm Water Runoff	U1907187	DW-AF79
UIC for Disposal of Storm Water Runoff	U1907188	DW-AF80
UIC for Disposal of Storm Water Runoff	U1907189	DW-AF80A
UIC for Disposal of Storm Water Runoff	U1907190	DW-AF81
UIC for Disposal of Storm Water Runoff	U1907191	DW-AF82
UIC for Disposal of Storm Water Runoff	U1907192	DW-AF83
UIC for Disposal of Storm Water Runoff	U1907193	DW-AF84
UIC for Disposal of Storm Water Runoff	U1907194	DW-AF85
UIC for Disposal of Storm Water Runoff	U1907195	DW-AF86
UIC for Disposal of Storm Water Runoff	U1907196	DW-AF87
UIC for Disposal of Storm Water Runoff	U1907197	DW-AF88
UIC for Disposal of Storm Water Runoff	U1907198	DW-AF89
UIC for Disposal of Storm Water Runoff	U1907199	DW-AF90
UIC for Disposal of Storm Water Runoff	U1907200	DW-AF91
UIC for Disposal of Storm Water Runoff	U1907201	DW-AF92
UIC for Disposal of Storm Water Runoff	U1907202	DW-AF93
UIC for Disposal of Storm Water Runoff	U1907203	DW-AF94
UIC for Disposal of Storm Water Runoff	U1907204	DW-AF95
UIC for Disposal of Storm Water Runoff	U1907205	DW-AF96
UIC for Disposal of Storm Water Runoff	U1907206	DW-AF97
UIC for Disposal of Storm Water Runoff	U1907207	DW-AF98
UIC for Disposal of Storm Water Runoff	U1907208	DW-AF99
UIC for Disposal of Storm Water Runoff	U1907209	DW-AF100
UIC for Disposal of Storm Water Runoff	U1907210	DW-AF101

SECTION 4. OTHER ENVIRONMENTAL PERMITS

A. Facility Type (Enter Code)	B. Permit Number	C. Description
UIC for Disposal of Storm Water Runoff	U1907211	DW-AF102
UIC for Disposal of Storm Water Runoff	U1907212	DW-AF103
UIC for Disposal of Storm Water Runoff	U1907213	DW-AF104
UIC for Disposal of Storm Water Runoff	U1907214	DW-AF105
UIC for Disposal of Storm Water Runoff	U1907215	DW-AF106
UIC for Disposal of Storm Water Runoff	U1907216	DW-AF107
UIC for Disposal of Storm Water Runoff	U1907107	DW-AF108
UIC for Disposal of Storm Water Runoff	U1909326	DW-AF109
UIC for Disposal of Storm Water Runoff	U1909327	DW-AF110
Production Wells	71119-207P	AF-1
Production Wells	71119-208P	AF-2
Production Wells	71119-209P	AF-3
Production Wells	71119-210P	AF-4
Production Wells	71119-211P	AF-5
Production Wells	040717057R	BPM-1
Production Wells	040717058R	MW-1
Production Wells	040717059R	MW-2
Production Wells	040717060R	MW-3
Production Wells	040717061R	MW-5A
Production Wells	040717062R	MW-6A
Production Wells	012617054R	MW-7A
Production Wells	040717062R	MW-8A
Production Wells	040717063R	MW-9A
Title V Air Permit	FO-001R1	Title V - Clean Air Operating
Underground Storage Tank	GEPA-UST-001	AAFES Service Station, AAFB - (4)
Underground Storage Tank	GEPA-UST-127	AAFB Fuel Pump House: (5) USTs: Tank #1 & Receipt Pad, 2,3,4
Underground Storage Tank	GEPA-UST-138	AAFB Andy III Tank Farm (6) USTs: Tank #19, #20, #21, #22, #23, #24
Solid Waste Management Facility	99-1001LF	Municipal Solid Waste (MSW)
Solid Waste Management Facility	19-033 HFL	Construction and Demolition
Solid Waste Management Facility	15-022PRO	Recycling Facility (Processing)
Solid Waste Management Facility	14-040TRA	Municipal Solid Waste-Transfer Station

Permit Conditions

Table of Contents

APPENDICES

SECTION I - GENERAL PERMIT CONDITIONS

I.A. EFFECT OF PERMIT

The Permittee is allowed to treat hazardous waste at the OB/OD unit in accordance with the conditions of this Permit. Any treatment of hazardous waste not authorized in this Permit is prohibited, except for treatment of hazardous waste, which occurs in RCRA permit-exempt units. Subject to Part X.A. (Adopts by reference 40 CFR 270.4) of Guam's Hazardous Waste Management Regulations (herein referred to as GHWMRs), compliance with this Permit generally constitutes compliance, for purposes of enforcement, with 10 Guam Code Annotated (GCA), Chapter 51, Solid Waste Management and Litter Control (Subtitle C of the Resource Conservation and Recovery Act) (RCRA). Issuance of this Permit does not convey any property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, any infringement of state or local law or regulations, or preclude compliance with any other Federal, State, and/or local laws and/or regulations governing the treatment and handling of explosives. Compliance with the terms of this Permit does not constitute a defense to any order issued or any action brought under Sections 3008(a), 3008(h), 3013, or 7003 of RCRA, except as provided in 40 CFR 270.4(a); Sections 106(a), 104 or 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq., commonly known as CERCLA), or any other law providing for protection of public health or the environment. Part X.A. [Adopts by reference 40 CFR 270.4, 270.30(g)] in the GHWMRs.

I.B. PERMIT ACTIONS

I.B.1. Permit Modification, Revocation and Reissuance, and Termination

This Permit may be modified, revoked and reissued, or terminated for cause, as specified in Part X.A., L, M, N, O, P, Q, and R (Adopts by reference 40 CFR 270.41, 270.42, and 270.43) of the GHWMRs. The filing of a request for a Permit modification, revocation and reissuance, or termination, or the notification of planned changes or anticipated noncompliance on the part of the Permittee, does not stay the applicability or enforceability of any Permit Condition. Part X.A. [Adopts by reference 40 CFR 270.4(a) and 270.30(f)] of the GHWMRs.

I.B.2. Permit Renewal

This Permit may be renewed as specified in Part X.A. [Adopts by reference 40 CFR 270.30(b)] of the GHWMRs and Permit Condition I.E.2. Review of any application for a Permit renewal shall consider improvements in the state of control and measurement technology, as well as changes in applicable regulations. Part X.A. [Adopts by reference 40 CFR 270.30(b), HSWA Section 212] of the GHWMRs.

I.C. SEVERABILITY

The provisions of this Permit are severable, and if any provision of this Permit, or the application of any provision of this Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby. Part XI.A. [Adopts by reference 40 CFR 124.16(a)] of the GHWMRs.

I.D. DEFINITIONS

For purposes of this Permit, terms used herein shall have the same meaning as those in Parts XI.A., II.A., VI.A., VIII.A., IX.A., and X.A. [Adopts by reference 40 CFR Parts 124, 260, 264, 266, 268, and 270] of the GHWMRs, unless this Permit specifically provides otherwise; where terms are not defined in the regulations or the Permit, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term. "Administrator" means the Administrator of Guam EPA, or his/her designee or authorized representative. “Foreign Source” or “Foreign Country” means any place, location, point, or area outside the territory of Guam.

I.E. DUTIES AND REQUIREMENTS

I.E.1. Duty to Comply

The Permittee shall comply with all conditions of this Permit, except to the extent and for the duration such noncompliance is authorized by an emergency Permit. Any Permit noncompliance, other than noncompliance authorized by an emergency Permit, constitutes a violation of RCRA, and 10 GCA Chapter 51 (Solid Waste Management and Litter Control) and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a Permit renewal application. Part X.A. [Adopts by reference 40 CFR 270.30(a)] of the GHWMRs.

I.E.2. Duty to Reapply

If the Permittee wishes to continue an activity allowed by this Permit after the expiration date of this Permit, the Permittee shall submit a complete application for a new Permit at least 180 days prior to Permit expiration. Part X.A. [Adopts by reference 40 CFR 270.10(h), 270.30(b)] of the GHWMRs.

I.E.3. Permit Expiration

Pursuant to Part X.A., and T. [Adopts by reference 40 CFR 270.50] of the GHWMRs, this Permit shall be effective for a fixed term of three (3) years as described under Part X.S. [Adopts by reference 40 CFR 270.50(a) as amended] of the GHWMRs. As long as Guam EPA is the Permit issuing authority, this Permit and all conditions herein will remain in effect beyond the Permit's expiration date, if the Permittee has submitted a timely, complete application (see Parts X. A, D, E, and F [adopts by reference 40 CFR 270.10, 270.13 through 270.29] of the GHWMRs and, if through no fault of the Permittee, the Administrator has not issued a new Permit, as set forth in Part X.A., and U. [Adopts by reference 40 CFR 270.51] of the GHWMRs.

I.E.4. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the Permittee, in an enforcement action, that it would have been necessary to halt or reduce the Permitted activity in order to maintain compliance with the conditions of this Permit. Part X.A. [Adopts by reference 40 CFR 270.30(c)] of the GHWMRs.

I.E.5. Duty to Mitigate

In the event of noncompliance with this Permit, the Permittee shall take all reasonable steps to minimize releases to the environment and shall carry out such measures, as are reasonable, to prevent significant adverse impacts on human health or the environment. Part X.A. [Adopts by reference 40 CFR 270.30(d)] of the GHWMRs.

I.E.6. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance/quality control procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Permit. Part X.A. [Adopts by reference 40 CFR 270.30(e)] of the GHWMRs.

I.E.7. Duty to Provide Information

The Permittee shall furnish to the Administrator, within a reasonable time, any relevant information which the Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to the Administrator, upon request, copies of records required to be kept by this Permit. Part X.A. [Adopts by reference 40 CFR 264.74(a), 270.30(h)] of the GHWMRs.

I.E.8. Inspection and Entry

Pursuant to Part X.A. [Adopts by reference 40 CFR 270.30(i)] of the GHWMRs, the Permittee shall allow the Administrator, or an authorized representative, upon the presentation of credentials and other documents, as may be required by law, to:

I.E.8.a. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Permit;

I.E.8.b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;

I.E.8.c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and

I.E.8.d. Sample or monitor, at reasonable times, for the purposes of assuring Permit compliance or as otherwise authorized by RCRA, any substances or parameters at any location.

I.E.9. Monitoring and Records

The Administrator may require such testing by the Permittee and may make such modifications to this Permit deemed necessary to ensure implementation of new regulations or requirements, or to ensure protection of human health and the environment.

I.E.9.a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method from Part III.A. [Adopts by reference Appendix I of 40 CFR Part 261] of the GHWMRs or an equivalent method approved by the Administrator. Laboratory methods must be those specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods SW-846, Standard Methods of Wastewater Analysis, or an equivalent method, as specified in the Waste Analysis Plan (Appendix A). Part X.A. [Adopts by reference 40 CFR 270.30(j)(1)] of the GHWMRs.

I.E.9.b. The Permittee shall retain records of all monitoring information, including, as applicable, all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports and records required by this Permit, the certification required by Part X.VI. [Adopts by reference 40 CFR 264.73(b)(9)] of the GHWMRs, and records of all data used to complete the application for this Permit for a period of at least 3 years from the date of the sample, measurement, report, record, certification, or application. These periods may be extended by request of the Administrator at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility. Part VI.A. and X.A. [Adopts by reference 40 CFR 264.74(b) and 270.30(j)(2)] of the GHWMRs. These requirements will also be applicable to open burning/open detonation units if groundwater monitoring is required.

I.E.9.c. Pursuant to Part X.A. [Adopts by reference 40 CFR 270.30(j)(3)] of the GHWMRs, records of monitoring information shall specify:

i. The dates, exact place, and times of sampling or measurements

ii. The individuals who performed the sampling or measurements

iii. The date’s analyses were performed

iv. The individuals who performed the analyses

v. The analytical techniques or methods used and

vi. The results of such analyses.

I.E.10. Reporting Planned Changes

The Permittee shall give notice to the Administrator, as soon as possible, of any planned physical alterations or additions to the Permitted facility. Part X.A. [Adopts by reference 40 CFR 270.30(l)(1)] of the GHWMRs.

I.E.11. Reporting Anticipated Noncompliance

The Permittee shall give advance notice to the Administrator of any planned changes in the permitted facility or activity, which may result in noncompliance with Permit requirements. Part X.A. [Adopts by reference 40 CFR 270.30(l)(2)] of the GHWMRs.

I.E.12. Transfer of Permits

This Permit is not transferable to any person, except after notice to the Administrator. The Administrator may require modification or revocation and reissuance of the Permit pursuant to Part X.A. [Adopts by reference 40 CFR 270.40] of the GHWMRs. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of Parts VI.A. and X.A. [Adopts by reference 40 CFR Parts 264 and 270] of the GHWMRs and this Permit. Parts X.A. and VI.A. [Adopts by reference 40 CFR 270.30(l)(3) and 264.12(c)] of the GHWMRs.

I.E.13. Eight Hour Reporting

I.E.13.a. The Permittee shall report to the Administrator any noncompliance, which may endanger health or the environment. Any such information shall be reported orally within eight (8) hours from the time the Permittee becomes aware of the circumstances. The report shall include the following:

i. Information concerning release of any hazardous waste that may cause an endangerment to public drinking water supplies.

ii. Any information of a release or discharge of hazardous waste, or of a fire or explosion from the hazardous waste management facility which could threaten the environment or human health outside the facility.

I.E.13.b. The description of the occurrence and its cause shall include:

i. Name, address, and telephone number of the owner or operator;

ii. Name, address, and telephone number of the facility;

iii. Date, time, and type of incident;

iv. Name and quantity of materials involved;

v. The extent of injuries, if any;

vi. An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and

vii. Estimated quantity and disposition of recovered material that resulted from the incident.

I.E.13.c. A written submission shall also be provided within five days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period(s) of noncompliance (including exact dates and times); whether the noncompliance has been corrected; and, if not, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The Administrator may waive the five day written notice requirement in favor of a written report within fifteen (15) days. Part X.A. [Adopts by reference 40 CFR 270.30(l)(6)] of the GHWMRs.

I.E.14. Other Noncompliance

The Permittee shall report all other instances of noncompliance not otherwise required to be reported above, Permit Conditions I.E.10.–14., at the time monitoring reports are submitted. The reports shall contain the information listed in Permit Condition I.E.13. Part X.A. [Adopts by reference 40 CFR 270.30(l)(10)] of the GHWMRs.

I.E.15. Other Information

Whenever the Permittee becomes aware that it failed to submit any relevant facts in the Permit application, or submitted incorrect information in a Permit application or in any report to the Administrator, the Permittee shall promptly submit such facts or information. Part X.A. [Adopts by reference 40 CFR 270.30(l)(11)] of the GHWMRs.

I.F. SIGNATORY REQUIREMENT

All applications, reports, or information submitted to or requested by the Administrator, his/her designee, or authorized representative, shall be signed and certified in accordance with Part X.A. [Adopts by reference 40 CFR 270.11 and 270.30(k)] of the GHWMRs.

I.G. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE ADMINISTRATOR

All applications, reports, notifications, or other submissions which are required by this Permit to be sent or given to the Administrator should be sent by certified mail or given to:

Administrator
Guam Environmental Protection Agency
17-3304 Mariner Avenue Tiyan
Barrigada, Guam 96913-1617

Attn: Air and Land Division

(671) 300-4760: Administrator Air & Land Programs
(671) 300-4751: Hazardous Waste Management Program

I.H. CONFIDENTIAL INFORMATION

In accordance with Part X.A. [Adopts by reference 40 CFR 270.12] of the GHWMRs, the Permittee may claim confidential, any information required to be submitted by this Permit.

I.I. DOCUMENTS TO BE SUBMITTED AFTER PERMIT ISSUANCE

The Permittee shall submit the following documents to the Administrator by the date shown:

Contingent Post-Closure Care Plan ninety (90) days from the date that the Permittee or Administrator determines that the hazardous waste management unit cannot be clean-closed pursuant to Permit Condition V.

Monitoring plans for Groundwater as described in Permit Condition IV.

Schedule and deliverables for the Corrective Action Program as described in Permit Condition VII.

I.J. DOCUMENTS TO BE MAINTAINED AT THE FACILITY

The Permittee shall maintain at the facility, until closure is completed and certified by an independent, registered professional engineer, the following documents, and all amendments, revisions and modifications to these documents:

Waste Analysis Plan, as required by Part VI.A. [Adopts by reference 40 CFR 264.13] of the GHWMRs and this Permit.

Inspection schedules, as required by Part VI.A. [Adopts by reference 40 CFR 264.15(b)(2)] of the GHWMRs and this Permit.

Personnel training documents and records, as required by Part VI.A. [Adopts by reference 40 CFR 264.16(d)] of the GHWMRs and this Permit.

Contingency Plan, as required by Part VI.A. [Adopts by reference 40 CFR 264.53(a)] of the GHWMRs and this Permit.

Operating record, as required by Part VI.A. [Adopts by reference 40 CFR 264.73] of the GHWMRs and this Permit.

Closure Plan, as required by Part VI.A. [Adopts by reference 40 CFR 264.112(a)] of the GHWMRs and this Permit.

Contingent Post-Closure Plan and other plans as required by Part VI.A. [Adopts by reference 40 CFR 264.118 (a)] of the GHWMRs, Permit Conditions I.I and V, Contingent Post-Closure Care.

All other documents required by Permit Conditions I-VI.

SECTION II - GENERAL FACILITY CONDITIONS

II.A. DESIGN AND OPERATION OF FACILITY

The Permittee shall construct, maintain, and operate the facility to minimize the possibility of an unplanned fire, explosion, or any unplanned, sudden or non-sudden release of hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment, as required by Part VI.A. [Adopts by reference 40 CFR 264.31] of the GHWMRs.

II.B. REQUIRED NOTICES

II.B.1. Hazardous Waste from Off-Site Sources

When the Permittee is to receive hazardous waste from an off-site source (except where the Permittee is also the generator), it must inform the generator in writing that it has the appropriate Permits, and will accept the waste the generator is shipping. The Permittee must keep a copy of this written notice as part of the operating record. Part VI.A. [Adopts by reference 40 CFR 264.12(b)] of the GHWMRs.

II.B.2. Hazardous Waste Imports

The Permittee shall notify the Administrator in writing as least four (4) weeks in advance of the date the Permittee expects to receive hazardous waste from a foreign source, as required by Part VI.C. [Adopts by reference 40 CFR 264.12(a) and amended] of the GHWMRs. Notice of subsequent shipments of the same waste from the same foreign source in the same calendar year is required. When the Permittee imports hazardous waste into Guam from a foreign source, the Permittee must comply with the requirements delineated for imports of hazardous waste Part IV.N. [Adopts by reference 40 CFR 262.60(a) as amended] of the GHWMRs.

II.C. GENERAL WASTE ANALYSIS

The Permittee shall follow the waste analysis procedures required by Part VI.A. [Adopts by reference 40 CFR 264.13] of the GHWMRs, as described in the Waste Analysis Plan, Appendix A. Before the Permittee treats any reactive waste at the OB/OD unit having identifiable markings or other means of identification, it must review manufacturers or Department of Defense data or information which must be known to treat the waste safely and in accordance with this Permit. If waste or environmental media are subjected to analytical testing, the Permittee shall maintain proper functional instruments, use approved sampling and analytical methods, verify the validity of sampling and analytical procedures, and perform correct calculations.

If the Permittee uses a contract laboratory to perform analyses, then the Permittee shall inform the laboratory in writing that it must operate under the waste analysis conditions set forth in this Permit.

II.D. SECURITY

The Permittee shall comply with the security provisions of Part VI.A. [Adopts by reference 40 CFR 264.14(b)] of the GHWMRs and Appendix B of the Permit.

II.E. GENERAL INSPECTION REQUIREMENTS

The Permittee shall follow the inspection schedule set out in Appendix C of the Permit. The Permittee shall remedy any deterioration or malfunction discovered by an inspection, as required by Part VI.A. [Adopts by reference 40 CFR 264.15(c)] of the GHWMRs.

Records of inspection shall be kept, as required by Part VI.A. [Adopts by reference 40 CFR 264.15(d)] of the GHWMRs.

II.F. PERSONNEL TRAINING

The Permittee shall conduct personnel training, as required by Part VI.A. [Adopts by reference 40 CFR 264.16] of the GHWMRs. This training program shall follow the procedures set out in Appendix D of the Permit. The Permittee shall maintain training documents and records, as required by Part VI.A. [Adopts by reference 40 CFR 264.16(d) and (e)] of the GHWMRs.

II.G. SPECIAL PROVISIONS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

The Permittee shall comply with the requirements of Part VI.A. [Adopts by reference 40 CFR 264.17(a)] of the GHWMRs. The Permittee shall follow the procedures for handling ignitable, reactive, and incompatible wastes set forth in Appendix E of the Permit.

II.H. PREPAREDNESS AND PREVENTION

II.H.1. Required Equipment

At a minimum, the Permittee shall maintain at the facility the equipment set forth in the Contingency Plan, Appendix F of the Permit, as required by Part VI.A. [Adopts by reference 40 CFR 264.32] of the GHWMRs.

II.H.2. Testing and Maintenance of Equipment

The Permittee shall test and maintain the equipment specified in the Contingency Plan, Appendix F of the Permit, as necessary, to assure its proper operation in time of emergency, as required by Part VI.D. [Adopts by reference 40 CFR 264.33] of the GHWMRs.

II.H.3. Access to Communications or Alarm System

The Permittee shall maintain access to the communications or alarm system, as required by Part VI.A. [Adopts by reference 40 CFR 264.34] of the GHWMRs.

II.H.4. Arrangements with Local Authorities

The Permittee shall attempt to make arrangement with state and local authorities, as required by Part VI.A. [Adopts by reference 40 CFR 264.37] of the GHWMRs. If state or local officials decline to enter into preparedness and prevention arrangements with the Permittee, the Permittee must document this refusal in the operating record.

II.I. CONTINGENCY PLAN

II.I.1. Implementation of Plan

The Permittee shall immediately carry out the provisions of the Contingency Plan, Appendix F of the Permit, whenever there is an unplanned fire, explosion, or release of hazardous waste or constituents which could threaten human health or the environment.

II.I.2. Copies of Plan

The Permittee shall maintain a copy of the Contingency Plan at the facility and shall provide a copy to all local police departments, fire departments, hospitals, and State and local emergency response teams that may be asked to provide emergency assistance, as required by Part VI.A. [Adopts by reference 40 CFR 264.53] of the GHWMRs.

II.I.3. Amendments to Plan

The Permittee shall review and immediately amend, if necessary, the Contingency Plan, as required by Part VI.A. [Adopts by reference 40 CFR 264.54] of the GHWMRs.

II.I.4. Emergency Coordinator

A trained emergency coordinator shall be available at all times in case of an emergency, as required by Part VI.A. [Adopts by reference 40 CFR 264.55] of the GHWMRs.

The names, addresses, and phone numbers of all persons qualified to act as emergency coordinators must be kept up to date and included in the Contingency Plan. Part VI.A. [Adopts by reference 40 CFR 264.52(d)] of the GHWMRs.

II.J. DOCUMENTATION OF SHIPMENTS FROM OFF-SITE SOURCES

The Permittee shall use Incident Form 3265 to document and track shipments of reactive wastes from off-site sources to the installation.

II.K. RECORDKEEPING AND REPORTING

In addition to the record keeping and reporting requirements specified elsewhere in this Permit, the Permittee shall do the following:

II.K.1. Operating Record

The Permittee shall maintain a written operating record at the facility, in accordance with Part VI.A. [Adopts by reference 40 CFR 264.73] of the GHWMRs.

II.K.2. Annual Report

The Permittee shall comply with the annual reporting requirements of Part VI.F. [Adopts by reference 40CFR 264.75 as amended] of the GHWMRs.

II.K.3. Manifest System

The Permittee shall comply with the manifest requirements of Part VI.A. [Adopts by reference 264.71, 264.72, 264.76] of the GHWMRs.

II.L. GENERAL CLOSURE REQUIREMENTS

Closure of the facility must be in accordance with the provisions of the Part VI. [Adopts by reference 40 CFR Part 264] of the GHWMRs and the approved closure plan (Appendix G of the Permit, which includes the Sampling and Analysis Plan for Closure).

II.L.1. Performance Standard

The Permittee shall close the facility, as required by Part VI. [Adopts by reference 40 CFR 264.111] of the GHWMRs and in accordance with the Closure Plan, Appendix G of the Permit.

II.L.2. Amendment to Closure Plan

The Permittee shall amend the Closure Plan in accordance with Part VI. [Adopts by reference 40 CFR 264.112(c)] of the GHWMRs, whenever necessary.

II.L.3. Notification of Closure

The Permittee shall notify the Administrator in writing at least forty-five (45) days prior to the date on which he expects to begin closure of the OB/OD unit or final closure of the facility, as required by Part VI. [Adopts by reference 40 CFR 264.112(d)] of the GHWMRs.

II.L.4. Time Allowed For Closure

After receiving the final volume of hazardous waste at the OB/OD unit, the Permittee shall treat, remove from the unit or facility, or dispose of on-site all hazardous waste and shall complete closure activities, in accordance with Part VI.A. [Adopts by reference 40 CFR 264.113] of the GHWMRs and the schedules specified in the Closure Plan, Appendix G of the Permit.

II.L.5. Disposal or Decontamination of Equipment, Structures, and Soils

The Permittee shall decontaminate and/or dispose of all contaminated equipment, structures, and soils, as required by Part VI.A. [Adopts by reference 40 CFR 264.114] of the GHWMRs and the Closure Plan, Appendix G of the Permit.

II.L.6. Certification of Closure

The Permittee shall certify that the facility has been closed in accordance with the specifications in the Closure Plan, as required by Part VI.A. [Adopts by reference 40 CFR 264.115] of the GHWMRs.

II.M. GENERAL CONTINGENT POST-CLOSURE REQUIREMENTS

II.M.1. Post-Closure Care Period

The Permittee shall begin post-closure care, if required, for the OB/OD unit after completion of closure of the unit and continue for thirty (30) years after that date, or for a shorter or longer period pursuant to Part VI.A. [Adopts by Reference 40 CFR 264.117(a)(2)] of the GHWMRs. Post-Closure care shall be in accordance with Part VI.A. [Adopts by reference 40 CFR 264.117] of the GHWMRs and the Contingent Post-Closure Plan required by Appendix G of the Permit.

II.M.2. Post-Closure Security

The Permittee shall maintain security at the facility during the post-closure care period, in accordance with the Contingent Post-Closure Plan, and Part VI.A. [Adopts by reference 40 CFR 264.117(b)] of the GHWMRs.

II.M.3. Amendment to Contingent Post-Closure Plan

The Permittee shall amend the Contingent Post-Closure Plan in accordance with Part VI.A. [Adopts by reference 40 CFR 264.118(d)] of the GHWMRs, whenever necessary.

II.M.4. Post-Closure Notices

II.M.4.a. No later than sixty (60) days after certification of closure of the OB/OD unit, the Permittee shall submit a record to the Administrator of the types and estimated quantity of hazardous waste treated at the OB/OD unit over its operating life, to the best of its knowledge.

II.M.4.b. No later than submission of the certification of closure of the OB/OD unit, the Permittee shall submit to the Administrator and the local zoning authority or the authority with jurisdiction over local land use, a survey plat indicating the location and dimensions of the closed unit with respect to permanently surveyed benchmarks. This plat must be prepared and certified by a professional land surveyor. The plat must contain a note, prominently displayed, which states the Permittee's obligation to restrict disturbance of the closed unit in accordance with applicable Closure and Post-Closure regulations.

II.M.4.c. The Permittee shall request and obtain a Permit modification prior to post-closure removal of hazardous wastes, hazardous waste residues, liners, or contaminated soils, in accordance with Part VI.A. [Adopts by reference 40 CFR 264.119(c)] of the GHWMRs.

II.M.5. Certification of Completion of Post-Closure Care

The Permittee shall certify that the post-closure care period was performed in accordance with the specifications in the Contingent Post-Closure Plan, as required by Part VI.A. [Adopts by reference 40 CFR 264.120] of the GHWMRs.

II.N. COST ESTIMATE AND FINANCIAL ASSURANCE FOR FACILITY CLOSURE AND CONTINGENT POST-CLOSURE

In accordance with Part VI.A. [Adopts by reference 40 CFR 264.140] of the GHWMRs, the federal government is exempt from the financial assurance requirements of Part VI.A. [Adopts by reference 40 CFR Part 264, Subpart H] of the GHWMRs. Consequently, cost estimates and a financial assurance mechanism for closure and contingent post-closure care of the OB/OD units are not required.

II.O. LIABILITY REQUIREMENTS

In accordance with Part VI.A. [Adopts by reference 40 CFR 264.140(c)] of the GHWMRs, the federal government is exempt from maintaining liability coverage for sudden and non-sudden accidental occurrences.

SECTION III - TREATMENT OF REACTIVE WASTES

III.A. SECTION HIGHLIGHTS

Open burning and open detonation of waste ordnance materials occurs at the Explosive Ordnance Disposal (EOD) Range. The unit is located at the extreme eastern reach of Tarague Beach, ending just before Tagua Point (Appendix H of the Permit). The grid coordinates for the Open Detonation unit is 13 degrees, 35.58 minutes north, 144 degrees, 56.48 minutes east. This area has been in constant use since its inception at least 20 years ago. Its mission is to render unserviceable ordnance and other pyrotechnic devices harmless by either suppressed detonation or open burning. In addition, the EOD range has been used for EOD training purposes and emergency purposes.

The EOD range is defined as the open beach area bounded by the Pacific Ocean to the north and the jungle and/or limestone to the east, south, and west. Surrounding the active treatment units is a 2,400 foot-radius safety zone, as defined by operational requirements.

The active detonation units are located at the extreme eastern edge of Tarague Beach. They consist of two (2) pits; each located directly along the face of the cliff. Detonation of the munitions at the cliff face directs the destructive force of the detonation away from the occupied areas. Open detonation operations consists of several steps, including properly placing: the waste munitions, an explosive charge to detonate the waste munitions (if required), and an igniter to initiate the detonator. Detonations are initiated from the personnel bunker.

The inactive open burning pit is located approximately 80 feet from the jungle and 180 feet from the Pacific Ocean, approximately midway east west in the EOD Range. Open burning was conducted in a burn kettle approximately four feet in diameter and five feet tall. The OB pit was roughly 45 feet long by 14 feet wide by 6 feet deep.

Open burning operations consists of placing dunnage (wood) in the burn kettle to provide access for combustion air, placing the waste munitions in the burn kettle, placing a remote-controlled ignition device, placing approximately ten (10) gallons of virgin diesel fuel in the burn kettle, then remotely activating the ignition device from the personnel bunker.

Facility Pictures and a topographic map of the EOD Range are attached in Appendix H of the Permit.

After review of the ecological risk assessment in the Permit application, the Administrator has concluded that the mortality of biological receptors has to be protected from OB/OD activities. Therefore, the Permittee is required to follow the Biological Mitigation Plan, Appendix L, as described in this Permit.

Currently, the OB unit burn kettle is non-operational due to severe corrosion and the unit has not been used for several years. Before any open burning activity is allowed under the permit, the unit must meet the design and operational specifications described in the permit application as adopted in this Permit.

The Permittee shall operate the OB/OD unit in accordance with the Waste Analysis Plan, Standard Operating Procedures, Residue Management Plan, Groundwater Monitoring Plan, and the Biological Mitigation Plan as described in the Permit.

III.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

III.B.1. The Permittee may open burn/open detonate at the OB/OD unit hazardous wastes (also referenced in this Permit as "reactive waste") that consist of common military ordnance material (such as black powder, white/red phosphorus, tear gas, ammunitions, propellants, and explosive materials).

The Permittee shall abide by the restrictions for treatment through OB/OD of RCRA Hazardous waste materials as described in Appendix I, of the Permit, “Open Burning/Open Detonation RCRA hazardous waste treatment waste materials restrictions”.

III.B.2. The Permittee is prohibited from treating hazardous waste at the OB/OD unit that is not identified in Permit Condition III.B.1.

III.C. DESIGN, CONSTRUCTION, AND OPERATING REQUIREMENTS

III.C.1. Open Burning in a Containment Device

Open burning of the OB/OD unit shall be conducted pursuant to the information provided to meet design, construction, and operating requirements provided in the Process Information, the OB/OD Residue Management Plan, Flight Operating Instruction 32-3002 (FOI 32-3002), and the Biological Mitigation Plan (Appendix I, J, K and L of the Permit). The information addresses the following requirements:

III.C.1.a. The Permittee shall operate and maintain the open burning device in accordance with the Process Information, the OB/OD Residue Management Plan, FOI 32-3002, and the Biological Mitigation Plan (Appendix I, J, K and L of the Permit).

III.C.1.b. The Permittee shall design, construct, operate, and maintain a precipitation cover for the open burning tray(s) in accordance with the Procedures identified in Appendix I of the Permit.

III.C.1.c. The Permittee shall design, construct, operate, and maintain the open burning unit to minimize air emissions or exposure of people (onsite or offsite) to toxic or hazardous emissions in accordance with the Process Information, the OB/OD Residue Management Plan, FOI 32-3002, and the Biological Mitigation Plan (Appendix I, J, K and L of the Permit).

III.C.1.d. The Permittee shall provide guidance on how ash/residues from the open burning unit will be managed in accordance with the OB/OD Residue Management Plan (Appendix J of the

Permit).

III.C.1.e. The Permittee shall follow the procedures for the protection of ecological receptors in accordance with the Biological Mitigation Plan in Appendix L of the Permit.

III.C.2. Open Detonation On/In the Ground

III.C.2.a. The Permittee shall operate and maintain the open detonation area at the OB/OD unit in accordance with the operating procedures, the Process Information, the OB/OD Residue Management Plan, FOI 32-3002, and the Biological Mitigation Plan (Appendix I, J, K and L of the Permit).

III.C.2.b. The Permittee shall operate and maintain the open detonation area to minimize air emissions or exposure of people (onsite or offsite) to toxic or hazardous emissions in accordance with the hazard prevention procedures Appendix I of the Permit.

III.C.2.c. The Permittee shall manage residues from open detonation in accordance with Appendix J of the Permit.

III.D. HANDLING REQUIREMENTS

The Permittee shall handle/manage reactive waste that will be treated at the OB/OD unit in accordance with the Process Information, OB/OD Residue Management Plan, and FOI 32-3002 (Appendix I, J and K of the Permit).

III.E. INSPECTION SCHEDULES AND PROCEDURES

The Permittee shall inspect the OB/OD unit in accordance with the inspection schedule set out in Appendix C of the Permit.

III.F. PREVENTION OF UNINTENDED IGNITION OR REACTION OF WASTES

The Permittee shall follow the procedures, contained in Appendix E of the Permit, designed to prevent unintended ignition or reaction of waste.

III.G. MONITORING REQUIREMENTS

The Permittee shall conduct ground water monitoring at the OB/OD unit in accordance with Permit Condition IV. In addition, the Permittee shall follow the appropriate monitoring procedures under the Biological Mitigation Plan (Appendix L).

III.H. FACILITY MODIFICATION/EXPANSION

III.H.1. Permit Modification

Guam EPA reserves the right to modify this Permit in accordance with Part X.A. (Adopts by reference 40 CFR 270.41) of the GHWMRs.

III.H.2. Permit Modification At The Request Of The Permittee

Modifications or expansions of the facility shall be accomplished in accordance with Part X.A. (Adopts by reference 40 CFR 270.42) of the GHWMRs.

III.I. CLOSURE AND CONTINGENT POST-CLOSURE

III.I.1. At final closure of the OB/OD unit, the Permittee shall follow the procedures in the Closure Plan, Appendix G of the Permit.

III.I.2. If, after closure, the Permittee finds that not all contaminated soils and debris can be removed or decontaminated in accordance with the Closure Plan, then the Permittee shall close the OB/OD unit and perform post-closure care in accordance with requirements contained in Permit Condition V.

III.J. RECORDKEEPING

The Permittee shall develop and maintain all records required to comply with Part VI.A. [Adopts by reference 40 CFR 264.73 and 40 CFR 264.602] of the GHWMRs.

III.K. SCHEDULE FOR IMPROVEMENTS

The OB unit of the EOD range is in a non-operational condition and has not been maintained. In the event that the Permittee needs to conduct OB operations, the Permittee shall submit a schedule of repair for the OB unit to the Guam Environmental Agency for review and approval. The scope of repair work must enable the unit to meet the performance requirements and specifications for the OB unit described in the Permit. Pending completion and commencement of use of the improvements, the Permittee shall conduct open burning under interim status in accordance with Part VII.A. [Adopts by reference 40 CFR 265.382] of the GHWMRs.

The Permittee shall commence use of the permitted open burn component of the OB/OD unit if, within thirty (30) days of submission of certification of construction, the Administrator has not inspected the unit component; otherwise, the Permittee shall commence use of the permitted unit component at an earlier time upon Administrator inspection and approval.

SECTION IV - GROUNDWATER MONITORING

IV.A. SECTION HIGHLIGHTS

Open burning and open detonation of waste ordnance materials occurs at the Explosive Ordnance Disposal (EOD) Range. The unit is located at the extreme eastern reach of Tarague Beach, ending just before Tagua Point (Photo 9, Appendix H of the Permit). The grid coordinates for the Open Detonation unit is 13 degrees, 35.58 minutes north, 144 degrees, 56.48 minutes east. This area has been in constant use since its inception at least twenty (20) years ago. Its mission is to render unserviceable ordnance and other pyrotechnic devices harmless by either suppressed detonation or open burning. In addition, the EOD range has been used for EOD training purposes and emergency purposes.

The EOD range is defined as the open beach area bounded by the Pacific Ocean to the north and the jungle and/or limestone to the east, south, and west. Surrounding the active treatment units is a 2,400 foot-radius safety zone, as defined by operational requirements.

The reactive wastes treated at the OB/OD unit consist of common military ordnance material (such as black powder, white/red phosphorus, tear gas, ammunitions, propellants, and explosive materials).

After considering the Permittee's Subpart X application for the OB/OD unit, the Administrator has determined that the site monitoring program shall consist of ground-water monitoring to ensure that any release of hazardous waste or hazardous constituents from open burning/open detonation of reactive wastes to the shallow unconfined aquifer beneath the OB/OD unit are detected and, as appropriate, addressed through corrective action. The elements of the site-monitoring program to be established by the Permittee are derived from Part VI.A. [Adopts by reference 40 CFR Part 264, Subpart F] of the GHWMRs, but have been tailored as detailed herein to the site- and unit-specific risks and circumstances posed by this Subpart X unit. Therefore, any references herein to particular Part VI.A. [Adopts by reference 40 CFR Part 264, Subpart F] of the GHWMRs, requirements do not imply that the full Subpart F standards are applicable.

Due to the proximity of the facility to the ocean, additional information was collected for the design of the groundwater-monitoring program. The Permittee submitted a Dye Trace Study Work Plan for the purpose of determining suitable monitoring points for monitoring groundwater. The Dye Trace Study Work Plan has been implemented, and results reported in the Dye Trace Study Results Report. The Permittee used the data from the Dye Trace Study Results Report to prepare the facility Groundwater Monitoring Plan (Appendix M of the Permit). The Groundwater Monitoring Plan was approved by the Administrator in 2012 and is currently being implemented.

IV.A.1. Groundwater Monitoring Plan

The Permittee has submitted an application for Permit modification to the Administrator for the groundwater monitoring program for the shallow unconfined aquifer beneath the OB/OD unit. To the extent applicable, the application for Permit modification includes:

IV.A.1.a. The design of a well system which will yield ground-water samples from the shallow unconfined aquifer which represent the quality of up gradient water and water passing the down gradient boundaries of the OB/OD unit. Well locations and well construction details (for existing and any proposed wells) shall be specified in the design report. For proposed wells, the design report shall also include a schedule for installation (not to exceed ninety (90) days from the effective date of the Administrator's approval of the Permit modification request) and a schedule for submittal of certification of proper installation (not to exceed one hundred twenty (120) days from the effective date of the Administrator's approval of the Permit modification request).

IV.A.1.b. A sampling and analysis plan consisting of procedures and techniques for:

i. Sample collection

ii. Sample preservation and shipment

iii. Analytical procedures and

iv. Chain-of-custody control.

The plan shall also include a list of proposed parameters or constituents to be monitored. The list shall solely consist of the parameters identified in Permit Conditions IV.A.1. and IV.C. of this section, with the exception that if bis (2-ethylhexyl) phthalate is not detected during the verification sampling rounds or its presence can be attributed to non-OB/OD activities, it may be deleted from the proposed analyte list for the site monitoring program.

The plan shall also include the frequency for collecting samples, except that the frequency shall not be less than semiannual sampling of the site monitoring system, to be initiated commencing with the effective date of the Administrator's approval of the Permit modification request or the date of certification of any new wells that are installed, whichever is later.

IV.A.1.c. Criteria for establishing whether a release that may have adverse effects on human health and the environment has occurred from the OB/OD unit to ground water at the point of compliance wells. The Permittee shall propose one, the other, or a combination of the following methods, at the election of the Permittee, for determining the existence of a release:

i. Comparison of measured ground-water concentrations to concentration limits that will not pose a significant presence or potential risk to human health or the environment as long as the limits are not exceeded (risk-based concentration limits). The application for Permit modification shall include, as applicable, the proposed risk-based concentration limits and a detailed rationale and justification for development of these limits.

ii. Statistical evaluation of the groundwater data in accordance with Permit Condition IV.F., including comparison of collected data to data representative of background concentrations of metals and, as applicable, explosives concentrations in ground-water samples up gradient of the OB/OD unit. The application for Permit modification shall include, as applicable, any proposed background concentrations and a detailed rationale and justification for establishment of these limits and the statistical method(s) to be used by the Permittee.

IV.A.1.d. Procedures for notification to the Administrator in accordance with Permit Conditions IV.H.4.a. and b. of an exceedance of a risk-based concentration limit and/or statistically significant evidence of a release and for immediate re-sampling of the well(s) that exhibited the exceedance for the particular constituent(s).

IV.A.1.e. If the release is confirmed, procedures in accordance with Permit Conditions IV.H.4.d. or e. and/or IV.H.5.a.-d., for submittal of an application for Permit modification.

IV.A.1.f. Procedures for conducting a trend analysis on the ground-water data. At minimum, the Permittee shall propose to construct and maintain a graph for each well that depicts the variation in concentrations with respect to time and to update these graphs after receiving the results of each sampling event. The Permittee shall determine for each well whether any of the parameters have exhibited what appears to be a significant trend toward increased concentrations. In the event a significant trend is apparent, the Permittee shall propose one or more of the following measures to address the apparent trend: re-sampling of the well(s) in question, notification to the Administrator of the results of the re-sampling and whether the apparent trend is confirmed or not, and, as applicable, proposed changes in operating and/or monitoring practices to address the apparent trend.

IV.B. WELL LOCATION, INSTALLATION AND CONSTRUCTION

Upon the Administrator's approval of the application for Permit modification referenced in Permit Condition IV.A.1. and in accordance with the schedules contained in that approval, the Permittee shall install and maintain a ground-water monitoring system as specified below:

IV.B.1. The Permittee shall install and maintain the approved groundwater monitoring wells at the locations specified on a map to be submitted with the application for Permit modification. The map shall also provide unique identifiers for each well and shall identify point of compliance wells. The numbers and locations of the wells must be sufficient to identify and define the logical ground-water release pathways from the OB/OD unit based on the site-specific hydrogeologic characterization.

IV.B.2. The Permittee shall, for any wells constructed after the effective date of the Permit, construct and maintain the monitoring wells identified in Permit Condition IV.B.1. in accordance with the detailed plans and specifications to be submitted in and approved through the application for Permit modification.

IV.B.3. All wells deleted from the monitoring program shall be decommissioned in accordance with procedures to be specified in the application for Permit modification. The application shall also contain procedures for ensuring that well decommissioning methods and certification shall be submitted to the Administrator within thirty (30) days from the date the wells are removed from the monitoring program.

IV.C. INDICATOR PARAMETER AND MONITORING CONSTITUENTS

During the first year of groundwater monitoring, the Permittee established background levels for the explosive constituent cyclotrimethylene trinitramine (RDX), mercury, and lead for the site-monitoring program. The Administrator may allow determination of background quality for RDX, mercury, and lead based on samples from other wells on the installation. Subsequent monitoring events will continue to analyze for these parameters.

IV.D. SAMPLING AND ANALYSIS PROCEDURES

The Permittee shall use the following techniques and procedures when obtaining and analyzing samples from the groundwater monitoring wells described in Permit Condition IV.B.

IV.D.1. Samples shall be collected using the techniques described in the sampling and analysis plan referenced in Permit Condition IV.A.1.b. as approved by the Administrator.

IV.D.2. Samples shall be preserved and shipped in accordance with the procedures specified in the sampling and analysis plan referenced in Permit Condition IV.A.1.b. as approved by the Administrator.

IV.D.3. Samples shall be analyzed in accordance with the procedures specified in the sampling and analysis plan referenced in Permit Condition IV.A.1.b. as approved by the Administrator.

IV.D.4. Samples shall be tracked and controlled using the chain-of-custody procedures specified in the sampling and analysis plan referenced in Permit Condition IV.A.1.b. as approved by the Administrator.

IV.E. ELEVATION OF THE GROUNDWATER SURFACE

IV.E.1. The Permittee shall determine the elevation of the groundwater surface at each well each time the groundwater is sampled.

IV.E.2. The Permittee shall record the surveyed elevation of the monitoring well(s) when installed (with as-built drawings).

IV.F. STATISTICAL PROCEDURES

IV.F.1. As applicable, when evaluating the monitoring results in accordance with Permit Condition

IV.G. The Permittee shall use one of the following statistical methods:

IV.F.1.a. A parametric analysis of variance (ANOVA) followed by multiple comparison procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well mean and the background mean levels for each constituent.

IV.F.1.b. An analysis of variance (ANOVA) based on ranks followed by multiple comparison procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well median and the background median levels for each constituent.

IV.F.1.c. A tolerance or prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit.

IV.F.1.d. A control chart approach that gives control limits for each constituent.

IV.F.1.e. Another statistical test method submitted by the Permittee and approved by the Administrator.

IV.F.2. Any statistical method identified in Permit Condition IV.F.1. that is selected by the Permittee shall comply with the following performance standards, as appropriate, and shall be selected with regard to the appropriateness of these tests for site conditions as outlined in Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities: Interim Final Guidance (EPA, OSW, 1989):

IV.F.2.a. The statistical method used to evaluate groundwater-monitoring data shall be appropriate for the distribution of chemical parameters or hazardous constituents. If the distribution of the chemical parameters or hazardous constituents is shown by the Permittee to be inappropriate for a normal theory test, then the data should be transformed or a distribution-free theory test should be used. If the distributions for the constituents differ, more than one statistical method may be needed.

IV.F.2.b. If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a ground-water protection standard, the test shall be done at a Type 1 error level no less than 0.01 for each testing period. If a multiple comparisons procedure is used, the Type 1 experiment-wise error rate for each testing period shall be no less than 0.05; however, the Type 1 error of no less than 0.01 for individual well comparisons must be maintained. This performance level does not apply to tolerance intervals, prediction intervals, or control charts.

IV.F.2.c. If a control chart approach is used to evaluate groundwater monitoring data, the specific type of control chart and its associated parameter values shall be proposed by the Permittee and approved by the Administrator.

IV.F.2.d. If a tolerance interval or a prediction interval is used to evaluate groundwater monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, shall be proposed by the Permittee and approved by the Administrator. These parameters will be determined after considering the number of samples in the background database, the data distribution, and the range of the concentration values for each constituent of concern.

IV.F.2.e. The statistical method shall account for data below the limit of detection with one or more statistical procedures that are protective of human health and the environment. Any practical quantification limit (PQL) that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.

IV.F.2.f. If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.

IV.G. MONITORING PROGRAM AND DATA EVALUATION

IV.G.1. The Permittee shall collect, preserve, and analyze samples pursuant to Permit Condition IV.D.

IV.G.2. After approval of the application for Permit modification (Permit Condition IV.A.1.), the Permittee shall collect samples and conduct a determination semiannually as to whether there is an exceedance of a risk-based concentration limit and/or statistically significant evidence of contamination for the parameter and hazardous constituents specified in Permit Condition IV.C. The Permittee shall express the groundwater quality at each monitoring well in a form necessary for any determination of statistically significant increases (i.e., means and variances) and/or exceedance of a risk-based concentration limit.

IV.G.3. After approval of the application for Permit modification (Permit Condition IV.A.1.), the Permittee shall determine the groundwater flow rate and direction in the uppermost aquifer at least annually. Methods for flow monitoring shall be proposed by the Permittee in the application for Permit modification (Permit Condition IV.A.1.) and approved by the Administrator.

IV.G.4. After approval of the application for Permit modification (Permit Condition IV.A.1.), the Permittee shall determine whether there is an exceedance of a risk-based concentration limit and/or statistically significant increase over the background values for the parameter and hazardous constituents identified in Permit Condition IV.C. each time groundwater quality is determined at the compliance point. In determining whether such an increase has occurred, the Permittee must compare the groundwater quality at each monitoring well specified in Permit Condition IV.B.1. to the risk-based concentration limits established through Permit Condition IV.A.1c.i. and/or the background value established through Permit Condition IV.A.1.c.ii. in accordance with one or more of the statistical procedures specified in Permit Condition IV.F. as applicable.

IV.H. RECORDKEEPING AND REPORTING

IV.H.1. The Permittee shall enter all monitoring, testing, and analytical data obtained in accordance with Permit Condition IV.G. in the facility operating record. The data must include all computations and results associated with statistical tests, if used in evaluating groundwater monitoring data.

IV.H.2. The established risk-based concentration limits and/or background values and the computations necessary to determine these limits and/or values must be submitted to the Administrator.

Groundwater monitoring data collected, including actual levels of constituents, must be maintained in the facility operating record.

IV.H.3. The Permittee shall submit to the Administrator the analytical results required by Permit Condition IV.G.2. the groundwater flow rate and direction results required by Permit Condition IV.G.3., and the results of the initial analyses required by Permit Condition IV.G.4. in a semiannual site monitoring report to be submitted within sixty (60) days of receipt of analytical results from each semiannual sampling event.

IV.H.4. If the Permittee determines, pursuant to Permit Condition IV.G. that there is an exceedance of a risk-based concentration limit and/or a statistically significant increase above the background values for the parameter or hazardous constituents specified in Permit Condition IV.C., the Permittee shall:

IV.H.4.a. Notify the Administrator in writing within seven (7) days of the determination.

IV.H.4.b. Immediately sample the groundwater in the well(s) that exhibited the increase and determine the concentration of the particular constituent(s) that have shown an exceedance of a risk-based concentration limit and/or statistically significant increase in concentration.

IV.H.4.c. As applicable, the Permittee may establish the background values for the particular constituent(s).

IV.H.4.d. If a statistically significant release is confirmed, based on an exceedance of background values, pursuant to the re-sampling required by Permit Condition IV.H.4.b, within ninety (90) days of receipt of analytical results from the re-sampling, submit to the Administrator an application for a Permit modification to establish a compliance monitoring program. The application must include the following information:

An identification of the concentration of constituents found in the groundwater at each monitoring well at the compliance point.

Any proposed changes to the groundwater monitoring system at the facility necessary to meet the requirements of compliance monitoring.

i. Any proposed changes to the monitoring frequency, sampling and analysis procedures, or methods or statistical procedures used at the facility necessary to meet the requirements of compliance monitoring.

ii. For each hazardous constituent found at the compliance point, a proposed alternate background concentration limit or a notice of intent to seek an alternate concentration limit (ACL) for a hazardous constituent, or if no ACL will be sought a schedule for submittal of a corrective action feasibility plan in accordance with Part VI.A. [Adopts by reference 40 CFR Part 264.100] of the GHWMRs to the Administrator within one hundred eighty (180) days.

IV.H.4.e. If a release, which was identified based on an exceedance of a risk-based concentration limit, is confirmed pursuant to the re-sampling required by Permit Condition IV.H.4.b. within ten (10) days of receipt of analytical results from the re-sampling, the Permittee shall submit written notice to the Administrator that identifies the concentration(s) of constituents in the ground water at each monitoring well at the compliance point and that contains a notice of intent to submit an application for Permit modification that contains a corrective action feasibility plan.

Within 180 days of confirmation of the release identified pursuant to Permit Condition IV.H.4.e., the Permittee shall submit a corrective action feasibility plan in accordance with Part VI.A. [Adopts by reference 40 CFR Part 264.100] of the GHWMRs to the Administrator.

IV.H.5. If the Permittee determines, pursuant to Permit Condition IV.G. there is an exceedance of a risk-based concentration limit and/or statistically significant increase above the background values for the parameter and hazardous constituents specified in Permit Condition IV.C. it may demonstrate that a source other than a regulated unit caused the increase or that the increase resulted from error in sampling, analysis, or evaluation. In such cases, the Permittee shall:

IV.H.5.a. Notify the Administrator in writing within seven (7) days of the determination made pursuant to Permit Condition IV.G. that it intends to make a demonstration.

IV.H.5.b. Within ninety (90) days of the notice, submit a report to the Administrator, which demonstrates that a source other than a regulated unit caused the increase, or that the increase resulted from error in sampling, analysis, or evaluation.

IV.H.5.c. Within ninety (90) days of the notice, submit to the Administrator an application for a Permit modification to make any appropriate changes to the site-monitoring program at the facility.

IV.H.5.d. Continue to monitor in accordance with the site-monitoring program at the facility.

IV.I. REQUEST FOR PERMIT MODIFICATION

If the Permittee or the Administrator determines the site monitoring program no longer satisfies the requirements of the regulations, the Permittee must, within ninety (90) days of its determination or receipt of written notice of the Administrator's determination, submit an application for a Permit modification to make any appropriate changes to the program which will satisfy the requirements of Part VI.A. [Adopts by reference 40 CFR Part 264, Subpart X] of the GHWMRs.

SECTION V - CONTINGENT POST-CLOSURE CARE

V.A. UNIT IDENTIFICATION

In the event, the Permittee cannot or elects not to clean close the OB/OD unit, the Permittee shall provide post-closure care for the unit, subject to the terms and conditions of this Permit.

V.B. POST-CLOSURE PROCEDURES AND USE OF PROPERTY

V.B.1. The Permittee shall conduct post-closure care for the OB/OD unit, to begin after completion of closure of the unit and continue for thirty (30) years after that date, except that the thirty (30) year post-closure care period may be shortened upon application and demonstration approved by the Administrator that the facility is secure, or may be extended if the Administrator finds this is necessary to protect human health and the environment, Part VI.A. [Adopts by reference 40 CFR 264.117(a)] of the GHWMRs.

V.B.2. The Permittee shall maintain and monitor the site monitoring system of Permit Condition IV during the post-closure period.

V.B.3. If the OB/OD unit cannot be clean-closed, it must be closed as a landfill or as a land treatment unit, at the election of the Permittee.

V.B.3.a. If the Permittee elects to comply with the requirements for landfills, the following are applicable, except to the extent they may be modified by the Administrator for this Subpart X unit, Part VI.A. [Adopts by reference 40 CFR 264.310(b)] of the GHWMRs:

Maintain the integrity and effectiveness of the final cover, including making repairs to the cap, as necessary, to correct the effects of settling, subsidence, erosion, or other events;

Maintain and monitor the site monitoring system provided for in Permit Condition IV;

Prevent run-on and run-off from eroding or otherwise damaging the area

Protect and maintain surveyed benchmarks used in complying with the surveying and record keeping requirements of Part VI.A. [Adopts by reference 40 CFR 264.309] of the GHWMRs.

V.B.3.b. If the Permittee elects to comply with the requirements for land treatment units, the post-closure criteria in Part VI.A. [Adopts by reference 40 CFR 264.280(c)(2)-(6) and (d) and (e)] of the GHWMRs, are applicable, except to the extent these criteria may be modified by the Administrator for this Subpart X unit.

V.B.4. The Permittee shall comply with any security requirements required by the Administrator pursuant to Part VI.A. [Adopts by reference 40 CFR 264.117(b)] of the GHWMRs.

V.B.5. The Permittee shall not allow any use of the OB/OD unit, which will disturb the integrity of any final cover, any components of the containment system, or the function of the facility's monitoring system during the post-closure care period. Part VI.A. [Adopts by reference 40 CFR 264.117(c)] of the GHWMRs.

V.B.6. The Permittee shall implement the Contingent Post-Closure Plan. All post-closure care activities must be conducted in accordance with the provisions of the Contingent Post-Closure Plan. Part VI.A. [Adopts by reference 40 CFR 264.117(d) and 264.118(b)] of the GHWMRs.

V.C. INSPECTIONS

The Permittee shall inspect the components, structures, and equipment at the closed OB/OD unit in accordance with the Inspection Schedule in the Contingent Post-Closure Plan. Part VI.A. [Adopts by reference 40 CFR 264.117(a)(1)(ii)] of the GHWMRs.

V.D. NOTICES AND CERTIFICATION

V.D.1. No later than sixty (60) days after certification of closure of the OB/OD unit, the Permittee shall submit to the Administrator a record of the types and estimated quantity of hazardous wastes treated at the OB/OD unit. For hazardous wastes treated before January 12, 1981, the Permittee shall identify the type, location, and quantity of the hazardous wastes to the best of its knowledge and in accordance with any records it has kept. Part VI.A. [Adopts by reference 40 CFR 264.119(a)] of the GHWMRs.

V.D.2. No later than submission of certification of closure of the OB/OD unit, the Permittee shall:

V.D.2.a. Submit the survey plat referenced in Permit Condition II.M.4.b. to the Administrator and DPW Real Estate Division of the Permittee.

V.D.3. If the Permittee or any subsequent owner or operator of the land upon which the OB/OD unit is located, wishes to remove hazardous wastes and hazardous waste residues, the liner, if any, or contaminated soils, then he shall request a modification to this Permit in accordance with the applicable requirements in Part XI.A. [Adopts by reference 40 CFR Part 124] and Part X.A. [Adopts by reference 40 CFR Part 270] of the GHWMRs. The Permittee or any subsequent owner or operator of the land shall demonstrate that the removal of hazardous wastes will satisfy the criteria of Part VI.A. [Adopts by reference 40 CFR 264.117(c)] of the GHWMRs.

V.D.4. No later than sixty (60) days after completion of the established post-closure care period for the OB/OD unit, the Permittee shall submit to the Administrator, by registered mail, a certification that the post-closure care for the OB/OD unit was performed in accordance with the specifications in the approved Contingent Post-Closure Plan. The certification must be signed by the Permittee and an independent registered professional engineer. Documentation supporting the independent, registered professional engineer's certification must be furnished to the Administrator upon request. Part VI.A. [Adopts by reference 40 CFR 264.120] of the GHWMRs.

V.E. FINANCIAL ASSURANCE

V.E.1. In accordance with Part VI.A. [Adopts by reference 40 CFR 264.140] of the GHWMRs, the federal government is exempt from the financial assurance requirements of Part VI.A. [Adopts by reference 40 CFR Part 264, Subpart H] of the GHWMRs. Consequently, a cost estimate and financial assurance mechanism for post-closure care of the OB/OD unit are not required.

V.F. POST-CLOSURE PERMIT MODIFICATIONS

The Permittee must request a permit modification to authorize a change in the approved Contingent Post-Closure Plan. This request must be in accordance with applicable requirements of Part XI.A. [Adopts by reference 40 CFR Part 124] and Part X.A. [Adopts by reference 40 CFR Part 270] of the GHWMRs, and must include a copy of the proposed amended Post-Closure Plan for approval by the Administrator. The Permittee shall request a permit modification whenever changes in operating plans or facility design affect the approved Post-Closure Plan, there is a change in the expected year of final closure, or other events occur during the active life of the facility that affect the approved Post-Closure Plan. The Permittee must submit a written request for a permit modification at least sixty (60) days prior to the proposed change in facility design or operation, or no later than sixty (60) days after an unexpected event has occurred which has affected the Post-Closure Plan. Part VI.A. [Adopts by reference 40 CFR Part 264.118(d)] of the GHWMRs.

SECTION VI: ADDITIONAL PERMIT CONDITION

The application for Permit modification for the open burning improvements (Permit Condition III.K) shall also include a description of the measures, including confirmatory sampling. The Permittee shall take to ensure that the area of the OB/OD unit, where the open burning component(s) will be located is evaluated, as needed, and measures taken to protect from installation of a permanent structure or structures over an area where unexploded ordnance, debris, or scrap are located. Any soil or material that must be removed during construction and that will not be re-deposited at the unit for construction shall be properly characterized and removed to an authorized on or off-site treatment, storage, disposal, or recycling facility. The certification of construction to be submitted by the Permittee to the Administrator upon completion of the improvement shall include a description of how any excavated soil or material were characterized and managed.

SECTION VII - CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

Andersen Air Force Base began a base wide RCRA corrective action program in 1984. Many SWMUs have been identified at the Base. These SWMUs are widespread throughout the base and include such units such as landfills, drum storage areas, and fire training areas. After the Base was listed on the National Priorities List as a Superfund site in 1992, the Air Force entered into a three-party Federal Facilities Agreement (FFA) with USEPA Region IX and Guam Environmental Protection Agency. Under this agreement, SWMUs under the RCRA correction action program were to have been cleaned up under the Superfund. However, additional SWMUs have been identified that are not covered under the FFA. The Air Force has begun the corrective action process on these SWMUs (see Table 2). Regulatory oversight of corrective actions at the SWMUs not covered under the FFA will be accomplished through this Permit.

Guam EPA and USEPA Region IX shall review the Permittee's corrective action program. The Permittee shall address comments from the Administrator and USEPA Region IX. In addition, the Permittee shall conduct corrective action in accordance with the correction process described in this section, the schedule approved by the Administrator, and the references attached in this Section.

Specific Conditions are Pursuant to the Guam Hazardous Waste Management Regulations and the 1984 Hazardous and Solid Waste Amendments (HSWA) to RCRA for Andersen Air Force Base Guam EPA ID Number GU6571999519.

VII.A. DEFINITIONS

For purposes of these special conditions pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA and the Guam Hazardous Waste Management Regulations the following definitions shall apply:

"Administrator" means the Administrator of the Guam Environmental Protection Agency.

"Area of Concern" (AOC) means any discernable unit or area which, in the opinion of the Administrator, may have received solid or hazardous waste or waste containing hazardous constituents at any time. The Administrator may require investigation of the unit as if it were a SWMU. If shown to be a SWMU by the investigation, the AOC must be reported by the Permittee as a newly identified SWMU. If the AOC is shown not to be a SWMU by the investigation, the Administrator may determine that no further action is necessary and notify the Permittee in writing.

"CMS" means Corrective Measures Study.

“Days” means calendar days unless otherwise specified.

"Division Director" means the Division Director for the Hazardous Waste Management Division within the United States Environmental Protection Agency, Region IX.

"EPA" means the United States Environmental Protection Agency.

"Facility" means all contiguous property under the control of the United States Air Force seeking a permit under Subtitle C of RCRA.

"Guam EPA" means the Guam Environmental Protection Agency.

“GHWMRs” means the Guam Hazardous Waste Management Regulations

"Hazardous waste" means a solid waste as defined under the Guam Hazardous Waste Management Regulations (GHWMRs), or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. The term hazardous waste includes hazardous constituent as defined below.

"Hazardous constituent" means any constituent identified the Part III of GHWMRs (Adopts Appendix VIII of 40 CFR Part 261, Appendix IX of 40 CFR Part 264).

"HSWA" means the 1984 Hazardous and Solid Waste Amendments to RCRA.

"Permit" means the conditions embodied in these special conditions pursuant to Guam Hazardous Waste Management Regulations and the 1984 Hazardous and Solid Waste Amendments to RCRA.

"Permittee" means the United States Air Force Andersen Air Force Base, Guam EPA ID No. GU6571999519

"RCRA" means the Resource Conservation and Recovery Act of 1980 as amended by the Hazardous and Solid Waste Amendments (HSWA) of 1984.

"RCRA Permit" means the full permit, with GHWMRs, RCRA, and HSWA portions.

"RFA" means RCRA Facility Assessment.

"RFI" means RCRA Facility Investigation.

"Release" means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

"Solid Waste Management Unit" (SWMU) means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.

“USEPA Region IX” means United States Environmental Protection Agency, Region IX.

If, subsequent to the issuance of this permit, regulations are promulgated which redefine any of the above terms, the Administrator may, at its discretion, apply the new definition to this permit.

VII.B. STANDARD CONDITIONS

VII.B.1. WASTE MINIMIZATION

The Permittee shall submit a certified plan according to Part X.A. [Adopts by reference 40 CFR 270.11] of the GHWMRs, in writing, annually, by December 1, for the previous year ending September 30, specifying that: the Permittee has a program in place to reduce the volume and toxicity of all hazardous wastes which are generated by the facility's operation to the degree determined to be economically practicable; and that the proposed method of treatment, storage, or disposal is the practicable method currently available to the Permittee which minimizes the present and future threat to human health and the environment. This certified plan must address the items below:

Any written policy or statement that outlines goals, objectives, and/or methods for source reduction and recycling of hazardous waste at the facility;

Any employee training or incentive programs designed to identify and implement source reduction and recycling opportunities;

Any source reduction and/or recycling measures implemented in the last five years or planned for the near future;

An itemized list of the dollar amounts of capital expenditures (plant and equipment) and operating costs devoted to source reduction and recycling of hazardous waste;

Factors that have prevented implementation of source reduction and/or recycling;

Sources of information on source reduction and/or recycling received at the facility (e.g., local government, trade associations, suppliers, etc.);

An investigation of additional waste minimization efforts, which could be implemented at the facility. This investigation shall analyze the potential for reducing the quantity and toxicity of each waste stream through production reformulation, recycling, and all other appropriate means. The analysis shall include an assessment of the technical feasibility, cost, and potential waste reduction for each option;

The Permittee shall submit a flow chart or matrix detailing all hazardous wastes it produces by quantity, type, and building/area.

