



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6  
1445 ROSS AVENUE, SUITE 1200  
DALLAS, TX 75202-2733

NEW MEXICO  
ENVIRONMENTAL DEPARTMENT  
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~~CONFIDENTIAL~~

OCT 28 1994

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Ms. Kathleen M. Sisneros, Director  
Water & Waste Management Division  
New Mexico Environment Department  
P.O. Box 26110  
Santa Fe, NM 87502

RE: Transmittal of Hazardous Waste Permit for  
Melrose Air Force Range, EPA ID NO. NM5572124456

Dear Ms. Sisneros:

I have enclosed the Hazardous and Solid Waste Amendments (HSWA) permit for Melrose Air Force Range. If you have any questions, please contact Richard Mayer of my staff at (214) 665-7442.

Sincerely yours,

*Allyn M. Davis*

Allyn M. Davis, Director  
Hazardous Waste Management Division

Enclosure



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contains at least 50% recycled fiber



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6  
1445 ROSS AVENUE, SUITE 1200  
DALLAS, TX 75202-2733

OCT 28 1994

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

General William M. Guth, Commander  
United States Air Force  
Headquarters, 27th Fighter Wing (ACC)  
Cannon Air Force Base, NM 88103-5214

RE: Transmittal of Hazardous Waste Permit for  
Melrose Air Force Range, EPA ID NO. NM5572124456

Dear General Guth:

Enclosed is a copy of your permit to operate a hazardous waste facility, under the Hazardous and Solid Waste Amendments of 1984 (HSWA). Also enclosed is the Environmental Protection Agency's (EPA) response to comments on the draft permit.

The New Mexico Environment Department (NMED) and EPA have entered into a joint permitting agreement, whereby permits may be issued in New Mexico in accordance with the New Mexico Hazardous Waste Management Act, as well as the Resource Conservation and Recovery Act (RCRA). The agreement will remain effective until the State hazardous waste program receives authorization under RCRA to administer HSWA. In order for an applicant to have a fully effective permit, both NMED and EPA must issue the permit.

This letter transmits a copy of your HSWA permit with the necessary signature for EPA approval for permit issuance. The RCRA part of the full permit will be sent to you by NMED. The permit will become effective on the date indicated.

Procedures for requesting the EPA Administrator to review permit decisions are detailed at 40 CFR Part 124.19. Effective March 1, 1992, jurisdiction over petitions for review was changed from the Administrator to the Environmental Appeals Board. If you petition the Environmental Appeals Board for such a review, please send a copy of your petition to the Region 6 office.



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The filing for appeals should be sent to the address listed below:

U.S. Environmental Protection Agency  
Office of the Administrator  
401 M Street SW  
Room 1145 (West Tower)  
Washington, DC 20460

If you have any questions, please contact Richard Mayer of my staff at (214) 665-7442.

Sincerely yours,



Allyn M. Davis, Director  
Hazardous Waste Management Division

Enclosures

cc: Ms. Kathleen M. Sisneros  
New Mexico Environment Department

**LIBRARY COPY**

**RESOURCE CONSERVATION AND RECOVERY ACT  
HAZARDOUS WASTE FACILITY  
OPERATIONAL PERMIT  
No. NM5572124456-1**

to the

**UNITED STATES DEPARTMENT OF THE AIR FORCE  
CANNON AIR FORCE BASE**

for the

**TREATMENT OF WASTE EXPLOSIVES BY OPEN DETONATION**

at the

**MELROSE BOMBING RANGE  
ROOSEVELT COUNTY, NEW MEXICO**

October, 1994

Prepared by the  
New Mexico Environment Department  
Hazardous & Radioactive Materials Bureau  
525 Camino de los Marquez  
P.O. Box 26110  
Santa Fe, NM 87502

## HAZARDOUS WASTE FACILITY PERMIT

PERMITTEE: United States Department of the Air Force, Cannon  
Air Force Base  
IDENTIFICATION NUMBER: NM5572124456  
PERMIT NUMBER: NM5572124456-1  
FACILITY LOCATION: Melrose Air Force Range (MAFR), Roosevelt County,  
about 30 miles northwest of Portales and 25  
miles west of Cannon Air Force Base

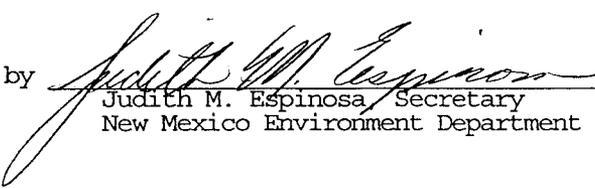
Pursuant to the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), as amended (42 U.S.C. 6901, et seq.), and the New Mexico Hazardous Waste Act (Section 74-4-1 et seq. NMSA 1978), a Permit is issued to the United States Department of the Air Force, Cannon Air Force Base (hereafter called the Permittee) to conduct treatment by open detonation at a hazardous waste facility. The facility includes one open detonation unit, support structures and equipment designated in the Permit and all contiguous land at the MAFR. Non-RCRA related activities conducted at the MAFR is not intended to be regulated by this Permit.

The Permittee must comply with all terms and conditions of this Permit and the requirements of the Hazardous and Solid Waste Act (HSWA) portion of the RCRA Permit for the facility. This Permit consists of the conditions contained herein including attachments. Applicable regulations cited in this Permit are those which were in effect during the application review process, New Mexico Hazardous Waste Management Regulations (HWMR-7, as amended 1992). This Permit shall become effective thirty (30) days after the date that this certification is signed by the Secretary and shall run for a period of ten (10) years from that date.

This Permit is also based on the assumption that all information contained in the Permit application and the administrative record is accurate and that the facility will be operated as specified in the application and the administrative record. The Permit application consists of information originally submitted in the September 1993 Part "B" Permit application, subsequently updated with technical data through February 1994, and earlier reports submitted in January and February of 1993. All updated materials and earlier reports are maintained in the administrative record of the Hazardous & Radioactive Materials Bureau of the New Mexico Environment Department.

Any inaccuracies found in the information submitted as the Part "B" application or technical support data in the administrative record may be grounds for the termination or modification of this Permit and/or potential enforcement action.

Signed this 30th day of November 1994

by   
Judith M. Espinosa, Secretary  
New Mexico Environment Department

## ATTACHMENT I

### Response to Public Comments on the Draft Melrose Air Force Range Open Detonation Permit (During the 45-day Public Comment Period, Ending 9/21/94)

September 29, 1994

The following public comments were received from Cannon Air Force Base. No other individuals or groups presented comments about the draft Permit. US EPA presented their comments to the draft Permit before the public comment period, and those comments are presented in Attachment II dated August 3, 1994.

#### **Item 1      Deferring Environmental Monitoring/Inspections**

CAFB:      RCRA hazardous wastes will not be treated at the Open Detonation Unit until the permitted construction has been completed. For this reason, a request is made to add language to the Permit that allows for suspension of all environmental sampling and all inspection activity until construction is completed and the unit is in use.

NMED:      Permit Conditions II.E. (Inspections) and III.G.1. and III.G.2. (Environmental Monitoring) have language added to the Permit which implies an allowance for temporary suspension of inspection requirements and environmental media sampling until such time that as the approved unit is constructed. The new wording is "...after completing construction of the Unit's approved design,..."

Recommendation not required by the Permit:

In the interim, between issuance of the permit and construction of the Open Detonation Unit, CAFB will be responsible for controlling the migration of all metals and explosive residues (including by-products) within the soil and vadose zones from past waste management activities. NMED recommends that CAFB install and maintain an impermeable cover over the central portion (100-foot diameter) of the existing clear area for the purposes of controlling the dispersion of dust and to prevent surface water from percolating through the soils that surround and fill abandoned trenches used during the interim status period. The berm circumscribing the clear area should be maintained to divert run-on and to control run-off from leaving the site. This recommendation is not a requirement of the Permit. The reason NMED has not made any requirements for the interim period, between issuance of the Permit and construction of a new Open Detonation Unit, is based on analytical results from the characterization of previously affected soils. Analysis showed tested soils to be low or void of hazardous waste constituents. The recommendation is strictly a precautionary measure.

**Item 2 Waste Analysis - Chemical Analysis vs. Documentation**

CAFB: Chemical analysis of explosives are not recommended for safety purposes. Instead, a suggestion is made to review manufacture specifications, compositions and other properties as presented in Tables A-1 through A-3 of Permit Attachment A (Waste Analysis Plan).

NMED: A general information requirements for the Part B Permit application is chemical and physical analysis of hazardous waste to be handled at the facility (HWMR-7, Part IX, §270.14(b)(2)). The purpose of this requirement is to provide all information necessary to treat or dispose of hazardous waste in accordance with the regulatory standards for owners and operators of hazardous waste management facilities (HWMR-7, Part V, §264). NMED believes that CAFB will satisfy the purpose of this requirement in carrying out the permitted Waste Analysis Plan (Permit Attachment A). Permit Condition II.C. states that the Permittee is to verify published and documented data for each waste on an annual basis. Chemical analysis for affected soils is mentioned in the Waste Analysis Plan and is more fully described in the Soil Sampling and Analysis Plan (Permit Attachment L).

CAFB has demonstrated to date a satisfactory knowledge of process by identifying precise ordnance items that are intended to be treated at the Open Detonation Unit, manufactured compositions of each item (active as well as inert components), and the expected by-products resulting after treatment for reactivity. The demonstration also includes environmental monitoring (site characterization and operational monitoring) that has and will continue to serve for detection of potential releases. Based on the above reasoning, no changes in permit language has been made.

**Item 3 Inspections - Unit and Munition Transport Vehicles**

CAFB: 1) A request is made to change the Permit to reflect that daily unit inspections are intended to mean every day that the Range Operations and Maintenance Contractor is at the Range. Similarly, the Permit should be changed to provide that munition transport vehicles need only be inspected when the Munition Management Flight is uses them.

2) Table C-3 needs to be changed to show that the Munition Management Flight is responsible for Vehicle Inspections.

3) A request is made to allow for upgrading the inspection checklist form (Table C-3).

NMED: 1) Language has been added to the Security Plan (Permit Attachment B, page PA-B-1, Security Procedures) and the Inspection Plan (Permit Attachment C, page PA-C-2, paragraph 4) that explain the term daily is intended to mean when the Range Contractor is present at the Range. Security patrols and inspections, however, are to be conducted at intervals that are not in excess of 1 week

apart.

Language has also been added to Permit Attachment C, page PA-C-2, paragraph 2, that requires the Munition Management Flight to inspect munition transport vehicles the day before and/or the day transport is to be conducted in association with permitted treatment operations. NMED understands that normally, the range is operated 6 days per week and that the Range Contractor is present only at those times.

2) Table C-3 does not address vehicle inspections. As indicated in the Part B application, the EOD Flight and the Range Contractor both use Table C-3. Vehicle inspections are registered on AF Form 1800 (Table C-2) and these inspections are the responsibility of the Munition Management Flight as specified in Permit Attachment C, page 2, paragraph 2.

3) All inspection items listed in Table C-3 have been approved based on information presented in the Part B permit application. Additional inspection items may be added outside of permit requirements, but, deletion of approved checklist items would require a permit modification. The same information is also applicable to all other tables presented in Permit Attachment C.

**Item 4 Permit Condition Labeling/Standing Water**

CAFB: 1) Permit Condition III.D.5. is labeled incorrectly. In the draft Permit, the incorrect labeling is designated III.C.5.

2) Standing water in the Open Detonation Unit, referred to in Permit Condition III.D.5. may not always be possible to be removed within the required 24-hours period. An example of this is when water accumulates after an inspection, and the next inspection does not take place until more than 24-hours later because the Range has been closed for the weekly day-off. The required time for the removal of standing water is requested to be changed from 24-hours to 48-hours.

NMED: 1) The typographic error in Permit Condition III.D.5. has been noted and corrected.

2) Regarding the removal of standing water from the Open Detonation Unit, language has been changed in the Inspection Plan (Permit Attachment C), page PA-C-2, paragraph 4, to require inspections for standing water only after a precipitation event which would generate run-off. Additional language, added to the Inspection Plan, page PA-C-2, paragraph 4, and Permit Condition III.D.5. states that in cases of the Range Contractor being absent due to the range being closed, precipitation could be allowed to stand or pond for as much as 48 hours, in which time all water will be mechanically removed. Otherwise, all standing water will be removed within 24 hours. NMED suggests that arrangements be made and equipment be provided to the Range Contractor for removal and

containment of standing water.

**Item 5 Permit Condition Labeling**

CAFB: Labeling for Permit Condition III.E.5.b., page III-4 needs to be corrected so that the letter "b." is not repeated twice.

NMED: The typographic error in Permit Condition III.E.5.b. has been noted and corrected.

**Item 6 HSWA - Waste Analysis**

CAFB: Permit Condition IV.B.6.d. requires annual waste analysis or analysis when a process changes. As notes in Item 2 (of this attachment), chemical analysis of waste is impractical.

NMED: All requests for changes in HSWA Permit Conditions must be submitted to the U.S. Environmental Protection Agency since EPA administers the HSWA program at this time.

**Item 7 HSWA - RFI Work Plans**

CAFB: Submittal dates as stated in the HSWA Permit Conditions for the required RFI Work Plan and subsequent documents may be problematic due to the availability of necessary funding. CAFB request a change in Permit Condition IV.J. to convey that the Permittee will submit a draft RFI schedule within 60 days after the effective date of the Permit. CAFB would also like to meet with the appropriate regulatory authority to negotiate a subsequent submittal schedule.

NMED: NMED does not have the authority to change any of the HSWA Permit Conditions. We advise CAFB to contact EPA, Region VI as soon as possible. After the Permit is signed by the NMED Secretary, it will be submitted to EPA for a 30-day period in which HSWA changes may be made. At that end of the 30 day period, the Permit will become effective.

**Item 8 HSWA - Agency identification**

CAFB: Specification of which State Agency must be notified prior to conducting environmental monitoring is needed in Permit Condition IV.K.1.

NMED: The State Agency requiring notification is the New Mexico Environment Department. NMED advises that you contact the EPA, Region VI as soon as possible to make the appropriate change. Since this is a change in the HSWA Permit Conditions, only EPA may make the change. Regarding EPA changes, refer to time constraints in the NMED response for Item 7.

**Item 9 Waste Analysis Plan - Approved Test Methods**

CAFB: In the Waste Analysis Plan, Permit Attachment A, under the heading Test Methods (page 4), a statement is made to use a

specific edition of SW-846 for selected test methods. A suggestion is made to include additional wording that allows for updates or new additions to SW-846 that may be approved by the Secretary.

NMED: The wording referred to in CAFB's comment comes directly from the Part B permit application. Additional language has been added to the Test Method Section (page PA-A-5, Test Methods), allowing for approval of updated or later revisions of the EPA document, SW-846. The change reflects that in addition to using EPA methods included in SW-846, later revisions of SW-846, approved by the Secretary in writing may also be used.

**Item 10 Missing Page**

CAFB: Page PA-A-17 appears to be missing from the Permit.

NMED: The copy of the draft Permit sent to CAFB contained page PA-A-7. This was verified in a subsequent conversation with CAFB staff. Apparently, the page was not reproduced in the copy of the copy presented to the reviewer that developed the comment.

**Item 11 Inspections - Munition Transport Vehicle**

CAFB: In Permit Attachment C, page PA-C-2, paragraph 2, vehicle inspection by the Munition Management Flight is required daily. A request is made to change this item to each day any vehicle is used to transport military personnel, safety equipment and munitions.

NMED: Language has been added to the Inspection Plan (Permit Attachment C), page PA-C-2, paragraph 2, explaining that the term daily is intended in the Inspection Plan to mean when the Munition Management Flight uses transport vehicles involved with waste explosive treatment operations.

**Item 12 Spelling Correction**

CAFB: A typographic error should be corrected in Table B-1 of the Security Plan, Permit Attachment B. The misspelled word is surveillance.

NMED: The typographic error in Table B-1 of the Security Plan has been noted and corrected.

**Item 13 Inspection - Range Contractor**

CAFB: A request is made to change daily inspections to weekly for the Range Contractor and to change the wording in Permit Attachment C on page 2, allowing for updated versions of the inspection checklist.

NMED: Items 3 of this attachment addresses the requested change from daily to weekly.

**Item 14 Conflict with Permit Use of Permittee's Internal Orders**

CAFB: The Permit refers to some specific Air Force Regulations, Technical Orders and Policies that may be subject to change. Our

suggestion is that language be added to the Permit which may allow revisions through written correspondence with NMED.

NMED: All reference to Air Force Regulations, Technical Orders and Policies were extracted directly from the RCRA Part B Permit Application. Any changes that would be more stringent are not necessary to be cleared through NMED prior to their implementation. Less stringent Air Force Requirements will need to be incorporated into the Permit through the permit modifications process. No permit changes have been made in response to CAFB's comment.

the Permittee in a manner that will promote explosive wastes to detonate upward in a vertical direction, rather than at a lower angle.

III.E.11. After each open detonation episode, the Permittee shall patrol the entire Open Detonation Unit for the purpose of removing any visible metal fragments or untreated explosive materials laying on the ground surface.

III.E.12. The Permittee shall not allow soils within the Open Detonation Unit to be disturbed after a detonation episode for which surficial soil samples will be collected, until after sampling is completed.

III.F. GENERAL REQUIREMENTS FOR HANDLING IGNITABLE, REACTIVE OR INCOMPATIBLE WASTES

The Permittee shall follow the special procedures for handling ignitable wastes set forth in Permit Attachment E and in compliance with HWMR-7, Part V, §264.17(a).

III.G. ENVIRONMENTAL MONITORING

III.G.1. The Permittee, after completing construction of the Unit's approved design, shall conduct soil monitoring in accordance with Permit Attachment L, for the purpose of determining the migration potential of hazardous waste constituents before they reach the uppermost aquifer. A summary report of laboratory analysis shall be submitted to the Secretary on an annual basis.

a. Soil Sample shall be collected under the supervision of a person with a minimum of one year of environmental media sampling experience.

b. Soil sample analysis shall be conducted by an EPA certified laboratory in accordance with Permit Attachment L.

III.G.2. The Permittee, after completing construction of the Unit's approved design, shall annually estimate the cumulative weight of emission of all known gases associated with the reactive component of all treated ordnance item when the net explosive weight of treated wastes is greater than 25 tons in any calendar year. Estimates may be based on published data for each type of permitted explosive reactant. When gases emanating from all ordnance item treated in any calendar year exceed 25 tons, special

permit modification in accordance with HWMR-7, Part IX, §270.42 prior to accepting such waste.

II.C. GENERAL WASTE ANALYSIS

The Permittee shall follow the waste analysis procedures required by HWMR-7, part V, §264.13, as described in the Waste Analysis Plan (Permit Attachment A). Analysis may include existing published or documented data on waste explosives and associated waste components intended for treatment in an Open Detonation Unit.

The Permittee shall verify the published and documented data, or chemical and physical waste analysis of each waste that will be treated in the Open Detonation Unit annually as part of the quality assurance program. For physical and chemical analysis, quality assurance shall be in accordance with Test Methods for Evaluating Solid Waste: Physical and Chemical Methods, EPA Publication SW-846. At a minimum, the Permittee shall maintain proper functioning 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 described in the Security Plan (Permit Attachment B) and HWMR-7, Part V, §§ 264.14 and 264.117(b).

II.E. INSPECTION REQUIREMENTS

The Permittee, after completing construction of the Unit's approved design, shall follow the inspection procedures specified in the Inspection Plan (Permit Attachment C) and shall remedy any deterioration or malfunction of equipment or structures discovered by inspection as required by HWMR-7, Part V, §264.15(c). Records of inspections shall be kept as required by §264.15(d).

II.F. PERSONNEL TRAINING

The Permittee shall conduct personnel training, as required by HWMR-7, Part V, § 264.16. This training program shall include, at a minimum, the information presented in the Personnel Training Plan (Permit Attachment D). The Permittee shall maintain the documents and records required by HWMR-7, Part V, §264.16(d) and (e).

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

The Permittee shall comply with the requirements of HWMR-7, Part V,

## **SECURITY PLAN**

Cannon Air Force Base (CAFB) personnel and the Melrose Air Force Range (MAFR) "Operations and Maintenance" contractor incorporates the proper equipment and procedures to ensure: 1) that public and livestock access to the range is controlled; and 2) that all personnel are protected from health hazards that could result from contact with extremely hazardous operations. Details of these provisions are specified in the following sections.

### **Security Procedures and Equipment**

MAFR is a United States government installation. Access is limited to personnel authorized by the Commander, 27th Fighter Wing, CAFB. The "Operations and Maintenance" contractor is responsible for all daily activities, including daily security patrols of the bombing and gunnery range facilities and the Open Detonation (OD) Unit. The term "daily" is intended here to mean those days in which the Range is being attended by the Contractor (The Range is operated 6 days each week.) At no time will there be a security patrol at intervals of less than 1 week apart. Table B-1 outlines the contractor's general responsibilities regarding security for the OD Unit.

### **24-Hour Surveillance System**

The area at the MAFR OD Unit is not protected by a 24-hour surveillance system. Access is controlled through the location of a barbed wire fence around the Unit, and locked gates at the two entry points. The OD Unit is contained within the range boundary. The Explosive Ordnance Disposal (EOD) Flight of the Civil Engineering Squadron has charge for all treatment operations conducted at the OD Unit. The munitions team chief assumes responsibility for safety at the OD Unit when treatment is being carried out. Access to the OD Unit is controlled during the treatment process by the Explosive Ordnance Disposal (EOD) safety supervisor.

### **Barrier and Means to Control Entry**

The Facility, MAFR, has a 5 foot high, 3-strand barbed wire fence surrounding the entire property boundary. In addition, the OD Unit is completely surrounded by a 5 foot high, 5-strand fence and has two lockable gates that control vehicle access. The gates are closed and locked except when authorized EOD personnel are entering or exiting the Unit. Visual surveillance is maintained during all treatment operations.

### **Warning Signs**

Warning signs, legible from a distance of 25 feet are posted

The Environmental Management Flight conducts quarterly inspections to ensure compliance with hazardous waste regulations. Table C-1 presents typical items that are inspected.

The Munitions Management Flight conducts daily inspections of vehicles used to transport military personnel, safety equipment and munitions. These vehicles are inspected the day before and/or the day any munition transport operation occurs. Inspections will be conducted prior to the transport vehicle(s) leaving CAFB on the day of a munition transport operation associated with permitted activities. The "Operator's Inspection Guide and Trouble Report", SF Form 1800, Table C-2 is used to record results from the inspection. This form contains a list of safety and emergency equipment, security devices, structural equipment, communications equipment and mobile equipment. Vehicles used to transport munitions to the OD Unit are inspected per AFR 127-100, Sect. 7-20 (Permit Attachment C - Appendix).

The EOD Flight conducts pre and post-operational inspections of the OD Unit. The OD Unit is inspected immediately prior to placement of ordnance wastes and immediately after the appropriate safety wait periods that are required following treatment operation. Table C-3 presents the typical item that are inspected.

The Range Operations and Maintenance Contractor conducts daily inspections of the security fencing and gates, warning signs, the presence of standing water, and all engineered structures associated with the OD Unit. These inspections are documented in a daily events log which is periodically reviewed by a CAFB quality assurance evaluator. The term daily is intended here to mean those days in which the range is being attended by the Contractor. At no time will there be inspections conducted by the Contractor at intervals of less than 1 week apart. The OD Unit is also inspected for standing water after all precipitation events which generate run-off. In cases of the Range Operations and Maintenance Contractor being absent due to the range being closed for one day, precipitation could stand for as much as 48 hours, in which time all water will be removed by mechanical means. When there are no breaks in the Range Contractors presence, precipitation ponding will not exceed a 24 hour period prior to water being removed. Tables C-3 and C-4 presents inspection items reviewed by the contractor.

### **Records**

All inspection logs and forms will be retained by CAFB EOD personnel. Copies will be maintained for a minimum of three calendar years from the inspection date.

### **Remedial Actions**

Inspections conducted prior to and after each open detonation

- III.D.2. The Open Detonation Unit and all associated structures shall at all times be maintained in accordance with the design plans as specified in Permit Attachment J to eliminate surface run-on from outside the Unit from entering the area inside the outer berm and for eliminating run-on from entering or remaining in the detonation structure.
- III.D.3. All fences, gates, and warning signs shall be maintained in operable conditions and remediated whenever necessary in accordance with Permit Attachment C.
- III.D.4. All safety and operating equipment shall be maintained in operable condition and remediated whenever necessary in accordance with Permit Attachment C.
- III.D.5. Standing water shall not be allowed in any portion of the Unit's detonation structure, described in Permit Attachment J. All standing water shall be removed within 24 hours after any precipitation event which could generate run-off, or within 48 hours when the Range has been closed for for a 24-hour period prior to being routinely inspected. Unless the water is tested by the Toxicity Characteristic Leaching Procedure (HWMR-7, Part II, Appendix II) or equivalent methods approved by the Secretary for being disqualified as a hazardous waste, the water must be managed as a hazardous waste (HWMR-7, Part II, §261, Subpart C).

III.E. OPERATION OF THE PERMITTED UNIT

- III.E.1. The Permittee shall operate and maintain the Open Detonation Unit in accordance with procedures contained in Permit Attachments C and K.
- III.E.2. The Permittee shall conduct open detonation operations only during day light hours.
- III.E.3. The Permittee shall not conduct open detonation whenever the top wind speed, in the vicinity of the Open Detonation Unit, exceeds 15 miles per hour.
- III.E.4. The Permittee shall not conduct detonation activity on any day whenever a snow or thunder storm is imminent or has been forecast, or when violent weather threatens within 10 miles of the Melrose Air Force Range, Open Detonation Unit.
- III.E.5. The Permittee shall make a record of weather

conditions at the time of treating hazardous waste. Recorded information shall include at a minimum the following:

- a. Gusting wind speeds
- b. Average wind speed
- bc. Wind directions
- ed. Temperature
- de. Inversion layering and height if present
- ef. Presence and intensity of cloud covering
- fg. Time and date of detonation

III.E.6. The Permittee shall conduct open detonation operations in a manner which exposes the minimum number of people to the smallest quantity of untreated explosives for the shortest period of time consistent with the operations being conducted. For example:

- a. Tasks not necessary to treatment operations shall be prohibited within the immediate area of the hazard.
- b. Personnel not needed by treatment operations will be prohibited from visiting, unless visits are in an official capacity.

III.E.7. The Permittee shall abide by all US Air Force Regulations pertaining to the safe handling and safe treatment of military munitions, including but not limited to CAFB Regulations 136-18 Disposal of Munitions at Melrose Bombing/Gunnery Range, Technical Order 11A-1-42 - General Instruction for Disposal of Conventional Munitions, and AFR 127-100 - Explosive Safety Standards.

III.E.8. The Permittee shall not place ignitable or reactive wastes into the Open Detonation Unit, unless the waste meets all applicable requirements of HWMR-7, Part VIII, §268, and the waste is treated or rendered safe immediately after being placed in the Open Detonation Unit.

III.E.9. The Permittee shall not place in the Open Detonation Unit any ignitable or reactive wastes that are not in a solid phase. Ignitable or reactive liquids shall not be permitted to be placed on the ground within the Open Detonation Unit.

III.E.10. The stacking orientation of waste explosives in the Unit's detonation structure shall be conducted by

*Edition (amended) or a later revision of SW-846, approved by the Secretary in writing.*

### Sampling Methods

The sampling methods used will depend on the physical form of the waste, as shown in Table A-8. To ensure that a representative sample of the residue (contained with or on the soil) is taken, a statistical methodology for determining an adequate number of discrete samples will be used. EPA method 530-SW-84-012 outlines the method that will be used to conduct sampling.

Since it is anticipated that the actual amount of waste (excluding fragmentation of the munitions casings) remaining following an open detonation episode will usually be small, discrete samples of residue and/or soil will be collected so that the OD Unit is characterized for potential and actual contamination resulting from treatment operations.

### Frequency of the Sampling and Analysis Events

Munitions are generally disposed of at the OD Unit once every calendar quarter. Sample collection and laboratory analysis will be performed quarterly within one week of a detonation (provided a detonation episode occurs within the calendar quarter), for the parameters specified in Table A-7. Special care will be taken not to disturb soils (e.g., grading activity) until sampling has been completed. After data for eight consecutive quarterly events have been compiled and studied, a permit modification to reduce the sampling event interval to an annual basis may be requested by CAFB provided no significant contamination is present. When there is a change in the munition wastestream (i.e., newly introduced ordnance items not previously treated of at the OD area) being treated at the OD Unit, sampling will be conducted immediately following an OD episode. All changes in munition type will be approved by NMED.

at 300 foot intervals around the OD Unit and at the access gates. These signs state, "DANGER - MUNITIONS AREA UNAUTHORIZED PERSONNEL KEEP OUT," and are printed in both English and Spanish.

**Table B-1. Contractual Responsibilities for Facility Security**

<b>Required Service</b>	<b>Standard</b>	<b>Frequency of Surveillance</b>
Control of traffic - OD Unit	A. Restrict range entry on the primary access routes to the OD Unit	Daily Checklist
	B. Keep access gates to the OD Unit locked during non OD treatment operations	Daily Checklist

## ATTACHMENT II

Response to EPA Comments on the  
Melrose Air Force Range Open Detonation Permit  
(Preliminary Draft Permit-Prior to Public Comment)  
August 3, 1994

The following comments are from the US EPA on the draft Permit before the draft was made available to the public. The arrangements for preliminary comments comes from a Joint Permitting Agreement.

### Item 1

EPA: Module II; General Facility Permit Condition: There needs to be a condition added to the permit requiring the owner or operator to notify the new owner or operator in writing of the requirements of 40 CFR 264 and 270 (264.12(c)).

NMED: Additional language has been added to Permit Condition I.E.12. to satisfy the required information.

### Item 2

EPA: Page II-3; There needs to be a condition placed in the permit requiring that the Air Force (Melrose Range) make arrangements with the local authorities (264.37).

NMED: Additional language has been added to Permit Condition II.I.4. to satisfy the required information.

### Item 3

EPA: Page II-2; Condition II.B.2.: Since the owner and the operator of Melrose Range is Cannon Air Force Base, this condition can be clarified by stating that no waste other than that generated by Cannon AFB or at the Range can be accepted.

NMED: Additional language has been added to Permit Condition II.B.2., page II-1, to satisfy the required information.

### Item 4

EPA: Page III-1; Condition III.B.4.: The word "per" needs to be inserted between the words "pounds" and "calendar".

NMED: The word "per" has been added to Permit Condition III.B.4.

### Item 5

General Comment: Did the permittee submit air modeling or air monitoring information on Melrose Range? If, not, the Region recommends that a condition requiring air modeling or air monitoring information be placed in the permit.

NMED: CAFB has demonstrated by the Unit's location relative to receptors, and by the quantity and types of waste being permitted

for treatment, that air monitoring or even air modeling is unwarranted at this time. CAFB has submitted adequate documentation supporting this conclusion in both the Part B permit application and follow-up correspondence.

I.E.9.c. Pursuant to HWMR-7, Part IX, §270.30(j)(3), 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 dates 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 Secretary, as soon as possible, of any planned physical alterations or additions to the permitted facility (i.e., the Open Detonation Unit) as required by HWMR-7, Part IX, §270.30(1)(1).

I.E.11. Reporting Anticipated Noncompliance

The Permittee shall give advance notice to the Secretary of any planned changes in the facility's permitted design (i.e., the Open Detonation Unit), construction or activity which may result in noncompliance with Permit Conditions (HWMR-7, Part IX, §270.30(1)(2)).

I.E.12. Transfer of Permits

This Permit is not transferable to any person, except after notice to the Secretary. The Secretary may require modification or revocation and reissuance of the Permit pursuant to HWMR-7, Part IX, §270.40 (~~HWMR-7, Part IX, §270.30(1)(3)~~). Before transferring ownership or operation of the facility during its operation life, the Permittee shall notify the new owner or operator in writing of the requirements of HWMR-7, Part V, §264.12(c) and Part IX, §270.30(1)(3).

I.E.13. Twenty-Four Hour and Subsequent Reporting

ignitable, reactive, and incompatible wastes set forth in Permit Attachment E.

#### II.H. LOCATION STANDARDS

The Permittee shall design, construct and maintain the Open Detonation Unit to prevent leaching or washout of any hazardous waste as a result of the 100-year flood and any smaller precipitation event and as required by HWMR-7, Part V, §264.18(b)(1).

#### II.I. PREPAREDNESS AND PREVENTION

##### II.I.1. Required Equipment

At a minimum, the Permittee shall maintain at the Melrose Air Force Range, the communication, decontamination, flood damage mitigation and fire control equipment set forth in the Contingency Plan (Permit Attachment F) as required by HWMR-7, Part V, §264.32.

##### II.I.2. Testing and Maintenance of Equipment

The Permittee shall test and maintain the equipment specified in Permit Condition II.I.1, as necessary, to assure its proper operation in time of emergency, as required by HWMR-7, Part V, §264.33.

##### II.I.3. Access to Communications or Alarm System

The Permittee shall maintain access to the communications or alarm system, as required by HWMR-7, Part V, §264.34.

##### II.I.4. Arrangements with Local Authorities

The permittee shall maintain arrangements with state and local authorities, as required by HWMR-7, Part V, §264.37. If state or local officials refuse to enter into preparedness and prevention arrangements with the Permittee, the Permittee must document this refusal in the operation record.

#### II.J. CONTINGENCY PLAN

##### II.J.1. Implementation of Plan

The Permittee shall immediately carry out the provisions of the Contingency Plan (Permit Attachment F), whenever there is a fire, unscheduled explosion, water damage or release of

**MODULE II - GENERAL FACILITY CONDITIONS**

**II.A. DESIGN AND OPERATION OF FACILITY**

II.A.1. Although the facility includes all contiguous lands at the Melrose Air Force Bombing and Gunnery Range, owned and operated by the Permittee, only one unit is being permitted. That unit is designed to treat hazardous waste by open detonation. The extent of the unit is far less encompassing than the entire facility. A description of the unit is provided in Module III. The facility includes all security barriers, roadways, support buildings and equipment, all related to the activities of the Open Detonation Unit. More broad definitions of the terms unit and facility are provided in Module I.

II.A.2. The Permittee shall construct, maintain and monitor the facility and the facility's Open Detonation Unit to minimize the possibility of an unexpected fire, an unscheduled explosion, water damage or any unplanned, sudden or unsudden release of hazardous waste constituents to air, soil, waters which could threaten human health or the environment. The Permittee shall maintain all structures and equipment and follow the procedures described in Permit Attachment A through K.

**II.B. REQUIRED NOTICE**

**II.B.1. Hazardous Waste Imports**

This Permit does not allow the Permittee to receive hazardous waste from a foreign source. If the Permittee is to receive hazardous waste from a foreign source, the Permittee shall apply for and receive a permit modification in accordance with HWMR-7, Part V, §264.42 prior to accepting such waste.

**II.B.2. Hazardous Waste from Off-Site Sources**

"Off-site source" refers to a waste generated by sources other than the Permittee or its contractor(s) operating at either Cannon Air Force Base or the Melrose Air Force Bombing and Gunnery Range. This Permit does not allow the Permittee to accept hazardous waste form off-site, of the facility other than that generated at Cannon Air Force Base or Melrose Air Force Range. If the Permittee is to receive hazardous waste from off-site, the Permittee shall apply for and receive a permit modification in accordance with HWMR-7, Part IX, §270.42 prior to accepting such waste.

MODULE III - CONDITIONS SPECIFIC TO  
THE OPEN DETONATION UNIT

III.A. MODULE HIGHLIGHTS

This Module provides conditions for the treatment of hazardous waste by open detonation in a discrete RCRA unit. Information provided by the Permittee has been compiled in Permit Attachments I through L, found in this Permit, and are the basis for complying with the New Mexico Hazardous Waste Management Regulations (HWMR-7) regarding specific wastes and quantities allowed for treatment, unit design, operating procedures, and environmental monitoring. Hazardous wastes treated at the permitted Open Detonation Unit are strictly waste munitions generated from U.S. Air Force operations both at Cannon Air Force Base and the Melrose Air Force Bombing and Gunnery Range, both located near Clovis, New Mexico. Hazardous wastes addressed by this module are primarily hazardous by nature of the reactivity characteristic, and to a lesser degree by the characteristic of toxicity.

III.B. PERMITTED AND PROHIBITED HAZARDOUS WASTES

- III.B.1. The Permittee may treat at the Open Detonation Unit only those hazardous wastes identified in Permit Attachment I, subject to the terms of this Permit.
- III.B.2. The Permittee is prohibited from treating hazardous waste not identified in Permit Attachment I. This prohibition is meant to include, but not limited to boxes or other packaging used for storage or transport of permitted hazardous wastes, unless otherwise properly analyzed and shown not to be a hazardous waste.
- III.B.3. The Permittee shall apply for and receive a permit modification prior to routine treatment of additional hazardous waste items not identified in Permit Attachment I. However, the Secretary may approve in writing treatment of newly identified items, on a one time basis, when the hazardous waste constituents are the same as those items in Permit Attachment I.
- III.B.4. The amount of hazardous waste allowed for treatment by this Permit shall not exceed a total of 8,000 pounds ~~per~~ calendar year. This amount applies strictly to the net explosive weight of all ordnance item treated.
- III.B.5. When the amount of any hazardous waste treated in a calendar year exceeds the amount listed in Permit Condition III.B.4., the Permittee shall submit a

**RESOURCE CONSERVATION AND RECOVERY ACT  
HAZARDOUS WASTE FACILITY  
OPERATIONAL PERMIT  
No. NM5572124456-1**

to the

**UNITED STATES DEPARTMENT OF THE AIR FORCE  
CANNON AIR FORCE BASE**

for the

**TREATMENT OF WASTE EXPLOSIVES BY OPEN DETONATION**

at the

**MELROSE BOMBING RANGE  
ROOSEVELT COUNTY, NEW MEXICO**

October, 1994

Prepared by the  
New Mexico Environment Department  
Hazardous & Radioactive Materials Bureau  
525 Camino de los Marquez  
P.O. Box 26110  
Santa Fe, NM 87502

## TABLE OF CONTENTS

<u>Part</u>	<u>Title</u>	<u>Page</u>
Module I	General Permit Conditions	I-1 to I-10
Module II	General Facility Conditions	II-1 to II-6
Module III	Conditions Specific to the Open Detonation Unit	III-1 to III-6
Module IV	HSWA Permit Conditions	IV-1 to IV-48
Permit Attachment A	Waste Analysis Plan	PA-A-1 to PA-A-22
Permit Attachment B	Security Plan	PA-B-1 to PA-B-2
Permit Attachment C	Inspection Plan and Appendix AFR 127-100	PA-C-1 to PA-C-10 119 to 121
Permit Attachment D	Personnel Training Plan	PA-D-1 to PA-D-14
Permit Attachment E	Special Considerations for the Handling of Incompatible, Reactive and Ignitable Wastes	PA-E-1 to PA-E-4
Permit Attachment F	Contingency Plan	PA-F-1 to PA-F-62
Permit Attachment G	Closure Plan	PA-G-1 to PA-G-13
Permit Attachment H	RCRA Part "A" Permit Application	PA-H-1 to PA-H-7
Permit Attachment I	Permitted Hazardous Wastes for the Open Detonation Unit	PA-I-1 to PA-I-2
Permit Attachment J	Design Plan for the Open Detonation Unit	PA-J-1 to PA-J-10
Permit Attachment K	Operational Procedures for the Open Detonation Unit	PA-K-1 to PA-K-4
Permit Attachment L	Soil Sampling and Analysis Plan	PA-L-1 to PA-L-39

**LIST OF TABLES**

<u>Table</u>	<u>Title</u>	<u>Page</u>
Table A-1.	Waste Analysis Data - Explosive Compositions	PA-A-6 to PA-A-7
Table A-2.	Physical and Chemical Properties of Common Energetic Materials	PA-A-8 to PA-A-12
Table A-3.	Waste Munitions - Cartridge Components and Combustion Products	PA-A-13 to PA-A-14
Table A-4.	Chemical Components and Combustion Products of Smoke and Illuminator Signals	PA-A-15 to PA-A-16
Table A-5.	Miscellaneous Explosive Materials	PA-A-17
Table A-6.	Waste Analysis Data: Typical Ordnance to be Open Detonated	PA-A-18 to PA-A-20
Table A-7.	Test Methods for Munition Residues found in Soils	PA-A-21
Table A-8.	Physical Form of Munitions Residue	PA-A-22
Table B-1.	Contractual Responsibilities for Facility Security	PA-B-2
Table C-1.	Open Detonation Unit - Environmental Management Flight Inspections	PA-C-4 to PA-C-6
Table C-2.	Operator's Inspection Guide and Trouble Report	PA-C-7 to PA-C-8
Table C-3.	Open Detonation Unit Inspection Log - EOD Flight and Range Contractor	PA-C-9
Table C-4.	Contractor's Responsibilities for the Open Detonation Unit	PA-C-10
Table E-1.	Disposal Range Separation Range Distance	PA-E-4
Table G-1.	Estimated Closure Schedule	PA-G-10
Table G-2.	Standard T-Tables 0.05 Level of Significance	PA-G-11
Table G-3.	Inspection and Maintenance Plan for the MAFR Open Detonation Unit	PA-G-12
Table G-4.	Example Post-Closure Inspection Log	PA-G-13

### LIST OF MAPS

<u>MAP</u>	<u>Title</u>	<u>Page</u>
Figure J-1.	Regional Location map of the Melrose AFR	PA-J-4
Figure J-2.	Vicinity Map of the Melrose AFR and Cannon AFB	PA-J-5
Figure J-3.	Existing Land Use at the Melrose AFR	PA-J-6
Figure J-4.	Open Detonation Unit - Plan View Detonation & Outer Berm Cross-Section (100 year flood plain identified)	PA-J-7
Figure J-5.	OD Unit - Detonation Berm Plan View	PA-J-8
Figure J-6.	OD Unit - Detonation & Outer Berm Cross-Sections	PA-J-9
Figure J-7.	OD Unit Outer Berm - Construction Cross-Section	PA-J-10

**PERMIT MODULE I  
GENERAL PERMIT CONDITIONS**

## MODULE I - GENERAL PERMIT CONDITIONS

### I.A. EFFECT OF PERMIT

The Permittee is allowed to treat hazardous waste in accordance with the conditions of this Permit. Any management of hazardous waste requiring a permit under HWMR-7, Part V (Standards for Owner and Operators of Storage, Treatment and Disposal Facilities) and not specifically authorized in this Permit is prohibited. Subject to HWMR-7, Part IX, §270.4, compliance with this Permit generally constitutes compliance, for purposes of enforcement, with the New Mexico Hazardous Waste Act (§§ 74-4-1 et seq. NMSA 1978, (as replaced 1989)) and HWMR-7, Parts V, VII, and IX for only those management practices specifically authorized by this Permit. The Permittee is also required to comply with HWMR-7, Parts I, II, III, and IV to the extent that those Parts are applicable. The Permittee must also comply with all applicable self-implementing provisions imposed by the Resource Conservation and Recovery Act (RCRA) or HWMR-7, Part VIII (Land Disposal Restrictions). A complete RCRA Permit consists of this Permit, and the incorporated Hazardous and Solid Waste Amendment of 1984 (HSWA) Permit prepared and issued by the U.S. Environmental Protection Agency (EPA) on December 17, 1989. The HSWA Permit addresses the portion of the RCRA program for which the State is not authorized. 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, or any infringement of state or local laws or regulations. Compliance with the terms of this Permit does not constitute a defense to any order issued or any action brought by Sections 3008(a), 3008(h), 3013, or 7003 of RCRA; 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 and the environment (HWMR-7, Part IX, §270.4 and §270.30(g)).

### I.B. PERMIT ACTIONS

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

This Permit may be modified, revoked and reissued, or terminated for cause, as specified in HWMR-7, Part IX, §§ 270.41, 270.42, and 270.43. 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 (HWMR-7, Part IX, §270.4(a) and §270.30(f)).

## I.B.2. Permit Renewal

I.B.2 a. This Permit may be renewed as specified in HWMR-7, Part IX, §270.30(b) 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 (HWMR-7, Part IX, §270.30(b)).

I.B.2.b. This Permit shall be reviewed by the Secretary five years after permit issuance since the Open Detonation Unit is land based with no secondary containment, and has potential to be a land disposal unit. Modifications shall be made by the facility as required by the Secretary and in accordance with HWMR-7, Part IX, §270.50(d).

## 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 (HWMR-7, Part X, §1004).

## I.D. DEFINITIONS

For purposes of this Permit, terms used herein are defined for each module. Terms found in Module I shall have the meaning defined in HWMR-7, Part I, §260.2, unless this Permit specifically provides otherwise. Terms found in Module II through III shall have the meaning defined in HWMR-7, Part I, §260.10, unless this Permit specifically provides otherwise. Where terms are not defined in the regulations or this 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.

"Secretary" means the Secretary of the New Mexico Environment Department (NMED), a designee or authorized representative.

"Permittee" means the U.S. Air Force, base commander for Cannon Air Force Base, New Mexico, EPA I.D. Number NM5572124456.

"Hazardous Waste Facility" or "Facility" means all contiguous land, and structures and other appurtenances and improvements at the Melrose Air Force Range on the land owned by the U.S. Air Force, used for treating, storing or disposing of hazardous waste. A facility may consist of one or more operational hazardous waste management unit.

"Hazardous Waste Management Unit" or "Unit" means the Open Detonation Unit.

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 is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application (HWMR-7, Part IX, §270.30(a)).

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 (HWMR-7, Part IX, §270.10(h) and §270.30(b)).

I.E.3 Permit Expiration

HWMR-7, Part IX, §270.50(a) sets a maximum term of ten (10) years for all RCRA permits. The term of this Permit shall be ten years. The Permittee is required to submit a renewal application for this Permit and any subsequent permit(s). As long as NMED 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 new application (see HWMR-7, Part IX, §§ 270.10, 270.13 through 270.29) and, through no fault of the Permittee, the Secretary has not issued a new permit (HWMR-7, Part IX, §270.51).

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 (HWMR-7, Part IX, §270.30(c)).

I.E.5. Minimizing Releases and Their Effects

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 (HWMR-7, Part IX, §270.30(d)).

I.E.6. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all equipment and systems of treatment, 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 (HWMR-7 Part IX, §270.30(e)).

