

# Document Modification Request

25. DMR No. 96-DMR-RMRS-0118

**Originator** *Print or Type all information (except signatures). Process procedures in accordance with 1-A01-PROC DEV-400, Procedure Process.*

1. Name/Phone/Pager/Location A. L. Peimrose / 4385 / 4675 / TB3A 2. Date 11/13/96

3. Existing Document Number and Revision GT. 10 Rev 2 4. Document Type:  Procedure  Plan  
 Other

5. Document Title Bore hole Clearing

6. Item	7. Page	8. Step	9. Proposed Modification
<u>General</u>			
<u>1</u>	<u>3</u>	<u>3.0</u>	<u>Remove references to EG &amp; G; substitute project personnel where applicable</u> <u>1<sup>st</sup> paragraph. ADD "who will verify the results of the survey" to the end of the 1<sup>st</sup> sentence.</u>

10. Item 10a. Justification (reason for modification, EJO #, TP #, etc.)

**Originator's Supervisor** MARLA BEOUSSARD *M. Beoussard* 11-14-96

11.  Process (print/sign/date)  
 Do not Process (state reason in Block 10a)

12.  Process (Complete Blocks 13-22) (print/sign/date)  
 Do not Process (state reason in Block 10a)

13. New Document/ Rev. No. (if new or changed)  
N/A

Complete either Section 14a. or 14b., as applicable. For procedures, attach completed Procedure Modification Worksheet from 1-A01-PROC DEV-400.

14a. Type of Complete Modification  
 New  Revision  Intent Change  Nonintent Change  
 One-Time-Use  Cancellation  Editorial Correction  Regular  
 Interim Approval Requested - Needed for Immediate Use (14-day limit for obtaining final approval)  
 Additional Attributes:  
 Temporary  One-Time-Use  Limited Distribution

15. ERM Change Control Board Required:  Yes  No (Applicable only to new procedures, revisions, and intent changes.)

List the reviewing disciplines in Block 16. After concurrence has been obtained (in accordance with 1-A01-PROC DEV-400), enter the name of the reviewer followed by /s/ in block 17. If the reviewer indicates No comments, the review signature constitutes concurrence. Enter the date concurrence is obtained in Block 18.

16. Organization	17. Reviewer/Concurren	18. Date	16a. Organization	17a. Reviewer/Concurren	18a. Date
<u>ER</u>	<u>T. Plouffe</u>	<u>11/13/96</u>			
<u>QA</u>	<u>Greg D. Gregoire</u>	<u>11-13-96</u>			
<u>TEOS</u>	<u>J. Anderson</u>	<u>11/13/96</u>			

19. Assigned SME/Phone/Pager/Location A. Peimrose / 4385 20. Cost Center R202 21. Charge Number  
22. Requested Completion Date 12-6-96

23. Prescreen/Screen/USOD Number N/A 24. Independent Safety Review Meeting and Date N/A

26. After obtaining ALL required signatures. Responsible Manager's Approval (print/sign/date) (Not required for New procedures or Revisions)  
*M. Beoussard* 11-14-96 ADMIN RECORD

27. Effective Date 12-6-96  
28. Expiration Date (if applicable)

**BOREHOLE CLEARING**

*Rocky Flats Environmental Technology Site*

~~EG&G ROCKY FLATS PLANT~~  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
GT.10, Rev. 2  
1 of 16  
March 1, 1992  
Environmental Management

Category 2

TITLE:  
BOREHOLE CLEARING

Approved By:

(Name of Approver)

5/12/92

(Date)

**1.0 TABLE OF CONTENTS**

1.0	TABLE OF CONTENTS .....	1
2.0	PURPOSE AND SCOPE .....	3
3.0	RESPONSIBILITIES AND QUALIFICATIONS .....	3
4.0	REFERENCES .....	4
4.1	SOURCE REFERENCES .....	4
4.2	INTERNAL REFERENCES .....	4
5.0	GEOPHYSICAL EQUIPMENT AND PROCEDURES .....	4
5.1	INTRODUCTION .....	4
5.2	ELECTROMAGNETICS .....	5
5.2.1	List of Necessary Equipment .....	7
5.2.2	Field Procedure .....	7
5.3	MAGNETIC LOCATOR .....	8
5.3.1	List of Necessary Equipment .....	9
5.3.2	Field Procedure .....	9
5.4	GROUND PENETRATING RADAR .....	9
5.4.1	List of Necessary Equipment .....	10
5.4.2	Field Procedure .....	11
5.5	DATA ANALYSIS .....	14
6.0	ADMINISTRATIVE BOREHOLE CLEARANCE .....	14

