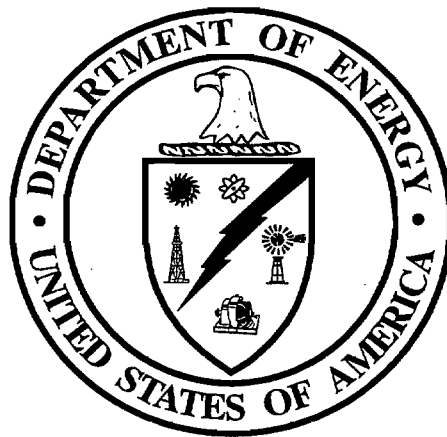


**DOE/OR/07-1895/V2&D1
PRIMARY DOCUMENT**

**Remedial Investigation Report
for Waste Area Grouping 3
at the
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**

**Volume 2 of 4
Appendixes A-F**



September 2000

CLEARED FOR PUBLIC RELEASE

**Remedial Investigation Report
for Waste Area Grouping 3
at the Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**

Volume 2 of 4. Appendixes A–F

Date Issued—September 2000

Prepared for the
U.S. Department of Energy
Office of Environmental Management

by

BECHTEL JACOBS COMPANY LLC
managing the
Environmental Management Activities at the
Paducah Gaseous Diffusion Plant
under contract DE-AC05-98OR22700
for the
U.S. DEPARTMENT OF ENERGY

**Remedial Investigation Report
for Waste Area Grouping 3
at the Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**

Volume 2 of 4. Appendixes A-F

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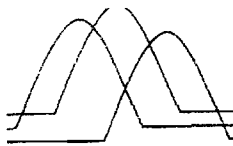
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APPENDIX A
SURFACE GEOPHYSICAL SURVEY



NAEVA GEOPHYSICS INC.

A SUBSIDIARY OF NORTH AMERICAN EXPLORATION OF VIRGINIA INC.

Subsurface Geophysical Surveys

GPR
MAGNETICS
ELECTROMAGNETICS
SEISMICS
RESISTIVITY
UTILITY LOCATION
BOREHOLE LOGGING
BOREHOLE CAMERA
STAFF SUPPORT

Results of Subsurface Investigation

Paducah Gaseous Diffusion Plant
WAG 3 – SWMU's 4, 5, & 6
Paducah, Kentucky

Prepared for: CDM Federal Programs Corporation
Fairfax, Virginia

Date of Investigations: March 23 - 27, 1999

Prepared by:

Jon Guillard
Project Geologist

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**Results of Subsurface Investigation
PGDP WAG 3 – SWMU's 4, 5, & 6
Paducah, Kentucky**

Introduction

On March 23 - 27, 1999, NAEVA Geophysics Inc. conducted subsurface investigations on WAG 3 – SWMU's 4 (C-747 contaminated burial yard), 5 (C-746-F classified burial yard), & 6 (C-747-B burial ground) at the U.S. Department of Energy (DOE) owned Paducah Gaseous Diffusion Plant in Paducah, Kentucky. The investigated sites were located inside of the security fence of the plant and were mainly open grassy areas with the exception of SWMU 6, which is a radiological contamination area containing stored (contaminated) equipment and metal debris. The purpose of the investigations was to delineate the extent of burial/trench areas within each SWMU.

Methods

The equipment selected for the investigations in SWMU's 4, 5, & 6 included a Geonics EM-31 terrain conductivity meter (SN# 9419005), a Geonics EM-61 electromagnetic (EM) metal detector (SN# 950707), and a Sensors & Software Noggin 250 MHz shielded monostatic antenna ground-penetrating radar unit (SN# 000001710008).

The EM-31 is an electromagnetic frequency-domain instrument primarily used to measure ground conductivity. The EM-31 provides an output of both the quadrature-phase (terrain conductivity) and inphase components of the induced electromagnetic field, which are recorded simultaneously. The quadrature-phase is a measurement of the conductivity in milliSiemens per meter (mS/m). Terrain conductivity is a function of porosity, degree of saturation, and the conductivity of the subsurface materials. The absolute values of terrain conductivity are not usually diagnostic, but their spatial variations are important. The ability to identify lateral variations in shallow subsurface materials makes quadrature-phase EM-31 data very useful in the delineation of soil changes and a variety of buried features. While the inphase, in general, is a better detector of metal, the quadrature-phase is more sensitive to linear features (e.g. utilities, pipelines, etc.), which are at least partially, in electrical contact with the ground.

The inphase component of the EM-31 data is primarily used in searching for buried metal, and is measured in units of relative parts per thousand (ppt) of the magnetic field. A negative instrument response is

generally expected over areas containing shallow buried metal (both ferrous and nonferrous).

The EM-61 is a time-domain EM metal detector capable of mapping the locations of buried metal with very good resolution. The EM-61 consists of two electrical coils that measure secondary magnetic fields generated by metallic objects in response to an induced EM field. At each site, only data from the bottom coil was used due to its greater sensitivity.

GPR provides a high-resolution, cross-sectional image of the shallow subsurface. A short pulse of electromagnetic energy is radiated into the subsurface. When this pulse strikes an interface between layers of material with different electrical properties, part of the wave reflects back, and the remaining energy continues to the next interface. As the antenna is moved along the surface at a consistent pace and data are collected continuously along profiles, a cross-sectional image of subsurface conditions is created. Buried materials can generally be identified, if the soil conditions are right, by the hyperbolic or chevron-shaped anomaly they cause in a radar data profile.

The data were temporarily stored in a Hewlett-Packard 200 LX palm-top computer (SN# SG50500335) for the EM-31 and a Omni Data Polycorder (SN# 6175939) for the EM-61. The data were then downloaded into a Toshiba Satellite 335CDS laptop computer (SN# 78881950A) for on-site processing using Geonics' DAT-31, DAT-61, Golden's Surfer, and SPIView software. Final presentation-quality maps were produced using Golden's Surfer, Autodesk's AutoCAD (Release 14), and Visio's Visio 5.0 software.

Quality Assurance/Quality Control

Calibration checks of the EM-31 and EM-61 were conducted outside of the survey area for SWMU's 4 & 6 (both at SWMU's 4 grid coordinates 0N+100E), and inside of the survey area for SWMU 5 (grid coordinates 80N+10E). All of the calibration checks were performed away from possible influences of culture (e.g. high voltage power lines, metal debris, etc.) using the manufacturer's standard procedure prior to data collection each day. All readings were within acceptable limits.

Additionally, a standard evaluation of consistency was conducted with the EM-31 & EM-61 repeating several survey lines of each grid. These lines are 100N & 120N for SWMU 4, 180N for SWMU 5, and 180N (EM-61), 190N (EM-31) & 200N for SWMU 6. The successful "repeatability" of the anomalous character of the lines viewed in profile validates the data. Also stationary static tests were performed for each SWMU using the EM-61 bottom receiver coil. The results of these tests are displayed in Appendix A.

Survey Design

SWMU 4

A grid of east-west traverses was established across an approximate 7-acre site at 20-foot intervals. EM-31 data were then collected at a 5-foot station spacing and EM-61 data collected at 0.656-foot station spacing along these traverses. All cultural features evident within the survey area were mapped and tied to local grid coordinates. Labeled wooden stakes were set at grid coordinates 100N+100E, 660N+100E, and 660N+640E for the purpose of grid reacquisition (figure 1).

SWMU 5

A grid of east-west traverses was established across an approximate 4-acre site at 20-foot intervals within the perimeter fence of the classified burial yard (SWMU 5). EM-31 data were then collected at a 5-foot station spacing and EM-61 data collected at 0.656-foot station spacing along these traverses. All cultural features evident within the survey area were mapped and tied to local grid coordinates. Labeled wooden stakes were set at grid coordinates 0N+0E, 0N+820E, 180N+0E, and 180N+ 820E for the purpose of grid reacquisition (figure 5).

SWMU 6

A grid of east-west traverses was established across an approximate 0.5-acre site at 10-foot intervals within the boundaries of the radiological contamination area burial ground (SWMU 6). The size of the survey area was reduced to this magnitude due to cultural obstructions (contaminated equipment). EM-31 data were then collected at 5-foot station spacing and EM-61 data collected at 0.656-foot station spacing along these traverses. Ground penetrating radar (GPR) lines/profiles were then run over a suspect EM anomaly. All cultural features evident within the survey area were mapped and tied to local grid coordinates. Labeled wooden stakes were set at grid coordinates 120N+210E, 100N+410E, 200N+200E, and 200N+ 410E for the purpose of grid reacquisition (figure 9).

Results

SWMU 4

Referring to figures 2, 3, and 4, there is good correlation between all three methods in defining the extents of the suspected burial areas in SWMU 4, especially between the terrain conductivity and the EM-61 bottom coil data contours. The EM-31 survey identified four distinct anomalous areas within the SWMU.

The only anomalous area completely confined within the surveyed area is the largest of the anomalies and was assigned the number "1" (refer to figure 1 for the approximate outline boundaries and their corresponding numbers of the four areas). This anomaly lies in the central-west central part of the survey area and covers ~ 1 acre. It trends in an east-west direction with a smaller north-south trending spur on the western edge. It is possible that the source(s) of this spur is separate. However, its proximity to the larger anomaly is too close for distinction. Both the EM-31 inphase and EM-61 data indicate that concentrations of buried metallic debris are scattered throughout this anomaly.

Anomalous area 2 lies in the north-central part of the survey area and trends north-south. It covers ~ 0.5 acres. Since this anomaly continues north into the radiological contamination area, and potentially beyond, its full extent is not known. The EM-31 inphase and the EM-61 data suggest that the majority of buried metallic debris is concentrated in the northern and western part of this anomaly.

Anomalous area 3 lies in the northeastern part of the survey area. It trends in an east-west direction and is ~ 0.2 acres in size. Again, its full extent is not known because it continues north into the radiological contamination area. It appears (when reviewing the EM-31 inphase and EM-61 data) that buried metallic material is scattered throughout this anomaly.

Anomalous area 4 is the smallest of the four areas and lies in the northwestern part of the survey area. It trends in a north-south direction and covers ~ 0.1 acres. Again, it continues west into the radiological contamination area. As in anomalous area 3, buried metallic material is scattered throughout this anomaly.

The only other significant anomaly is in the location of a mapped water line. It lies in the southern part of the survey area and roughly trends from grid coordinates 100N+120E to 340N+640E.

In addition to the above-mentioned anomalies, the inphase and EM-61 data identified several discreet metallic anomalies. The coordinates for these anomalies are: 400N+320E, 400N+355E,

400N+550E, 420N+470E, 440N+540E, 440N+600E, 460N+505E, 460N+615E, 480N+235E, 520N+475E, 520N+605E, 560N+225E, and 600N+530E. At the request of CDM, NAEVA place CPT stakes at these grid coordinates 420N+220E (CPT-04-01) and 580N+430E (CPT-04-02).

SWMU 5

Referring to figures 6, 7, and 8, there is a good correlation between all three methods used in defining the extent of the suspected burial/trench area in SWMU 5. Although no discrete trenches were identified, a large suspected burial area is prevalent east of grid line 120E, and continues through grid line 820E. The anomalous area appears to end at the edge of the east-west trending gravel road in the northern part of the survey area and continues at least to the perimeter fence to the east and south. Cultural influences were mainly identified in the EM-31 data. These included the perimeter fence along grid line 0E, grid line 0N and a culvert in the southwestern part of the survey area. The EM-61 identified additional anomalies west of grid line 120E. The data suggest that discrete near-surface objects cause these anomalies. They are located at grid coordinates 120N+35E, 140N+10E, 140N+70E, 140N+105E, 140N+125E, 160N+135E, 180N+20E, and 180N+55E.

SWMU 6

Referring to figures 10, 11, and 12, there is good correlation between the EM-31 and the EM-61 data in defining the extents of a suspected burial area in SWMU 6, particularly between the terrain conductivity and the EM-61 bottom coil data contours. The EM-31 and EM-61 surveys identified one distinct anomalous area within this SWMU. This anomalous area is ~ 0.07 acres in size and is approximately centered at grid coordinates 150N+295E. Ground penetrating radar (GPR) lines/profiles were then run over this suspected anomaly. The GPR data did not provide any additional conclusive information. The GPR profile lines are illustrated on figure 9 and hard copies are in appendix B. Known cultural features can explain the remaining geophysical anomalies identified. These features are the vehicles/equipment/metal debris areas, the generator, the forklift, the mower, and the culvert/metal pipe (refer to figure 1 for the grid locations of these anomalies). At the request of CDM, NAEVA place a CPT stake at grid coordinates 180N+360E (CPT-06-01).

Conclusions

SWMU 4

NAEVA Geophysics Inc. identified four suspected burial areas within this SWMU. The only cultural anomaly identified is a known


(mapped) water line. All of the suspected burial areas are north of the water line and three out of the four extend beyond the area of investigation into radiological contamination areas outside of the area of investigation. These radiological contamination areas prevented NAEVA from confirming the extent of the anomalous areas. Two radiological contamination areas within the area of investigation also prevented data collection; however, cover was adequate on all sides of these areas such that interpretation was not seriously affected. The individual small discrete anomalies are also located north of the water line and a majority of them are located east of the north-south gravel road. Because of the line spacing (in this case 20 feet), the size and extent of small anomalies such as these cannot be accurately interpreted. It is believed, however, that a number of them, though not all, are single source near-surface anomalies.

SWMU 5

NAEVA Geophysics Inc. identified a suspected burial area within this SWMU located approximately east of grid line 120E through 820E. The extent is conclusive to the west and north (it appears to end at the gravel road) but inconclusive to the east and south because of the perimeter fence. Discrete individual trench-like features are not apparent in the data.

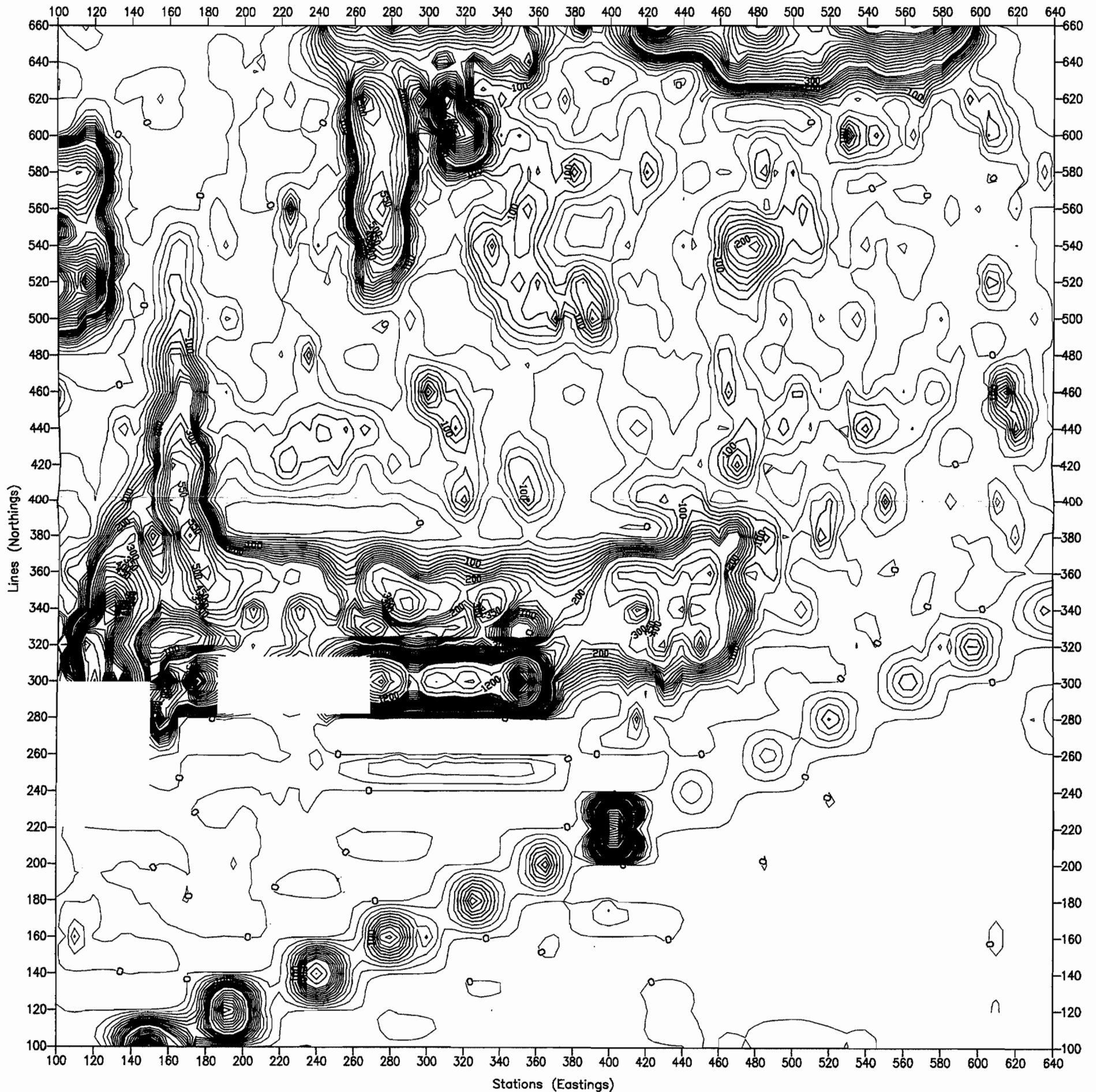
SWMU 6

NAEVA Geophysics Inc. identified a suspected burial area within this SWMU. Due to cultural obstructions (contaminated equipment), adequate coverage was not achievable in these areas, therefore, the area of investigation had to be modified from its original scope. The extent of the anomalous area is conclusive in the EM methods although the GPR profiles did not show any conclusive hyperbolic events. The most probable cause for the lack of GPR confirmation is that the soil conditions at the site prevented adequate penetration. To investigate the area further, the cultural obstructions would have to be moved out of the area of investigation.




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FIGURE 4
 CLIENT: CDM FEDERAL PROGRAMS CORP.
 EM-61 BOTTOM COIL CONTOURS
 WAG 3 - SWMU 4
 PADUCAH GASEOUS DIFFUSION PLANT
 PADUCAH, KENTUCKY
 DATE OF SURVEY: MARCH 23-25, 1999

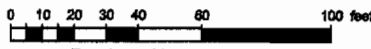


EM-61 BOTTOM COIL DATA

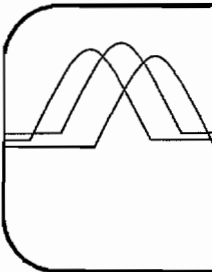
Range	Contour Interval	Color
0 to 60	20 mV	Cyan
80 to 160	20 mV	Blue
180 to 300	20 mV	Green
350 to 1000	50 mV	Red
> 1000	200 mV	Magenta



Approximate

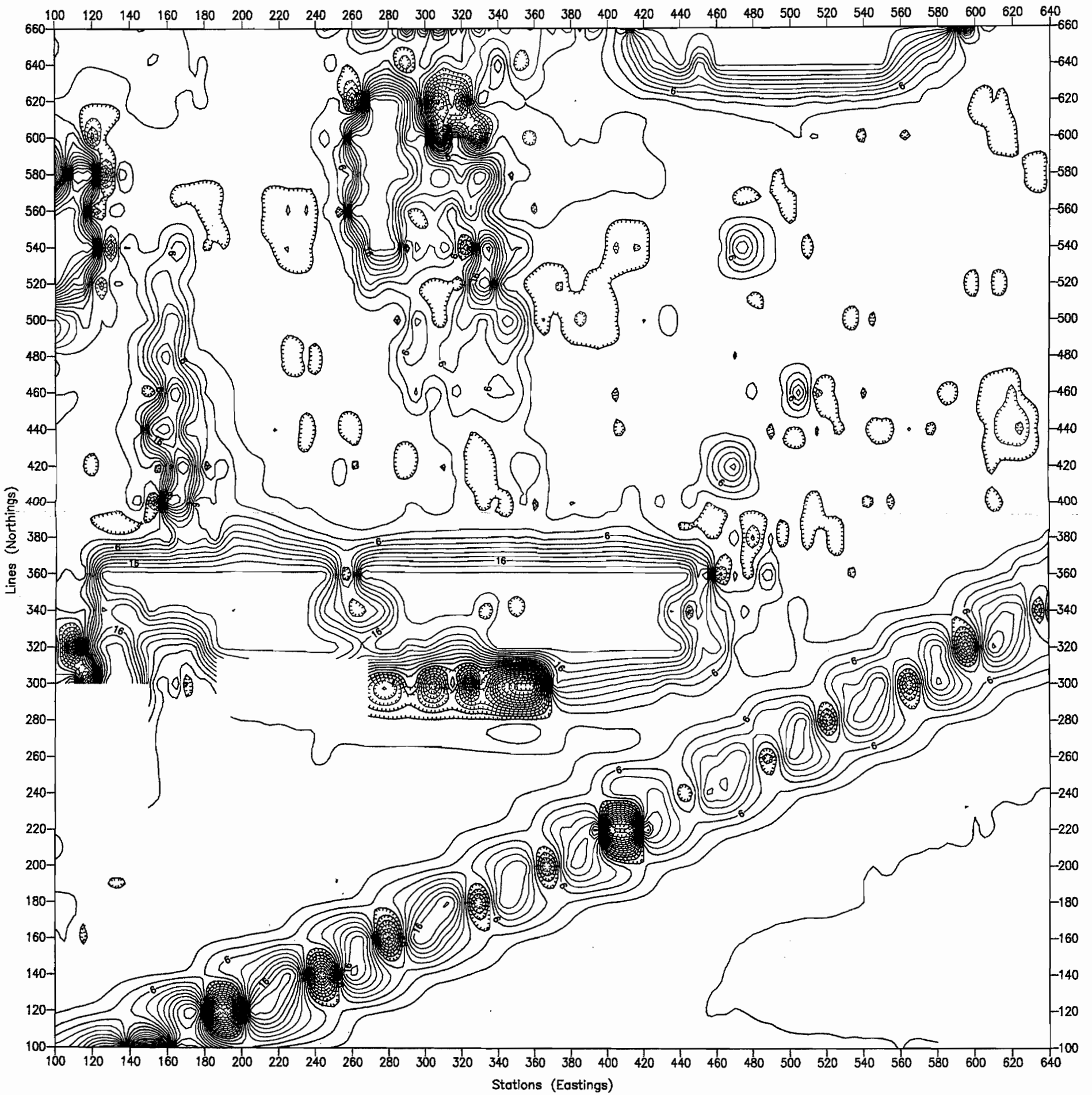


Scale: 1 in = 60ft



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FIGURE 3
 CLIENT: CDM FEDERAL PROGRAMS CORP.
 EM-31 INPHASE CONTOURS
 WAG 3 - SWMU 4
 PADUCAH GASEOUS DIFFUSION PLANT
 PADUCAH, KENTUCKY
 DATE OF SURVEY: MARCH 23-25, 1999

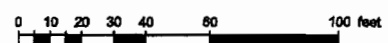


CONTOUR INTERVAL: 2 ppt

Range	Color
< 0	Cyan
0 to 6	Blue
8 to 12	Green
> 12	Red



Approximate



Scale: 1in = 60ft

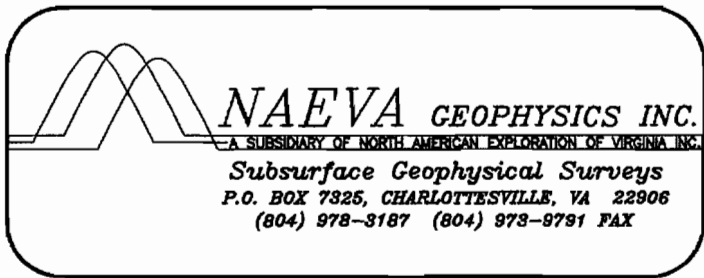
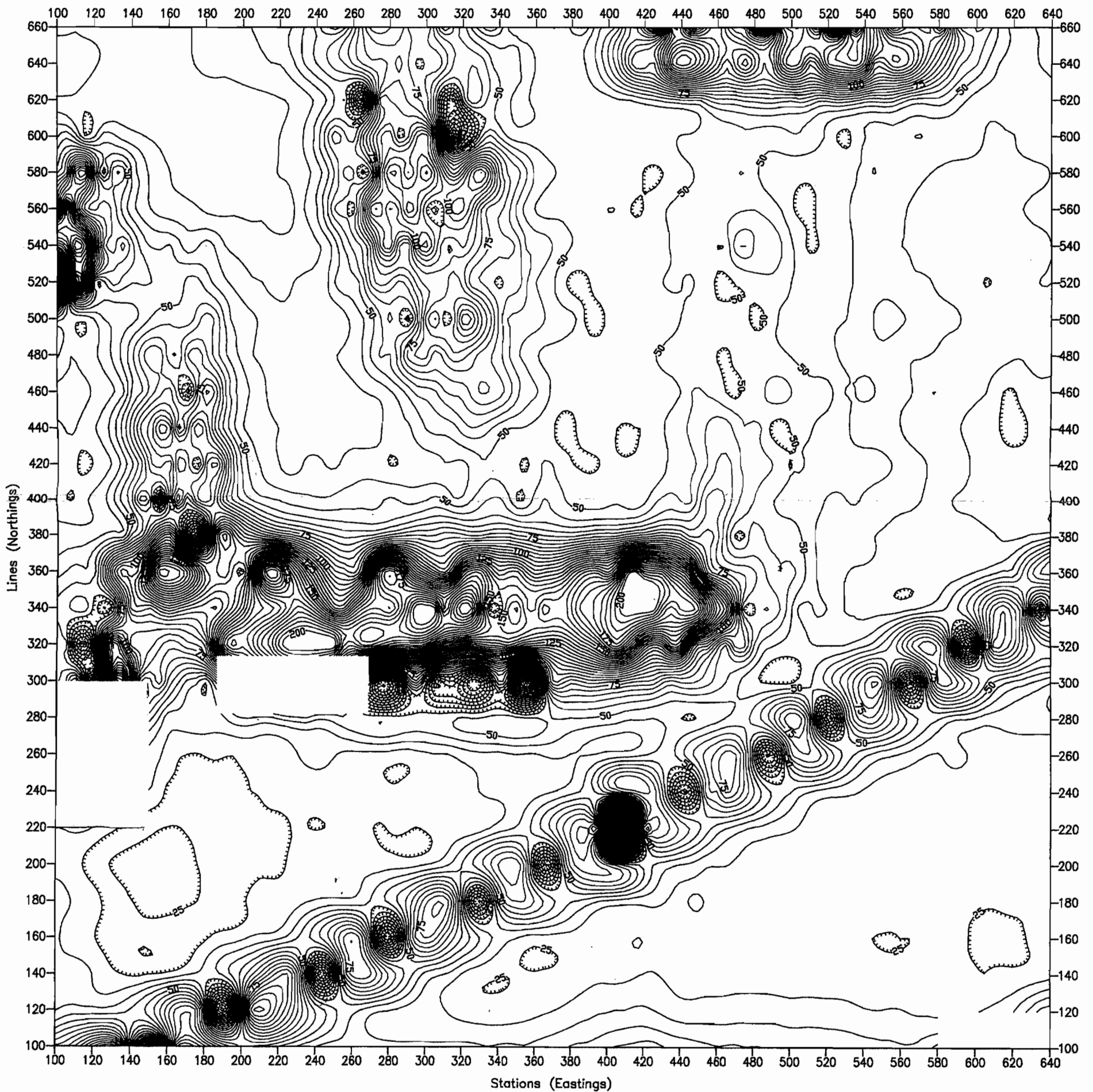


FIGURE 2
 CLIENT: CDM FEDERAL PROGRAMS CORP.
 EM-31 TERRAIN CONDUCTIVITY CONTOURS
 WAG 3 - SWMU 4
 PADUCAH GASEOUS DIFFUSION PLANT
 PADUCAH, KENTUCKY
 DATE OF SURVEY: MARCH 23-25, 1999

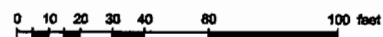


CONTOUR INTERVAL: 5 mS/m

Range	Color
< 0	Cyan
0 to 50	Blue
55 to 100	Green
105 to 150	Red
> 150	Magenta



Approximate



Scale: 1in = 60ft

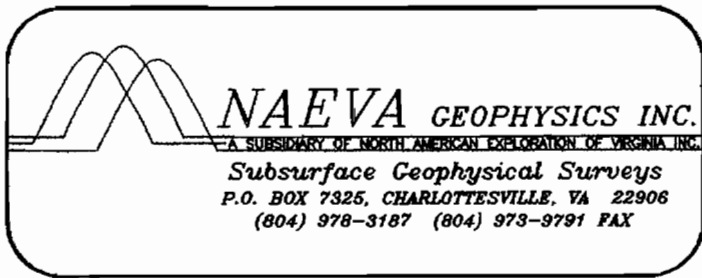
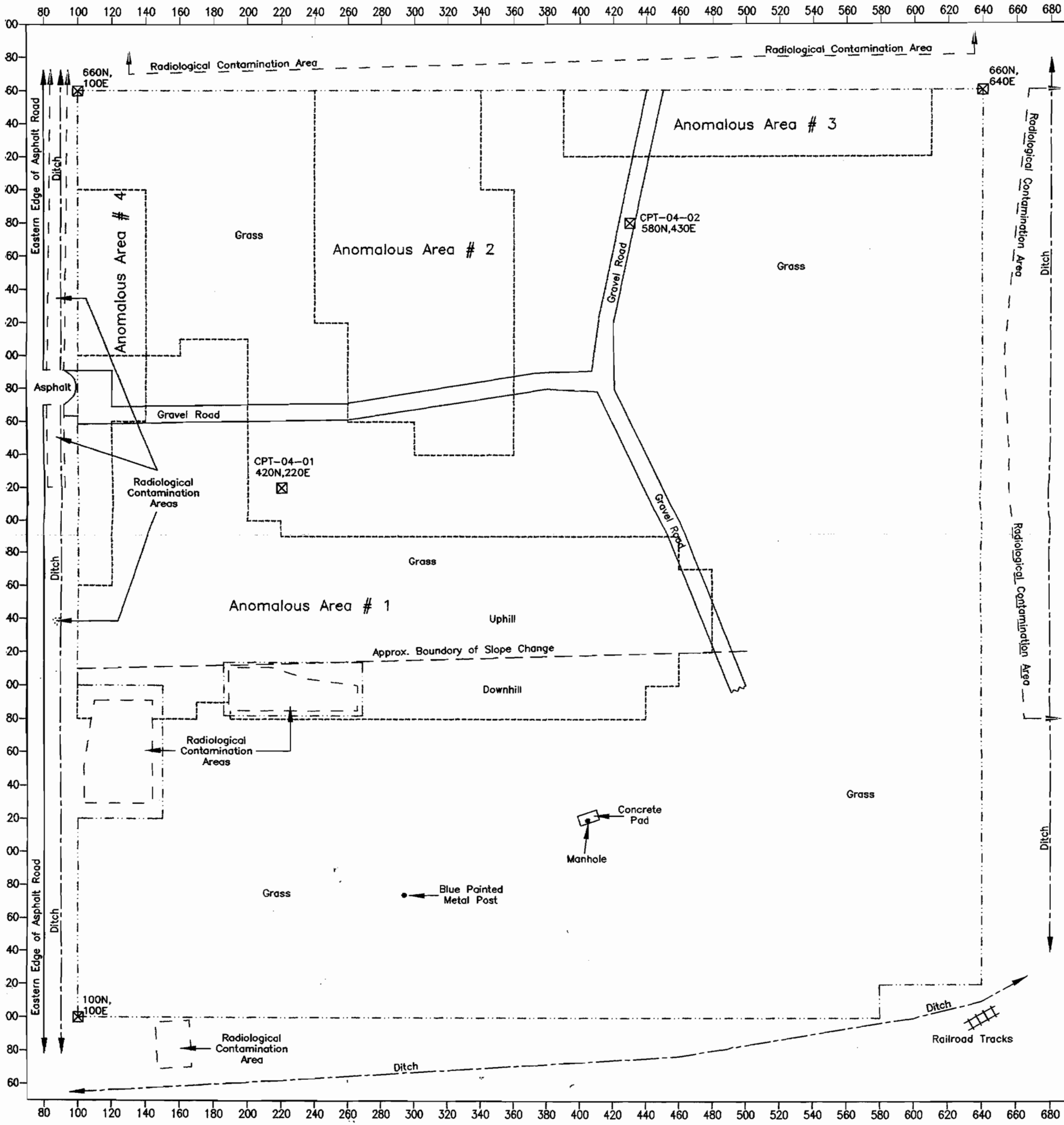



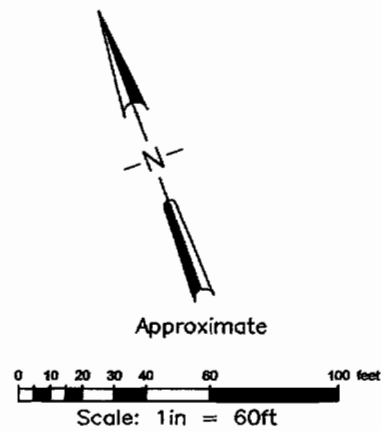


FIGURE 1
 CLIENT: CDM FEDERAL PROGRAMS CORP.
 AREA OF GEOPHYSICAL INVESTIGATION
 WAG 3 - SWMU 4
 PADUCAH GASEOUS DIFFUSION PLANT
 PADUCAH, KENTUCKY
 DATE OF SURVEY: MARCH 23-25, 1999



LEGEND

-  Area of Investigation
-  1180N, 1000E
Labeled Wooden Stakes
Also Registration Mark
for Figures 2, 3 & 4
-  Anomalous Areas Marked in
the Field by NAEVA Personnel



Color	Contour Interval	Range
Cyan	10 mV	0 to 20
Blue	10 mV	30 to 90
Green	10 mV	100 to 140
Red	10 mV	150 to 200
Magenta	50 mV	> 200

EM-61 BOTTOM COIL DATA

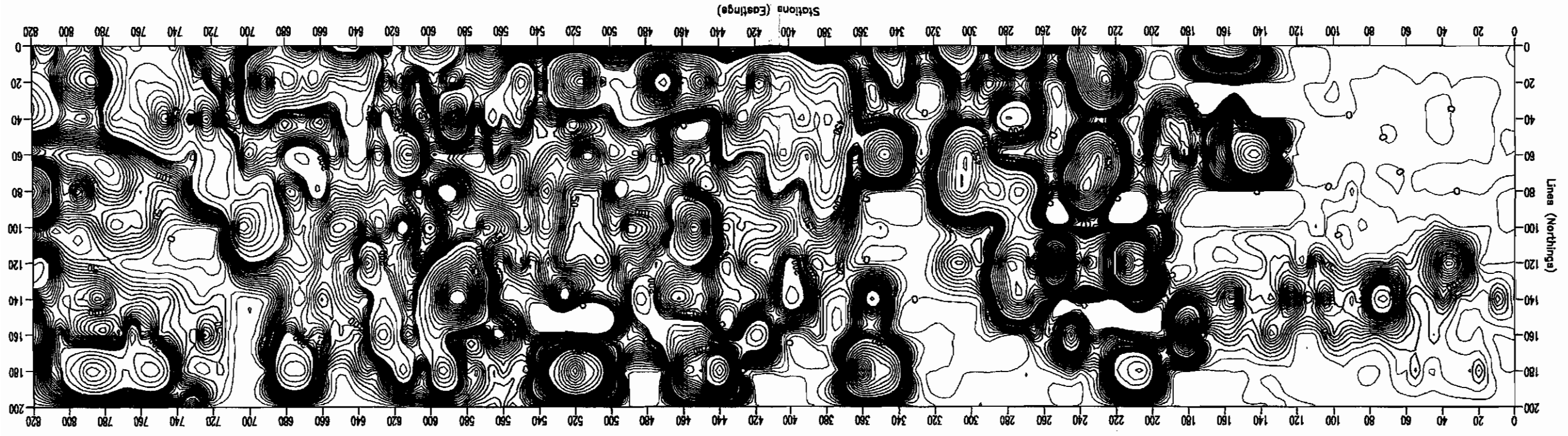
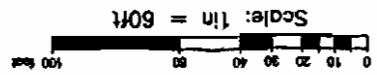


FIGURE 8
 CLIENT:CDM FEDERAL PROGRAMS CORP.
 EM-61 BOTTOM COIL CONTOURS
 WAG 3 - SWMU 5
 PADUCAH GASEOUS DIFFUSION PLANT
 PADUCAH, KENTUCKY
 DATE OF SURVEY: MARCH 26, 1999



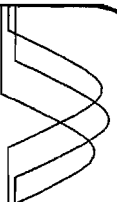
Approximate



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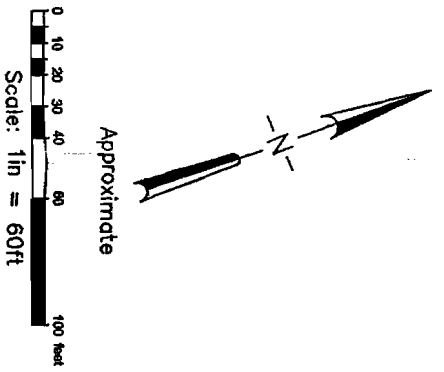
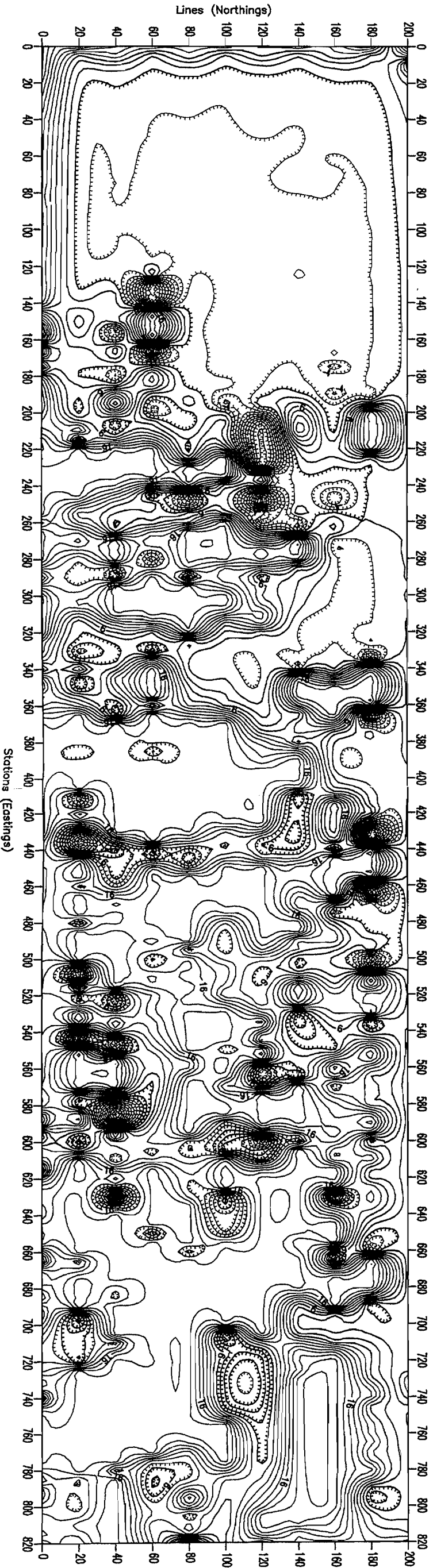


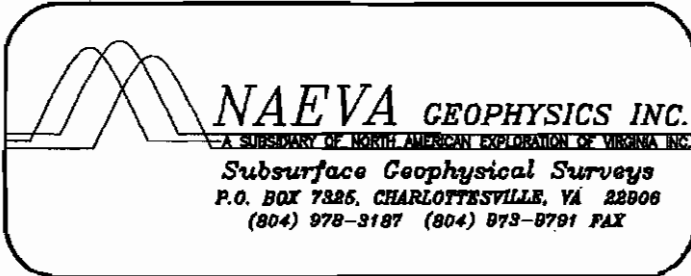
FIGURE 7

CLIENT: **CDM FEDERAL PROGRAMS CORP.**
 EM-31 INPHASE CONTOURS
 WAG 3 - SWMU 5
 PADUCAH GASEOUS DIFFUSION PLANT
 PADUCAH, KENTUCKY
 DATE OF SURVEY: MARCH 26, 1999



CONTOUR INTERVAL: 2 ppi

Range	Color
< 0	Cyan
0 to 6	Blue
8 to 12	Green
> 12	Red



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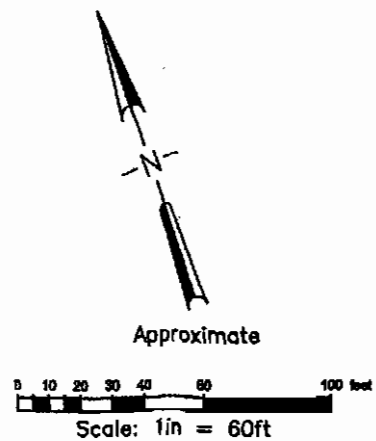
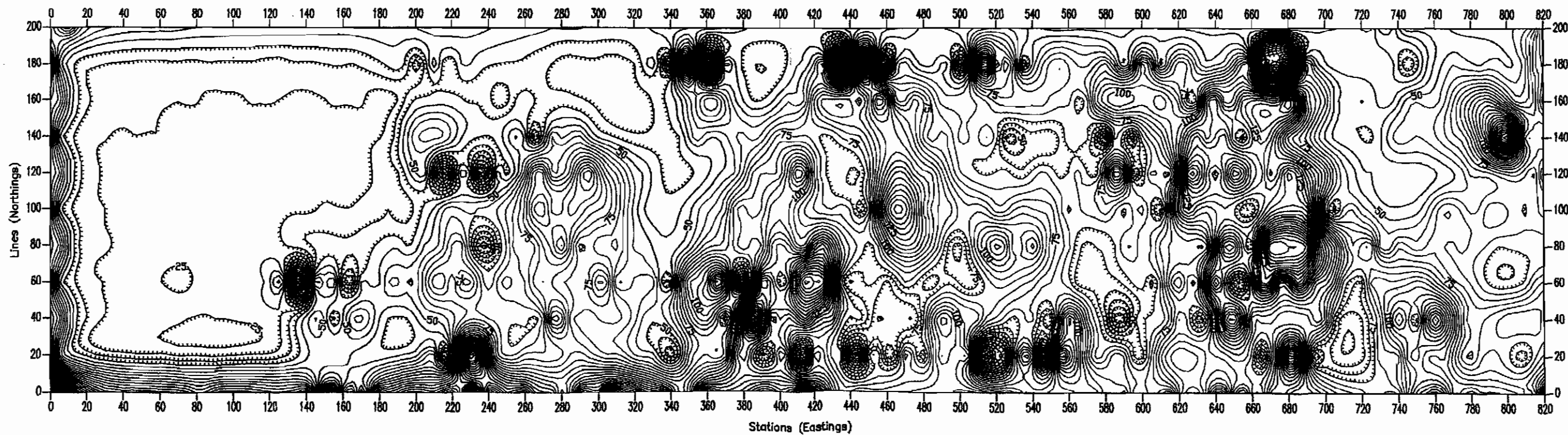
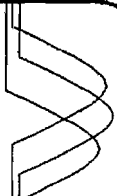


FIGURE 6
 CLIENT: CDM FEDERAL PROGRAMS CORP.
 EM-31 TERRAIN CONDUCTIVITY CONTOURS
 WAG 3 - SWMU 5
 PADUCAH GASEOUS DIFFUSION PLANT
 PADUCAH, KENTUCKY
 DATE OF SURVEY: MARCH 26, 1999



CONTOUR INTERVAL: 5 mS/m

Range	Color
< 0	Cyan
0 to 50	Blue
55 to 100	Green
105 to 150	Red
> 150	Magenta


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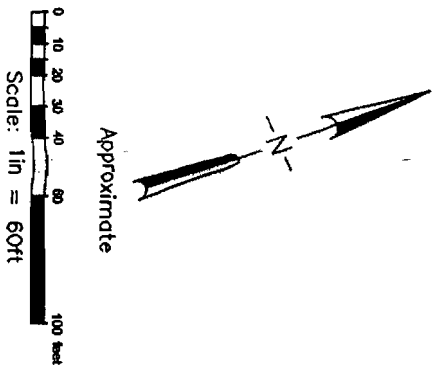
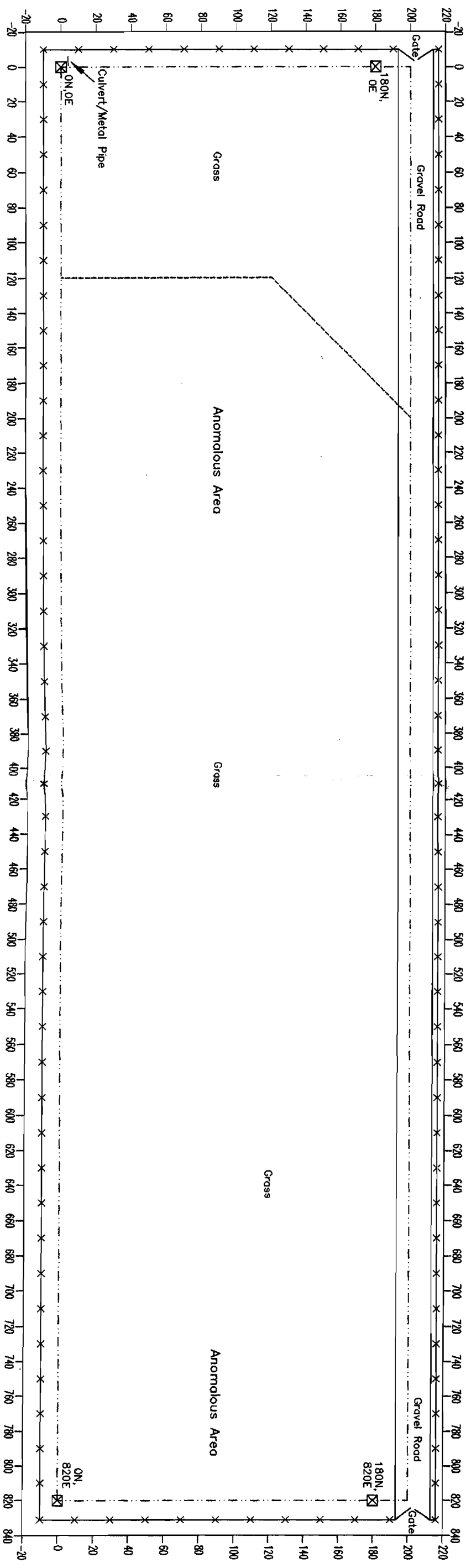




FIGURE 5
CLIENT: CDM FEDERAL PROGRAMS CORP.
AREA OF GEOPHYSICAL INVESTIGATION
WAG 3 - SWMU 5
PADUCAH GASEOUS DIFFUSION PLANT
PADUCAH, KENTUCKY
DATE OF SURVEY: MARCH 26, 1999



LEGEND

-  Area of Investigation
-  Labeled Wooden Stakes
Also Registration Mark for Figures 6, 7 & 8

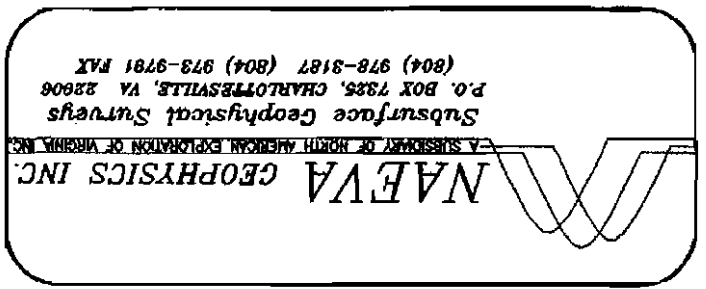
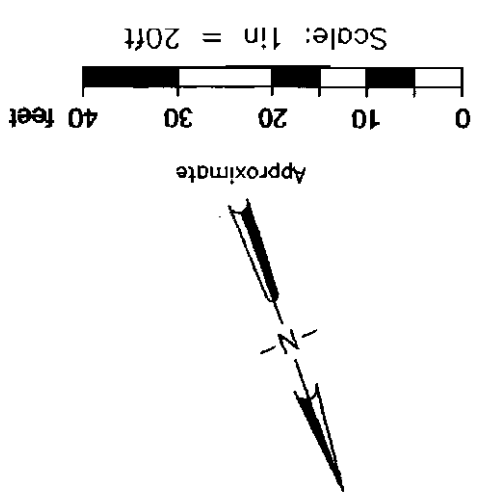
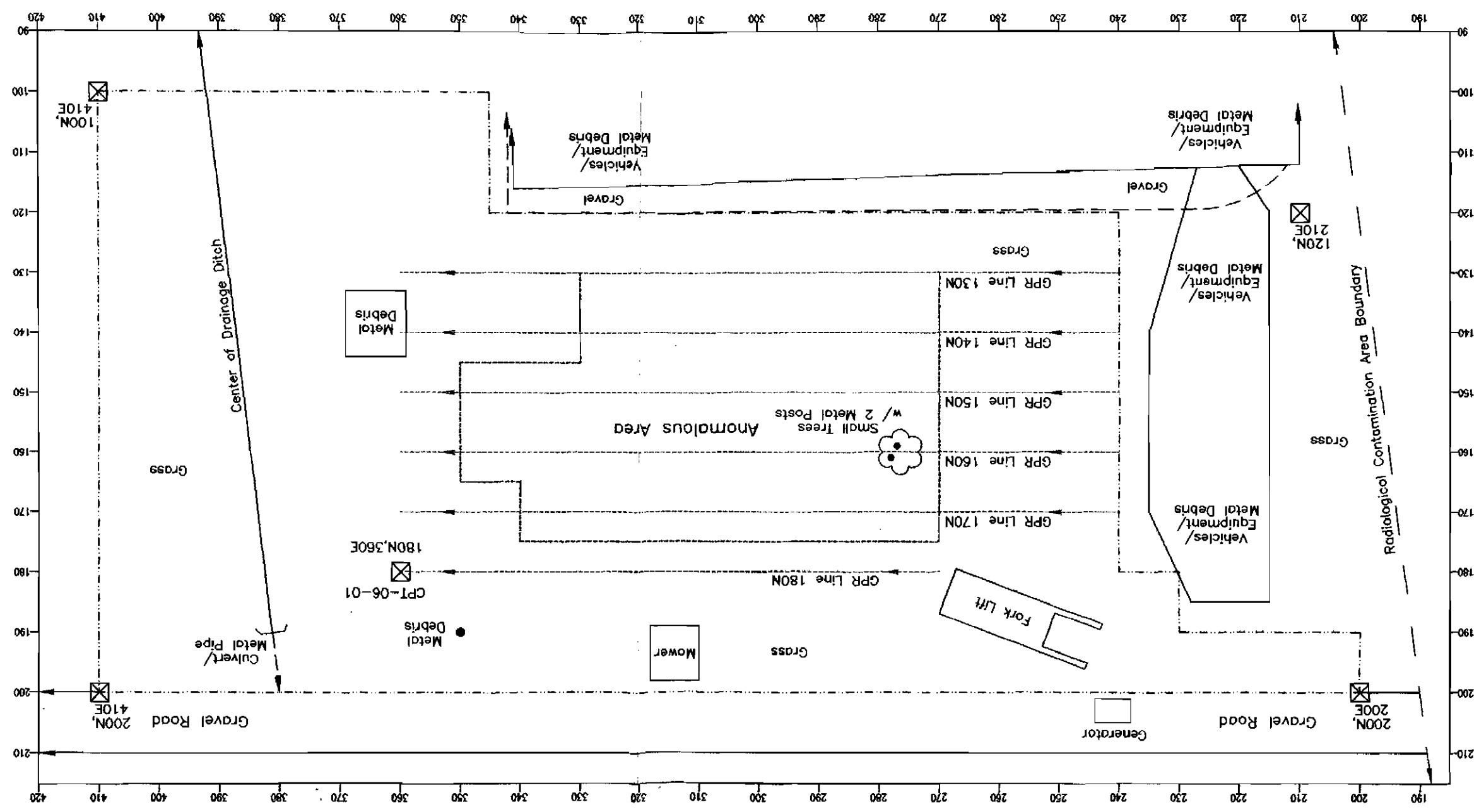


FIGURE 9
 CLIENT: CDM FEDERAL PROGRAMS CORP.
 AREA OF GEOPHYSICAL INVESTIGATION
 WAG 3 - SWMU 6
 PADUCAH GASEOUS DIFFUSION PLANT
 PADUCAH, KENTUCKY
 DATE OF SURVEY: MARCH 25 & 27, 1999



LEGEND
 [Dashed Box] Area of Investigation
 [Solid Box] Anomalous Area Marked in the Field by NAEVA Personnel
 [Box with X] Labeled Wooden Stakes Also Registration Mark for Figures 10, 11 & 12
 [Arrow] GPR Line 130N
 [Arrow] GPR Profile Showing Direction of Traverse

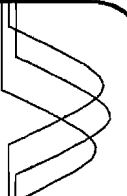
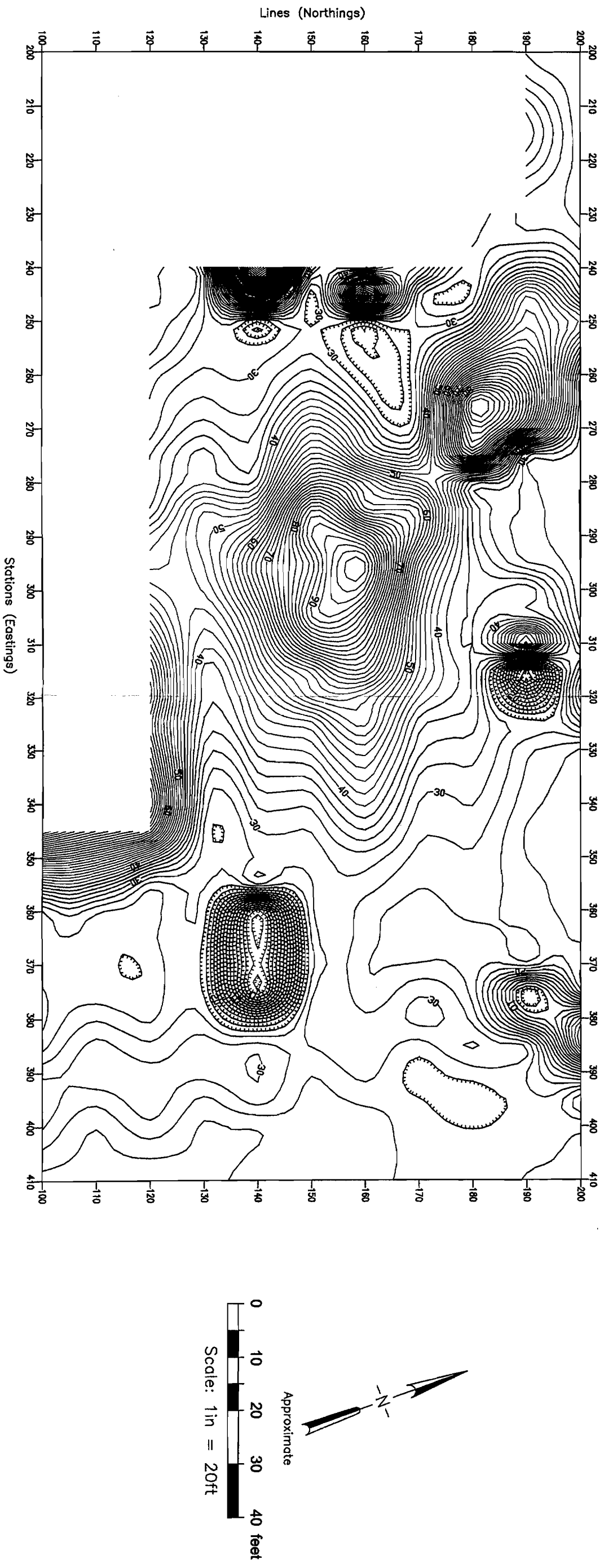
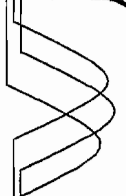

NAEVA GEOPHYSICS INC.
A SUBSIDIARY OF NORTH AMERICAN EXPLORATION OF VIRGINIA, INC.
 Subsurface Geophysical Surveys
 P.O. BOX 7326, CHARLOTTESVILLE, VA 22906
 (804) 978-9187 (804) 978-9791 FAX

FIGURE 10
 CLIENT: **CDM FEDERAL PROGRAMS CORP.**
 EM-31 TERRAIN CONDUCTIVITY CONTOURS
 WAG 3 - SWMU 6
 PADUCAH GASEOUS DIFFUSION PLANT
 PADUCAH, KENTUCKY
 DATE OF SURVEY: MARCH 25 & 27, 1999