I.E.7. Duty to Provide Information

The Permittee shall furnish to the Secretary, within a reasonable time, any relevant information which the Secretary 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 Secretary, upon request, copies of records required to be kept by this Permit (HWMR-7, Part V, §264.74(a), and Part IX, §270.30(h)).

I.E.8. Inspection and Entry

Pursuant to HWMR-7, Part IX, §270.30(i), the Permittee shall allow the Secretary, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, inspection and entry privileges authorized by Permit Condition I.E.8.a. through I.E.8.d.

- 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.
- 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. The Permittee shall be provided the opportunity to obtain split or duplicate samples.

I.E.9. Monitoring and Records

- 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 or waste constituents to be analyzed must be approved by the Secretary and is described in the Waste Analysis Plan, (Permit Attachment A). Analytical methods must be those specified in the most current edition of the U.S. EPA document Test Methods for Evaluating Solid Waste: Physical/Chemical Methods SW-846, Standard Methods of Wastewater Analysis, or an equivalent method approved by the Secretary (HWMR-7, Part IX, §270.30(j)(1)).
- I.E.9.b. The Permittee shall retain records of all monitoring information including 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 certifications required by HWMR-7, Part V, §264.73(b)(9); and records of all data used to complete the application for this Permit for a period of at least three (3) years from the date of the sample, measurement, report, certification or application. These periods may be extended by request from the Secretary at any time and are automatically extended during the course of any unresolved enforcement action regarding Melrose Air Force Range.

I.E.9.c. Pursuant to HWMR-7, Part IX, §270.30(j)(3), 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 dates 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 Secretary, as soon as possible, of any planned physical alterations or additions to the permitted facility (i.e., the Open Detonation Unit) as required by HWMR-7, Part IX, §270.30(l)(1).

I.E.11. Reporting Anticipated Noncompliance

The Permittee shall give advance notice to the Secretary of any planned changes in the facility's permitted design (i.e., the Open Detonation Unit), construction or activity which may result in noncompliance with Permit Conditions (HWMR-7, Part IX, §270.30(l)(2)).

I.E.12. Transfer of Permits

This Permit is not transferable to any person, except after notice to the Secretary. The Secretary may require modification or revocation and reissuance of the Permit pursuant to HWMR-7, Part IX, §270.40. Before transferring ownership or operation of the facility during its operation life, the Permittee shall notify the new owner or operator in writing of the requirements of HWMR-7, Part V, §264.12(c) and Part IX, §270.30(l)(3).

I.E.13. Twenty-Four Hour and Subsequent Reporting

I.E.13.a. The Permittee shall report to the Secretary

any noncompliance which may endanger health or the environment. This report must be made orally within twenty-four (24) hours of the time the Permittee becomes aware of the situation and the report must be made even if the Contingency Plan (Permit Attachment F) is not implemented. The report must include:

- i. Information concerning releases of any hazardous waste constituents that may cause an endangerment to public drinking water supplies;
- ii. Any information concerning hazardous waste constituent releases or discharges at a hazardous waste management unit as a result of flooding or explosion which could threaten the environment or human health outside the hazardous waste management unit.

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 quantities of materials involved;
- v. The extent of the injuries, if any;
- vi. An assessment of actual or potential hazards to the environment and human health outside the hazardous waste unit, where this is applicable; and
- vii. Estimated quantity and disposition of recovered materials that resulted from the incident.

I.E.14. Other Noncompliance

The Permittee shall report all other instances of noncompliance not otherwise required above in Permit Conditions I.E.1. through I.E.13., at the time monitoring reports are submitted. The reports

shall contain the information listed in Permit Condition I.E.13(b) (HWMR-7, Part IX, §270.30(1)(10)).

I.E.15. Other Information

Whenever the Permittee becomes aware that it failed to submit any relevant facts in the permit application, or it submitted incorrect information in a permit application or in any report to the Secretary, the Permittee shall promptly submit such facts or information (HWMR-7, Part IX, §270.30(1)(11)).

I.F. SIGNATORY REQUIREMENT

All applications, reports, or information submitted to or requested by the Secretary, a designed, or authorized representative, shall be signed and certified in accordance with HWMR-7, Part IX, §270.11 and §270.30(k).

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

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

RCRA Permits Program Manager  
New Mexico Environment Department  
Hazardous & Radioactive Materials Bureau  
525 Camino de los Marquez  
P.O. Box 26110  
Santa Fe, New Mexico 87502

I.H. CONFIDENTIAL INFORMATION

In accordance with HWMR-7, Part IX, §270.12, the Permittee may claim confidential any information required to be submitted by this Permit.

I.I. DOCUMENTS TO BE SUBMITTED - COMPLIANCE SCHEDULE

I.I.a. The Permittee shall submit the following documents to the Secretary by the dates shown. These are mandatorily scheduled requirements. Additional reporting requirements of a conditional nature are stated in Permit Modules I through III:

<u>Document</u>	<u>Date Due to the Secretary</u>
1. Biennial Reports (Module II.L.2.)	March 1 of every even numbered year for the previous two

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|---|---|
|   | years ending<br>December 31   |
| 2. Notification for completion of Unit construction (Module III.C.1.)   | 30 days after construction is completed; prior to conducting treatment                            |
| 3. Annual Soil Sampling and Analysis Report (Module III.G.1.)   | March 1 of every calendar year after Unit is constructed for the previous year ending December 31 |
| 4. Signed Quarterly Progress Reports of all activities conducted pursuant to the provisions of this Permit (Module IV.F.1.) | Beginning within 90 days of the effective date of this Permit                                     |

I.I.b. The Permittee shall submit the additional documents required by the Hazardous and Solid Waste Amendment Act and as itemized in Module IV of this Permit to the EPA Regional Administrator by the dates shown. These are mandatorily scheduled requirements. Additional reporting requirements of a conditional nature are stated in Permit Module IV, Table 1:

<u>Document</u>	<u>Date Due to the Regional EPA Administrator</u>
1. Certified Waste Minimization Plan (Module IV.B.1.)	Annually by December 1 for the previous year ending September 30
2. Report addressing 40CFR, §264, Subparts AA and BB (Module IV.D.)	Within 90 days of the effective date of this Permit
3. Signed Quarterly Progress Reports of all activities conducted pursuant to the provisions of this Permit (Module IV.F.1.)	Beginning within 90 days of the effective date of this Permit
4. RFI Work Plan (Module IV.J.1.)	Within 120 days of the effective date of this Permit

I.J. DOCUMENTS TO BE MAINTAINED

I.J.1. The Permittee shall maintain at Cannon Air Force

Base, until closure is completed and certified by an independent, registered professional engineer, the following documents and all amendments, revisions and modifications to these documents:

- a. Waste Analysis Plan, as required by HWMR-7, Part V, §264.13 and this permit;
- b. Inspection schedules, as required by HWMR-7, Part V, §264.15(b)(2)) and this Permit. Logs must also be maintained as required by HWMR-7 V, §264.15(d) and as designated in the Inspection Plan (Permit Attachment C);
- c. Personnel training documents and records, as required by HWMR-7, Part V, §264.16(d) and this Permit;
- d. Contingency Plan, as required by HWMR-7, Part V, §264.53(a) and this Permit;
- e. Operating record, as required by HWMR-7, Part V, §264.73 and this Permit; and
- f. Closure Plans, as required by HWMR-7, Part V, §264.112 and all Closure Certification Reports applicable to permitted units.

I.J.2. The Permittee shall maintain a copy of the Contingency Plan at the facility as required by HWMR-7, Part V, §264.53(a).

I.J.3. The Permittee shall maintain a copy of the inspection schedules (HWMR-7, Part V, §264.15(b)(2)) and logs of inspections conducted by the Permittee's contractor (HWMR-7 V, §264.15(d)).

#### I.K. PERMIT CITATIONS

Whenever paragraphs of this Permit or of the Hazardous Waste Regulations are cited, such citations include all subordinate sections of the cited paragraph. When subordinate sections are cited, such citations include all subsections of the cited paragraphs. All such citations shall be considered an inclusion by reference to this Permit in accordance with HWMR-7, Part IX.

**PERMIT MODULE II  
GENERAL FACILITY CONDITIONS**

## MODULE II - GENERAL FACILITY CONDITIONS

### II.A. DESIGN AND OPERATION OF FACILITY

- II.A.1. Although the facility includes all contiguous lands at the Melrose Air Force Bombing and Gunnery Range, owned and operated by the Permittee, only one unit is being permitted. That unit is designed to treat hazardous waste by open detonation. The extent of the unit is far less encompassing than the entire facility. A description of the unit is provided in Module III. The facility includes all security barriers, roadways, support buildings and equipment, all related to the activities of the Open Detonation Unit. More broad definitions of the terms unit and facility are provided in Module I.
- II.A.2. The Permittee shall construct, maintain and monitor the facility and the facility's Open Detonation Unit to minimize the possibility of an unexpected fire, an unscheduled explosion, water damage or any unplanned, sudden or unsudden release of hazardous waste constituents to air, soil, waters which could threaten human health or the environment. The Permittee shall maintain all structures and equipment and follow the procedures described in Permit Attachment A through K.

### II.B. REQUIRED NOTICE

#### II.B.1. Hazardous Waste Imports

This Permit does not allow the Permittee to receive hazardous waste from a foreign source. If the Permittee is to receive hazardous waste from a foreign source, the Permittee shall apply for and receive a permit modification in accordance with HWMR-7, Part V, §264.42 prior to accepting such waste.

#### II.B.2. Hazardous Waste from Off-Site Sources

"Off-site source" refers to a waste generated by sources other than the Permittee or its contractor(s) operating at either Cannon Air Force Base or the Melrose Air Force Bombing and Gunnery Range. This Permit does not allow the Permittee to accept hazardous waste from off-site of the facility other than that generated at Cannon Air Force Base or Melrose Air Force Range. If the Permittee is to receive hazardous waste from off-site, the Permittee shall apply for and receive a

permit modification in accordance with HWMR-7, Part IX, §270.42 prior to accepting such waste.

II.C. GENERAL WASTE ANALYSIS

The Permittee shall follow the waste analysis procedures required by HWMR-7, part V, §264.13, as described in the Waste Analysis Plan (Permit Attachment A). Analysis may include existing published or documented data on waste explosives and associated waste components intended for treatment in an Open Detonation Unit.

The Permittee shall verify the published and documented data, or chemical and physical waste analysis of each waste that will be treated in the Open Detonation Unit annually as part of the quality assurance program. For physical and chemical analysis, quality assurance shall be in accordance with Test Methods for Evaluating Solid Waste: Physical and Chemical Methods, EPA Publication SW-846. At a minimum, the Permittee shall maintain proper functioning 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 described in the Security Plan (Permit Attachment B) and HWMR-7, Part V, §§ 264.14 and 264.117(b).

II.E. INSPECTION REQUIREMENTS

The Permittee, after completing construction of the Unit's approved design, shall follow the inspection procedures specified in the Inspection Plan (Permit Attachment C) and shall remedy any deterioration or malfunction of equipment or structures discovered by inspection as required by HWMR-7, Part V, §264.15(c). Records of inspections shall be kept as required by §264.15(d).

II.F. PERSONNEL TRAINING

The Permittee shall conduct personnel training, as required by HWMR-7, Part V, § 264.16. This training program shall include, at a minimum, the information presented in the Personnel Training Plan (Permit Attachment D). The Permittee shall maintain the documents and records required by HWMR-7, Part V, §264.16(d) and (e).

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

The Permittee shall comply with the requirements of HWMR-7, Part V,

§164.17(a). The Permittee shall follow the procedures for handling ignitable, reactive, and incompatible wastes set forth in Permit Attachment E.

II.H. LOCATION STANDARDS

The Permittee shall design, construct and maintain the Open Detonation Unit to prevent leaching or washout of any hazardous waste as a result of the 100-year flood and any smaller precipitation event and as required by HWMR-7, Part V, §264.18(b)(1).

II.I. PREPAREDNESS AND PREVENTION

II.I.1. Required Equipment

At a minimum, the Permittee shall maintain at the Melrose Air Force Range, the communication, decontamination, flood damage mitigation and fire control equipment set forth in the Contingency Plan (Permit Attachment F) as required by HWMR-7, Part V, §264.32.

II.I.2. Testing and Maintenance of Equipment

The Permittee shall test and maintain the equipment specified in Permit Condition II.I.1, as necessary, to assure its proper operation in time of emergency, as required by HWMR-7, Part V, §264.33.

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

The Permittee shall maintain access to the communications or alarm system, as required by HWMR-7, Part V, §264.34.

II.I.4. Arrangements with Local Authorities

The permittee shall maintain arrangements with state and local authorities, as required by HWMR-7, Part V, §264.37. If state or local officials refuse to enter into preparedness and prevention arrangements with the Permittee, the Permittee must document this refusal in the operation record.

II.J. CONTINGENCY PLAN

II.J.1. Implementation of Plan

The Permittee shall immediately carry out the provisions of the Contingency Plan (Permit Attachment F), whenever there is a fire,

unscheduled explosion, water damage or release of hazardous waste or constituents which could threaten human health or the environment (HWMR-7, Part V, §264.51(b)).

II.J.2. Copies of Plan

The Permittee shall maintain and distribute copies of the Contingency Plan in accordance with the requirements of HWMR-7, Part V, §264.53. A copy, at all times, shall be available at the Melrose Air Force Range's Range Operation Control Office.

II.J.3. Amendments to Plan

The Permittee shall review and immediately amend, if necessary, the Contingency Plan, as required by HWMR-7, Part V, §264.54.

II.J.4. Emergency Coordinator

- a. A trained emergency coordinator shall be available at all times in case of an emergency, as required by HWMR-7, Part V, §264.55. He must implement the requirements of HWMR-7, Part V, §264.56.
- b. Changes in the emergency coordinator list shall be sent to the Secretary within 30 days after the change occurs. The change will be added to the Permit as an update and not a permit modification.

II.K. MANIFEST SYSTEM

The Permittee shall comply with the manifest requirements of HWMR-7, Part V, §§ 264.71, 264.72 and 264.76.

II.L. RECORDKEEPING AND REPORTING

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

II.L.1. Operating Record

The Permittee shall maintain a written operating record at Cannon Air Force Base, in accordance with HWMR-7, Part V, §264.73.

II.L.2. Biennial Report

The Permittee shall comply with the biennial reporting requirements of HWMR-7, Part V, §264.75.

II.M.        GENERAL CLOSURE REQUIREMENTS

II.M.1.     Performance Standard

The Permittee shall close the facility (i.e., Open Detonation Unit), as required by HWMR-7, Part V, §264.111 and in accordance with the Closure Plan (Permit Attachment G).

II.M.2.     Amendment to Closure Plan

The Permittee shall amend the Closure Plan, in accordance with HWMR-7, Part V, §264.112(c), whenever necessary.

II.M.3.     Notification of Closure

The Permittee shall notify the Secretary in writing at least sixty (60) days prior to the date on which the Permittee expects to begin closure of the Open Detonation Unit, in accordance with HWMR-7, Part V, §264.112(d). The Open Detonation Unit is considered to have components of land treatment (during the units operating life) and land disposal (if closed with waste remaining in the unit after closure) and shall therefore be regulated as such in accordance with HWMR-7, Part V, §264.601.

II.M.4.     Time Allowed for Closure

After receiving the final volume of hazardous waste, the Permittee shall treat, remove from the Open Detonation Unit or dispose of on-site all hazardous waste and shall complete closure activities, in accordance with HWMR-7, Part V, §264.113 and the schedule specified in the Closure Plan (Permit Attachment G).

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

The Permittee shall decontaminate and dispose of all contaminated equipment, structures, and soils, as required and HWMR-7, Part V, §264.114 and the Closure Plan.

II.M.6.     Certification of Closure

The Permittee shall certify that the Open Detonation Unit has been closed in accordance with specifications in the Closure Plan, as required by HWMR-7, Part V, §264.115.

II.M.7. Survey Plat

The Permittee shall submit a survey plat no later than the submission of certification of closure of the Open Detonation Unit if the unit is closed with waste remaining in the unit, as specified by HWMR-7, Part V, §264.116.

II.M.8. Post-Closure Notice

The Permittee shall submit a record of the type, location, and quantity of hazardous waste disposed of within the Open Detonation Unit, no later than sixty (60) days after the certification of closure, if the unit is closed with waste remaining in the unit, as specified by HWMR-7, Part V, §264.119.

**PERMIT MODULE III  
CONDITIONS SPECIFIC TO THE  
OPEN DETONATION UNIT**

**MODULE III - CONDITIONS SPECIFIC TO  
THE OPEN DETONATION UNIT**

III.A. MODULE HIGHLIGHTS

This Module provides conditions for the treatment of hazardous waste by open detonation in a discrete RCRA unit. Information provided by the Permittee has been compiled in Permit Attachments I through L, found in this Permit, and are the basis for complying with the New Mexico Hazardous Waste Management Regulations (HWMR-7) regarding specific wastes and quantities allowed for treatment, unit design, operating procedures, and environmental monitoring. Hazardous wastes treated at the permitted Open Detonation Unit are strictly waste munitions generated from U.S. Air Force operations both at Cannon Air Force Base and the Melrose Air Force Bombing and Gunnery Range, both located near Clovis, New Mexico. Hazardous wastes addressed by this module are primarily hazardous by nature of the reactivity characteristic, and to a lesser degree by the characteristic of toxicity.

III.B. PERMITTED AND PROHIBITED HAZARDOUS WASTES

- III.B.1. The Permittee may treat at the Open Detonation Unit only those hazardous wastes identified in Permit Attachment I, subject to the terms of this Permit.
- III.B.2. The Permittee is prohibited from treating hazardous waste not identified in Permit Attachment I. This prohibition is meant to include, but not limited to boxes or other packaging used for storage or transport of permitted hazardous wastes, unless otherwise properly analyzed and shown not to be a hazardous waste.
- III.B.3. The Permittee shall apply for and receive a permit modification prior to routine treatment of additional hazardous waste items not identified in Permit Attachment I. However, the Secretary may approve in writing treatment of newly identified items, on a one time basis, when the hazardous waste constituents are the same as those items in Permit Attachment I.
- III.B.4. The amount of hazardous waste allowed for treatment by this Permit shall not exceed a total of 8,000 pounds per calendar year. This amount applies strictly to the net explosive weight of all ordnance item treated.
- III.B.5. When the amount of any hazardous waste treated in a calendar year exceeds the amount listed in Permit Condition III.B.4., the Permittee shall submit a

report explaining the situation to NMED. The report shall be made to the Secretary within thirty (30) days after the end of the calendar year in which the additional waste was treated. If the increase in annual quantities is expected to be repeated, the Permittee shall submit a revised RCRA Part A permit form by March 1 of the following year. New quantities listed on the revised Part A form may be used to modify Permit Attachment K. If operational practices specified in Permit Attachment K change as a result of an increase in the new annual quantity, the Permittee shall request a permit modification identifying all affected parts of the Permit.

### III.C. DESIGN AND CONSTRUCTION OF THE PERMITTED UNIT

- III.C.1. The Permittee shall construct the Open Detonation Unit in accordance with the Design Plan, Permit Attachment J. Upon completion of construction of the Open Detonation, the Permittee shall submit a written report to the Secretary indicating that the Unit is ready and prepared to receive treatment wastes.
- III.C.2. The Permittee shall construct the Open Detonation Unit to minimize the possibility of unplanned, sudden or nonsudden releases of hazardous waste constituents into the air, soil, or waters which could threaten human health or the environment (HWMR-7, part V, §264.31).
- III.C.3. Bilingual (English and Spanish) warning signs shall be posted on the fence surrounding and defining the Open Detonation Unit in sufficient numbers that are legible from any approach for a distance of 25 feet. The posted signs shall have the wording, "Danger-Unauthorized Persons Keep Out" (HWMR-7, Part V, §246.14(c)).

### III.D. MAINTENANCE OF THE PERMITTED UNIT

- III.D.1. The Permittee shall maintain a two foot height and field label that portion of the outer berm, identified in Permit Attachment J, that falls within the 100 year flood plain of the adjacent Noname Arroyo. Vertical measurement of the berm's height shall be from the outside base to the crest. The purpose of this requirement is to prevent washouts of any hazardous waste or hazardous waste constituents in accordance with HWMR-7, Part V, §264.18(b).

- III.D.2. The Open Detonation Unit and all associated structures shall at all times be maintained in accordance with the design plans as specified in Permit Attachment J to eliminate surface run-on from outside the Unit from entering the area inside the outer berm and for eliminating run-on from entering or remaining in the detonation structure.
- III.D.3. All fences, gates, and warning signs shall be maintained in operable conditions and remediated whenever necessary in accordance with Permit Attachment C.
- III.D.4. All safety and operating equipment shall be maintained in operable condition and remediated whenever necessary in accordance with Permit Attachment C.
- III.D.5. Standing water shall not be allowed in any portion of the Unit's detonation structure, described in Permit Attachment J. All standing water shall be removed within 24 hours after any precipitation event which could generate run-off, or within 48 hours when the Range has been closed for for a 24-hour period prior to being routinely inspected. Unless the water is tested by the Toxicity Characteristic Leaching Procedure (HWMR-7, Part II, Appendix II) or equivalent methods approved by the Secretary for being disqualified as a hazardous waste, the water must be managed as a hazardous waste (HWMR-7, Part II, §261, Subpart C).

III.E. OPERATION OF THE PERMITTED UNIT

- III.E.1. The Permittee shall operate and maintain the Open Detonation Unit in accordance with procedures contained in Permit Attachments C and K.
- III.E.2. The Permittee shall conduct open detonation operations only during day light hours.
- III.E.3. The Permittee shall not conduct open detonation whenever the top wind speed, in the vicinity of the Open Detonation Unit, exceeds 15 miles per hour.
- III.E.4. The Permittee shall not conduct detonation activity on any day whenever a snow or thunder storm is imminent or has been forecast, or when violent weather threatens within 10 miles of the Melrose Air Force Range, Open Detonation Unit.
- III.E.5. The Permittee shall make a record of weather

conditions at the time of treating hazardous waste. Recorded information shall include at a minimum the following:

- a. Gusting wind speeds
- b. Average wind speed
- c. Wind directions
- d. Temperature
- e. Inversion layering and height if present
- f. Presence and intensity of cloud covering
- g. Time and date of detonation

III.E.6. The Permittee shall conduct open detonation operations in a manner which exposes the minimum number of people to the smallest quantity of untreated explosives for the shortest period of time consistent with the operations being conducted. For example:

- a. Tasks not necessary to treatment operations shall be prohibited within the immediate area of the hazard.
- b. Personnel not needed by treatment operations will be prohibited from visiting, unless visits are in an official capacity.

III.E.7. The Permittee shall abide by all US Air Force Regulations pertaining to the safe handling and safe treatment of military munitions, including but not limited to CAFB Regulations 136-18 Disposal of Munitions at Melrose Bombing/Gunnery Range, Technical Order 11A-1-42 - General Instruction for Disposal of Conventional Munitions, and AFR 127-100 - Explosive Safety Standards.

III.E.8. The Permittee shall not place ignitable or reactive wastes into the Open Detonation Unit, unless the waste meets all applicable requirements of HWMR-7, Part VIII, §268, and the waste is treated or rendered safe immediately after being placed in the Open Detonation Unit.

III.E.9. The Permittee shall not place in the Open Detonation Unit any ignitable or reactive wastes that are not in a solid phase. Ignitable or reactive liquids shall not be permitted to be placed on the ground within the Open Detonation Unit.

III.E.10. The stacking orientation of waste explosives in the Unit's detonation structure shall be conducted by

the Permittee in a manner that will promote explosive wastes to detonate upward in a vertical direction, rather than at a lower angle.

III.E.11. After each open detonation episode, the Permittee shall patrol the entire Open Detonation Unit for the purpose of removing any visible metal fragments or untreated explosive materials laying on the ground surface.

III.E.12. The Permittee shall not allow soils within the Open Detonation Unit to be disturbed after a detonation episode for which surficial soil samples will be collected, until after sampling is completed.

III.F. GENERAL REQUIREMENTS FOR HANDLING IGNITABLE, REACTIVE OR INCOMPATIBLE WASTES

The Permittee shall follow the special procedures for handling ignitable wastes set forth in Permit Attachment E and in compliance with HWMR-7, Part V, §264.17(a).

III.G. ENVIRONMENTAL MONITORING

III.G.1. The Permittee, after completing construction of the Unit's approved design, shall conduct soil monitoring in accordance with Permit Attachment L, for the purpose of determining the migration potential of hazardous waste constituents before they reach the uppermost aquifer. A summary report of laboratory analysis shall be submitted to the Secretary on an annual basis.

a. Soil Sample shall be collected under the supervision of a person with a minimum of one year of environmental media sampling experience.

b. Soil sample analysis shall be conducted by an EPA certified laboratory in accordance with Permit Attachment L.

III.G.2. The Permittee, after completing construction of the Unit's approved design, shall annually estimate the cumulative weight of emission of all known gases associated with the reactive component of all treated ordnance item when the net explosive weight of treated wastes is greater than 25 tons in any calendar year. Estimates may be based on published data for each type of permitted explosive reactant. When gases emanating from all ordnance item treated in any calendar year exceed 25 tons, special

consideration for limiting releases through improved design, construction, maintenance or operational practices shall be proposed to the Secretary for approval. Estimates and special considerations shall be presented to the Secretary on March 1 following the calendar year in which the exceedance occurred. (HWMR-7, Part V, §264.601(c)).

- III.G.3. The Permittee is not required to establish a ground water monitoring program unless soil contamination is detected at a depth of 20 feet below the ground surface at the Open Detonation Unit. When soil contamination is detected at 20 feet below the ground surface, the Permittee shall submit a monitoring program for ground water in compliance with HWMR-7, Part V, §264, Subpart F. The program must be approved by the Secretary.

**PERMIT MODULE IV  
HSWA PERMIT CONDITIONS**

145

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION 6  
HAZARDOUS WASTE PERMIT  
(HAZARDOUS AND SOLID WASTE AMENDMENTS, 1984)

PERMITTEE: U.S. Cannon Air Force Base

OWNER: United States Air Force

LOCATION: Melrose Air Force Range, Roosevelt County,  
approximately 30 miles northwest of Portales and 25 miles  
west of Cannon Air Force Base

I.D. NUMBER: NM5572124456

EFFECTIVE DATE: December 15, 1994

EXPIRATION DATE: December 15, 2004

Pursuant to the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), and the Hazardous and Solid Waste Amendments of 1984 (HSWA), 42 U.S.C. Sections 6901, et seq., a permit is issued to Melrose Air Force Range (hereinafter called the Permittee) to operate a hazardous waste disposal facility at the above-referenced location.

The Permittee must comply with all the terms and conditions of this permit. This permit consists of the conditions contained herein (including the attachments). Said conditions are needed to ensure that the Permittee's hazardous waste management activities comply with all applicable Federal statutory and regulatory requirements. Applicable requirements are those which are found in, referenced in, or incorporated into that version of RCRA or the regulations promulgated pursuant to RCRA that are in effect on the date this permit is issued. (See 40 CFR 270.32 (c).)

This permit is issued in part pursuant to the provisions of Section 201, 202, 203, 206, 207, 212, 215, and 224 of HSWA which modified Sections 3004 and 3005 of RCRA. These require corrective action for all releases of hazardous waste or hazardous constituents from any solid waste management unit at a treatment, storage, or disposal facility seeking a permit, regardless of the time at which the waste was placed in such unit and provides the authority to review and modify the permit at any time. The decision to issue this permit is based on the assumption that all information contained in the permit application is accurate and that the facility will be operated as specified in the permit application. Any inaccuracies found in the application may be grounds for termination or modification of this permit (see 40 CFR 270.41, 270.42 and 270.43) and potential enforcement action.

Under Federal Law, this permit is effective on the effective date specified above unless a petition to the Administrator of the U.S. Environmental Protection Agency is filed in accordance with the requirements of 40 CFR 124.19.

Issued this 28 day of October, 1994

by Allyn M. Davis  
Allyn M. Davis, Director  
Hazardous Waste Management Division

MODULE IV., SPECIAL CONDITIONS PURSUANT TO THE 1984 HAZARDOUS AND SOLID WASTE AMENDMENTS (HSWA) TO RCRA FOR MELROSE AIR FORCE RANGE, EPA I.D. NUMBER NM5572124456

TABLE OF CONTENTS

A. DEFINITIONS . . . . . IV-3

B. STANDARD CONDITIONS . . . . . IV-4

    1. Waste Minimization . . . . . IV-4

    2. Dust Suppression . . . . . IV-5

    3. Permit Modification . . . . . IV-5

    4. Permit Review . . . . . IV-7

    5. Compliance with Permit . . . . . IV-7

    6. Specific Waste Ban . . . . . IV-7

    7. Information Submittal . . . . . IV-8

    8. Plans and Schedules Incorporation Into Permit . . IV-8

    9. Data Retention . . . . . IV-9

C. SPECIFIC CONDITION - SURFACE IMPOUNDMENTS AND LANDFILLS . . . . . IV-9

D. AA-BB AIR REGULATIONS . . . . . IV-10

E. CORRECTIVE ACTION . . . . . IV-11

    1. Corrective Action for Releases . . . . . IV-11

    2. Releases Beyond Facility Boundary . . . . . IV-11

    3. Financial Responsibility . . . . . IV-11

    4. Dispute Resolution . . . . . IV-11

F. REPORTING REQUIREMENTS . . . . . IV-12

G. NOTIFICATION REQUIREMENTS FOR AND ASSESSMENT OF NEWLY-IDENTIFIED SWMUs . . . . . IV-13

H. NOTIFICATION REQUIREMENTS FOR NEWLY-DISCOVERED RELEASES AT SWMU(s) . . . . . IV-14

I. INTERIM MEASURES . . . . . IV-14

J. RFI WORKPLAN . . . . . IV-15

K. RFI IMPLEMENTATION . . . . . IV-16

L. RFI FINAL REPORT AND SUMMARY . . . . . IV-17

M. DETERMINATION OF NO FURTHER ACTION . . . . . IV-17

N. CMS PLAN . . . . . IV-18

O.	CMS IMPLEMENTATION . . . . .	IV-19
Q.	CORRECTIVE MEASURE (REMEDY) SELECTION AND IMPLEMENTATION . . . . .	IV-21
R.	RFI SCOPE OF WORK . . . . .	IV-21
	1. Purpose . . . . .	IV-21
	2. Scope . . . . .	IV-21
	3. Task I: RFI Workplan . . . . .	IV-21
	4. Task II: RCRA Facility Investigation . . . . .	IV-33
	5. Task III: RFI Final Report and Summary . . . . .	IV-34
S.	CMS SCOPE OF WORK . . . . .	IV-35
	1. Purpose . . . . .	IV-35
	2. Scope . . . . .	IV-35
	3. Task IV: CMS Plan . . . . .	IV-36
	4. Task V: Corrective Measures Study . . . . .	IV-37
	5. Task VI: CMS Final Report and Summary . . . . .	IV-44
Table 1:	RFI/CMS SUBMISSION SUMMARY . . . . .	IV-46
Table 2:	SWMUs REQUIRING AN RFI . . . . .	IV-48

A. DEFINITIONS

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

**"Administrative Authority"** means the New Mexico Environment Department (NMED), or his/her designee, or, in the case of HSWA provisions for which the State is not authorized, the United States Environmental Protection Agency (EPA).

**"CMS"** means Corrective Measures Study.

**"EPA"** means the United States Environmental Protection Agency.

**"Facility"** means all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA.

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

**"Hazardous constituent"** means any constituent identified in Appendix VIII of 40 CFR Part 261, or any constituent identified in Appendix IX of 40 CFR Part 264.

**"Hazardous waste"** means a solid waste, 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.

**"NMED"** means the New Mexico Environment Department.

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

**"Permittee"** means the Melrose Air Force Range, located in Roosevelt County, New Mexico, approximately 25 miles west of Cannon Air Force Base, EPA ID Number NM5572124456.

**"RCRA"** means the Resource Conservation and Recovery Act of 1980 as amended by HSWA in 1984.

**"RCRA Permit"** means the full permit, which includes the 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.

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

B. STANDARD CONDITIONS

1. Waste Minimization

The Permittee shall submit a certified plan according to 40 CFR 270.11 in writing annually, by December 1, for the previous year ending September 30, specifying that:

a. 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:

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

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

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

4) 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;

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

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

7) 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;

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

9) 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.

## 2. Dust Suppression

Pursuant to 40 CFR 266.23(b), the Permittee shall not use waste or used oil or any other material which is contaminated with dioxin, polychlorinated biphenyls (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.

## 3. Permit Modification

a. If at any time for any of the reasons specified in 40 CFR 270.41, the Administrative Authority determines that

modification of this Permit is necessary, the Administrative Authority may require the Permittee to request a permit modification per Module IV.B.3.b or may initiate a modification according to 40 CFR 124.5, as follows:

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

2) 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 40 CFR 124.10(c)(1)(ix), 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).

3) If the Administrative Authority 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 Administrative Authority will:

a) Notify the Permittee in writing of the final decision.

b) 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.

4) If the Administrative Authority receives written comment on the proposed modification, the Administrative Authority will make a final determination concerning the modification after the end of the comment period. The Administrative Authority will:

a) Notify the Permittee in writing of the final decision.

b) 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.

b. The Permittee may initiate permit modifications proceeding under 40 CFR 270.42. All applicable

requirements and procedures as specified in 40 CFR 270.42 shall be followed.

c. Modifications of the Permit do not constitute a reissuance of the Permit.

4. Permit Review

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

5. Compliance with Permit

Compliance with this Permit during its term constitutes compliance, for the purposes of enforcement, with 40 CFR Parts 264 and 266 only for those management practices specifically authorized by this Permit. The Permittee is also required to comply with Parts 260, 261, 262, and 263 as applicable.

6. Specific Waste Ban

a. The Permittee shall not place in any land disposal unit the wastes specified in 40 CFR 268 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.

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

c. The Permittee is required to comply with all requirements of 40 CFR 268.7 as amended. Changes to the waste analysis plan will be considered permit modifications at the request of the Permittee, pursuant to 40 CFR 270.42.

d. 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.

e. The Permittee must comply with requirements restricting placement of hazardous wastes in or on land which become effective by statute or promulgated under Part 268, regardless of requirements in the Permit. Failure to comply with the regulations may subject the Permittee to enforcement action under Section 3008 of RCRA.

This section applies to the RCRA Permit.

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 (40 CFR 270.43).

The Permittee shall ensure that all plans, reports, notifications, and other submissions to the Administrative Authority required in this Permit are signed and certified in accordance with 40 CFR 270.11. A summary of the planned reporting requirements pursuant to this Permit is found in Table 1. Two (2) copies and one (1) 3.5" IBM compatible disk copy each of these plans, reports, notifications or other submissions shall be submitted to the Administrative Authority by Certified Mail or hand delivered to:

U.S. EPA, Region 6  
Hazardous Waste Management Division  
1445 Ross Avenue  
Dallas, Texas 75202-2733

and

New Mexico Environment Department  
Hazardous and Radioactive Materials Bureau  
525 Camino de los Marquez  
P.O. Box 26110  
Santa Fe, New Mexico 87502

8. Plans and Schedules Incorporation Into Permit

All plans and schedules required by this Permit are, upon approval by the Administrative Authority, 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 Administrative Authority in accordance with Module IV.B.3.

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

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.

C. SPECIFIC CONDITION - SURFACE IMPOUNDMENTS AND LANDFILLS

1. Operation/Construction of Surface Impoundments and Landfills

The Permittee shall not place hazardous waste in any surface impoundment or landfill unless the unit meets the Minimum Technological Requirements outlined in 40 CFR 264.221(a) and 40 CFR 264.301(a). The Administrative Authority must approve plans and specifications for retrofitting or construction prior to commencement of construction by the Permittee.

2. Surface Impoundment and Landfill Specific Waste Ban

The Permittee shall not place hazardous waste prohibited by 40 CFR 268 in any surface impoundment or landfill unless:

a. The waste meets treatment standards specified in 40 CFR 268.40, .41, .42, and .43;

b. A variance from the treatment standards has been granted pursuant to 40 CFR 268.44;

c. A petition has been granted on a case-by-case extension to the effective date, pursuant to 40 CFR 268.5;

d. A "no-migration" petition has been granted pursuant to 40 CFR 268.6; or

e. A surface impoundment is exempt under 40 CFR 268.4.

D. AA-BB AIR REGULATIONS

The Permittee must comply with the requirements of 40 CFR 264 Subparts AA and BB, as applicable. Within 90 days of the effective date of this Permit, the Permittee shall submit to the Administrative Authority a report which must contain, at minimum, the following information:

1. An equipment list which includes all the information required under 264.1064(b)(1) for equipment that contains or contacts hazardous wastes with organic concentrations of at least 10 percent by weight, and a list of all process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations managing hazardous waste with organic concentrations of at least 10 percent by weight.
2. For the process vents listed above, the amount of vent emissions in lb/hr or kg/hr, and in lb/yr or kg/yr.
3. If the emissions in paragraph 2 of this section exceed the emission limits cited in 264.1032(a)(1), the report must detail the manner in which compliance will be obtained, i.e., by the reduction of total organic emissions to the limits in 264.1032(a)(1), or reduction by means of a control device per 264.1032(a)(2).
4. If a closed-vent system and control device is installed to comply with the requirements in 264.1032(a)(2), provide the following information:
  - a. An implementation schedule that includes dates by which the closed-vent system and control device will be installed and in operation per 40 CFR 264.1033(a)(2).
  - b. The type of control device under 264.1033 to be installed (e.g. vapor recovery, flare, etc.).
5. If the Permittee feels any of the requirements of this Module IV.D, or of 40 CFR 264 Subparts AA and BB, are not applicable to this facility, the Permittee must provide justification for this decision as part of the report.

E. CORRECTIVE ACTION

1. Corrective Action for Releases: Section 3004(u) of RCRA, as amended by HSWA, and 40 CFR 264.101, require that permits issued after November 8, 1984, address corrective action for releases of hazardous waste including hazardous constituents from any SWMU at the facility, regardless of when the waste was placed in the unit.
2. Releases Beyond Facility Boundary
  - a. The Permittee shall notify the Administrative Authority verbally, within 24 hours of discovery, of any release of hazardous waste or hazardous constituents that has the potential to migrate off-site.
  - b. Section 3004(v) of RCRA as amended by HSWA, and Federal regulations promulgated as 40 CFR 264.101(c), 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.
3. Financial Responsibility: Assurances of financial responsibility for corrective action shall be provided as specified in the Permit following major modification for remedy selection.
4. Dispute Resolution
  - a. 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 workplans, 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 EPA within ten business days of the receipt of 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 EPA's proper

determination. 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 in accordance with Module IV.E.4.b. 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.

b. If the Permittee objects to any EPA determination regarding any requirement by EPA that the Permittee perform work, the Permittee shall, within ten days of its receipt of EPA's decision pursuant to Module IV.E.4.a, notify EPA in writing of its objections, and may request that the Hazardous Waste Management Division Director convene an informal conference. The Director shall state in writing his 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.

#### F. REPORTING REQUIREMENTS

1. The Permittee shall submit, in accordance with Module IV.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. These reports shall contain:
  - a. A description of the work completed and an estimate of the percentage of work completed;
  - b. Summaries of all findings, including summaries of laboratory data;
  - c. Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems;
  - d. Projected work for the next reporting period;
  - e. 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;
  - f. Changes in key project personnel during the reporting period; and

- g. Summaries of all changes made in implementation during the reporting period.
2. Copies of other reports (e.g., inspection reports), drilling logs and laboratory data shall be made available to the Administrative Authority upon request.
3. 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 Administrative Authority.

G. NOTIFICATION REQUIREMENTS FOR AND ASSESSMENT OF NEWLY-IDENTIFIED SWMUS

1. The Permittee shall notify the Administrative Authority, in writing, of any newly-identified SWMU(s) (i.e., a unit not specifically identified during the RFA), discovered in the course of ground water monitoring, field investigations, environmental audits, or other means, no later than thirty (30) calendar days after discovery. The notification shall include the following items, to the extent available:
  - a. The location of the newly-identified SWMU in relation to other SWMUs;
  - b. The type and function of the unit;
  - c. The general dimensions, capacities, and structural description of the unit (supply any available drawings);
  - d. The period during which the unit was operated;
  - e. The specifics, to the extent available, on all wastes that have been or are being managed at the SWMU; and
  - f. 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.
2. Based on the results of this Notification, the Administrative Authority will determine the need for further investigations or corrective measures at any newly-identified SWMU(s). If the Administrative Authority determines that such investigations are needed, the Administrative Authority may require the Permittee to prepare a plan for such investigations. This plan will be reviewed for approval as part of the RFI Workplan or a new RFI Workplan under Module IV.J.3. The Permit will be modified according to Module IV.B.3 to incorporate the

investigation requirements for the newly-identified SWMU(s), if required.

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

The permittee shall notify the Administrative Authority in writing, no later than fifteen (15) calendar days after discovery, of any release(s) of hazardous waste or hazardous constituents 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 Administrative Authority had previously determined no further investigation was necessary. The Administrative Authority 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 Workplan or a new RFI Workplan under Module IV.J.3. The Permit will be modified according to Module IV.B.3 to incorporate the investigation, if required.

I. INTERIM MEASURES

1. If during the course of any activity initiated under this Permit, the Administrative Authority determines that a release or potential release of hazardous constituents from a SWMU poses a threat to human health and the environment, the Administrative Authority may require interim measures. The Administrative Authority 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 Administrative Authority shall notify the Permittee in writing of the requirement to perform interim measures. The Administrative Authority shall modify this Permit according to Module IV.B.3 to incorporate interim measures into the Permit.
2. The following factors will be considered by the Administrative Authority in determining the need for interim measures:
  - a. Time required to develop and implement a final remedy;
  - b. Actual and potential exposure to human and environmental receptors;

- c. Actual and potential contamination of drinking water supplies and sensitive ecosystems;
- d. The potential for further degradation of the medium in the absence of interim measures;
- e. Presence of hazardous wastes in containers that may pose a threat of release;
- f. Presence and concentration of hazardous waste including hazardous constituents in soil that have the potential to migrate to ground water or surface water;
- g. Weather conditions that may affect the current levels of contamination;
- h. Risks of fire, explosion, or accident; and
- i. Other situations that may pose threats to human health and the environment.

J. RFI WORKPLAN

1. The RFI Workplan as specified in Module IV.R.3 shall be submitted to the Administrative Authority within 120 days of the effective date of this Permit. The RFI Workplan must address releases of hazardous waste or hazardous constituents to all media for those SWMUs listed in Table 2. The SWMU numbers are from the RFA Report, prepared by A. T. Kearney, Inc., dated July 1987.
  - a. The Workplan 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 Workplan 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 Module IV.R.
  - b. The RFI Workplan 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.

c. Development of the RFI Workplan and reporting of data shall be consistent with the following EPA guidance documents or the equivalent thereof:

- 1) RCRA Facility Investigation Guidance Document (EPA 530/5W-89-031);
  - 2) RCRA Groundwater Monitoring Technical Enforcement Guidance Document (OSWER 9950.1) September 1986; and
  - 3) Test Methods for Evaluating Solid Waste (SW 846, 2nd ed.) 1982.
2. After the Permittee submits the Workplan, the Administrative Authority will either approve, disapprove, or modify the Workplan in writing.

If the Administrative Authority approves the workplan, the Permittee shall implement the plan within two weeks (14 days) of receipt of approval, according to the schedule contained in the plan. All approved workplans become incorporated into this Permit as per Module IV.B.8.

In the event of disapproval (in whole or in part) of the workplan, the Administrative Authority shall specify deficiencies in writing. The Permittee shall modify the plan to correct these within the time frame specified in the notification of disapproval by the Administrative Authority. The modified workplan shall be submitted in writing to the Administrative Authority 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 Module IV.E.4.

3. The Administrative Authority shall review for approval as part of the RFI Workplan or as a new workplan any plans developed pursuant to Module IV.G addressing further investigations of newly-identified SWMUs, or Module IV.H addressing new releases from previously-identified SWMUs.

#### K. RFI IMPLEMENTATION

Upon receipt of written approval from the Administrative Authority for the RFI Workplan, the Permittee shall implement the RFI according to the schedules and in accordance with the approved RFI Workplan and the following:

1. The Permittee shall notify EPA and NMED 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.

2. Deviations from the approved RFI Workplan which are necessary during implementation of the investigations must be approved by the Administrative Authority and fully documented and described in the progress reports and in the RFI Final Report.

L. RFI FINAL REPORT AND SUMMARY

1. The Permittee shall submit the RFI Final Report and Summary according to the schedule contained in the approved (by the Administrative Authority) RFI Workplan. The RFI Final Report shall describe the procedures, methods, and results of all investigations as described in Module IV.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 Workplan. 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.
2. After the Permittee submits the RFI Final Report and Summary, the Administrative Authority shall either approve or disapprove them in writing.

If the Administrative Authority 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 Administrative Authority determines the RFI Final Report and Summary do not fully meet the objectives stated in Module IV.R, the Administrative Authority may disapprove the RFI Final Report and Summary. If the Administrative Authority 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.

M. DETERMINATION OF NO FURTHER ACTION

1. Based on the results of the RFI and other relevant information, the Permittee may submit an application to

the Administrative Authority for a Class III permit modification under 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 40 CFR 270.42(c).

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) day public comment period required for Class III permit modifications, the Administrative Authority 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 Administrative Authority will grant the requested modification.

2. If necessary to protect human health or the environment, a determination of no further action shall not preclude the Administrative Authority 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.
3. 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 Administrative Authority shall initiate a modification to the Permit according to Module IV.B.3.

#### N. CMS PLAN

1. If the Administrative Authority 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.

2. The Permittee shall submit a CMS Plan to the Administrative Authority 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 Module IV.S.3.

The CMS Plan shall provide the following information:

- a. A description of the general approach to the investigation, and potential remedies;
  - b. A definition of the overall objectives of the study;
  - c. Specific plans for evaluating remedies to ensure compliance with remedy standards;
  - d. Schedules for conducting the study; and
  - e. The proposed format for the presentation of information.
3. After the Permittee submits the CMS Plan, the Administrative Authority will either approve, disapprove, or modify the plan in writing.

If the Administrative Authority approves the CMS Plan, the Permittee shall implement the plan per Module IV.O.

In the event of disapproval (in whole or in part) of the CMS Plan, the Administrative Authority shall specify deficiencies in writing. The Permittee shall modify the plan to correct these within the time frame specified in the notice of deficiency. The modified CMS Plan shall be submitted in writing to the Administrative Authority 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 Module IV.E.4.

