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**ROCKY FLATS PLANT  
EMD OPERATING  
PROCEDURES MANUAL**

**Manual No.: 5-21000-OPS-GT  
Procedure No.: Table of Contents, Rev 40  
Page: 1 of 3  
Effective Date: 05/10/93  
Organization: Environmental Management**

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

- VOLUME I: FIELD OPERATIONS (FO)**
- VOLUME II: GROUNDWATER (GW)**
- VOLUME III: GEOTECHNICAL (GT)**
- VOLUME IV: SURFACE WATER (SW)**
- VOLUME V: ECOLOGY (EE)**
- VOLUME VI: AIR (AP)**

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FOR VOLUME III: GEOTECHNICAL**

<b>Procedure No.</b>	<b>Title</b>	<b>Rev. No.</b>	<b>Effective Date</b>
GT.01	Logging Alluvial and Bedrock Material	2	05/12/92
DCN 92.01	Specialized Logging Form	2	11/13/92
DCN 93.01	Logging	2	01/15/93
DCN 93.02	Logging Deliverables Standard Practices	2	01/25/93
GT.02	Drilling and Sampling Using Hollow Stem Auger Techniques	2	05/12/92
DCN 92.01	Superseded by DCN 92.03	2	07/27/92
DCN 92.02	Superseded by DCN 92.03	2	07/27/92
DCN 92.03	Addition of the Drum Characterization	2	07/27/92
DCN 92.04	Prevention of Down Hole Contamination	2	08/26/92
DCN 92.05	Field Modification	2	12/04/92
DCN 93.01	Analytical Samples	2	01/25/93
DCN 93.02	Drum Characterization	2	03/17/93
GT.03	Isolating Bedrock from Alluvium with Grouted Surface Casing	2	05/12/92
DCN 92.03	Expired	2	09/03/92
DCN 93.01	Data Quality Objectives for PLF Investigations	2	02/10/93
*DCN 93.02	PVC/UHSU/Grout Changes	2	05/10/93

**ADMIN RECORD**

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

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GT.04	Rotary Drilling and Rock Coring	2	05/12/92
GT.05	Plugging and Abandonment of Boreholes	2	05/12/92
DCN 92.01	Field Modification	2	12/09/92
DCN 93.01	5.2 Revision	2	02/04/93
GT.06	Monitoring Wells and Piezometer Installation	2	05/12/92
DCN 92.05	Schematic Diagram Land Fill Methane Wells	2	06/04/92
DCN 92.06	EXPIRED (replaced with DCN 93.01)	2	
DCN 92.07	Provide Consistency	2	12/17/92
DCN 93.01	Borehole Advancement	2	01/04/93
DCN 93.02	Well Point Installation	2	01/28/93
DCN 93.03	Piezometer Logging Modification	2	02/04/93
DCN 93.04	Wells - 5.3.2.2 Revised	2	02/10/93
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
GT.07	Logging and Sampling of Test Pits and Trenches	2	05/12/92
GT.08	Surface Soil Sampling	2	05/12/92
DCN 92.01	Clarification of Soil Sampling	2	09/03/92
DCN 92.02	Consistency Change	2	10/12/92
DCN 93.01	Work Plan Consistency	2	01/05/93
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
GT.09	Soil Gas Sampling and Field Analysis	2	05/12/92
GT.10	Borehole Clearing	2	05/12/92
GT.11	Plugging and Abandonment of Wells	2	05/12/92

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<b><u>Procedure No.</u></b>	<b><u>Title</u></b>	<b><u>Rev. No.</u></b>	<b><u>Effective Date</u></b>
GT.15	Geophysical Borehole Logging	2	05/12/92
GT.17	Land Surveying	2	05/12/92
GT.18	Surface Geophysical Surveys	2	05/12/92
DCN 92.01	Surface Magnetic Surveys Procedure	2	09/30/92
DCN 92.02	Modification to Stacking Requirements	2	10/15/92
DCN 92.03	Modification to Method of Taking Readings	2	10/15/92
DCN 93.01	5.4 Field Procedure Revisions	2	01/25/93
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
GT.24	Approval Process for Construction Activities on or Near Individual Hazardous Substance Sites (IHSSs)	0	05/12/92

**ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT  
 DOCUMENT CHANGE NOTICE (DCN)**

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DOCUMENT NUMBER Procedure No. 5-21000-OPS-GT.3 Rev. 2

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TITLE Isolating Bedrock from the Alluvium with Grouted Surface Casing	DATE <u>5-10-93 RD</u> <i>M.E. 4/17/93</i> <del>April 11, 1993</del>	DCN NUMBER <del>GT.3-93</del> 93.02
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EXPIRES: ~~December 31, 1993~~ 5-10-94 RD PROCEDURE REVISION REQUIRED  YES  NO

SCOPE LIMITATION: ~~OU2 Bedrock~~ NA 5/6/93 None

Item Number	Page	Step or Paragraph	Changes (Use DCN CONTINUATION SHEET for additional space)
(1)	5 of 10	Section 5.1.1	Replace schedule 40 PVC with schedule 80 PVC. <i>(First sentence)</i>
(2)	6 of 10	Section 5.2	Replace the last paragraph with the following: Surface casing will be emplaced to a depth that will isolate the upper hydrostratigraphic unit (UHSU). If the core samples indicate siltstone or sandstone immediately below the base of the UHSU, the auger hole will be terminated at the base of the UHSU and the surface casing will be emplaced to the base of the UHSU. If claystone, surface casing will be embedded a minimum of 3 feet into the lower hydrostratigraphic unit (LHSU).
(3)	6 of 10	Section 5.3	<i>Replace entire section w/ the following</i> Place surface casing with threaded PVC cap or rubber plug on bottom end into borehole. Fill surface casing with potable water to ensure positive pressure. Following installation of surface casing in the borehole, a <sup>2 to 3</sup> foot thick bentonite seal consisting of 1/4-inch compressed bentonite pellets will be placed at the bottom of the annulus surrounding the surface casing. If the borehole annulus does not contain water, potable water will be added to hydrate the pellets prior to grouting. Following the installation of the bentonite seal the grout seal will be emplaced. The grout mixture will be emplaced in the annular space between the augers or drill casing and surface casing. Upon removal of each section of auger or drill casing, additional grout will be added to the annulus. The grout will be emplaced by means of a tremie pipe. The grout will be allowed to set for 24 hours.

Justification (Reason for change - Provide numbers to reference corresponding items above.)

- To increase strength of PVC surface casing.
- To insure the UHSU is isolated and to prevent potential cross contamination between UHSU and LHSU.
- To prevent grout contamination downhole.

Concurrence	Organization	Req.	Date	Concurrence	Organization	Req.	Date
<i>[Signature]</i>	QAPM	X	5/6/93	<i>[Signature]</i>	User	X	4/14/93
<i>[Signature]</i>	EOM		4/15/93	<i>[Signature]</i>	EQS		4/29/93
				<i>[Signature]</i>	User		5/6/93

13. Approval of Responsible Manager <i>[Signature]</i>	14. Date 4/14/93	15. Is Posting Required yes Upon Receipt	16. if Yes, by what date Upon Receipt	17. Date Posted
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**DOCUMENT CLASSIFICATION REVIEW WAIVER  
 PER R.B. HOFFMAN, CLASSIFICATION OFFICE  
 JUNE 11, 1991**