**BOREHOLE CLEARING**

*Rocky Flats Environmental Technology Site*

~~EG&G ROCKY FLATS PLANT~~  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
GT.10, Rev. 2  
2 of 16  
March 1, 1992  
Environmental Management

Category 2

6.1	RADIOLOGICAL WORK PERMIT .....	15
6.2	SOIL DISTURBANCE ASSESSMENT AUTHORIZATION .....	15
7.0	DOCUMENTATION .....	16

LIST OF TABLES

TABLE GT.10-1	EM INSTRUMENT MODE APPLICATION .....	6
---------------	--------------------------------------	---

## BOREHOLE CLEARING

*Rocky Flats Environmental Technology Site*

~~ROCKY FLATS PLANT~~  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
GT.10, Rev. 2  
3 of 16  
March 1, 1992  
Environmental Management

Category 2

### 2.0 PURPOSE AND SCOPE

This standard operating procedure (SOP) describes procedures that will be used at the Rocky Flats Plant (RFP) for clearing drill sites and intrusive work sites within Individual Hazardous Substance Sites (IHSSs). Geophysical clearing will be implemented to ensure that selected locations are free of buried metal objects to a depth of 18 feet and metal utility lines. This SOP describes geophysical administrative clearance techniques, and geophysical data reduction and analyses that will be used for field data collection and documentation.

The geophysical techniques that are employed involve electromagnetic (EM) techniques, a magnetic locator, and ground penetrating radar (GPR). EM and magnetic surveys can be used for identifying areas where subsurface metal objects might be located. The techniques indicate contrasts in conditions due to variations in the electrical conductivity or magnetic properties of subsurface materials. GPR is useful for detection of shallow variations in the subsurface dielectric constant.

A magnetic locator can be used when the clearing depth-of-interest is 18 inches or less. EM techniques and a magnetic locator will both be used when the clearing depth-of-interest is deeper than 18 inches. Generally, GPR is applicable to depths of 0-6 feet at the RFP site.

### 3.0 RESPONSIBILITIES AND QUALIFICATIONS

Oversight and supervision of the geophysical surveys will be conducted by ~~EG&S~~ <sup>ER Project Team</sup> personnel. Project staff performing these surveys will be trained geophysicists or trained personnel with a significant amount of geophysical field experience. <sup>Who will verify the results of the survey.</sup> The subcontractor's project manager will document personnel qualifications related to this procedure in the subcontractor's project QA files.

The subcontractor's project manager is responsible for obtaining administrative borehole clearance.

96-DMR-RMRS-018

## BOREHOLE CLEARING

Rocky Flats Environmental Technology Site

~~ROCKY FLATS PLANT~~  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
GT.10, Rev. 2  
4 of 16  
March 1, 1992  
Environmental Management

Category 2

### 4.0 REFERENCES

#### 4.1 SOURCE REFERENCES

The following is a list of references reviewed prior to the writing of this procedure:

A Compendium of Superfund Field Operations Methods. EPA/540/P-87/001. December 1987.

Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. Interim Final. EPA/540/G-89/004. October 1988.

RCRA Facility Investigation Guidance. EPA. Interim Final. May 1989.

#### 4.2 INTERNAL REFERENCES

A related SOP cross-referenced by this SOP is:

- SOP GT.18, Surface Geophysical Surveys

### 5.0 GEOPHYSICAL EQUIPMENT AND PROCEDURES

#### 5.1 INTRODUCTION

Borehole clearing using geophysical methods will be employed within an IHSS where buried trenches are known to exist or where buried metal may be present. Surface geophysical surveys have been conducted at the ~~RF~~<sup>RFETS</sup>. Research of these previous geophysical surveys should be exhausted prior to conducting the following procedures.