#### O. CMS IMPLEMENTATION

No later than fourteen (14) calendar days after the Permittee has received written approval from the Administrative Authority 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 Module IV.B.8.

P. CMS FINAL REPORT AND SUMMARY

1. 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:
  - a. attain compliance with corrective action objectives for hazardous constituents in each medium, as established in Module IV.S;
  - b. control sources of releases;
  - c. meet acceptable waste management requirements; and
  - d. protect human health and the environment.
2. After the Permittee submits the CMS Final Report and Summary, the Administrative Authority will either approve or disapprove them in writing.

If the Administrative Authority 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 Administrative Authority determines the CMS Final Report and Summary do not fully meet the objectives stated in Module IV.S, the Administrative Authority may disapprove the CMS Final Report and Summary. If the Administrative Authority 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.
3. 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.

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 Module IV.B.3, for corrective measure (remedy) selection, based on the approved CMS Final Report. The resultant modified permit will include schedules for remedy implementation.

R. RFI SCOPE OF WORK

1. Purpose

The purpose of the RFI is to determine the nature and extent of releases of hazardous wastes or hazardous constituents from 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.

2. Scope

The RFI consists of three tasks:

Task I: RFI Workplan

- a. Introduction
- b. Environmental Setting
- c. Source Characterization
- d. Contamination Characterization
- e. Potential Receptor Identification
- f. Data Collection Quality Assurance Plan
- g. Data Management Plan
- h. Health and Safety Plan
- i. Community Relations Plan
- j. Project Management Plan

Task II: RCRA Facility Investigation

Task III: RFI Final Report and Summary

3. Task I: RFI Workplan

The Permittee shall prepare a RFI Workplan as specified in Module IV.J and the following. The RFI Workplan shall provide for and address the following information needs:

a. Introduction

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:

a) Map(s) depicting the information specified below. All maps shall be consistent with requirements set forth in 40 CFR 270.14 and shall be of sufficient detail and accuracy to locate all current and future work performed at the site.

(1) general geographic location;

(2) 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;

(3) topography, waterways, wetlands, floodplains, water features, and drainage patterns;

(4) all tanks, buildings, utilities, paved areas, rights-of-way, and other features;

(5) all solid waste management units, including new SWMUs identified after the 1987 RFA;

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

(7) surrounding land uses (residential, commercial, agricultural, recreational); and

(8) 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).

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

c) 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.

d) 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.

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

2) Nature and Extent of Contamination

a) 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:

(1) location of unit/area on a facility map;

(2) quantities of solid, hazardous, and radiochemical wastes;

(3) quantities of radiochemical and hazardous constituents, to the extent known; and

(4) identification of areas where additional information is necessary.

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

(1) available monitoring data and qualitative information on locations and levels of contamination at the facility;

(2) all potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and

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

### 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:

a) 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;

b) Schedules for design, construction and monitoring; and

c) Schedule for progress reports.

#### b. Environmental Setting

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

##### 1) Hydrogeology

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

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

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

c) 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.

d) 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:

- (1) unconsolidated sand and gravel deposits;
- (2) zones of fracturing or channeling in consolidated or unconsolidated deposits; and
- (3) zones of high permeability or low permeability that might direct and restrict the flow of contaminants.

e) A description of representative water level or fluid pressure based on data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient 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.

f) 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.

## 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.

### 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:

1) 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.

2) 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, photodegradation rates, hydrolysis rates, chemical transformations).

#### 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, media sampled, concentrations found, 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:

##### 1) Ground Water Contamination

The Workplan 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 needs:

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

b) the horizontal and vertical direction of contamination movement;

- c) the velocity of contaminant movement;
- d) the horizontal and vertical concentrations of any 40 CFR 264 Appendix IX constituents;
- e) an evaluation of factors influencing the plume movement; and
- f) an extrapolation of future contaminant movement.

## 2) Soil Contamination

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

- a) a description of the vertical and horizontal extent of contamination;

- b) 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.

- c) plume migration and transformation; specific contaminant concentrations; the velocity and direction of contaminant movement; and an extrapolation to future contaminant movement.

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

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

c) 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.

d) 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;

e) the horizontal and vertical direction and velocity of contaminant movement;

f) an evaluation of the physical, biological, chemical, and radiochemical factors influencing contaminant movement;

g) an extrapolation to future contaminant movement;

h) 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.

#### 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 amount of the release; and the chemical, radiochemical, and physical composition of the contaminants released, including horizontal and vertical concentration profiles.

#### 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.

e. 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:

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

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

b) location of all ground water wells, names of owners or tenants at those locations, USGS/DODT well designations, and current use of those wells within a 1 mile radius of facility.

2) 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.

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

4) 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.

5) 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.

f. 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.

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

a) description of the intended uses for the data, and the necessary level of precision and accuracy for those intended uses;

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

c) schedule and information to be provided in quality assurance reports, including at least:

(1) periodic assessment of measurement data accuracy, precision, and completeness;

(2) results of performance audits;

(3) results of systems audits; and

(4) significant quality assurance problems and resolutions.

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

a) selecting appropriate sampling and field measurements locations, depths, etc.;

b) providing a statistically sufficient number of sampling and field measurement sites;

c) determining conditions under which sampling or field measurements shall be conducted;

d) determining which parameters are to be measured and where;

e) selecting the frequency of sampling and length of sampling period;

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

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

h) documenting field sampling operations and procedures;

i) selecting appropriate sample containers;

j) preserving samples;

k) controlling chain-of-custody; and

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

3) The Sample Analysis shall include:

a) chain-of-custody procedures;

b) sample storage procedures and holding times;

c) sample preparation methods;

d) analytical procedures;

e) calibration procedures and frequency;

f) data reduction, validation and reporting; and

g) frequency of internal quality control checks and laboratory performance audits.

g. 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 set up data documentation materials and procedures (data record), project file requirements, and project-related progress reporting procedures and documents.

1) 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.

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

a) 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.

b) 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.

#### h. Health and Safety Plan

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

a) a description of the facility including availability of resources such as roads, water supply, electricity and telephone service;

b) 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;

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

d) a delineation of the work area;

e) a description of levels of protection to be worn by personnel in the work area;

f) procedures established to control site access;

g) decontamination procedures for personnel and equipment;

h) site emergency procedures;

i) emergency medical care procedures for injuries and toxicological problems;

j) requirements for an environmental field monitoring program;

k) routine and special training requirements for responders; and

l) procedures for protecting workers from weather-related problems.

2) The Facility Health and Safety Plan shall be consistent with:

a) NIOSH Occupation Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

b) EPA Order 1440.1 - Respiratory Protection;

c) EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;

d) approved Facility Contingency Plan;

e) EPA Operating Safety Guide (1984);

f) OSHA regulations, particularly 29 CFR 1910 and 1926;

g) State and local regulations; and

h) other EPA guidance as provided.

i. Community Relations Plan

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

j. Project Management Plan

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

4. Task II: RCRA Facility Investigation

The facility investigation activities shall follow the RFI Workplan. 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 Workplan to increase or decrease the detail of information collected to accommodate the facility's 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 measures alternatives during the Corrective Measures Study, when necessary.

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 Module IV.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, ground water 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.

6. General RFI Reporting Requirements

a. Two hard copies and one IBM compatible disk copy of all reports and data shall be submitted by the Permittee to the Administrative Authority as specified in Module IV.B.7.

b. The RFI Workplan shall be submitted by the Permittee to the Administrative Authority as described in Module IV.J.

c. The RFI Final Report and Summary shall be submit by the Permittee to the Administrative Authority as described in Module IV.L.

d. Within 90 days of the effective date of this Permit, the Permittee shall provide the Administrative Authority with signed, quarterly progress reports as specified in Module IV.F.1.

S. CMS SCOPE OF WORK

1. Purpose

The purpose of the CMS is to develop and evaluate corrective measures 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.

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

3. Task IV: CMS Plan

a. 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.

b. Establishment of Corrective Action Objectives

The Permittee shall propose to the Administrative Authority 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.

c. 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 measures alternatives, as discussed in detail in Module IV.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.

d. 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.

4. Task V: Corrective Measures Study

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

a. Identification of Preliminary Corrective Measures 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.

b. Screening of Preliminary Corrective Measures 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 inapplicable technologies are described in more detail below:

1) 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;

2) 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.

3) Technological Limitations. The level of technology development, performance record, 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.

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 practice 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 measures alternatives. The alternatives developed should represent a workable number of options that each appear 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.

1) 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.

2) 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.

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

d. Evaluation of Corrective Measures Alternative(s)

The Permittee shall evaluate each corrective measures alternative developed in Module IV.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.

1) Technical, Environmental, Human Health, and Institutional Concerns

The Permittee shall provide a description of each corrective measure 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:

a) Technical

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

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

(a) 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.

(b) 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.

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

(a) 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.

(b) 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.

(3) The Permittee shall describe the implementability of each corrective measure including relative ease of installation (constructibility) and total time required to achieve a given level of response:

(a) Constructibility 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 the 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.

(b) Time has two 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.

(4) The Permittee shall evaluate each corrective measures alternative with regard to 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.

#### b) 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.

c) 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 Administrative Authority.

d) 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.

2) Cost Estimate

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

a) Capital costs consist of direct and indirect costs.

(1) Direct capital costs include:

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

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

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

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

(2) Indirect capital costs include:

(a) Engineering expenses: Costs of administration, design, construction, supervision, drafting, and testing of corrective measures alternatives;

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

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

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

b) Operation and maintenance 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:

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

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

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

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

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

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

(7) 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;

(8) 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

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

e. Selection of Corrective Measures Alternative(s)

The Permittee shall select a corrective measures 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.

1) Technical

a) 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;

b) 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;

c) 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

d) 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.

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.

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.

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. A summary of all the corrective measures 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. Trade-offs among health risks, environmental effects, and other pertinent factors shall be highlighted.

b. 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.

c. 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.

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

e. A schedule for corrective measure (remedy) implementation.

6. General CMS Reporting Requirements

a. Two hard copies and one IBM compatible disk copy of all reports shall be submitted by the Permittee to the Administrative Authority as specified in Module IV.B.7.

b. The CMS Plan shall be submitted by the Permittee to the Administrative Authority as described in Module IV.N.

c. The CMS Final Report and Summary shall be submitted by the Permittee to the Administrative Authority as described in Module IV.P.

d. Within 90 days of the date the Permittee is notified to begin a CMS, the Permittee shall provide the Administrative Authority with signed, quarterly progress reports as specified in Module IV.F.1.

Table 1: RFI/CMS SUBMISSION SUMMARY

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

<u>Actions</u>	<u>Due Date</u> (examples)
Progress reports on all activities	quarterly; no later than ninety (90) calendar days after effective date of Permit
RFI Workplan	120 calendar days after the effective date of the Permit
Revised RFI Workplan	as determined by Administrative Authority, usually within thirty (30) calendar days of receipt of NOD
RFI Report and Summary	as scheduled in the approved (by the Administrative Authority) RFI workplan
Revised RFI Report and Summary	as determined by Administrative Authority, usually within thirty (30) calendar days of receipt of NOD
Notification of newly-identified SWMUs	thirty (30) calendar days after discovery
Notification of newly-discovered releases	fifteen (15) calendar days after discovery
Interim Measures Plan	as determined by Administrative Authority
Revised Interim Measure Plan	as determined by Administrative Authority
CMS Plan	forty five (45) calendar days after notification of requirement to perform CMS

Revised CMS Plan

as determined by  
Administrative Authority,  
usually within thirty (30)  
calendar days of receipt of  
NOD

CMS Final Report and Summary

sixty (60) calendar days after  
completion of CMS

Revised CMS Final Report

as determined by the  
Administrative Authority,  
usually thirty (30) calendar  
days after receipt of NOD

Demonstration of Financial  
Assurance at Facility

one hundred and twenty  
(120) calendar days after  
permit modification to  
implement corrective measures

Table 2: SWMUs REQUIRING AN RFI

Below is a list of the SWMUs requiring an RFI. The SWMU numbers are from the RFA prepared by A. T. Kearney, Inc., dated July 1987.

1. SWMU No. 114 - Melrose Bombing Range Expended Ordnance Burial Site
2. SWMU No. 115 - Melrose Bombing Range Explosives Contaminated Burial Site
3. SWMU No. 117 - Melrose Bombing Range Domestic Waste Pile

**PERMIT ATTACHMENT A  
WASTE ANALYSIS PLAN**

## WASTE ANALYSIS PLAN

### Introduction

The Waste Analysis Plan describes the types of hazardous wastes intended to be treated at the Open Detonation (OD) Unit located at the Melrose Air Force Range (MAFR). Also presented are the procedures that will ensure proper waste identification. Specific ordnance items that are permitted for treatment are listed in Permit Attachment I of this Permit.

### Chemical and Physical Analysis

Due to the presence of trace amounts of toxic metals, wastes to be treated at the MAFR OD Unit will generally be hazardous by virtue of the characteristic reactivity, and to a lesser degree, by toxicity. The wastes to be treated are physically intact explosive ordnance items that include a wide variety of small unserviceable munitions items and unexploded (dud fired) practice bombs. Although it is possible that some off-specification ordnance may be treated at the OD Unit, the chemical components should be consistent with the data presented in this section. Table A-1 presents a list of the basic compositions of those energetic materials that are in general use today as part of the overall Cannon Air Force Base (CAFB) mission.

The reactive munitions demilitarized by open detonation treatment methods generally consist of an assortment of explosive chemical fill materials, along with associated metal casings (brass, aluminum, and steel), projectiles, and primer components. Metal components make up the majority of the total mass of the munitions, and reactive/explosive materials are usually less than 20% of the gross munitions weight.

A number of reactive compounds are present in munitions. These compounds fall into four general classes: propellants, pyrotechnic compositions, priming compositions, and high explosives. Propellants, pyrotechnic compositions, and primers react by burning, exhibiting great heat generation and light intensity. High explosives reactions are exhibited in the form of detonations. The physical and chemical properties of several component compounds characteristic of these types of munitions are listed in Table A-2.

When these munitions are treated in an OD Unit, various combustion and detonation products are formed. These combustion products are no longer reactive but may result in some impact to environmental media. Tables A-3, A-4, and A-5 lists components and resulting combustion by-products of some of the more typical ordnance treated at the OD Unit. Due to the nature of these reactions, the primary products released during treatment are gaseous in nature. In addition, groundwater and soil contamination

could potentially occur. The Soil Sampling and Analysis Plan outlines procedures to study these pathways prior to such an occurrence.

The propellant mixtures are typically classified as single- or double-based. Single-based propellants are composed mainly of nitrocellulose, while double-based propellants are mixtures of nitrocellulose and nitroglycerin. A number of miscellaneous chemical compounds are added to the propellant to control deflagration characteristics or to promote stability during storage. These additives include various nitrated organic compounds, petrolatum, metals, and metal salts. The additives incorporated into the propellant fuels generally account for 3% of the mixture and are oxidized during the deflagration reaction. For this reason, they are of minor consequence relative to their impact on the environment. All components of military propellants are in solid form and contain no free liquids.

Pyrotechnic compositions are mixtures of compounds designed to emit smoke and/or light. These munitions consist primarily of a mixture of fuel and oxidizing compounds. The fuels are usually metal powders, such as Mg, Al, Ti, or Zr powder. Typical oxidizers consist of metal nitrates, ammonium, or metal perchlorates, chlorates, and peroxides. Secondary constituents also present in pyrotechnic mixtures are binders, ignition agents, retardants, and colorants. A variety of chemical compounds are present in these additives. Typical minor components include black powder, chlorinated organics, waxes, sugar, asphalt, polyvinyl chloride, and vegetable oils. Military pyrotechnic compositions contain no free liquids. The thermal treatment of these devices generates gaseous combustion products and solid particulates.

Priming compositions are mixtures that are very sensitive to shock or friction and are used to provide a source of ignition for pyrotechnics, propellants, or explosives. Primers are a mixture of fuel, oxidizer, and explosive compounds. Typical fuels are antimony sulfide and lead thiocyanate; oxidizers include barium nitrate and potassium nitrate. The primary explosives are lead azide and lead styphnate.

High explosives are typically nitrated organic materials that generate large quantities of gaseous reaction products as a result of detonation. The most common high explosives are trinitrotoluene (TNT), cyclotrimethylenetrinitramine (RDX), trinitrophenylmethyl nitramine (tetryl), cyclotetramethylenetetranitramine (HMX), and various combinations of these compounds. High explosive ordnance may have waxes or aluminum powder as additives. All constituents are in solid form.

A representative list of ordnance types to be demilitarized and their reactive contents, usually expressed as net explosive weight (NEW) is given in Table A-6. Obsolete and off-specification

items have the same characteristics as other permitted wastes items that were classified as wastes for different reasons. Explosive content by weight and type may vary by model. CAFB plans to treat by open detonation approximately 8,000 pounds NEW maximum of waste ordnance each year at the OD Unit. The volume of residue remaining after an open detonation episode varies according to the type and amount of explosive being treated. For example, some munitions items have a low explosive-to-weight ratio, while others have a high explosive-to-weight ratio. In general, however, the amount of residue resulting from open detonation treatment is very small.

#### Containers

All munitions which are manufactured with a metal housing or casing (e.g., cartridge, metal bomb body) will be treated in their original containment casing. These casings are designed by the manufacturer to provide long-term stability for containerization of explosive materials. Any wooden crates, boxes, or other packaging used for storage or transport of munitions will be discarded prior to any OD operations to eliminate unnecessary wastes resulting from such treatment operations.

#### Land Treatment (Aspect Component of Open Detonation)

Based upon the current design of the OD Unit and the fact that munitions are detonated on ground surface, very small quantities of residues may remain in soil. These residues can potentially be incidentally degraded or transformed through photochemical oxidation or other natural processes.

#### Landfills (Aspect Component of Open Detonation)

The OD Unit is intended only for the treatment of waste munitions. Such activities may result in some minor amounts of waste residues remaining after open detonation treatment. Any waste contaminants determined through sampling and analysis to be present in ambient soils at levels above site-specific action levels will be properly containerized and disposed.

#### **Waste Analysis**

All waste munitions that will be treated at the MAFR OD Unit are standard military end items with well-defined specifications on their physical and chemical characteristics (Tables A-1 and A-2). Detailed pretreatment waste analysis is not intended to be performed. For the limited number of munitions treated at the MAFR OD Unit, process knowledge using manufacture specifications for each permitted ordnance type should be sufficient for understanding chemical composition and constituent quantities. If a new type of munitions is added to the inventory at CAFB, written notice of the waste stream modification, describing the components and combustion by-products will be forwarded to the New Mexico Environment

Department (NMED) for review and approval. A modification to the Permit will be duly submitted. No unknown wastes (i.e., those with no available data) will be treated. The current treatment methods to be used for all future open detonation operations are specified in USAF Technical Orders (TOs). The existing published data for munitions anticipated for future disposal at the OD Unit meet the general waste analysis requirements listed in this plan. Detailed physical and chemical characteristics for energetic materials in munitions to be treated at the MAFR OD Unit are shown in Tables A-1, A-2, and A-6.

Munitions and their components are inherently unstable, and instability normally increases with age. Therefore, the timely treatment of waste ordnance is an important safety concern. When sampling and analysis is needed, the increased hazards associated with the time necessary to conduct these functions must be considered when such data are requested.

The open detonation process normally will result in air emissions during treatment. Air emissions, in a worse case scenario, should not exceed the weight of waste explosives being treated. In accordance with the weight of explosives limited by this Permit, no more than 4 tons of gaseous emissions per year can be expected within the unit boundary. This amount would be significantly less at the facility boundary due to diffusion in air.

Particulates in the form of explosive and metallic residues are also expected to be released into the environment. The greatest amounts of these residues are expected to fall-out from the detonation plume at or near the point of detonation. The amount of particulates should decrease with distance from the center of the Unit. The stacking position of all waste ordnance items, prior to detonation, will be oriented to detonate vertically into the air, rather than to the side at some angle other than straight up. Wind direction and velocity at the time of detonation will be accounted for when considering the spread of particulate wastes and collecting soil samples that will be used to evaluate the extent of contamination. Soil sampling and analysis is discussed in Permit Attachment K.

#### Test Methods

Munition residues in soil will be sampled and analyzed for waste characteristics that are representative of the munitions' original components and combustion products. The analytical test methods for each chemical element or compound associated with the permitted wastes are listed in Table A-7. All tests will be performed by an EPA-approved laboratory and in accordance with the appropriate methodology detailed in *Test Methods for Evaluating Solid Waste, Physical and Chemical Methods U.S. EPA, Office of Solid Waste and Emergency Response, November 1986, SW-846, Third*

*Edition (amended)* or a later revision of SW-846, approved by the Secretary in writing.

### Sampling Methods

The sampling methods used will depend on the physical form of the waste, as shown in Table A-8. To ensure that a representative sample of the residue (contained with or on the soil) is taken, a statistical methodology for determining an adequate number of discrete samples will be used. EPA method 530-SW-84-012 outlines the method that will be used to conduct sampling.

Since it is anticipated that the actual amount of waste (excluding fragmentation of the munitions casings) remaining following an open detonation episode will usually be small, discrete samples of residue and/or soil will be collected so that the OD Unit is characterized for potential and actual contamination resulting from treatment operations.

### Frequency of the Sampling and Analysis Events

Munitions are generally disposed of at the OD Unit once every calendar quarter. Sample collection and laboratory analysis will be performed quarterly within one week of a detonation (provided a detonation episode occurs within the calendar quarter), for the parameters specified in Table A-7. Special care will be taken not to disturb soils (e.g., grading activity) until sampling has been completed. After data for eight consecutive quarterly events have been compiled and studied, a permit modification to reduce the sampling event interval to an annual basis may be requested by CAFB provided no significant contamination is present. When there is a change in the munition wastestream (i.e., newly introduced ordnance items not previously treated of at the OD area) being treated at the OD Unit, sampling will be conducted immediately following an OD episode. All changes in munition type will be approved by NMED.

**Table A-1. Waste Analysis Data: Basic Explosive Compositions**

Type of waste	Constituents	General or typical concentration or amount	Comment
Propellant (single base—exact composition varies by use and types)	Nitrocellulose	52% to 98%	$C_3H_5N_3O_9$
	Nitroglycerin	2% to 43%	
		Traces of other chemicals to retard burn	
Propellant (20-mm, 30-mm, 40-mm target practice)	Nitrocellulose/nitroglycerin	75%	
	Charcoal	12.5%	
	Sulfur	12.5%	
	Graphite	Trace	
Black powder	Potassium (or sodium) nitrate	75%	$K(Na)NO_3$
	Charcoal	15%	
	Sulfur	10%	
Primer Components	Potassium chlorate	53%	High temperature percussion primers
	Antimony trisulfide	25% to 30%	
	Calcium silicide	12% to 17%	
	Lead azide	20%	Stab detonators
	Basic lead styphnate	40% to 60%	
	Tetracene	5%	
	Barium nitrate	20% to 25%	
	Antimony sulfide	10% to 15%	
	Powdered aluminum	10%	
	Potassium chlorate	8.5% to 66.7%	Electronic Primer
	Lead mononitroresorcinate	76.5%	
	Nitrocellulose	15%	
	Lead thiocyanate	45%	
	DDNP	20% to 75%	
Charcoal	15%		
Nitrostarch	5%		
Titanium	33.3%		
Aluminum	33.3%		
Illumination mixture	Sodium nitrate	36% to 40%	
	Magnesium	53% to 56%	
	Polymeric binder	4% to 8%	
Tetryl	Trinitrophenylmethylnitramine		$C_7H_5N_5O_8$
PETN	Pentaerythritol tetranitrate		$C_5H_8N_4O_{12}$
TNT	Trinitrotoluene		$C_7H_5N_3O_6$
RDX	Cyclotrimethylenetrinitrimine		$C_3H_6N_6O_6$

**Table A-1. (continued)**

Type of waste	Constituents	General or typical concentration or amount	Comment
C-4	RDX	91%	
	Polyisobutylene	2%	
	Binder	7%	
Incendiary mix	Ammonium perchlorate	35%	NH <sub>4</sub> ClO <sub>4</sub>
	Aluminum	52%	
	Calcium stearate	1.9%	Ca(C <sub>18</sub> H <sub>35</sub> O <sub>2</sub> ) <sub>2</sub>
	Other	9.7%	
PBX	RDX, HMX, HNS, or PETN with polymeric binder (polyester, polyurethane, nylon, polystyrene, etc.)	91% to 94% 6% to 9%	

Tetryl = trinitrophenylmethylnitramine  
 PETN = pentaerythritol tetranitrate  
 TNT = trinitrotoluene  
 RDX = cyclotrimethylenetrinitramine  
 PBX = plastic bonded explosives  
 DDNP = diazodinitrophenol  
 HMX = cyclotetramethylenetetranitramine  
 HNS = hexanitrostilbene

**Table A-2. Physical and Chemical Properties of Common Energetic Materials**

Explosive	Composition or chemical formula	Molecular weight	Density (g/cc)	Physical state/appearance	Solubility	Activation energy (Kcal/mole)*	Hazard/toxicity
<b>Primary explosives</b>							
Lead azide	N=28.8% Pb=71.2%	291	4.68	Colorless, crystalline (very sensitive needles)	Soluble in water at 20°C, 0.05%	23.74	Severe explosion risk; highly toxic; avoid inhalation; TLV <sup>b</sup> (as Pb) is 0.15 mg/m <sup>3</sup> in air
Lead styphnate	C=15.4% H=0.6% N=9.0% O=30.8% Pb=44.2%	706	3.02	Yellow orange or reddish brown, rhombic needles	Practically insoluble in water	75.39	Detonates at 260°C; dangerous explosion risk; an initiating explosive
Tetracene	C=12.8% H=4.3% N=74.4% O=8.5%	188	1.35	Colorless to pale yellow, fluffy material with needle crystals	Practically insoluble in water and ethanol; insoluble in ether, benzene, acetone, carbon tetrachloride, and ethylene dichloride	NA	Explodes when shocked, reacts with oxidizing materials
<b>Booster and secondary explosives</b>							
Nitrocellulose	C=26.46% H=2.78% N=12.60% O=58.16%	272	1.66	Pulp, cotton-like, amorphous solid (dry); colorless liquid to semi-solid (solution)	High-nitrogen forms soluble in acetone, insoluble in ether-alcohol mixture; low-N is soluble in ether-alcohol mix and acetone; insoluble in water	NA	Flammable, dangerous fire and explosion risk; tests have shown no toxicity to mammals (rats and dogs)

Table A-2. (continued)

Explosive	Composition or chemical formula	Molecular weight	Density (g/cc)	Physical state/appearance	Solubility	Activation energy (Kcal/mole) <sup>a</sup>	Hazard/toxicity
Nitroglycerin	C=15.9% H=2.2% N=18.5% O=63.4%	227	1.609	Pale yellow to clear, colorless viscous/oily liquid; odorless; has sweet, burning taste	Slightly soluble in water; soluble in alcohol and ether	41.5	Severe explosion risk; highly sensitive to shock and heat; toxic by ingestion, inhalation, and skin absorption; TLV is 0.05 ppm in air
PETN	C=19.0% H=2.5% N=17.7% O=60.8%	316	1.75	White, crystalline material	Very soluble in acetone; slightly soluble in alcohol and ether; insoluble in water	47	Due to its insolubility in water and the fact that it is usually handled wet, cannot be absorbed through skin and inhalation of dust improbable; Shock-sensitive explosive; detonates at 210° C
HMX	C=16.2% H=2.7% N=37.9% O=43.2%	296	1.905	White, crystalline solid; has four polymorphs: alpha, beta, gamma, and delta	Insoluble in water, slight solubility in various solvents	52.7	High explosive; toxic by inhalation and skin contact
RDX	C=16.3% H=2.7% N=37.8% O=43.2%	222	1.82	White, crystalline solid; form varies according to precipitation process, may be needles, plates, or crystals	Insoluble in water, alcohol, carbon tetrachloride, and carbon disulfide; slightly soluble in methanol and ether	47.5	High explosive, easily initiated by mercury fulminate; toxic by inhalation and skin contact; TLV is 1.5 mg/m <sup>3</sup> of air
Nitroguanidine	C=11.5% H=3.9% N=53.8% O=30.8%	104	1.72	Exists in two forms, $\alpha$ and $\beta$ : (1) long, thin, flat, flexible lustrous needles; (2) small, thin, elongated plates	$\beta$ form is more soluble in water	NA	May explode when shocked or heated

Table A-2. (continued)

Explosive	Composition or chemical formula	Molecular weight	Density (g/cc)	Physical state/appearance	Solubility	Activation energy (Kcal/mole) <sup>a</sup>	Hazard/toxicity
Tetryl	C=29.3% H=1.7% N=24.4% O=44.6%	287	1.73	Yellow crystals	Insoluble in water; soluble in alcohol, ether, benzene, glacial acetic acid	34.9	Dangerous fire and explosion risk; moderately toxic by inhalation or ingestion; skin irritant, can cause dermatitis; inhalation of tetryl dust has recognized toxic effects; TLV is 1.5 mg/m <sup>3</sup> of air
HNS	Prepared from 2,4,6-trinitrobenzyl chloride	450	1.72	Yellow crystals	Soluble in dimethyl formamide and slightly soluble in hot acetone, methyl ethyl ketone, and glacial acetic acid	NA	High explosive (less sensitive to impact than tetryl)
TNT	C=37.0% H=2.2% N=18.5% O=42.3%	227	1.65	Yellow, monoclinic needles	Soluble in alcohol and ether; insoluble in water	34.4	Flammable, dangerous fire risk, moderate explosion risk; will detonate only if vigorously shocked or heated; toxic by ingestion, inhalation, or skin absorption; TLV is 0.5 mg/m <sup>3</sup> of air
Composition B	RDX=60% TNT=40% Wax=1%	224	1.65	White to yellow crystalline solid	Insoluble in water	NA	High explosive; toxic by inhalation and skin contact; TLV is 1.5 mg/m <sup>3</sup> of air

**Table A-2. (continued)**

Explosive	Composition or chemical formula	Molecular weight	Density (g/cc)	Physical state/appearance	Solubility	Activation energy (Kcal/mole)*	Hazard/toxicity
<b>Propellants</b>							
Barium nitrate	Ba(NO <sub>3</sub> ) <sub>2</sub>	261	3.24	White to yellowish, crystalline powder	Soluble in alcohol and water	NA	Strong oxidizing agent; flammable (pyrophoric) at room temperature in powder form; TLV is 0.5 mg/m <sup>3</sup>
Potassium sulfate	K <sub>2</sub> SO <sub>4</sub>	174	2.66	Colorless or white, hard crystals or powder; bitter saline taste	Soluble in water; insoluble in alcohol	NA	No hazards cited in referenced literature
Potassium nitrate	KNO <sub>3</sub>	101	2.10	Transparent, colorless or white, crystalline powder or crystals; slightly hygroscopic; pungent, saline taste	Soluble in water and glycerol; slightly soluble in alcohol	NA	Dangerous fire and explosion risk when shocked or heated, or in contact with organic materials; strong oxidizing agent
Ethyl centralite	Nitrated by-products of nitrocellulose decomposition	268	1.12	White, crystalline solid; peppery odor	Insoluble in water; soluble in organic solvents	NA	
<b>Pyrotechnics</b>							
Strontium nitrate	Sr(NO <sub>3</sub> ) <sub>2</sub>	212	2.98	White powder	Soluble in water; slightly soluble in absolute alcohol	NA	Strong oxidizing agent; fire risk in contact with organic materials; may explode when shocked or heated
Potassium perchlorate	KClO <sub>4</sub>	139	2.52	Colorless crystals or white, crystalline powder; decomposed by concussion, organic matter, and agents subject to oxidation	Soluble in water; insoluble in alcohol	NA	Fire risk in contact with organic materials; strong oxidizing agent; strong irritant

**Table A-2. (continued)**

Explosive	Composition or chemical formula	Molecular weight	Density (g/cc)	Physical state/appearance	Solubility	Activation energy (Kcal/mole) <sup>a</sup>	Hazard/toxicity
Black powder	KNO <sub>3</sub> =74% S=10.4% Charcoal=15.6%	84	Variable	Powder or granulated	NA	NA	Moderately toxic by inhalation and ingestion

<sup>a</sup>Activation energy is the minimum energy to be acquired for a molecule before it can be regarded as being activated. Activation is the process of treating a substance molecule, or atom by heat or radiation (i.e., supplying energy such as an electrical or thermal ignition source) to the degree where the substance, molecule, or atom attains the necessary energy level for the occurrence of a chemical reaction, such as detonation.

<sup>b</sup>TLVs, or Threshold Limit Values, are standards established by the American Conference of Governmental Industrial Hygienists for concentrations of airborne substances found in the workplace. They are time-weighted averages derived from conditions that workers are likely to be exposed to day after day without adverse effects. They are intended to serve as guidance numbers for monitoring and controlling health hazards.

- PETN = Pentaerythritol tetranitrate
- HMX = Cyclotetramethylenetetranitramine
- RDX = Cyclotrimethylenetrinitramine
- HNS = Hexanitrostilbene
- NA = Not Available (Information was unavailable from sources cited in this permit application.)
- TLV = Threshold Limit Value
- TNT = Trinitrotoluene

**Table A-3. Waste Munitions  
Cartridge Components and Combustion Products**

WASTE MUNITION	COMPONENTS				PROPELLENT COMBUSTION PRODUCTS		PRIMER COMBUSTION PRODUCTS (all cartridges)	
	Propellants	Percent Composition	Primers/Igniters	Percent Composition	Ingredient	Mol/Kg	Ingredient	Mol/Kg
.38 Cal. M41 Special Ball	<i>Double-based, flake</i>		<i>Percussion</i>		-Carbon monoxide	10.17	-Antimony sulfide	0.23
	-N in Nitrocellulose -Nitroglycerin -Ethyl centralite -Graphite -Nitrocellulose	12.6% to 13.3% 36% to 42% 1.5% 0.75% Remainder	-Lead styphnate -Tetracene -Barium nitrate -Antimony sulfide -Aluminum powder	38% 2% 44% 12% 4%	-Carbon dioxide -Hydrogen -Nitrogen -Potassium hydroxide -Water	4.74 2.07 5.05 0.07 16.03	-Barium hydroxide -Barium peroxide -Carbon monoxide -Carbon dioxide -Lead -Lead monoxide -Nitrogen -Sulfur dioxide -Water	0.06 0.39 2.44 5.77 0.05 0.25 8.81 1.37 6.08
.38 Cal. Wadcutter	<i>Double-based, flake</i>		<i>Percussion</i>		-Carbon monoxide -Carbon dioxide -Hydrogen -Nitrogen -Potassium hydroxide -Water	1.49 6.11 3.91 5.77 0.05 18.53		
	-Nitroglycerin -Potassium sulfate -Ethyl centralite -Nitrocellulose	38% to 42% 1% 1% 56% to 60%	-Lead styphnate -Tetracene -Barium Nitrate -Antimony sulfide -Aluminum powder	38% 2% 44% 12% 4%				
ARD 446-1/863-1 Impulse Cartridge	<i>Double-based, smokeless</i>		<i>Percussion</i>		<i>Solid Products of Combustion:</i>			
	-Nitrocellulose -Nitroglycerin -Ethyl centralite -Barium nitrate -Potassium nitrate -Graphite -Ash -Water	71.3% 20% 6.5% 1% 0.7% 0.1% 0.1% to 0.2% 0.25%	-Nitrocellulose -Nitroglycerin -Dinitrotoluene -Graphite -Diphenylamine -Sodium sulfate -Dibutylphthalate -Ash -Ammonium carbonate -Residual solubles -Water	56% 39.5% 0.35% 1% 1% 0.1% 0.4% 0.25-0.5% 0.3-0.4% 0.3% 0.5%	-Lead oxide -Barium oxide -Antimony oxide -Aluminum oxide -Potassium oxide -Sulfur oxide			

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09/10/93

Table A-3. (continued)

WASTE MUNITION	COMPONENTS				PROPELLENT COMBUSTION PRODUCTS		PRIMER COMBUSTION PRODUCTS (all cartridges)	
	Propellants	Percent Composition	Primers/Igniters	Percent Composition	Ingredient	Mol/Kg	Ingredient	Mol/Kg
40 mm Cartridge	-Nitrocellulose -Nitroglycerin -Nitroguanidine -Ethyl centralite -Potassium nitrate -Potassium sulfate -Diphenylamine -Dinitrotoluene -Dibutylphthalate -Cryolite -Total volatiles -Graphite	22% to 90% 19% to 40% 54.7% 0.75% to 6% 1.5% 1% 1% 8% 2% 0.3% 0.3% to 3.2% 0.15% to 0.4%	NA		NA		NA	

NA - Information not available

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PA-A-14

09/10/93

**Table A-4. Chemical Components and Combustion Products of Smoke and Illuminator Signals**

COMPONENTS					
First Fire Composition	Scratch Mixture	Prime Mixture	Smoke Igniter	Flare Composition	Smoke Composition
<ul style="list-style-type: none"> <li>-Potassium nitrate, 49%</li> <li>-Antimony sulfide, 20%</li> <li>-Sulfur, 12%</li> <li>-Black powder, 16%</li> <li>-Dextrin, 3%</li> </ul>	<ul style="list-style-type: none"> <li>-Red phosphorus, 54%</li> <li>-Varnish, 38%</li> <li>-Petroleum Spirits, 8%</li> </ul>	<ul style="list-style-type: none"> <li>-Black powder, 98.5%</li> <li>-Binder, cellulose nitrate-camphor, 0.06%</li> <li>-Amyl acetate, 1.44%</li> </ul>	<ul style="list-style-type: none"> <li>-Cupric oxide, 20.8%</li> <li>-Silicon, 20.8%</li> <li>-Lead dioxide, 20.9%</li> <li>-Binder, cellulose nitrate-camphor, 1.5%</li> <li>-Amyl acetate, 36%</li> </ul>	<ul style="list-style-type: none"> <li>-Potassium perchlorate, 15%</li> <li>-Strontium nitrate, 45%</li> <li>-Magnesium, 20.4%</li> <li>-Hexachlorobenzene, 12%</li> <li>-Asphaltum, 7%</li> <li>-Castor oil, 0.3%</li> <li>-Linseed oil, 0.3%</li> </ul>	<ul style="list-style-type: none"> <li>-Dye mixture (solvent orange, disperse red), 60.19%</li> <li>-Sugar, 14.56%</li> <li>-Potassium chlorate, 18.93%</li> <li>-Graphite, 1.46%</li> <li>-Diatomaceous Earth, 4.86%</li> </ul>
PROBABLE COMBUSTION PRODUCTS OR RESIDUES					
<ul style="list-style-type: none"> <li>-Carbon monoxide</li> <li>-Carbon dioxide</li> <li>-Carbonyl sulfide</li> <li>-Hydrogen</li> <li>-Water</li> <li>-Hydrogen sulfide</li> <li>-Potassium sulfide</li> <li>-Potassium sulfate</li> <li>-Potassium hydroxide</li> <li>-Nitrogen</li> <li>-Nitric oxide</li> <li>-Sulfur dimer</li> <li>-Disulfur monoxide</li> <li>-Antimony trioxide</li> <li>-Antimony pentoxide</li> <li>-Sulfur monohydride</li> <li>-Sulfur monoxide</li> <li>-Sulfur dioxide</li> <li>-Sulfur trioxide</li> </ul>	<ul style="list-style-type: none"> <li>-Carbon</li> <li>-Carbon dioxide</li> <li>-Carbon monoxide</li> <li>-Methane</li> <li>-Hydrogen</li> <li>-Phosphorus Nitride</li> <li>-Phosphorus trioxide</li> </ul>	<ul style="list-style-type: none"> <li>-Carbon</li> <li>-Carbon dioxide</li> <li>-Carbon monoxide</li> <li>-Carbon disulfide</li> <li>-Water</li> <li>-Hydrogen sulfide</li> <li>-Potassium carbonate</li> <li>-Potassium sulfate</li> <li>-Nitrogen</li> <li>-Sulfur</li> </ul>	<ul style="list-style-type: none"> <li>-Copper</li> <li>-Hydrogen</li> <li>-Lead</li> <li>-Silicon</li> <li>-Silicon nitride</li> <li>-Silicon carbide</li> <li>-Silicon dioxide</li> </ul>	<ul style="list-style-type: none"> <li>-Carbon</li> <li>-Methane</li> <li>-Carbon monoxide</li> <li>-Carbon dioxide</li> <li>-Hydrogen</li> <li>-Water</li> <li>-Hydrogen chloride</li> <li>-Hydrogen cyanide</li> <li>-Potassium</li> <li>-Potassium chloride</li> <li>-Magnesium oxide</li> <li>-Nitrogen</li> <li>-Ammonia</li> <li>-Nitric oxide</li> <li>-Strontium chloride</li> <li>-Strontium oxide</li> </ul>	<ul style="list-style-type: none"> <li>-1,1-Biphenyl</li> <li>-1,2-Propadienylbenzene</li> <li>-1,3-Dimethylbenzene</li> <li>-1-(1,1-Dimethylethyl)- naphthalene</li> <li>-1-Aminanthraquinone</li> <li>-1-Aminonaphthalene</li> <li>-1-Cyanonaphthalene</li> <li>-1-Hexynylbenzene</li> <li>-1-Isocyanonaphthalene</li> <li>-1-Methylaminoanthraquinone</li> <li>-1-Methylaminobiphenylene</li> <li>-1-Methylnaphthalene</li> <li>-1-phenyl-1-butyne</li> <li>-1-Phenylnaphthalene</li> <li>-1H-indene</li> <li>-1H-indene, 1-methylene</li> <li>-2-Amino-9H-fluorene</li> <li>-2-Aminanthraquinone</li> <li>-2-Methylisocyanobenzene</li> <li>-2-Methylnaphthalene</li> <li>-2-Phenyloxazole</li> <li>-3-Phenyl-2-propenal</li> <li>-4-Hydroxybenzotrile</li> <li>-4-Methyl-1,1-biphenyl</li> </ul>

Table A-4. (continued)

PROBABLE COMBUSTION PRODUCTS OR RESIDUES					
First Fire Composition	Scratch Mixture	Prime Mixture	Smoke Igniter	Flare Composition	Smoke Composition
					<ul style="list-style-type: none"> <li>-9H-Fluorene</li> <li>-Acetophenone</li> <li>-Alpha-phenylaminobenzeneacetonitrile</li> <li>-Amino-1,1-biphenyls</li> <li>-Amino-beta-naphthol</li> <li>-Anisole</li> <li>-Anthracene</li> <li>-Anthraquinone</li> <li>-Benzaldehyde</li> <li>-Benzofuran</li> <li>-Benzonitrile, N-oxide</li> <li>-Biphenylene</li> <li>-C10-alkene</li> <li>-C13-alkanes</li> <li>-Carbon dioxide</li> <li>-Carbon monoxide</li> <li>-Cyanobenzene</li> <li>-Dibenzofuran</li> <li>-Diethylphthalate</li> <li>-Hydrogen chloride</li> <li>-Hydrogen cyanide</li> <li>-Isoquinone</li> <li>-Methylphenyldiazene-1-oxide</li> <li>-N,N-diethylbenzeneamine</li> <li>-Naphthol (2,1-b) furan</li> <li>-Nitrogen oxides</li> <li>-Phenol</li> <li>-Phenylacetylene</li> <li>-Phenyldiazine</li> <li>-Styrene</li> <li>-Toluene</li> <li>-Xylene-azo-beta-naphthol</li> </ul>

FP930618, LTY51

PA-A-16

09/10/93

**Table A-5. Miscellaneous Explosive Materials**

Ordnance	Components/Constituents
Proximity fuse	Detonator: Lead azide/PETN Primer: Grade N Impulse cartridge:       50% LMNR 50% Black powder
Signal cartridge	Primer: Commercial shotgun shell primer <ul style="list-style-type: none"> <li>• 2 gm smokeless powder</li> <li>• 20 to 25 cc titanium tetrachloride</li> <li>• Red phosphorus</li> </ul>
Engine starter cartridge	Propellant: Ammonium nitrate oxidizer and rubber-based binder Igniter: Two electric matches (M100 Atlas squibs) and black powder Booster: Ammonium perchlorate and boron potassium
Flare	Magnesium powder Polytetrafluorethylene Binder
Water gel (Iremite 60)	Ammonium nitrate solution Calcium nitrate Sodium nitrate Ethylene glycol Water Aluminum Charcoal Polysaccharide thickener
Detonating cord (DIPAM)	100 mg hexanitrostilbene 2.5 grains diaminohexanitrobiphenyl

**Table A-6. Waste Analysis Data: Typical Ordnance to be Open Detonated.**

Type of waste	Constituents		General or typical concentration or amount NEW (lbs.)
	Major Reactant(s)	Major inert (casings)	
Actuator, deployment	Single-based	Steel	0.0110
Adapter, ADU-449/B	Single-based	Steel	0.0083
Adapter, booster nose	Tetryl	Steel	0.3900
Adapter, booster tail	Tetryl	Steel	0.8800
Assembly, explosive transfer	Tetryl	Steel	0.1300
Assembly, initiator	Single-based	Steel	1.00
Blasting cap	PETN/Tetryl	Aluminum	0.0019
Block, demolition	TNT	Paper & Tin	2.0
Cartridge, 12 gauge	Single-based	Paper, Plastic, & Steel	0.0038
Cartridge, 22 LR	Single-based	Brass, Copper, & Steel	0.0003
Cartridge, .30 caliber	Single-based	Steel & Aluminum	0.0018
Cartridge, 30mm HEI	RDX/Incendiary mix	Steel & Aluminum	0.0916
Cartridge, 30mm TP	Target practice propellant	Steel & Aluminum	0.3308
Cartridge, .38 caliber	Single-based	Brass, Copper, & Steel	0.0008
Cartridge, 40mm M674	Single-based	Steel & Aluminum	0.2156
Cartridge, 40mm HE	RDX/TNT	Steel & Aluminum	0.0780
Cartridge, 40mm practice	Single-based	Steel & Aluminum	0.0008
Cartridge, 40mm smoke	Single-based	Steel & Aluminum	0.1722
Cartridge, .45 caliber	Single-based	Brass, Copper, & Steel	0.0008
Cartridge, .50 Cal ball	Single-based	Brass & Lead	0.0342
Cartridge, .50 Cal blank	Black powder	Brass	0.0243
Cartridge, 5.56mm ball	Single-based	Brass, Copper, & Steel	0.0041
Cartridge, 5.56mm blank	Black powder	Brass	0.0011
Cartridge, 7.62mm ball	Single-based	Brass, Copper, & Steel	0.0067
Cartridge, 9mm ball	Single-based	Brass, Copper, & Steel	0.0009
Cartridge, aircraft, M3A1	Single-based	Aluminum	0.4500
Cartridge, delay	Single-based	Aluminum	0.0140
Cartridge, impulse	Single-based	Aluminum	0.0208
Cartridge, signal MK4	Black powder	Aluminum	0.0602

6/23/94

**Table A-6. (continued)**

Type of waste	Constituents		General or typical concentration or amount NEW (lbs.)
	Major Reactant(s)	Major inert (casings)	
Cartridge, starter, MXU-4A	Single-based	Tin	8.00
Cartridge, thruster	Single-based	Aluminum	0.0080
Catapult, rocket, CKU-5A/A	Single-based	Aluminum	5.500
Charge, demo, C-4	RDX, Polisobutylene	Plastic	30.0
Charge, shaped, C-4	RDX, Polisobutylene	Steel	0.8300
Charge, spotting, CXU-3A/B	Black powder phosphorus	Aluminum	0.0830
Cluster, MK20 Mod 3	Tetryl/RDX	Aluminum	100.0
Cord, detonation	PETN/RDX	Plastic	0.0070
Detonator, electric	RDX	Steel	0.0003
Explosive scent, K-9	Tetryl/RDX	None	8.0
Flare, ALA-17/A	Black powder phosphorus	Aluminum	2.800
Flare, signal, M206	Single-based phosphorus	Aluminum	0.2866
Flare, surface	Single-based phosphorus	Aluminum	0.300
Fuze, blasting	Tetryl/RDX	Plastic	0.0070
Fuze, bomb nose	Tetryl/RDX	Aluminum & Steel	0.1640
Fuze, bomb tail	Tetryl/RDX	Aluminum & Steel	0.0150
Fuze, delay, M9	Tetryl/RDX	Aluminum	0.0002
Fuze, extension, M1A1	Tetryl/RDX	Steel	2.00
Fuze, FMU-130/B	Tetryl/RDX	Aluminum, Steel, & Plastic	0.3600
Fuze, FMU-139A/B	Tetryl/RDX	Aluminum, Steel, & Plastic	0.2778
Fuze, FMU-54A/B	Tetryl/RDX	Aluminum & Steel	0.3600
Fuze, MK339	Tetryl/RDX	Aluminum & Steel	0.0006
Fuze, practice M228	Tetryl/RDX	Aluminum & Steel	0.0030
Generator, pressure	Single-based	Aluminum	0.0111
GTR-18, smokey sam	Black powder	Styrofoam	1.100
Grenade, M18	Single-based	Steel	0.7200
Grenade, M67	RDX	Steel	0.4100
Grenade, smoke	Black powder	Tin	1.200

6/23/94

**Table A-6. (continued)**

Type of waste	Constituents		General or typical concentration or amount NEW (lbs.)
	Major Reactant(s)	Major inert (casings)	
Grenade, TH-3	RDX	Tin	1.700
Pot, smoke	Black powder	Tin	28.00
Rocket motor	Black powder	Tin	1.100
Signal kit	Single-based	Tin	0.0812
Simulator, air burst	Black powder	Paper & Plastic	0.0825
Simulator, booby trap	Black powder	Paper & Plastic	0.0095
Simulator, detonation	Black powder	Paper & Plastic	0.0070
Simulator, grenade	Black powder	Paper & Plastic	0.0813
Simulator, projectile	Black powder	Paper & Plastic	0.1410

NEW = net explosive weight  
 PETN = pentaerythritol tetranitrate  
 TNT = trinitrotoluene  
 Tetryl = trinitrophenylmethylnitramine  
 RDX = cycletrimethylenetrinramine  
 HEI = high explosive incendiary  
 LR = long range  
 TP = target practice  
 HE = high explosive

**Table A-7. Test Methods for Munition Residues found in Soils**  
 (These methods will be used in soil analysis - Permit Attachment L)

Parameter/Constituent	EPA Hazardous waste number	Test method	Reference
<b>Explosive compounds</b>	D003	Method 8330	<i>Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, EPA SW-846, 3rd Ed. November 1986 (amended)</i>
Cyclotetramethylenetrinitramine (HMX)			
Cyclotrimethylenetrinitramine (RDX)			
Trinitrobenzene (TNB)			
Dinitrobenzene (DNB)			
Trinitrophenylmethylnitramine (Tetryl)			
Nitrobenzene (NB)			
Trinitrotoluene (TNT)			
2,4 Dinitrotoluene (24DNT)			
2,6 Dinitrotoluene (26DNT)			
2 Nitrotoluene (2NT)			
3 Nitrotoluene (3NT)			
4 Nitrotoluene (4NT)			
<b>Elemental metals</b>			
Antimony <sup>a</sup>	—	Method 6010	
Arsenic <sup>a</sup>	D004	Method 6010	
Barium	D005	Method 6010	
Beryllium <sup>a</sup>	—	Method 6010	
Cadmium <sup>a</sup>	D006	Method 6010	
Chromium	D007	Method 6010	
Cobalt	—	Method 6010	
Copper <sup>a</sup>	—	Method 6010	
Lead <sup>a</sup>	D008	Method 6010	
Mercury	D009	Method 7471	
Nickel <sup>a</sup>	—	Method 6010	
Selenium <sup>a</sup>	D010	Method 6010	
Silver	D011	Method 6010	
Thallium <sup>a</sup>	—	Method 6010	
Vanadium	—	Method 6010	
Zinc <sup>a</sup>	—	Method 6010	

<sup>a</sup>Priority Pollutant Metals

**Table A-8.** Physical Form of Munitions Residue

Waste type	Reference
Crushed or powdered residue	ASTM Standard D346-75
Soil or rock-like residue	ASTM Standard D1452-69
Soil-like material	ASTM Standard 1452-65
Fly ash-like material	ASTM Standard D2234-76

ASTM = American Society of Testing and Materials

**PERMIT ATTACHMENT B  
SECURITY PLAN**

## **SECURITY PLAN**

Cannon Air Force Base (CAFB) personnel and the Melrose Air Force Range (MAFR) "Operations and Maintenance" contractor incorporates the proper equipment and procedures to ensure: 1) that public and livestock access to the range is controlled; and 2) that all personnel are protected from health hazards that could result from contact with extremely hazardous operations. Details of these provisions are specified in the following sections.

