

ROCKY FLATS PLANT  
EMD OPERATING  
PROCEDURES MANUAL  
VOLUME III: GEOTECHNICAL

Manual No.: 5-21000-OPS-GT  
Procedure No.: Table of Contents, Rev 50  
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Organization: Environmental Management

THIS IS ONE VOLUME OF A SIX VOLUME SET  
WHICH INCLUDES:

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EG&G  
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•DCN 92.05	EXPIRED	2	EXPIRED
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•93-DMR-000955	Form GT.2A Modification	2	01/10/94
•93-DMR-000960	QC Sample Collection Modification	2	01/10/94

ADMINISTRATIVE

DOCUMENT CLASSIFICATION REVIEW WAIVER  
PER R.B. HOFFMAN, CLASSIFICATION OFFICE  
JUNE 11, 1991

A-SW-001356

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DCN 92.03	EXPIRED	2	EXPIRED
DCN 93.01	Data Quality Objectives for PLF Investigations	2	02/10/93
•DCN 93.02	INCORPORATED	2	01/10/94
•DCN 93.03	INCORPORATED	2	01/10/94
•DCN 93.04	INCORPORATED	2	01/10/94
•93-DMR-000956	Form GT.3A Modification	2	01/10/94
GT.04	Rotary Drilling and Rock Coring	2	05/12/92
•93-DMR-000957	FORM GT.4A Modification	2	01/10/94
GT.05	Plugging and Abandonment of Boreholes	2	05/12/92
•DCN 92.01	INCORPORATED	2	01/10/94
•DCN 93.01	INCORPORATED	2	01/10/94
•93-DMR-000961	Form GT.5A Modification	2	01/10/94
GT.06	Monitoring Wells and Piezometer Installation	2	05/12/92
DCN 92.05	EXPIRED	2	EXPIRED
DCN 92.06	EXPIRED (replaced with DCN 93.01)	2	EXPIRED
•DCN92.07	EXPIRED ProvideConsistency	2	EXPIRED
•DCN 93.01	EXPIRED Borehole Advancement	2	EXPIRED
DCN 93.02	Well Point Installation	2	01/28/93
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DCN 93.05	Temperatures - 5.3.2.3 Revised	2	02/10/93
DCN 93.06	Provide Numbers to Reference Corresponding Items	2	02/23/93
DCN 93.07	DCN 93.01 Modification	2	03/17/93
DCN 93.08	PVC Schedule Change	2	05/10/93
DCN 93.09	Change to PVC Casing Thickness	2	05/11/93
DCN 93.10	SVE Bentonite Chips	2	08/20/93
DCN 93.11	SVE Well Specifications	2	08/20/93
DCN 93.12	Riser Installation	2	09/02/93
DCN 93.13	Cancel DCN 93.11, Item #1 for OU 2 SVE Study	2	10/06/93
DCN 93.14	Revision of Figure GT.6-3	2	10/06/93
GT.07	Logging and Sampling of Test Pits and Trenches	2	05/12/92

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DCN 92.01	EXPIRED	2	EXPIRED
DCN 92.02	EXPIRED Consistency Change	2	EXPIRED
DCN 93.01	EXPIRED Work Plan Consistency	2	EXPIRED
DCN 93.02	New Section-Surficial Profiling	2	01/15/93
DCN 93.03	CDH Compliance	2	01/25/93
DCN 93.04	Site Identification	2	04/13/93
DCN 93.05	Sample Volumes	2	04/13/93
DCN 93.06	Data Form Replacement	2	10/06/93
GT.09	Soil Gas Sampling and Field Analysis	2	05/12/92
GT.10	Borehole Clearing	2	05/12/92
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•93-DMR-000962	Form GT.11A Modification	2	01/10/94
GT.15	Geophysical Borehole Logging	2	05/12/92
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GT.18	Surface Geophysical Surveys	2	05/12/92
•DCN 92.01	Surface Magnetic Surveys Procedure	2	EXPIRED
•DCN 92.02	Modification to Stacking Requirements	2	EXPIRED
•DCN 92.03	Modification to Method of Taking Readings	2	EXPIRED
DCN 93.01	5.4 Field Procedure Revisions	2	01/25/93
DCN 93.02	5.5 Time Domain Electromagnetic Metal Detection	2	11/22/93
GT.19	Field Gas Chromatographs	2	05/12/92
GT.20	Procedures for Soil Interstitial Water Sampling and Sampler Installation	2	05/12/92
GT.21	Cone Penetrometer Testing	1	05/12/92
DCN 93.01	CPT Rods	1	01/15/93
DCN 93.02	Offsets	1	03/17/93