The Permittee shall demonstrate the need to use those processes, which produce a particular hazardous waste due to a lack of alternative processes, or available technology that would produce less hazardous waste.

The Permittee shall include this certified plan in the operating record. This section applies to the RCRA Permit.

VII.B.2. DUST SUPPRESSION

Pursuant to the Part VIII.A. [Adopts by reference 40 CFR 266.23(b)] of the GHWMRs, the Permittee shall not use waste or used oil or any other material which is contaminated with dioxin, polychlorinated biphenyl’s (PCBs), or any other hazardous waste (other than a waste identified solely on the basis of ignitability), for dust suppression or road treatment. This section applies to the RCRA Permit.

VII.B.3. PERMIT MODIFICATION

If at any time for any of the reasons specified in Part X.A. [Adopts by reference 40 CFR 270.41] of the GHWMRs, the Administrator determines that modification of this Permit is necessary, the Administrator may require the Permittee to request a permit modification per Permit Condition VII.B.3. or may initiate a modification according to Part XI.A. [Adopts by reference 40 CFR 124.5] of the GHWMRs, as follows:

Notify the Permittee in writing of the proposed modification and the date by which comments on the proposed modification must be received.

Publish a notice of the proposed modification in a locally distributed newspaper, broadcast the notice over a local radio station, mail a notice to all persons on the facility mailing list maintained according to Part XI.A. [Adopts by reference 40 CFR 124.10(c)(1)(ix)] of the GHWMRs, and place a notice in the facility's information repository (a central source of all pertinent documents concerning the remedial action, usually maintained at the facility or some other public place in the vicinity of the permitted facility, such as a public library).

If the Administrator receives no written comment on the proposed modification, the modification will become effective five (5) calendar days after the close of the comment period. The Administrator will:

Notify the Permittee in writing of the final decision.

Notify individuals on the facility mailing list in writing that the modification has become effective and shall place a copy of the modified permit in the information repository, if a repository is required for the facility.

If the Administrator receives written comment on the proposed modification, the Administrator will make a final determination concerning the modification after the end of the comment period.

The Administrator will:

Notify the Permittee in writing of the final decision.

Provide notice of the final modification decision in a locally distributed newspaper and place a copy of the modified permit in the information repository, if a repository is required for the facility.

The Permittee may initiate a permit modifications proceeding under Part X.A. [Adopts by reference 40 CFR 270.42] of the GHWMRs. All applicable requirements and procedures as specified in Part X.A. [Adopts by reference 40 CFR 270.42] of the GHWMRs shall be followed. Modifications of the Permit do not constitute a reissuance of the Permit.

VII.B.4. PERMIT REVIEW

This Permit may be reviewed by the Administrator three years after the date of permit issuance and may be modified as necessary as provided for in Permit Condition VII.B.3. Nothing in this section shall preclude the Administrator from reviewing and modifying the Permit at any time during its term. This section applies to the RCRA Permit.

VII.B.5. COMPLIANCE WITH PERMIT

Compliance with this Permit during its term constitutes compliance, for the purposes of enforcement, with Parts VI.A. and Part VIII.A. [Adopts by reference 40 CFR Parts 264 and 266] of the GHWMRs, only for those management practices specifically authorized by this Permit. The Permittee is also required to comply with Parts II, III, IV.A., and V.A. [Adopts by reference 40 CFR Parts 260, 261, 262, and 263] of the GHWMRs as applicable.

VII.B.6. SPECIFIC WASTE BAN

The Permittee shall not place in any land disposal unit wastes specified in Part IX.A. [Adopts by reference 40 CFR Part 268] of the GHWMRs, after the effective date of the prohibition unless the Administrator has established disposal or treatment standards for the hazardous waste and the Permittee meets such standards and other applicable conditions of this Permit. Because OB/OD is a treatment process, it is not subject to the land disposal restrictions imposed by Section 3004(d) through (m) of RCRA (52 Federal Register 46952, Dec. 10, 1987).

The Permittee may store wastes restricted under Part IX.A. [Adopts by reference 40 CFR Part 268] of the GHWMRs, solely for the purpose of accumulating quantities necessary to facilitate proper recovery, treatment, or disposal provided that it meets the requirements of Part IX.A. [Adopts by reference 40 CFR 268.50(a)(2)] of the GHWMRs, including, but not limited to, clearly marking each tank or container.

The Permittee is required to comply with all requirements of Part IX.A. [Adopts by reference 40 CFR 268.7] of the GHWMRs as amended. Changes to the waste analysis plan will be considered permit modifications at the request of the Permittee; pursuant to Part X.A. [Adopts by reference 40 CFR 270.42] of the GHWMRs. The Permittee shall perform a waste analysis at least annually or when a process changes, to determine whether the waste meets applicable treatment standards. Results shall be maintained in the operating record.

The Permittee must comply with requirements restricting placement of hazardous wastes in or on land which become effective by statute or promulgated under Part IX.A. [Adopts by reference 40 CFR Part 268) of the GHWMRs, regardless of requirements in the Permit. Failure to comply with the regulations may subject the Permittee to enforcement action under the GHWMRs and Section 3008 of RCRA. This section applies to the RCRA Permit.

VII.B.7. INFORMATION SUBMITTAL

Failure to comply with any condition of the Permit, including information submittal, constitutes a violation of the Permit and is grounds for enforcement action, permit amendment, termination, revocation, suspension, or denial of permit renewal application. Falsification of any submitted information is grounds for termination of this Permit in accordance with Part X.A. [Adopts by reference 40 CFR 270.43] of the GHWMRs.

The Permittee shall ensure that all plans, reports, notifications, and other submissions to the Administrator required in this Permit are signed and certified in accordance with Part X.A. [Adopts by reference 40 CFR 270.11] of the GHWMRs. A summary of the planned reporting requirements pursuant to this Permit is found in Table 1. Two (2) copies and one electronic copy each of these plans, reports, notifications, or other submissions shall be submitted to the Administrator by certified mail or hand delivered to:

Administrator
Guam Environmental Protection Agency
17-3304 Mariner Avenue Tiyan
Barrigada, GU 96913-1617
Attn: Hazardous Waste Management Program

An additional copy of these documents must be submitted to the following:

U.S. Department of the Interior
Fish and Wildlife Service
Pacific Islands Office
Post Office Box 50167
Honolulu, HI 96850
Attn: Field Supervisor

VII.B.8. PLANS AND SCHEDULES INCORPORATED INTO PERMIT

All plans and schedules required by this Permit are, upon approval by the Administrator, incorporated into this Permit by reference and become an enforceable part of this Permit. Since required items are essential elements of this Permit, failure to submit any of the required items or submission of inadequate or insufficient information may subject the Permittee to enforcement action under Section 3008 of RCRA which may include fines, suspension, or revocation of the Permit.

Any noncompliance with approved plans and schedules shall be termed noncompliance with this Permit. Written requests for extensions of due dates for submittals may be granted by the Administrator in accordance with Permit Condition VII.B.3.

If the Administrator determines that actions beyond those provided for, or changes to what is stated herein are warranted, the Administrator may modify this Permit according to procedures in Permit Condition VII.B.3.

VII.B.9. DATA RETENTION

All raw data, such as laboratory reports, drilling logs, bench-scale or pilot-scale data, and other supporting information gathered or generated during activities undertaken pursuant to this Permit shall be maintained at the facility during the term of this Permit, including any reissued Permits.

VII.C. SPECIFIC CONDITION - CLOSURE & POST-CLOSURE (Reserved)

VII.D. SPECIAL CONDITIONS

Within 30 days from the Issuance of the Permit, the Permittee shall submit to the Administrator up to date status reports for all the SWMUs and Areas of Concerns (AOCs) covered under this Permit and/or not being addressed under the Andersen Air Force Base Federal Facilities Agreement. The reports shall include all relevant documents in the corrective action process. Permittee shall address all relevant and appropriate comments from the Administrator.

VII.E. CORRECTIVE ACTION

VII.E.1. CORRECTIVE ACTION FOR RELEASES

Section 3004(u) of RCRA, as amended by HSWA, and Part VI.A. [Adopts by reference 40 CFR 264.101] of the GHWMRs require that permits issued after November 8, 1984, address corrective action for releases of hazardous wastes including hazardous constituents from any solid waste management unit (SWMU) at the facility and Andersen Air Force Base, regardless of when the waste was placed in the unit. (Table 2 lists the SWMUs and AOCs that are covered under this Permit. Updates of the status for each SWMU are provided through the Quarterly Progress Report as required in the Submission Summary (Table 1).

VII.E.2 RELEASES BEYOND FACILITY BOUNDARY

The Permittee shall notify the Administrator verbally, within 24 hours of discovery, of any release of hazardous waste or hazardous constituents that has the potential to migrate off-site.

Section 3004(v) of RCRA as amended by HSWA, and Part VI.A. [Adopts by reference 40 CFR 264.101(c)] of the GHWMRs, require corrective actions beyond the facility property boundary, where necessary to protect human health and the environment, unless the Permittee demonstrates that, despite the Permittee's best efforts, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where offsite access is denied.

VII.E.3. FINANCIAL RESPONSIBILITY

Assurances of financial responsibility for corrective action shall be provided as specified in the Permit following major modification for remedy selection. The federal government is exempt from this requirement.

VII.E.4.DISPUTE RESOLUTION

The parties shall use their best efforts to informally and in good faith resolve all disputes or differences of opinion. If, however, disputes arise concerning the corrective action which the parties are unable to resolve informally, including but not limited to, disputes over implementation of work plans, approval of documents, scheduling of any work, selection, performance or completion of any corrective action, or any other obligation assumed hereunder, the Permittee shall present a written notice of such dispute and the basis for the objections to Guam EPA within ten business days of the receipt of Guam EPA's disapproval, decision or directive. The notice shall set forth the specific points of the dispute, the position the Permittee maintains should be adopted as consistent with the Permit's requirements, the basis therefore, and any matters which it considers necessary for Guam EPA's proper determination. Guam EPA shall provide to the Permittee a written statement of its decision on the pending dispute, which shall be incorporated into the final Permit unless the Permittee requests an opportunity for a conference. The existence of a dispute as defined herein and the consideration of such matters which are placed into dispute shall not excuse, toll, or suspend any compliance obligation or deadline while the dispute resolution process is pending.

If the Permittee objects to any Guam EPA determination regarding any requirement by Guam EPA that the Permittee perform work, the Permittee shall, within ten days of its receipt of Guam EPA's decision, notify the Administrator in writing of its objections, and may request an informal conference. The Administrator shall state in writing his/her decision regarding the factual issues in dispute. Such decision shall be the final resolution of the dispute and shall be implemented immediately by the Permittee according to the schedule contained therein.

VII.F. REPORTING REQUIREMENTS

The Permittee shall submit, in accordance with Permit Condition VII.B.7., signed quarterly progress reports of all activities (i.e., RFI, CMS) conducted pursuant to the provisions of this Permit beginning no later than ninety (90) calendar days from the effective date of this Permit. This first progress report shall satisfy the reporting requirements for the particular calendar quarter that occurs within the 90 calendar days from Permit issuance. Thereafter, progress reports will be made within each consecutive calendar quarter of the year(s). These reports shall contain:

A description of the work completed and an estimate of the percentage of work completed;

Summaries of all findings, including summaries of laboratory data;

Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems;

Projected work for the next reporting period;

Summaries of contacts pertaining to corrective action or environmental matters with representatives of the local community, public interest groups or State government during the reporting period;

Changes in key project personnel during the reporting period; and

Summaries of all changes made in implementation during the reporting period.

Copies of other reports (e.g., inspection reports), drilling logs and laboratory data shall be made available to the Administrator upon request.

In addition to the written reports, at the request of the Administrative Authority, the Permittee shall provide status review through semi-annual briefings with the Administrator.

VII.G. NOTIFICATION REQUIREMENTS FOR AND ASSESSMENT OF NEWLY-IDENTIFIED SOLID WASTE MANAGEMENT UNITS (SWMUs)

The Permittee shall notify the Administrator, in writing, of any newly-identified SWMU(s) (i.e., a unit not specifically identified during the RFA), discovered in the course of groundwater-monitoring, field investigations, environmental audits, or other means, no later than 30 calendar days after discovery. The notification shall include the following items, to the extent available:

The location of the newly-identified SWMU in relation to other SWMUs;

The type and function of the unit;

The general dimensions, capacities, and structural description of the unit (supply any available drawings);

The period during which the unit was operated;

The specifics, to the extent available, on all wastes that have been or are being managed at the SWMU; and

Results of any sampling and analysis required for the purpose of determining whether releases of hazardous waste including hazardous constituents have occurred, are occurring, or are likely to occur from the unit.

Based on the results of this Notification, the Administrator will determine the need for further investigations or corrective measures at any newly identified SWMU(s). If the Administrator determines that such investigations are needed, the Administrator may require the Permittee to prepare a plan for such investigations. This plan will be reviewed for approval as part of the RFI Work Plan or a new RFI Work Plan under Permit Condition VII.J.3. The Permit will be modified according to Permit Condition VII.B.3., to incorporate the investigation requirements for the newly identified SWMU(s), if required.

VII.H. NOTIFICATION REQUIREMENTS FOR NEWLY-DISCOVERED RELEASES AT SWMU(s)

The Permittee shall notify the Administrator in writing, no later than fifteen (15) calendar days after discovery, of any release(s) of hazardous waste or hazardous constituents associated with a SWMU discovered during the course of ground water monitoring, field investigation, environmental auditing, or other means. Such newly discovered releases may be from newly-identified units or from units for which, based on the findings of the RFA, the Administrator had previously determined no further investigation was necessary. The Administrator may require further investigation and/or interim measures for the newly identified release(s), and may require the Permittee to prepare a plan for the investigation and/or interim measure. The plan will be reviewed for approval as part of the RFI Work Plan or a new RFI Work Plan under Permit Condition VII.J.3. The Permit will be modified according to Permit Condition VII.B.3., to incorporate the investigation, if required.

VII.I. INTERIM MEASURES

If during the course of any activity initiated under this Permit, the Administrator determines that a release or potential release of hazardous constituents from a SWMU poses a threat to human health and the environment, the Administrator may require interim measures. The Administrator shall determine the specific measure(s) or require the Permittee to propose a measure(s). The interim measure(s) may include a permit modification, a schedule for implementation, and a written plan. The Administrator shall notify the Permittee in writing of the requirement to perform interim measures. The Administrator shall modify this Permit according to Permit Condition VII.B.3. to incorporate interim measures into the Permit.   The following factors will be considered by the Administrator in determining the need for interim measures:

Time required to develop and implement a final remedy;

Actual and potential exposure to human and environmental receptors;

Actual and potential contamination of drinking water supplies and sensitive ecosystems;

The potential for further degradation of the medium in the absence of interim measures;

Presence of hazardous wastes in containers that may pose a threat of release;

Presence and concentration of hazardous waste including hazardous constituents in soil that have the potential to migrate to ground water or surface water;

Weather conditions that may affect the current levels of contamination;

Risks of fire, explosion, or accident; and

Other situations that may pose threats to human health and the environment.

VII.J. RFI WORKPLAN

Table 1 specifies the due date for the RFI Work Plan “As Determined”. The RFI Work Plan must address releases of hazardous waste or hazardous constituents to all media for those SWMUs and AOCs listed in Table 2.

The work plan shall describe the objectives of the investigation and the overall technical and analytical approach to completing all actions necessary to characterize the direction, rate, movement, and concentration of releases of hazardous waste or hazardous constituents from specific units or groups of units, and their actual or potential receptors. The RFI Work Plan shall detail all proposed activities and procedures to be conducted at the facility, the schedule for implementing and completing such investigations, the qualifications of personnel performing or directing the investigations, including contractor personnel, and the overall management of the RFI. The Scope of Work for a RCRA Facility Investigation (RFI) is in Permit Condition VII.R.

The RFI Work Plan shall describe sampling, data collection quality assurance, and data management procedures, including formats for documenting and tracking data and other results of investigations, and health and safety procedures.

Development of the RFI Work Plan and reporting of data shall be consistent with the following EPA guidance documents or the equivalent thereof:

RCRA Facility Investigation Guidance Document (EPA 530/SW-89-031) May 1989;

RCRA Groundwater Monitoring Technical Enforcement Guidance Document (OSWER 9950.1) September 1986; and

Test Methods for Evaluating Solid Waste (SW 846, 3rd ed.) 2007.

After the Permittee submits the work plan, the Administrator will approve, disapprove, or modify the work plan in writing.

If the Administrator approves the work plan, the Permittee shall begin implementing the plan within two weeks (14 days) of receipt of approval, according to the schedule contained in the plan. All approved work plans become incorporated into this Permit as per Permit Condition VII.B.8.

In the event of disapproval (in whole or in part) of the work plan, the Administrator shall specify deficiencies in writing. The Permittee shall modify the plan to correct these within the timeframe specified in the notification of disapproval by the Administrative Authority. The modified work plan shall be submitted in writing to the Administrator for review. Should the Permittee take exception to all or part of the disapproval, the Permittee shall submit a written statement of the grounds for the exception within 10 days of receipt of the disapproval per Permit Condition VII.E.4.

The Administrator shall review for approval as part of the RFI Work Plan or as a new work plan any plans developed pursuant to Permit Condition VII.G., addressing further investigations of newly identified SWMUs, or Permit Condition VII.H., addressing new releases from previously-identified SWMUs.

VII.K. RFI IMPLEMENTATION

Upon receipt of written approval from the Administrator for the RFI Work Plan, the Permittee shall implement the RFI according to the schedules and in accordance with the approved RFI Work Plan and the following:

The Permittee shall notify the Administrator and EPA at least 10 days prior to any sampling, testing, or monitoring activity required by this Permit to give Agency personnel the opportunity to observe investigation procedures and/or split samples.

Substantive deviations from the approved RFI Work Plan which are necessary during implementation of the investigations must be approved by the Administrator and fully documented and described in the progress reports and in the RFI Final Report.

VII.L. RFI FINAL REPORT AND SUMMARY

Within sixty (60) calendar days after the completion of the RFI, the Permittee shall submit an RFI Final Report and Summary. The RFI Final Report shall describe the procedures, methods, and results of all investigations as described in Permit Condition VII.R.5. This includes SWMUs and their releases, the type and extent of contamination at the facility, sources and migration pathways, and actual or potential receptors. The RFI Final Report shall present all information gathered under the approved RFI Work Plan. The RFI Final Report must contain adequate information to support further corrective action decisions at the facility. The Summary shall summarize the RFI Final Report.

After the Permittee submits the RFI Final Report and Summary, the Administrator shall either approve or disapprove them in writing.

If the Administrator approves the RFI Final Report and Summary, the Permittee shall mail the approved Summary to all individuals on the facility mailing list established pursuant to 40 CFR 124.10(c)(1)(ix), within fifteen (15) calendar days of receipt of approval.

If the Administrator determines the RFI Final Report and Summary do not fully meet the objectives stated in Permit Condition VII.R., the Administrator may disapprove the RFI Final Report and Summary. If the Administrator disapproves the Report, the Administrative Authority shall notify the Permittee in writing of the Report's deficiencies and specify a due date for submittal of a revised Final Report and Summary. Once approved, the Summary shall be mailed to all individuals on the facility mailing list as specified above.

VII.M. DETERMINATION OF NO FURTHER ACTION

Based on the results of the RFI and other relevant information, the Permittee may submit an application to the Administrator for a Class III permit modification under Part X.A. of the GHWMRs [Adopts by reference 40 CFR 270.42(c)] to terminate the RFI/CMS process for a specific unit. This permit modification application must contain information demonstrating that there are no releases of hazardous waste including hazardous constituents from a particular SWMU at the facility that pose threats to human health and/or the environment, as well as additional information required in Part X.A. [Adopts by reference 40 CFR 270.42(c)] of the GHWMRs.

If, based upon review of the Permittee's request for a permit modification, the results of the RFI, and other information, including comments received during the sixty (60) days public comment period required for Class III permit modifications, the Administrator determines that releases or suspected releases which were investigated either are non-existent or do not pose a threat to human health and/or the environment, the Administrator will grant the requested modification. If necessary to protect human health or the environment, a determination of no further action shall not preclude the Administrator from requiring continued or periodic monitoring of air, soil, ground water, or surface water, when site-specific circumstances indicate that releases of hazardous waste or hazardous constituents are likely to occur.

A determination of no further action shall not preclude the Administrative Authority from requiring further investigations, studies, or remediation at a later date, if new information or subsequent analysis indicates a release or likelihood of a release from a SWMU at the facility that is likely to pose a threat to human health or the environment. In such a case, the Administrator shall initiate a modification to the Permit according to Permit Condition VII.B.3.

VII.N. CMS PLAN

If the Administrator has reason to believe that a SWMU has released concentrations of hazardous constituents, or if the Administrative Authority determines that contaminants present a threat to human health or the environment given site-specific exposure conditions, the Administrative Authority may require a CMS and shall notify the Permittee in writing. The notification may also specify remedial alternatives to be evaluated by the Permittee during the CMS.

The Permittee shall submit a CMS Plan to the Administrator within forty-five (45) calendar days from notification of the requirement to conduct a CMS. The Scope of Work for a CMS Plan is in Permit Condition VII.S.3.

The CMS Plan shall provide the following information:

A description of the general approach to the investigation, and potential remedies;

A definition of the overall objectives of the study;

Specific plans for evaluating remedies to ensure compliance with remedy standards;

Schedules for conducting the study; and

The proposed format for the presentation of information.

After the Permittee submits the CMS Plan, the Administrator will approve, disapprove, or modify the plan in writing.

If the Administrator approves the CMS Plan, the Permittee shall implement the plan per Permit Condition VII.O.

In the event of disapproval (in whole or in part) of the CMS Plan, the Administrator shall specify deficiencies in writing. The Permittee shall modify the plan to correct these within the period specified in the notice of deficiency. The modified CMS Plan shall be submitted in writing to the Administrator for review. Should the Permittee take exception to all or part of the disapproval, the Permittee shall submit a written statement of the grounds for the exception within ten (10) days of receipt of the disapproval per Permit Condition VII.E.4.

VII.O. CMS IMPLEMENTATION

No later than fourteen (14) calendar days after the Permittee has received written approval from the Administrator for the CMS Plan, the Permittee shall implement the Corrective Measures Study according to the schedules specified and in accordance with the approved CMS Plan. All approved plans become incorporated into this Permit as per Permit ConditionVII.B.8.

VII.P. CMS FINAL REPORT AND SUMMARY

Within sixty (60) calendar days after the completion of the CMS, the Permittee shall submit a CMS Final Report and Summary. The Summary shall summarize the Final Report. The CMS Final Report shall discuss the results of investigations of each remedy studied and of any bench-scale or pilot tests conducted. It must include an evaluation of each remedial alternative. The CMS Final Report shall present all information gathered during the CMS, and must contain adequate information to support the remedy selection process. In the CMS Final Report, the Permittee shall propose a corrective action program that shall:

Attain compliance with corrective action objectives for hazardous constituents in each medium, as established in Permit Condition VII.S.;

Control sources of releases;

Meet acceptable waste management requirements; and

Protect human health and the environment.

After the Permittee submits the CMS Final Report and Summary, the Administrator will either approve or disapprove them in writing.

If the Administrator approves the CMS Final Report and Summary, the Permittee shall mail the approved Summary to all individuals on the facility mailing list established pursuant to 40 CFR 124.10(c)(1)(ix), within fifteen (15) calendar days of receipt of approval.

If the Administrator determines the CMS Final Report and Summary do not fully meet the objectives stated in Permit Condition VII.S., the Administrator may disapprove the CMS Final Report and Summary. If the Administrator disapproves the Report, the Administrative Authority shall notify the Permittee in writing of the Report's deficiencies and specify a due date for submittal of a revised Final Report and Summary. Once approved, the Summary shall be mailed to all individuals on the facility mailing list as specified above.

Based on preliminary results and the CMS Final Report, the Administrative Authority may require the Permittee to evaluate additional remedies or particular elements of one or more proposed remedies.

VII.Q. CORRECTIVE MEASURE (REMEDY) SELECTION AND IMPLEMENTATION

Within fifteen (15) calendar days from receipt of approval of CMS Final Report and Summary, the Permittee shall submit a Permit Modification request according to Permit Condition VII.B.3., for corrective measure (remedy) selection, based on the approved CMS Final Report. The resultant modified permit will include schedules for remedy implementation.

VII.R. RFI SCOPE OF WORK

VII.R.1. PURPOSE

The purpose of the RFI is to determine whether a release of hazardous wastes or hazardous constituents has occurred and the nature and extent of releases of hazardous wastes or hazardous constituents from the solid waste management units. The required information shall include each item specified under Tasks I-III. The Permittee shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RFI.

If the Permittee believes that certain requirements of the Scope of Work are not applicable, the specific requirements shall be identified and a detailed rationale for inapplicability shall be provided.

VII.R.2. SCOPE

The RFI consists of three tasks:

TASK I: RFI WORKPLAN

Introduction

Environmental Setting

Source Characterization

Contamination Characterization

Potential Receptor Identification

Data Collection Quality Assurance Plan

Data Management Plan

Health and Safety Plan

Community Relations Plan

Project Management Plan

Task II: RCRA Facility Investigation

Task III: RFI Final Report and Summary

VII.R.3. Task I: RFI Work Plan

The Permittee shall prepare a RFI Work Plan as specified in Permit Condition VII.J. The RFI Work Plan shall provide for and address the following information needs:

VII.R.3.a. Introduction

VII.R.3.a.1. Facility Description

The introduction shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage, or disposal of solid and hazardous waste. Information from existing reports and studies is acceptable, as long as the source of this information is documented, pertinent, and reflective of current conditions. This section shall include:

Map(s) depicting the information specified below. All maps shall be consistent with requirements set forth in Part X.A. [Adopts by reference 40 CFR 270.14] of the GHWMRs and shall be of sufficient detail and accuracy to locate all current and future work performed at the site.

General geographic location;

Property lines, with the owners of all adjacent property clearly indicated, and all land previously owned and/or used by the Permittee around the facility;

Topography, waterways, wetlands, floodplains, water features, and drainage-patterns;

All tanks, buildings, utilities, paved areas, rights-of-way, and other features;

All solid waste management units;

All known past solid or hazardous waste treatment, storage and disposal areas or units regardless of whether they were active on November 19, 1980;

Surrounding land uses (residential, commercial, agricultural, recreational); and

The location of all production and ground water monitoring wells. These wells shall be clearly labeled and ground and top of casing elevations included (these elevations may be included as an attachment).

A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the facility.

A summary of approximate dates or periods of past waste releases, identification of the materials released, the amount released, the location released, and a description of the response actions conducted (local, state, or Federal response units, or private parties), including any inspection reports or technical reports generated as a result of the response.

A reference to all environmental, geologic, and hydrogeologic studies performed by all parties, at or near the facility, with a short summary of the purpose, scope, and significant findings thereof.

A reference to all environmental permits, applied for and/or received, the purpose thereof, and a short summary of requirements.

VII.R.3.a.2. Nature and Extent of Contamination

The Introduction shall summarize all possible source areas of contamination. This, at a minimum, should include all SWMUs. For each area, the Permittee shall identify the following:

Location of unit/area on a facility map;

Quantities of solid, hazardous, and radiochemical wastes;

Quantities of radiochemical and hazardous constituents, to the extent known; and

Identification of areas where additional information is necessary.

The Permittee shall prepare an assessment and description of the existing degree and extent of contamination. This should include:

Available monitoring data and qualitative information on locations and levels of contamination at the facility;

All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and

The potential impact(s) on human health or the environment, including demography, groundwater, and surface water use, and land use.

VII.R.3.a.3. Implementation of Interim Measures

The Permittee shall document and report on all interim measures which were or are being undertaken at the facility, including under state or Federal compliance orders, other than those specified in the Permit. This shall include:

Objectives of the interim measures: how the measure is mitigating a potential threat to human health or the environment and/or is consistent with and integrated into requirements for a long term solution;

Schedules for design, construction and monitoring; and

Schedule for progress reports.

VII.R.3.b. Environmental Setting

The work plan shall provide for collection of information to supplement and verify existing information on the environmental setting at the facility. The work plan shall provide for characterization of the following:

VII.R.3.b.1. Hydrogeology

The work plan shall describe in detail a program to evaluate hydrogeologic conditions at the facility. This program shall provide for least the following information needs:

A description of the regional, local, facility wide and SWMU-specific geologic and hydrogeologic characteristics affecting ground water flow beneath the facility.

An analysis of any topographic features including surface water bodies that might influence the ground water flow system.

A representative and accurate classification and description of the hydrogeologic units which may be part of migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated units) based on field data, tests (e.g., gamma and neutron logging of existing and new wells, piezometers and borings), and cores.

The extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of migration pathways based on field studies and cores, structural geology, and hydrogeologic cross sections, including:

Unconsolidated sand and gravel deposits;

Zones of fracturing or channeling in consolidated or unconsolidated deposits; and

Zones of high permeability or low permeability that might direct and restrict the flow of contaminants.

A description of representative water level or fluid pressure based on data obtained from ground water monitoring wells and piezometers installed up gradient and down gradient of the potential contaminant source. Information needs include: potentiometric surface maps; hydrologic cross sections showing vertical gradients; vertical and horizontal components of flow; temporal changes in hydraulic gradients; and flow nets.

A description of man-made influences that may affect site hydrogeology such as active and inactive local water supply and production wells, pipelines, french drains, and ditches.

VII.R.3.b.2. Soils

The Permittee shall describe in detail a program designed to characterize soil and rock units above the water table. Such characterization shall include, but is not limited to, the following information: surface soil distribution; soil profile, including ASTM and USCS classifications of soils; transects of soil stratigraphy; saturated hydraulic conductivity; porosity; cation exchange capacity (CEC); soil pH; particle size distribution; depth to water table; moisture content; effect of stratification on unsaturated flow; infiltration; evapotranspiration; residual concentration of contaminants in soil; total natural organic carbon content; and mineral and metal content.

VII.R.3.c. Source Characterization

The Permittee shall describe in detail a program designed to completely characterize the wastes and the areas where wastes have been placed, including: type, quantity, physical form, composition, disposition (containment and nature of wastes), and the facility characteristics affecting releases (e.g., facility security, engineered barriers). This shall include quantification of the following specific characteristics, at each source area:

Unit/disposal area characteristics, including but not limited to: location of unit/disposal area; type of unit/disposal area; design features; operating practices (past and present); period of operation; age of unit/disposal area; general physical conditions; and method used to close the unit/disposal area.

Waste characteristics, including but not limited to: type of waste placed in unit (hazardous classification, quantity, chemical composition); physical and chemical characteristics (physical form, physical description, temperature, pH, general chemical class, molecular weight, density, boiling point, viscosity, solubility in water, solubility in solvents, cohesiveness, vapor pressure); and migration and dispersal characteristics of the waste (sorption coefficients, biodegradability, photo degradation rates, hydrolysis rates, chemical transformations).

VII.R.3.d. Contamination Characteristics

The Permittee shall describe in detail a program to collect analytical data on ground water, soils, surface water, sediment, and subsurface gas contamination when necessary to characterize contamination from a SWMU. The data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data required shall include time and location of sampling, concentration found, media sampled, conditions during sampling, and the identity of the individual(s) performing the sampling and analysis. Each medium (ground water, surface water and sediments, soil, air, and gas) must be investigated. If the Permittee believes certain media could not be affected by a release from a specific unit, a detailed justification for not investigating those media must be provided. The Permittee shall address the following types of contamination at the facility:

VII.R.3.d.1. Groundwater Contamination

The work plan shall describe in detail a program of ground water investigation to characterize any plumes of contamination at the facility. The program shall at a minimum provide for the following information:

A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility;

The horizontal and vertical direction of contamination movement;

The velocity of contaminant movement;

The horizontal and vertical concentrations of any 40 CFR Part 264 Appendix IX constituents reasonably expected to be present in the plume;

An evaluation of factors influencing the plume movement; and

An extrapolation of future contaminant movement.

VII.R.3.d.2. Soil Contamination

The Permittee shall describe in detail a program to characterize contamination of soil and rock units above the water table near the contaminant release. The program shall provide for the following information:

A description of the vertical and horizontal extent of contamination;

A description of contaminant and soil chemical properties within the contaminant source area. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation, natural total organic carbon content, and other factors that might affect contaminant migration and transformation.

Plume migration and transformation; specific contaminant concentrations; the velocity and direction of contaminant movement; and an extrapolation to future contaminant movement.

VII.R.3.d.3. Surface Water and Sediment Contamination

The Permittee shall describe in detail a program to characterize contamination in surface water bodies and sediment resulting from contaminant releases at the facility. The investigation shall at minimum include the following:

A description of the surface water body including location, elevation, flow, velocity, depth, width, seasonal fluctuations, flooding tendencies, drainage patterns, and evapotranspiration rates.

A description of sediment characteristics including depositional area, thickness, mineralogy, grain size, density, ion exchange capacity, and total natural organic carbon content.

Maps for all areas included in surface water and sediment investigations, which meet requirements in 40 CFR 270.14 and which are sufficiently detailed and accurate to depict all the information required.

A description of the horizontal and vertical extent of any immiscible or dissolved plumes originating from the facility, and the extent of contamination in the underlying sediments; the horizontal and vertical direction and velocity of contaminant movement;

An evaluation of the physical, biological, chemical, and radiochemical factors influencing contaminant movement;

An extrapolation to future contaminant movement;

A description of the chemistry of the contaminated surface waters and sediments. This includes pH, temperature, total dissolved solids, total suspended solids, biochemical oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients, chemical oxygen demand, total organic carbon, and specific contaminant concentrations.

VII.R.3.d.4. Air Contamination

The Permittee shall describe in detail a program to characterize particulate and gaseous contaminants released into the atmosphere. This investigation shall provide the following information:

A description of the horizontal and vertical direction and velocity of contaminant movement;

The rate and quantity of the release;

The chemical, radiochemical, and physical composition of the contaminants released;

Horizontal and vertical concentration profiles.

VII.R.3.d.5. Subsurface Gas

The Permittee shall describe in detail a program to characterize the nature, rate, and extent of releases of reactive gases from the units. Such a program shall include, but is not limited to: provisions for monitoring subsurface gases released from the unit, and an assessment of the potential for threat to human health and/or the environment.

VII.R.3.d.6. Potential Receptors

The Permittee shall describe in detail a program to collect data to describe human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical and radiochemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be required. The following characteristics shall be identified:

Local uses and possible future uses of ground water, including:

Type of use (i.e., potable, domestic, agricultural, residential, industrial, municipal)

Location of all ground water wells, names of owners or tenants at those locations, USGS/DOD well designations, and current use of those wells within one (1) mile radius of facility.

Local uses and possible future uses of surface waters within a 1.5 mile radius of the facility, including domestic and municipal, recreational, agricultural, industrial, and environmental.

Human use of or access to the facility and adjacent lands, including but not limited to recreation, hunting, residential, commercial, and industrial.

A demographic profile of people who use or have access to the facility and adjacent land, including, but not limited to age, gender, and sensitive subgroups.

A description of the local ecology, including biota in surface water bodies on, adjacent to, or affected by the facility, and a description of any endangered or threatened species near the facility.

VII.R.3.d.7. Data Collection Quality Assurance Plan

The Permittee shall prepare a plan to document all monitoring procedures: sampling, field measurements, and sample analysis performed at the facility during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented.

The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

Description of the intended uses for the data, and the necessary level of precision and accuracy for those intended uses;

Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;

Schedule and information to be provided in quality assurance reports, including at least:

Periodic assessment of measurement data accuracy, precision, and completeness;

Results of performance audits;

Results of systems audits; and

Significant quality assurance problems and resolutions.

The Sampling and Field Measurements Section of the Data Collection Quality Assurance Plan shall at least discuss:

Selecting appropriate sampling and field measurement locations, depths, etc.;

Providing a statistically sufficient number of sampling and field measurement sites;

Determining conditions under which sampling or field measurements shall be conducted;

Determining which parameters are to be measured and where;

Selecting the frequency of sampling and length of sampling period;

Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;

Delineating procedures designed to prevent contamination of sampling or field measurements equipment and cross contamination between sampling points;

Documenting field sampling operations and procedures;

Selecting appropriate sample containers;
Reserving samples;

Controlling chain-of-custody; and

Disposing of all contaminated materials generated by activities in a manner compliant with all state and Federal regulations.

The Sample Analysis shall include:

Chain-of-custody procedures;

Sample storage procedures and holding times;

Sample preparation methods;

Analytical procedures;

Calibration procedures and frequency;

Data reduction, validation and reporting; and

Frequency of internal quality control checks and laboratory performance audits.

VII.R.3.d.8. Data Management Plan

The Permittee shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and setup data documentation materials and procedures (data record), project file requirements, and project-related progress reporting procedures and documents.

The data record shall include at least the following for all sample and field measurements: unique measurement code; measurement location; measurement type; laboratory ID number; property or component analyzed; and results of analysis.

The Data Management Plan shall provide the format to be used to present the data and conclusions of the investigation, etc.

The following shall be presented in tables: raw data; data sorted by significant features such as location, media, constituent; data reduction for statistical analysis; and summary data.

The following shall be presented in graphical formats (e.g., bar graphs, line graphs, plan maps, isopleth plots, cross-sections, three-dimensional displays, etc.): sampling location and grid; levels of contamination at each sampling location; geographical extent of contamination; and changes in concentration relative to source, time, depth, and other parameters.

VII.R.3.d. 9. Health and Safety Plan

The Permittee shall prepare a facility Health and Safety Plan, which shall include:

A description of the facility including availability of resources such as roads, water supplies, electricity and telephone services;

A description of the known hazards and evaluation of the risks associated with each activity conducted, including but not limited to on and off-site exposure to contaminants during implementation of interim measures;

A list of key personnel and alternatives responsible for site safety, response operations, and for protection of public health;

A delineation of the work area;

A description of levels of protection to be worn by personnel in the work area;

Procedures established to control site access;

Decontamination procedures for personnel and equipment;

Site emergency procedures;

Emergency medical care procedures for injuries and toxicological problems;

Requirements for an environmental field monitoring program;

Routine and special training requirements for responders; and

Procedures for protecting workers from weather-related problems.

The Facility Health and Safety Plan shall comply with the OSHA regulations, particularly 29 CFR 1910 and 1926, and state and local regulations, as applicable.

VII.R.3.d.10. Community Relations Plan

The Permittee shall prepare a plan for dissemination of information to the public regarding investigation activities and results.

VII.R.3.d.11. Project Management Plan

The Permittee shall prepare a Project Management Plan, which will include a discussion of the technical approach, schedules, budget, and essential project personnel. The project management plan will also include a description of qualifications of important project personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RFI.

VII.R.4. Task II: RCRA Facility Investigation

The facility investigation activities shall follow the RFI Work Plan. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map. During the RFI, it may be necessary to revise the RFI Work Plan to increase or decrease the detail of information collected to accommodate the facility specific situation.

The Permittee shall conduct investigations of SWMUs previously identified with known or suspected releases of contamination to characterize the facility (Environmental Setting), define the source (Source Characterization), define the degree and extent of contamination (Contamination Characterization), and identify actual or potential receptors.

The investigations should result in data of adequate technical quality to develop and evaluate corrective measure alternatives during the Corrective Measures Study, when necessary.

VII.R.5. Task III: RFI Final Report and Summary

The Permittee shall analyze all facility investigation data collected during the RFI process and prepare a detailed report on the type and extent of contamination at the facility including sources and migration pathways. All information generated during the investigation shall be presented and analyzed. All evidence and procedures used for making any determinations (e.g., velocity of groundwater, extent of contamination) shall be fully documented. The report shall describe extent of contamination (qualitative/quantitative) in relation to background levels indicative for the area.

The report shall contain the results of all tests, calculations, inspections, record searches, and observations. It shall contain soil and ground water contamination profiles, statistical comparisons, and the results of all sampling events conducted as part of the investigation. It shall display results in tables, graphs, maps, and cross sections as discussed in the Data Management Plan and Permit Condition VII.R.3.g.2.

The Permittee shall identify all relevant and applicable standards for the protection of human health or the environment (e.g., National Ambient Air Quality Standards, federally approved state water quality standards, groundwater protection standards, etc.)

Data shall be evaluated to ensure it is sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, to evaluate the potential threat to human health or the environment, and to support a CMS, if required. The report shall present all data in an Appendix.

VII.R.5.a. General RFI Reporting Requirements

Two hard copies and one compact disc copy of all reports and data shall be submitted by the Permittee to the Administrator as specified in Permit Condition VII.B.7.

The RFI Work Plan shall be submitted by the Permittee to the Administrative Authority as described in Permit Condition VII.J.

The RFI Final Report and Summary shall be submitted by the Permittee to the Administrator as described in Permit Condition VII.L.

Within ninety (90) days of the effective date of this Permit, the Permittee shall provide the Administrator with signed, quarterly progress reports as specified in Permit Condition VII.F.1.

VII.S. CORRECTIVE MEASURES STUDY (CMS) SCOPE OF WORK

VII.S.1. Purpose

The purpose of the CMS is to develop and evaluate corrective measure alternatives and to recommend the corrective measure or measures to be taken. The required information shall include each item specified under CMS Tasks IV-VI. The Permittee will furnish the personnel, materials, and services necessary to prepare the CMS, except as otherwise specified.

If the Permittee believes that certain requirements of the Scope of Work are not applicable, the specific requirements shall be identified and the rationale for inapplicability shall be provided.

VII.S.2. Scope

The Corrective Measure Study consists of three tasks:

Task IV: CMS Plan

a. Description of Current Situation

b. Establishment of Corrective Action Objectives

c. Description of Approach to CMS

d. Schedule for CMS

Task V: Corrective Measures Study

a. Identification of Corrective Measures Alternatives(s)

b. Screening of Corrective Measures Alternatives(s)
c. Development of Corrective Measures Alternative(s)

d. Evaluation of Corrective Measures Alternative(s)

e. Selection of Corrective Measures Alternative(s)

Task VI: CMS Final Report and Summary

VII.S.3. Task IV: CMS Plan

Description of Current Conditions

The Permittee shall briefly describe current conditions at the facility to update information provided in the RFI Final Report and Summary. This shall include previous and/or ongoing remedial activity or interim measures.

Establishment of Corrective Action Objectives

The Permittee shall propose to the Administrator for review and approval, facility specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RFI, EPA guidance, and the requirements of any applicable Federal statutes and regulations.

Description of Approach to CMS

The Permittee shall describe the general approach to the corrective measures study. The approach shall include identification, development, screening, and evaluation of the corrective measure alternatives, as discussed in detail in Permit Condition VII.S.4. The Permittee shall describe specific plans for laboratory and bench-scale studies, or field studies, if needed. Specific plans for evaluating remedy effectiveness shall also be developed. The approach shall specify formats to be used for data presentation, including raw data, maps, charts, graphs, engineering schematics, construction design, etc.

Schedule

The Permittee shall develop a schedule for implementing the corrective measures study, and a schedule for submitting quarterly progress reports on the study implementation.

VII.S.4. Task V: Corrective Measures Study

The CMS consists of five (5) parts: identification, screening, development, evaluation, and selection of the corrective measure alternative(s).

VII.S.4.a. Identification of Preliminary Corrective Measure Alternative(s)
Based on the results of the RFI and the CMS Plan objectives, the Permittee shall identify all possible alternatives for removal, containment, treatment, and/or other remediation of the contamination.

VII.S.4.b. Screening of Preliminary Corrective Measure Alternatives

The Permittee shall screen the identified preliminary corrective measures alternatives to eliminate those that may not prove feasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective action objective within a reasonable time period. This screening process focuses on eliminating those technologies, which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technological limitations.

Site, waste, and technological characteristics, which are used to screen in applicable technologies, are described in more detail below:

Site Characteristics. Site data should be reviewed to identify conditions, which may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration.

Waste Characteristics. Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by waste characteristics should be eliminated from consideration.

Technological Limitations. The level of technology development, performance records, and operation and maintenance problems shall be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process.

VII.S.4.c. Development of Corrective Measures Alternatives

The Permittee shall develop corrective measures alternatives based on corrective measures objectives, and identification and screening of preliminary alternatives. The Permittee shall rely on engineering practices to determine which of the previously identified and screened technologies appear most suitable for the site. Technologies can be combined to form the overall corrective measure alternatives. The alternatives developed should represent a workable number of options that each appears to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. The Permittee shall document the reasons for excluding technologies.

When a new technology is proposed or similar waste streams have not routinely been treated or disposed of using the technology, the Permittee shall conduct laboratory and/or bench-scale studies to determine the applicability to facility conditions. The Permittee shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

The Permittee shall develop a testing plan identifying the type(s) and goal(s) of the study (ies), the level of effort needed, and the procedures to be used for data management and interpretation. Upon completion of testing, the Permittee shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan.

The Permittee shall prepare a report summarizing the testing program and its results, both positive and negative.

VII.S.4.d. Evaluation of Corrective Measures Alternative(s)

The Permittee shall evaluate each corrective measure alternative developed in Permit Condition VII.S.4.c. The evaluation shall be based on technical, environmental, human health and institutional concerns. The Permittee shall also develop cost estimates for each corrective measure.

VII.S.4.d.1. Technical, Environmental, Human Health and Institutional Concerns

The Permittee shall provide a description of each corrective measures alternative which includes but is not limited to the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. The Permittee shall evaluate each alternative in the four following areas:

Technical - The Permittee shall evaluate each corrective measure alternative based on performance, reliability, implementability, and safety.

The Permittee shall evaluate performance based on the effectiveness and useful life of the corrective measure:

Effectiveness shall be evaluated in terms of the ability to perform intended functions such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation.

Any specific waste or site characteristics, which could potentially impede effectiveness, shall be considered. The evaluation should also consider the effectiveness of combinations of technologies.

Useful life is defined as the length of time the level of effectiveness can be maintained. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the future life of the technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

The Permittee shall provide information on the reliability of each corrective measure including operation and maintenance requirements and demonstrated reliability:

Operation and maintenance requirements include the frequency and complexity of operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered.

Demonstrated and expected reliability is a way of measuring risk and effect of failure. The Permittee should evaluate whether technologies have been used effectively under analogous conditions; whether the combination of technologies have been used together effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.

The Permittee shall describe the implementation of each corrective measure including relative ease of installation and total time required achieving a given level of response.

Construction is determined by conditions both internal and external to facility conditions and includes such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of facility (i.e., remote location vs. congested urban area). The Permittee shall evaluate what measures can be taken to facilitate construction under site specific conditions. External factors, which affect implementation, include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities.

Time has two (2) components to be addressed: the time it takes to implement a corrective measure and the time it takes to see beneficial results. Beneficial results are defined as the reduction of contaminants to acceptable levels as established in the corrective measures objectives.

The Permittee shall evaluate each corrective measure alternative about safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider include fire, explosion, and exposure to hazardous substances.

Environmental: The Permittee shall perform an Environmental Assessment for each alternative. The assessment shall focus on facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include at a minimum, an evaluation of the short- and long-term beneficial and adverse effects of the response alternative, evaluation of any adverse effects on environmentally sensitive areas, and an analysis of measures to mitigate adverse impacts.

Human Health: The Permittee shall assess each alternative in terms of the extent to which it mitigates short- and long-term potential exposure to any residual contamination and protects human health both during and after implementation of the corrective measure. The assessment will describe the levels and characterizations of contaminants on-site, potential exposure routes, and potentially affected populations. Each alternative will be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative with existing criteria, standards, or regulations acceptable to the Administrator.

Institutional: The Permittee shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, State, and Local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative shall be considered, as applicable.

VII.S.4.d.2. Cost Estimate

The Permittee shall develop an estimate of the cost of each corrective measure alternative and for each phase or segment of the alternative. The cost estimate shall include capital, and operation and maintenance costs.

VII.S.4.d.2.a. Capital costs consist of direct and indirect costs.

Direct capital costs include:

Construction costs: Cost of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure alternative;

Equipment costs: Costs of treatment, containment, disposal, and/or servicing of equipment used to implement the action;

Land and site development costs: Expenses associated with purchase of land and development of existing property; and

Building and services costs: Costs of process and non-process buildings, utility connections, purchased services, and disposal costs.

Indirect capital costs include:

Engineering expenses: Costs of administration, design, construction, supervision, drafting, and testing of corrective measure alternatives;

Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;

Start-up and shakedown costs: Costs incurred during corrective measure start-up; and

Contingency allowances: Funds to cover costs resulting from unforeseen circumstances such as adverse weather conditions, strikes, and inadequate facility characterization.

VII.S.4.d.2.b. Operation and maintenance costs (O&M)

O&M costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. The Permittee shall consider the following operation and maintenance cost components:

Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operation;

Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;

Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;

Purchased services: Sampling costs, laboratory fees, and professional fees, which can be predicted;

Disposal and treatment: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operation;

Administrative costs: Costs associated with administration of corrective measures operation and maintenance not included under other categories;

Insurance, taxes, and licensing costs: Costs of such items as liability and accident insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;

Maintenance reserve and contingency funds: Annual payments into escrow funds to cover costs of anticipated replacement or rebuilding of equipment, and any large unanticipated operation and maintenance costs; and

Other costs: Items that do not fit any of the above categories.

VII.S.4.e. Selection of Corrective Measures Alternative(s)

The Permittee shall select a corrective measure alternative using technical, human health, and environmental criteria. At a minimum, the following criteria shall be used to select the final corrective measure or measures.

VII.S.4.e.1. Technical

Performance - Corrective measure or measures which are most effective at performing their intended functions and maintaining performance over extended periods of time will be given preference;

Reliability - Corrective measure or measures which do not require frequent or complex operation and maintenance activities and have proven effective under conditions similar to those anticipated will be given preference;

Implementability - Corrective measure or measures which can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time will be preferred; and

Safety - Corrective measure or measures, which pose the least threat to the safety of nearby residents and environments as well as workers during implementation, will be preferred.

VII.S.4.e.2. Human Health

The corrective measure or measures must comply with existing EPA criteria, standards, or regulations for the protection of human health. Corrective measures, which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time, are preferred.

VII.S.4.e.3. Environmental

The corrective measure or measures imposing the least adverse impact or greatest improvement on the environment over the shortest period of time will be preferred.

VII.S.5. Task VI: CMS Final Report and Summary

The Permittee shall prepare a CMS Final Report and Summary presenting the results of the CMS and recommending a corrective action program. The Report shall at a minimum include:

A summary of all the corrective measure alternatives originally identified, and the screening rationale employed. The results of development of each alternative shall be described, and the evaluation of those developed shall be presented in detail. The report will describe the rationale for selection of a corrective measures alternative, including performance expectations, preliminary design criteria and rationale, general operation and maintenance requirements, and long-term monitoring requirements. The report shall include summary tables, which allow the alternative or alternatives to be easily understood. Tradeoffs among health risks, environmental effects, and other pertinent factors shall be highlighted.

A proposed corrective action program that will attain compliance with concentration level objectives, control sources of releases, meet acceptable waste management requirements, and protect human health and the environment.

Design and implementation precautions, including special technical problems, additional engineering data required, permits and regulatory requirements, access, easements, and right-of-way, health and safety requirements, and community relations activities.

Cost estimates and schedules including capital cost estimate, operation and maintenance cost estimate, and project schedule (design, construction, and operation).

A schedule for corrective measures (remedy) implementation.

VII.S.5.a. General CMS Reporting Requirements

Two (2) hard copies and electronic copy of all reports shall be submitted by the Permittee to the Administrator as specified in Permit Condition VII.B.7.

The CMS Plan shall be submitted by the Permittee to the Administrative Authority as described in Permit Condition VII.N.

The CMS Final Report and Summary shall be submitted by the Permittee to the Administrator as described in Permit Condition VII.P.

Within ninety (90) days of the date the Permittee is notified to begin a CMS, the Permittee shall provide the Administrator with signed, quarterly progress reports as specified in Permit Condition VII.F.1.

VIII. Project Coordinator

Within ninety (90) days of the effective date of this Permit, the Permittee shall designate a Project Coordinator and shall notify the Administrator and USEPA Region IX in writing of the Project Coordinator it has selected. The Permittee's Project Coordinator shall be responsible for overseeing the implementation of corrective action at the facility in accordance with this Part (Corrective Action) of the Permit and for designating a person to act in his or her absence.

The Permittee must provide at least seven (7) days written notice to the Administrator and USEPA Region IX before changing the Project Coordinator.

Table 1: FACILITY CORRECTIVE ACTION SUBMISSION SUMMARY

Below is a summary of the planned reporting requirements pursuant to this Permit:

Facility Submission/Action Requirements	Due Date
Designate Project Coordinator	Ninety (90) days from effective date of Permit
Notification of newly-identified SWMUs	Fifteen (15) calendar days after discovery
Notification of newly discovered releases	Fifteen (15) calendar days after discovery
Progress Reports on all activities	Quarterly, monthly, etc. no later than ninety (90) calendar days after Permittee is required to begin implementation.
SWMU Assessment Report	Thirty (30) calendar Days after the completion of the implementation of SWMU Assessment Plan
RFI Work Plan	As determined
Revised RFI Work Plan	As determined
Start RFI Implementation	Thirty (30) days from written approval
RFI Report and Summary Report	Sixty (60) calendar days after completion of RFI
Revised RFI Report and Summary Report	Thirty (30) calendar Days after notification of deficiency
Interim Measures Plan for interim measures required after permit issuance	Thirty (30) calendar days after notification
Revised Interim Measure Plan	As determined

Table 2: AOCs/SWMUs Listing

No.	Site ID	Location	Name	Permit	FFA	Status[1]
1	AOC 1	19017	Hazardous Waste Storage Facility	X		NFRAP
2	AOC 2	19013	Hazardous Waste Accumulation/Storage Area		X	Under Investigation
3	AOC 4	9016	Asbestos Disposal Trench		X	NFRAP
4	AOC 5	North field	Trench of EIS Site 4		X	IRP2
5	AOC 7A	18006	Aircraft Maintenance Shop – Battery shops	X		NFRAP
6	AOC 7B	18006	Aircraft Maintenance Shop – Underground Storage Tanks		X	NFRAP
7	AOC 7C	18006	Aircraft Maintenance Shop – Waste Products Storage Area		X	NFRAP
8	AOC 7D	18006	Aircraft Maintenance Shop – Degreasing Unit		X	NFRAP
9	AOC 8	2550	Former Firefighter Training Area 3		X	IRP2
10	AOC 9	North field	Oil Blending Facility		X	NFRAP
11	AOC 29	18018	Hazardous Waste Storage Area	X		NFRAP
12	SWMU 4	19015	Outside Aircraft Washrack Oil/Water Separator		X	Clean-Up Complete1
13	SWMU 6	18027	Outside Drum Storage Area		X	NFRAP
14	SWMU 7	18017	Inside Washrack Oil/Water Separator	X		Active OWS
15	SWMU 8A	18004	Outside Drum Storage Area		X	Clean-Up Complete1
16	SWMU 8B	18004	East Oil/Water Separator		X	Active OWS Clean-Up Complete2
17	SWMU 8C	18004	West Oil/Water Separator		X	OWS Removed2 Clean-Up Complete2
18	SWMU 9	18006	Outside Drum Storage Area		X	NFRAP
19	SWMU 10	17006	Outside Drum Storage Area		X	NFRAP
20	SWMU 11	20021	Outside Drum Storage Area		X	Clean-Up Complete1
21	SWMU 12	18040	Outside Drum Storage Area		X	Clean-Up Complete1
22	SWMU 13A	2600	Outside Drum Storage Area		X	NFRAP

No.	Site ID	Location	Name	Permit	FFA	Status[1]
23	SWMU 13B	2600	Oil/Water Separator	X		OWS Removed2 NFRAP1/2
24	SWMU 15	2550	Buildings 2550 and 2552 Oil/Water Separator		X	Under Investigation
25	SWMU 16A	26229	Oil/Water Separator	X		Active OWS Under Investigation
26	SWMU 16C	26229	Waste Oil Storage Tanks		X	NFRAP
27	SWMU 17	26051	Oil/Water Separator		X	Active OWS Clean-Up Complete2
28	SWMU 18	14507	Outside Drum Storage Area		X	Clean-Up Complete1
29	SWMU 20D	26101	Service Station: Outside Drum Storage Area		X	NFRAP
30	SWMU 20E	26101	Service Station: In-ground Sumps and Trenches		X	NFRAP
31	SWMU 21C	26000	USAF Clinic, Photo lab: Incinerator	X		NFRAP
32	SWMU 22A	18017	Aircraft Corrosion Control: Inside Drum Storage Area		X	NFRAP
33	SWMU 22B	18017	Aircraft Corrosion Control: Inside Storage Room		X	NFRAP
34	SWMU 22C	18017	Aircraft Corrosion Control: Outside Drum Storage Area		X	NFRAP
35	SWMU 23A	18004	Hazardous Waste Satellite Accumulation Point	X		NFRAP
36	SWMU 23B	18004	Used Petroleum Products Area		X	NFRAP
37	SWMU 25	17000	Defensive Fire Control: Drum Storage Area	X		NFRAP
38	SWMU 27	18040	Corrosion Control (Hazardous Waste Accumulation Area, Flammable Storage Room)	X		NFRAP
39	SWMU 29A	2799	Industrial Corrosion Control – Drum Storage Area		X	NFRAP
40	SWMU 29B	2799	Industrial Corrosion Control – Hazardous Materials Storage Areas and Associated Spill Areas		X	NFRAP
41	SWMU 29C	2799	Industrial Corrosion Control – Septic System		X	Under Investigation
42	SWMU 30C	23022	Aerospace Ground Equipment: Oil/Water Separator: Includes Settling Tank		X	OWS Removed1/2 Under Investigation
43	SWMU 30D	23022	Aerospace Ground Equipment: Drum Storage Areas		X	Under Investigation

No.	Site ID	Location	Name	Permit	FFA	Status[1]
44	SWMU 31A	26229	Refueling Maintenance: Drum Storage Area	X		NFRAP
45	SWMU 31B	26229	Refueling Maintenance: Spill Site		X	NFRAP
46	SWMU 32A	26051	Auto Hobby Shop: Inside Drum Storage Area	X		NFRAP
47	SWMU 32D	26051	Auto Hobby Shop: Used Petroleum Products Storage Area	X		NFRAP
48	SWMU 32E	26051	Auto Hobby Shop: Abandoned Car Storage Area		X	NFRAP
49	SWMU 32G/F	26051	Auto Hobby Shop: Used Battery Storage Area		X	NFRAP
50	SWMU 33	26203	Fuels Laboratory		X	Clean-Up Complete1
51	SWMU 34A	26224	Liquid Oxygen (LOX) Facility: Oil/Water Separators		X	OWS Removed1/2 Clean-Up Complete1
52	SWMU 34B	26224	Liquid Oxygen (LOX) Facility: Septic Tank and Leach Field	X		NFRAP
53	SWMU 35A	18002	Bomb Renovation, Paint and Refrigeration: Inside Storage Area		X	NFRAP
54	SWMU 35C	18002	Bomb Renovation, Paint and Refrigeration: Outside Storage and Staging Area		X	Clean-Up Complete2
55	SWMU 37A	9004	Line Delivery and Handling: Vehicle Maintenance Pit		X	Clean-Up Complete1
56	SWMU 40B	20021	Roads and Grounds (and heavy equipment shops): Flammable Materials Storage Room	X		NFRAP
57	SWMU 40C	20021	Roads and Grounds (and heavy equipment shops): Equipment Washing Area – Washrack		X	Clean-Up Complets2
58	SWMU 41	17002	Fire Protection Branch		X	NFRAP
59	SWMU 42B	18001	Oil/Water Separator		X	Active OWS Under Investigation
60	SWMU 42C	18001	Battery Shop	X		NFRAP
61	SWMU 42D	18001	Hazardous Waste Satellite Accumulation Point		X	NFRAP
62	SWMU 42E	18001	Drum Storage Area		X	Clean-Up Complete1
63	SWMU 42F	18001	Vehicle Salvage Area		X	Clean-Up Complete2
64	SWMU 43	14526	Dumpster Washrack		X	Clean-Up Complete2

No.	Site ID	Location	Name	Permit	FFA	Status[1]
65	SWMU 44	18020	Hanger Oil/Water Separator		X	Active OWS Clean-Up Complete1
66	SWMU 46A	26204	POL Washrack Oil/Water Storage Area		X	Active OWS Clean-Up Complete1
67	SWMU 46B	26204	Outside Drum Storage Area		X	Clean-Up Complete1
68	SWMU 47C	NW field	Northwest Field – Power Plant: Waste Oil Storage		X	Clean-Up Complete2
69	SWMU 53B	Andy TF	Andersen 1 Tank Farm: Drum Storage Area		X	Clean-Up Complete1
70	SWMU 53C	Andy TF	Andersen 1 Tank Farm: Land Disposal Area		X	Under Investigation
71	SWMU 53D	Andy TF	Andersen 1 Tank Farm: Routine Spill Site		X	NFRAP
72	SWMU 53F	Andy TF	Andersen 2 Tank Farm: Collection Pit		X	Under Investigation
73	SWMU 56	IRP Site 01	Landfill Complex – Landfill 01	X		NFRAP
74	SWMU 57	IRP Site 33	Drum Storage Area No. 2		X	Clean-Up Complete2
75	DSA-1		Drum Storage Area No. 1		X	Active Site

Note(s)

1 Status information provided in the December 2007 Remediation Report

NFRAP – No Further Response Action Planned Decision Document for Eight Areas of Concerns and 34 Solid Waste Management Units, Andersen AFB, Guam. EA Engineering, Science, and Technology dated November 2006

IRP1 – Transferred to Installation Restoration Program for remedial design and remediation.

IRP2 – Transferred to Installation Restoration Program for further investigation.

NPDES – Transferred to the National Pollution Discharge Elimination System Program for management.

Clean-Up Complete1 – Documentation included in Final Remediation Verification Report for 13 Solid Waste Management Units at Andersen Air Force Base, Guam. EA Engineering, Science, and Technology date June 2007

Clean-Up Complete2 – Documentation included in *Final Remediation Verification Report for 9 Solid Waste Units at Andersen Air Force Base, Guam.* EA Engineering, Science, and Technology dated June 2008

OWS Removed1 – Final Closure and Decommissioning Report for 14 Oil-Water Separator Removals at Andersen Air Force Base, Guam dated March 2010.

Active OWS/OWS Removed2 – Final Oil Water Separator Management Plan, July 2011.

Appendix A

OB/OD Waste Analysis Plan

Table of Contents

Attachments

1.0 Purpose

Andersen Air Force Base Explosive Ordnance Disposal (EOD) treats waste munitions materials that meet the definition of hazardous waste under the United States Environmental Protection Agency and Guam Environmental Protection Agency regulatory definition. In addition to waste munitions treatment, the EOD range is also used for EOD proficiency training and EOD emergency response operations.

In addition, EOD Flight also detonates or burns other munitions materials which are not defined as hazardous wastes. This Waste Analysis Plan will be used to determine the treatability of the hazardous waste materials at Andersen AFB's EOD range.

The Waste Analysis Plan presents a procedurally oriented process for waste identification and determination of the treatability of the hazardous waste materials at Andersen AFB's EOD range. Waste sampling and analysis procedures are normally not necessary since the waste composition is already well documented for each waste to be treated. Furthermore, sampling and analysis procedures are normally not feasible due to the inherent safety issues associated with further undue handling of waste ordnance materials.

2.0 Related Documents

2.1 Environmental Performance Standards, Appendix I

2.2 T.O. 11A-1-42 General Instructions for Emergency Destruction of Munitions (EDM) This document provides information on accident prevention, description of demolition materials and firing system procedures (not releasable).

2.3 T.O. 1lA-1-46 This document provides supplementary technical information on each type of munition, including NEW, National Stock Number, hazard classification, and compatibility group (not releasable).

2.4 EOD 60 Series T.O.'s - These documents provide technical information for each type of munition regarding chemical and physical components and construction. These documents provide information on type, description of hazardous components, functioning, markings, and render safe procedures (not releasable).

2.5 Table III-1, Maximum Permissible Quantity of Metals and Sulfur that can be Treated per OB Event, Attachment 3

2.6 Table III-2, Maximum Permissible Quantity of Metals and Sulfur that can be Treated per OD Event, Attachment 4

2.7 Table III-7. Composition Data of Ordnances as Modeled for AAFB, Attachment 5

3.0 Definitions

AAFB: Andersen Air Force Base

ADR: Ammunition Disposition Requisition This is the request for the EOD Flight to dispose of munitions. This request is evaluated with respect to acceptability of waste for treatment prior to acceptance at EOD Flight.

AFK: Munitions Supply

DODIC: Department of Defense Identification Code

DOD: Department of Defense

DLA: Defense Logistics Agency, Disposition Services

Energetic Material: Any explosive material, whether contained within an ordnance or separated from the ordnance during treatment.

EPS: Environmental Performance Standards, a set of operational criteria presented within the Andersen AFB EOD RCRA Part B Application. These criteria include Limits on the amounts; types; and/or item constituents which are allowable for treatment at this EOD Range.