### **Security Procedures and Equipment**

MAFR is a United States government installation. Access is limited to personnel authorized by the Commander, 27th Fighter Wing, CAFB. The "Operations and Maintenance" contractor is responsible for all daily activities, including daily security patrols of the bombing and gunnery range facilities and the Open Detonation (OD) Unit. The term "daily" is intended here to mean those days in which the Range is being attended by the Contractor (The Range is operated 6 days each week.) At no time will there be a security patrol at intervals of less than 1 week apart. Table B-1 outlines the contractor's general responsibilities regarding security for the OD Unit.

### **24-Hour Surveillance System**

The area at the MAFR OD Unit is not protected by a 24-hour surveillance system. Access is controlled through the location of a barbed wire fence around the Unit, and locked gates at the two entry points. The OD Unit is contained within the range boundary. The Explosive Ordnance Disposal (EOD) Flight of the Civil Engineering Squadron has charge for all treatment operations conducted at the OD Unit. The munitions team chief assumes responsibility for safety at the OD Unit when treatment is being carried out. Access to the OD Unit is controlled during the treatment process by the Explosive Ordnance Disposal (EOD) safety supervisor.

### **Barrier and Means to Control Entry**

The Facility, MAFR, has a 5 foot high, 3-strand barbed wire fence surrounding the entire property boundary. In addition, the OD Unit is completely surrounded by a 5 foot high, 5-strand fence and has two lockable gates that control vehicle access. The gates are closed and locked except when authorized EOD personnel are entering or exiting the Unit. Visual surveillance is maintained during all treatment operations.

### **Warning Signs**

Warning signs, legible from a distance of 25 feet are posted

at 300 foot intervals around the OD Unit and at the access gates. These signs state, "DANGER - MUNITIONS AREA UNAUTHORIZED PERSONNEL KEEP OUT," and are printed in both English and Spanish.

**Table B-1. Contractual Responsibilities for Facility Security**

Required Service	Standard	Frequency of Surveillance
Control of traffic - OD Unit	A. Restrict range entry on the primary access routes to the OD Unit	Daily Checklist
	B. Keep access gates to the OD Unit locked during non OD treatment operations	Daily Checklist

**PERMIT ATTACHMENT C  
INSPECTION PLAN**

## INSPECTION PLAN

### Introduction

A program has been established to inspect all components of the Open Detonation (OD) Unit for malfunctions, deterioration, operator errors, and discharges that may cause or contribute to the release of hazardous waste and hazardous waste constituents to the environment. These inspections are performed at the Melrose Air Force Range (MAFR), OD Unit quarterly, weekly and before and after each treatment operation. Any problem found during inspections will be resolved in a timely manner. Four Cannon Air Force Base (CAFB) agencies conduct inspection of the OD Unit:

- Environmental Management Flight,
- Munitions Management Flight,
- Explosive Ordnance Disposal (EOD) Flight, and
- Operations and Maintenance Contractor at Melrose AFR .

### Types of Problems

The inspection checklists, in Tables C-1 through C-4, specify the types of problems to look for during any inspection. If a deficiency is noted during an inspection, the following basic actions will be taken:

1. The deficiency is noted on the appropriate inspection form or log book and annotated with the problem, the time the deficiency was noted, and any immediate actions required to correct the deficiency. If the finding is serious or requires remedial actions, the CAFB contracting office and/or the Environmental Management Flight are contacted.
2. Remedial actions, if required, are taken to correct the deficiency.
3. After correction of the deficiency, the actions taken and the date the deficiency was corrected are annotated and signed off on the appropriate inspections form or log book.

### Frequency of Inspection

Inspections of all materials, security devices, safety equipment and communications devices will be conducted, at a minimum, daily as well as before and after each open detonation operation. Logs of all findings and actions will be kept by Munitions Management Flight personnel. These logs will be maintained for at least three calendar years from the inspection date. The following organizations conduct inspections pertaining to the OD Unit.

The Environmental Management Flight conducts quarterly inspections to ensure compliance with hazardous waste regulations. Table C-1 presents typical items that are inspected.

The Munitions Management Flight conducts inspections of vehicles used to transport military personnel, safety equipment and munitions. These vehicles are inspected the day before and/or the day any munition transport operation occurs. Inspections will be conducted prior to the transport vehicle(s) leaving CAFB on the day of a munition transport operation associated with permitted activities. The "Operator's Inspection Guide and Trouble Report", SF Form 1800, Table C-2 is used to record results from the inspection. This form contains a list of safety and emergency equipment, security devices, structural equipment, communications equipment and mobile equipment. Vehicles used to transport munitions to the OD Unit are inspected per AFR 127-100, Sect. 7-20 (Permit Attachment C - Appendix).

The EOD Flight conducts pre and post-operational inspections of the OD Unit. The OD Unit is inspected immediately prior to placement of ordnance wastes and immediately after the appropriate safety wait periods that are required following treatment operation. Table C-3 presents the typical item that are inspected.

The Range Operations and Maintenance Contractor conducts inspections of the security fencing and gates, warning signs, the presence of standing water, and all engineered structures associated with the OD Unit. These inspections are documented in a daily events log which is periodically reviewed by a CAFB quality assurance evaluator. The term daily is intended here to mean those days in which the range is being attended by the Contractor. At no time will there be inspections conducted by the Contractor at intervals of less than 1 week apart. The OD Unit is also inspected for standing water after all precipitation events which generate run-off. In cases of the Range Operations and Maintenance Contractor being absent due to the range being closed for one day, Precipitation could stand for as much as 48 hours, in which time all water will be removed by mechanical means. When there are no breaks in the Range Contractors presence, precipitation ponding will not exceed a 24 hour period prior to water being removed. Tables C-3 and C-4 presents inspection items reviewed by the contractor.

### **Records**

All inspection logs and forms will be retained by CAFB EOD personnel. Copies will be maintained for a minimum of three calendar years from the inspection date.

### **Remedial Actions**

Inspections conducted prior to and after each open detonation

treatment operation will reveal areas where remedial action could be necessary. If an inspection reveals the need for remedial action, CAFB EOD personnel will initiate immediate action to prevent further damage and to reduce the need for emergency repairs.

Surficially exposed scrap metal and other surficial debris is removed after each detonation. Scrap metal may be recovered for recycling. Sifting the soil for buried scrap will be accomplished when any accumulation presents an environmental, operational or safety problem.

### **Inspection Forms/Log Books**

Inspection log sheets contain location information, items inspected, dates and times of inspections, conditions at the time of the inspection, and dates and times that remedial action took place. Tables C-1 through C-4 are example inspection logs. Although inspection logs may be updated, inspection items will basically remain the same.

### **Equipment Requirements**

Equipment required for open detonation operations will be inspected before, during and after all treatment operations. Those inspections following cool-down from a detonation will include internal and external communication equipment, emergency equipment such as first aid and spill control equipment, and mobile equipment. The following listed equipment is kept at the EOD Flight shop on CAFB and taken to the MAFR OD Unit when needed. All equipment is inspected for serviceability prior to use.

- Hand-held Motorola radio
- Respirator
- Chemical apron
- Respirator cartridge
- Leather gloves
- 55-Gal barrel
- Rubber gloves
- Broom
- Rubber boots
- Long handle shovel
- Goggles
- Dust pan
- Face shield
- First aid kit

Table C-1. Environmental Management Flight - OD Unit Inspection Log

OD Thermal Treatment Facility 27 CES/CEV	Date & Time of Inspection _____ Inspector(s) Name/Title _____ Weather Conditions _____	Page No. _1_ of 3			
Quarterly Inspection Checklist					
Regulatory Authority 40 CFR Part	Requirement/Violation	Status		Remarks	Date and Nature of Repairs/Remedial Action
		Sat	Unsat		
264.14(c)	All warning signs posted				
264.14(b)(2)(i)/(ii)	Gates, fencing, and berms secured and in good condition				
262.32	All container contents are clearly marked				
264.15(b)(1) and 264.32	Safety, spill, and emergency equipment on-hand and working				
	Fire extinguishers				
	Personal protective (PPE)				
	Decontamination				
	First aid				
262.34(a)(2)(3)	Labels clearly visible				
264.172 and 173	Containers managed to prevent leaks (no spills or leaks present)				
264.172	Containers are compatible with the material stored				

PA-C-14

16/01/7/91

**Table C-1. (continued)**

<p><b>OD Thermal Treatment Facility</b> 27 CES/CEV</p>	<p>Date &amp; Time of Inspection _____ Inspector(s) Name/Title _____ Weather Conditions _____</p>	<p>Page No. <u>2</u> of 3</p>			
<p><b>Quarterly Inspection Checklist</b></p>					
<p>Regulatory Authority 40 CFR Part</p>	<p>Requirement/Violation</p>	<p>Status</p>		<p>Remarks</p>	<p>Date and Nature of Repairs/Remedial Action</p>
		<p>Sat</p>	<p>Unsat</p>		
<p>264.17(b) and (c)</p>	<p>Hazardous Waste containers are segregated into compatibility categories</p>				
<p>264.32(a)</p>	<p>Communication equipment on-hand and working (int/ext)</p>				
<p>CAFR 19-12</p>	<p>Facility clear of all debris</p>				
	<p>Pit clear</p>				
	<p>OD area prepared for receiving explosives</p>				
<p>CAFR 136-18</p>	<p>Authorization documents on-hand and signed</p>				
<p>265.52 and CAFB 19-12</p>	<p>Supervisors assigned</p>				
<p>262.73(a)(b)</p>	<p>Current inventory matches waste on-site</p>				
<p>262.43</p>	<p>Copies of Hazardous Waste Manifests onfile</p>				
<p>262.43</p>	<p>All records maintained for three/five calendar years</p>				
<p>265.15(b)(1)(2)</p>	<p>Written inspection schedule</p>				
<p>265.174</p>	<p>Weekly inspection log up-to-date</p>				

PA-C-5

**Table C-1. (continued)**

<p><b>OD Thermal Treatment Facility 27 CES/CEV</b></p>	<p>Date &amp; Time of Inspection _____ Inspector(s) Name/Title _____ Weather Conditions _____</p>	<p>Page No. <u>3</u> of 3</p>			
<p><b>Quarterly Inspection Checklist</b></p>					
<p>Regulatory Authority 40 CFR Part</p>	<p>Requirement/Violation</p>	<p>Status</p>		<p>Remarks</p>	<p>Date and Nature of Repairs/Remedial Action</p>
		<p>Sat</p>	<p>Unsat</p>		
<p>262.43</p>	<p>Environmental correspondence and inspection reports available</p>				
<p>262.34(a)(4) and 265.16</p>	<p>Personnel on roster trained in HAZCOMM</p>				
	<p>Personnel on roster trained in Hazardous Waste Management</p>				
	<p>Personnel trained in AFSC specialty codes</p>				
<p>265.16(b-e)</p>	<p>New personnel trained within 6 months of assignment</p>				
	<p>Other personnel with initial training have proper annual updates</p>				
<p>265.16</p>	<p>Personnel have written job titles and descriptions</p>				
<p>264.32(d)</p>	<p>Adequate water volume and pressure to operate required equipment</p>				
<p>262.11</p>	<p>Is any ash from OD tested? What are the results? If a hazardous waste, how is it managed?</p>				
<p>264</p>	<p>Do the Waste Analysis Plan and the analysis done of the manifested waste support the conclusions as to the RCRA identity of what was manifested and the LDR notices accompanying the manifests?</p>				
<p>CAFR 19-12</p>	<p>Was the Point of Contact informed of the inspection results?</p>				

PA-C-6

06/07/94

ITEMS TO BE CHECKED (continued)		
16. OTHER (specify)		
17. OTHER (specify)		
18. OTHER (specify)		
19. OTHER (specify)		
OPERATOR'S SIGNATURE SIGNIFIES ACCOMPLISHMENT OF CHECKS		
DAY	DAY	DAY
1	11	21
2	12	22
3	13	23
4	14	24
5	15	25
6	16	26
7	17	27
8	18	28
9	19	29
10	20	30
		31
MONTHLY TIRE PRESSURE CHECK		
TIRE PRESSURE GAUGED (COLD) AND ADJUSTED TO:		
FRONT _____ LBS	REAR _____ LBS	
OPERATOR'S SIGNATURE	DATE PERFORMED	

OPERATOR'S INSPECTION GUIDE AND TROUBLE REPORT			DATE (MO/YR)
(GENERAL PURPOSE VEHICLES)			
VEHICLE TYPE		REGISTRATION NUMBER	
USING ORGANIZATION	LOCATION	PHONE NUMBER	
NAME OF VEHICLE COMMANDER	OFFICER	NUMBER	
ITEMS TO BE CHECKED WEEKLY INSPECTIONS CAN BE DONE MORE FREQUENTLY AS DIRECTED BY MAJCOM (Operator's signature required on reverse)			
1. CLEAN VEHICLE (exterior and interior)			
2. DAMAGE (exterior and interior, missing parts)			
3. TIRES (visually check for damage/abnormalities)			
4. LEAKS (visually check fuel/oil/coolant)			
5. ENGINE OIL AND COOLANT (visually check fluid levels) <sup>1</sup>			
6. BATTERY (visually check fluid level/hold-down secure/cleanliness)			
7. DRIVE BELTS (visually check for fraying or cracking)			
8. LIGHTS (visually check all for proper operation)			
9. SAFETY DEVICES (seatbelts/harness, headrests, warning lights, etc.)			
10. INSTRUMENTS/HORN/WINDSHIELD WIPERS (functionally check for operation)			
11. BRAKES/STEERING (functionally check-responsive/effective/smooth)			
12. UNUSUAL OCCURRENCES (noise/vibration/odor/erratic instruments/etc.)			
13. OTHER (specify)			
14. OTHER (specify)			
15. OTHER (specify)			
<sup>1</sup> Check engine oil following each refueling.			

AF Form 1800, APR 87 PREVIOUS EDITION WILL BE USED

Table C-2.

PA-C-7



**Table C-3. OD Unit Inspection Log (Applicable to EOD Flight and the Range Contractor)**

<b>OD Thermal Treatment Facility</b>	Date & Time of Inspection _____				
	Inspector(s) Name/Title _____				
	Weather Conditions _____				
<b>Weekly, Pre-operational, and Post-operational Inspection Checklist</b>					
Regulatory Authority 40 CFR Section	Requirement/Violation	Status		Remarks	Date and Nature of Repairs/Remedial Action
		Sat	Unsat		
264.14(c)	All warning signs posted (Daily and weekly)				
264.14(b)(2)(i)/(ii)	Gates, fencing, and berms secured and in good condition (Daily and weekly)				
264.172 and 264.173	Materials managed to prevent leaks and spills Explosives Ignition devices (fuel)				
264.15(b)(1) and 264.32	Safety, spill, and emergency equipment on-hand and working -Fire extinguishers -Personal protective (PPE) -Decontamination -First aid				
264.32(a)	Communication equipment on-hand and working (int/ext)				
CAFR 19-12	Facility clear of all debris -OD areas prepared according to specifications				
CAFR 136-18	Authorization documents on-hand and signed				
264.16(d)(1) & (2)	Personnel properly trained in EOD disposal activities				

PA-C-9

**Table C-4. Contractor's Responsibilities for the Merlose Air Force Range, Open Detonation Unit**

Required service	Standard	Frequency of surveillance
Control of traffic in impact area leading to OD Unit	Restrict range entry on the primary access route to the Open Detonation Unit	Daily checklist
Reoccurring reports	Prepare recurring quarterly reports based upon information obtained from compilation of daily and monthly reports	Quarterly report
Perform maintenance to gates, fences, and signs	Inspect, repair, and maintain gates, fences, and signs as required to ensure a viable impediment to unauthorized access to both the Air Force range and the thermal treatment area	As required checklist
Remove standing water in of the OD Unit's detonation structure. Transfer water to the cleared area or manage as a hazardous waste.	Inspect for the presence of standing water	As required checklist
Maintenance to Open Detonation Unit (EOD Range)	Grade and clear an area to a radius of 500 feet from the center of the Open Detonation Unit (not affecting detonation structure). Maintain designed height of all berms and 2 percent slope for the interior base of the detonation structure . The entire Open Detonation Unit shall be kept free of all combustible material and vegetation. After any detonation episode, grade work shall not commence until after clearance has been given by the Environmental Management Flight. Soil samples must be collected first. Grading should never extend below a depth of 1 foot of the designed finish grade.	Daily checklist

Permit Attachment C - Appendix

AFR 127-100 - Section 7-20  
Motor Vehicle Transportation

**7-20. Motor Vehicle Transportation:****a. General Information:**

(1) Existing specially designed equipment for explosives and specific weapons should be used where possible or required.

(2) Cargo-type trucks and tractor-drawn semitrailer vans are preferred for the general transportation of explosives. Other types of vehicles should not be used unless the items involved make handling by cargo vehicles or vans impractical. Cargo will be properly secured, regardless of the transportation used.

(3) Vehicle batteries and wiring will be located so that they will not come in contact with containers or explosives.

**b. Vehicle Body.** Exposed ferrous metal in the cargo compartment will be covered before transporting any explosives which are not packaged in DOT specification containers or equivalent. If tops or coverings are needed, they should be of a noncombustible or flameproof material.

**c. Red Lights.** Red lights will not be used on the front of vehicles transporting explosives on or off base. A security police vehicle may use a flashing red light on and off base when escorting a convoy unless prohibited by local law.

**d. Inspection of Vehicles.** Motor vehicles used to transport explosives will be inspected before use to determine that:

(1) Fire extinguishers are filled and are in good working order.

(2) Electric wiring is in good condition and properly attached.

(3) Fuel tank and piping are secure and not leaking.

(4) Mufflers and spark arresters, when applicable, meet military specifications and are properly installed and clean.

(5) LP-fueled vehicles comply with the National Fire Codes.

(6) Safety chains or other breakaway control devices are properly installed, if applicable.

(7) Brakes, tires, steering, and other equipment are in good condition and tires are properly inflated.

(8) Exhaust system is free of oil, grease, and fuel.

**(e.) Operating Requirements.** Ensure safe operation of vehicles transporting explosives. The following applies:

(1) Use wheel chocks (in addition to brakes or gears as prescribed for the specific vehicle) while loading or unloading, or for explosives loaded vehicles and trailers parked, on any grade or ramp steep enough to cause the vehicle to roll.

(2) When it is necessary to transport explosives on routes where ferryboats, tunnels, or toll bridges will be encountered, ask local or state officials what procedures must be followed to comply with their regulations.

(3) If a motor vehicle containing explosives is to use a ferryboat or other passenger-carrying vessel, give the driver an identification letter, signed by an officer, requesting transportation on the vessel. The letter will be presented to the master of the vessel or his or her representative. The letter will refer to the bill of lading (copy of which will be in the possession of the driver) and will state the truck license number and the name of the owner (CFR 49).

(4) Refuel trucks before loading explosives. Trucks containing explosives should not be refueled within an explosives area of an installation, including refueling from mobile units. A central refueling station should be used. Trucks should be refueled before loading explosives.

(5) Do not load or unload explosives from a motor vehicle while the engine is running, except under the following conditions:

(a) Where the engine is required to provide power to vehicle mechanical handling equipment used in loading and unloading the vehicle.

(b) Where necessary for emergency operations or timing for exercises simulating execution of emergency plans. In this case, small loads or packages of explosives, requiring only momentary unloading time to be delivered to aircraft on the flightline, may be removed from a vehicle while the motor is running.

(c) Engines of diesel-powered vehicles may continue to run during loading or unloading of explosives except when exposed explosives are involved.

(d) When the vehicle engine is being operated under (a), (b), or (c) above, the following conditions apply:

1. Ensure adequate ventilation is provided to prevent unnecessary build-up of exhaust gases.

2. Equip the vehicle with spark and flame arresters where necessary according to paragraph 7-17g(2).

3. Only keep the vehicle at the aircraft or storage location as long as needed to complete the explosives loading or unloading operation. If a delay occurs, the vehicle must be moved away from the location.

4. Ensure the vehicle operator sets the brakes and remains in the driver's position; or sets the brakes, chocks the wheels, and remains close to the vehicle.

(e) Where the vehicle was designed and built for these operations. Refer to the drivers manuals for accepted procedures.

(6) Do not operate vehicles containing explosives until the cargo has been checked to ensure safe transportation. **Explosives containers will be loaded, blocked, braced, tied down, or otherwise secured to the vehicle to prevent movement.** Load securing methods must not damage explosives or containers. Vehicles will have sideboards and tailgates as high as the load. These are not needed where item size would make such protection impractical (b above) or where the vehicle is specially designed or adapted for the item and the load is securely held.

(7) When transporting items containing EEDs, fully consider the hazards discussed in paragraph 6-21 where vehicles are equipped with transmitters or other electromagnetic radiation sources which may create exposures on the routes to be traveled.

(8) **Do not leave explosives-laden vehicles unattended unless they are parked in a properly designated area, such as the weapons storage area, holding yard, or ready munitions area.**

(9) Ensure forklifts use skids or pallets to transport containers of explosives, except when containers are designed with fully enclosed stirrups (360 o) for forklift tines.

(10) Unfused weapons may be carried on forklift forks when the weapon body is long enough to be firmly supported on both forks and strong enough to prevent damage.

#### f. Off-Base Explosives Shipments:

(1) Inspection of Incoming Shipments. All incoming motor vehicles carrying DOT Class A and B explosives and poisons will be inspected at a designated inspection station by a representative of the commander.

(a) The inspection station should be as remote as practical from hazardous areas such as explosives or POL sites, populated areas, and flightlines.

(b) If the inspection station is used as a temporary explosives storage or operating loca-

tion, it must meet Q-D criteria. Also, vehicle inspections must be stopped while storage or operations are in progress.

(c) The inspection station may be used as an interchange yard ((4) below).

(d) Inspections will be done according to AFR 75-2, using DD Form 626, Motor Vehicle Inspection (Transporting Hazardous Material).

(e) Once a vehicle has passed the initial inspection, a visual inspection of the external condition of the cargo may be done at any suitable location, including the unloading point.

(f) Any vehicle found or suspected to be in a hazardous condition will be moved to a "suspect vehicle" area which is isolated from other locations by the proper Q-D, unless it is more hazardous to move the vehicle. If use of the suspect vehicle area is very infrequent, an event waiver as specified in paragraph 11-2f may be used if Q-D cannot be met. Prompt corrective action or a detailed inspection will be done at this location to ensure that the vehicle and cargo are safe enough for further movement.

(2) Inspection of Outgoing Shipments. All vehicles to be used for off-base shipments of explosives will be inspected by shipping activities before and after loading for compliance with safety regulations.

(a) DD Form 626 will be filled out according to AFR 75-2.

(b) A record will be kept of the vehicle number, the type of explosive cargo, and the number of each seal applied to the vehicle.

(c) Drivers must be thoroughly familiar with the DOT Motor Carrier Safety Regulations.

(d) DD Form 836, Special Instructions for Motor Vehicle Drivers, will be used to instruct drivers on the nature of their cargo, firefighting methods, and other specific precautions for the particular shipment. Information on the preparation and use of DD Form 836 is in AFR 75-2.

(e) Overseas units should use bilingual instructions on the DD Forms 626 and 836 where needed.

(f) Where special purpose vehicles are authorized to transport explosive loads, applicable technical data will be used.

(g) Use of DD Forms 626 or 836 is not required for military vehicles or drivers transporting explosives (assembled or partially assembled in a delivery mode) across or on public highways from one part of a base to another. For example, transportation of munitions from

a preparation area across the highway to the main base flightline, or on the highway to a nearby auxiliary field. If this is a daily operation, there should be an agreement with local authorities on any local restrictions to be imposed. Driver qualification and motor vehicle inspection requirements of paragraphs 7-14 and 7-20d apply.

(3) Internal Shipments by Commercial Carrier. Commercial carriers used to move explosives over public highways from one area to another area of an installation will be externally inspected before entering the second area. This is not needed if they were escorted or under surveillance en route.

(4) Interchange Yards. Where necessary, an interchange yard may be established in a remote area on the same basis, or together with the inspection station in (1) above. This location will be used for the exchange of tractor trailers between the common carrier and the base activity involved. Explosives Q-D criteria will not be applied if the exchange is made and the vehicles removed promptly.

g. Holding Yards. If the explosives-loaded vehicles cannot be dispatched to unloading points immediately, they must be moved to a holding yard.

(1) The holding yard must be sited to meet Q-D criteria according to chapter 8.

(2) Where possible, explosives-loaded vehicles should be separated from each other by the applicable aboveground magazine distance.

(3) If magazine distance between vehicles cannot be met, vehicles should be parked in groups, with magazine separation between each group. Distances to other exposures will then be based on the total amount of explosives within a group of vehicles.

(4) Where neither (2) nor (3) above is possible, the total explosives weight of all vehicles will be used to determine separation distances.

(5) Loaded vehicles should not remain in a holding yard for a period exceeding 24 hours.

(6) Holding yards may be used for interchange and inspection activities. However, when loaded vehicles are being held there, the yard may not be concurrently used for vehicle inspections.

h. Maintenance of Vehicles Carrying Explosives:

(1) Only operator inspection and maintenance normally related to the operation of a vehicle will be done on explosives-laden vehicles. Such maintenance includes servicing with fuel,

oil, air, lubrication and water, changing tires, fuses, hoses and drive belts, etc.

(2) No maintenance will be done on an explosives-loaded vehicle or trailer that would increase the probability of fire or would require the use of heat-producing equipment.

(3) No restrictions are imposed on tractor maintenance when the tractor is physically separated by at least 50 feet from an explosives-loaded trailer.

(4) When tires are being changed, the vehicle or trailer must not be elevated so as to shift the load or place an excessive strain on the tie-downs.

(5) Vehicles carrying nuclear weapons are also subject to the maintenance restrictions in TO 11N-45-51.

**PERMIT ATTACHMENT D  
PERSONNEL TRAINING PLAN**

## PERSONNEL TRAINING PLAN

### Outline of the Plan

Facility personnel who handle hazardous wastes must successfully complete a program of classroom instruction and/or on-the-job training prior to working with hazardous waste. This will prepare them to operate and maintain the Open Detonation (OD) Unit in a manner that ensures compliance with the Resource Conservation and Recovery Act (RCRA) training requirements and New Mexico Hazardous Waste Management Regulations (HWMR-7). The 27th Fighter Wing Support Group Commander is responsible for ensuring that personnel at Cannon Air Force Base (CAFB) and Melrose Air Force Range (MAFR) receive proper and timely training. This responsibility has been delegated to the Environmental Management Flight of the Wing.

U.S. Department of Defense (DoD) Explosive Ordnance Disposal (EOD) personnel must attend the Explosives Ordnance School at Indian Head Naval Ordnance Station, Indian Head, Maryland. This is a single training point for all military personnel in the EOD career field. Senior EOD personnel also support this training with on-the-job training and close supervision. The school has been in operation for over 40 years and is the primary focal point for explosives operations within the U.S. government.

EOD personnel operating the OD Unit also attend a training program for RCRA at CAFB. This course covers all aspects of operating a RCRA-regulated unit. This is discussed further in this plan under the EOD Training Program, Annual RCRA Training.

Handling of explosives will be supervised only by the EOD Team Chief in accordance with Air Force technical order AF TO 11A-1-42 and Memorandum of Instruction (MOI) 136-6. A Specialty Training Standard (STS)-464X0 proficiency checklist, is used to assess proficiency levels of EOD personnel. Training records will be kept until final closure of the facility.

### Job Titles and Duties

EOD supervisory personnel at CAFB are directly responsible for the proper handling of explosive ordnance. The duties, responsibilities, and qualifications of these positions are as follows:

#### Air Force EOD Superintendent

- Responsibilities: Directs the operations at OD Unit at MAFR. The EOD superintendent provides assistance and guidance on EOD and management at the OD Unit.

- Duties:

- Plans, coordinates, and directs all EOD operations at CAFB and MAFR. Interprets regulations and develops necessary operating procedures as required. Determines requirements for manpower, space, and equipment and initiates actions required. Determines need for modifications to existing facilities and initiates action to improve economy, efficiency, safety, and physical security of operations. Develops appropriate requirements and initiates requests for work.
- Establishes, directs, and conducts on-the-job training for explosive ordnance disposal personnel. Inspects and evaluates EOD disposal activities. Conducts periodic and special inspection activities to ensure compliance with policies, regulations, and technical orders (TOs). Interprets inspection findings and recommends corrective action.
- Maintains personal contact with local, state, and government agencies and military commands.
- Assigns work to subordinate employees or supervisors based on priorities. makes decisions on work problems referred by subordinate supervisors. Ensures that workload and project responsibilities are specifically delegated and assigned to subordinates.

- Experience and Qualifications:

- Knowledge of composition and characteristics of U.S. and known foreign explosive, incendiary, and nuclear ordnance, and basic electricity.
- Qualification as an EOD technician.
- Basic understanding of detecting, identifying, rendering safe, recovering, or destroying explosive, incendiary, or nuclear ordnance.

Air Force EOD Craftsman and Journeyman (Team Chief and Technician)

- Responsibilities: Advises on technical issues involving EOD. The EOD Craftsman and Journeyman supervise weapons-related functions to ensure that all activities are coordinated and performed as directed and required. The Journeyman is subordinate to the Craftsman.

- Duties:
  - Conducts technical area reconnaissance for the detection, identification, and removal of unexploded ordnance (UXOs). Renders UXOs safe by utilizing appropriate techniques, calculating and fabricating explosive charges, and planning and directing EOD disposal activities.
  - Coordinates EOD disposal activities and movements with other military and civilian agencies. Prepares reports concerning EOD activities.
  - Supervises related munitions and weapons functions. Establishes procedures and standards for the availability of supplies, tools, and equipment pertaining to EOD disposal. Monitors and determines the proper procedures for turn-in or disposal of unserviceable supplies, tools, and equipment.
- Experience and Qualification:
  - Knowledge of the composition and characteristics of U.S. and known foreign explosive, incendiary, and nuclear ordnance and basic electricity.
  - Experience in performance or supervision in rendering safe, removing, and destroying dangerous or unserviceable explosive ordnance and in decontamination activities.
  - Qualification in AFSC 46470 according to standards in AFR 35-1.

Air Force EOD Specialist

- Responsibilities: Performs EOD-related functions including reconnaissance, survey, removal, and disposal of UXOs.
- Duties:
  - Conducts removal operations for UXOs using special techniques. Operates and interprets RADIAC and other applicable detecting instruments for monitoring areas adjacent to UXOs suspected of containing toxic or radioactive contaminants.
  - Disposes of unserviceable munitions by burning or detonation. Neutralizes and disposes of improvised explosive devices. Renders safe, removes, and

disposes of UXOs resulting from crashed or disabled aircraft and missiles.

- Provides assistance to disaster preparedness officers in the detecting, monitoring, evaluating, and decontaminating of radioactive, chemical, or biological hazards.
- Experience and Qualification:
  - Knowledge of composition and characteristics of U.S. and known foreign explosive, incendiary, and nuclear ordnance and basic electricity.
  - Graduation from Phases I and II of the Naval Ordnance School at Indian Head Naval Air Station, Maryland, according to the standards of AFSC 46420/50.
  - Experience rendering safe, removing, or destroying hazardous or unserviceable U.S. explosive ordnance. Experience with foreign explosives is desirable.

### Training Content, Frequency and Techniques

#### EOD Training Program

The EOD training program is taught at Indian Head, Maryland, and is required for all EOD personnel within DoD. All personnel must pass the basic course, and supervisory personnel must pass two additional advanced courses.

All personnel working at CAFB and MAFR receive extensive on-the-job training in each task they are required to perform. CAFB has developed a self-audit program to ensure personnel remain qualified in their assigned duties. A person may be evaluated at any time on a task specified in their AFSC. If the person fails to meet the task standards, he is decertified and sent for remedial training and reevaluation before working unsupervised on that task again.

The outline for the basic course is as follows:

1. Explosive Ordnance Disposal Specialist/Technician Career Field
  - A. Progression in career ladder 464X0
  - B. Duties of AFSCs 46430/50/70
2. Security
  - A. Communications security (COMSEC)
    - (1) Classify information and use MAJCOM/SOA EEFIs
    - (2) Prevent security violations

- (3) Observe security precautions
- B. Operations security (OPSEC)
  - (1) Background and history of OPSEC
  - (2) Definition of OPSEC
  - (3) Relationship of OPSEC to other security programs including COMSEC, Information Security, and Physical Security
  - (4) Common OPSEC vulnerabilities
  - (5) OPSEC significance of unclassified data and procedures
  - (6) Specific OPSEC vulnerabilities of AFSC 464X0
- C. Resources Security
  - (1) EOD publications
    - a. Storage requirements
    - b. Control/Access procedures
    - c. Destruction/Disposition requirements
  - (2) Protection of firearms and munitions
  - (3) Arming and use of force by USAF personnel
- 3. Air Force Occupational Safety and Health
  - A. The USAF safety program
  - B. Principles pertaining to:
    - (1) Ground safety
    - (2) Explosives and missile safety
    - (3) Nuclear safety
  - C. Investigate and report USAF mishaps
- 4. Publications
  - A. USAF publications
  - B. USAF TOs
    - (1) USAF TO system
    - (2) Use indexes (NI and RI)
    - (3) Locate desired information
    - (4) Use TOs when performing tasks
    - (5) Establish and maintain TO files
    - (6) Initiate TO improvement reports
    - (7) Requisition TOs
- 5. Participate in USAF Graduate Evaluation Program
- 6. Management
  - A. EOD unit management
    - (1) Organizational structure
    - (2) Functions and responsibilities
  - B. Inspection systems
  - C. Material deficiency reporting
- 7. Applied Principles of Physics
  - A. Properties of matter
  - B. Laws of motion

- C. Simple machines
  - D. Measurement systems
    - (1) English
    - (2) Metric
    - (3) Convert from system to system
8. Fundamentals of Electricity
- A. Ohms Law
  - B. Series Circuit
  - C. Parallel Circuits
9. EOD Tools
- A. Maintain tools
  - B. Handtools
    - (1) Select proper tools
    - (2) Use tools properly
  - C. Special tools
    - (1) Select proper tools
    - (2) Use tools properly
10. Military Explosives (General)
- A. Identification
  - B. Characteristics
  - C. Effects
11. Destruction of Explosive Materials
- A. Demolition equipment
  - B. Firing systems
    - (1) Electric
    - (2) Nonelectric
  - C. Disposal procedures
    - (1) Routine
    - (2) Emergency
  - D. Munitions residue
    - (1) Inspect
    - (2) Certify
    - (3) Turn-in
  - E. Environmental considerations
  - F. Transport munitions
12. Render Safe Techniques
- A. Immobilize fuses
  - B. Remove fuses by remote means
  - C. Disable electrical components
  - D. Disrupt firing trains
  - E. Use shaped charge and demolition techniques
13. Chemical Warfare Agents
- A. Classification
    - (1) Physical state
    - (2) Tactical use
    - (3) Physiological action

- (4) Persistency
  - B. Use protective clothing and equipment
  - C. Downwind hazards
  - D. Use detection and identification kits
  - E. Apply first aid/self aid procedures
  - F. Use decontaminants and decontamination kits
  
- 14. Chemical Munitions
  - A. Munitions characteristics
  - B. Identification
  - C. Seal and package leaking munitions
  - D. Respond to incidents involving chemical munitions
  - E. Transport hazardous chemical munitions
  - F. Use disposal methods
  
- 15. Placed Munitions
  - A. Land mines and fuses
    - (1) Classification
    - (2) Identification
  - B. Booby traps and fuses
    - (1) Classification
    - (2) Identification
  - C. Locate
    - (1) Land mines
    - (2) Booby traps
  - D. Placed munitions and their fuse
    - (1) Render safe
    - (2) Disposal
  - E. Placed munitions of foreign countries
  
- 16. Projected Munitions, Rockets, and Grenades
  - A. Projected munitions and their fuses
    - (1) Classification
    - (2) Identification
    - (3) Locate
    - (4) Render safe
    - (5) Disposal
  - B. Projected munitions, rockets, and grenades of foreign countries
  
- 17. Dropped Munitions
  - A. Bombs
    - (1) Classification
    - (2) Identification
    - (3) Render safe
    - (4) Disposal
  
  - B. Bomb clusters and dispensers
    - (1) Classification
    - (2) Identification
    - (3) Render safe
    - (4) Disposal

- C. Fuses
    - (1) Classification
    - (2) Identification
    - (3) Render safe
    - (4) Disposal
  - D. Dropped munitions of foreign countries
18. Aircraft Systems and Explosives
- A. Aircraft egress/weapons systems
    - (1) Aircraft/egress
    - (2) Gun systems
    - (3) Release systems
    - (4) Missile/rocket launching systems
    - (5) Miscellaneous explosive-actuated devices
  - B. Aircraft explosive devices
    - (1) Locate
    - (2) Render safe
    - (3) Remove
    - (4) Disposal
19. Pyrotechnics
- A. Classification
  - B. Identification
  - C. Render safe
  - D. Disposal
20. Guided Missiles
- A. Classification
  - B. Identification
  - C. Propulsion systems
    - (1) Identification
    - (2) Characteristics
  - D. Hazardous missile components and propellants
    - (1) Identification
    - (2) Render safe
    - (3) Removal
    - (4) Disposal
  - E. Guided missiles of foreign countries
21. Nuclear Weapons
- A. Classification
  - B. Identification
  - C. Fusing and firing systems
  - D. Nuclear weapons and hazardous components
    - (1) Render safe
    - (2) Disposal
  - E. Use protective clothing and equipment
  - F. Use equipment
22. RADIAC Instruments, Radiological Monitoring, and Radiological Hazards
- A. Principles of RADIAC instrument operation

- B. Use RADIAC instruments
  - C. Perform operator maintenance on RADIAC instruments
  - D. Compute stay times
23. Explosive Ordnance Reconnaissance
- A. Recognition of terrain changes due to UXO
  - B. Locate, mark, and report UXOs
  - C. Incident categories
  - D. Determine hazard distance
  - E. Safety requirements
  - F. Protective works
  - G. Technical intelligence
    - (1) Use photograph equipment
    - (2) Reporting
24. Access and Recovery
- A. Characteristics of soils
  - B. Effects of weather on soils
  - C. Methods of gaining access
  - D. Performing field rigging and improvised hoisting
  - E. Tie knots, bends, and hitches
25. Ranges
- A. Decontaminate ranges
    - (1) Active
    - (2) Inactive
    - (3) Excess
  - B. Proficiency/Demolition ranges
    - (1) Establish
    - (2) Maintain
26. Improvised Devices
- A. Improvised explosive devices
    - (1) Identification
    - (2) Gain access
    - (3) Render safe
    - (4) Disposal
  - B. Radiography interpretation
  - C. Improvised nuclear devices (IND)

#### Annual RCRA Training

Annual RCRA training provided to all EOD personnel by the installation Environmental Management Flight is as follows:

- 1. Regulatory Overview
  - A. RCRA—A Federal Act
  - B. 1984 RCRA amendments
  - C. Legal liability
  - D. Enforcement program and the Federal Facilities Compliance Act

2. What is Hazardous Waste?
  - A. Definition
  - B. Identification of hazardous waste
  - C. Solid wastes that are not hazardous wastes
  - D. Listed waste
  - E. Characteristic waste
  - F. Mixtures and residues ("derived from" rule)
  
3. Hazardous Waste Generation
  - A. Identification
  - B. Waste analysis
  - C. Sampling and analysis
  
4. Basic Management Practices
  - A. General overview
  - B. Accumulation of waste on-site
  - C. Waste disposal options
  - D. Recordkeeping
  - E. Waste analysis report
  - F. Manifesting
  - G. Training
  
5. On-Site Management
  - A. Generator responsibility
  - B. Storage
  - C. DOT hazardous materials table
  - D. Packaging
  - E. Marking, labeling, and placarding
  - F. Generator transportation
  
6. Shipping Off-Site
  - A. General obligations
  - B. Uniform hazardous waste manifest
  - C. Documentation
  
7. Spill Contingency and Emergency Response
  - A. Hazard recognition and evaluation
  - B. Basic response actions
    - (1) Small spills
    - (2) large spills
  - C. Equipment
  - D. Training
  - E. Reporting requirements
  
8. Personal Safety and Protection
  - A. Hazard recognition and evaluation
  - B. Physical hazards
    - (1) Ignitability
    - (2) Corrosivity
    - (3) Reactivity
    - (4) Toxicity
  - C. Personal Protective Equipment

- (1) Respiratory protection
  - (2) Protective gear for chemical hazards
9. Pollution Prevention
- A. A Goals
  - B. Reduction in hazardous waste generation
  - C. Reduction in hazardous waste use
10. Environmental Media Monitoring
- A. Air
  - B. Water
  - C. Soil

#### CAFB Training Program

CAFB has developed a base-specific training program for all EOD personnel. The program consists of specific tasks associated with EOD operations at CAFB and MAFR. The topics are reviewed monthly as follows:

#### Month 1

##### A. Knowledge

1. EFFACE 127 Series: Ground safety standards pertaining to EOD.
2. Explosive Safety: Proper procedures for transportation, storage, and handling. Information Includes safety standards associated with the OD Unit.
3. TO 11A-1-60: Familiarization with requirements of processing, inspecting, and turn-in of munitions residue to DEMO.
4. New Mexico Environmental Department: Familiarization with the OD process and the environmental implications (potential releases to air soil and water and applicable monitoring activity)

##### B. Task/Practical

1. Notification of Operation: Obtain proper signatures required to operate the OD Unit in accordance with CAFB Regulation 136-18.
2. OD Process: Withdrawal to a safe distance and area security.