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GT.24	Approval Process for Construction Activities on or Near Individual Hazardous Substance Sites (IHSSs)	0	05/12/92

**DOCUMENT MODIFICATION REQUEST (DMR)**

Refer to 1-A01-PPG-001 for Processing Instructions.  
Print or Type All Information (Except Signatures).

1. Date 11-2-93	25. DMR No. 93-DMR-000957
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2. Existing Document Number/Revision 5-21000-OPS-GT.04/Rev. 2	3. New Document Number or Document Number if it is to be changed with this Revision N/A
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4. Originator's Name/Phone/Pager/Location P. A. Kiefer, X8698, 080	5. Document Title RR 11/22/93 Rotary drilling and Rock Coring
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6. Document Type <input checked="" type="checkbox"/> Procedure <input type="checkbox"/> Other	7. Document Modification Type (Check only one) <input type="checkbox"/> New <input type="checkbox"/> Revision <input checked="" type="checkbox"/> Intent Change <input checked="" type="checkbox"/> Nonintent Change <input type="checkbox"/> Editorial Correction <input type="checkbox"/> Cancellation
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8. Item	9. Page	10. Step	11. Proposed Modifications
1	3	4.2	Add reference as identified on attached.
2	9,10	7.0	Change requirements of Daily Field Drilling Activities Report as identified on attached
3	FORM GT 4A		Eliminate. Information will be recorded on GT.2A

12. Justification (Reason for Modification, EJO #, TP #, etc.)

Eliminate GT.4A, as all information will be recorded on GT.2A which is a combination of GT.2A, GT.3A, GT.4A and FO.14E.

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PER R.B. HOFFMAN, CLASSIFICATION OFFICE  
JUNE 11, 1991

If modification is for a new procedure or a revision, list concurring disciplines in Block 13, and enter N/A in Blocks 14 and 15. If modification is for any type of change or a cancellation, organizations are listed in Block 13, then Concurrors prints, and signs in Block 14, and dates in Block 15.

13. Organization	14. Print, Sign (if applicable)	15. Date (if applicable)
SME	T. P. Lovseth <i>Timothy Lovseth</i>	11-10-93
SM	P. A. Kiefer <i>P. A. Kiefer</i>	11-2-93
EQS	M. C. Brooks (RR) <i>M. C. Brooks</i>	12-13-93
COM	C. M. Broussard <i>C. M. Broussard</i>	12-09-93
RPM	W.S. Busby <i>W.S. Busby</i>	12-13-93

16. Originator's Supervisor (print/sign/date)  
D. D. Stagg *D. D. Stagg 11/2/93*

17. Assigned SME/Phone/Pager/Location T.P. Lovseth / 8706/5134/080-223	18. Cost Center 0202	19. Charge Number ER-GT	20. Requested Completion Date 12/15/93	21. Effective Date 1-10-94
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22. Accelerated Review? Yes  No  23. ORC Review  
ORC Review NOT Required

24. Responsible Manager (print/sign/date)  
Steve Singer *Steve Singer* 12/13/93

ROTARY DRILLING AND ROCK CORING

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- SOP GT.10, Borehole Clearing
- SOP FO.14, Field Data Management
- SOP GT.24, Approval Process for Construction Activities on or Near Individual Hazardous Substance Sites (IHSSs)

5.0 EQUIPMENT AND PROCEDURES

5.1 GENERAL

Rotary drilling and rock coring methods that use air or water as the drilling media are common techniques employed to obtain stratigraphic, lithologic, hydrogeologic, geotechnical, and environmental data, as well as a means for monitoring well installation. In general, hollow-stem continuous-flight augers will be the preferred technique for drilling boreholes to collect environmental samples of soil and rock (see SOP GT.2, Drilling and Sampling Using Hollow-Stem Auger Techniques). The use of air or water can alter analytical chemistry or physical property test results by altering sample moisture, by volatilizing contaminants (in the case of air), or by washing

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## ROTARY DRILLING AND ROCK CORING

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runs. The core barrels and measuring tapes will be decontaminated after each boring is complete.