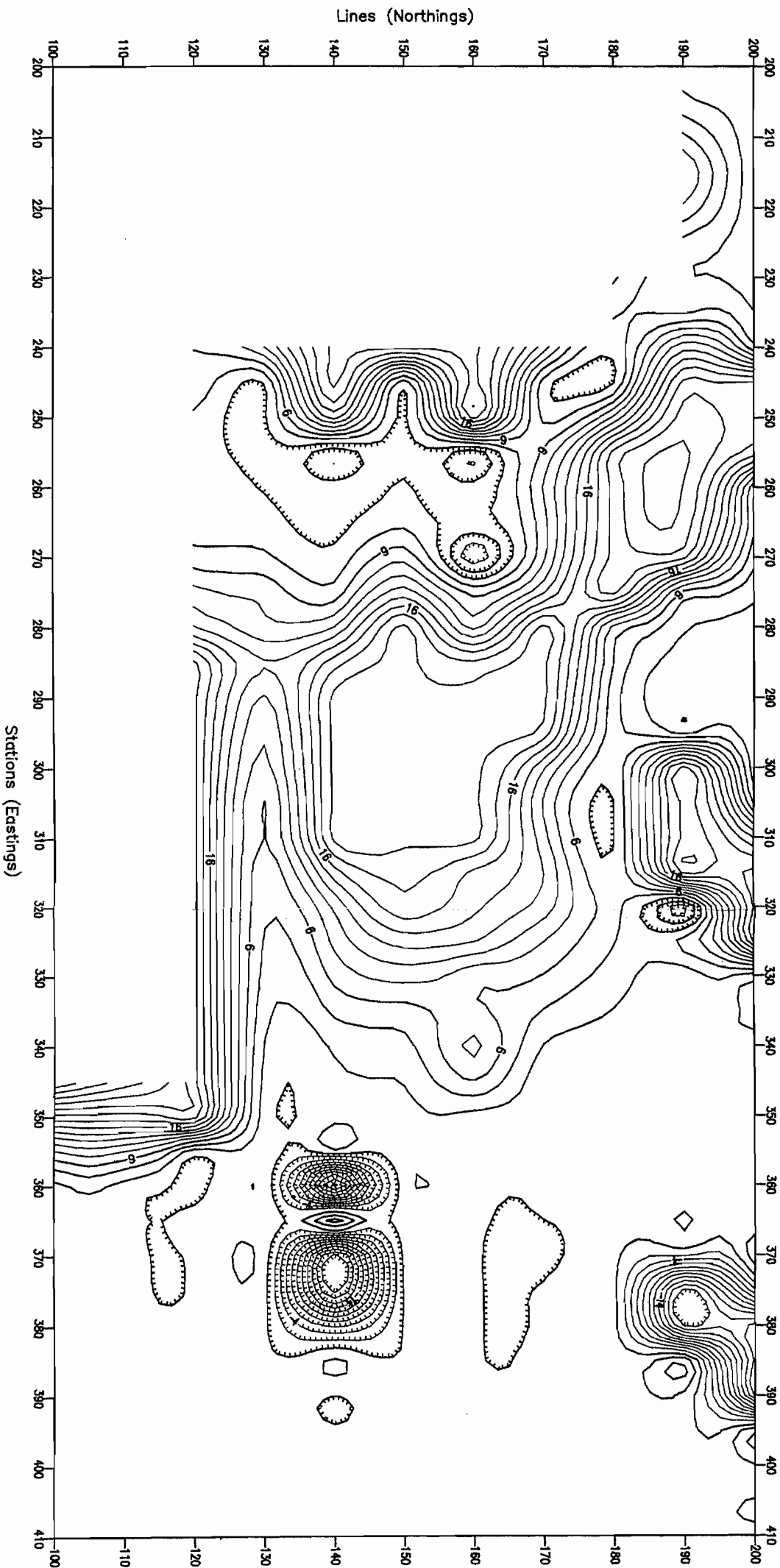




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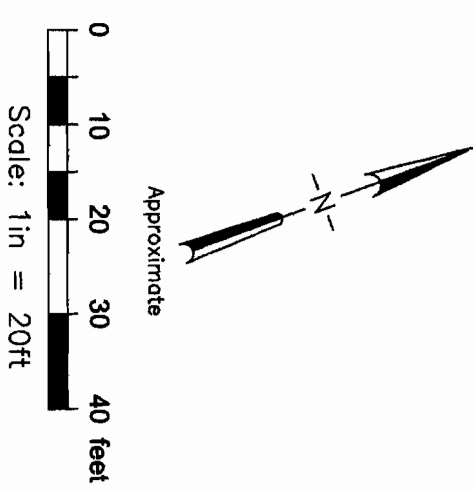
FIGURE 11

CLIENT: **CDM FEDERAL PROGRAMS CORP.**
 EM-31 INPHASE CONTOURS
 WAG 3 - SWMU 6
 PADUCAH GASEOUS DIFFUSION PLANT
 PADUCAH, KENTUCKY
 DATE OF SURVEY: MARCH 25 & 27, 1999



CONTOUR INTERVAL: 2 ppi

Range	Color
< 0	Cyan
0 to 6	Blue
8 to 12	Green
> 12	Red

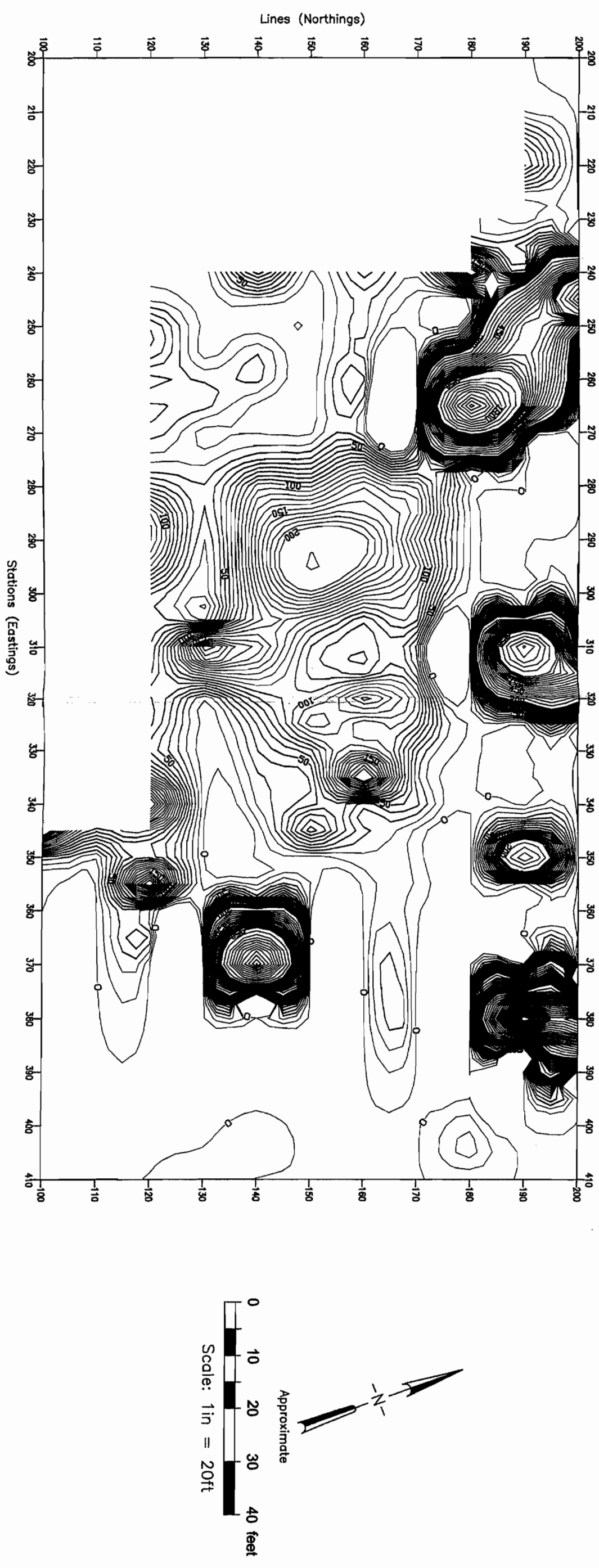




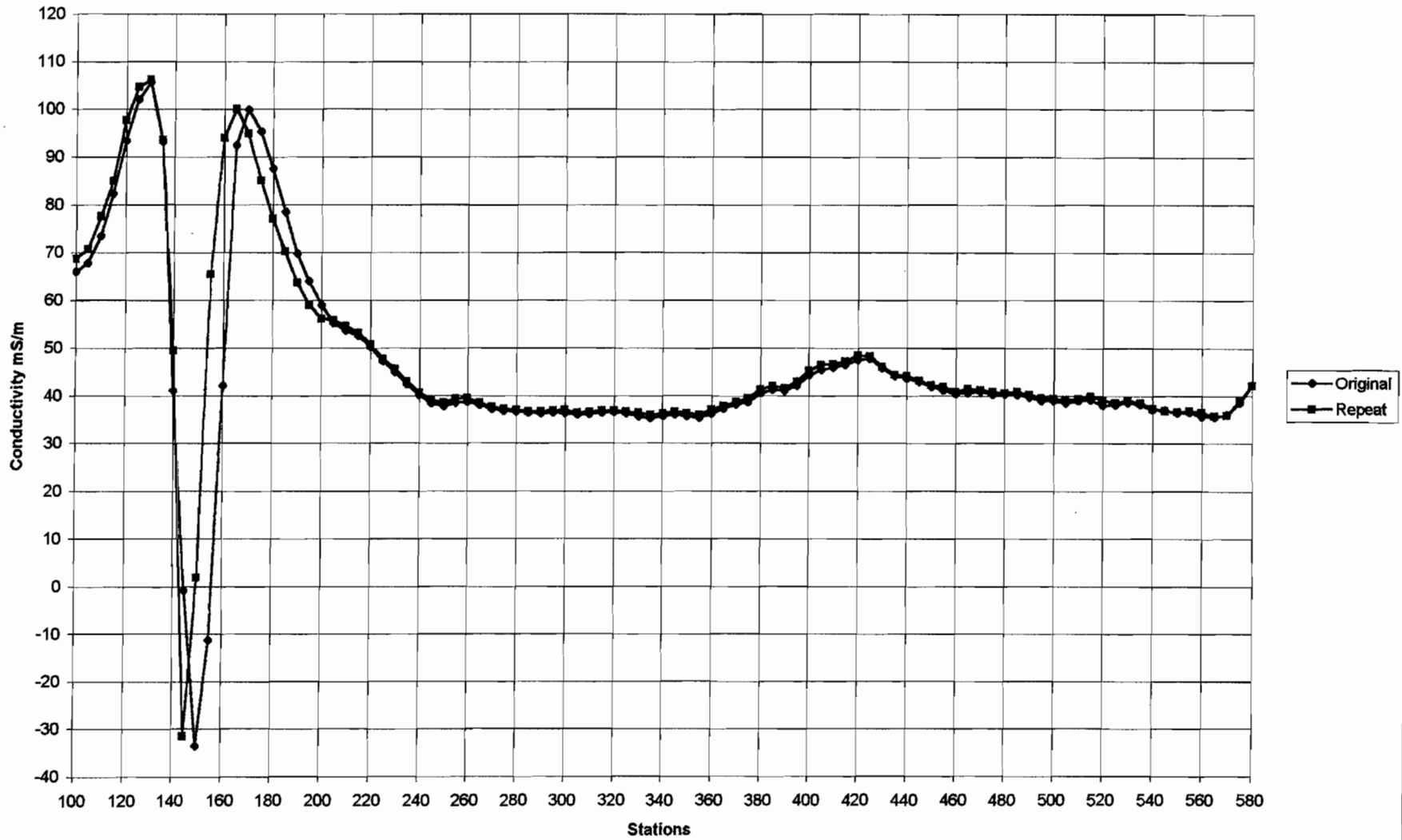
NAEVA GEOPHYSICS INC.
A SUBSIDIARY OF NORTH AMERICAN EXPLORATION OF VIRGINIA INC.
 Subsurface Geophysical Surveys
 P.O. BOX 7326, CHARLOTTESVILLE, VA 22906
 (804) 978-9187 (804) 973-9791 FAX

FIGURE 12

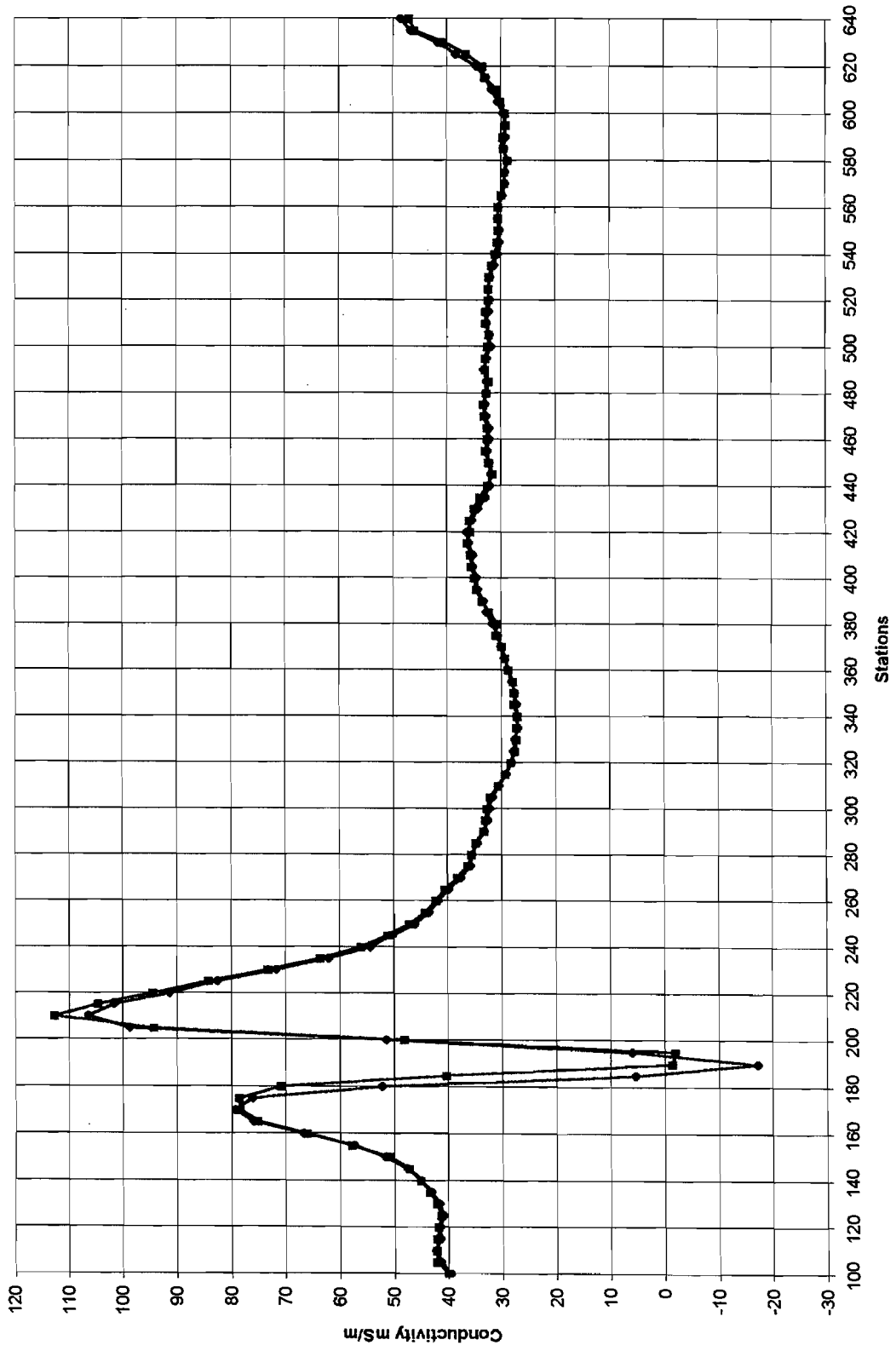
CLIENT: **CDM FEDERAL PROGRAMS CORP.**
 EM-61 BOTTOM COIL CONTOURS
 WAG 3 - SWMU 6
 PADUCAH GASEOUS DIFFUSION PLANT
 PADUCAH, KENTUCKY
 DATE OF SURVEY: MARCH 25 & 27, 1999



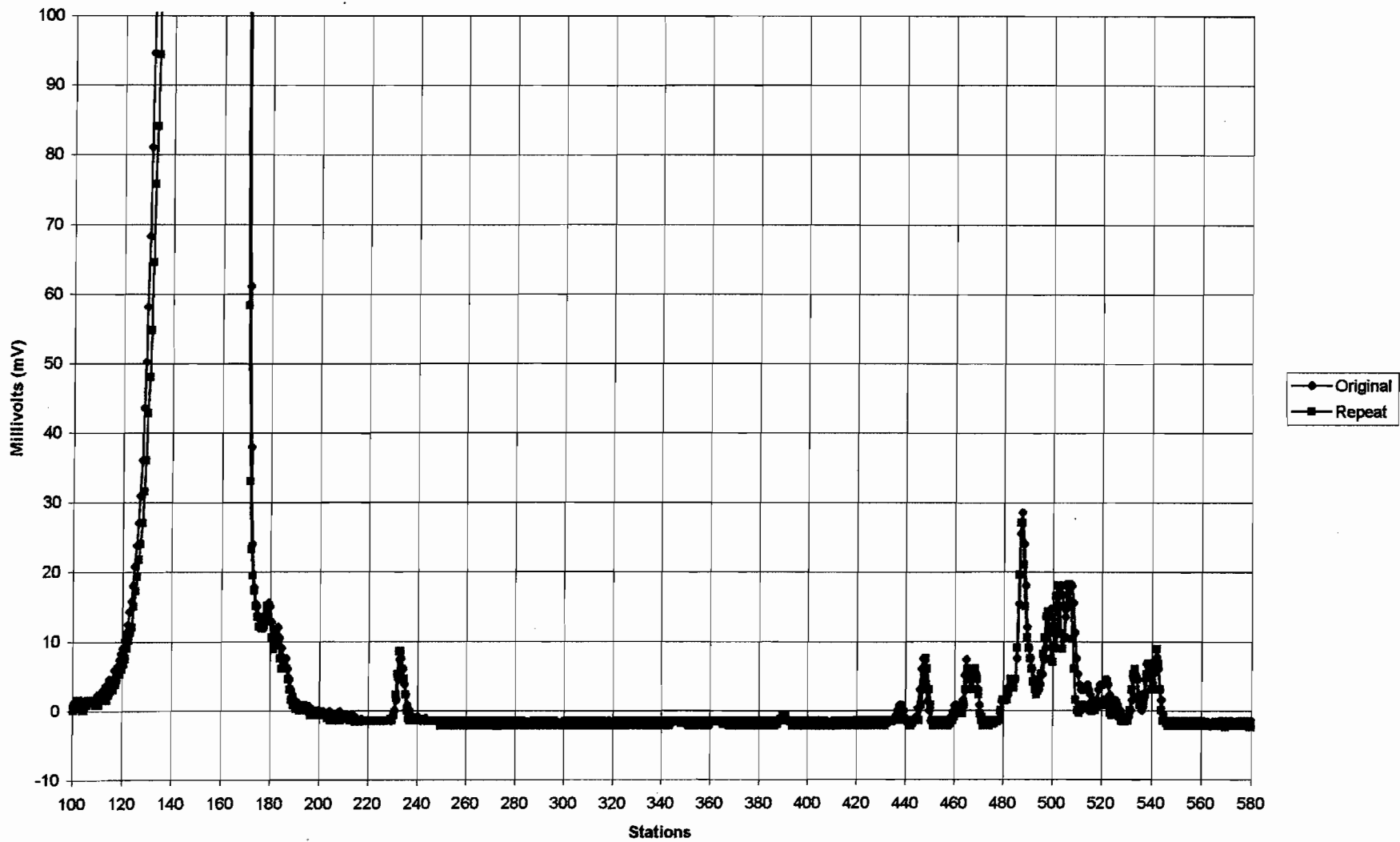
EM-31 Original vs. Repeat Quadrature Data
WAG 3 - SWMU 4 Line 100N



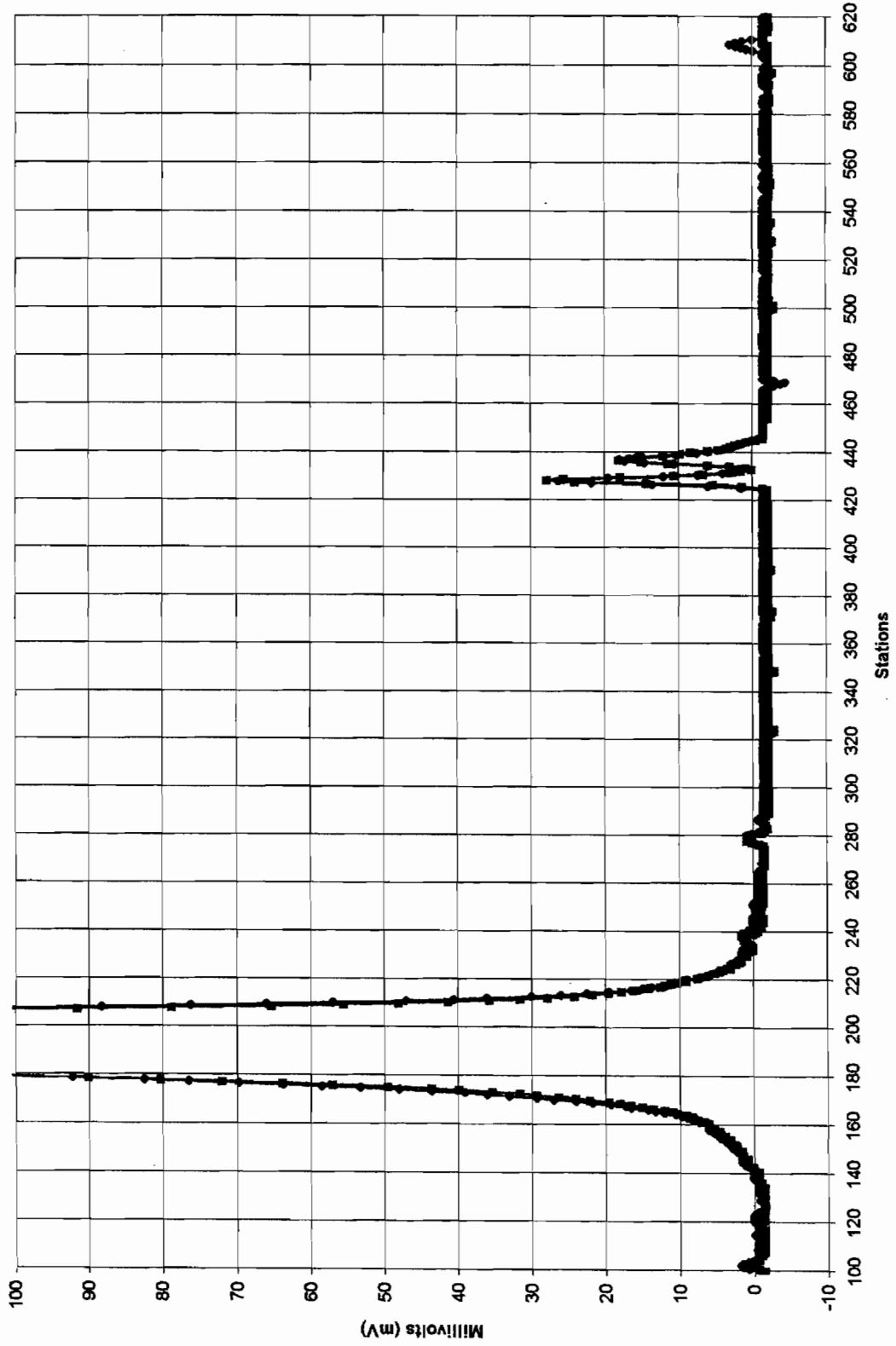
**EM-31 Original vs. Repeat Quadrature Data
WAG 3 - SWMU 4 Line 120N**



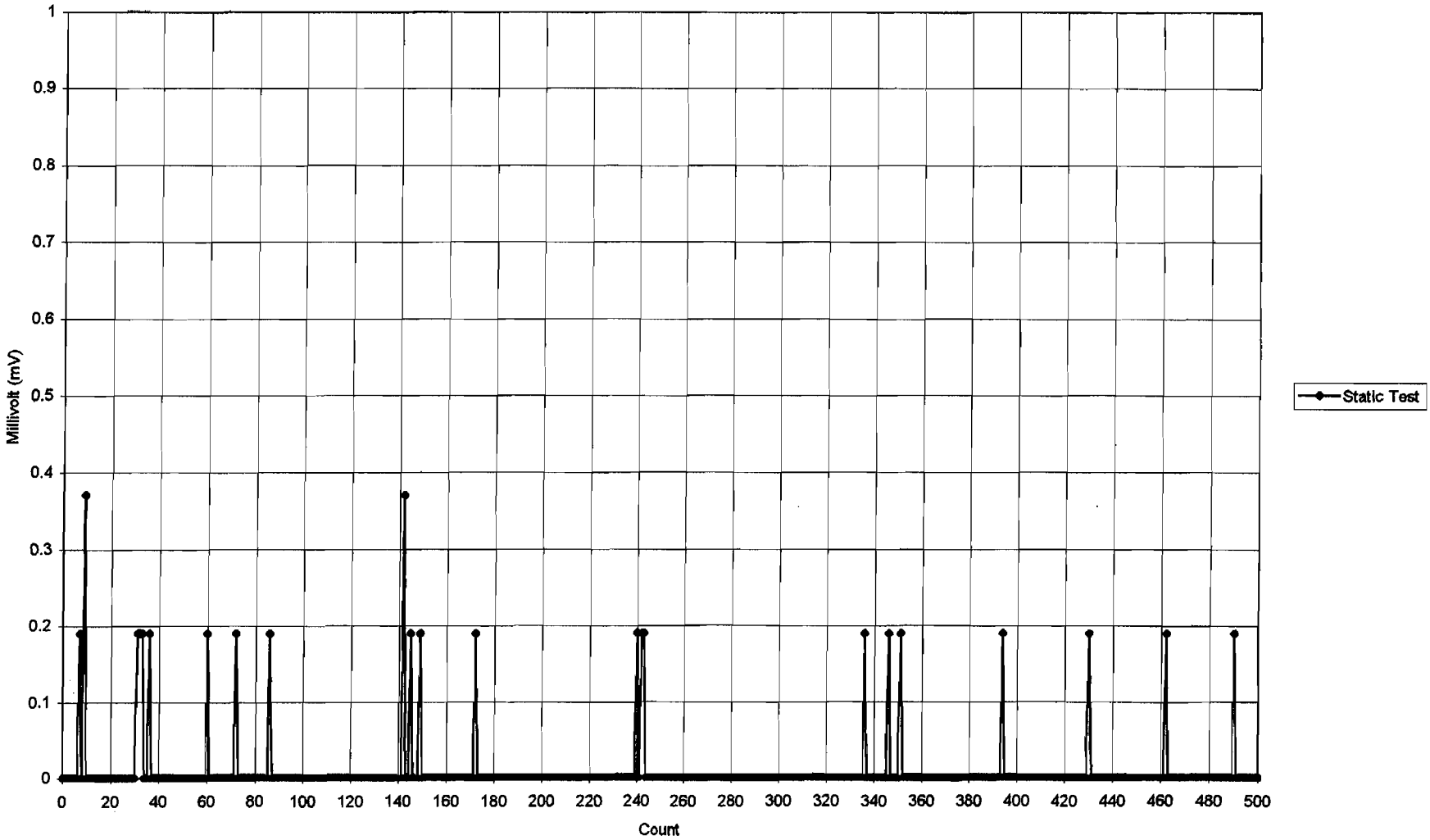
**EM-61 Original vs. Repeat Bottom Coil Data
WAG 3 - SWMU 4 Line 100N**



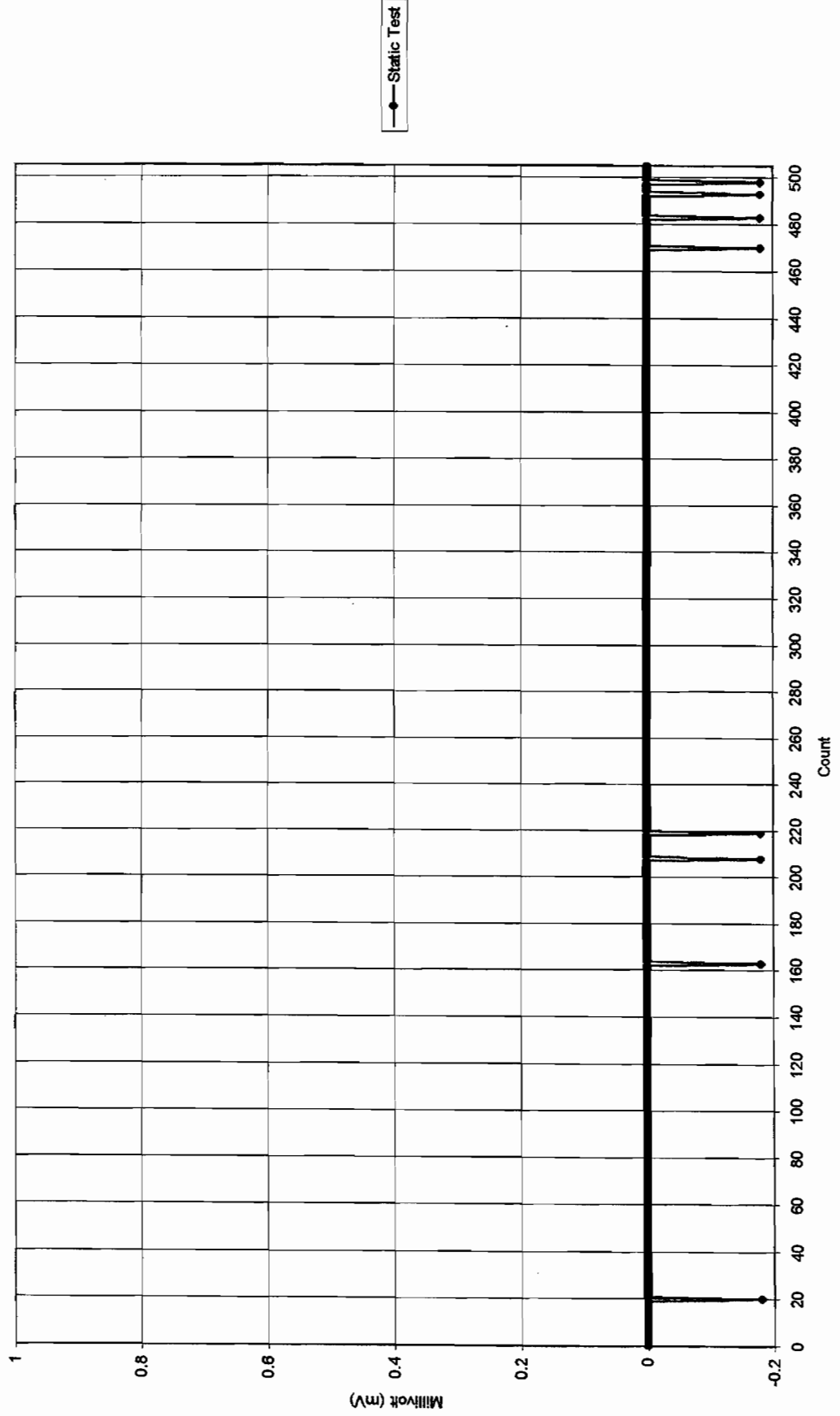
**EM-61 Original vs. Repeat Bottom Coil Data
WAG 3 - SWMU 4 Line 120N**



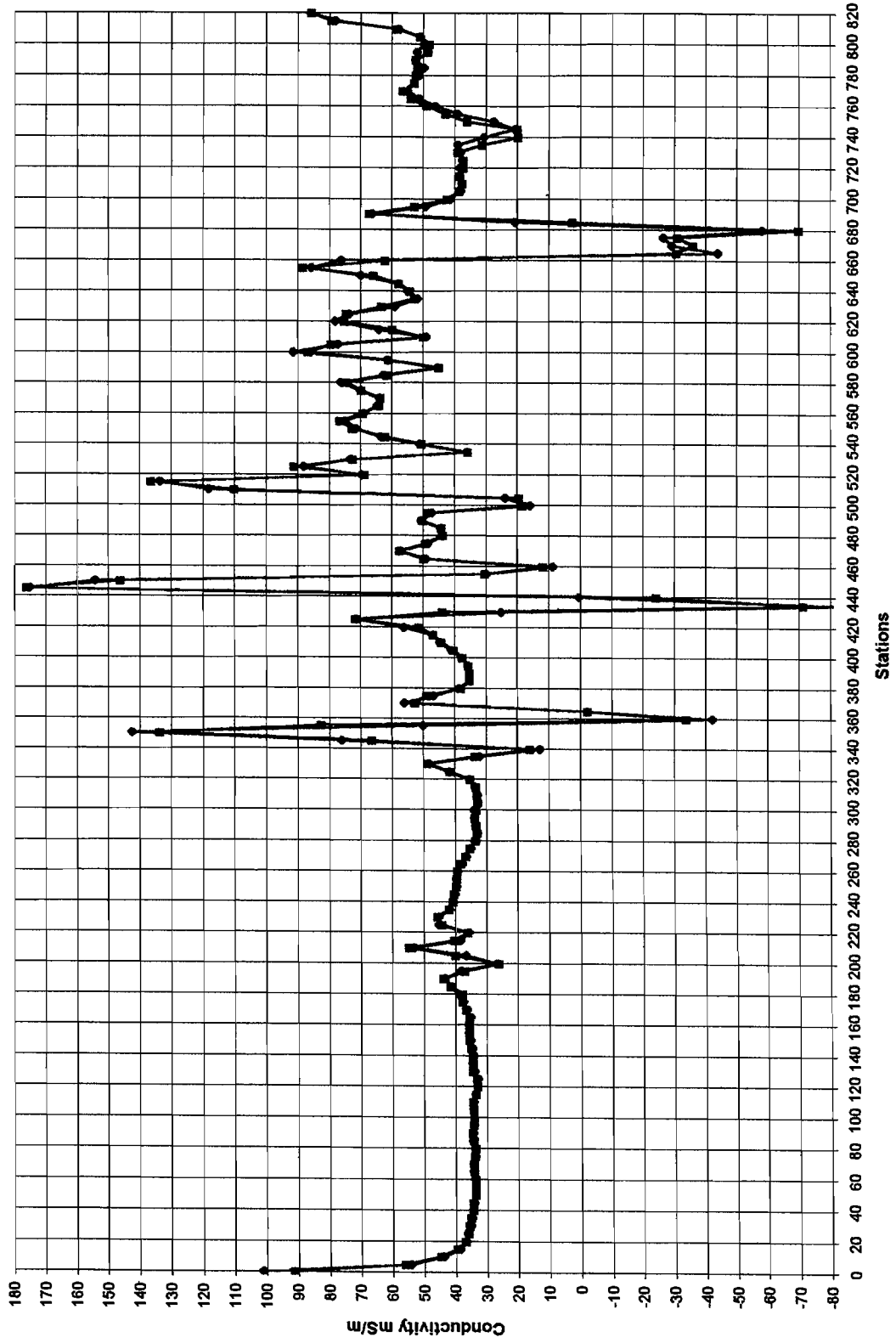
EM-61 Stationary Static Test (Bottom Coil Data)
WAG 3 - SWMU 4



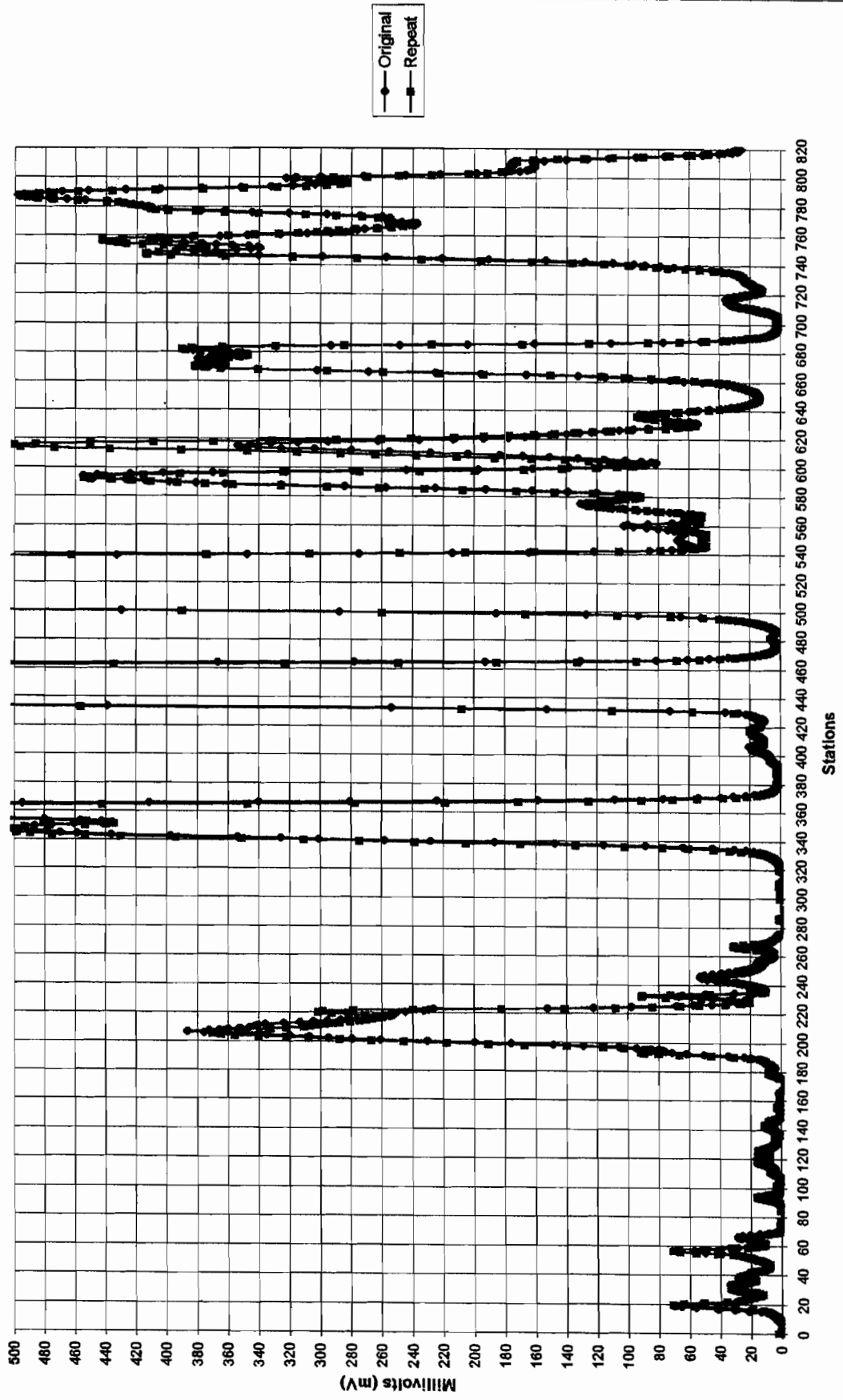
EM-61 Stationary Static Test (Bottom Coil Data)
WAG 3 - SWMU 5



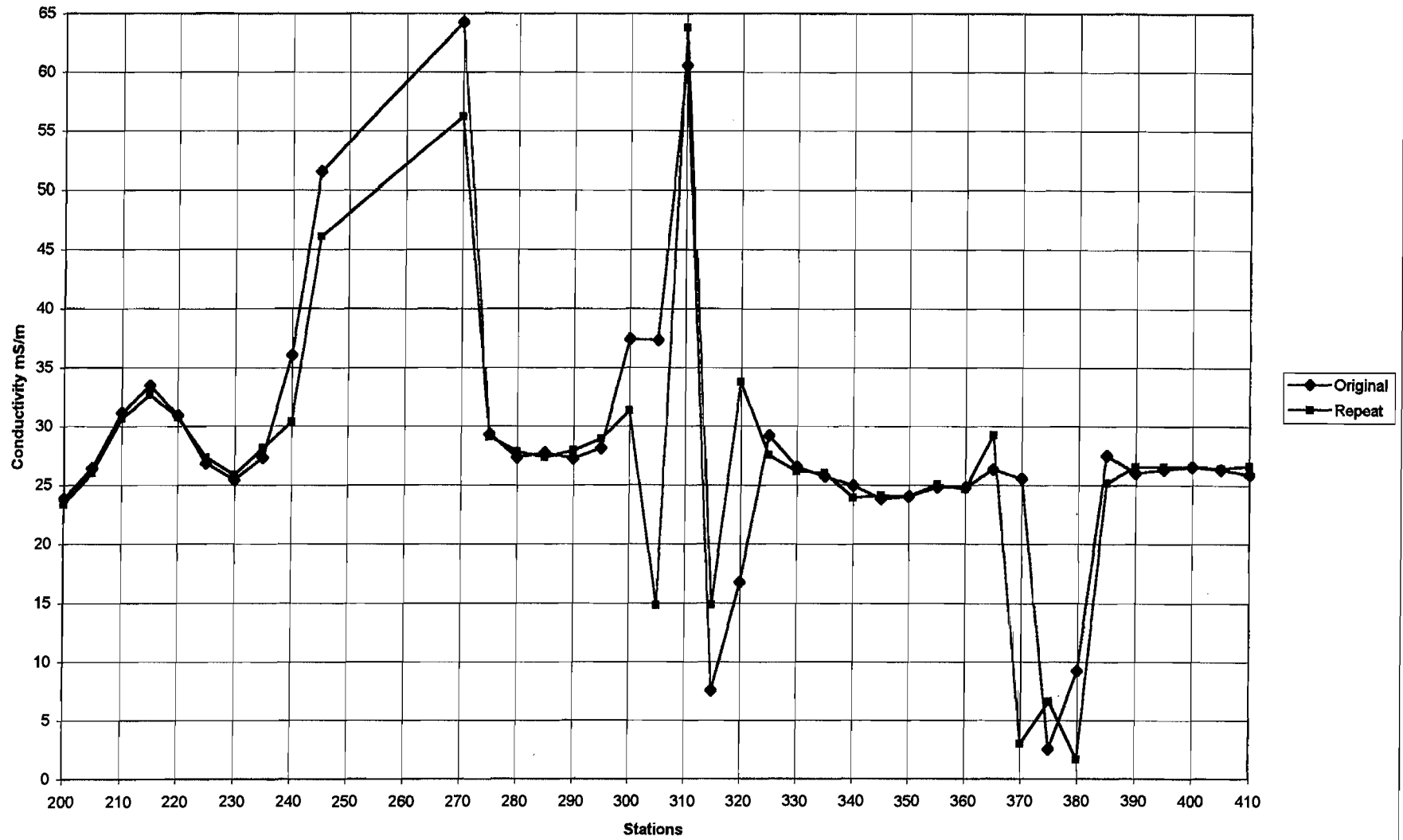
**EM-31 Original vs. Repeat Quadrature Data
WAG 3 - SWMU 5 Line 180N**



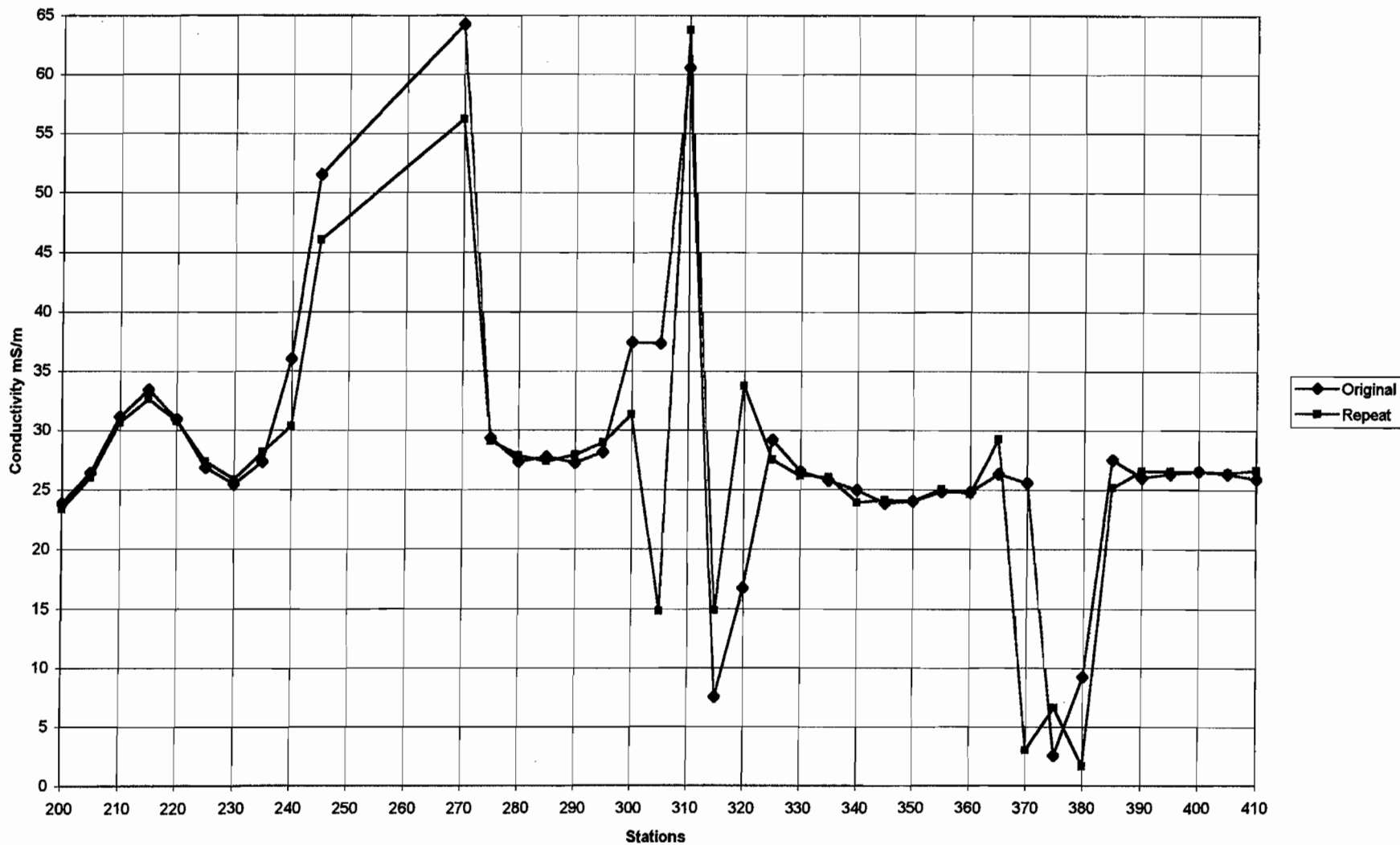
**EM-61 Original vs. Repeat Bottom Coil Data
WAG 3 - SWMU 5 Line 180N**



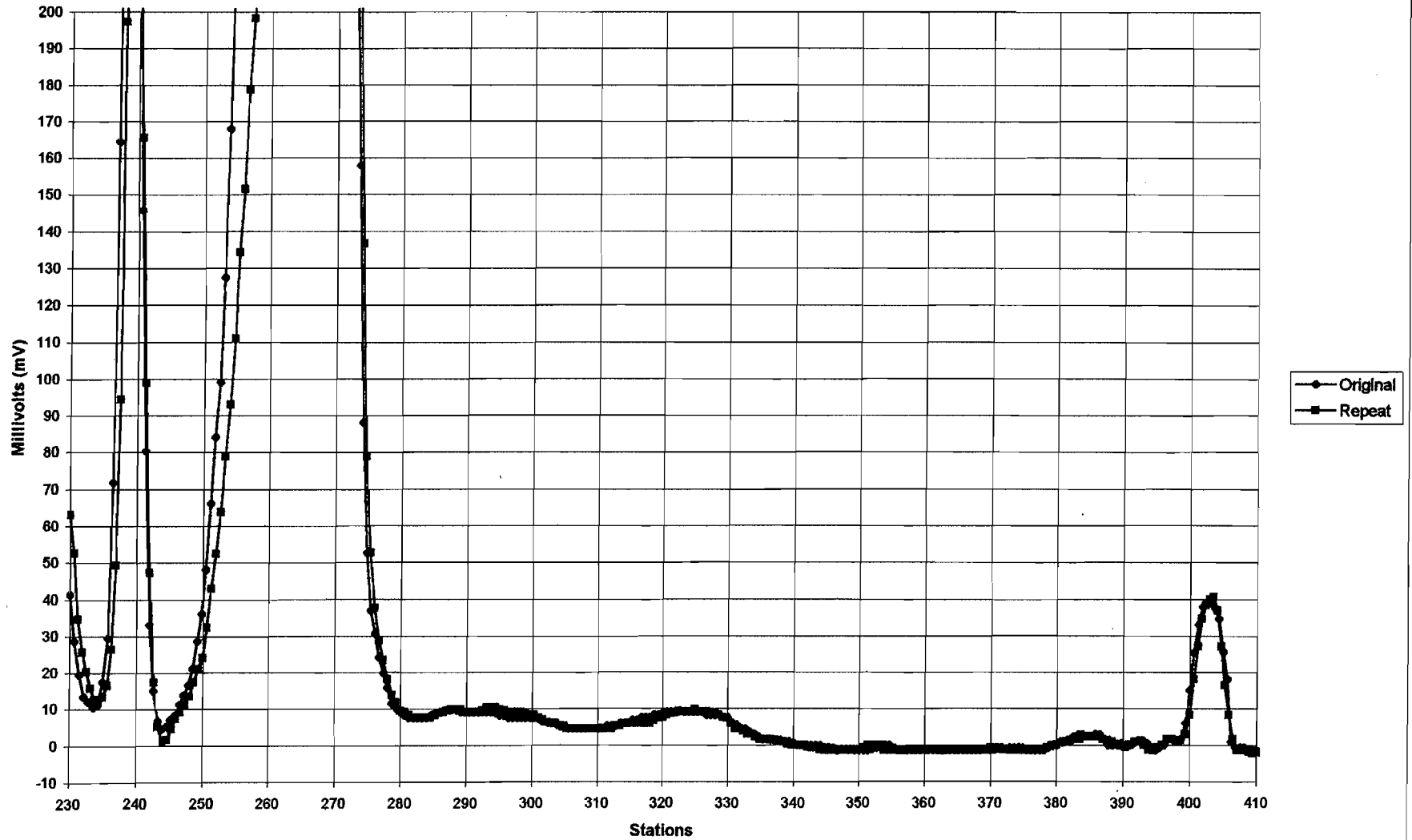
EM-31 Original vs. Repeat Quadrature Data
WAG 3 - SWMU 6 Line 190N



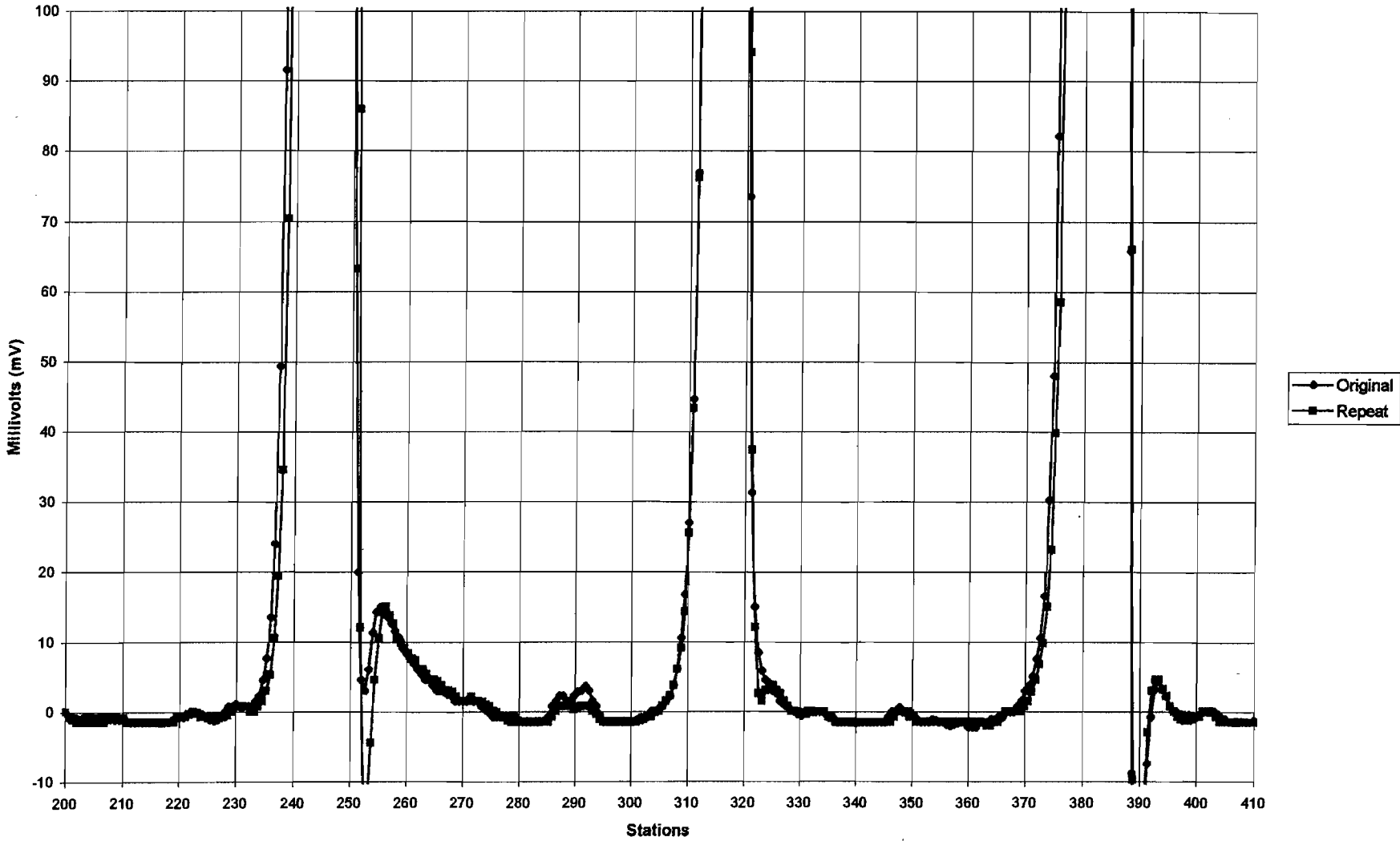
EM-31 Original vs. Repeat Quadrature Data
WAG 3 - SWMU 6 Line 190N



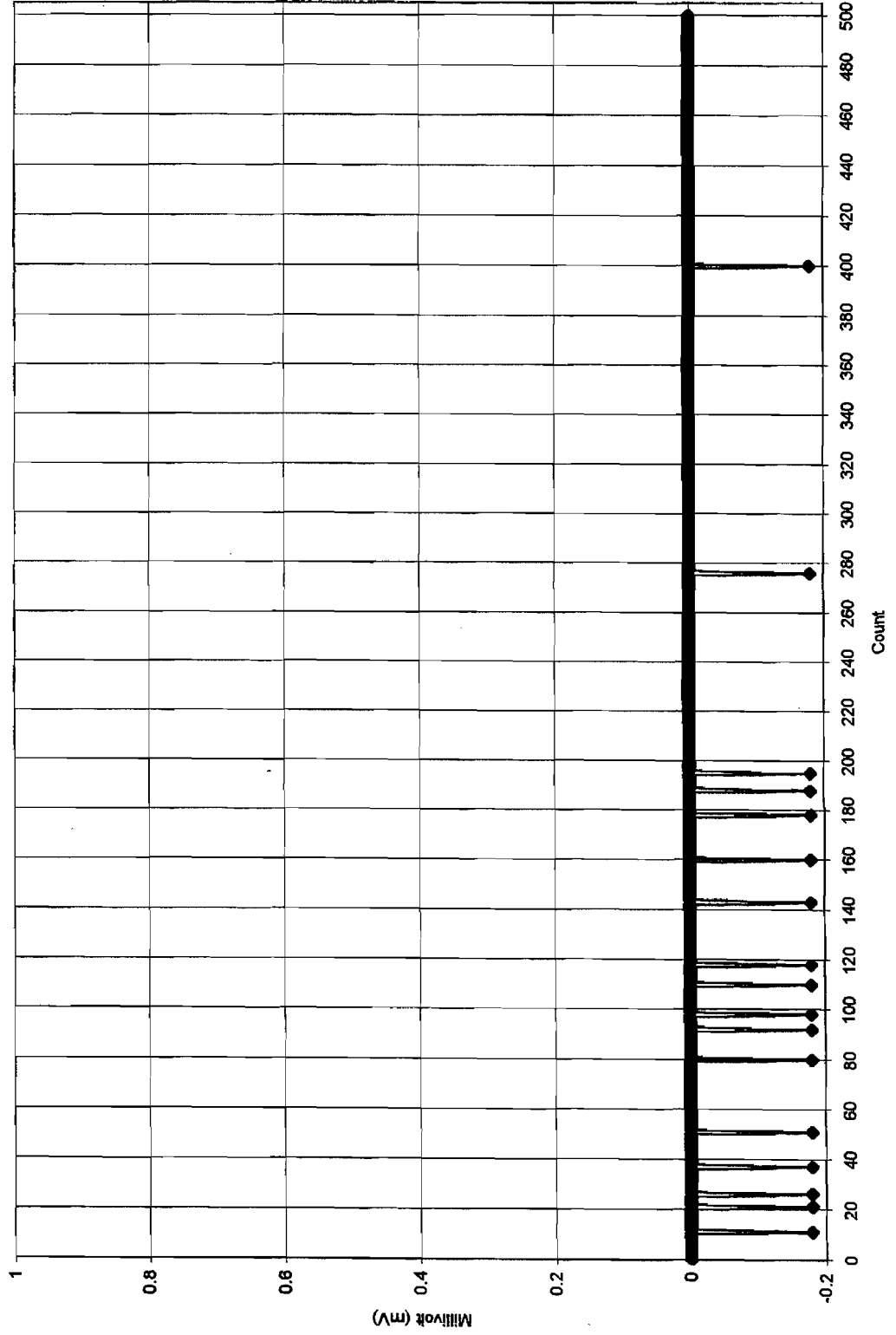
**EM-61 Original vs. Repeat Bottom Coil Data
WAG 3 - SWMU 6 Line 180N**