## BOREHOLE CLEARING

---

*Rocky Flats Environmental Technology Site*

<del>ROCKY FLATS PLANT</del>	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	GT.10, Rev. 2
	Page:	5 of 16
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

---

Instruments used for geophysical clearing will be recalibrated and recertified, if required. The date of the manufacturer's last calibration and certification will be documented on the Borehole Clearing Analysis Form (Form GT.10A).

Each instrument will have a field calibration check prior to and after field use. Personnel performing the field calibration check should refer to the manufacturer's instructions. An example of a field calibration check would be to use the instrument over a known buried object. If the instrument does not respond appropriately, the instrument should be returned to the manufacturer for recalibration and recertification.

Geophysical methods have limitations which must be considered when implementing a geophysical survey. In some instances, the limitations may be sufficient to make the geophysical results ambiguous or non-conclusive. Therefore, it is imperative that an experienced geophysical operator conduct the clearing of boreholes.

Electromagnetics, magnetics, and GPR are influenced by surface cultural features, such as fences, power lines, and metallic debris. These cultural effects can be mitigated by the use of a directional magnetic locator, which responds to a magnetic gradient. However, if borehole clearing is being performed within 40 to 50 feet of a cultural feature, reliable geophysical clearing may be difficult to achieve. In cases where a site cannot be definitively cleared, the location will be moved to the nearest clearable location.

### 5.2 ELECTROMAGNETICS

An EM survey can be used to detect ferrous and nonferrous metals as well as areas of high inorganic contamination. This method involves the induction of electrical current into the ground. A small alternating current passing through a transmitter coil produces a primary magnetic field. Through inductive coupling, the primary magnetic field produces small eddy currents in the

## BOREHOLE CLEARING

*Rocky Flats Environmental Technology Site*

~~EG&G~~ ROCKY FLATS PLANT  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
GT.10, Rev. 2  
6 of 16  
March 1, 1992  
Environmental Management

Category 2

subsurface which, in turn, create their own secondary magnetic field. The receiver coil senses both the primary and secondary fields. This results in an output voltage that is linearly related to the terrain conductivity. The instrument then converts the voltage to a ground conductivity value which can be recorded by a strip recorder or digital logger. Electrical conductivity is a function of the soil or rock composition, the porosity and permeability of the rock units, and the conductivity of the fluids filling the pore spaces. The conductivity values are subsequently plotted on a map so that their variation over the site can be analyzed.

A Geonics EM-31, EM-38, or equivalent ground conductivity meter will be used for the EM surveys. Through the use of the horizontal dipole mode (HDM), the EM-31 has a depth penetration to 9 feet. When deeper penetration is required, the vertical dipole mode (VDM) will be used in addition to the HDM. This scenario will provide high resolution detection of objects to 9 feet and will allow detection of larger metal objects to 18 feet. The size of a metal object that can be detected is proportional to the depth of burial. For shallow investigation (less than 9 feet), the HDM provides the greatest resolution and can normally detect objects as small as a 1-foot length of rebar. By monitoring the in-phase component of the induced magnetic field, small amounts of subsurface metal can be detected. For high resolution of depths less than 5 feet, the EM-38 can be used. Table GT.10-1 summarizes instrument modes and applications.

Table GT.10-1  
EM INSTRUMENT MODE APPLICATION

<u>Instrument</u>	<u>Mode</u>	<u>Depth of Penetration (ft)</u>	<u>Approximate Size of Detected Object</u>
EM-31	HDM	9	1-foot piece of rebar Steel drum
	VDM	18	
EM-38	HDM	2.5	
	VDM	5	

## BOREHOLE CLEARING

<u>Rocky Flats Environmental Technology Site</u>		
<del>EG&amp;G</del> ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	GT.10, Rev. 2
	Page:	7 of 16
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

---

### 5.2.1 List of Necessary Equipment

The following is a list of equipment that will be necessary to complete an EM survey:

- A Geonics EM-31, EM-38, or equivalent terrain conductivity meter
- Digital logger and/or analog strip recorder (when data collection is over large grid area)
- Appropriate health and safety equipment
- Wood stakes or lath
- Flagging
- Field notebook
- Black waterproof (permanent) pens
- Form GT.10A, Borehole Clearing Analysis (see Section 7.0, Documentation).