## Month 2

### A. Task/Practical

1. Transportation: Preparation of hazardous waste manifest and transportation procedures. Includes loading, unloading, securing of explosives, placarding, and notification requirements.
2. OD Process: Placement of munitions, detonators, and initiators.

## Month 3

### A. Knowledge

1. TO 11A-1-42: Preparation of area and operational procedures defined by CAFR 136-18. Research and verification for each item that has been designated on an ADR.

### B. Task/Practical

1. Processing ADR: Individual will work with Base Supply and equipment personnel in the break out and packaging of ADRs. Includes verification of ADR number to item and ensuring that nomenclature, quantity, and proper documentation are maintained.
2. OD Process: Clean and inspect area.

## Month 4

### A. Task/Practical

1. OD Process: Obtain permission to initiate OD.

## Month 5

### A. Task/Practical

1. Post Action: Inspect area for kickouts. Recover or perform procedures for item in place. Clean OD Unit and collect casings.

## Month 6

### A. Task/Practical

1. OD Process: Withdraw to a safe distance and area security

2. Post Action: Inspect area for kickouts. Recover or perform procedures for item in place. Clean OD Unit and collect casings.

#### Training Director

The EOD superintendent is responsible for ensuring that assigned personnel receive adequate training in handling potentially hazardous waste. All personnel receiving training must have training documentation on file, either through A Form 55 or unit automated systems. Training for civilians will be documented in accordance with AFR 40-410. If certificates are given to students who complete training, these too shall be kept in their training records.

At a minimum, the training records must state the student's name, job title and description, date and place trained, and the expected date of retraining. Records of previous and ongoing training courses are maintained at the CAFB Civil Engineering Squadron training office.

#### Relevance of Training to Job Positions

EOD supervisory personnel who are responsible if an emergency occurs have been trained in handling explosive ordnance and potentially hazardous waste and in responding to emergency situations. Each has attended the EOD course at Indian Head Ordnance School, Maryland.

#### Training for Emergency Response

The Naval Ordnance Station training program ensures that personnel receive emergency response training. On-the-job training requires each person to read and understand various official publications, including but not limited to:

AFR 127-100	Explosive Safety Standards
EFFACE 127-66	General Industrial Operations
TO 11A-1-1	Ammunition Restricted or Suspended
TO 11A-1-42	General Instructions for Disposal of Conventional Munitions
TO 11A-1-46	Fire Fighting Guidance, Transportation and Storage, Management Data, and Complete Round Charts
TO 11A-1-53	General Instructions for Ammunition Color Coding, Identification of Empty and Inert Loaded Ammunition Items and Components,

and Assignment of Version Numbers to  
Training and Dummy Ammunition Items

TO 11A-1-60

General Instructions for Inspection of Reusable Munitions Containers and Scrap Material Generated from Items Exposed to or Containing Explosives

TO 60 series

This series is common to all military services. Various titles regarding specific items containing explosive ordnance [e.g., TO 60B-2-2-11-4 (MK 106 Practice Bombs)]

**Implementation of the Training Program**

All current EOD personnel and future employees assigned to handle hazardous materials and hazardous wastes will complete the training program described above within 6 months of their date of assignment. Refresher training for all personnel is required at least once each year.

**PERMIT ATTACHMENT E**  
**SPECIAL CONSIDERATIONS FOR THE HANDLING OF**  
**INCOMPATIBLE, REACTIVE AND IGNITABLE WASTES**

## **SPECIAL PROVISIONS FOR IGNITABLE, REACTIVE OR INCOMPATIBLE WASTE**

### **Intoduction**

This Permit Attachment presents special handling procedures tailored to the types of wastes that are treated at the facility's Open Detonation Unit. All treated wastes are explosive in nature and explosives must always be handled with care. Explosive wastes may at times be ignitable, reactive and incompatible when mixed together. Procedures not discussed in this Permit Attachment may be found in Permit Attachment K, Operational Procedures.

### **Transportation and Unloading Operations**

Explosive ordnance items transported from Cannon Air Force Base (CAFB) or from the Melrose Air Force Range (MAFR) outside the Open Detonation Unit are unloaded directly into the detonation structure at the Open Detonation Unit. Waste munitions are transported by specially designated explosive ordnance disposal (EOD) vehicles in ordnance container. EOD personnel are trained in the safe handling of waste munitions and take all precautions necessary to minimize the hazard potential during transportation and unloading operations.

During transportation, a primary and assistant operator will be assigned to each vehicle transporting explosives on public highways, roads or streets. When transporting explosives, operators must observe the following safety rules.

#### **o Vehicles**

Ensure that vehicles are in good condition. Inspect all vehicles intended for hauling explosives before loading explosives. Pay particular attention to protecting against any short circuits in the electrical system.

When using vehicles with steel or partial steel bodies, install fire-resistant and nonsparking cushioning to separate explosives from the metal truck components.

Do not overload vehicles beyond their rated capacities when transporting explosives. Cover open-body vehicles with a fire-resistant tarpaulin.

Do not carry metal tools, carbide, oils, matches, firearms, electrical storage batteries, flammable substances, acids, or oxidizing or corrosive compounds in the bed or body of any vehicle.

No smoking within 50 feet of any explosive.

o **Cargo (Explosives)**

Do not leave explosives unattended.

Do not mix live and inert explosives.

Do not permit anyone other than the primary and the assistant operator to ride on or in a truck transporting explosives.

Do not fuel a vehicle while carrying explosives.

**General Precautions for Handling Ignitable or Reactive Wastes or Accidentally Mixing Incompatible Wastes**

EOD personnel are trained in the treatment of military waste munitions and will not accept ordnance items with which they are unfamiliar. Incompatible explosive wastes are not commingled and will not be mixed or transported to the Open Detonation Unit.

In accordance with technical orders, TO 11A-1-42, paragraph 1-11, the mixing of bulk explosives will not be permitted during treatment operations. Bulk explosives are explosives that are not enclosed within a jacket, shell, projectile, bomb body or other mechanism. An example of bulk explosives is block demolition charges: prepackaged explosive charges for general demolition operations such as cutting, breaching and cratering.

The method of destruction utilized for each explosive is outlined in technical order, TO 11A-1-42. Based on the Department of Defense (DoD) studies of military ordnance, a set of guidelines has been developed for the proper treatment of military munitions. These policy directives are standardized throughout DoD and outline methods for safe and expeditious ordnance treatment. DoD technical orders, TO 60-series, outlines safe handling and destruction procedures for each ordnance item in the DoD inventory.

**Specific Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Wastes**

The procedures used in handling reactive wastes, referenced in technical orders and regulations AF TO 11A-1-42, 60A-I-1-31 and AFR 127-100, (available in the Part B application), have been developed by the US Air Force and the US Army over many years. These requirements ensure the safe handling of explosive wastes so as to prevent accidental ignition or reaction.

All waste explosives, reactive by design, are packaged securely, separated from incompatible items, secured on vehicles, and transported in accordance with the US Department of Transportation and US Air Force regulations.

## **Special Consideration for Handling Reactive & Ignitable Wastes**

### **Special Requirements for Ignitable or Reactive Waste**

The Open Detonation (OD) Unit has been located at the Melrose Air Force Range (MAFR) due to its remote nature. This adds to both human and environmental safety not available at other sites.

The OD Unit will be operated in compliance with the safety distance requirements specified in TO 11A-1-42 and facility boundary distance requirements defined under HWMR-7, Part VI, §265.382. Table E-1 below shows the distance requirements to the nearest property boundary from OD Unit per pound of explosives. The maximum weight of any combination of munitions to be treated during an open detonation episode will be 1000 pounds by net explosive weight.

The perimeter of the OD Unit at the MAFR is approximately 8500 feet (2590 meters) from the nearest (east) range property line. Thus, separation distances are sufficient to accommodate open detonation of the amounts of munitions specified above and allowed by the Permit.

### **Generally Accepted Wastes for Open Detonation**

Only unexploded ordnance will be detonated in the OD Unit. No other types of wastes will be managed at the OD Unit.

To prevent accidental ignition of explosive material, Air Force Regulations, AFR 127-100, prohibits smoking within 50 feet of any motor vehicle or material handling equipment loaded with explosives items. Cannon Air Force Base policy also prohibits smoking within 50 feet of operations involving explosives items.

Hazardous wastes are treated by demolition immediately after completion of the unloading operations at the OD Unit. An inspection of the area is performed immediately prior to and after all open detonation treatment episodes. A safe waiting period (minimum of 2 hours) is observed after the open detonation treatment for any post-treatment inspection. Visual surveillance is maintained during the treatment operations.

Technical orders (TO 11A-1-42) specify that the number of personnel involved with the treatment operations will be kept to a minimum consistent with each operation; but in no instance will there be less than two qualified munitions management personnel present.

While at the OD Unit, Explosive Ordnance Disposal (EOD) personnel are in two-way radio contact with the Range Control Tower. A red flag is flown during treatment operations and is displayed at a height that provides visible warning from a safe distance to all points of access for the OD Unit area. The flag is removed only after the OD Unit has been cleared and declared safe.

**Table E-1. Disposal Range Separation Distances**

<b>Pounds of waste explosive or propellants</b>	<b>Minimum distance from open burning or detonation to the property of others</b>
0 to 100	204 meters (670 ft)
101 to 1,000	380 meters (1,250 ft)
1,001 to 10,000	530 meters (1,730 ft)
10,001 to 30,000	690 meters (2,260 ft)

**PERMIT ATTACHMENT F  
CONTINGENCY PLAN**

Melrose AFR Plan 106

SECURITY INSTRUCTIONS

1. The long title of this document is Spill Prevention and Response (SPR) Plan. The title is unclassified.
2. This document is unclassified and requires no special handling or control measures.
3. As this plan is unclassified, it does not come within the scope of directives governing the protection of information affecting national security as specified in Air Force Directives in the 205 series.
4. This plan will be distributed to those organizations shown on the Distribution List, Section X. The plan will be controlled in accordance with established USAF procedures for unclassified documents.
5. Tasked organizations are authorized to extract and reproduce those portions of this document essential in the accomplishment of necessary planning and in the preparation of supporting documents.

Melrose AFR Plan 106

RECORD OF CHANGES AND ANNUAL REVIEW

RECORD OF CHANGES:

CHANGE NUMBER	DATE	DATE OF ENTRY	SIGNATURE AND ORG. OF INDIVIDUAL POSTING ENTRY

RECORD OF REVIEW:

REVIEWED BY	ORGANIZATION	DATE REVIEWED	REMARKS

Melrose AFR Plan 106  
PLAN SUMMARY

1. Purpose. This plan provides guidance and assigns responsibility for the prevention and proper response to spills of oils, sewage, or hazardous substances. This plan was prepared and formatted in accordance with Air Force Engineering and Services Center's Guidance Manual for Preparation of Spill Prevention and Response Plans. This plan outlines the procedures for the Melrose AFR to comply with federal, state, and local environmental laws and regulations.
  
2. Conditions of Execution.
  - a. This plan will be effective for execution upon discovery of an oil or hazardous substance spill.
  
  - b. The plan will be executed in accordance with Chapter 3, "Plan Execution," for the general procedures and Annex I for site-specific situations.
  
3. Operations to be Conducted.
  - a. Forces Assigned. Melrose AFR- and/or Cannon AFB-assigned personnel.
  
  - b. Supporting Plans/Orders
    - (1) This plan may be implemented in conjunction with Cannon AFB Operations Plan 355-1, Cannon AFB Disaster Preparedness Operations Plan.
  
    - (2) Agencies handling oils, sewage or hazardous substances will develop a checklist for initial notification in accordance with Phase I, Spill Discovery and Initial Notification.
  
    - (3) Key Assumption. Required personnel will be available.
  
    - (4) Operational Constraints. Federal, state, and local laws and regulations on the handling of oil, sewage, and hazardous substances.
  
    - (5) Command Relationships. 27 SPTG/CEV is the Office of Primary Responsibility (OPR) for the plan and will request support through the Environmental Protection Committee.
  
    - (6) Logistic Appraisal. This plan is logistically feasible.
  
    - (7) Personnel Appraisal. This plan is supportable with current resources.

## LIST OF ACRONYMS

ACC	Air Combat Command
AFB	Air Force Base
AFESC	Air Force Engineering Service Center
AFR	Air Force Range
BCE	Melrose AFR Civil Engineer
CE	Civil Engineering
CECC	Civil Engineering Control Center
CECT	Civil Engineering Cleanup Team
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEV	27th Civil Engineering Squadron/Environmental Management Flight
CFR	Code of Federal Regulations
CHEMTREC	Chemical Transportation Emergency Center
CHRIS	Chemical Hazardous Response Information System
CRT	Cleanup and Recovery Team
CWA	Clean Water Act
DCCP	Disaster Casualty Control Plan
DCG	Disaster Control Group
DoD	U.S. Department of Defense
DRMO	Defense Reutilization and Marketing Office
DSN	Defense Switching Network
EOD	Explosive Ordnance Detachment
EPA	Environmental Protection Agency
EPC	Environmental Protection Committee
ETIS	Environmental Technical Information System
HAZMAT	Hazardous Materials
HMIS	Hazardous Material Information System
HQ	Headquarters
HW	Hazardous Wastes
IRP	Installation Restoration Program
MSDS	Material Safety Data Sheet
NMED	New Mexico Environmental Department
NOSC	National On-Scene Coordinator
NRC	National Response Center
NSN	National Stock Number
OEHL	Occupational and Environmental Health Laboratory
OHMTADS	Oil and Hazardous Materials Technical Assistance Database System
OHSPC	Oil and Hazardous Substance Pollution Contingency
OPLAN	Operations Plan
OPR	Office of Primary Responsibility

## LIST OF ACRONYMS - Continued

OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
POL	Petroleum, Oil, and Lubricants
RCRA	Resource Conservation and Recovery Act
RQ	Reportable Quantity
RRT	Regional Response Team
SPR	Spill Prevention and Response
SPTG	Support Group
UOCP	Used Oil Collection Point
USAF	United States Air Force
USCG	United States Coast Guard

Melrose AFR Plan 106  
TABLE OF CONTENTS

Contents

SECURITY INSTRUCTIONS . . . . .

RECORD OF CHANGES AND ANNUAL REVIEW . . . . .

PLAN SUMMARY . . . . .

LIST OF ACRONYMS . . . . .

TABLE OF CONTENTS . . . . .

CHAPTER 1 - BACKGROUND . . . . .

    1.1 PURPOSE . . . . .

    1.2 AUTHORITY . . . . .

    1.3 APPLICABLE DEFINITIONS . . . . .

CHAPTER 2 - RESPONSE ORGANIZATIONS . . . . .

    2.1 GENERAL SPILL RESPONSE ACTIVITIES . . . . .

    2.2 BASE SPILL RESPONSE CENTER . . . . .

    2.3 ORGANIZATIONAL FUNCTIONS . . . . .

        2.3.1 Environmental Protection Committee . . . . .

        2.3.2 On-Scene Coordinator (OSC) . . . . .

        2.3.3 Disaster Control Group (DCG) . . . . .

        2.3.4 Hazardous Materials Response Team (HAZMAT) Team . . . . .

        2.3.5 Civil Engineering Cleanup Team (CECT) . . . . .

        2.3.6 Tasked Commanders and Staff Agency Chiefs . . . . .

        2.3.7 Individuals Assigned, Attached to, or Working at Melrose AFR . . . . .

CHAPTER 3 - PLAN EXECUTION . . . . .

    3.1 GENERAL PROCEDURES . . . . .

    3.2 PHASE I - INITIAL NOTIFICATION AND RESPONSE . . . . .

    3.3 PHASE II - FOLLOW-ON RESPONSE . . . . .

    3.4 PHASE III - SHORT-TERM SITE RESTORATION . . . . .

    3.5 PHASE IV - LONG-TERM SITE RESTORATION . . . . .

    3.6 NOTIFICATION PROCEDURES . . . . .

        3.6.1 Initial Notification Checklist . . . . .

        3.6.2 Procedures for Notifying HQ ACC . . . . .

        3.6.3 Procedures for Notifying Regulatory Agencies . . . . .

        3.6.4 Off-Base Contact Notification Procedures . . . . .

        3.6.5 Activation of Disaster Control Group (DCG) . . . . .

TABLE OF CONTENTS (Continued)

CHAPTER 4 - CONTINGENCY PLAN . . . . .

- 4.1 IMMEDIATE SPILL EMERGENCY ACTION PLAN . . . . .
- 4.2 GENERAL FACILITY INFORMATION . . . . .
- 4.3 POTENTIAL SPILL ROUTES . . . . .
  - 4.3.1 Fire Safety Plan . . . . .
- 4.4 FIRE AND SPILL EQUIPMENT . . . . .
- 4.5 HAZARDOUS MATERIALS STORED AT THIS SITE . . . . .
- 4.6 INSPECTIONS AND PERSONNEL TRAINING . . . . .
- 4.7 PLAN UPDATING AND POSTING REQUIREMENTS . . . . .

CHAPTER 5 - TRAINING REQUIREMENTS . . . . .

- 5.1 PERSONNEL TRAINING REQUIREMENT . . . . .
  - 5.1.1 Level 1 - First Responder (Awareness) . . . . .
  - 5.1.2 Level 2 - First Responder (Operations) . . . . .
  - 5.1.3 Level 3 - Hazardous Materials Technician . . . . .
  - 5.1.4 Level 4 Hazardous Materials Specialist . . . . .
  - 5.1.5 Level 5 - OSC . . . . .
  - 5.1.6 Level 6 - Cleanup Response Team Members . . . . .
- 5.2 HAZMAT TEAM TRAINING . . . . .
- 5.3 CIVIL ENGINEERING CLEANUP TEAM (CECT) . . . . .

CHAPTER 6 - PLAN REVIEW AND UPDATE . . . . .

ANNEX I CHECKLISTS FOR SPILL NOTIFICATION AND RESPONSE

ANNEX II EQUIPMENT INVENTORIES

ANNEX III SUMMARY OF CANNON AIR FORCE BASE CIVIL ENGINEERING  
CLEANUP TEAM MEMBERS/ORGANIZATIONS AND CURRENT  
TELEPHONE CONTACT NUMBERS

ANNEX IV SUMMARY LISTING OF OFF-BASE SPILL NOTIFICATIONS  
PROCEDURES AND RESPONSE ORGANIZATIONS

ANNEX V RANGE MAP

ANNEX VI HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES

ANNEX VII DISTRIBUTION LIST

Melrose AFR Plan 106  
Quick Reference Table

This table should be used as a quick reference listing when responding to a spill. The first response should be to determine the substance spilled and whether it is hazardous. This listing contains the most common hazardous substances and their associated National Stock Numbers (NSNs) used at Melrose Air Force Range (AFR) and the reportable quantity of that substance.

### Quick Reference Chemical Listing

Substance	RQ
Aboveground Storage Tank, Leaking	1 lb
Antifreeze (Hazardous)	5000 lb
Diesel Fuel	25 gal
Engine Oil	25 gal
Gasoline	25 gal
Hydrazine	any amount
Hydraulic fluid	1 lb
JP-4	25 gal
Lubricant oils	25 gal
Listed Hazardous Substances (Listing in Section I)	Varies
Paint Waste - Thinners	100 lb
Sulfuric Acid	100 lb
Synthetic Oils	25 gal
Used Paint Rags	100 lb

## CHAPTER 1 - BACKGROUND

### 1.1 PURPOSE

This Spill Prevention and Response (SPR) Plan is intended to fulfill the requirements of an Oil and Hazardous Substance Pollution Contingency (OHSPC) Plan and the hazardous waste spill prevention and response requirements. The Contingency Plan portion of the document specifies procedures to be followed when responding to releases, accidents, and spills involving oils, sewage, or hazardous substances. These include spill detection, reporting, containment, cleanup, and disposal procedures. The plan should be implemented in conjunction with the Cannon Air Force Base (AFB) Disaster Preparedness OPLAN, 355-1, if circumstances warrant implementation of the OPLAN. Also included within this document are general procedures for training programs and procedures for plan reviews and updates. The SPR Plan is supported by several vital annexes that provide the specific information associated with the facilities found on Cannon AFB.

### 1.2 AUTHORITY

This plan was developed in accordance with applicable legislation/regulations. The major federal oil and hazardous substances spill prevention and response legislation and regulations are as follows:

Clean Water Act (CWA), PL 92-500, 33 USC 1251 as amended by PL 95-217 and PL 95-576. Effective date 1977. The CWA authorizes the President to issue regulations establishing procedures, methods, equipment, and other requirements to prevent discharges of oil and hazardous substances from onshore and offshore facilities, and to contain such discharges.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), PL 96-510, 42 USC 9601. Effective date 11 December 1980. CERCLA provides for spill reporting, liability compensation, cleanup, and emergency response for hazardous substances (excluding oil) released into the environment and the cleanup of inactive disposal sites.

Resource Conservation and Recovery Act (RCRA), PL 94-580, 42 USC 6901. Effective date 21 October 1976. Subtitle C of the Solid Waste Disposal Act, as amended by RCRA, directs the Environmental Protection Agency to promulgate regulations establishing a federal hazardous waste management system.

33 Code of Federal Regulations (CFR) Part 153, Control of Pollution by Oil and Hazardous Substances, Discharge Removal. Effective date 26 April 1976. Requires the notification of Duty Officer, National Response Center, U.S. Coast Guard (USCG) of the discharge of oil or a hazardous substance from a facility in violation of section 311(b)(3) of the CQA).

40 CFR Part 110, Environmental Protection Agency Regulations on Discharge of Oil. Effective date 11 November 1976. Defines a reportable spill of oil.

40 CFR Part 117, Determination of Reportable Quantities for Hazardous Substances. Effective date 28 September 1979. Defines reportable spill quantities for substances designated under section 311 of the CWA and requires notification of the National Response Center in the event of a reportable spill.

40 CFR Part 151, Hazardous Substance Pollution Prevention for Facilities Subject to Permitting Requirements. Proposed regulation 1 September 1978. Requires the preparation and implementation of a Spill Prevention Control and Countermeasures plan to prevent discharge of CWA Section 311 hazardous substances by any facility subject to permitting requirements under the National Pollutant Discharge Elimination System.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

40 CFR Part 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Effective date 19 May 1980. Established requirements under Section 3004 of RCRA for owners and operators of facilities that treat, store, and dispose of hazardous waste. Requirements include preparedness and prevention of hazards, contingency planning, emergency procedures, manifests, recordkeeping, reporting, security, inspection of facilities, and personnel training.

40 CFR Part 300, National Oil and Hazardous Substance Pollution Contingency Plan. effective date 16 July 1982. Provides for coordinated federal action to try to prevent discharges of oil and hazardous substances, and to protect the environment from damage when discharges occur. The plan also requires federal local contingency plans for federal installations and promotes federal-state coordination.

### 1.3 APPLICABLE DEFINITIONS

Cleanup and Recovery Team (CRT) -- A team of predesignated individuals at Melrose Air Force Range (AFR) and stationed at Cannon AFB, trained and equipped to specifically clean up spills. The CRT is currently composed of members of the Cannon AFB Civil Engineering Squadron.

Environment -- Means the navigable waters, water of the contiguous zone, and any other surface water, groundwater, drinking water supply, land surface, and subsurface strata, or ambient air under the jurisdiction of the United States.

Hazardous Material -- Any material which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may pose a substantial hazard of any release to the environment.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

Hazardous Material Response Team -- A team of predesignated individuals at each AFB and AFR, trained and equipped to execute operations for the response, control, and containment of hazardous substance spills.

Hazardous Substance -- Hazardous material or hazardous waste designated as hazardous under Section 101(14) of CERCLA. A comprehensive list of CERCLA regulated hazardous waste that may be present at Melrose AFR is presented on the Quick Reference Chemical Listing on page iv of the SPR Plan.

Hazardous Waste - Any solid, semisolid, or contained gaseous material designated as waste for disposal as defined or identified in 40 CFR Part 261.

Release/Spill -- Synonymous terms as defined by section 101(22) of CERCLA, relating to the intentional or accidental loss, including any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of a hazardous substance into the environment. It includes the release of any material of any size, nature, and quantity that:

- (1) Occurs in or endangers critical water areas;
- (2) Generates public interests;
- (3) Becomes the focus of an enforcement action; or
- (4) In any way poses a real or potential threat to public health or welfare, of the environment.

Reportable Quantity -- The quantity designated for each of 699 hazardous substances in 40 CFR 302, under the provisions of section 102 of the CERCLA. These spill quantities are for any 24-hour period and include spills on land and in air in addition to spills in the water.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

Spills typically may occur in the work place and are cleaned up without a threat to the environment, public health, and property.

Response Personnel -- Those predesignated personnel charged with being knowledgeable of the nature of hazardous material present in their work places and storage areas. These personnel will also be knowledgeable on spill containment and the cleanup of operational type spills, site layout (e.g., material locations and spill equipment), and use of the site plan.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

## **CHAPTER 2 - RESPONSE ORGANIZATIONS**

### **2.1 GENERAL SPILL RESPONSE ACTIVITIES**

The Cannon AFB On-Scene Coordinator (OSC) has available all base resources in determining and performing response actions in the event of an oil or hazardous substance spill. Deployment of personnel and resources will be activated only if called by the OSC, the OSC's representatives on-scene, or the Base Commanding Officer. For spills beyond the capabilities of Melrose AFR and Cannon AFB, additional emergency services can be obtained from the state of New Mexico or contractors or through the U.S. Environmental Protection Agency (EPA) Regional Response Team (RRT).

### **2.2 BASE SPILL RESPONSE CENTER**

The Cannon AFB Fire Department receives all initial spill reports from Melrose AFR. The Fire Department operates 24-hr/day and alerts/activates the Melrose AFR SPR Plan. The Fire Department also notifies the Base Command Post, who in turn passes the report up the chain of command.

### **2.3 ORGANIZATIONAL FUNCTIONS**

Spill response organizations consist of representatives from various squadrons and basewide functions.

#### **2.3.1 Environmental Protection Committee**

The Base Environmental Protection Committee is responsible for reviewing the SPR Plan before its promulgation by the Installation Commander and before finalization of any

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

modifications occurring during the annual review and update of the plan. The committee will develop pollution abatement policy guidance, monitor implementation of this plan and other pollution abatement directives, and ensure that supporting procedures by responsible commanders are published.

### **2.3.2 On-Scene Coordinator (OSC)**

The OSC is the individual assigned the responsibility for directing and coordinating all spill response actions for U.S. Air Force (USAF) spills (see Executive Order 12316). The OSC will have the authority to use the expertise and resources of the HAZMAT Team and Disaster Control Group (DCG) in determining and performing response actions. It is also the responsibility of the OSC to ensure that training programs regarding spill response activities are routinely conducted. The OSC will ensure only certified and trained personnel perform spill containment, recovery, cleanup, disposal, and restoration activities.

The primary OSC for spills of oil and hazardous substances at Melrose AFR will be the Commander, 27 Support Group (27 SPTG/CC). 27 SPTG/CC may appoint someone as OSC according to OPLAN 355-1. The alternate OSC will assume full responsibility in the absence of the primary OSC.

### **2.3.3 Disaster Control Group (DCG)**

Members notified by the DCG (under the responsibility of the 27 FW Command Post) are tasked to respond to all spills when requested by the OSC and to provide services for spill containment, recovery, cleanup, disposal, and restoration activities as directed by the OSC.

The personnel on the DCG and their designated responsibilities are discussed below.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

### **2.3.3.1 Commander 27 SPTG**

The Commander 27 SPTG will:

- (1) Act as primary OSC responsible for directing and coordinating all spill response actions.
- (2) Implement Cannon AFB OPLAN 355-1, if deemed necessary.
- (3) Properly report and document oil or hazardous substance spills. Authorize and coordinate with higher headquarters all required notifications and requests for assistance to federal (outside the USAF), state, or local agencies and the news media.
- (4) Appoint first alternate OSC according to OPLAN 355-1 Chain of Command.

### **2.3.3.2 Base Civil Engineer**

The Base Civil Engineer (BCE) (27 SPTG/CE) will:

- (1) Provide Environmental personnel to furnish technical expertise relative to pollution control techniques.
- (2) Within his capability, provide personnel, transportation and equipment for containment, cleanup, and restoration of landscape due to spills of oils and hazardous substances that exceed the capability of the Base agency responsible for the spill.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- (3) Notify the Commander 27 SPTG of personnel and equipment requirements that exceed Base capability.
- (4) Ensure that adequate types and quantities of spill response and protective equipment, sandbags, absorbent material, cleanup equipment, etc., are stocked as designated in this plan, and that such gear is properly inspected, operated, and maintained.
- (5) Provide suitable inventory and storage for chemical agents, absorbent materials, and equipment not otherwise specified to be furnished by other units employed in combating pollution.

#### **2.3.3.3 Base Fire Chief**

The Base Fire Chief (27 SPTG/CEF) will:

- (1) Act as the OSC until the Commander 27 SPTG or designee arrives at the spill scene.
- (2) Direct Fire Department to record all spill reports received from the Emergency Call Line (911) on a designated telephone log.
- (3) Immediately respond to spills as necessary to protect life and property with due regard for the environment.
- (4) Direct emergency dispatch operator to notify Base Hospital if injuries are reported.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- (5) Provide technical assistance to the OSC concerning response to and handling of combustible or flammable substances.
- (6) Direct emergency dispatch operator to notify the Environmental Flight on spill occurrences, if necessary.
- (7) Measure explosive concentrations and determine if an explosive hazard exists. This information will be provided to the OSC for use in establishing the cordon.
- (8) Provide trained personnel, transportation, and equipment for containment of spills of hazardous chemicals where special protection equipment is required (i.e., self-contained breathing systems, corrosive resistant clothing, etc.) This team shall be called the Fire Department HAZMAT Team (HAZMAT Team). Training of the HAZMAT Team members shall include the 24-Hour HAZMAT First Responder course.
- (9) Maintain a current list of all members of the HAZMAT Team along with their duty telephone numbers as well as nonduty telephone numbers.
- (10) Contact the HAZMAT Team members and inform them to assemble at a designated area as soon as possible.
- (11) Evaluate and identify the spill area and determine whether health hazards have been eliminated.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- (12) Direct emergency dispatch operator to notify Security Police of spill occurrence if evacuation is required.
- (13) Notify the Chief of Operations when the Civil Engineering Cleanup Team (CECT) is needed for containment and cleanup.
- (14) Fully equip, train, and maintain HAZMAT Team members to provide initial control, emergency rescue, and hazard mitigation at the scene of a hazardous spill.

#### **2.3.3.4 Chief, Environmental Management**

The Chief, Environmental Management (27 SPTG/CEV) and assigned staff will:

- (1) Respond to all spill emergency calls. Provide technical and scientific support to the OSC in environmental pollution matters during all oil or hazardous substance incidents.
- (2) Advise the OSC as to the need to, or in his/her absence, activate specific members of the HAZMAT Team and the CECT.
- (3) Determine the adequacy of the ultimate cleanup effort and advise the OSC of any additional cleanup requirements.
- (4) Represent the commanding officer in matters of coordination between Melrose AFR and federal/state agencies exercising jurisdiction in environmental pollution control.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- (5) Ensure proper containerization and disposal of all hazardous wastes resulting from the spill.
- (6) Maintain official records and photographs documenting the extent of the spill and all contaminants, cleanup and recovery actions taken, and procedures used.
- (7) Report to the scene of the spill immediately upon notification, as ordered by the OSC.
- (8) Provide technical expertise on severity of spill, containment, and remediation.
- (9) Assess environmental impact.
- (10) Notify the state of New Mexico, the New Mexico Emergency Response Center (through the New Mexico State Police and in accordance with Chapter 3 and OPLAN 355-1), the National Response Center (NRC), and Air Combat Command (ACC) of reportable spills. Submit pollution incident reports.
- (11) Ensure proper cleanup and disposal of contaminated materials.
- (12) Notify Base Bioenvironmental Engineer of spill and materials that require testing.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

**2.3.3.5 Bioenvironmental Engineer**

The Bioenvironmental Engineer (27 MG/SPB) will:

- (1) Upon notification of a spill, and at the direction of the OSC, sample and test the affected waterways to monitor the extent and degree of pollution caused by the spill, if any.
- (2) Provide the technical assistance and advice to the OSC and the hospital with respect to the health hazards associated with oils and hazardous substances.
- (3) Perform confirmation sampling after cleanup activities to ensure that hazardous constituents have been removed.

**2.3.3.6 Readiness Officer**

The Readiness Officer (27 SPTG/CEAD) will

- (1) Ensure that the Cannon AFB Disaster Preparedness OPLAN 355-1 is coordinated with the SPR Plan in the event of a hazardous substance spill requiring the implementation of the Disaster Preparedness OPLAN 355-1.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

#### **2.3.3.7 Chief, Security Police**

The Chief of Security Police (27 FW/SP) will:

- (1) Immediately mobilize his or her organization to an actual or potential oil, sewage or hazardous substance spill, to isolate the spill area and control traffic when and where necessary as directed by the OSC.
- (2) Ensure that while individuals in the security force are on normal patrols, they are continuously aware of oil and hazardous substance spills and report all areas that appear to be suspect.

#### **2.3.3.8 Liquids Fuels Maintenance Technician**

The Liquid Fuels Maintenance Technician will:

- (1) Report to the scene, at the request of the OSC, to measure explosive vapor concentrations and determine where explosion hazards exist. This information will be provided to the OSC for use in establishing the cordon.

#### **2.3.3.9 Staff Judge Advocate**

The Staff Judge Advocate will:

- (1) Respond to all oil and hazardous substance pollution spills, at the request of the OSC, to ensure that information, records, and samples adequate for legal purposes are obtained and safeguarded for future use.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- (2) Advise the OSC on the legal aspects of spill response when parties other than the USAF are responsible for the spill.
- (3) Obtain necessary permission from land owners to investigate and clean up spills.

#### **2.3.3.10 Public Affairs Officer**

The Public Affairs Officer will:

- (1) Respond to all oil or hazardous substance spills when requested by the OSC.
- (2) Keep abreast of all Melrose AFR actions during a spill and prepare to provide prompt and accurate news releases on the nature of the discharge and the steps being taken to correct the problem. This policy must be followed to obtain understanding from the public, ensure cooperation from all interested parties, and check the spread of misinformation.
- (3) Coordinate all news media releases involving actions with the Wing Commander.
- (4) If the Regional Response Team News Office is activated, coordinate all news releases with them. If a Regional Response Team News Office is not activated, the EPA's Public Information Office can be contacted (404-881-3004) if deemed appropriate.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- (5) Prepare and direct a public awareness program to inform all personnel assigned to Melrose AFR (military, civilian, and contractor) about spill prevention programs as well as spill discovery and notification responsibilities and procedures.

#### **2.3.3.11 Safety Officer**

The Safety Officer will:

- (1) Provide technical assistance to the OSC with respect to the safety of personnel.

#### **2.3.3.12 Base Hospital Commander**

The Base Hospital Commander (27 MG/CC) will:

- (1) Ensure that medical personnel and ambulance(s) are dispatched to the site of the spill as directed.
- (2) Ensure that emergency treatment is rendered and injured personnel are removed to the Base Hospital for treatment.
- (3) Ensure that current and follow-up information on injured personnel is provided to the OSC as soon as possible.
- (4) Ensure that hospital staff are familiar with health effects of hazardous substances present at Melrose AFR.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- (5) Implement, if required, the 27 Medical Group Disaster Casualty Control Plan (DCCP) to ensure prompt admittance of the injured for treatment (this includes strict control measures to prevent risks of hazards to hospital personnel and the public).

#### **2.3.3.13 Transportation Officer**

The Transportation Officer will:

- (1) Provide OSC with transportation as required for spill response personnel and equipment.

#### **2.3.3.14 Weather Officer**

The Base Weather Officer will:

- (1) Ensure that the OSC is provided with up-to-date weather information as requested.
- (2) Assist in calculating direction and downwind concentration of airborne contaminants.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

**2.3.3.15 Chief, Communications Squadron**

The Chief, Communications Squadron (27 SPTG/CS) will:

- (1) Ensure that a photographer documents with photographs, as directed by the OSC, the extent of the spill as well as the containment, countermeasures, and restoration procedures used.

**2.3.3.16 Comptroller**

The Comptroller will:

- (1) Assign job numbers to identify resources on materials and labor due to oil or hazardous substance spills.
- (2) Accumulate costs and report to the Wing Commander the value of resources expended.
- (3) Initiate action to recover funds as appropriate.

**2.3.4 Hazardous Materials Response Team (HAZMAT Team)**

Trained personnel will remain on 24-hour alert at the Base Fire Department. The HAZMAT Team will work under the direction of the Base Fire Chief and in coordination with the OSC. The necessary equipment will be on hand for the HAZMAT Team to perform the following tasks in the event of an emergency:

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- (1) Serve as the first responder (if directed by the Fire Chief) to any spill where the amount of material spilled exceeds the Reportable Quantity (RQ).
- (2) Provide emergency rescue of endangered personnel while protecting others from existing hazards.
- (3) Establish a cordon around affected areas with controlled access/egress.
- (4) Control, mitigate, or otherwise contain spill material to prevent loss of life and property and prevent degradation of the environment.
- (5) Coordinate with outside spill response agencies and emergency personnel if OPLAN 355-1 is implemented.

The HAZMAT response effort requires the total cooperation of all organizations to handle the incident. The HAZMAT team is built around functional roles, or elements, with one or more persons assigned. Specific checklists covering each of the following functional elements shall be developed to handle incidents involving both facility and transportation, specific chemicals, and generic responses. Each of the functional elements is defined below.

The Hazard Group Supervisor will:

- (1) Assist the OSC with the overall scene management and directly supervise the HAZMAT team, and
- (2) Keep the OSC fully advised of technical or specific information relative to the spill incident at hand.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

The Information Management Monitor will:

- (1) Assemble and analyze all technical reference material, incident data, and other resources to include interviews with Bioenvironmental Engineering personnel and other technical specialists, and
- (2) Make recommendations to the HAZMAT Supervisor concerning evacuation criteria, personal protective equipment and clothing, and mitigation procedures.

This is one of the first positions that will be filled during an incident, and requires one to three persons depending on the complexity of the incident.

The Safety and Health Monitor will:

- (1) Monitor the safety and health of all personnel within the hazard area (hot and warm zones),
- (2) Consult with the Bioenvironmental Engineering personnel and other technical specialists on the safety and health aspects of the incident,
- (3) Have the authority to alter, suspend, or terminate activities that pose an imminent danger condition or are immediately dangerous to life or health,
- (4) Remain in constant contact with the Hazard Supervisor and maintain a log of exposure times for each person in the hot zone, and

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- (5) Be knowledgeable in the operations being used and trained in the emergency handling of hazardous materials.

This position usually requires one to two persons depending on the complexity or geographical size of the incident.

The Entry Personnel Element will:

- (1) Perform the physical reconnaissance of the problem area, if safely possible. They will document and report the presence of potential life hazards and environmental factors,
- (2) Assist in plan formulation for control actions,
- (3) Don proper protective equipment and gear and enter the hot zone to perform product control. All personnel in the hot zone must work in pairs. There must be backup personnel on standby to perform assistance or rescue of personnel in the hot zone wearing appropriate level of protective equipment, and
- (4) Ensure that emergency medical services personnel are available with transport capabilities.

The element requires a minimum of four to six persons.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

The Decontamination Element will:

- (1) Determine the proper decontamination procedures and setup the decontamination zone site before anyone enters the hot zone,
- (2) Coordinate all decontamination activities with the Hazard Group Supervisor, the Safety and Health Monitor, and the Information Management Monitor, and
- (3) Perform decontamination procedures on all persons leaving the hot zone. Decontamination personnel shall wear personal protective equipment appropriate to the incident.

The element requires a minimum of four to six persons.

The Resources Management Element will:

- (1) Control all tools, protective clothing, and equipment used during the incident,
- (2) Be responsible for all members of the HAZMAT team not specifically assigned to other functional areas,
- (3) Document the use of all expendable items, and
- (4) Assist the Entry Element in donning and doffing their protective equipment and clothing.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

This element requires a minimum of four to six persons depending on the complexity and/or geographic size of the incident.

### **2.3.5 Civil Engineering Cleanup Team (CECT)**

The CECT will be staffed by the Civil Engineering Squadron and shall be under the control of the Base Civil Engineer. The CECT shall:

- (1) Be staffed, trained, and equipped to handle oil and hazardous substance spills that may be encountered at Cannon AFB. Hazardous substance spills include nitrogen tetroxide and hydrazine.
- (2) Respond to all Cannon-related spill emergency calls on and off base as requested by the OSC.
- (3) Clean up the spills to satisfy all federal, state, and local requirements.
- (4) Conduct bimonthly training sessions to prepare the Civil Engineering Cleanup Team members for oil and hazardous substance spills that may be encountered.
- (5) Be placed on a recall roster to permit after-hours cleanup of oil and hazardous substance spills.

### **2.3.6 Tasked Commanders and Staff Agency Chiefs**

It is the responsibility of tasked commanders and staff agency chiefs to publish such procedures that are necessary for implementing this plan and ensure that adequate training is

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

conducted and environmental protection/pollution abatement procedures are implemented in their areas of responsibility. They will designate additional project officers and monitors as required to ensure an effective program and continually inspect the work areas under their control to ensure that effective pollution abatement procedures are followed. They will also ensure that Site-Specific Contingency Plans developed for their particular areas are posted in prominent locations at potential spill sites.

### **2.3.7 Individuals Assigned, Attached to, or Working at Melrose AFR**

Each individual assigned to, attached to, or working at Melrose AFR is tasked to report any spill of oil or hazardous substance to the Base Fire Department and to take every reasonable precaution to prevent the spillage of oil or hazardous substances. In addition, all contractors performing services will be notified prior to the initiation of the contract of their responsibilities to take every reasonable precaution to prevent the spillage of oil or hazardous substances and to report any spills of this nature to the Base Fire Department.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

## CHAPTER 3 - PLAN EXECUTION

### 3.1 GENERAL PROCEDURES

The Oil and Hazardous Substance Contingency Plan for Cannon AFB designates the procedures to be followed in the event of releases, accidents, and spills involving oils, sewage or hazardous substances and the organizations, personnel, and equipment responsible for carrying out the response functions.

The OSC is the individual assigned the authority for directing and coordinating all spill response actions. The OSC will have the authority to use the expertise and resources of the HAZMAT Response Team and personnel associated with the Primary Crash Network. Only the OSC or his/her designee can activate the HAZMAT Team. The activation of the HAZMAT Team and the Disaster Control Group (DCG) is effected to provide a coordinated response to contain, control, recover, and restore the environment from all spills. Annex IV summarizes all Base telephone numbers used for contacting these organizations. Off-duty telephone numbers are maintained by the primary and alternate OSCs, the Fire Department, and the Civil Engineering Service Call Desk. Annex IV also summarizes all off-base response organizations along with the telephone numbers used for contacting those organizations. The responsibilities of the OSC and personnel assigned to the HAZMAT Team and DCG regarding contingency planning are outlined in Chapter 2.

Due to the diversity of materials stored at Melrose AFR and the variable severity of the hazards presented in the event of a spill, the response actions will vary. General procedures should be reviewed and, if necessary, updated before adopting courses of action in a particular situation. Site-Specific Contingency Plans exist for each facility at Melrose AFR; these are referred to in Chapter 4 for use in the event of a release. The execution of the SPR Plan is divided into four phases:

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- Phase I - Spill Discovery and Initial Notification,
- Phase II - Response Actions,
- Phase III - Short-Term Site Restoration, and
- Phase IV- Long-Term Site Restoration.

It should be noted that this plan deals primarily with solid and liquid pollutants.

### 3.2 PHASE I - INITIAL NOTIFICATION AND RESPONSE

Phase I designates the initial spill response procedures to be followed by any individual discovering a spill or potential spill of oil, sewage or hazardous substances. The person(s) discovering a spill is responsible for providing initial defensive actions without undue risk of personal injury. Figure 3-1 presents a flow chart for visualization of the notification and response processes. The initial notification will vary depending on the amount of material spilled.

- (1) The party discovering the spill will immediately call the Fire Department at 911 to notify emergency personnel:
  - (a) When notifying the Fire Department of the spill occurrence, the following information should be provided if it is known or can reasonably be determined.
    - Name of individual reporting spill.
    - Location of spill, including street address.
    - Number of injured personnel and nature of injuries (if applicable).
    - Type of substance spilled.