EOD: Explosive Ordnance Disposal

EOD Flight: Group of Andersen AFB personnel tasked with munitions disposal.

EOD Range: The area used by EOD personnel to perform treatment operations, EOD mission training, and emergency operations. The EOD Range is surrounded by a safety exclusion zone to minimize risk to human life during operations.

Explosive (Explosive Ordnance): Any chemical compound, mixture, or device whose primary purpose is to function by detonation or deflagration with instantaneous release of heat and gas.

Hazardous Waste: A solid waste that exhibits any of the characteristics of hazardous waste (ignitability, corrosivity, reactivity, and toxicity) or is a listed hazardous waste under RCRA (40 CFR 261.3).

Ignition Materials: Materials used to initiate the OB treatment process. These generally consist of a radio controlled igniter with a small quantity (10-20 gallons) of virgin diesel fuel.

Metallic Fragment: Any metallic material that remains following ordnance treatment. Metallic fragment can include items remaining in the OB or OD treatment units or ejecta thrown out during treatment.

Munitions Squadron: The AAFB unit responsible for munitions related activities.

NEW: Net Explosive Weight is the mass of the explosive material within the particular munitions item.

Non-hazardous Waste: A solid waste that does not exhibit characteristics of hazardous waste.

NSN: National Stock Number, an internal DOD tracking number for each type of munitions.

Open Burning (OB): Combustion of PEP or explosive ordnance without the control of combustion air, containment of the combustion reaction in an enclosed device, or control of gaseous and particulate combustion products.

Open Detonation (OD): Unconfined, violent reaction of PEP or explosive ordnance without the control of combustion air, containment of the combustion reaction in an enclosed device, or control of emission of gaseous and particulate combustion products.

PEP: Term used to refer collectively to propellants, explosives, and pyrotechnics.

Residue: Any material remaining from OB/OD activities. Residue may include materials from non-RCRA treatment OB/OD operations (i.e. training, or emergency operations) which may also take place on the EOD Range.

T.O. Documents: DOD Technical Order documents.

4.1 Waste Analysis Procedures

The Waste Analysis Procedure is essentially a waste identification process which is comprised of the following general steps.

- General item identification
- Comparison to a pre-evaluated list
- NEW quantity determination
- Specific component chemical identification
- Determination of treatment method
- Evaluation with respect to Environmental Performance Standards

The waste analysis procedure is then followed by a decision to proceed as proposed, proceed with a modified procedure, or not proceed with treatment of waste munitions.

A graphic presentation of these steps is shown in the Environmental Performance Standards Waste Evaluation Flow Chart. As shown in the Flow Chart, if the waste munitions have not been pre-evaluated, several additional evaluation steps are required.

4.2 EOD Flight Notification

The process is initiated when EOD Flight receives notification from AAFB AFK of a desire to treat waste munitions, normally via e-mail. This notification includes operational identification information such as ADR number, lot number(s), stock number, DODIC, common name, NEW, Condition code, and quantity of each item.

4.3 General Item Identification

EOD Flight researches each individual munition type listed in the ADR by using the 60-series TO that covers the munition item and/or TO 11A-1-46. The information in these documents is used to confirm the identification of each type of munition on the basis of physical description, characteristic markings, DODIC number (analogous to make and model number), and matching stock number.

4.4 Comparison to Pre-Evaluated List

Following identification of each munition, EOD determines whether each item has been pre-evaluated as acceptable for treatment by OB or OD.

The munitions items which have been pre-evaluated as acceptable for treatment at AAFB's EOD Range are listed in Table III-7, along with the treatment method (OB or OD).

4.5 Treatment of Pre-Evaluated Munitions

The following steps are followed for treatment events which include only pre-evaluated waste munitions.

4.4.1 NEW Quantity Research

EOD Flight researches the NET Explosive Weight of the explosive materials within each munition using T.O. 11A-1-46 and/or the 60 Series T.O.s.

4.4.2 Evaluation of Environmental Performance Standard Restrictions

For a treatment event composed entirely of pre-evaluated items, the only additional evaluation is comparison of the munitions and quantities slated for treatment to the limitations presented in Table EPS-19 (for Open Burning treatment events) or Table EPS-21 (for Open Detonation treatment events) as appropriate. These two Environmental Performance Standards restrict the quantity of certain specific munitions per treatment event. (Item numbers refer to those presented in Table III-7)

Table III-EPS 19
Maximum NEW per Open Burn Treatment Event
Andersen AFB EOD Range, RCRA Waste Treatment Operations

The maximum NEW for each OB event is 100 lbs, except for the following items.	
Item Nos. 10, 42,43,45, 50	Restricted to 5 lbs (total NEW)
Item Nos. 36, 37, 38, 39, 40, 51	Restricted to 10 lbs (total NEW)
Item No. 4	Restricted to 50 lbs (total NEW)

(reference: EPS 19)

Table III-EPS 21
Maximum NEW per Open Detonation Treatment Event
Andersen AFB EOD Range, RCRA Waste Treatment Operations

The maximum NEW for each OD event is 600 lbs, except for the following items.		
Total NEW (lbs)	Maximum Munition Item NEW (lbs)	
For OD Event	No. 95	No. 14,15,
1	0.26	1.0
5	0.54	2.7
20	0.64	3.2
50	1.4	7.0
100	2.1	10
200	3.5	17
300	5.0	25
400	6.7	33
500	8.3	42
600	10.0	50

(reference: EPS 21)

4.4.3 Treatment

Providing all munitions are listed in Table III-7, the proposed treatment event proceeds as proposed or is modified, if required, as per the restrictions imposed by Environmental Performance Standards #7, #19 and/or #21.

4.5 Treatment Events Including Waste Munitions Not Pre-evaluated

For munitions not listed as pre-evaluated, additional evaluation must be accomplished as follows for all munitions in the proposed treatment event.

EOD Flight researches the specific chemical components which makeup the explosive materials within each munition using the 60 Series EOD T.O.'s. Data gathered from the appropriate T.O. includes both chemical constituents and quantity of each constituent.

4.5.1 Treatment Events including Munitions Not Pre-evaluated Without Compounds of Concern

If the research of the munitions which were not pre-evaluated reveal no compounds of concern (metals and sulfur), the NEW of the munitions is totaled, and the proposed treatment event may proceed with only those restrictions imposed by EPS #7, #19 and/or #21.

4.5.2 Treatment Events including Munitions not Pre-evaluated with Compounds of Concern

If the research of the munitions which were not pre-evaluated reveals they contain compounds of concern (metal and sulfur compounds), these compounds must then be evaluated for all munitions in the proposed treatment event.

The totals for each of the chemical components of concern are compared to the maximum permissible quantity of metals and sulfur per treatment event as specified in Table III-1 (for OB treatment) or Table III-2 (for OD treatment).

Following this evaluation, the proposed treatment event may proceed under the restrictions imposed by Table III-1 (for OB treatment) or Table III-2 (for OD treatment), or by EPS #7. #19 and/or #21 whichever is more restrictive.

5.0 Documentation

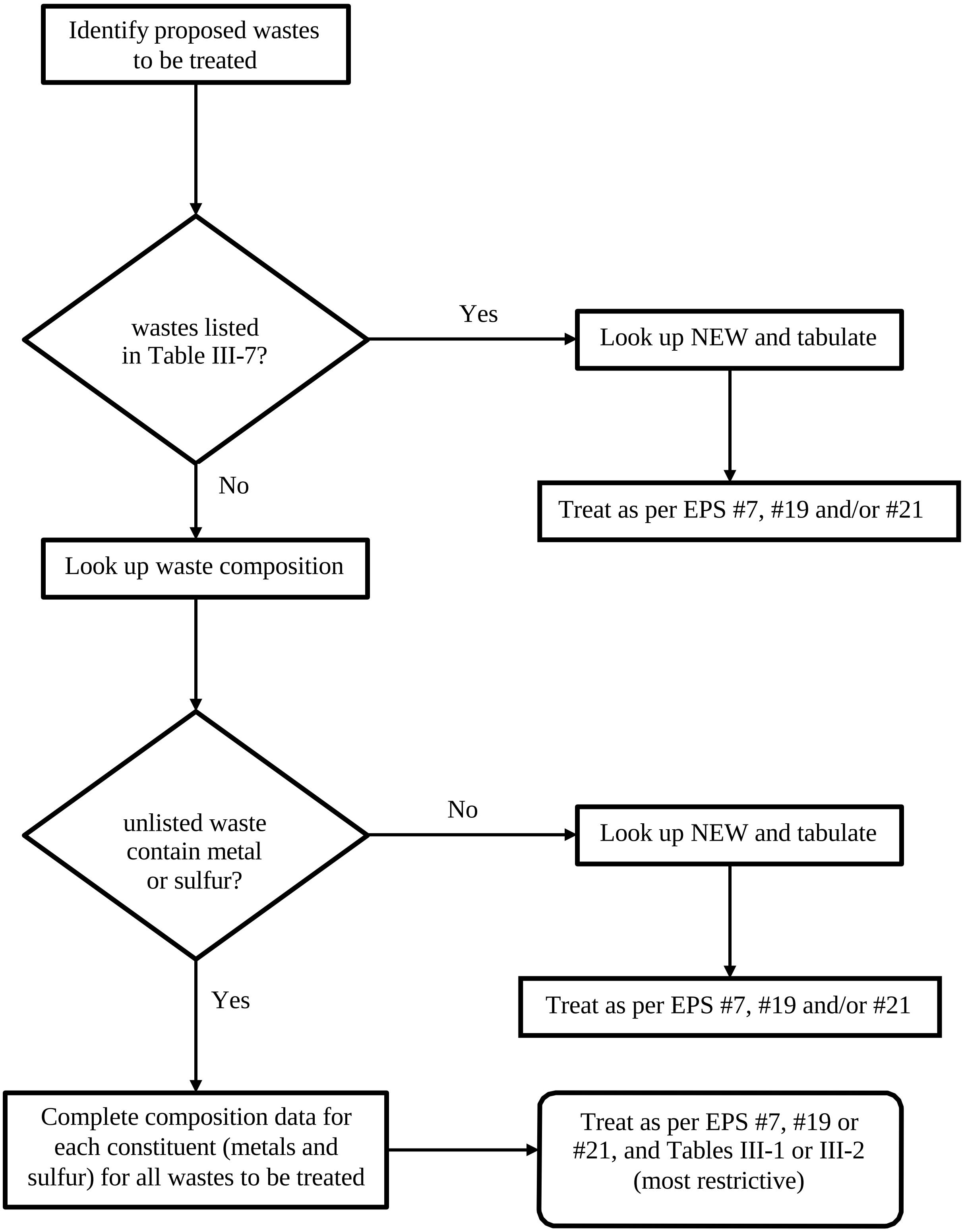
The procedures completed for evaluating the acceptability of the proposed waste munitions for treatment by either OB or OD are documented using the Waste Munitions Analysis Checklist (see Attachment 5).

Attachment 1

Environmental Performance Standards

Waste Evaluation Flow Chart

Environmental Performance Standards
Waste Evaluation Flow Chart



Attachment 2

Table III-1 Maximum Permissible Quantity of Metals and Sulfur that can be Treated per OB Event, AAFB EOD RCRA Part B Application

TABLE III – 1
Maximum Permissible Quantity of Metals and Sulfur that can be Treated per OB Event
Andersen AFB EOD Range, RCRA Waste Treatment Operations

Constituent	Quantity per Event (lbs)
Aluminum Cpds, as Al	25.30
Antimony Cpds, as Sb	2.50
Barium Cpds, as Ba	0.51
Calcium Cpds, as Ca	0.34
Copper Cpds, as Cu*	0.00
Iron Cpds, as Fe	84.80
Lead Cpds, as Pb	2.72
Magnesium Cpds, as Mg	57.20
Potassium Cpds, as K	45.90
Silver Cpds, as Ag	1.02
Sodium Cpds, as Na	35.10
Strontium Cpds, as Sr	4.09
Sulfur Cpds, as S	0.63
Tin Cpds, as Sn	0.07
Uranium Cpds, as U	1.11
Zinc Cpds, as Zn	19.00

*Copper compounds not evaluated.
Historically no copper compound containing items have been treated by OB.

Attachment 3

Table III-2 Maximum Permissible Quantity of Metals and Sulfur that can be Treated per OD Event, AAFB EOD RCRA Part B Application

TABLE III – 2
Maximum Permissible Quantity of Metals and Sulfur that can be Treated per OD Event
Andersen AFB EOD Range, RCRA Waste Treatment Operations

	Maximum Quantity per Event (lbs)							
Constituent	Total Event NEW 1 lb	Total Event NEW 5 lb	Total Event NEW 20 lb	Total Event NEW 50 lb	Total Event NEW 100 lb	Total Event NEW 200 lb	Total Event NEW 400 lb	Total Event NEW 600
Aluminum Cpds, as Al	4.03	8.36	13.98	21.62	32.43	54.04	101.33	152.00
Antimony Cpds, as Sb*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barium Cpds, as Ba	0.07	0.14	0.23	0.36	0.54	0.89	1.67	2.51
Calcium Cpds, as Ca	0.20	0.42	0.71	1.10	1.64	2.74	6.13	7.70
Copper Cpds, as Cu	0.01	0.01	0.02	0.03	0.05	0.08	0.15	0.22
Iron Cpds, as Fe	8.32	17.26	28.87	44.66	66.99	111.64	209.33	314.00
Lead Cpds, as Pb	0.47	0.98	1.64	2.53	3.80	6.33	11.87	17.80
Magnesium Cpds, as Mg	8.47	18.14	30.34	46.93	70.40	117.33	220.00	330.00
Potassium Cpds, as K	0.36	0.75	1.25	1.93	2.90	4.84	9.07	13.60
Silver Cpds, as Ag*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sodium Cpds, as Na	5.59	11.60	19.40	30.01	45.01	75.02	140.67	211.00
Strontium Cpds, as Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfur Cpds, as S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tin Cpds, as Sn*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uranium Cpds, as U*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc Cpds, as Zn	3.02	6.27	10.48	16.21	24.32	40.53	76.00	114.00

* Noted compounds not evaluated
Historically, no items containing these compounds have been treated by OD

Attachment 4

Table III-7 Ordnances Pre-Evaluated

Andersen AFB EOD RCRA Treatment Operations

Table III-7
Ordnances Pre-Evaluated
Andersen AFB EOD RCRA Treatment Operations
(Page 1 of 3)

Ordnance #	Name	OB	OD
1	Cartridge, 5.56 mm Ball	X	X
2	Cartridge, 5.56 mm Ball/tracer	X	X
3	Cartridge, 5.56 mm Blank	X	X
4	Cartridge, 7.62 mm Blank	X	X
5	Cartridge, 7.62 Ball	X	X
6	Cartridge, 9 mm Para	X	X
7	Cartridge, 12 gauge	X	X
8	Cartridge, .30-06	X	X
9	Cartridge, .357 Magnum	X	X
10	Cartridge, 20 mm HEI		X
11	Cartridge, 40 mm	X	X
12	M58A3 40mm		X
13	Simulator, Booby Trap	X	X
14	Cap, Electric blasting		X
15	Cap, Non-electric blasting		X
16	Cord, detonating		X
17	FLSC 100 to 600 GPF		X
18	Fuse, time	X	X
19	Igniter, M60	X	X
20	Charge, demolition, M112 (C4)		X
21	Charge, demolition, TNT		X
22	Charge, assembly, demolition		X
23	Demolition kit, Bangalore torpedo, M1A1		X
24	Charge, demolition block, M118		X
25	Charge, demolition roll		X
26	Deta Sheet		X
27	Charge, demolition, shaped 15lb		X
28	Charge, demolition, shaped 40lb		X
29	Cratering charge M180		X
30	Demolition kit, projected charge, M1		X
31	Dynamite, military, M1		X
32	Water Gel Explosive		X
33	Single-base smokeless powder	X	X
34	Black powder	X	X
35	Fireworks, seal	X	X
36	Firing device, M1	X	X
37	Firing device, demolition, M1A1	X	X
38	Firing device, demolition, M5	X	X
39	Firing device, demolition, M3	X	X
40	Firing device, demolition, M1	X	X

Table III-7
Ordnances Pre-Evaluated
Andersen AFB EOD RCRA Treatment Operations
(Page 2 of 3)

Ordnance #	Name	OB	OD
41	Cartridge, Fire Extinguisher	X	X
42	Detonator, percussion, M2A1	X	X
43	Detonator, percussion, M1A2	X	X
44	Cutter, line M21	X	X
45	Detonator kit, M1		X
46	Cartridge, impulse	X	X
47	Cartridge set, impulse	X	X
48	Cartridge, initiator	X	X
49	Cartridge, actuator	X	X
50	Primer, percussion, cap	X	X
51	Firing device, demolition, M142	X	X
52	Simulator, ground, M115/M116	X	X
53	Smoke Pot		X
54	Squib, Fire Extinguisher	X	X
55	Squib, M1	X	X
56	Signal, Smoke/illuminating	X	X
57	Kit, Aot Deploy	X	X
58	2 Bomblet		X
59	M74 Bomblet		X
60	AN/M50		X
61	Bomb, MK 82		X
62	Bomb,M117		X
63	Fuze, Type 93		X
64	Fuze, FMU 113/B		X
65	Fuze, FMU 54A/B		X
66	Fuze, MK 28		X
67	Fuze, MK18		X
68	Fuze, M905		X
69	Booster, M147/M148		X
70	Mortar, M49A2		X
71	Mortar, Type 97		X
72	Projectile, 5 inch		X
73	Projectile, high explosive		X
74	Projectile, MK28		X
75	Projectile, MK34		X
76	Projectile, MK35		X
77	Projectile, MK44		X
78	Projectile, MK45		X

Table III-7
Ordnances Pre-Evaluated
Andersen AFB EOD RCRA Treatment Operations
(Page 3 of 3)

Ordnance #	Name	OB	OD
79	Projectile, MK165, 76 mm		X
80	Projectile, White Phosphorus		X
81	Rocket, LAW		X
82	Rocket, LAW-35mm subcaliber	X	X
83	Mine, antipersonnel, M16		X
84	Mine, antipersonnel, M14		X
85	Mine, antipersonnel, M26		X
86	Mine, antitank, M15		X
87	Mine, antitank, M19		X
88	Mine, Claymore, M18		X
89	Flare, MK25		X
90	Flare, AN-M 26		X
91	Flare, MK124	X	X
92	Flare, Personal distress	X	X
93	Flare, ALA17/B	X	X
94	MK 24 Cluster		X
95	Grenade, MK1, Illuminating		X
96	Grenade, M14	X	X
97	Grenade, MK-2		X
98	Grenade, Smoke, M18	X	X
99	Grenade, Type 97		X
100	Grenade, Type 99		X
101	Grenade, fragmentation		X
102	Grenade, offensive, MK3A2		X
103	Weapons, Confiscated		X
104	Ethylene Oxide	X	X

Attachment 5

Waste Munitions Analysis Checklist

Date of Request for Disposition of Waste Munitions: ________
Proposed date of Waste Munitions Treatment Event: ________

1. Complete Proposed Waste Treatment Event Munitions Evaluation Form 1.

Form 1. Proposed Waste Treatment Event Munitions Evaluation

	Item	Table III-7 Item #	Quantity	Individual Item NEW	Total NEW	Contaminants of Concern?
Munitions Pre-Evaluated						
Munitions Not Pre-Evaluated						
			n/a			
			n/a			
			n/a			
				Total NEW		

2. Are all proposed wastes pre-evaluated?

a. YES________ …. continue to STEP 3 ….

b. NO ______ …. go to STEP 8 ….

3. Total NEW for proposed event _____

4. Verify acceptability with EPS #7. _____

5. Verify acceptability with EPS #19 (Open Burn Treatment). _____

    5a. 5 lb NEW restriction (Item Nos. 27, 28, 99, 100, 102, 111) _____

    5b. 10 lb NEW restriction (Item Nos. 3, 104, 105, 106, 107, 108, 109, 113) _____

    5c. 50 lb NEW restriction (Item No. 4) _____

6. Verify acceptability with EPS #21 (Open Detonation Treatment) _____

    6a. Any Item # 30 _____

    6b. Any Items # 12, 13, and/or 95 _____

7. Proceed with Treatment Event

8. Does research indicate any contaminants of concern (metals and sulfur) contained within waste munitions not pre-evaluated??

    a. YES_____ .... continue to STEP 9 ....

    b. NO______ .... return to STEP 2 and complete evaluation ....

9. Complete FORM 2 detailing quantities of contaminants of concern.

10. Do any quantities of contaminants of concern exceed limits presented in Table III-2?

    a. YES_____ …. revise proposed waste munitions treatment and repeat STEP ….

    b. NO______ …. return to STEP 2 and complete evaluation ….

APPENDIX A - OB/OD WASTE ANALYSIS PLAN
Form 2
Determination of Quantity of Metals and Sulfur for Proposed Event
Andersen AFB EOD Range, RCRA Waste Treatment Operations

	Item:		Item:		Item:		Item:		
	No. of Items:		No. of Items:		No. of Items:		No. of Items:		
Contaminant of Concern	Amount per Item	Total for Items	Amount per Item	Total for Items	Amount per Item	Total for Items	Amount per Item	Total for Items	All Items
Aluminum Cpds, as Al									
Antimony Cpds, as Sb									
Barium Cpds, as Ba									
Calcium Cpds, as Ca									
Copper Cpds, as Cu									
Iron Cpds, as Fe									

Proposed Treatment Event Date: __________

Contaminant of Concern

Lead Cpds, as Pb

Magnesium Cpds, as Mg

Potassium Cpds, as K

Silver Cpds, as Ag

Sodium Cpds as Na

Strontium Cpds, as Sr

Sulfur Cpds, as S

Tin Cpds, as Sn

Uranium Cpds, as U

Zinc Cpds, as Zn

Proposed Treatment Event Date: ______________

Appendix B

Security Procedures and Equipment

APPENDIX B – SECURITY PROCEDURES AND EQUIPMENT

1. Procedures To Prevent Hazards

Security Procedures and Equipment (Parts X.A. and VI.A. [Adopts by reference 40 CFR 270.l4(b)(4) and 40 CFR 264.14] of the GHWMRs)

Demonstration That Unknown or Unauthorized Contact with Waste Is Not Harmful (Part VI.A. [Adopts by reference 40 CFR 264.14(a)(1)] of the GHWMRs)

Unauthorized contact with the waste treated at the OB/OD cannot happen, as the wastes are only on-site during attended operations. Therefore, this section is not applicable.

Demonstration That Disturbance of Waste or Equipment Will Not Cause Violation of 40 CFR 264 (Part VI.A. [Adopts by reference 40 CFR 264.14(a)(2)] of the GHWMRs)

Unauthorized contact with the waste treated at the OB/OD cannot happen, as the wastes are only on-site during attended operations. Therefore, this section is not applicable.

Description of a 24-hour Surveillance System (Part VI.A. [Adopts by reference 40 CFR 264.14(b)(1)] of the GHWMRs)

There are varying degrees of security requirements and procedures at Andersen AFB to control access to the main base as well as to restricted areas. Each entry has certain restrictions that must be observed by all personnel. Base employees are issued identification cards and are required to show the cards to gain access to the base. Visitors to the base, including guests of military personnel and Government of Guam agency representatives, must be sponsored onto the base.

The main base may be entered at two locations: the front (main) entrance and the rear entrance. The main entrance is on Marine Corps Drive and a 24-hour-a-day manned guardhouse, fence, and gates control access. The rear entrance is on Santa Rosa Boulevard and consists of a guardhouse, fence, and gates that currently provide access 12 hours per day.

Security at Andersen AFB is maintained by the 36th Wing, 36th Security Forces Squadron. In addition to manning the guardhouses, the police squadron provides a 24-hour, 7-day per week roving patrol service throughout the base.

Entry into the flight line and restricted areas, such as the EOD Range, by unauthorized base and off-base personnel is prohibited. Escorts and log-in requirements are imposed upon entry to restricted areas. These areas are either completely fenced in or bounded by a natural barrier such as a cliff or forest. Vehicular access to the EOD Range is denied by two sequential gates on the only access road.

Description of the Artificial or Natural Barrier (Part VI.A. [Adopts by reference 40 CFR 264.14(b)(2)(i)] of the GHWMRs)

In addition to the security provisions of fencing, gates, and guards several natural features contribute to the safety and security of the EOD Range. Access to the EOD Range is controlled through the use of both natural and artificial barriers. It is bounded to the north by the Pacific

Ocean, by the flight line cliff on the south and east, and by two separately locked gates on the access road to the west.

As discussed above, the only vehicular access route is by the only access road, which has two sequential locked gates. Non-vehicular access is denied from three of four compass directions by natural barriers.

The EOD Range is bordered to the north by the Pacific Ocean. This area of the island of Guam is encircled by a continuous reef line approximately 200 feet off shore. One cannot bring a boat to shore in this area. Likewise, a swimmer would sustain serious injury attempting to cross the reef.

The EOD Range is bordered to the south and east by a dense jungle in arid etched karst limestone bedrock in an area of tremendous topographic relief. The ground surface elevation south of the range rises some 500 feet in less than 1/2 mile. These two barriers should prevent any person from accessing the EOD Range.

The EOD Range is bordered to the west by the same dense jungle growth. Line of sight distances in this dense jungle growth average less than 50 feet. Only two clear paths are available from the west. The first is the access road, which has security structures as previously discussed. The second potential line of access is the beach itself, which is approximately 100 feet wide at the east end of Tarague Beach. Wave action and typhoon conditions on the beach have made it extremely difficult to maintain any barriers to physically prevent entry from the west along the beach. Unknowing entry is prevented through warning signs maintained at the Pati Point Recreation Area approach.

In addition to the above discussion of the natural barriers to all four cardinal compass headings, one must also bear in mind that the EOD Range is totally enclosed on three of four sides by Andersen AFB. The nearest public or private property is several miles off base.

Method to Control Entry and Number of Personnel in the Treatment Area (Part VI.A. [Adopts by reference 40 CFR 264.14(b)(2)(ii)] of the GHWMRs)

In addition to the warning signs and locked gates to prevent unauthorized entry, red warning flags are flown during EOD operations. The red flags are flown at two locations: the gate at the small arms range on Tarague Well Road and on the beach near the personnel bunker at the EOD treatment area.

Sign Posted at Each Entrance with Legend "Danger -Unauthorized Personnel Keep Out" (Part VI.A. [Adopts by reference 40 CFR 264.14(c)] of the GHWMRs)

Warning signs are posted along both accessible and inaccessible boundaries of the EOD Range to provide would-be trespassers ample notice that the site is a restricted area. All signs are written in English and Chamorro and are legible from at least 25 feet away. Warning signs that read "Danger, Explosive Disposal Range Keep Out" are posted along the cliff top above the EOD Range. The warning signs at the Pati Point Recreation Area approach to the west consist of the following legend: "Danger, Small Arms Range, DOD Ammunition Dud Area, Off Limits To All

Personnel." Prior to any operation of the EOD Range, the beach area is inspected to eliminate the possibility of unauthorized entry. Warning signs are also posted at both locked gates on the access roads and on the beach at the treatment area within the EOD Range. The signs state: "Danger, Explosive Disposal Range, Keep Out."

To reinforce that the EOD Range is a restricted area, 40 warning signs with a legend in both English and Chamorro will be distributed around the perimeter of the EOD Range. These signs will be legible from a distance of 25 feet. The legend consists of "DANGER" in white 4-inch capital letters on a red and black background. Beneath the word "Danger," in 4-inch black lettering, is "EXPLOSIVE DISPOSAL RANGE KEEP OUT" on a white background. Beneath the warning written in English is a corresponding warning written in the local language of Chamorro.

Appendix C

Inspection Schedule

1. Inspection Schedule

Copy of Inspection Schedule (Parts X.A. and VI.A [Adopts by reference 40 CFR 270.14 and 264.15] of the GHWMRs)

Operation of the EOD Range is in accordance with standard operating procedures (SOPs) in place at Andersen AFB. Flight Operating Instruction (FOI 32-3002) provides procedures for the safe operation of the EOD Range. These operating procedures direct EOD personnel to inspect the range before and after operations as well as after any typhoons/storms. FOI 32-3002 details information on EOD procedures, personnel safety and responsibilities, and checklists on safety inspections and range/demolition.

Types of Problems to Be Checked (Part VI.A. [Adopts by reference 40 CFR 264.15] of the GHWMRs)

Inspection of the EOD Range occurs both before and after conducting any operations at the site. These are the most critical times for inspections to correct deficiencies, which may interfere with the safe progress of the treatment process and threaten human health and the environment. The purpose of these inspections is to detect any unexploded ordnance (UXO), metal fragments, and/or other discharges that could affect human health or the environment. The pre-operation inspection includes checking for any unauthorized personnel on the beach prior to accepting delivery of the munitions to the range. Additional pre-operations checklists examine the integrity of security devices and emergency response equipment. A copy of the inspection checklists may be found in the EOD Operating Procedures Appendix.

Frequency of Inspections of Equipment and Process (Part VI.A. [Adopts by reference 40 CFR 264.15(b)(4)] of the GHWMRs)

Inspections of the OB equipment occur before and after operations, as well as after any typhoons/storms. As previously stated, there is no other equipment to inspect.

Inspection Record Keeping (Part VI.A. [Adopts by reference 40 CFR 264.15] of the GHWMRs)

Records of inspections and the inspection schedule are documented in the EOD Incident Management System (EODIMS) report. (EODIMS is an online database that far exceeds 3 year requirement)

Schedule of Remedial Action (Part VI.A. [Adopts by reference 40 CFR 264.15] of the GHWMRs)

During EOD Range inspections, any deterioration/malfunction of equipment will be noted and the problem alleviated prior to commencing operations. Repair/replacement of the burn equipment are the only approved actions.

Daily Inspection for Leaks, Spills, and Fugitive Emissions, and All Emergency Shutdown Controls and System Alarms (Part VII.A. [Adopts by reference 40 CFR 265.377] of the GHWMRs)

No stacks, emission control devices, or associated equipment are present on the EOD Range treatment site. The site consists of an isolated open area composed primarily of beach sand and coral. Prior to commencing operations on the EOD Range, the inspection procedures outlined in FOI 32-3002 are completed. Deficiencies are noted and corrected prior to commencing operations.

2. Preparedness and Prevention (Parts X.A. and VI.A. [Adopts by reference 40 CFR 270.14 and 40 CFR 264(Subpart G)] of the GHWMRs)

The intent of the preparedness and prevention measures taken by Andersen AFB is to minimize the possibility of a fire, accidental explosion, or any unplanned sudden or non-sudden releases of hazardous waste (HW) or hazardous constituents, which could threaten human health or the environment.

Description and Location of Internal Communications and Alarm System to Instruct Facility Personnel (Part VI.A. [Adopts by reference 40 CFR 264.32(a)] of the GHWMRs)

Operating personnel on the EOD Range maintain visual contact. Communication is by voice or handheld radios.

Appendix D

Personnel Training

APPENDIX D – PERSONNEL TRAINING

Personnel Training

Outline of Both the Introductory and Continuing Training Programs (Part X.A. [Adopts by reference 40 CFR 270.14(b)(12)] of the GHWMRs) and Training Content, Frequency, and Techniques

All EOD personnel go through extensive training, introductory through advanced levels, through schools at Naval School Explosive Ordnance Disposal, Eglin AFB, FL (NAVSCOLEOD, and continue with on-the-job practical training, textbook training, and off-site training courses. EOD training is constantly being updated and revised to keep up with improved techniques and new technology. Therefore, the training outline and specific courses discussed here are subject to change throughout the active life of the unit. However, these revisions will not cause reduction but will enhance the overall quality and excellence of the current EOD training requirements.

Preliminary Training Program

EOD students must first graduate from Air Force basic training prior to enrolling in the EOD program. Many new students in the EOD program have transferred from another Air Force duty and are continuing in EOD for cross training. EOD students start out with preliminary training course four weeks in length, which introduces EOD work. If students pass the preliminary course, they then proceed to NAVSCOLEOD.

EOD Basic Training Programs

Explosive Ordnance Disposal Basic Training course is located at NAVSCOLEOD, Eglin AFB, Florida. This intensive basic training program takes approximately eight to twelve months to complete. It incorporates classroom and practical hands-on training. Each phase of the training covers the following subject areas; however, there is overlap in some subject areas.

- Researching Explosive Data
- Tool Sets and Techniques for Remote Procedures
- Demolition Procedures
- Chemical Ordnance Decontamination and Disposal
- Explosive Effects and Properties
- Comprehension of Demolition Materials
- Comprehension of Firing Techniques
- Operation of .50 Caliber Dearmer, U.S. Tool Set & Remote Wrench
- Comprehension of Shaped and Special Charges
- Special Explosive Techniques
- Disposal Procedures for Conventional Explosives and Related Hazardous Materials
- Nuclear Ordnance Identification
- Conventional Ordnance Identification and Function
- Conventional Ordnance Safe Rendering and Disposal

Upon successfully completing NAVSCOLEOD, EOD Apprentices are assigned to an EOD unit at specific bases such as Andersen AFB. The duties and responsibilities of an EOD Apprentice are described in the Skill Level Summary, in the Training Plan Appendix.

EOD Advanced and Continuing Training Programs

The level of activity and responsibility for EOD Apprentice is continuously increased as they become proficient in EOD operations. Students become certified in various techniques by conducting them with a certified experienced EOD supervisor. EOD personnel are required to complete extensive practical and textbook training. Training is conducted approximately three days per week during the duty day. Practical EOD training is conducted three to nine times a month. During practical training, EOD flight members are trained and evaluated by supervisors.

There are several training programs that are completed concurrently by EOD personnel. Training is a continuous process, and each individual must advance in training level in accordance with specified time limits in order to remain in the EOD unit. Individual Apprentices are constantly reviewing previously learned techniques in order to retain their proficiency.

There are four levels of training and proficiency (skill levels). A member of an EOD unit starts as an EOD Apprentice (as mentioned above). The second level of proficiency is an EOD Journeyman. The third level is an EOD Craftsman. The highest level of training and proficiency is an EOD Superintendent. Many training programs have specific time limits to complete in order to maintain EOD status.

A Description of How Training Will Be Designed to Meet Actual Job Tasks (Part X.A. [Adopts by reference 40 CFR 264.16(e) *of the GHWMRs)*

Training records are maintained for each individual. The required training programs are discussed below.

Air Force Institute for Advanced Distributed Learning, Air University (Course # 3E851). This 12-month course, referred to as the Career Development Course (CDC), includes extensive reading requirements followed by testing to graduate. This course requires EOD members to increase their level of knowledge pertaining to overall EOD operations. Graduation from this course moves EOD members up one level on the training scale within the individual's skill level. EOD personnel must complete this course within one year in order to remain in EOD.

Department of Air Force, EOD Training (Course # STS 3E8X1). The purpose of this training program is to train airmen to perform duties in the Explosive Ordnance Disposal ladder of the Civil Engineer career field. As EOD personnel perform the on-the-job training, they qualify under Job Qualification Standards. The purpose of the EOD Qualification is to train EOD members on specific explosive techniques and overall EOD functions. EOD must be "qualified" prior to handling a certain type of ordnance. All training under the Specialty Training Standard (STS) is recorded on Air Force Training Record (AFTR) computer based training records. EOD personnel must likewise study and pass Promotion Tests to advance to higher ranks/enlisted grades.

APPENDIX D – PERSONNEL TRAINING

This training continues throughout the career of an EOD member. Proficiency in training items is reviewed annually by the supervisor to determine whether level of knowledge and proficiency has been maintained. If not, STS training will have to be recertified. The general areas of this training include:

- Security
- Air Force Occupational Safety and Health
- Explosive Ordnance Disposal
- Electricity
- Tools and Equipment
- Explosives and Propellants
- Destruction of Explosives and Related Hazardous Materials
- Explosive Ordnance Reconnaissance
- Protection of Personnel and Property
- U.S. and Foreign Dropped and Projected Munitions, Missiles, and Pyrotechnics
- Underwater Ordnance

Pacific Air Forces (PACAF) Job Qualifications Standards (JQSs). This course work is sent to Andersen AFB from PACAF and/or established by the Andersen EOD Flight Chief. It makes up the requirements for Initial Qualification Evaluation (IQE), certification, and additional duty position requirements needed to support EOD agencies. It includes both practical and textbook training requirements. PACAF training continues throughout the careers of EOD personnel at Andersen AFB and other Air Force bases within PACAF. EOD personnel must meet JQSs each year.

Flight Operating Instructions. Flight Operating Instructions (FOIs) are written at the Flight level, and Instructions are written at the Base or Command level for EOD personnel for specific operations at Andersen AFB. The FOIs must go through the base chain of command for coordination and approval before they become official operating documents.

The PACAF training checklists include reading and understanding FOIs that are applicable to EOD operations. All EOD personnel must be certified for each applicable Andersen AFB FOI; they cover the following areas (FOI #, date):

- FOI 32-3001 EOD Standby and Response Procedures (Sep 2020)

- FOI 32-3002 EOD Demolition Range Procedures (Sep 2020)

- FOI 32-3003 EOD Transportation of Explosives (Sep 2020)

- FOI 32-3004 Use of EOD Explosive Actuated Tool Kits and Techniques Off-Range (Sep 2020)

- FOI 32-3005 EOD Respiratory Protection Program (Sep 2020)

- FOI 32-3007 EOD Storage (Sep 2020)

Training in Hazardous Waste Management

In addition to highly technical EOD training for the disposal of ordnance, EOD personnel attend the Hazardous Materials Awareness and Operator level Certification course and regulatory requirements under RCRA.

Industrial Hygiene Professionals, Inc. provides the aforementioned training in hazardous waste management. This training provides compliance with 40 CFR 264.16, TSDF Standards. EOD personnel must complete this course within six months of assignment, and may not work with hazardous waste in an unsupervised capacity until they have completed the training. This training is updated annually.

The following subject areas are covered during the training:

- Introduction
- Liabilities
- Responsibility
- Identification of Hazardous Waste
- Management of Hazardous Waste (accumulation point management)
- Spill Prevention and Response to Emergencies
- Contingency Planning and Emergency Response
- Hazardous Waste Turn-in Procedure
- Container Labeling/Management
- Waste Minimization
- Personnel Safety

- Exam

Training for Emergency Response (Part X.A. [Adopts by reference 40 CFR 264.16(a)(3)] of the GHWMRs)

EOD personnel are trained in emergency response by several training mechanisms. The PACAF JQS training and Department of the Air Force training (#STS 3E8X1) cover the Instructions and documents listed below. These documents include Air Force Instructions (AFI) and Air Force Technical Orders (AFTO). Several of these items, which are specific to EOD operations, are described in detail in the Training Plan Appendix.

- DESR6055.09 AFMAN 91-201: Explosive Safety Standards
- AFTO 11A-1-42, General Instructions for Disposal of Conventional Munitions
- AFTO 11A-1-46, Fire Fighting Guidance
- AFTO 60A-1-1-31, General Information on EOD Disposal Procedures
- AFI 31-101, Volume I, Physical Security Program
- EOD personnel are required to read and understand the Installation's Comprehensive Emergency Management Plan (IEMP) 10-2.

All EOD personnel will be required to become familiar with the Contingency Plan of this RCRA Part B Permit Application for the EOD OB/OD operations. (Appendix F)

Occupational Safety and Health requirements, including personal protective equipment, emergency shower and eyewash unit, chemical safety, and hazard communication, are taught through the advanced and continuing training programs and technical areas. Safety requirements unique to specific equipment are taught in conjunction with the operational training for that equipment. For example, EOD personnel are trained in safety requirements for electric power tools, specialized explosive tools, and explosives. Hazardous noise and fire protection briefings are conducted annually.

Maintenance of Training Records/Copy of Personnel Training Document (Parts VI.A. and X.A. [Adopts by reference 40 CFR 264.16(d)(e) and 270.14(b)(12)] of the GHWMRs)

Training content, frequency, and techniques. All EOD personnel will maintain their electronic training records in AFTR. Formal EOD training is recorded as well as all on-the-job training and testing. Personnel EOD training records will be transferred via the Unit Training Manager when they are transferred to another duty station.

All required training records for the hazardous waste management course would be kept until closure of the facility by 36th Civil Engineer Squadron, Environmental Flight (36 CES/CEV) staff. EOD personnel are generally stationed at Andersen AFB for a period of two years. Therefore, there will be several changes of personnel through the operating period. It is unlikely that many (if any) current employees of Andersen AFB EOD will be employed at the time of closure.

Training records for the hazardous waste management course will be maintained by 36 CES/CED for three years after Permanent Change of Station (PCS). To ensure compliance with this requirement, 36 CES/CED will provide copies of the hazardous waste management training record to 36 CES/CEV HW Manager.

Director of the Training Program: Experience and Training in Hazardous Waste Management Procedures (Part VI.A. [Adopts by reference 40 CFR 264.16(a)(2)] of the GHWMRs)

Position. The EOD person holding this position will generally meet the job description/skill level of Explosive Ordnance Disposal Superintendent.

Job Titles and Job Descriptions of All Employees Involved in OB/OD Operations

The senior ranking EOD member will be the Range Safety Officer (RSO), responsible for all operations conducted on the range. The Team Chief will be identified prior to operations, and is responsible for running the operation and directing other team members on the range. All others will be team members and follow the direction of the RSO and Team Chief.

Other positions that track and evaluate training for OB/OD operations are:

The Training Monitor is responsible for scheduling the monthly training sessions for all EOD personnel and any additional training that Andersen EOD require. The Training Monitor ensures all required training is completed by the Andersen AFB EOD flight. He accomplishes this by tracking the training in a computer database.

The Quality Assurance function reviews the training records to ensure the Training Monitor is properly performing his/her job correctly and that all required training has been conducted in accordance with acceptable guidelines.

Appendix E

Prevention of Ignition or Reaction

The EOD operations are manually prepared and initiated and do not require electrical equipment that would be affected by power outages.

Personnel Protection Procedures (Part X.A. [Adopts by reference 40 CFR 270.14] of the GHWMRs)

The handling of HW for OB/OD operations is conducted in a manner that minimizes contact of involved personnel with the waste. Requirements for personnel protection are in accordance with applicable AFOSH SOPs.

Hearing protection devices (ear plugs, earmuffs) are available for use. Half-face respirators with appropriate cartridges are also provided for use, as necessary. Likewise, gloves and safety glasses are used, where appropriate.

Procedures to Minimize Releases to the Atmosphere (Part X.A. [Adopts by reference 40 CFR 270.14] of the GHWMRs)

The nature of OB/OD HW treatment on the EOD Range does not provide for procedures to minimize releases to the atmosphere. Appendix G provides information on the atmospheric, meteorological, and topographic characteristics of the unit.

Prevention of Accidental Ignition or Reaction of Wastes (Parts VI.A. and X.A. [Adopts by reference 40 CFR 264.7 and 40 CFR 270.14] of the GHWMRs)

Description of Procedures to Prevent Accidental Ignition or Reaction of Wastes (Part VI.A. [Adopts by reference 40 CFR 264.17] of the GHWMRs)

Movement in a military vehicle of minimum quantities of explosive items necessary for demolition operations, to include proficiency training is permitted. Blasting caps, demolition explosives and unserviceable (but not dangerously unserviceable) munitions may be transported by the same vehicle provided explosives and initiators are separated as much as possible and are in adequate transportation configuration. Upon delivery to the range the waste munitions are placed in one holding area and the initiating devices are put into a separate holding bunker at least 50 feet apart.

Operations at the EOD Range are suspended if there is a wildfire or lightning hazard within 5 nautical miles.

During the pre-operational safety briefing, the only authorized smoking area is identified. Spark producing items are collected during the safety briefing. No smoking is allowed during handling of explosives.

OB/OD operations, generate heat, pressure (shock waves), fires and explosions, and sometimes violent reactions. Andersen AFB is interpreting this requirement to mean that the intentional initiation of such phenomena must be carried out in a controlled setting, which is the intent of the OB/OD operation.

APPENDIX E – PREVENTION OF IGNITION OR REACTION

Documentation of Adequacy of Procedures (Part VI.A. [Adopts by reference 40 CFR 264.17] of the GHWMRs)

EOD Range operators are very familiar with the procedures to prevent accidental ignition or reaction of the waste munitions. In addition to the precautions found in the SOPs utilized on the range, EOD personnel spend much of their time in training exercises (Appendix D, Personnel Training). DOD-wide historical experience has shown that accidental detonation or combustion have been extremely rare when SOPs are strictly followed.

Appendix F

Contingency Plan

Table of Contents

HAZARDOUS WASTE CONTINGENCY PLAN
FOR EXPLOSIVE ORDNANCE DISPOSAL FACILITY
ANDERSEN AIR FORCE BASE, GUAM

1.0 INTRODUCTION

The purpose of the Explosive Ordnance Disposal (EOD) Facility Contingency Plan is to describe the actions that EOD personnel will take to minimize hazards to human health or the environment in response to any unplanned fires, explosions, or any sudden or non-sudden releases of hazardous waste (HW) or constituents. This EOD Contingency Plan is specifically for use during the treatment of ammunition/munitions items at the EOD Range. It applies to all assigned EOD personnel and others assisting in treatment operations. This EOD Contingency Plan does not cover the storage or transportation of the ammunition/munitions and is specific to operations at the EOD Range. *Andersen AFB Installation Emergency Management Plan (IEMP) 10-2* provides a Basewide Contingency Plan for operations conducted at Andersen AFB.

HW treatment operations conducted at the EOD Range are not typical of normal RCRA treatment, storage, and disposal (TSD) operations. The wastes which are treated at an EOD Range are designated hazardous due to their reactive (explosive) characteristic. Treatment methods address the elimination of the explosive hazard of the waste. As such, the overriding operational concern is safety. Three types of emergencies are possible: 1) explosive, 2) fire, and 3) environmental. Environmental releases are unlikely for either explosive or fire emergencies. In either of these cases, human health and safety is the overriding concern. An environmental emergency would most likely consist of a virgin diesel fuel spill, which would be handled under procedures outlined in the Base Spill Prevention, Control and Countermeasure (SPCC) plan.

The EOD Contingency Plan is designed to minimize hazards to human health and the environment resulting from unplanned releases of hazardous materials associated with EOD operations.

Actions to Take in Case of Emergency (Part VI.A. [Adopts by reference 40 CFR 264.53 and 40 CFR 264.56] of the GHWMRs)

Figure 1 in the EOD Range Contingency Plan provides a flow chart of Emergency Response Actions for Andersen.

2.0 DEFINITIONS

2.1 EOD Range – The EOD Range, the unit to be permitted, is located at the extreme eastern reach of Tarague Beach, ending just before Tagua Point. The grid coordinates for the range are 13 Degrees, 35.58 minutes North, 144 Degrees, 56.48 minutes East. See Appendix G for the location. Its mission is to render unserviceable ordnance and other pyrotechnic devices harmless by either open detonation or open burning, as well as to allow EOD personnel to maintain a proficiency in the operation of explosive actuated EOD tool sets.

2.2 Open Burning (OB) – Waste military energetic materials are burned in containment devices. Typically dunnage is placed into the bottom of the containment device and the OB materials are placed on top. Virgin diesel fuel is carefully added, and the initiating charges are placed on top. The device is secured with an ejection reduction device (e.g., chain link fence, steel perforated planking, etc.). Following final safety checks, the charge is initiated remotely.

2.3 Open-Detonation (OD) – Ammunition or explosives to be treated by detonation are placed on the ground at the base of the flight line cliff. An adequate number of initiating devices are placed on top of the items to be detonated. Following a final safety check, the items are detonated remotely. Maximum net explosive weight for all explosives will not exceed 600 pounds.

3.0 EMERGENCY RESPONDERS

3.1 Arrangements with Local Authorities (Part VI.A. [Adopts by reference 40 CFR 264.52] of the GHWMRs)

In the event of an emergency at the EOD Range, on-base police, fire department, and medical support personnel will provide the necessary coverage. 36 Wing IEMP 10-2 dictates the coordination and responsibilities of the response teams. These agencies are tasked to conduct personnel training to ensure that their response capabilities for an emergency at EOD Range are effective.

3.2 Names, Addresses, and Phone Numbers of Emergency Coordinators (Part VI.A. [Adopts by reference 40 CFR 264.52 and 40 CFR 264.55] of the GHWMRs)

The emergency coordinator will be known as the Incident Commander (IC). The initial IC will be the Range Safety Officer (RSO). If any emergencies are beyond the capabilities of the EOD personnel on site, IC will transfer to the Senior Fire Officer (SFO), once they are on-scene. The RSO will remain to advise the IC once command has transferred.

The IC will be thoroughly familiar with all aspects of the EOD Range Contingency Plan, all operations and activities at the range, the location and characteristics of wastes handled, the location of applicable records, and the facility layout. He/she is responsible for coordination of emergency containment, control, and cleanup activities during and after an uncontrolled release at the EOD Range. In case of an emergency he/she is the primary point of contact and is responsible for activation of a response team, as needed.

The following personnel are qualified to act as Emergency Coordinators/Incident Commanders for the EOD Range:

PRIMARY:

Fire Chief
36 CES/CEF, Unit 14007 APO AP 96543-4007
Duty Phone: 366-6201 Non-duty Phone: 366-5284

ALTERNATES:

Deputy Fire Chief
36 CES/CEF, Unit 14007 APO AP 96543-4007
Duty Phone: 366-6201 Non-duty Phone: 366-5284

Asst. Chief of Operations
36 CES/CEF, Unit 14007 APO AP 96543-4007
Duty Phone: 366-5284 Non-duty Phone: 653-5284

Chief, EOD Flight
36 CES/CED, APO AP 96543-4009
Duty Phone: 366-5198 Non-duty Phone: 366-2981

NCOIC, EOD Flight
36 CES/CED, APO AP 96543-4009
Duty Phone: 366-5198 Non-duty Phone: 366-2981

4.0 EMERGENCY EQUIPMENT

Location and Description of Emergency Equipment at the Facility (Part VI.A. [Adopts by reference 40 CFR 264.52] of the GHWMRs)

4.1 EOD Equipment – During EOD Range operation the following equipment is on-site:

- First Aid Kit
- Potable Water
- At a minimum, explosive laden vehicles will have two 2A:10BC ABC fire extinguishers
- 1 communication radio per vehicle
- Two, 2 way portable hand held radios
- 2 shovels

Emergency equipment is inspected before and after all OB/OD operations. During the safety briefing, prior to EOD Range operations, the location of all emergency equipment is reviewed with the EOD team. The portable radios are continually monitored during an EOD operation. The location and number of vehicles present during the operation is also noted. Each explosive laden vehicle at the EOD Range contains 2 easily accessible, 2A:10BC ABC fire extinguishers as well as a vehicle radio.

4.2 Fire Equipment – In the event of a fire emergency on the EOD Range beyond the capacity of EOD equipment, Andersen Fire Department would be alerted. The Fire Department would respond to the EOD Range area with the equipment required to mitigate the situation, as determined by the SFO.

This equipment is located at Fire Protection Flight, Building 17002, on Andersen AFB, and available for emergency response to the EOD Range. Estimated time of response to the EOD Range is approximately 8 – 10 minutes.

4.3 Environmental Equipment – During the open burning treatment of HW, approximately ten to twenty gallons of virgin diesel fuel is used per burn. The possibility exists that a small amount of fuel could spill. EOD personnel would remove any contaminated sand and treat it in the burn containment device. If an environmental response is required that is beyond the capabilities of the EOD personnel, the Base environmental spill team can be activated by the Fire Department.

The spill response vehicle is located on Base at the Civil Engineering Squadron, Building 18001 parking lot. It is equipped with personal protection devices and spill containment. Heavy equipment for soil removal are located at the Heavy Equipment Shop, Building 20021.

5.0 EVACUATION PLAN

Evacuation Plan for Facility Personnel (Part VI.A. [Adopts by reference 40 CFR 264.52] of the GHWMRs)

5.1 EOD Range – There is only a limited number of personnel on the range during operations. In most emergency situations, the safest position for people is the personnel bunker. This is the position from where the detonations are initiated for both OB and OD operations. This bunker provides cover from explosives ejecta for detonations and open burns up to the range safety limit.

The only possible situation, in which personnel would commence evacuation of the range, would be where a fire has engulfed unexploded ordnances in the immediate vicinity of the personnel bunker. In this case, the personnel on the range would evacuate by foot or by vehicle to the small arms range and regroup at the emergency phone. If the Fire

Department was required, and had not been contacted by radio, they would be contacted by the small arms range emergency phone.

5.2 Base – A Base wide evacuation plan is not applicable to this operation. Unlike a typical RCRA Treatment, Storage, and Disposal (TSD) operation, the EOD Range has an established safety zone surrounding the treatment area. This safety zone encompasses the maximum distance that detonation/burn fragments will travel in accordance with a maximum net explosive weight for all explosives that will not exceed 600 pounds.

6.0 CONTINGENCY PLAN COPY LOCATION

Location and Distribution of Contingency Plan (Parts X.A. and VI.A. [Adopts by reference 40 CFR 270.14 and 40 CFR 264.53] of the GHWMRs)

Copies of the Contingency Plan as well as any updates or revisions to the plan will be located at the following places:

EOD Flight Office
EOD Range Binder
CEV Environmental Flight
Fire Protection Flight
Medical Clinic
Security Police
Emergency Response Spill Team
Emergency Operations Center
Bioenvironmental Office
Safety Flight

7.0 EMERGENCY RESPONSE PROCEDURES

Immediate Procedures for Emergency Coordinator to Alert All Facility Personnel in Case of Emergency and Notify State and Local Agencies If Help Is Needed (Part VI.A. [Adopts by reference 40 CFR 264.56(a)] of the GHWMRs)

Any person who detects an imminent or actual fire, explosion, or any other unplanned sudden or non-sudden release of HW or constituents will immediately sound a vocal and/or radio warning to endangered personnel.

Upon detection of an emergency incident the situation will be immediately reported to the EOD Range Safety Officer (RSO). Once the RSO declares an emergency, they are known as the Incident Commander (IC). The IC will evaluate the incident to determine the potential for endangerment to human health and/or the environment. The EOD Contingency Plan will be implemented immediately by the IC in the event that there is an accident at the EOD Range which could result in the release of HW or constituents that could threaten human health or the environment.

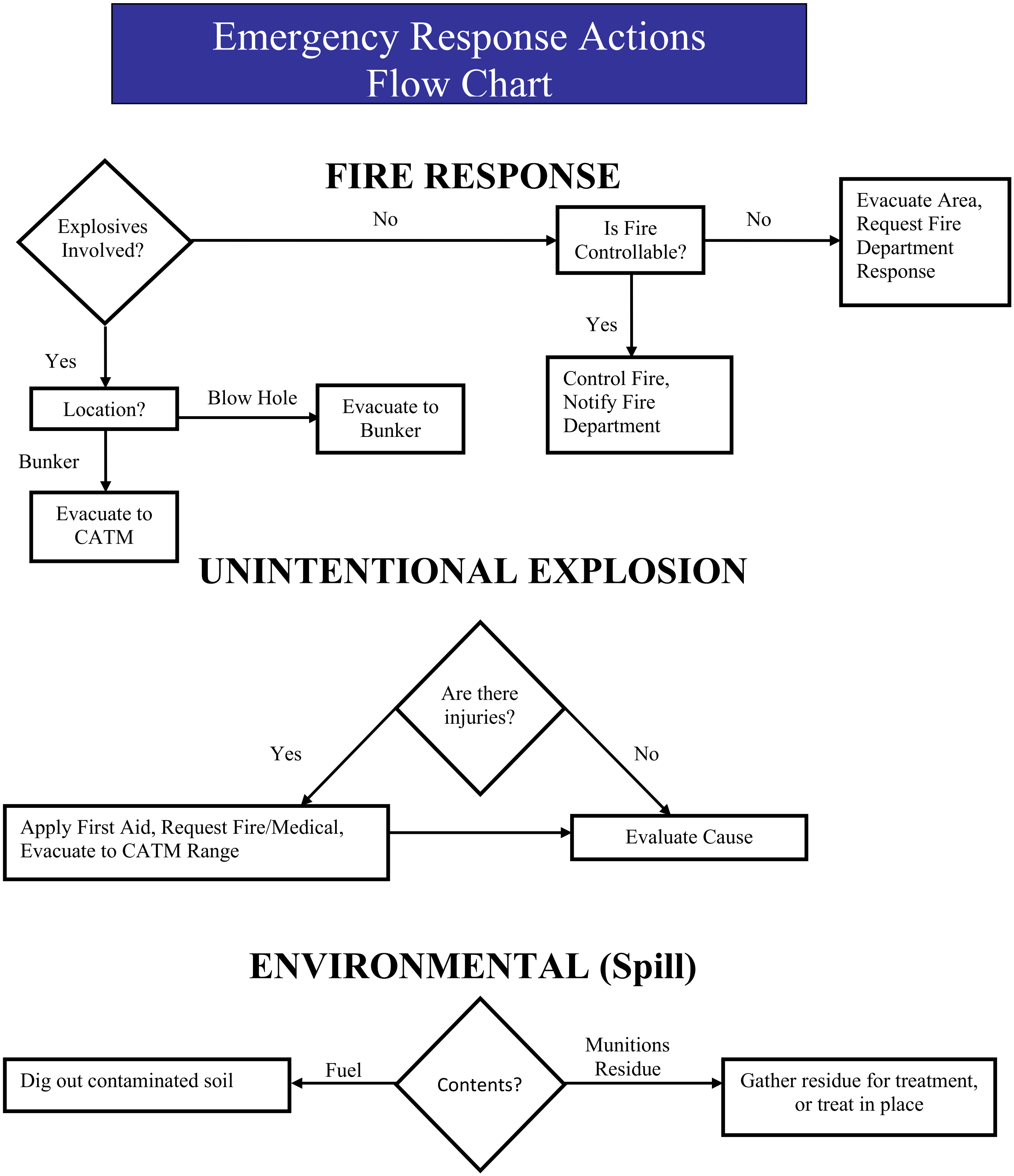
APPENDIX F – CONTINGENCY PLAN

The IC will be thoroughly familiar with all aspects of the EOD Range Contingency Plan, all operations and activities at the Range, the location and characteristics of wastes handled, the location of applicable records, and the facility layout. The IC is responsible for coordination of cleanup activities in the event of an uncontrolled release of HW at the EOD Range. The emergency procedures outlined in Flight Operating Instruction 32-3002 will be followed to dispose of any uncontrolled HW releases.

EOD Range personnel will be used to initially respond to spills and other cleanup operations in terms of initial defensive actions. The Andersen Air Force Base Spill Prevention and Response Plan will be implemented immediately upon a spill incident. In the event of an emergency at the EOD Range that is beyond the response capabilities of EOD personnel, Andersen Fire Department will be notified by the IC. Once Fire Department gets on-scene, IC will transfer to the Senior Fire Officer. The RSO will remain with the IC to advise him/her. The IC will direct operations as needed to ensure that the situation is brought under control.

Dependent on the nature of the emergency, the IC will provide appropriate notification to on-base offices or teams, who will aid in the emergency response (e.g., medical personnel, spill team, etc). All emergency response teams that may be called upon to provide emergency service are located on base. The emergency response actions for implementing the EOD Range Contingency Plan are illustrated in Figure 1.

Figure 1


Emergency Response Actions
Flow Chart
FIRE RESPONSE
Explosives Involved?
No
Is Fire Controllable?
No
Evacuate Area, Request Fire Department Response
Yes
Control Fire, Notify Fire Department
Yes
Location?
Blow Hole
Evacuate to Bunker
Bunker
Evacuate to CATM
UNINTENTIONAL EXPLOSION
Are there injuries?
Yes
No
Apply First Aid, Request Fire/Medical, Evacuate to CATM Range
Evaluate Cause
ENVIRONMENTAL (Spill)
Contents?
Fuel
Dig out contaminated soil
Munitions Residue
Gather residue for treatment, or treat in place

8.0 IDENTIFICATION OF HAZARDOUS MATERIALS RELEASED

Plans for the Emergency Coordinator to Identify the Character, Source, Amount, and Areal Extent of Any Explosion, Fire, or Release (Part VI.A. [Adopts by reference 40CFR 264.56] of the GHWMRs)

The IC will identify the characteristics and hazards of the fire, explosion, or release by knowledge of process or container contents, observation, or documented analytical information.

9.0 ASSESSMENT OF POSSIBLE HAZARDS TO HUMAN HEALTH OR THE ENVIRONMENT

Means for Assessment of Possible Hazards to Human Health or the Environment from an Explosion, Fire, or Release (Part VI.A. [Adopts by reference 40 CFR 264.56] of the GHWMRs)

Upon determining that the facility has had an explosion, fire, or release that could threaten human health or the environment, the OSC is responsible for assessing the nature of the threat. Both direct and indirect effects of the explosion, fire, or release must be considered during the assessment. The criteria to be used to assess a possible hazard to human health or the environment and the need for evacuation or other measures will be largely qualitative. The following criteria should be considered:

a) The nature and magnitude of the explosion, fire, or release;
b) Weather (e.g., wind direction and speed) and other conditions at the time of the explosion, fire, or release;
c) The possibility that the explosion, fire, or release may result in the spreading of additional explosions, fires, or releases, and,
d) The possible threat to human health and/or the environment from an explosion, fire, or release.

Procedures to be Followed by Emergency Coordinator in Case of a Threat to Human Health or the Environment Outside the Facility (Part VI.A. [Adopts by reference 40 CFR 264.56] of the GHWMRs)

The EOD Range is located in an isolated area on a secure base. Therefore, the possible threat to human health or the environment outside the facility is limited. If the assessment indicates the need for evacuation, the IC will coordinate with the appropriate military authorities.

10.0 PROCEDURES TO PREVENT EXPLOSIONS, FIRES, RELEASES

Procedures to be Followed by Emergency Coordinator to Prevent Fires, Explosion, or Release from Occurring, Recurring, or Spreading to Other Hazardous Wastes at the Facility (Part VI.A. [Adopts by reference 40 CFR 264.56] of the GHWMRs)

During an emergency, the OSC will take all reasonable measures necessary to ensure that explosions, fires, and releases do not occur, recur, or spread to other hazardous waste at the facility. The guidance established in the FOI 32-3002, provides EOD Range personnel with procedures to follow to prevent explosions, fires, or releases from occurring, recurring, or spreading to other hazardous waste at the facility. Historically, procedures developed for the treatment of hazardous waste munitions at DOD facilities have ensured the safety of EOD personnel.

10.1 Fire Hazards - In the event of an uncontrolled fire at the EOD Range, the IC will attempt to maintain control of the situation through the implementation of the EOD Range Contingency Plan, if necessary. Due to the inherent danger associated with EOD operations, fire prevention is an important safety concern. Fires involving explosives are extremely dangerous and can react in an unpredictable manner. Some explosives exposed to fire will burn, detonate, or a combination of both. The following factors should be considered when fighting fires involving explosives:

- Personnel risk
- Safety of others in the immediate area
- Loss of valuable equipment
- Loss of other explosives

For fire emergencies that do not involve explosives, the initial fire-fighting response is from EOD Range personnel. Fires beyond the capabilities of EOD Range fire-fighting equipment will require notification and response by Andersen Fire Department.

10.2 Spills - The hazardous waste is a containerized solid (bomb cases, shells) until its actual burn/detonation, limiting the potential for spills. The only potential for a liquid spill would be the virgin diesel fuel used to ignite the OB. The procedures outlined in the Andersen AFB Spill Prevention and Response Plan (also known as SPCC) provides information on the actions that would be required to protect human health and the environment in case of a spill involving diesel fuel. Small volumes (10-20 gallons) of virgin diesel fuel are utilized for the OB; any contaminated sand would be immediately shoveled up for proper disposal as petroleum-contaminated soil.

11.0 STORAGE AND TREATMENT OF RELEASE MATERIAL

Storage, Treatment, and Disposal of Released Material (Part VI.A. [Adopts by reference 40 CFR 264.56] of the GHWMRs)

Immediately following an incident, the IC will make arrangements for the treatment and disposal of recovered waste, waste residues, and any contaminated materials. It is often considered unsafe to transfer or containerize spilled explosives. If conditions permit, the material will be detonated in place. If the IC determines that it is safe to move any spilled material, it will be collected and re-detonated at the OD pit in accordance with FOI 32-3002.

12.0 MONITORING

Monitoring for Leaks, Pressure Buildup, Gas Generation or Ruptures of Released Material (Part VI.A. [Adopts by reference 40 CFR 264.56] of the GHWMRs)

The EOD Range does not incorporate equipment that would require monitoring for leaks, pressure buildup, or gas generation. All equipment that is on on-site is inspected before and after any OB/OD operations.

13.0 INCOMPATIBLE WASTE

Procedures for Preventing Handling of Incompatible Wastes Until Cleanup is Complete (Part VI.A. [Adopts by reference 40 CFR 264.56] of the GHWMRs)

The IC will ensure that no waste that might be incompatible with the released materials is treated until cleanup procedures are complete. This decision is made based on the chemical and physical characteristics of the waste.

14.0 DECONTAMINATION PROCEDURES (Part VI.A. [Adopts by reference 40 CFR 264.56] of the GHWMRs)

Following an emergency response, the IC will ensure that all equipment is decontaminated, as necessary. Equipment decontamination will be accomplished in accordance with CES/CEV (Environmental Flight) direction. Prior to EOD operations resuming, any emergency equipment used during an emergency response will be clean and ready for its intended use.