### 5.2.2 Field Procedure

A standard field procedure for conducting an EM survey is initiated by a reconnaissance survey of each drill site. The survey will involve a review of existing magnetic data at the site, a review of the site utility plans, an acknowledgement from the telephone and utility site locators that the site is clear of these utilities, and a field check for overhead wires, pipes, or other objects that may restrict drilling operations. Note surface conditions of the site on Form GT.10A (see Section 7.0, Documentation) including excessive and/or large metal objects on the ground surface and large variations in topography. Following the instrument manufacturer's instructions, initiate a site survey traverse on an approximate 1-foot grid, clearing a minimum of 6 feet around the drilling location stake. When anomalous values indicative of buried metal are observed, record the anomaly on Form GT.10A. If an anomaly is not present, document the results on Form GT.10A.

## BOREHOLE CLEARING

*Rocky Flats Environmental Technology Site*

~~EMD~~ ROCKY FLATS PLANT  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
GT.10, Rev. 2  
8 of 16  
March 1, 1992  
Environmental Management

Category 2

Drilling locations with anomalous values will require moving the location to the nearest "clear" area. By using the above procedures, determine an area within 50 feet of the original drilling location that is free of anomalies. Mark the new drilling location with a wood stake and document the new location on Form GT.10A. Notify the project site manager of the new location.

For larger areas or for locating buried trenches or pits, follow a surveyed grid pattern when traversing with the EM instrument. If the grid is not surveyed prior to the EM traverse, place a wood stake marker at the end of each traverse and document the marker location on the field data record (Form GT.10A). All EM traverses should be documented on a field map during the survey. For larger areas, a portable computer may be required to quickly analyze the data and facilitate the location of additional survey lines.

### 5.3 MAGNETIC LOCATOR

A magnetic locator detects magnetic fields associated with certain objects. The depth of investigation depends on the size of the object. The Schonstedt magnetic locator, for example, can detect well casings up to 15 feet deep; however, a 1 1/4-inch nail can be detected only to a depth of 8 inches.

A magnetic locator responds to the magnetic gradient between two magnetic field sensors (A and B). If no anomalies exist, the magnetic field between sensors A and B is balanced, and a 40 Hz frequency signal is heard on the magnetic locator's audio output. This frequency output (40 Hz) is the ambient magnetic field of the earth. However, when the magnetic field becomes stronger at sensor A (located at the bottom of the locator) than at sensor B, the output signal increases in frequency. When the tip of the locator is directly over the ferrous object, the audio signal increases to its highest frequency.

## BOREHOLE CLEARING

*Rocky Flats Environmental Technology Site*

~~EMD~~ ROCKY FLATS PLANT  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
GT.10, Rev. 2  
9 of 16  
March 1, 1992  
Environmental Management

---

### 5.3.1 List of Necessary Equipment

The following is a list of equipment that will be necessary to complete a geophysical survey:

- Schonstedt Model GA-52B magnetic locator or equivalent
- Appropriate health and safety equipment
- Wood stakes or lath
- Flagging
- Field notebook
- Black waterproof (permanent) pens
- Form GT.10A, Borehole Clearing Analysis (see Section 7.0, Documentation)

### 5.3.2 Field Procedure

The field procedures for a magnetic survey are the same as the procedures described for the EM survey (Subsection 5.2.2).

## 5.4 GROUND PENETRATING RADAR

Ground penetrating radar (GPR) has been used for mapping shallow geologic interfaces, delineating shallow bedrock, locating voids in concrete or limestone, and finding buried pipeline or reinforcement bars.

GPR involves a system that transmits electromagnetic pulses into the ground from an antenna near the surface. These pulses are reflected from a variety of subsurface interfaces back to a receiver. As the antenna is towed along a survey line, the GPR signals are processed and displayed on a graphic recorder. The displayed data is a two-dimensional continuous profile along the surveyed

## BOREHOLE CLEARING

<u>Rocky Flats Environmental Technology Site</u>		
<del>EG&amp;G</del> ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	GT.10, Rev. 2
	Page:	10 of 16
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

---

line depicting time versus distance. The display is very similar to a geologic section, except that the record is a time section rather than a depth section.