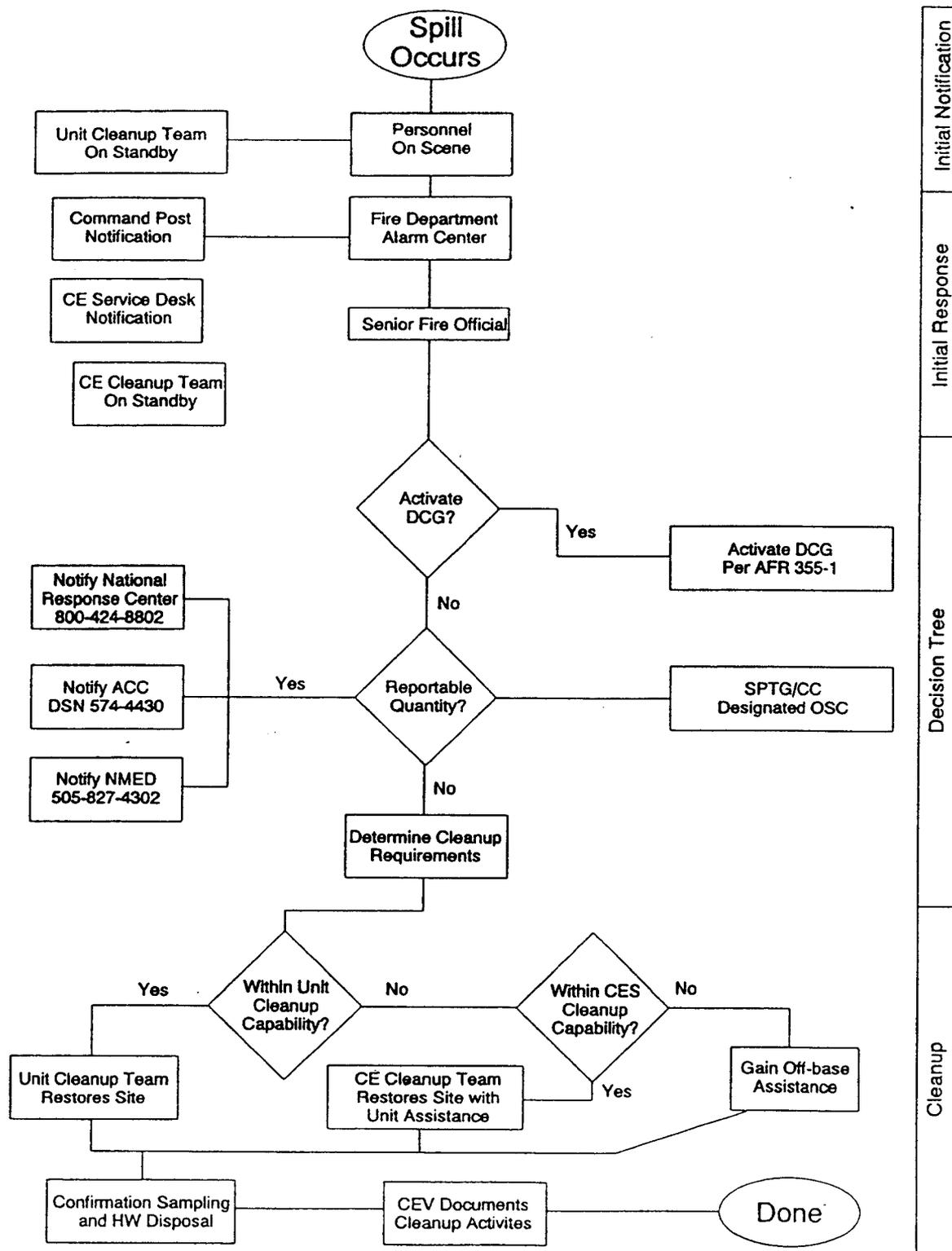


Figure 3-1. Decision Matrix

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- Amount spilled (estimated).
  - Rate material currently spilling (estimated).
  - Time spill occurred (estimated).
  - Extent spill has traveled.
  - Any additional pertinent information (i.e., other potential hazards).
- (b) After notifying the fire department, implement the following actions as necessary upon discovery of a spill. The order of the actions will depend on existing conditions.
- Initiate evacuation, if necessary.
  - Notify Base Hospital (via ext. 4-911) for injuries.
  - Check causes and stop the source of spill, when possible, without undue risk of personal injury; use of on-site spill containment equipment and materials may be necessary.
  - Restrict access to spill scene to authorized personnel.
  - Restrict all sources of ignition when flammable substances are involved.
  - Report to OSC upon arrival.
- (c) Base personnel other than Fire Department personnel receiving reports of spills shall aid in channeling the report to the Fire Department, who will respond as outlined.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- (2) The Fire Department will:
- (a) Immediately respond as necessary to protect life and property with due regard for the environment.
  - (b) Record spill reports on a Spill Report/Response Form (Annex I), designed to record the information listed in paragraph (1)b in this section along with the time of the report.
  - (c) Notify the Fire Chief and Environmental Flight (or Base Civil Engineer if Environmental Flight cannot be contacted) as well as the Base Hospital if injuries are reported. The Fire Chief will notify the Command Post, who will execute notification through the DCG. The Fire Chief will serve as the OSC until relieved by the Base Civil Engineer or the Base Commander. This designation is vital for success of the spill response. The current duty telephone numbers for these personnel are listed in Annex III.
  - (d) Activate the HAZMAT Team to establish cordon, contain migration, and rescue the injured.
  - (e) Notify the Chief of Operations or Deputy Chief of Operations when the cleanup team is needed.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- (3) The Base Environmental Flight or Civil Engineer will:
  - (a) Respond with available personnel, equipment and materials, if requested by appropriate authority and approved by the OSC.
  - (b) Advise the cleanup team on cleanup procedures and proper disposal methods.
  
- (4) The Command Post will:
  - (a) Maintain a current list of all members of the DCG including their duty telephone numbers (Annex III) as well as nonduty telephone numbers. A backup copy of this list will be posted at the Fire Department dispatch desk, which receives all CE Service Call Desk calls during nonduty hours.
  - (b) Activate the DCG members designated by the OSC and inform them to assemble within 15 minutes at a specified location.

### 3.3 PHASE II - FOLLOW-ON RESPONSE

- (1) Spill Containment and Control:

To be written by Cannon AFB Fire Department

- (2) Spill Response Actions: The OSC or his designee will direct and coordinate all spill response actions. The actions under the responsibility of the OSC are:

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- (a) Activate or authorize action from appropriate members of the HAZMAT Team based on information obtained during initial notification or information provided by the Environmental Flight and immediately investigate the reported spill.
- (b) Determine the source, type, extent, approximate quantity, and cause of the spill and institute appropriate action to stop the source of spill, if the spill is still occurring.
- (c) Evaluate the magnitude and severity of the threat to public health, welfare, and natural resources. Material Safety Data Sheets are on file with Bioenvironmental Engineering and should be maintained at each facility.
- (d) Take appropriate safety precautions to protect response personnel and any additional personnel located in proximity to the probable spill route (in accordance with OPLAN 355-1). The Security Police Squadron (27 SPS) will be used to initiate evacuation procedures and establish traffic control points and entry control points as determined by the OSC.
- (e) Institute spill containment procedures. In accomplishing this task, the OSC should refer to the following sources of information either contained in this document or kept on file:
  - Chapter 4 for the Melrose AFR Site-Specific Contingency Plan.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- Material Safety Data Sheets which are on file with Bioenvironmental Engineering. The HMIS database can also be utilized.
  - Annex II for spill response equipment inventories and locations of equipment.
  - Annex V for a map to assist in the determination of probable spill routes and access to the spill sites.
- (f) Determine the party responsible for the spill.
- If the USAF is the responsible party, spill cleanup actions will be the responsibility of the facility where the spill occurred.
  - If someone other than the USAF is the responsible party, the responsible party should be informed of the spill and their response action evaluated by the Base OSC.
- (g) Direct the Environmental Flight to contact HQ ACC/CEV by telecon (DSN 574-3553) if uncertain of the spill classification. For spills occurring after normal duty hours or on weekends, the ACC/CE alert duty officer should be contacted through the ACC Command Post (DSN 574-2224/2225).

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- (h) Determine whether a "Reportable Spill" has occurred. Annex IV includes "Reportable Spill" criteria for the substances identified on the Base as potential "Reportable Spill" substances.
- (i) Telephonic and message notification of other federal and state agencies must be made promptly by the Environmental Flight representative following telecon notification of reportable spill to HQ ACC/CEV. These agencies are listed in Annex IV.
- (j) Direct the Base Bioenvironmental Engineer to take samples to determine the chemical nature, pollutant concentration, and extent of the spill as required for response actions and documentation.
- (k) Advise Base Public Affairs of the size and nature of the spill and response actions.
- (l) Initiate cleanup actions. Pollutants will be collected to the maximum extent possible.
  - Reusable or reclaimable JP-4 will be stored in tanks for proper disposition. All other oils and hazardous substances will be disposed of through DRMO in accordance with Cannon AFB Operations Plan 18-4, Management of Recoverable and Unusable Liquid Petroleum Products, or Cannon AFB Hazardous Waste Management Operations Plan, as appropriate.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- Absorbent and similar material will be placed in 55-gal drums, labeled, turned in to the DRMO (by the organization causing the spill) and stored there, if necessary, until eventual disposal in accordance with federal, state, and local environmental laws and regulations.
  - Hazardous pollutants will be collected in polyethylene-lined drums (see 49 CFR 178.133) or other approved drums, as specified by 49 CFR 172.101 or 102; labeled; turned in to DRMO (by the organization causing the spill); and stored there, if necessary, until eventual disposal in accordance with DoD and RCRA regulations.
- (m) Develop corrective action plans to ensure that spills or similar spills do not occur again.
- (n) On completion of cleanup operations, a "final" report will be submitted to HQ ACC/CEV, with information copies to HQ USAF/CEV and NMED; within 15 days of a spill of hazardous waste requiring the implementation of the SPR Plan, such a report will be submitted to the Regional Administrator of EPA. Both regulatory agency reports and internal USAF reports should contain all of the information listed in Annex IV.

### 3.4 PHASE III - SHORT-TERM SITE RESTORATION

Phase III site restoration occurs when: (1) the spill has been deemed a "Reportable Quantity"; (2) the release has been mitigated, flow of spill material has ceased, and migration pathways have been closed; and (3) the event is no longer an imminent threat to humans or the environment.

Cleanup and disposal will then be the responsibility of the CECT under the authority of the OSC in coordination with the Base Civil Engineer and the Chief, Environmental Management. The cleanup method used will depend on the characteristics of the spilled material, size of spill, location of spill, character of the area, and potential impacts.

If it is decided to clean up the spill with on-base resources, the OSC will instruct the CECT to assemble and move to the Control Site. Cleanup personnel shall use proper protective equipment at all times during cleanup operations.

The CECT shall:

- (1) Treat the spill, if safe and feasible, to mitigate hazards;
- (2) Clean all contaminated surfaces of the spilled material. Water, detergents and/or solvents can be used to remove residual spill material from asphalt, and other hard, impermeable surfaces;
- (3) Collect spill residue, other contaminated material, and all nonreusable cleanup materials, including disposable clothing, sorbents, brushes, rags, brooms, and containers. Package material in U.S. Department of Transportation-approved containers. Mark and label container in

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

accordance with Department of Transportation and EPA requirements,  
as appropriate;

- (4) Thoroughly decontaminate and inspect all reusable protective clothing and equipment before it is returned to their proper storage location; and
- (5) Ventilate indoor areas.

If it is decided that cleanup is beyond the capabilities of the CECT, the OSC shall activate any other appropriate on-base resources to aid in clean-up or coordinate any required additional assistance with the Wing Commander. If cleanup is done by an outside contractor or agency, the OSC shall maintain on-scene command and support cleanup as needed until relieved by higher authority, if necessary.

### **3.5 PHASE IV - LONG-TERM SITE RESTORATION**

Phase IV may require an extended time period to complete. This phase includes spill site restoration where hazardous chemicals have contaminated large quantities of earth or groundwater or where surface water is contaminated. Phase IV actions will prevent further contamination, restore contaminated earth and water, and permit productive use of the spill site. These restoration activities are administrated and contracted out to a service contractor through the Environmental Flight Installation Restoration Program (IRP) section.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

### **3.6 NOTIFICATION PROCEDURES**

#### **3.6.1 Initial Notification Checklist**

The Initial Notification Checklist, provided in Annex I, should be used when notifying the Fire Department at Ext. 4-911 of a reportable spill. The minimum information that should be provided, as outlined in the checklist, is as follows:

- a. Name/rank of individual reporting the spill.
- b. Location of spill, including street address.
- c. Description of injuries.
- d. Name of spilled substance.
- e. Amount of substance spilled.
- f. Rate of spill (if spill is still occurring).
- g. Time of spill.
- h. Distance spill has traveled/spread.
- i. Other pertinent information.

The completed form should be delivered to 27 SPTG/CEV within two working days after the incident.

#### **3.6.2 Procedures for Notifying HQ ACC**

HQ ACC/CEVCM is responsible for environmental oversight at Melrose AFR. It also provides advice and staff assistance in all areas of environmental protection including spill

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

response matters. HQ ACC/CEVCM is located at Langley AFB, VA and can be contacted in the following manner:

DSN	574-3553
Commercial	(804) 764-3553

### 3.6.3 Procedures for Notifying Regulatory Agencies

Submit a pollution report within 60 days of a "major" oil spill or when requested by the National Response Team and the Regional Response Team [40 CFR 300.56]; within 60 days of a 1,000-gal oil spill or two reportable oil spills in 12 months to the Regional Administrator of EPA [40 CFR 112.4]; within 60 days of a reportable spill of CWA Section 303 substances to the Regional EPA Enforcement Division Director and the appropriate state agency [proposed 40 CFR 151.4]; and within 15 days of a spill of a hazardous waste that requires the implementation of the SPR Plan to the Regional Administrator of EPA [40 CFR 264.56, 265.56]. The reports must be in narrative form for regulatory reports and as prescribed in Air Force Rule 19-8 for USAF Reports. The reports must contain the following information [40 CFR 300.56, 264.56, 265.56, Air Force Regulation 19-8 Paragraph 6, Figure 1]:

- Name, owner, and address of installation.
- Name and telephone number of OSC.
- Incident report (initial, second, third, final).
- Date and time of incident.
- Time of official spill notification to the National Response Center and other regional and state officials.
- Location of incident and the nature of the terrain at the location to include surface and subsurface drainage characteristics and relationships to water

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

bodies (estimate extent of area affected, such as miles of stream or acres of lake).

- Weather conditions and how they affected response action.
- Cause of incident.
- Type and estimated amount (barrels, gallons, pounds) of pollutant and the official size classification for oil spills (minor, medium, major).
- Actual damage and/or potential threat to human life, to property (private, state, or federal), and to plant or animal life.
- Corrective action taken to eliminate pollution source.
- Corrective action taken to remove pollutant.
- Assistance required (federal, state, private contractors).
- Estimated completion date of remedial actions and anticipated effectiveness.
- Estimated quantity and disposition of spill material and contaminated soil and water.
- Description of any problems encountered during implementation of the SPR Plan and an explanation of how the SPR Plan was, or will be, modified to prevent the recurrence of the spill event.
- Anticipated or actual reaction by the news media and public to the incident. Specify potential for liability (for internal USAF reports only).
- Whether all emergency equipment used in a spill response has been decontaminated. Response equipment must be decontaminated and ready for use before the areas of a facility affected by a spill can be put back into service [40 CFR 264.56, 265.56].
- A copy of this SPR Plan if one is requested.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

#### **3.6.4 Off-Base Contact Notification Procedures**

Various off-base entities can be used for information and assistance during a spill event. A complete discussion of off-base resources is discussed in Section IV.

#### **3.6.5 Activation of Disaster Control Group (DCG)**

The DCG must operate in concert with the OSC to ensure that spill response and disaster response activities are coordinated when the DCG is activated. It is the responsibility of Commander 27 SPTG, acting as OSC, to implement Cannon OPLAN 355-1, if deemed necessary.

## CHAPTER 4 - CONTINGENCY PLAN

### 4.1 IMMEDIATE SPILL EMERGENCY ACTION PLAN

**WARNING:** Predesignated personnel at Cannon AFB have been specifically tasked, trained, and equipped to respond to all hazardous substance spills. Unauthorized individuals shall never undertake the response to or investigation of any actual or suspected hazardous spill.

#### IN CASE OF AN OIL OR HAZARDOUS SUBSTANCE SPILL

- Initiate evacuation, if necessary.
- Notify Base Hospital (via ext. 911) for injuries.
- Notify 911 immediately. Be prepared to provide the information outlined below (Spill Response Checklist).
- Check causes and stop the source of the spill without undue risk of personal injury; use of on-site spill containment equipment and materials may be necessary.
- Make spill scene "OFF LIMITS" to unauthorized personnel.
- Restrict all sources of ignition.
- Report to OSC upon arrival.
- When notifying the fire department of the spill, the following information should be provided:
  - Name of individual reporting the spill;
  - Location of spill;
  - Number of injured personnel, types of injuries;
  - Type of substance spill;
  - Rate material is currently spilling (estimated);
  - Time that spill occurred (estimated);

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- Extent spill has traveled; and
- Any additional, pertinent information.

#### 4.2 GENERAL FACILITY INFORMATION

Melrose AFR is approximately 40 miles west of Cannon AFB in Roosevelt County, New Mexico. The primary function of the range is to provide support facilities for USAF aircraft to practice conventional and nuclear bombing and strafing techniques. The primary wastes generated by the range are diesel fuel, used engine oil, and waste paints.

The facility has been in operation since 1965 and is attached to Operations Group. The facility consists of the following structures:

- Operations Center
- Fire Department Annex
- Aboveground Storage Tanks for Fuels
- Open Detonation Thermal Treatment Unit

Personnel at this facility are military and civilian and work the following shifts:

Shift	Area Supervisor	Extension	Military	Civilian
Days	Range Manager	4-2571	1	7

### 4.3 POTENTIAL SPILL ROUTES

Spills within the buildings will be contained inside. If a spill occurs in the compound, the spill will migrate into the ground and will have to be cleaned up accordingly.

#### 4.3.1 Fire Safety Plan

- (1) Building Construction: Metal frame on concrete foundation. Steel roof.
- (2) Evacuation: In the event of a fire or potential fire/explosion, all personnel in any building within 500 feet in all directions will be evacuated.  
Toxic/flammable vapors or fumes being carried downwind may endanger personnel in building in all directions. Notify the Fire Department immediately to alert local authorities.
- (3) Containment Measures:
  - Minor spills occurring inside the building should be confined with absorbents. Material should be picked up and containerized, if possible. The spill area should be cleaned up using absorbent materials.
  - Major spills should be contained by absorbent materials and cleaned up by the CECT.
  - Releases involving the thermal treatment unit will be handled in accordance with the operating procedures outlined in the RCRA Permit

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

for Open Detonation Activities at Melrose AFR, Section G -  
Contingency Plan.

- (4) Utilities: The building is heated using natural gas. Primary lighting is provided through overhead florescent bulbs. There are lights located at each exit from the facility.

#### 4.4 FIRE AND SPILL EQUIPMENT

Fire extinguisher are located throughout the facility. The following spill response equipment and materials are stored at the range:

<u>Quantity</u>	<u>Description</u>
13	Halon 1211, 28 pound, Model GH-17F fire extinguishers
2	Water hose connection with hose
2	Face shields
2	Pair chemical resistant gloves
2	Rubber aprons
1	Eyewash station (adjacent to vat room)
1	Nonaggressive fluid absorbent spill kit (PIG Corp)
1	50-lb bag of absorbent material
4	55-gal OH drums (17E)
4	Telephones (three in main building and one in tower)
1	Radio - UHF, VHF/D fixed site
6	Johnson handheld
3	CBs (one in each vehicle)

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

<u>Quantity</u>	<u>Description</u>
3	Pick up trucks
1	Dumptruck
1	Grader
1	Backhoe
1	Bull Dozer
2	500-gal water trucks

Procedures should be implemented to ensure that this equipment is in a state of readiness and that, after use, reusable equipment is cleaned and fit for reuse. Used equipment should be assessed to ensure that only reusable equipment is cleaned. Other used equipment should be managed as hazardous waste and replaced immediately by the Environmental Management Office.

During thermal treatment operations, munitions and EOD personnel will have on-hand the following additional equipment.

<u>Quantity</u>	<u>Description</u>
1	First Aid Kit
1	Fire extinguishers per vehicle
1	Respirator with appropriate cartridges per person
2	Shovels per EOD vehicle
1	55-gal open head drum
1	Chemical apron per person
1	Pair leather or rubber gloves per person
1	Pair rubber boots per person
1	Pair goggles or face shields per person
4	Handheld Motorola Radios

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- 1 Front End Loader
- 1 Ambulance or first aid vehicle

#### 4.5 HAZARDOUS MATERIALS STORED AT THIS SITE

Material Stored	Approximate Maximum Quantity	Location
Used Engine Oil	< 20 gal	Used Oil Collection Point
Diesel Fuel	< 500 gal	Hazardous Material Storage
Paint Products	< 10 gal	Hazardous Material Storage

The Material Safety Data Sheets for substances used at this site are located in the training office.

#### 4.6 INSPECTIONS AND PERSONNEL TRAINING

The facility hazardous waste monitor conducts weekly inspections of the hazardous materials generating areas. These inspections are documented in the hazardous waste logs and any deficiencies noted are immediately corrected.

All personnel who work with hazardous materials in the shop are required to take both Hazardous Communications training through Military Public Health and Hazardous Waste Management Training through Environmental Management. Training includes:

- Identification and use of hazardous materials, hazardous waste, and oil products;
- The use of spill and fire control equipment;

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

- Spill response procedures for various work areas;
- The locations and functions of all shutoff switches;
- The physical characteristics and hazards associated with materials used in the shop; and
- Safe operating procedures for all shop activities.

#### **4.7 PLAN UPDATING AND POSTING REQUIREMENTS**

The facility supervisor shall notify the Environmental Management Office in writing whenever changes occur at this facility which may affect the effective implementation of this plan. At a minimum, the plan must be updated annually. The Environmental Management Office is responsible for updating this site-specific contingency plan.

The facility supervisor must post a copy of this site-specific contingency plan in an open area, accessible to all personnel working in the shop. In addition, all personnel must have access to the Material Safety Data Sheets for any hazardous materials used by the facility.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

## **CHAPTER 5 - TRAINING REQUIREMENTS**

All military, civilian, and contractor personnel assigned to Melrose AFR will successfully complete a training program that teaches them to perform their duties in a way that ensures compliance with the federal, state, and DoD regulations.

### **5.1 PERSONNEL TRAINING REQUIREMENT**

Commanders will ensure all personnel (military and civilian) who use, handle, or are potentially exposed to oil or hazardous substances complete the Federal Hazard Communication Training Program in accordance with Air Force Occupational, Safety and Health Standard 161-21, dated 23 January 1989 and OPLAN 355-1. This training will be conducted upon initial work area assignment and whenever a new hazard is introduced into their working area. OSHA HAZWOPER Training in accordance with OSHA regulation 29 CFR 1910.120 and HQ ACC - Hazardous Waste Operations and Emergency Response Implementation Guidance.

#### **5.1.1 Level 1 - First Responder (Awareness)**

This level is covered under HAZMAT Training administered by the Readiness Flight. Personnel covered include: Security/Law Enforcement, Command and Control, Air Traffic Control, Accumulation Point Managers, Hazardous Material Storage Location Personnel, Ground Safety Personnel, Readiness Personnel, and On-Scene Disaster Control Group (DCG) (As Assigned).

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

### **5.1.2 Level 2 - First Responder (Operations)**

This level is covered under HAZMAT Training administrated by the Readiness Flight. Personnel covered include: On-Scene Disaster Control Group (DCG) (As Assigned), Fire Protection, Environmental Managers, Fuels Management Personnel, Bioenvironmental Engineer, Safety, Readiness Personnel, Accumulation Point Managers, and Hazardous Material Users (as directed by EPC).

### **5.1.3 Level 3 - Hazardous Materials Technician**

Level 3 will be provided by Fire Department training personnel or by contractors administrated through the Environmental Flight. Personnel covered include: Explosive Ordnance Personnel, HAZMAT Response Team, Cleanup Response Team (as assigned), Fuels Management Personnel, and Readiness.

### **5.1.4 Level 4 Hazardous Materials Specialist**

Level 4 will be provided by Fire Department training personnel or by contractors administrated through the Environmental Flight. Personnel covered include: HAZMAT Response Team Leader(s), Cleanup Response Team Leaders, Hydrazine Specialists, Bioenvironmental Engineers and Technicians, and Environmental Flight.

### **5.1.5 Level 5 - OSC**

This training must be the requirements of the formal Air Training Command (ATC) OSC Course G307R0516-001, in accordance with Air Force Rule 355-1, Chapter 7. Personnel covered include: Installation Commander, Logistics Group Commander; Operations Group Commander, Support Group Commander; Disaster Preparedness, and Senior Fire Officials.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

### **5.1.6 Level 6 - Cleanup Response Team Members**

Level 6 will be provided by Fire Department training personnel or by contractors administrated through the Environmental Flight. Personnel covered include personnel assigned to the Cleanup Response Team and Fuels Management Personnel.

### **5.2 HAZMAT TEAM TRAINING**

All Base personnel designated by the Fire Department as part of the HAZMAT Team must take part in periodic spill response training programs. The training will be in accordance with the Occupational Safety and Health Administration (OSHA) Rule protecting hazardous waste workers and emergency responders (29 CFR 1910.120) Fire fighters will complete their training in accordance with ACC Supplement 1 to Air Force Rule 92-1.

The training will consist of formal classroom training and spill exercises. Spill response exercises will be conducted at least annually. Response to an actual spill will satisfy the annual requirement for spill response exercises. New HAZMAT Team members should be given a copy of the SPR Plan and be briefed when they are assigned to the team.

### **5.3 CIVIL ENGINEERING CLEANUP TEAM (CECT)**

All Base personnel assigned and designated by the Chief of Operations as part of the CECT, must take part in the periodic cleanup response training program. The training will be in accordance with the Occupational Safety and Health Administration (OSHA) rule protecting hazardous waste workers and emergency responders (29 CFR 1910.120).

The training will consist of formal classroom training and spill exercises. Spill response exercises will be conducted at least annually. Response to an actual spill cleanup will satisfy

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

the annual requirement for a spill response exercise. New CECT members should be given a copy of the SPR Plan and be briefed when they are assigned to the team.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

## CHAPTER 6 - PLAN REVIEW AND UPDATE

The SPR Plan will be reviewed annually, at a minimum, and amended as required. Other circumstances which will warrant a plan review and update are listed as follows:

- When a RCRA permit is modified;
- When facility changes occur which increase the potential for spills or change the spill prevention and response procedure methods and equipment;
- When the SPR Plan fails or proves to be ineffective in the prevention of or response to a spill event;
- At the request of the U.S. Environmental Protection Agency or the New Mexico Environment Department;
- After enactment of, or amendment to, pertinent federal or state legislation, or changes in DoD or USAF policy. Particular attention should be given to changes in reportable spill quantities;
- After pertinent modifications of federal, regional and state contingency plans;
- After any changes in adjacent land and water use that would affect spill prevention and response considerations; and
- At the request of the Cannon AFB EPC.

27TH FIGHTER WING (ACC)  
MELROSE AIR FORCE RANGE  
NEW MEXICO 88103-5000  
25 FEBRUARY 1993

The Environmental Protection Committee will be responsible for reviewing the report, monitoring any corrective actions and amending the SPR Plan when necessary. The review of the SPR Plan, and any resulting amendments or changes to the plan will be logged on the record sheet at the front of this document.

**PERMIT ATTACHMENT G  
CLOSURE PLAN**

## **CLOSURE AND CONTINGENCY POST CLOSURE PLANS CLOSURE PLAN**

### **Introduction**

This plan identifies the closure process to be employed at the Melrose Air Force Range (MAFR), Open Detonation (OD) Unit. Closure under this plan will commence after an anticipated operating life of 30 years or when Cannon Air Force Base (CAFB) is closed. There is also the possibility that closure of the OD Unit may be necessary before the end of the anticipated operating life due to environmental contamination. This closure plan and associated records will be maintained by the Environmental Management Flight at Cannon Air Force Base (CAFB) until closure activity is approved by the New Mexico Environment Department (NMED). This plan will be modified as necessary at closure.

### **Closure Performance Standard**

It is the intention of this plan that after closure no further maintenance will be needed within the area of the OD Unit. All hazardous waste and hazardous waste constituents will be removed from the Unit at closure. In an effort to demonstrate clean closure, an appropriate number of soil samples will be taken and analyzed for toxic metals and explosive residues. The soil sampling and analysis plan for closure will be preapproved by NMED. If the analysis indicates that concentrations are below an established clean-up standards, all contaminated soils will be collected, containerized and transported to an approved treatment, storage, or disposal facility. If, due to the extent of contamination, it is not feasible for all contaminated soils to be removed, the contingency post-closure care plan will be implemented. Ground water monitoring is one aspect of the contingency plan.

The OD Unit will be dismantled, and regraded to natural contours when soil sampling and analysis indicates that soils are not contaminated, and after approval of an amended closure plan. All closure equipment that come in contact with potentially contaminated soils, will be decontaminated as described in this plan.

### **Maximum Waste Inventory**

Current operating practice and permit restrictions precludes the storage of hazardous wastes at the facility. For reasons of safety, waste munitions are treated as received or as generated.

The quantity of waste munitions to be treated during the life of the OD Unit depends on national defense policy requirements for keeping MAFR active. For the purpose of estimating a maximum waste inventory, a 30 year life has been assigned to the MAFR. The

maximum amount of waste treated during a single open detonation event at any time during the life of the Open Detonation Unit will be 1000 pounds, net explosive weight (NEW). This amount also coincides with the MAFR explosive limit. The estimated maximum inventory for the life of the OD Unit is estimated to be 240,000 pounds NEW. This is derived from the estimated annual 8,000 pounds of NEW, specified in the Part A application, multiplied by the estimated life of the unit (30 years).

### **Schedule for Closure**

The Estimated Closure Schedule (Table G-1) presents times for each closure activity and the total time needed to close the OD Unit. Within 90 days after receipt of the final volume of hazardous waste, final closure activities will be initiated.

Notification of intent to close will be submitted to the NMED RCRA Permits Program Manager and the U.S. Environmental Protection Agency (EPA) Regional Administrator 180 days prior to beginning closure activities. Final closure will be supervised and certified by an independent professional engineer who is registered in the state of New Mexico.

#### Extensions for Closure Time

If an extension is warranted, a request will be submitted to the NMED RCRA Permits Program Manager. The request will identify the need for the extension, the status of the unit, and the actions to prevent threats to the environment or human health during the extension period. The written request will include a copy of the amended closure plan for review and approval by the NMED RCRA Permits Program Manager.

### **Sampling Requirements**

As part of closure activities, background concentrations of hazardous constituents or health based risk assessment value will be compared with concentrations found in the OD Unit at closure. Based on the results of the sampling analysis, NMED will determine the necessity for additional testing to achieve clean closure. The parameters for analysis will include but not necessarily be limited to toxic metals and explosive compounds. Dioxin may also be added to the analysis.

#### Statistical Analysis Requirements

To provide statistical comparisons for evaluating analytical data, quantitative analysis will be performed using Cochran's Approximation to the Behrens-Fisher Student's t-Test. For any set of data ( $X_1, X_2, \dots, X_n$ ), the mean is calculated by:

and the variance is calculated by:

$$\bar{X} = \frac{X_1 + X_2 + \dots + X_n}{n}$$

$$s^2 = \frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots + (X_n - \bar{X})^2}{n-1}$$

where "n" denotes the number of observations in the set of data.

The t-test uses these data summary measures to calculate a t-statistic ( $t^*$ ) and a comparison to calculate a t-statistic ( $t_c$ ). The  $t^*$  value is compared to the  $t_c$  value, and a conclusion is reached about whether there has been a statistically significant change in any indicator parameter. The t-statistic for all parameters except pH and similar monitoring parameters is:

$$t^* = \frac{\bar{X}_M - \bar{X}_B}{\sqrt{\frac{S_M^2}{n_m} + \frac{S_B^2}{n_b}}}$$

If the value of this t-statistic is negative, then there is no significant difference between the monitoring data the background data. However, significantly small negative values may be indicative that the assumption made for the test validity failed, or that errors were made in collecting the background data.

The t-statistic ( $t_c$ ) against which  $t^*$  will be compared necessitates finding  $t_b$  and  $t_m$  from standard (one-tailed) (see Table G-2) where,

$t_b$  = t-tables with  $(n_b-1)$  degrees of freedom at a 0.05 level of significance

$t_m$  = t-tables with  $(n_m-1)$  degrees of freedom at a 0.05 level of significance

Finally, the special weightings  $W_b$  and  $W_m$  are defined as:

$$W_b = \frac{s_b^2}{n_b} \qquad W_m = \frac{s_m^2}{n_m}$$

and so the comparison t-statistic is:

$$t_c = \frac{W_b t_b + W_m t_m}{W_b + W_m}$$

The t-statistic ( $t^*$ ) is now compared with the comparison t-statistic ( $t_c$ ) using the following decision rule:

1. If  $t^*$  is equal to or larger than  $t_c$  ( $t^* \geq t_c$ ), then conclude that there most likely has been a significant increase in this specific parameter.
2. If  $t^*$  is less than  $t_c$  ( $t^* < t_c$ ), then conclude that most likely there has not been a change in this specific parameter.

The t-statistic for testing pH and similar monitoring parameters is constructed in the same manner as previously described except that the negative sign (if any) is discarded and the caveat concerning small negative values is ignored. The standard (two-tailed) tables are used in the construction  $t_c$  for pH and similar monitoring parameters. Comparison of  $t^*$  and  $t_c$  follow the same decision rules listed above.

A further discussion of the test method may be found in Statistical Methods (6th Edition, Sect. 4.14) by G.W. Snedecor and W.G. Cochran.

### **Inventory Disposal, Removal, or Decontamination of Equipment**

There will be no hazardous waste inventory at the OD Unit since waste is not stored at the facility. However, a final detonation will be scheduled for waste munitions from CAFB to allow time to find an alternative location or method of disposal once closure begins.

The objective of closure of the OD Unit will be for clean closure where there will be no further need for maintenance and/or monitoring of the facility. This objective will be demonstrated through closure sampling and analysis. A sufficient number of samples will be collected and analyzed to adequately demonstrate the absence of any waste constituents resulting from OD operations. To ensure that the entire area potentially affected by treatment residues and waste debris is properly characterized, a minimum of three discrete (grab) samples will be collected. Sampling locations will be chosen as specified in the NMED approved Sampling

and Analysis Plan. The samples will be analyzed for explosive compounds and toxic metals identified in the Plan. The analytical results from site specific samples will be compared to the analytical results from the established background and baseline investigations conducted for the Unit. Soil with contamination higher than the background concentrations found in the initial investigation will be removed and disposed of at a permitted hazardous waste disposal facility. A health based risk assessment derived hazardous waste constituent concentrations may also be used to establish a final clean-up standard. Soil will be excavated until sampling shows that the contaminated soil has been removed; the area will then be backfilled with clean soil and regraded to original contours. An alternative to this would be the placement of a permanent cap over the site and implementation of a ground water monitoring program. The choices will be decided on after sampling has been completed.

All decontamination and soil removal equipment will be washed with detergent and triple rinsed with water. The final rinse water will be collected for analysis. If the third rinsate meets an established decontamination criteria, the equipment will be considered clean.

All hazardous liquids and solids generated as a result of closure activities will be shipped to an RCRA permitted TSD facility in accordance with RCRA generator and transporter requirements.

A field notebook will be maintained to record all sampling activities. The data and the time sampling is conducted will be recorded, as well as the sample identification number, the analysis requirements, and the laboratory conducting the analyses.

Appropriate safety precautions will be taken while sampling. Personnel will use personal protective equipment as deemed necessary. Additional equipment to be used in sampling operations include a small auger for excavation, 1 quart glass containers, 40 milliliter glass vials, teflon-sealed plastic lids, a small trowel, and gummed labels for sample identification. The sample vials will be cleaned by washing them in detergent and rinsing with organic-free water. The auger will be cleaned after taking each sample.

Collected samples will be placed in vials and sealed. Each sample will be labeled with a site-identification number, a sample number, and the date collected. Samples will be delivered to an approved testing facility within 72 hours of collection.

Custody of the samples obtained at the MAFR OD Unit will be recorded on a chain-of-custody form. Similar forms will be used at the analytical laboratory. A form listing the number of samples, the type of sample and location, and the sample identification

numbers will be prepared. The analytical laboratory will confirm receipt of the samples by matching the shipment with the list on the form.

### **CONTINGENCY POST-CLOSURE PLAN**

This section is provided in the event that contaminated soils or ground water cannot be completely removed or decontaminated during closure (HWMR-7, Part V, §264.603). The contingency post-closure plan is based on the general requirements of §264.118 and the performance standards for landfills specified under §264.310.

#### **Post-Closure Care and Use of Property**

##### Post-Closure Care Period

The post-closure care period for the OD Unit will begin after the completion of closure and will continue for 30 years after that date. If it is necessary to either shorten or lengthen the post-closure care period, steps will be taken to implement the proper procedures for permit modification in accordance with HWMR-7, Part IX, §270.42.

##### Post-Closure Security

The same security measures used for the management of hazardous wastes during the OD Unit's operating life, Permit Attachment B, will be provided during the post-closure period. Security for the facility will consist of the following:

- A 24-hour surveillance system that provides continuous monitoring of the closed portion of the facility;
- A natural barrier or a fence that completely surrounds the OD Unit prevents the unauthorized entry of persons or livestock; and
- Entry to the closed portion of the facility will be maintained with the use of a gate or other entrance controls.

The facility will be clearly posted with signs that state, "DANGER-UNAUTHORIZED PERSONNEL KEEP OUT." These signs will be posted at all entrances to the closed portion of the facility and at other locations so as to be seen from any approach to the closed Unit. The legend will be written in both English and Spanish and will be legible from a distance of at least 25 feet.

## Post-Closure Use of Property

The post-closure use of property following partial or final closure of the OD Unit will be restricted to eliminate any disturbance to an environmental cover, components to the cover system or the monitoring system.

### **Post-Closure Contact**

The name, address, and phone number of the office to contact regarding the OD Unit during the post-closure period is listed below. An updated post-closure plan will be maintained at the office during the post-closure period.

Installation Commander  
27 FW CC  
Cannon AFB, NM 88103-5000  
(505) 784-2727

### **Post-Closure Care Monitoring**

Post-closure care monitoring will be restricted to surveillance of groundwater. Ground water monitoring will be conducted to determine whether there have been any releases of hazardous wastes or constituents from any contaminated soils at the OD Unit that were left in place at closure. All ground water monitoring wells selected will be approved by NMED.

### **Post-Closure Care Environmental Cover**

If contaminated soil from the OD Unit is allowed to remain in place at closure, the affected portions of the Unit will be capped with an environmental cover. The cover will be constructed to: (1) provide long-term minimization of liquid migration through the closure; (2) function with minimal maintenance; (3) promote drainage and minimize erosion or abrasion to the cover; (4) prevent settling and subsidence that could threaten the cover's structural integrity; and (5) have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

### **Inspection and Maintenance**

The final cover will be maintained by inspections and follow-up remedial action to ensure its structural integrity and effectiveness. Any necessary repairs will be performed on the cap to correct the effects of settling, subsidence, wind and water erosion, animal burrowing or other detrimental events. Any surveyed benchmarks will also be protected and maintained.

Specific items inspected during the post-closure care period

are outlined in Table G-3. The inspections will be conducted on a schedule specified in Table G-3, and response will be implemented for problems that might occur. Since erosion damage can be significant, the final cover will be inspected following all precipitation events equivalent to a 10 year, 24 hour storm.

A written schedule will be used for inspecting monitoring equipment, safety and emergency equipment, security devices, and equipment used to prevent, detect, or respond to hazards that may threaten human health and the environment. The schedule includes the types of problems that are most likely to be associated with the care and maintenance of the closed OD Unit (e.g., a defective monitoring well or subsidence of the final cover). The schedule will be kept at the facility's range operations control center at all times.

All inspections that are conducted will be recorded in an inspection log that will be kept at the range operations control center. The inspection log will include the date and time of the inspection, the name of the inspector, a notation of observations made, and the date and nature of any repairs or remedial measures taken to correct the problem. An example of the post-closure inspection log is presented in Table G-4.

If an inspection reveals deterioration or malfunction of equipment and/or structures, remediation of the problem will be implemented to prevent or mitigate any harm to human health and the environment. When such a hazard is recognized as being an imminent threat, remedial action will be taken immediately.

#### **Amendment of Post-Closure Plan**

An amended post-closure plan will be submitted for review and approval if: (1) changes in the operating plans or engineering design affect the approved post-closure plan; or (2) events occur during the active life of the Open Detonation Unit, including partial and final closure, that affect the approved post-closure plan.

The post-closure plan will be amended at least 60 days prior to any proposed change in engineering design or no later than 60 days after an unexpected event has occurred that affects the post-closure plan.

#### **Post-Closure Notices**

A record of the type, location, and quantity of hazardous wastes disposed of within the OD unit will be submitted to the local zoning authority, the authority with jurisdiction over local land use, the U.S. Army Corp of Engineers and the NMED RCRA Permits Program Manager no later than 60 days following closure of the OD

Unit.

Additionally, a notation on the deed to the facility property will be recorded within 60 days of final certification of the OD Unit closure. This information will include whether: (1) the land has been used to manage hazardous wastes; and (2) the land use is restricted under HWMR-7, Part V, §264, Subpart G.

A survey plat and record of the type, location, and quantity of hazardous wastes disposed of at the OD Unit will be filed with the local zoning authority or the authority with jurisdiction over local land use the U.S. Army Corp of Engineers and the NMED RCRA Permits Program Manager. The plat will state CAFB's obligation to restrict disturbances to the hazardous waste disposal unit area in accordance with applicable Subpart G regulations.

A certification that has been signed by an authorized official of CAFB and that signifies that the deed notation has been recorded, including a copy of the document in which the notation has been placed, will be submitted to the NMED RCRA Permits Program Manager.

#### **Certification of Completion of Post-Closure Care**

A certification that the post-closure care period for the OD Unit was performed in accordance with the specifications in the approved post-closure plan will be submitted by registered mail to the NMED RCRA Program Manager no later than 60 days following completion of the established post-closure care period. The certification will be signed by an authorized official of CAFB and an independent registered professional engineer. Documentation supporting the independent registered professional engineer's certification will be furnished to the NMED RCRA Program Manager upon request.

Table G-1. Estimated Closure Schedule

Activity	Days
Receive and treat final volume of waste	0 to 10
Submit schedule for closure	10 to 20
Contract for sampling	20 to 50
Soil sampling and analysis	50 to 80
Contract for Feasibility Study and/or Risk Assessment to determine best alternative treatment (BAT)	80 to 120
Review BAT with NMED (approval of closure plan)	120 to 150
Contract for selected closure option	150 to 180
Conduct closure activities including any additional sampling, soil removal, and soil stabilization	180 to 210
Submit closure certification/post-closure documentation	210 to 240
NMED issues closure certification (clean closure) or post-closure permit (non-clean closure)	240 to 270

Table G-2. Standard T-Tables 0.05 level of significance

Degrees of Freedom	t-values (1-tail)	t-values (2-tail)
1	6.3141	2.706
2	2.920	4.303
3	2.353	3.182
4	2.132	2.776
5	2.015	2.571
6	1.943	2.447
7	1.895	2.365
8	1.860	2.036
9	1.833	2.262
10	1.812	2.228
11	1.796	2.201
12	1.782	2.179
13	1.771	2.160
14	1.761	2.145
15	1.753	2.131
16	1.746	2.121
17	1.740	2.110
18	1.734	2.101
19	1.729	2.093
20	1.725	2.086
21	1.721	2.080
22	1.727	2.074
23	1.714	2.069
24	1.711	2.064
25	1.708	2.060
30	1.697	2.042
40	1.684	2.021

Table G-3. Inspection and maintenance plan for Melrose AFR OD Unit

Area/Equipment	Specific Items	Types of Problems	Corrective Action	Frequency of Inspection
Security devices	Facility fence	Broken	Repair immediately if damaged	Quarterly
	Access gate	Locking mechanism jammed	Repair/replace	Quarterly
	Signs	Illegible	Replace	Quarterly
Final cover	Natural cover (may include vegetation)	Dead spots, weed growth	Remove any competitive species	Quarterly
	Cover Integrity	Cover subsistence; rills, areas of bare soil; rodent burrows	Restore site to grade; reseed	Quarterly (immediately following any 10 year, 24-hour intensity rainfall event)
Runon and runoff drainage control system	Drainage channels/pipes	Settlement, ponded water, blockage, erosion	Repair settlement and erosion, remove blockages	Quarterly
Detection/ monitoring equipment	Monitoring wells	Unlocked well caps, damaged casings, protective posts or well pads	Secure well caps; if damage precludes the use of the well, seal damaged well and install a replacement well	Quarterly
Benchmarks	N/A	Damage	Replace if damaged	Quarterly

**Table G-4. EXAMPLE POST-CLOSURE INSPECTION LOG**

Date: _____
Time of Inspection: _____
Inspector: _____
<b>OBSERVATION OF AREA/EQUIPMENT</b>
<u>Security Devices</u>
<ol style="list-style-type: none"><li>1. General condition of facility fence and gate, locks, legibility of signs</li><li>2. Identify existing problems requiring repair or replacement, if any</li></ol>
<u>Final Cover</u>
<ol style="list-style-type: none"><li>1. Description of cover conditions/appearance</li><li>2. Identify areas &gt; 25 ft<sup>2</sup> requiring revegetation, resurfacing, and grading, if any</li></ol>
<u>Drainage Control</u>
<ol style="list-style-type: none"><li>1. Identify areas containing significant volumes of ponded water (i.e., &gt; 25 ft<sup>2</sup>); identify areas of &gt; 25 ft<sup>2</sup> of eroded cover</li><li>2. Identify other areas indicative of degradation, blockage, settlement, etc.</li></ol>
<u>Detection/Monitoring Equipment</u>
<ol style="list-style-type: none"><li>1. Notation of any monitoring wells that are not locked</li><li>2. Notation of damaged casings, protective posts, eroded well pads</li></ol>
<u>Benchmarks</u>
<ol style="list-style-type: none"><li>1. Description of any damage to benchmarks</li></ol>
<b>REPAIRS OR REMEDIAL MEASURES</b>
A narrative of the date and nature of repairs or remedial actions taken since the previous inspection. Documentation may include photographs and/or sketches of the deteriorated conditions prior to corrective action.