**EM-61 Original vs. Repeat Bottom Coil Data
WAG 3 - SWMU 6 Line 200N**

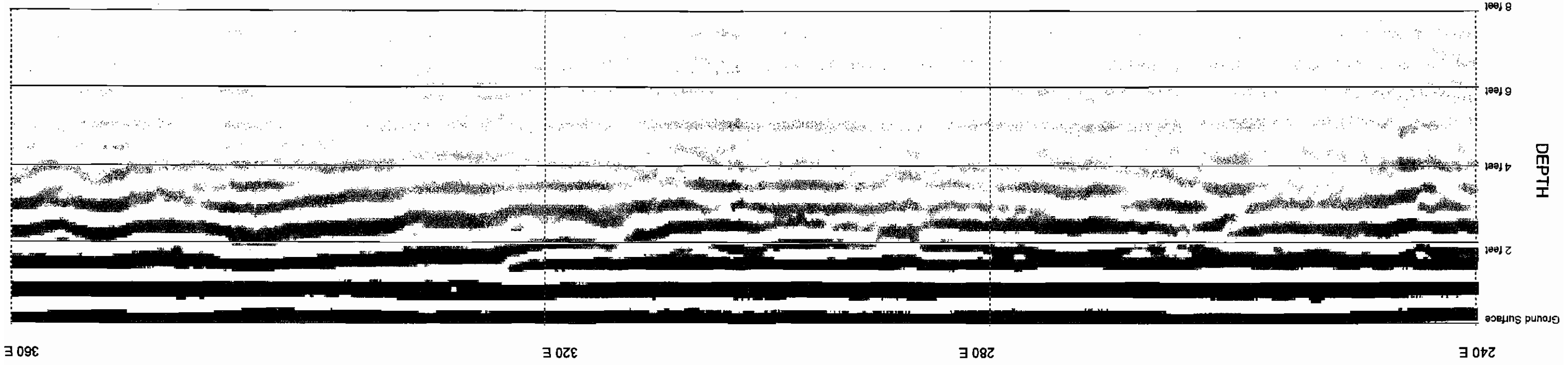


EM-61 Stationary Static Test (Bottom Coil Data)
WAG 3 - SWMU 6

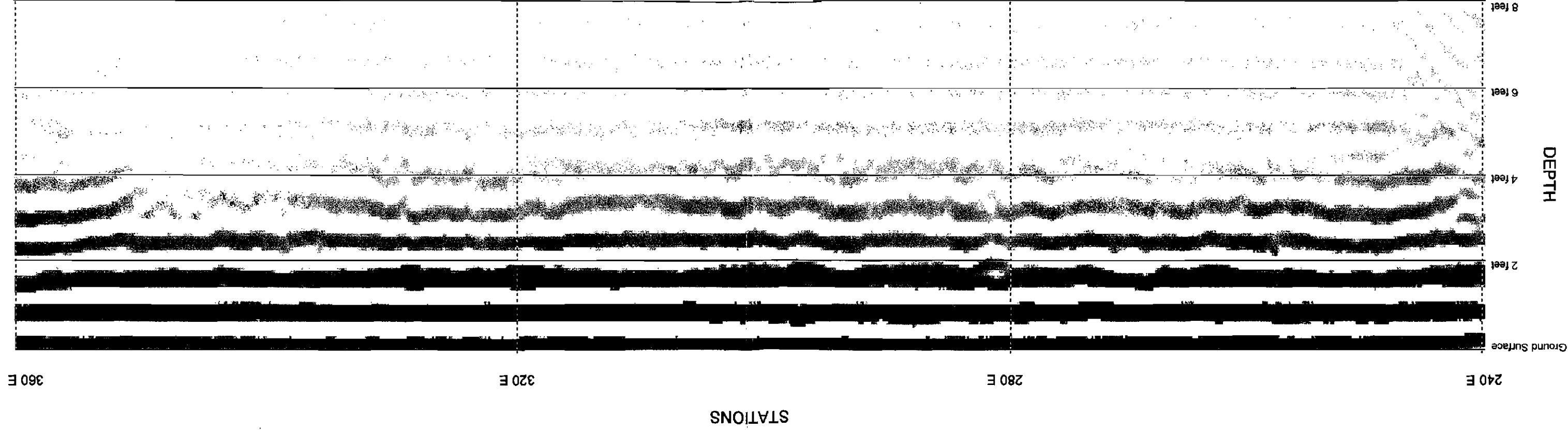


WAG 3 SWMU 6
GPR PROFILE
LINE 130 N

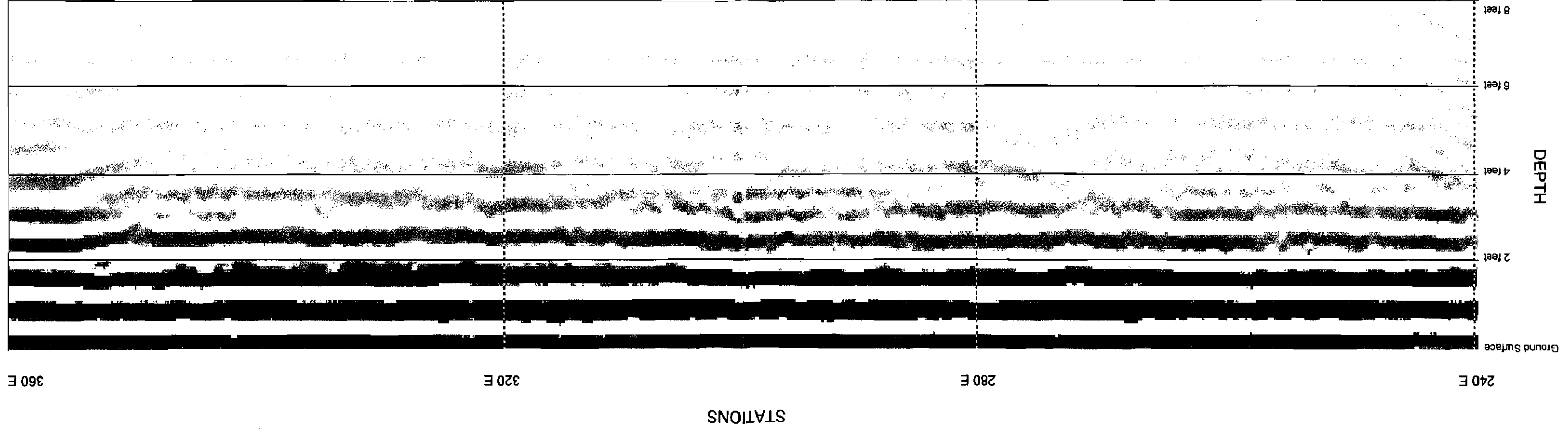
STATIONS



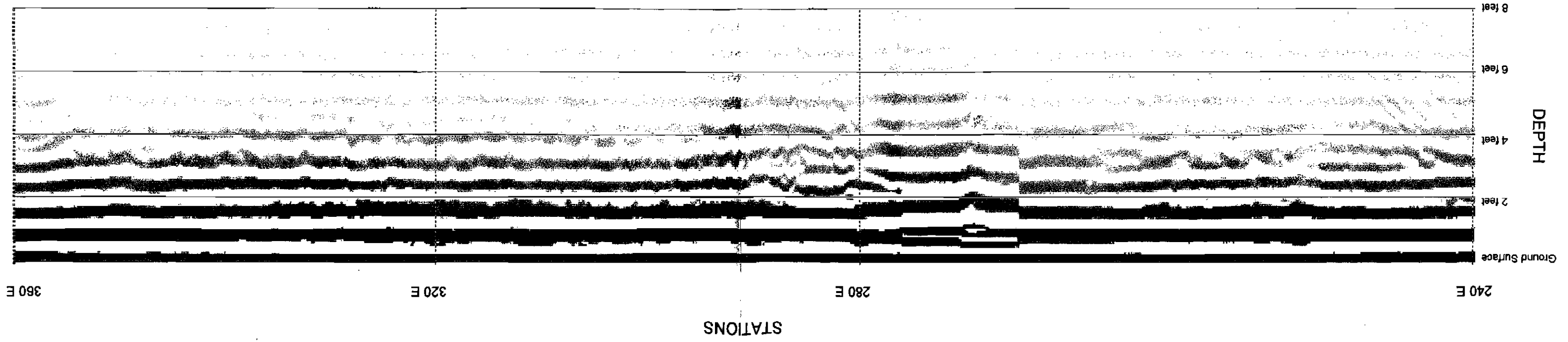
WAG 3 SWMU 6
GPR PROFILE
LINE 140 N



WAG 3 SWMU 6
GPR PROFILE
LINE 150 N

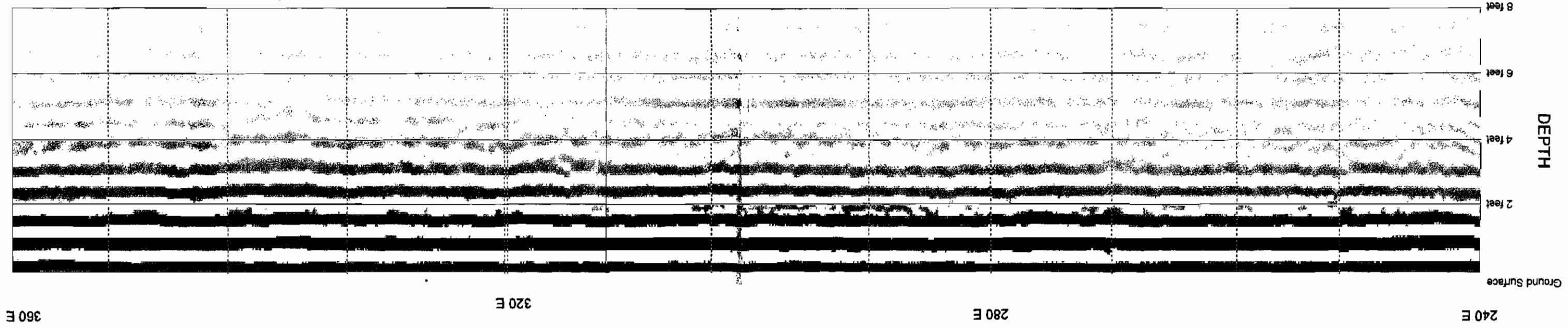


WAG 3 SWMU 6
GPR PROFILE
LINE 160 N



WAG 3 SWMU 6
GPR PROFILE
LINE 170 N

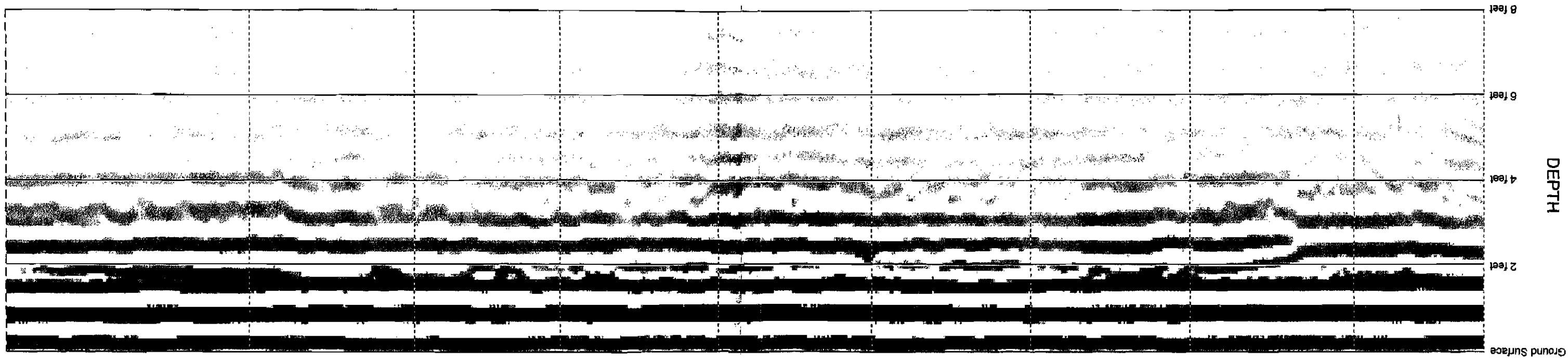
STATIONS



WAG 3 SWMU 6
GPR PROFILE
LINE 180 N

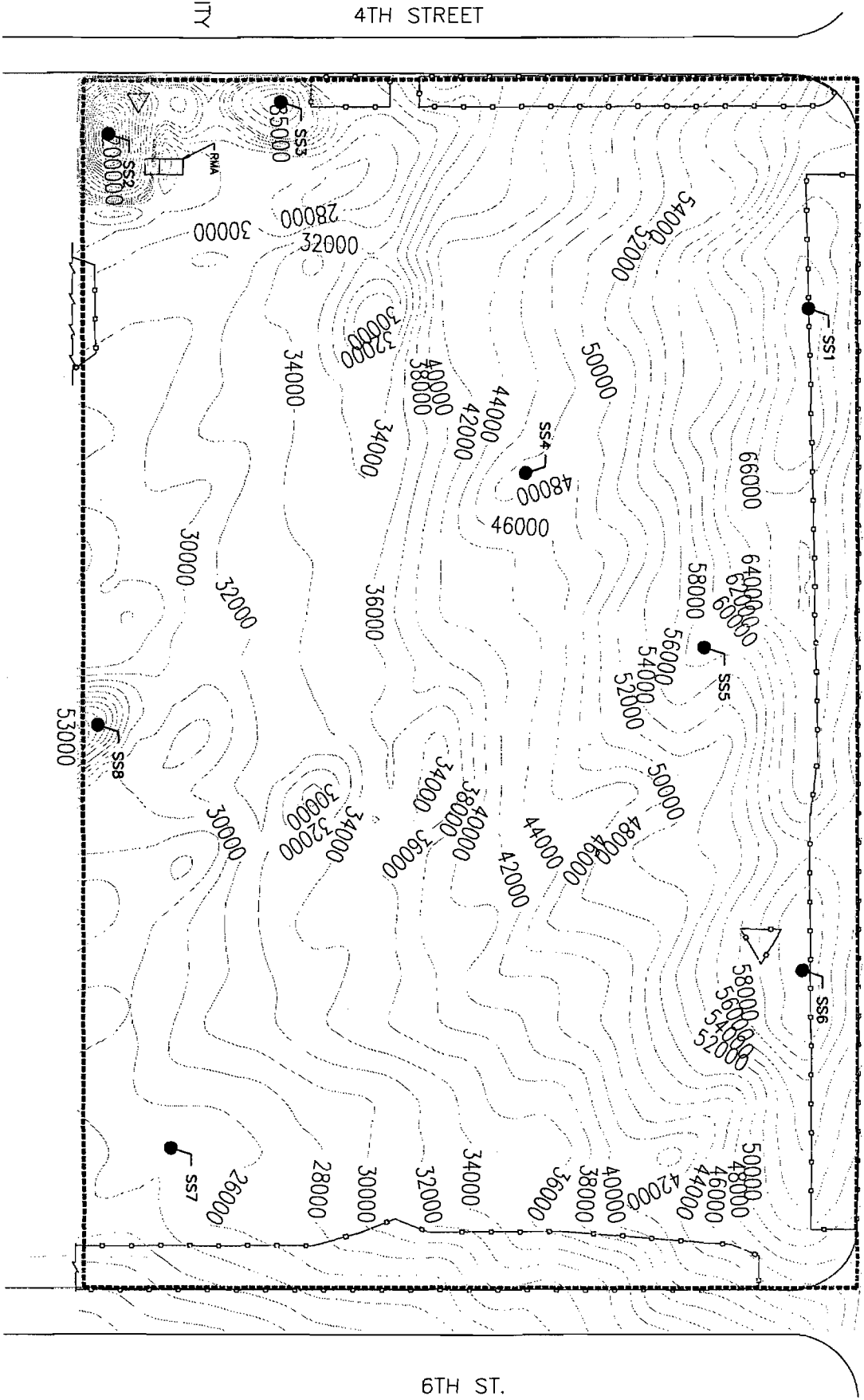
STATIONS

270 E 280 E 320 E 360 E



APPENDIX B
SURFACE RADIOLOGICAL SURVEY

SS3 NOT TAKEN
DUE TO PROXIMITY
OF DRILL RIG



VIRGINIA AVE.

4TH STREET

6TH ST.

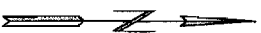
LEGEND:

..... SWMU BOUNDARY

..... CONTAMINATION AREA

XXXXX 2X2 Ndi CPM

..... SAMPLE LOCATION



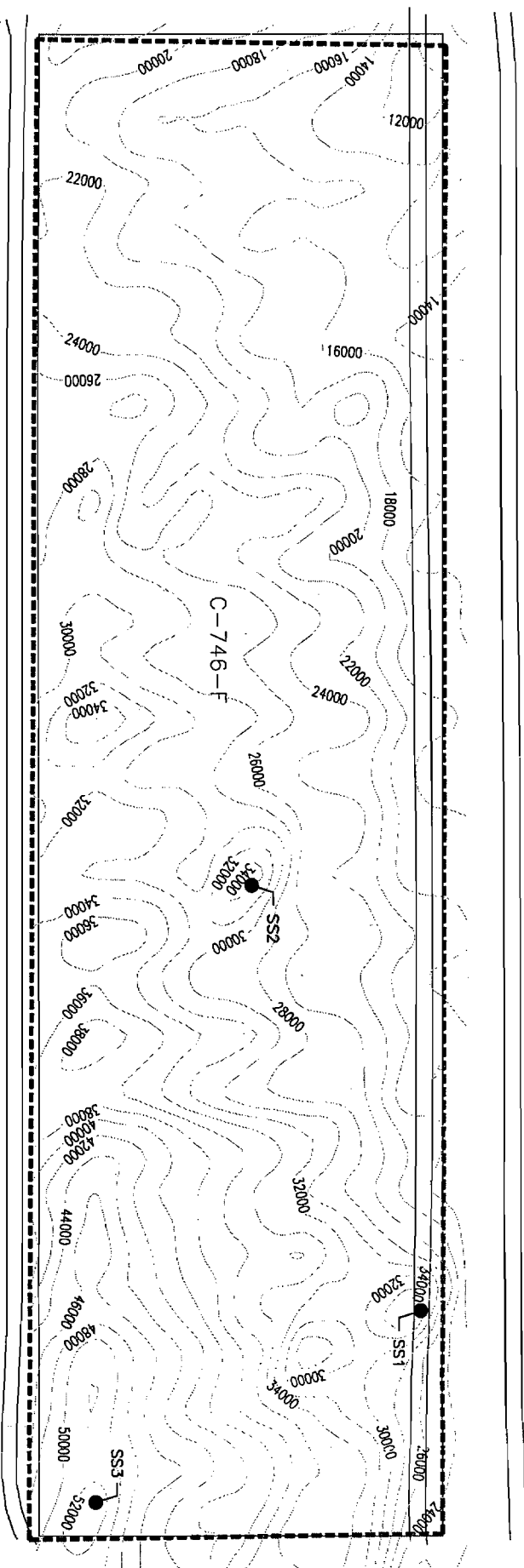
TJM & Associates, Inc.
Engineering and Science

PADUCAH GASEOUS
DIFFUSION PLANT

RADIOLOGICAL WALKOVER SURVEY
WAG 3 - SWMU 4

SHEET 1 March 2000

TEXAS AVE.

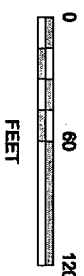


LEGEND:

..... SWMU BOUNDARY

XXXXX ... 2X2 NoI CPM

● SAMPLE LOCATION



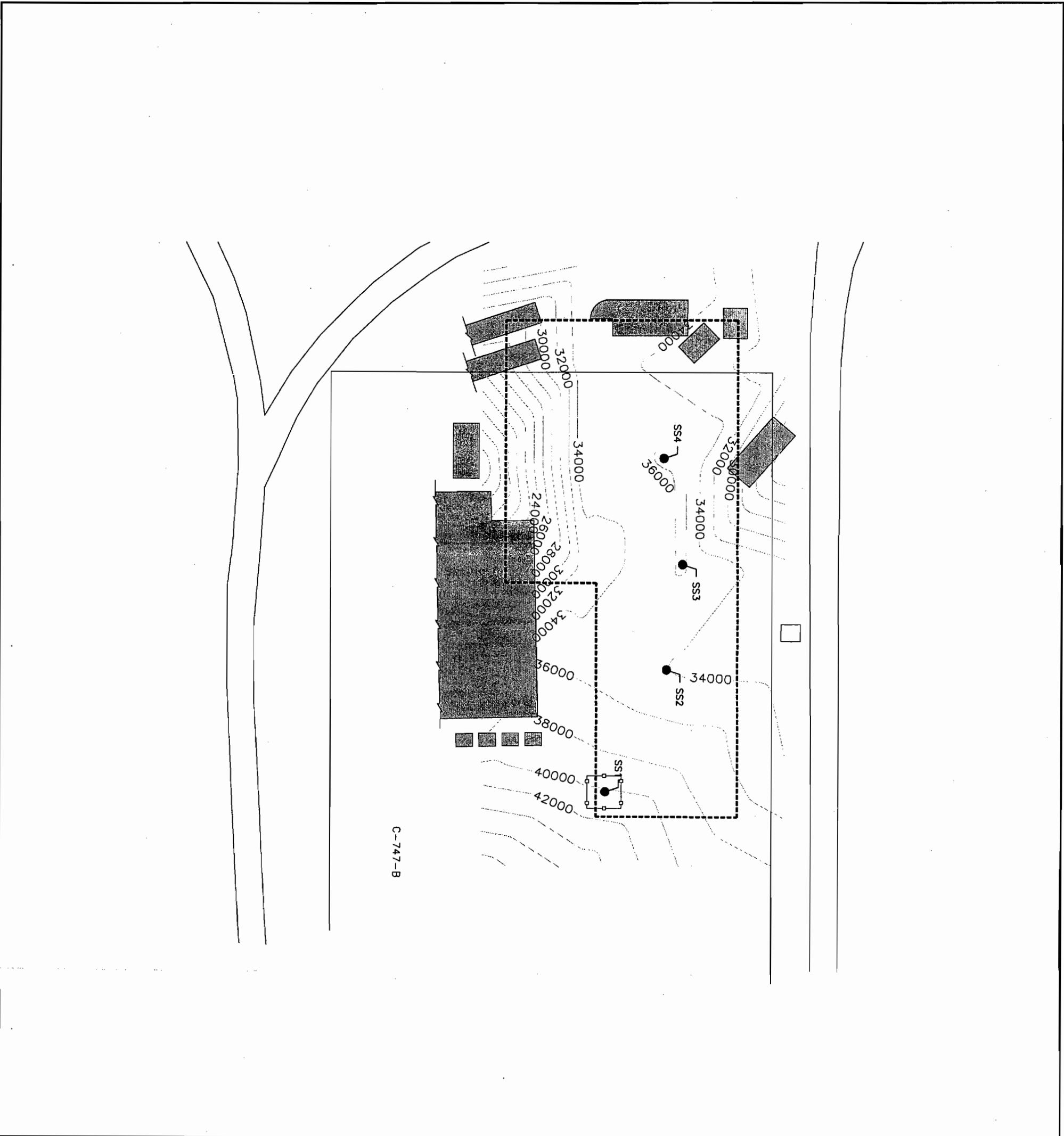
TNI T. M. & Associates, Inc.
 Engineering and Science

PADUCAH GASEOUS
 DIFFUSION PLANT

RADIOLOGICAL WALKOVER SURVEY
 WAG 3 - SWMU 5




SHEET 1

MARCH 2000




C-747-B

LEGEND:

-  SWMU BOUNDARY
-  INACCESSIBLE AREA
-  CONTAMINATION AREA

XXXXX ... 2X2 NpI CPM

 SAMPLE LOCATION



TN M & Associates, Inc.
Engineering and Science

PADUCAH GASEOUS
DIFFUSION PLANT

RADIOLOGICAL WALKOVER SURVEY
WAG 3 - SWMU 6

SHEET 1 MARCH 2000

Rad Walkover

QA/QC



Certificate of Calibration

#1

Environmental Restoration Group, Inc.
 12809 Arroyo De Vista
 Albuquerque, NM 87111
 (505) - 298 - 4224

Manufacturer: Ludlum Model: 2221 Serial No.: 108862
 All Ranges Calibrated Electronically; Ludlum Pulsar Generator S.N. 97743
 Temp.: 76 F Rel. Humidity 70 % Bar. Pressure 26.5 in. of Hg

FUNCTION CHECKS:

Reset Audio Window Operation Mechanical Battery
 High Voltage 500v 1000v 1500v

Instrument found within tolerance (+/- 10%) YES NO

COMMENTS: Threshold 100 = 10 mV

Reference Setting	Ratemeter	Instrument "As found reading"
400 Kcpm	<u>400K</u>	<u>± 10%</u>
100 Kcpm	<u>100K</u>	
40 Kcpm	<u>40K</u>	
10 Kcpm	<u>10K</u>	
4 Kcpm	<u>4K</u>	
1 Kcpm	<u>1K</u>	
400 cpm	<u>400</u>	
100 cpm	<u>100</u>	<u>✓</u>

Reference Setting	Digital Readout	Log Scale	Instrument Received
400 Kcpm	<u>399297</u>	<u>400K</u>	<u>± 10%</u>
40 Kcpm	<u>39927</u>	<u>40K</u>	
4 Kcpm	<u>3992</u>	<u>4K</u>	
400 cpm	<u>399</u>	<u>400</u>	<u>✓</u>

Calibrated By: Kenneth Baker Calibration Date: 8/3/99

Calibration Due: 2/3/00

Reviewed By: Patricia Baker Date: 8/3/99

Certificate of Calibration

Voltage Plateau

#1

Environmental Restoration Group, Inc.
 12809 Arroyo de Vista NE
 Albuquerque, NM 87111
 (505) - 298 - 4224

Detector Mfg.: Ludlum Model: 44-10 Serial No.: PR150507
 Counter Mfg.: Ludlum Model: 2221 Serial No.: 108862
 Counter Input Sensitivity 10 mV
 Temp.: 76 F Rel. Humidity 70 % Bar. Pressure 26.5 in. of Hg

Source: Cs-137 Activity: 9.2 uCi on 3/10/99 Serial No.: 92CS2500954
 Geometry: 6" from end
 Comments: of probe

Count Time: 0.5 minute(s)

High Voltage	Gross Source Counts	Background Counts	Net Source Counts
550	12662		
600	19267		
650	28750		
700	37420		
750	41427		
800	44236		
850	45767		
900	48105	5701	
1010950	48799		

Recommended Operating Voltage: 900 volts

Calibrated By: Kenneth R Baker Calibration Date: 8/3/99

Calibration Due: 2/3/00

Reviewed By: Patricia Baker Date: 8/3/99

Certificate of Calibration

Environmental Restoration Group, Inc.
 12809 Arroyo De Vista
 Albuquerque, NM 87111
 (505) - 298 - 4224

Manufacturer: Ludlum Model: 2221 Serial No.: 117649
 All Ranges Calibrated Electronically; Ludlum Pulser Generator S.N. 97743
 Temp.: 76 F Rel. Humidity 70 % Bar. Pressure 26.5 in. of Hg

FUNCTION CHECKS:

Reset Audio Window Operation Mechanical Battery
 High Voltage 500v 1000v 1500v

Instrument found within tolerance (+/- 10%) YES NO

COMMENTS: Threshold 100 = 10 mV

Reference Setting	Ratemeter	Instrument "As found reading"
<u>400 Kcpm</u>	<u>400K</u>	<u>± 10%</u>
<u>100 Kcpm</u>	<u>100K</u>	
<u>40 Kcpm</u>	<u>40K</u>	
<u>10 Kcpm</u>	<u>10K</u>	
<u>4 Kcpm</u>	<u>4K</u>	
<u>1 Kcpm</u>	<u>1K</u>	
<u>400 cpm</u>	<u>400</u>	
<u>100 cpm</u>	<u>100</u>	

Reference Setting	Digital Readout	Log Scale	Instrument Received
<u>400 Kcpm</u>	<u>400081</u>	<u>400K</u>	<u>± 10%</u>
<u>40 Kcpm</u>	<u>40008</u>	<u>40K</u>	
<u>4 Kcpm</u>	<u>4006</u>	<u>4K</u>	
<u>400 cpm</u>	<u>400</u>	<u>400</u>	

Calibrated By: Kenneth Baker Calibration Date: 8/3/99

Calibration Due: 2/3/00

Reviewed By: Patricia Baker Date: 8/3/99

Certificate of Calibration

Voltage Plateau

Environmental Restoration Group, Inc.
 12809 Arroyo de Vista NE
 Albuquerque, NM 87111
 (505) - 298 - 4224

Detector Mfg.: Ludlum Model: 44-10 Serial No.: PR 154615
 Counter Mfg.: Ludlum Model: 2221 Serial No.: 117649
 Counter Input Sensitivity 10 mV
 Temp.: 75 F Rel. Humidity 70 % Bar. Pressure 26.5 in. of Hg

Source: C-137 Activity: 9.2 uCi Serial No.: 92 C524-00974
 Geometry: 6" from end on 7/12/92
 Comments: of probe

Count Time: 0.5 minute(s)

High Voltage	Gross Source Counts	Background Counts	Net Source Counts
450	717		
500	14358		
550	25590		
600	36506		
650	42750		
700	46206		
750	47929	5679	
800	50345	6012	

Recommended Operating Voltage: 750 volts

Calibrated By: Kenneth Baker Calibration Date: 8/3/99

Calibration Due: 2/3/00

Reviewed By: Patricia Baker Date: 8/3/99

Certificate of Calibration

Environmental Restoration Group, Inc.
 12809 Arroyo De Vista
 Albuquerque, NM 87111
 (505) - 298 - 4224

Manufacturer: Ludlum Model: 2221 Serial No.: 149953
 All Ranges Calibrated Electronically; Ludlum Pulser Generator S.N. 97743
 Temp.: 76 F Rel. Humidity 70 % Bar. Pressure 26.5 In. of Hg

FUNCTION CHECKS:

Reset Audio Window Operation Mechanical Battery
 High Voltage 500v 1000v 1500v

Instrument found within tolerance (+/- 10%) YES NO

COMMENTS: Threshold 100 = 10 mV

Reference Setting	Ratemeter	Instrument "As found reading"
<u>400 Kcpm</u>	<u>400K</u>	<u>± 10%</u>
<u>100 Kcpm</u>	<u>100K</u>	
<u>40 Kcpm</u>	<u>40K</u>	
<u>10 Kcpm</u>	<u>10K</u>	
<u>4 Kcpm</u>	<u>4K</u>	
<u>1 Kcpm</u>	<u>1K</u>	
<u>400 cpm</u>	<u>400</u>	
<u>100 cpm</u>	<u>100</u>	

Reference Setting	Digital Readout	Log Scale	Instrument Received
<u>400 Kcpm</u>	<u>399786</u>	<u>400K</u>	<u>± 10%</u>
<u>40 Kcpm</u>	<u>39976</u>	<u>40K</u>	
<u>4 Kcpm</u>	<u>3996</u>	<u>4K</u>	
<u>400 cpm</u>	<u>399</u>	<u>400</u>	

Calibrated By: Kenneth R. Baker Calibration Date: 8/3/99

Calibration Due: 2/3/00

Reviewed By: Patricia Baker Date: 8/3/99

Certificate of Calibration

Voltage Plateau

#3

Environmental Restoration Group, Inc.
 12809 Arroyo de Vista NE
 Albuquerque, NM 87111
 (505) - 298 - 4224

Detector Mfg.: Ludlum Model: 44-10 Serial No.: PR150852
 Counter Mfg.: Ludlum Model: 2221 Serial No.: 149953
 Counter Input Sensitivity 10 mV
 Temp.: 70 F Rel. Humidity 70 % Bar. Pressure 26.5 in. of Hg

Source: Cs-137 Activity: Cs-137 Serial No.: 920525-00974
 Geometry: 6" from end 9.24Ci on 3/12/92
 Comments: of probe

Count Time: 0.5 minute(s)

High Voltage	Gross Source Counts	Background Counts	Net Source Counts
650	27445		
700	21405		
750	30059		
800	36424		
850	41020		
900	43277		
950	45444		
1000	46728		
1050	48450	5676	
1100	48567		

Recommended Operating Voltage: 1050 volts

Calibrated By: Kenneth R Baker Calibration Date: 5/7/99

Calibration Due: 2/3/00

Reviewed By: Patricia Baker Date: 8/3/99

Certificate of Calibration

Environmental Restoration Group, Inc.
 12809 Arroyo De Vista
 Albuquerque, NM 87111
 (505) - 298 - 4224

Manufacturer: Ludlum Model: 2221 Serial No.: 149940
 All Ranges Calibrated Electronically; Ludlum Pulsar Generator S.N. 97743
 Temp.: 76 F Rel. Humidity 70 % Bar. Pressure 26.5 In. of Hg

FUNCTION CHECKS:

Reset Audio Window Operation Mechanical Battery
 High Voltage 500v 1000v 1500v

Instrument found within tolerance (+/- 10%) YES NO

COMMENTS: Threshold 10mV = 100

Reference Setting	Ratemeter	Instrument "As found reading"
<u>400 Kcpm</u>	<u>400K</u>	<u>± 10%</u>
<u>100 Kcpm</u>	<u>100K</u>	
<u>40 Kcpm</u>	<u>40K</u>	
<u>10 Kcpm</u>	<u>10K</u>	
<u>4 Kcpm</u>	<u>4K</u>	
<u>1 Kcpm</u>	<u>1K</u>	
<u>400 cpm</u>	<u>400</u>	
<u>100 cpm</u>	<u>100</u>	

Reference Setting	Digital Readout	Log Scale	Instrument Received
<u>400 Kcpm</u>	<u>400145</u>	<u>400k</u>	<u>± 10%</u>
<u>40 Kcpm</u>	<u>40022</u>	<u>40k</u>	
<u>4 Kcpm</u>	<u>4002</u>	<u>4k</u>	
<u>400 cpm</u>	<u>400</u>	<u>400</u>	

Calibrated By: Kenneth R. Bahr Calibration Date: 8/3/99

Calibration Due: 8/3/00

Reviewed By: Patricia Bahr Date: 8/3/99

Certificate of Calibration

Voltage Plateau

41

Environmental Restoration Group, Inc.
 12809 Arroyo de Vista NE
 Albuquerque, NM 87111
 (505) - 298 - 4224

Detector Mfg.: Ludlum Model: 44-10 Serial No.: PR 150786
 Counter Mfg.: Ludlum Model: 2221 Serial No.: 149940
 Counter Input Sensitivity 10 mV
 Temp.: 75 F Rel. Humidity 70 % Bar. Pressure 26.5 in. of Hg

Source: Cs-137 Activity: 9.2 uCi on 3/12/92 Serial No.: 9253 2500934
 Geometry: 6" from end
 Comments: of probe

Count Time: 0.5 minute(s)

High Voltage	Gross Source Counts	Background Counts	Net Source Counts
600	15962		
650	26071		
700	36151		
750	40899		
800	43942		
850	45292		
900	48010	5787	
950	49165		

Recommended Operating Voltage: 900 volts

Calibrated By: Kenneth Baker Calibration Date: 8/3/99

Calibration Due: 2/3/00

Reviewed By: Patricia Baker Date: 8/3/99

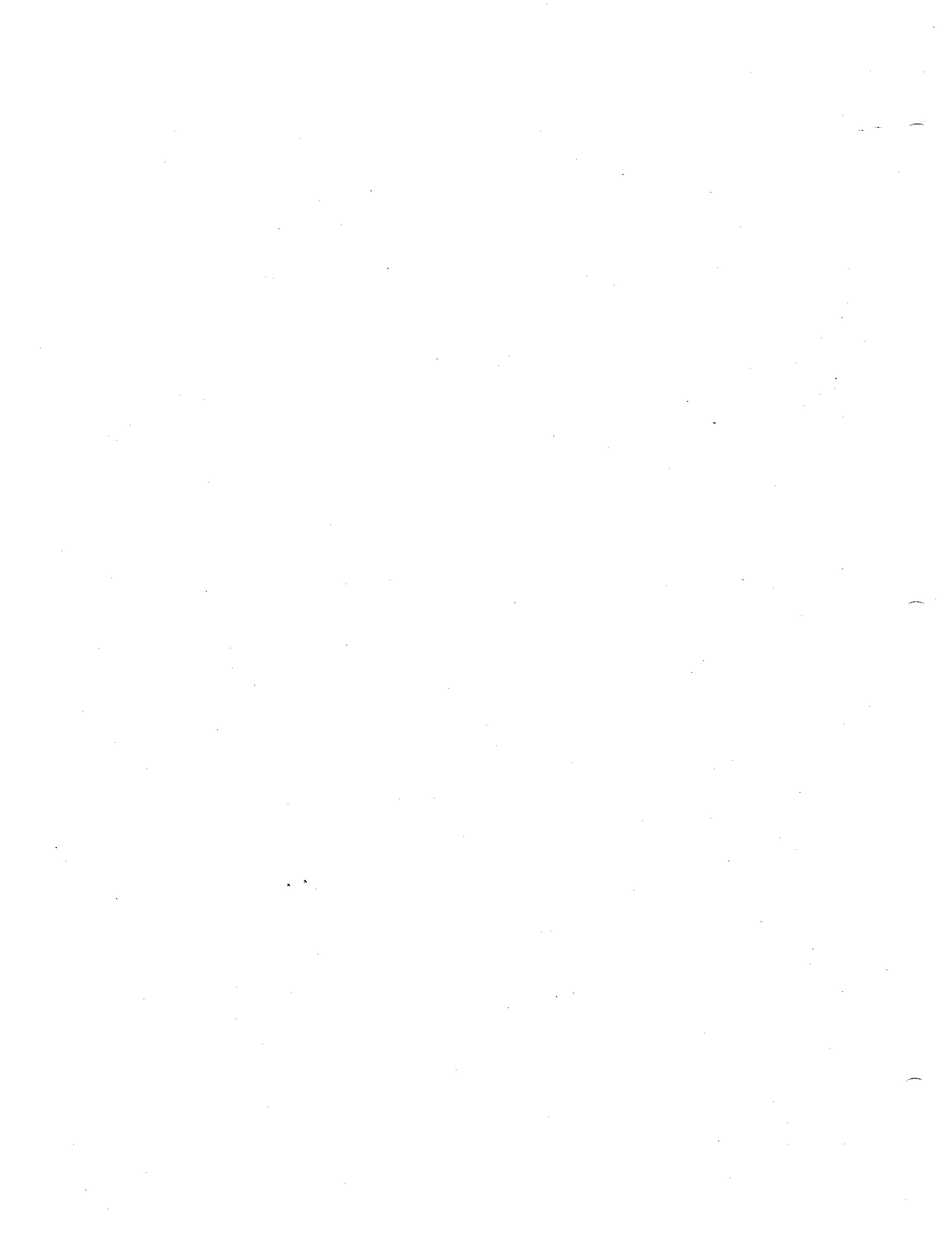
Environmental Restoration Group, Inc.
12809 Arroyo De Vista NE
Albuquerque, NM 87111
(505) 298-4224
<http://Members.AOL.Com/ERGOoffice>

Leak Test Certificate

Isotope CS-137 (5.12 μ Ci m 6-16-94)
Result of Leak Test < 0.00004 μ Ci
Date of Leak Test 8-6-99
Source Serial Number 333-94
Analyst Kenneth L. Baker



Rad Walkover Results



10713

RADIATION / CONTAMINATION SURVEY MAP

QUALITY FGDP SWMU 5 DATE 8/21 TIME NA
PURPOSE Radiological Walkover Survey RWP # _____

INSTRUMENTS USED:

INSTRUMENT	PROBE
SN 108862	SN PR 150507 (#1)
SN 117649	SN PR 154615 (#2)
SN 149953	SN PR 150852 (#3)
SN 149940	SN PR 150786 (#4)

TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
 722351 / Jaron R. Dublin Jaron R. Dublin
Cher D. Marston Cher D. Marston 701944
Regina Oller Regina Oller 722368
Bobby Murray Bobby Murray

Date	Instrument ID	Location		Activity (CPM)
		Northing	Easting	
8-21 1354	4	202	-7212	15,100
8-21 1441	4	172	-7212	11,500
8-21 1440	4	142	-7212	18,400
8-21 1440	4	142	-7212	18,900
8-21 1441	4	82	-7212	21,000
8-21 1441	4	52	-7212	20,800
8-21 1442	4	22	-7212	22,800
8-21 1442	4	-8	-7212	23,400
8-21 1442	4	-38	-7212	20,800
8-21 1354	4	202	-7182	12,300
8-21 1440	3	172	-7182	11,200
8-21 1447	3	142	-7182	13,800
8-21 1448	7	112	-7182	15,600
8-21 1448	7	82	-7182	16,600
8-21 1449	7	52	-7182	17,800
8-21 1450	7	22	-7182	19,400
8-21 1450	7	-8	-7182	19,900
8-21 1354	4	-38	-7182	21,900
8-21 1354	4	202	-7152	13,700
8-21 1440	2	172	-7152	11,500
8-21 1447	2	142	-7152	12,500

8-24

See Attached Map

8-24

REMARKS: O - survey location, # - general area dose rate, -x-x-x-x- radiological boundaries., # @ c - dose rate at contact

E. S. Bazzell [Signature] 702076

PREPARED BY:

DATE:

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 5 DATE 8/21 TIME NA Page 2 of 13
 PURPOSE Radiological walkover Survey RWP # NA

TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbin 722251 Cher D. Morrison 701944 Cher D. Mann B. Murray
Sharon R. Durbin Regina Oller Regina Oller 722368 E.J. BAZZUC

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location #70207C		Activity (CPM)
		Northing	Easting					Northing	Easting	
1447	2	401/12	-7152	13800	480	1453	3	47/52	-7122	18100
1448	7	49/82	-7152	15800	8-24	1452	3	49/22	-7122	20400
1449		40/52	-7152	15500		1452	3	52/-8	-7122	22700
1450		41/22	-7152	15400		1527	4	55/38	-7122	22,000
1450		52/-8	-7152	19200		1353	4	31/202	-7092	14,400
1526	4 # 361	55/-38	-7152	20,600	8-24	1456	2	51/172	-7092	12600
1353	4 # 361	31/202	-7122	12,600	8-24	1455	2	51/142	-7092	15300
1456	3	31/172	-7122	14900		1454	2	40/112	-7092	15800
1455	3	31/142	-7122	16200		1453	2	43/82	-7092	14800
1454	3	40/112	-7122	16100		1453	2	46/52	-7092	17700
1453	3	43/82	-7122	17600		1452	2	49/22	-7092	17900

REMARKS: _____

REVIEWED BY: _____ DATE: _____

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RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 5 DATE 8/21 TIME NA Page 3 of 13
 PURPOSE Radiological Walkover Survey RWP # NA

TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbin 722251 Cher D. Morrison 701944 E.J. BAZZIGL
Sharon R. Durbin Regina Oller 722368 Regina Oller 702076

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
1450	2	523 -8	-7092	21900		1352	4	35 202	-7032	13,200
1508	4	523 -38	-7092	21,000	8-24	1458	2	35 172	-7032	13900
1352	4	34 202	-7062	13,600	8-24	1458	2	37 142	-7032	14900
1458	3	37 172	-7062	14700		1458	2	40 112	-7032	16900
1458	3	37 142	-7062	15700		1459	2	43 82	-7032	16900
1458	3	40 112	-7062	17500		1500	2	45 52	-7032	21300
1459	3	43 82	-7062	18700		1500	2	45 22	-7032	22900
1500	3	46 52	-7062	21600		1501	2	52 -8	-7032	23500
1500	3	49 22	-7062	22700	9-24	1528	4	55 -38	-7032	24,800
1501	3	52 -8	-7062	22800	8-24	1351	4	56 202	-7002	15,900
1529	4	55 -38	-7062	23,600	8-24	1507	2	56 172	-7002	15800

REMARKS: S. Murray, Buddy Murray

REVIEWED BY: _____ DATE: _____

B-29

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDD SWMU 5 DATE 8/21 TIME MA
 PURPOSE Radiological Walkover Survey RWP # NA
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Haron R. Duckin Sharon K. Aubin 700051 Regina Oller (Regina Oller 700038)
Hee D. Morrison Chris D. Morrison 701944 Buddy Munn Buddy Munn

E.J. O'Connell
8/21/2008 #702076

Time	Instrument ID	Location		Activity (CPM)	Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting				Northing	Easting	
1506	3	376 142	-7002	21200	1505	2	451 82	-6972	19600
1505	3	460 112	-7002	17700	1504	2	461 52	-6972	23000
1505	3	426 82	-7002	21500	1504	2	497 22	-6972	25200
1504	3	460 52	-7002	24800	1503	2	521 -8	-6972	27500
1504	3	496 22	-7002	28700	1530 1503	4 2	557 -38	-6972	26800
1503	3	526 -8	-7002	27500	1350	4	918 202	-6942	15,600
1503	3	556 -38	-7002	27500	1508	3	348 172	-6942	16200
1351	4	377 202	-6972	14,800	1508	3	378 142	-6942	21200
1507	2	317 172	-6972	14800	1509	3	408 112	-6942	25800
1506	2	377 142	-6972	19200	1509	3	438 82	-6942	24600
1505	2	407 112	-6972	19300	1510	3	468 52	-6942	27200

8-24
 520
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 520
 8/21
 8-24

REMARKS:

REVIEWED BY: _____

DATE: _____

B-30

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY: PGDF
 PURPOSE: Radon Water Survey
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER):
Sharon R. Dyer in 722251
Sharon R. Dyer

SWMU: 5
 DATE: 8/21
 TIME: NA
 RWP #: NA

Activity (CPM):
 Cher D. Manion Chn D. Manion 19144
 Regina Olier. Regina Olier 722368

Page 5 of 10
 E. J. O'Brien # 702071
 B. Murray

Time	Instrument ID	Location		Activity (CPM)	Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting				Northing	Easting	
1510	3	411 22	-6942	23100	8-21 1530	4	411 -38	-6912	27800
1511	3	511 8	-6942	31300	7-14 1349	4	311 202	-6982	15800
1530	4	551 -38	-6942	26200	8-21 1516	3	511 172	-6982	17800
1549	4	411 202	-6912	15800	8-21 1516	3	311 142	-6982	23000
1508	2	411 172	-6912	15200	1515	3	411 112	-6982	25200
1508	2	411 142	-6912	19600	1515	3	411 82	-6982	27800
1509	2	411 112	-6912	19700	1515	3	411 52	-6982	28400
1509	2	411 82	-6912	23500	1514	3	411 22	-6982	30300
1510	2	411 52	-6912	24700	1513	3	511 -8	-6982	31100
1510	2	411 22	-6912	26500	1531	4	411 -38	-6982	28700
1511	2	411 -8	-6912	28800	1548	4	411 202	-6952	16200

REMARKS: B. Murray, Bucky Manion

REVIEWED BY: _____ DATE: _____

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 5 DATE 8/21 TIME NA
 PURPOSE Radio Biological Walkover Survey RWP # NA
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbin - Sharon R. Durbin 703351 B. Murray Buddy Murray
Herb D. Morrison - Herb D. Morrison 701944 Regina Oller (Regina Oller 702368)

E.J. BAZZELL
8/21/21 # 702076

Time	Instrument ID	Location		Activity (CPM)	Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting ^{SEP}				Northing	Easting ^{SEP}	
1516	2	172	65852	16500	1522	3	112	65822	25600
1516	2	142	65852	21100	1523	3	82	65822	28500
1515	2	112	65852	22800	1523	3	52	65822	27900
1515	2	82	65852	25600	1524	3	22	65822	32800
1515	2	52	65852	25900	1524	3	-8	65822	36700
1514	2	22	65852	27500	1532	4	-38	65822	39200
1513	2	-8	65852	30000	1347	4	202	65792	16800
1514	2	-38	65852	27500	1521	2	172	65792	17500
1347	4	202	65822	17800	1522	2	142	65792	22600
1521	3	172	65822	19400	1522	2	112	65792	23200
1522	3	142	65822	25200	1523	2	82	65792	24500

REMARKS:

REVIEWED BY: _____ DATE: _____

B-32

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 5 DATE 8/21 TIME N/A
 PURPOSE Radiological walkover Survey RWP # NA
 TECHNICIAN (NAME, SIGNATURE/BADGE NUMBER)
Sharon R. Durbin Sharon R. Durbin 702251 Buddy Murray Buddy Murray
Chris D. Morrison Chris D. Morrison 701944 Regina Oller Regina Oller 702368

E.S. BARRELL
702076

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
1523	2	52	65792	28700		1527	3	54-8	65762	34100
1524	2	22	65792	28300	8-24	1535	4	44-38	65762	229,100
1524	2	-8	65792	31600	8-24	1545	4	54-202	65732	18,800
154	4	-38	65792	31,200	8-24	1529	2	35-72	65732	18600
1546	4	202	65762	19,200	8-24	1529	2	38-142	65732	23500
1529	3	172	65762	18600		1528	2	45-112	65732	24400
1529	3	142	65762	25000		1528	2	45-82	65732	36500
1528	3	112	65762	25800		1527	2	47-52	65732	28900
1528	3	82	65762	29700		1527	2	45-22	65732	31500
1527	3	52	65762	30900		1527	2	53-8	65732	31700
1527	3	22	65762	33300		1534	4	56-38	65732	33,200

REMARKS:

REVIEWED BY: _____

DATE: _____

B-33

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU S DATE 8/21 TIME 15:31
 PURPOSE Radiological Walkover Survey RWP# NA
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Duchin 782251 Cher D. Morrison 701944
Sharon R. Duchin Regina Oller 722368

Page 8 of 13

E. J. BARTILL
698092 702078

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)	
		Northing	Easting					Northing	Easting		
1345											
1530	SRD 24	376	202	-6702	25800	1532	2	377	142	-6672	23700
1531	3	378	172	-6702	22400	1533	2	417	112	-6672	23800
1532	3	376	142	-6702	25800	1533	2	447	82	-6672	27900
1533	3	416	112	-6702	26400	1534	2	477	52	-6672	28500
1533	3	416	82	-6702	29900	1534	2	507	22	-6672	32600
1534	3	476	52	-6702	31800	1534	2	537	-8	-6672	35500
1534	3	506	22	-6702	37100	1538	4	567	-38	-6672	34,800
1534	3	576	-8	-6702	37700	1544	4	374	202	-6642	20,200
1538	4	546	-38	-6702	34,100	1541	3	358	172	-6642	21700
1532	SRD 24	376	202	-6672	23700	1541	3	386	142	-6642	26300
1533	2	357	172	-6672	20000	1539	3	418	112	-6642	28300

REMARKS: B. Murray, Budd Murray

REVIEWED BY: _____

DATE: _____

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RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 5 DATE 8/23 TIME 827 Page 10 of 13
 PURPOSE Radiological Walkover Survey RWP # N/A

TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbins Sharon R. Durbins 722251 B. Murray Buddy Murray E.J. BAZZELL
Har D. Morrison Chris D. Morrison 701904 Regina Ciller Regina Ciller 722368 # 702070

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)	
		Northing	Easting					Northing	Easting		
1540	4	570	-38	-6582	37,500	8:30	1	362	172	-6522	27800
6:30	4	331	202	-6552	27800	8:31	1	372	142	-6522	31200
8:30		361	172	-6552	22700	8:31	1	422	112	-6522	36400
8:29	1	371	142	-6552	27100	8:32	1	452	82	-6522	35700
8:29	1	421	112	-6552	29700	8:32	1	482	52	-6522	38100
8:29	1	451	82	-6552	33800	8:32	1	512	22	-6522	42700
8:28	1	481	52	-6552	37900	8:33	1	542	-8	-6522	48300
8:28	1	511	22	-6552	40600	8:33	4	572	-38	-6522	39400
8:27	1	541	8	-6552	46600	8:34	4	333	202	-6492	21400
1540	4	571	-38	-6552	41,500	8:36	1	363	172	-6492	37800
1341	4	332	202	-6522	21,400	8:36	1	373	142	-6492	32000

REMARKS: _____

REVIEWED BY: _____ DATE: _____

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RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 5 DATE 8/23 TIME NA
 PURPOSE Radiologic CN Walkover Survey RWP# NA
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbin Sharon R. Durbin 722251 B. Murray Buddy Murray E. S. BAZZELL
Chad D. Morrison Chad D. Morrison 701944 Regina Oller Regina Oller 722368 E. S. BAZZELL #702076

Time	Instrument ID	Location		Activity (CPM)	Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting				Northing	Easting	
835	1	433 112	-6492	32000	842	1	481 52	-6462	43200
834	1	453 82	-6492	33200	842	1	514 22	-6462	47300
834	1	483 52	-6492	39700	842	1	544 -8	-6462	52600
834	1	513 22	-6492	43600	843	1	574 -38	-6462	45,700
833	1	543 -8	-6492	46000	846	4	337 202	-6432	23,200
834	1543 L4	573 -38	-6492	43600	845	1	385 172	-6432	26300
844	4	591 202	-6462	22,700	845	1	395 142	-6432	30800
837	1	364 172	-6462	27400	844	1	425 112	-6432	34200
837	1	394 142	-6462	29800	844	1	455 82	-6432	37100
838	1	424 112	-6462	25400	844	1	485 52	-6432	40600
838	1	454 82	-6462	37600	843	1	515 22	-6432	45800

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8-24
8-24

REMARKS:

REVIEWED BY: _____

DATE: _____

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PLGDP SWMU 5 DATE 8/23 TIME NA Page 12 of 13
 PURPOSE Radiological Walkover Survey RWP# NA
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Duchin Sharon R. Duchin 722251 B. Murray Buddy Murray E.S. Bussell
Cher D. Morrison Cher D. Morrison 701944 Regina Oller Regina Oller 722368 E.S. Bussell 702076

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
842	1	515 - 9	-6432	52900		8-24 1336	4	351 202	-6372	23100
1544	4	515 - 38	-6432	46,200	8-24	851	1	301 172	-6372	24700
1359	4	336 202	-6402	23,300	8-24	851	1	317 142	-6372	34000
846	1	326 172	-6402	26700		850	1	427 112	-6372	34200
846	1	316 142	-6402	35400		850	1	457 82	-6372	41000
847	1	426 112	-6402	37100		850	1	487 52	-6372	41900
847	1	456 82	-6402	42600		849	1	517 22	-6372	5600
848	1	486 52	-6402	46100		849	1	517 - 8	-6372	54100
848	1	516 3222	-6402	47600		1449	4	517 - 38	-6372	48,500
848	1	546 - 8	-6402	51700		8-24 1338	4	336 202	-6342	24800
1545	4	516 - 38	-6402	47,900	8-24 8-24	1604	4	308 172	-6342	28,800

REMARKS:

REVIEWED BY: _____ DATE: _____

B-38

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWML 5 DATE 8-24-99 TIME MA Page 13 of 13
 PURPOSE Radiological Walkover Survey RWP # NA
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Dublin Sharon R. Dublin 70051 B. Murray Ruddy Murray E.J. BARKELL
Herb Morrison Chris B. Merrin 70194 Regina Oller Regina Oller 722368 C. J. ... 702074

Time	Instrument ID	Location		Activity (CPM)	Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting				Northing	Easting	
1605	4	348	142	-6342	33,200				
1605	4	475	112	-6342	35,800				
1606	4	456	82	-6342	37,200				
1606	4	458	52	-6342	43,200				
1606	4	515	22	-6342	45,500				
1601	4	918	-8	-6342	51,400				
1545	4	578	-38	-6342	50,800				
END 8-20-99						END 8-29-99			

REMARKS:

REVIEWED BY: _____

DATE: _____

B-39

RADIATION / CONTAMINATION SURVEY MAP

UTILITY PG&P SWMU 6 DATE 8-24-99 TIME N/A
 PURPOSE Radiological Walkover Survey RWP # N/A

INSTRUMENTS USED:

INSTRUMENT	PROBE
SN 108862	SN PR 150507 (#1)
SN 117649	SN PR 154615 (#2)
SN 149953	SN PR 150852 (#3)
SN 149940	SN PR 150786 (#4)

TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)

D. J. BATTLE 702071
Cher D. Morrison 701944
S. Murray Buddy Murray

Date	Instrument ID	Location		Activity (CPM)
		Northing	Easting	
1627	1	571 154	-8300	30,200
1628	1	586 134	-8300	35,500
1628	1	593 104	-8300	35,900
1628	1	600 74	-8300	38,900
1627	1	590 154	-8270	30,900
N/A	→	571 134	-8270	Inaccessible
1626	1	574 104	-8270	35,200
1625	1	601 74	-8270	22,500
1623	1	581 154	-8240	22,000
1624	1	588 134	-8240	36,300
1624	1	595 104	-8240	35,200
1625	1	602 74	-8240	12,200
1622	1	582 154	-6210	32,800
1622	1	587 134	-6210	36,200
1621	1	596 104	-6210	32,400
N/A	→	603 74	-6210	Inaccessible
1620	1	585 154	-6180	33,300
1620	1	590 134	-6180	33,600
1620	1	597 104	-6180	35,500
N/A	→	604 74	-6180	Inaccessible
1619	1	584 154	-6150	34,100

See Attached Map

REMARKS: O - survey location, # - general area dose rate, -x-x-x-x- radiological boundaries., # @ c - dose rate at contact

PERFORMED BY:

DATE:

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PC^{up} DE SWMU 6 DATE 8-24 TIME NA Page 2 of 2
 PURPOSE _____ RWP # _____
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Cher B. Morrison Chad D. Thomas 701944 B. Murray Buddy Murray E.S. BAZZELL
Spec # 702076

Time	Instrument ID	Location		Activity (CPM)	Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting				Northing	Easting	
1618	1	591	134	-6150	37,900				
1618	1	518	104	-6150	38,900				
1617	1	605	74	-6150	40,400				
1615	1	585	154	-6120	35 37,800				
1615	1	592	134	-6120	39,800				
1616	1	599	104	-6120	45,100				
1617	1	600	74	-6120	49,000				
END 8-20-99					END 8-20-99				

REMARKS: _____

REVIEWED BY: _____ DATE: _____

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RADIATION / CONTAMINATION SURVEY MAP

CITY PGDP SWMU 4 DATE 8-19-99 TIME 1200
 PURPOSE Radiological Walkover Survey RWP # NA

INSTRUMENTS USED:

INSTRUMENT	PROBE
SN 108862	SN PR 150507 (#1)
SN 117649	SN PR 154615 (#2)
SN 149953	SN PR 150852 (#3)
SN 149940	SN PR 150786 (#4)

TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)

Sharon R. Durbin Sharon R. Durbin 722251
Cher D. Morrison Cher D. Morrison 701944
Regina Oller Regina Oller 722368
B. Murray Buddy Murray

Date	Instrument ID	Location		Activity (CPM)
		Northing	Easting	
8-19-99	1244 #1	-1510	-6471	209,000
1230	#4	-1485	-6485	58,000
1230	#3	-1443	-6490	50,000
<p>**See Attached Map**</p>				

REMARKS: O - survey location, # - general area dose rate, -x-x-x-x- radiological boundaries, # @ c - dose rate at contact

These readings represent areas in Swmu 4 that have activity > 2x background.
The activity readings for areas on grid points are documented separately

APPROVED BY: _____

DATE: _____

page 1 of 1

RADIATION / CONTAMINATION SURVEY MAP

LITY PGDP SWMU 4 DATE 8/21 TIME NH
 PURPOSE Radiological Walkover Survey RWP # _____

INSTRUMENTS USED:

INSTRUMENT	PROBE
SN 108862	SN PR 150507 (#1)
SN 117649	SN PR 154615 (#2)
SN 149953	SN PR 150852 (#3)
SN 149940	SN PR 150786 (#4)

TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)

Sharon R. Durbin Sharon R. Durbin 72225
Cher D. Morrison Cher D. Morrison 701944
Regina Oller Regina Oller 722368
Bob B. Murray Bob B. Murray

Time Date	Instrument ID	Location		Activity (CPM)
		Northing	Easting	
1/6:04	1	-1140	-6500	70300
23/10:04	1	-1170	-6500	60000
45/10:05	1	-1200	-6500	54500
67/10:06	1	-1230	-6500	49300
89/10:07	1	-1260	-6500	45700
111/10:07	1	-1290	-6500	40300
133/10:08	1	-1320	-6500	37700
155/10:08	1	-1350	-6500	40600
177/10:09	1	-1380	-6500	32200
199/10:10	1	-1410	-6500	27800
221/10:11	1	-1440	-6500	30100
243/10:11	1	-1470	-6500	27500
265/10:12	1	-1500	-6500	29600
287/10:13	1	-1530	-6500	22800
2/10:23	1	-1140	-6470	65700
24/10:21	1	-1170	-6470	67100
46/10:21	1	-1200	-6470	58900
68/10:20	1	-1230	-6470	54500
90/10:20	1	-1260	-6470	49100
112/10:19	1	-1290	-6470	43300
134/10:19	1	-1320	-6470	38900

See Attached Map

REMARKS: O - survey location, # - general area dose rate, -x-x-x- radiological boundaries., # @ c - dose rate at contact

EWED BY: _____

DATE: _____

Page 1 of 15

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 4 DATE 8/21 TIME 10:02
 PURPOSE Radiological walkover Surrey RWP# _____

TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon Duchin 722251 Cher D. Morrison Cher D. Morrison 701944 B. Murray Buddy Murray
Sharon R. Duchin Regina Oller (Regina Oller 722308)

Time	Instrument ID	Location		Activity (CPM)	Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting				Northing	Easting	
10:18	1	-1350	-6470	31400 ²⁴⁰ 30851 ¹⁵⁶	9/1024	1	-1260	-6440	47800
10:18	1	-1390	-6470	28320 ¹⁷⁸	113/1024	1	-1290	-6440	42300
10:17	1	-1410	-6470	32800 ²⁰⁰	135/1024	1	-1320	-6440	39300
10:17	1	-1440	-6470	29900 ²²²	157/1025	1	-1350	-6440	37700
10:16	1	-1470	-6470	28100 ²⁴⁴	179/1026	1	-1380	-6440	26400
10:16	1	-1500	-6470	27600 ²⁶⁶	201/1026	1	-1410	-6440	24300
10:15	1	-1530	-6470	39400 ²⁸⁸	223/1026	1	-1440	-6440	28200
10:02	1	-1140	-6440	67000 ³	245/1027	1	-1470	-6440	27200
10:20	1	-1170	-6440	67900 ²⁵	267/1027	1	-1500	-6440	26500
10:23	1	-1200	-6440	55400 ⁴⁷	289/1028	1	-1530	-6440	25200
10:23	1	-1230	-6440	52900 ¹⁹	4/1028	1	-1140	-6410	14700

REMARKS: _____

REVIEWED BY: _____ DATE: _____

B-45

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 4 DATE 8/19 TIME 0810
 PURPOSE Radiological Workover Survey RWP# N/A
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbin Sharon R. Durbin 702251 Regina Oller Regina Oller 722368
Cher D. Morrison Cher D. Morrison 701944 B. Murray Buddy Murray

Time	Instrument ID	Location		Activity (CPM)	Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting				Northing	Easting	
0810	2	-1170	-6410	70685 26	26/0818	2	-1500	-6410	30352
0811	2	-1200	-6410	606180 48	27/0819	2	⁰⁷ 1500 ⁻¹⁵³⁰	-6410	28227
0811	2	-1230	-6410	57911 70	8/21 5/922	1	-1140	-6380	68200
0812	2	-1260	-6410	51550 92	27/0842	2	-1170	-6380	73254
0813	2	-1290	-6410	48374 114	19/0842	2	-1200	-6380	62017
0814	2	-1320	-6410	43454 136	7/0841	2	-1230	-6380	58072
0814	2	-1350	-6410	42610 138	9/0841	2	-1260	-6380	53417
0815	2	-1380	-6410	30735 180	11/0840	2	-1290	-6380	48474
0816	2	-1410	-6410	36602 202	13/0840	2	-1320	-6380	44574
0817	2	-1440	-6410	31676 204	15/0840	2	-1350	-6380	41922
0817	2	-1470	-6410	32273 246	18/0827	2	-1380	-6380	23534

REMARKS:

REVIEWED BY: _____ DATE: _____

B-46

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGOP SWMU 4 DATE 8/19 TIME 0820
 PURPOSE Radiological Walkover Survey RWP# N/A

TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbin Sharon R. Durbin 722251 Regina Oller Regina Oller 722368
Chris D. Morrison Chris D. Morrison 701944 G. Murray Bubby Murray

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
0825	2	-1410	-6380	34628	203	138/0844	2	-1320	-6350	43829
0824	2	-1440	-6380	34004	225	160/0845	2	-1350	-6350	41171
0821	2	-1470	-6380	29994	247	182/0845	2	-1380	-6350	31993
0820	2	-1500	-6380	29994	269 RD 8/19	204/0845	2	-1410	-6350	35114
0820	2 4	-1530	-6380	30119	291 RD 8/19	226/0846	2	-1440	-6350	32692
0821	2 1	-1140	-6350	27747	6 SD 8/19	248/0846	2	-1470	-6350	31234
0843	2	-1170	-6350	71281	28	270/0846	2	-1500	-6350	28143
0843	2	-1200	-6350	61047	50	292/0847	2	-1530	-6350	28972
0843	2	-1230	-6350	57659	72	08/21 7:49:20	1	-1140	-6320	63500
0844	2	-1260	-6350	49886	94	29/0850	2	-1170	-6320	73050
0844	2	-1290	-6350	47036	116	51/0855	2	-1200	-6320	69826

REMARKS:

REVIEWED BY: _____ DATE: _____

B-47

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 4 DATE 8/19 TIME NA
 PURPOSE Radiological Walkover Survey RWP # NA
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbin Sharon R. Durbin 722351 Regina Oller Regina Oller 722368
Cher D. Morrison Cher D. Morrison 701944 B. Murray Buddy Murray

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
08:53	2	-1230	-6320	59172	13	8/21/89	1	-1140	-6290	61700
08:53	2	-1260	-6320	50868	95	30/08:58	2	-1170	-6290	68267
08:53	2	-1290	-6320	48442	117	58/08:58	2	-1200	-6290	66820
08:52	2	-1320	-6320	44689	157	72/08:59	2	-1230	-6290	56259
08:51	2	-1350	-6320	39133	161	96/08:59	2	-1260	-6290	52290
08:49	2	-1380	-6320	32998	183	118/09:00	2	-1290	-6290	46962
08:49	2	-1410	-6320	35197	205	140/09:01	2	-1320	-6290	49245
08:48	2	-1440	-6320	32171	227	162/09:01	2	-1350	-6290	41078
08:48	2	-1470	-6320	32151	249	184/09:01	2	-1380	-6290	33924
08:48	2	-1500	-6320	29429	271	206/09:02	2	-1410	-6290	35268
08:48	2	-1530	-6320	31177	293	228/09:02	2	-1440	-6290	33123

REMARKS:

REVIEWED BY: _____ DATE: _____

B-48

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY P&DP SWMU 4 DATE 8/19 TIME 09:03
 PURPOSE Radiological Walkover Survey RWP# NA
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbin Sharon R. Durbin 720051 Reeddy Murray B. Murray
Cher D. Morrison Cher D. Morrison 701944 Regina Cifer Regina Cifer 122368

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
0903	2	-1470	-6290	29321	250	1050959	2	-1380	-6260	35543
0904	2	-1500	-6290	29910	272	2091000	2	-1410	-6260	34159
0904	2	-1530	-6290	28748	277	2091000	2	-1440	-6260	32930
0956	2	-1140	-6260	68986	31	2511001	2	-1470	-6260	31647
0956	2	-1170	-6260	68986	31	273/1001	2	-1500	-6260	29085
0957	2	-1200	-6260	63303	53	61295/1033	2	-1530	-6260	28258
0957	2	-1230	-6260	55819	75	621/10 917	1	-1140	-6230	62500
0958	2	-1260	-6260	48589	97	321008	2	-1170	-6230	68846
0959	2	-1290	-6260	46150	119	541007	2	-1200	-6230	62661
0959	2	-1320	-6260	43150	141	761007	2	-1230	-6230	56099
0959	2	-1350	-6260	42070	163	981004	2	-1260	-6230	52477

REMARKS: _____

REVIEWED BY: _____ DATE: _____

B-49

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 4 DATE 8/19 TIME NA
 PURPOSE Radiological Walkover Survey RWP# NA
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbin Sharon R. Durbin 72251 Regina Oller Regina Oller 122268
Cher D. Morrison Cher D. Morrison 70194 B. Murray (Buddy, MD)

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
1006	2	-1290	-6230	45233	120	551009	2	-1200	-6200	55318
1005	2	-1320	-6230	43391	142	177 1010	2	-1230	-6200	58229
1005	2	-1350	-6230	42091	164	99 1010	2	-1260	-6200	52430 72386
1004	2	-1380	-6230	36592	186	121 1011	2	-1290	-6200	45107
1004	2	-1410	-6230	34460	208	143 1012	2	-1320	-6200	41496
1004	2	-1440	-6230	32043	230	165 1012	2	-1350	-6200	39170
1003	2	-1470	-6230	31330	252	187 1013	2	-1380	-6200	35129
1002	2	-1500	-6230	25554	274	209 1014	2	-1410	-6200	34384
1002	2	-1530	-6230	27588	296	231 1015	2	-1440	-6200	33033
9:16	1	-1140	-6200	60800	11 5/21	253 1015	2	-1470	-6200	30343
1009	2	-1170	-6200	66119	33	275 1016	2	-1500	-6200	29346

REMARKS:

REVIEWED BY: _____ DATE: _____

B-50

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 4 DATE 8/18 TIME 14:09

PURPOSE Walkover RAD Survey RWP # N/A

TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER) SR. Durbin Anna Durbin 722251 / Regina Oller Regina Oller 722368

Cher D. Morrison Cher D. Morrison 701944 B. Murray Buddy Murray

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
10:17	2	-1530	-6200	27043	997	232 14:51	2	-1440	-6170	32032
15:03	2	-1140	-6170	58200	128(a)	234 14:59	2	-1470	-6170	26625
15:03	2	-1170	-6170	66084	34	276 16:24	2	-1500	-6170	31541
15:03	2	-1200	-6170	52227	50	292 14:58	2	-1530	-6170	52989
15:02	2	-1230	-6170	54279	78	292 9:19	1	-1140	-6140	59200
15:02	2	-1260	-6170	51482	100	35 2:09 PM	2	-1170	-6140	65900
15:02	2	-1290	-6170	46018	122	57 2:11 PM	2	-1200	-6140	54753
15:01	2	-1320	-6170	42135	144	79 2:12 PM	2	-1230	-6140	48822
15:01	2	-1350	-6170	33155	166	101 14:13	2	-1260	-6140	44766
15:00	2	-1380	-6170	36773	188	123 14:14	2	-1290	-6140	46817
15:00	2	-1410	-6170	33754	210	145 14:51	2	-1320	-6140	42025

REMARKS:

REVIEWED BY: _____

DATE: _____

B-51

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 4 DATE 8/18 TIME N/A
 PURPOSE B. M. Murray Radiological Wellpoint Survey RWP# N/A
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbin Sharon R. Durbin 722251 Regina Oller Regina Oller 722308
Her D. Morrison Her D. Morrison 701944 B. Murray B. Murray

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
14:53	2	-1350	-6140	32377	107	102 15:06	2	-1260	-6110	50091
14:53	2	-1380	-6140	36880	109	04 15:07	2	-1290	-6110	43280
14:54	2	-1410	-6140	26686	211	106 15:07	2	-1320	-6110	41856
14:55	2	-1440	-6140	32910	233	108 15:08	2	-1350	-6110	39011
14:55	2	-1470	-6140	30278	255	190 15:08	2	-1380	-6110	36196
16:24	2	-1500	-6140	28140	277	202 15:09	2	-1410	-6110	32936
14:57	2	-1530	-6140	26512	299	234 15:09	2	-1440	-6110	31912
9:13	1	-1140	-6110	57600	1A-251	206 15:09	2	-1470	-6110	23025
15:05	2	-1170	-6110	59878	30	300 15:10	2	-1530	-6110	25761
15:05	2	-1200	-6110	53217	58	272 16:23	2	-1500	-6110	26413
15:06	2	-1230	-6110	51373	80	8/21/15 9:13	1	-1140	-6080	57300

REMARKS:

REVIEWED BY: _____

DATE: _____

B-52

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY RGDP SWMU 4 DATE 8/18 TIME NK
 PURPOSE B. Mar. Res. Rad. by cal Walkway Survey RWP # 115
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbin Sharon R. Durbin 722251 Regina Oller Regina Oller 722368
Cher D. Morrison Cher D. Morrison 21944 R. Murray Betty Mann

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
1521	2	-1170	-6080	69271	37	279/1622	2	-1500	6080	28810
1520	2	-1200	-6080	57616	49	321/1513	2	-1530	-6080	21215
1519	2	-1230	-6080	48960	81	182/1609/9112	1	-1140	-6050	55800
1519	2	-1260	-6080	48027	103	38/1600	2	-1170	-6050	63948
1518	2	-1290	-6080	47196	125	60/1607	2	-1200	-6050	58260
1517	2	-1320	-6080	39699	147	82/1601	2	-1230	-6050	52571
1517	2	-1350	-6080	39663	169	104/1601	2	-1260	-6050	44915
1516	2	-1380	-6080	34503	191	126/1602	2	-1290	-6050	42165
1515	2	-1410	-6080	35267	213	148/1602	2	-1320	-6050	4231
1515	2	-1440	-6080	32098	235	170/1602	2	-1350	-6050	38161
1514	2	-1470	-6080	28383	257	192/1603	2	-1380	-6050	39770

REMARKS:

REVIEWED BY: _____

DATE: _____

B-53

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 4 DATE 8/18 TIME NA Page 11 of 15
 PURPOSE Radiological Walkover Survey RWP # NA
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Farouk L. Durbia Sharon R. Durbia 722251 Regina Oller Regina Oller 722368
Cher D. Morrison Cher D. Morrison 721944 B. Murray B. Murray 721944

Time	Instrument ID	Location		Activity (CPM)	Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting				Northing	Easting	
16:04	2	-1410	-6050	33354/214	16:09	2	-1320	-6020	38466
16:04	2	-1440	-6050	31633/230	17/16:08	2	-1350	-6020	32317
16:05	2	-1470	-6050	28373/150	18/16:08	2	-1380	-6020	25696
16:05	2	-1500	-6050	25936/200	25/16:08	2	-1410	-6020	33936
16:05	2	-1530	-6050	25567/302	26/16:07	2	-1440	-6020	31325
9:11	1	-1140	-6020	55100/11 2/1	27/16:07	2	-1470	-6020	30013
16:10	2	-1170	-6020	64459/39	28/16:17	2	-1500	-6020	25773
16:10	2	-1200	-6020	56713/101	30/16:07	2	-1530	-6020	26800
16:10	2	-1230	-6020	51101/183	12/9:10	1	-1140	-5990	53000
16:09	2	-1260	-6020	44893/105	8/21 40/813	1	-1170	-5990	57800
16:09	2	-1290	-6020	42213/127	42/812	1	-1200	-5990	46800

REMARKS: _____

REVIEWED BY: _____ DATE: _____

B-54

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 4 DATE 8/21 TIME 8:02 Page 12 of 15

PURPOSE walkover RWP# N/A

TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon Durbin 722251 Cher D. Morrison Cher D. Morrison 701944 B. Murray Buddy Murray
Sharon R. Durbin Regina Aler Regina Aler 722368

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
0810	1	-1230	-5990	47500	84	8/21/9:10	1	-1140	-5960	51500
0810	1	-1260	-5990	43500	100	4/8:14	1	-1170	-5960	51800
0809	1	-1290	-5990	36900	128	6/8:15	1	-1200	-5960	48900
0808	1	-1320	-5990	36800	150	8/8:15	1	-1230	-5960	39500
0807	1	-1350	-5990	32900	172	10/8:16	1	-1260	-5960	41200
0806	1	-1380	-5990	30800	194	12/8:17	1	-1290	-5960	37500
0805	1	-1410	-5990	29500	216	15/8:17	1	-1320	-5960	34900
0804	1	-1440	-5990	27200	238	17/8:18	1	-1350	-5960	32500
0804	1	-1470	-5990	26400	260	19/8:19	1	-1380	-5960	30500
1621	2	-1500	-5990	26183	282/9/10	21/8:19	1	-1410	-5960	27800
0803	1	-1530	-5990	24500	304	23/8:20	1	-1440	-5960	25900

REMARKS: _____

REVIEWED BY: _____ DATE: _____

B-55

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 4 DATE 8/21 TIME N/A
 PURPOSE B. M. on-site Road & large cul Walkway Survey RWP # N/A
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbin Sharon R. Durbin 722251 B. Murray Berdy Murray
Hertz Morrison Chris R. Morrison 701944 Regina Oller Regina Oller 72236R

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
8:21	1	-1470	-5960	24200	261	196/8:26	1	-1380	-5930	31300
16:26	2	-1500	-5960	25048	283 8/18	218/8:25	1	-1410	-5930	28500
8:23	1	-1530	-5960	22900	305	240/8:25	1	-1440	-5930	27400
9:09	1	-1140	-5930	49800	20 9/21	262/8:24	1	-1470	-5930	26800
8:29	1	-1170	-5930	54600	42	281/8:24	1	-1500	-5930	23200
8:29	1	-1200	-5930	48500	64	306/8:23	1	-1530	-5930	23900
8:28	1	-1230	-5930	44600	86	361 2 9:08	1	-1140	-5900	47800
8:28	1	-1260	-5930	42400	108	43 8:32	1	-1170	-5900	47600
8:27	1	-1290	-5930	38300	130	65 8:20-94 1700	# 1	-1200	-5900	43,500
8:27	1	-1320	-5930	34800	152	87 8:20-94 1701	↓	-1230	-5900	41,800
8:26	1	-1350	-5930	33900	174	109 8:20-94 1702	↓	-1260	-5900	33,000

REMARKS:

REVIEWED BY: _____ DATE: _____

B-56

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 4 DATE 8/21 TIME 8:56 Page 14 of 15
 PURPOSE Radiological Work Survey RWP# NA

TECHNICIAN (NAME SIGNATURE, BADGE NUMBER)
Sharon R. Durbin 722251 Cher D. Morrison Cher D. Morrison 701944
Sharon R. Durbin Regina Oller Regina Oller 722368 B. Murray Buddy M...

Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
8:20-94 1703	#1	-1290	-5900	30,500	131	8:57	1	-1200	-5870	37300
8:20-94 1704		-1320	-5900	31,800	153	8:58	1	-1230	-5870	34500
8:20-94 1705		-1350	-5900	26,000	175	8:58	1	-1260	-5870	31900
8:20-94 1706		-1380	-5900	26,300	197	8:58	1	-1290	-5870	28400
8:20-94 1707		-1410	-5900	26,200	219	8:59	1	-1320	-5870	26200
8:20-94 1708		-1440	-5900	24,300	241	8:59	1	-1350	-5870	23900
8:20-94 1709		-1470	-5900	22,700	263	9:00	1	-1380	-5870	22200
8:20-94 1710		-1500	-5900	20,000	285	9:00	1	-1410	-5870	21500
8:20-94 1711		-1530	-5900	19,300	307	9:01	1	-1440	-5870	18800
8:56	1	-1140	-5870	49100	22	9:01	1	-1470	-5870	17400
8:57	1	-1170	-5870	40100	44	9:01	1	-1500	-5870	16900

REMARKS:

REVIEWED BY: _____ DATE: _____

B-57

RADIATION / CONTAMINATION SURVEY CONTINUATION

FACILITY PGDP SWMU 4 DATE 8/21 TIME 9:02 Page 15 of 15
 PURPOSE Rad.ological Walkover Survey RWP# NA
 TECHNICIAN (NAME, SIGNATURE, BADGE NUMBER)
Sharon R. Durbin 722251 Cher D. Morrison 701444
Sharon R. Durbin Regina Oler 722368 S. Murray Betty Mun

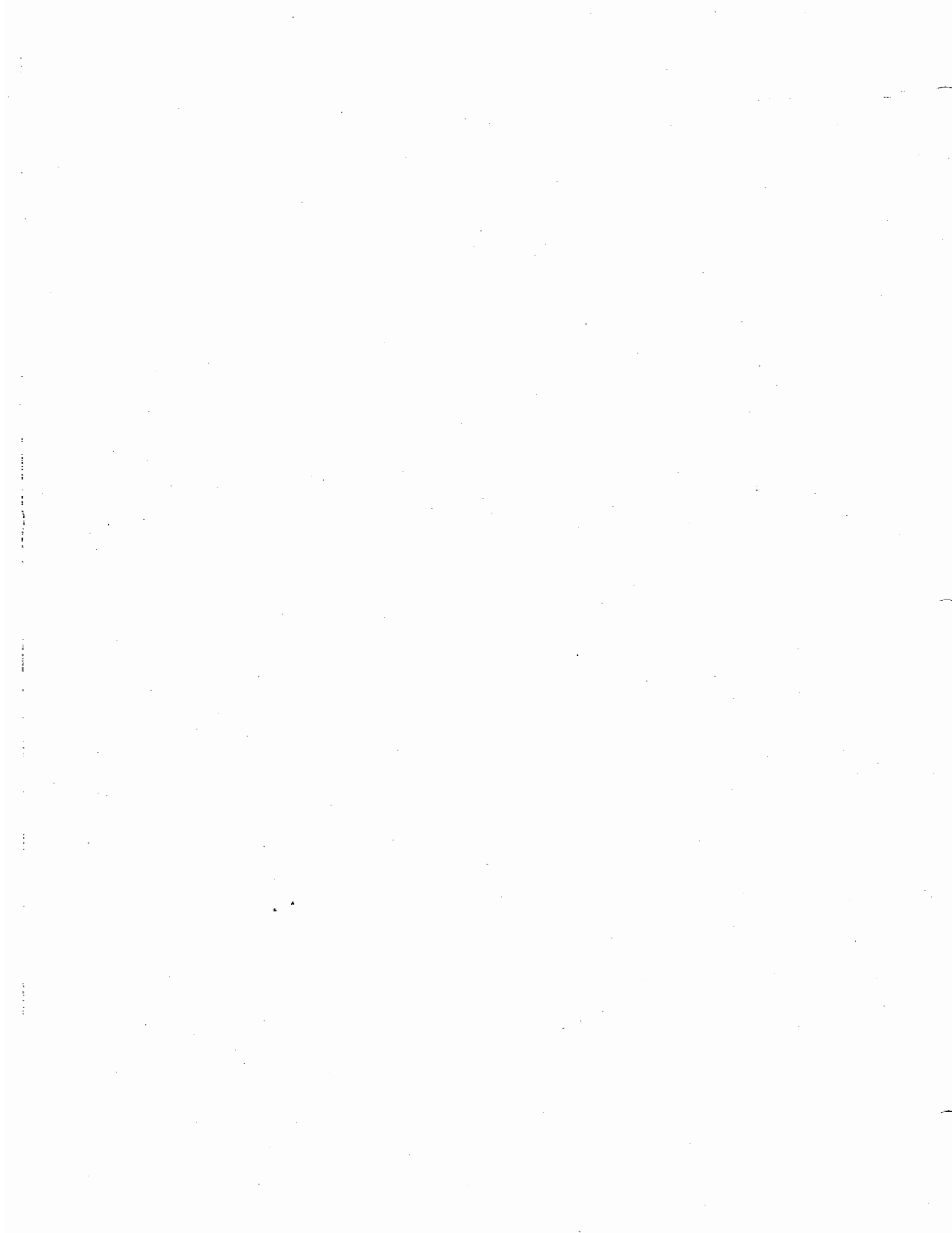
Time	Instrument ID	Location		Activity (CPM)		Time	Instrument ID	Location		Activity (CPM)
		Northing	Easting					Northing	Easting	
9:02	1	-1530	-5870	1430 ± 14300	308 8/21					
N										
A										
NA										

REMARKS: _____

REVIEWED BY: _____ DATE: _____

B-58

In Situ Gamma Spectroscopic Analysis Results



 **CANBERRA**
Interoffice Memorandum

To	D. McKeen TN & Associates 124 S. Jefferson Circle Oak Ridge, TN 37830	File No.	Ltr. #NDA99-204R
		Date	December 8, 1999
Subject	Results of In-Situ Soil Measurements at PGDP WAG 3 SWMU 4, 5, & 6.	From	J. D. Marsh, Jr. Nondestructive Assay Services Canberra Oak Ridge, LLC
Copies To	C. Callis, B. Murray, M. Keever, File (NoRC)	At	K-1030 Ext 574-3204 MS-7319 Pager 417-1486

At your request, Canberra made 14 in-situ soil measurements at three separate solid waste management areas (SWMU 4, 5, & 6) in Waste Area Grouping (WAG) 3 at the Paducah Gaseous Diffusion Plant (PGDP) from September 27-30, 1999. Twelve background radiation measurements were also conducted during that time period. The measurements were performed using a high-purity germanium (HPGe) detector and Canberra's ISOCS software. Gamma-ray spectroscopic analysis was performed to obtain activity values for all detected radionuclides and to obtain the ²³⁵U enrichment.

Quality control (QC) measurements were also performed each day prior to beginning analyses and at the end of the series of analyses for that day. QC measurements consisted of counting a known source and observing the count rates and full-width-half-maximum (FWHM) of peaks of selected isotopes. The results were plotted on a QC chart with Canberra Genie 2K QC software to show statistical deviations from the norm. For this series of measurements, no deviations were observed.

The results are based on the measurement of a 2 m by 2 m by 15.24 cm (6 in) volume (6.096E+05 cm³) and a soil density of 1.02 g/cm³ to give a soil weight of 621.8 kg. The soil density was assumed because of no known density measurements of the burial grounds. A density greater than this would tend to lower the pCi/g activity and the minimum detectable activity (MDA) values. Since soil is denser than water, there is less of a chance that the values would increase.

The results of the measurements are in Attachment 1. Natural levels of thorium were found at all three sites, denoted by the ²³²Th/²³⁰Th atom ratio being on the order of the ratio of their half-lives ~10⁵. Potassium-40 (⁴⁰K), another naturally occurring radionuclide, was also found at all three sites at activities typical of those found in soil (Eisenbud & Gesell, 1997). The only non-natural radioisotope found was cesium-137 (¹³⁷Cs) which was found at all four sites measured at SWMU6. No uranium was found at any of the SWMUs. MDAs, based on Currie's method

Paducah Soil Project WAG 3

Dimensions of Soil Plot

length (m) width (m) depth (in) Volume (cc)
2 2 6 609600

Density of Soil (g/cc) 1.02
Weight of Soil (Kg) 621.792

All units in pCi/g

SWMU4

Site	Date	MDA						Measured Radionuclides		
		U-238	U-235	Np-237	Am-241	Co-60	Cs-137	Th-232	Th-230	K-40
SS-1	9/29/99	1.95	0.21	0.33	0.81	0.20	0.22	1.31	2.61	30.07
SS-2	9/30/99	1.41	0.18	0.31	0.55	0.20	0.21	2.24	1.53	31.20
SS-4	9/30/99	1.82	0.19	0.31	0.69	0.19	0.21	2.32	1.22	32.81
SS-5	9/29/99	1.83	0.22	0.32	0.76	0.21	0.22	2.24	1.47	30.72
SS-6	9/30/99	1.83	0.20	0.31	0.77	0.22	0.21	2.16	1.01	32.33
SS-7	9/30/99	1.33	0.18	0.30	0.55	0.20	0.21	2.09	1.42	29.43
SS-8	9/30/99	1.40	0.18	0.31	0.53	0.20	0.21	2.06	1.50	32.00

SWMU5

Site	Date	MDA						Measured Radionuclides		
		U-238	U-235	Np-237	Am-241	Co-60	Cs-137	Th-232	Th-230	K-40
SS-1	9/27/99	1.45	0.15	0.23	0.60	0.15	0.10	0.82	0.91	10.13
SS-2	9/28/99	1.66	0.18	0.29	0.69	0.19	0.18	2.01	1.01	24.77
SS-3	9/28/99	1.95	0.21	0.30	0.81	0.19	0.21	1.88	1.13	28.79

SWMU6

Site	Date	MDA						Measured Radionuclides		
		U-238	U-235	Np-237	Am-241	Co-60	Cs-137	Th-232	Th-230	K-40
SS-1	9/28/99	1.62	0.18	0.28	0.69	0.18	0.32	1.66	1.04	23.64
SS-2	9/28/99	1.61	0.18	0.30	0.65	0.17	0.26	1.62	1.01	24.77
SS-3	9/28/99	1.55	0.17	0.26	0.62	0.16	0.37	0.80	0.89	16.24
SS-4	9/28/99	1.60	0.14	0.16	0.59	0.16	0.38	1.21	0.72	18.49

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU4 SS-1

Data was acquired: September 29, 1999
Data was analyzed: October 19, 1999 02:17 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPFILES\Swmu4ss1.rpt
library = C:\GENIE2K\Library\ornllib.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = Steel; thickness = 0.00 cm ; density = 7.8 g/cc
height = 200 cm ; length = 200 cm ; depth = 15.2 cm
tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc
sample is homogeneous
volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg
density (measured) = 1.020 g/cc

Detector calibration point-source reference distance: 30.0 cm
Geometry correction factor: 20.22

***** Nuclide Results *****

Nuclide	Grams	nCi	%err
Th-230	3.87E-05	8.14E+02	46.44
Th-232	1.47E+01	1.62E+03	45.55
K-40	2.62E+00	1.87E+04	44.01

***** Minimum Detectable Activity for Measured Geometry *****

File: C:\GENIE2K\REPPFILES\Swm4ss1.rpt

Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
-7	2.63E-12	9.18E+02
Na-22	2.27E-11	1.42E+02
K-40	1.41E-01	1.01E+03
Co-60	1.12E-10	1.26E+02
Zn-65	4.26E-11	3.51E+02
Kr-85	7.63E-08	2.99E+04
Tc-99	1.08E+00	1.83E+07
Cs-134	1.02E-10	1.31E+02
Cs-137	1.57E-09	1.36E+02
Th-230	8.23E-06	1.73E+02
Th-232	9.49E-01	1.04E+02
U-234	1.21E-02	7.53E+04
U-235	5.98E-02	1.29E+02
Np-237	2.89E-04	2.04E+02
U-238	3.60E+00	1.21E+03
AM-241	4.90E-09	5.05E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

* SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS1.CNF
* Sample ID: SWMU4 SS-1
* Additional Description: PGDP WAG3 SWMU4 SS-1
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/29/99 4:34:16 PM

* Data acquired by: JDM/HRW
* Detector: 4 meter square *BE-4512*
* Channels Analyzed: 250 to 8192
* Real Time: 1813 Live Time: 1800 Dead Time: 0.72%
*
* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S4SS1BKG.CNF

```

*****
*****      C O U N T   -   R A T E   R E P O R T      *****
***              (Corrected for Detector Efficiency)          *****
*****

```

MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU4 SS-1

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS1.CNF

Peak Analysis Performed on: 10/18/99 4:17:41 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	74.93	-9.98E+002	131.09	2.56E-003	8.06E-005	-2.16E+002
M 2	84.76	1.70E+002	56.50	2.57E-003	6.91E-005	3.66E+001
m 3	87.13	1.74E+002	53.85	2.57E-003	6.65E-005	3.75E+001
M 4	238.62	6.76E+002	33.09	1.41E-003	4.25E-005	2.66E+002
M 5	295.21	2.10E+002	21.62	1.08E-003	3.63E-005	1.08E+002
M 6	338.33	1.57E+002	18.41	9.14E-004	2.98E-005	9.57E+001
M 7	351.88	4.22E+002	30.15	8.71E-004	2.76E-005	2.69E+002
M 8	381.64	2.69E+001	9.29	7.88E-004	2.29E-005	1.90E+001
M 9	510.88	2.02E+002	22.63	5.56E-004	9.85E-006	2.02E+002
M 10	583.22	3.07E+002	19.58	4.78E-004	7.82E-006	3.57E+002
M 11	609.32	3.25E+002	23.02	4.55E-004	7.50E-006	3.97E+002
M 12	795.19	3.59E+001	9.58	3.41E-004	5.95E-006	5.84E+001
M 13	851.56	2.11E+001	6.80	3.17E-004	5.60E-006	3.70E+001
M 14	911.17	2.74E+002	17.44	2.96E-004	5.45E-006	5.16E+002
M 15	969.03	1.45E+002	14.20	2.78E-004	5.48E-006	2.91E+002
M 16	1120.22	8.31E+001	12.76	2.40E-004	5.86E-006	1.92E+002
M 17	1460.78	8.00E+002	28.49	1.85E-004	5.46E-006	2.40E+003
M 18	1764.63	8.16E+001	9.93	1.56E-004	1.25E-005	2.91E+002

M = First peak in a multiplet region
m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

* SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS1BKG.CNF
* Sample ID: s4sslbkg
Additional Description: PGDP WAG3 SWMU4 SS-1 BK
* :
* :
* Gross Wt:
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/29/99 4:00:40 PM

* Data acquired by: manager
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1831 Live Time: 1800 Dead Time: 1.74%
*
* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

 COUNT - RATE REPORT *****
 *** (Corrected for Detector Efficiency) *****

MEASUREMENT SERIES: 4 sq meters

Sample ID: s4ssl1bkg
 Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS1BKG.CNF
 Peak Analysis Performed on: 10/07/99 2:38:13 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	48.16	2.51E+002	458.51	2.52E-003	8.81E-005	5.52E+001
M 2	72.78	7.27E+002	98.87	2.56E-003	8.30E-005	1.58E+002
m 3	74.87	1.52E+003	113.72	2.56E-003	8.07E-005	3.31E+002
M 4	113.22	1.67E+002	144.34	2.59E-003	6.72E-005	3.58E+001
M 5	152.25	6.30E+001	98.87	2.26E-003	8.81E-005	1.55E+001
M 6	169.48	2.20E+001	73.78	2.06E-003	7.83E-005	5.94E+000
M 7	185.38	1.90E+001	58.33	1.88E-003	6.51E-005	5.60E+000
M 8	214.51	2.01E+001	42.48	1.60E-003	4.79E-005	6.99E+000
M 9	227.00	3.91E+001	61.10	1.50E-003	4.44E-005	1.45E+001
M 10	231.34	1.97E+001	37.00	1.47E-003	4.36E-005	7.48E+000
M 11	274.90	1.61E+001	25.60	1.19E-003	3.87E-005	7.53E+000
M 12	284.04	5.33E-001	29.09	1.14E-003	3.77E-005	2.60E-001
M 13	310.87	6.19E+000	33.87	1.02E-003	3.41E-005	3.39E+000
M 14	351.95	7.01E+001	16.82	8.70E-004	2.76E-005	4.48E+001
M 15	431.34	1.80E+001	8.27	6.79E-004	1.62E-005	1.47E+001
M 16	473.66	2.09E+001	8.30	6.07E-004	1.22E-005	1.91E+001
M 17	495.22	3.37E+000	10.62	5.76E-004	1.07E-005	3.25E+000
m 18	498.12	2.45E+000	7.74	5.72E-004	1.05E-005	2.38E+000
M 19	505.96	1.14E+001	6.06	5.62E-004	1.01E-005	1.13E+001
M 20	510.37	1.74E+000	14.14	5.56E-004	9.88E-006	1.74E+000
M 21	531.13	8.97E+000	1.34	5.31E-004	9.02E-006	9.38E+000
M 22	609.26	5.17E+001	8.56	4.55E-004	7.50E-006	6.31E+001
M 23	690.19	3.68E+000	5.58	3.96E-004	6.81E-006	5.15E+000
M 24	770.01	5.62E+000	4.58	3.53E-004	6.14E-006	8.85E+000
M 25	819.07	6.49E+000	4.54	3.30E-004	5.78E-006	1.09E+001
M 26	920.48	5.99E+000	3.16	2.93E-004	5.44E-006	1.14E+001
m 27	925.49	7.23E+000	3.37	2.91E-004	5.44E-006	1.38E+001
M 28	1010.22	8.52E+000	4.28	2.66E-004	5.58E-006	1.78E+001
M 29	1112.03	4.84E+000	3.50	2.42E-004	5.85E-006	1.11E+001
M 30	1226.12	2.25E+000	3.62	2.19E-004	5.86E-006	5.70E+000
M 31	1252.15	6.78E+000	4.01	2.15E-004	5.81E-006	1.75E+001
M 32	1366.08	5.42E+000	3.10	1.97E-004	5.46E-006	1.53E+001
M 33	1460.40	2.33E+001	5.40	1.85E-004	5.46E-006	6.97E+001

M = First peak in a multiplet region
 m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU4 SS-2

Data was acquired: September 30, 1999

Data was analyzed: October 19, 1999 02:26 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPPFILES\Swmu4ss2.rpt
library = C:\GENIE2K\Library\ornllib.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = None; thickness = 0.00 cm ; density = 0 g/cc
height = 200 cm ; length = 200 cm ; depth = 15.2 cm
tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc
sample is homogeneous
volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg
density (measured) = 1.020 g/cc

Detector calibration point-source reference distance: 30.0 cm

Geometry correction factor: 20.22

***** Nuclide Results *****

Nuclide	Grams	nCi	%err
Th-230	4.54E-05	9.53E+02	46.35
Th-232	1.27E+01	1.39E+03	45.73
K-40	2.72E+00	1.94E+04	44.01

***** Minimum Detectable Activity for Measured Geometry *****

File: C:\GENIE2K\REFFILES\Swmu4ss2.rpt

Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
Fe-7	2.45E-12	8.56E+02
La-22	2.19E-11	1.37E+02
K-40	1.08E-01	7.73E+02
Co-60	1.12E-10	1.26E+02
Zn-65	4.30E-11	3.55E+02
Kr-85	7.00E-08	2.74E+04
Tc-99	7.64E-01	1.30E+07
Cs-134	1.03E-10	1.33E+02
Cs-137	1.50E-09	1.30E+02
Th-230	6.79E-06	1.43E+02
Th-232	8.75E-01	9.64E+01
U-234	7.79E-03	4.84E+04
U-235	5.29E-02	1.14E+02
Np-237	2.72E-04	1.91E+02
U-238	2.60E+00	8.76E+02
AM-241	3.31E-09	3.41E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

** SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS2.CNF
* Sample ID: SWMU4 SS-2
Additional Description: PDGP WAG3 SWMU4 SS-2
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/30/99 12:23:53 PM

* Data acquired by: JDM/HRW
* Detector: 4 meter square *BE-4512*
* Channels Analyzed: 250 to 8192
* Real Time: 1808 Live Time: 1800 Dead Time: 0.45%
*
* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S4SS2BKG.CNF

 ***** C O U N T - R A T E R E P O R T *****
 ***** (Corrected for Detector Efficiency) *****

MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU4 SS-2

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS2.CNF

Peak Analysis Performed on: 10/18/99 4:22:19 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	74.94	1.10E+002	145.05	2.56E-003	8.06E-005	2.40E+001
M 2	84.62	2.11E+002	52.28	2.57E-003	6.93E-005	4.56E+001
m 3	87.30	2.17E+002	55.91	2.57E-003	6.63E-005	4.68E+001
m 4	92.44	3.02E+002	50.95	2.58E-003	6.15E-005	6.50E+001
M 5	238.65	7.64E+002	36.49	1.41E-003	4.25E-005	3.01E+002
M 6	295.25	2.32E+002	26.52	1.08E-003	3.63E-005	1.19E+002
M 7	338.32	1.79E+002	20.19	9.14E-004	2.98E-005	1.09E+002
M 8	351.94	3.71E+002	28.59	8.70E-004	2.76E-005	2.37E+002
M 9	409.69	4.57E+001	12.09	7.22E-004	1.89E-005	3.52E+001
M 10	510.74	4.11E+001	18.80	5.56E-004	9.86E-006	4.11E+001
M 11	583.16	3.25E+002	21.83	4.78E-004	7.82E-006	3.78E+002
M 12	609.25	3.80E+002	24.68	4.55E-004	7.50E-006	4.65E+002
M 13	695.62	1.18E+001	12.24	3.93E-004	6.77E-006	1.66E+001
M 14	727.12	3.94E+001	10.11	3.75E-004	6.50E-006	5.83E+001
M 15	860.82	5.35E+001	9.97	3.14E-004	5.57E-006	9.48E+001
M 16	911.14	2.36E+002	17.84	2.96E-004	5.45E-006	4.44E+002
M 17	964.78	3.16E+001	9.37	2.79E-004	5.48E-006	6.30E+001
m 18	969.02	1.34E+002	13.80	2.78E-004	5.48E-006	2.68E+002
M 19	1044.91	2.09E+001	7.33	2.57E-004	5.68E-006	4.52E+001
M 20	1120.24	1.10E+002	14.90	2.40E-004	5.86E-006	2.55E+002
M 21	1460.67	8.31E+002	29.56	1.85E-004	5.46E-006	2.49E+003
M 22	1592.37	3.47E+001	7.73	1.71E-004	7.10E-006	1.13E+002
M 23	1764.29	1.06E+002	11.20	1.56E-004	1.25E-005	3.78E+002

M = First peak in a multiplet region
 m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

* SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS2BKG.CNF
* Sample ID: S4SS2BKG
Additional Description: PDGP WAG3 SWMU4 SS2 BKG
* :
* :
* Gross Wt:
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/30/99 11:51:21 AM

* Data acquired by: MANAGER
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1809 Live Time: 1800 Dead Time: 0.50%
*
* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

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*****
*****          C O U N T   -   R A T E   R E P O R T          *****
****          (Corrected for Detector Efficiency)          *****
*****

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MEASUREMENT SERIES: 4 sq meters

Sample ID: S4SS2BKG

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS2BKG.CNF

Peak Analysis Performed on: 10/07/99 2:39:56 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	75.06	2.45E+002	137.29	2.56E-003	8.05E-005	5.32E+001
M 2	99.76	7.91E+001	254.07	2.58E-003	5.81E-005	1.70E+001
M 3	108.41	2.09E+000	54.81	2.59E-003	6.16E-005	4.49E-001
m 4	109.58	1.60E+000	41.99	2.59E-003	6.27E-005	3.44E-001
M 5	145.40	6.13E+001	141.55	2.34E-003	8.81E-005	1.46E+001
M 6	161.04	3.10E-001	56.46	2.16E-003	8.44E-005	7.99E-002
M 7	163.09	6.43E+000	50.84	2.13E-003	8.31E-005	1.67E+000
M 8	218.57	8.03E+000	54.50	1.57E-003	4.66E-005	2.85E+000
M 9	226.43	4.64E+000	40.26	1.50E-003	4.46E-005	1.71E+000
M 10	230.31	2.11E+001	29.21	1.47E-003	4.38E-005	7.97E+000
M 11	236.80	2.54E+001	16.10	1.42E-003	4.27E-005	9.92E+000
M 12	245.31	3.17E+001	16.24	1.36E-003	4.17E-005	1.29E+001
M 13	274.80	7.38E+000	20.87	1.19E-003	3.88E-005	3.45E+000
M 14	295.04	4.90E+001	12.31	1.09E-003	3.64E-005	2.51E+001
M 15	321.30	5.57E+000	19.18	9.75E-004	3.25E-005	3.17E+000
M 16	351.80	5.83E+001	11.57	8.71E-004	2.76E-005	3.72E+001
M 17	367.37	1.03E+001	11.60	8.25E-004	2.51E-005	6.91E+000
M 18	418.80	1.78E+001	7.63	7.03E-004	1.77E-005	1.41E+001
M 19	423.80	1.05E+001	7.82	6.93E-004	1.71E-005	8.43E+000
M 20	510.92	5.19E+001	11.02	5.56E-004	9.85E-006	5.19E+001
M 21	583.33	7.94E+000	4.49	4.77E-004	7.82E-006	9.24E+000
M 22	596.71	8.63E+000	3.63	4.65E-004	7.64E-006	1.03E+001
M 23	609.25	4.19E+001	8.38	4.55E-004	7.50E-006	5.12E+001
M 24	628.50	7.64E+000	0.40	4.39E-004	7.32E-006	9.66E+000
M 25	662.76	4.17E+000	7.37	4.14E-004	7.04E-006	5.59E+000
M 26	713.18	5.78E+000	2.13	3.83E-004	6.62E-006	8.38E+000
M 27	742.13	6.97E+000	3.75	3.67E-004	6.37E-006	1.06E+001
M 28	797.75	4.32E-001	5.36	3.40E-004	5.93E-006	7.06E-001
M 29	985.29	6.76E+000	1.54	2.73E-004	5.52E-006	1.38E+001
M 30	994.83	8.75E-001	5.20	2.70E-004	5.54E-006	1.80E+000
M 31	1050.34	3.75E-001	5.41	2.56E-004	5.70E-006	8.14E-001
M 32	1120.44	1.09E+001	4.38	2.40E-004	5.86E-006	2.52E+001
M 33	1209.64	2.56E+000	4.30	2.22E-004	5.88E-006	6.40E+000
M 34	1827.47	4.13E+000	2.33	1.51E-004	1.52E-005	1.52E+001

M = First peak in a multiplet region

m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU4 SS-4

Data was acquired: September 30, 1999

Data was analyzed: October 19, 1999 02:28 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPPFILES\Swmu4ss4.rpt

library = C:\GENIE2K\Library\ornllib.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = None; thickness = 0.00 cm ; density = 0 g/cc

height = 200 cm ; length = 200 cm ; depth = 15.2 cm

tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc

sample is homogeneous

volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg

density (measured) = 1.020 g/cc

Detector calibration point-source reference distance: 30.0 cm

Geometry correction factor: 20.22

***** Nuclide Results *****

Nuclide	Grams	nCi	%err
Th-230	3.60E-05	7.57E+02	46.58
Th-232	1.31E+01	1.44E+03	45.61
K-40	2.86E+00	2.04E+04	43.99

***** Minimum Detectable Activity for Measured Geometry *****

File: C:\GENIE2K\REPFILES\Swm4ss4.rpt

Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
Be-7	2.51E-12	8.78E+02
La-22	2.31E-11	1.45E+02
K-40	1.02E-01	7.27E+02
Co-60	1.05E-10	1.19E+02
Zn-65	3.87E-11	3.19E+02
Kr-85	7.46E-08	2.92E+04
Tc-99	1.29E+00	2.19E+07
Cs-134	1.05E-10	1.36E+02
Cs-137	1.50E-09	1.30E+02
Th-230	7.45E-06	1.57E+02
Th-232	9.55E-01	1.05E+02
U-234	9.99E-03	6.21E+04
U-235	5.54E-02	1.20E+02
Np-237	2.74E-04	1.93E+02
U-238	3.00E+00	1.01E+03
AM-241	4.16E-09	4.28E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

** SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS4.CNF
* Sample ID: SWMU4 SS-4
Additional Description: PGDP WAG3 SWMU4 SS-4
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/30/99 11:05:17 AM

* Data acquired by: JDM/HRW
* Detector: 4 meter square *BE-4512*
* Channels Analyzed: 250 to 8192
* Real Time: 1808 Live Time: 1800 Dead Time: 0.49%
*
* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S4SS4BKG.CNF

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*****
*****      C O U N T   -   R A T E   R E P O R T      *****
****      (Corrected for Detector Efficiency)      *****
*****

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MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU4 SS-4

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS4.CNF

Peak Analysis Performed on: 10/18/99 4:40:23 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	74.81	-7.61E+002	114.05	2.56E-003	8.08E-005	-1.65E+002
M 2	84.39	-3.17E+002	121.42	2.57E-003	6.96E-005	-6.85E+001
m 3	87.39	2.74E+002	51.86	2.57E-003	6.62E-005	5.92E+001
m 4	89.98	3.00E+002	50.88	2.58E-003	6.36E-005	6.47E+001
m 5	92.44	2.91E+002	50.69	2.58E-003	6.15E-005	6.28E+001
M 6	238.57	7.66E+002	33.04	1.41E-003	4.25E-005	3.02E+002
M 7	242.02	9.47E+001	20.47	1.39E-003	4.20E-005	3.79E+001
M 8	295.24	1.56E+002	26.54	1.08E-003	3.63E-005	7.97E+001
M 9	338.32	1.61E+002	17.96	9.14E-004	2.98E-005	9.81E+001
M 10	351.90	2.94E+002	29.19	8.71E-004	2.76E-005	1.88E+002
M 11	409.01	1.08E+001	18.27	7.24E-004	1.90E-005	8.33E+000
M 12	462.87	6.41E+001	12.45	6.24E-004	1.30E-005	5.71E+001
** 13	510.64	1.34E+002	20.23	5.56E-004	9.86E-006	1.34E+002
14	583.13	3.24E+002	19.41	4.78E-004	7.82E-006	3.77E+002
M 15	609.33	3.02E+002	24.10	4.55E-004	7.50E-006	3.69E+002
M 16	727.08	6.35E+001	11.59	3.75E-004	6.50E-006	9.42E+001
M 17	794.99	4.32E+001	10.33	3.41E-004	5.95E-006	7.04E+001
M 18	911.21	2.45E+002	16.73	2.96E-004	5.45E-006	4.60E+002
M 19	964.83	4.52E+001	9.13	2.79E-004	5.48E-006	9.01E+001
m 20	968.99	1.55E+002	13.51	2.78E-004	5.48E-006	3.11E+002
M 21	1120.11	9.24E+001	11.19	2.40E-004	5.86E-006	2.14E+002
M 22	1237.88	3.30E+001	9.04	2.17E-004	5.84E-006	8.45E+001
M 23	1460.76	8.73E+002	28.69	1.85E-004	5.46E-006	2.62E+003
M 24	1592.38	2.78E+001	7.03	1.71E-004	7.10E-006	9.04E+001
M 25	1764.23	7.71E+001	9.72	1.56E-004	1.25E-005	2.75E+002

M = First peak in a multiplet region

m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* 25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

* * SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS4BKG.CNF

* Sample ID: S4SS4BKG

Additional Description: PGDP WAG3 SWMU4 SS4 BKG

* :

* :

* Gross Wt:

*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/30/99 10:31:00 AM

* Data acquired by: MANAGER

* Detector: 4 meter square

* Channels Analyzed: 250 to 8192

* Real Time: 1822 Live Time: 1800 Dead Time: 1.24%

*

* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

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*****
****          C O U N T   -   R A T E   R E P O R T          ****
****          (Corrected for Detector Efficiency)            ****
*****

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MEASUREMENT SERIES: 4 sq meters

Sample ID: S4SS4BKG

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS4BKG.CNF

Peak Analysis Performed on: 10/07/99 2:36:10 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	59.86	1.78E+002	430.01	2.54E-003	9.22E-005	3.88E+001
M 2	63.16	2.69E+002	582.28	2.55E-003	9.09E-005	5.87E+001
M 3	72.73	5.04E+002	85.87	2.56E-003	8.30E-005	1.09E+002
m 4	74.89	1.19E+003	99.64	2.56E-003	8.07E-005	2.58E+002
M 5	84.62	6.83E+002	108.35	2.57E-003	6.93E-005	1.47E+002
M 6	124.48	3.66E-001	66.62	2.54E-003	9.62E-005	8.01E-002
M 7	170.32	2.39E+001	57.40	2.05E-003	7.77E-005	6.48E+000
M 8	180.01	1.07E+002	75.04	1.94E-003	6.95E-005	3.07E+001
M 9	187.31	5.17E+001	121.76	1.86E-003	6.36E-005	1.54E+001
M 10	201.33	2.10E+001	36.26	1.72E-003	5.40E-005	6.79E+000
m 11	202.57	1.53E+001	26.38	1.71E-003	5.33E-005	4.97E+000
M 12	223.20	1.16E+001	48.09	1.53E-003	4.53E-005	4.21E+000
M 13	234.31	3.70E+001	18.77	1.44E-003	4.31E-005	1.43E+001
M 14	244.59	5.67E+001	21.23	1.37E-003	4.17E-005	2.30E+001
M 15	265.09	3.90E+000	32.33	1.24E-003	3.97E-005	1.75E+000
M 16	272.62	1.40E+001	27.17	1.20E-003	3.90E-005	6.49E+000
M 17	294.88	6.70E+001	15.93	1.09E-003	3.64E-005	3.43E+001
M 18	312.18	1.11E+001	22.64	1.01E-003	3.39E-005	6.08E+000
M 19	331.63	3.76E+000	20.18	9.37E-004	3.09E-005	2.23E+000
M 20	351.87	1.12E+002	17.21	8.71E-004	2.76E-005	7.12E+001
M 21	371.90	7.88E-001	17.06	8.13E-004	2.44E-005	5.38E-001
m 22	375.15	7.12E-001	15.42	8.04E-004	2.39E-005	4.92E-001
M 23	379.26	2.28E+001	10.05	7.94E-004	2.33E-005	1.59E+001
M 24	397.05	9.57E+000	13.44	7.50E-004	2.06E-005	7.08E+000
M 25	434.56	1.20E+000	11.01	6.73E-004	1.58E-005	9.89E-001
m 26	436.99	1.22E+000	11.24	6.68E-004	1.56E-005	1.02E+000
m 27	439.21	1.36E+000	12.49	6.64E-004	1.53E-005	1.14E+000
M 28	443.23	2.31E+000	11.57	6.57E-004	1.49E-005	1.96E+000
M 29	465.80	1.09E+001	6.23	6.19E-004	1.28E-005	9.78E+000
M 30	473.12	2.88E+001	25.47	6.08E-004	1.22E-005	2.64E+001
M 31	511.12	4.74E+001	11.23	5.55E-004	9.84E-006	4.74E+001
M 32	609.54	9.35E+001	12.00	4.54E-004	7.50E-006	1.14E+002
M 33	622.74	2.00E+000	6.66	4.44E-004	7.37E-006	2.50E+000
M 34	640.15	1.12E+001	4.80	4.31E-004	7.22E-006	1.44E+001
M 35	687.96	2.64E+000	2.33	3.98E-004	6.83E-006	3.69E+000
m 36	690.70	1.02E+001	3.64	3.96E-004	6.81E-006	1.43E+001
M 37	717.55	1.43E+000	5.97	3.80E-004	6.58E-006	2.09E+000
M 38	728.41	1.18E+001	6.54	3.74E-004	6.49E-006	1.75E+001
M 39	794.90	6.66E+000	1.24	3.41E-004	5.95E-006	1.09E+001
M 40	845.75	7.33E+000	3.79	3.19E-004	5.63E-006	1.27E+001
M 41	920.80	5.18E+000	3.29	2.92E-004	5.44E-006	9.84E+000
M 42	1069.07	7.75E+000	3.59	2.51E-004	5.75E-006	1.71E+001