GPR has excellent resolution of subsurface features when favorable conditions exist. However, actual depth penetration is highly site-specific and depends on the near-surface soil conductivity. Highly conductive soils, such as clays, can reduce penetration to less than three feet. Less conductive materials, such as limestone, will allow depth penetration of 30 - 50 feet.

### 5.4.1 List of Necessary Equipment

The following is a list of equipment that will be necessary to complete a GPR survey:

- GSSI SIR System-3 or equivalent radar system
- Flagging
- Lath or wooden stakes
- Field notebook
- Black waterproof (permanent) pens
- Tape measure (200 feet minimum) (Note: for relatively smooth surfaces, a measuring wheel can be substituted)
- Extra paper for profile recorder
- Extra stylus(s) for profile recorder

## BOREHOLE CLEARING

<u>Rocky Flats Environmental Technology Site</u>		
<del>EG&amp;G</del> ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	GT.10, Rev. 2
	Page:	11 of 16
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

---

- Form GT.10A, Borehole Clearing Analysis (See Section 7.0, Documentation)

### 5.4.2 Field Procedure

A standard field procedure for collecting GPR data is described below. Prior to GPR data collection, two preliminary procedures must be conducted. These are:

- Design appropriate field parameters, given the purpose of the survey (orientation of lines or grid, grid spacing, frequency or antenna, antenna shielding, etc.).
- Locate endpoints along each line in addition to any other points of interest, and denote these locations in the field with lath or other wood stakes.

Design of appropriate field parameters must consider the following:

- The antenna and associated transmitter frequency used must optimize the penetration depth and required resolution given the survey purpose. Typical frequencies are 80 Mhz, 100 Mhz, 120 Mhz, 300 Mhz, 500 Mhz, and 1000 Mhz. Higher frequency antennas allow greater subsurface resolution, but penetration is reduced over that of lower frequencies. To optimize results, surveys should be designed to have a minimum of two antenna frequencies available. For most clearing applications, a 300 Mhz or 120 Mhz antenna will be appropriate.
- For grid areas, intraline spacing affects resolution; a spacing of 2 to 20 feet is commonly used for clearing applications. Actual spacing chosen must consider overall project objectives.

## BOREHOLE CLEARING

Rocky Flats Environmental Technology Site

~~ROCKY FLATS PLANT~~  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
GT.10, Rev. 2  
12 of 16  
March 1, 1992  
Environmental Management

Category 2

- Method of antenna towing must be evaluated given the site conditions. For smooth surfaces or terrain, the antenna can be towed directly on the surface. For areas with significant vegetation or surface stones and rocks, the antenna may need to be suspended 6-18 inches above the ground or carried in a plastic non-conductive wagon to prevent antenna damage and potentially dubious GPR data collection.
- Antenna shielding will be considered and appropriate shielding provided given the site conditions. Surface features such as fences, power lines, etc. can cause interfering reflections on the radar record.

A standard field procedure for conducting a GPR survey is described below.

1. Perform a visual survey along the proposed lines. The visual survey will include a review of site utility plans; check for overhead wires; check for manhole covers, buried cables, buried gas line indicators, or cased monitoring wells; and have site locators confirm the presence of any possible telephone and utility features. Note features in the field notebook.
2. In the field notebook, note excessive amounts of large pieces of metal on the ground surface.
3. In the field notebook, note large nearby variations in topography or building (within 50 feet).
4. Note moisture content of surveyed media, in addition to relative clay content, as these will affect penetration depths.

## BOREHOLE CLEARING

*Rocky Flats Environmental Technology Site*

~~EMD~~ ROCKY FLATS PLANT  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
GT.10, Rev. 2  
13 of 16  
March 1, 1992  
Environmental Management

Category 2

5. Conduct a test line using manufacturer's procedures. Instrument settings must be optimized to obtain appropriate data given project goals. Specific recording parameters that must be optimized include, but are not limited to, the following:

- Radar scan speed
- Signal range gain
- High and low pass filter settings
- Time range for recording
- Transmitter pulse rate
- Recording printer speed
- Antenna towing speed

Instrument settings should be varied during the test line to determine the optimum recording parameters. When possible, the test line should be conducted over a known buried feature in the survey area to help instrument setting optimization, and help calibrate penetration depths.