**PERMIT ATTACHMENT H  
RCRA PART "A" PERMIT APPLICATION**





A.I.C. Number (enter from page 1)										Secondary ID Number (enter from page 1)													
N	M	5	5	7	2	1	2	4	4	5	6												

**XI. Nature of Disposal (provide a brief description)**

This facility will be utilized for Open Detonation for the demilitarization munitions, munition related item, and similiar reactive items. Items are transported from Cannon AFB to Melrose Range on military vehicles. The operation is conducted as described in the Sep 93 Part B Permit Application Section D.

**XII. Process - Codes and Design Capacities**

- A. PROCESS CODE** - Enter the code from the list of process codes below that best describes each process to be used at the facility. Twelve lines are provided for entering codes. If more lines are needed, attach a separate sheet of paper with the additional information. If a process will be used that is not included in the list of codes below, then describe the process (including its design capacity) in the space provided in item XIII.
- B. PROCESS DESIGN CAPACITY** - For each code entered in column A, enter the capacity of the process.
  - 1. **AMOUNT** - Enter the amount. In a case where design capacity is not applicable (such as in a closure/post-closure or enforcement action) enter the total amount of waste for that process unit.
  - 2. **UNIT OF MEASURE** - For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.
- C. PROCESS TOTAL NUMBER OF UNITS** - Enter the total number of units used with the corresponding process code.

PROCESS CODE	PROCESS	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY	UNIT OF MEASURE	UNIT OF MEASURE CODE
	<b>DISPOSAL:</b>			
D79	INJECTION WELL	GALLONS; LITERS; GALLONS PER DAY; OR LITERS PER DAY	GALLONS .....	G
D80	LANDFILL	ACRE-FEET OR HECTARE-METER	GALLONS PER HOUR .....	E
D81	LAND APPLICATION	ACRES OR HECTARES	GALLONS PER DAY .....	U
D82	OCEAN DISPOSAL	GALLONS PER DAY OR LITERS PER DAY	LITERS .....	L
D83	SURFACE IMPOUNDMENT	GALLONS OR LITERS	LITERS PER HOUR .....	H
	<b>STORAGE:</b>			
S01	CONTAINER (barrel, drum, etc.)	GALLONS OR LITERS	LITERS PER DAY .....	V
S02	TANK	GALLONS OR LITERS	SHORT TONS PER HOUR .....	D
S03	WASTE PILE	CUBIC YARDS OR CUBIC METERS	METRIC TONS PER HOUR .....	W
S04	SURFACE IMPOUNDMENT	GALLONS OR LITERS	SHORT TONS PER DAY .....	N
	<b>TREATMENT:</b>			
T01	TANK	GALLONS PER DAY OR LITERS PER DAY	METRIC TONS PER DAY .....	S
T02	SURFACE IMPOUNDMENT	GALLONS PER DAY OR LITERS PER DAY	POUNDS PER HOUR .....	J
T03	INCINERATOR	SHORT TONS PER HOUR; METRIC TONS PER HOUR; GALLONS PER HOUR; LITERS PER HOUR; OR BTU'S PER HOUR	KILOGRAMS PER HOUR .....	R
			CUBIC YARDS .....	Y
T04	OTHER TREATMENT	GALLONS PER DAY; LITERS PER DAY; POUNDS PER HOUR; SHORT TONS PER HOUR; KILOGRAMS PER HOUR; METRIC TONS PER DAY; METRIC TONS PER HOUR; OR SHORT TONS PER DAY	CUBIC METERS .....	C
	<small>(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundment or incinerators. Describe the processes in the space provided in item XIII.)</small>		ACRES .....	B
			ACRE-FEET .....	A
			HECTARES .....	Q
			HECTARE-METER .....	F
			BTU's PER HOUR .....	K









**PERMIT ATTACHMENT I  
PERMITTED HAZARDOUS WASTES FOR THE  
OPEN DETONATION UNIT**

## HAZARDOUS WASTES PERMITTED FOR OPEN DETONATION TREATMENT

Adapter, ADU-449/B	Single-based	0.0083
Adapter, booster nose	Tetryl	0.3900
Adapter, booster tail	Tetryl	0.8800
Assembly, explosive transfer	Tetryl	0.1300
Assembly, initiator	Single-based	1.00
Blasting cap	PETN/Tetryl	0.0019
Block, demolition	TNT	2.0
Cartridge, 30mm HEI	RDX/Incendiary mix	0.0916
Cartridge, 40mm M674	Single-based	0.2156
Cartridge, 40mm HE	RDX/TNT	0.0780
Cartridge, 40mm practice	Single-based	0.0008
Cartridge, 40mm smoke	Single-based	0.1722
Catapult, rocket, CKU-5A/A	Single-based	5.500
Charge, demo, C-4	RDX, Polisobutylene	30.0
Charge, shaped, C-4	RDX, Polisobutylene	0.8300
Charge, spotting, CXU-3A/B	Black powder phosphorus	0.0830
Cluster, MK20 Mod 3	Tetryl/RDX	100.0
Cord, detonation	PETN/RDX	0.0070/ft
Detonator, electric	RDX	0.0003
Explosive scent, K-9	Tetryl/RDX	8.0
Fuze, blasting	Tetryl/RDX	0.0070
Fuze, bomb nose	Tetryl/RDX	0.1640
Fuze, bomb tail	Tetryl/RDX	0.0150
Fuze, delay, M9	Tetryl/RDX	0.0002
Fuze, extension, M1A1	Tetryl/RDX	2.00
Fuze, FMU-130/B	Tetryl/RDX	0.3600
Fuze, FMU-139A/B	Tetryl/RDX	0.2778
Fuze, FMU-54A/B	Tetryl/RDX	0.3600
Fuze, MK339	Tetryl/RDX	0.0006
Fuze, practice M228	Tetryl/RDX	0.0030

Adapter, ADU-449/B	Single-based	0.0083
Adapter, booster nose	Tetryl	0.3900
Rocket motor	Black powder	1.100
Signal kit	Single-based	0.0812
Simulator, air burst	Black powder	0.0825
Simulator, booby trap	Black powder	0.0095
Simulator, detonation	Black powder	0.0070
Simulator, grenade	Black powder	0.0813
Simulator, projectile	Black powder	0.1410

---

NEW = net explosive weight  
 PETN = pentaerythritol tetranitrate  
 TNT = trinitrotoluene  
 Tetryl = trinitrophenylmethylnitramine  
 RDX = cycletrimethylenetrinramine  
 HEI = high explosive incendiary  
 LR = long range  
 TP = target practice  
 HE = high explosive

**PERMIT ATTACHMENT J  
DESIGN PLAN FOR THE OPEN DETONATION UNIT**

## DESIGN PLAN FOR THE PERMITTED OPEN DETONATION UNIT

### Introduction

The Open Detonation (OD) Unit design described in this Permit Attachment incorporates features that are an improvement over the interim status design because they provide conditions that are more favorable for valid monitoring of affected soils. This new design will also improved the containment of waste residues, both during detonations and between quarterly treatment episodes. Berms are used to control the spread of blast particles as well as the run-on and run-off drainage.

Open detonation operations for the treatment of military waste munitions have been conducted at Melrose Air Force Range (MAFR) OD Unit since the early 1960's. Historical records that fully describe early treatment practices are not available. Until recently, open detonation had been conducted in below-grade, open trenches that had been located in the approximate center of the unit. After each detonation episode the current trench, at the time, was backfilled with native soil to preclude infiltration of run-on drainage. Just before each subsequent open detonation episode, a new trench was constructed, and again backfilled after treatment was completed. This process was repeated. Waste munitions were also treated by open burning. In the late 1980's, according to available records, open burning was conducted in the same open trenches as were used for open detonation. More recently, a metal burn box at the OD Unit had been used for containing open burns. Open burning is no longer being conducted and is not being requested for permitting at this time.

The site has been investigated for environmental contaminants associated with the type of munitions that are known to have historically been treated. The investigative studies will be used for baseline characterization of the site, and will provide information to supplement the routine monitoring activities associated with the Permit Attachment K, Soil Sampling and Analysis Plan.

The design features discussed in this plan will be incorporated into the construction of the OD Unit after the RCRA Permit becomes effective.

### Basic Design Parameters, Dimensions, and Materials of Construction

The OD Unit, located at the MAFR, is contained within the confines of a barbed-wire fence that is 750 feet long on each of four sides (Figures J-1 through J-4). Fence lines extend north and south and east and west. Access can be gained from one of two locked gates, each of which is located on the east and the west

fence line. Symmetrically positioned within the fenced area is a 1 to 2 foot high continuous berm that is nearly circular in plan view and has a variable radius between 600 and 650 feet. This berm is referred to as the **outer berm** (Figures J-5 and J-6). Near the center of the area enclosed by the outer berm is another bermed area which is referred to as the **detonation structure** (Figures J-5 and J-7). The area between the outer berm and the detonation structure is called the **cleared zone** (Figure J-4 and J-5).

#### Outer Berm

The outer berm will encircle the entire unit and range in height from 1 to 2 feet, depending on location relative to the flood plain of the nearest arroyo (No Name Arroyo). Vehicle access will be provided by a ramp that will not threaten the integrity of the berm. Construction of the berm will consist of clayey soil layered in 8 inch lifts, and compacted to 95% of the undisturbed native soil's compaction, as measured by standard proctor compaction tests. The outer edge of the berm will be scarified for placement of a geotextile membrane and seeded with native grasses to prevent erosion.

#### Detonation Structure

Open detonations will occur in a single, grade-level, bermed structure. The structure including its bermed walls will be, on its interior, approximately 72 feet long, 44 feet wide and 4 feet high. The detonation pad within the detonation structure will have a 2% slope to ensure that water will run-off to the low topographic end of the cleared zone outside the structure and not pond within the structure.

The detonation structure's berm and detonation pad will consist of clayey soil that will be laid down in several 8 inch. lifts, compacted to 95% of the undisturbed native soil's compaction, as measured by standard proctor compaction tests. This may be accomplished using standard construction equipment such as a sheeps foot roller or plate tamper. The clayey soil may be obtained nearby from sources such as along the bank of the adjacent intermittent draw, located 700 feet north.

After each detonation episode, the Range Control Officer (RCO) will be required to reshape and recompact the detonation structure berm and reslope the detonation pad. Special care will be taken to collect soil samples from the inside of the detonation structure, prior to the RCO redressing the structure, so that explosive waste residues are not diluted or redistributed (Sampling and Analysis Plan - Permit Attachment L).

The volume of ordnance disposed of during any one detonation episode is estimated to be less than 10% of the total volume of the detonation structure. Waste munitions to be placed in the unit

will be in solid form and will not contain free liquids.

#### Cleared Zone

The cleared zone, located between the inside of the outer berm and the outside of the detonation structure's berm, acts as a fire break and as a containment for drainage. Special care will be given not to disturb soils before being appropriately sampled for potential contaminants. Clearing of vegetation (e.g., weeds and grasses) and other maintenance will be performed in a manner that will not create interference with the collection of valid soil samples from shallow depths.

#### **Description of How New Design Features Will Promote Drainage**

Physical barriers or structures associated with the Open Detonation Unit will be emplaced to prevent or minimize surface water run-off and run-on.

#### Outer Berm

The exterior of the outer berm will divert precipitation derived sheet flow and channel overflow from entering the clear area and the detonation structure. The interior of the outer berm will contain, at its topographic low end, potentially contaminated run-off from the clear area and the detonation structure.

#### Detonation Structure

The berm of the detonation structure, will be oriented with its access ports (relative to the topography), to create an exterior diversion for precipitation that falls within the outer berm. The interior slope of the detonation structure's berm and the sloped detonation pad will eliminate precipitation from collecting within the detonation structure.

The detonation structure, where contamination in the form of explosive waste residue is expected to be most highly concentrated, will be constructed to eliminate ponded precipitation that could filter into the soil. Clayey soil used to construct the berm and the detonation pad are intended to prevent or minimize the development of cracks, holes, or other openings. This will ensure that most waste residues will be contained within the OD structure during and after each treatment episode. The detonation pad's sloping surface is designed to preclude precipitation from pooling within the bermed detonation structure.

Figure J-1. Regional Location Map of the Melrose AFR  
PA-J-4

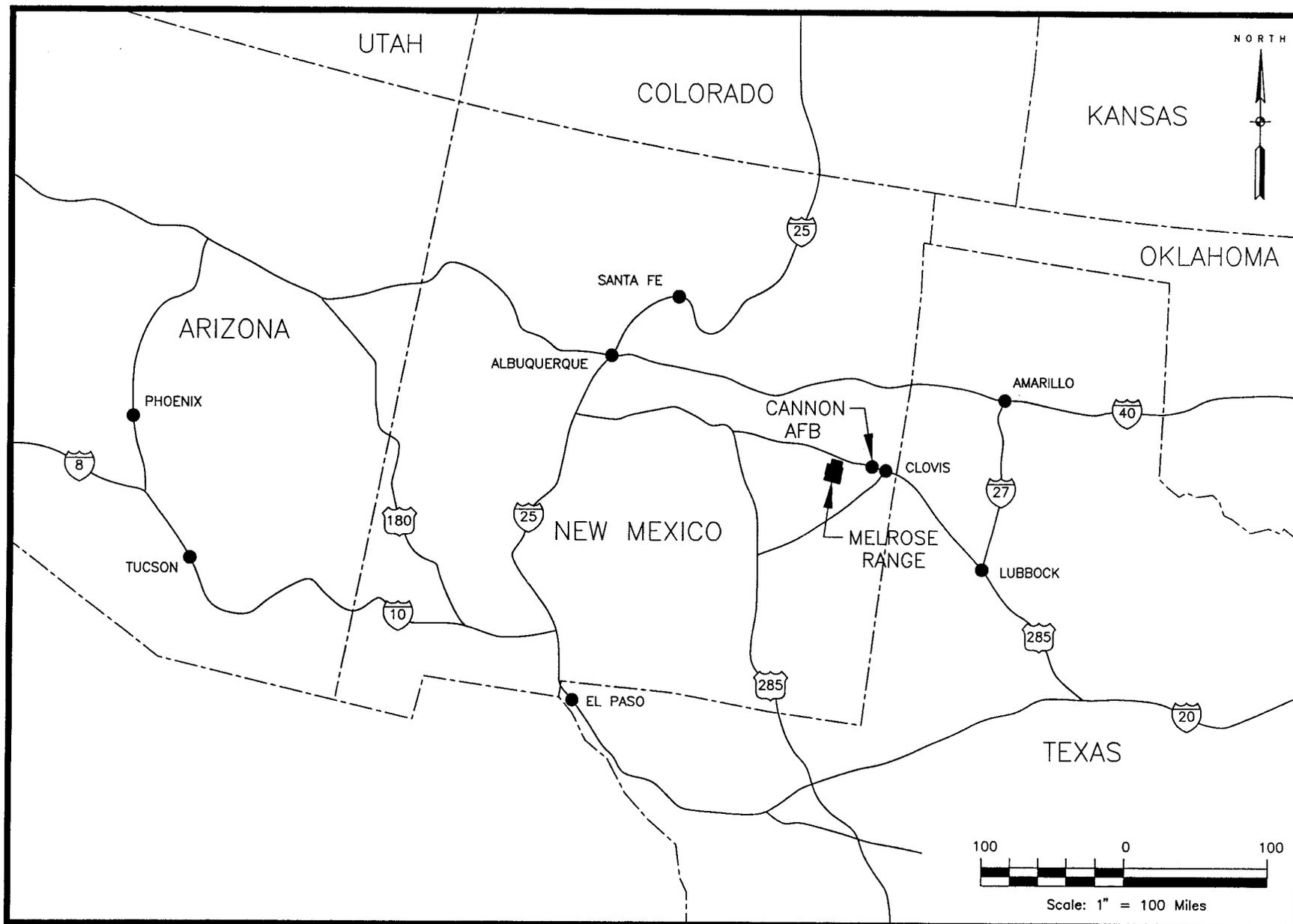
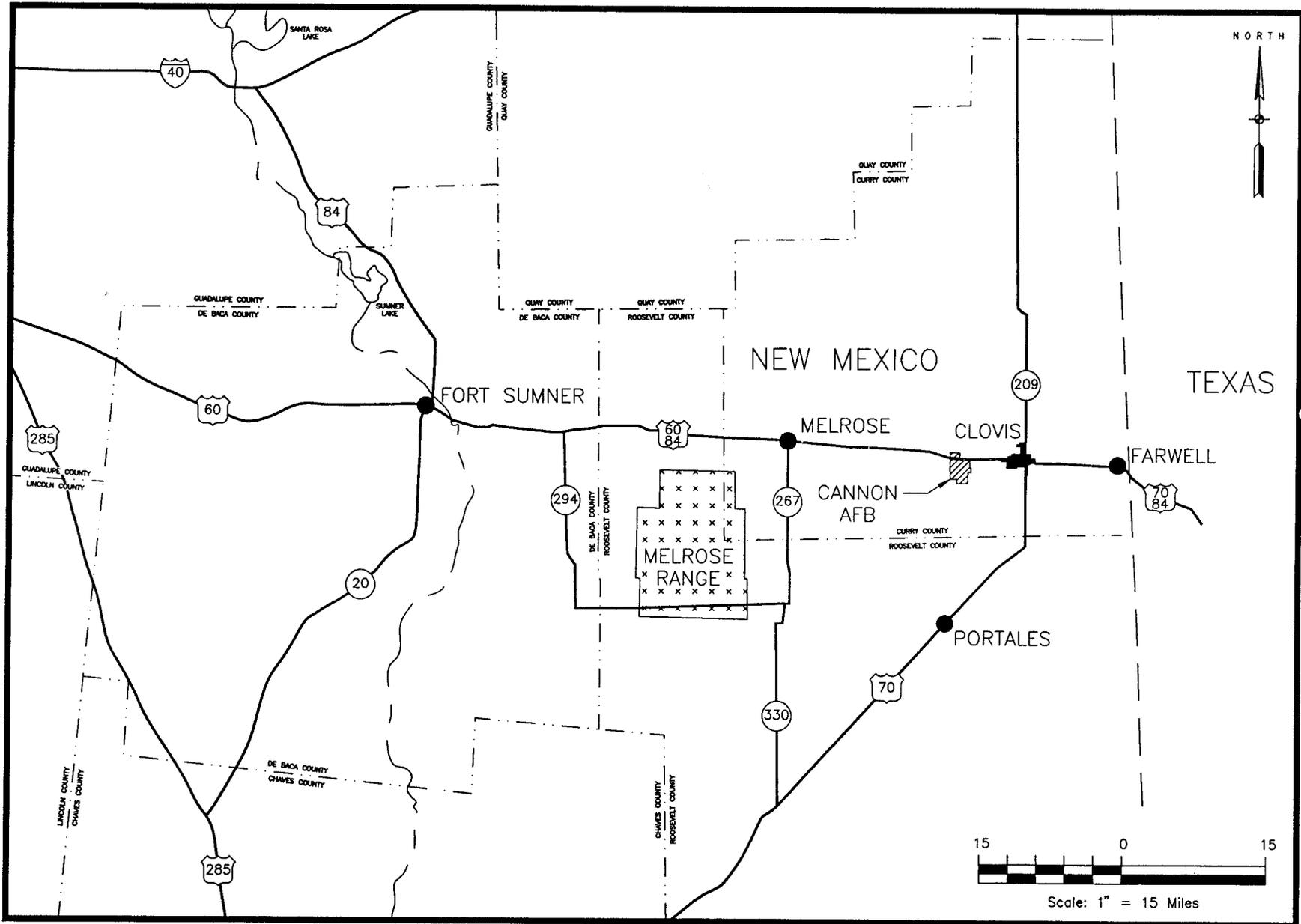
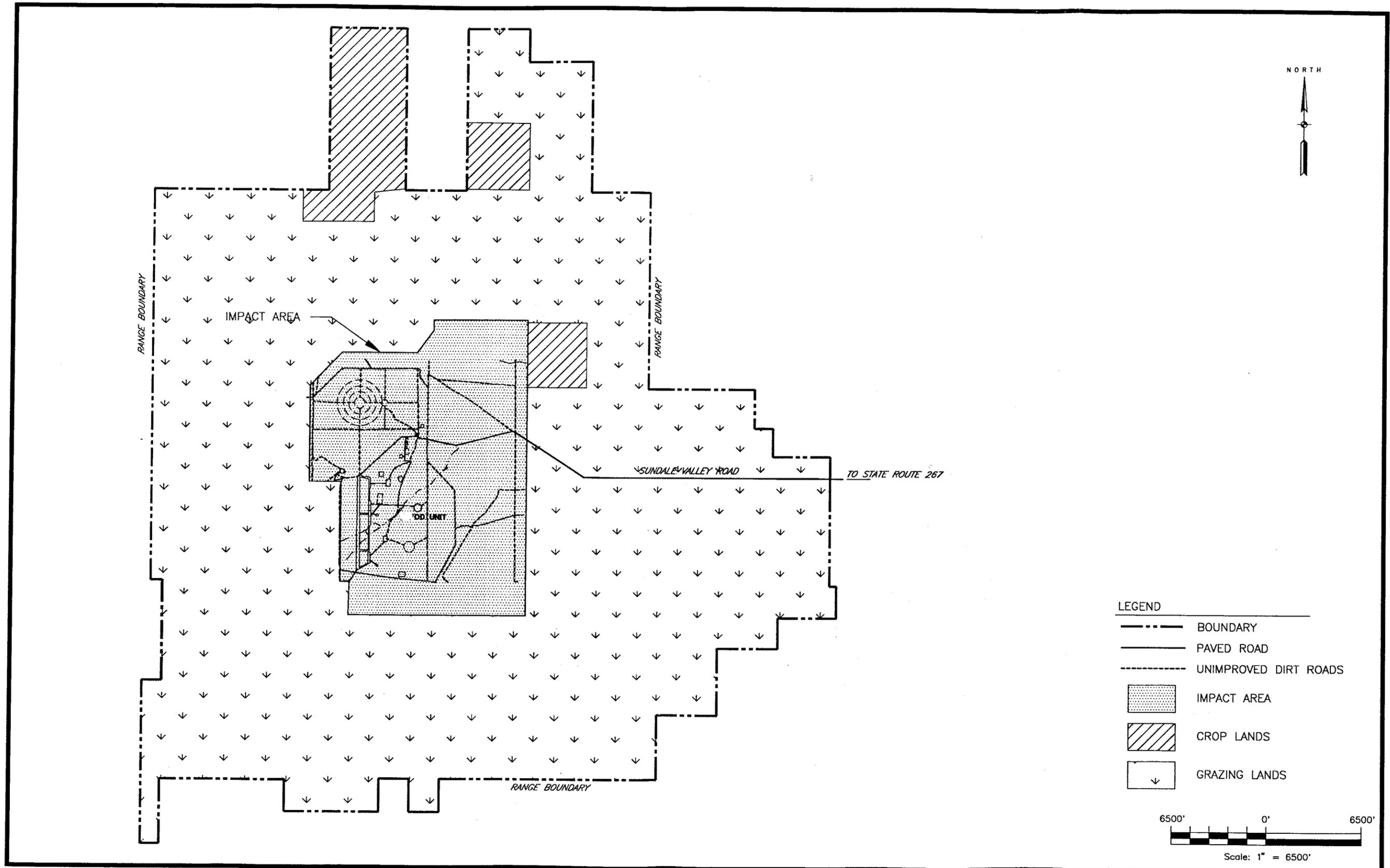


Figure J-2. Vicinity Map of the Melrose AFR and Cannon AFB

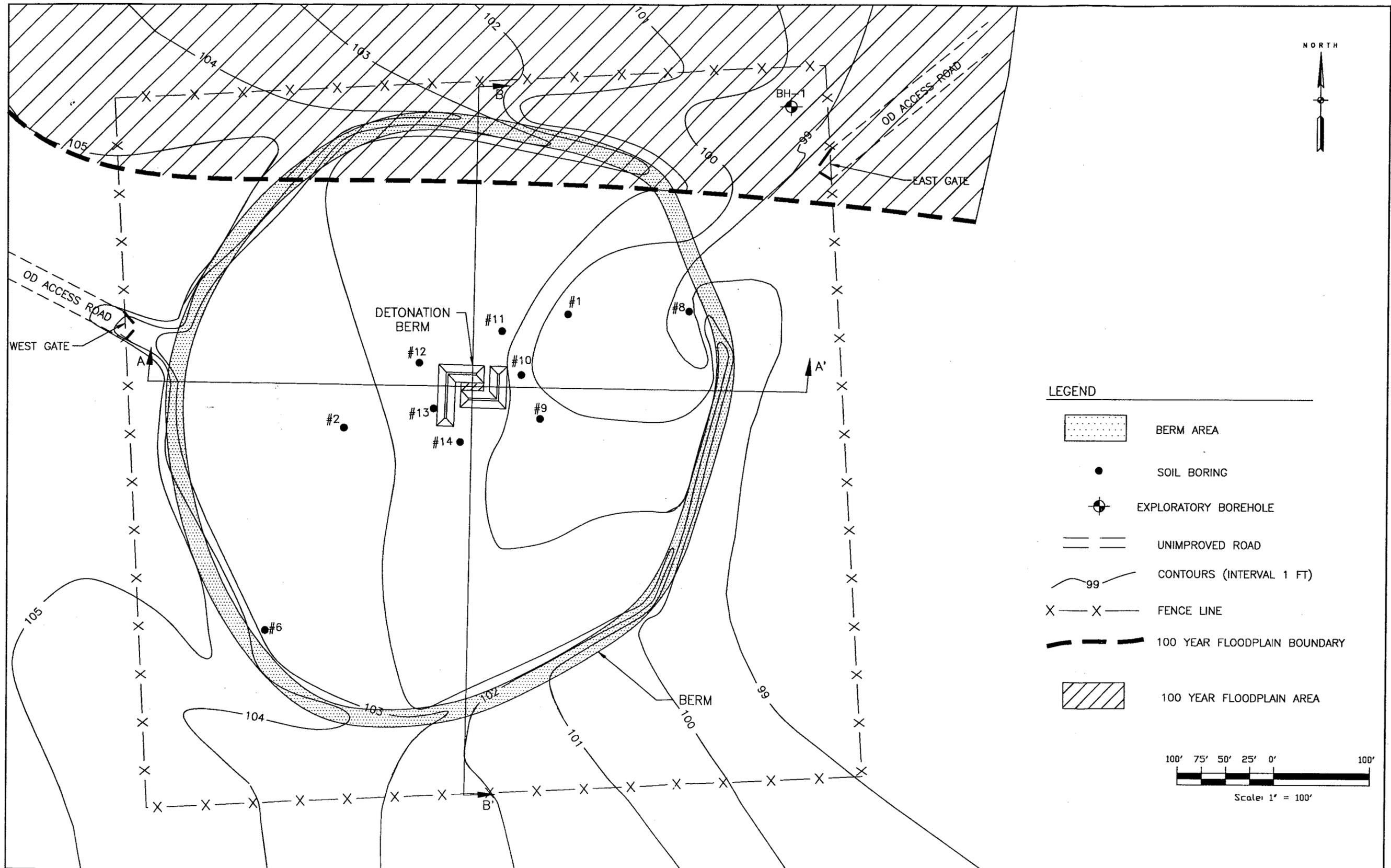
PA-J-5





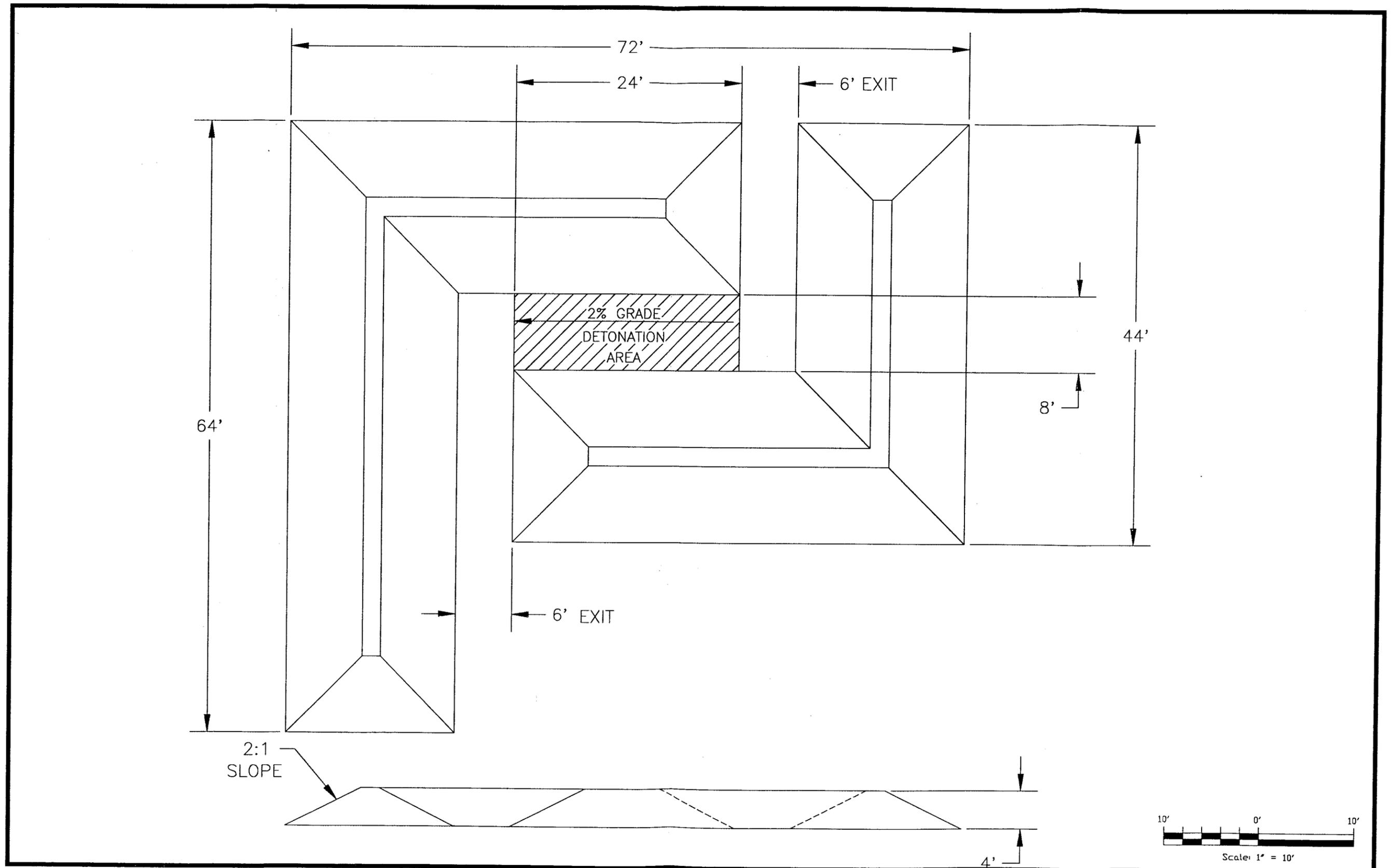
N:\26420512\01\NEWLAND\7-18-93

**Figure J-3. Existing Land Use at the Melrose AFR**



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**Figure J4. | OD Unit Plan View – Detonation and Outer Berm Cross-Sections**

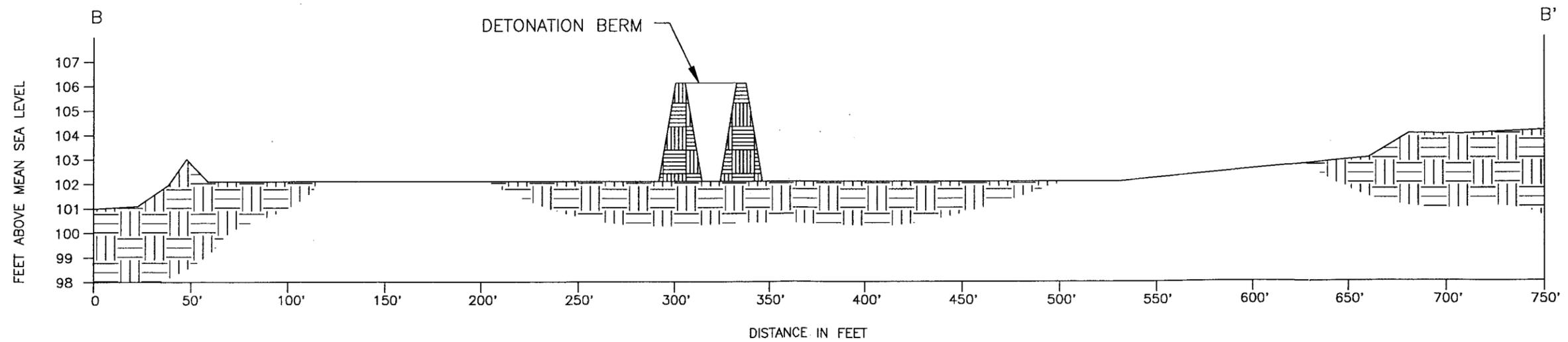
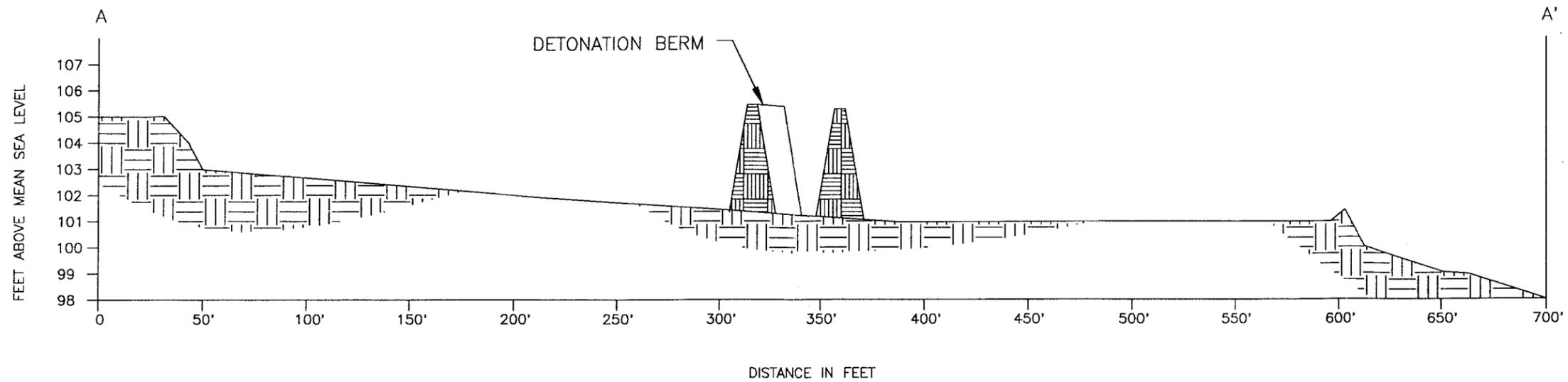


DETONATION BERM DESIGN

PA-J-8

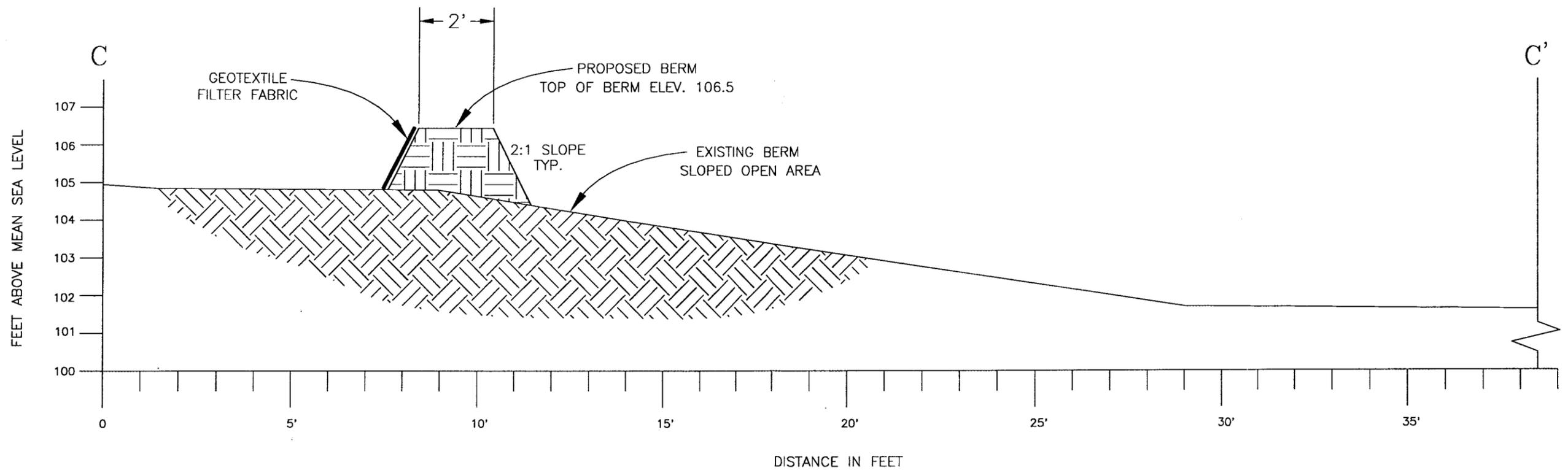
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Figure J5. OD Unit -  
Detonation Berm Plan View



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**Figure J-6. OD Unit – Detonation and Outer Berm Cross-Sections**



PROPOSED BERM



N:\26420512\01\NEWBERM\9-8-93

Figure J-7. OD Unit Outer Berm - Construction Cross-Section

**PERMIT ATTACHMENT K  
OPERATIONAL PROCEDURES FOR THE OPEN DETONATION UNIT**

## OPERATIONAL PROCEDURES FOR TREATMENT OF WASTE MUNITIONS BY OPEN DETONATION

### Introduction

The treatment of military ordnance at the Melrose Air Force Range (MAFR) is necessary due to safety concerns associated with the handling of waste munitions. Waste munitions are generated by:

- (1) exceedance of shelf-life;
- (2) unserviceable due to damage in transport; and
- (3) identification by higher headquarters of an unserviceable lot.

Open Detonation operations performed at MAFR include munitions from all three of the above categories. The Open Detonation (OD) Unit at MAFR is intended only for treatment of military waste munitions by open detonation; open burning (OB) has not been conducted at the OD Unit since 1989 and is not being considered for permitting at this time. Open detonation treatment at MAFR has historically been conducted in an open trench located in the center of the Unit. After each detonation episode, the current trench at the time was backfilled with native soil. Immediately prior to the next open detonation episode a new trench was constructed, and again backfilled after treatment was completed. This process was repeated. All open detonation episodes regulated by the conditions of this Permit will be performed in an engineered grade-level bermed detonation structure, which is fully described in Permit Attachment I.

### Quantifying Military Munitions as a Waste

The 27 Equipment Maintenance Squadron (EMS)/Munitions Flight (EMU) (Munitions Maintenance) reviews ordnance records on a quarterly basis and conducts annual visual inspections of munitions. Munitions typically have several components other than explosives. These components may include fuses, delays, timers, propellants and pyrotechnics, all of which are encased separately from the main body of the munition. They are inspected upon initial acceptance and withdrawal from storage, and they may have a specific shelf-life. These measures ensure that the munitions are safe and will properly function when delivered from the aircraft. At times, these components will be deemed "out of specification" for such reasons as expired shelf-life, damage, manufacturing defects, cause for safety, or discontinuation of the item (technology change). If an item is determined to be out of specification, the item is given a "Condition Code H". If a "Condition Code H" is given, 27 EMS proceeds to complete an Ammunition Disposal Report (ADR), which is what Explosive Ordnance Disposal (EOD) personnel will use for scheduling the next detonation operation.

## Transportation of Waste

27 EMS (the transporter), in conjunction with 27 CEV (the generator), will establish a Hazardous Waste Manifest for transport of the munitions item to MAFR. The items are then loaded from the munitions storage area in accordance with US Department of Transportation (DOT) and Air Force regulations (AFR). These procedures are reviewed, monitored, and closely scrutinized by the Department of Defense (DoD) Explosive Safety Board. The Base Traffic Management Office, which serves as the point of contact for all Base materials shipments, regularly reviews the procedures involved in preparing munitions for transport. When the items are ready for shipment, they are transported to the range by truck via U.S. Highway 60/84. At MAFR, 27 EMS personnel check in with the Range Control Officer (RCO) and EOD. Clearance is then granted to move to the OD Unit where the munitions are off-loaded and reinventoried by EOD personnel using the manifest and ADR listing to ensure that no items are missing.

EOD personnel prepare the munitions for destruction (treatment) by laying items in rows or stacking them in the OD Unit's detonation structure. Plastic explosive (C-4), with a blasting cap/time fuse inserted, is laid across the top of the items to initiate the detonation. Once preparations are complete and the EOD technician-in-charge has reviewed all actions, nonessential personnel are withdrawn to at least 1200 feet upwind of the OD Unit. Detonation clearance is then requested from the Range Control Officer (RCO) to ensure that the entire facility (MAFR) is safe for detonation. Upon approval, the time fuse is initiated, and all personnel withdraw immediately to a safe distance.

If the system fails to detonate, a mandatory 30-min "safety wait" is observed prior to re-entering the OD Unit. Only the minimum number of EOD personnel required to inspect the "Dud fire" of the system are allowed to reenter the unit. If the system successfully detonates, a 30-min safety wait is also observed. After the 30-minute safety wait, EOD personnel re-enter the area to check for "kick-outs" and other debris that may not have been fully destroyed.

Once treatment is complete, EOD personnel sign the manifest as the treatment facility operator, and the completed manifests are submitted to the Environmental Flight (CEV) and EOD Flight.

Records are also kept for weather conditions under which each treatment detonation occurs. Wind direction, wind speed, cloud cover/clear sky, ambient air temperature at ground zero, etc. are recorded. Logged notes are maintained at the EOD Flight office at CAFB, and copies are distributed to the Environmental Flight (CEV) office. CEV utilizes recorded weather conditions for developing a soil sample collection strategy.

## **General Treatment Practice**

The Explosive Ordnance Disposal (EOD) Flight is responsible for all disposal operations conducted at the MAFR OD Unit. An overview of the munitions treatment operations for open detonation follows.

Treatment operations will only be conducted during daylight hours. Prior to treatment operations, the Base weather station is contacted to verify that weather conditions are favorable. The following conditions will result in the suspension of activities:

- electrical storm or lightning within 5 miles of the OD Unit;
- winds approaching or gusting in excess of 15 mph; or
- rain, snow, hail, or dust storms.

Open detonation treatment procedures usually involve placement of items within the detonation structure, installing an explosive donor charge, priming, retiring to a safe and proper distance away from the OD Unit, and then effecting detonation. Depending on the type of munitions, the placement of the items and the selection of explosive charge and primer may vary. Technical Orders (TOs) require that a search of the surrounding area be made after each operation and that any munitions thrown from the pile be detonated by EOD personnel. Scrap metal fragments from the OD Unit and vicinity will be collected and sold as recyclable metal by the CAFB Defense Reutilization and Marketing Office (DRMO).

## **Allowable and Expected Quantities for Treatment**

Quantities for treatment of waste munitions at any one time are limited by CAFB Regulation 136-18. The current limit for on-base or on-range (i.e., CAFB and MAFR) generated waste munitions that may be treated at the MAFR OD Unit total 1000 pounds, net explosive weight (NEW), of Class 1, Division 1 explosives per detonation. The average amount per calendar quarter will actually be 500 pounds NEW. However, because some of the large "live" bombs with 990 pounds NEW may require detonation, the maximum amount for open detonation per quarter is projected at 3000 pounds NEW. If a special instance for detonation of ordnance over 1000 pounds NEW per open detonation episode or 3000 pounds NEW per quarter is required, CAFB will request a one-time waiver from New Mexico Environment Department (NMED) prior to detonation. The total amount of waste explosives permitted per calendar year is not expected to exceed 8,000 pounds NEW.

## **Frequency of Treatment Operations**

Open detonation operations are currently conducted at the MAFR on a quarterly basis, unless circumstances such as having a large

lot of munitions require multiple detonations; however, this occurs infrequently.

### **Internal Regulations**

The operating standards of the OD operations are governed by CAFB Regulation 136-18, "Decontamination of Melrose Bombing/Gunnery Range and Disposal of Munitions"; USAF TO 11A-1-42, "General Instructions for Disposal of Conventional Munitions"; USAF TO 60A-1-1-31, "Explosive Ordnance Disposal Procedure"; Maintenance Operating Instructions (MOI) 136-6, "Demolition Range Operations" (Appendix D); USAF TO 11A-1-60, "Inspection of Reusable Munitions Containers and Scrap Materials Generated from Items Exposed to, or Containing Explosives"; and AFR 127-100, "Explosive Safety Standards." All referenced documents are available in the Part B, September 1993 Permit Application on record at CAFB and the New Mexico Environment Department (NMED).

### **Management of Waste Munition Residue**

EOD treatment operations at the OD Unit will be conducted in a manner that minimizes, to the maximum extent possible, the release of hazardous wastes or hazardous waste constituents to ambient soils. Open detonation treatment processes generally produce very small quantities of waste residues, which may contain trace amounts of toxic metals, and effectively eliminate the explosive characteristics of waste munitions. Open detonation processes also result in the ejection of ordnance casing fragments that may be thrown some distance away from the OD Unit.

The OD Unit's Soil Sampling and Analysis Plan (Permit Attachment L) will be implemented to monitor detectable quantities and distribution of any waste constituents present in the ambient soil (i.e. debris). Fragments from expended ordnance casings and other inert materials will be collected after each open detonation episode. If residues are characteristically hazardous, EOD personnel will containerize them for off-site disposal at an authorized facility in accordance with state and federal regulations.