Sample ID: S4SS4BKG

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS4BKG.CNF

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 43	1121.14	1.95E+001	5.95	2.40E-004	5.86E-006	4.52E+001
M 44	1156.11	6.72E+000	0.84	2.32E-004	5.90E-006	1.61E+001
M 45	1231.59	7.99E+000	3.71	2.18E-004	5.85E-006	2.03E+001
M 46	1239.01	1.03E+001	4.42	2.17E-004	5.83E-006	2.62E+001
m 47	1243.45	4.84E+000	3.02	2.16E-004	5.83E-006	1.24E+001
M 48	1286.55	3.95E+000	2.93	2.09E-004	5.71E-006	1.05E+001
M 49	1392.60	2.67E+000	3.90	1.94E-004	5.40E-006	7.64E+000
M 50	1554.37	6.88E+000	3.88	1.75E-004	6.38E-006	2.19E+001
M 51	1598.65	1.81E+000	4.63	1.70E-004	7.24E-006	5.91E+000
M 52	1765.76	3.59E+001	6.45	1.56E-004	1.25E-005	1.28E+002

M = First peak in a multiplet region

m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU4 SS-5

Data was acquired: September 29, 1999

Data was analyzed: October 19, 1999 02:33 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPFILES\Swmu4ss5.rpt
library = C:\GENIE2K\Library\ornllib.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = None; thickness = 0.00 cm ; density = 0 g/cc
height = 200 cm ; length = 200 cm ; depth = 15.2 cm
tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc
sample is homogeneous
volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg
density (measured) = 1.020 g/cc

Detector calibration point-source reference distance: 30.0 cm
Geometry correction factor: 20.22

***** Nuclide Results *****

Nuclide	Grams	nCi	%err
Th-230	4.36E-05	9.16E+02	46.31
Th-232	1.27E+01	1.39E+03	45.66
K-40	2.67E+00	1.91E+04	44.01

***** Minimum Detectable Activity for Measured Geometry *****

File: C:\GENIE2K\REPFILES\Swwu4ss5.rpt

Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
Na-22	2.43E-12	8.49E+02
Na-22	2.29E-11	1.43E+02
K-40	1.62E-01	1.15E+03
Co-60	1.15E-10	1.30E+02
Zn-65	3.86E-11	3.18E+02
Kr-85	7.35E-08	2.88E+04
Tc-99	1.34E+00	2.28E+07
Cs-134	1.01E-10	1.30E+02
Cs-137	1.56E-09	1.35E+02
Th-230	7.62E-06	1.60E+02
Th-232	9.70E-01	1.07E+02
U-234	1.15E-02	7.12E+04
U-235	6.34E-02	1.37E+02
Np-237	2.81E-04	1.98E+02
U-238	3.38E+00	1.14E+03
AM-241	4.61E-09	4.75E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

** SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS5.CNF
* Sample ID: SWMU4 SS-5
Additional Description: PDGP WAG3 SWMU4 SS-5
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/29/99 5:59:40 PM

* Data acquired by: JDM/HRW
* Detector: 4 meter square *BE-4512*
* Channels Analyzed: 250 to 8192
* Real Time: 1823 Live Time: 1800 Dead Time: 1.27%
*
* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S4SS5BKG.CNF

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*****
*****          C O U N T   -   R A T E   R E P O R T          *****
*****          (Corrected for Detector Efficiency)            *****
*****

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MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU4 SS-5

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS5.CNF

Peak Analysis Performed on: 10/18/99 4:44:25 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	74.94	-8.20E+002	113.56	2.56E-003	8.06E-005	-1.78E+002
M 2	84.91	-3.62E+002	92.68	2.57E-003	6.90E-005	-7.83E+001
m 3	87.40	1.58E+001	84.64	2.57E-003	6.62E-005	3.41E+000
m 4	89.70	1.87E+002	54.28	2.58E-003	6.39E-005	4.03E+001
m 5	93.27	9.79E+001	80.36	2.58E-003	6.09E-005	2.11E+001
M 6	121.33	6.40E+001	68.92	2.60E-003	8.13E-005	1.37E+001
M 7	186.09	1.44E+002	61.04	1.88E-003	6.45E-005	4.26E+001
M 8	213.01	6.04E+001	20.76	1.62E-003	4.85E-005	2.08E+001
M 9	238.65	7.60E+002	33.74	1.41E-003	4.25E-005	2.99E+002
M 10	285.94	3.40E+001	14.05	1.13E-003	3.75E-005	1.67E+001
M 11	295.23	1.80E+002	26.57	1.08E-003	3.63E-005	9.24E+001
M 12	338.35	1.23E+002	21.77	9.14E-004	2.98E-005	7.48E+001
M 13	351.95	4.00E+002	32.50	8.70E-004	2.76E-005	2.55E+002
14	510.91	1.61E+002	20.39	5.56E-004	9.85E-006	1.61E+002
M 15	583.25	3.12E+002	19.33	4.78E-004	7.82E-006	3.64E+002
M 16	609.29	3.66E+002	22.65	4.55E-004	7.50E-006	4.47E+002
M 17	727.12	6.68E+001	11.19	3.75E-004	6.50E-006	9.90E+001
M 18	768.48	3.80E+001	12.33	3.53E-004	6.15E-006	5.97E+001
M 19	794.85	4.13E+001	9.80	3.41E-004	5.95E-006	6.73E+001
M 20	847.41	1.83E+001	6.74	3.19E-004	5.62E-006	3.19E+001
M 21	911.16	2.37E+002	16.90	2.96E-004	5.45E-006	4.44E+002
M 22	964.88	2.66E+001	9.60	2.79E-004	5.48E-006	5.30E+001
m 23	969.03	1.24E+002	13.60	2.78E-004	5.48E-006	2.48E+002
M 24	1120.27	7.35E+001	11.59	2.40E-004	5.86E-006	1.70E+002
M 25	1460.75	8.18E+002	29.37	1.85E-004	5.46E-006	2.45E+003
M 26	1764.59	8.36E+001	9.88	1.56E-004	1.25E-005	2.98E+002

M = First peak in a multiplet region

m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

** SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS5BKG.CNF
* Sample ID: S4SS5BKG
Additional Description: PGDP WAG3 SWMU4 SS-5 BK
* :
* :
* Gross Wt:
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/29/99 5:26:33 PM

* Data acquired by: MANAGER
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1818 Live Time: 1800 Dead Time: 1.04%:
*
* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

 ***** C O U N T - R A T E R E P O R T *****
 ***** (Corrected for Detector Efficiency) *****

MEASUREMENT SERIES: 4 sq meters

Sample ID: S4SS5BKG

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS5BKG.CNF

Peak Analysis Performed on: 10/12/99 3:07:42 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	41.32	1.55E+002	134.46	2.51E-003	7.84E-005	3.43E+001
M 2	68.61	1.59E+002	779.88	2.55E-003	8.70E-005	3.45E+001
M 3	72.79	7.53E+002	87.77	2.56E-003	8.30E-005	1.64E+002
m 4	74.93	1.42E+003	93.99	2.56E-003	8.07E-005	3.09E+002
M 5	84.79	6.99E+002	71.84	2.57E-003	6.91E-005	1.51E+002
m 6	87.17	2.97E+002	62.90	2.57E-003	6.65E-005	6.42E+001
m 7	90.95	1.25E+002	58.60	2.58E-003	6.27E-005	2.70E+001
m 8	93.37	2.04E+002	58.18	2.58E-003	6.08E-005	4.40E+001
m 9	95.97	2.52E+002	58.14	2.58E-003	5.92E-005	5.43E+001
M 10	101.76	1.29E+001	101.78	2.59E-003	5.81E-005	2.77E+000
M 11	126.47	1.75E+002	56.82	2.53E-003	9.05E-005	3.86E+001
M 12	142.34	1.85E+002	119.35	2.37E-003	8.73E-005	4.33E+001
M 13	155.07	5.47E+001	102.75	2.23E-003	8.73E-005	1.36E+001
14	185.18	1.10E+001	54.24	1.89E-003	6.53E-005	3.25E+000
M 15	223.60	1.49E+000	23.89	1.53E-003	4.52E-005	5.41E-001
m 16	224.95	3.29E+000	52.82	1.52E-003	4.49E-005	1.20E+000
M 17	257.67	1.29E+001	38.60	1.28E-003	4.04E-005	5.57E+000
M 18	294.94	2.91E+001	15.76	1.09E-003	3.64E-005	1.49E+001
m 19	296.43	5.00E+001	17.25	1.08E-003	3.62E-005	2.57E+001
M 20	316.62	7.51E+000	22.22	9.93E-004	3.33E-005	4.20E+000
M 21	338.27	2.47E+001	11.23	9.15E-004	2.98E-005	1.50E+001
M 22	351.75	6.44E+000	22.38	8.71E-004	2.76E-005	4.11E+000
M 23	364.33	2.10E+001	15.69	8.34E-004	2.56E-005	1.40E+001
M 24	376.65	2.82E+000	14.44	8.00E-004	2.37E-005	1.96E+000
M 25	392.33	4.29E+000	15.22	7.61E-004	2.13E-005	3.13E+000
M 26	510.85	7.41E+001	10.72	5.56E-004	9.85E-006	7.41E+001
M 27	570.72	7.97E+000	4.28	4.89E-004	8.02E-006	9.05E+000
M 28	609.28	4.86E+001	8.09	4.55E-004	7.50E-006	5.94E+001
M 29	639.54	9.89E+000	4.25	4.31E-004	7.23E-006	1.27E+001
M 30	696.49	8.17E+000	3.56	3.93E-004	6.76E-006	1.16E+001
M 31	768.28	8.33E-002	7.17	3.53E-004	6.15E-006	1.31E-001
M 32	777.40	5.00E-001	11.77	3.49E-004	6.08E-006	7.96E-001
M 33	785.57	3.11E+000	5.92	3.45E-004	6.02E-006	5.00E+000
M 34	810.07	8.10E+000	3.25	3.34E-004	5.84E-006	1.35E+001
M 35	818.79	8.12E+000	3.84	3.30E-004	5.78E-006	1.37E+001
M 36	888.69	5.05E+000	2.41	3.03E-004	5.48E-006	9.25E+000
m 37	891.72	6.10E+000	2.65	3.02E-004	5.48E-006	1.12E+001
m 38	896.24	4.65E+000	2.26	3.01E-004	5.47E-006	8.58E+000
39	1000.89	1.38E+001	4.16	2.69E-004	5.56E-006	2.85E+001
40	1032.86	6.09E+000	3.17	2.60E-004	5.65E-006	1.30E+001
M 41	1183.53	8.44E-001	5.08	2.27E-004	5.90E-006	2.06E+000
M 42	1460.72	2.81E+001	5.85	1.85E-004	5.46E-006	8.44E+001

Sample ID: S4SS5BKG

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS5BKG.CNF

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 43	1764.55	6.40E+000	2.05	1.56E-004	1.25E-005	2.29E+001

M = First peak in a multiplet region

m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU4 SS-6

Sample was acquired: September 30, 1999
Data was analyzed: October 19, 1999 03:10 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPPFILES\Swm4ss6.rpt
library = C:\GENIE2K\Library\ornllib.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = None; thickness = 0.00 cm ; density = 0 g/cc
height = 200 cm ; length = 200 cm ; depth = 15.2 cm
tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc
sample is homogeneous
volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg
density (measured) = 1.020 g/cc

Detector calibration point-source reference distance: 30.0 cm
Geometry correction factor: 20.22

***** Nuclide Results *****

Nuclide	Grams	nCi	%err
Th-230	2.99E-05	6.27E+02	46.93
Th-232	1.22E+01	1.34E+03	45.64
K-40	2.82E+00	2.01E+04	43.99

***** Minimum Detectable Activity for Measured Geometry *****

File: C:\GENIE2K\REPPFILES\Swmu4ss6.rpt

Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
Li-7	2.51E-12	8.78E+02
Na-22	2.39E-11	1.50E+02
K-40	1.26E-01	8.99E+02
Co-60	1.19E-10	1.34E+02
Zn-65	4.07E-11	3.35E+02
Kr-85	7.28E-08	2.86E+04
Tc-99	1.76E+00	2.98E+07
Cs-134	9.84E-11	1.27E+02
Cs-137	1.53E-09	1.32E+02
Th-230	8.35E-06	1.75E+02
Th-232	2.00E+00	2.20E+02
U-234	1.16E-02	7.17E+04
U-235	5.88E-02	1.27E+02
Np-237	2.76E-04	1.95E+02
U-238	3.38E+00	1.14E+03
AM-241	4.63E-09	4.77E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

** SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS6.CNF
* Sample ID: SWMU4 SS-6
Additional Description: PGDP WAG3 SWMU4 SS-6
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/30/99 9:41:12 AM

* Data acquired by: JDM/HRW
* Detector: 4 meter square *BE-4512*
* Channels Analyzed: 250 to 8192
* Real Time: 1809 Live Time: 1800 Dead Time: 0.53%
*
* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S4SS6BKG.CNF

 ***** C O U N T - R A T E R E P O R T *****
 *** (Corrected for Detector Efficiency) *****

MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU4 SS-6

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS6.CNF

Peak Analysis Performed on: 10/18/99 4:47:31 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	69.68	1.98E+002	135.42	2.56E-003	8.61E-005	4.30E+001
M 2	74.87	-7.51E+002	113.73	2.56E-003	8.07E-005	-1.63E+002
M 3	84.82	4.30E+002	65.88	2.57E-003	6.91E-005	9.29E+001
m 4	89.42	2.99E+002	61.95	2.58E-003	6.42E-005	6.46E+001
m 5	92.97	3.56E+002	62.67	2.58E-003	6.11E-005	7.67E+001
M 6	129.10	1.04E+002	347.34	2.50E-003	8.60E-005	2.31E+001
M 7	238.58	6.92E+002	77.55	1.41E-003	4.25E-005	2.72E+002
M 8	295.18	1.01E+002	30.81	1.08E-003	3.63E-005	5.19E+001
M 9	338.26	1.74E+002	18.18	9.15E-004	2.98E-005	1.06E+002
M 10	351.94	2.63E+002	30.23	8.70E-004	2.76E-005	1.68E+002
M 11	510.93	1.85E+002	16.57	5.56E-004	9.85E-006	1.85E+002
M 12	583.19	3.48E+002	20.14	4.78E-004	7.82E-006	4.05E+002
" 13	609.30	2.50E+002	24.53	4.55E-004	7.50E-006	3.06E+002
" 14	726.96	1.02E+002	12.37	3.75E-004	6.50E-006	1.51E+002
M 15	835.72	3.83E+001	8.91	3.23E-004	5.68E-006	6.57E+001
M 16	860.19	3.78E+001	9.58	3.14E-004	5.57E-006	6.70E+001
M 17	911.16	2.28E+002	15.92	2.96E-004	5.45E-006	4.28E+002
M 18	964.63	3.29E+001	8.98	2.79E-004	5.48E-006	6.56E+001
m 19	968.99	1.04E+002	12.61	2.78E-004	5.48E-006	2.08E+002
M 20	974.72	1.23E+001	3.90	2.76E-004	5.49E-006	2.48E+001
M 21	1120.13	9.86E+001	13.77	2.40E-004	5.86E-006	2.28E+002
M 22	1460.75	8.62E+002	29.11	1.85E-004	5.46E-006	2.58E+003
M 23	1592.26	3.68E+001	7.31	1.71E-004	7.10E-006	1.20E+002
M 24	1730.31	4.72E+000	4.42	1.58E-004	1.12E-005	1.66E+001
M 25	1764.55	3.65E+001	10.75	1.56E-004	1.25E-005	1.30E+002

M = First peak in a multiplet region

m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

* SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS6BKG.CNF
* Sample ID: S4SS6BKG
Additional Description: PGDP WAG3 SWMU4 SS-6 BK
* :
* :
* Gross Wt:
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/30/99 9:06:41 AM

* Data acquired by: manager
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1821 Live Time: 1800 Dead Time: 1.16%
*
* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

 ***** COUNT - RATE REPORT *****
 **** (Corrected for Detector Efficiency) ****

MEASUREMENT SERIES: 4 sq meters

Sample ID: S4SS6BKG
 Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS6BKG.CNF
 Peak Analysis Performed on: 10/12/99 3:11:26 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	74.66	1.29E+003	94.85	2.56E-003	8.09E-005	2.81E+002
M 2	139.24	6.93E+001	85.26	2.41E-003	8.60E-005	1.60E+001
M 3	146.66	9.55E+001	36.45	2.32E-003	8.83E-005	2.28E+001
M 4	149.50	1.31E+001	108.33	2.29E-003	8.84E-005	3.17E+000
M 5	237.66	5.89E+001	70.09	1.42E-003	4.26E-005	2.30E+001
M 6	241.94	5.71E+001	52.64	1.39E-003	4.20E-005	2.28E+001
M 7	259.52	2.51E+001	38.92	1.27E-003	4.03E-005	1.10E+001
M 8	281.30	3.30E+001	10.48	1.15E-003	3.80E-005	1.59E+001
M 9	285.01	4.71E+001	17.72	1.13E-003	3.76E-005	2.31E+001
M 10	294.80	1.35E+002	22.10	1.09E-003	3.64E-005	6.92E+001
M 11	320.12	2.34E+000	35.99	9.80E-004	3.27E-005	1.33E+000
M 12	351.64	1.73E+002	18.89	8.71E-004	2.77E-005	1.10E+002
M 13	358.57	2.06E+001	10.09	8.51E-004	2.65E-005	1.35E+001
M 14	385.36	6.31E+000	18.03	7.78E-004	2.23E-005	4.50E+000
M 15	575.83	1.11E+001	5.39	4.84E-004	7.93E-006	1.27E+001
M 16	590.69	3.70E+000	8.29	4.71E-004	7.72E-006	4.37E+000
M 17	609.11	1.44E+002	13.11	4.55E-004	7.50E-006	1.75E+002
M 18	636.89	3.40E+000	7.54	4.33E-004	7.25E-006	4.36E+000
M 19	646.99	2.02E+000	6.72	4.26E-004	7.17E-006	2.64E+000
M 20	714.20	7.22E+000	3.69	3.82E-004	6.61E-006	1.05E+001
M 21	768.11	1.02E+001	4.32	3.54E-004	6.16E-006	1.61E+001
m 22	771.95	6.12E+000	3.22	3.52E-004	6.13E-006	9.66E+000
M 23	903.66	8.86E+000	1.75	2.98E-004	5.46E-006	1.65E+001
M 24	934.50	1.64E+001	5.05	2.88E-004	5.44E-006	3.17E+001
M 25	1038.54	3.85E+000	5.51	2.59E-004	5.66E-006	8.26E+000
M 26	1102.24	8.94E+000	3.80	2.44E-004	5.83E-006	2.04E+001
M 27	1119.91	2.71E+001	5.81	2.40E-004	5.86E-006	6.26E+001
M 28	1238.22	9.64E+000	4.44	2.17E-004	5.84E-006	2.47E+001
M 29	1267.14	6.36E+000	3.80	2.12E-004	5.77E-006	1.66E+001
M 30	1377.50	3.00E+000	5.20	1.96E-004	5.43E-006	8.51E+000
M 31	1452.68	6.37E+000	2.93	1.86E-004	5.43E-006	1.90E+001
M 32	1461.27	1.36E+001	4.81	1.85E-004	5.46E-006	4.08E+001
M 33	1730.47	8.47E+000	0.40	1.58E-004	1.12E-005	2.97E+001
M 34	1764.58	3.01E+001	5.46	1.56E-004	1.25E-005	1.08E+002

M = First peak in a multiplet region
 m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU4 SS-7

Data was acquired: September 30, 1999

Data was analyzed: October 19, 1999 03:15 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPFILS\Swmu4ss7.rpt

library = C:\GENIE2K\Library\ornllib.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = None; thickness = 0.00 cm ; density = 0 g/cc
height = 200 cm ; length = 200 cm ; depth = 15.2 cm
tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc
sample is homogeneous
volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg
density (measured) = 1.020 g/cc

Detector calibration point-source reference distance: 30.0 cm

Geometry correction factor: 20.22

***** Nuclide Results *****

Nuclide	Grams	nCi	%err
Th-230	4.19E-05	8.80E+02	46.35
Th-232	1.18E+01	1.30E+03	45.67
K-40	2.56E+00	1.83E+04	44.01

***** Minimum Detectable Activity for Measured Geometry *****

File: C:\GENIE2K\REFFILES\Swmu4ss7.rpt

Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
La-7	2.40E-12	8.38E+02
Na-22	2.05E-11	1.28E+02
K-40	1.43E-01	1.03E+03
Co-60	1.10E-10	1.25E+02
Zn-65	3.91E-11	3.22E+02
Kr-85	7.19E-08	2.82E+04
Tc-99	7.31E-01	1.24E+07
Cs-134	1.07E-10	1.38E+02
Cs-137	1.49E-09	1.29E+02
Th-230	7.20E-06	1.51E+02
Th-232	9.37E-01	1.03E+02
U-234	7.85E-03	4.87E+04
U-235	5.19E-02	1.12E+02
Np-237	2.67E-04	1.88E+02
U-238	2.46E+00	8.29E+02
AM-241	3.32E-09	3.42E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

** SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS7.CNF
* Sample ID: SWMU4 SS-7
Additional Description: PGDP WAG3 SWMU4 SS-7
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/30/99 3:10:18 PM

* Data acquired by: JDM/HRW
* Detector: 4 meter square *BE-4512*
* Channels Analyzed: 250 to 8192
* Real Time: 1806 Live Time: 1800 Dead Time: 0.35%
*
* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S4SS7BKG.CNF

 **** C O U N T - R A T E R E P O R T ****
 **** (Corrected for Detector Efficiency) ****

MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU4 SS-7

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS7.CNF

Peak Analysis Performed on: 10/18/99 4:54:00 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	84.55	2.15E+002	42.66	2.57E-003	6.94E-005	4.65E+001
m 2	87.20	1.54E+002	39.97	2.57E-003	6.64E-005	3.33E+001
m 3	92.69	8.11E+001	38.62	2.58E-003	6.13E-005	1.75E+001
M 4	238.55	7.94E+002	32.90	1.41E-003	4.25E-005	3.12E+002
M 5	295.19	2.18E+002	26.77	1.08E-003	3.63E-005	1.12E+002
M 6	338.34	1.46E+002	17.62	9.14E-004	2.98E-005	8.86E+001
M 7	351.89	3.65E+002	25.37	8.71E-004	2.76E-005	2.33E+002
M 8	510.75	1.94E+002	16.49	5.56E-004	9.86E-006	1.94E+002
M 9	583.25	3.34E+002	19.90	4.77E-004	7.82E-006	3.88E+002
M 10	609.25	3.51E+002	22.60	4.55E-004	7.50E-006	4.29E+002
M 11	727.06	5.35E+001	10.99	3.75E-004	6.50E-006	7.93E+001
M 12	768.06	4.69E+001	10.33	3.54E-004	6.16E-006	7.36E+001
M 13	830.83	3.82E-001	11.31	3.25E-004	5.71E-006	6.53E-001
M 14	911.18	2.20E+002	15.84	2.96E-004	5.45E-006	4.13E+002
M 15	964.72	6.21E+001	9.82	2.79E-004	5.48E-006	1.24E+002
m 16	969.09	1.23E+002	12.79	2.78E-004	5.48E-006	2.47E+002
M 17	1120.48	8.71E+001	11.39	2.40E-004	5.86E-006	2.02E+002
M 18	1238.18	2.59E+001	8.79	2.17E-004	5.84E-006	6.63E+001
M 19	1460.71	7.83E+002	28.51	1.85E-004	5.46E-006	2.35E+003
M 20	1592.87	4.37E+001	7.63	1.71E-004	7.11E-006	1.42E+002
M 21	1764.48	8.55E+001	10.26	1.56E-004	1.25E-005	3.05E+002

M = First peak in a multiplet region.
 m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

* * SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS7BKG.CNF
* Sample ID: S4SS7BKG
Additional Description:
* :
* :
* Gross Wt:
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/30/99 2:35:35 PM

* Data acquired by: MANAGER
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1806 Live Time: 1800 Dead Time: 0.38%
*
* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

 **** COUNT - RATE REPORT ****
 **** (Corrected for Detector Efficiency) ****

MEASUREMENT SERIES: 4 sq meters

Sample ID: S4SS7BKG

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS7BKG.CNF

Peak Analysis Performed on: 10/12/99 4:28:39 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	36.07	9.40E+001	446.55	2.50E-003	7.07E-005	2.09E+001
M 2	62.81	7.41E+001	98.14	2.55E-003	9.11E-005	1.62E+001
M 3	75.05	3.92E+002	55.65	2.56E-003	8.05E-005	8.51E+001
M 4	80.39	3.22E+001	179.51	2.57E-003	7.43E-005	6.97E+000
M 5	104.31	1.36E+002	434.52	2.59E-003	5.88E-005	2.93E+001
M 6	132.03	7.21E+001	39.83	2.48E-003	8.42E-005	1.62E+001
M 7	146.00	1.26E+001	44.68	2.33E-003	8.82E-005	3.01E+000
M 8	156.87	9.10E+000	36.95	2.21E-003	8.66E-005	2.29E+000
M 9	246.36	1.56E+001	22.35	1.36E-003	4.15E-005	6.38E+000
M 10	262.95	2.87E+001	12.04	1.25E-003	3.99E-005	1.27E+001
M 11	293.95	4.86E+000	11.57	1.09E-003	3.65E-005	2.48E+000
m 12	295.53	7.18E+000	17.07	1.08E-003	3.63E-005	3.68E+000
13	298.51	1.42E+001	24.26	1.07E-003	3.59E-005	7.38E+000
M 14	331.26	1.71E+000	12.97	9.39E-004	3.10E-005	1.01E+000
M 15	335.78	3.45E+000	16.47	9.23E-004	3.02E-005	2.08E+000
M 16	351.97	3.52E+001	9.99	8.70E-004	2.76E-005	2.25E+001
M 17	361.15	2.07E+001	8.91	8.43E-004	2.61E-005	1.36E+001
M 18	385.60	1.19E+001	2.89	7.78E-004	2.23E-005	8.54E+000
M 19	416.16	9.70E+000	1.41	7.09E-004	1.80E-005	7.60E+000
M 20	421.30	7.39E-001	5.92	6.98E-004	1.74E-005	5.88E-001
m 21	423.25	1.03E+000	8.28	6.94E-004	1.72E-005	8.27E-001
M 22	437.16	3.42E+000	9.12	6.68E-004	1.56E-005	2.85E+000
M 23	464.95	8.88E+000	4.42	6.20E-004	1.29E-005	7.95E+000
M 24	471.56	7.33E+000	3.95	6.10E-004	1.23E-005	6.67E+000
M 25	539.21	1.55E+000	7.54	5.22E-004	8.76E-006	1.65E+000
M 26	609.53	5.40E+001	7.92	4.55E-004	7.50E-006	6.60E+001
M 27	741.62	1.11E+001	4.00	3.67E-004	6.38E-006	1.68E+001
M 28	755.07	7.99E+000	3.90	3.60E-004	6.26E-006	1.23E+001
M 29	760.01	1.05E+001	3.58	3.57E-004	6.22E-006	1.63E+001
M 30	806.12	6.03E+000	3.00	3.36E-004	5.87E-006	9.97E+000
M 31	838.68	7.18E+000	3.06	3.22E-004	5.67E-006	1.24E+001
M 32	957.34	4.49E+000	2.71	2.81E-004	5.47E-006	8.87E+000
M 33	1140.87	4.84E+000	3.99	2.36E-004	5.89E-006	1.14E+001
M 34	1461.15	3.53E+001	6.11	1.85E-004	5.46E-006	1.06E+002
M 35	1472.24	5.26E+000	1.36	1.84E-004	5.51E-006	1.59E+001

= First peak in a multiplet region
 m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU4 SS-8

Data was acquired: September 30, 1999

Data was analyzed: October 19, 1999 03:16 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPPFILES\Swmu4ss8.rpt

library = C:\GENIE2K\Library\ornllib.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = None; thickness = 0.00 cm ; density = 0 g/cc
height = 200 cm ; length = 200 cm ; depth = 15.2 cm
tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc
sample is homogeneous
volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg
density (measured) = 1.020 g/cc

Detector calibration point-source reference distance: 30.0 cm

Geometry correction factor: 20.22

***** Nuclide Results *****

Nuclide	Grams	nCi	%err
Th-230	4.45E-05	9.35E+02	46.30
Th-232	1.16E+01	1.28E+03	45.72
K-40	2.78E+00	1.99E+04	44.00

**** Minimum Detectable Activity for Measured Geometry ****
File: C:\GENIE2K\REPFILES\Swmu4ss8.rpt
Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
Se-7	2.51E-12	8.78E+02
Na-22	2.25E-11	1.40E+02
K-40	1.34E-01	9.58E+02
Co-60	1.09E-10	1.23E+02
Zn-65	3.76E-11	3.10E+02
Kr-85	7.03E-08	2.75E+04
Tc-99	1.18E+00	2.01E+07
Cs-134	1.06E-10	1.37E+02
Cs-137	1.49E-09	1.29E+02
Th-230	6.67E-06	1.40E+02
Th-232	9.03E-01	9.94E+01
U-234	7.91E-03	4.91E+04
U-235	5.29E-02	1.14E+02
Np-237	2.75E-04	1.94E+02
U-238	2.59E+00	8.73E+02
AM-241	3.22E-09	3.32E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

** SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS8.CNF
* Sample ID: SWMU4 SS-8
Additional Description: PDGP WAG3 SWMU4 SS-8
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/30/99 1:49:23 PM

* Data acquired by: JDM/HRW
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1806 Live Time: 1800 Dead Time: 0.37%
*
* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S4SS8BKG.CNF

 **** COUNT - RATE REPORT ****
 **** (Corrected for Detector Efficiency) ****

MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU4 SS-8

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU4SS8.CNF

Peak Analysis Performed on: 10/18/99 5:02:01 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	74.89	2.38E+002	133.79	2.56E-003	8.07E-005	5.15E+001
m 2	77.14	4.43E+002	44.37	2.56E-003	7.81E-005	9.59E+001
M 3	84.69	-1.80E+002	69.80	2.57E-003	6.92E-005	-3.89E+001
m 4	87.09	3.85E+002	47.31	2.57E-003	6.66E-005	8.31E+001
m 5	89.89	1.47E+002	42.32	2.58E-003	6.37E-005	3.18E+001
m 6	92.76	3.68E+002	44.94	2.58E-003	6.12E-005	7.93E+001
M 7	238.60	6.59E+002	31.97	1.41E-003	4.25E-005	2.59E+002
M 8	242.00	4.83E+001	17.03	1.39E-003	4.20E-005	1.93E+001
M 9	295.21	2.84E+002	21.55	1.08E-003	3.63E-005	1.45E+002
M 10	338.38	1.55E+002	17.51	9.14E-004	2.98E-005	9.41E+001
M 11	351.91	3.57E+002	25.56	8.71E-004	2.76E-005	2.28E+002
M 12	462.71	3.84E+001	11.62	6.24E-004	1.30E-005	3.42E+001
M 13	510.91	1.43E+002	15.80	5.55E-004	9.85E-006	1.43E+002
M 14	583.15	3.04E+002	19.33	4.78E-004	7.82E-006	3.54E+002
M 15	609.26	3.74E+002	22.79	4.55E-004	7.50E-006	4.56E+002
M 16	727.40	7.31E+001	11.59	3.75E-004	6.50E-006	1.08E+002
M 17	772.33	2.14E+001	9.54	3.51E-004	6.12E-006	3.39E+001
M 18	794.86	1.65E+001	15.95	3.41E-004	5.95E-006	2.69E+001
M 19	911.11	2.17E+002	16.30	2.96E-004	5.45E-006	4.07E+002
M 20	964.78	5.97E+001	10.00	2.79E-004	5.48E-006	1.19E+002
m 21	968.89	1.61E+002	13.70	2.78E-004	5.48E-006	3.22E+002
M 22	1120.33	9.10E+001	11.66	2.40E-004	5.86E-006	2.11E+002
M 23	1460.72	8.49E+002	29.43	1.85E-004	5.46E-006	2.55E+003
M 24	1764.27	8.15E+001	9.65	1.56E-004	1.25E-005	2.91E+002

M = First peak in a multiplet region

m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

* * SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS8BKG.CNF
* Sample ID: S4SS8BKG
Additional Description: PGDP WAG3 SWMU4 SS8 BKG
* :
* :
* Gross Wt:
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/30/99 1:14:27 PM

* Data acquired by: MANAGER
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1806 Live Time: 1800 Dead Time: 0.38%
*
* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

 COUNT - RATE REPORT *****
 (Corrected for Detector Efficiency) *****

MEASUREMENT SERIES: 4 sq meters

Sample ID: S4SS8BKG

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S4SS8BKG.CNF

Peak Analysis Performed on: 10/12/99 4:35:31 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	24.52	6.64E+000	694.38	2.46E-003	1.26E-004	1.50E+000
M 2	50.61	1.47E+002	152.20	2.53E-003	9.02E-005	3.23E+001
M 3	62.10	2.53E+001	97.28	2.55E-003	9.14E-005	5.51E+000
M 4	69.95	2.98E+002	126.69	2.56E-003	8.58E-005	6.48E+001
M 5	75.04	1.85E+002	125.83	2.56E-003	8.05E-005	4.01E+001
M 6	84.61	3.68E+002	52.70	2.57E-003	6.93E-005	7.96E+001
M 7	114.04	5.62E+001	153.69	2.59E-003	6.84E-005	1.20E+001
m 8	115.24	1.38E+002	358.36	2.59E-003	7.02E-005	2.96E+001
M 9	218.50	5.72E+001	43.17	1.57E-003	4.66E-005	2.03E+001
M 10	230.29	1.71E+001	23.33	1.47E-003	4.38E-005	6.45E+000
M 11	285.26	5.92E+000	23.50	1.13E-003	3.76E-005	2.90E+000
m 12	287.79	5.14E+000	20.43	1.12E-003	3.73E-005	2.55E+000
M 13	298.23	8.48E+000	16.17	1.07E-003	3.59E-005	4.40E+000
M 14	307.45	1.28E+001	53.48	1.03E-003	3.46E-005	6.91E+000
M 15	352.16	3.89E+001	9.81	8.70E-004	2.76E-005	2.48E+001
M 16	357.97	1.36E+001	12.86	8.52E-004	2.66E-005	8.87E+000
M 17	376.84	5.25E+000	10.08	8.00E-004	2.36E-005	3.65E+000
M 18	384.31	3.29E+000	10.64	7.81E-004	2.25E-005	2.34E+000
M 19	398.57	1.07E+001	5.45	7.47E-004	2.04E-005	7.94E+000
M 20	458.01	1.13E+001	5.09	6.32E-004	1.35E-005	9.95E+000
M 21	483.10	9.03E+000	4.48	5.93E-004	1.15E-005	8.46E+000
M 22	519.11	9.77E+000	0.53	5.45E-004	9.48E-006	9.95E+000
M 23	609.46	4.08E+001	7.45	4.55E-004	7.50E-006	4.99E+001
m 24	612.77	7.76E+000	4.50	4.52E-004	7.47E-006	9.54E+000
M 25	642.35	2.80E+000	4.73	4.29E-004	7.20E-006	3.63E+000
m 26	644.89	3.23E+000	5.44	4.27E-004	7.18E-006	4.20E+000
M 27	797.50	6.25E+000	2.80	3.40E-004	5.93E-006	1.02E+001
M 28	836.85	1.00E+000	5.19	3.23E-004	5.68E-006	1.72E+000
M 29	901.75	5.07E+000	3.03	2.99E-004	5.46E-006	9.43E+000
M 30	979.19	4.11E+000	4.80	2.75E-004	5.50E-006	8.32E+000
M 31	1266.45	6.33E+000	3.61	2.13E-004	5.77E-006	1.66E+001
M 32	1356.17	1.02E+001	3.96	1.99E-004	5.48E-006	2.84E+001
M 33	1393.24	4.99E+000	3.54	1.94E-004	5.40E-006	1.43E+001
M 34	1461.24	1.57E+001	4.53	1.85E-004	5.46E-006	4.72E+001

M = First peak in a multiplet region
 = Other peak in a multiplet region

Errors quoted at 1.000 sigma

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU5 SS-1

Data was acquired: September 27, 1999

Data was analyzed: October 19, 1999 03:19 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPFIL\Swmu5ss1.rpt

library = C:\GENIE2K\Library\ornllib.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = None; thickness = 0.00 cm ; density = 0 g/cc
height = 200 cm ; length = 200 cm ; depth = 15.2 cm
tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc
sample is homogeneous
volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg
density (measured) = 1.020 g/cc

Detector calibration point-source reference distance: 30.0 cm

Geometry correction factor: 20.22

***** Nuclide Results *****

nuclide	Grams	nCi	%err
Th-230	2.70E-05	5.68E+02	46.66
Th-232	4.65E+00	5.12E+02	46.64
K-40	8.81E-01	6.30E+03	44.29

***** Minimum Detectable Activity for Measured Geometry *****
 File: C:\GENIE2K\REPFILES\Swmu5ss1.rpt
 Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
Se-7	1.67E-12	5.82E+02
Na-22	1.42E-11	8.88E+01
K-40	7.93E-02	5.67E+02
Co-60	8.09E-11	9.14E+01
Zn-65	2.75E-11	2.27E+02
Kr-85	5.07E-08	1.99E+04
Tc-99	7.83E-01	1.33E+07
Cs-134	7.74E-11	9.97E+01
Cs-137	7.42E-10	6.41E+01
Th-230	5.06E-06	1.06E+02
Th-232	5.94E-01	6.54E+01
U-234	8.77E-03	5.44E+04
U-235	4.45E-02	9.62E+01
Np-237	2.05E-04	1.44E+02
U-238	2.68E+00	9.02E+02
AM-241	3.62E-09	3.73E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

* * SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU5SS1.CNF
* Sample ID: SWMU5 SS-1
Additional Description: PGDP WAG3 SWMU5 SS-1
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/27/99 5:15:06 PM
* Data acquired by: JDM/HRW
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1805 Live Time: 1800 Dead Time: 0.29%:
*
* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S5SS1BKG.CNF

 **** C O U N T - R A T E R E P O R T ****
 **** (Corrected for Detector Efficiency) ****

MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU5 SS-1

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU5SS1.CNF

Peak Analysis Performed on: 10/18/99 5:07:54 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)	
M 1	84.77	-6.60E+001	90.34	2.57E-003	6.91E-005	-1.43E+001	
m 2	87.58	5.22E+001	79.72	2.57E-003	6.60E-005	1.13E+001	
m 3	92.43	3.15E+002	46.22	2.58E-003	6.15E-005	6.78E+001	
M 4	219.98	7.08E+001	16.50	1.56E-003	4.62E-005	2.53E+001	
M 5	238.60	2.95E+002	22.07	1.41E-003	4.25E-005	1.16E+002	
M 6	295.14	1.59E+002	16.44	1.08E-003	3.63E-005	8.13E+001	
M 7	351.86	2.05E+002	20.12	8.71E-004	2.76E-005	1.31E+002	
M 8	510.65	6.81E+001	11.06	5.56E-004	9.86E-006	6.81E+001	
M 9	583.14	9.00E+001	11.29	4.78E-004	7.82E-006	1.05E+002	
M 10	609.30	2.26E+002	19.00	4.55E-004	7.50E-006	2.77E+002	
M 11	661.67	3.13E+001	10.12	4.15E-004	7.05E-006	4.19E+001	
M 12	911.03	8.68E+001	10.31	2.96E-004	5.45E-006	1.63E+002	
	13	1237.91	2.51E+001	6.79	2.17E-004	5.84E-006	6.42E+001
M 14	1460.59	2.69E+002	16.41	1.85E-004	5.46E-006	8.07E+002	
M 15	1764.66	4.31E+001	8.08	1.56E-004	1.25E-005	1.54E+002	

M = First peak in a multiplet region

m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

** SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S5SS1BKG.CNF
* Sample ID: SWMU 5 SS-1 BKG
Additional Description: WAG 3 PGDP

* :
* :
* Gross Wt:
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/27/99 4:31:57 PM

* Data acquired by: manager
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1813 Live Time: 1800 Dead Time: 0.73%
*

* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

 COUNT - RATE REPORT *****
 (Corrected for Detector Efficiency) *****

MEASUREMENT SERIES: 4 sq meters

Sample ID: SWMU 5 SS-1 BKG

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S5SS1BKG.CNF

Peak Analysis Performed on: 10/13/99 10:06:39 AM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	57.45	1.72E+001	137.88	2.54E-003	9.26E-005	3.77E+000
M 2	59.43	1.08E+002	136.84	2.54E-003	9.23E-005	2.35E+001
M 3	63.27	1.41E+002	745.64	2.55E-003	9.09E-005	3.08E+001
M 4	75.39	5.88E+002	79.05	2.56E-003	8.01E-005	1.28E+002
M 5	79.11	1.25E+002	698.14	2.57E-003	7.58E-005	2.70E+001
M 6	85.15	4.16E+002	75.12	2.57E-003	6.87E-005	8.99E+001
m 7	87.85	1.18E+002	66.16	2.57E-003	6.57E-005	2.54E+001
M 8	118.59	3.55E+001	36.21	2.60E-003	7.60E-005	7.60E+000
M 9	122.66	2.68E+000	82.19	2.60E-003	8.40E-005	5.73E-001
M 10	143.57	3.14E+000	57.36	2.36E-003	8.77E-005	7.40E-001
M 11	189.02	4.44E+001	43.33	1.85E-003	6.22E-005	1.34E+001
M 12	205.21	9.70E+000	36.55	1.69E-003	5.19E-005	3.20E+000
M 13	246.50	5.00E+000	27.38	1.36E-003	4.15E-005	2.05E+000
M 14	274.75	1.50E+001	22.57	1.19E-003	3.88E-005	7.02E+000
M 15	308.93	1.28E+001	22.13	1.02E-003	3.44E-005	6.96E+000
M 16	331.35	4.14E+001	2.36	9.38E-004	3.10E-005	2.45E+001
M 17	352.11	2.39E+001	11.14	8.70E-004	2.76E-005	1.52E+001
M 18	378.39	6.12E+000	16.43	7.96E-004	2.34E-005	4.27E+000
M 19	396.77	2.97E+001	11.24	7.51E-004	2.07E-005	2.20E+001
M 20	438.43	1.31E+001	7.10	6.65E-004	1.54E-005	1.09E+001
M 21	511.70	4.02E+001	9.27	5.55E-004	9.81E-006	4.03E+001
m 22	514.50	1.92E+001	6.22	5.51E-004	9.68E-006	1.93E+001
M 23	536.06	1.03E+001	6.12	5.26E-004	8.86E-006	1.09E+001
M 24	557.84	7.18E+000	4.00	5.02E-004	8.27E-006	7.94E+000
M 25	563.64	6.13E+000	8.00	4.96E-004	8.15E-006	6.86E+000
M 26	579.08	1.17E+001	2.23	4.81E-004	7.88E-006	1.35E+001
M 27	609.64	5.10E+001	8.36	4.54E-004	7.50E-006	6.23E+001
M 28	624.49	6.16E+000	2.66	4.42E-004	7.36E-006	7.73E+000
M 29	649.13	1.18E+001	4.69	4.24E-004	7.15E-006	1.55E+001
M 30	661.54	1.21E+001	4.47	4.15E-004	7.05E-006	1.62E+001
M 31	890.52	9.11E+000	3.46	3.03E-004	5.48E-006	1.67E+001
M 32	944.64	7.86E+000	0.37	2.85E-004	5.45E-006	1.53E+001
M 33	1173.38	1.91E+001	4.69	2.29E-004	5.91E-006	4.64E+001
M 34	1192.31	6.21E+000	3.33	2.25E-004	5.90E-006	1.53E+001
M 35	1232.09	5.35E+000	3.31	2.18E-004	5.85E-006	1.36E+001
M 36	1332.77	1.36E+001	4.07	2.02E-004	5.56E-006	3.72E+001
M 37	1763.99	6.21E+000	3.06	1.56E-004	1.25E-005	2.22E+001

M = First peak in a multiplet region
 m = Other peak in a multiplet region

Count Rate

10/13/99 10:07:06 AM

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Errors quoted at 1.000 sigma

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU5 SS-2

Data was acquired: September 28, 1999

Data was analyzed: October 19, 1999 03:56 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPPFILES\Swm5Sss2.rpt
library = C:\GENIE2K\Library\ornllib.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = None; thickness = 0.00 cm ; density = 0 g/cc
height = 200 cm ; length = 200 cm ; depth = 15.2 cm
tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc
sample is homogeneous
volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg
density (measured) = 1.020 g/cc

Detector calibration point-source reference distance: 30.0 cm

Geometry correction factor: 20.22

***** Nuclide Results *****

Nuclide	Grams	nCi	%err
Th-230	2.99E-05	6.27E+02	46.59
Th-232	1.14E+01	1.25E+03	45.69
K-40	2.16E+00	1.54E+04	44.05

***** Minimum Detectable Activity for Measured Geometry *****
File: C:\GENIE2K\REPFILES\Swmu5ss2.rpt
Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
Se-7	1.13E-12	3.95E+02
Na-22	2.09E-11	1.30E+02
K-40	1.36E-01	9.70E+02
Co-60	1.03E-10	1.16E+02
Zn-65	3.72E-11	3.07E+02
Kr-85	6.78E-08	2.66E+04
Tc-99	9.25E-01	1.57E+07
Cs-134	9.37E-11	1.21E+02
Cs-137	1.30E-09	1.13E+02
Th-230	5.50E-06	1.16E+02
Th-232	8.54E-01	9.40E+01
U-234	1.02E-02	6.31E+04
U-235	5.35E-02	1.15E+02
Np-237	2.54E-04	1.79E+02
U-238	3.05E+00	1.03E+03
AM-241	4.18E-09	4.30E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

** SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU5SS2.CNF
* Sample ID: SWMU5 SS-2
Additional Description: PGDP WAG3 SWMU5 SS-2
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/28/99 12:08:16 PM
* Data acquired by: JDM/HRW
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1807 Live Time: 1800 Dead Time: 0.42%
*
* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S5SS2BKG.CNF

 **** C O U N T - R A T E R E P O R T ****
 **** (Corrected for Detector Efficiency) ****

MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU5 SS-2

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU5SS2.CNF

Peak Analysis Performed on: 10/18/99 5:12:10 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	74.86	2.36E+002	100.88	2.56E-003	8.07E-005	5.12E+001
M 2	84.79	1.76E+001	90.22	2.57E-003	6.91E-005	3.81E+000
m 3	87.25	2.96E+002	52.90	2.57E-003	6.64E-005	6.39E+001
m 4	92.95	2.00E+002	50.42	2.58E-003	6.11E-005	4.31E+001
M 5	102.40	6.88E+001	66.04	2.59E-003	5.82E-005	1.48E+001
M 6	238.61	6.50E+002	30.59	1.41E-003	4.25E-005	2.56E+002
M 7	295.30	2.14E+002	19.84	1.08E-003	3.63E-005	1.10E+002
M 8	300.05	5.31E+001	14.22	1.06E-003	3.57E-005	2.78E+001
M 9	338.27	1.23E+002	17.12	9.14E-004	2.98E-005	7.50E+001
M 10	352.01	3.50E+002	21.89	8.70E-004	2.76E-005	2.23E+002
M 11	414.62	3.11E+001	9.62	7.12E-004	1.82E-005	2.43E+001
M 12	462.78	1.50E+001	18.39	6.24E-004	1.30E-005	1.34E+001
13	473.36	9.09E+000	15.66	6.07E-004	1.22E-005	8.31E+000
M 14	477.84	1.42E+001	15.75	6.01E-004	1.18E-005	1.31E+001
M 15	510.77	1.19E+002	14.79	5.56E-004	9.86E-006	1.19E+002
M 16	583.18	2.57E+002	17.77	4.78E-004	7.82E-006	2.99E+002
M 17	609.24	2.51E+002	20.05	4.55E-004	7.50E-006	3.06E+002
M 18	726.80	6.93E+001	11.16	3.75E-004	6.51E-006	1.03E+002
M 19	795.19	3.58E+001	9.58	3.41E-004	5.94E-006	5.83E+001
M 20	860.64	3.11E+001	9.14	3.14E-004	5.57E-006	5.51E+001
M 21	911.13	2.12E+002	15.49	2.96E-004	5.45E-006	3.98E+002
M 22	964.75	3.18E+001	8.57	2.79E-004	5.48E-006	6.33E+001
m 23	968.97	1.17E+002	12.49	2.78E-004	5.48E-006	2.33E+002
M 24	1120.09	1.09E+002	11.26	2.40E-004	5.86E-006	2.53E+002
M 25	1237.73	4.52E+001	9.32	2.17E-004	5.84E-006	1.16E+002
M 26	1460.76	6.59E+002	26.44	1.85E-004	5.46E-006	1.98E+003
M 27	1592.13	3.37E+001	7.49	1.71E-004	7.09E-006	1.09E+002
M 28	1730.32	1.04E+001	3.53	1.58E-004	1.12E-005	3.65E+001
M 29	1764.39	4.92E+001	9.32	1.56E-004	1.25E-005	1.75E+002

M = First peak in a multiplet region
 m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

** SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S5SS2BKG.CNF
* Sample ID: S5SS2BKG
Additional Description: PGDP WAG 3 SWMU-5 SS-2
* :
* :
* Gross Wt:
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/27/99 6:53:35 PM

* Data acquired by: Manager
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1814 Live Time: 1800 Dead Time: 0.82%
*

* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

 *** C O U N T - R A T E R E P O R T *****
 *** (Corrected for Detector Efficiency) *****

MEASUREMENT SERIES: 4 sq meters

Sample ID: S5SS2BKG

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S5SS2BKG.CNF

Peak Analysis Performed on: 10/13/99 10:09:06 AM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	16.64	8.76E+000	36.98	2.42E-003	2.91E-004	2.01E+000
M 2	33.76	1.02E+002	3427.77	2.49E-003	7.01E-005	2.27E+001
M 3	57.62	1.58E+001	31.38	2.54E-003	9.26E-005	3.46E+000
m 4	59.32	1.05E+002	208.71	2.54E-003	9.23E-005	2.30E+001
M 5	65.84	7.36E+001	141.67	2.55E-003	8.92E-005	1.60E+001
M 6	85.39	2.77E+002	71.87	2.57E-003	6.84E-005	5.99E+001
M 7	91.57	3.90E+001	173.03	2.58E-003	6.22E-005	8.41E+000
M 8	98.13	1.05E+002	62.45	2.58E-003	5.84E-005	2.26E+001
M 9	99.99	9.32E+001	52.42	2.58E-003	5.80E-005	2.00E+001
M 10	112.32	6.30E+001	121.99	2.59E-003	6.60E-005	1.35E+001
M 11	132.12	1.02E+002	45.97	2.48E-003	8.42E-005	2.28E+001
M 12	139.29	1.88E+002	98.73	2.41E-003	8.61E-005	4.34E+001
13	185.83	4.26E+001	21.88	1.88E-003	6.47E-005	1.26E+001
m 14	187.15	5.07E+001	42.80	1.86E-003	6.37E-005	1.51E+001
M 15	212.45	4.58E+001	33.02	1.62E-003	4.87E-005	1.57E+001
M 16	216.55	2.96E+000	38.29	1.58E-003	4.72E-005	1.04E+000
M 17	329.31	1.79E+001	11.24	9.46E-004	3.13E-005	1.05E+001
M 18	336.12	9.87E+000	31.40	9.22E-004	3.02E-005	5.95E+000
M 19	346.05	2.34E+001	10.07	8.89E-004	2.86E-005	1.46E+001
M 20	367.74	8.27E+000	17.08	8.24E-004	2.51E-005	5.57E+000
M 21	411.48	4.25E+000	13.10	7.18E-004	1.86E-005	3.29E+000
M 22	421.37	2.19E+001	8.82	6.98E-004	1.74E-005	1.74E+001
M 23	525.00	3.59E+000	8.89	5.38E-004	9.25E-006	3.71E+000
M 24	609.64	3.32E+001	7.36	4.54E-004	7.50E-006	4.06E+001
M 25	676.17	1.00E+000	5.89	4.05E-004	6.93E-006	1.37E+000
M 26	860.22	7.56E+000	2.96	3.14E-004	5.57E-006	1.34E+001
M 27	956.69	5.36E+000	2.70	2.81E-004	5.46E-006	1.06E+001
M 28	975.55	5.24E+000	0.30	2.76E-004	5.50E-006	1.06E+001
M 29	1182.34	5.73E+000	3.06	2.27E-004	5.90E-006	1.40E+001
M 30	1239.15	8.62E+000	3.91	2.17E-004	5.83E-006	2.21E+001
M 31	1460.72	2.37E+001	5.32	1.85E-004	5.46E-006	7.10E+001
M 32	1764.17	1.30E+001	4.64	1.56E-004	1.25E-005	4.63E+001

M = First peak in a multiplet region

m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU5 SS-3

Data was acquired: September 28, 1999

Data was analyzed: October 19, 1999 04:00 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPFILES\Swmu5ss3.rpt
library = C:\GENIE2K\Library\ornllib.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = None; thickness = 0.00 cm ; density = 0 g/cc
height = 200 cm ; length = 200 cm ; depth = 15.2 cm
tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc
sample is homogeneous
volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg
density (measured) = 1.020 g/cc

Detector calibration point-source reference distance: 30.0 cm
Geometry correction factor: 20.22

***** Nuclide Results *****

nuclide	Grams	nCi	%err
Th-230	3.36E-05	7.05E+02	46.57
Th-232	1.06E+01	1.17E+03	45.74
K-40	2.50E+00	1.79E+04	44.02

**** Minimum Detectable Activity for Measured Geometry ****

File: C:\GENIE2K\REPFILES\Swmu5ss3.rpt

Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
Je-7	2.53E-12	8.85E+02
Na-22	2.24E-11	1.40E+02
K-40	1.44E-01	1.03E+03
Co-60	1.07E-10	1.21E+02
Zn-65	3.94E-11	3.25E+02
Kr-85	7.25E-08	2.84E+04
Tc-99	1.10E+00	1.87E+07
Cs-134	9.56E-11	1.23E+02
Cs-137	1.54E-09	1.33E+02
Th-230	8.72E-06	1.83E+02
Th-232	8.97E-01	9.87E+01
U-234	1.22E-02	7.58E+04
U-235	5.96E-02	1.29E+02
Np-237	2.67E-04	1.88E+02
U-238	3.58E+00	1.21E+03
AM-241	4.86E-09	5.01E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

** SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU5SS3.CNF
* Sample ID: SWMU5 SS-3
Additional Description: PGDP WAG3 SWMU5 SS-3
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/28/99 1:53:51 PM
* Data acquired by: JDM/HRW
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1809 Live Time: 1800 Dead Time: 0.55%
* :
* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S5SS3BKG.CNF