6. Initiate site survey traverse. Beginning at the GPR line endpoint, tow the antenna along the line with appropriate speed determined from test line, and use optimum instrument settings determined from the test line. Continue the above procedure for the entire line and subsequent grid lines.
7. If hard copies of each line of data from the printer are made, label all notations on the record to correspond to notes made in the field notebook, including recording parameters.
8. Permanent copies of this GPR data must be retained digitally on tape or disk, or on hard copy plots.

## BOREHOLE CLEARING

*Rocky Flats Environmental Technology Site*  
~~BORE ROCKY FLATS PLANT~~ Manual: 5-21000-OPS  
EMD MANUAL OPERATION SOP Procedure No.: GT.10, Rev. 2  
Page: 14 of 16  
Effective Date: March 1, 1992  
Category 2 Organization: Environmental Management

---

### 5.5 DATA ANALYSIS

When the anticipated hazards are isolated pieces of metal, borehole locations will be cleared to a minimum of 6 feet around the drilling location stake. In these cases, data will not be retained for later analysis, but the results will be documented on Form GT.10A. If an anomalous area within 6 feet of the borehole location stake is identified, the borehole location will be changed to an anomaly-free area within 50 feet of the original borehole location to minimize the possibility of contact with any anomalous material below the surface.

When the hazard is buried trenches or pits, larger areas will have to be geophysically surveyed to clear borehole locations. In these cases, electromagnetic data will be collected with a digital data logger. The data will be transferred to a personal computer for analysis. Adjustments to the boring location (if required) will be made after the data are analyzed and interpreted.

In both of the above cases, Form GT.10A will be used to document the procedures and reasoning for the relocation or approval of a borehole location.

At all times, geophysical data will be collected and interpreted in a conservative and prudent manner. Additionally, appropriate levels of caution will be exercised by all field crews involved in intrusive activities, even on geophysically "cleared" boring locations.

### 6.0 ADMINISTRATIVE BOREHOLE CLEARANCE

Administrative borehole clearance will be required for drilling operations at the RFP and will consist of excavation authorization. Copies of the required forms are included in Section 7.0, Documentation.

**BOREHOLE CLEARING**

*Rocky Flats Environmental Technology Site*

~~EG&G~~ ROCKY FLATS PLANT  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
GT.10, Rev. 2  
15 of 16  
March 1, 1992  
Environmental Management

Category 2

**6.1 RADIOLOGICAL WORK PERMIT**

Radiological work permits will be required for drilling operations in Radiologically Controlled Areas, which may include IHSSs. These permits will be issued by the Radiological Engineering Department. These permits will remain valid until completion of the work for which the permit was issued.

Daily work permits will be required for drilling operations within the Protected Area (PA).

The Radiological Work Permit will be kept at the drill site in the contamination reduction or support zone.

**6.2 SOIL DISTURBANCE ASSESSMENT AUTHORIZATION**

Operations involving drilling or excavating will require approval from the Soil Disturbance Assessment Committee prior to beginning work.

Initiation of the process begins by contacting the <sup>RMS</sup>~~EG&G~~ Environmental Operations Division and completing the Soil Disturbance Assessment Committee Evaluation Form (see Section 7.0, Documentation) with the project-specific information.

Approval by the Soil Disturbance Assessment Committee is required for each project and will be valid for a period of 60 days.

A copy of the approval form will be kept at the work site in the contamination reduction or support zone.

## BOREHOLE CLEARING

*Rocky Flats Environmental Technology Site*

~~EG&G ROCKY FLATS PLANT~~  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
GT.10, Rev. 2  
16 of 16  
March 1, 1992  
Environmental Management

Category 2

A Land Use Request Form (see Section 7.0, Documentation) will be required for excavation and/or drilling work in the RFP buffer zone.