15.0 NOTIFICATION AND REPORTING PROCEDURES

Procedures for Record Keeping and Reporting to EPA (Part VI.A. [Adopts by reference 40 CFR 264.56] of the GHWMRs)

15.1 Base Authorities – *Air Force Instruction 91-204*, Investigating and Reporting US Air Force Mishaps provides SOPs for reporting explosives and chemical agent mishaps. In the event of a mishap on the EOD Range a USAF Hazard Report, AF Form 457, is completed and submitted to the Safety Flight Office.

The fire protection flight retains a computer log of all emergency response. The reports must be prepared and submitted according to directions provided in DOD 6055.7-M, Fire Incident Reporting Manual.

CEV Environmental Flight is contacted by the Fire Department to identify any possible environmental damage, and, if applicable, receives a spill report.

15.2 Regional and Federal Notifications – Dependent upon the nature of the Incident, other agencies may require notification. If the incident is a threat to human health or the environment, the National Spill Response Center (800) 424-8802 must be notified. An emergency release into the ocean requires notification of the U.S. Coast Guard, Guam EPA, and the Division of Aquatic and Wildlife. U.S. Fish and Wildlife requires notification of a HW emergency release if the possibility exists for potential impact to endangered species.

A written report of the emergency incident which required implementation of the EOD Contingency Plan must be submitted to Guam EPA and the Regional Administrator within 15-days of the incident. The report must include, at a minimum, the following information:

- Name, address, and telephone number of the owner or operator;
- Name, address, and telephone number of the facility;
- Date, time, and type of incident (e.g., fire, explosion);
- Name and quantity of material(s) involved;
- Extent of injuries, if any;
- Where applicable, an assessment of actual or potential hazards to human health or the environment; and
- Estimated quantity and disposition of recovered material that resulted from the incident.

This report must be submitted to:

Administrator
Guam Environmental Protection Agency
17-3304 Mariner Avenue Tiyan
Barrigada, Guam 96913-1617
Attn: Air and Land Division

16.0 AMENDMENTS AND REVISIONS TO THE EOD RANGE CONTINGENCY PLAN

The EOD Range Contingency Plan will be reviewed annually and amended as required. Amendments may be required whenever the following occurs:

- The EOD Range Permit is revised;
- The plan fails in an emergency;
- A change occurs in EOD Range operations, design, or other circumstances that would increase the potential for an emergency or changes the response necessary in an emergency;
- A change in the list of emergency coordinators; or
- The list of emergency equipment changes.

Review of this Plan will involve input/sign-off from the following people:

CEV Environmental Flight
Fire Protection Flight
EOD Flight
Commander, 36th Civil Engineer Squadron

17.0 REFERENCES

Flight Operating Instruction 32-3002, Appendix K
Andersen AFB Installation Emergency Management Plan 10-2
Andersen AFB Spill Prevention Control and Countermeasures Plan (SPCC)

Appendix G

Closure and Post-Closure Plan

APPENDIX G – CLOSURE AND POST – CLOSURE PLAN

Closure and Post-Closure Plan

Closure Plan Documentation (Part X.A. [Adopts by reference 40 CFR 270.14(b)(13)] of the GHWMRs)

Introduction

The purpose of this closure plan is to describe the procedures and methods by which the open burning/open detonation (OB/OD) units and surrounding area of the Andersen AFB Explosive Ordnance Disposal (EOD) Range will be closed in accordance with the Resource Conservation and Recovery Act (RCRA).

This plan describes the OB/OD units, decontamination and sampling procedures, health and safety requirements during closure, and the approximate closure schedule. This plan includes a Sampling and Analysis Plan (SAP) and a Quality Assurance Project Plan (QAPP) to be implemented at time of closure. (Attachment 1)

This closure plan is based on the achievement of clean closure of the facility. If clean closure cannot be achieved, this closure plan will be revised to include post-closure care requirements and restrictions. It will then be submitted to the appropriate regulatory agencies for review and approval.

Location and Description of OB/OD Operations Facility

The EOD Range has been operated exclusively for EOD purposes since the time (> 20 years) of its designation by Andersen Air Force Base. No operations other than OB/OD are conducted at the EOD Range. The mission of the range has been to render unserviceable ordnance and other pyrotechnic devices harmless by either suppressed detonation or open burning, as well as to allow EOD personnel to maintain a proficiency in the operation of explosive-actuated EOD tool sets. In addition, the range has been used for emergency purposes.

The EOD Range is located at the extreme eastern reach of Tarague Beach, just west of Tagua Point. The grid coordinates for the OD units are 13 degrees, 35.58 minutes north, 144 degrees, 56.48 minutes east. The active treatment units are provided with a 2,400-foot-radius safety zone, above and below the cliff line. The location of the treatment unit and the 2,400-foot-radius safety zone are delineated in Figure 2-12.

The active open detonation units are located at the extreme eastern edge of Tarague Beach. They consist of two pits, each located directly along the face of an approximately 30-foot tall cliff. Due to previous detonations, the cliff has been hollowed out slightly. Rocks which have been removed during previous detonations are piled on either side of the active OD units. Detonation of the munitions at the cliff face provides for additional safety with respect to directing the destructive force of the detonation away from occupied areas. Open detonations consist of placing the waste munitions in the OD pit, placing detonating charges (to initiate the detonation of the waste munition) and ignitors (to initiate the detonating charges). Detonation is remotely initiated from the personnel bunker.

The inactive open burning pit was located directly on the beach in the sand in an area free of vegetation. It is approximately 80 feet north of the jungle (with a sharp rise), 150 to 190 feet south of the Pacific Ocean, and approximately centered east-west within the open range area.

APPENDIX G – CLOSURE AND POST – CLOSURE PLAN

The open burning units are operated in a different manner than the open detonation units. The open burning operations are characterized by: flammable dunnage (wood) is placed in the burn equipment for fuel and to provide air to the fire. Next, the waste munitions are placed in the burn equipment. These materials are then soaked with 10 - 15 gallons of fresh diesel fuel. An ignition device is placed in the burn equipment. The munitions are then remotely activated from the personnel bunker.

Open burning in the active OB unit was conducted in a burn equipment. This equipment was approximately 4 feet in diameter and 5 feet tall. The OB pit in which the burn equipment was placed was roughly 45 feet long by 14 feet wide by 6 feet deep.

Previous to 1992, the open burning operations at Andersen AFB EOD Range were not contained in a burn equipment, but were burned on the ground within the pit.

Applicability of Closure and Post-Closure Care Regulations

1. All owners or operators of hazardous waste management facilities must prepare closure plans describing how each open burning and open detonation at the facility will be closed.

2. The hazardous waste management unit operated after November 18, 1980 (OB/OD units) at Andersen Air Force Base EOD Range is considered hazardous waste management units, since they treat reactive waste.

3. Therefore, the closure requirements under Part VII.A. [Adopts by reference 40CFR 264.110 – 264.120 (Subpart G)] of the GHWMRs are applicable to this facility.

Post-closure care regulations are applicable to Hazardous Waste Management Units that cannot be "clean closed" and must be closed in place. The post-closure care period for each unit that is closed in place must begin as soon as the unit is closed and must continue for 30 years (or other as specified in the permit).

It is the intention of this closure plan to achieve clean closure, thereby eliminating the requirement for post-closure care requirements.

Closure Requirements

This plan describes the steps and techniques to completely close the Explosive Ordnance Disposal (EOD) Open Burning/Open Detonation (OB/OD) Range. This document has been prepared in accordance with Parts VI.A. and X.A. [Adopts by reference 40 CFR 264 Subpart X, Miscellaneous Units, 40 CFR 270.14(b)(l3), and 40 CFR 264 Subpart G] of the GHWMRs requirements.

Andersen AFB Environmental Flight Office will maintain a copy of this closure plan, including all revisions, at least until certification of closure

Amendments to Closure Plan

Any revisions to this closure plan will be submitted to the Guam Environmental Protection Agency (Guam EPA) for approval. The plan will be revised whenever any of the following would affect closure:

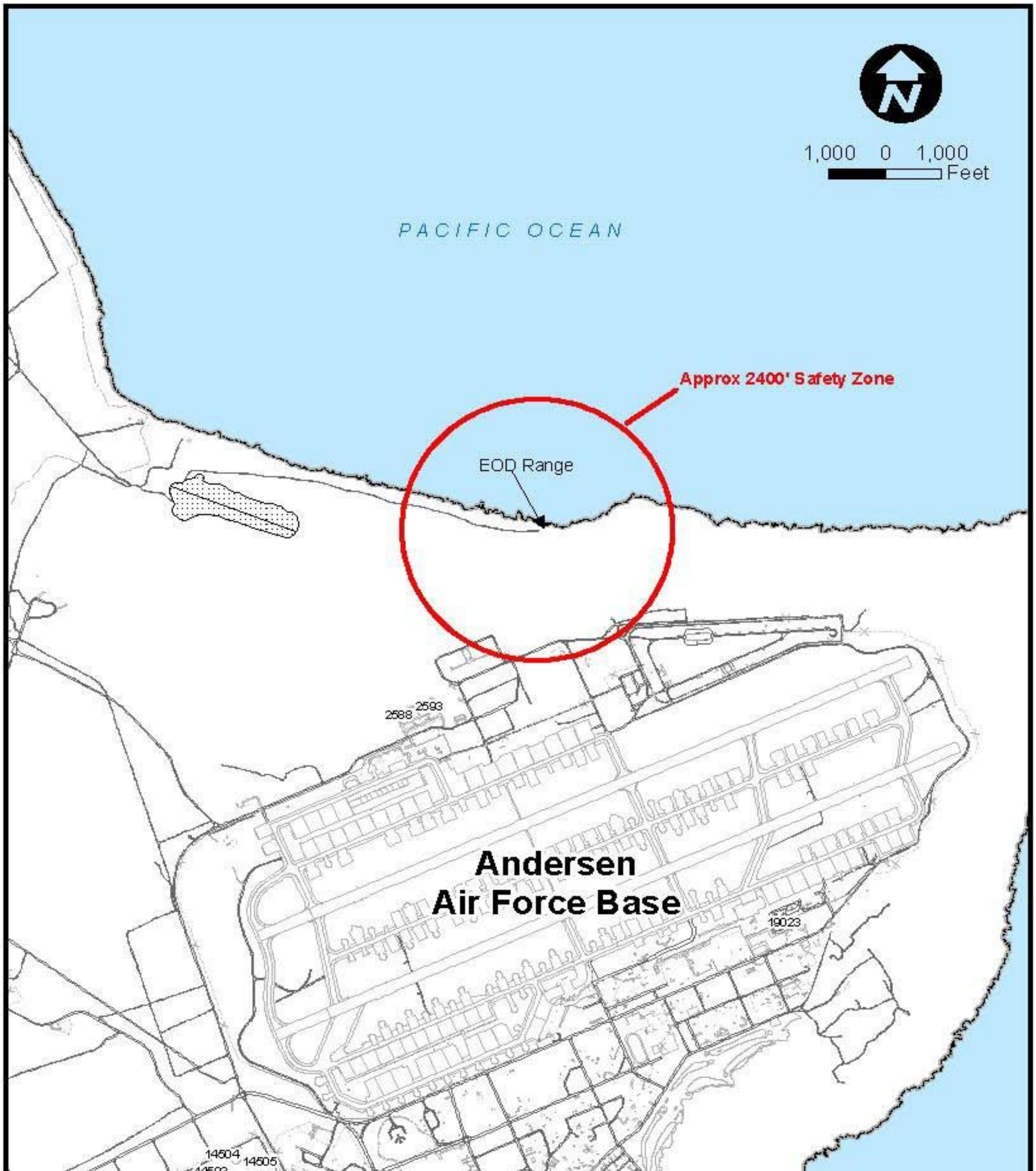


Figure 2-12
EOD Range with 2400' Safety Zone
Andersen Air Force Base, Guam

Produced by 36th Geo Integration Office
maps\standard\environmental\rcra

- modifications are made to existing OB or OD structures;
- the quantity or composition of the waste material to be treated by OB/OD is increased or altered, operating procedures are revised, or regulatory requirements change;
- the expected year of closure changes;
- during closure activities, unexpected events occur that require a modification to the closure plan; and
- any closure plan procedures (e.g., decontamination or sampling) are revised to accommodate modern techniques.

Closure Performance Standard (Part VI.A. [Adopts by reference 40 CFR 264.111(a), (b) and (c)]of the GHWMRs)

The OB/OD units will be closed in such a manner as to meet the Closure Performance Standard. The proposed clean-closure will eliminate the need for further maintenance. The units will be closed to the extent necessary to protect human health and the environment through closure and post-closure. The closure procedures implemented herein will prevent the escape of hazardous waste, hazardous constituents, contaminated run-off, and waste decomposition products to the ground or surface waters or to the atmosphere. Part VI.A. [Adopts by reference 40 CFR 264.601 Subpart X] of the GHWMRs requires that miscellaneous units are closed in a manner that prevents any releases that may have adverse affects on human health and the environment due to migration of waste constituents in the groundwater, subsurface environment, surface water, wetlands, or on soil surface. Clean closure will assure that the closed OB/OD units will not affect human health or the environment.

Previous DOD studies of open burning units on the ground that had been operating a number of years have shown that contaminated soils and residues were present in the immediate vicinity of the OB unit; however, they were generally limited to the top 18 inches of soil (U.S. Army AEHA 1987). In addition, the soils were frequently not hazardous due to EP toxicity. Based on these studies and knowledge of the OB/OD units, it is anticipated that clean closure will be achieved for both the OB and OD units.

Closure will be achieved based on soil removal and decontamination as discussed in the following sections. These procedures will be utilized to achieve cleanup standards which are protective of human health and the environment, which are determined prior to closure. Several regulatory and health-based criteria will be considered, in conjunction with the planned use of the site, to determine cleanup levels. Health-based target concentrations (carcinogenic and non-carcinogenic effects) which have been developed in conjunction with this application will be considered for water and soil. These health based criteria may be revised at time of closure if risk assessment values or methods have been updated. Depending on the proposed groundwater usage, drinking water or other Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act and Alternative Concentration Limits (ACLs) will be evaluated for groundwater concentrations. Background concentration limits for waste constituents in the soil will be evaluated as potential cleanup criteria, depending on plausible future patterns of use. The compounds of concern are those which will be sampled as per the closure sampling plan and baseline sampling plan. These compounds are listed in Table II-4, Standards, Criteria, and Benchmark Values of

Sampling Parameters. The performance standard to eliminate air contamination is based on the termination of OB/OD activities.

Certification of Closure

Certification that final closure of the units has been completed in accordance with the approved closure plan will be submitted to Guam EPA within 60 days of final closure. The certification will be sent by registered mail. The certification will be signed by the owner or operator (Andersen AFB Base Civil Engineer), the engineer responsible for oversight of the closure, and an independent professional engineer.

Description of Partial or Final Closure Procedures (Part VI.A. [Adopts by reference 40 CFR 264.1 12(b)(1) and (2)]of the GHWMRs)

Andersen AFB intends to operate both the OB and OD units in tandem, until the units are no longer required. It is estimated that the OB/OD units will be operated until the Air Force Base ceases operation.

Therefore, the OB and OD units will be closed at the same time; no partial closure activities are contemplated.

The management of investigation and potential remediation of inactive SWMUs in the EOD Range are discussed in Section J, RCRA Corrective Action Section.

During final closure, each unit will be closed by treating the final volume of hazardous waste, treating the explosive residues generated during the last treatment, and removing of all metal from the surface of the beach for resale as scrap or disposal in accordance with applicable regulations.

The pit of each unit will then be sampled and analyzed in accordance with the OB/OD Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) for Closure, Attachment 1. If any contaminated soil is identified, it will be removed and disposed of offsite. If it cannot be removed and disposed of, closure-in-place will be implemented following approval of a modified closure plan. After sampling and soil removal, the pits will be backfilled and re-graded. In addition to closure of the land pits, the burn equipment(s) will be decontaminated and recycled or disposed of in accordance with applicable regulations.

Description of Maximum Unclosed Portion During the Active Life of the Facility (Part VI.A. [Adopts by reference 40 CFR 264.112(b)(2)] of the GHWMRs)

RCRA requires that the closure plan include a description identifying the maximum extent of the operations which will be unclosed during the active life of the facility.

During the active life of the EOD facility, the active OB/OD units will not be closed. The OD unit consists of two (2) pits, each located directly along the face of the cliff at the extreme eastern end of the beach. The active open burning treatment unit is located approximately 80 feet from the cliff and 150 to 190 feet from the ocean, approximately centered east-west within the range.

Table II-4
Standards, Criteria and Benchmark Values for Sampling Parameters

Chemical Name Listed in Composition and Combustion Lists	Human Health Criteria								
	RCRA Action Level			Health-Based Target Concentration					
				Non-carcinogenic Effects			Carcinogenic Effects		
	Air (mg/m^3)	Water (µg/L)	Soil (mg/kg)	Air (mg/m^3)	Water (µg/L)	Soil (mg/kg)	Air (mg/m^3)	Water (µg/L)	Soil (mg/kg)
Barium	4.0E-01	2.0E+03	4.0E+03	5.90E-05	1.04E+00	5.20E+03			
Lead		1.5E+02		1.5E-03	2.23E-03	1.11E+01			
Silver			3.0E+02	2.9E-03	7.4E-02	3.71E+02			
Aluminum		2.0E+01	3.0E+01						
Copper				2.20E-02	5.48E-01	2.75E+03			
Iron									
Magnesium									
Strontium				3.56E-00	8.9E+00	4.46E+04			
Phosphorus									
Antimony		1.0E+03	3.0E+01	2.38E-04	5.94E-03	2.79E+01			
Calcium		1.0E+03	3.0E+03						
Potassium		2.0E+03	4.0E+03						
Tin				3.56E-01	8.91E+00	4.46E+04			
Sulfur									
Sulfates				6.77E+00	1.63E+02	7.20E+04			
Nitrates				9.50E-01	2.38E+01	1.19E+05			
Nitrites									
Ammonia				1.72E-02	1.44E+01	7.20E+04			
Cyanide									
1,3-Dinitrobenzene		4.00E+00	8.00E+00	5.94E-05	1.49E-03	7.43E+03			
2,4-Dinitrotoluene		5.0E-02		1.19E-04	2.97E-02	1.49E+02	9.64E-06	1.12E-04	9.01E-01
2,6-Dinitrotoluene		5.0E-02		5.94E-04	1.49E-02	7.43E+01	9.64E-06	1.12E-04	9.01E-01
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetra (HMX)				2.97E-02	7.43E-01	3.70E+03			

Table II-4
Standards, Criteria and Benchmark Values for Sampling Parameters

Chemical Name Listed in Composition and Combustion Lists	Human Health Criteria								
	RCRA Action Level			Health-Based Target Concentration					
				Non-carcinogenic Effects			Carcinogenic Effects		
	Air (mg/m^3)	Water (µg/L)	Soil (mg/kg)	Air (mg/m^3)	Water (µg/L)	Soil (mg/kg)	Air (mg/m^3)	Water (µg/L)	Soil (mg/kg)
Nitroglycerin				2.97E-04	7.43E-03	3.71E+01	3.86E-04	4.50E-03	3.60E+01
Pentaerythritol tetranitrate (PETN)									
Hexahydro-1,3,5-trinitro-1,2,5-triazine (RDX)				1.78E-03	4.46E-02	2.23E+02	5.96E-05	6.95E-04	3.75E+00
2,4,6-Trinitrotoluene (TNT)				2.97E-04	7.42E-03	3.71E+00	2.19E-04	2.55E-03	2.04E+01
Tetryl (Trinitrophenylmethyl nitramine)				5.94E-03	1.49E-01	7.43E+02			
Nitroguanidine				5.94E-02	1.49E+00				
Dibutyl phthalate		4.00E+03	8.00E+03	5.94E-02	1.49E+00				
Diphenylamine		9.00E+02	2.00E+03	1.49E-02	3.71E-01				
Hexachlorobenzene				4.75E-04	1.19E-02	4.10E-06	4.78E-05	3.38E-01	
TPH									
Hydrogen Cyanide				1.19E-02	2.97E-01				
Hydrogen Sulfide				1.54E-04	4.46E-02				
Nitrobenzene				3.56E-04	7.43E-03				
1,3,5-Trinitrobenzene				2.97E-05	7.43E-04				
White Phosphorus				1.19E-05	2.97E-04				

APPENDIX G – CLOSURE AND POST – CLOSURE PLAN

Estimate of Maximum Waste Inventory in Storage and Treatment During Facility Life (Part VI.A. [Adopts by reference 40 CFR 264.112(b)(3)]of the GHWMRs)

The maximum inventory of hazardous wastes at the facility is based on the allowable range limitation on the net explosive weight (NEW) of unserviceable munitions.

The maximum amount of unserviceable munitions accommodated by the OB/OD units at one time is 600 pounds.

Description of Procedures for Removal or Decontamination of Hazardous Waste Residues, Equipment, Structures, and Soils (Part VI.A [Adopts by reference 40 CFR 264.112(b)(4) and 264.114]of the GHWMRs) and Location of Disposal Facility

The closure of the OB/OD units will be based on the most effective and practical treatment available at the time of closure. It will consist of removing and/or decontaminating all structures, soil and other materials contaminated with hazardous waste or hazardous constituents. The closure process will be phased to provide for most effective use of labor and equipment to accomplish the task. Critical decisions will be made throughout the process regarding subsequent steps, based on analysis conducted during closure to determine the extent of contamination and effectiveness of closure procedures.

Closure Phase I -Materials Removal

The first phase of the closure activities will consist of identification and removal of metallic debris and unexploded ordnance materials. This closure phase will consist of several individual tasks:

1. Visual identification of the beach area surrounding the OB/OD units for metallic debris and unexploded ordnance (UXO) materials. This will consist of a complete "sweep" of the range for materials visible on the surface. Metallic materials will be collected and forwarded to the DRMO (Defense Reutilization and Marketing Office) for proper handling, storage, and recycling. UXO observed will be collected for final treatment by burning or detonation.

2. The beach sand in the range will then be mechanically raked to a depth of approximately 18 inches. Metallic debris and UXO materials observed during this raking will be similarly removed for disposal or treatment.

3. A sweep of the ocean floor between the shoreline and reef-line will be conducted of the area in front of (north) the EOD Range in a similar manner as the beach sweep.

4. A sweep of the jungle within a 300-foot-radius of the open detonation units will be conducted in a similar manner as the beach sweep.

5. In addition to the above noted sweeps, several lines will be traversed through the jungle beyond the 300-foot-radius to ensure there are no materials from the EOD operations. These traversed lines will continue out to the extent of the declared safety zone, 2,400 feet from the open detonation pits.

Closure Phase II - Equipment Decontamination

The second phase of the closure process includes removal of residues on the OB burn equipment, sampling, and decontamination phase, if required.

The material from the last treatment conducted in the burn equipment will be handled as per the accepted FOI 32-3002. In summary, it will then be sampled to determine if it is hazardous waste or contains hazardous waste constituents. If the material is determined to be a hazardous waste, it will be disposed of at a permitted hazardous waste facility in accordance with regulatory requirements; otherwise, it will be disposed of in a permitted solid waste landfill to be determined.

Once the residues are removed, the burn equipment will be decontaminated. Two possible methods of decontamination of the burn equipment are described below. It is likely the final determination will be made at the time of closure.

1. Flashing. This method is accomplished by using the appropriate fuel and oxidizer to cause the temperature of the containment device to exceed the auto ignition or decomposition temperature of the PEP wastes that have been burned in the unit. The process is utilized by explosives handlers to decontaminate equipment used to haul or store explosive materials (U.S. Army AEHA 1987).

2. Washing. This method consists of decontaminating the burn equipment by first washing with a detergent followed by steam cleaning. After decontamination, any waste waters generated will be placed in appropriate sized drums and sampled for the parameters listed in the OB/OD SAP/QAPP for Closure, Attachment 1. The liquid wastes will then be disposed of in accordance with regulatory requirements.

Once the burn equipment is decontaminated, it will be sampled with surface wipe testing to assure that the decontamination was effective. The wipe sample(s) will be analyzed for the parameters listed in Section 5 and Table 5-1 (Sample ID# OBCD), of the OB/OD SAP/QAPP for Closure, Attachment 1.

Location of Disposal Facility. Once confirmatory sampling is completed, the burn equipment will be processed through the DRMO for recycling as scrap steel. Disposal of contaminated soils (if required) will also be processed through the DRMO facility.

Closure Phase III - Soil/Groundwater Investigation

The third phase of the closure will consist of implementation of the sampling plan to determine the extent of contamination of hazardous wastes or hazardous constituents at the OB/OD range.

Prior to sampling, the range will be evaluated as to whether unexploded ordnance (UXO) remains on site below the depths reached in the beach raking operation. An electromagnetic surveyor ground penetrating radar will be implemented to detect the presence of metal. The ocean will be surveyed by one of these methods for metallic UXO materials from the beach to the reef line, in the vicinity of the OB/OD units. The beach and jungle immediately surrounding the OB/OD units will also be surveyed by one of these methods for metallic UXO materials (300 foot radius).

If buried UXO is detected in or around the OD unit, the unit will be evaluated by a remote drilling operation. It is unlikely that UXO will be found in the EOD Range. However, if it is located, it will be treated in-place or in the OB/OD unit(s).

Methods for Sampling and Testing Surrounding Soils. Sampling activities will commence once the UXO survey is completed. Representative soil samples will be taken from locations throughout the OB/OD range. Sampling and analysis will conform to the procedures summarized in the OB/OD SAP/QAPP for Closure, Attachment 1.

Once samples have been analyzed, a decision will be made regarding the next step of closure. If soil samples have been determined to be contaminated with hazardous wastes or hazardous constituents, secondary sampling may be conducted to determine more precisely the extent of soil that should be removed.

Criteria for Determining Decontamination Levels. The criteria for determining the extent of decontamination required to satisfy the closure performance standards will be developed prior to closure. The units will be closed to the extent necessary to protect human health and the environment by implementation of a clean-closure. The cleanup levels will be based on regulatory and health-based criteria in conjunction with the planned use of the site. Potential future uses of the site include archaeological and/or wildlife preservation areas.

Health-based target concentrations (carcinogenic and non-carcinogenic effects) which have been developed in conjunction with this application will be considered for water and soil. These health-based criteria may be revised at time of closure if risk assessment values or methods have been updated. If the groundwater may be used for drinking water in the future, MCLs established under the Safe Drinking Water Act will be applied to groundwater. However, ACLs will be evaluated for groundwater concentrations if there are no future plans for drinking water (see Table II-4, Standards Criteria, and Benchmark Values for Sampling Parameters). Background concentration limits for waste constituents in the soil will be evaluated as potential cleanup criteria, depending on plausible future patterns of use. The compounds of concern are those which will be sampled as per the closure sampling plan and baseline sampling plan. These compounds are listed in Table 5-2.

<u>Closure Phase IV –Soil/Groundwater Closure</u>

The fourth phase will consist of soil removal and confirmatory sampling, if required to achieve clean closure. If excavation is required, it is probable that a request for extension of closure will be submitted for approval. The final decision as to treatment method(s) will be determined at the time of closure. If any soil is determined to be hazardous, remediation will be implemented. All contaminated soil will be excavated, placed in drums, and disposed of in accordance with applicable regulations at a permitted facility to be determined. Excavation would be completed to the extent possible and/or practical. If it were determined that it was not feasible to excavate soil and a closure-in-place would be required, an amendment to the closure plan would be submitted to Guam EPA for approval. However, it is the intent of this closure plan to achieve clean closure and this requirement for closure in-place is considered highly unlikely.

If buried UXO cannot be removed or disposed of safely, it will remain in place. In this unlikely event, the facility will be considered closed-in-place, and an amendment to the closure plan will be submitted for review and approval to the appropriate regulatory agencies. If buried UXO is not removed, a deed restriction will be placed on the property (refer to the Documentation of Notice of Deed of this section). Clean sand or soil will be brought to the treatment units for clean fill. The beach area will then be re-graded.

Personnel and Human Health Protection During Closure Activities

The closure of the OB/OD units will be implemented in a manner that is safe to all involved personnel and to human health and the environment The Contingency Plan and the Preparedness and Prevention Plan as included in the RCRA Part B Subpart X Permit for the EOD Range will be implemented as appropriate to closure operations. All contractors involved with closure activities will be required to be familiar with these plans.

In addition, a Health and Safety Plan (HASP) will be developed and implemented to address the potential hazards associated with this closure. It is probable that the most likely potential hazard(s) is unexploded energetic material and other physical/equipment hazards. The potential for chemical hazards is low.

Andersen AFB EOD personnel or other trained EOD specialists will conduct or will oversee all closure activities that involve reactive materials or UXO. All personnel involved with closure will have the appropriate training in hazardous waste operations.

EOD security and inspection procedures will continue throughout the closure period through closure certification. In addition, EOD personnel or contractors performing closure tasks will inspect temporary storage areas.

Hazardous Waste and Materials

A temporary storage area will be set up on the EOD Range to store closure equipment and wastes generated during closure prior to disposal. Any material determined to be reactive or UXO will be treated onsite in the OB/OD units in accordance with the standard FOI (SOP) and will not be stored in the temporary storage area.

All wastes will be properly labeled. If any wastes are determined to be hazardous, they will be marked with "Hazardous Waste" labels, the EPA ID number of Andersen AFB, the date of generation, and other items required by RCRA regulations and additional Guam EPA requirements, if any. Wastes which may be stored in the temporary storage area include the following:

- burn equipment waste
- contaminated soils and debris contaminated liquids (generated from decontamination procedures)
- miscellaneous wastes (paper, wood, metal, etc.) collected from the EOD Range or generated (during closure activities)

Description of Additional Activities Performed During Closure (Part VI.A. [Adopts by reference 40 CFR 264.112(b)(5)] of the GHWMRs)

Groundwater monitoring. For discussion of groundwater monitoring, refer in this section to Description of Procedures for Removal or Decontamination of Hazardous Waste Residues, Equipment, Structures and Soils, Soil and Groundwater Investigation and Closure Sampling Plan.

Leachate collection. Leachate collection will not be applicable since the unit will undergo clean closure.

Run-on and run-off control. Run-on and run-off may be utilized during closure activities such as covering of drums of decontamination wastes. Run-on and run-off control will not be required during post-closure, since clean closure will be achieved.

Description of Closure Schedule (Part VI.A. [Adopts by reference 40 CFR 264.112(b)(6) and 264.113] of the GHWMRs)

The federal regulations require that the owner or operator must treat, remove from the unit or facility, or dispose of on-site, all hazardous wastes in accordance with the approved closure plan within 90 days after receiving the final volume of hazardous wastes. In the case of the EOD operations, when munitions are determined to be unserviceable, they are declared to be hazardous waste. As long as there are munitions at Andersen AFB, the potential exists for the generation of hazardous waste. Therefore, for purposes of this application, the 90-day clock will not commence until all munitions, which may eventually be declared unserviceable and may be treated by EOD operations, are removed or treated by the EOD units. The exception to this statement is if a new process is designed which may treat the unserviceable munitions at Andersen AFB more effectively or in a more environmentally feasible process.

On the day final volume of hazardous wastes is received, the EOD Range will treat the final volume of hazardous wastes and any hazardous residues which may remain in the burn equipment.

The regulations require that the owner or operator complete final closure activities in accordance with the approved closure plan within 180 days after receiving the final volume of hazardous wastes. It is anticipated that the EOD Range will undergo clean closure within the 180-day period without the need of an extension.

See Table II-5, Timetable of Closure Activities.

Table II-5
Timetable of Closure Activities

Task	Days from Initiation of Closure
Phase 1	
Notify Guam EPA of intent to close facility	0 -30
Receive final volume of hazardous waste	0
Treat final volume of hazardous waste	0
Remove residues from final volume of waste treated	1
Initiate closure	1
Rake EOD Range for UXO’s and Metals	2 to 45
Treat any UXO that is recovered from raking	10 to 55
Recover and remove all metal	1 to 45
If more time is required for closure, request extension	60 to 150
Phase 2	
Decontaminate, sample and dispose of burn equipment	55 to 90
Phase 3	
Sample and analyze soil surrounding units in accordance with sampling plan and QAPP	90 to 120
Phase 4	
Remove contaminated soil if required	120 to 160
Confirmatory sampling of units if required	120 to 160
Fill re-grade treatment units	160 to 179
Complete clean closure	180
Submit closure certification to Guam EPA	180 to 240

Note: Minor variances from this timetable may be made as required to accommodate closure requirements. These variances will comply with regulatory requirements.

APPENDIX G – CLOSURE AND POST – CLOSURE PLAN

The closure of the EOD Range will take place in accordance with the time line provided in Table II-5, Timetable of Closure Activities.

Estimate of Year of Closure (Part VI.A. [Adopts by reference 40 CFR 264.112(b)(7)] of the GHWMRs)

The estimate of the year of closure is not predictable at this time. It is assumed that the EOD Range will be required to operate as long as ordnance are maintained at Andersen AFB. It is expected that ordnance will be maintained until the base is closed. The decision to close Andersen AFB will ultimately be made through· governmental process and will not be the responsibility of the EOD Commander or the Andersen AFB Commander.

For purposes of this permit, however, the estimate year of closure is 2043, or 50 years from the date of this application.

Extension of Closure Time (Part VI.A. [Adopts by reference 40 CFR 264.113(a) and (b)] of the GHWMRs)

Final closure will be completed within 180 days after receiving the final volume of hazardous wastes. If it is determined that final closure activities will, of necessity, take longer than 180 days to complete; it is determined that closure of the unit(s) is incompatible with continued operation of Andersen AFB; or if there is reasonable likelihood that another person will recommence operation within 1 year, then a modification to the closure plan permit will be requested. The request for modification will be submitted to Guam EPA at least 30 days prior to the end of the 180-day period (after receiving final volume of hazardous waste).

The request will demonstrate the reason(s) for requesting an extension. In addition, the request will demonstrate that the range will continue to be operated in compliance with all applicable permit requirements and that all steps to prevent threats to human health and the environment will be taken.

Copy of Post-Closure Plan (Part VI.A. [Adopts by reference 40 CFR 264.117, 264.118, and 264.603] of the GHWMRs)

The purpose of the closure plan is to achieve clean closure; therefore, post-closure requirements will not be applicable to the OB/OD units on the EOD Range. The determination that clean closure can be achieved is based on the type of operation utilized and scientific judgment. Clean closure is the preferred option, since it will result in the lowest level risk to human health and the environment. If, in the unlikely event it is determined that the quantity of soil required to be removed to achieve clean closure is not practical then a c1osure-in-place will be implemented. In this case the closure plan will be amended and submitted to Guam EPA for review and approval.

The following paragraphs discuss the applicability of post-closure requirements based on the achievement of clean closure.

APPENDIX G – CLOSURE AND POST – CLOSURE PLAN

Post-Closure Care Mechanisms (Part VI.A. [Adopts by reference 40 CFR 264.603] of the GHWMRs)

A miscellaneous unit that is a disposal unit must be maintained in a manner during the post-closure period that prevents any releases that may have adverse affects on human health and the environment due to migration of waste constituents in the groundwater, subsurface environment, surface water, wetlands, or on soil surface. Clean closure will assure that the closed OB/OD units will not affect human health or the environment.

In the event that clean closure is not achieved, the closure plan will be amended to include criteria to assure that any waste constituents remaining at closure will not cause adverse effects to human health or the environment.

Description of Maintenance, Monitoring, Inspection, and Frequencies Required to Comply with Applicable Regulatory Requirements (Part VI.A. [Adopts by reference 40 CFR 264.118(b)(1) and (2)] of the GHWMRs)

Based on clean-closure, the units will not require post-closure monitoring of groundwater, air or soil. Since there will be no structural requirements for clean closure (such as a cap), there will be no post-closure maintenance or inspection requirements.

In the event that clean closure is not achieved, the closure plan will be amended to include post-closure monitoring, maintenance, and inspection plan.

Identification and Location of Person Responsible for Storage and for Updating Facility Copy of Post--Closure Plan During Post-Closure Period (Part VI.A. [Adopts by reference 40 CFR 264.118(b)(3)] of the GHWMRs)

Based on clean-closure, a post-closure plan is not required for this application; therefore, this is not an applicable requirement.

In the event that post-closure is required an employee in CES/CEV or EOD will be designated to store and update copies of the post-closure plan. The post-closure plan will be maintained for at least 30 years after certification of closure.

Procedure for Updating All Other Copies of Post-Closure Plan (Part VI.A. [Adopts by reference 40 CFR 264.118(b)(2)] of the GHWMRs)

Based on clean-closure, a procedure for updating all other copies of the post-closure plan is not required. In the event that post-closure is required a procedure for updating all other copies of the post-closure plan will be implemented in the amendment submitted to Guam EPA. An employee in CES/CEV or EOD will be designated to update all other copies of the post-closure plan.

Survey Plat

Based on clean-closure, a survey plat is not required.

In the event that post-closure is required, a survey plat will be submitted to the local zoning authority. The plat will be certified by a registered professional engineer and will meet all designated regulatory requirements.

Post-Closure Certification

Based on clean-closure, a post-closure certification is not required.

In the event that post-closure is required, a certification of post-closure will be submitted to Guam EPA, 60 days prior to the end of the post-closure care period (30 years from closure certification).

Submittal of Post-Closure Record of Hazardous Waste

Based on clean-closure, hazardous waste will not remain at the facility after closure. Therefore, a record of hazardous waste will not be required to be submitted to the local zoning authority, or authority with jurisdiction over local land use, and Guam EPA.

If clean-closure is not achieved, a record of the type, location and quantity of hazardous wastes remaining within each unit will be submitted to the above mentioned agency within 60 days after certification of closure.

Copy of Most Recent Closure and Post-Closure Cost Estimates (Parts VI.A and X.A. [Adopts by reference 40 CFR 264.142, 264.144, and 270.14(b)(15) and (16)] of the GHWMRs)

Since U.S. Government installations are exempt from these requirements, they are not addressed in this application.

Copy of Documents Used as Financial Assurance Mechanisms (Part VI.A. [Adopts by reference 4O CFR 264.143, 264.145, and 264.146] of the HWMRs)

Since U.S. Government installations are exempt from these requirements, they are not addressed in this application.

Documentation of Notice of Deed (Parts VI.A and X.A. [Adopts by reference 264.11940 and CFR 270.14(b)(l4)] of the GHWMRs)

Since this closure plan is based on clean closure, post-closure notices, including a notice of deed restriction, will not be required.

If clean closure, is not achieved (contaminated soil is not removed or UXO is left in place) or if it is determined at the time of closure that a potential for UXO exists at the EOD Range, then the Air Force will record a notation on the deed to the facility property. Alternatively, a notation may be placed on some other instrument, such as a restrictive covenant or easement, which is normally examined during title search. This notation will state that hazardous wastes have been disposed on the property and that property use is restricted under 40 CFR Subpart G regulations. The deed notice will also indicate that a survey plat and record of waste have been filed.

If required, the deed notation will be recorded within 60 days of certification of closure of the first and last hazardous waste disposal unit. Following the notation to the deed, the Air Force will sign a certification, stating that the deed notification has been recorded. This certification will be sent to the Administrator of Guam EPA, and it will include a copy of the document in which the notification has been placed.

Copy of Insurance Policy (Part VI.A. [Adopts by reference 40 CFR 264.147] of the GHWMRs)

Since U.S. Government installations are exempt from these requirements, they are not addressed in this application.

Closure Sampling Plan

Introduction

The closure sampling plan for clean-closure of the Andersen AFB EOD OB/OD units will be implemented in accordance with 40 CPR 264 Subpart G requirements. The sampling activities that will be performed at the time of closure of the OB/OD units will be reevaluated based on the results of the initial baseline sampling program and continued sampling program for detection monitoring. Closure sampling will be conducted before, during and after site remediation activities.

Pre-Closure Soil Quality Sampling

Shallow soil sampling will be performed on a sampling grid established during the baseline sampling program. Soil sample site grid concentrations will be greater in the immediate vicinity of the OD pit and the burn pit. A limited number of soil samples will be collected along traverse lines extending from the OD pit and burn pit extending to the ocean and the edge of the safety zone.

A geophysical survey of the OD pit, burn pit, and adjacent areas will be conducted prior to soil sampling to detect buried metallic objects which may be indicative of live ordnance. Reconnaissance surveying will be performed using electromagnetic induction (EM-31 and EM-34). Electrical anomalies defined with the EM techniques will be followed with high-resolution profiling using ground penetrating radar (GPR) (as required). Geophysical anomalies that would indicate the potential presence of live ordnance would be brought to the attention of EOD experts. Soil sample locations will be positioned to void any potential safety hazards identified with these geophysical tools.

Pre-closure shallow soil sampling will be divided into two separate sampling schemes. The first scheme will define the vertical and lateral extent of soil contamination within the areas of greatest potential contamination, the OB and OD pits and their immediate vicinity. The second sampling scheme will be conducted outside the immediate vicinity of the active units to determine if significant contamination has resulted from ordnance and related materials ejected during OD unit operations.

The soil sample collection scheme and methodology are discussed in the OB/OD SAP/QAPP for Closure. (Attachment 1)

Soil Closure Sampling

After the removal of contaminated soil, a round of clearance samples will be collected to determine the effectiveness of the remediation. The clearance samples will be collected from a depth interval below the contaminated soil excavation. Approximately 15 clearance samples will be collected from randomly selected grid cells from the OB and OD pits and their immediate vicinity. Upon evaluation of the clearance sample analytical results, additional soil excavation and sampling may be warranted.

Groundwater Sampling

Groundwater sampling during closure activities will be based upon the OB/OD SAP/QAPP for Closure. (Attachment 1) During the active operation of the OB/OD units, a groundwater monitoring program will be implemented based on 40 CFR 264 Subpart F, Releases from Solid Waste Management Units. The first phase of proposed monitoring will consist of baseline monitoring event. The parameters for this event are listed in Table 5-2 of the OB/OD Sampling and Analysis Plan/Quality Assurance Project Plan for Closure. Based on the initial sampling, a detection monitoring program may be developed to determine whether hazardous constituents are detected at the active facility. If detection monitoring is continued throughout the active life of the facility, the closure sampling will consist of the final round of detection groundwater monitoring. The quality of the groundwater at the EOD range will be well defined prior to closure, in this case.

If the analytical results of the monitoring program indicate that groundwater remediation is warranted, an appropriate groundwater remedial plan will be developed. Prior to clean closure, a final round of groundwater samples will be collected for laboratory analysis.

Monitoring Well Closure

Following review of the final round of groundwater monitoring analytical results the monitoring wells will be closed in an environmentally appropriate manner. Well closure will include removal of casing and over-drilling and plugging with a non-shrinking grout.

Quality Assurance Project Plan

All samples taken for analysis will be analyzed in accordance with Quality Assurance Project Plan requirements, Section 6, Attachment 1 of Appendix G.

Attachment 1

OB/OD Sampling and Analysis Plan / Quality Assurance Project Plan for Closure

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List of Abbreviations and Acronyms

AAFB	Andersen Air Force Base
BTEX	benzene. toluene. ethyl benzene. and xylenes
EOD	explosive ordnance disposal
ft	foot
ft-msl	feet above mean sea level
GCMS	gas chromatography-mass spectrometry
GPS	global positioning system
HASP	Health and Safety Plan
HMX	1,3,5,7-tetrazocine, octahydro-l,3,5.7-tetranitro
HWMF	Hazardous Waste Management Facility
ICP	inductively coupled plasma
ICPMS	inductively coupled plasma-mass spectrometry
IRP	Installation Restoration Program
MS/MSD	matrix spike/matrix spike duplicate
OB/OD	open burning/open detonation
PCBs	polychlorinated biphenyls
PETN	pentaerythritol tetranitrate
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RDX	cyclotrimethylene trinitramine
SVOA	semivolatile organic analysis
TIC	tentatively identified compound
TKN	total Kjeldahl nitrogen
USATHAMA	United Stated Army Toxic and Hazardous Materials Agency USEPA United States Environmental Protection Agency
VOA	Volatile Organic Analysis

Section 1: Introduction

This Sampling and Analysis Plan for Closure of the Open Burning/Open Detonation (OB/OD) Facility at Andersen Air Force Base is based on clean closure. As part of the closure process, sampling will be performed to evaluate the extent of site contamination (if any) and to determine the effectiveness of remedial activities. Additional sampling and analysis will be required to characterize closure-generated waste and investigation-derived waste in order to determine appropriate disposal procedures.

This plan presents the sampling and analysis activities that will be performed at the time of closure of the OB/OD units and supplements information provided in Appendix G. A brief description of the EOD site is presented in Section 2, the sampling program is presented in Section 3, sampling procedures in Section 4, analytical scope in Section 5, and quality assurance procedures presented in Section 6. Certain elements of this plan refer to other sampling programs that may have not yet been implemented, specifically the baseline sampling program and the groundwater monitoring plan.

In addition, this closure sampling and analysis plan was compiled using current practices and practically available technology circa mid 1990's. This closure plan is intended, to be implemented at the time of closure of the EOD Range facility. The time of closure was stated in the 1993 RCRA Part B application to be approximately 50 years hence. It is reasonable to presume this proposed plan will be reevaluated prior to implementation to confirm its appropriateness.

Section 2: Site Description

AAFB is currently the home of the Pacific Air Forces' 36th Wing. The AAFB EOD Range has been operated solely for EOD purposes since the time of its designation more than 20 years ago. The primary mission of the EOD Range has been to render harmless those ordnance and other pyrotechnic devices that are unserviceable. In addition, the range has been used for EOD training and emergency purposes.

2.1 Location

AAFB is at the northern end of the island of Guam. The island is 30 miles long and ranges from 4 to 12 miles wide (see Figure 2-1). AAFB is approximately 8 miles east to west and varies from 2 to 4 miles north to south.

The EOD Range is at the extreme eastern reach of Tarague Beach, ending just before Tagua Point (Figure 2-2). The EOD Range is defined as the open beach area at the east end of Tarague Beach, bounded by the Pacific Ocean to the north and the jungle and/or limestone cliff line to the east, south, and west. A 2,400-foot (ft)-radius safety zone, defined by operational requirements, surrounds the detonation treatment unit.

The EOD range is in a restricted area within AAFB, north of the active runways. The area within at least 1,000 feet (ft) of the EOD range is restricted military land, including fringing reef and reef flat, beach, old coconut plantations, and limestone forest (jungle).

2.2 Meteorology

The dominant winds on Guam are the trade winds, which blow onto the island from the east or northeast. The wind rose for AAFB is presented in Figure 2-3, based on data collected at the main runway during the period of 1987-1991. Winds at the EOD Range are expected to be similar to those observed at the AAFB meteorological station, primarily from the east and northeast

Annual rainfall at AAFB averages approximately 92 inches. Most of this precipitation occurs during the wet season, from July through mid-November. Monthly average rainfall ranges from approximately 4 inches in April to approximately 14 inches in August. Some precipitation occur an average of 246 days per year. Rainfall at the EOD range is expected to be consistent with the average amounts measured at the AAFB meteorological station.

Temperatures at AAFB are uniformly warm, and relative humidity is high throughout the year. Average daily maximum temperatures range from 82°F to 86°F and average daily minimum temperatures range from 71°F to 73°F. Relative humidity typically ranges from 70 to 80 percent during the day and from 85 to 95 percent during the night.

2.3 Topography

The EOD Range facility has an elevation ranging from sea level at the northern end to approximately 40 feet above mean sea level (ft-msl) to the south. The EOD Range facility restricted area is surrounded by uninhabited limestone forest (jungle) to the south (including a cliff approximately 450 feet high), east, and west and the Pacific Ocean to the north. Within the EOD range topographic features include a gently sloping sand beach (0-25' MSL) and a 25 feet tall cliff in the immediate vicinity of the OD treatment unit.

2.4 Geology

Bedrock geology at the EOD Range consists of Pliocene/Pleistocene Age Mariana Limestone overlain by recent beach deposits of calcareous sand. The Mariana Limestone consists of two members: the main body of the unit and the Agana argillaceous member. The main body is then made up of four (4) mappable reef-associated facies.

The detrital facies of the Mariana Limestone underlies the entire EOD Range, extending from the near shore reef line to the north to the cliff crest to the south. The detrital facies consists of fine-to coarse grained detrital limestone representing a lagoonal depositional environment. Field observation confirmed that this limestone is porous and cavernous in places and contains scattered to abundant fossilized coral heads. The presumption is made that this facies underlies the local beach deposits.

Laterally, the dermal facies extends eastward around Pati Point and thins westward to Ritidian Point. Within the westward thinning, this facies has inclusions of the Mariana Limestone reef facies and Miocene Age Barrigada Limestone.

Bedrock outcrops were observed throughout the EOD range. Outcropping was abundant within the intertidal zone, along the terrace and cliff base, and within the jungle, due to poor soil development.

2.5 Hydrogeology

Available Installation Restoration Program (IRP) documents indicate that a test boring in the area of the EOD Range encountered a surficial aquifer at a depth of approximately 21 feet below grade. The test boring was installed on October 9, 1992, at a location approximately 120 feet west of the OB unit.

Considering tidal fluctuations, the reported depth to water approximates sea level, as would be expected.No additional groundwater data have been collected to date.

Although specific local groundwater data are unavailable, the groundwater gradient at the EOD Range is presumed to be north towards the Pacific Ocean. This presumption is made based on the field verification of groundwater discharges to the Pacific Ocean. Preliminary data from the IRP investigation indicate the overall large-scale (across the whole base) gradient is flat.

2.6 Surface Water

Perennial streams do not exist on the northern half of the island because this area is underlain by highly permeable limestone and beach sands. During heavy rainfall, the surface water runoff may flow in short channels in the limestone but eventually disappears into the numerous sinkholes and fissures.

The EOD Range facility is bounded on the north by the Pacific Ocean. Portions of the range are within the l00 year flood plain zone because of susceptibility to flooding during typhoons or from tidal waves.

Figure 2-1

Island Map of Guam

Andersen Air Force Base, Guam

Figure 2-1

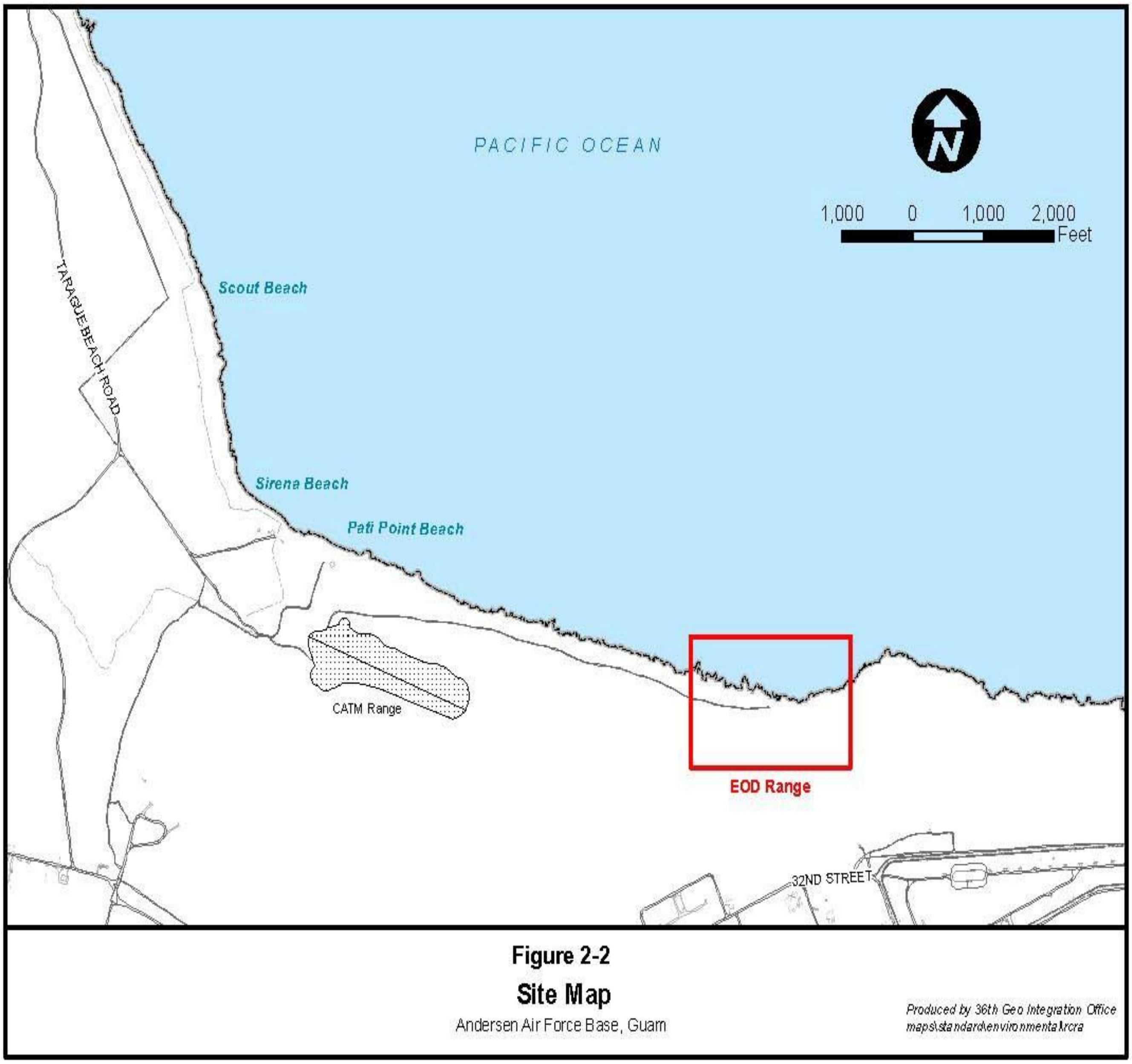
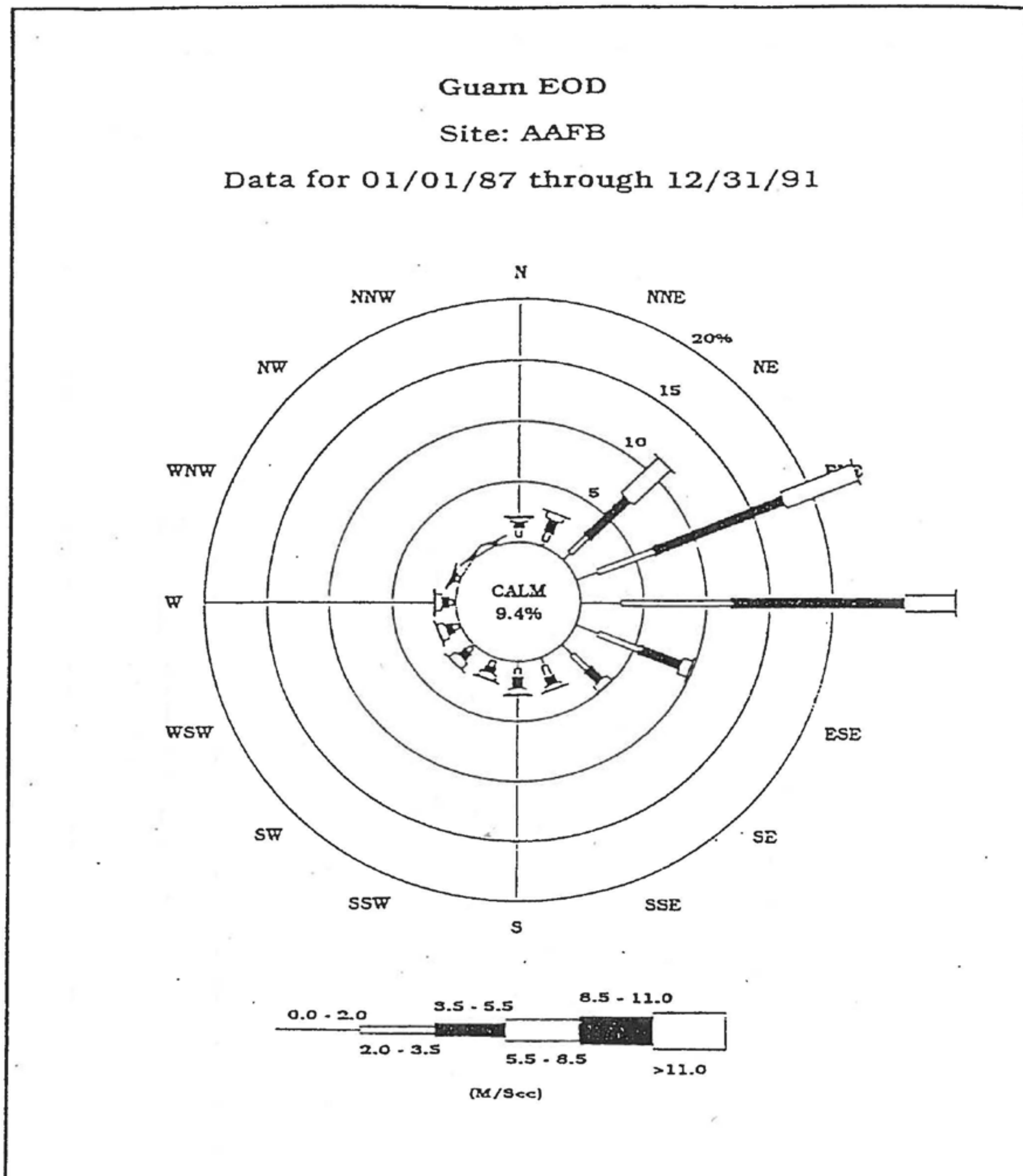

PACIFIC OCEAN
1,000 0 1,000 2,000
Feet
Scout Beach
TARAGUE BEACH ROAD
Sirena Beach
Pati Point Beach
CATM Range
EOD Range
32ND STREET
Figure 2-2
Site Map
Andersen Air Force Base, Guam
Produced by 36th Geo Integration Office
maps\standard\environmental\rcra

Figure 2-2



SOURCE: Andersen AFB RCRA Application, Part B (March, 1993)

Figure 2-3
Wind Rose
Andersen Air Force Base, Guam

Figure 2-3

Section 3: Sampling Program

The closure sampling program will consist of collecting samples for analysis of soil and groundwater to characterize the extent of potential impacts by OB/OD operations as well as confirmation of completion of closure activities.

Pre-closure soil sampling will be performed to define the vertical and lateral extent of soil contamination within the areas of greatest potential contamination, the OB/OD units. In addition, pre-closure soil, marine surface water, and marine sediment sampling will be performed at other locations on the EOD range outside the immediate vicinity of the units to determine whether contamination is present. Similarly, a final round of groundwater monitoring samples will be collected to evaluate potential impacts and to determine the need for groundwater remediation.

Additional samples (soil clearance sampling, burn equipment wipe sampling) will be collected to evaluate the effectiveness of remedial activities. Samples will also be collected to complete characterization of closure generated waste(s) and investigation derived waste(s).

Locations for each of the sample points are shown in Figures 3-1, for the overall Tarague Basin area and 3-2, for those samples within the immediate vicinity of the EOD Range. The coordinates of these locations are presented in Table 3-2 (Soil Sample Locations) and Table 3-3 (Surface Water Sample Locations) . The locations of the sample points will be reestablished prior to initiation of the sampling program.

The rationale for each of these sample locations is presented in Table 3-1. This information presents a description of each sample location and the intent for selecting each of these points.

Each element of the sampling program is discussed separately below.

3.1 Pre-Closure Samples OB and OD Treatment Units

Ten shallow soil samples will be collected at each of the OB and OD treatment units, at a rate of one (1) sample per approximately 4,000 ft^2, Samples will be collected at each location at one-foot depth intervals. (i.e., 0 - 1 foot, 1 - 2 feet, and 2 - 3 feet) Data from these samples will be used to determine the extent of excavation necessary for removal to achieve clean closure.

3.2 Pre-Closure Samples - Other

Shallow soil samples will be collected at the 21 locations both on and off the EOD Range HWMF. These same sampled locations were used for the baseline monitoring program as detailed in Figures 3-1 and 3-2. All samples will be collected from the upper 6 inches to avoid disturbance of cultural resources, as they were during the baseline sampling program. Sample matrices include beach sand, jungle soil and "cliff-crest" soil. Sample locations include potential impact locations as well as background locations for each matrix. The rationale for each sample point is summarized in Table 3-1.

In addition, marine surface water and marine sediments samples will be collected at 16 locations to evaluate potential for contamination off site of the EOD Range HWMF. These samples likewise will be the same as those sampled for the baseline program. These locations are depicted in Figures 3-1 and 3-2.

3.3 Remedial Action Clearance Samples

Two types of remedial action clearance samples are anticipated.

3.3.1 Treatment Unit Excavations

Clearance sampling will be performed in the areas from which contaminated soil was removed to evaluate the effectiveness of the remediation. Grab samples will be collected at a depth interval of 0 - 0.5 feet below the floor (or wall) of the excavation. A grid of one sample per 500 ft^2 of excavation surface area will be used. Clearance sampling will be repeated as necessary to show the remediation has achieved required minimum containment.

3.3.2 Open Burn Containment Device Decontamination Clearance Samples

Sampling of the burn equipment will be performed after decontamination to evaluate the effectiveness of the remediation. Five (5) wipe samples, each covering a one (1) square foot area, will be collected from the bottom (two samples) and sides (three samples) of the burn equipment inner surface.

3.4 Groundwater Samples

Groundwater sampling will be performed in accordance with the groundwater monitoring plan. This final round of sampling will utilize the sampling locations, sampling procedures and analytical scope and methodology specified for the groundwater monitoring plan.

3.5 Closure Generated Waste Samples

Two (2) types of wastes will be generated by closure activities and will require environmental information for proper disposal or treatment.

3.5.1 Excavated Material

Contaminated soils from treatment units may require additional sampling for full characterization prior to treatment or disposal. Data will be available from the treatment unit evaluation sampling efforts. Additional sampling will be accomplished for only those additional parameters imposed due to waste transport and/or treatment or disposal restrictions.

3.5.2 Investigative or Remediation Derived Wastes

Similarly, additional characterization sampling will be accomplished for investigative or remediation derived wastes as necessary for proper disposal or treatment. Most of these wastes will be liquid in nature, generated from decontamination of sampling or excavation equipment. Results from sampling data related to these wastes will be available for most, if not all, characterization efforts. Additional sampling will be accomplished for only those additional parameters imposed due to waste transport and/or treatment or disposal restriction.

3.6 Quality Assurance

Additional sampling will be accomplished to provide quality assurance necessary to demonstrate validity of the analytical data and appropriateness of the sampling and equipment decontamination procedures.