 **** C O U N T - R A T E R E P O R T ****
 **** (Corrected for Detector Efficiency) ****

MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU5 SS-3

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU5SS3.CNF

Peak Analysis Performed on: 10/18/99 5:20:53 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	84.43	-5.93E+002	108.14	2.57E-003	6.95E-005	-1.28E+002
m 2	87.30	1.32E+002	94.76	2.57E-003	6.63E-005	2.85E+001
m 3	93.11	1.72E+002	56.23	2.58E-003	6.10E-005	3.70E+001
M 4	216.17	1.10E+001	29.09	1.59E-003	4.74E-005	3.85E+000
M 5	238.64	7.26E+002	32.65	1.41E-003	4.25E-005	2.86E+002
M 6	291.14	1.20E+001	20.65	1.10E-003	3.69E-005	6.04E+000
M 7	295.35	1.17E+002	34.86	1.08E-003	3.63E-005	6.01E+001
M 8	338.39	1.62E+002	18.37	9.14E-004	2.98E-005	9.82E+001
M 9	351.94	3.52E+002	39.31	8.70E-004	2.76E-005	2.25E+002
M 10	510.77	8.28E+001	17.55	5.56E-004	9.86E-006	8.27E+001
M 11	583.24	3.22E+002	19.65	4.78E-004	7.82E-006	3.74E+002
M 12	609.28	2.81E+002	22.19	4.55E-004	7.50E-006	3.44E+002
M 13	727.16	6.69E+001	11.50	3.75E-004	6.50E-006	9.92E+001
M 14	795.04	3.84E+001	9.50	3.41E-004	5.95E-006	6.26E+001
M 15	860.63	7.64E+001	10.05	3.14E-004	5.57E-006	1.35E+002
M 16	911.17	1.99E+002	15.21	2.96E-004	5.45E-006	3.73E+002
M 17	969.02	1.11E+002	12.33	2.78E-004	5.48E-006	2.21E+002
M 18	1120.17	8.95E+001	11.46	2.40E-004	5.86E-006	2.07E+002
M 19	1460.70	7.64E+002	28.07	1.85E-004	5.46E-006	2.29E+003
M 20	1495.26	1.12E+001	4.21	1.81E-004	5.66E-006	3.43E+001
M 21	1588.20	1.92E+001	5.39	1.71E-004	7.01E-006	6.22E+001
m 22	1591.77	2.07E+001	5.58	1.71E-004	7.09E-006	6.74E+001
M 23	1764.24	7.34E+001	9.18	1.56E-004	1.25E-005	2.62E+002

M = First peak in a multiplet region
 m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

** SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S5SS3BKG.CNF
* Sample ID: s5ss3bkg
Additional Description: PGDP WAG 3 SWMU-5 SS-3
* :
* :
* Gross Wt:
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/28/99 1:19:38 PM

* Data acquired by: MANAGER
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1822 Live Time: 1800 Dead Time: 1.24%
*
* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

 **** C O U N T - R A T E R E P O R T ****
 **** (Corrected for Detector Efficiency) ****

MEASUREMENT SERIES: 4 sq meters

Sample ID: s5ss3bkg

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S5SS3BKG.CNF

Peak Analysis Performed on: 10/13/99 10:29:47 AM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	18.75	6.17E+000	58.79	2.43E-003	2.32E-004	1.41E+000
M 2	73.09	7.02E+001	215.22	2.56E-003	8.27E-005	1.52E+001
M 3	75.29	1.17E+003	102.42	2.56E-003	8.02E-005	2.53E+002
M 4	85.08	8.05E+002	89.91	2.57E-003	6.88E-005	1.74E+002
m 5	87.31	1.02E+002	74.57	2.57E-003	6.63E-005	2.21E+001
M 6	108.11	3.83E+001	189.53	2.59E-003	6.13E-005	8.22E+000
M 7	128.69	5.24E+001	81.19	2.51E-003	8.65E-005	1.16E+001
M 8	131.76	1.71E+002	591.97	2.48E-003	8.43E-005	3.84E+001
M 9	135.84	1.62E+002	54.75	2.44E-003	8.47E-005	3.68E+001
M 10	140.42	1.66E+002	54.89	2.39E-003	8.65E-005	3.86E+001
M 11	172.84	8.08E+001	41.44	2.02E-003	7.56E-005	2.22E+001
M 12	189.67	1.86E+002	130.84	1.84E-003	6.18E-005	5.63E+001
M 13	262.96	1.35E+001	51.58	1.25E-003	3.99E-005	6.00E+000
M 14	270.61	2.20E+001	35.87	1.21E-003	3.92E-005	1.01E+001
M 15	278.25	7.51E-001	33.20	1.17E-003	3.84E-005	3.57E-001
M 16	296.22	4.79E-002	29.08	1.08E-003	3.62E-005	2.46E-002
M 17	309.22	1.89E+001	27.23	1.02E-003	3.44E-005	1.03E+001
M 18	313.20	1.43E+001	26.77	1.01E-003	3.38E-005	7.87E+000
M 19	342.24	1.66E+000	22.67	9.01E-004	2.92E-005	1.02E+000
M 20	352.60	2.02E+001	31.87	8.68E-004	2.75E-005	1.29E+001
m 21	354.68	9.91E+000	15.65	8.62E-004	2.72E-005	6.39E+000
m 22	357.07	1.01E+001	15.90	8.55E-004	2.68E-005	6.54E+000
M 23	431.07	2.23E+000	14.26	6.79E-004	1.62E-005	1.83E+000
M 24	459.13	8.66E+000	11.47	6.30E-004	1.34E-005	7.64E+000
M 25	502.83	2.78E-002	11.95	5.66E-004	1.03E-005	2.73E-002
M 26	510.20	2.73E+001	8.28	5.56E-004	9.88E-006	2.73E+001
m 27	511.75	4.50E+001	9.40	5.54E-004	9.81E-006	4.51E+001
M 28	515.59	1.62E+001	7.63	5.50E-004	9.63E-006	1.64E+001
M 29	535.37	1.28E+001	0.87	5.26E-004	8.88E-006	1.35E+001
M 30	566.98	6.95E+000	4.32	4.93E-004	8.09E-006	7.84E+000
M 31	573.47	5.40E+000	8.67	4.87E-004	7.97E-006	6.16E+000
M 32	609.81	7.68E+001	9.52	4.54E-004	7.50E-006	9.39E+001
M 33	676.51	6.92E+000	2.12	4.05E-004	6.93E-006	9.49E+000
M 34	688.84	8.45E+000	4.22	3.97E-004	6.83E-006	1.18E+001
M 35	717.62	1.08E+001	3.82	3.80E-004	6.58E-006	1.58E+001
M 36	777.40	8.76E+000	4.11	3.49E-004	6.08E-006	1.39E+001
M 37	832.96	7.56E+000	3.63	3.25E-004	5.70E-006	1.29E+001
M 38	909.50	7.69E-001	6.19	2.96E-004	5.45E-006	1.44E+000
M 39	976.22	1.67E+000	3.58	2.76E-004	5.50E-006	3.36E+000
M 40	1081.12	4.49E+000	2.66	2.49E-004	5.78E-006	1.00E+001
M 41	1281.38	4.67E+000	2.83	2.10E-004	5.72E-006	1.24E+001
M 42	1461.08	2.92E+001	5.92	1.85E-004	5.46E-006	8.77E+001

Sample ID: s5ss3bkg

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S5SS3BKG.CNF

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 43	1535.46	5.36E+000	3.53	1.77E-004	6.10E-006	1.69E+001
M 44	1603.18	1.75E+000	3.89	1.70E-004	7.34E-006	5.73E+000
M 45	1694.40	4.86E+000	2.64	1.61E-004	9.92E-006	1.67E+001

M = First peak in a multiplet region

m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU6 SS-1

Data was acquired: September 28, 1999

Data was analyzed: October 19, 1999 04:03 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPFILS\Swmu6ss1.rpt

library = C:\GENIE2K\Library\ornllib.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = None; thickness = 0.00 cm ; density = 0 g/cc

height = 200 cm ; length = 200 cm ; depth = 15.2 cm

tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc

sample is homogeneous

volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg

density (measured) = 1.020 g/cc

Detector calibration point-source reference distance: 30.0 cm

Geometry correction factor: 20.22

***** Nuclide Results *****

Nuclide	Grams	nCi	%err
Th-230	3.07E-05	6.46E+02	49.29
Th-232	9.33E+00	1.03E+03	48.17
Cs-137	2.29E-09	1.98E+02	49.48
K-40	2.06E+00	1.47E+04	45.78

***** Minimum Detectable Activity for Measured Geometry *****

File: C:\GENIE2K\REFFILES\Swmu6ss1.rpt

Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
Le-7	2.19E-12	7.65E+02
Na-22	1.91E-11	1.19E+02
K-40	1.43E-01	1.02E+03
Co-60	1.02E-10	1.15E+02
Zn-65	3.49E-11	2.87E+02
Kr-85	6.35E-08	2.49E+04
Tc-99	8.96E-01	1.52E+07
Cs-134	9.34E-11	1.20E+02
Cs-137	7.75E-10	6.69E+01
Th-230	5.72E-06	1.20E+02
Th-232	8.02E-01	8.83E+01
U-234	9.91E-03	6.16E+04
U-235	5.23E-02	1.13E+02
Np-237	2.48E-04	1.75E+02
U-238	2.98E+00	1.01E+03
AM-241	4.15E-09	4.28E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

** SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU6SS1.CNF
* Sample ID: SWMU6 SS-1
Additional Description: PDGP WAG3 SWMU6 SS1
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/28/99 4:02:53 PM

* Data acquired by: JDM/HRW
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1807 Live Time: 1800 Dead Time: 0.40%:
*

* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S6SS1BKG.CNF

 **** COUNT - RATE REPORT ****
 **** (Corrected for Detector Efficiency) ****

MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU6 SS-1

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU6SS1.CNF

Peak Analysis Performed on: 10/19/99 1:38:53 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	71.84	1.57E+002	95.55	2.56E-003	8.40E-005	3.41E+001
M 2	84.72	-3.00E+002	113.37	2.57E-003	6.92E-005	-6.48E+001
m 3	87.15	-4.98E+001	94.13	2.57E-003	6.65E-005	-1.07E+001
M 4	105.41	4.64E+001	75.44	2.59E-003	5.94E-005	9.97E+000
M 5	238.62	5.37E+002	28.50	1.41E-003	4.25E-005	2.11E+002
M 6	295.34	1.78E+002	18.46	1.08E-003	3.63E-005	9.11E+001
M 7	338.27	5.97E+001	19.95	9.14E-004	2.98E-005	3.63E+001
M 8	351.93	2.76E+002	19.77	8.70E-004	2.76E-005	1.76E+002
M 9	463.15	3.84E+001	10.77	6.23E-004	1.30E-005	3.43E+001
M 10	510.86	1.35E+002	14.20	5.56E-004	9.85E-006	1.35E+002
M 11	583.26	2.24E+002	17.02	4.78E-004	7.82E-006	2.60E+002
M 12	609.26	2.58E+002	19.84	4.55E-004	7.50E-006	3.15E+002
M 13	661.70	1.31E+002	13.08	4.15E-004	7.05E-006	1.76E+002
M 14	727.28	6.08E+001	10.06	3.75E-004	6.50E-006	9.02E+001
M 15	755.33	2.05E+001	7.10	3.60E-004	6.26E-006	3.16E+001
M 16	795.11	2.71E+001	7.54	3.41E-004	5.94E-006	4.42E+001
M 17	806.61	2.52E+001	6.89	3.36E-004	5.86E-006	4.17E+001
M 18	911.13	1.74E+002	14.10	2.96E-004	5.45E-006	3.27E+002
M 19	968.84	7.72E+001	10.57	2.78E-004	5.48E-006	1.54E+002
M 20	1093.86	6.11E-001	10.15	2.46E-004	5.81E-006	1.38E+000
M 21	1460.72	6.30E+002	25.99	1.85E-004	5.46E-006	1.89E+003
M 22	1678.44	1.19E+001	4.22	1.63E-004	9.40E-006	4.06E+001
M 23	1764.29	5.37E+001	8.53	1.56E-004	1.25E-005	1.92E+002

M = First peak in a multiplet region

m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

** SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S6SS1BKG.CNF
* Sample ID: S6S123BG
Additional Description: PGDP WAG3 SWMU6 BKG
* :
* :
* Gross Wt:
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/28/99 3:29:00 PM

* Data acquired by: MANAGER
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1814 Live Time: 1800 Dead Time: 0.79%
*
* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

```
*****
****          C O U N T   -   R A T E   R E P O R T          ****
****          (Corrected for Detector Efficiency)          ****
*****
```

MEASUREMENT SERIES: 4 sq meters

Sample ID: S6S123BG

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S6SS1BKG.CNF

Peak Analysis Performed on: 10/13/99 10:35:29 AM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	74.94	3.12E+002	170.65	2.56E-003	8.06E-005	6.76E+001
M 2	84.68	5.05E+002	99.36	2.57E-003	6.92E-005	1.09E+002
m 3	86.98	1.76E+002	78.93	2.57E-003	6.67E-005	3.79E+001
M 4	110.50	1.46E+001	147.05	2.59E-003	6.37E-005	3.12E+000
M 5	126.90	1.96E+001	99.60	2.52E-003	8.95E-005	4.31E+000
M 6	204.91	1.38E+001	47.20	1.69E-003	5.21E-005	4.53E+000
M 7	212.32	6.42E+001	26.43	1.62E-003	4.88E-005	2.20E+001
M 8	319.25	5.84E+000	22.35	9.83E-004	3.29E-005	3.30E+000
M 9	332.70	1.69E+001	9.68	9.34E-004	3.07E-005	1.01E+001
M 10	337.51	4.72E+001	12.82	9.17E-004	3.00E-005	2.86E+001
m 11	339.23	3.95E+001	12.57	9.11E-004	2.97E-005	2.41E+001
M 12	393.27	5.57E-001	13.80	7.59E-004	2.12E-005	4.08E-001
13	406.97	3.32E+000	8.78	7.28E-004	1.92E-005	2.53E+000
m 14	408.21	3.70E+000	9.78	7.25E-004	1.91E-005	2.84E+000
M 15	446.74	1.15E+000	9.88	6.51E-004	1.45E-005	9.79E-001
M 16	455.34	1.06E+001	5.20	6.36E-004	1.37E-005	9.29E+000
M 17	502.33	7.25E+000	0.66	5.67E-004	1.03E-005	7.11E+000
M 18	568.99	9.15E+000	1.96	4.91E-004	8.05E-006	1.04E+001
M 19	581.53	3.25E+000	9.39	4.79E-004	7.84E-006	3.77E+000
M 20	609.29	4.15E+001	7.79	4.55E-004	7.50E-006	5.06E+001
M 21	617.52	7.59E+000	3.28	4.48E-004	7.42E-006	9.41E+000
M 22	637.79	4.18E+000	7.86	4.32E-004	7.24E-006	5.37E+000
M 23	729.03	5.23E+000	3.97	3.74E-004	6.49E-006	7.78E+000
M 24	734.83	4.50E+000	1.50	3.71E-004	6.44E-006	6.74E+000
M 25	752.97	7.44E+000	1.56	3.61E-004	6.28E-006	1.14E+001
M 26	857.26	6.93E+000	2.80	3.15E-004	5.58E-006	1.22E+001
M 27	869.43	5.92E+000	3.15	3.10E-004	5.54E-006	1.06E+001
M 28	1120.57	1.30E+001	4.59	2.40E-004	5.86E-006	3.01E+001
M 29	1222.58	4.48E+000	2.70	2.20E-004	5.87E-006	1.13E+001
M 30	1461.05	3.29E+001	6.26	1.85E-004	5.46E-006	9.88E+001
M 31	1700.15	6.98E+000	0.36	1.61E-004	1.01E-005	2.41E+001

M = First peak in a multiplet region
m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU6 SS-2

Data was acquired: September 28, 1999

Data was analyzed: October 19, 1999 04:13 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPPFILES\Swmu6ss2.rpt

library = C:\GENIE2K\Library\ornllib.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = None; thickness = 0.00 cm ; density = 0 g/cc
height = 200 cm ; length = 200 cm ; depth = 15.2 cm
tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc
sample is homogeneous
volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg
density (measured) = 1.020 g/cc

Detector calibration point-source reference distance: 30.0 cm

Geometry correction factor: 20.22

***** Nuclide Results *****

nuclide	Grams	nCi	%err
Th-230	2.98E-05	6.25E+02	46.61
Th-232	9.19E+00	1.01E+03	45.87
Cs-137	1.84E-09	1.59E+02	47.26
K-40	2.15E+00	1.54E+04	44.05

***** Minimum Detectable Activity for Measured Geometry *****
File: C:\GENIE2K\REPPFILES\Swmu6ss2.rpt
Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
Li-7	2.22E-12	7.76E+02
Na-22	1.93E-11	1.20E+02
K-40	1.39E-01	9.92E+02
Co-60	9.42E-11	1.07E+02
Zn-65	3.49E-11	2.87E+02
Kr-85	6.50E-08	2.55E+04
Tc-99	8.96E-01	1.52E+07
Cs-134	9.20E-11	1.19E+02
Cs-137	7.26E-10	6.27E+01
Th-230	5.81E-06	1.22E+02
Th-232	8.78E-01	9.67E+01
U-234	9.42E-03	5.85E+04
U-235	5.23E-02	1.13E+02
Np-237	2.65E-04	1.87E+02
U-238	2.97E+00	1.00E+03
AM-241	3.93E-09	4.05E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

** SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU6SS2.CNF
* Sample ID: SWMU6 SS-2
Additional Description: PGDP WAG3 SWMU6 SS-2
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/28/99 4:51:41 PM

* Data acquired by: JDM/HRW
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1807 Live Time: 1800 Dead Time: 0.40%:
*
* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S6SS1BKG.CNF

 **** C O U N T - R A T E R E P O R T ****
 **** (Corrected for Detector Efficiency) ****

MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU6 SS-2
 Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU6SS2.CNF
 Peak Analysis Performed on: 10/19/99 1:44:33 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	77.21	2.30E+002	48.33	2.56E-003	7.80E-005	4.99E+001
M 2	84.68	-2.78E+002	111.92	2.57E-003	6.92E-005	-6.01E+001
m 3	87.15	1.93E+001	93.26	2.57E-003	6.65E-005	4.16E+000
m 4	92.60	2.29E+002	48.92	2.58E-003	6.14E-005	4.94E+001
M 5	238.61	4.58E+002	28.06	1.41E-003	4.25E-005	1.80E+002
M 6	295.16	1.81E+002	18.83	1.08E-003	3.63E-005	9.27E+001
M 7	338.27	9.14E+001	20.67	9.15E-004	2.98E-005	5.55E+001
M 8	342.07	3.18E+000	16.31	9.02E-004	2.92E-005	1.96E+000
M 9	351.90	2.90E+002	20.02	8.71E-004	2.76E-005	1.85E+002
M 10	463.21	1.55E+001	15.99	6.23E-004	1.30E-005	1.38E+001
M 11	511.08	1.43E+002	14.65	5.55E-004	9.84E-006	1.43E+002
M 12	583.17	2.09E+002	16.22	4.78E-004	7.82E-006	2.43E+002
M 13	609.33	2.50E+002	20.25	4.55E-004	7.50E-006	3.05E+002
M 14	661.54	1.05E+002	12.47	4.15E-004	7.05E-006	1.41E+002
M 15	911.14	1.71E+002	14.29	2.96E-004	5.45E-006	3.22E+002
M 16	964.60	4.61E+001	8.43	2.79E-004	5.48E-006	9.18E+001
m 17	968.76	7.89E+001	10.73	2.78E-004	5.48E-006	1.58E+002
M 18	1120.30	6.41E+001	11.47	2.40E-004	5.86E-006	1.49E+002
M 19	1377.38	1.97E+001	5.38	1.96E-004	5.43E-006	5.58E+001
M 20	1460.68	6.57E+002	26.55	1.85E-004	5.46E-006	1.97E+003
M 21	1587.74	2.16E+001	5.42	1.71E-004	7.00E-006	6.99E+001
m 22	1592.55	3.99E+001	7.09	1.71E-004	7.10E-006	1.30E+002
M 23	1764.51	7.54E+001	9.69	1.56E-004	1.25E-005	2.69E+002

M = First peak in a multiplet region
 m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division

*** SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S6SS1BKG.CNF
* Sample ID: S6S123BG
Additional Description: PGDP WAG3 SWMU6 BKG
* :
* :
* Gross Wt:
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/28/99 3:29:00 PM

* Data acquired by: MANAGER
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1814 Live Time: 1800 Dead Time: 0.79%
*
* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

 *** C O U N T - R A T E R E P O R T *****
 *** (Corrected for Detector Efficiency) *****

MEASUREMENT SERIES: 4 sq meters

Sample ID: S6S123BG

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S6SS1BKG.CNF

Peak Analysis Performed on: 10/13/99 10:35:29 AM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	74.94	3.12E+002	170.65	2.56E-003	8.06E-005	6.76E+001
M 2	84.68	5.05E+002	99.36	2.57E-003	6.92E-005	1.09E+002
m 3	86.98	1.76E+002	78.93	2.57E-003	6.67E-005	3.79E+001
M 4	110.50	1.46E+001	147.05	2.59E-003	6.37E-005	3.12E+000
M 5	126.90	1.96E+001	99.60	2.52E-003	8.95E-005	4.31E+000
M 6	204.91	1.38E+001	47.20	1.69E-003	5.21E-005	4.53E+000
M 7	212.32	6.42E+001	26.43	1.62E-003	4.88E-005	2.20E+001
M 8	319.25	5.84E+000	22.35	9.83E-004	3.29E-005	3.30E+000
M 9	332.70	1.69E+001	9.68	9.34E-004	3.07E-005	1.01E+001
M 10	337.51	4.72E+001	12.82	9.17E-004	3.00E-005	2.86E+001
m 11	339.23	3.95E+001	12.57	9.11E-004	2.97E-005	2.41E+001
M 12	393.27	5.57E-001	13.80	7.59E-004	2.12E-005	4.08E-001
I 13	406.97	3.32E+000	8.78	7.28E-004	1.92E-005	2.53E+000
m 14	408.21	3.70E+000	9.78	7.25E-004	1.91E-005	2.84E+000
M 15	446.74	1.15E+000	9.88	6.51E-004	1.45E-005	9.79E-001
M 16	455.34	1.06E+001	5.20	6.36E-004	1.37E-005	9.29E+000
M 17	502.33	7.25E+000	0.66	5.67E-004	1.03E-005	7.11E+000
M 18	568.99	9.15E+000	1.96	4.91E-004	8.05E-006	1.04E+001
M 19	581.53	3.25E+000	9.39	4.79E-004	7.84E-006	3.77E+000
M 20	609.29	4.15E+001	7.79	4.55E-004	7.50E-006	5.06E+001
M 21	617.52	7.59E+000	3.28	4.48E-004	7.42E-006	9.41E+000
M 22	637.79	4.18E+000	7.86	4.32E-004	7.24E-006	5.37E+000
M 23	729.03	5.23E+000	3.97	3.74E-004	6.49E-006	7.78E+000
M 24	734.83	4.50E+000	1.50	3.71E-004	6.44E-006	6.74E+000
M 25	752.97	7.44E+000	1.56	3.61E-004	6.28E-006	1.14E+001
M 26	857.26	6.93E+000	2.80	3.15E-004	5.58E-006	1.22E+001
M 27	869.43	5.92E+000	3.15	3.10E-004	5.54E-006	1.06E+001
M 28	1120.57	1.30E+001	4.59	2.40E-004	5.86E-006	3.01E+001
M 29	1222.58	4.48E+000	2.70	2.20E-004	5.87E-006	1.13E+001
M 30	1461.05	3.29E+001	6.26	1.85E-004	5.46E-006	9.88E+001
M 31	1700.15	6.98E+000	0.36	1.61E-004	1.01E-005	2.41E+001

M = First peak in a multiplet region
 m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU6 SS-3

Data was acquired: September 28, 1999
Data was analyzed: October 19, 1999 04:15 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPPFILES\Swmu6ss3.rpt
library = C:\GENIE2K\Library\ornllib.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = None; thickness = 0.00 cm ; density = 0 g/cc
height = 200 cm ; length = 200 cm ; depth = 15.2 cm
tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc
sample is homogeneous
volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg
density (measured) = 1.020 g/cc

Detector calibration point-source reference distance: 30.0 cm
Geometry correction factor: 20.22

***** Nuclide Results *****

Nuclide	Grams	nCi	%err
Th-230	2.64E-05	5.56E+02	46.67
Th-232	4.51E+00	4.96E+02	47.09
Cs-137	2.66E-09	2.30E+02	46.61
K-40	1.42E+00	1.01E+04	44.17

**** Minimum Detectable Activity for Measured Geometry ****

File: C:\GENIE2K\REFFILES\Swwu6sa3.rpt

Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
H-7	2.02E-12	7.06E+02
Na-22	1.71E-11	1.07E+02
K-40	1.35E-01	9.64E+02
Co-60	8.75E-11	9.90E+01
Zn-65	3.33E-11	2.74E+02
Kr-85	6.11E-08	2.39E+04
Tc-99	8.52E-01	1.44E+07
Cs-134	8.01E-11	1.03E+02
Cs-137	7.66E-10	6.62E+01
Th-230	4.83E-06	1.01E+02
Th-232	7.41E-01	8.15E+01
U-234	8.93E-03	5.55E+04
U-235	4.89E-02	1.06E+02
Np-237	2.26E-04	1.59E+02
U-238	2.86E+00	9.62E+02
AM-241	3.75E-09	3.87E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

* SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU6SS3.CNF
* Sample ID: SWMU6 SS-3
Additional Description: PGDP WAG3 SWMU6 SS-3
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/28/99 5:35:38 PM

* Data acquired by: JDM/HRW
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1806 Live Time: 1800 Dead Time: 0.35%:
*
* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S6SS1BKG.CNF

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*****
*****          C O U N T   -   R A T E   R E P O R T          *****
*****          (Corrected for Detector Efficiency)          *****
*****

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MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU6 SS-3

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU6SS3.CNF

Peak Analysis Performed on: 10/19/99 1:48:01 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	67.55	9.59E+001	421.14	2.55E-003	8.79E-005	2.09E+001
M 2	84.74	-2.62E+002	109.81	2.57E-003	6.92E-005	-5.66E+001
m 3	87.05	-8.64E+001	89.26	2.57E-003	6.66E-005	-1.87E+001
m 4	92.45	1.98E+002	43.48	2.58E-003	6.15E-005	4.27E+001
M 5	238.60	3.41E+002	24.25	1.41E-003	4.25E-005	1.34E+002
M 6	242.00	5.44E+001	15.50	1.39E-003	4.20E-005	2.18E+001
M 7	295.16	1.80E+002	17.70	1.08E-003	3.63E-005	9.22E+001
M 8	338.46	4.02E+001	18.95	9.14E-004	2.98E-005	2.44E+001
M 9	351.89	2.61E+002	18.48	8.71E-004	2.76E-005	1.67E+002
M 10	422.86	7.02E+000	17.23	6.95E-004	1.72E-005	5.61E+000
M 11	510.65	1.06E+002	13.88	5.56E-004	9.86E-006	1.06E+002
M 12	583.15	1.46E+002	13.95	4.78E-004	7.82E-006	1.70E+002
M 13	609.34	2.22E+002	18.79	4.55E-004	7.50E-006	2.71E+002
M 14	618.20	1.48E+001	8.12	4.47E-004	7.42E-006	1.84E+001
M 15	661.58	1.52E+002	13.59	4.15E-004	7.05E-006	2.04E+002
M 16	794.64	1.97E+001	7.31	3.41E-004	5.95E-006	3.21E+001
M 17	911.22	8.43E+001	11.41	2.96E-004	5.45E-006	1.58E+002
M 18	968.90	3.58E+001	7.65	2.78E-004	5.48E-006	7.15E+001
M 19	1460.71	4.32E+002	22.26	1.85E-004	5.46E-006	1.30E+003
M 20	1764.48	3.99E+001	7.28	1.56E-004	1.25E-005	1.42E+002

M = First peak in a multiplet region

m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* ~~K25~~ Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

* SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S6SS1BKG.CNF
* Sample ID: S6S123BG
Additional Description: PGDP WAG3 SWMU6 BKG
* :
* :
* Gross Wt:
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/28/99 3:29:00 PM

* Data acquired by: MANAGER
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1814 Live Time: 1800 Dead Time: 0.79%
*
* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

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*****
***          C O U N T   -   R A T E   R E P O R T          *****
***          (Corrected for Detector Efficiency)          *****
*****

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MEASUREMENT SERIES: 4 sq meters

Sample ID: S6S123BG

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S6SS1BKG.CNF

Peak Analysis Performed on: 10/13/99 10:35:29 AM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	74.94	3.12E+002	170.65	2.56E-003	8.06E-005	6.76E+001
M 2	84.68	5.05E+002	99.36	2.57E-003	6.92E-005	1.09E+002
m 3	86.98	1.76E+002	78.93	2.57E-003	6.67E-005	3.79E+001
M 4	110.50	1.46E+001	147.05	2.59E-003	6.37E-005	3.12E+000
M 5	126.90	1.96E+001	99.60	2.52E-003	8.95E-005	4.31E+000
M 6	204.91	1.38E+001	47.20	1.69E-003	5.21E-005	4.53E+000
M 7	212.32	6.42E+001	26.43	1.62E-003	4.88E-005	2.20E+001
M 8	319.25	5.84E+000	22.35	9.83E-004	3.29E-005	3.30E+000
M 9	332.70	1.69E+001	9.68	9.34E-004	3.07E-005	1.01E+001
M 10	337.51	4.72E+001	12.82	9.17E-004	3.00E-005	2.86E+001
m 11	339.23	3.95E+001	12.57	9.11E-004	2.97E-005	2.41E+001
M 12	393.27	5.57E-001	13.80	7.59E-004	2.12E-005	4.08E-001
M 13	406.97	3.32E+000	8.78	7.28E-004	1.92E-005	2.53E+000
M 14	408.21	3.70E+000	9.78	7.25E-004	1.91E-005	2.84E+000
M 15	446.74	1.15E+000	9.88	6.51E-004	1.45E-005	9.79E-001
M 16	455.34	1.06E+001	5.20	6.36E-004	1.37E-005	9.29E+000
M 17	502.33	7.25E+000	0.66	5.67E-004	1.03E-005	7.11E+000
M 18	568.99	9.15E+000	1.96	4.91E-004	8.05E-006	1.04E+001
M 19	581.53	3.25E+000	9.39	4.79E-004	7.84E-006	3.77E+000
M 20	609.29	4.15E+001	7.79	4.55E-004	7.50E-006	5.06E+001
M 21	617.52	7.59E+000	3.28	4.48E-004	7.42E-006	9.41E+000
M 22	637.79	4.18E+000	7.86	4.32E-004	7.24E-006	5.37E+000
M 23	729.03	5.23E+000	3.97	3.74E-004	6.49E-006	7.78E+000
M 24	734.83	4.50E+000	1.50	3.71E-004	6.44E-006	6.74E+000
M 25	752.97	7.44E+000	1.56	3.61E-004	6.28E-006	1.14E+001
M 26	857.26	6.93E+000	2.80	3.15E-004	5.58E-006	1.22E+001
M 27	869.43	5.92E+000	3.15	3.10E-004	5.54E-006	1.06E+001
M 28	1120.57	1.30E+001	4.59	2.40E-004	5.86E-006	3.01E+001
M 29	1222.58	4.48E+000	2.70	2.20E-004	5.87E-006	1.13E+001
M 30	1461.05	3.29E+001	6.26	1.85E-004	5.46E-006	9.88E+001
M 31	1700.15	6.98E+000	0.36	1.61E-004	1.01E-005	2.41E+001

M = First peak in a multiplet region
m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

Program ISOTOPIC V

Paducah Soil

Sample Identifier: SWMU6 SS-4

Data was acquired: September 28, 1999
Data was analyzed: October 19, 1999 04:59 PM by J. Daniel Marsh

Detector: ID = 4 meter ; height = 100 cm ; offset = 100 cm ; standoff = 100 cm

Files: sample = C:\GENIE2K\REPPFILES\Swmu6ss4.rpt
library = C:\GENIE2K\Library\Ornl.rpt; energy tolerance = 1. keV

Configuration: Soil Volume

Container: material = None; thickness = 0.00 cm ; density = 0 g/cc
height = 200 cm ; length = 200 cm ; depth = 15.2 cm
tare wt = 0.0 kg

Matrix: material = Soil; thickness = 15.2 cm ; density (effective) = 1.02 g/cc
sample is homogeneous
volume = 6.08E+5 cc; gross wt = 6.202E+2 kg; net wt = 6.202E+2 kg
density (measured) = 1.020 g/cc

Total attenuation correction factor for the 185.7-keV gamma ray: 2.123

Detector calibration point-source reference distance: 30.0 cm
Geometry correction factor: 20.22

***** Nuclide Results *****

Nuclide	Grams	nCi	%err
Th-230	2.12E-05	4.45E+02	47.07
Th-232	6.82E+00	7.50E+02	46.01
Cs-137	2.79E-09	2.41E+02	46.56
K-40	1.60E+00	1.15E+04	44.11

**** Minimum Detectable Activity for Measured Geometry ****
 File: C:\GENIE2K\REPFILES\Swmu6ss4.rpt
 Configuration: Soil Volume Density: 1.02 g/cc

Nuclide	Grams	nCi
Li-7	2.18E-12	7.61E+02
Na-22	1.80E-11	1.12E+02
K-40	1.19E-01	8.53E+02
Co-60	8.98E-11	1.01E+02
Zn-65	3.10E-11	2.55E+02
Kr-85	5.86E-08	2.30E+04
Tc-99	8.59E-01	1.46E+07
Cs-134	8.09E-11	1.04E+02
Cs-137	7.54E-10	6.52E+01
Th-230	6.22E-06	1.31E+02
Th-232	7.99E-01	8.79E+01
U-234	8.44E-03	5.24E+04
U-235	4.04E-02	8.72E+01
Np-237	1.42E-04	1.00E+02
U-238	2.95E+00	9.95E+02
AM-241	3.58E-09	3.68E+02

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

** SAMPLE INFORMATION

MEASUREMENT SERIES: Paducah Soil

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU6SS4.CNF
* Sample ID: SWMU6 SS-4
Additional Description: PGDP WAG3 SWMU6 SS-4
* :
* :
* Gross Wt: 620.2
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/28/99 6:17:06 PM

* Data acquired by: JDM/HRW
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1806 Live Time: 1800 Dead Time: 0.35%
*
* Background file: C:\GENIE2K\CAMFILES\SAMPLES\S6SS4BKG.CNF

C O U N T - R A T E R E P O R T
 (Corrected for Detector Efficiency)

MEASUREMENT SERIES: Paducah Soil

Sample ID: SWMU6 SS-4

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\SWMU6SS4.CNF

Peak Analysis Performed on: 10/19/99 1:53:41 PM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	84.57	-3.45E+002	92.73	2.57E-003	6.94E-005	-7.45E+001
m 2	87.12	-2.04E+002	84.41	2.57E-003	6.65E-005	-4.41E+001
m 3	92.41	3.66E+002	48.41	2.58E-003	6.15E-005	7.89E+001
M 4	185.81	1.44E+002	24.79	1.88E-003	6.47E-005	4.27E+001
M 5	238.51	2.97E+002	23.88	1.41E-003	4.25E-005	1.17E+002
M 6	295.14	1.27E+002	17.08	1.08E-003	3.63E-005	6.50E+001
M 7	311.89	5.93E+001	14.27	1.01E-003	3.40E-005	3.26E+001
M 8	338.17	6.32E+001	13.76	9.15E-004	2.99E-005	3.84E+001
M 9	351.91	2.60E+002	23.22	8.71E-004	2.76E-005	1.66E+002
M 10	510.62	7.67E+001	12.69	5.56E-004	9.86E-006	7.66E+001
M 11	583.13	1.57E+002	14.17	4.78E-004	7.82E-006	1.83E+002
M 12	609.22	1.77E+002	18.50	4.55E-004	7.50E-006	2.17E+002
M 13	661.75	1.60E+002	13.86	4.15E-004	7.05E-006	2.14E+002
M 14	911.15	1.27E+002	11.57	2.96E-004	5.45E-006	2.39E+002
M 15	968.77	6.50E+001	10.04	2.78E-004	5.48E-006	1.30E+002
M 16	1120.03	4.93E+001	10.76	2.40E-004	5.86E-006	1.14E+002
M 17	1177.07	1.56E+001	5.88	2.28E-004	5.91E-006	3.80E+001
M 18	1377.49	1.78E+001	5.07	1.96E-004	5.43E-006	5.06E+001
M 19	1460.72	4.90E+002	22.73	1.85E-004	5.46E-006	1.47E+003
M 20	1764.30	6.51E+001	8.05	1.56E-004	1.25E-005	2.32E+002

M = First peak in a multiplet region

m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

* K25 Nondestructive Assay Department
* Lockheed Martin Energy Systems, Inc.
* EM & Enrichment Facilities Technical Support Division
*

** SAMPLE INFORMATION

MEASUREMENT SERIES: 4 sq meters

* Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S6SS4BKG.CNF
* Sample ID: S6SS4BKG
Additional Description: PGDP WAG3 SMWU6 SS4 BKG
* :
* :
* Gross Wt:
*

*** ANALYSIS INFORMATION

*Acquisition Date/Time: 9/28/99 6:50:34 PM

* Data acquired by: MANAGER
* Detector: 4 meter square
* Channels Analyzed: 250 to 8192
* Real Time: 1817 Live Time: 1800 Dead Time: 0.95%
*
* Background file: C:\GENIEPC\CAMFILES\08BG3284.CNF

 ***** COUNT - RATE REPORT *****
 (Corrected for Detector Efficiency) *****

MEASUREMENT SERIES: 4 sq meters

Sample ID: S6SS4BKG

Sample File: C:\GENIE2K\CAMFILES\SAMPLES\S6SS4BKG.CNF

Peak Analysis Performed on: 10/13/99 10:40:44 AM

Peak No.	Energy (keV)	Net Peak Area	Net Area Uncertainty	Peak Efficiency	Efficiency Uncertainty	Count Rate (Eff. Corr.)
M 1	64.96	3.27E+002	178.99	2.55E-003	8.98E-005	7.13E+001
M 2	75.36	1.13E+003	91.11	2.56E-003	8.02E-005	2.44E+002
M 3	85.05	5.27E+002	80.03	2.57E-003	6.88E-005	1.14E+002
m 4	87.73	3.08E+002	71.79	2.57E-003	6.59E-005	6.64E+001
m 5	89.15	1.86E+002	68.56	2.58E-003	6.44E-005	4.01E+001
m 6	91.28	8.92E+001	66.47	2.58E-003	6.25E-005	1.92E+001
M 7	103.86	1.88E+002	751.36	2.59E-003	5.86E-005	4.04E+001
M 8	192.59	7.77E+000	77.29	1.81E-003	5.96E-005	2.39E+000
M 9	221.61	1.21E+001	46.28	1.54E-003	4.57E-005	4.37E+000
M 10	225.42	1.50E+001	37.71	1.51E-003	4.48E-005	5.50E+000
M 11	241.42	6.95E+001	23.14	1.39E-003	4.21E-005	2.78E+001
M 12	267.36	9.74E+000	45.96	1.23E-003	3.95E-005	4.41E+000
M 13	273.38	3.28E+001	16.35	1.19E-003	3.89E-005	1.52E+001
14	289.70	4.68E+001	9.05	1.11E-003	3.70E-005	2.34E+001
M 15	319.27	4.28E+000	16.80	9.83E-004	3.29E-005	2.42E+000
m 16	320.42	4.97E+000	19.53	9.79E-004	3.27E-005	2.82E+000
M 17	346.78	9.84E+000	17.81	8.87E-004	2.84E-005	6.17E+000
m 18	348.38	9.93E+000	17.98	8.82E-004	2.82E-005	6.26E+000
M 19	352.57	3.59E+001	12.19	8.69E-004	2.75E-005	2.29E+001
M 20	393.53	2.03E+001	9.02	7.58E-004	2.11E-005	1.49E+001
M 21	447.58	1.06E+000	12.61	6.49E-004	1.45E-005	9.07E-001
M 22	468.23	3.08E+000	26.45	6.15E-004	1.26E-005	2.78E+000
M 23	485.55	2.03E+001	7.37	5.89E-004	1.13E-005	1.91E+001
M 24	570.74	7.99E+000	5.70	4.89E-004	8.02E-006	9.07E+000
M 25	609.73	4.87E+001	8.06	4.54E-004	7.50E-006	5.96E+001
M 26	849.76	6.49E+000	1.55	3.18E-004	5.61E-006	1.13E+001
M 27	938.62	6.34E+000	3.73	2.87E-004	5.45E-006	1.23E+001
M 28	993.84	5.31E+000	1.52	2.71E-004	5.54E-006	1.09E+001
M 29	1093.96	6.34E+000	1.05	2.46E-004	5.81E-006	1.44E+001
M 30	1120.76	2.50E+000	5.60	2.40E-004	5.86E-006	5.79E+000
M 31	1440.48	5.33E+000	3.07	1.88E-004	5.40E-006	1.58E+001
M 32	1461.27	1.92E+001	4.76	1.85E-004	5.46E-006	5.76E+001

M = First peak in a multiplet region
 m = Other peak in a multiplet region

Errors quoted at 1.000 sigma

APPENDIX C
INFILTROMETER TEST RESULTS



PROJECT: MegaWag Infiltrometer
 LOCATION: SWMU 4, SW corner

TEST DATE: 09/30/1999
 OPERATOR: S. Dolvin

RING DIAMETER (CM)
 Inner: 30.5
 Annular: 61.0

TESTING LIQUID: Water
 SOIL TYPE: silty clay w/ some gravel; grass covered

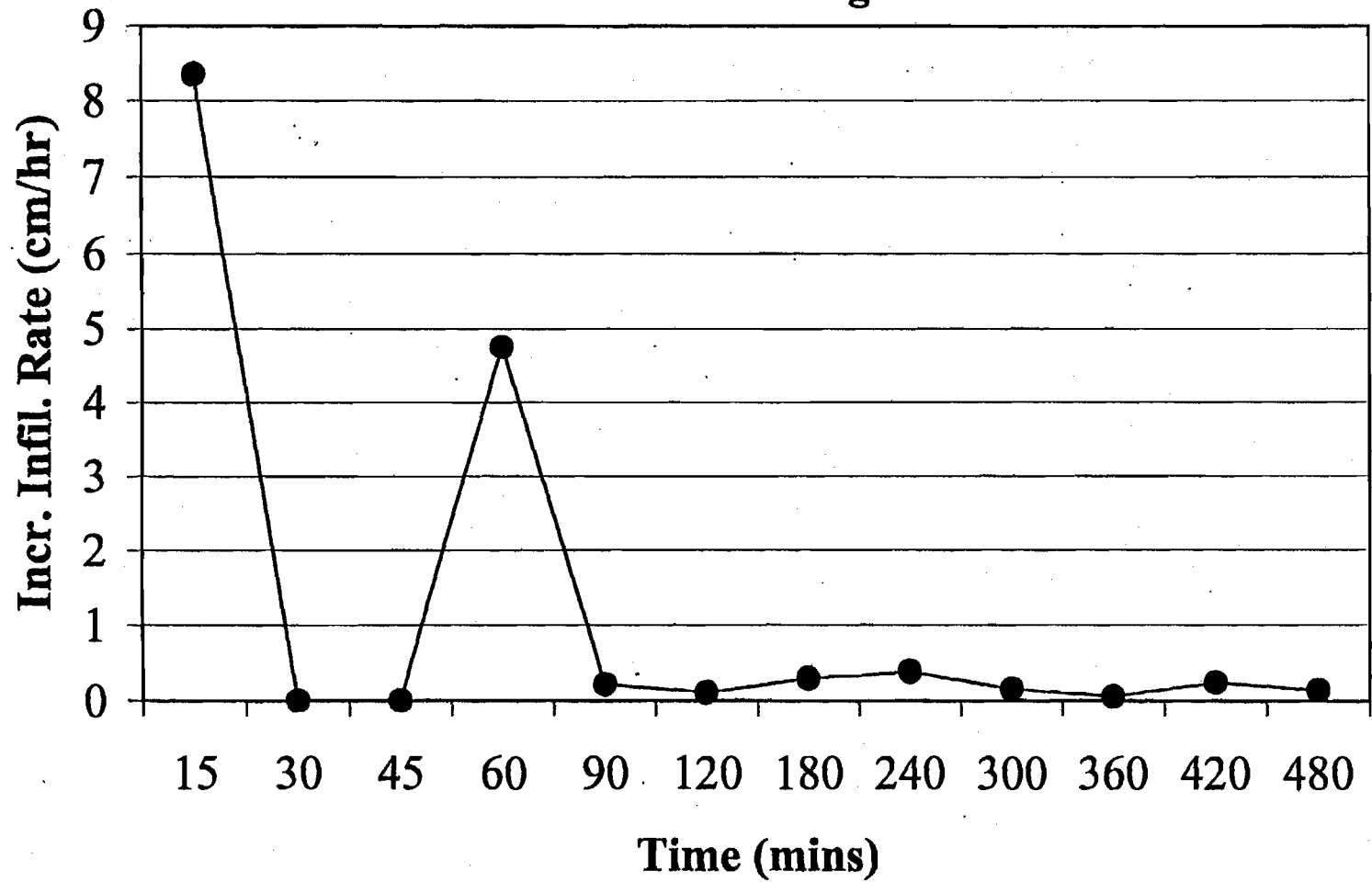
RING AREA (cm²) MAROTTE VOLUME (cm³)
 Inner: 706.85 Inner: 78.5
 Annular: 2827.43 Annular: 227.0

Incremental Infiltration Rate
 $V_{ir} = dV_r / [(Air)(dt)]$ where,
 V_{ir} = ring incr. infil. rate (cm/hr)
 dV_r = vol of liquid used during time interval from marotte tube (cm³)
 Air = area of ring (cm²)
 dt = time interval (hr)

*Note: pH/Water temp meter in-operable

Interval Reading Number	Time Start End	Interval Elapsed (hrs)	Inner Flow Readings			Annular Flow Readings			Water Temp (C) pH	Weather	Comments
			dheight cm	dVir cm ³	Vr cm/hr	dheight cm	dVir cm ³	Vr cm/hr			
1	0800	0.25	64.0	1476.6	8.36	130.0	16274.5	23.02		prtly cloudy, 75F SW@ 5-8mph	At 0804 refilled annular from 0 to 66 cm.
	0815	0.25	45.2			58.3					
2	0815	0.25	45.2	0.0	0.00	58.3	0.0	0.00		A/A	No comment.
	0830	0.5	45.2			58.3					
3	0830	0.25	45.2	0.0	0.00	58.3	476.7	0.67		mstly sunny, 78F SW@ 5-8mph	No comment.
	0845	0.75	45.2			56.2					
4	0845	0.25	45.2	840.4	4.76	56.2	385.9	0.55		A/A	No comment.
	0900	1	34.5			54.5					
5	0900	0.5	34.5	78.5	0.22	54.5	385.9	0.27		mstly sunny, 82F SW@ 8-12mph	No comment.
	0930	1.5	33.5			52.8					
6	0930	0.5	33.5	39.3	0.11	52.8	227.0	0.16		A/A	No comment.
	1000	2	33.0			51.8					
7	1000	1	33.0	212.1	0.30	51.8	2042.8	0.72		full sun, 84F SW@ 8-12mph	No comment.
	1100	3	30.3			42.8					
8	1100	1	30.3	274.9	0.39	42.8	2428.7	0.86		mstly sunny, 86F SW@ 8-12mph	No comment.
	1200	4	26.8			32.1					
9	1200	1	26.8	110.0	0.16	32.1	1566.2	0.55		full sun, 86F SW@ 8-12mph	No comment.
	1300	5	25.4			25.2					
10	1300	1	25.4	39.3	0.06	25.2	658.2	0.23		full sun, 86F SW@ 8-12mph	No comment.
	1400	6	24.9			22.3					
11	1400	1	24.9	172.8	0.24	22.3	839.8	0.30		full sun, 84F SW@ 8-12mph	No comment.
	1500	7	22.7			18.6					
12	1500	1	22.7	102.1	0.14	18.6	749.0	0.26		full sun, 81F SW@ 8-12mph	No comment.
	1600	8	21.4			15.3					

Incremental Infiltration Rate Inner Ring



C-4

PROJECT: MegaWag Infiltrometer
LOCATION: SWMU 4, SW corner

TEST DATE: 09/30/1999
OPERATOR: S. Dolvin

PROJECT: MegaWag Infiltrometer
 LOCATION: SWMU 4, NE corner

TEST DATE: 10/04/1999
 OPERATOR: S. Dolvin

RING DIAMETER (CM)
 Inner: 30.5
 Annular: 61.0

TESTING LIQUID: Water
 SOIL TYPE: silty clay w/ some gravel; grass covered

RING AREA (cm²) MARROTTE VOLUME (cm³)
 Inner: 706.85 Inner: 78.5
 Annular: 2827.43 Annular: 227.0

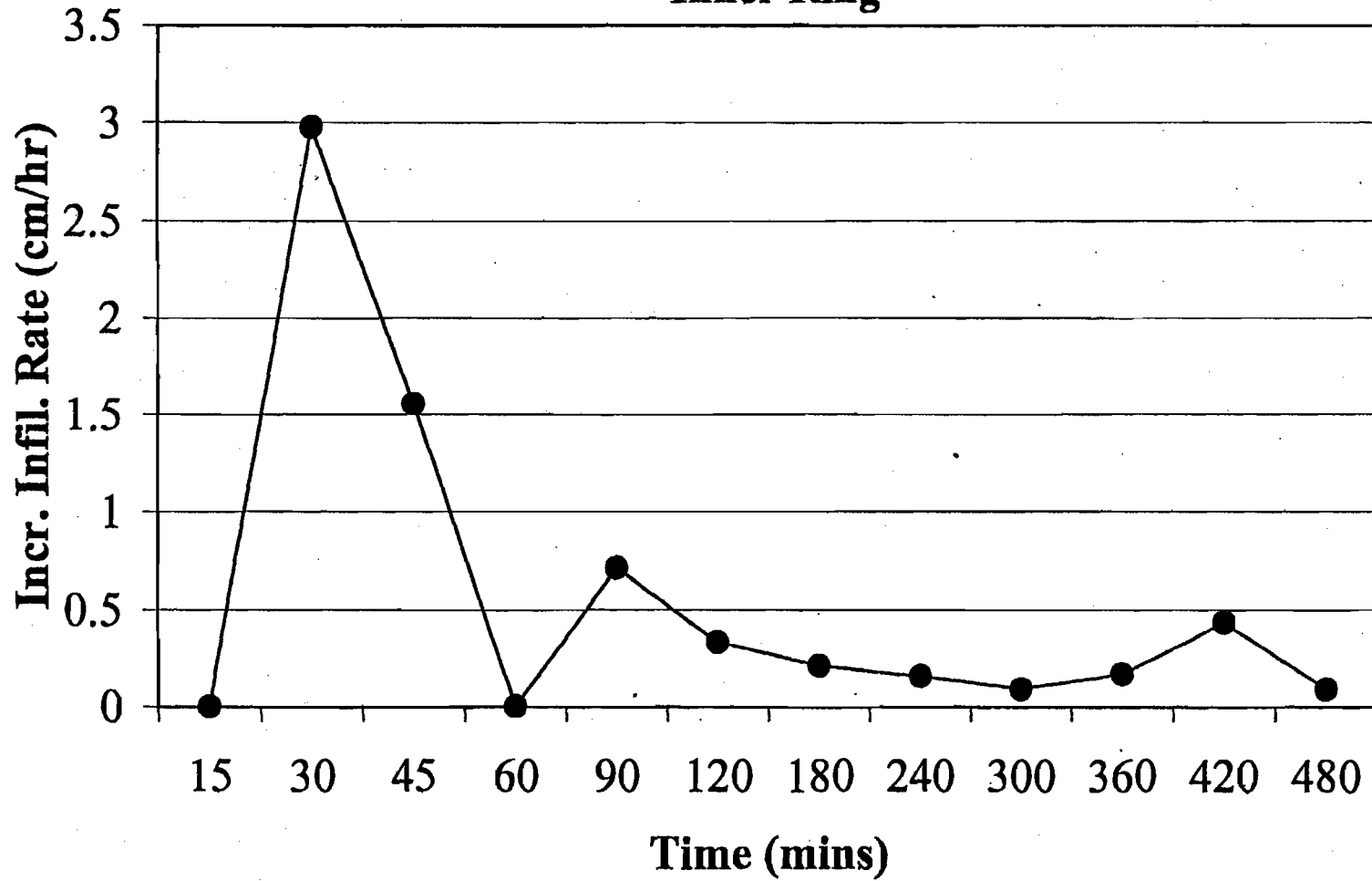
Incremental Infiltration Rate
 $Vir = dVr / [(Air)(dt)]$ where,
 Vir = ring incr. infil. rate (cm/hr)
 dVr = vol of liquid used during time interval from marrotte tube (cm³)
 Air = area of ring (cm²)
 dt = time interval (hr)

*Note: pH/Water temp meter in-operative

Interval Reading Number	Time Start End	Interval Elapsed (hrs)	Inner Flow Readings			Annular Flow Readings			Water Temp (C) pH	Weather	Comments
			dheight cm	dVir cm ³	Vr cm/hr	dheight cm	dVir cm ³	Vr cm/hr			
1	0800	0.25	64.0	0.0	0.00	64.0	0.0	0.00	12.8	100% cloud cover WSW @ 10-15	An initial delay of infiltration, then rapid infiltration
	0815	0.25	64.0			64.0			8.4		
2	0815	0.25	64.0	526.2	2.98	64.0	3926.8	5.56	14.4	A/A	No comment.
	0830	0.5	57.3			46.7			8.4		
3	0830	0.25	57.3	274.9	1.56	46.7	3586.3	5.07	14.5	A/A	No comment.
	0845	0.75	53.8			30.9			8.5		
4	0845	0.25	53.8	0.0	0.00	30.9	1475.4	2.09	14.6	A/A temp = 10.1F	No comment.
	0900	1	53.8			24.4			8.5		
5	0900	0.5	53.8	251.3	0.71	24.4	1384.6	0.98	13.9	A/A	Inner ring is showing minimal infiltration
	0930	1.5	50.6			18.3			8.5		
6	0930	0.5	50.6	117.8	0.33	18.3	749.0	0.53	13.9	A/A temp = 12.1F	No comment.
	1000	2	49.1			15.0			8.5		
7	1000	1	49.1	149.2	0.21	15.0	3404.7	1.20	11.9	A/A temp = 14F	No comment.
	1100	3	47.2			0.0			8.5		
8	1100	1	47.2	110.0	0.16	64.0	3722.5	1.32	14.3	A/A temp = 14.3F	Refilled annular marotte
	1200	4	45.8			47.6			8.5		
9	1200	1	45.8	62.8	0.09	47.6	1974.7	0.70	14.9	A/A temp = 15.9F	No comment.
	1300	5	45.0			38.9			8.4		
10	1300	1	45.0	117.8	0.17	38.9	2065.5	0.73	15.5	A/A temp = 19.4F	No comment.
	1400	6	43.5			29.8			8.4		
11	1400	1	43.5	306.3	0.43	29.8	2133.6	0.75	15.9	A/A temp = 17.4F	No comment.
	1500	7	39.6			20.4			8.5		
12	1500	1	39.6	62.8	0.09	20.4	2360.6	0.83	15.6	A/A temp = 15.9F	Test complete
	1600	8	38.8			10.0			8.5		

C-5

Incremental Infiltration Rate Inner Ring



C-6

PROJECT: MegaWag Infiltrometer
LOCATION: SWMU 4, NE corner

TEST DATE: 10/04/1999
OPERATOR: S. Dolvin

PROJECT: MegaWag Infiltrometer
 LOCATION: SWMU 5

TEST DATE: 09/29/1999
 OPERATOR: S. Dolvin

RING DIAMETER (CM)

Inner: 30.5
 Annular: 61.0

TESTING LIQUID: Water
 SOIL TYPE: silty clay w/ some gravel; grass covered

RING AREA (cm²) MARROTTE VOLUME (cm³)