- Drilling equipment. Decontamination (augers, drill stems, drill bits, and other downhole equipment) will be conducted after each boring is complete. The drill rig will be decontaminated when moved to a new work area that has a different contaminant characterization. Decontamination of drilling equipment is described in SOP FO.4, Heavy Equipment Decontamination.

### 7.0 DOCUMENTATION

All information required by this SOP will be documented on the Borehole Log Form (Form GT.1A) and the ~~Rotary/Core Drilling Field Activities Report Form (Form GT.4A)~~ Daily Field Drilling Activities Report Form (Form GT.2A). The Daily Field Drilling Activities Report Form will be filled out for each day of drilling at a given borehole location and, in situations where more than one boring is drilled and completed per day per drill rig, at least one form will be completed per boring. The borehole log will include information on subsurface material classification and lithology. ~~Information on core length, core loss, percent of recovery, core breakage due to discontinuities, total core breakage, and rock classification and lithology will be recorded on the log form.~~ The Daily Field Drilling Activities Report will include the following information and have space for comments and documentation of general observations:

- Project name and bore identification
- Location code
- Subcontractor
- Date
- Weather conditions
- Equipment descriptions (rig, bits, etc.)
- Drilling company and driller

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## ROTARY DRILLING AND ROCK CORING

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- Geologist and other crew members ~~(with subcontractors)~~
- Borehole depth ~~and diameter~~
- ~~Water level~~
- ~~Sample number~~
- ~~Depth to bedrock~~
- ~~QC Code~~
- ~~Time~~
- ~~Sampling types and depths~~
- ~~QMD and radiological readings~~
- Drilling fluid used
- ~~Drilling fluid return/loss and pressures~~
- ~~Compressor/pump type~~
- End-of-day status (in progress of drilling complete)
- Chronological record of activities

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The above information shall be entered into the field data capture program (Datacap) (see procedure FO.14, Field Data Management).

### ROTARY/CORE DRILLING FIELD ACTIVITIES REPORT

PROJECT NAME \_\_\_\_\_

BOREHOLE IDENTIFICATION \_\_\_\_\_ DATE \_\_\_\_\_

WEATHER CONDITIONS \_\_\_\_\_

RIG TYPE \_\_\_\_\_

DRILLER & DRILLING COMPANY \_\_\_\_\_

GEOLOGIST \_\_\_\_\_

CREW MEMBER(S) \_\_\_\_\_

SUBCONTRACTOR(S) \_\_\_\_\_

TOTAL DEPTH (FT) \_\_\_\_\_ BORING DIAMETER (IN) \_\_\_\_\_

DEPTH TO BEDROCK (FT) \_\_\_\_\_ WATER LEVEL (FT) \_\_\_\_\_

BIT: TYPE & SIZE I.D. (IN) \_\_\_\_\_

SAMPLING TYPES & DEPTHS (FT) \_\_\_\_\_

CASING: TYPE & SIZE (IN) \_\_\_\_\_

CASING HAMMER SIZE (LB) \_\_\_\_\_

DRILLING FLUID TYPE \_\_\_\_\_

FLUID RETURN/LOSS AND  
PRESSURES \_\_\_\_\_

COMPRESSOR/PUMP TYPE \_\_\_\_\_

END OF DAY STATUS (CHECK 1)  In Progress  Drilling Completed

CHRONOLOGICAL RECORD OF ACTIVITIES (AND COMMENTS)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

COMPLETED BY: \_\_\_\_\_  
Print Name Signature Date

SUBCONTRACTOR: \_\_\_\_\_

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