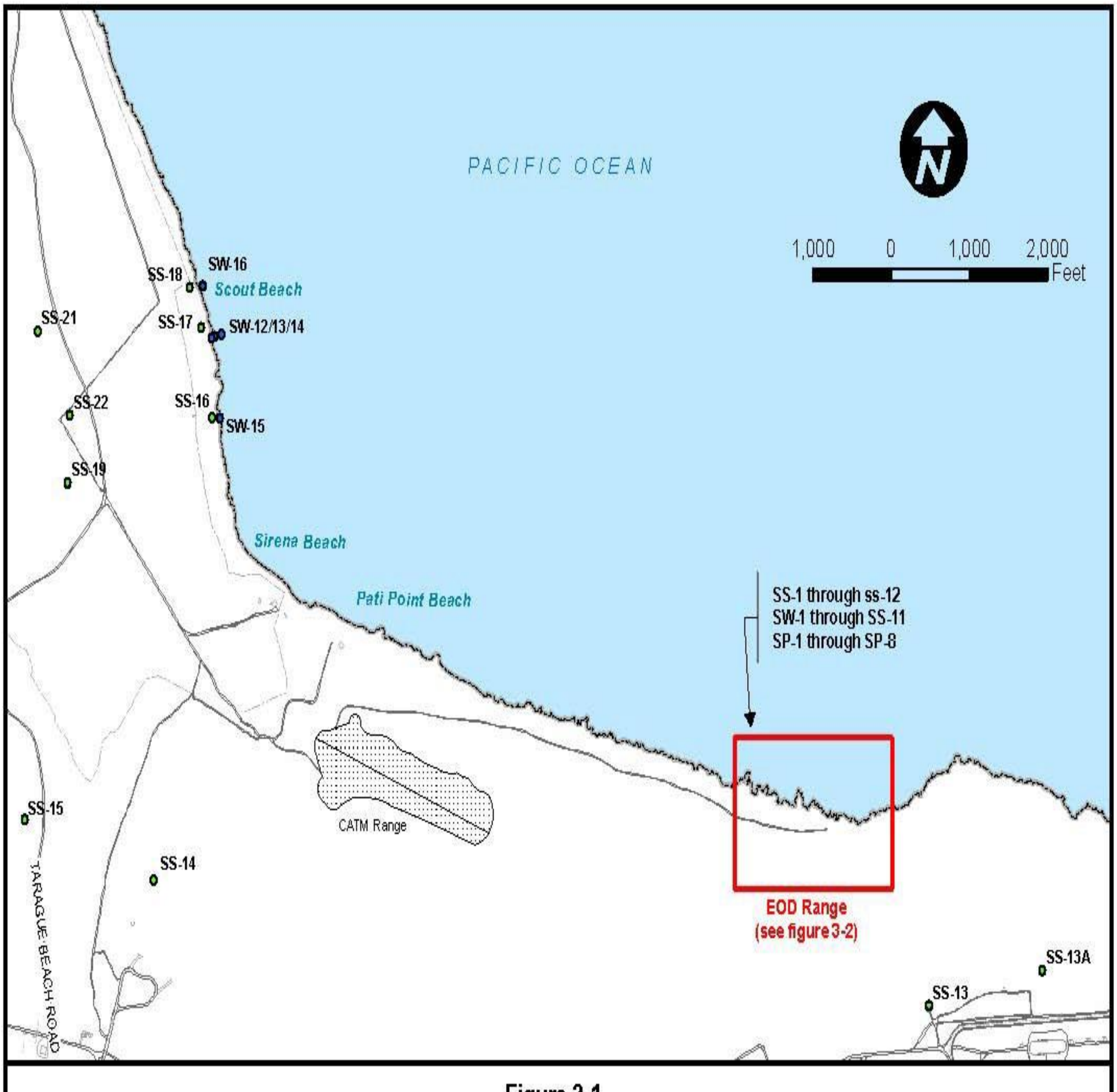


Figure 3-1
Sample Locations
Andersen Air Force Base, Guam

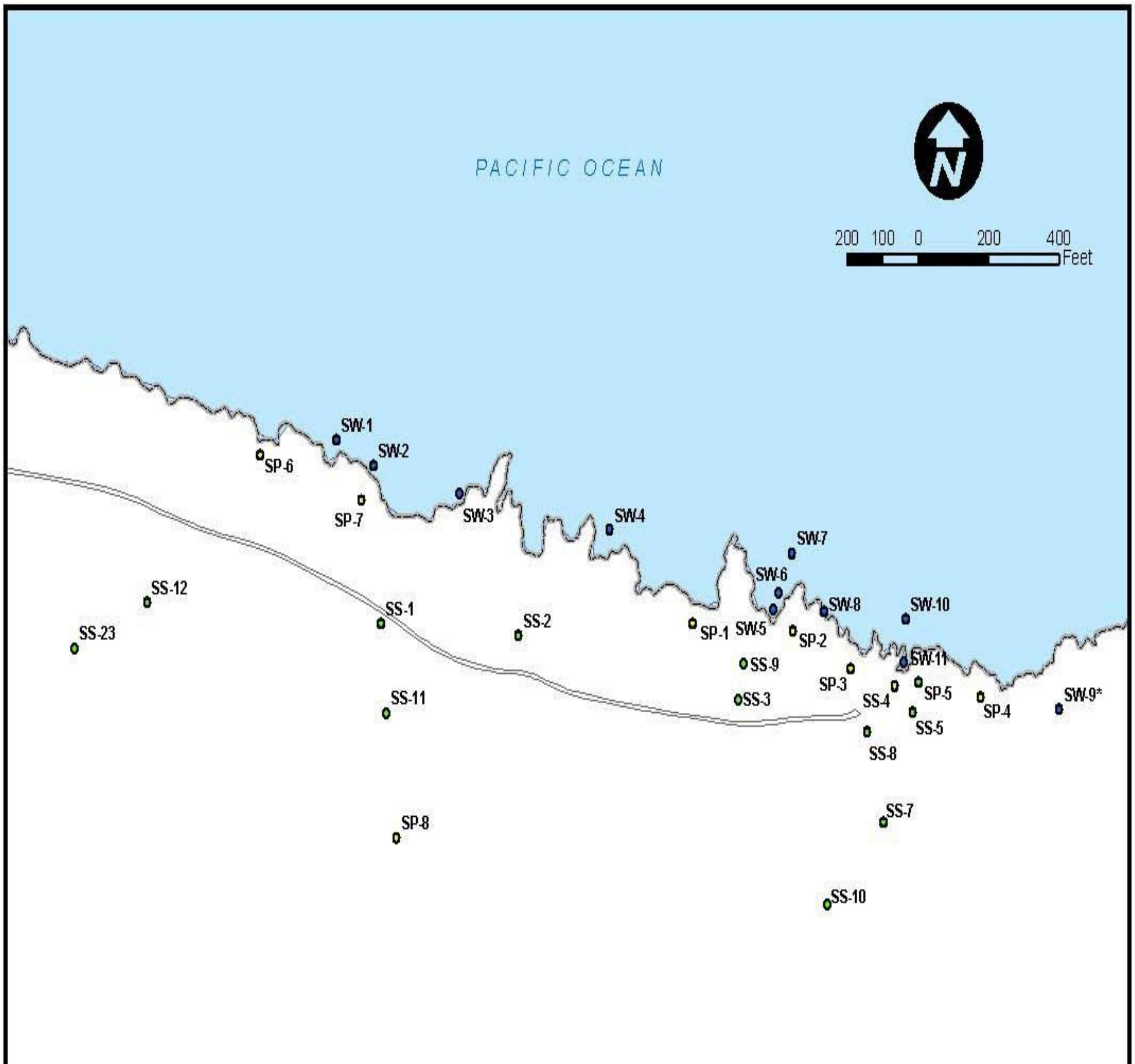


Figure 3-2

Sample Locations

Andersen Air Force Base, Guam

TABLE 3-1: SAMPLE RATIONALE

Shallow Soil Samples				
Sample Matrix	**Sample I.D.**	**Analytical Scope**	**Sample Location**	**Sample Rationale**
Beach Sand	SS-1	Intermediate	Beach near access road; west side within 1,000 feet radius of OB Unit	Downwind of OB and OD Units
Beach Sand	SS-2	Intermediate	Beach; west side near personnel bunker	Downwind of OB and OD Units; close proximity to personnel bunker
Beach Sand	SS-3	Full and PCBs	Beach; adjacent to OB unit	OB source characterization
Beach Sand	SS-4	Intermediate	Beach; north of OD unit	Near OD Unit
Beach Sand	SS-5	Full	Beach; immediately adjacent to OD unit	Near OD Unit
Rock (pulverized)	SS-6	Full	Material within OD pit	OD source characterization
Jungle Soil	SS-7	Intermediate	Limestone Terrace; east side	Near OD Unit
Beach Sand	SS-8	Intermediate	Beach; west of OD unit	Near OD Unit
Beach Sand	SS-9	Intermediate and PCBs	Beach; north of OB unit	Near OB Unit
Jungle Soil	SS-10	Intermediate	Limestone Terrace; south of OB unit	Near OB and OD Unit
Jungle Soil	SS-11	Intermediate	Jungle; west of OB and OD Units; within 1000 feet radius of OB Unit	Downwind of OB and OD Units
Jungle Soil	SS-12	Intermediate	Jungle; west of OB and OD units; outside 1,000 feet radius of OB Unit	Downwind of OB and OD Units
Cliff-Crest Soil	SS-13	Intermediate	Crest of Cliff; 2,200 feet southeast of OB and OD Units	Background
Cliff-Crest Soil	SS-13A	Short	Crest of Cliff; 3,200 feet southeast of OB and OD Units	Background
Cliff-Crest Soil	SS-14	Full	Crest of Cliff; 8,400 feet west of OB and OD Units	Downwind of OB and OD Units
Cliff-Crest Soil	SS-15	Intermediate	Crest of Cliff; 10,000 feet west of OB and OD Units	Downwind of OB and OD Units
Beach Sand	SS-16	Short	Beach at Scout Beach; south	Downwind of OB and OD Units
Beach Sand	SS-17	Intermediate	Beach at Scout Beach; center	Background
Beach Sand	SS-18	Short	Beach at Scout Beach; north	Background
Jungle Soil	SS-19	Short	Jungle at Scout Beach; south	Background
Jungle Soil	SS-20	Intermediate	Jungle at Scout Beach; center	Background
Jungle Soil	SS-21	Short	Jungle at Scout Beach; north	Background
Jungle Soil	SS-22	Short	Jungle, west of OB and OD units, within 1,000 feet radius of OB Unit	Downwind of OB and OD Units
Jungle Soil	SS-23	Intermediate	Jungle, west of OB and OD units, within 1,000 feet radius of OB Unit	Downwind of OB and OD Units

TABLE 3-1: SAMPLE RATIONALE

Marine Surface Water/Sediment (1)				
Marine/Water Sediments	SW/SED-1	Short	Central "reef flat" (2); 1,350 feet west-northwest of OB Unit	Downdrift of OB and OD Units; not associated with a seep
Marine/Water Sediments	SW/SED-2	Intermediate	Central "reef flat" (2); 1,225 feet west-northwest of OB Unit	Downdrift of OB and OD Units; associated with seep SP-7
Marine/Water Sediments	SW/SED-3	Short	Central "reef flat" (2); 1,000 feet west of OB Unit	Downdrift of OB and OD Units; not associated with a seep
Marine/Water Sediments	SW/SED-4	Short	Central "reef flat" (2); 550 feet west of OB Unit	Downdrift of OB and OD Units; not associated with a seep
Marine/Water Sediments	SW/SED-5	Intermediate	N-S transet at OB Unit; immediately seaward of SP-2, nearshore	Associated with seep SP-2 (highest potential impact for OB Unit)
Marine/Water Sediments	SW/SED-6	Intermediate	N-S transet at OB Unit; immediately seaward of SP-2, nearshore	Associated with seep SP-2 (highest potential impact for OB Unit)
Marine/Water Sediments	SW/SED-7	Full	N-S transet at OB Unit; immediately seaward of SP-2, nearshore	Associated with seep SP-2 (highest potential impact for OB Unit)
Marine/Water Sediments	SW/SED-8	Intermediate	Beach at Scout Beach; center	Between OB and OD Units; not associated with a seep
Marine/Water Sediments	SW/SED-9	Full	Beach at Scout Beach; north	Associated with seep SP-4 (second highest potential impact for OD Unit)
Marine/Water Sediments	SW/SED-10	Full	N-S transet at OB Unit; immediately seaward of SP-2, nearshore	Associated with seep SP-5 (highest potential impact for OB Unit)
Marine/Water Sediments	SW/SED-11	Full	N-S transet at OB Unit; immediately seaward of SP-2, nearshore	Associated with seep SP-5 (highest potential impact for OD Unit)
Marine/Water Sediments	SW/SED-12	Intermediate	N-S transet at OB Unit; immediately seaward of SP-2, nearshore	Background
Marine/Water Sediments	SW/SED-13	Short	N-S transet at OB Unit; immediately seaward of SP-2, nearshore	Background
Marine/Water Sediments	SW/SED-14	Intermediate	N-S transet at OB Unit; immediately seaward of SP-2, nearshore	Background
Marine/Water Sediments	SW/SED-15	Short	Central "reef flat" (2); Scout Beach	Background
Marine/Water Sediments	SW/SED-16	Intermediate	Central "reef flat" (2); at Scout Beach	Background
Groundwater (Seep/Cave)				
Groundwaters	DGW - 1 DGW - **	As per Detection Monitoring Plan	Various, in accordance with Detection Monitoring Plan	Point of Compliance for groundwater

TABLE 3-1: SAMPLE RATIONALE

Treatment Unit Soils				
Open Detonation Treatment Unit Soils	OD-1 through OD-5	Full	Grid across entire OD Treatment Unit, one sample per 4,000 ft sq; 3 samples depths (0-1 ft), (1-2 ft), (2-3 ft) per location	Evaluation for presence of contamination requiring removal for disposal/treatment
Open Burning Treatment Unit Soils	OB-1 through OB-5	Full	Grid across entire OD Treatment Unit, one sample per 4,000 ft sq; 3 samples depths (0-1 ft), (1-2 ft), (2-3 ft) per location	Evaluation for presence of contamination requiring removal for disposal/treatment
Remedial Action Clearance Samples				
Treatment Unit Excavations	RAC - 1 RAC - **	As necessary	As necessary within treatment units	Confirmation of adequate extent of excavation and removal for treatment or disposal
OB Containment Device Decontamination Clearance	OBCD - 1 OBCD - **	Full	Inside bottom of device (OBCD-1, OBCD-2); inside walls of device (OBCD-3 thru OBCD-5)	Decontamination clearance sample
Closure Generated Waste				
Excavated Soils	ES - 1 ES - **	As necessary	From stockpiled material in accordance SW-846 methods	Additional information as necessary to characterize material for treatment or disposal
Investigative or Remediation Equipment Decontamination Derived Wastes	IDW - 1 IDW - **	As necessary	From temporary stored material in accordance with SW-846 methods	Additional information as necessary to characterize material for treatment or disposal

(1) Each marine surface water sample was collected at the associated sediment sample location (both samples from the same x,y location)

(2) Potential environmental impact based on proximity to the unit, seep flow rate, and other pertinent observations.

(3) “Central reef flat” means midway between shore and inner edge of dead coral reef.

TABLE 3-2: SOIL SAMPLE LOCATIONS

POINT	NORTH	EAST
SS-1	209942.60	225059.06
SS-2	209923.00	225448.25
SS-3	209800.84	226070.67
SS-4	209840.00	226581.05
SS-5	209779.98	226565.46
SS-7	209560.53	226483.87
SS-8	209740.00	226436.42
SS-9	209873.65	226085.57
SS-10	209395.00	226326.51
SS-11	209764.56	225074.96
SS-12	209978.93	224396.95
SS-13	208193.98	227742.94
SS-13A	208523.02	229188.86
SS-16	213385.46	218537.40
SS-17	214189.59	218389.17
SS-18	214543.07	218238.34
SS-19	212778.71	216697.60
SS-21	214134.82	216303.95
SS-22	213382.82	216716.17

TABLE 3-3: SURFACE WATER SAMPLE LOCATIONS

POINT	NORTH	EAST
SW-1	210308.14	224929.28
SW-2	210258.56	225034.42
SW-3	210204.21	225277.97
SW-4	210136.43	225703.11
SW-5	209982.12	226168.15
SW-6	210015.60	226183.89
SW-7	210093.43	226220.48
SW-8	209978.96	226312.88
SW-9*	209790.00	226979.00
SW-10	209965.89	226544.20
SW-11	209880.30	226539.11
SW-12	214133.04	218653.38
SW-13	214106.53	218563.19
SW-14	214095.81	218526.74
SW-15	213375.11	218640.61
SW-16	214561.65	218408.87

SECTION 4: Sampling Procedures

The following section outlines the procedures to be employed in collection of the required samples.

4.1 Shallow Soils

The following procedures will be employed in collection of shallow soil samples as of the pre-closure, treatment unit evaluation, and remediation clearance sampling programs.

4.1.1 Pre-closure

Sample points will be relocated using appropriate means, likely by surveying. Following completion of the baseline sampling program, the sample locations were surveyed relative to the established AAFB coordinate grid system. Surveying will be used to re-establish those sample locations which cannot be positively identified through other means (observation of remaining flagging or other identification).

The shallow surface soil samples for the pre-closure sampling program will be collected using stainless steel spoons. The sample will be collected directly into their respective sample containers for labeling and shipment to the analytical laboratory.

4.1.2 Treatment Unit Evaluation

Soil samples will be collected for the treatment unit evaluation using a hand core sampler, as the samples will be from slightly greater depths. The soil samples will be placed into their respective sample containers directly from the core sampler unit.

Following sample collection, the ground surface at each sample location will be backfilled with investigation derived material as necessary. Treatment unit evaluation samples will be marked with a labeled survey flag. Each sample point will be surveyed and placed on a site plan for use in presenting analytical results and evaluating remedial steps necessary.

4.1.3 Remediation Clearance

Remediation clearance samples will be collected directly from the extent of the excavation to demonstrate effectiveness of the remedial action. Sampling will also use pre-decontaminated spoons. Samples will be placed directly into sample containers for transport to the analytical laboratory.

4.2 Groundwater

Groundwater samples will be collected in accordance with the procedures specified in the groundwater monitoring plan. As such, they will represent a continuation of the same data set as established by the on-going groundwater monitoring plan.

4.3 Marine Surface Water

Marine surface water samples will be collected from eleven (11) locations at the EOD range and five (5) background locations at Scout Beach. All sample locations will be on the reef flat (between the beach and the reef). No samples will be collected on the reef itself or north of the reef. The reef flat is shallow and all samples locations are to be accessible by walking/wading.

Marine surface water samples will be collected by submerging the sample container into the surface water until it is filled. When surface water flow is present, the container's opening will be positioned to face upstream while the sampling personnel stand downstream to avoid stirring up sediments that could contaminate the sample. The pH, specific conductance, dissolved oxygen, and temperature will be measured at each location and recorded in the field notebook, along with other pertinent site conditions.

At the start of each sampling day, the pH meter will be calibrated in accordance with manufacturer's instructions and documented on calibration forms in the field notebook. Immediately prior to sampling, all sample containers will be properly labeled using waterproof ink. All samples will have preservatives added after sample collection and placed in a cooler with ice to maintain a temperature of 4 degrees Celsius (ºC).

4.4 Marine Sediments

Nine (9) surface soil samples will be collected, to include three (3) background samples at Scout Beach. All soil samples will be collected from the upper six (6) inches to avoid impacting cultural resources. Surface soil samples will be collected using decontaminated stainless steel spoons, pre-cleaned in the laboratory prior to being transported to the site. Each spoon will be used for one sampling location.

4.5 Closure Generated Wastes

Sampling for these materials will be limited to those parameters necessary to adequately characterize these wastes for determination of treatment or disposal methods. Sample analysis is likely to be limited as the nature of these wastes will be relatively well known based upon the data from the soils or wastes handled.

4.5.1 Contaminated Soils

Sampling of the closure generated waste contaminated soils will be accomplished using a combination of hand tools, pre-decontaminated spoons and/or manual soil core units as appropriate.

4.5.2 Remediation Equipment Decontamination Wastes

Samples of the remediation equipment decontamination wastewater will be collected using disposable sample bailers. Sampling of the OB treatment unit containment device wastewaters will likewise use disposable bailers to extract samples from the temporary wastewater storage container(s).

4.5.3 Investigative Derived Wastes

Sampling of investigative derived wastewaters will also be accomplished using disposable bailers. Personnel protective equipment (PPE) wastes will likely not be sampled, rather other available data will be used to evaluate proper disposal requirements.

4.6 Sampling Equipment Decontamination Procedures

Sampling equipment will be properly decontaminated prior to use in collection of samples for analysis. Procedures will consist of generally recognized steps of: general cleaning, organic solvent rinse, and nitric acid rinse (for samples requiring metal analysis).

Shallow soils sampling equipment will likely consist of stainless steel spoons as were used in the baseline sampling program. These sampling spoons are to be pre-cleaned in the laboratory with detergent wash followed by an organic solvent rinse. After air drying, they will be wrapped in aluminum foil for transport to the site for use. Since each sampling spoon will be used only once, there is no need for the decontamination on-site.

Sampling equipment intended for collection of more than one (1) sample (shallow soil core equipment) will be decontaminated between sample locations in a similar manner to their initial decontamination procedure.

Wastewater will be sampled using single use, pre-cleaned disposable bailers. As such, no field decontamination procedures are required.

Section 5: Analytical Scope and Procedures

The following section presents the scope of analyses and procedures specified for analyses. In general, the overall impact evaluation samples are grouped, as they were in the baseline sampling program, into three (3) categories for analyses: short, intermediate, and full scope groups of analyses. Short analytical list parameters consist of ammonia, total kjeldahl nitrogen (TKN), nitrate and nitrite, and inductively couple argon plasma (ICAP) metals, plus mercury. Intermediate analytical list parameters consists of cyanide, volatile organics, and semi-volatile organics in addition to ammonia, TKN, nitrate and nitrite, total PO, and ICAP metals, plus mercury and explosives. The full scope analytical list adds nitrocellulose, nitroglycerin, pentaerythritols, tetranitrate (PETN) and white phosphorus in addition to the intermediate analytical list parameters. In addition to the above parameters, selected samples will be analyzed for PCBs.

5.1 Pre-Closure Samples – OB/OD Treatment Units

Soil samples will be analyzed for approximately 113 compounds potentially associated with OB and OD operations, including metals, volatile organics, semi-volatile organics, and explosive/energetics. Analyses will be performed in accordance with USEPA approved procedures when available. USATHAMA procedures will be used for explosives, due to the lack of an USEPA method. Similarly, white phosphorus will be analyzed in accordance with a laboratory developed method. Target analyses and their associated analytical methods and reporting limits are presented in Table 5-2.

5.2 Pre-Closure Samples – EOD Range, Other

The shallow soil, marine surface water, and marine sediment samples collected will be analyzed for the same potential contaminants evaluated for the baseline program, i.e. varying from short, intermediate to full scope analyses. These various lists include metals, volatile organics, semi-volatile organics, and explosives/energetics.

5.3 Remedial Action Clearance Samples

Shallow soil samples collected for the evaluation of remedial action effectiveness will be analyzed only for the contaminants of concern, which prompted that remedial action. For example, if the remedial action was undertaken due to contamination by one or more particular metals, the clearance sample will be limited to those contaminants.

5.4 Groundwater Samples

Groundwater samples will be analyzed for the parameters in the Groundwater Monitoring Plan in accordance with the method specified therein.

5.5 Equipment Decontamination Clearance Samples

Equipment decontamination clearance samples will be analyzed only for those hazardous waste characteristic parameters potentially present. The potential contaminants will be known as the contaminants present in the materials handled by the equipment will have been characterized. If the equipment decontamination wastes are characterized as non-hazardous, alternate sampling and analyses may be required to address other non-hazardous waste disposal concerns prior to disposal.

5.6 Open Burn Containment Device Wipe Samples

Open burn containment device wipe samples will be analyzed for hazardous waste characteristics to provide data with respect to disposal concerns or restrictions.

5.7 Closure Generated Wastes

Closure generated wastes including excavated contaminated soils, decontamination wastewaters from investigation and remediation equipment, will be analyzed for a limited suite of parameters. The specific parameters will be determined by the data need of the proposed disposal/treatment method for these wastes which exceed appropriate data generated by other portions of the closure sampling program.

TABLE 5-1: ANALYTICAL PARAMETERS

Sample Matrix	Sample I.D.	Analytical Scope	Metals	Cyanide	Volatile Organics	Semi-Volatile Organics	Explosives		
							Group A	Group B	Group C
Shallow Soil Samples	SS-1	Intermediate	X	X	X	X	X	X	
	SS-2	Intermediate	X	X	X	X	X	X	
	SS-3	Full	X	X	X	X	X	X	X
	SS-4	Intermediate	X	X	X	X	X	X	
	SS-5	Full	X	X	X	X	X	X	X
	SS-6	Full	X	X	X	X	X	X	X
	SS-7	Intermediate	X	X	X	X	X	X	
	SS-8	Intermediate	X	X	X	X	X	X	
	SS-9	Intermediate	X	X	X	X	X	X	
	SS-10	Intermediate	X	X	X	X	X	X	
	SS-11	Intermediate	X	X	X	X	X	X	
	SS-12	Intermediate	X	X	X	X	X	X	
	SS-13	Intermediate	X	X	X	X	X	X	
	SS-13A	Short	X						
	SS-14	Full	X	X	X	X	X	X	X
	SS-15	Intermediate	X	X	X	X	X	X	
	SS-16	Short	X						
	SS-17	Intermediate	X	X	X	X	X	X	
	SS-18	Short	X						
	SS-19	Short	X						
	SS-20	Intermediate	X	X	X	X	X	X	
	SS-21	Short	X						
	SS-22	Short	X						
	SS-23	Short	X						

TABLE 5-1: ANALYTICAL PARAMETERS

Sample Matrix	Sample I.D.	Analytical Scope	Metals	Cyanide	Volatile Organics	Semi-Volatile Organics	Explosives		
							Group A	Group B	Group C
Marine Sediment Samples	SED-1	Short	X						
	SED-2	Intermediate	X	X	X	X	X	X	X
	SED-3	Short	X						
	SED-4	Short	X						
	SED-5	Intermediate	X	X	X	X	X	X	
	SED-6	Intermediate	X	X	X	X	X	X	
	SED-7	Full	X	X	X	X	X	X	X
	SED-8	Intermediate	X	X	X	X	X	X	
	SED-9	Full	X	X	X	X	X	X	X
	SED-10	Full	X	X	X	X	X	X	X
	SED-11	Full	X	X	X	X	X	X	X
	SED-12	Intermediate	X	X	X	X	X	X	
	SED-13	Short	X						
	SED-14	Intermediate	X	X	X	X	X	X	
	SED-15	Short	X						
	SED-16	Short	X	X	X	X	X	X	
Marine Surface Water Samples	SW-1	Short	X						
	SW-2	Intermediate	X	X	X	X	X		
	SW-3	Short	X						
	SW-4	Short	X						
	SW-5	Intermediate	X	X	X	X	X		
	SW-6	Intermediate	X	X	X	X	X		
	SW-7	Full	X	X	X	X	X	X	X
	SW-8	Intermediate	X	X	X	X	X		
	SW-9	Full	X	X	X	X	X	X	X

TABLE 5-1: ANALYTICAL PARAMETERS

Sample Matrix	Sample I.D.	Analytical Scope	Metals	Cyanide	Volatile Organics	Semi-Volatile Organics	Explosives Group A	Explosives Group B	Explosives Group C
	SW-10	Full	X	X	X	X	X	X	X
	SW-11	Full	X	X	X	X	X	X	X
	SW-12	Intermediate	X	X	X	X	X		
	SW-13	Short	X						
	SW-14	Intermediate	X	X	X	X	X		
	SW-15	Short	X						
	SW-16	Intermediate	X	X	X	X	X		
Ground waters	DGW - 1 DGW - **	As per Detection Groundwater Monitoring Plan							
Treatment Unit Soils	OD-1	Full	X	X	X	X	X	X	X
	OD-2	Full	X	X	X	X	X	X	X
	OD-3	Full	X	X	X	X	X	X	X
	OD-4	Full	X	X	X	X	X	X	X
	OD-5	Full	X	X	X	X	X	X	X
	OB-1	Full	X	X	X	X	X	X	X
	OB-2	Full	X	X	X	X	X	X	X
	OB-3	Full	X	X	X	X	X	X	X
	OB-4	Full	X	X	X	X	X	X	X
	OB-5	Full	X	X	X	X	X	X	X
Remedial Action Clearance Samples	RAC - 1 RAC - **	As necessary for final closure clearance							
	OBCD - 1 OBCD - **	Full							

TABLE 5-1: ANALYTICAL PARAMETERS

Sample Matrix	Sample I.D.	Analytical Scope	Metals	Cyanide	Volatile Organics	Semi-Volatile Organics	Explosives		
							Group A	Group B	Group C
Closure Generated Waste	ES - 1 ES - **	As necessary for disposal/treatment characterizations							
	IDW - 1 IDW - **	As necessary for disposal/treatment characterizations							

TABLE 5-2: TARGET ANALYTES. ANALYTICAL METHODS AND REPORTING LIMITS

Analyte	Solid Samples			Water Samples		
	Method	Reporting Limit	Concentration Unit	Method	Reporting Limit	Concentration Unit
Nutrients:						
Ammonia	CE-81-1	6.5	mg/kg - dry	350.1	0.05	mg/L
TKN	CE-81-1	10.0	mg/kg - dry	351.2	0.10	mg/L
Nitrate and Nitrite	9056A	4.0	mg/kg - dry	353.2	0.01	mg/L
Phosphorus PO4	9056A	2.5	mg/kg - dry	365.1	0.01	mg/L
Metals:						
Aluminum	6010C	10.0	mg/kg - dry	6010C	50.00	mg/L[2]
Antimony	6010C	5.0	mg/kg - dry	6020A	0.50	mg/L
Arsenic	6010C	10.0	mg/kg - dry	6020A	1.00	mg/L
Barium	6010C	2.0	mg/kg - dry	6020A	0.50	mg/L
Beryllium	6010C	0.5	mg/kg - dry	6020A	0.20	mg/L
Cadmium	6010C	0.39	mg/kg - dry	6020A	0.10	mg/L
Calcium	6010C	75.0	mg/kg - dry	6010C	0.10	mg/L
Chromium	6010C	1.0	mg/kg - dry	6020A	1.00	mg/L
Cobalt	6010C	2.0	mg/kg - dry	6020A	0.50	mg/L
Copper	6010C	0.5	mg/kg - dry	6020A	0.50	mg/L
Iron	6010C	25.0	mg/kg - dry	6010C	45.00	mg/L
Lead	6010C	10.0	mg/kg - dry	6020A	0.50	mg/L
Magnesium	6010C	25.0	mg/kg - dry	6010C	0.05	mg/L
Manganese	6010C	2.5	mg/kg - dry	6020A	0.50	mg/L
Mercury	7471B	0.1	mg/kg - dry	7470A	0.20	mg/L
Molybdenum	6010C	1.0	mg/kg - dry	6020A	1.00	mg/L
Nickel	6010C	2.0	mg/kg - dry	6020A	1.00	mg/L
Potassium	6010C	100.0	mg/kg - dry	6010C	0.60	mg/L
Selenium	6010C	10.0	mg/kg - dry	6020A	2.00	mg/L
Silver	6010C	0.5	mg/kg - dry	6020A	0.10	mg/L
Sodium	6010C	50.0	mg/kg - dry	6010C	0.10	mg/L
Strontium	6010C	2.0	mg/kg - dry	6010C	2.50	mg/L
Thallium	6010C	20.0	mg/kg - dry	6020A	0.10	mg/L
Tin	6010C	5.0	mg/kg - dry	6010C	0.20	mg/L
Titanium	6010C	2.0	mg/kg - dry	6010C	1.00	mg/L
Vanadium	6010C	1.0	mg/kg - dry	6010C	1.00	mg/L
Zinc	6010C	5.0	mg/kg - dry	6010C	2.00	mg/L
Cyanide	9010C	0.3	mg/kg - dry	9010C	5.00	mg/L
Volatile Organics:						
Benzene	8021B	100.0	ug/kg - dry	8021B	1.00	ug/L
Ethyl Benzene	8021B	100.0	ug/kg - dry	8021B	1.00	ug/L

TABLE 5-2: TARGET ANALYTES. ANALYTICAL METHODS AND REPORTING LIMITS

Analyte	Solid Samples			Water Samples		
	Method	Reporting Limit	Concentration Unit	Method	Reporting Limit	Concentration Unit
Toluene	8021B	100.0	ug/kg - dry	8021B	1.00	ug/L
Xlyenes-Total	8021B	100.0	ug/kg - dry	8021B	1.00	ug/L
O-Xylene	8021B	100.0	ug/kg - dry	8021B	1.00	ug/L
M-and/or P-Xylene	8021B	100.0	ug/kg - dry	8021B	1.00	ug/L
Semi-Volatile Organics:						
Acenaphthalene	8270D	70	ug/kg - dry	8270D	1.0	ug/L
Acenathphtylene	8270D	70	ug/kg - dry	8270D	1.0	ug/L
Anthracene	8270D	70	ug/kg - dry	8270D	1.0	ug/L
Benzyl alcohol	8270D	140	ug/kg - dry	8270D	2.0	ug/L
Benzoic acid	8270D	1,350	ug/kg - dry	8270D	30.0	ug/L
Benzo(a)anthraecene	8270D	100.0	ug/kg - dry	8270D	1.5	ug/L
Benzo(b)fluoranthene	8270D	100.0	ug/kg - dry	8270D	1.5	ug/L
Benzo(k)fluoranthene	8270D	100.0	ug/kg - dry	8270D	1.5	ug/L
Benzo(a)pyrene	8270D	140.0	ug/kg - dry	8270D	2.0	ug/L
Benzo(ghi)perylene	8270D	160.0	ug/kg - dry	8270D	2.5	ug/L
Butylbenzylphtalate	8270D	100.0	ug/kg - dry	8270D	1.5	ug/L
Bis(2-chloroethyl)ether	8270D	70.0	ug/kg - dry	8270D	1.5	ug/L
Bis(2-chloroethoxy)methane	8270D	70.0	ug/kg - dry	8270D	1.0	ug/L
Bis(2-ethylhexyl)phthalate	8270D	100.0	ug/kg - dry	8270D	2.0	ug/L
Bis(2-chloroisophropyl)ether	8270D	70.0	ug/kg - dry	8270D	1.0	ug/L
4-Bromophenylphenylether	8270D	140.0	ug/kg - dry	8270D	1.0	ug/L
4-Chloroaniline	8270D	300.0	ug/kg - dry	8270D	4.0	ug/L
2-Chloronaphthalene	8270D	70.0	ug/kg - dry	8270D	1.0	ug/L
2-Chlorophenol	8270D	140.0	ug/kg - dry	8270D	2.0	ug/L
4-Chlor-3-Mehtylphenol	8270D	140.0	ug/kg - dry	8270D	1.5	ug/L
4-Chlorophenylphenylether	8270D	100.0	ug/kg - dry	8270D	1.0	ug/L
Chrysene	8270D	100.0	ug/kg - dry	8270D	1.5	ug/L
Dibenzo(a,h)anthracene	8270D	160.0	ug/kg - dry	8270D	2.5	ug/L
Dibenzofuran	8270D	70.0	ug/kg - dry	8270D	1.0	ug/L
Di-n-butylphthalate	8270D	70.0	ug/kg - dry	8270D	1.0	ug/L
1,3-Dichlorobenzene	8270D	70.0	ug/kg - dry	8270D	1.0	ug/L
1,2-Dichlorobenzene	8270D	70.0	ug/kg - dry	8270D	1.0	ug/L
1,4-Dichlorobenzene	8270D	70.0	ug/kg - dry	8270D	1.0	ug/L
3,3-dichlorobenzidine	8270D	500.0	ug/kg - dry	8270D	5.00	ug/L
2,4-Dichlorophenol	8270D	140.0	ug/kg - dry	8270D	2.00	ug/L
Diethyl phthalate	8270D	70.0	ug/kg - dry	8270D	1.00	ug/L
2,4-Dimehtlylphenol	8270D	140.0	ug/kg - dry	8270D	2.00	ug/L
Dimethyl pthalate	8270D	100.0	ug/kg - dry	8270D	2.00	ug/L

TABLE 5-2: TARGET ANALYTES. ANALYTICAL METHODS AND REPORTING LIMITS

Analyte	Solid Samples			Water Samples		
	Method	Reporting Limit	Concentration Unit	Method	Reporting Limit	Concentration Unit
2,4-Dinitrophenol	8270D	1300.0	ug/kg - dry	8270D	30.00	ug/L
2,4-Dinitrotoluene	8270D	140.0	ug/kg - dry	8270D	2.00	ug/L
2,6-Dinitrotoluene	8270D	140.0	ug/kg - dry	8270D	2.00	ug/L
Di-n-octylhthalate	8270D	140.0	ug/kg - dry	8270D	2.40	ug/L
Fluoranthene	8270D	70.0	ug/kg - dry	8270D	1.00	ug/L
Fluorene	8270D	70.0	ug/kg - dry	8270D	1.00	ug/L
Hexachlorobenzene	8270D	100.0	ug/kg - dry	8270D	2.00	ug/L
Hexachlorobudatiene	8270D	140.0	ug/kg - dry	8270D	2.00	ug/L
Hexachlorocyclopentadiene	8270D	1000.0	ug/kg - dry	8270D	10.00	ug/L
Hexachloroethane	8270D	100.0	ug/kg - dry	8270D	1.50	ug/L
Indeno(1,2,3-cd)pyrebe	8270D	160.0	ug/kg - dry	8270D	2.50	ug/L
Isophorone	8270D	140.0	ug/kg - dry	8270D	1.00	ug/L
2-methylnaphthalene	8270D	100.0	ug/kg - dry	8270D	1.00	ug/L
2-Methyl-1,6-dinitrophenol	8270D	1000.0	ug/kg - dry	8270D	20.00	ug/L
2-Methylphenol	8270D	140.0	ug/kg - dry	8270D	2.00	ug/L
4-Methylphenol	8270D	140.0	ug/kg - dry	8270D	2.00	ug/L
Naphthalene	8270D	70.0	ug/kg - dry	8270D	1	ug/L
2-Nitroaniline	8270D	300.0	ug/kg - dry	8270D	5	ug/L
3-Nitoaniline	8270D	300.0	ug/kg - dry	8270D	5	ug/L
4-Nitoraniline	8270D	300.0	ug/kg - dry	8270D	5	ug/L
Nitrobenzene	8270D	70.0	ug/kg - dry	8270D	1	ug/L
2-Nitrophenol	8270D	140.0	ug/kg - dry	8270D	2	ug/L
4-Nitrophenol	8270D	500.0	ug/kg - dry	8270D	10	ug/L
N-nittrosodi-n-propylamine	8270D	100.0	ug/kg - dry	8270D	10	ug/L
N-nitrosodiphenylamine	8270D	70.0	ug/kg - dry	8270D	1	ug/L
Pentachlorophenol	8270D	500.0	ug/kg - dry	8270D	10	ug/L
Phenanthrene	8270D	70.0	ug/kg - dry	8270D	1	ug/L
Phenol	8270D	140.0	ug/kg - dry	8270D	2	ug/L
Pyrene	8270D	70.0	ug/kg - dry	8270D	1	ug/L
1,2,4-Trichlorobenzene	8270D	100.0	ug/kg - dry	8270D	1	ug/L
2,4,6-Trichlorophenol	8270D	300.0	ug/kg - dry	8270D	4.5	ug/L
2,4,5-Trichlorophenol	8270D	300.0	ug/kg - dry	8270D	4	ug/L
Explosive/Energetics:						
Group A						
2-Amino,4,6-dinitrotoluene				UW32	0.15	ug/L
4-Amino,2,6-dinitrotoluene				UW32	0.15	ug/L
1,3-Dinitrotoluene	LW12	0.20	mg/kg - dry	UW32	0.1	ug/L
2,4-Dinitrotoluene	LW12	0.15	mg/kg - dry	UW32	0.06	ug/L

TABLE 5-2: TARGET ANALYTES. ANALYTICAL METHODS AND REPORTING LIMITS

Analyte	Solid Samples			Water Samples		
	Method	Reporting Limit	Concentration Unit	Method	Reporting Limit	Concentration Unit
2,6-Dinitrotoluene	LW12	0.20	mg/kg - dry	UW32	0.07	ug/L
HMX	LW12	0.50	mg/kg - dry	UW32	0.25	ug/L
Nitrobenzene	LW12	0.30	mg/kg - dry	UW32	0.2	ug/L
2-Nitrotoluene	LW12	0.50	mg/kg - dry	UW32	0.25	ug/L
3-Nitrotoluene	** 1		mg/kg - dry	UW32	0.25	ug/L
4-Nitrotoluene	** 1		mg/kg - dry	UW32	0.3	ug/L
RDX	LW12	0.50	mg/kg - dry	UW32	0.25	ug/L
Tetryl	LW12	0.30	mg/kg - dry	UW32	0.2	ug/L
1,3,5-Trinitrobenzene	LW12	0.25	mg/kg - dry	UW32	0.2	ug/L
2,4,6-Trinitrotoluene	LW12	0.25	mg/kg - dry	UW32	0.15	ug/L
Group B						
Nitroglycerine	LW12	4.0	mg/kg - dry	UW19	20	ug/L
PETN	LW12	4.0	mg/kg - dry	UW19	10	ug/L
Group C						
Nitrocellulose	LF03	10.5	mg/kg - dry	UF03	553	ug/L
White Phosphorus	** 2	0.07	mg/kg - dry	** 2	0.03	ug/L
PCBs						
PCB - 1016	8081B	60.0	ug/kg - dry	** 3		
PCB - 1221	8081B	60.0	ug/kg - dry	** 3		
PCB - 1232	8081B	60.0	ug/kg - dry	** 3		
PCB - 1242	8081B	60.0	ug/kg - dry	** 3		
PCB - 1248	8081B	60.0	ug/kg - dry	** 3		
PCB - 1254	8081B	60.0	ug/kg - dry	** 3		
PCB - 1260	8081B	60.0	ug/kg - dry	** 3		

** 1 Solid samples not analyzed for these analytes
** 2 Gas Chromatograph/flame photometric detector (GC/FPD) - ESE Internal Standard
** 3 Water samples not analyzed for these samples

Section 6: QA Project Plan

6.1 General Requirements

Critical objectives for each field team member are to:

1. Collect a sample that is representative of the matrix being sampled; and
2. Maintain sample integrity from the time of sample collection to receipt by the laboratory.

All field notes will be recorded in indelible ink on standard forms in bound notebooks. The field team leader will complete a daily field trip log form. This form will be signed and dated daily. Significant events occurring during the day will be reported to the base project manager at the end of each day's activities. Daily communication is essential to ensure that timely corrective actions can be implemented, if necessary.

All forms in the field notebook(s) must provide for the team members to sign and date the entries. The field team leader must review all field notes and document approval of these notes by either signing each page or stating that the notes were reviewed.

Pre-field meetings/conference calls will be held prior to field investigation. These meetings are intended to ensure that all laboratory and field personnel are aware of the field activity and can plan accordingly. The project manager will schedule a meeting/conference call with the project QA supervisor, field team leader, and analytical task manager at least one (1) week prior to the sampling documented by the signatures of the personnel on the form.

6.2 Special Sampling Requirements

Samples will be analyzed in the parts per billion ranges for many compounds: therefore, extreme care must be exercised to prevent sample contamination. When sampling for BTEX, field team members must use caution to ensure that the samples are not exposed to the atmosphere unnecessarily.

The following precautions should be taken when sampling for all trace contaminants:

1. Clean pair of new disposable gloves is worn for each new sampling station;
2. Sampling must be performed so that any material or liquid being collected contacting the gloves (and/or any external surface of the sample container) does not contaminate the sample;
3. When possible, samples should be collected from stations that are least contaminated (i.e. background) followed by stations in increasing of contamination; and
4. When possible, in sampling surface waters, the water sample should be collected working from downstream to upstream.

When sampling for the presence of organic parameters, the following additional precautions will be taken:

1. All sample bottles and equipment must be kept away from fuels and solvents.
2. All sampling equipment should be made of Teflon glass or stainless steel that is decontaminated. Other materials, such as plastic, may contaminate samples with phthalate esters that interfere with many analyses.
3. Water samples for volatile analysis must be collected so that no air passes through them (to prevent

volatiles from being stripped from the samples); the bottles should be filled by slowly running the sample down the side of the bottle until there is convex meniscus over the neck of the bottle. The Teflon side of the septum (in cap) should be positioned against meniscus and the cap screwed on tightly, and the sample should be inverted and bottle lightly tapped. The absence of an air bubble indicates a successful seal; if a bubble is evident, the cap should be removed, more sample added, and the bottle resealed.

4. Soil samples for volatiles analysis should be collected with as little air space as possible to prevent loss to the headspace.
5. The BTEX samples should not be composited due to the potential for loss when homogenizing the sample.

6.3 Sampling Site Selection

Soil and water sampling locations and analytical parameters were selected to document current conditions at potential contaminated areas and in adjacent locations believed to represent background conditions. These sampling sites are listed in Table 3-1 this closure sampling plan. Table 5-1 lists the environmental samples that will be collected at each site.

6.4 Sample Blanks and Field Duplicates

Two types of sample blanks must be processed: travel trip blanks and equipment (rinseate) blanks. Field duplicates and split samples are also addressed in this section.

Field duplicate samples are collected to measure the precision of the sampling process. Split field duplicate samples (sample split) will be sent to the QA laboratory.

6.4.1 Trip Blank

Trip blank are analyzed for purgeable compounds only and consist of sample bottles filled in the laboratory with organic-free water, the sample bottles are then sent to the sampling location with sample kits. The trip blanks are returned from the sampling location along with the samples designated for VOC analysis. Similarly, trip blanks will accompany split VOC samples to the QA laboratory.

6.4.2 Equipment Blank

Equipment blanks are processed by rinsing decontaminated sampling equipment with ultra-pure water obtained from the laboratory. The rinse water is collected in sample bottles, preserved, and handled in the same manner as the samples. Approximately seven (7) equipment blank samples will be collected during the program, covering the various matrices and types of sampling equipment. Collection of seven (7) equipment blanks meets the minimum five percent (5%) requirement.

6.4.3 Field Duplicates

Field duplicates will be collected during this program at the rate of one per ten samples for each sample matrix and analytical group. A minimum of one field blank will be collected per sample matrix and analytical group. The field duplicate samples will be identified on the labels and chain-of-custody forms. Split field duplicate samples will be sent to the QA laboratory.

The field duplicate samples will be identified on the labels and chain-of-custody forms as "DUP xx" (where xx represents a field assigned designation for sample identification) without further information as to the source of the replicate. The source information will be recorded in the field notes but not on the chain-of-custody form recorded by the field team at the time of collection. The identity of the duplicates will not be given to the contractor laboratory. The source information will be forwarded to the QA reviewer to aid in the contractor's review and validation of the data. The source of the field duplicate for the QA samples will be clearly identified on the chain-of-custody form sent to the QA laboratory.

6.4.4 Split Samples

Field split samples are collected to provide a measure of comparability between laboratories. A minimum of one half that of the rate for field duplicates for collection and analyses. Split samples will be submitted to the QA laboratory.

6.5 Field Equipment Decontamination

Decontamination of sampling equipment is addressed in Section 4.3.6 of the sampling plan.

6.6 Sample Containers and Preservation Techniques

Sample volume requirements are presented in Table 5-1 along with sample container requirements for each analyte and media. The field team leader is responsible for proper sampling, labeling of samples, preservation and shipment of samples to the laboratory to meet required holding times.

Sample volume requirements are presented in Table 5-1 along with sample container requirements for each analyte and media. The field team leader is responsible for proper sampling, labeling of samples, preservation, and shipment of samples to the laboratory to meet required holding times. With hazardous samples it may be necessary to rinse the outer portion of sample containers with deionized water prior to packaging for shipment. The latest DOT and USDA procedures for shipment of environmental samples will be used in all cases. The quantity of acids or bases added as preservatives generally should not exceed 0.15 percent by weight, or the samples must be shipped as corrosives.

6.7 Sample Security, Custody, Handling, Preparation and Documentation

6.7.1 Security

Security involves procedures used to ensure sample integrity from sample collection until sample disposal after laboratory analyses are complete. Security procedures are described in the following paragraphs

Once collected, samples will be in the possession of field team members or locked in coolers in the field facility. Quality Assurance/Quality Control (QA/QC) samples will also be collected and analyzed to document sample integrity. Samples will be transported to the lab by a recognized international shipper.

Samples will be stored in the laboratory in a secure area with access limited to authorized laboratory personnel. Upon receipt of coolers containing samples, laboratory personnel will check to ensure that the chain-of-custody seals are intact, measure the temperature of each cooler and document the condition of the samples.

6.7.2 Sample Custody

The primary objective of sample custody is to create an accurate written verified record that can be used to trace the possession and handling of the samples from the moment of collection until receipt by the laboratory. Adequate sample custody will be achieved by means of approved field and analytical documentation. A sign-in and sign-out log will be maintained at the laboratory.

A sample for this project is defined to be in a person's custody if it is:

1. In one's actual physical possession;
2. In one's view after being in one's physical possession;
3. In one's physical possession and then locked or otherwise sealed so that tampering will be evident; or
4. Kept in a secure area restricted to authorized personnel only.

6.7.3 Sample Handling, Preparation, and Field Documentation

Field procedures will be designed to minimize sample handling and transfers. During sampling, field team members record the following information in field notebooks and on the field chain-of-custody log sheet using indelible ink:

1. Unique sample number as obtained from the sample label;
2. Source of sample (including site name, location. and sample type);
3. Date and time of sample collection;
4. Preservatives used;
5. Name(s) of collector(s); and
6. Field data (pH, temperature, and specific conductance) for aqueous samples.

All samples will be appropriately preserved and chilled to 4°C prior to shipment. Each sample fraction contained in the cooler will be specified on the log sheet. Other field information such as sample type, time and date of sample collection, new station code (if different from tentative station ID), and field measurements results (e.g., pH, temperature), is also entered on the log sheet. The method of shipment is entered on the log sheet and the sampler signs and dates the log sheet. The log sheet is placed in a waterproof container taped to the inside lid of the cooler, and sealed in the cooler with the samples. The custody seal will not be removed until the samples arrive in the analytical laboratory and are checked in by the analytical task manager or designee. The field team leader will alert the analytical task manager to pertinent shipping information at the end of each sampling day.

Sample container shipment will follow sample handling protocols for low, medium, and high concentration samples of hazardous waste procedures (ER-1110-1-263). The addresses of laboratories used in this project are as follows:

Primary Lab: Laboratory
Name Street
Address
City, State, Zip code
Attn: Individual's Name
Telephone Number

Facsimile Number

Split Lab: Laboratory Name
Street Address
City, State, Zip code
Attn: Individual's Name
Telephone Number
Facsimile Number

6.8 Analytical Procedures

Analytical methods and reporting limits for the target analytes are specified in Table 5-2.

6.9 Internal QC Check

Trip blanks, travel blank (trip blanks), equipment blanks (rinseate blanks), and replicate samples (duplicate samples) are discussed in Section 5.

6.9.1 Laboratory QC Checks

Calibration controls will be required for analytical operations of this project. Each instrument will be calibrated and both initial and continuing calibrations will meet the minimum criteria listed in the EPA SW846 method requirements. Calibration will be documented in a parameter notebook or the analyst's notebook.

Method blanks, sample matrix spikes, surrogate spikes, QC check sample, sample duplicates, and interferant check samples will be analyzed as required by standard laboratory protocol. These analyses will be performed in accordance with SW846 protocol.

6.9.2 Calculation of Data Quality Indicators

The contracted laboratory will determine if accuracy, detection limits, and completeness are within criteria set by SW 846.

6.10 Project Organization and Responsibilities

An organization chart showing the project team will be developed as part of the preparation before initiation of field efforts.

6.10.1 Field Personnel

The project manager is responsible for the effectiveness of day-to-day management of the project team and direct communication and liaison with AAFB. The project manager's responsibility to QA is to ensure all project QC procedures are followed during this project. The Field Team Leader is responsible for successfully accomplishing sample collection and shipment, and associated documentation.

6.10.2 Laboratory Personnel

The Chemical Analysis Supervisor serves as liaison between field and laboratory operations, is responsible for the following:

1. Receipt of sample custody from field members, verification of sample integrity and transfer of sample fractions to appropriate analytical departments;
2. Coordination of sample analyses to meet project objectives;
3. Preparation of analytical reports;
4. Review of laboratory data for compliance with precision, accuracy, and completeness objectives;
5. Review of any QC deficiencies reported by the Analytical Department Manager; and
6. Coordination of any data changes resulting from review by the Project QA Supervisor and/or Project Manager.

6.10.3. Project QA Personnel

6.10.3.1 QA/QC Personnel

The QC staff includes both field and laboratory personnel. The Field Team Leader is responsible for all field QC procedures, and for providing consistent and accurate field data. The Field Team Leader is also responsible for implementing and overseeing all field QA/QC requirements.

The Laboratory QA/QC Officer ensures that all QC requirements for each analytical procedure or process are in place and followed.

6.10.3.2 Project QA Supervisor

The Project QA Supervisor ensures that specific QA and primary technical operations are coordinated efficiently for the project. The Project QA Supervisor is independent of the project team and is responsible for the following:

1. Performance and/or system audits of laboratory operations to ensure compliance with the QAPP;
2. System audits of field operations to ensure compliance with the QAPP;
3. Provision of guidance and coordination to rapidly resolve any QA/QC problems;
4. Independent review of QA/QC information to ensure the quality of all deliverables to, or outputs from the project team to AAFB; and
5. Interaction and communication with AAFB to resolve QA/QC problems specific to the project.

6.11 Calibration Procedures and Frequency

6.11.1 Analytical Laboratory Instruments

Calibration controls will be required for analytical operations of this project. Each instrument will be calibrated and both initial and continuing calibrations will meet the minimum criteria listed in the SW 846 method requirements. Calibration will be documented in a parameter notebook or, the analyst's notebook.

6.11.1.1 Gas Chromatograph/High Pressure Liquid Chromatograph (GC-Non-volatiles/HPLC) Calibration

Standard Curve Calibration -- Initial calibration standard solutions will be prepared by sequential dilution of a single stock standard solution to cover the analytical working range of the method. These may be

either composite standard of more than one analyte or single-analyte solutions. The concentrations will be adjusted to take into account the instrumental and method detection limit. A minimum of three initial calibration standard concentrations or the number of standards specified by the method covering the working range and a blank will be prepared and analyzed.

The initial calibration standards and the blank will be analyzed in every analytical run. At least one calibration standard at the middle or high range of the curve will be analyzed every 20 samples and repeated at the end of the run. A QC check standard is analyzed every time new calibration standards are prepared and analyzed to verify acceptability of the new calibration standards.

The initial calibration curve will be produced by plotting the standard response for each standard versus the concentration of each standard from the initial calibration run. The concentrations of the standards may be expressed in units of mass injected or in terms of the concentration of the standard solution, if the injection volume is constant for standards and samples. QC evaluation criteria for initial calibration, recalibration, and continuing calibrations are as follows:

1. The initial calibration curve and the subsequent recalibrations possess a minimum of three points and a blank or possess the number of calibration standards specified by the method;
2. The correlation coefficient of the curve is 0.995 or greater;
3. Continuing calibration standards are within 15 percent of the same initial calibration standard for GC (25 percent for NP detector) and within 10 percent of the same initial calibration standard for HPLC;
4. The QC check standard must be within the acceptance range provided by the vendor or within 25 percent of the standard's true if a standard from a different source or lot number is used; and
5. The calibration curve brackets the response for all samples.

The concentration (or amount) of the injected sample will be obtained by entering the response for the sample into the initial calibration curve equation and determining the sample concentration after all appropriate extract and sample dilution factors have been applied.

6.11.1.2 GC/MS Tuning and Calibration

GC/MS Tuning -- Daily instrument tuning will be practiced to ensure the instrument is calibrated and in proper working condition. The GC/MS will be tuned daily with decafluorotriphenylphosphine (DFTPP) for semi-volatiles analysis and bromofluorobenzene (BFB) for volatiles analysis.

6.11.1.2.1 GC/MS Calibration

Relative response factors for the individual compounds will be determined as follows:

$$\mathbf{RF} = \frac{\mathbf{A_C Q_{IS}}}{\mathbf{A_{IS} Q_C}}$$

Where: **A** = integrated area taken from the extracted ion current profile.
Q = quantity of material
C = compound and
IS = internal standard.

Initial calibration using a minimum of five (5) levels of the compound will be used to determine the instrument linearity. The average response factor (RF) will be calculated for each compound. The response factors for the System Performance Check Compounds (SPCC) must be >0.30 (0.25 for bromoform) for EPA 8240 and >0.05 for EPA 8270. The percent relative standard deviation (% RSD) will be calculated for each calibration check compound (CCC). The percent RSD of the (CCC) in the initial calibration must be <30 percent.

A 1-point calibration using a midlevel standard from the initial calibration will be used daily for all subsequent analysis. The RFs of the SPCC for EPA 8240 and 8270 in this continuing calibration standard must meet the minimum response factors specified for the initial calibration previously mentioned. The RFs of the calibration check compounds in this daily calibration standard should be ≤ 25 percent difference from the average RFs in the initial calibration.

6.11.1.3 Gas Chromatograph (GC Volatiles) Calibration

Standard Curve Calibration -- Calibration standard solutions will be prepared as needed by sequential dilution of a single stock standard solution (prepared every 2 months) to cover the analytical working range of the method. These may be either composite standard of more than one (1) analyte or single-analyte solutions. The concentrations will be adjusted to take into account the instrumental and method detection limit. A minimum of three (3) calibration standard concentrations or the number of standards specified by the method covering the working range and a blank will be prepared and analyzed. The calibration standards and the blank will be analyzed every 20 samples and repeated at the end of the run to ensure constant instrument response. A QC check standard is analyzed every time new calibration standards are prepared to verify acceptability of the new calibration standards.

6.11.1.4 General Inorganic and Organic Parameters Calibration

Standard Curve Calibration -- This section applies to those inorganic and organic analyses procedures [i.e., spectrophotometric, infrared (IR)] that use a standard curve for calibration. Working standard solutions will be prepared by sequential dilution of a single-stock standard to bracket the analytical working range of the method. Working standard solutions may be either composite standard of more than one (1) analyte or single-analyte solutions. The standard concentrations will be adjusted to take into account the instrument and method, upper and lower limits of linearity and the instrumental detection limit. A minimum of three (3) standard concentrations, or the number of standards specified by .the method, covering the working range and a blank will be prepared and analyzed. The working standards and the blank will be analyzed at the beginning of every analytical run, and at least one (1) mid-level standard will be analyzed at minimum intervals of every 20 samples during the run and at the end of the run to check for constant instrument response.

The preparation of calibration standard is verified by the analysis of the initial calibration verification (ICV) solution. The ICV is an independent standard prepared from different stock solutions than those used to prepare the calibration standards. Typically, an EPA or NIST reference is used as the ICV and is prepared according to the supplier's instructions.

The working curve will be produced by plotting the standard response for each standard versus the concentration of each standard from the initial calibration run. The following QC evaluation criteria for working curves are:

1. The working curve possesses a minimum of three points, or the number of standards specified by the method, and a blank;
2. The correlation coefficient of the line is 0.995 or greater;
3. The response for the CCV analyzed at minimum intervals of every 20 samples during the run and at the end of the run is within 20 percent of true value;
4. The ICV is within 10 percent of the element's true value; and
5. The calibration curve brackets the response for all samples.

The sample concentration will be obtained by entering the response for the sample into the working curve equation and determining the sample concentration after all appropriate extract and sample dilution factors have been applied.

6.11.1.5 Trace Metals Analysis Calibration

Atomic Absorption Spectroscopy (AAS) Standard Curve Calibration -- Working standard solutions will be prepared to include the analytical working range of the method; these solutions may be either composite standard of more than one metal or single-metal solution. The standard concentrations will be adjusted to take into account the instrument method, upper and lower limits of linearity and the instrument detection limit. A minimum of three (3) standard concentrations, or the number of standards specified by the method, covering the working range and a blank will be prepared and analyzed. The working standards and the blank will be analyzed at the minimum intervals of every 20 samples during the run and at the end of the run to check for constant instrument response.

The calibration is verified by the analysis of the ICV solution. The ICV is an independent standard prepared from different stock solutions than those used to prepare the calibration standards. Typically an EPA or NIST reference is used as the ICV and is prepared according to the supplier's instructions.

The working curve will be produced by plotting the standard response for each standard versus the concentration of each standard from the initial calibration run. The following QC evaluation criteria for working curves are:

1. The working curve possesses a minimum of three points or the number of standards specified by the method and a blank;
2. The correlation coefficient of the line is 0.995 or greater;
3. The response for the midlevel standard analyzed at minimum intervals of every 20 samples during the run and at the end of the run is within 20 percent of true value;
4. The ICV is within 10 percent of the element's true value; and
5. The calibration curve brackets the response for all samples.

Corrective action procedures will be taken if these QC evaluation criteria for calibration are not met.

The concentration of the sample is obtained by entering the response for the sample into the working curve equation and determining the sample concentration after all appropriate digestate and sample dilution factors have been applied.

Inductively Coupled Argon Plasma (ICAP) Single Point Calibration--This procedure uses a single standard concentration for each element to obtain an instrument response (emission counts) and is analyzed in every analytical run. A second single point emission counts obtained when aspirating a blank solution (undigested, acidified DI water), is used in conjunction with the standard to calibrate the instrument in concentration unit.

The calibration is verified by the analysis of an ICV solution which is an independent standard prepared from different stock solutions than those used to prepare the calibration standards. The elemental concentrations of the calibration verification solution must be within the calibration range of the instrument and at concentrations other than those used for instrument calibration.

A multi-element interference check solution (ICS) and a method blank (acidified DI water that is carried through the digestion process) are analyzed each day prior to analyzing the samples. The ICS is used to verify the correction of spectroscopic interference caused by emissions adjacent to analyte emission lines.

The CCV solution is analyzed at minimum intervals of every 20 samples during the run and at the end of the run to document constant instrument response. This solution contains one-half the concentration of each element present in the calibration standards. This solution may be prepared by dilution of an aliquot of the calibration standard or prepared as a separate solution in a manner analogous to the calibration standard preparation procedure.

The following QC evaluation criteria for the instrument calibration standard are:

1. A calibration standard and a calibration blank are used;
2. All the values for the ICV are within 10 percent of each element's true value;
3. Values for the ICS are 20 percent of each element's true value; and
4. The measured concentrations of the elements in the CCV solution for which calibration was performed are within 10 percent of their respective true values.

Corrective action procedures will be taken if these QC evaluation criteria are not.

Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) Single Point Calibration -- Mass calibration and tuning of the ICP/MS will be performed each time the instrument is set up. The tune response factor and mass calibration will be verified and documented before any sample analysis and at the end of each analytical run. If the mass calibration exceeds a difference of more than 0.lamu from actual value, then the mass calibration must be adjusted to the correct value.

This procedure uses a single standard concentration for each element to obtain an instrument response (intensity counts) and is analyzed in every analytical run. A second single point intensity counts obtained when aspirating a blank solution (undigested, acidified DI water) is used in conjunction with the standard to calibrate the instrument in concentration limits.

The calibration is verified by the analysis of an ICV solution which is an independent standard prepared from different stock solution than those used to prepare the calibration standards. The elemental concentration of the calibration verification solution must be within the linear range of the instrument and at concentrations other than those used for instrument calibration.

A multi-element interference check solution (ICS) and a method blank (acidified DI water that is carried through the digestion process) are analyzed each day prior to analyzing the samples. The ICS is used to verify the adequate application of elemental interference equation.

The CCV solution is analyzed at minimum intervals of every 10 samples during the run and at the end of the run to document constant instrument response. This solution contains one-half the concentration of each element present in the calibration standards. This solution may be prepared by the dilution of an aliquot of the calibration standard or prepared as a separate solution in a manner analogous to the calibration standard preparation procedure.

QC evaluation criteria for the instrument calibration standard are as follows:

1. A calibration standard and a blank are used;
2. All the values for the ICV are within 10 percent of each element’s true value;
3. Values for the ICS are adequately corrected for in the interference equation; and
4. The measured concentrations of the elements in the CCV solution for which the calibration was performed are within 10 percent of their respective true values.

Corrective action procedures will be taken if these evaluation criteria are not met.

6.11.1.6 Gravimetric Methods Calibration

Two general types of analytical balances are used at most commercial laboratories:
1. The more sensitive microanalytical balance, and
2. The top-loading balance.

The calibration of the microanalytical balances is verified daily by weighing the following Class S and NIST-certified weights [in grams (g)]:

Weight (g)	Tolerance
Limits 0.2	+0.0005
1.0	+0.0005
3.0	+0.0005
5.0	+0.0005

The calibration of the top loading balance is verified daily by weighing the following Class S and NIST – certified weights:

Weight (g)	Tolerance
Limits 5	+0.02
20	+0.05
50	+0.05

The results are recorded in the instrument logbook. If these criteria are not met, the weight may be reweighed. If the criteria are not met for the second weighing, the balance is taken out of service and repaired. The Class S weights are sent to the manufacturer yearly for calibration and recertification. Two sets of Class S weights are available in-house.

6.12 Data Reduction, Validation, Reporting

6.12.1 Field Data

All field information will be recorded in sequentially numbered bound notebook using non-erasable, waterproof ink. The Field Team Leader is responsible for initial data validation including and ensuring the following:

1. Completeness of field records, and
2. QC measures for sampling procedures (i.e., duplicates, trip blanks, equipment blanks, and calibration checks).

Field analytical data (i.e., pH, temperature, and conductivity) will be sent to the contracted laboratory on the chain-of-custody field log sheet and will be included with the project analytical deliverable as a hard copy laboratory report.

Data transfer and reduction are essential functions in summarizing information to support conclusions. It is essential that these processes are performed accurately and in the case of data reduction, that accepted statistical techniques are used. QA/QC procedures will be adhered to as outlined in this QAPP.

Example calculations will be included with the analytical method where appropriate, to facilitate review. The entry of input data and calculations should be checked and the signature/initials of the data technician and reviewer(s) should accompany all data transfers with and without reduction.

For routine analyses performed at the laboratory, sample response data information will be entered into the computer system by the Laboratory Analyst or other designated individual(s). The computer calculates the following:

1. Linear or quadratic regression line for standards;
2. Coefficients of variation for replicates;
3. Spiked recoveries;
4. Reference sample concentrations, and
5. Sample concentrations.

Linear or quadratic equations will be used to calculate final data for laboratory analyses requiring a calibration curve:

$$\textit{Concentration} = \textit{Intercept} + M\ (\textit{Response}) + M2\ (\textit{Response})^2$$

The equation used to calculate the final data for laboratory is independent on the linearity of the standard curve and method of analyses.

Purgeable organics by GC/MS are calculated as follows:

$$\textit{Concentration (ug/L)} = \frac{(A_{sa})(Q_{is})}{(RF)\,(A_{is})(PV)}$$

Where:
A_{sa} = area from the extracted iron profile of the primary characteristic ion for the target analyte in the sample
Q_{is} = quantity of the internal standard [nanograms (ng)]
RF = Response factor (see Section 5.12.1.1),
A_{is} = area from the extracted ion profile of the primary characteristic ion of the internal standard in the sample, and 29
PV = purge volume (milliliter (mL)

Acid and base/neutral extractable are calculated as follows:

$$\textit{Concentration (ug/L)} = \frac{(A_{sa})\ (Q_{is})}{(A_{is})(RF)} * \frac{1}{FE} * \frac{1}{volume} * DF$$

A_{sa} = area from the extracted ion profile of the primary characteristic ion for the target analyte in the sample
A_{is} = area from extracted ion profile of the primary characteristic ion of the internal standard in the sample
Q_{is} = quantity of the internal standard (ng)
RF = response factor (see Section 5.12.1)
FE = fraction extract analyzed

$$\frac{\textit{Volume injected [microliter(ug/L)]}}{\textit{Extract volume (uL)}}$$

Volume = volume of extracted sample (mL), and
DF = dilution factor

$$\frac{\textit{Final extraction volume for injection (mL)}}{\textit{Extraction volume prior to dilution (mL)}}$$

QC acceptance criteria for the relative percent difference of replicate spike recoveries and for the range of acceptance recoveries will be stored in the data management computer files for each STORET number/method code combination. If the sample in a sample lot does not pass the entire QC checks the results reported in all samples processed in the same sample set may be considered suspect and the analysis may need to be repeated.