Inner: 706.85 Inner: 78.5
 Annular: 2827.43 Annular: 227.0

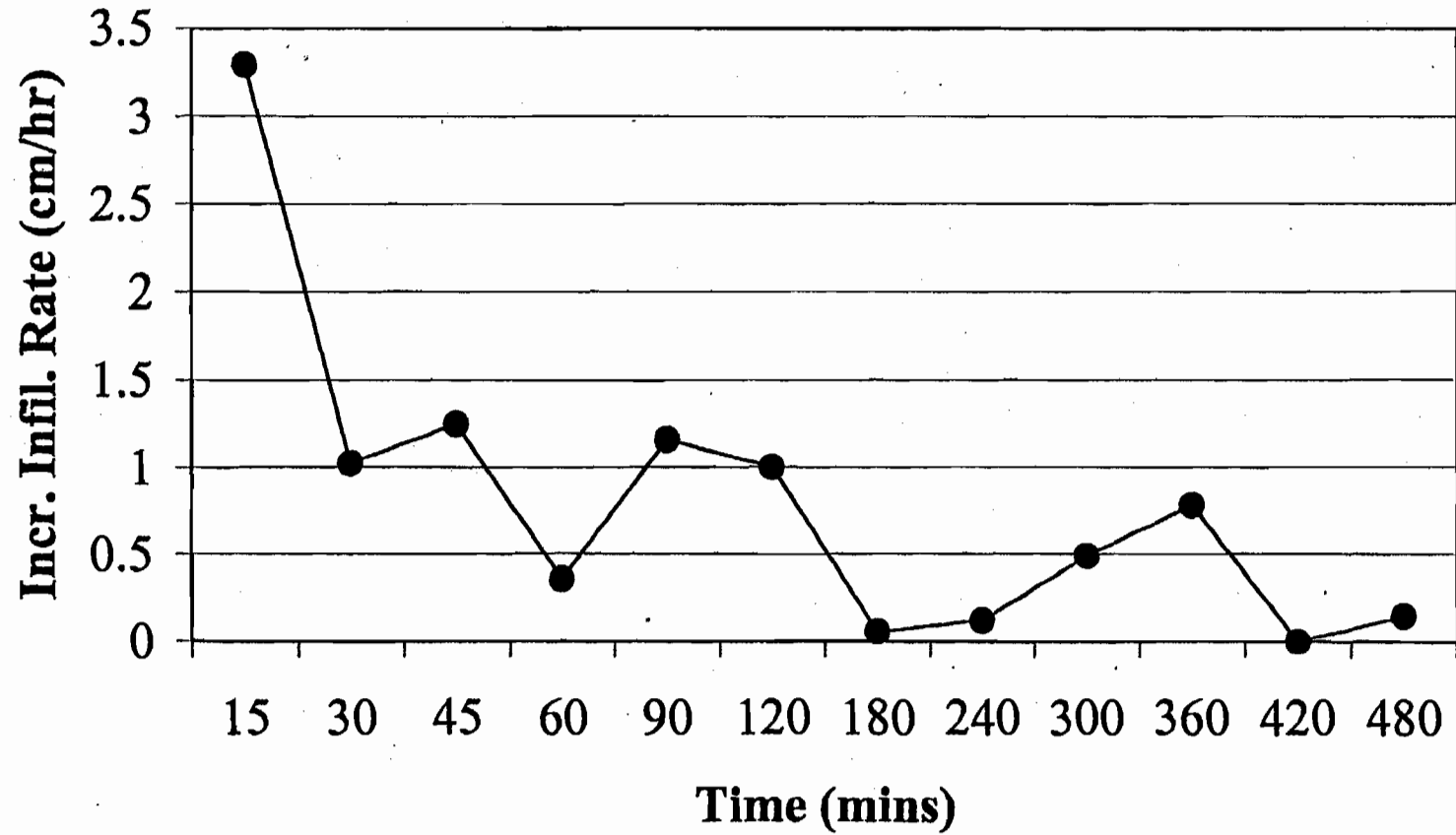
Incremental Infiltration Rate
 $Vir = dVr / [(Air)(dt)]$ where,
 Vir = ring incr. infil. rate (cm/hr)
 dVr = vol of liquid used during time interval from marrotte tube (cm³)
 Air = area of ring (cm²)
 dt = time interval (hr)

*Note: pH/Water temp meter in-operable

Interval Reading Number	Time Start End	Interval Elapsed (hrs)	Inner Flow Readings			Annular Flow Readings			Water Temp (C) pH	Weather	Comments
			dheight cm	dVir cm ³	Vr cm/hr	dheight cm	dVir cm ³	Vr cm/hr			
1	0730	0.25	58.0	581.2	3.29	55.0	4766.6	6.74	rain/showers full clouds,67F	Used tent to keep site covered Also used side shields	
	0745	0.25	50.6			34.0					
2	0745	0.25	50.6	180.6	1.02	34.0	68.1	0.10	A/A	No comment.	
	0800	0.5	48.3			33.7					
3	0800	0.25	48.3	219.9	1.24	33.7	385.9	0.55	A/A	No comment.	
	0815	0.75	45.5			32.0					
4	0815	0.25	45.5	62.8	0.36	32.0	317.8	0.45	A/A	No comment.	
	0830	1	44.7			30.6					
5	0830	0.5	44.7	408.4	1.16	30.6	817.1	0.58	A/A	No comment.	
	0900	1.5	39.5			27.0					
6	0900	0.5	39.5	353.4	1.00	27.0	295.1	0.21	Stopped raining	No comment.	
	0930	2	35.0			25.7					
7	0930	1	35.0	39.3	0.06	25.7	1702.4	0.60	Clearing wind 10-12 mph	No comment.	
	1030	3	34.5			18.2					
8	1030	1	34.5	86.4	0.12	18.2	3472.8	1.23	Partly cloudy	No comment.	
	1130	4	33.4			2.9					
9	1130	1	33.4	345.6	0.49	63.0	340.5	0.12	A/A	Refilled annular marotte to 63cm	
	1230	5	29.0			61.5					
10	1230	1	29.0	549.8	0.78	61.5	567.5	0.20	A/A	No comment.	
	1330	6	22.0			59.0					
11	1330	1	22.0	0.0	0.00	59.0	1520.8	0.54	mostly sunny, NW @ 10-12mph	No comment.	
	1430	7	22.0			52.3					
12	1430	1	22.0	102.1	0.14	52.3	1271.1	0.45	A/A	No comment.	
	1530	8	20.7			46.7					

C-7

Incremental Infiltration Rate Inner Ring



PROJECT: MegaWag Infiltrometer
LOCATION: SWMU 5

TEST DATE: 09/29/1999
OPERATOR: S. Dolvin

PROJECT: MegaWag Infiltrometer
 LOCATION: SWMU 6

TEST DATE: 09/28/1999
 OPERATOR: S. Dolvin

RING DIAMETER (CM)
 Inner: 30.5
 Annular: 61.0

TESTING LIQUID: Water
 SOIL TYPE: silty clay w/ some gravel; grass covered

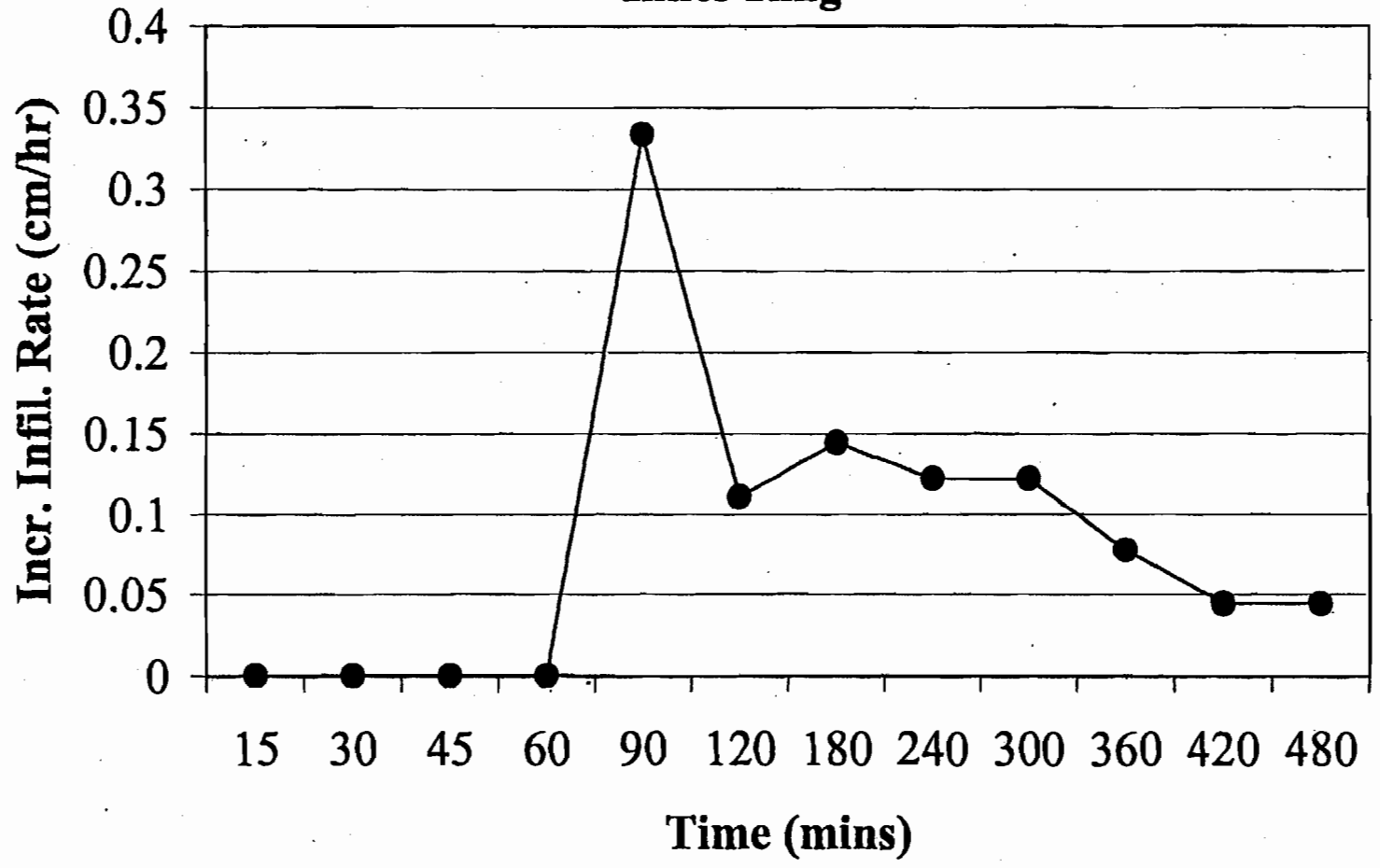
RING AREA (cm²) MARROTTE VOLUME (cm³)
 Inner: 706.85 Inner: 78.5
 Annular: 2827.43 Annular: 227.0

Incremental Infiltration Rate
 $V_{ir} = dV_r / [(Air)(dt)]$ where,
 V_{ir} = ring incr. infil. rate (cm/hr)
 dV_r = vol of liquid used during time interval from marrotte tube (cm³)
 Air = area of ring (cm²)
 dt = time interval (hr)

C-9

Interval Reading Number	Time Start End	Interval Elapsed (hrs)	Inner Flow Readings			Annular Flow Readings			Water Temp (C) pH	Weather	Comments
			dheight cm	dVir cm ³	Vr cm/hr	dheight cm	dVir cm ³	Vr cm/hr			
1	0830	0.25	62.0	0.0	0.00	63.0	0.0	0.00	25	prtlly cloudy, 75F SE @ 0-6mph	Some transfer of water from outer ring to inner.
	0845	0.25	62.0			63.0			8.7		
2	0845	0.25	62.0	0.0	0.00	63.0	158.9	0.22	25	A/A	no change in water levels
	0900	0.5	62.0			62.3			8.9		
3	0900	0.25	62.0	0.0	0.00	62.3	0.0	0.00	25	mstly sunny, 78F SE @ 0-6 mph	no change in water levels
	0915	0.75	62.0			62.3			8.9		
4	0915	0.25	62.0	0.0	0.00	62.3	0.0	0.00	24.7	A/A	slight changes in water levels. Established a constant flow.
	0930	1	62.0			62.3			8.9		
5	0930	0.5	62.0	117.8	0.33	62.3	2905.3	2.06	25.7	mstly sunny, 82F SE <<5mph	No comment.
	1000	1.5	60.5			49.5			8.8		
6	1000	0.5	60.5	39.3	0.11	49.5	567.5	0.40	25.8	A/A	No comment.
	1030	2	60.0			47.0			8.7		
7	1030	1	60.0	102.1	0.14	47.0	1134.9	0.40	26.6	full sun, 86F no wind	No comment.
	1130	3	58.7			42.0			8.6		
8	1130	1	58.7	86.4	0.12	42.0	1339.2	0.47	27.7	mstly sunny, 86F SE <<5mph	No comment.
	1230	4	57.6			36.1			8.5		
9	1230	1	57.6	86.4	0.12	36.1	839.8	0.30	28.5	full sun, 88F SE <<5mph	No comment.
	1330	5	56.5			32.4			8.5		
10	1330	1	56.5	55.0	0.08	32.4	817.1	0.29	29.1	spotty clouds, 86F SE <<5mph	No comment.
	1430	6	55.8			28.8			8.4		
11	1430	1	55.8	31.4	0.04	28.8	1316.5	0.47	29.3	mstly sunny, 84F SE <<5mph	No comment.
	1530	7	55.4			23.0			8.5		
12	1530	1	55.4	31.4	0.04	23.0	726.3	0.26	29.1	full sun, 84F SE <<5mph	No comment.
	1630	8	55.0			19.8			8.5		

Incremental Infiltration Rate Inner Ring



C-10

PROJECT: MegaWag Infiltrometer
LOCATION: SWMU 6

TEST DATE: 09/28/1999
OPERATOR: S. Dolvin

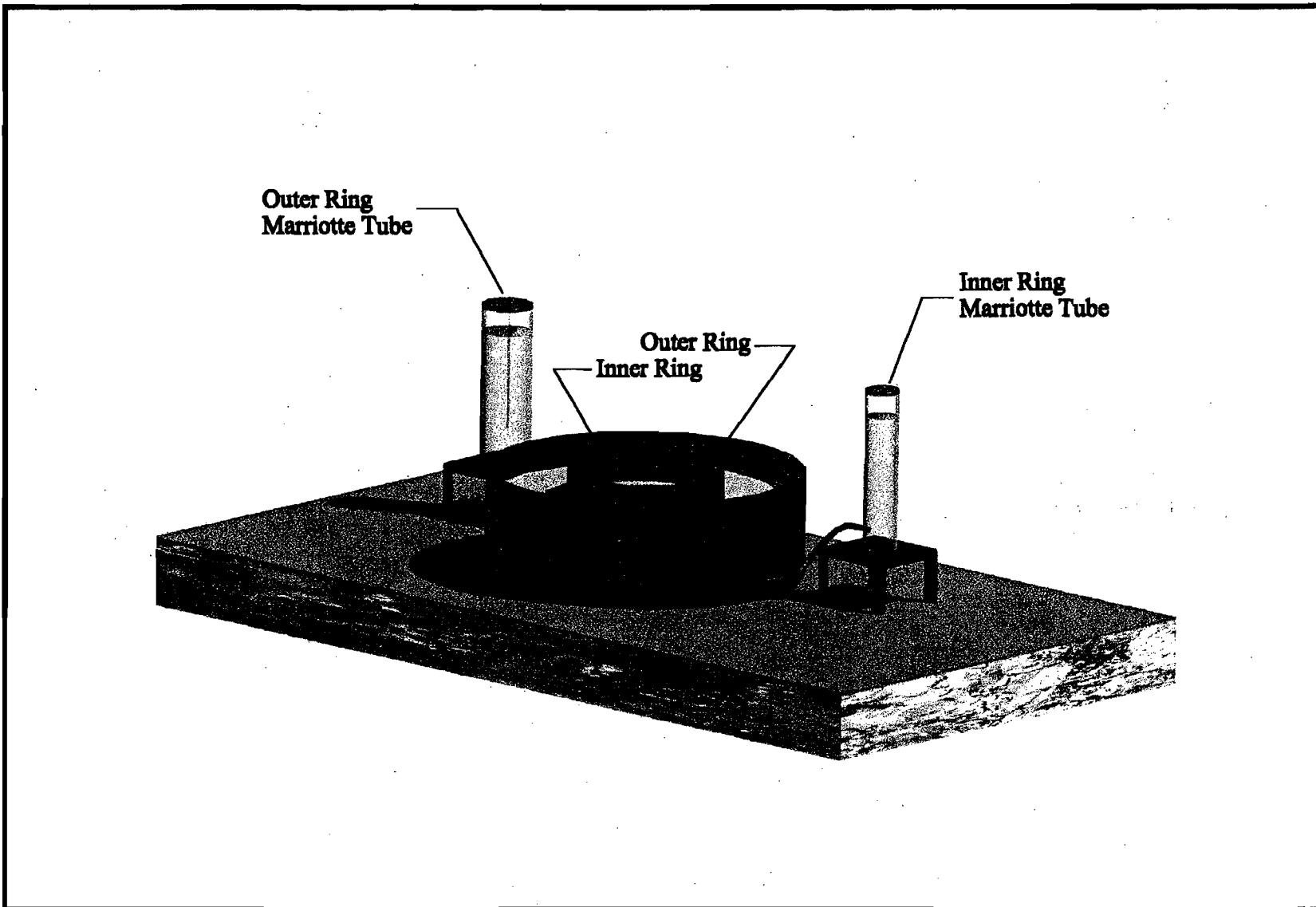


Figure C.1. Infiltrometer Equipment



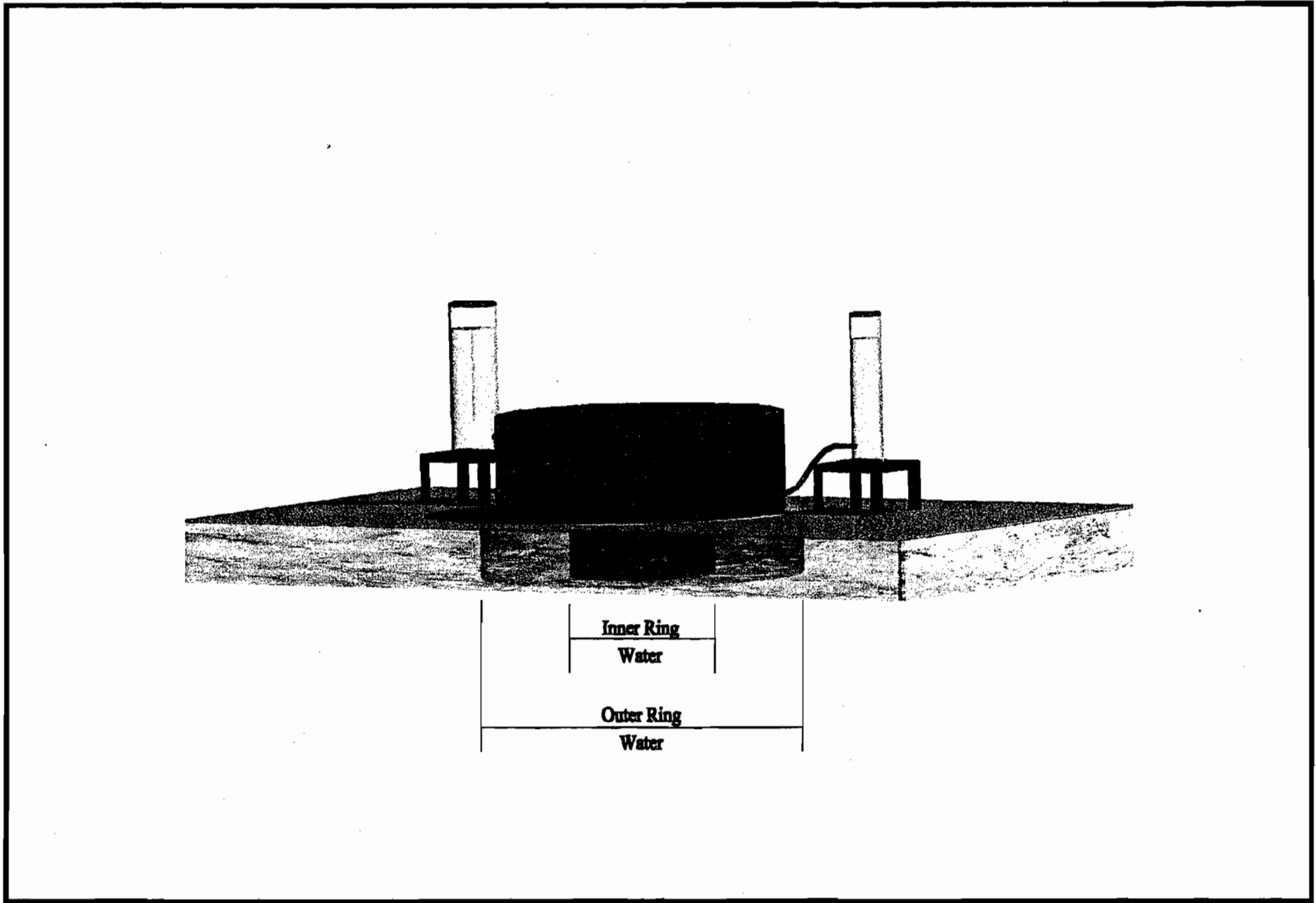


Figure C.2. Infiltrimeter Induced Water Columns



APPENDIX D
CONE PENETRATION TEST LOG



FUGRO GEOSCIENCES, INC.



6105 Rookin
Houston, TX 77074
Phone : 713-778-5580
Fax : 713-778-5501

October 19, 1999
Report Number 0305-0034

TN & Associates, Inc.
101 N. Rutgers Ave., Suite 202
Oakridge, TN 37830

Attention: Mr. Doug Combs

**REPORT FOR
CPT AND RELATED SERVICES
PADUCAH GASEOUS DIFFUSION PLANT
PADUCAH, KENTUCKY
SUBCONTRACT AGREEMENT: 1999006-FG**

Dear Mr. Combs :

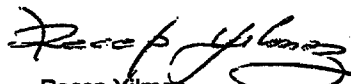
Please find attached the final results of the cone penetration tests conducted at the above referenced location. Also enclosed are diskettes containing the CPT electronic data.

Field investigation was carried out under the supervision of TN & Associate's field personnel. Cone penetration testing (piezocone and piezocone with conductivity sensor) was conducted according to ASTM D5778-95 methods and procedures.

For your information, the soil stratigraphy was identified using Campanella and Robertson's Simplified Soil Behavior Chart. Please note that because of the empirical nature of the soil behavior chart, the soil identification should be verified locally.

Fugro Geosciences, Inc. appreciates the opportunity to be of service to your organization. If you should have any questions, or if we can be of further assistance, please do not hesitate to contact us. We look forward to working with you in the future.

Very truly yours,
FUGRO GEOSCIENCES, INC.

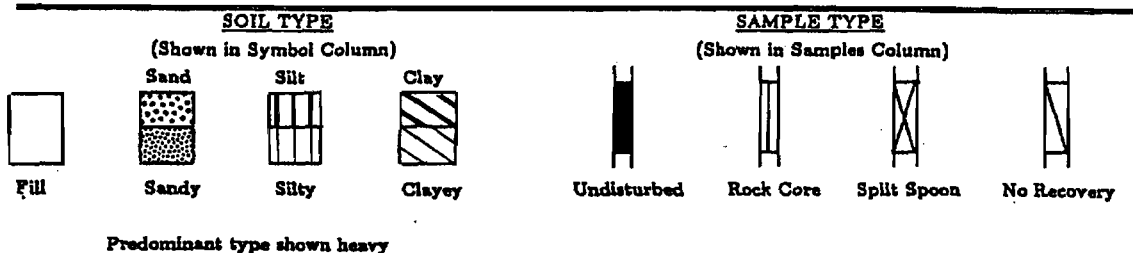

Recep Yilmaz
President

RY/mdt

2 Diskettes Enclosed

A member of the Fugro group of companies with offices throughout the world.

Key to Soil Classification and Symbols



TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE GRAINED SOILS (Major portion Retained on No. 200 Sieve)

Includes (1) clean gravels & sand described as fine, medium or coarse, depending on distribution of grain sizes (2) silty or clayey gravels & sands & (3) fine grained low plasticity soils ($P_L < 10$) such as sandy silts. Condition is rated according to relative density, as determined by lab tests or estimated from resistance to sampler penetration.

Descriptive Term	Penetration Resistance*	Relative Density
Loose	0-10	0 to 40%
Medium Dense	10-30	40 to 70%
Dense	30-50	70 to 90%
Very Dense	Over 50	90 to 100%

*Blows/Ft., 140# hammer, 30" drop

FINE GRAINED SOILS (Major Portion Passing No. 200 Sieve)

Includes (1) inorganic & organic silts & clays, (2) sandy, gravelly or silty clays, & (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings or by unconfined compression tests for soils with $P_L \geq 10$.

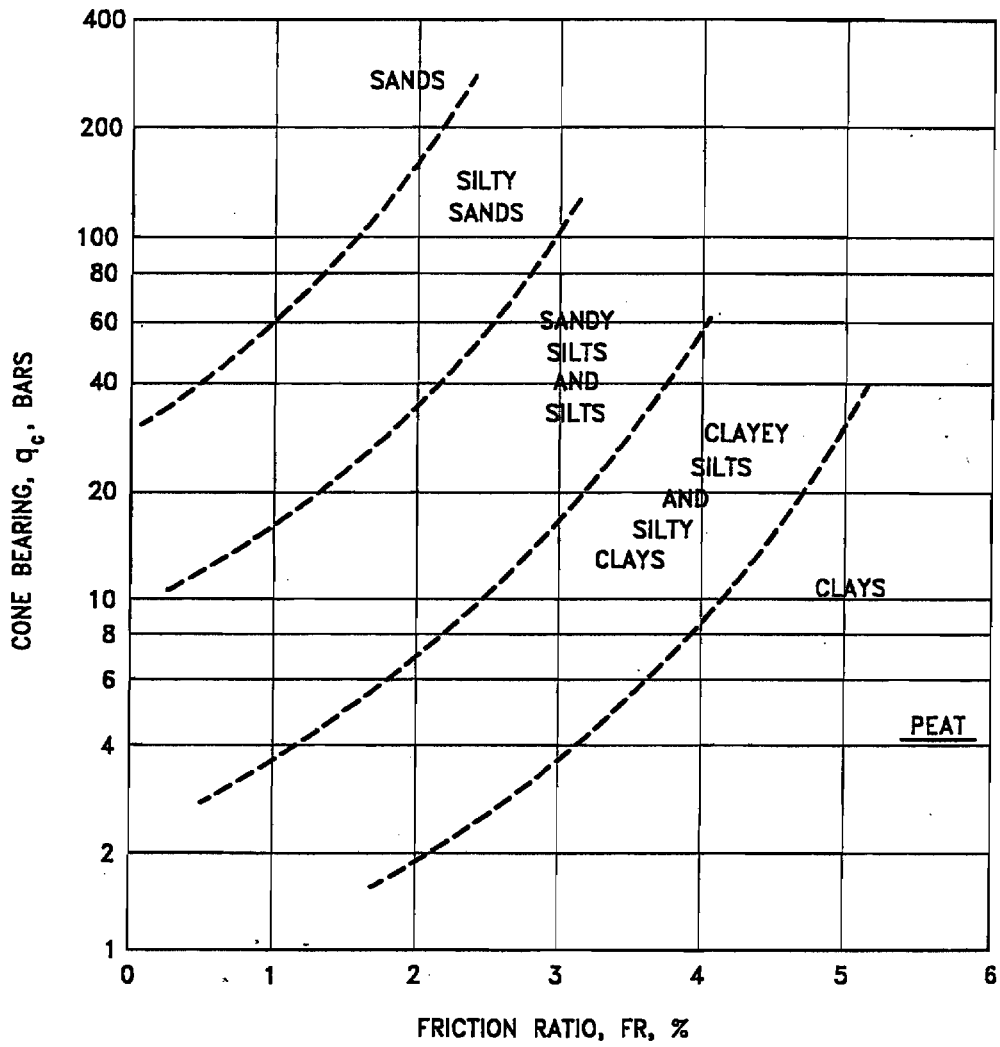
Descriptive Term	Cohesive Shear Strength Tons/Sq. Ft.
Very Soft	Less Than 0.125
Soft	0.125 to 0.25
Firm	0.25 to 0.50
Stiff	0.50 to 1.00
Very Stiff	1.00 to 2.00
Hard	2.00 and Higher

Note: Slickensided and fissured clay may have lower unconfined compressive strengths than shown above because of planes of weakness or shrinkage cracks; consistency ratings of such soils are based on hand penetrometer readings.

TERMS CHARACTERIZING SOIL STRUCTURE

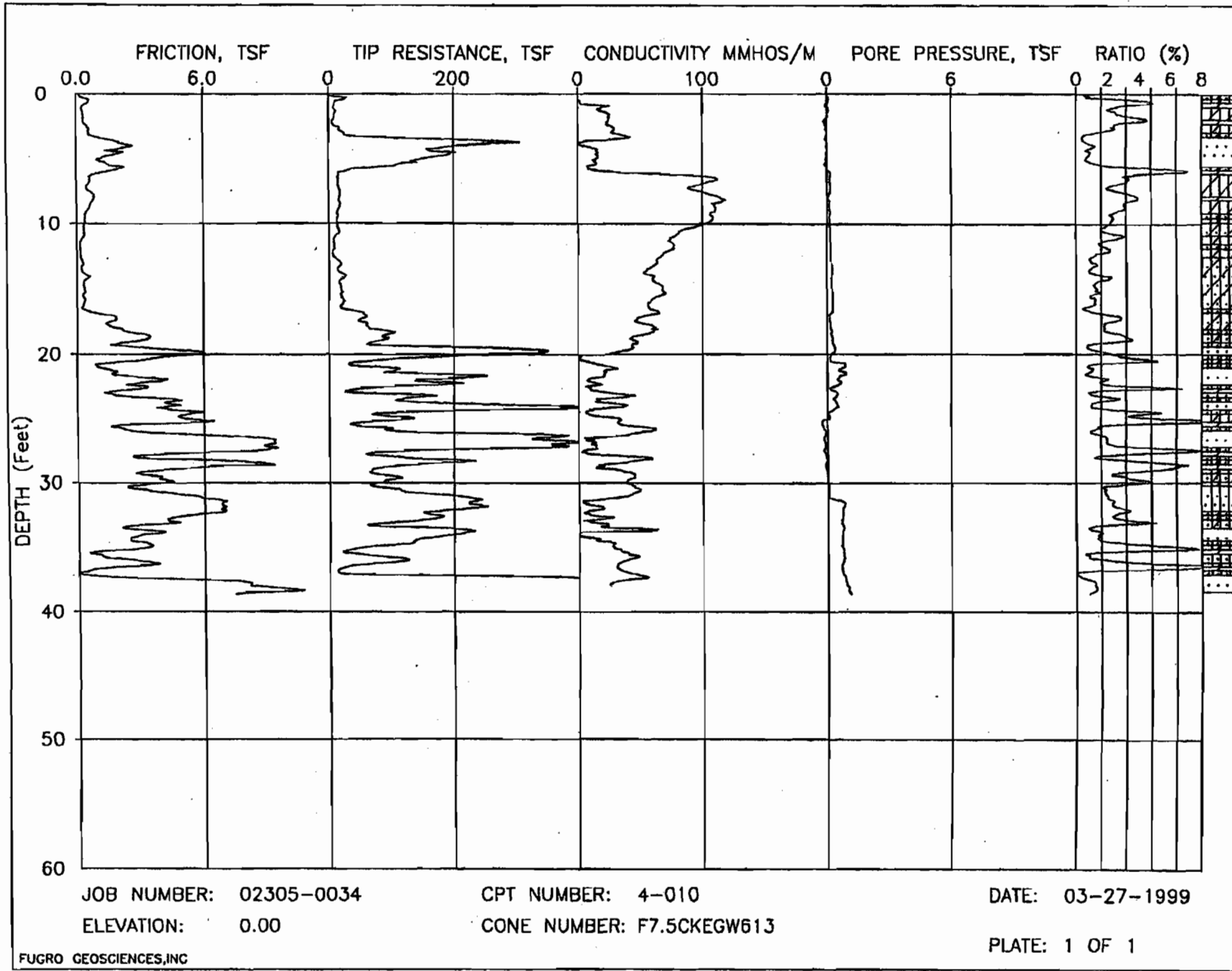
Parting:	paper thin in size	Slickensided:	having inclined planes of weakness that are slick and glossy in appearance.
Seam:	1/8"-3" thick		
Layer:	greater than 3"		
Fissured:	containing shrinkage cracks, frequently filled with fine sand or silt, usually more or less vertical	<u>Degree of Slickensided Development</u>	
Sensitive:	pertaining to cohesive soils that are subject to appreciable loss of strength when remolded	Slightly Slickensided:	slickensides present at intervals of 1'-2', soil does not easily break along these planes
Interbedded:	composed of alternate layers of different soil types	Moderately Slickensided:	slickensides spaced at intervals of 1'-2', soil breaks easily along these planes
Laminated:	composed of thin layers of varying color and texture	Extremely Slickensided:	continuous and interconnected slickensides spaced at intervals of 4"-12", soil breaks along the slickensides into pieces 3"-6" in size
Calcareous:	containing appreciable quantities of calcium carbonate	Intensely Slickensided:	slickensides spaced at intervals of less than 4", continuous in all directions; soil breaks down along planes into nodules 1/4"-2" in size
Well Graded:	having wide range in grain sizes and substantial amounts of all intermediate particle sizes		
Poorly Graded:	predominately of one grain size, or having a range of sizes with some intermediate size missing		
Flocculated:	pertaining to cohesive soils that exhibit a loose knit or flakey structure		

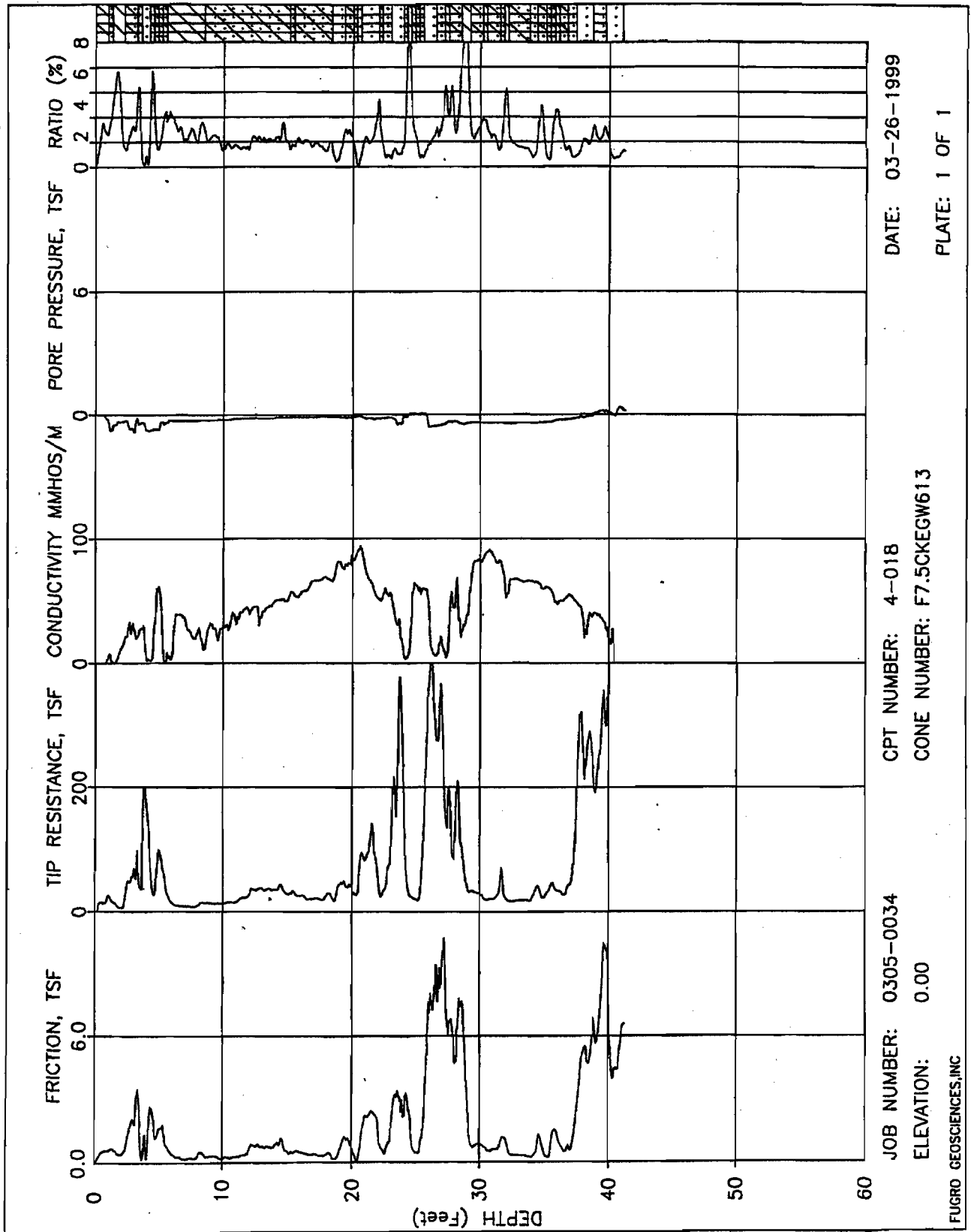
1 BAR=100 kPA=1.02 KG/CM²



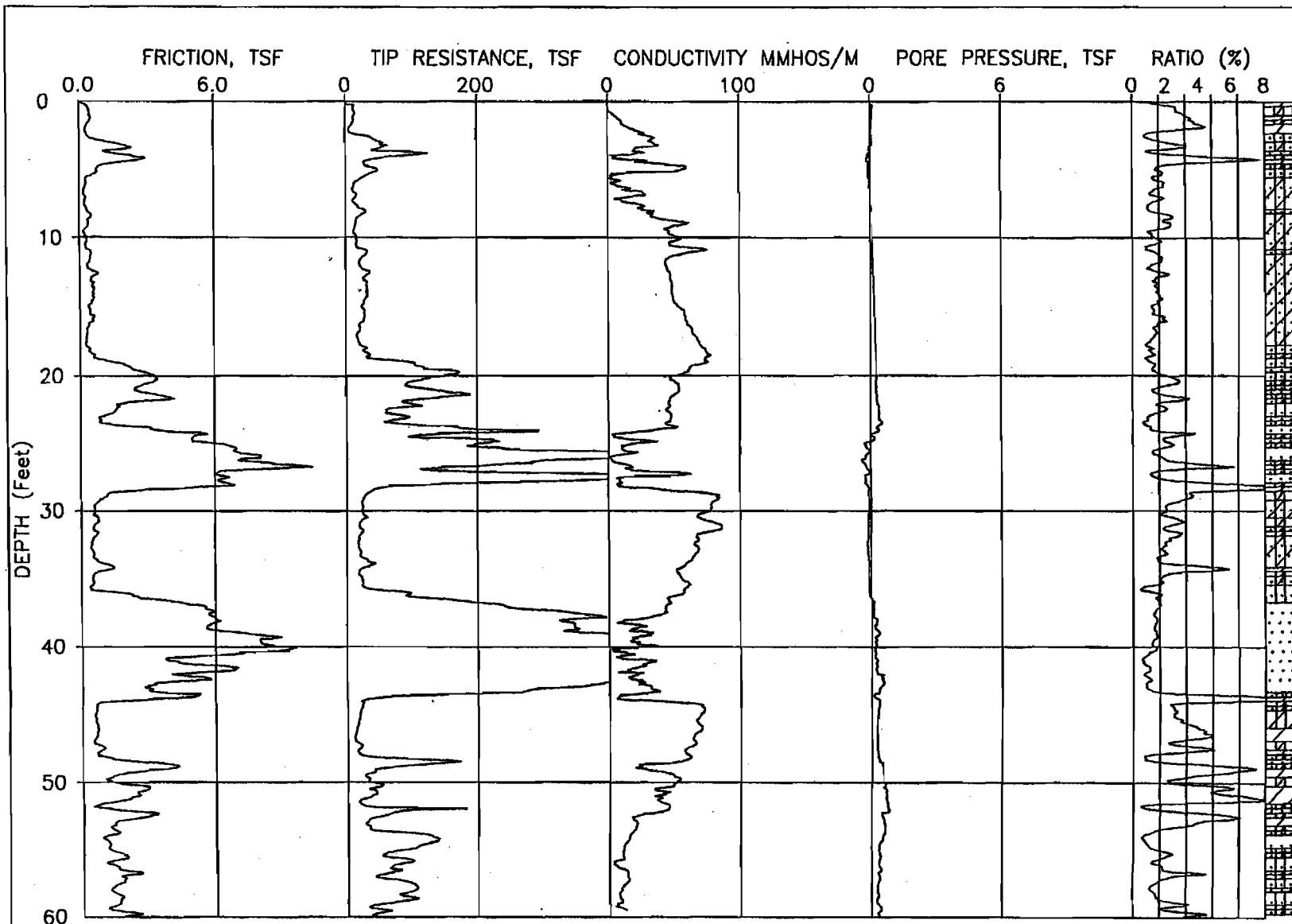
CAMPANELLA AND ROBERTSON CLASSIFICATION CHART (1983)

D-6





D-8

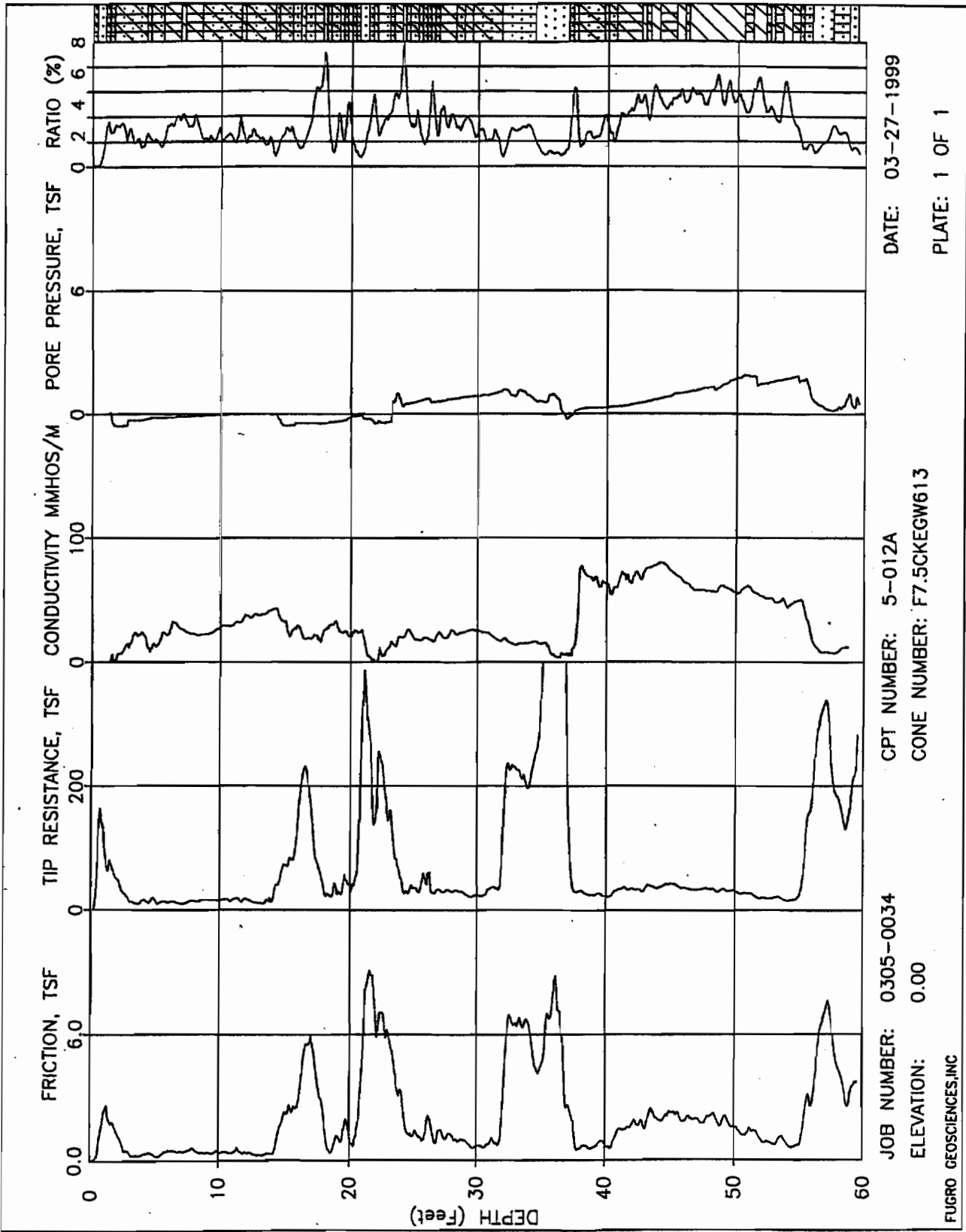


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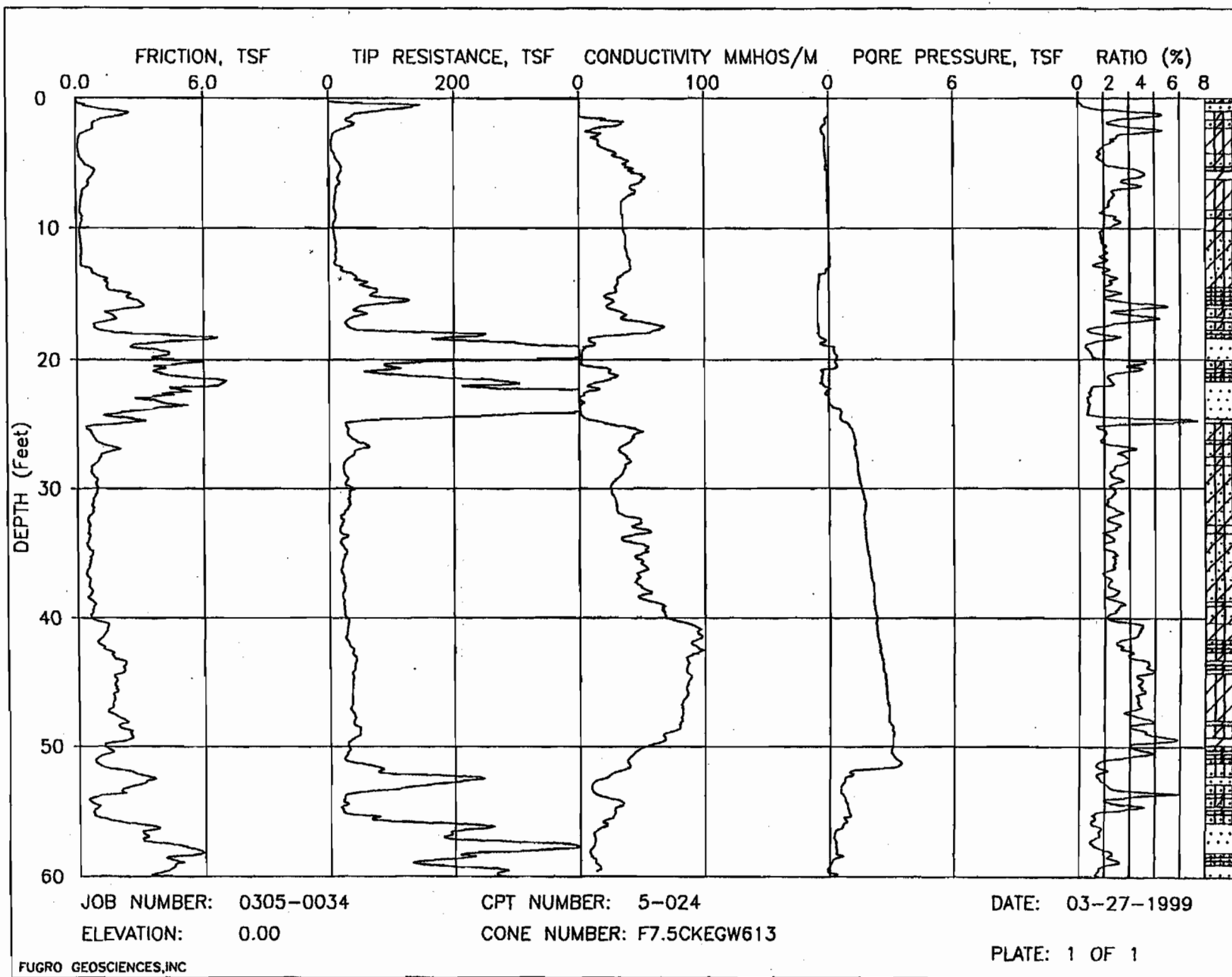
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CONE NUMBER: F7.5CKEGW613

DATE: 03-26-1999

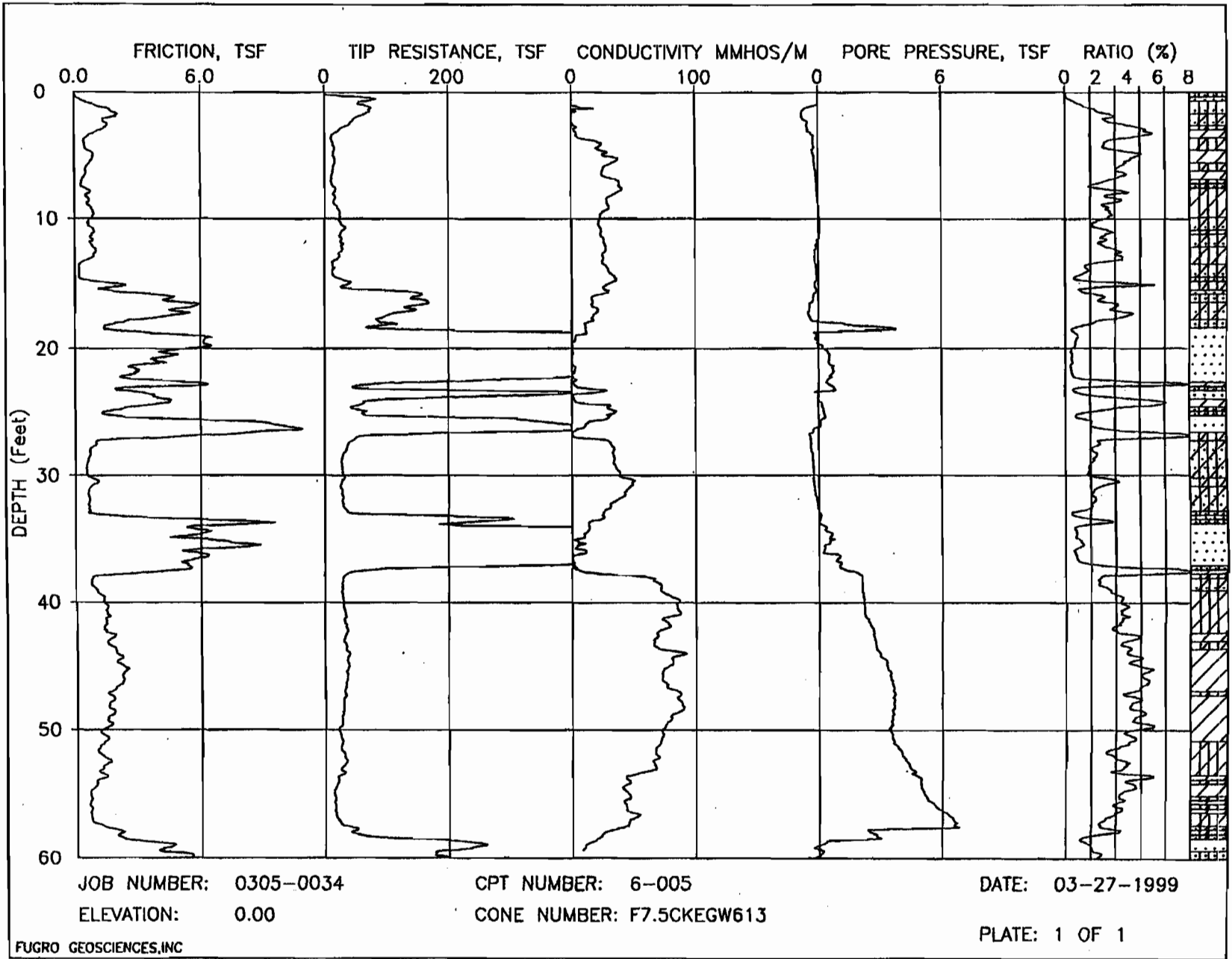
PLATE: 1 OF 1



D-10



D-11





APPENDIX E
BOREHOLE LITHOLOGIC LOGS

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-008		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 07/22/99 0925		DRILL END: 07/22/99 1425		TOTAL DEPTH: 19 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1229.27 E -6264.29		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 376.22 FT AMBL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	①	004008 SA007	1.5	BKGD	NA	Silty CLAY, stiff, coarse-grained gravel, asphalt/metal disk, grey (10YR6/1), some brownish yellow (10YR6/8), dry		TIME: 1000
7	②	004008 SA010	.05	271	NA	Manmade materials and coarse gravel from previous sample - possible dissolved, brick-dark red (10R3/8) and dark green grey (1GREY3/1)		TIME: 1025
10	③	004008 SA013	3.0	BKGD	0			TIME: 1045
13	④	004008 SA018	3.0	BKGD	0	Silty CLAY, stiff, mottled brownish yellow (10YR6/8) and greenish grey (1GREY5/1), some light grey (10YR7/1), moist		TIME: 1220
16	⑤	004008 SA017 004008 SA019	3.0	211	0			TIME: 1245
20						Silty CLAY, firm, mottled brownish yellow (10YR6/8), some dark yellowish brown (10YR4/8), little light grey (10YR7/1), moist		Boring terminated at 19 ft bgs
25						Sandy CLAY, soft, saturated coarse, dark greyish brown (10YR4/2)		Groundwater sample collected at 14 to 18 ft bgs on 7/24, sample ID 004008WA019
30						Clayey SILT, stiff, light grey (10YR7/1), some brownish yellow (10YR6/8), dry		
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-009		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 07/08/99 1025		DRILL END: 07/09/99 1410		TOTAL DEPTH: 39 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1435.47 E -6346.66		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 378.19 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	①	004009 SA007		BKGD	0	SILT, organics, roots, pale brown (10YR8/3), dry		TIME: 1415 07/08/99
5	②	004009 SA008	3	300	0	Silty CLAY, firm to stiff, friable, little iron oxide nodules, some chert gravel fragments, trace plastic sheeting, mottled yellowish brown (10YR5/8) and greyish brown(10YR5/2), dry		TIME: 1030
15	③	004009 SA016	3	BKGD	0.7	Silty CLAY, firm, mottled brownish yellow (10YR6/6) and light brownish grey (10YR6/2), dry		TIME: 1125
25	④	004009 SA025	0.76	BKGD	0	Silty, sandy CLAY, firm, fine to medium grained sand, light brownish grey (10YR6/2) and some brownish yellow (10YR6/8), dry		TIME: 1315
40	⑤	004009 SA040	1.5	BKGD	12.9	Sandy CLAY, firm, fine to medium grained sand, mottled pale brown (10YR6/3) and yellowish brown (10YR6/8), moist		Boring terminated at 39 ft bgs Groundwater sample collected at 39 to 40 ft bgs on 7/9, sample ID 004009WAD40

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-011		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 07/22/99 1505		DRILL END: 07/23/99 0945		TOTAL DEPTH: 19 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N -1306.95 E -6427.19		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 376.6 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&B MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOCS (ppm)			
0								
5	①	004011 SA007	0.3	447	0	Gravelly CLAY, angular, light grey (10YR7/1) and brownish yellow (10YR6/8), dry		TIME: 1510 07/22/99
	②	004011 SA010	0	313	0	No recovery		TIME: 1535
10	③	004011 SA013	3.0	BKGD	0	Silty CLAY, firm, mottled light yellowish brown (10YR 8/4) and light grey (10YR7/1), moist to saturated		TIME: 1545
15	④	004011 SA016	3.0	BKGD	0.4	Silty CLAY, firm to stiff, mottled pale brown (10YR6/8) and yellowish brown (10YR5/8), little very dark greyish brown (10YR3/2), moist		TIME: 0850 07/22/99
20	⑤	004011 SA019	3.0	211	0	Silty CLAY, firm to stiff, friable, light grey (10YR7/1), little yellowish brown (10YR5/8), dry		TIME: 0915
25								Boring terminated at 19 ft bgs
30								Groundwater sample collected at 14 to 19 ft bgs on 7/24, sample ID 004011WA019
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPLUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-012		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2 "	
DRILL START: 07/23/99 1040		DRILL END: 07/23/99 1521		TOTAL DEPTH: 13 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1270.18 E -6298.97		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 376.18 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOC'S (ppm)			
0								
5	①	004012 SA007	1.5	BKGD	0	Silty CLAY, firm to stiff, mottled light grey (10YR7/1) and brownish yellow (10YR6/8), trace very dark greyish brown (10YR3/2), dry No recovery		TIME: 1045 07/23/99
	②	004012 SA010	0	N/A	N/A			TIME: 1100
10	③	004012 SA013	0	N/A	N/A			TIME: 1110
15								Refusal at 13 ft bgs
20								
25								
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-017		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 07/08/99 1505		DRILL END: 07/09/99 1320		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N -1215.04 E -6348.74		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 375.75 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	0	004017 SA001	0	BKGD	0	Clayey SILT, firm, roots, organics, mottled light brownish grey (10YR8/2) and light yellowish brown (10YR8/4), dry		TIME: 1300 07/08/99
5	2	004017 SA008	2.25	BKGD	0	Clayey SILT, trace fine sand, trace plastic sheeting, stiff, mottled light grey (10YR7/2) and yellowish brown (10YR5/6), dry		TIME: 1515
15	3	004017 SA016	3.0	BKGD	0.1	Silty CLAY, firm to stiff, mottled light grey (10YR5/8) and yellowish brown (10YR7/2), little iron oxide nodules, little very dark grey (10YR3/1), moist		TIME: 1525
25	4	004017 SA025	1.5	BKGD	0	Silty CLAY, stiff, gravelly chert fragments, angular to subangular, yellowish brown (10YR5/8), some light grey (10YR7/1), moist		TIME: 1545
40	5	004017 SA040	3.0	BKGD	0	SAND, fine to medium grained, yellowish brown (10YR5/6), little dark grey (10YR3/1), moist to wet		TIME: 1610
45								Groundwater sample collected at 39 to 40 ft bgs on 7/9 and 7/15, sample ID 004017WA040
50	6	004017 SA050	3.0	BKGD	1.0	Silty CLAY, little fine sand, firm to stiff, yellowish brown (10YR5/6), dry		TIME: 1040 07/09/99
60	7	004017 SA060	1.5	BKGD	0.3	Silty CLAY, fine sand, firm to stiff, yellowish brown (10YR5/6), moist		TIME: 1100 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**