**PERMIT ATTACHMENT L  
SOIL SAMPLING AND ANALYSIS**

*For Official Use Only*

**Sampling and Analysis Plan  
for the Open Detonation Unit  
Melrose Air Force Range, New Mexico**

February 1994

Prepared for  
Cannon Air Force Base, New Mexico

Prepared by  
Radian Corporation  
120 South Jefferson Circle  
Oak Ridge, Tennessee 37830  
Doc. #D940215.4PS51

## TABLE OF CONTENTS

	Page
1.0 INTRODUCTION . . . . .	PA-L-6
2.0 SITE DESCRIPTION . . . . .	PA-L-7
3.0 SAMPLING APPROACH AND RATIONALE . . . . .	PA-L-8
3.1 Sample Approach . . . . .	PA-L-8
3.2 Analysis . . . . .	PA-L-8
3.3 Rationale . . . . .	PA-L-10
4.0 SAMPLING PROCEDURES AND METHODOLOGY . . . . .	PA-L-11
4.1 Sampling Frequency . . . . .	PA-L-11
4.2 Sample Location . . . . .	PA-L-11
4.3 QC Samples . . . . .	PA-L-13
4.4 Sampling Methodology . . . . .	PA-L-13
4.5 Contamination Control . . . . .	PA-L-18
4.6 Health and Safety Procedures . . . . .	PA-L-18
5.0 SAMPLE HANDLING AND COC . . . . .	PA-L-20
5.1 Sample Container and Preservation Requirements . . . . .	PA-L-20
5.2 Packaging and Transportation . . . . .	PA-L-22
6.0 DOCUMENTATION OF ACTIVITIES . . . . .	PA-L-24
6.1 Sample Coding . . . . .	PA-L-24
6.2 Sample Identification . . . . .	PA-L-24
6.3 Field Logbooks . . . . .	PA-L-25
7.0 LABORATORY ANALYSIS . . . . .	PA-L-26
7.1 Laboratory . . . . .	PA-L-26
7.2 QA/QC . . . . .	PA-L-27
7.3 Sampling DQOS . . . . .	PA-L-27
7.3.1 Precision . . . . .	PA-L-27
7.3.2 Accuracy . . . . .	PA-L-28
7.3.3 Representativeness . . . . .	PA-L-29

## TABLE OF CONTENTS (Continued)

	Page
7.3.4 Completeness . . . . .	PA-L-29
7.3.5 Comparability . . . . .	PA-L-29
7.4 Sample Return or Disposal . . . . .	PA-L-30
8.0 STATISTICAL ANALYSIS . . . . .	PA-L-31
8.1 Preliminary Sample Calculations . . . . .	PA-L-31
8.2 Routine Sample Calculations . . . . .	PA-L-32
9.0 DATA RESOLUTION AND REMEDIAL RESPONSE . . . . .	PA-L-35
10.0 REFERENCES . . . . .	PA-L-39

## LIST OF FIGURES

	<b>Page</b>
4-1 Sampling Strata, OD Unit, Melrose AFR . . . . .	<b>PA-L-12</b>
5-1 Typical COC Form . . . . .	<b>PA-L-21</b>

## LIST OF TABLES

3-1 Test Methods for Soils . . . . .	<b>PA-L-9</b>
5-1 Summary of Sample Container, Preservative, and Holding Time Requirements .	<b>PA-L-23</b>
9-1 Calculated Risk-Based Action Levels for Soils . . . . .	<b>PA-L-36</b>

## ACRONYMS

AFB	Air Force Base
AFR	Air Force Range
ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
COC	chain of custody
DQO	data quality objective
EOD	explosive ordnance disposal
EPA	U.S. Environmental Protection Agency
GZ	Ground Zero
NMED	New Mexico Environmental Department
OD	open detonation
PARCC	precision, accuracy, representativeness, completeness, and comparability
PC	percent complete
PR	percent recovery
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SVOC	semivolatile organic compound
USAF	U.S. Air Force
VOC	volatile organic compound

## 1.0

## INTRODUCTION

This Sampling and Analysis Plan (SAP) has been prepared to support the Resource Conservation and Recovery Act (RCRA) Subpart X Permit Application for the Melrose Air Force Range (AFR), assigned to Cannon Air Force Base (AFB), New Mexico. Melrose AFR is operated under contract by Westar Corporation, which also provides day-to-day maintenance of the explosive ordnance disposal (EOD) range. This SAP provides guidance for the required routine environmental sampling at the open detonation (OD) unit at Melrose AFR. Environmental sampling is necessary to demonstrate that the OD unit is operating so that residual waste constituents are not contaminating soils above RCRA action levels and/or background levels. The plan provides procedures to routinely test the soils at the OD unit to monitor the effectiveness of the treatment process and to ascertain whether any contamination has impacted ambient soils.

The plan ensures that sufficient samples are taken to draw statistical conclusions and to statistically demonstrate the migration potential of all waste constituents. The plan also explains how and why samples are collected and the spatial relationships for sample collection. The plan's design is based on U.S. Air Force (USAF) OD operational procedures, knowledge of the waste munitions' characteristics, and the environmental conditions at Melrose AFR. Where applicable, the procedures and quality assurance/quality control (QA/QC) techniques in U.S. Environmental Protection Agency's (EPA's) November 1986 Test Methods for Evaluating Solid Waste have been used to prepare this SAP.

Specific sections covered in this plan include: Site Description; Sampling Approach and Rationale; Sampling Procedures and Methodology; Health and Safety Procedures; Sample Handling and Chain of Custody (COC); Sample Documentation; Laboratory Procedures; QA/QC; Statistical Analysis; and Data Resolution and Remedial Response.

## 2.0 SITE DESCRIPTION

The OD unit is within the boundaries of Melrose AFR in Roosevelt County, New Mexico, approximately 25 miles west-southwest of Cannon AFB. The location of Melrose AFR and the exact location of the OD unit are shown in Figures B-2 and B-3 of Section B of the permit application. The OD area within which the OD unit is located generally consists of a 700-ft cleared, circular area devoid of vegetation and debris and encircled by an earthen berm. The OD unit is described in detail in Section B of the permit application, as well as the environmental conditions, including geology, hydrogeology, topographic and drainage features, and climate at the Melrose AFR. The OD unit is operated in accordance with Cannon AFB Regulation 136-18, USAF Regulation Technical Orders 11A-1-42, 60A-1-1-31, Maintenance Operation Instructions 136-6, and USAF Regulation 127-100 (Appendix C). Section D of the permit application describes the unit's operation in detail.

## 3.0 SAMPLING APPROACH AND RATIONALE

### 3.1 Sample Approach

Enough samples must be collected and analyzed to draw statistical conclusions and to demonstrate the migration potential of all hazardous waste constituents from the OD unit. Weapons testing site sampling plans differ from the simple random sampling procedures employed at other hazardous waste sites because concentrations of contaminants are stratified, i.e., greater and most variable at Ground Zero (GZ) and decrease with distance.

Sometimes, a systematic radii sampling procedure is employed. The systematic radii method has certain disadvantages in that incorrect conclusions may be drawn if the sampling pattern corresponds exactly or approximately to a pattern of contaminant distribution over space and time. Therefore, a stratified random sampling approach has been chosen for this sampling plan to help overcome this disadvantage. Sampling methodology and location are discussed in more detail in Section 4 of this plan.

### 3.2 Analysis

This section summarizes the analytical procedures to be followed for proper site characterization. Soil samples will be analyzed for all toxic metals, including priority pollutant metals, listed in the New Mexico Hazardous Waste Management Regulations-7, Part V, Appendix IX, for explosive residues, and soil moisture. Table 3-1 lists all analytes as referenced above, along with their EPA SW-846 or American Society for Testing and Materials (ASTM) test methods. Analytical requirements are discussed further in Section 7.

**Table 3-1**  
**Test Methods for Soils**

Parameter/ Constituent	EPA Hazardous Waste Number	Test Method	Reference
Explosive Compounds	D003	Method 8330	<u>Test Methods for Evaluating Solid Waste, Physical and Chemical Methods</u> , EPA SW-846, 3rd Ed. November 1986 (amended)
HMX RDX 1,3,5-TNB 1,3-DNB Tetryl NB 2,4,6-TNT 2,4-DNT 2,6-DNT 2-NT 3-NT 4-NT			
Toxic Metals			<u>Test Methods for Evaluating Solid Waste, Physical and Chemical Methods</u> , EPA SW-846, 3rd Ed. November 1986 (amended)
Antimony Arsenic Barium Beryllium Cadmium Chromium Copper Lead Mercury Nickel Selenium Silver	— D004 — — D006 D007 — D008 D009 — D010 D011	6010 6010 6010 6010 6010 6010 6010 6010 7471 6010 6010 6010	
Soil Moisture	—	ASTM D 2216	<u>Laboratory Determination of Moisture Content of Soil</u> , ASTM D 2216-71, 1972.

### 3.3

#### Rationale

Melrose AFR has never been used for the research and development of nuclear, chemical warfare, or other exotic warfare types of weapons. The only munitions delivered or disposed of at Melrose AFR have been conventional live and training munitions. Therefore, the chemical components and combustion by-products are consistent with what is typical for military munitions items; thus, the emphasis of sampling and analysis for the OD unit should be to search only for the constituents present in these types of wastes. This rationale is supported by the studies conducted to characterize emissions from thermal treatment (OD) of explosive munitions (the "Bang Box" studies conducted by Johnson et. al during 1991 and 1993). These studies included emissions analyses for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals. Conclusions drawn from the emissions testing of selected ordnance found that VOCs were consistently detected at trace concentrations and that SVOCs were detected at approximately two orders of magnitude less than metals (which is the primary indicator and most persistent form of contamination). Together, this approach supports using the analytical methods described in Table 3-1. Any further investigations should be addressed during closure of the unit, and then only if appropriate.

## **4.0 SAMPLING PROCEDURES AND METHODOLOGY**

### **4.1 Sampling Frequency**

Soil sampling will occur quarterly, immediately after (within one week of) a detonation episode, to demonstrate that the OD treatment activities are being performed properly and that residual waste constituents are not contaminating soils above RCRA action levels and/or background concentrations. If, after two years of quarterly monitoring, results from sampling indicate soils within the OD area are unaffected, then, with prior approval from New Mexico Environment Department (NMED), sampling frequency will be changed to an annual basis.

### **4.2 Sample Location**

Sample locations will be chosen based on a stratified random sampling approach to adequately characterize any residual contamination from the OD waste treatment residues. A stratified random sample is obtained by separating the population elements into non-overlapping groups, called strata, and then selecting a simple random sample from each stratum.

Sampling locations will include the bermed OD unit into which the unexploded ordnance was placed for destruction and all areas outside the bermed unit that may have received ejecta, metal fragments, or explosive residues resulting from treatment activities. The OD area will be divided into three strata for sampling purposes: (1) Stratum A, (2) Stratum B, and (3) Stratum C (see Figure 4-1). Prevailing wind direction will be determined prior to each detonation episode and will be noted in the field logbook before OD to ensure that proper sampling locations are chosen following detonation.

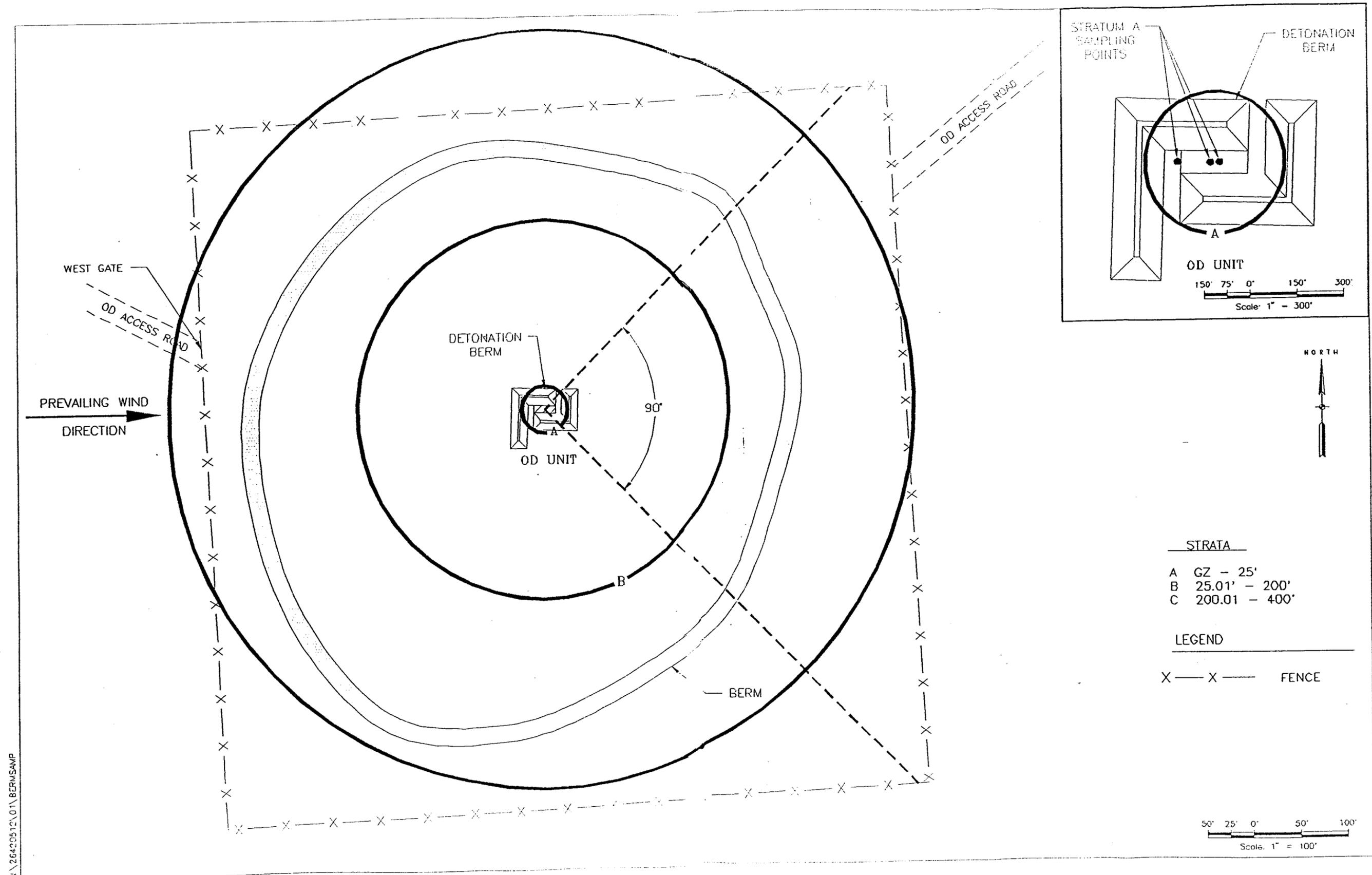


Figure 4-1. Sampling Strata, OD Unit, Melrose AFR

### 4.3

#### QC Samples

This section addresses requirements for field QC samples. Field QC is monitored by a variety of QC samples taken with sufficient frequency to verify the quality of field samples. Field rinsates will be collected during each sampling event to ensure that decontamination procedures in the field are adequate to prevent carryover of contamination from one sampling area to the next. Field rinsate blanks shall be collected by rinsing cleaned equipment with ASTM Type II water and collecting the runoff as a sample. Field duplicates (samples taken at the same sampling location) will be collected during each sampling event. Duplicates ensure that the sampling procedure is reproducible and that the sample is representative of the location. One duplicate sample will be taken from one of the three sampling strata (see Figure 4-1). A different area will be chosen during each sampling event to ensure that, over time, duplicates are selected from all three sampling strata.

### 4.4

#### Sampling Methodology

A stratified random sampling plan has been chosen for this site based on the unique contaminant distribution associated with detonation sites. There are three reasons stratified random sampling often results in increased information for a given cost:

1. The data should be more homogenous within each stratum than in the population as a whole.
2. The cost of conducting the actual sampling tends to be less for stratified random sampling than for simple random sampling because of administrative convenience.
3. When stratified sampling is used, separate estimates of population parameters can be obtained for each stratum without additional sampling.

If prior or historical data can be validated and placed in the appropriate stratum, then the following statistical equation can be used to determine initial sample ( $n_0$ ) size.

$$n_0 = \sum_{i=1}^h \frac{W_h S_h^2}{V} \quad (1)$$

where  $V$  is the specified variance. If, instead the margin of error, "d" has been specified, then  $V = (d/t)^2$ , where "t" is the normal deviate corresponding to the allowable probability that the error will exceed the desired margin. For example, if the margin of error of the sample results is estimated at  $\pm 5\%$  of the true population mean, then  $d = 0.05$ . Also, if the experimenter designates a 1 in 100 chance of pulling an invalid sample (99% confident), then this would give an  $\alpha$  value of 0.01. The corresponding t value to  $\alpha$  is 2.58.  $W_h$  is the stratum weight and  $S_h^2$  is the stratum variance.

If prior data cannot be validated and stratified, a minimum of three preliminary random samples need to be taken from each stratum. Three samples were chosen to produce somewhat statistically meaningful results. This value is not based upon any statistical formula and should only be used as a rough estimate to determine the population mean and variance. This information will then be used to help determine the number of samples needed to develop a 99% confidence interval for levels of contaminants (population mean).

If preliminary random sampling is conducted, it is recommended for the preliminary sampling effort to consist of three strata:

- Stratum A: GZ to 25-ft radius
- Stratum B: intermediate zone between 25.01- to 200-ft radius from GZ
- Stratum C: outer zone from 200.01- to 400-ft radius from GZ

Required sampling equipment includes a soil auger for excavation, containers consisting of 100- to 500-mL glass vials, plastic caps, small stainless steel or Teflon-lined

trowel, small stainless steel or Teflon-lined spatulas/scoops/spoons, and gummed labels for sample identification. Sampling procedures will be performed in accordance with ASTM D 1452, "Standard Practice for Soil Investigation and Sampling by Auger Borings," where applicable.

Preliminary and quarterly sampling procedures for the three sampling areas are as follows:

#### **Stratum A: GZ to 25 ft**

Stratum A includes the bermed area and the area up to a 25-ft radius of GZ. It is assumed that this area possesses a normal contaminant distribution. As mentioned earlier, if historical data cannot be validated and stratified, it will be necessary to perform preliminary sampling to determine the number of samples required to estimate the population mean per detonation event.

A minimum of three random samples is required to calculate the number of additional samples needed to develop a 99% confidence interval for the population mean. However, NMED has requested a minimum of five preliminary samples for a better estimate of initial sample size. Samples will be collected from two soil borings advanced within the detonation crater to a depth of 5 ft. Within each soil boring, two samples will be collected—one at surface (top 6 in.) and one at 5 ft below ground surface. One additional surface soil sample will be taken at the bottom of the sloped detonation pad (see the inset in Figure 4-1). Additional sampling will be performed according to the results of this calculation to produce statistically valid results (Section 8 discusses statistical analysis in greater detail).

Appropriate sampling information (date, time, sample number, etc.) and observations about the sample location will be recorded in the field logbook. A separate sampling implement will be used for each of the sampling locations. Field logbooks and

COC forms will be completed in accordance with Sections 5 and 6 of this SAP. Samplers will be knowledgeable about care and preservation of environmental samples and the content of this SAP

**Stratum B: 25.01 to 200 ft**

Stratum B is the intermediate zone between the 25.01- and 200-ft radius from GZ. It is assumed that this area possesses a normal contaminant distribution. However, due to prevailing wind direction, higher concentrations of contaminants could exist due to wind effects. To compensate for this possibility, the prevailing wind direction will be noted for each detonation period. It is assumed that the area 45° on either side of the prevailing wind direction will be the most contaminated. Therefore, samples will be randomly chosen in this area to produce a more conservative estimate of the population mean.

Three random preliminary samples will be taken, and the results will be used to calculate the initial sample size. Additional sampling will be performed according to the results of this calculation to produce statistically valid results (see Section 8). Samples will be collected from surface soil to a maximum depth of 6 in. The samples will be taken using a spatula/scoop/spoon according to ASTM D 1452.

Appropriate sampling information (date, time, sample number, etc.) and observations about the sample location will be recorded in the field logbook. A separate sampling implement will be used for each of the sampling locations. Field logbooks and COC forms will be completed in accordance with Sections 5 and 6 of this SAP. Samplers will be knowledgeable about care and preservation of environmental samples and the content of this SAP

### **Stratum C: 200.01 to 400 ft**

Stratum C is designated as the outer zone from the 200.01- to 400-ft radius from GZ. It is assumed that this area possesses a normal contaminant distribution. However, due to prevailing wind direction, higher concentrations of contaminants could exist due to wind effects, as was indicated for Stratum B. To compensate for this possibility, the prevailing wind direction will be noted for each detonation period. It is assumed that the area 45° on either side of the prevailing wind direction will be the most contaminated. Therefore, samples will be randomly chosen in this area to produce a more conservative estimate of the population mean.

Three random preliminary samples will be taken, and the results will be used to calculate the initial sample size. Additional sampling will be performed according to the results of this calculation to produce statistically valid results (see Section 8). Samples will be collected from surface soil to a maximum depth of 6 in. The samples will be taken using a spatula/scoop/spoon according to ASTM D 1452.

If fall-out from a detonation event visibly exceeds the 400-ft radius designated for Stratum C, then two additional samples will be collected outside the perimeter of Stratum C at visually observed impact areas; upon analysis of results a Stratum D will be determined.

Appropriate sampling information (date, time, sample number, etc.) and observations about the sample location will be recorded in the field logbook. A separate sampling implement will be used for each of the sampling locations. Field logbooks and COC forms will be completed in accordance with Sections 5 and 6 of this SAP. Samplers will be knowledgeable about care and preservation of environmental samples and the content of this SAP.

#### 4.5 Contamination Control

Sampling tools and equipment will be protected from contamination sources before sampling and decontaminated before and between sampling points. Sample containers should also be protected from contamination sources. Sampling personnel will wear chemical-resistant gloves when handling the sampling equipment and samples. Gloves will be decontaminated or disposed of between samples.

To prevent cross contamination, sampling equipment will be subject to decontamination procedures following sample collection at each location. Sampling equipment will be decontaminated in a decontamination zone by being:

- brush-scrubbed in tap water and Liquinox detergent wash in a tub to remove any soil from the equipment,
- rinsed in tap water in a separate tub,
- rinsed in deionized water,
- rinsed in isopropanol rinse,
- air-dried in an area upwind of the decontamination process, and
- stored for future sampling after being wrapped in aluminum foil (shiny side out).

#### 4.6 Health and Safety Procedures

If deemed necessary, personnel performing sampling activities will use personal protective equipment such as rubber gloves, boots, aprons, and eye protection. Personnel will not be permitted to conduct any sampling until they have been cleared by the range contractor and EOD personnel. Sampling personnel will be properly trained in hazardous waste sampling, and have a minimum of 2 years sampling experience. Personnel will also have 29 Code of Federal Regulations (CFR) 1910.120 (Occupational Safety and

Health Administration training) and appropriate medical monitoring and certification. Sampling personnel will also be briefed by Cannon AFB on the hazards of sampling explosive compounds.

## 5.0 SAMPLE HANDLING AND COC

COC procedures will be followed to track possession of the samples from the time they are collected until the analytical data from the samples are received and recorded. For all soil samples, procedures will begin once sampling is complete. A sample will be considered under custody if it is:

- in the possession of the sampling team;
- in view of the sampling team; or
- transferred to a secure area.

An area is considered secure only when it is locked and access is controlled. The sampling team leader is responsible for custody of the collected samples in the field until they have been properly transferred to the shipping coordinator, who is responsible for sample custody until the samples are properly packaged, documented, and released to a courier or directly to the analytical laboratory. A COC record such as the one shown in Figure 5-1 will be used for the sampling effort.

### 5.1 Sample Container and Preservation Requirements

The following arrangements will be made ahead of time for the selected laboratory to conform to the following special requirements:

- Method 6010 Elemental Metals: Refrigerate the samples at 4°C until analysis.
- Method 7471 Mercury: Refrigerate the samples at 4°C until analysis.
- Method 8330 Explosive Residues: If soil samples are wet, they should be air dried at room temperature or colder. Refrigerate the samples at 4°C until analysis.



Table 5-1 summarizes the container, preservative, and holding time requirements for the samples to be collected.

## **5.2            Packaging and Transportation**

At the end of each sampling day, samples will be packaged in shipping containers with ice packs. The samples will be carefully packaged so that they will not break during shipping. Each shipping container will be sealed with a custody seal and shipped to the analytical laboratory by an overnight delivery service.

**Table 5-1**

**Summary of Sample Container, Preservative,  
and Holding Time Requirements**

<b>SW 836 Method</b>	<b>Analyte</b>	<b>Container</b>	<b>Preservative</b>	<b>Holding Time</b>
6010	Elemental metals	600-mL wide-mouthed glass or plastic jar	None, cool, 4°C	14 days to extraction 26 months after extraction
7471	Mercury	400-mL wide-mouthed glass or plastic jar	None, cool, 4°C	14 days to extraction 28 days after extraction
8330	Explosive residues	60-mL wide-mouthed amber glass jar with Teflon-lined cap	None, cool, 4°C	14 days to extraction 40 days after extraction

## 6.0 DOCUMENTATION OF ACTIVITIES

### 6.1 Sample Coding

Labels for sample containers will be uniquely coded to identify the individual composite sample's location, the treatment unit, and date. Examples of a sample code for the three sampling zones are listed below.

- AOD080194 (OD unit sample taken within Stratum A on August 1, 1994)
- BOD080194 (sample from Stratum B of the OD unit taken on August 1, 1994)
- COD080194 (sample from Stratum C of the OD unit taken on August 1, 1994)

### 6.2 Sample Identification

The samples collected will be identified by a tag or other means (e.g., tape) along with the following information:

- Collector name,
- Sample code,
- Place of collection (facility and location),
- Date sample taken, and
- Time sample taken.

Any other information deemed necessary will also be added to the tag.

### 6.3

#### Field Logbooks

Bound, water-resistant field logbooks and waterproof black ink pens will be used to document the methodology, procedures, and events pertaining to sample and data acquisition. The logbooks will be considered formal documents representing a complete and organized record of all field activities. The entries will include, but not be limited to the following:

- personnel present; name of sampler(s);
- date and time of every recording;
- work location;
- description of work and treatment process;
- purpose of sampling;
- environmental conditions (previous 24-hour and present weather conditions, amount and date of last precipitation, and any other conditions or activities that would affect samples);
- soil sample descriptions;
- description and location of area sampled;
- sample numbers;
- field QC data;
- other important notes on field activities, conditions, or problems; and
- initials/signature of person entering data.

Entries made in the logbook should be of sufficient detail to reconstruct the taking of a sample by the reading of the entries and information recorded in it. No erasures or deletion marks are permitted. If a mistake is made in a logbook, it must be corrected by marking a line through the error and writing the correction in the note section.

## 7.0 LABORATORY ANALYSIS

### 7.1 Laboratory

Design and execution of the testing program will be coordinated with an analytical chemist experienced in contaminated soil testing. The laboratory report will state the following in distinguishable print: dates of sampling and testing, sample descriptions and numbers, name and address of the laboratory performing the tests, name and qualifications of the person performing the test, test method used for all tests, detection limits achieved, and name and model number of major instruments used.

EPA SW-846 addresses all procedures proposed in this SAP. Extracts will be analyzed using Method 7471 for mercury and Method 6010 for elemental metals. The Method of Standard Addition will be performed for each metal on one of the submitted samples per sampling event. The laboratory will be required to achieve the required or estimated detection limits as specified in EPA SW-846. If equivalent methods are used, this must be justified in advance. Approval for any equivalent methods employed by the laboratory will be at the discretion of Cannon AFB and NMED.

Soil samples will also be analyzed for soil moisture content, in accordance with ASTM D 2216.

### 7.2 QA/QC

For all tests, the samples will be spiked with known quantities of the hazardous constituent and spike concentration and percent recovery (PR) reported. The surrogate spike recoveries will be reported for all organic tests. Results from method blanks on the samples will be submitted. Blanks will not be subtracted. The method of how the reported lower detectable limit was determined must also be reported. To ensure that the established data quality objectives (DQOs) can be attained, the level of analytical quality

achieved will be at least Level III. One set of samples (samples collected in any one day or one sample package) per year will undergo the more rigorous QA/QC to ensure data of Level IV data quality. The laboratory will report data equivalent to Contract Laboratory Program (CLP) Routine Analytical Services deliverables. Data will be sufficiently documented to allow personnel to review and evaluate data quality. Other samples sent for that year will be tested by the same analytical methods, but will require less QA/QC and reporting requirements to achieve Level III data quality. Quick turn-around time on the Level III data will allow Cannon AFB to determine whether, based on the results, the OD treatment process is affecting the environment.

### **7.3            Sampling DQOS**

DQOs are quantitative and qualitative statements specified to ensure that data of known and appropriate quality are obtained during sampling. The overall objective of sampling is to provide an accurate, precise, and representative confirmation that the OD unit treatment process is not contaminating surrounding soils above RCRA action or background levels. DQOs will be followed in terms of precision, accuracy, representativeness, completeness, and comparability (PARCC). The PARCC parameters indicate data quality. The procedures described in this section are designed to obtain PARCC for each sampling and analytical method and analysis.

#### **7.3.1            Precision**

Precision is a measure or estimate of the reproducibility of measurements under a given set of conditions. Specifically, precision is a qualitative measure of the variability of a group of measurements compared to their average value. A simple measure of precision is the standard deviation. The methods and protocols found in the most recent version of EPA SW-846 will be used by the laboratory performing the sample analyses.

The overall precision of measurement data is a mixture of sampling and analytical factors. The objective for precision in the chosen laboratory for certain samples is to equal the precision demonstrated for the CLP methods on similar samples. Laboratories commonly determine precision from duplicate samples; thus, precision is usually expressed as relative percent difference (RPD). The calculation for RPD is:

$$\text{RPD} = \frac{V1 - V2}{(V1 + V2) \div 2 \times 100} \quad (2)$$

where V1 and V2 are the reported concentrations for each duplicate sample.

### 7.3.2 Accuracy

Accuracy is the ability to obtain a true value. The accuracy of an entire measurement system indicates any bias that exists; this is generally difficult to measure through the entire data collection process, since there are potentially many sources of error. These include the sampling process, field and laboratory cross contamination, preservation, handling, sample matrix, sample preparation, and analytical techniques. Sampling accuracy can be assessed by evaluating the results of field blanks; analytical accuracy, through the use of known and unknown QC samples and matrix spiked samples.

Laboratory accuracy is checked by adding a known amount of surrogate compounds (compounds unlikely to be found in actual samples) to a sample and ensuring that amount is recovered in the analysis. This process is referred to as spiking, and the samples are referred to as spikes. The objective for accuracy in the chosen laboratory for certain samples is to equal the accuracy demonstrated for the CLP methods on similar samples being analyzed for similar concentrations of contaminants. Laboratory accuracy is expressed as PR, calculated by:

$$\text{PR} = \frac{Ss - So}{Sa \times 100} \quad (3)$$

where So is the background value obtained by analyzing the sample (before the spike is added), Sa is the concentration of the spike added to the sample, and Ss is the value obtained by analyzing the sample after the spike has been added.

### 7.3.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter most concerned with the proper design of the sampling program. The representativeness criterion is satisfied by carefully selecting sample locations, sampling techniques, and analytical techniques and collecting a sufficient number of samples. Adherence to this SAP will ensure that sufficient representativeness has been achieved.

### 7.3.4 Completeness

Completeness is a measure of the amount of data actually obtained as compared to the amount planned to be obtained. Situations sometimes arise in the field and the laboratory that may deter the progress of an investigation. Technical difficulties are sometimes encountered both in the field and in the laboratory.

Completeness is recorded in the laboratory by comparing the number of theoretically obtainable results under ideal conditions to the actual number of valid results obtained. CLP data has been found to be 80 to 85% complete (PC) on a nationwide basis; therefore, the completeness goal for this sampling effort is 80%. The PC is calculated by:

$$PC = \frac{Na}{Ni \times 100} \quad (4)$$

where Na is the actual number of valid results obtained and Ni is the number of results that may have been obtained under ideal conditions.

### 7.3.5 Comparability

Comparability reflects the confidence with which data sets can be compared to each other. This is accomplished through using standard sampling techniques for all sampling events and standard analyzing techniques for all samples. Comparability is limited

to the precision and accuracy parameters of PARCC, because only when these parameters are known can data sets be compared with confidence.

#### **7.4 Sample Return or Disposal**

Unless directed otherwise by Cannon AFB, the laboratory will dispose of all soil samples following analysis. The laboratory will provide certification that its facilities qualify for the exemption in 40 CFR 261.4(d), which excludes waste samples from many hazardous waste management requirements. In addition, all laboratories will provide the base with an explanation of the disposal practices used with respect to sample residual.

## 8.0 STATISTICAL ANALYSIS

Since contaminant populations of a weapons testing site are generally stratified, one cannot conclude that the entire population is normally distributed. It is necessary to divide this population into subpopulations that are non-overlapping groups, called strata. For this site we have initially designated these strata as A, B, C. Each stratum is assumed to be homogenous within itself thus yielding a normally distributed subpopulation. Together, these sub-populations comprise the whole population. When expressed mathematically, the basic ideas underlying stratified random sampling are:

- The total number of population units,  $N$ , is divided into  $L$  non-overlapping groups of population units. These groups are called strata (i.e., concentric rings around a detonation site). The number of population units in strata 1, 2, 3, ...,  $L$  are  $N_1, N_2, \dots, N_L$ , respectively, where  $N_1 + N_2 + \dots + N_L = N$ .
- The  $N_1, N_2, \dots, N_L$ , are known constants, i.e., the sizes of strata are known.
- A simple random sample is drawn from each strata independently. The size of the sample in the  $h^{\text{th}}$  stratum is  $n_h$ , and  $n = n_1 + n_2 + \dots + n_L$  is the total sample size over all  $L$  strata.

### 8.1 Preliminary Sample Calculations

The analytical results from the preliminary soil sampling need to have the following statistical calculations performed for each analyte found in strata A,B,C above detection limits:

- Calculate the sample mean (i.e., strata mean)

$$\bar{X}_h = \sum_{i=1}^n \frac{X_i}{n} \quad (5)$$

where  $X_i$  is the concentration,  $n$  is the number of samples in Stratum  $H$ , and  $h$  is the stratum.

- Next calculate the sample variance

$$S_h^2 = \sum_{i=1}^n \frac{(X_i - \bar{X}_h)^2}{n - 1} \quad (6)$$

where  $X_i$  is the concentration,  $\bar{X}_h$  is the sample mean in Stratum H, and n is the number of samples in Stratum H

- Next calculate the standard deviation

$$S_h = \sqrt{S_h^2} \quad (7)$$

Calculate  $n_0$  using equation 1. Then calculate n for your population based on the calculated  $n_0$ . The equation for n is given below:

$$n = \frac{n_0}{1 + \frac{n_0}{N}} \quad (8)$$

where  $n_0$  is the calculated initial sample size, and N is the number of population units.

Additional sampling will need to be performed as defined above, proportionally in each stratum (i.e.,  $nW_h$ ). Then the calculations in Section 8.2 should be completed.

## 8.2 Routine Sample Calculations

- Calculate the sample mean (i.e., strata mean)

$$\bar{X}_h = \sum_{i=1}^n \frac{X_i}{n} \quad (9)$$

where  $X_i$  is the concentration, n is the number of samples in Stratum H, and h is the stratum.

- Next, calculate the sample variance

$$S_h^2 = \sum_{i=1}^n \frac{(X_i - \bar{X}_h)^2}{n - 1} \quad (10)$$

where  $X_i$  is the concentration,  $\bar{X}_h$  is the sample mean in Stratum H, and n is the number of samples in Stratum H.

- Next calculate the standard deviation

$$S_h = \sqrt{S_h^2} \quad (11)$$

- Next define stratum areas

$$A_a = \Pi r_a^2, \quad A_b = \Pi r_b^2 - \Pi r_a^2, \quad A_c = \Pi r_c^2 - \Pi r_b^2 \quad (12)$$

where  $\Pi r^2$  is the area for a circle,  $r_a$  is the radius of Stratum A from GZ,  $r_b$  is the radius of Stratum B from GZ, and  $r_c$  is the radius of Stratum C from GZ.

- Next define stratum weights

$$W_a = \frac{A_a}{\Pi r_c^2}, \quad W_b = \frac{A_b}{\Pi r_c^2}, \quad W_c = \frac{A_c}{\Pi r_c^2} \quad (13)$$

where  $\Pi r_c^2$  is the total sampling area.

- The next step is to estimate the true mean for the population

$$\bar{X}_{st} = \sum_{h=1}^L W_h \bar{X}_h \quad (14)$$

where  $\bar{X}_{st}$  is the true mean for the stratified population,  $W_h$  is the stratum weight for Stratum H, and  $\bar{X}_h$  is the mean for Stratum H.

- Next, calculate the variance for the population, assuming measurement errors are negligible

$$S^2(\bar{X}_{st}) = \sum_{h=1}^L \frac{W_h^2 S_h^2}{n_h} - \sum_{h=1}^L \frac{W_h^2 S_h^2}{N} \quad (15)$$

where  $n_h$  is the number of samples in Stratum H.

- Next, calculate the standard deviation for the population

$$S(\bar{X}_{st}) = \sqrt{S^2(\bar{X}_{st})} \quad (16)$$

Then if the  $n_h$  are sufficiently large,  $100(1-\alpha)\%$  confidence limits on the true mean over all strata are computed as

$$\bar{X}_{st} \pm Z_{(\alpha/2)} S(\bar{X}_{st}) \quad (17)$$

where  $Z_{\alpha/2}$  is the standard normal distribution value that cuts off  $100(\alpha/2)\%$  of each tail of the normal distribution, e.g., 99% confidence interval would have a corresponding  $Z_{\alpha/2}$  value of 2.58. If the  $n_h$  are small an alternative procedure for computing limits is to use the  $t$ -value from the tables of Student's  $t$  instead of from the normal table (Cochran 1963, p.94).

## 9.0

### DATA RESOLUTION AND REMEDIAL RESPONSE

All data results from routine (i.e., quarterly) sampling activities will be statistically evaluated as prescribed in Section 8 to determine if a significant increase over the concentrations limits for any of the specified hazardous constituents in Table 9-1 has occurred. The action levels that will be used for monitoring are either calculated values or background upper threshold limits, which will be determined from soil sampling site baseline study (planned for the March–April 1994 period—analytical results generated from this activity should be available for submittal to NMED by June 1994). The analytes that will have background concentrations as action levels include arsenic, beryllium, cadmium, and chromium (VI). The rationale for using background levels for these particular toxic metals is because the background concentrations determined in 1993 for these contaminants approached or exceeded the calculated levels in Table 9-1. Therefore, calculated action levels would be inappropriate. Action levels were calculated for most of the constituents for soil using the methodology prescribed in the proposed RCRA Subpart S regulations, “Appendix D: Recommended Exposures Assumptions for Use in Deriving Action Levels” and “Appendix E: Examples of Calculations of Action Levels.” These calculated soil action levels are for the analytes being tested at Melrose AFR.

In the event that soil sampling statistically determines (i.e., determine through a statistical evaluation, which may include simple comparison to the action level), that any concentration limit of those hazardous constituents listed in Table 9-1 is exceeded at any sampling point, the sampling point will be immediately resampled to confirm the presence of contamination. If such sampling confirms that there is contamination, then additional sampling will be performed to account for potential migration of waste constituents. For instance, if contamination is found at surface, additional sampling would be performed to an appropriate depth until no contamination is found. In any event where contamination is confirmed, such an occurrence will be noted, NMED will be duly notified in writing, and a report describing the occurrence will be submitted to NMED within seven days of the sample confirmation.

Table 9-1

## Calculated Risk-Based Action Levels for Soils

Constituent	Carcinogenic Class <sup>a</sup>	Reference Dose (RfD)	Carcinogenic Slope Factor (CSF) <sup>b</sup>	Source <sup>c</sup>	Calculated Soil Action Level (mg/kg) <sup>d</sup>	
					Carcinogenic	Noncarcinogenic
Toxic Metals						
Antimony	NA <sup>e</sup>	$4.00 \times 10^{-4}$	—	IRIS	—	$3.2 \times 10^{+1}$
Arsenic	A	$3.00 \times 10^{-4}$	$5.00 \times 10^{+1}$	IRIS	$1.4 \times 10^{-2f}$	—
Barium	NA	$7.00 \times 10^{-2}$	—	IRIS	—	$5.6 \times 10^{+3}$
Beryllium	B2	$5.00 \times 10^{-3}$	$4.30 \times 10^{+0}$	IRIS	$1.63 \times 10^{-1f}$	$4.00 \times 10^{+2}$
Cadmium	B1	$5.00 \times 10^{-4}$	$6.10 \times 10^{+0}$	IRIS	$1.14 \times 10^{-1f}$	—
Chromium (III)	NA	$1.00 \times 10^{+0}$	—	IRIS	—	$8.00 \times 10^{+4}$
Chromium (VI)	A	$5.00 \times 10^{-3}$	$4.10 \times 10^{+1}$	IRIS	$1.7 \times 10^{-2f}$	—
Copper	NA	$4.0 \times 10^{-10g}$	—		—	$3.2 \times 10^{+3}$
Lead	B2	NA	—		—	$5.0 \times 10^{+2h}$
Mercury	D	$3.00 \times 10^{-4}$	—	IRIS	—	$2.4 \times 10^{+1}$
Nickel	D	$2.00 \times 10^{-2}$	—	IRIS	—	$1.6 \times 10^{+3}$
Selenium	D	$5.00 \times 10^{-3}$	—	IRIS	—	$4.00 \times 10^{+2}$
Silver	D	$5.00 \times 10^{-3}$	—	IRIS	—	$4.00 \times 10^{+2}$
Explosive Compounds						
HMX	D	$5.00 \times 10^{-2}$	—	IRIS/EPA Office of Water	—	$5.00 \times 10^{+3}$
RDX	C	$3.00 \times 10^{-3}$	$1.10 \times 10^{-1}$	IRIS/EPA Office of Water	$6.4 \times 10^{+1}$	—
1,3,5-Trinitrobenzene (1,3,5-TNB)	NA	$5.00 \times 10^{-5}$	—	IRIS	—	$4.00 \times 10^{+0}$
1,3-Dinitrobenzene (1,3-DNB)	D	$1.00 \times 10^{-4}$	—	IRIS	—	$8.00 \times 10^{+0}$
Tetryl	NA	$1.00 \times 10^{-2}$	—	IRIS	—	$8.00 \times 10^{+2}$
Nitrobenzene (NB)	D	$5.00 \times 10^{-4}$	—	IRIS	—	$4.00 \times 10^{+1}$
2,4,6-Trinitrotoluene (2,4,6-TNT)	C	$5.00 \times 10^{-4}$	$3.00 \times 10^{-2}$	Burrows, 1989 <sup>f</sup>	$2.33 \times 10^{+2}$	—
2,4-Dinitrotoluene (2,4-DNT)	B2	$2.00 \times 10^{-3}$	$6.80 \times 10^{-1}$	IRIS	$1.03 \times 10^{+0}$	—

Table 9-1  
(Continued)

Constituent	Carcinogenic Class <sup>a</sup>	Reference Dose (RfD)	Carcinogenic Slope Factor (CSF) <sup>b</sup>	Source <sup>c</sup>	Calculated Soil Action Level (mg/kg) <sup>d</sup>	
					Carcinogenic	Noncarcinogenic
2,6-Dinitrotoluene (2,6-DNT)	B2	$1.00 \times 10^{-3}$	$6.80 \times 10^{-1}$	IRIS	$1.03 \times 10^{+0}$	—
2-Nitrotoluene (2-NT)	NA	$1.00 \times 10^{-2}$	—	IRIS	—	$8.00 \times 10^{+2}$
3-Nitrotoluene (3-NT)	NA	$1.00 \times 10^{-2}$	—	IRIS	—	$8.00 \times 10^{+2}$
4-Nitrotoluene (4-NT)	NA	$1.00 \times 10^{-2}$	—	IRIS	—	$8.00 \times 10^{+2}$

<sup>a</sup>The Human Health Assessment Group of the EPA classifies chemicals into one of the following groups:

Group A - Human carcinogen (sufficient evidence of carcinogenicity in humans)

Group B - Probable human carcinogen (B1 - limited evidence of carcinogenicity in humans; B2 - sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans).

Group C - Possible human carcinogen (limited evidence of carcinogenicity in animals and inadequate or lack of human data).

Group D - Not classifiable as to human carcinogenicity (inadequate or no evidence).

Group E - Evidence of noncarcinogenicity for humans (no evidence of carcinogenicity in adequate studies).

<sup>b</sup>Human risk is assumed to be via oral ingestion, where oral doses are all assumed to be chronic. In certain cases where there was no published (carcinogenic) oral slope factor for the constituent, the inhalation slope factor (which for many chemicals is the same as the oral slope factor) was used.

<sup>c</sup>Values cited for the RfD and the CSF were obtained from the June 1993 toxicity values from EPA's Integrated Risk Assessment System (IRIS) and Health Effects Assessment Summary Table (HEAST), unless otherwise noted.

<sup>d</sup>The methodology for performing the calculations of action levels are those referenced in Section 9 of the SAP.

<sup>e</sup>Carcinogenic classes designated as NA means that the criteria is not applicable (i.e., not classifiable) because the chemical is not currently considered a human carcinogen. NA and D group are similar designations.

<sup>f</sup>The action levels presented for these metals are for information purposes only. Background concentrations determined during the initial site characterization study approached or exceeded the calculated levels in this table. Therefore, background threshold limits to be determined during the follow-up site characterization effort will be provided.

<sup>g</sup>Reference dose (RfD) for copper is derived from its secondary maximum contaminant limit (1.3 mg/L).

<sup>h</sup>There is no published RfD for lead. The action level is based on guidance in OSWER Directive 9355.4-02 *Interim Guidance on Establishing Soil Cleanup Levels at Superfund Sites*, September 7, 1989.

<sup>i</sup>This source references the 1989 report (Burrows, Rosenblatt, Mitchell, and Parmer) *Organic Explosives and Related Compounds: Environmental and Health Considerations*, Technical Report 8901, U.S Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Maryland.

Remediation of soils will be conducted if confirmatory soil sampling indicates soil is contaminated with any of the hazardous constituents listed in Table 9-1 with levels above action levels or determined to be widespread over the OD site. Such remediation would constitute an interim measure coordinated with NMED to help minimize the potential spread of contamination and keep the facility uncontaminated. The remediation will be conducted by a properly qualified contractor in proper protective equipment (depending upon sample results). The actual equipment used will be based on the extent of the contamination. If remediation is necessary, simple work and safety plans will be developed to provide guidelines for this interim remediation. Remediated soil will be drummed and disposed of through Defense Reutilization and Marketing Office as a waste based on the sampling results.

## 10.0

## REFERENCES

1. New Mexico Environmental Department, Hazardous and Radioactive Materials Bureau. "Notice of Deficiency Comments for Melrose Air Force Range RCRA Operating Permit." December 22, 1992, Santa Fe, New Mexico.
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3. Tran-Stat, Statistics for Environmental Studies, Battelle Memorial Institute, August 1983, Number 24, Chapter 4.
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5. Sampling Techniques, William G. Cochran, 1963, pgs. 87-153.