Completed batch folders will be stored in a central location arranged by department and numerically by batch number. Raw instrument output copies of parameter notebook, pertinent calculations, and solution documentation will be stored in the batch folders.

When the data set is complete for each sampling effort, the computer will be used to organize the information in the field group in numerous formats. The final reports will be reviewed and approved by the Laboratory Coordinator.

6.12.2 Sampling and data Results Report

6.12.2.1 Report Format

Laboratory data reports will be generated directly without manual manipulation. The analytical report will include the following items:

1. Case narrative will include a general discussion of the results and any analytical problems encountered;
2. Laboratory data, all field QC sample results (including trip blanks, equipment rinseate, and field duplicates) and tentatively identified compound (TIC) reports for semi-volatiles;
3. Dates of collection, extraction, and analysis, and the days elapsed between each step of the analytical process;
4. Methodology and batch number for each sample; and
5. Sample ID cross reference (to field and laboratory ID).

The laboratory data will be provided in hard copy. Copies of completed chain-of-custody forms will also be provided. These forms will include the temperature of the cooler upon arrival and the general conditions of the samples.

6.13 Performance and System Audit

Two (2) types of audit procedures will be used to assess and document the performance of the project staff: system audit and performance audits. These are performed at frequent intervals under the direction of the Project QA Supervisor. These audits form one of the bases for corrective action requirements and constitute a permanent record of the conformance of measurement systems to QA requirements.

6.13.1 System Audit

System audits are inspections of training status, records, QC data, calibrations, and conformance to SOPs without the analysis of check samples. System audits are conducted quarterly for the laboratory. Field audits may be conducted at the initial sampling activities of this project.

The system audit protocol is summarized as follows:

1. Field Operations – The Project QA Supervisor will periodically:
   - (a) Check field notebooks, log sheets, chain-of-custody forms, and report any inconsistencies and/or omissions; and
   - (b) Check implementation of field sampling procedures: calibration of field instruments, decontamination, packaging, and shipping.
2. Laboratory Operations – The Project QA Supervisor will periodically check:
   - (a) Parameter and/or laboratory notebook;

   (b) Instrument logbook;
   (c) Sample log-in, dispensing, and labeling for analysis;
   (d) Update QC criteria for spike recoveries; and
3. Final Reports – The Project QA Supervisor will audit the deliverable review sheets to ensure that all final report are peer reviewed before they are sent to the client.

6.13.2 Performance Audit

The contracted laboratory should participate in the following proficiency programs:

1. National Institute of Occupational Safety and Health (NIOSH) through its Proficiency Analytical Testing Program (PAT) and Environmental Lead Proficiency Analytical Testing Program (ELPAT);
2. EPA Water Pollution and Water Proficiency Programs;
3. USACE; and
4. Department of Energy Environmental Measurement Laboratory Quality Assessment Program.

6.14 Preventive Maintenance

To minimize the occurrence of instrument failure and other system malfunctions, a preventive maintenance program for field and laboratory instruments is being implemented. The preventive maintenance performed for each major piece of field and analytical equipment is listed in the following sections.

All maintenance performed on the laboratory instruments are documented in each instrument's maintenance logbook which is kept with the instrument. The date, initials of the analyst performing the maintenance, and the type of maintenance performed are recorded in this maintenance logbook. Receipts from the routine maintenance performed by the manufacturer's representative are kept on file.

6.15 Corrective Actions

Corrective action is necessary when any measurement system fails to follow this QAPP. Item which may need corrective action range from a minor problem of a field team member failing to sign a field form to a major problem of a Laboratory Analyst using an improper analytical method. For this reason, corrective action protocol must be flexible. In general, items needing corrective action fall into three (3) correction categories: Short term, long term, and QC; each requires different action.

6.15.1 Short-Term Corrective Action

Short-term problems may be minor and major problems, which can be corrected immediately. Examples include failure to date or sign a field form, incorrectly preserving samples, and errors in data entry. Corrective action is initiated by verbally calling attention to the problem and seeing that it is corrected.

6.15.2 Long-Term Corrective Action

Long-term problem may be minor and major problems, which require series of actions to resolve. The actions to be taken are coordinated by the Project QA Supervisor, and a QA corrective action request and routing form is used to track the action. An example of this type of corrective action is as follows:

Problem – A field team member fails to calibrate the pH meter in the field prior to use.
Corrective Action – The problem is identified by the person originating the corrective action, responsibility is assigned to an appropriate person (may be someone other than the person failing to calibrate the meter) an appropriate standard is selected, the standard is ordered, the order is verified as being filled properly, field members are trained in the use of the standard as required, and the pH meter is calibrated in the field during the next field trip. The Project QA Supervisor audits this process to ensure that it is completed in an expeditious manner.

6.15.3 QC Corrective Action

These actions consist of corrective action following a failure to meet QC criteria specified in this QAPP and the analytical methods. Action taken consists of two (2) types:

1. Those resolved within each analytical department; and
2. Those resolved outside the department.

Examples outlining the difference between these two (2) types of corrective actions are as follows:

WITHIN-DEPARTMENT ACTION:

QC Failure	Department Action
Tuning results for GC/MS fail criteria in EPA Method 8240 and 8270	Laboratory Analyst retunes instrument
Percent recoveries fail Criteria and sample holding time have not expired	Laboratory Analyst investigates problem and re-analyses
Standard curve correlation coefficient is less than 0.995	Laboratory Analyst investigates problem and re-runs curve and samples
Sample response falls outside calibration curve	Laboratory Analyst dilutes sample into range of curve

OUTSIDE-DEPARTMENT ACTION:

QC Failure	Department Action
Holding time are exceeded	Notify Project Manager and Project QA Supervisor re-sampling may be necessary

Percent recoveries fail criteria and sample holding time have expired	Notify Project Manager and QA officer, re-sampling may be necessary if a significant number of QC failures occur

Corrective action may be initiated for each measurement system (individual disciplines) by the Project Manager or other responsible individuals such as the laboratory QA/QC Manager. The Project QA Supervisor and the Project Manager will be responsible for approving the corrective action. AAFB will be notified in writing within 48 hours of any significant QA/QC problem.

6.16 QA Reports to Management

Activities and actions to be reported will include:

1. The project status in relation to the progress of proposed schedule
2. Result of ongoing system audits, and
3. Proposed corrective action and significant QA problems.

The Project QA Supervisor reports the results of these activities to the Project Manager and the affected line managers.

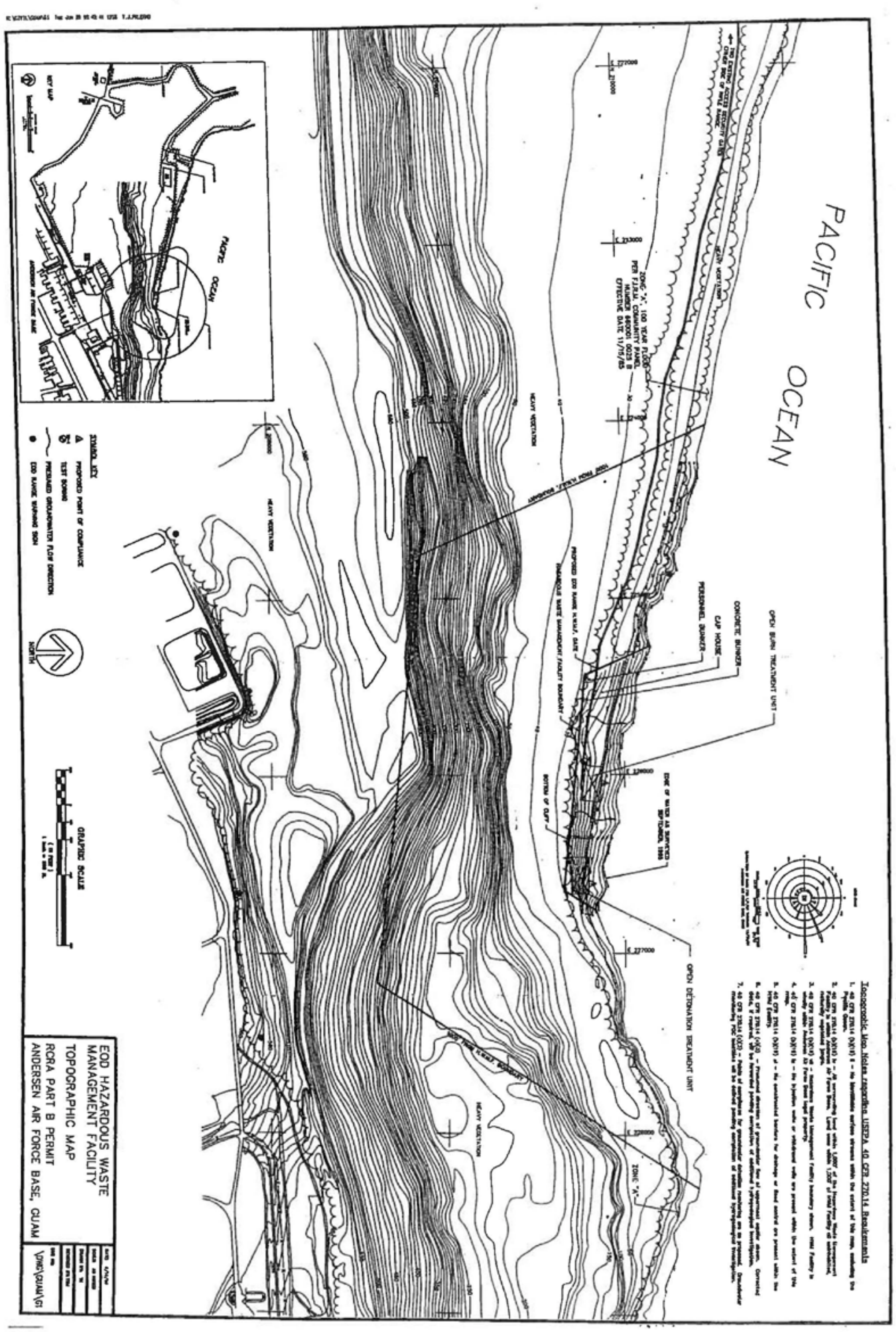
Appendix H

OB/OD Facility Map and Photos

APPENDIX H – EOD OB/OD FACILITY MAP AND PHOTOS

FIGURE 2-1: EOD LOCATION MAP

FIGURE 2-2: OB/OD AERIAL



TOPOGRAPHIC MAP

Photo 1. View of Tarague Beach (looking west) EOD Range in Foreground

Photo 2. OB proposed area (looking west)

Photo 3. West End of EOD Range (looking south) Cement/personnel bunker to left and holding points on center

Photo 4. Cement/personnel bunker (looking east)

Photo 5. Distance of OB area from sand (looking south)

Photo 6. Distance of OD unit from shore (looking north)

Photo 7. OD unit cliff line (looking south)

Photo 8. OD unit close-up (2-3 feet deep)

Photo 9. View of Tagua Point (nearly inaccessible) at east end of EOD (looking east)

Photo 10. View from east end of EOD (looking west)

Appendix I

Process Information

A. Process Information

Applicability As a "Miscellaneous Unit" (Parts VI.A. and X.A. [Adopts by reference 40 CFR 264.600 and 270.23] of the GHWMRs)

Activities performed at the OB/OD units at AAFB consist of treatment in "miscellaneous units" as defined in 40 CFR 260.10 in the RCRA regulations. Specifically, the units do not meet the definition of containers, tanks, surface impoundments, piles, land treatment units, landfills, incinerators, boilers, industrial furnaces, underground injection wells, or units eligible for research, development, and demonstration permits. Additionally, the preamble to the Subpart X regulations specifically states that the miscellaneous unit regulations are applicable to OB/OD activities for propellants, explosives, and pyrotechnics (PEP).

A1. Open Burning (OB) in Containment Devices (Part X.A. [Adopts by reference 40 CFR 270.23 and 270.32] of the GHWMRs)

Appropriateness of Treatment Methods (Part X.A. [Adopts by reference 40 CFR 270.32(b)] of the GHWMRs)

Waste energetic materials have been historically treated by OB, since this technology has been determined to be the most appropriate from a health and safety standpoint. Many types of military ordnances are designed so that they cannot be easily and safely disassembled, and for these types of ordnances, the OB technology may be the only method of treatment that provides an adequate margin of worker safety. In addition, OB is also inexpensive, and technically simple and relatively easy to conduct.

The effectiveness of other forms of treatment of waste energetic material is for the most part, unknown. Effectiveness in this context refers to the following:

- The ability to eliminate the reactive or explosive hazard posed by the materials, or to reduce such hazards so that the materials are no longer defined to be reactive or explosive.

- The ability to reduce hazardous and/or toxic materials to innocuous materials, as compared to the original material treated.

The Department of Defense has performed and continues to perform significant research and development activities to identify and evaluate alternative treatment technologies to OB/OD. While some alternatives have progressed beyond the conceptual or laboratory scale, most are still years away from being a viable alternative to OB/OD technologies. Additionally, although some technologies may show promise on a laboratory or pilot scale, they are only applicable to a small subset of the total universe of wastes, which may require treatment at AAFB. Therefore, implementation of alternative technologies that may be applicable at some future date may not permit total elimination of OB/OD activities at AAFB.

The current OB/OD treatment technologies are also very safe for waste handlers. In the process of refining OB/OD procedures throughout DOD, numerous SOPs have been developed that specifically ensure the safety of waste handlers. In fact, one of the key limitations to implementing alternative technologies is that the quality of worker safety provisions is not verified.

Containment Device Description (Part X.A. [Adopts by reference 40 CFR 270.23(a)] of the GHWMRs)

Physical characteristics, construction materials, and dimensions of the unit (Part X.A. [Adopts by reference 40 CFR 270.23(a)(1)] of the GHWMRs)

All OB operations treating reactive hazardous wastes occur in a metallic containment device. The containment device used for these activities is selected to meet the following objectives:

- Prevent incorporation of soil into the wastes and materials being burned;
- Contain fuels used in OB operations to prevent releases to the environment;
- Minimize the ejection of materials or wastes from the device onto the ground;
- Retain a large quantity of the heat generated during the burn; and
- Retain the minor detonations, which might occur when munitions are burned.

A large array of containment devices could meet these objectives and therefore could be employed for OB operations. Previously, a containment device used at AAFB was fabricated from a former aboveground fuel storage tank, which has been cut in half and placed on end. The device takes the form of a cylinder with a flat bottom and no top. The approximate dimensions of this containment device is 4 ft in diameter and 5 ft tall. This device is made of one-quarter inch steel. A section of chain-link fence is placed over the top of the containment device to minimize the ejection of materials or wastes during the burn. **This device is no longer in use**.

The integrity of the existing containment device is expected to deteriorate with time, necessitating renovation or replacement of the device. Replacement devices may not necessarily consist of former aboveground tanks. Although specific designs or dimensions of future containment devices cannot be identified at this time all devices will meet the containment objectives provided above. Additionally, the dimensions of the existing devices will be typical of future devices.

Engineering drawings of the fabricated device Part X.A. [Adopts by reference 40 CFR 270.23(a)(2)] of the GHWMRs)

As the rudimentary containment device as described in the previous paragraph has not been designed and fabricated specifically for use at the OB area, no engineering drawings of this former tank exist. Similarly, future containment devices used to replace the existing structure are not expected to be designed specifically for OB application. Therefore, it is not anticipated that engineering drawings of these devices will be available or necessary for proper identification and description of the unit. A general site plan of the area showing the OB unit is located in Appendix H.

Similarly, engineering plans and reports are not applicable to operation, maintenance, monitoring, and inspection activities. Engineering plans and reports for closure are addressed in the closure plan contained in Appendix G.

Lining material within device (Part X.A. [Adopts by reference 40 CFR 270.23(a)(1) and (2)] of the GHWMRs)

No lining materials are present in the containment device as previously described. Future containment devices are similarly not expected to include a lining material.

Lining material below device Part X.A. [Adopts by reference 40 CFR 270.23(a)(1) and (2)] of the GHWMRs)

No lining materials below the containment device are used. Placement of lining materials beneath the device is not feasible given the potential destructive nature of the surf during storm events, as well as high temperature.

Leak Detection Provisions (Part X.A. [Adopts by reference 40 CFR 270.23(a) (2)] of the GHWMRs)

Following residue collection at the end of each burn event, the containment device was turned upside down to prevent accumulation of precipitation within the device. At that time, the device is inspected to ensure there are no holes, cracks, or other weaknesses in the structure of the device, and thus detect any leaks that may have occurred. This same inspection procedure is performed before the device is turned right side up prior to subsequent OB events. These activities prevent any wastes or materials placed within the device from leaking and therefore prevent releases to the environment.

Precipitation Cover (Part X.A. [Adopts by reference 40 CFR 270.23(a)(1) and (2)] of the GHWMRs)

Following residue collection at the end of each burn event, the containment device was turned upside down to prevent accumulation of precipitation within the device. This negates the need for a formal precipitation cover above the containment device.

Control of Releases of Ashes and Residues During OB (Integrity of Containment Devices) (Part X.A. Adopts by reference 40 CFR 270.23(a) (2)] of the GHWMRs)

Several procedures or facets of the containment device design have been implemented to control the release of ash and other residues during OB activities. Some of the wastes treated in the containment device may have a tendency to be ejected from the device during certain circumstances. The AAFB device is covered with a section of chain link fence to minimize the quantity of items, which are ejected from the device during the burn.

The second action taken to minimize the ejection of partially burned wastes consists of proper placement of materials and wastes to be burned within the containment device. All materials and wastes are placed at least 2 feet below the top of the containment device to minimize the possibility that wastes could be ejected from the device.

Because these measures will minimize but not completely prevent the ejection of wastes from the containment device, the Andersen AFB OB/OD Residue Management Plan, contained in the appendices, includes procedures to identify, collect and properly manage any wastes, which may have been ejected.

These procedures are implemented after the OB device is safe to approach, and never later than the day following the OB event. The following is an excerpt from the Residue Management Plan:

- 1.2.3 The vicinity of the containment device is inspected for any items, which may have been ejected from the device. Items still containing energetic materials are placed back into the containment device for burning that day. Metallic items not containing energetic materials are placed in the OB metal fragments container.

Ash and other residues are removed from the containment device the day after the burn is initiated. This action further minimizes the potential for release of ash after the burn is completed.

A final procedure to prevent release of residues from the OB containment device is to regularly monitor the integrity of the device and repair it if there is a concern over its integrity. Following residue collection at the end of each burn event, the containment device is turned upside down to prevent accumulation of precipitation within the device. At that time, the device is inspected to ensure there no holes, cracks, or other weaknesses in the structure of the device. This same inspection procedure is performed before the device is turned right side up prior to subsequent OB events. These activities prevent any wastes or materials placed within the device from leaking from the device and therefore prevent releases of ash or other residues to the environment.

To retain ejected materials in close proximity of the containment device, the device has been placed in a shallow depression in the beach. In this configuration, the vast majority of wastes ejected from the containment device are retained within the depression, facilitating location and collection of the ejected wastes following completion of the burns.

Methods to Control Deterioration of Fabricated Devices (Part X.A. [Adopts by reference 40 CFR 270.23(a) (2)] of the GHWMRs)

Deterioration of the containment device is not controlled; however, the device is routinely inspected for deterioration and maintained if deterioration is evident. Following residue collection at the end of each burn event, the containment device is turned upside down to prevent accumulation of precipitation within the device.

At that time, the device is inspected to ensure there are no holes, cracks, or other weaknesses in the structure of the device. This same inspection procedure is performed before the device is turned right side up prior to subsequent OB events. If a weak spot or hole is observed, either a piece of steel is welded over the problem area, or a replacement containment device is obtained.

Prevention of Accumulation of Precipitation (Part X.A. [Adopt by reference 40 CFR 270.23(a) (2)] of the GHWMRs)

Although attempts are made not to schedule burn activities during and immediately after rainfall events, measurable precipitation may occur in the vicinity of the EOD Range any day of the year, especially during the rainy season. Additionally, it is impossible to predict with complete certainty if measurable precipitation will occur after the burn but before the containment device can be approached. Therefore, measures are taken to minimize the accumulation of precipitation in the OB containment device but complete prevention of accumulation of precipitation is nearly impossible.

The following measures are implemented to minimize accumulation of precipitation. After the containment device can be safely approached following completion of the burn (not later than the day after the burn was initiated), EOD personnel inspect and collect the residues contained within the device. If precipitation has collected within the device, a second burn will be initiated to evaporate the liquid in the device. Following residue collection at the end of each burn event, the containment device is turned upside down to prevent accumulation of precipitation within the device between burn events.

Handling of Precipitation Accumulated in Fabricated Devices (Part X.A. [Adopts by reference 40 CFR 270.23(a) (2)] of the GHWMRs)

After the containment device can be safely approached following completion of the burn (not later than the day after the burn was initiated), EOD personnel inspect and collect the residues contained within the device. If precipitation has collected within the device, a second burn will be initiated to evaporate the liquid in the device.

Controls to Prevent Wind Dispersion of Ash and Other Residue (Part X.A. [Adopts by reference 40 CFR 270.23(a)(J) and (2)] of the GHWMRs)

The design of the containment device, use of a fence to cover the device, placement of the containment device within a shallow depression, and procedures for placement of wastes and materials within the device are such that the ejection of residues from the device during the burn is minimized. Additionally, following completion of the burn, ash and other residue is routinely only several inches deep, therefore well below the top of the containment device. Wind dispersion is minimized in this way. Additionally, ash is removed from the device soon after the burn is completed and never later than the day after the burn, further minimizing the opportunity for ash to be dispersed by the wind.

Inspection, Monitoring, and Maintenance Plan (Part X.A. [Adopts by reference 40 CFR 270.23(a)(2)] of the GHWMRs)

As there are no facets of the containment system specifically engineered for OB operations, and no movable parts, inspection, monitoring and maintenance can be very effective yet quite simplified. Following residue collection at the end of each burn event, the containment device is turned upside down to prevent accumulation of precipitation within the device. At the time, the device is inspected and monitored to ensure there are no holes, cracks, or other weaknesses in the structure of the device. This same inspection procedure is performed before the device is turned right side up prior to subsequent OB events. If a weak spot or hole is observed, either a piece of steel is welded over the problem area, or a replacement containment device is obtained. Welding will only occur when no energetic materials are present at the EOD Range. More general inspection procedures for the EOD Range are described in Appendix C.

The OB containment device is not approached for at least 12 hours after a burn is conducted to ensure the burn is completed and the residue has cooled. Not later than one calendar day after the burn occurs, residue management and inspection procedures are put into place. As stated in the Andersen AFB OB/OD Residue Management Plan contained in the appendices:

- 1.2.1 Residues within the containment device are inspected to ensure all items have been successfully burned. Items remaining in the containment device still containing energetic materials are burned the day they are discovered.

- 1.2.3 The vicinity of the containment device is inspected for any items which may have been ejected from the device. Items still containing energetic materials are placed back into the containment device for burning that day. Metallic items not containing energetic materials are placed in the OB metal fragments container.

Ash and Residue Management (Part X.A. [Adopts by reference 40 CFR 270.23(a)(2)] of the GHWMRs)

The Andersen AFB OB/OD Residue Management Plan, contained in the EOD operating procedures Appendix has been specifically prepared to address management of ash and other residues resulting from OB/OD operations. The following OB residue management procedures, described in the Management Plan, are implemented as soon as the containment device can be approached, and not later than the calendar day after the burn occurs:

- <u>Ash Contained in the Containment Device</u> – separated from metallic fragments, collected, analyzed for explosive and TCLP metal content, containerized, and disposed of properly based on the results of the analytical testing;

- <u>Metallic Fragments Not Containing Energetic Materials. Located in the Containment Device</u> – separated from the ash, collected, and accumulated for recycling at a permitted facility;

- <u>Metallic Fragments Containing Energetic Materials. Located in the Containment Device</u> – burned in the containment device the day they are located;

- <u>Metallic Fragments Containing Energetic Materials. Ejected from the Containment Device</u> – collected, and burned in the containment device the day they are located; and

- <u>Metallic Fragments Not Containing Energetic Materials. Ejected from the Containment Device</u> – collected, accumulated for shipment to the Defense Reutilization & Marketing Office to facilitate recycling at a permitted facility.

Copy of Standard Operating Procedures (SOPs) (Part X.A. [Adopts by reference 40 CFR 270.23(a)(2)] of the GHWMRs)

A significant number of U.S. Air Force and Andersen AFB SOPs have been developed to effectively perform both OB and OD operations. A brief summary of the principal SOPs follows:

1. Flight Operating Instruction
32-3002 (July 2017)

This document is an eighteen -page outline for all operational procedures conducted on the range. This document in turn references four other documents, which are Air Force-wide documents:

AFMAN 91-201 (12 January 2011): See separate discussion section on AFMAN 91-201, Explosives Safety Standards

TO 11A-1-42 (6 October 2000): See separate discussion section on TO 11A-1-42, General Instructions for Disposal of Conventional Munitions.

TO 11A-1-66 (1 August 2003): General Instructions. Demolitions

TO 60A-1-1-31 (24 April 2009): Explosive Ordnance Disposal Procedures. EOD Disposal Procedures

This Wing Instruction also includes seven attachments:

1. Range Notification Lists
    a. Non-Fragmenting Operations/5 Inch Diameter or Less
    b. Fragmenting Munitions Greater than 5 Inch Diameter
2. Range Operation Checklist
3. Post Range Operations Checklist
4. Safety Briefing
5. Proper Detonation Point/Cliff Orientation and Quarterly Clean-up Area
6. Security Forces Cordon Locations

Attachment 3 outlines the procedures followed during treatment of RCRA waste munitions. This attachment is included in the EOD Operating Procedures Appendix in its entirety.

2. Technical Order 11A-1-42. General Instructions for Disposal of Conventional Munitions
Dated: 15 July 1997
Revised: Change 6 – 30 October 2000

This is a very comprehensive USAF-wide document, which details procedures for disposal/demolition of a wide variety of munitions. Chapter headings of significance for this application are:

- Safety and Accident Prevention
- Description of Demolition Materials
- Methods of Disposal
- Firing Systems Procedures

- Treatment of Chemical Agent Casualties
- Munition Disposal Procedures
- Missile Explosive Components
- Rocket Motors and Warheads
- Aircraft Egress Items

3. Technical Order 11-A-1-46 (1 December 2003), Fire Fighting Guidance, Transportation, and Storage Management Data and Ammunition Complete Round Chart

This document presents data in lists of tables regarding munitions. The information presented in this document consists of item stock number, cross-reference numbers, net explosive weight, and munitions descriptions.

4. AFMAN 91-201, Explosive Safety Standards
Dated: 12 January 2011

This document is USAF-wide and contains mechanical details of explosive safety. This document is for general handling of explosives, not necessarily specifically oriented to EOD operations.

5. Technical Order 60A-1-1-31, Explosive Ordnance Disposal Procedures, EOD Disposal Procedures
Dated: 24 April 2009
Revised: Revision 6

This manual describes the type and nature of the materials and equipment used to conduct EOD disposal procedures. This document covers general instruction for explosive ordnance disposal. This document is not releasable. Most of the operational material is covered in TO 11A-1-42. Other areas covered in this document include operations that are not included in this TSD application, including emergency operations, training, etc.

6. 36 AW Operations Plan 32-1, Disaster Preparedness Peacetime Operations
Dated: May 2002
Reference: OPR: 36 CES/CEV

This plan specifies procedures for preparing for and recovering from the effects of major peacetime accidents and natural disasters. This plan also specifies procedures for rendering assistance to civil authorities after natural disasters. It provides Andersen AFB specific outlines for responses to major accidents (military mishaps), and natural disasters.

A2. OB on the Ground Surface Where Unit Incorporates the Soil as Part of the Unit (Part X.A. [Adopts by reference 40 CFR 270.23 and 270.32] of the GHWMRs)

This section does not apply, since all OB activities at AAFB occur within a containment device, which prevents the incorporation of soil as part of the unit. These activities are addressed in A1.

A3. Open Detonation (OD) (Part X.A. [Adopts by reference 40 CFR 270.23 and 270.32] of the GHWMRs)

Appropriateness of Treatment Technology (Part X.A. [Adopts by reference 40 CFR 270.32(b)] of the GHWMRs)

The first portion of A1 provided a rationale as to why the OB technology is the most appropriate treatment technology for energetic reactive hazardous wastes. This discussion is also applicable to OD activities. Given the large net explosive weight contained in many of the ordnance items routinely detonated at the AAFB OD unit, the potential for use of alternative technologies is even more limited than in OB.

Description of OD Unit (Part X.A. [Adopts by reference 40 CFR 270.23(a)] of the GHWMRs)

Physical characteristics, materials of construction, and dimensions of the unit (Part X.A. [Adopts by reference 40 CFR 270.23(a)(1)] of the GHWMRs)

All OD operations occur directly on the ground (beach) surface; therefore, there are no physical characteristics or materials of construction to discuss. Detonation activities occur adjacent to the base of the lower cliff, and are limited to a small portion of the cliff base less than 50 feet in length.

Engineering plan and drawings of the OD unit (Part X.A. [Adopts by reference 40 CFR 270.23(a)(2)] of the GHWMRs)

Engineering plans or drawings of the OD unit are not applicable, since there is no man-made device or structure at the unit. A general site plan of the area showing the OD unit is contained in Appendix H.

Inspection, Monitoring, and Maintenance Plan (Part X.A. [Adopts by reference 40 CFR 270.23(a)(2)] of the GHWMRs)

As there are no "engineered" facets of the OD system, and no moving parts, inspection and monitoring can be very effective yet quite simplified. Soon after the OD unit can be safely approached following completion of a detonation (generally within 1 hour of the detonation), the OD unit is inspected for any items which may remain after detonation, as stated in the Andersen AFB OB/OD Residue Management Plan contained in the EOD Operating Procedures Appendix:

2.2 The OD area will be inspected for any items which may remain after detonation. Items still containing energetic materials are either placed into the OB containment device for burning that day, or detonated that day. Metallic items not containing energetic materials are placed in a container labeled "OD Metal Fragments."

More general inspection procedures for the EOD Range are described in Appendix C.

Ash and Residue Management (Part X.A. [Adopts by reference 40 CFR 270.23(a)(2)] of the GHWMRs)

The Andersen AFB OB/OD Residue Management Plan, contained in Appendix J, has been specifically prepared to address management of ash and other residues resulting from OB/OD operations. The following OD residue management procedures, described in the Management Plan, are implemented as soon as the OD unit can be approached, generally within 1 hour of completion of the detonation:

- Metallic Fragments Containing Energetic Materials – collected, and either burned in the OB containment device or detonated the day they are collected; and

- Metallic Fragments Not Containing Energetic Materials – collected, and accumulated recycling or disposal at a Guam EPA permitted facility.

Negligible quantities of ash are generated from OD operations. Therefore, the residue management procedures described above strictly address any metallic residues (principally metal fragments), which may remain after the detonation.

Run-on and Run-off Management (Part X.A. [Adopts by reference 40 CFR 270.23(a)(2)] of the GHWMRs)

The OD unit is located in the upper beach area on highly permeable materials. As such, even in major precipitation events, run-on and run-off are negligible at this site. Management of run-on and run-off at the OD unit is therefore not necessary.

Copy of SOPs (Part X.A. [Adopts by reference 40 CFR 270.23(a)(2)] of the GHWMRs)

The last portion of Section A1, Copy of Standard Operating Procedures (SOPs), contains a summary of several SOPs, which address operations both at OD and OB activities. It also references specific SOPs contained in the Appendix.

B. Environmental Performance Standards

Environmental performance standards for OB/OD RCRA hazardous waste treatment activities at the Andersen AFB EOD Range are provided in the following list of 21 items. References to those sections of this application which provide technical justification for the development of these performance standards are provided in parentheses.

Environmental Performance Standards

General

1. OB/OD activities will only occur during daylight hours.

2. OB/OD activities will only occur when wind speeds are less than or equal to 15 miles per hour.

3. OB/OD activities will not be performed if electrical storms are within 5 nautical miles of

the EOD Range.

4. OB/OD activities will not be performed if major storms capable of flooding the EOD Range are forecasted to occur within 24 hours.

5. Residue from OB or OD activities which contains energetic materials will be burned or detonated the day they are located.

6. The beach area in the vicinity of the EOD Range will be policed, and all metal items collected, at least quarterly in addition to the policing conducted following each OB or OD operation.
7. Usage of the EOD Range will be restricted, as follows:

   12 hours per day
   50 days/year
   1 Open Burn operation per day
   4 Open Detonation operations per day of any listed ordnance
   Up to 23 additional Open Detonation operations per day of bombs containing tritonal (No. 10 and/or No. 42, see list at end of Environmental Performance Standards)

   Burn and detonation events may occur on the same day.

8. At least once per quarter, the reef will be inspected for fragments and unexploded ordnance (UXO), with all identified items recovered from the water. The area inspected will be from the beach to the reef line, and 100 ft east and west of the OD area.

Open Burning/Open Detonation RCRA hazardous waste treatment waste materials restrictions

9. Any ordnance or other energetic material listed in Table III-7 of Appendix A may be burned or detonated, subject to limitations contained in Environmental Performance Standards number 19 and 21.

10. Any ordnance or other energetic material <u>not</u> listed in Table III-7 of Appendix A may be burned or detonated, if they do not contain metals or sulfur-bearing compounds, subject to limitations contained in Environmental Performance Standard numbers 19 and 21.

11. Waste ordnance or other energetic material <u>not</u> listed in Table III-7 of Appendix A which contains metals or sulfur-bearing compounds, may be burned or detonated, subject to the maximum acceptable quantities specified by the tables listed in Tables III-1 or III-2.

Open Burning RCRA hazardous waste treatment operating restrictions

12. OB activities will occur in a suitable containment device.

13. The OB containment device will incorporate a coarse screen over the top of the device in

order to minimize ejection of materials during OB treatment. Also, waste ordnance will be placed a minimum of 2 feet below the top of the device, and the containment device will be placed in a shallow depression in the sand.

14. The OB containment device will be inspected before and after each burn to ensure structural integrity.

15. The OB containment device will be turned upside down after each burn to prevent accumulation of precipitation.

16. Residues remaining in the OB containment device will be collected no later than the day after the burn, but before the device is turned upside down.

17. If precipitation accumulates in the OB containment device before residue can be removed, then an additional burn will take place to evaporate all moisture from the residue.

18. Residues ejected from the OB containment device will be collected no later than the day after the burn.

19. The maximum NEW for each OB event is 100 lbs, except for the following items (as numbered in Table III-7 of Appendix A):

    Restricted to 5 lbs (total): Nos. 10, 42, 43, 45, 50
    Restricted to 10 lbs (total): Nos. 36, 37, 38, 39, 40, 51
    Restricted to 50 lbs (total): No. 4

Open Detonation RCRA hazardous waste treatment operating restrictions

20. Residues remaining after detonation must be collected no later than 1 hour after the detonation is initiated.

21. The maximum NEW for each OD event is 600 lbs, except for the following items (as numbered in Table III-7 of Appendix A):

Total NEW (lbs) For OD Event	No. 95	Weight Restriction (lbs) No. 14 or 15
1	0.26	1.0
5	0.54	2.7
20	0.64	3.2
50	1.4	7.0
100	2.1	10
200	3.5	17
300	5.0	25
400	6.7	33

500	8.3	42
600	10.0	50

Restricted Open Burn items:

4 – 7.62 blank
18 – fuse, time
42 – detonator, percussion, M2A1
43 – detonator, percussion, M2A2
45 – detonator kit, M1
36 – firing device, M1
37 – firing device, demolition, M1A1
38 – firing device, demolition, M5
39 – firing device, demolition, M3
40 – firing device, demolition, M1
50 – primer, percussion, cap
29 – cratering charge M180

Restricted Open Detonation items:

14 – caps, electric blasting
15 – caps, non-electric blasting
95 – grenade, MK1, illuminating

TABLE III-1 MAXIMUM PERMISSIBLE QUANTITY OF METALS AND SULFUR THAT CAN BE TREATED PER OB EVENT

Constituent	Quantity per Event (lbs)
Aluminum Cpds, as Al	2.53E+01
Antimony Cpds, as Sb	2.50E+00
Barium Cpds, as Ba	5.11E-01
Calcium Cpds, as Ca	3.37E-01
Copper Cpds, as Cu	0.00E+00
Iron Cpds, as Fe	8.48E+01
Lead Cpds, as Pb	2.72E+00
Magnesium Cpds, as Mg	5.72E+01
Potassium Cpds, as K	4.59E+01
Silver Cpds, as Ag	1.02E+00
Sodium Cpds, as Na	3.51E+01
Strontium Cpds, as Sr	4.09E+00
Sulfur Cpds, as S	6.26E-01
Tin Cpds, as Sn	7.25E-02
Uranium Cpds, as U	1.11E+00
Zinc Cpds, as Zn	1.90E+01

This table presents maximum quantities of metals and sulfur compounds that can be treated during a single OB event. The table is used to comply with Environmental Performance Standard # 11, i.e., only when waste ordnance or other energetic materials not listed in Table III-7 of Appendix A are to be treated.

TABLE III-2 MAXIMUM PERMISSIBLE QUANTITY OF METALS AND SULFUR THAT CAN BE TREATED PER OD EVENT

Constituent	Quantity per Event (lbs)							
	Total NEW 1 lb	Total NEW 5 lb	Total NEW 20 lb	Total NEW 50 lb	Total NEW 100 lb	Total NEW 200 lb	Total NEW 400 lb	Total NEW 600 lb
Aluminum Cpds, as Al	4.03E+00	8.36E+00	1.40E+01	2.16E+01	3.24E+01	5.40E+01	1.01E+02	1.52E+02
Antimony Cpds, as Sb	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium Cpds, as Ba	6.65E-02	1.38E-01	2.31E-01	3.57E-01	5.35E-01	8.92E-01	1.67E+00	2.51E+00
Calcium Cpds, as Ca	2.04E-01	4.23E-01	7.08E-01	1.10+00	1.64E+00	2.74E+00	6.13E+00	7.70E+00
Copper Cpds, as Cu	5.83E-03	1.21E-02	2.02E-02	3.13E-02	4.69E-02	7.82E-02	1.47E-01	2.20E-01
Iron Cpds, as Fe	8.32E+00	1.73E+01	2.88E+01	4.47E+01	6.70E+01	1.12E+02	2.09E+02	3.14E+02
Lead Cpds, as Pb	4.72E-01	9.79E-01	1.64E+00	2.53E+00	3.80E+00	6.33E+00	1.19E+01	1.78E+01
Magnesium Cpds, as Mg	8.47E+00	1.81E+01	3.03E+01	4.69E+01	7.04E+01	1.17E+02	2.20E+02	3.30E+02
Potassium Cpds, as K	3.60E-01	7.48E-01	1.25E+00	1.93E+00	2.90E+00	4.84E+00	9.07E+00	1.36E+01
Silver Cpds, as Ag	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sodium Cpds, as Na	5.59E+00	1.16E+01	1.94E+01	3.00E+01	4.50E+01	7.50E+01	1.41E+02	2.11E+02
Strontium Cpds, as Sr	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sulfur Cpds, as S	1.59E-06	3.30E-06	5.52E-06	8.53E-06	1.28E-05	2.13E-08	4.00E-05	6.00E-05
Tin Cpds, as Sn	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Uranium Cpds, as U	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc Cpds, as Zn	3.02E+00	6.27E+00	1.05E+01	1.62E+01	2.43E+01	4.05E+01	7.60E+01	1.14E+02

This table presents maximum quantities of metals and sulfur compounds that can be treated during a single OB event. The table is used to comply with Environmental Performance Standard # 11, i.e., only when waste ordnance or other energetic materials not listed in Table III-7 of Appendix A are to be treated.

Appendix J

OB/OD Residue Management Plan

Table of Contents

1.0 PURPOSE

The purpose of this plan is to provide a procedure by which OB/OD residue is identified, collected, and directed for further treatment, proper hazardous waste storage, recycling, or land filling, as appropriate. For the purposes of this plan, residue generated during OB/OD activities includes:

1. Ash contained in the OB containment device (note that OD operations produce no identifiable ash).

2. Metallic fragments which include partially burned/detonated energetic materials contained within the OB or OD treatment units.

3. Items containing partially burned/detonated energetic materials ejected from the OB or OD treatment units.

4. Metallic fragments not containing partially burned/detonated energetic materials contained within the OB or OD treatment units.

5. Items not containing partially burned/detonated energetic materials ejected from the OB or OD treatment units.

6. Miscellaneous materials found at the EOD range.

These residue(s) may be generated from either RCRA hazardous waste treatment or non-RCRA (i.e. training or emergency disposal) operations. This Residue Management Plan is intended to address all residues on the EOD Range, regardless of origin.

In addition, this Residue Management Plan outlines procedures for maintaining general cleanliness of the EOD Range.

2.0 RELATED DOCUMENTS

2.1 Flight Operating Instruction (FOI) 32-3002

2.1.1 Attachment 1: Range Notification List
2.1.2 Attachment 2: Range Operation Checklist
2.1.3 Attachment 3: Post Range Operations Checklist
2.1.4 Attachment 4: Safety Briefing
2.1.5 Attachment 5: Proper Detonation Point/Cliff Orientation and Quarterly Clean-up Area
2.1.6 Attachment 6: Rescission of Compensatory Measure

2.2 Andersen AFB Hazardous Waste Management Plan

2.3 Andersen AFB Hazardous Waste Characterization Form

2.4 Explosive Ordnance Disposal Scrap Metal Clearance Log

2.5 Certificate of Clearance for Munitions Residue

2.6 DOD Form DD1348, for Scrap Turn-in

3.0 DEFINITIONS

AAFB: Andersen Air Force Base

Ash: All solid residue remaining following Open Burning operations.

Containment Device: Essentially a large drum with a wire fitting for holding OB materials for disposal. Into this container are placed the materials for treatment (within the pierced burn container), dunnage, and ignition material. A removable wire mesh cover is placed on the top of the drum during burn operations to further limit ejecta.

DOD: Department of Defense

DLA: Defense Logistics Agency Disposition Services

Dunnage: Wood, combustible material placed within the OB containment device to sustain the combustion during treatment process.

Ejecta: Any ordnance material, which is thrown from the treatment unit during the treatment process.

Energetic Material: Any explosive material, whether contained within an ordnance or separated from ordnance.

EOD: Explosive Ordnance Disposal

EOD Flight: Military designation for the group of individuals assigned to conduct the EOD operations.

EOD Range: The area used by EOD personnel to perform treatment operation, as well as EOD mission training, and emergency operations. The EOD Range is surrounded by a safety exclusion zone to minimize risk to human life during operations.

Explosive (Explosive Ordnance): Any chemical compound, mixture, or device whose primary purpose is to function by detonation or deflagration with instantaneous release of heat and gas.

Hazardous Waste: A solid waste that exhibits any of the characteristics of hazardous waste. (ignitability, corrosivity, reactivity, and toxicity) or is a listed hazardous waste under RCRA (40 CFR 261.3)

IDW: Investigative derived waste, waste materials generated during completion of investigation activities.

Ignition Materials: Materials used to initiate the OB combustion process. These generally consist of a radio-controlled igniter with a small quantity (approximately 5 gallons) of virgin diesel fuel.

Metallic Fragment: A metallic material that remains following ordnance treatment. Metallic fragments can include items remaining in the OB or OD treatment units or ejecta thrown out during treatment.

Non-hazardous Waste: A solid waste that does not exhibit characteristics of hazardous waste.

Open Burning (OB): Combustion of PEP or explosive ordnance without the control of combustion air, containment of the combustion reaction in an enclosed devise, or control of emission of gaseous and particulate combustion products.

Open Detonation (OD): Unconfined, violent reaction of PEP or explosive ordnance without the control of combustion air, containment of the combustion reaction in an enclosed device, or control of emission of gaseous and particulate combustion products.

PEP: Term used to refer collectively to propellants, explosives, and pyrotechnics.

Pierced Burn Container: A small metallic box, pierced with holes, in which the OB materials to be treated are placed. This Pierced Burn Container is then placed within the Containment Device for treatment by combustion.

PPE: Personal protective equipment, safety equipment worn by individuals to eliminate or mitigate potential exposure to harmful materials.

Range Policing: The periodic and routine visual inspection and removal of OB/OD residue from the EOD Range.

Reef Crest: Sharp break in slope at seaward margin or edge of reef flat

Reef Flat: The area located between the beach and the reef rock rim/reef crest.

Reef Rock Rim: The highest energy zone of a coral reef ecosystem with intense wave action and surges. Parts of it may be exposed at low tide.

Residue: Any material remaining from OB/OD activities (examples include: ash, incompletely treated ordnance, fragments). The term residue may also include materials from non-RCRA treatment OB/OD operations (i.e., training, or emergency operations), which may also take place on the EOD range.

TCLP: Toxic characteristic leaching procedure, a hazardous waste regulatory specified method for waste analysis, also includes list of specific compounds, which determine hazardous characteristic.

T.O.: DOD Technical Order documents.

4.0 RESIDUE MANAGEMENT – OB EVENTS

4.1 General

Residue management activities related to OB activities area are allowed to begin no sooner than 12 and not later than 24 hours after the burn is conducted. This delay (as required by USAF EOD procedures) provides time to ensure that the burn is complete and the residue has cooled to a temperature allowing safe handling in case there is incomplete treatment.

4.2 Follow-u p Range Policing Activities

Range policing is performed to collect any material, which may have been ejected, from the treatment unit for retreatment or proper disposal. Policing involves a thorough visible inspection of the beach area from the water to the jungle. During range policing, the EOD Team performs an organized "sweep" of the range.

The inspection sweep follows a "Foreign Object Detection" approach, whereby team members line up, separated by a short distance, and walk forward, searching the area directly ahead of their forward progress. Large objects, which are not easily picked up and carried, and objects that may pose a potential hazard (i.e., are suspected to contain energetic material), are marked with a flag and removed following the range sweep. Any other object is removed during the sweep. The sweep is continued until the entire range area has been cleared.

Particular attention is given to the area within 200 feet of the burn containment device where shrapnel may have been ejected during the burn.

4.3 Residue Collection Procedures

4.3.1 Within the OB Treatment Unit

Residues within the OB pierced burn container as well as the OB containment device are visually inspected to ensure that energetic material has been destroyed. If visual inspection is inconclusive, a representative sample of the ash is removed and tested for presence of nitro explosives using Webster's Reagent.

If untreated wastes or items still containing energetic materials are discovered, they are re-treated the same day. If the treatment operation is determined to have been complete, the burn ash residues are removed for proper handling in accordance with Section 4.5.

4.3.2 Ejecta

During the post burn policing, any items, which may have been ejected during the burn, are collected. Each collected item is inspected for energetic material.

Items still containing energetic material are re-treated the day they are discovered. Metal fragments not containing energetic material are handled in accordance with Section 4.4.

4.4 OB Metallic Fragments Handling Procedure

Metal fragments not containing energetic material will be policed up and be disposed of or recycled properly at a permitted facility.

4.5 OB Ash Handling Procedures

Handling of OB ash subsequent to the completion of the OB treatment event is accomplished in accordance with the Andersen AFB Hazardous Waste Management Plan (Sept. 2007). Specific procedures pertinent to this particular waste stream are reiterated in this Residue Management Plan as follows.

4.5.1 Waste Characterization

Based upon historical data, the ash generated by Open Burning treatment events is presumed to be hazardous waste based upon TCLP Lead criteria. Following confirmation of complete reaction (i.e., no explosive materials remaining), this OB ash is handled, transported, and disposed of as a TCLP Lead hazardous waste.

4.5.2 Environmental Flight Notification

Andersen AFB Environmental Flight (36 CES/CEV) is notified of the generation of OB ash by completion and submission of the Andersen AFB Material/Waste Characterization Form. (Note: Due to the scheduled nature of most, if not all, of the OB events, and the need for notification to initiate the event, Environmental Flight will already be cognizant of the waste generation.)

4.5.3 On-Base Transportation

Upon authorization by Environmental Flight (36 CES/CEV), AAFB EOD personnel transport this waste to the on-base less than 90 days hazardous waste accumulation site, Building 19017.

4.5.4 OB Ash Handling Procedures

OB ash consists of materials remaining within the small, pierced burn container and the OB containment device. Note that any metal fragments present in the ash are handled as ash (hazardous waste), and not recovered. Handling of this ash is accomplished as follows.

- The ash within the pierced burn container is dry brush swept into a small, 15 gallon sealed, metal container.

- The OB containment device is tipped on its side.

- The ash residue is transferred to the same small 15 gallon sealed metal container as the pierced burn container ash. This may be accomplished by dry brushing and scooping with hand tools (i.e., dust pan, trowel).

- This metal container is transported to Building 19017.

- The ash in the container is transferred to the designated temporary storage drum by simple pouring, followed by light dry brushing.

- The brush and any other small hand equipment used for transfer of ash material are returned to its original or replacement doubled plastic bag.

4.6 Waste Disposal Procedures

Two waste streams, one hazardous and one non-hazardous, are associated with the OB treatment process. These are disposed of as follows.

4.6.1 Hazardous waste includes burn ash generated by the OB treatment operation and small amounts of miscellaneous waste generated through handling of the ash. These materials are presumed hazardous due to TCLP Lead content.

Both the burn ash and the ash handling generated wastes such as PPE (limited to disposable gloves and respirator cartridges) and plastic bags from the equipment storage, are placed with other IDW or hazardous waste handling PPE wastes in Building 19017 for proper disposal.

4.6.2 Non-hazardous wastes are composed primarily of scrap metal fragments. This non-hazardous metallic fragment waste will be disposed of or recycled properly at a permitted facility.

4.7 Ash Handling Equipment Storage

When not in use, the equipment used in handling OB ash is secured at the EOD Flight, Building 2600. The handling equipment consists of small containers and hand tools including pierced burn container, 15 gallon steel ash drum, small brush, and metal dustpan or scoop. These items are stored in doubled sealed plastic bags and properly labeled to avoid usage in other applications.

4.8 Personnel Health and Safety

Health and safety issues are addressed in the AAFB basewide Health and Safety Plan. The only issues of consequence for ash handling are: (1) dermal contact, and (2) respirable dust. These are mitigated by use of disposable gloves, and half face respirators respectively.

4.9 Documentation

FOI 32-3002 Attachment 2 checklist documents the operational aspects of handling the waste generated by EOD treatment operations within AAFB.

4.9.1 Hazardous Waste

For the burn ash, a known hazardous waste, the AAFB Waste Characterization form is completed and forwarded to Environmental Flight for review and acceptance of the waste at Building 19017.

4.9.2 Scrap Metal

EOD Flight completes a Certificate of Clearance for Munitions Residue to document the waste is no longer reactive and forwards to Environmental Flight.

The scrap metal will be properly recycled at a permitted facility.

5.0 RESIDUE MANAGEMENT – OD EVENTS

5.1 General

Residue management activities related to OD activities begin as soon as the area is declared safe. This generally occurs within one hour after completing treatment activities.

5.2 Follow-up Range Policing Activities

Range policing is performed to collect any material, which may have been ejected, from the treatment unit for retreatment or proper disposal. Policing involves a thorough visible inspection of the beach area from the ocean to the jungle. During range policing, the EOD Team performs an organized "sweep" of the range.

The inspection sweep follows a "Foreign Object Detection" approach, whereby team members line up, separated by a short distance, and walk forward, searching the area directly ahead of their forward progress. Large objects which are not easily picked up and carried, and objects that may pose a potential hazard (i.e., are suspected to contain energetic material), are marked with a flag and removed following the range sweep. Any other object is removed during the sweep. The sweep is continued until the entire range area has been cleared.

Particular attention is given to the area within 200 feet of the OD treatment unit where material may have been ejected by the detonation.

5.3 Residue Collection Procedures

5.3.1 Within OD Treatment Unit

Residues within the OD containment device, if found, are inspected to ensure that energetic material has been destroyed. Typically, the OD treatment is very complete. If untreated wastes or items still containing energetic materials are discovered, they are immediately retrieved for treatment the same day. Experience indicates that there is no identifiable ash which remains following a detonation event and that residue will be metal fragments (shrapnel).

Metal fragments without evidence of energetic material are removed from the treatment unit. These materials are then handled in accordance with the procedures in Section 5.4.

5.3.2 Ejecta

During the post detonation policing, any items, which may have been ejected beyond the OD treatment unit, are collected. Each collected item is inspected for energetic material. Items still containing energetic material are retrieved for retreatment the day they are discovered. Metal fragments not containing energetic material are handled in accordance with Section 5.4. A visual survey of the nearby Pacific Ocean will be conducted from the beach area quarterly to identify and recover any UXO ejected into the ocean during OD activities. The area surveyed will be that area of the 'reef flat' that lies within the Quantity-Distance arc. This area is approximately 4,000 feet up the shoreline (west) from our detonation point and as far as safely and reasonably possible down the shoreline (east). The shore line area east of the detonation site is dangerous cliff lined area (no beach) with high crashing surf.

5.4 OD Metallic Fragments Handling Procedures

Metal fragments not containing energetic material will be policed up and be disposed of or recycled properly at a permitted facility.

5.5 OD Ash Handling Procedures

Any ash or secondary source of contamination due to OD airborne contaminants, which come to rest on the ground surface, will be characterized via chemical or visual methods, removed, and disposed of in accordance with all applicable rules and regulations.

5.6 Waste Disposal Procedures

All wastes generated by the OD treatment procedure are non-hazardous. These wastes are characterized as metallic fragments. These wastes are policed up and disposed of or recycled properly at a permitted facility.

6.0 ROUTINE EOD RANGE POLICING ACTIVITIES

6.1 General

While every effort is made to collect and properly dispose of OB/OD residues within 24 hours of any activity, remnants from past EOD operations, training exercises, and past wars are routinely found on the EOD range and adjacent beach area. In most cases, these items are either washed ashore from the ocean or brought to the surface from beneath the beach due to wave action, heavy rains, and or winds. The purpose of routine range policing activity is to minimize environmental exposure from any man-made materials located in the EOD range and adjacent areas.

In addition, the ocean wave and current actions also provide a continuing source of general trash, which washes onto the EOD Range. This material is routinely cleaned up during the general policing activities.

6.2 Routine Site Inspections

Routine range policing is performed regardless of whether any EOD operations have been conducted. Range policing is performed to collect any material that could be related to EOD operations, regardless of whether it was actually generated by EOD operations. Upon collection of such material, it is sorted for retreatment or proper disposal as outlined in Section 5.3. Policing involves a thorough visible inspection of the beach area from the ocean to the jungle. During range policing, the EOD Team performs an organized “sweep” of the range.

The inspection follows a “Foreign Object Detection” approach, whereby team members line up, separated by a short distance, and walk forward, searching the area directly ahead of their forward progress. Large objects which are not easily picked up and carried, and objects that may pose a potential hazard (i.e., are suspected to contain energetic material), are marked with a flag and removed immediately following the range sweep. Any other object is removed during the sweep. The sweep is continued until the entire range area has been cleared.

Particular attention is given to the areas within 200 feet of the OD treatment unit and the OB treatment unit where material may have been ejected by the detonation and/or burn.

Note that the areas adjacent to the EOD range area located on the beach but not easily accessible (i.e., jungle) are policed less frequently.

6.3 Frequency of Routine Range Policing Operations

6.3.1 Beach Area

The beach area will be policed quarterly and following each explosive operation. If after a previous policing operation a significant amount of waste or debris material is discovered on the beach, the routine range policing operation frequency will be increased until such time as the policing uncovers no waste material.

6.3.2 Jungle Areas

Due to difficulty in accessibility, the jungle areas will be policed annually. Policing of the jungle area will be performed concurrent with a routine policing of the beach area. If, after a routine policing operation a significant amount of waste material is discovered in the jungle areas routine policing of these areas will be performed until the collection of waste reaches a minimal level.

6.4 Identification of Waste

During range policing operations, any object that could be related to EOD operations (metallic fragment, shell, ordnance, etc.) shall be collected and handled as appropriate.

6.5 Disposition of Waste Collected

One or more of three types of wastes may be collected during general policing activities: wastes with energetic materials, metal fragments without energetic materials, or general trash.

Waste found with energetic materials is treated as specified in Section 4.3.2 (OB) or Section 5.4 (OD), (i.e., disposed of or recycled properly at a permitted facility.).

General trash, which is retrieved from the EOD Range, is transferred to any one of the general trash dumpsters located throughout the base for disposal.

7.0 NON-ROUTINE EOD RANGE POLICING ACTIVITIES

7.1 General

Natural phenomena may result in the exposure of EOD residue, items remaining from training operations, or remaining shrapnel from past wars on the EOD Range beach area, which are not found during routine policing activities. Additionally, general trash also ends up on the EOD Range through the actions of these natural phenomena. These items are typically either washed ashore from the ocean, or brought to the surface from beneath the beach due to wave action, heavy rains, and/or winds. The purpose of non-routine EOD Range policing activities is to ensure that these materials, which end up on the EOD range through natural phenomena, are removed in a timely fashion in order to minimize any risk from exposure.

7.2 Non-routine Site Inspections

Non-routine site inspections are conducted following the occurrence of significant atmospheric, oceanic, or geological phenomena at the facility. Examples of such phenomena include typhoons, flooding tsunami, landslide, etc. EOD personnel will schedule a non-routine inspection as soon as practical following such significant events. Once commenced, the non-routine inspection is carried out using the same procedures as outlined for routine site inspections (See Section 6.2).

7.3 Identification

Identification is performed in a manner consistent with the method outlined in Section 6.4.

7.4 Disposition of Waste

Disposition of waste collected is accomplished in a manner consistent with the method outlined in Section 6.5.

Appendix K

Flight Operating Instruction 32-3002

BY ORDER OF THE
SECRETARY OF THE AIR FORCE

FLIGHT OPERATING INSTRUCTION
32-3002

15 September 2020

EXPLOSIVE ORDNANCE DISPOSAL (EOD) DEMOLITION RANGE PROCEDURES

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

NOTICE: This Flight Operating Instruction (FOI) is available digitally on the shared drive.

OPR: 36 CES/CED (TSgt Kurt Ziobro)

Certified by: 36 CED/Superintendent
(SMSgt William Knight)

Supersedes EOD FOI 32-3001, 23 January 2019

Pages: 21
Distribution: X

This instruction implements AFPD 32-30, Explosive Ordnance Disposal, as well as a memorandum from PACAF/SEW rescinding compensatory measures from Andersen-06-S60CM05 and supplements procedures contained in 36 Wing Instruction 13-204, Airfield Operations. It establishes procedures for the safe operation of the EOD Demolition Range. This instruction applies to all military, civilian, and local law enforcement organizations and members; assigned, TDY, or deployed to Andersen AFB (including AFRC or ANG units or members). This publication may not be supplemented by lower organizational elements.

SUMMARY OF REVISIONS

Changes to this edition are primarily grammatical and reflect the new updated references.
Added Para 3.6. to the Range Safety Brief addressing smoking on the range.
Added Flight Chief Risk Assessment requirement to Range Notifications.
Range Safety Brief was formatted to look more professional and better reflect its inclusion in the AF TTP.

1. References:

1.1. Explosive Site Plan Requests, Explosives Ordnance Disposal (EOD) Fragmenting Demolition Range, EOD Demolition Control Site, and Aboveground Magazine, Andersen AFB, Guam (PACAF-Andersen 06-S060, 07-S004 and 07-S005), 27 Sep 2007

1.2. Explosive Site Plan, (PACAF-Andersen 06-S060, 07-S04 and 07-S05) EOD Disposal Range, 27 Sep 2007

1.3. AFMAN 32.3001, Explosive Ordnance Disposal Program, 26 April 2019

1.4. Technical Order 60A-1-1-4, Protection of Personnel and Property, 2 May 2015

1.5. Technical Order 60A-1-1-31, General Info on EOD Disposal Procedures, 9 Dec 2014

1.6. AFMAN 91-201, Explosive Safety Standards, PACAF Supplement, 9 June 2017

1.7. 36 WGI 13-204, Airfield Operations, 27 April 2015

1.8. Air Force Policy Directive 32-30, Explosive Ordnance Disposal, 25 July 2018

1.9. PACAF/SEW Memorandum of 17 Jul 2008, Subject: Rescission of Compensatory Measure

1.10. AF TTP 3-32.5. Volume 7, EOD Range Operations, 24 February 2015

2. General Information:

2.1. The EOD Demolition Range is intended for use by the EOD Flight for the demolition of hazardous/unserviceable munitions (emergency and routine), explosives, and for maintaining proficiency in general demolition procedures and the operation of explosive actuated EOD tool sets. Other agencies requiring range use must coordinate their request through the 36th Civil Engineer Squadron EOD Flight prior to use. Furthermore, agencies requesting range use will provide all equipment and materials required for the operation and will be escorted by an NCO possessing a senior (or higher) EOD badge or a certified 7-level assigned to the 36 CES EOD Flight.

2.2. The EOD Demolition Range is located on the northern coastline 8,000 feet west of Pati Point and 4,600 feet north of runway 06L/24R. The MGRS coordinates for the range demolition site are 55P BR 75750 04400. The range is also within the Combat Arms Training and Maintenance small arms firing range “footprint”. CATM and EOD operation can be conducted simultaneously with proper coordination. Communications must be maintained with CATM personnel to ensure that no small arms firing is taking place while personnel are transiting to and from the EOD range on the access road. Coordination with CATM personnel is imperative prior to planning any operation. For planning purposes, Fridays are used for pre-scheduled and routine detonations since the CATM range is generally active Monday through Thursday.

2.3. The Mk-84 (2,000 pound) bomb was selected as the worst case fragment producing item; consequently, all items detonated on the range must have a fragmentation range less than that of a Mk-84 bomb.

2.4. The destruction area will be policed after every use. The reef and jungle area will be policed quarterly from the reef line to 100 feet east of the detonation area (see attachment 5).

2.5. A stand-by team will maintain radio communications with Fire/Crash if assisting during destruction operations to facilitate timely responses. In the event of an EOD response, range operations will cease until the stand-by team completes and reconstitutes from the response.

3. Personnel Limits:

3.1. The maximum number of personnel on range will be commensurate with a safe and efficient operation, but will not be less than two qualified EOD personnel.

3.2. No visitors will be allowed on range during explosive operations. If visitors arrive, explosive operations will stop and an escort will be assigned and will not exceed a visitor to escort ratio of 1:5. The Range Safety Officer (RSO) may be the Escort, but only if there is a separate TL leading the operation (one person may not be all three, TL, RSO and Escort). All visitors will be off range before operations restart.

3.3. Only one supervisor and one worker will be present during priming operations.

4. Explosive Limits:

4.1. The range explosive limit is **600 pounds** NEW Hazard Class/Division 1.1 for any single detonation. This includes all demolition materials.

4.2. The range explosive limit for open burn is **100 pounds** NEW for any single operation. This includes all demolition materials.

5. Safety:

5.1. When conducting live explosive training, (e.g., tool use, inert ordnance destruction, or other demolition) emergency medical support must be available within 30 minutes while the operations are being performed.

5.2. Medical support during planned high-explosives operations (destruction of live munitions) is a mandatory safety requirement. Medical support personnel will remain in a designated safe area unless required for injury/incident response.

5.3. The range will not be used without permission of the 36 CES EOD Flight CC/Chief.

5.4. The EOD Range Book will be on-site during all operations and will contain at a minimum:

5.4.1. A copy of this instruction.

5.4.2. Technical Order 11A-1-42, General Instructions for Disposal of Conventional Munitions.

5.4.3. Technical Order 11A-1-66, General Instructions, Demolitions.

5.4.4. Flight Operating Instruction 32-3003, Transportation of Explosives.

5.5. The CATM and EOD range flags will be raised before conducting any explosive operations.

5.6. The RSO, the highest-ranking EOD personnel with minimum 7-skill level, will maintain positive control over all firing devices.

5.7. Demolition explosives and initiators will be separated and secured in bunkers, if feasible, when not in use.

5.8. For operations involving munitions greater than five inches in diameter, a minimum of 4 feet of dirt shall be placed on the munitions. All personnel working in facilities within 2,000 feet will be evacuated, if ordnance is buried.

5.9. A personnel protective bunker is located 1,250 feet west of the detonation point and must be utilized during all fragmentation producing operations.

5.10. The minimum withdrawal distance for non-essential personnel is 1,250 feet. This distance was selected since all detonations are conducted at the base of a 520-foot cliff and that cliff line channels fragments out to sea.

5.11. During all instances of lost communications, demolition operations will cease until communications are restored.

6. Misfire Procedures:

6.1. A **1-hour** wait time will be observed for all non-electric misfires. One EOD technician, with minimum senior EOD badge, will clear the misfire with another EOD technician serving as a safety observer.

6.2. A **30-minute** wait time will be observed for all electric misfires. One EOD technician, with minimum senior EOD badge will clear the misfire with another EOD technician serving as a safety observer.

6.3. Immediately notify the Andersen Tower and Airfield Management Operations (AMOPS) of any misfire that involves the restriction of airspace and the associated wait time.

7. Non-Fragmentation Producing Operations
*__Applies to all planned detonations in excess of 300 pounds NEW.__

7.1. The EOD Flight Commander/Chief will designate a Team Leader for each operation. The senior EOD member present (minimum senior EOD badge) will serve as the RSO. The Team Leader and RSO may be the same individual if necessary due to manning constraints.