### 7.0 DOCUMENTATION

A permanent record of the implementation of this SOP will be kept by documenting field observations and data. The date of the manufacturer's most recent calibration and certification will be documented if this information is available. Field calibration checks, geophysical observations, and data will be documented on the Borehole Clearing Analysis Form (Form GT.10A). Administrative clearances will be documented on the Environmental Management excavation authorization. The Soil Disturbance Assessment Committee Evaluation Form and Land Use Request form are attached.



SOIL DISTURBANCE ASSESSMENT COMMITTEE  
EVALUATION FORM

The purpose of this information is to assist the committee in identifying the potential hazard(s) associated with this soil disturbance.

REQUESTOR: Name \_\_\_\_\_ Group \_\_\_\_\_ Phone/Pager \_\_\_\_\_

JOB TITLE: \_\_\_\_\_ CHARGE # \_\_\_\_\_

Will the disturbance occur in or near an INDIVIDUAL HAZARDOUS  
SUBSTANCE SITE (IHSS, formerly SWMU)? \_\_\_\_\_

Are overhead utilities present? \_\_\_\_\_

Are underground utilities present? \_\_\_\_\_

Will a utility outage be required? \_\_\_\_\_

IS THE EXCAVATION FOR:

Trenching \_\_\_\_\_ Sampling \_\_\_\_\_ Driven rods/posts \_\_\_\_\_

Grounding \_\_\_\_\_ Post holes \_\_\_\_\_ Other types \_\_\_\_\_

IF SAMPLING: Soil removal by hand? \_\_\_\_\_ Drilling? \_\_\_\_\_

Depth of drilling \_\_\_\_\_ Diameter \_\_\_\_\_

IF CONSTRUCTION:

Hand digging only? \_\_\_\_\_

Will mechanical equipment be required? \_\_\_\_\_ What type? \_\_\_\_\_

Depth of excavation \_\_\_\_\_ Length of excavation \_\_\_\_\_

Width of excavation \_\_\_\_\_ Will shoring be required? \_\_\_\_\_

Requestor shall fill out this form and submit it along with information required in SOIL DISTURBANCE  
GUIDELINE to EXCAVATION ADMINISTRATOR.

R.J. LaBorde  
T130F  
X2538, D-0719

**LAND USE REQUEST**

SOW or CA Title:

Authorization No:

WC No:

Work Manager:

Group:

Phone No.:

Check the Boxes That Apply:

IAG Driven       Routine Program       Other

Regulatory Driven       Site Investigation

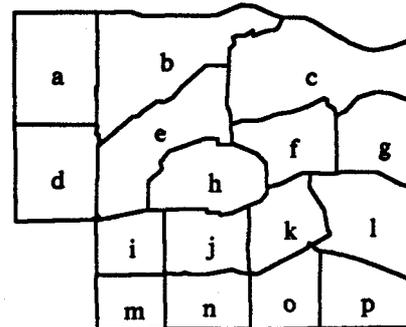
Describe \_\_\_\_\_

RCRA

CERCLA

Job Description/Objectives:

Location Description (Describe Below and Indicate on Locator Map to Right - Also Attach Detailed Plan and Location Map):



Emergency Contacts (Name and Number):

EG&G Project Manager:

Subcontractor Manager:

Plant Support Required? If Yes, List/Describe (If No, List Contractor Support To Be Provided):  Yes  No

Duration of Project (Include Start/End Dates):

Is This Follow-Up To Existing Work?  Yes  No

Contract No. \_\_\_\_\_ Title \_\_\_\_\_ Manager \_\_\_\_\_

Describe:

Note: Upon Contract Award, Submit List of Subcontract Personnel Needing Access to Buffer Zone

**AUTHORIZATION**

<input type="checkbox"/>	RECOMMEND REFERRAL TO RFP LONG RANGE PLANNING COMMITTEE
<input type="checkbox"/>	PERMISSION DENIED
<input type="checkbox"/>	REQUEST MORE INFORMATION AS SPECIFIED
<input type="checkbox"/>	PERMISSION GRANTED
	LMC Signature: _____
	Date: _____
	Control No. _____