*7.2. **2-weeks** prior to the planned operation, the operation dates/times will be forwarded to Public Affairs for base newspaper and TV bulletin release. A template for the TV bulletin is located at shared drive: \\ajjy-fs-022v\36 CES\CED\2. Operations & Training\2a. Operations\04. Range\03. Range Ops\TV and Newspaper Template.

*7.3. **2-weeks** prior to the planned operation, an e-mail will be sent to the following distribution lists via the 36 CES/CC:

7.3.1. 36 WG/CC

7.3.2. 36 WG/GROUP CC's

7.3.3. 36 WG/Squadron CCs

7.3.4. Andersen Chief's Group

Sample Statement is below:

"The 36 CES Explosive Ordnance Disposal Flight will be destroying munitions at the EOD range from (time window) on (Day), (Date). As a safety precaution, Pati Beach, the CATM range, Tarague overlook, and some facilities on the North Ramp will be closed during this time. Please contact the 36 CES Explosive Ordnance Disposal Flight at 366-5198 for more information."

7.4. The Team Leader will ensure proper Above Ground Level (AGL) safe distance is calculated utilizing technical order 60A-1-1-4, AFMAN 91-201 and the Tactical Decision Aid. The AGL will be included on the range notification worksheet and can be found on shared drive: \\ajjy-fs-022v\36 CES\CED\2. Operations & Training\2a. Operations\04. Range\02. Range Notifications.

7.4.1. **72-hours** prior to a scheduled operation, a completed range notification worksheet will be emailed to the Andersen Tower, Air Field Management Operations, Guam Combined Control Facility (CCF), and the U.S. Coast Guard. U.S. Coast Guard & Environmental will in turn issue a "General Warning" to watercraft in the Tarague Basin.

7.5. If manning permits, standby team will remain in EOD Operations to facilitate coordination as needed. If manning is not available, the operation Team Leader will perform these duties from the range.

7.6. The operation Team Leader will:

7.6.1. Ensure all required notifications are recorded using attachment 1.

7.6.2. Conduct a safety briefing for all personnel prior to handling any explosives using attachment 4.

7.6.3. Ensure all required tools/equipment, vehicles and technical data are on-hand and functional prior to conducting explosive operations.

7.6.4. Maintain radio contact with either EOD Operations or Crash Control throughout the operation.

7.6.5. Perform a 360-degree visual scan of the area prior to any detonation. If water traffic is spotted within the required clear zone, contact EOD Operations. EOD Operations will contact the Coast Guard to report the incident and remove the vessel. If contact cannot be made, suspend operations until the water traffic departs to a safe distance.

7.6.6. Contact Andersen Tower and AMOPS 30 minutes prior to expected detonation.

7.6.7. Contact Andersen Tower and AMOPS 5 minutes prior to detonation.

7.6.8. Notify Andersen Tower and AMOPS after each detonation is complete and again when all detonations are complete for the day.

8. Fragmentation and Non-Fragmentation Producing Operations Involving Ordnance Less Than 300 Pounds

8.1. The EOD Flight Commander/Chief will designate a Team Leader for each operation. The senior EOD member present (minimum senior EOD badge) will serve as the RSO. The Team Leader and RSO may be the same individual if necessary due to manning constraints.

8.2. The Team Leader will ensure proper Above Ground Level (AGL) safe distance is calculated utilizing technical order 60A-1-1-4, AFMAN 91-201 and the Tactical Decision Aid. The AGL will be included on the range notification worksheet and can be found on shared drive: \\ajjy-fs-022v\36 CES\CED\2. Operations & Training\2a. Operations\04. Range\02. Range Notifications.

8.2.1. **72-hours** prior to a scheduled operation, a completed range notification worksheet will be emailed to the Andersen Tower, Air Field Management Operations, Guam Combined Control Facility (CCF), and the U.S. Coast Guard. U.S. Coast Guard will in turn issue a "General Warning" to watercraft in the Tarague Basin.

8.3. For operations with calculated fragmentation distances over 1,850 feet, EOD Team Leader will ensure the Tarague Overlook is clear of personnel. One EOD team member will be posted where 32nd street makes a sharp bend to the south by the MSA 2 fence (MGRS: 55P BR 05749 92917).

8.4. For emergency destruction operations, the 36 CES/CC will be notified by the most expeditious manner possible (e.g. phone, Land Mobile Radio (LMR), email) before initiation of the detonation, if possible.

8.5. The standby team will remain in EOD Operations to facilitate coordination.

8.6. The operation Team Leader will:

8.6.1. Ensure all required notifications are recorded using attachment 1.

8.6.2. Conduct a safety briefing for all personnel prior to handling any explosives using attachment 4.

8.6.3. Ensure all required tools/equipment, vehicles, and technical data are on-hand and in good working condition prior to conducting explosive operations.

8.6.4. Maintain radio contact with either EOD Operations or Crash Control throughout the operation.

8.6.5. Perform a 360-degree visual scan of the area prior to any detonation. If water traffic is spotted within the required clear zone, contact EOD Operations. EOD Operations will contact the Coast Guard to report the incident and remove the vessel. If contact cannot be made, suspend operations until the water traffic departs to a safe distance.

8.6.6. Contact Andersen Tower and AMOPS 30 minutes prior to expected detonation.

8.6.7. Contact Andersen Tower and AMOPS five minutes prior to detonation.

8.6.8. Notify Andersen Tower and AMOPS after each detonation is complete and again when all detonations are complete for the day.

9. Fragmentation Producing Operations Involving Ordnance Greater Than 300 Pounds

9.1. The EOD Flight Commander/Chief will designate a Team Leader for each operation. The senior EOD member present, minimum senior EOD badge, will serve as the RSO. The Team Leader and RSO can be the same individual if necessary due to manning constraints.

9.2. **2-weeks** prior to the planned operation, the operation dates/times will be forwarded to Public Affairs for base newspaper and TV bulletin release. A template for the TV bulletin is located on shared drive \\ajjy-fs-022v\36 CES\CED\2. Operations & Training\2a. Operations\04. Range\03. Range Ops\TV and Newspaper Template.

9.3. **2-weeks** prior to the planned operation, an e-mail will be sent to the following distribution lists via the 36 CES/CC:

9.3.1. 36 WG/CC

9.3.2. 36 WG/GROUP CC's

9.3.3. 36 WG/Squadron CCs

9.3.4. Andersen Chief's Group

Sample statement is below:

"The 36 CES Explosive Ordnance Disposal Flight will be destroying munitions at the EOD range from (time window) on (Day), (Date). As a safety precaution, Pati Beach, the CATM range, Tarague overlook, and some facilities on the North Ramp will be closed during this time. Please contact the 36 CES Explosive Ordnance Disposal flight at 366-5198 for more information."

9.4. Due to mission requirements, if any Commander cannot support on the requested day/time, notify the 36 CES/CC as soon as possible.

9.5. The Team Leader will ensure the proper Above Ground Level (AGL) safe distance is calculated utilizing technical order 60A-1-1-4, AFMAN 91-201 and the Tactical Decision Aid. The AGL will be included on the range notification worksheet and can be found on shared drive: \\ajjy-fs-022v\36 CES\CED\2. Operations & Training\2a. Operations\04. Range\02. Range Notifications.

9.5.1. **72-hours** prior to a scheduled operation, a completed range notification worksheet will be emailed to the Andersen Tower, Air Field Management Operations, Guam Combined Control Facility (CCF), and the U.S. Coast Guard. The Coast Guard will in turn issue a "General Warning" to watercraft in the Tarague Basin.

9.6. **Emergency destruction** operations will be coordinated through the 36 CES/CC in the most expeditious manner possible (e.g. phone, LMR, e-mail) before initiation of the detonation, if possible.

10. Day of Planned Operation Involving Buried Ordnance Greater than 300 Pounds

10.1. 36 SFS will:

10.1.1. Ensure all personnel on the CATM firing range complex are afforded frontal and overhead protection during detonation.

10.2. 36 CES will:

10.2.2. Direct the construction management office to account for and evacuate all contractors working inside the 2,000-foot arc.

11.8.3. Ensure that a 10K, AT front-end loader is available for range support.

10.3. The EOD Team Leader will:

10.3.1. Ensure all required notifications are recorded using attachment 1.

10.3.2. Verify evacuation is complete.

10.3.3. Conduct a safety briefing for all personnel prior to handling any explosives using attachment 4.

10.3.4. Ensure all required tools/equipment, vehicles, and technical data are on-hand and functional prior to conducting explosive operations.

10.3.5. Maintain radio contact with EOD Operations, Crash Control, and SFS throughout the operation.

10.3.6. Perform a 360-degree visual scan of the area prior to any detonation. If water traffic is spotted within the required clear zone, contact EOD Operations. EOD Operations will contact the Coast Guard to report the incident and remove the vessel. If contact cannot be made, suspend operations until the water traffic departs to a safe distance.

10.3.7. Position bombs/projectiles as close to the cliff line as possible. Refer to attachment 5.

10.3.8. Ensure general purpose bombs (i.e. M117, Mk 80-series, BLU-109, etc.) are placed perpendicular to and within three feet of the cliff line. Position base plate directly towards the Philippine Sea and nose directly into the cliff line. Remove lugs when possible, and angle strong backs towards the ground. Munitions items must be buried a minimum of 4 feet.

10.3.9. Contact Andersen Tower and AMOPS 30 minutes prior to expected detonation.

10.3.10. Contact Andersen Tower and AMOPS five minutes prior to detonation.

10.3.11. Notify Andersen Tower and AMOPS after each detonation is complete and again when all detonations are complete for the day.

10.3.12. After each detonation, EOD personnel will police the detonation area of explosive residue and inspect the integrity of the cliff face. When the area is cleared, the next bomb will be placed. If the cliff face is deemed unsafe, remaining operations will be delayed until the problem is resolved or cancelled.

11. Emergency Procedures:

11.1. Cease operations and secure area/items involved in an accident/incident.

11.2. Render first aid, as required.

11.3. Request emergency assistance via EOD Operations or Andersen Crash Control, if required.

11.4. Notify the operation Team Leader/RSO, Flight Chief or Commander immediately. Notify the 36 CES/CC and Wing Safety as soon as possible.

11.5. Take all actions necessary to secure the area for emergency responders.

11.5.1. This includes making contact with CATM to call a cease fire for vehicles transiting to and from the EOD Range.

12. Supplemental Range Information:

12.1. The EOD Demolition Range is a culturally and ecologically sensitive area. Limit vehicle operations to the road and destruction area, as much as practical.

12.2. The beach is a protected habitat. Green Sea Turtle nesting on Guam may occur at any time of the year. Because of this vehicle traffic in the destruction area should be minimized. Close coordination with University of Guam Marine Laboratory Sea Turtle Monitoring Section (671-734-4054) should occur to identify nesting sites. Furthermore, reduced N.E.W. should be utilized to minimize ground shock in accordance with A-1-1-4 when nests are in the vicinity of the destruction site.

12.3. The range is also home to two protected species of bats and crows. The 36 CES Environmental flight must be notified before and after operations to ensure these species were not affected.

WILLIAM J. KNIGHT, SMSgt, USAF
Superintendent, EOD Flight

Attachments:

1. Range Notification Lists
2. Range Operation Checklist
3. Post Range Operations Checklist
4. Safety Briefing
5. Proper Detonation Point/Cliff Orientation and Quarterly Clean-up Area
6. Rescission of Compensatory Measure Andersen-06-S60-CM05

Attachment 1
Range Notification List

AGENCY	INITIALS/DATE		TIME	
*EOD Leadership (Risk Assessment)				
*Law Enforcement Desk: 366-2910/2911/2912				
*Fire Department: 366-5284/5264/5261				
*Medical: 366-4706/3231				
*Command Post: 366-2981/2982				
36 WG Safety: 366-4222/7233				
Coast Guard: 355-4821/4866 Email: rccguam@uscg.mil				
36 WG Tower: 366-4737/4281	Initial	30 Min	5 Min	Cold
Airfield Management Operations: 366-4188/1010 Email: 36 OSS-OSAM	Initial	30 Min	5 Min	Cold
Guam CCF: 99-473-1210				
Munitions Control: 366-6393/6300/6394/6395				
CATM: 366-2254/3220				
CES Environmental: 366-2101/2556/2557				
Seismology: 727-3544 (If over 300 lbs. NEW)				
Public Affairs: 366-4202/2228 (If over 300 lbs. NEW refer to para. 7.2 & 9.2)				
Weather: 366-5230				
*Minimum Calls for Off-Range Use of Tools				

Date: ____

N.E.W.: ____

AGL Required: ____

# of Shots: ____

CHECKLIST COMPLETED BY:
PRINT/SIGN/DATE:____

Attachment 2

Range Operation Checklist

______ Provide a safety briefing prior to the operation

______ Ensure emergency permit is received for non-permitted items (see EPA permit), if required

______ Ensure ADR items are inventoried and only authorized munitions are being treated

______ Notify all agencies before beginning explosive operations

______ Secure all entrances to the range prior to detonations

______ Post range warning signs

______ Ensure the red range flag is flown at the CATM gate and on EOD range until completion of the operation

______ Comply with all requirements for safe transportation of explosives

______ Ensure first aid equipment is immediately available on the range

______ Function check/make available satellite phone and Motorola radios for use on the range

______ Confirm there are no electrical storms within 5 nautical miles prior to beginning operations

______ Ensure blasting caps, bulk explosives, and munitions are properly segregated

______ Inspect tools/equipment, vehicles, and the range prior to and immediately following any operation

______ Ensure fire extinguishers are available

______ Ensure range is clear of unauthorized personnel to include beach, cliff line, and water

______ Check beach to determine if hazardous materials have washed ashore in the immediately area

______ Ensure all personnel, except for the initiation team, are withdrawn from the detonation site prior to connecting initiators to explosives

______ Obtain clearance from tower immediately prior to initiating any explosives

______ Ensure all personnel take appropriate cover prior to initiating fragment producing detonations

Attachment 3
Post Range Operations Checklist

______ Perform a detailed inspection of the range after all detonations are complete for the day and ensure no residue remains

______ Ensure all munitions are visually inspected for explosive residue

______ Perform clean up shot if necessary. Under no circumstances will kick outs be removed from the range and restored.

______ Collect scrap metal and other trash and dispose of accordingly.

______ Collect spent cartridges and turn into the Munitions Inspections section

Attachment 4 Safety Briefing

AFTTP 3-32.5, Volume 7, EOD Range Operations, Attachment 3, STANDARD PRE-OPERATION SAFETY BRIEFING

This pre-operation sheet will be filled out and briefed before conducting any explosive operation on Andersen AFB and/or Guam. The purpose of the checklist is to maximize safety during operations by ensuring personnel are aware of all explosive hazards involved and the appropriate actions to take in the event of an emergency.

1. Explosive and Personnel Limits.

1.1. Operation to be performed: ____

1.1.1. Munitions involved: ____

1.1.2. Number and NEWQD (w/TNT-equivalent) of Detonations: ______________________

1.1.3. Maximum Fragmentation Distance (per T.O. 60A-1-1-4, Protection of Property and Personnel, TDA, and applicable 60 series publications) for each Detonation: ______________________

1.1.3.1. Hazardous Fragmentation Range (HFR): ______________________________

1.1.3.2. Maximum Fragmentation Range – Horizontal (MFR-H):______________________

1.1.3.3. Maximum Fragmentation Range – Vertical (MFR-V):________________________

1.1.4. Explosive Hazards (per applicable 60 series publications):

____

____

1.2. Location where operation is to be performed (detonation site): ____________________

1.3. Operating Location for Essential Personnel (For operating locations with aerospace vehicle traffic seek the appropriate Air Ground Level (AGL) clearance (based on calculated MFR-V) from local Air Traffic Controllers.):____________________________________

1.3.1. Distance from detonation site: ____________________________________

1.3.1.1. If distance from detonation is less than Maximum Fragmentation Distance:

1.3.1.1.1. Apply protective measures (AFMAN 91-201 para 12.74.4 and 12.74.8):

____

1.3.1.1.2. Note all standing or approved ORM considerations IAW AFPAM 90-902 and overall assessments (i.e. Range OI, etc.): ____________________________________

1.3.2. Commander approving ORM assessment based on being inside the maximum fragmentation distance (if applicable): ____

1.4. Evacuation Assembly Point / Non-Essential Personnel:__________________________

1.5. Explosive Limits: ____

1.6. Personnel Limit for the range is ____________________________________

1.6.1. A minimum of three EOD personnel, one who is a PAFSC 3E871 or higher, will be present during explosive operations.

1.6.2. The parameter in 1.6.1 may be adjusted to a minimum of two EOD-qualified personnel, one of which is an E-5 that has been awarded a 5-skill level, when the mission is defined by EOD-coordinated instructions (local stand-by duties, exercise support, testing support, etc), or when approved through Commander ORM determination during periods of critical manning or other unique circumstances to meet mission requirements. Document commander ORM data and maintain for inclusion in EODIMS report.

1.7. Personnel/Duty assignments (name/rank):

Range Safety Officer (RSO): ____

EOD Team Leader (TL): ____

EOD Team Members (TM): ____

Support Team / Medical (Casuals): ____

Non-Essentials (Stop all operations when visitors are present):______________________________

Non-Essential Escort: ____

1.8. Conduct briefing to ensure personnel are familiar with all the hazards involved prior to commencing.

2. Equipment Requirements.

2.1. General Safety Equipment Requirements:

______Water	______Portable radios
______Gloves	______First Aid Kit
______Sun-screen (as needed)	______Fire Extinguishers
______Safety glasses (explosive ops)	

2.2. Special personnel protective equipment (e.g., laser goggles, helmet, body armor):

______________________________ ______________________________

______________________________ ______________________________

2.3. Special operational equipment (e.g., Mk-series tools, robotics, etc.):

______________________________ ______________________________

______________________________ ______________________________

3. Pre-operational Safety Assessment.

3.1. EOD operations will be conducted under the supervision and control of the EOD Team Leader (TL).

3.2. Prior to the start of disposal or training operations, the TL designates a Range Safety Officer (RSO). The RSO is responsible for ensuring all safety aspects of the operation are properly applied in support of the TL. The RSO will not participate as a worker during the explosive operation.

3.2.1. The RSO will conduct a briefing to cover tasks to be performed, safety precautions and emergency procedures. The duties of the RSO and TL may be performed by the same person.

WARNING

Ground yourself prior to handling initiating explosives; work on grounded surfaces if possible.

Personnel handling electrically initiated explosive devices will avoid wearing clothes made of material, which have high static generating characteristics.

Use available frontal/overhead protection during detonation – do not stand in view of the munitions to be detonated.

CAUTION

Remember Cardinal Principal of Explosive Safety: "Expose the minimum amount of people to the minimum amount of explosives for the minimum amount of time."

3.2.2. The RSO will brief visitors and casuals on type of ordnance and associated hazards. Provide specific instructions on where to drive, park, and walk; and not to touch items they may encounter ("if you didn't drop it, don't pick it up"). Show visiting and casual personnel the specific frontal/overhead protected area in which to take cover.

3.3. Non-Essential Personnel Escort: If visitors are on range, stop all operations and assign an escort to ensure safety rules are followed. Escort to visitor ratio will not exceed 1:5. The RSO may be the Escort, but only if there is a separate TL leading the operation (one person may not be all three, TL, RSO and Escort).

NOTE

All personnel wanting to proceed down range after commencement of the operation will do so only after obtaining approval from the Range Safety Officer (RSO). Personnel will then be briefed on all hazards present.

Any unsafe actions observed by EOD personnel will be immediately brought to the attention of the RSO. The RSO will cease operations until unsafe condition is corrected. If unable to resume safe operations, withdraw to a safe distance and inform EOD Operations [and appropriate Range Control Office] that the EOD operation is terminated.

3.4. The TL will ensure two-way radio (or phone) communication is operational and available (for both TL and RSO) during all explosive operations. Both a primary and a secondary means communication are preferred.

WARNING

Do not conduct hand-held radio transmissions within 25 feet (100 feet when using vehicle radios) of electro-explosive devices (EEDs).

Modern Mobile Emitters (MME) such as key fobs and cellular phones will not be operated within 10 feet of EEDs.

3.5. Remove rings and watches prior to starting any explosive operation.

3.6. No smoking will be conducted on the range during live explosive operations. RSO can designate a proper smoking location that will be downwind and no closer than 50 feet from any explosives or flammables.

3.7. Do not handle munitions roughly (e.g., rolled, tumbled, dropped, dragged or thrown).

3.8. If an abnormal condition occurs, stop the operation until the condition is corrected.

3.9. Observe wait times of 30 minutes for electrically primed misfires and 1 hour for non-electrically primed misfires.

3.10. Cease all explosive operations when there is lightning within 5 nautical miles (AFMAN 91-201, paragraph 7.34).

3.11. Only one EOD technician will check the detonation point after a planned detonation with a second person acting as a safety backup. This rule also applies when checking items kicked out by a detonation. Deviation for the sake of training is not authorized.

3.12. Do not proceed directly down range if the detonation results in a range fire. If it can be ascertained that the fire can be contained, immediately respond and try to control the fire while the FD is responding (AFMAN 91-201, para 10.9.4). If the decision is made not to fight the fire, the area should be evacuated and remain so until it has cooled for at least 24 hours. Inform [the range controller or other local authorities] as to the extent of the fire so appropriate notifications can be made. Follow the safety measures outlined in AFTO 60A-1- 1-31 and below prior to returning to the detonation site.

3.12.1. Wait at least 24 hours after the fire has been extinguished to check the detonation point.

3.12.2. Do not approach a pyrotechnic or incendiary ordnance burn area for 24 hours after the cessation of burning.

3.13. Make positive identification before taking any action on a munition item.

3.14. Destroy in place or clearly mark for later destruction any dud munitions that cannot be safely moved.

4. Emergency Procedures.

4.1. In the event of an accident or fire,______________________________(normally the RSO) will notify the appropriate agency (e.g. fire department, ambulance, range controller or EOD Operations).

4.1.1. Evacuate all nonessential personnel_____________________________feet as required.

4.1.2. The Evacuation Assembly Point is ____

4.2. Fire extinguishers/equipment are located: ____

4.3. First Aid Kit is located: ____

4.4. _____________and______________will fight the fire and note the time if any munitions become engulfed in flames.

WARNING

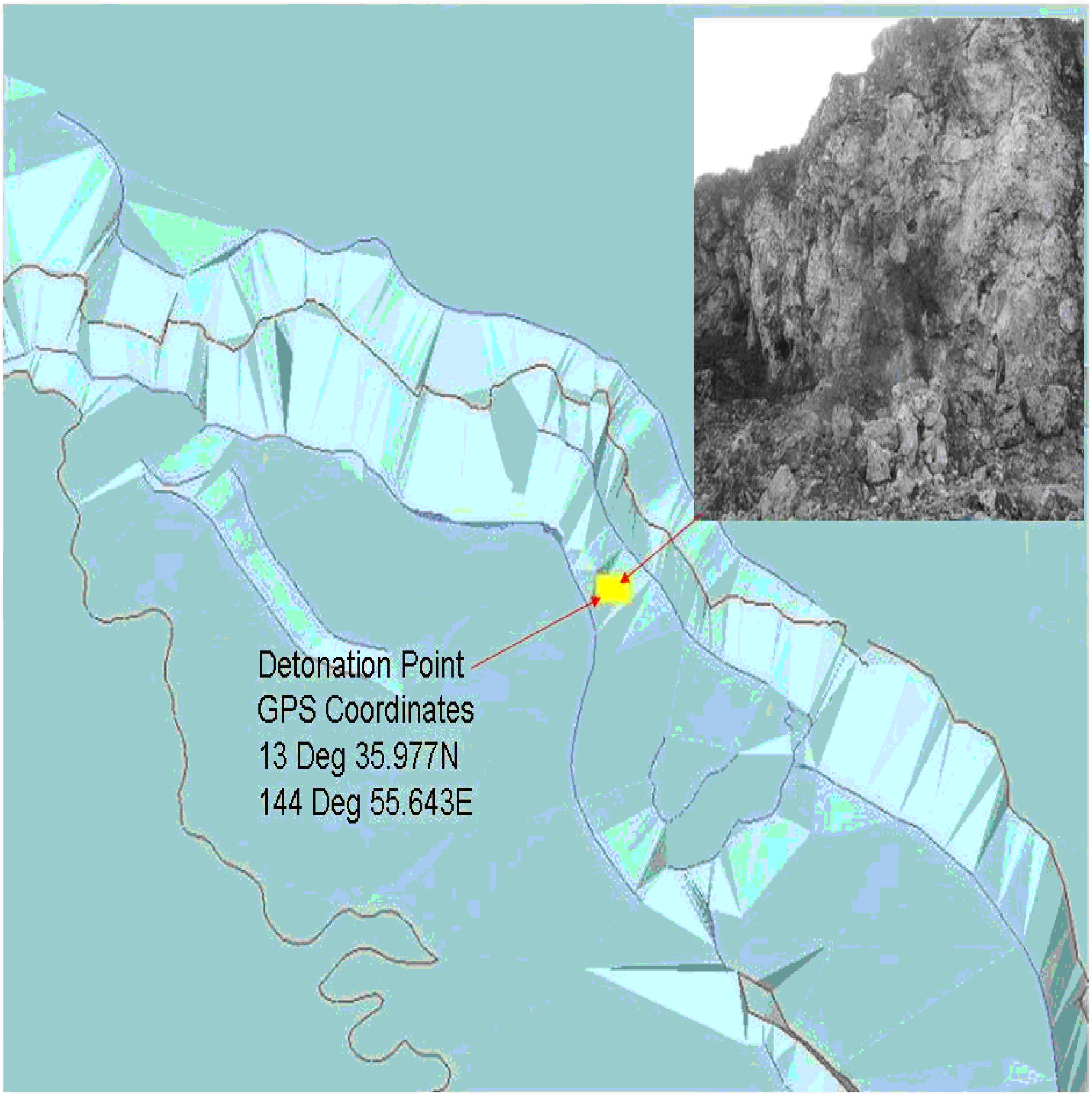
Do not fight fires involving 1.1 munitions engulfed in flames unless attempting a rescue.

4.5. ______________will sound the alarm and go to the Evacuation Assembly Point and direct emergency responding personnel to the scene.

4.6. _____________________________ and ______________________ will secure the site of unused explosives for storage or later disposition.

4.7. When evacuation is accomplished, RSO will account for everyone involved in the operation.

Attachment 5
Proper Detonation Point/Cliff Orientation and Quarterly Clean-up Area



Attachment 6

Rescission of Compensatory Measure
Andersen-06-S60-CM05

DEPARTMENT OF THE AIR FORCE
PACIFIC AIR FORCES

17 Jul 08

MEMORANDUM FOR HQ AFSC/SEWV

FROM: PACAF/SEW

SUBJECT: Rescission of Compensatory Measure Andersen-06-S60-CM05

1. PACAF/SEW has reviewed and concurs with rescission of compensatory measure Andersen-06-S60-CM05.

2. Direct questions to HQ PACAF/SEW, 448-2990/1/89 or e-mail PACAF.SEW@hickam.af.mil.

Bruce R. Martineau

BRUCE R. MARTINEAU, MSgt, USAF
Command Weapons Safety Manager

Attachment:
1. 36 WG/SEW Compensatory Measure Rescission Memo

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS, 36TH AIR BASE WING (PACAF)
UNIT 14003, APO AP 96543-4003

17 July 08

MEMORANDUM FOR PACAF/SE

FROM: 36 WO/SEW
Unit 14003, Box 27
APO AP 96543-4003

SUBJECT: Rescission of Compensatory Measure CMOS from Site Plan Andersen-06-S60

1. Per DDESB recommendation during Guam Military Munitions Working Group. Compensatory measure CMOS contained in site plan Andersen 06-S60 should be rescinded. CMOS calls for a 4,000-foot clear zone for destruction of munitions greater than five inches on Andersen's EOD range.

2. Fragmentation modeling using TRAJ and CONWEP has produced recommended distances of 2,000 feet for all operations on the Andersen range. The range is at the base of a S20 foot cliff and actual detonation point is contained under a cliffline overhang that removes potential for fragmentation above the cliffline. Current range operating procedures require exact placement of munitions for detonation based on OPS coordinates to remove any margin of error. All items are buried to a depth of 4 feet with lugs down and baseplate facing out towards the open water. The 4,000-foot requirement was used as an additional precaution that is no longer needed due to use of OPS coordinates for munitions placement. Removal of 4,000-foot requirement will also allow for OSD planned Marine buildup at Andersen to take place.

3. Any questions pertaining to this subject can be forwarded to the 36 WO/SEW office at 366-2904 or 366-4222.

DAVID C. SAWYER, MSgt, USAF
Superintendent, Weapons Safety

Appendix L

Biological Mitigation Plan

APPENDIX L - BIOLOGICAL MITIGATION PLAN

BIOLOGICAL MITIGATION PLAN
FOR OPEN BURN-OPEN DETONATION OPERATIONS
ANDERSEN AFB

Mariana Crow

The last remaining Mariana crow on Guam, known as Kahit, was introduced from the island of Rota, has been monitored by SWCA Environmental Consultants over the last 3 consecutive years. However, as of July 2011, the individual has not been spotted on the installation and the last known acoustic observation of this individual was in August of 2011. This species is now believed to be extirpated from the island of Guam.

Mariana Fruit Bat

In 1973, the Air Force set aside 281 hectares of cliff line habitat, designated as the Pati Point Natural Area immediately north of the Andersen AFB OB/OD area for nature conservation. A recent review of Real Estate documents suggests the Pati Point Area may be GovGuam property. The Pati Point Natural Area is off limits to human intrusion except for colony monitoring. GDAWR will be consulted at each three-year permit renewal to review possible changes to the situation. Any significant changes in the level of OB/OD activity that occur during interim periods will be submitted to Guam EPA and GDAWR for review before implementation.

Nighttime use of the range would be of concern since the range lies within the colony's foraging area and along the foraging route of the bats when flying to western feeding sites. However, OB/OD activities are prohibited at night so this is not an issue.

Based on fruit bat surveys conducted in 2011 and 2012, the last remaining bat colony on Guam is believed dispersed. However, a large family group (10-15 individuals) has been observed infrequently in Munitions Storage Area 1.

Green Sea Turtles

The beach adjacent to the OB/OD area is nesting habitat for the endangered Green Sea Turtle. Beach areas and adjacent waters are scanned for turtle activity prior to conducting OB/OD activities. When green sea turtles are present on the beach or in adjacent waters, operations will be tailored to limit the ground shock imparted at the nearest nest. Driving on beaches used by turtles for egg-laying can crush incubating eggs, crush hatchlings in the nest, and trap hatchlings after they emerge from the nest cavity. Vehicles are prohibited from the EOD and OB/OD beach.

Candidate Species

Two butterfly and three snail species are currently priority 2 for listing under the Endangered Species Act, as amended. Extensive surveys are ongoing at the installation to document any observations of these individuals. Though the host plants *(Procris* *pedunculata, Elatostema calcerum,* and *Maytenus thompsonii)* have been infrequently observed throughout the Tarague Basin, no known individuals occupy the vicinity of the site. Furthermore, no observations have been made of the candidate invertebrates within the area or adjacent lands for over 5 years. Therefore, we believe that detonation activities at the site in question will have no direct or indirect impacts on the species or their survival.

Due to the location of the site outside of the jointly managed Guam National Wildlife Refuge Overly Area, no additional species of concern are considered. The cooperative management agreement from 1994 and a copy of the Endangered Species Act consultation concurrence letter from the U.S. Fish and Wildlife Service (2004) for this action are attached as reference to this appendix. According to Federal environmental regulation, no further consultation or species considerations are required to approve, or undertake this action as outlined. If species' status or the proposed action changes, then Andersen Environmental will reinitiate consultation with the Service. This determination and outlined conservation actions are in compliance with the Joint Region Mariana Integrated Natural Resources Management Plan, as drafted.

Migratory Birds

The Migratory Bird Treaty Act of 1918 (MBTA) is administered by the U.S. Fish and Wildlife Service (USFWS) and is the cornerstone of migratory bird conservation and protection in the United States and its territories. The Act authorizes the Secretary of Interior to regulate the taking of migratory birds, the Act provides that it shall be unlawful, except as permitted by regulations to pursue, take, or kill any migratory birds, or any part, nest or egg of any such bird.

Migratory birds are frequently observed foraging and resting along Andersen's shores and within Andersen Air Force Base Open Detonation site. The Permittee will use deterrent devices to disperse birds to include but not limited to visual and auditory techniques, using both simple and sophisticated devices in order to respond to the unique habits of different bird species and surrounding environments.

Some frequently observed species on Andersen Air Force Base include the Common Sandpiper *(Actitis hypoleucos)*, Ruddy Turnstone *(Arenaria interpres)*, Pacific Golden Plover *(Pluvialis fulva)*, Wandering Tattler *(Tringa incana)*, and the Wedge-tailed Shearwater *(Puffinus pacificus)*.

To avoid potential impacts to these species during coordinated activities, the Permittee will conduct a visual survey of the site and its immediate vicinity. If migratory birds are spotted in the area, personnel will utilize bull horns, vehicle sirens, or other mechanical devices to deter the migratory birds from entering the area during blasting activities. No birds will be harmed. If EOD personnel or Base natural resource staff determines that the taking (killing) of a bird species may be necessary, then a permit will be obtained from the US Fish and Wildlife as appropriate. The above subject actions serve to avoid the taking of protected migratory bird species during operation of the detonation site.

APPENDIX L - BIOLOGICAL MITIGATION PLAN

Accidental taking of migratory bird(s) during the detonation of munitions will be reported to the Guam Environmental Protection Agency and Department of Agriculture within twenty-four hours. The report shall include but not limited to the following information:

AVIAN MORTALITY REPORT

1) Date of Report:
2) Time of Call:
3) Source of Information (Name/Department);
4) Phone Number:
5) Date/Time carcass was discovered:
6) Species (If Known):
7) Nest? Taken/Salvaged? Eggs? (Quantity) Taken/Salvaged?
8) Is the bird banded/marked? If yes, provide band number:
9) Sex, if known:
10) Suspected Cause of Death:
11) Weather Condition:
12) GPS (Latitude/Longitude or UTM)
13) Carcass collected by: Date/Time:
14) Guam Environmental Protection Agency Representative Notified: Date/Time:
15) Department of Agriculture Representative Notified: Date/Time:
16) Carcass delivered/disposed to:

Appendix M

OB/OD Groundwater Monitoring Plan

THE UNITED STATES AIR FORCE

FINAL

OPEN BURN/OPEN DETONATION RANGE GROUNDWATER MONITORING PLAN FOR ANDERSEN AIR FORCE BASE, GUAM

AUGUST 2015

PREPARED BY:

THE UNITED STATES AIR FORCE

FINAL

OPEN BURN/OPEN DETONATION RANGE GROUNDWATER MONITORING PLAN FOR ANDERSEN AIR FORCE BASE, GUAM

AUGUST 2015

Prepared by:

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Tel: 671-479-3977
Fax: 671-479-3990

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List of Acronyms

AAFB	Andersen Air Force Base
ACL	Alternate Concentration Limit
ASTM	American Society for Testing and Materials
CAFP	Corrective Action Feasibility Plan
CFR	Code of Federal Regulations
COC	Chain of Custody
DEHP	bis(2-ethylhexyl)phthalate *aka* di(2-ethylhexyl)phthalate
DOT	Department of Transportation
DTS	Dye Trace Study
EOD	Explosive Ordnance Disposal
GAR	Guam Administrative Rules
Guam EPA	Guam Environmental Protection Agency
GHPO	Guam Historic Preservation Officer
GHWMR	Guam Hazardous Waste Management Regulations
GWMP	Groundwater Monitoring Plan
IDW	Investigation Derived Waste
IRP	Installation Restoration Program
MCL	Maximum Contaminant Level
µg/L	micrograms per liter
MSL	mean seal level
NGL	Northern Guam Lens
NOAA	National Oceanic and Atmospheric Administration
OB/OD	Open Burn/Open Detonation
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RDX	cyclotrimethylenetrinitramine *aka* hexahydro-1,3,5-trinitro-1,3,5-triazine
SOP	Standard Operating Procedure
SP	Seep
SSI	statistically significant increase
SWMU	Solid Waste Management Unit
USEPA	United States Environmental Protection Agency

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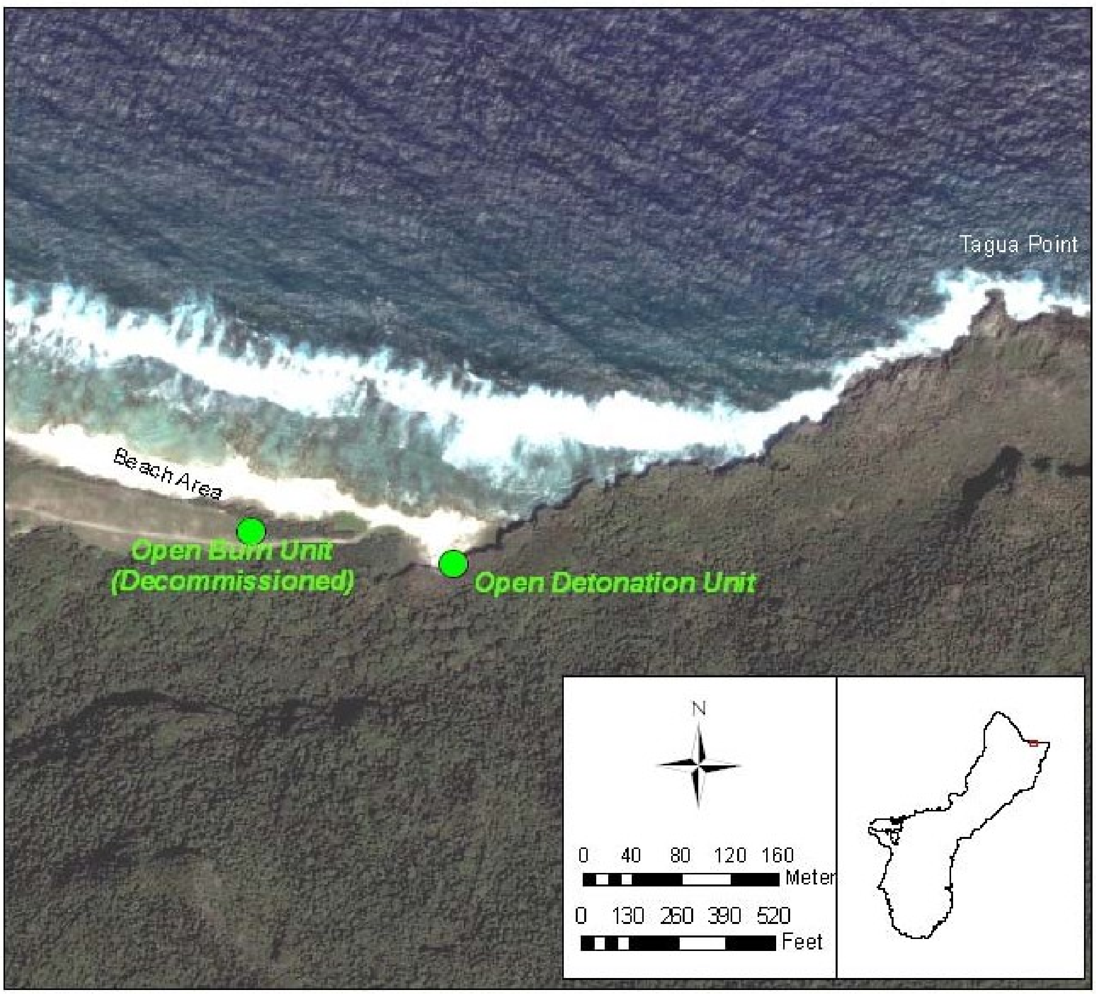
1.0 Introduction

1.1. *Site Introduction*

The mission of the Open Burn/Open Detonation (OB/OD) Range is to render unserviceable ordnance, other pyrotechnic devices, and waste munitions or explosive harmless by either open burning or open detonation. The OB/OD Range exists within the Explosive Ordnance Disposal (EOD) Range of Andersen Air Force Base (AAFB). Located at the extreme eastern sector of Tarague Beach on AAFB ending just before Tagua Point (Figure 1-1), the OB/OD Range is defined as the open beach area surrounded by the Pacific Ocean to the north and limestone forest in all other directions. The range has a 2,400 foot radius safety zone.

The active open detonation (OD) Unit is situated along the face of the cliff, which allows the projection of any residue from waste ammunition or explosive detonations away from occupied areas. The open burn (OB) Unit is located approximately 80 feet from the adjacent limestone forest and 180 feet from the ocean, was dismantled in 2007, and is currently non-operational.

Figure 1-1: Location Map of OB/OD Range, AAFB, Guam



1.2. *Purpose and Objectives*

The OB/OD Range is required to comply with the Guam Environmental Protection Agency (Guam EPA) Rules and Regulations under the Guam's Solid Waste Management and Litter Control Act (10 Guam Code) and Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA) of 1976, as amended by the Hazardous Waste Regulations promulgated under Guam EPA as well as regulations promulgated by the United States Environmental Protection Agency (USEPA) referenced in Title 40 of the Code of Federal Regulations.

This Groundwater Monitoring Plan adopted the guidance provided in the United States Environmental Protection Agency's (USEPA's) *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* (USEPA, 2009).

In accordance with Guam EPA Operating Permit for a Hazardous Waste Management Facility (number GUS002), a site monitoring program shall be developed and consist of groundwater monitoring to ensure that any release of hazardous waste or hazardous constituents from open burning/open detonation of reactive wastes to the shallow unconfined aquifer beneath the OB/OD Range are detected. If a release is detected, plans for corrective actions would be developed and submitted separately from this Groundwater Monitoring Plan (GWMP). See Section 6.

This GWMP has been prepared to satisfy the permit requirements for a groundwater monitoring plan, and includes: (1) the well system/locations for sampling which will yield groundwater samples from the shallow unconfined aquifer which represent the quality of upgradient water and water passing the downgradient boundaries of the OB/OD Range; (2) criteria for establishing whether or not a release that may have adverse effects on human health and the environment has occurred from the OB/OD Range to groundwater; (3) sampling and analysis procedures and techniques; (4) statistical methods for conducting trend analysis on the collected groundwater data; and (5) procedures for notifying the Administrator of an exceedance of risk-based concentration limits and follow-up actions. AAFB has previously completed a Dye Trace Study for the OB/OD Range, results of which have been incorporated into this GWMP (AAFB 2006a).

1.3. *Plan Organization*

This GWMP is organized into the following sections:

- **Section 1** briefly introduces the OB/OD Range and describes the purpose of the plan and the plan organization.
- **Section 2** describes the AAFB and OB/OD Range geology, groundwater and groundwater seeps, land use, and cultural significance.
- **Section 3** contains a description of the groundwater sampling and analysis plan, including proposed sample locations, hazardous constituent release criteria, sampling frequency, background data collection, detection, verification resampling, and compliance monitoring phases, and groundwater flow and direction.
- **Section 4** presents sampling procedures for the upgradient well and downgradient groundwater seeps ,, including procedures for inspecting the monitoring well and seeps, measuring water level, collecting groundwater and groundwater seeps, sample handling and documentation, decontamination of sampling equipment, and field quality assurance/quality control (QA/QC).
- **Section 5** describes the statistical analysis approach, an overview of inter-well comparisons and intra-well comparisons with Shewhart-CUSUM control charts and the proposed statistical analysis software.
- **Section 6** describes the record keeping and reporting procedures as required by the permit, and includes the semiannual site monitoring report, exceedance notification and confirmation procedures, constituent release confirmation, and other potential contamination sources.
- **Section 7** provides a list of the references.

2.0 AAFB and OB/OD Range Background

2.1 Geology

AAFB is situated on an undulating limestone plateau with karst features. The geology of the Main Base consists of outcrops of the Mariana and Barrigada Limestones, underlain at the basement by the volcanic rocks of the Alutom Formation. The Pliocene- and Pleistocene-aged Mariana Limestone consists of reef and lagoonal limestone, which is clay-rich. Permeability ranges from moderate to high near the older volcanic uplands to very high in deposits that contain fissures and channels. The minor reef beach deposits are composed of mostly sand and gravel with some deposits of volcanic sand (Gingerich, 2003).

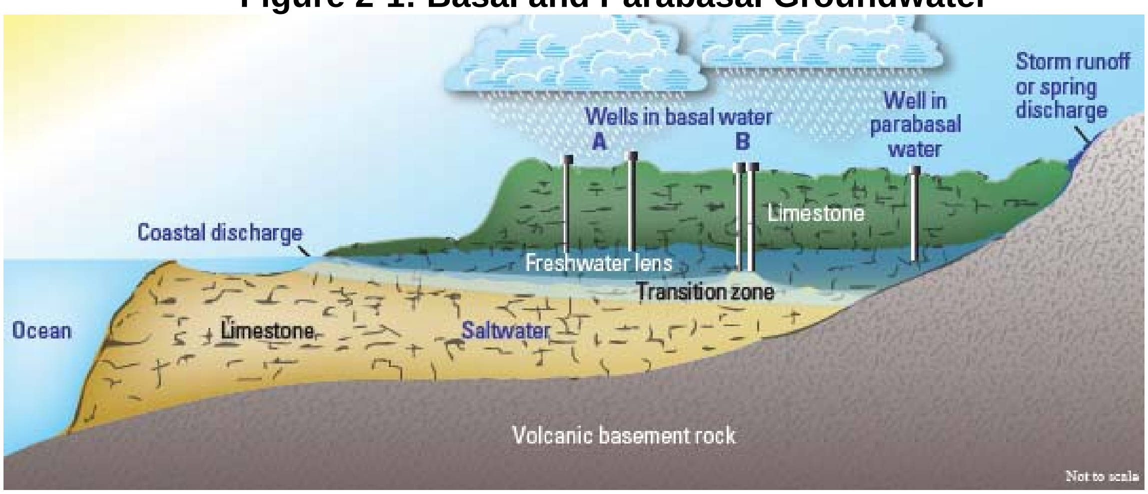
The Miocene-aged Barrigada Limestone lies beneath Mariana Limestone and is generally a deep-water deposit of medium to coarse grained textures that ranges from compact and well- lithified to extremely friable. It is the principal water-bearing unit, and contains abundant solution openings, voids, and fissures. The Eocene/Oligocene-aged Alutom Formation unconformably underlies the Barrigada Limestone and consists of well-bedded, fine-to-coarse-grained volcanic and volcanoclastic rocks (Tracey et al, 1964). The OB/OD Range exists in an area that is mainly composed of Mariana Limestone (reef beach deposits) without Barrigada Limestone.

2.2 Groundwater and Groundwater Seeps

Throughout most of northern Guam, fresh groundwater floats on seawater in an approximate buoyant equilibrium described by the Ghyben-Herzberg model. Practical application of this model, when combined with the effect of dynamics of the freshwater flow, will result in a lens-shaped configuration of freshwater with parabolic surfaces at both the freshwater-air interface and freshwater-seawater interface (AAFB, 2006b).

The groundwater aquifer on northern Guam is commonly referred to as the Northern Guam Lens (NGL). The NGL occurs under two conditions, basal and parabasal. The basal groundwater lens is the portion of the freshwater lens described by the Ghyben-Herzberg model where the lower boundary of the freshwater lens directly overlies the transition zone or seawater. As the groundwater moves inland, to areas where the base of the NGL directly intercepts the rising Alutom volcanics, the Ghyben-Herzberg model no longer applies. The volcanic surface becomes the lower boundary and the fresh water that rest directly on volcanic rocks is referred to as parabasal groundwater. A general illustration of basal and parabasal groundwater is provided in Figure 2-1.

Figure 2-1: Basal and Parabasal Groundwater



Source: *USGS Fact Sheet 2010-3084*

The OB/OD Range is located approximately 150 to 200 feet from the shoreline of the Pacific Ocean. The NGL is under basal conditions at the OB/OD Range, and the freshwater lens is expected to be very thin to non-existent due to the mixing action caused by tidal fluctuations. Furthermore, due to its proximity to the ocean, the NGL at this site probably consists of a relatively thin zone of brackish water floating atop seawater.

Regionally, the groundwater flow direction in the NGL moves from the limestone/volcanic contacts of the Alutom formation toward the sea (AAFB, 2006a). The Dye Trace Study (DTS) conducted in 2006 at the OB/OD Range supports that flow direction. Dye concentrations demonstrated groundwater movement from the OB/OD Range toward the seeps located in the beach area (AAFB, 2006b). No additional aquifer tests have been conducted after the 2006 DTS since only well IRP-52 exists within a 150 meter radius of the OB/OD Range.

A DTS conducted in the AAFB Landfill Complex indicated that groundwater in the vicinity of the OB/OD Range travels through the aquifer at average velocities ranging from 20 to 36 feet per day (AAFB, 2006b). The velocities increase as the groundwater reaches the shore and exits from the seeps.[1]

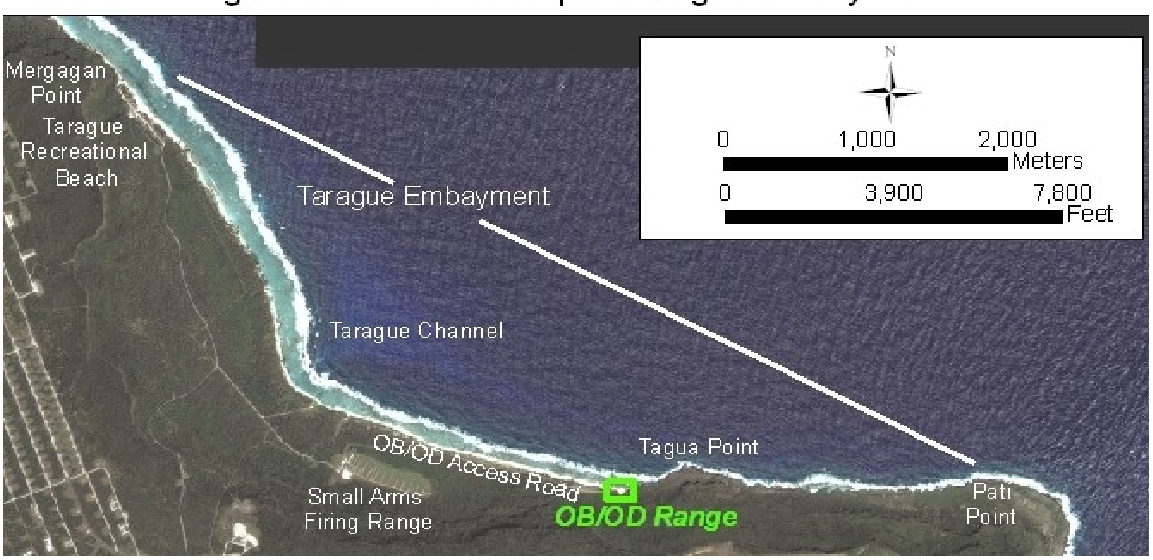
2.3 Land Use, Sensitive Receptors and Essential Habitats

The OB/OD Range is located in a locked, fenced area of AAFB, with restricted access and precludes the building or inhabitation of any permanent structures. Human receptors are limited to EOD personnel and wildlife that occasionally access/use this site. As such, human exposures to the OB/OD Range are limited (AAFB, 2006b).

2.4 Cultural Resources

The OB/OD Range is located within an area of the Tarague Historic District, which has been evaluated for inclusion in the National Register of Historic Places (Earth Tech, 2003). The Tarague Historic District is a group of archaeological sites located within the Tarague Embayment. The OB/OD Range is situated in the eastern portion of the Tarague Embayment as depicted in Figure 2-2 (AAFB, 2006b).

Figure 2-2: Location Map of Taragueo Embayment



[1] The generalized velocity of groundwater flow at the OB/OD range is presumed to increase because hydraulic conductivity increases as groundwater moves more rapidly in gravels and sands than in clay or tiny rock fractures where movement is slower (UCD, 2003). The hydraulic conductivity of the NGL can vary from speeds of 2 feet/day to over 20,000 feet/day (AAFB, 1998).

3.0 Groundwater Sampling and Analysis Plan

3.1 Sampling Locations

IRP-52, which is upgradient of the OB/OD Range, shall be utilized as a background sample location (See Figure 3-1). This well was installed by the Installation Restoration Program (IRP) in October 1996 to test for contaminants at a nearby landfill (Site 11) and Solid Waste Management Unit (SWMU-29B). IRP-52 was selected to provide background samples that are representative of the quality of groundwater that has not been affected by potential contaminants from the OB/OD Range. This background location follows the *RCRA Groundwater Monitoring Draft Technical Guidance* (USEPA, 1992b).

There are no existing wells downgradient of the OB/OD Range. Installation of new downgradient wells would be problematic. As discussed in Section 2.0, the OB/OD Range is located within the Tarague Historic District where drilling to install downgradient wells would require consultation with the Guam Historic Preservation Officer (GHPO). The OD Unit is less than 150 feet from the shore (AAFB, 2006a). This proximity would make the installation of downgradient wells impractical as they would likely sustain damage from open detonation and would be located too close to the ocean.

Four groundwater seeps (SP-1, SP-2, SP-4, and SP-5) will serve as the downgradient sample locations (See Figure 3-2). These seeps were used during the Dye Trace Study (DTS) conducted in June 2006 at the OB/OD Range. Hydraulic connectivity between the upgradient well IRP-52, the OB/OD Range, and the seeps were observed during the study. The results of the DTS also recommended these seeps as groundwater monitoring locations because they demonstrated the strongest dye concentrations coming from the OB/OD Range. Further, the location of the seeps is geographically adjacent to the hazardous waste management area limits, which follows guidance conditions in the *RCRA Groundwater Monitoring Draft Technical Guidance* (USEPA, 1992b). These locations are ideal to intercept potential pathways of contaminant migration.

Table 3-1 below provides survey coordinates for the upgradient well for background data collection and the downgradient groundwater seeps which will serve as the detection monitoring points. At the time of sampling, if there is no flow at the groundwater seeps, alternate monitoring points at the nearest distance from the OD/OD Range and listed coordinates will be selected.

Table 3-1: Summary of Sample Locations

Well/Seep[2]	Survey Coordinates[3]	
IRP-52	207653.28 Northing	226771.98 Easting
SP-1	209814.4 Northing	226722.5 Easting
SP-2	209833.5 Northing	226486.0 Easting
SP-4	209938.4 Northing	226205.9 Easting
SP-5	209953.5 Northing	225931.0 Easting

[2] Seep numbers obtained from Figure 2-1 of the AAFB Dye Trace Study Results at the OB/OD Range, September 2006.
[3] Seep coordinates obtained from Table 2-2 of the AAFB WP/SAP for Dye Trace Study and Groundwater Monitoring at OB/OD Range, May 2006.

Figure 3-1: Map of Upgradient Well

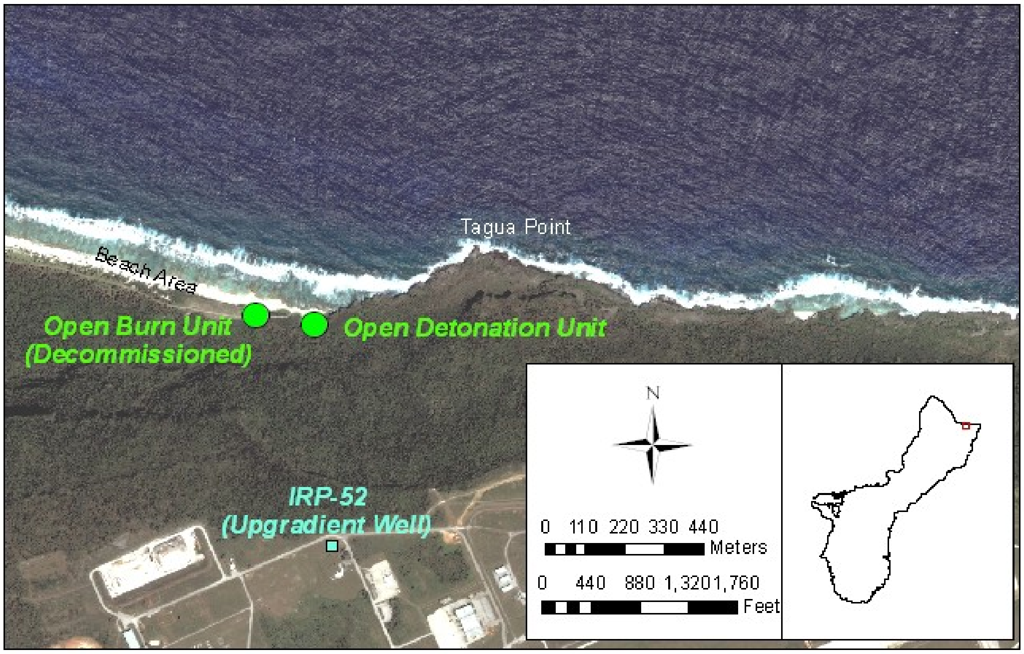
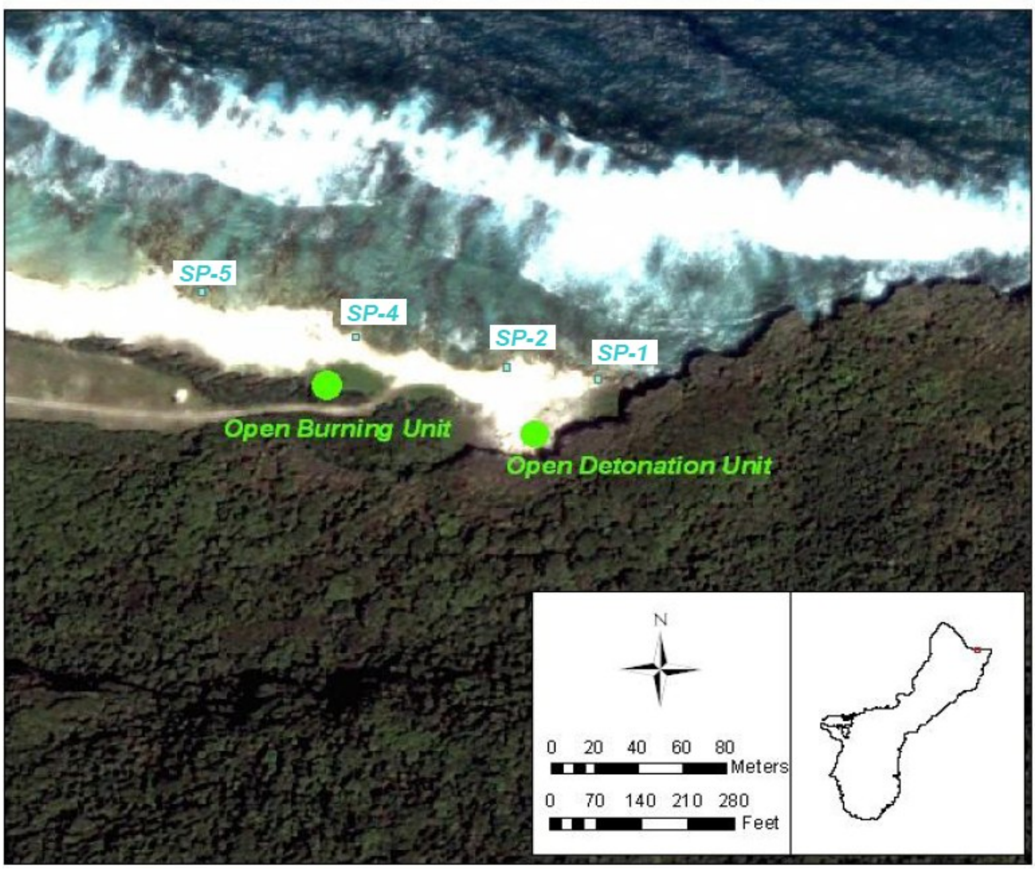


Figure 3-2: Map of Downgradient Seeps



3.2 Hazardous Constituent Criteria

The permit requires the establishment of criteria for determining whether or not a release (which may have adverse effects on human health and the environment) has occurred from the OB/OD Range to groundwater at the monitoring points. The criteria must be based either on risk-based concentration limits or background concentrations. The permit-stipulated chemicals of concern include: lead, mercury, bis(2-ethylhexyl)phthalate (DEHP or di(2-ethylhexyl)phthalate), and cyclotrimethylenetrinitramine (RDX or hexahydro-1, 3, 5-trinitro-1, 3, 5-triazine). If DEHP is not detected during the first two years of detection monitoring or its presence can be attributed to non-OB/OD Range activities, it will be removed from the constituent list.

In order to expedite implementation of this groundwater monitoring plan, AAFB will utilize risk- based concentration limits to determine whether or not a release has occurred from the OB/OD Range. This approach would allow AAFB to begin the detection monitoring phase immediately after background data collection because the criteria for determining a release has been predetermined (whereas, if background concentration limits were selected, AAFB would be required to submit to Guam EPA proposed limits subsequent to the submittal of this GWMP).

This GWMP will use risk-based concentration limits provided by United States Environmental Protection Agency (USEPA) as depicted in Table 3-2 to determine if a release has occurred. The values in the table are based on the *USEPA Regional Screening Level Summary Table* (USEPA, 2011). Results from the detection monitoring phase will be compared to these values to determine if any of the hazardous constituents pose a potential risk to human health or the environment.

Table 3-2: Hazardous Constituent Risk-Based Concentration Limits

Parameter	MCL (µg/L)
DEHP or bis(2-ethylhexyl)phthalate or di(2-ethylhexyl) phthalate	6.0
Lead & Compounds	15.0
Mercury (elemental) **RDX or cyclotrimethylenetrinitramine or hexahydro-1,3,5-trinitro-1, 3, 5 - triazine**	2.0 0.25[1]

Source: *USEPA Regional Screening Level Summary Table* (May 2011)
MCL – Maximum Contaminant Level
µg/L – microgram per liter
[1] Value taken from USEPA 8330 Explosives Method Reporting Limit

3.3 Sampling Phases and Frequency Schedule

This GWMP describes three distinct phases of sampling: Background Data Collection; Detection Monitoring; and Verification Resampling. These phases were developed per permit requirements and USEPA Technical Guidance, and are summarized in Table 3-3 below.

Table 3-3: Summary of Sampling Phases

Phase	Frequency	Locations	Parameters	Number of Water Samples Collected
Background Data Collection: Groundwater Geochemistry	Semiannually during 1st year only	IRP-52 and four seeps (SP-1, SP-2, SP-4, and SP-5)	Chloride, Sulfate, Sodium, Potassium, Magnesium, Calcium, Bicarbonate	2 from each location
Background Data Collection: Constituent Baseline Levels	Quarterly during 1st year only	IRP-52 and four seeps (SP-1, SP-2, SP-4, and SP-5)	DEHP, Lead, Mercury, RDX	2 from each location
Detection Monitoring	Semiannually starting the 2nd year of Implementation	IRP-52 and four seeps (SP-1, SP-2, SP- 4, and SP-5)	DEHP, Lead, Mercury, RDX	1 from each location (including 1 blind duplicate)
Verification Resampling	Immediately upon identification of exceedance	Four seeps (SP-1, SP-2, SP-4, and SP-5); IRP-52 (only if exceedance detected)	Parameter(s) with Exceedance	1 from each location (including 1 blind duplicate)

3.4 Background Data Collection

Groundwater geochemistry data and background water quality/constituent baseline levels were collected in 2014 and 2015 under the original permit requirements.

3.4.1 Groundwater Geochemistry

The inorganic geochemistry of the groundwater at the OB/OD Range was analyzed using both upgradient well, IRP-52, and downgradient seep locations, SP-1, SP-2, SP-4, and SP-5. A total of two (2) water samples were taken from each location in June 2014 and March 2015. Chloride, sulfate, sodium, potassium, magnesium, calcium and bicarbonate were analyzed for their total ionic concentrations. Semiannual detection monitoring samples collected in May 2015 do not show any differences in groundwater quality between the sample locations over time. The results indicate similar geochemistry, as described in the September 2006 Dye Trace study results at the OB/OD Range, indicating that groundwater from the upgradient and the downgradient locations originate from the same source.

3.4.2 Background Water Quality / Constituent Baseline Levels

Background water quality levels were established by taking two (2) water samples quarterly in June 2014, September 2014, November 2014, and March 2015, from the upgradient well, IRP-52, and downgradient seeps, SP-1, SP-2, SP-4, and SP-5, to establish baseline levels for background chemical concentrations or existing constituent/parameter levels (USEPA, 2009). All samples were analyzed for the parameters listed in Table 3-2 (DEHP, lead, mercury and RDX).

3.5 Detection Monitoring

Semiannual sampling for detection monitoring will be conducted upon completion of background data collection. During detection monitoring, one (1) water sample each from upgradient well IRP-52 and downgradient seeps SP-1, SP-2, SP-4, and SP-5, will be collected approximately 7 to 21 days following an OB/OD event and analyzed. One (1) blind duplicate shall be submitted to the laboratory for each monitoring event.

3.6 Verification Resampling

If the concentration levels of contaminants from a sampled seep during detection monitoring are above the risk-based concentration limit(s), a verification sample must immediately be collected at the seep where the exceedance occurred. Analytical results shall be analyzed for the contaminants that exceeded concentration limits. Sampling procedures must follow those outlined in Section 4.0. AAFB must notify Guam EPA within seven (7) days of the initial exceedance determination as stipulated in Sections IV H(4)(a) and H(4)(b) of the permit.

3.7 Permit Modification for Compliance Monitoring

Per Section IV H(4)(d) of the permit, if verification resampling confirms an exceedance, AAFB must submit to Guam EPA, within ten (10) days of receipt of analytical results, a written notice that identifies the concentration(s) of these contaminants at each monitoring location. AAFB must also submit a notice of intent for an application for permit modification containing a corrective action feasibility plan. See Section 6.0 for details on permit modification requirements.

3.8 Groundwater Flow and Direction

Per Section IV G(3) of the permit, groundwater flow rate and direction in the uppermost aquifer shall be determined at least annually. However, as discussed in Section 2.2 of this GWMP, groundwater flow rate and direction have been established for the uppermost aquifer and verified in a previous DTS conducted at the landfill complex. Groundwater elevation maps from 2003 indicate that the groundwater in the area flows in a north-northeast direction that eventually discharges into the Pacific Ocean (AAFB, 2011). A site-specific aquifer test to determine groundwater flow rate and direction is not feasible at the OB/OD Range because only well IRP-52 exists within a 150 meter radius of the OB/OD Range.[4]

[4] Groundwater monitoring systems, as stated in 40 CFR 258.51(a)(2), should have wells that represent the quality of ground water passing the relevant point of compliance as specified by the Director of an approved State under §258.40(d) or at the waste management unit boundary in unapproved States. Design criteria, as stated in 40 CFR 258.40(d), provides that the “relevant point of compliance by the Director of an approved State shall be no more than 150 meters from the waste management unit boundary and shall be located on land owned by the owner of the MSWLF unit.”

3.9 Monitoring Well Decommissioning

Per Section IV B(3) of the permit, monitoring wells must be properly decommissioned and closed once they no longer serve the purpose for which they were constructed. AAFB shall submit a written statement to the Administrator providing details for abandoning wells within thirty (30) days of removal from the monitoring program and following the guidance set forth in 22 GAR, Water Resource Development and Operating Regulations (amended August 1990).

Before the hole is filled, a licensed and certified well driller shall determine the well condition, details of construction, and whether there are obstructions that will interfere with filling and sealing. The certified well driller shall submit an application along with a description of the work, site map, and construction diagram of the well to be abandoned. Forty-eight (48) hours prior to the abandonment, AAFB shall notify the Administrator of the intent to commence work in order to give Guam EPA the opportunity to inspect the work and insure that proper procedures are carried out.

Wells will be sealed starting at the bottom of the well using a tremie pipe to place the appropriate fill material and impervious sealing material. All surface completions, traffic vaults, and well head materials shall also be removed.

4.0 Sampling Procedures

4.1 Sample Collection

The seeps are exposed to significant tidal mixing, which would result in high chloride concentrations. It is important to minimize the intermixing of the seawater with the groundwater seeps to obtain samples that are representative of the groundwater from the aquifer beneath the OB/OD Range. To minimize this effect, all samples shall be collected thirty (30) to sixty (60) minutes[5] prior to the lowest tide (lower low water) as predicted in the charts posted by the National Oceanic and Atmospheric Administration (NOAA) found in the website: http://tidesandcurrents.noaa.gov/geo.shtml?location=1631428; and by also obtaining the current moon phase calendar during the Spring tides to find the predicted date for a new moon or full moon appearance (see website: http://www.calendar-365.com/moon/moon-calendar.html).[6] Procedures and techniques for well and seep sample collection, sample preservation and shipment, analytical procedures and chain-of-custody control are discussed in the sections below.

Table 4-1 provides a summary of analytical methods and sample requirements for samples collected during the groundwater geochemistry investigations of the background data collection phase. Table 4-2 provides a summary of the analytical methods and sample requirements for the samples collected during background data collection, detection monitoring and verification resampling phases.

Table 4-1: Analytical Methods and Sample Requirements for Groundwater Geochemistry Samples

Analyte	Analytical Method	Sample Container/Size	Preservative	Holding Time
Chloride	SM 4500 Cl^-	(1)500-mL Poly	None	28 days until analysis
Sulfate	SM 4500 SO_4^{2-}E	(1)500-mL Poly	None	28 days until analysis
Sodium, Potassium, Magnesium, Calcium	6010C	(1)1-Liter Poly	HNO_3	180 days (6 months)
Bicarbonate	SM 2320B	(1)1-Liter Poly	None	14 days until analysis

Table 4-2: Analytical Methods and Sample Requirements for the Permit-Stipulated Parameters

Analyte	Analytical Method	Sample Container/Size	Preservative	Holding Time
RDX	8330	(2) 1-Liter Amber Glass	None	7 days to extraction; analyze within 40 days after extraction
Lead	6010C	1-Liter Poly	HNO_3	6 months (180 days)
Mercury	7470A	500-mL Poly	HNO_3	28 days
DEHP	8270C	1-Liter Amber Glass	None	14 days

[5] Recommendation based on dye concentration levels and data that support that some seeps "turn-off" or do not have available flow during extreme low tides (AAFB, 2006a).
[6] Spring tides occur during the full moon and new moon, when the gravitational pull of the moon and sun are combined resulting in very high tides or very low tides. In the Pacific, Spring tides occur between eleven (11) and fourteen (14) days after the previous new or full moon (UK Hydrographic Office, 2011).

4.1.1 Upgradient Well (Groundwater) Sampling

Water Level Measurements

The water level at IRP-52 shall be measured prior to each sampling event using a water level indicator (such as a Solinst®) or equivalent device, by slowly lowering the probe into the monitoring well until it contacts the water surface, resulting in an audible alarm. The reading shall be obtained from an established mark on the well casing, measured to the nearest 0.01 foot. The groundwater level measurement will be recorded into a field log book. The appropriate procedure to be used by personnel for measuring groundwater levels is discussed in detail in Appendix A SOP #3, Groundwater Level Measurements.

Sea water elevations relative to mean sea level (MSL) shall also be obtained for the same period well water level measurements are obtained. Data for sea water elevations will be obtained from NOAA database at the following website: *http://tidesandcurrents.noaa.gov/geo.shtml?location=1630000*.

Low-Flow Purging and Sampling

Prior to collecting a sample from the upgradient well, groundwater will be purged. Low-flow purging (also commonly referred to as micro-purging, low-stress purging, low-impact purging, or minimal drawdown purging) involves the same approach and equipment as low-flow sampling.

Groundwater monitoring well IRP-52 will be purged and sampled using a portable lowflow double valve pump. During low-flow purging, field measurements (pH, temperature, and conductivity at a minimum) will be monitored. The well will be purged until field measurements have stabilized to within 10% of the previous readings.

An example of a field setup of a portable low flow double valve pump assembly is illustrated in Appendix B. Appendix C provides a breakdown of the process and a listing of SOPs to be used for sampling; Appendix A includes all the SOPs required for sampling of the upgradient well (IRP-52).

4.1.2 Downgradient Seeps Sampling

Appendix C provides a detailed discussion of the process and a listing of SOPs to be used for sampling; Appendix A includes all the SOPs for sampling of the downgradient seeps.

Field Chloride Test

Field chloride tests shall be conducted before obtaining a grab sample from the seeps using a field chloride ion test kit.

Due to the proximity of seeps (sample locations) to the Pacific Ocean, there will be significant tidal mixing. As a result, chloride concentrations will fluctuate. Chloride concentrations at the seeps will range between 500 and 5,000 mg/L; as such, a chloride reading within this range shall constitute a fresh water seep sample (AAFB, 2006b).

Grab Sampling

The seep samples shall be collected in accordance with SOP #2 Groundwater Seeps Sampling and by using the Semiannual Groundwater Seeps Sampling Form (Appendix A), with the exception of chloride measurements. If flow is minimal or does not allow for collection with a transfer bottle, it may be necessary to use a battery or hand-operated peristaltic pump with Teflon® hose to obtain a sample.

4.2 Sampling Documentation, Handling and Packaging

4.2.1 Well Sampling Form

All well samples collected will be documented using well sampling form. One well sampling form shall be completed per sample per well. At a minimum, the following information shall be noted:

- Sample Location
- Personnel Present
- Sampling Date and Time
- Time Departing Site
- Weather Conditions
- Depth-to-Water
- Sampling Device Used
- Well Appearance Description
- Purge Method
- Purge Start Time
- Purge Completion Time
- Total Purge Volume
- Well Water pH Reading
- Conductivity
- Temperature
- Estimated Flow Rate
- Water Turbidity
- Water Odor (if any)

Examples of the well sampling form can be found in Appendix A SOP #1.

4.2.2 Groundwater Seeps Sampling Form

All seep samples shall be documented using the Semiannual Groundwater Seeps Sampling Form. Well measurements and well sampling methods will not apply to seep samples. An example of the Semiannual Groundwater Seeps Sampling Formis found in Appendix A SOP #2.

4.2.3 Sample Labeling

To prevent misidentification of samples, all containers shall be pre-labeled. Sample identification numbers will be affixed to each sample container and entered on the chain-of-custody form. The sample number will uniquely identify the sample to a specific location. The labels will be filled out using waterproof ink and be protected with clear, water-resistant tape. The labels will contain the following information:

- Sample Date and Time;
- Sample Location;
- Analysis Required;
- Sampler’s Initials.

Both field and duplicate samples shall be labeled in the same manner. Sample identification numbers shall be determined by the analytical laboratory. For samples requiring multiple containers, a single sample identification number shall be used on all containers (AAFB, 2006b).

4.2.4 Chain-of-Custody

Chain-of-Custody (COC) procedures will provide an accurate written record that can be used to trace the possession of each sample from the time it is collected until completion of all required analyses. The coolers in which samples are packed will be accompanied by a COC record. When transferring samples, the assigned personnel relinquishing and receiving them will sign, date, and note the time on the chain-of-custody record to document sample custody transfer. Details pertaining to custody procedures can be found in Appendix A, SOP #9. The chain-of-custody record will include the following types of information:

- Collection Date and Time;
- Sample Matrix;
- Sample Location;
- Number of Containers;
- Analytical Test Parameters;
- Signature of Collector;
- Signature(s) of Person(s) Involved In Chain and Dates of Possession.

4.2.5 Sample Packaging and Delivery

All collected samples will be packaged and delivered to a certified laboratory in a manner that will ensure the safety and integrity of every sample. Sample procedures will be in accordance with applicable federal and territorial requirements.

Each sample bottle set will be separated from other sets with a sealed plastic bag. A cooler will be used as a shipping container and the temperature of approximately 4 degrees Celsius (°C) ± 2° C maintained by using ice or frozen gel packs. The drain plug will be taped shut from the inside and outside. Paperwork accompanying the samples will be placed inside a plastic bag, sealed, and taped to the inside of the cooler lid. Custody seals will be placed across the lid and body of the cooler.

Sample transport time to a certified laboratory shall not exceed 6 hours. All shipments shall be in compliance with applicable packaging, labeling and shipping requirements as indicated in SOPs #8 and #9of Appendix A.

4.3 Equipment Decontamination

All sampling and measuring equipment shall be thoroughly decontaminated with distilled water and non-phosphate detergent (e.g. Liquinox or Alconox) prior to and after each use at sampling locations. The water level indicator tape shall be wiped with clean paper towels while reeling in from each well. Decontaminated sampling equipment should not be allowed to come into contact with the ground or other contaminated surface prior to sample collection. See Appendix A SOPs #1 and #10 for further information.

4.4 Investigation Derived Waste

All Investigation Derived Waste (IDW) generated during well purging and water sample collection activities must be properly packed in approved United States Department of Transportation (DOT) containers. The containers must be labeled to include: project name, project location, date, container contents, and emergency contact name and phone number. IDW containers and content shall be recorded in a field log. IDW shall be stored in a secure location until analytical (laboratory) results are obtained, and the IDW is accepted at a final disposal facility (hazardous or non-hazardous waste disposal facility). Maintain proper disposal manifests in project records. Filter membranes, gloves, and paper towels shall be disposed as solid waste. See Appendix A SOP #11.

4.5 Quality Assurance / Quality Control (QA/QC)

4.5.1 Field Duplicate Samples

Field duplicate samples will be collected to check for natural sample variance, and consistency of field collection techniques and laboratory analyses. Field duplicate samples will be submitted blind to the laboratory and analyzed for the same parameters as the original sample (AAFB, 2006b).

4.5.2 Field Blank

Field blanks will be collected and analyzed to detect contamination that may be introduced to the groundwater samples during sampling. The field blank will consist of deionized, distilled, containers. When a field blank is used to monitor ambient conditions during sampling, the container holding the field blank shall be opened, remain open throughout the process of filling all sample containers, and then closed thereafter. The sample location where the field blank is prepared will be identified on the field sampling form, along with any observations that may help explain anomalous results (i.e., potential sources of contamination). One field blank will be analyzed per 20 samples or one per day if less than 20 samples. The field blank will be handled in the same manner as the rest of the samples (AAFB, 2006b).

4.5.3 Equipment Rinsate Blank

Equipment rinsate blank samples will be used to assess the efficiency of the decontamination process and possible cross-contamination between samples. Equipment rinsate blanks will be collected and analyzed only when non-dedicated sampling equipment is used. Equipment rinsate blank samples will be collected by pouring laboratory-provided “analyte-free” water (distilled water) over decontaminated sampling equipment used for collecting various samples (AAFB, 2006b).

4.5.4 QA/QC Review of Data

Prior to statistical analysis, all data shall be reviewed by a certified laboratory QA officer for data verification and validation. QA/QC parameters will include measures of accuracy (percent recovery), precision (relative percent difference), and sample contamination (blank determination), if any. Data that appears questionable should be flagged and reevaluated by the QA officer.

All data shall then undergo a second level of review of historical trends analysis as they become available and compare those trends with new results; apparent visual outliers or other anomalies shall be flagged and reevaluated. If an apparent outlier or anomaly is detected, the data shall be reevaluated by the laboratory QA officer before accepting the result.

5.0 Statistical Analysis

AAFB shall perform statistical analyses upon receipt of the semiannual detection monitoring laboratory results. Statistical tests shall be performed for each constituent for each well and seep. The background data collected during the first year of plan implementation will be included in the statistical tests.

The statistical analysis will include inter-well and intra-well comparisons using combined Shewhart-CUSUM control charts, an approach that gives control limits for each constituent, to monitor hazardous constituents in the groundwater. This analysis will detect trends in constituent concentrations. If a significant increase in trend is apparent, AAFB shall treat the finding as if an exceedance has been identified as stipulated in Section IV A(1)(f) of the permit.

Per Section IV F(1) of the permit, four statistical methods may be used to evaluate groundwater results: Analysis of variance (ANOVA), parametric ANOVA, tolerance or prediction interval, and control chart. According to the EPA's Unified Guidance: Statistical Analysis of Groundwater Monitoring Data, at least 50% of the data should be detectable in order to compare either well means or medians. However, results for background and the 1st semi-annual detection monitoring have been mostly non-detects rendering the ANOVA and parametric ANOVA methods not applicable for evaluating groundwater data from the OB/OD Range.

5.1 Inter-Well Comparisons

Inter-well comparisons will compare the concentration of each hazardous constituent from each sampling location. This comparison will be useful in identifying variability between the upgradient well and downgradient seeps, thereby better attributing an exceedance either to other potential sources of contamination (outside of the EOD) or to the OB/OD Range activities.

5.2 Intra-Well Comparisons with Shewhart-CUSUM Control Charts

Intra-well comparisons using Shewhart-CUSUM control charts will provide two types of analyses. First, the control charts will indicate whether or not a sample from the well or seep has exceeded the risk-based concentration levels. Second, the control charts will compare the sample results at each well and seep, with previous results and determine if concentrations of a hazardous constituent are significantly increasing.

The concentration of each monitored parameter at each well/seep will also be compared to its respective background concentration to determine if there has been a release. The comparison involves creating a plot (time vs. concentration) of the parameter on its appropriate Shewhart- CUSUM control chart.

5.3 Groundwater Monitoring Analysis Software

DUMPStat, a computer program, will be utilized to perform the above-described routine trend analyses of the sampling results at each well and seep. DUMPStat imports lab data for each sampling event at each well and seep, and provides complete analysis of constituents in a simple step. It utilizes algorithm calculations that can evaluate error rates for various facilities. It also automatically selects the most appropriate statistics to minimize both false positive and false negative rates. DUMPStat is consistent with EPA RCRA Subtitle C and D regulations, all applicable EPA regulations and guidance, and ASTM (American Society for Testing and Materials) D6312-98 guidance. DUMPStat utilizes prediction limits, tolerance limits, and control charts for statistical evaluation and it addresses distribution abnormalities by correcting for spatial variability in intra-well comparisons and seasonal variability over time. Per Section IV F(2)(b) of the permit, error levels of no less than 0.01 for each event or no less than 0.05 for multiple comparisons must be maintained. However, these limits only apply to ANOVA, and not tolerance limits, prediction limits, or control charts. Tolerance and prediction limits will not be used unless the distribution is abnormal, in which case, a statistical method in addition to control charts may be needed.

6.0 Record Keeping and Reporting

6.1 Record Keeping – Data Entry

AAFB shall maintain a written facility operating record for the OB/OD Range for a minimum of five (5) years. The following must be recorded:

- Monitoring, testing, and analytical data obtained from the range;
- All computations and results associated with evaluating groundwater monitoring data;
- Groundwater monitoring data collected and actual level of constituents.

6.2 Reporting

6.2.1 Semiannual Site Monitoring Report

A semiannual site monitoring report shall be submitted to Guam EPA within sixty (60) days of receipt of analytical results of each semiannual sampling event. The following shall be included in the semiannual report:

- A description of the sampling event(s);
- Analytical results of samples collected; and
- A determination of whether or not there is an exceedance of a risk-based concentration limit.

6.2.2 Initial Exceedance Notification Procedure

If the semiannual results show that an exceedance of a risk-based concentration limit has occurred or if there is a significant trend toward increased concentrations, AAFB shall:

- Notify Guam EPA within seven (7) days of the determination;
- Immediately resample the groundwater in the well/seep(s) that exhibited the increase;
- Determine the concentration of the particular constituent(s) that exhibited the increase;
- AAFB may choose to establish the background value(s) for the particular constituent(s);
- AAFB may also propose changes in operating and/or monitoring procedures to address the apparent trend increase.

6.2.3 Exceedance Confirmation Procedure

If an exceedance of a risk-based concentration limit is confirmed by the resampling results (verification resampling) AAFB shall submit to Guam EPA, a written notice, within ten (10) days of receipt of analytical results. The notice will identify the concentration of any constituent(s) in the groundwater at each monitoring well/seep location. AAFB also must submit a notice of intent for an application for permit modification containing a corrective action feasibility plan (CAFP).

Permit Modification Requirements

The permit modification must include the following:

- An identification of the concentration of constituents found in the groundwater at each monitoring well/seep(s) at the point of compliance;
- Any proposed changes to the groundwater monitoring system at the OB/OD Range necessary to meet the requirement of compliance monitoring;
- Any proposed changes to the monitoring frequency, sampling and analysis procedures, methods or statistical procedures necessary to meet the requirements of compliance monitoring;
- For each hazardous constituent found at the point of compliance, a notice of intent to seek an alternate concentration limit (ACL) for a hazardous constituent;
- If no alternate ACL will be sought, then AAFB shall submit to Guam EPA a schedule for

submittal of a CAFP in accordance with Part VI of the Guam Hazardous Waste

Management Regulations (GHWMR) (40 CFR Part 264.100) within one hundred eighty (180) days.

Submittal of CAFP

If AAFB chooses to submit to Guam EPA a CAFP, it must be developed in accordance with Part VI of the GHWMRs, and must be submitted to Guam EPA within one hundred eighty (180) days of confirmation of the release as discussed in Section 6.2.4.

6.2.4 Other Potential Sources of Contamination

If an exceedance determination of a risk-based concentration limit is confirmed by verification resampling, then AAFB may demonstrate that a source other than a regulated unit within the OB/OD Range caused the increase; or, that the increase resulted from a possible error in sampling, analysis, or evaluation.

If AAFB chooses to do this, then AAFB shall submit to Guam EPA:

- Written notice within seven (7) days that it intends to make a demonstration;
- A report, within ninety (90) days of the notice, which demonstrates that a source, other than a regulated unit within the OB/OD Range or possible error in sampling, analysis, or evaluation, caused the increase;
- An application for permit modification, within ninety (90) days of the notice, to make any appropriate changes to the groundwater monitoring program.

AAFB shall continue to monitor in accordance with this GWMP pending Guam EPA permit modification approval.

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APPENDICES

APPENDIX A: AAFB STANDARD OPERATING PROCEDURES
APPENDIX B: LOW FLOW DOUBLE VALVE PUMP FIELD SET-UP
APPENDIX C: PROCESSES AND REQUIREMENTS FOR SAMPLE COLLECTION

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APPENDIX A: AAFB STANDARD OPERATING PROCEDURES

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GROUNDWATER WELL SAMPLING (IRP-52)

1.0 SCOPE AND APPLICATION

Groundwater samples collected from groundwater monitoring wells provide vital information that can be used in the evaluation of groundwater quality and movement in the aquifer. This Standard Operating Procedure is applicable only to the collection of representative groundwater samples at well IRP-52. Samples are to be collected from well IRP-52 using a low-flow double valve pump.

Groundwater sampling procedures will be split into two, purging and sampling. Purging is the process of removing stagnant water from the well prior to sampling and replacing it with groundwater from the adjacent formation. This will ensure that the sampler(s) collect a more representative sample of the actual aquifer condition.

2.0 EQUIPMENT

- Electronic Pump Control Unit (Solinst Model 464)
- Portable Double valve pump (Model 408 SS 1.66” diameter)
- Electronic water level indicator
- Portable nitrogen air tank
- YSI 556 Multi-probe meter (pH, specific conductance, and temperature)
- Orion Star A214 chloride meter
- pH buffer solution (4, 7, and 10)
- Specific Conductivity calibration solutions; 1,000 µS and 10,000 µS
- Deionized water
- Field Logbook and pen
- Container to containerize purged water
- Plastic sheeting
- Cotton gloves
- Nitrile gloves
- Glass beaker
- Sample bottles
- Coolers and Icepacks
- Camera
- Activity Hazard Analysis

GROUNDWATER WELL SAMPLING (IRP-52)

3.0 PROCEDURES

3.1 All staff involved in the sampling of well IRP-52 will read Andersen AFB Activity Hazard Analysis (AHA) and follow applicable requirements and procedures.

3.2 Calibrate water quality instrument for pH, specific conductance, and temperature and chloride using SOPs #4, #5, #6 and #7. Record results on the Equipment Calibration Daily Log Sheet.

3.3 Lay sample bottles on a plastic sheeting.

3.4 Remove well cap.

3.5 Using an electronic water level indicator, measure the depth to water from the reference point on the top of the well casing and record the depth in hundredths of a foot in the field logbook and in the Semiannual Groundwater Sampling Form (Attachment A).

3.6 Connect the Air Supply Line to the Air fitting on the control unit. Attach the other end of the supply line to the fitting on the nitrogen air tank regulator.

3.7 Connect the Drive Line from the Air Out fitting to the fitting on the reel (drive and sample line).

3.8 Connect the Sample Line and Drive Line (from the tubing reel) to the assembled double valve pump.

3.9 Attach the stainless steel safety line (Solinst Tag Line) to the eye bolt on the double valve pump.

3.10 Attach a short (3 ft.) length of ¼" OD sample line to the sample connector located on the reel.

3.11 Using the Tag Line, carefully lower the double valve pump down the well 10 feet below the water table surface.

3.12 Press any button on the keypad to turn the Control Unit on.

3.13 Set the nitrogen gas supply regulator to 250 psi.

3.14 Set the Control Unit to 250 psi.

3.15 Set the drive/vent cycle to 75 drive and 80 cycle.

Purging

3.16 Start the selected drive/vent cycle.

3.17 With pump operating, monitor and record field parameters approximately once every 1 Liter. Measure temperature, pH, and specific conductivity. Record all results in the field logbook and transfer this information to the Semiannual Groundwater Sampling Form. Continue purging until the field parameters have stabilized. Water Chemistry is considered stabilized when the following conditions have been met for three consecutive readings:

- Change in temperature is within ± 1°C,
- pH is within ± 0.1 unit
- Conductivity is within ± 5%

Sample Collection

3.18 For RDX and DEHP, fill sample bottles directly from the discharge tubing.
3.19 Record the required information for each sample in the field logbook and transfer this information to the Semiannual Groundwater Sampling Form.
3.20 Immediately place the sample into a cooler with ice. Refer to SOPs #7 and #8 for sample packing/shipping and sample custody procedures, respectively.

Decontamination

3.21 After sampling well IRP-52 with the portable double valve pump, decontaminate pump as follows:

- With the tubing on the pump reel, scrub the outside of the pump and the tubing (submerged below the water table), with a detergent solution consisting of potable water and Liquinox, or equivalent laboratory grade detergent.
- Place the pump in a clean drum with a solution of potable water and Liquinox.
- Start the pump and pump the solution through the tubing. The water and detergent solution can be recycled in the container.
- Continue pumping for about 15 minutes. After circulating for 15 minutes, transfer the solution to the bulk IDW holding tank.
- Rinse the outside of the pump with potable water and place the pump in a clean container filled with only potable water and purge at least three to five tubing volumes.
- Do not recycle rinse water back into the drum.
- The remainder of the tubing column that was not in contact with groundwater will be thoroughly rinsed with potable water to ensure that

sufficient water is applied to rinse the outside of the tubing. This rinse water will be allowed to fall onto the ground.

3.22 At the end of each sampling day, pumps will be decontaminated in accordance with the procedures outlined in 3.21, wrapped or contained in plastic, and stored in an appropriate storage area. Pumps should not be stored in an area where volatile sources (e.g., household cleaning chemicals, fuels, oils) are present; pumps shall not be stored without appropriate decontamination. Prior to use, the outside of the pump and tubing should be thoroughly rinsed with clean water.

4.0 INVESTIGATIVE DERIVED WASTE MANAGEMENT

4.1 Purged water and decontamination fluid shall be handled in accordance with SOP #11.

4.2 Measure the chloride concentrations of all purged water, using a chloride meter, prior to disposal of purge water on the ground. If field chloride measurements exceed the USEPA National Secondary Drinking Water Regulations (NSDWR or secondary standard) value of 250 mg/L, then the purge water will be containerized and transported from the well to a temporary storage located at a designated staging area on Andersen AFB.

5.0 PRECAUTIONS

5.1 Protect equipment from contamination by storing on plastic sheeting or portable table.

5.2 Use a clean pair of gloves.

5.3 Avoid activities at the wellhead that may result in the introduction of foreign materials into the well.

6.0 ATTACHMENTS

Attachment A – Semiannual Groundwater Sampling Form

SEMIANNUAL GROUNDWATER SAMPLING FORM

Andersen AFB Open Burning Open Detonation
Semiannual Groundwater Sampling Form
(Detection Monitoring)

Well ID: IRP-52 Date:_____________
Reference Point/Top of Riser Pipe: ~2.5 feet By:_______________
Casing Diameter: 5 inches ___________________
Elevation/Depth to Top of Screen: 532 feet
Elevation/Depth to Bottom of Screen: 552 feet Mean Sea Level: __________
Depth to Water (DTW): __________ Water Column: ______________(552 – DTW = WC)

Semiannual

Field Analyses: Initial Purging

Time	pH	Temp (°C)	Specific Conductance (µohm/cm)	Chloride (mg/L)	Flow Rate (gpm)	Volume Purged (gal.)	DTW (ft.)	Observations (Color, Odor, etc.)

Field Analyses: During Purging $V = 3.14 \times r^2 \times L$;
V= volume, r= radius of pipe (0.0635m), L = length of water in column in meter (total depth – depth to water)

Time	pH	Temp (°C)	Specific Conductance (µohm/cm)	Chloride (mg/L)	Flow Rate (gpm)	Volume Purged (gal.)	DTW (ft.)	Observations (Color, Odor, etc.)

Analysis	Bottle Size	Preservative	Quantity	Method Number	Holding Time
Lead	1 500 mL HDPE	HNO_3 (5 ml)	1	6010C	180 days
Mercury	1 500 mL HDPE	HNO_3 (5 ml)	1	7470C	28 days
RDX	1 Liter Amber Glass	None	1	8330	7 days to extraction; analyze w/in 40 days after extraction
DEHP	1 Liter Amber Glass	None	1	8270C	14 days
Bottle Count:			**4**		

GROUNDWATER SEEPS SAMPLING (OB/OD RANGE)

1.0 SCOPE AND APPLICATION

This standard operating procedure (SOP) is to be followed when collecting groundwater samples from groundwater seeps occurring along the shorelines.

2.0 EQUIPMENT

- Field chloride meter
- pH, specific conductivity, and temperature meter
- GPS system
- Groundwater seeps coordinates
- Sample bottles
- Cooler and Icepack
- pH buffer solution (4, 7, and 10)
- Specific Conductivity calibration solutions; 1,000 µS and 10,000 µS
- Deionized water
- Field Logbook and pen
- Nitrile gloves
- Glass beaker
- Camera
- Activity Hazard Analysis

3.0 PROCEDURES

3.1 All staff involved in the sampling of the groundwater seeps sampling will read Andersen AFB Activity Hazard Analysis (AHA) and follow applicable requirements and procedures.

3.2 Locate groundwater seeps using the coordinates and the GPS system.

3.3 It may be necessary to scoop a depression in the beach sediment to allow a pool of water to form. Allow sediment to settle out, and then fill the sample bottle as described in step 3.5. If a depression cannot be scooped out, a new location will be chosen for sample collection. If there is no flow of water at the groundwater seep(s), alternate monitoring points at the nearest distance from the OB/OD Range will be selected.

3.4 Measure chloride concentration of seeps before sampling. A Chloride reading at the seeps between 500 mg/L to 5,000 mg/L constitutes a groundwater seep sample. Record chloride measurements in the field logbook.

GROUNDWATER SEEPS SAMPLING (OB/OD RANGE)

3.5 Collect a groundwater sample and measure pH, specific conductivity, and temperature. Record all measurements in the field logbook.

3.6 The groundwater will be collected into sample bottles as follows:

3.6.1 Collect groundwater seeps samples for semi-volatiles by submerging the sample containers into the groundwater seeps. If flow is minimal and sample bottles cannot be submerged, collect groundwater seeps samples using a transfer container such as a glass beaker. Transfer the collected groundwater seep sample from the transfer container into the semi-volatile sample bottles, place the cap on and secure.

3.6.2 Sample collection for mercury and lead can either be directly or by using a transfer container such a glass beaker.

3.6.3 Record the required information for each sample on the Semiannual Groundwater Seeps Sampling Form (Attachment A). Immediately place the sample into a cooler containing ice. Refer to SOPs #8 and #9 for sample packing/shipping and sample custody procedures, respectively.

4.0 PRECAUTIONS

4.1 Use gloves and appropriate foot wear when collecting groundwater seeps samples. Use personal protective equipment outlined in the Activity Hazard Analysis. Avoid activities at the wellhead that may result in the introduction of foreign materials into the well.

5.0 ATTACHMENTS

Attachment A – Semiannual Groundwater Seeps Sampling Form

SEMIANNUAL GROUNDWATER SEEPS SAMPLING FORM

DZSP 21

Andersen AFB Open Burning and Open Detonation
Semiannual Groundwater Seeps Sampling Form
(Detection Monitoring)

Location (Seep ID): ___________________ Date: ________________
Time on Site: ________________ Weather Condition: ________________
Time Departed Site: ___________ Sample Method: ___________________
Low Tide Time: _______________

Personnel: ______________________ ______________________
______________________ ______________________
______________________ ______________________

Field Analyses					
Sample Time	Chloride (mg/L)	pH	Temperature (°C)	Specific Conductance (μohm/cm)	Sample Observation (Color, Odor, Etc.)

Analysis	**Bottle Size**	**Preservative**	**Quantity**	**Method Number**	**Holding Time**
Lead	1 500 mL HDPE	HNO_3 (5 ml)	1	6010C	180 days
Mercury	1 500 mL HDPE	HNO_3 (5 ml)	1	7470C	28 days
RDX	1 Liter Amber Glass	None	1	8330	7 days to extraction; analyze w/in 40 days after extraction
DEHP	1 Liter Amber Glass	None	1	8270C	14 days
Bottle Count			4		

Note:

GROUNDWATER LEVEL MEASUREMENTS (IRP-52)

1.0 SCOPE AND APPLICATION

This standard operating procedure (SOP) describes the procedures for measuring groundwater levels; a technique often used to evaluate the aquifer groundwater surface gradient. Groundwater measurements will be obtained by using an electronic water level indicator.

2.0 EQUIPMENT

- Electronic water level indicator (Solinst Model 101)
- Decontamination Equipment
- Field Logbook and pen
- Camera
- Personal protective equipment
- Activity Hazard Analysis

3.0 PROCEDURES

3.1 All staff involved in the sampling of well IRP-52 will read Andersen AFB Activity Hazard Analysis (AHA) and follow applicable requirements and procedures.

3.2 Water Level Measurement:

3.2.1 Prior to leaving the field office, decontaminate the probe and cable by washing with detergent and thoroughly rinsing with clean water. Decontamination will be completed in the field after measurement, consisting of rinsing the probe with detergent (such as Liquinox) and clean water.

3.2.2 Inspect well casing and locking cap for tampering, damage, rust, or odor, and make note of the conditions in the field logbook.

3.2.3 Pre-test the water indicator to ensure battery has charge and to ensure the equipment is properly working.

3.2.4 Slowly lower the probe into the monitoring well until it contacts the water surface, resulting in an audible alarm. Gently lift and lower the probe until an accurate measurement can be determined. Obtain the reading from an established mark on the well casing and measure to the nearest 0.01 feet, then record results in the field logbook and on the

Semiannual Groundwater Sampling Form. Document and record any problems encountered during measurement.

4.0 PRECAUTIONS

4.1 Check batteries of electronic water level indicator to ensure proper operation prior to using in the field.

5.0 ATTACHMENTS

None

WATER QUALITY FIELD MEASUREMENTS

1.0 pH MEASUREMENT - SCOPE AND APPLICATION

This standard operating procedure (SOP) will be used to obtain pH readings for all aqueous solutions, including groundwater and groundwater seeps. pH is a measurement of the hydrogen ion activity in a solution and indicates the acidity of an aqueous sample.

Measurement of pH can be used to check the quality and corrosivity of water samples, and to correlate other chemical analyses to determine probable sources. This may be a separate meter, or may be in a combination with specific conductance meter.

2.0 EQUIPMENT

- Portable field pH meter with probes for pH and temperature measurements
- Buffer solutions of pH 4, 7, and 10
- Deionized water in squirt bottle
- Beaker or other suitable containers
- Field logbook and pen

3.0 PROCEDURES

3.1 Decontaminate equipment by rinsing with deionized water.

3.2 The instrument will be cleaned, checked, and calibrated according to the equipment operations manual.

3.3 The pH meter shall be calibrated once a week, or after every 10 samples. At least two buffer solutions that bracket the expected sample pH shall be used (e.g., 7.0 and 10.0). Record calibration result in the Equipment Calibration Daily Log Sheet (Attachment A).

3.4 Obtain the water sample in a beaker, after having rinse with source water.

3.5 Rinse electrode with deionized water.

3.6 Immerse the electrode in water sample. Make sure groundwater seep is one-inch above electrode for proper measurement. Allow sample to stabilize and record pH and temperature readings in the field logbook.

3.7 Following field measurements:

3.7.1 Report and log any problems on the field logbook and in the calibration daily log sheet (Attachment A).

3.7.2 Clean all dirt off meter and inside carrying case.

3.7.3 Clean electrode and store in deionized water, or as required by the manufacturer.

4.0 PRECAUTIONS

4.1 When calibrating the meter, use pH buffers 4 and 7 for samples where pH is anticipated <7, and 7 and 10 when pH is anticipated >7.

4.2 Measurement of pH is temperature dependent. Therefore, the buffer temperature should be within 2 °C of sample temperatures.

4.3 Weak organic or inorganic salts, and oil and grease, interfere with pH measurements. If oil and grease are visible, note it on the sample log sheet.

4.4 Accuracy and precision are dependent on the instrument used; refer to manufacturer's manual. Expected accuracy and precision are ± 0.1 pH units.

4.5 Use buffer solutions that have not expired.

4.6 Refer to operation manual for recommended maintenance.

4.7 Keep instrument and water sample out of direct sunlight.

5.0 ATTACHMENTS

Attachment A – Equipment Calibration Daily Log Sheet

EQUIPMENT CALIBRATION DAILY LOG SHEET

DZSP|21

Andersen AFB Open Burning Open Detonation
Equipment Calibration Daily Log Sheet

Equipment Type and Serial No.	Date	Parameter (Unit)	Amount of Reagent	Initial Measurement	Final Measurement	Initial
YSI 556 Model		**Barometer (mmHg)** http://w1.weather.gov/obhistory/PGUA.html	N/A			
		***Conductivity/Specific Conductance/Salinity**	55 ml			
		pH (7.0) Range 0 mV ± 50 mV	30 ml			
		pH (10.0) Range -165 to -180 from 7 buffer mV value	30 ml			
		pH (4.0) Range + 165 to + 180 from 7 buffer mV value	3 ml (1/8")			
Chloride Meter (YSI Pro Plus)						

YSI 556 Model

1. Use the transport/calibration cup (clear plastic cup) for all calibrations.
2. Rinse with distilled water and dry with clean paper towel after each calibration.
3. Pre-rinse transport cup and sensor probe with a small amount of reagent you are about to calibrate.
4. Use the proper amount of reagents to ensure sensors are completely submersed when calibrating values are entered.
4. Do not over-tighten transport cup to sensor probe as this could cause damage the threads.
5. *Calibrating any one option will automatically calibrate the other two.

WATER QUALITY FIELD MEASUREMENTS

1.0 SPECIFIC CONDUCTIVITY - SCOPE AND APPLICATION

This standard operating procedure (SOP) is used to obtain specific conductance measurements for aqueous solutions, including groundwater sample and groundwater seeps samples. Specific conductance is the ability of a solution to pass an electrical current. The current is primary carried by dissolved inorganic anions such as chlorides, nitrates, and sulfates, as well as cation such as sodium, calcium, and magnesium.

This may be a separate meter, or may be in a combination with temperature, and or specific conductance meters.

2.0 EQUIPMENT

- Portable field conductivity meter and electrode
- Calibration solutions; 1,000 µS and 10,000 µS
- Confidence solution
- Deionized water in squirt bottle
- Beaker or other suitable containers
- Field logbook and indelible pen

3.0 PROCEDURES

3.1 Decontaminate equipment by rinsing with deionized water.

3.2 The instrument will be cleaned, checked, and calibrated according to the equipment operations manual.

3.3 Calibrate the meter using the 1,000 µS and 10,000 µS calibration solutions. After calibration, Record calibration result in the Equipment Calibration Daily Log Sheet (Attachment A).

3.4 After calibration, rinse the sensors with deionized water. Rinse the sensors with a small portion of confidence solution (YSI 5580). Pour the confidence solution into a clean dry calibration cup making sure that the top vent hole of the conductivity sensor is immersed in the solution during the check. Place probes into the calibration cup and turn on instrument.

3.5 Wait about approximately 2 minutes for readings to stabilize.

WATER QUALITY FIELD MEASUREMENTS

3.6 Take reading values and compare with values listed in the confidence solution container. If reading is within the listed range, the instrument is ready to collect data. Record results in the calibration daily log sheet.

3.7 Obtain the water sample in a beaker, after having rinse with source water.

3.8 Rinse electrode with deionized water.

3.9 Immerse the electrode in water sample. Make sure groundwater seep is one-inch above electrode for proper measurement. Allow sample to stabilize and record pH and temperature readings in the field logbook.

3.10 Following field measurements:

3.10.1 Report and record any problems in the field logbook and on the calibration daily log sheet (Attachment A).

3.10.2 Clean all dirt off meter and inside carrying case.

3.10.3 Clean electrode and store in deionized water, or as required by the manufacturer.

4.0 PRECAUTIONS

4.1 Use standards that have not expired.

4.2 Refer to operations manual for recommendations on calibration and maintenance.

4.3 Keep instrument and water sample out of direct sunlight.

5.0 ATTACHMENTS

Attachment A – Equipment Calibration Daily Log Sheet

EQUIPMENT CALIBRATION DAILY LOG SHEET

DZSP|21

Andersen AFB Open Burning Open Detonation
Equipment Calibration Daily Log Sheet

Equipment Type and Serial No.	Date	Parameter (Unit)	Amount of Reagent	Initial Measurement	Final Measurement	Initial
YSI 556 Model		Barometer (mmHg) http://w1.weather.gov/obhistory/PGUA.html	N/A			
		*Conductivity/Specific Conductance/Salinity	55 ml			
		pH (7.0) Range 0 mV ± 50 mV	30 ml			
		pH (10.0) Range -165 to -180 from 7 buffer mV value	30 ml			
		pH (4.0) Range + 165 to + 180 from 7 buffer mV value	3 ml (1/8")			
Chloride Meter (YSI Pro Plus)						

YSI 556 Model
1. Use the transport/calibration cup (clear plastic cup) for all calibrations.
2. Rinse with distilled water and dry with clean paper towel after each calibration.
3. Pre-rinse transport cup and sensor probe with a small amount of reagent you are about to calibrate.
4. Use the proper amount of reagents to ensure sensors are completely submersed when calibrating values are entered.
4. Do not over-tighten transport cup to sensor probe as this could cause damage the threads.
5. *Calibrating any one option will automatically calibrate the other two.

WATER QUALITY FIELD MEASUREMENTS

1.0 TEMPERATURE - SCOPE AND APPLICATION

This standard operating procedure (SOP) is used to obtain temperature readings for a liquid sample. Temperature measurements will be taken using a digital portable meter. This may be a separate meter, or may be in a combination with the pH, and or specific conductance meters.

2.0 EQUIPMENT

- Temperature meter
- Deionized water in squirt bottle
- Beaker or other suitable containers
- Field logbook and indelible pen

3.0 PROCEDURES

3.1 Multi-probe instruments (e.g., YSI or equivalent) typically have factory-calibrated temperature probes. For those probes that are not factory-calibrated, calibrate according to manufacturer's operation manual. When calibrating, use temperatures that bracket the expected range of sample temperatures. Record on Equipment Calibration Daily Log Sheet (Attachment A).

3.2 Following calibration, rinse temperature probe with deionized water.

4.0 PRECAUTIONS

4.1 Refer to operations manual for recommendations on calibration and maintenance.

4.2 Keep dirt off meter when not in use. Clean probe and meter prior to leaving site and before probe is immersed in another sample.

4.3 Keep instrument and water sample out of direct sunlight.

5.0 ATTACHMENTS

None

WATER QUALITY FIELD MEASUREMENTS

1.0 CHLORIDE MEASUREMENTS - SCOPE AND APPLICATION

This standard operating procedure (SOP) will be used to obtain chloride readings for all aqueous solutions including groundwater and groundwater seeps.

Chloride concentrations at the groundwater seeps will range between 500 mg/L and 5,000 mg/L. A chloride reading between 500 mg/L to 5,000 mg/L constitutes a fresh water seep sample.

2.0 EQUIPMENT

- Portable field chloride meter
- Chloride calibration solution up to 1,000 mg/L
- Deionized water in squirt bottle
- Beaker or other suitable containers
- Field logbook and indelible pen

3.0 PROCEDURES

3.1 Decontaminate equipment by rinsing with deionized water.

3.2 Use a calibration solution of up to 1,000 mg/L. If reading is above 1,000 mg/L, dilution of the sample may be necessary to meet the specified range.

3.3 Calibrate the instrument at the beginning of each sampling day according to manufacturer's operation manual. Clean the probe according to manufacturer's recommendations. Record data and time of calibration on calibration daily log sheet (Attachment A).

3.4 Collect water sample in beaker and immerse chloride probe. Allow probe reading to stabilize and record chloride reading in logbook.

4.0 PRECAUTIONS

4.1 Use standards that have not expired.

4.2 Refer to operations manual for recommendations on calibration and maintenance.

4.3 Keep dirt off meter when not in use. Clean probe and meter prior to leaving site and before probe is immersed in another sample.

4.4 Keep instrument and water sample out of direct sunlight.

5.0 ATTACHMENTS

Attachment A – Equipment Calibration Daily Log Sheet

EQUIPMENT CALIBRATION DAILY LOG SHEET

DZSP 21

Andersen AFB Open Burning Open Detonation
Equipment Calibration Daily Log Sheet

Equipment Type and Serial No.	Date	Parameter (Unit)	Amount of Reagent	Initial Measurement	Final Measurement	Initial
YSI 556 Model		Barometer (mmHg) http://w1.weather.gov/obhistory/PGUA.html	N/A			
		*Conductivity/Specific Conductance/Salinity	55 ml			
		pH (7.0) Range 0 mV ± 50 mV	30 ml			
		pH (10.0) Range -165 to -180 from 7 buffer mV value	30 ml			
		pH (4.0) Range + 165 to + 180 from 7 buffer mV value	3 ml (1/8")			
Chloride Meter (YSI Pro Plus)						

YSI 556 Model
1. Use the transport/calibration cup (clear plastic cup) for all calibrations.
2. Rinse with distilled water and dry with clean paper towel after each calibration.
3. Pre-rinse transport cup and sensor probe with a small amount of reagent you are about to calibrate.
4. Use the proper amount of reagents to ensure sensors are completely submersed when calibrating values are entered.
4. Do not over-tighten transport cup to sensor probe as this could cause damage the threads.
5. *Calibrating any one option will automatically calibrate the other two.

SAMPLE PACKING AND SHIPPING

1.0 SCOPE AND APPLICATION

This standard operating procedure is applicable to the packing and shipping of samples of all media types. Proper packing/shipping is critical to the sample Chain-of-Custody, as well as protection of the shipper and carrier.

The properly labeled samples are placed in plastic bags, put in a cooler with bubble wrap and ice, which is then taped shut. Custody seals are applied and the samples are shipped to the laboratory.

2.0 EQUIPMENT

- Plastic resealeable bags
- Custody seals
- Strapping tape
- Clear tape
- Bubble wrap
- Ice cooler and ice
- “This Side Up” and “Fragile” labels
- Bubble wrap or other packing/cushioning material

3.0 PROCEDURES

3.1 Prepare cooler(s) for shipment:

- Tape drain(s) shut with duct tape or equivalent.
- Affix “This Side Up” and “Fragile” labels on all four sides of each cooler.
- Place mailing labels with laboratory address atop of cooler(s).
- Line inside of cooler(s) with bubble wrap making sure bottom layer is at least ½ inch thick.
- Place appropriate packing lists, applicable permits and corresponding custody seals atop each cooler.

3.2 Arrange the decontaminated sample containers in groups by sample number.

3.3 Secure the appropriate sample identification/label to the sample containers.

3.4 Secure the container caps/lids with strapping tape or equivalent.

3.5 Arrange containers in front of their assigned coolers.

3.6 Wrap all glass containers in bubble wrap, and seal each container in a separate plastic resealable bag.

SAMPLE PACKING AND SHIPPING

3.7 Arrange containers in each cooler so that they do not touch (place bubble wrap between samples as appropriate).

3.8 If ice is required to preserve the samples, it should be repackaged in a double ziploc bags and placed on and around the containers.

3.9 Fill the remaining spaces with bubble wrap or poly foam liner on top of the samples.

3.10 Sign the Chain-of-Custody (COC) record form (or obtain the signature) and indicate the time and date it will be relinquished to the carrier.

3.11 Separate the copies of the forms. One copy accompanies the cooler and one copy is held in the project file. Photocopy the COC if more than one cooler is sent. Each cooler should have a copy of COC, indicating shipper and waybill number.

3.12 Close the lid and latch the cooler.

3.13 Sign and date the custody seal. Carefully peel the custody seals from their backings and place them intact over the edge of the cooler (right front and left back). Cover the seals with clear packaging tape.

3.14 Tape the cooler shut on both ends, making several complete revolutions with packaging tape.

3.15 Attach all applicable permits, including United States Department of Agriculture (USDA) soil permit and compliance agreement, preform invoice, and shipping waybill.

3.16 Relinquish the cooler(s) to the laboratory, the overnight carrier, or commercial airlines.

3.17 Email the laboratory to inform them that a shipment was sent Attach a copy of the COCs to the email and provide the following information:

- Your name
- Project name
- Number of samples sent to each laboratory for analysis
- Airbill numbers

This must be done immediately following sample shipment.

4.0 PRECAUTIONS

4.1 Perform sample packing and shipping with experienced/qualified personnel.

SAMPLE PACKING AND SHIPPING

5.0 ATTACHMENTS

None.

SAMPLE CUSTODY PROCEDURES

1.0 SCOPE AND APPLICATION

This standard operating procedure (SOP) describes the necessary steps for transferring samples through the use of Chain-of-Custody (COC) record forms. A COC record form is required, without exception, for the tracking and recording of all samples collected for on-site or off-site analysis. Use of the COC record form creates a written record that can be used to trace the possession and handling of the sample from the moment of its collection through analysis. The guideline identifies the necessary custody records and describes their completion.

The term “Chain-of-Custody” refers to procedures which ensure that evidence presented in a court of law is what it is represented to be. THE COC procedures track the evidence from the time and place it is first obtained to the courtroom. These procedures also provide an auditable trail for the evidence as it is moved and/or passes from the custody of one individual to another. In addition, procedures for consistent and detailed records facilitate the admission of evidence under Rule 803(b) of the Federal Rules of Evidence (P.L. 93-575).

2.0 EQUIPMENT

- COC record forms
- Idelible ink pen
- Site logbook

3.0 PROCEDURES

3.1 The following information must be written in the sample logbook when in-situ measurements or samples for laboratory analysis are collected:

- Project code
- Station number
- Location of station
- Date and time of measurement
- Field observations (include date and time)
- Level of personal protection (if required)

Measurements and observations shall be recorded using black or blue waterproof ink.

3.2 Sample Label

Samples, other than in-situ measurements, are removed and transported from the sample location to another location for analysis. Before removal, however, a sample is often divided into portions, depending upon the analyses to be performed. Each portion is preserved in accordance with the Groundwater Monitoring Plan. Each sample container is identified by a sample label.

The sample fills out the following information on the sample label:

- <u>Sample Number</u> – The unique number identifying this sample.
- <u>Date</u> – An eight-digit number indicating the month, day, and year of the sample collection (e.g., 06/08/2004).
- <u>Time</u> – A four-digit number indicating the 24-hour time of collection (e.g., 0954h is 9:54am).
- <u>Matrix</u> – Water, Soil, Sediment, Sludge, Leachate.
- <u>Sample Type</u> – Grab or composite.
- <u>Preservation</u> – Type, quantity, and concentration of preservative added.
- <u>Analysis</u> – Same as analyses on sample identification tag.
- <u>Sample By</u> – Name of sampler(s).

3.3 COC Procedures

After collection, separation, identification, and preservation, the sample is maintained under COC procedures until it is in the custody of the analytical laboratory and has been stored or disposed of (Attachment A).

3.4 Field Custody procedures

- Samples are collected as described in the Groundwater Monitoring Plan. Care must be taken to record precisely the sample location and to ensure that the sample number on the label exactly matches those numbers on the sample log sheet and the COC record form (Attachment A).

- The person undertaking the actual sampling in the field is responsible for the care and custody of the samples collected until they are properly transferred or dispatched.
- When photographs are taken of the sampling as part of the documentation procedure, the name of the photographer, date, time, site location, and site description are entered sequentially in the site logbook or by use of a dry erase board or equivalent.
- Sample labels are to be completed for each sample using waterproof ink unless prohibited by weather conditions.

3.5 Transfer of Custody and Shipment

Samples are accompanied by a COC record form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record form. This record documents sample custody transfer from the sampler, often through another person, to the analyst in the laboratory. The COC record form is completed as follows:

- Enter header information (project number and name) for each station number, enter date, time, composite/grab, station location, number of containers, analytical parameters and name of sampler(s).
- Sign, date, and enter the time under “Relinquished by” entry.
- Make sure that the person receiving the sample signs the “Received by” entry, or enter the name of the carrier (e.g., UPS) under “Received by.”Receiving laboratory will sign “Received for Laboratory by” on the lower line and enter the date and time.
- Enter the bill-of-lading or airbill number under COC if appropriate.
- Place the original (top, signed copy) of the COC record form, secured with packaging tape to the top inside of the appropriate sample shipping package.
- Shipping containers should be secured to ensure samples have not been disturbed during transport by using nylon strapping tape and custody seals. The custody seals should be placed on the containers so that they cannot be opened without breaking the seal.
- Complete other carrier-required shipping papers.

SAMPLE CUSTODY PROCEDURES

The custody record is competed using waterproof ink. Any corrections are made by drawing a line through and initialing and dating the change, then entering the correct information. Erasures are not permitted.

Common carriers usually will not accept responsibility for handling COC record forms; this necessitates packing the record in the sample container (enclosed with other documentation in a plastic resealable bag). As long as custody forms are sealed inside the sample container and the custody seals are intact, commercial carriers are not required to sign off on the custody form.

The laboratory representative who accepts the incoming sample shipment signs and dates the COC record, completing the sample transfer process. It is then the laboratory's responsibility to maintain internal logbooks and custody records throughout the sample preparation and analysis.

4.0 PRECAUTIONS

4.1 Duplicate or field spike samples shall not be identified as such on the label, as this may compromise the quality control function.

4.2 Complete information must be supplied.

4.3 Cross-out errors with single line and initial.

5.0 ATTACHMENTS

Attachment A – COC record form

CHAIN – OF – CUSTODY FORM

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CHAIN OF CUSTODY

DATE : ____________

COC #: ____________

PAGE: 1 OF 1

US NAVY LABORATORY

CUSTOMER:	ADDRESS:	PROJECT ABBREV:	Disposal Instructions:
		SAMPLED BY:	Shipment Method:
POINT OF CONTACT:	CONTACT NUMBER:	UNIT/COMPANY:	Waybill Number:

COMMENTS:

TURN AROUND TIME (TAT) URGENT (3 Days) ☐ RUSH (7 Days) ☐ ROUTINE (14 Days) ☐

SAMPLE INFORMATION								METHODS FOR ANALYSIS								# of Bottles	
							CONTAINERS & PRESERVATIVES	500mL Poly	Nitric Acid	500mL Poly	Nitric Acid	1 Liter Amber Glass	None	1 Liter Amber Glass	None		
No.	Sample ID / Description	Date Sampled	Time Sampled	Matrix	Composite (hr)	Grab	Sampler	Lead	3010C	Mercury	EPA 245.7	RDX	8330	DEHP	8270C	QC (MS/MSD)	TOTAL BOTTLES
1																	
2																	
3																	
4																	
5																	
8																	
9																	
10																	

Relinquished By:	Unit/Company:	Date:	Time: 0915H
Received By:	Unit/Company:	Date:	Time:
Relinquished By:	Unit/Company:	Date:	Time:
Received By (LAB):	Unit/Company:	Date:	Time:

Laboratory Contact Information
Laboratory Manager: STACY DEMACLID - 349-9157
AA/Sample Custodian: MARI BABAUTA - 349-9220

LABORATORY NOTES:

Form ID: LAB-F-0001
Revision #: 9
Revision Date: 04/10/2012

Printed document may be obsolete - validate before use
DZSP 21 Proprietary

DECONTAMINATION OF SAMPLING EQUIPMENT

1.0 SCOPE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to provide methodology, protocol, and reference information on the proper decontamination procedures to be used on sampling equipment. Decontaminate sampling equipment used at sites that directly or indirectly contacts contaminated media at a designated area within the boundaries of the site. All decontamination activities should be documented (see Attachment A) and all efforts will be made to minimize generation of wastes during decontamination.

2.0 EQUIPMENT

- Liquinox or equivalent laboratory grade detergent
- Scrub brushes
- Buckets
- Rinse water
- Plastic sheeting
- Logbook and pen
- Decontamination Log Sheet (Attachment A)

3.0 PROCEDURES

3.1 After sampling each well with the portable double valve pump, decontaminate the pump as follows:

- With the tubing on the pump reel, scrub the outside of the pump and the tubing (submerged below the water table) with a detergent solution consisting of potable water with Liquinox, or equivalent laboratory grade detergent.
- Then place the pump in a clean drum, bucket, or other suitable container filled with a solution of potable water and Liquinox.
- Start the pump and pump the solution through the tubing. The water and detergent solution can be recycled in the container.
- Continue pumping for about a 15-minute cycle. After circulating for 15 minutes, transfer solution to the bulk IDW container.

DECONTAMINATION OF SAMPLING EQUIPMENT

- Rinse the outside of the pump with the potable water and place the pump in a clean container filled only with potable water, and purge at least three to five tubing-volumes.
- Do not recycle rinse water back into the drums.

The remainder of tubing column that was not in contact with groundwater will be thoroughly rinsed with potable water, to ensure that sufficient water is applied to rinse the outside of the tubing. This rinse water will be allowed to fall onto the ground.
Potable water should be obtained from a routinely tested source such as the Andersen AFB water system.

3.2 At the end of each day of sampling, pumps will be decontaminated and wrapped or contained in plastic, and stored in an appropriate storage area. Pumps should not be stored in an area where volatile sources are present. Pumps shall not be stored without appropriate decontamination. Prior to use, the outside of the pump and the tubing should be thoroughly rinsed with clean potable water.

4.0 PRECAUTIONS

4.1 Hexane is not to be used as a rinse solvent according to Guam Environmental Protection Agency.

5.0 ATTACHMENTS

Attachment A – Decontamination Log Sheet

DECONTAMINATION LOG SHEET

Andersen AFB Open Burning Open Detonation
Decontamination Log Sheet

Date:	Site Location:
Recorded By:	Checked By: (including the date)

Decontamination Checklist:

Equipment	Purpose of Use	Liquinox / Water Rinse	Potable Water Rinse	Type II Reagent Water Rinse	Other Water Rinse	Isopropanol/ HNO_3 (dilution) Rinse

Decontamination Procedure Checklist (Mark Y for Yes and N for No, If No explain in comments)	**Yes**	**No**
Placed washing tubs on plastic sheeting?		
Scrubbed sampling equipment in Liquinox/water until all visible dirt/grim grease, oil, etc. have been removed?		
Rinsed sampling equipment with a final rinse using the designated water listed in the table above?		
Placed decontaminated equipment on clean plastic sheeting for drying and transport?		
Placed decontamination fluids in sealed container?		

Comments (e.g. initial decontamination, between locations, or last decontamination for the day):

____

____

____

____

INVESTIGATIVE DERIVED WASTE MANAGEMENT

1.0 SCOPE AND APPLICATION

This standard operating procedure (SOP) describes the procedures for handling of investigative derived wastes (IDW) at Andersen AFB. IDW will be generated as a result of groundwater sampling and decontamination of sampling equipment. Water derived from purging activities will be containerized for later disposal in the publicly owned treatment works (POTW) upon receiving Base approval.

2.0 EQUIPMENT

- Plastic sheetings
- Waste containers
- Chloride meter

3.0 PROCEDURES

3.1 For purge water collected during groundwater sampling activities, the water will be collected in bulk storage containers/drums or directed to the ground surface at the well using the procedures. If low-flow sample techniques are utilized, approximately 55-gallons of purge water will be produced at the well.

3.2 If analytical data indicates any analytes above regulatory limits (safe Drinking Water Act MCLs) for the respective well, or chloride measurements are above 250 mg/L (Secondary MCL), then the purge water will be placed in a container or drum and will be transported from the well to a temporary storage tank located at a designated staging area on Andersen AFB. As needed or at the end of the groundwater sampling, the purge water will be sampled and sent to an off-island laboratory for analysis.

4.0 PRECAUTIONS

4.1 Read all relevant health and safety plan, work plan, Groundwater Sampling Plan.

4.2 Read all appropriate SOPs

4.3 Make sure monitoring instruments are properly calibrated and SOPs are followed for calibration.

4.4 Ensure that proper containment is provided for cuttings that are derived from below the water table. Excess water could run off the plastic sheeting and onto the ground prior to approved disposal.

5.0 ATTACHMENTS

None.

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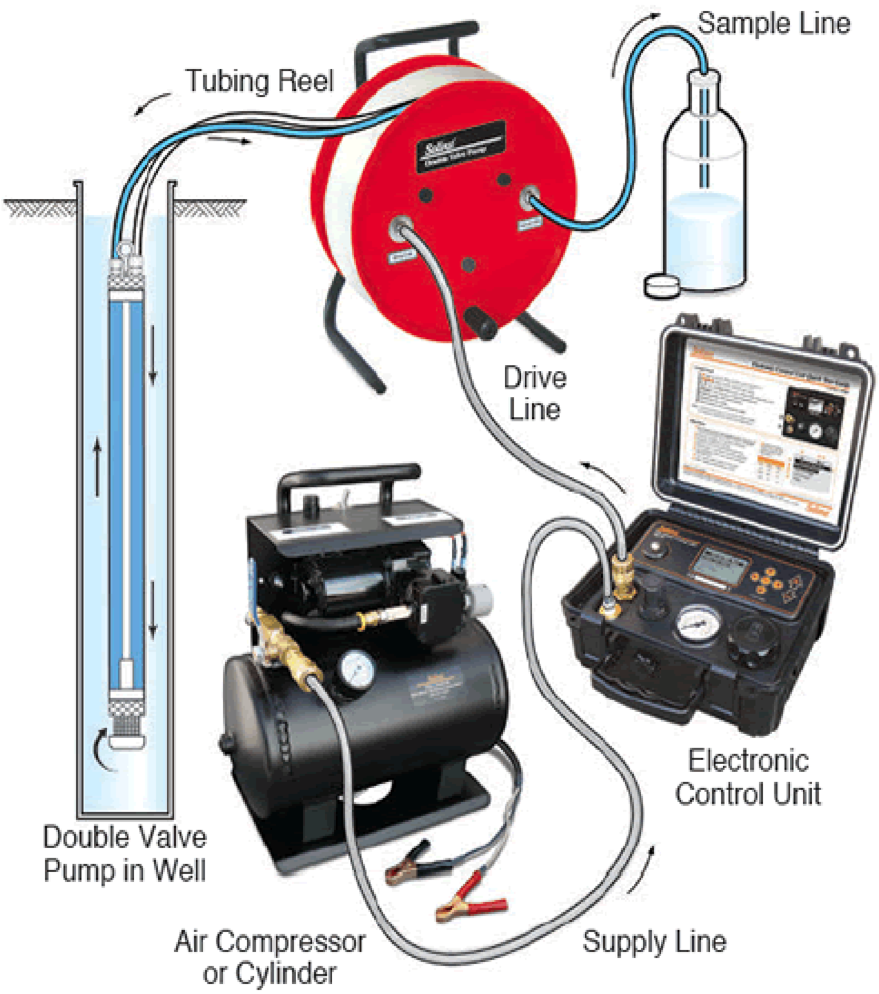
APPENDIX B: LOW FLOW DOUBLE VALVE PUMP FIELD SETUP

Low Flow Double Valve Pump Illustration



Low Flow Double Valve Pump Setup

Low Flow Double Valve Pump Setup in Field

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APPENDIX C: PROCESSES AND REQUIREMENTS FOR SAMPLE COLLECTION

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APPENDIX C:
PROCESSES AND REQUIREMENTS FOR SAMPLE COLLECTION

To minimize the collection of marine water during sample collection, all samples shall be collected during the lowest tide (lower low water) as predicted in the charts posted by NOAA found in the website: http://tidesandcurrents.noaa.gov/geo.shtml?location=1631428; and by also obtaining the current moon phase calendar to find the predicted date for a quarter moon (near the new moon and full moon) appearance (see the website: http://www.calendar-365.com/moon/moon-calendar.html).

A. MONITORING WELL SAMPLING (to be used for upgradient well)

- SOPs needed: 1, 3, 4, 5, 6, 7, 8, 9, 10, 11
- Forms needed: Semiannual Groundwater Sampling Form, Equipment Calibration Daily Log Sheet, Chain-of-Custody Record, and Decontamination Log Sheet.
- Steps needed:
  1. Follow **SOP: 1** Groundwater Well Sampling
  2. Calibrate equipment for pH, conductivity, temperature, and chloride measurements (See **SOP: 4 through 7** Water Quality Field Measurements)
  3. Use electric water level meter (See **SOP: 3** Groundwater Level Measurements)
  4. Follow **SOP: 1** Groundwater well Sampling
     i. Purge well
     ii. Measure pH, conductivity, temperature, and chloride levels
     iii. Record results
  5. Follow **SOP: 1**,obtain samples using the Groundwater Well Sampling procedures
     i. Record information for each sample
     ii. Refer to **SOP: 8** for Sample Packing/Shipping Procedures
     iii. Refer to **SOP: 9** for Custody Procedures
  6. Follow **SOP: 1** and **SOP: 10**, for Decontamination of Sampling Equipment
  7. Follow **SOP: 11** for Investigative Derived Waste Management

B. GROUNDWATER SEEPS SAMPLING (to be used for downgradient seeps)

- SOPs needed: 2, 8, 9
- Forms needed: Semiannual Groundwater Seeps Sampling Form, Equipment Calibration Daily Log Sheet, and Chain-of-Custody Record
- Steps needed:
  1. Follow **SOP: 1** Groundwater Seeps Sampling
  2. Check seeps for proper water flow
  3. Check chloride concentration of seeps before sampling
  4. Use peristaltic pump with Teflon®, if necessary
  5. Collect sample and record chloride, pH, conductivity, salinity, and temperature measurements
  6. Photograph sample area and record information in field/site logbook and on the Semiannual Groundwater Seeps Sampling Form (attached)
  7. Refer to **SOP: 8** for Sample Packing/Shipping Procedures
  8. Refer to **SOP: 9** for Sample Custody Procedures

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