LITHOLOGIC LOG		BORING/WELL NO: 004-019		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 07/09/99 1540		DRILL END: 07/10/99 1040		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1454.19 E -5925.14		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 374.06 FT AMSL	

DEPTH (FT)	SAMPLE			RAD		H&S MONIT.		LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOC'S (ppm)					
0	0-1	004019 SA001		BKGD	0			Clayey SILT, some roots, light grey (10YR7/2), dry		TIME: 1040 07/09/99
5	1-2	004019 SA006	3.0	BKGD	0			Silty CLAY, firm, mottled light grey (10YR7/1) and yellow (10YR7/6), dry		TIME: 1545
15	2-3	004019 SA016	1.5	BKGD	0			Silty CLAY, stiff, friable, dark yellowish brown (10YR4/6), little light grey (10YR7/1), dry		TIME: 1600
25	3-4	004019 SA025	0.3	BKGD	0			Clayey sandy GRAVEL, cherty fragments, angular to subangular, dark yellowish brown (10YR4/6), dry		TIME: 1615
40	4-5	004019 SA040	3.0	BKGD	0.3			Sandy CLAY, firm, little subangular cherty gravel, mottled brownish yellow (10YR6/8) and light grey (10YR7/1), moist		TIME: 0840 07/10/99
50	5-6	004019 SA050	1.5	BKGD	0.3			Silty CLAY, stiff, trace fine sand, yellowish brown (10YR5/8) and little black (10YR2/1), dry		TIME: 0910
60	6-7	004019 SA060	3.0	BKGD	0			SAND, fine to medium grained, subrounded, brownish yellow (10YR6/8) and little black (10YR2/1)		Groundwater sample collected at 53 to 60 ft bgs on 7/10, sample ID 004019WA040 TIME: 0945 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-020		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4 "	
DRILL START: 09/10/99 1510		DRILL END: 09/11/99 1755		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/RIG TYPE: AHSA		COORDINATES: N -1223.57 E -6485.90		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS		Angle: 45° Azimuth: 138° Directional Bearing: Southeast		ELEVATION: 373.38 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOC'S (ppm)			
0								
5	①	004020 SA006	0.20	BKGD	0	SILT, roots, pale brown (10YR6/3), dry		
10						Silty CLAY, firm, dark yellowish brown (10YR4/6), moist		TIME: 1530 09/11/99
15						Trace fine sand		TIME: 1705
20						Trace to little fine to medium sand, plastic		
25	②	004020 SA035	2.0	BKGD	0	Sandy, gravelly CLAY, stiff, some medium to coarse sand, rounded cherty gravel to cobble, mottled dark yellowish brown (10YR4/6) and light grey (10YR7/1), moist		
30								
35	③	005022 SA047	0.10	BKGD	0	Clayey SAND, fine to medium grained, subangular sand, dark yellowish brown (10YR4/6), moist to wet		TIME: 0820 09/11/99
40								
45	④	004020 SA058	2.0	BKGD	0	Sandy CLAY, firm, fined sand, mottled yellowish brown (10YR5/8), some light grey (10YR7/1), and little black (10YR7/2), moist		TIME: 0855
50	⑤	004020 SA073	2.0	BKGD	0	Sandy CLAY, firm, fine to medium sand, trace iron oxide staining and nodules bonded with very little brown (10YR8/2), mottled strong brown (7.5YR5/6) and yellow (10YR7/6), moist		TIME: 0956
55								Groundwater sample collected at 60 ft bgs on 9/11, sample ID 004020WA085
60	⑥	004020 SA085	0.50	BKGD	0	SAND, fine to medium grained, well-sorted, yellowish brown (10YR5/6), wet		TIME: 1045 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-021		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4"	
DRILL START: 09/20/99 1010		DRILL END: 09/20/99 1115		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/RIG TYPE: AHSA		COORDINATES: N -1228.18 E -6335.86		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS		Angle: 45° Azimuth: 111° [Southeast] Directional Bearing: Southeast		ELEVATION: 375.89 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	1	004021 SA006	0.50	BKGD	0.0	SILT, hard, trace rounded gravel, pinkish white (7.5YR8/2), dry		TIME: 1020 09/20/99
10						Silty CLAY, firm, trace fine sand, dark yellowish brown (10YR4/6), moist		
15						Little greenish grey (10Y6/1)		
20						Some medium sand, yellowish brown (10YR5/8)		
25	2	004021 SA035	0.25	BKGD	0.0	Sandy CLAY, firm, medium to coarse grained, light brownish yellow (10YR6/4), some yellowish brown (10YR5/8), wet to saturated		TIME: 1300
30								
35	3	004021 SA047	2.0	BKGD	0.0	Silty CLAY, firm to stiff, trace fine sand, mottled light grey (10YR7/1), and brownish yellow (10YR6/6), and trace dark yellowish brown (10YR4/6), moist		TIME: 1345
40						Soft, saturated		
45	4	004021 SA056	2.0	BKGD	0.0	Silty CLAY, stiff, trace medium sand, mottled yellowish brown (10YR5/8), brownish yellow (10YR6/6), and little light grey (10YR7/1), moist		TIME: 1455
50						More moist, plastic		
55	5	004021 SA073	2.0	BKGD	0	Sandy CLAY, stiff, fine to medium sand, yellowish brown (10YR5/6) and trace light grey (10YR7/1), moist		TIME: 1555
60								Groundwater sample collected at 60 ft bgs on 9/21, sample ID 004021WA085
60	6	004021 SA085	0.50	BKGD	0	Sandy CLAY, soft, fine to medium sand, yellowish brown (10YR5/8), saturated		TIME: 1650 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-022		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4 "	
DRILL START: 12/01/99 1021		DRILL END: 12/06/99 0943		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/ RIG TYPE: AHSA		COORDINATES: N -1555.99 E -6124.15		PROTECTION LEVEL: B	
LOGGED BY: VIRGINIA MULLINS		Angle: 45° Azimuth: 350° Directional Bearing: Northwest		ELEVATION: 375.27 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						SILT, roots, light brownish grey (10YR6/2), dry		
10	10-11	004022 SA014	3.0	BKGD	0.0	Silty CLAY, firm to stiff, trace fine sand, slightly plastic, light grey (10YR7/1) with little brownish yellow (10YR6/8), slightly moist		TIME: 1050
25	24-26	004022 SA035	2.25	N/A	N/A	Sandy CLAY, stiff, medium grained subangular sand, light brownish grey (10YR6/2) and little brownish yellow (10YR6/8), moist		TIME: 1310
30	29-31	004022 SA047	2.25	BKGD	3.4	Sandy CLAY, firm, medium grained subangular sand, brownish yellow (10YR6/8), with some grey (10YR6/1), moist		TIME: 1440
45	44-46	004022 SA059	3.0	BKGD	0.0	Sandy CLAY, firm, fine to medium grained sand, slightly plastic, little coarse sand, grey (10YR6/1), mottled with some brownish yellow (10YR6/8), moist to wet		TIME: 0825
50	49-51	004022 SA073	1.5	BKGD	1.9	SAND, some clay, medium to coarse grained, well-sorted, subangular, brownish yellow (10YR6/8), moist to wet		TIME: 0950
60	59-61	004022 SA085	3.0	BKGD	0	SAND, some clay, medium to coarse grained, well-sorted, subangular, brownish yellow (10YR6/8), moist to wet		Groundwater sample collected at 60 ft bgs on 12/2, sample ID 004022WA085 TIME: 1030 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊕ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 004-023		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4 "	
DRILL START: 09/21/99 1527		DRILL END: 09/23/99 1010		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/ RIG TYPE: AHSA		COORDINATES: N -1286.50 E -6266.59		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS		Angle: 45° Azimuth: 180° [South] Directional Bearing: South		ELEVATION: 376.90 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOC'S (ppm)			
0						SILT, very pale brown (10YR7/3), dry		
5						Silty CLAY, firm, little medium to coarse sand, greyish brown (10YR5/2), dry		
10	①	004023 SA014	2.0	BKGD	0	Silty CLAY, firm, little iron oxide staining, trace slag, trace fine to medium sand, yellowish brown (10YR5/4), little dark yellowish brown (10YR4/6), moist		TIME: 1600 09/21/99
15								
25	②	004023 SA035	0.25	BKGD	0	Silty CLAY, firm, slag pieces, brownish yellow (10YR6/6), moist		TIME: 1645
30								
35	③	004023 SA047	2.0	BKGD	0	Silty CLAY, firm, little fine to coarse sand, strong brown (7.5YR5/6), some brownish yellow (10YR6/6), and trace light grey (10YR7/1), moist		TIME: 1715
40								
45	④	004023 SA059	2.0	BKGD	0	Sandy CLAY, stiff, fine to medium sand, plastic, yellowish brown (10YR5/6), moist		TIME: 0830 09/23/99
50	⑤	004023 SA073	1.0	BKGD	0	Sandy CLAY, stiff, medium sand, well-sorted, trace iron oxide staining, mottled yellowish brown (10YR5/8) and trace light grey (10YR7/1), moist		TIME: 1000
55								Groundwater sample collected at 60 ft bgs on 9/22, sample ID 004023WA085
60	⑥	004023 SA085	0.25	BKGD	0	SAND, medium to coarse, well-sorted, yellowish brown (10YR5/8), saturated		TIME: 1650 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊕ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-024		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4 "	
DRILL START: 09/23/99 1418		DRILL END: 09/24/99		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/RIG TYPE: AHSA		COORDINATES: N -1438.66 E -6369.88		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				Angle: 45° Azimuth: 270° Directional Bearing: West	
				ELEVATION: 377.44 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						SILT, roots, light grey (10YR7/2), dry		
5						Silty CLAY, firm, greenish grey (10YR5/1), dry		
						Moist		
10	①	004024 SA014	2.0	BKGD	0.0	Silty CLAY, firm, trace iron oxide staining, trace roots, mottled light brownish grey (10YR6/2) and yellowish brown (10YR5/8), moist		TIME: 1450 09/23/99
15						Sandy CLAY, saturated		
25	②	004024 SA035	0	N/A	N/A	No recovery		TIME: 0910 09/24/99
30						Sandy CLAY		
35	③	004024 SA047	2.0	BKGD	0.0	Sandy CLAY, firm, little coarse sand, yellowish brown (10YR5/8), and trace light grey (10YR7/1), moist		TIME: 0930
40						Trace gravel		
45	④	004024 SA059	2.0	BKGD	0.0	Sandy CLAY, stiff, medium to coarse grained sand, yellowish brown (10YR5/8) and little strong brown (7.5YR4/6), moist		TIME: 1055
50	⑤	004024 SA073	2.0	BKGD	0	Clayey SAND, soft to firm, medium grained, trace coarse sand, well-sorted, one cobble, yellowish brown (10YR5/8), trace very dark brown (10YR2/2), wet		TIME: 1230 Groundwater sample collected at 60 ft bgs on 9/24 and 9/28, sample ID 004024WA085 and 004024WB085
60	⑥	004024 SA085	1.0	BKGD	0	SAND, medium to coarse grained, well-sorted, yellowish brown (10YR5/6), wet		TIME: 1315 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-025		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4 "	
DRILL START: 11/18/99 0918		DRILL END: 11/22/99 1630		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/RIG TYPE: AHSA		COORDINATES: N -1255.67 E -6062.94		PROTECTION LEVEL: B	
LOGGED BY: VIRGINIA MULLINS/CHARLES CALLIS				Angle: 45° Azimuth: 3° [North] Directional Bearing: North	
				ELEVATION: 375.16 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						SILT, roots, light grey (10YR7/1), dry		
5						Silty CLAY, friable, yellowish brown (10YR5/4), dry		
10	①	004025 SA014	3.0	BKGD	0	SILTY CLAY, stiff, trace organics, trace sand, slightly plastic, roots, light grey (10YR6/1), mottled with little brownish yellow (10YR6/8), six inches of grey (10YR5/1), moist		TIME: 0940 11/18/99
15								
25	②	004025 SA035	0.75	BKGD	39	Clayey, sandy GRAVEL, subangular medium to coarse sand, dark yellowish brown (10YR4/6), wet		TIME: 1330
30						Sandy CLAY, medium grained, wet		
30	③	004025 SA047	2.25	BKGD	0	Sandy CLAY, firm to stiff, medium to coarse sand, plastic, mottled light grey (10YR7/1), brownish yellow (10YR6/8), moist		TIME: 1510
35								
40								
45	④	004025 SA058	3.0	BKGD	0	CLAY, dark yellowish brown (10YR4/6), some areas of grey (7.5YR7/1)		TIME: 0850 11/22/99
50	⑤	004025 SA073	3.0	BKGD	0	CLAY, stiff, trace fine sand, plastic, little areas of grey (7.5YR7/1), yellowish brown (10YR7/2), moist		TIME: 0925
55								Groundwater sample collected at 60 ft bgs on 11/22, sample ID 004025WA085
60	⑥	004025 SA085	0.60	BKGD	0	SAND, medium to coarse grained, well-sorted, subangular, yellowish brown (10YR5/8), saturated		TIME: 1120 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊕ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-026		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4 "	
DRILL START: 11/12/99 1155		DRILL END: 11/16/99 1618		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/ RIG TYPE: AHSA		COORDINATES: N -1591.67 E -6326.93		PROTECTION LEVEL: B	
LOGGED BY: VIRGINIA MULLINS				Angle: 45° Azimuth: 0° [North] Directional Bearing: North	
				ELEVATION: 376.70 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						Silty CLAY, firm, friable, pale yellow (2.5Y7/3), dry		
10	①	004026 SA014	3.0	BKGD	0.0	SILTY CLAY, firm to stiff, friable, little fine to medium sand, trace iron oxide nodules, pale yellow (2.5Y7/3), mottled with brownish yellow (10YR6/6), dry		TIME: 1230 11/12/99
25	②	004026 SA035	3.0	BKGD	0.0	Silty CLAY, stiff, slightly plastic, trace fine sand, mottled brownish yellow (10YR6/6) and light grey (10YR7/2), dry		TIME: 0925 11/13/99
30	③	004026 SA047	3.0	BKGD	0	Little gravel Sandy CLAY, firm, medium to coarse sand, plastic, brownish yellow (10YR6/6), moist to wet		TIME: 1045
40						Little gravel Saturated		
45	④	004026 SA058	3.0	BKGD	0	Sandy CLAY, stiff, medium sand, subangular, mottled brownish yellow (10YR6/6) and very pale brown (10YR7/3), moist to wet		TIME: 1320
50	⑤	004026 SA073	0.76	BKGD	0	SAND, medium to coarse grained, subangular, trace cobbles, reddish yellow (7.5YR6/8), moist to wet		TIME: 1445
60	⑥	004026 SA085	0	N/A	N/A	No recovery		Groundwater sample collected at 60 ft bgs on 11/16, sample ID 004026WA085 TIME: 0915 11/16/99 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**






LITHOLOGIC LOG		BORING/WELL NO: 004-027		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4"	
DRILL START: 11/09/99 1012		DRILL END: 11/11/99 1343		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/RIG TYPE: AHSA		COORDINATES: N -1607.82 E -6421.82		PROTECTION LEVEL: B	
LOGGED BY: VIRGINIA MULLINS		Angle: 45° Azimuth: 303° Directional Bearing: Northwest		ELEVATION: 374.36 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						Clayey SILT, dark yellowish brown (10YR4/6), dry		
5						SILTY CLAY, slightly plastic, trace fine sand, slightly moist		
10	①	004027 SA014	0.12	BKGD	0	Clayey SILT, stiff, trace fine sand, yellowish brown (10YR5/4), dry		TIME: 1040 11/09/99
15						Silty CLAY, friable, trace fine sand, dark yellowish brown (10YR4/6), moist		
20						Sandy CLAY		
25	②	004027 SA035	0	BKGD	0	No recovery		TIME: 1400
30						Sandy CLAY, firm, plastic, medium to coarse sand, dark yellowish brown (10YR4/6), moist		
35	③	004027 SA047	3.0	BKGD	0	Sandy CLAY, firm, trace coarse sand, trace to little gravel; mottled yellowish brown (10YR5/8) and light grey (10YR7/2), moist		TIME: 0850 11/11/99
40								
45	④	004027 SA059	3.0	BKGD	0	Sandy CLAY, stiff, fine to medium sand, trace coarse sand, strong brown (7.5YR5/6), moist		TIME: 1115
50	⑤	004027 SA073	1.5	BKGD	0	Silty, sandy, CLAY, firm to stiff, fine to medium sand, plastic, yellowish brown (10YR5/6), wet		TIME: 1345
55								Groundwater sample collected at 60 ft bgs on 11/11, sample ID 004027WA085
60	⑥	004027 SA085	1.5	N/A	N/A	SAND, medium to coarse grained, subrounded to subangular, brownish yellow (10YR6/6), saturated		TIME: 1610 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊕ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-028		PAGE 1 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/03/99		DRILL END: 09/08/99 1700		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/RIG TYPE: DWRC		COORDINATES: N 1204.97 E -6597.46		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 370.77 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOCs (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	1		N/A	BKGD	0	SILT, trace very fine sand, yellowish brown (10YR5/8), dry		Rad Bkgd = 80 cpm
5	2		N/A	BKGD	0	No sample		Clogged drill bit
10	3		N/A	BKGD	0	No sample		Clogged drill bit
15	4		N/A	BKGD	0	SILT/CLAY, semi-plastic, brown to dark brown, damp		
20	5		N/A	BKGD	0	No sample		Clogged drill bit
25	6		N/A	BKGD	0	No sample		
30	7		N/A	BKGD	0	GRAVEL, chert, angular, some quartz, poorly sorted		Top of gravel 30 to 33 ft bgs
35	8		N/A	BKGD	0	GRAVEL, slightly coarse, chert, angular, some quartz, poorly sorted		
40	9	004028 WAD40	N/A	BKGD	0	SILT, few small gravels, yellowish brown (10YR5/6)		
45	10		N/A	BKGD	0	No sample		Clogged drill bit
50	11		N/A	BKGD	0	No sample		Clogged drill bit
55	12		N/A	BKGD	0	No sample		Clogged drill bit

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	○ = OTHER	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 004-028		PAGE 2 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/03/99		DRILL END: 09/08/99 1700		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/ RIG TYPE: DWRC		COORDINATES: N 1204.97 E -6597.46		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 370.77 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOC'S (ppm)			
60	13	004028 WA080	N/A	BKGD	0	Silty GRAVEL, some very fine sand		Top of RGA at 63 ft bgs
65	14	004028 WA085	N/A	BKGD	0	GRAVEL, chert, angular to subangular, poorly to moderately well sorted		
70	15	004028 WA070	N/A	BKGD	0	SAND and GRAVEL, sand is medium to coarse, gravel is subangular to subrounded		
75	16	004028 WA075	N/A	BKGD	0	SAND and GRAVEL, sand is medium to coarse, gravel is subangular to subrounded		
80	17	004028 WA080	N/A	BKGD	0	SAND and GRAVEL, sand is medium to coarse, gravel is subangular to subrounded		
85	18	004028 WA085	N/A	BKGD	0	GRAVEL, chert, subangular to subrounded, well sorted		
90	19	004028 WA090	N/A	BKGD	0	SAND and GRAVEL, subangular to subrounded, well sorted, fine to medium grained sand		
95	20	004028 WA095	N/A	BKGD	0	Silty, clayey SAND and GRAVEL, subangular to subrounded, well sorted, fine to medium grained sand		
100	21	004028 WA100	N/A	BKGD	0	Silty, clayey SAND, fine grained, well sorted, yellowish brown (10YR5/6)		
105	22	004028 WA105	N/A	BKGD	0	SAND and CLAY, fine grained sand, well sorted, plastic, soft clay, grey to bluish grey		
110	23	004028 WA110	N/A	BKGD	0	Silty SAND, very fine to fine-grained, well sorted, green to greenish grey, damp		
115	24	004028 WA120	N/A	BKGD	0	CLAY, soft to firm, trace very fine sand, plastic, homogeneous, dark grey to black		

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	○ = OTHER	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 004-028		PAGE 3 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/03/99		DRILL END: 09/08/99 1700		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/RIG TYPE: DWRC		COORDINATES: N 1204.97 E -6597.46		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 370.77 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
120	25		N/A	BKGD	0	SAND, fine-grained, well-sorted, dark grey to greenish grey		Top of RGA at 63 ft bgs
125	26		N/A	BKGD	0	Silty CLAY, moderate dense, semi-plastic, homogeneous		
130	27		N/A	BKGD	0	Silty CLAY, moderate dense, semi-plastic, homogeneous		
135	28		N/A	BKGD	0	Silty CLAY, moderate dense, semi-plastic, homogeneous		
140	29		N/A	BKGD	0	CLAY, very dense, crumbly plastic when wet, dark grey to black		
145	30		N/A	BKGD	0	CLAY, very dense, crumbly plastic when wet, dark grey to black		
150	31		N/A	BKGD	0	CLAY, very dense, crumbly plastic when wet, dark grey to black		
155	32	004028 WA100	N/A	BKGD	0	CLAY, moderately dense, plastic, light grey to grey		
160								
165								
170								
175								
180								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	○ = OTHER	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 004-029		PAGE 1 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/10/99		DRILL END: 09/13/99		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/ RIG TYPE: DWRC		COORDINATES: N -1472.00 E -6513.69		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 371.58 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	1		NA	BKGD	0	SILT/CLAY, soft, semi-plastic, yellowish brown (10YR5/6), moist to dry	[Symbol]	Rad Bkgd = 60 cpm
5	2		NA	BKGD	0	SILT/CLAY, soft, semi-plastic, yellowish brown (10YR5/6), moist to dry	[Symbol]	
10	3		NA	BKGD	0	SILT/CLAY, soft, semi-plastic, yellowish brown (10YR5/6), moist to dry	[Symbol]	
15	4		NA	BKGD	0	Silty SAND, very fine grained, subangular to subrounded, well-sorted, yellowish brown (10YR5/6)	[Symbol]	
20	5		NA	BKGD	0	Silty SAND, medium grained, subangular to subrounded, well-sorted, yellowish brown (10YR5/6)	[Symbol]	
25	6		NA	BKGD	0	Sandy SILT, medium grained, subangular to subrounded, well-sorted, yellowish brown (10YR5/6)	[Symbol]	
30	7		NA	BKGD	0	Sandy SILT, medium grained, subangular to subrounded, well-sorted, yellowish brown (10YR5/6)	[Symbol]	
35	8		NA	BKGD	0	GRAVEL, rounded, weathered, well-sorted	[Symbol]	
40	9		NA	BKGD	0	Sandy SILT, medium grained, subangular to subrounded, well-sorted, yellowish brown (10YR5/6)	[Symbol]	
45	10	004029 WAD40	NA	BKGD	0	SAND, very fine to medium-grained, well-sorted, subangular to subrounded	[Symbol]	
50	11		NA	BKGD	0	SAND, very fine to medium grained, well-sorted, subangular to subrounded, yellowish brown	[Symbol]	
55	12		NA	BKGD	0	SAND, some gravel, fine grained, well-sorted gravel to 1/2" diameter	[Symbol]	
60							[Symbol]	Top of the RGA at 58 to 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	○ = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-029		PAGE 2 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/10/99		DRILL END: 09/13/99 1700		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/RIG TYPE: DWRC		COORDINATES: N 1472.00 E -6513.69		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 371.58 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
60	13	004029 WA080	N/A	BKGD	0	GRAVEL, chert, subangular to subrounded, moderately well-sorted		
65	14	004029 WA085	N/A	BKGD	0	GRAVEL, chert, angular to subangular, well-sorted, some coarse sand 1/32" to 1/4" diameter		
70	15	004029 WA070	N/A	BKGD	0	GRAVEL, chert, angular to subangular, well-sorted, some coarse sand		
75	16	004029 WA075	N/A	BKGD	0	SAND with a few gravels, angular to subangular, well-sorted, coarse-grained		
80	17	004029 WA080	N/A	BKGD	0	SAND with gravels, angular to subangular, well-sorted, coarse-grained		
85	18	004029 WA085	N/A	BKGD	0	GRAVEL, chert, subangular to subrounded, well sorted		
90	18	004029 WA090	N/A	BKGD	0	GRAVEL, chert, subangular to subrounded, well sorted		
95	20	004029 WA085	N/A	BKGD	0	GRAVEL, chert, subangular to subrounded, well sorted		
100	21	004029 WA100	N/A	BKGD	0	SAND, some clay, soft, fine-grained, well-sorted, plastic, light grey clay		
105	22	004029 WA105	N/A	BKGD	0	SAND, some silt and clay, soft, fine-grained, well-sorted, plastic, light grey clay		
110	23	004029 WA110	N/A	BKGD	0	SAND, some silt and clay, soft, fine-grained, well-sorted, plastic, light grey clay		
115	24	004029 WA115	N/A	BKGD	0	SAND, some silt and clay, soft, fine-grained, well-sorted, plastic, light grey clay		
120								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	○ = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-029		PAGE 3 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/10/99		DRILL END: 09/13/99		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/RIG TYPE: DWRC		COORDINATES: N 1472.00 E -6513.69		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 371.58 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
120			N/A	BKGD	0	SAND, fine grained, well-sorted, dark grey to greenish grey		Top of McNairy at 122 to 123 ft bgs
125			N/A	BKGD	0	Silty CLAY, moderate dense, semi-plastic, homogeneous		
130			N/A	BKGD	0	Silty CLAY, moderate dense, semi-plastic, homogeneous, few small gravels		
135			N/A	BKGD	0	Silty CLAY, moderate dense, semi-plastic, homogeneous, few small gravels		
140			N/A	BKGD	0	CLAY, very dense, dark grey to black, crumbly plastic when wet, moist		
145			N/A	BKGD	0	CLAY, very dense, dark grey to black, crumbly plastic when wet, moist		
160			N/A	BKGD	0	CLAY, very dense, dark grey to black, crumbly plastic when wet, moist		
155			N/A	BKGD	0	CLAY, moderately dense, plastic, light grey to grey		
180								Boring terminated at 158 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 004-030		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 4 1/2"	
DRILL START: 08/04/99 0920		DRILL END: 08/05/99 1530		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/ RIG TYPE: HSA		COORDINATES: N -1490.87 E -6454.05		PROTECTION LEVEL: D	
LOGGED BY: SCOTT DOLVIN				ELEVATION: 375.56 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H/S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5								
10								
15								No soil cuttings collected; loss to voids in the formation.
20								
25	①	004030 SA025	0.5		0.0	Clayey sandy GRAVEL, medium to fine grained sand, gravel pieces = 2-3cm, light brownish grey (10YR5/1) to orangish tan (10YR8/8), fairly wet		
30								
35								
40								
45						- 600CPM -		
50	②	004030 SA050	2	250	0	Silty sandy CLAY, medium sand, well sorted and subrounded, high plasticity, tan to greyish tan (10YR6/4)		No soil cuttings collected
55								
60	③	004030 SA060	1.75		0	Clayey silty SAND, medium grained, subrounded to subangular, goldenrod (2.5Y6/8) and greyish goldenrod (2.5Y6/6)		No soil cuttings collected Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON CONT. CORING	⊕ = HYDROPLUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-032		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 07/20/99 0941		DRILL END: 07/20/99 1330		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1229.00 E -6063.58		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 375.06 FT AML	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (Ft)					
0	0-1	004032 SA001C		BKGD	0	Clayey SILT, very pale brown (10YR7/3), dry	---	TIME: 1330 07/20/99
5	1-2	004032 SA006C	3.0	280	0	Silty CLAY, stiff, plastic, greyish brown (10YR5/2), dry	---	TIME: 0945 07/20/99
15	2-3	004032 SA018C	3.0	BKGD	0	Silty CLAY, firm, trace fine sand, mottled brownish grey (10YR6/2) and little yellowish brown (10YR5/8), dry	---	TIME: 1020
25	3-4	004032 SA025C	3.0	BKGD	0	Sandy CLAY, firm, medium to coarse sand, some angular to subangular gravel, mottled yellowish brown (10YR5/6) and very pale brown (10YR7/3), moist	---	TIME: 1040
40	4-5	004032 SA040C	.75	BKGD	0	Clayey SAND, medium to very coarse grained subangular sand, mottled yellowish brown (10YR5/6) and yellow (10YR7/6), dry to moist	---	TIME: 1055
50	5-6	004032 SA050C	3.0	BKGD	0	Silty CLAY, stiff, trace fine sand, trace iron oxide staining, yellowish brown (10YR5/86) and little very pale brown (10YR7/3), dry	---	TIME: 1220 Groundwater sample collected at 55 to 60 ft bgs on 7/20, sample ID 004032WA040C
60	6-7	004032 SA060C	2.25	BKGD	0	Sandy CLAY, soft, fine to medium grained sand, mottled pale brown (10YR6/3) and yellowish brown (10YR5/8), moist to wet	---	TIME: 1250 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-033		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 07/20/99 1535		DRILL END: 07/21/99 1115		TOTAL DEPTH: 28 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1461.48 E -6462.81		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 274.26 FT AMSL	

DEPTH (FT)	SAMPLE			RAD		H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOC'S (ppm)				
0	0	004033 SA001		BKGD	0		Clayey SILT, very pale brown (10YR7/3), dry		TIME: 1045 07/21/99
5	2	004033 SA008	3.0	800	0		Clayey SILT, stiff, pale brown (10YR6/3) and some brownish yellow (10YR6/6), dry		TIME: 1010
15	3	004033 SA018	3.0	BKGD	4.1		Silty CLAY, firm, mottled light grey (10YR7/2) and brownish yellow (10YR6/6) and very dark brown (10YR2/2), dry		TIME: 0810
25	4	004033 SA025	2.25	BKGD	11.9		Sandy gravelly CLAY, stiff, medium to coarse sand, some angular to subangular gravel, mottled yellowish brown (10YR5/6) and very pale brown (10YR7/3), moist		TIME: 0825
30									Refusal at 28 ft bgs
35									Groundwater sample collected at 21 to 28 ft bgs on 7/24, sample ID 004033WA040C
40									
45									
50									
55									
60									

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-034		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2 "	
DRILL START: 07/21/99 1245		DRILL END: 07/21/99 1400		TOTAL DEPTH: 26 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1577.60 E -8311.12		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 376.27 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	0	004034 SA001C		BKGD	NA	Clayey SILT, roots, light yellowish brown (10YR6/4), dry		TIME: 1350 07/21/99
5	2	004034 SA006C	3.0	BKGD	NA	Clayey SILT, friable, light brownish grey (10YR6/2) and some brownish yellow (10YR8/68), dry		TIME: 1250
15	3	004034 SA018C	3.0	BKGD	0	Silty CLAY, stiff, light brownish grey (10YR6/2) and brownish yellow (10YR6/6), dry		TIME: 1310
25	4	004034 SA029C	0.3	BKGD	0	Gravelly CLAY, stiff, poorly sorted medium to coarse grained sand, angular to subangular gravel, yellowish brown (10YR5/6), dry		Refusal at 26 ft bgs
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-035		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/07/99 0910		DRILL END: 08/07/99 1120		TOTAL DEPTH: 23 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1427.02 E -6187.24		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 379.03 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	YOC'S (ppm)			
0								
5	①	004035 SA005C	3.0	220 BCR 72000 METAL/GRASS	0	Clayey SILT, roots, light yellowish brown (10YR6/4), dry		TIME: 0915 08/07/99
10	②	004035 SA010C	3.0	BKGD	0	Clayey SILT, friable, light brownish grey (10YR6/2) and some brownish yellow (10YR6/6), dry		TIME: 1000
15	③	004034 SA015C	3.0	BKGD	2.4	Silty CLAY, stiff, light brownish grey (10YR6/2) and brownish yellow (10YR6/6), dry		TIME: 1025
20	④	004035 SA022C	3.0	BKGD	28.2	Gravelly CLAY, stiff, poorly sorted medium to coarse grained sand, angular to subangular gravel, yellowish brown (10YR5/6), dry		TIME: 1100
25								Refusal at 23 ft bgs
30								Groundwater sample collected at 18 to 23 ft bgs on 8/12, sample ID 004035WA040C
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-036		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/09/99 0920		DRILL END: 08/09/99 1056		TOTAL DEPTH: 25 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N -1407.48 E -6463.02		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 376.31 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H/S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	1	004036 SA009C	1.5	BKGD	0	Silty Clay, stiff, friable, trace rounded gravel, mottled light grey (10YR7/2) and brownish yellow (10YR6/6) and trace dark brown (10YR3/3), dry		TIME: 0925 08/09/99
10	2	004036 SA010C	3.0	BKGD	0	Silty CLAY, firm, trace iron oxide staining, brownish yellow (10YR6/5) and some very pale brown (10YR7/2), dry to moist		TIME: 0955
15	3	004036 SA015C	3.0	BKGD	0	Silty CLAY, firm to stiff, little iron oxide nodules and staining, grey (10YR8/1), mottled brownish yellow (10YR6/6), dry to moist		TIME: 1010
20	4	004036 SA022C	3.0	BKGD	28.2	Sandy CLAY, firm, trace rounded gravel, fine to medium sand, mottled yellowish brown (10YR5/8) and light grey (10YR7/2), trace very dark greyish brown (10YR3/2), moist		Refusal at 25 ft bgs Groundwater sample collected at 20 to 25 ft bgs on 8/12, sample ID 004036WA040C
25								
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-037		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/09/99 1235		DRILL END: 08/09/99 1440		TOTAL DEPTH: 45 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N -1191.26 E -6424.53		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 376.58 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	HHS MONIT. VOCs (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	1	004037 SA006C	3.0	BKGD	0	Clayey SILT, stiff, trace fine sand, trace iron oxide staining, mottled light grey (10YR7/1) and brownish yellow (10YR6/6), dry		TIME: 1240 08/09/99
10	2	004037 SA016C	3.0	BKGD	N/A	Silty CLAY, stiff, friable, trace iron oxide nodules, mottled brownish yellow (10YR6/6) and some very pale brown (10YR7/8), dry		TIME: 1300
15	3	004037 SA019C	3.0	BKGD	0	Silty CLAY, firm, trace fine to medium sand, little iron oxide staining, mottled pale brown (10YR6/3) and brownish yellow (10YR6/8), moist		TIME: 1320
20	4	004037 SA022C	3.0	BKGD	0	Silty sandy CLAY, stiff to very stiff, little rounded to subangular chert gravel, fine sand, mottled light grey (10YR7/2) and brownish yellow (10YR6/6), moist		TIME: 1340
30	5	004037 SA030C	3.0	BKGD	0	Sandy CLAY, firm, fine to medium sand, yellowish brown (10YR5/6) and light grey (10YR8/1), moist		TIME: 1400
45	6	004037 SA045C	0.3	BKGD	0	Sandy GRAVEL, fine to medium sand, cherty gravel, saturated, moist		TIME: 1420 Terminated at 45 ft bgs Groundwater sample collected at 40 to 45 ft bgs on 8/10, sample ID 004037WA040C
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-038		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/10/99 0805		DRILL END: 08/10/99 0928		TOTAL DEPTH: 25 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N -1213.04 E -6197.40		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 376.03 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	1	004038 SA005C	3.0	BKGD	0	Silty CLAY, firm, trace fine sand, mottled grey (10YR6/1), yellowish brown (10YR5/4) and trace very dark brown (10YR2/3), dry		TIME: 0810 08/10/99
10	2	004038 SA010C	3.0	BKGD	0	Silty CLAY, firm, trace fine sand, mottled grey (10YR6/1) and little yellowish brown (10YR5/4), dry		TIME: 0830
15	3	004038 SA015C	3.0	BKGD	0	Silty CLAY, firm, trace iron oxide staining, fine sand, light brownish grey (10YR6/2) and little brownish yellow (10YR6/6), moist		TIME: 0845
20	4	004038 SA022C	1.5	BKGD	0	Sandy CLAY, firm, subangular gravel, fine to coarse sand, mottled grey (10YR6/1) and yellowish brown (10YR5/6), moist		TIME: 0805
25								Terminated at 25 ft bgs
30								Groundwater sample collected at 20 to 25 ft bgs on 8/23 and 8/24, sample ID 004038WA040C
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPLUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-039		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/11/99 0855		DRILL END: 08/11/99 1030		TOTAL DEPTH: 36 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1223.81 E -6135.62		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 375.75 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	1	004039 SA008C	1.5	BKGD	0.6	Silty CLAY, stiff, friable, trace rounded gravel, trace coal, greenish grey (10YR6/1) and little brownish yellow (10YR6/6), dry	---	TIME: 0900 08/11/99
15	2	004039 SA016C	3.0	BKGD	0	Silty CLAY, firm, grey (10YR6/1) and trace yellowish brown (10YR5/6), moist	---	TIME: 0928
25	3	004039 SA025C	1.5	BKGD	0	Sandy gravelly CLAY, medium to coarse sand, subangular cherty gravel, dark yellowish brown (10YR4/4), moist	---	TIME: 0940
35	4	004039 SA035C	3.0	BKGD	0	Sandy CLAY, firm, fine to medium sand, trace gravel at 35', yellowish brown (10YR5/6) and some light grey (10YR7/2), moist	---	TIME: 1000 Terminated at 36 ft bgs Groundwater sample collected at 31 to 36 ft bgs on 8/23, sample ID 004039WAD40C
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 004-040		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/11/99 1230		DRILL END: 08/11/99 1422		TOTAL DEPTH: 25 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1229.83 E -6223.62		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 376.15 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	1	004040 SA008C	3.0	310	0	Sandy gravelly CLAY at 3'-4.5', medium to coarse sand, subangular gravel, dark yellowish brown (10YR4/4), dry 4.5'-6' Silty CLAY, stiff, olive grey (5Y5/2), dry		TIME: 1235 08/11/99
10	2	004040 SA011C	3.0	BKGD	0	Silty CLAY, firm, trace iron oxide staining, mottled light grey (10YR7/1) and brownish yellow (10YR6/8), trace dark brown (10YR3/3), moist		TIME: 1315
15	3	004040 SA016C	3.0	BKGD	0	Silty CLAY, firm, friable, mottled light yellowish brown (10YR6/4) and yellowish brown (10YR6/8), moist		TIME: 1335
20	4	004040 SA021C	3.0	BKGD	0	Silty CLAY, firm, trace organics, little fine sand, mottled yellowish brown (10YR6/1) and some very dark brown (10YR2/2), moist		TIME: 1350
25	5	004040 SA025C	2.25	BKGD	0	Sandy gravelly CLAY, stiff, medium to coarse sand, angular cherty gravel, yellowish brown (10YR5/8), moist		TIME: 1410
30								Terminated at 25 ft bgs
35								Groundwater sample collected at 20 to 25 ft bgs on 8/24, sample ID 00404QWA030C
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-041		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/16/99 0905		DRILL END: 08/16/99 1340		TOTAL DEPTH: 24 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1278.32 E -6264.48		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 376.29 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	1	004041 SA008C	3.0	BKGD	0	Silty CLAY at 3'-4.5', firm, trace rounded gravel, grayish brown (10YR5/2), dry 4.5'-6' Silty CLAY, firm, trace rounded gravel, little white friable material, greenish grey (10YR6/1), dry	-----	TIME: 0915 08/16/99
15	2	004041 SA018C	3.0	BKGD	0	Silty CLAY, firm, trace fine sand, light greenish grey (10YR6/1) and little brownish yellow (10YR6/1), moist	-----	TIME: 0935
25	3	004041 SA028C	1.5	BKGD	0	Sandy silty CLAY, firm, trace angular gravel, medium to coarse sand, light grey (10YR7/2) and brownish yellow (10YR6/8), wet at 23.5' BGS	-----	TIME: 0950 Refusal at 24 ft bgs
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-042		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/16/99 1425		DRILL END: 08/17/99 0820		TOTAL DEPTH: 30 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1348.02 E -6321.30		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 376.37 FT AMSL	

DEPTH (FT)	SAMPLE			RAD		H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOCS (ppm)				
0									
5	1	004042 SA008C	3.0	BKGD	0		Silty CLAY at 3'-4.5', stiff, mottled grey (10YR5/1) and dark yellowish brown (10YR4/6), dry	----	TIME: 1430 08/16/99
10	2	004042 SA011C	3.0	BKGD	0		4.5'-6' Clayey SILT, stiff, greenish grey (10YR6/1), dry	----	TIME: 1505
15	3	004042 SA015C	3.0	BKGD	0		Silty CLAY, firm, mottled greenish grey (10YR6/1) and yellowish brown (10YR5/8), dry	----	TIME: 1520
20	4	004042 SA021C	3.0	BKGD	0		Silty CLAY, firm, trace fine sand, mottled yellowish brown (10YR5/4) and light grey (10YR7/1), moist	----	TIME: 1535
25	5	004042 SA025C	2.25	BKGD	0.5		Sandy CLAY, firm, fine sand, mottled light grey (10YR7/1) and brownish yellow (10YR6/6), moist	----	TIME: 1550
30	6	004042 SA030C	1.5	BKGD	0		Sandy CLAY, firm, fine sand, light yellowish brown (10YR6/4) and little yellowish brown (10YR5/8), dry to moist	----	TIME: 1610
30							Sandy gravelly CLAY, stiff, subangular gravel, medium to coarse sand, dark yellowish brown (10YR4/6), moist	----	Boring terminated at 30 ft bgs
35									
40									
45									
50									
55									
60									

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-043		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/17/99 0845		DRILL END: 08/17/99 1050		TOTAL DEPTH: 25 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1286.03 E -6347.78		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 375.94 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	①	004043 SA008C	3.0	BKGD	0	Silty CLAY, firm, friable, mottled light grey (10YR7/2) and yellowish brown (10YR5/8), dry	-----	TIME: 0850 08/17/99
10	②	004043 SA011C	3.0	BKGD	0	Silty CLAY, stiff, light yellowish brown (10YR6/4) and little dark yellowish brown (10YR4/4), moist	-----	TIME: 0910
15	③	004043 SA015C	2.25	BKGD	0	Silty CLAY, stiff, light yellowish brown (10YR6/4) and light dark yellowish brown (10YR4/4), moist	-----	TIME: 0925
20	④	004043 SA021C	3.0	BKGD	0	Silty CLAY, firm, friable, mottled grey (10YR5/1) and some yellowish brown (10YR5/6), dry to moist	-----	TIME: 0940
25	⑤	004043 SA025C	3.0	BKGD	0	Silty CLAY, firm to stiff, mottled dark yellowish brown (10YR4/6), brownish yellow (10YR6/6), and light grey (10YR7/1), dry to moist	-----	TIME: 0955
25						Sandy, clayey GRAVEL at 24'-25', medium to coarse sand, subangular gravel, dark yellowish brown (10YR4/6), moist		Refusal at 25 ft bgs
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: DPT 004-044		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/17/99 1230		DRILL END: 08/17/99 1502		TOTAL DEPTH: 40 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1259.70 E -6447.56		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 376.94 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	1	004044 SA009C	3.0	BKGD	0	Silty CLAY, firm, friable, trace iron oxide staining, trace subangular gravel, mottled light grey (10YR7/2), yellowish brown (10YR5/8), and little very dark brown (10YR2/2), dry	- - - - - - - - - - - - - - -	TIME: 1200 08/17/99
15	2	004044 SA015C	3.0	BKGD	0	Silty CLAY, firm, mottled light grey (10YR7/2), some brownish yellow (10YR6/6), and little very dark brown (10YR2/2), moist	- - - - - - - - - - - - - - -	TIME: 1250
25	3	004044 SA025C	.75	BKGD	0	Sandy, clayey GRAVEL, medium to coarse sand, subangular gravel dark yellowish brown (10YR4/4), moist	- - - - - - - - - - - - - - -	TIME: 1315
35	4	004044 SA035C	.75	BKGD	0	Sandy CLAY, firm, medium sand, trace subangular gravel, mottled light grey (10YR7/1) and dark yellowish brown (10YR4/6), dry	- - - - - - - - - - - - - - -	TIME: 1330
40								Refusal at 40 ft bgs
40								Groundwater sample collected at 37 to 40 ft bgs on 8/17, sample ID 004044WAD40C
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-045		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/17/99 1530		DRILL END: 08/18/99 1055		TOTAL DEPTH: 30 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1318.40 E -6447.37		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 376.84 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	1	004045 SA008C	3.0	BKGD	0	Silty CLAY at 3'-4.5', stiff, friable, trace iron oxide staining, light grey (10YR7/2), little yellowish brown (10YR5/8), and trace very dark brown (10YR2/2), dry		TIME: 1540 08/17/99
10	2	004045 SA011C	3.0	BKGD	0	Silty CLAY, firm to stiff, mottled brownish yellow (10YR6/8), light grey (10YR7/1), and little yellowish brown (10YR5/8), trace very dark brown (10YR2/2), dry		TIME: 1550
15	3	004045 SA015C	3.0	BKGD	0	Silty CLAY, firm to stiff, friable, trace fine sand, light grey (10YR7/2) with little brownish yellow (10YR6/8), and very dark brown (10YR2/2), dry		TIME: 1610
20	4	004045 SA021C	2.25	BKGD	0	Clayey SAND, fine to medium grained sand, yellowish brown (10YR5/8), moist		TIME: 1620
25	5	004045 SA025C	0.75	BKGD	0	Sandy clayey GRAVEL, medium to coarse sand, subangular gravel, yellowish brown (10YR5/8), wet		TIME: 0820 08/18/99
30	6	004045 SA030C	3.0	BKGD	0	Sandy CLAY, firm, fine sand, trace gravel, dark yellowish brown (10YR7/6) mottled with yellow (10YR7/6), moist		TIME: 0945
35								Boring terminated at 30 ft bgs
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-046		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/18/99 1220		DRILL END: 08/18/99 1515		TOTAL DEPTH: 24 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1357.32 E -6404.45		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 375.60 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	①	004046 SA006C	3.0	750	0	Silty CLAY, stiff, some fine sand, yellowish brown (10YR5/6) mottled with light gray (10YR7/1), dry	- - - - - - - - - - - - - - -	TIME: 1225 08/18/99
15	②	004046 SA015C	3.0	BKGD	0	Silty CLAY, firm to stiff, mottled light gray (10YR7/1), brownish yellow (10YR6/6), and some very dark brown (10YR2/2), dry	- - - - - - - - - - - - - - -	TIME: 1345
25	③	004046 SA025C	0.75	BKGD	0	Sandy gravelly CLAY, stiff, medium to coarse sand, subangular gravel, dark yellowish brown (10YR4/6), dry	- - - - - - - - - - - - - - -	TIME: 1515 Refusal at 24 ft bgs
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-047OS		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/19/99 0935		DRILL END: 08/19/99 1245		TOTAL DEPTH: 24 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N -1438.23 E -6082.84		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 378.17 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&B MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	1	004047 SA008C	3.0	220	0	3'-4' Silty CLAY, stiff, friable, little gravel, brownish yellow (10YR6/6), dry		TIME: 0940 08/19/99
						4'-6' Silty CLAY, stiff, friable, greenish grey (10Y8/1), dry		
10	2	004047 SA011C	3.0	BKGD	0	Silty CLAY, firm, greenish grey (10Y5/1), trace yellowish brown (10YR6/6), moist		TIME: 1025
15	3	004047 SA015C	3.0	BKGD	0	Silty CLAY, firm, trace fine sand, grey (10YR6/1), little yellowish brown (10YR5/6), moist		TIME: 1040
20	4	004047 SA021C	3.0	BKGD	0	Clayey SILT, stiff, trace fine sand, light grey (10YR7/1) and yellowish brown (10YR6/6), dry		TIME: 1050
25	6	004047 SA022C	2.25	BKGD	0	Sandy CLAY, firm, medium to coarse sand, little subangular gravel, yellowish brown (10YR5/6), some light grey (10YR7/1), moist to wet		TIME: 1105
30								Refusal at 24 ft bgs
35								Groundwater sample collected at 23 to 24 ft bgs on 8/19, sample ID 004047WA030C
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-047		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/19/99 1220		DRILL END: 08/19/99 1245		TOTAL DEPTH: 3.5 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N -1439.91 E -6102.31		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 378.29 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H/S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOC'S (ppm)			
0								
5	①	004047 SA006C	0.8	1200	N/A	Silty CLAY, firm, light brownish grey (10YR6/2) and yellowish brown (10YR5/8), some very dark brown (10YR2/2), dry		TIME: 0805 08/19/99 Boring terminated at 3.5 ft bgs; hole was offset
10								
15								
20								
25								
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: DPT 004-048		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/19/99 1320		DRILL END: 08/19/99 1600		TOTAL DEPTH: 6 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1503.88 E -6071.97		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 377.06 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	①	004048 SAG08C	1.5	8000	N/A	Silty CLAY, firm, friable, greenish grey (10Y8/1), brownish yellow (10YR6/6), dry Dark grey, flakey material at tip		TIME: 1325 08/19/99 Boring terminated at 6 ft bgs; hole was offset
10								
15								
20								
25								
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-049		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/20/99 1040		DRILL END: 08/20/99 1400		TOTAL DEPTH: 21 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1557.67 E -6113.06		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 377.06 FT AMSL	

DEPTH (FT)	SAMPLE		RECOVERY (FT)	RAD		H&S MONIT. (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER		CPM	VOC'S				
0									
5	①	004048 SA006C	.76	BKGD	0		Clayey SILT, firm to stiff, mottled light grey (10YR7/1) and little brownish yellow (10YR6/8), dry		TIME: 1045 08/20/99
10	②	004048 SA011C	2.25	BKGD	0		Silty CLAY, soft, trace fine sand, mottled light grey (10YR7/1) and yellowish brown (10YR5/8), moist to wet		TIME: 1100
15	③	004048 SA015C	1.5	BKGD	0		Silty CLAY, soft, trace fine sand, mottled light grey (10YR7/1) and yellowish brown (10YR5/8), moist		TIME: 1115
20	④	004048 SA021C	3.0	BKGD	0		Silty CLAY, stiff, medium to coarse sand, subangular gravel, yellowish brown (10YR5/8), dry		TIME: 1240
25									Refusal at 21 ft bgs
30									Groundwater sample collected at 20 to 21 ft bgs on 8/20, sample ID 004048WA030C
35									
40									
45									
50									
55									
60									

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-050		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/20/99 1430		DRILL END: 08/20/99 1535		TOTAL DEPTH: 19 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N -1569.71 E -6483.30		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 371.34 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	①	004050 SA008C	3.0	BKGD	0	Silty CLAY, firm, friable, mottled brownish yellow (10YR6/6) and light grey (10YR7/2), moist	---	TIME: 1435 08/20/99
10								
15	②	004050 SA015C	.75	BKGD	0	Sandy clayey GRAVEL, medium to coarse sand, subangular gravel, yellowish brown (10YR5/6), dry	---	TIME: 1455
20								
25								
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 004-051		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 6 1/4"	
DRILL START: 08/16/99 1053		DRILL END: 08/17/99 0930		TOTAL DEPTH: 51 FT BGS	
DRILL METHOD/RIG TYPE: HSA		COORDINATES: N -1470.51 E -6033.90		PROTECTION LEVEL: D	
LOGGED BY: SCOTT DOLVIN				ELEVATION 377.53 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5								
10								
15								
20	1	004051 SA021C	2			Clayey SAND to Sandy CLAY, some gravel, medium well sorted subrounded sand, yellowish tan (10YR5/6), slightly moist	---	TIME: 1450
25	2	004051 SA028C	1.5			Sandy GRAVEL, with some silt and clay, fragmented gravel, yellowish tan (10YR6/8)	---	TIME: 1515
30								
35								
40	3	004051 SA041C	2			Sand GRAVEL, with some silt and clay, medium to coarse sand, subangular poorly sorted sand, tan (10YR6/4) and yellow tan (10YR6/6), medium moisture	---	TIME: 1530
45								
50	4	004051 SA051C	2			Clayey SAND, some silt, medium subrounded well sorted sand, slightly plastic, light yellow tan (10YR6/6) and yellow tan (10YR6/8), moist	---	TIME: 1605 Terminated at 51 ft bgs
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 004-052		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 6 1/4"	
DRILL START: 08/17/99		DRILL END: 08/17/99		TOTAL DEPTH: 51 FT BGS	
DRILL METHOD/RIG TYPE: HSA		COORDINATES: N -1291.76 E -6394.03		PROTECTION LEVEL: D	
LOGGED BY: SCOTT DOLVIN				ELEVATION: 377.54 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						Clayey SILT, crumbly, no plasticity, light tan (2.5YR6/4) to dark tan (10YR8/8), dry		
5								
10								
15								
20	①	004052 SA0221C	1.5			Silty SAND, little clay, crumbly, fine sand, tanish grey (10YR7/2) mottled with rust brown (10YR5/8), slightly damp	----	TIME: 1345
25	②	004052 SA0226C	1			Silty GRAVEL, with some clay, rust brown (7.5YR5/8), medium moisture	----	
30								
35								
40	③	004052 SA0411C	2			Silty gravelly SAND, some clay, no plasticity, medium to coarse subrounded sand, rust brown (7.5YR5/8), medium moisture	----	TIME: 1425
45								
50	④	004052 SA0511C	2			Silty clayey SAND, some gravel, medium to coarse subrounded well sorted sand, rust brown (7.5YR5/8)	----	Boring terminated at 51 ft bgs
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-053		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/31/99 1325		DRILL END: 08/31/99 1440		TOTAL DEPTH: 25 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N -1346.02 E -5812.87		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 374.45 FT AMSL	

DEPTH (FT)	SAMPLE			RAD		H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOC'S (ppm)				
0	1	004053 SA003C	0	N/A	N/A		No recovery		TIME: 1330 08/31/99
5	2	004053 SA008C	1.5	BKGD	0		Silty CLAY, firm, trace fine sand, trace roots, greenish grey (10YR5/1), dry to moist		TIME: 1340
	3	004053 SA008C	3.0	BKGD	0		Silty CLAY, firm to stiff, trace fine sand and iron oxide staining, mottled light greenish grey (10YR7/1) and yellowish brown (10YR5/8), moist		TIME: 1350
10	4	004053 SA025	0	BKGD	0		No recovery		TIME: 1400
15	5	004053 SA040	3.0	BKGD	0		Silty CLAY, firm, trace fine sand, mottled yellowish brown (10YR5/8), some light yellowish brown (10YR6/4), moist		TIME: 1405
20	6	004053 SA021C	3.0	BKGD	0		Silty CLAY, firm, friable, trace fine sand, mottled very pale brown (10YR7/3) and brownish yellow (10YR6/8), dry		TIME: 1420
25	7	004053 SA025C	3.0	BKGD	0		Sandy CLAY, firm, fine to medium sand, mottled very pale brown (10YR7/3) and strong brown (7.5YR5/8), moist		TIME: 1430
30									Boring terminated at 25 ft bgs
35									
40									
45									
50									
55									
60									

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-054		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/31/99 0830		DRILL END: 08/31/99 0955		TOTAL DEPTH: 20 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1204.97 E -6597.46		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 370.77 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	HSS MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	1	004054 SA003C	3.0	BKGD	0	SILT, hard, little roots, mottled pale brown (10YR6/3) and brownish yellow (10YR6/8), dry	[Symbol]	TIME: 0835 08/31/99
5	2	004054 SA008C	3.0	BKGD	0	Silty CLAY, firm to stiff, mottled light grey (10YR7/2) and dark yellowish brown (10YR4/6), moist	[Symbol]	TIME: 0850
10	3	004054 SA009C	2.25	BKGD	0	Silty CLAY, firm, trace fine sand, very pale brown (10YR7/3) and yellowish brown (10YR5/8), moist	[Symbol]	TIME: 0905
10	4	004054 SA012C	3.0	BKGD	0	Silty CLAY, firm, trace fine sand, pale brown (10YR6/3), some dark yellowish brown (10YR4/6), moist	[Symbol]	TIME: 0920
15	5	004054 SA015C	2.25	BKGD	0	Silty CLAY, firm, trace fine sand, pale brown (10YR6/3), some dark yellowish brown (10YR4/6), moist	[Symbol]	TIME: 0930
20	6	004054 SA021C	0.3	BKGD	0	Sandy, gravelly CLAY, medium to coarse sand, subangular gravel, dark yellowish brown (10YR4/6), moist	[Symbol]	TIME: 0945 Boring terminated at 20 ft bgs
25								
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-055		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/31/99 1030		DRILL END: 08/31/99 1245		TOTAL DEPTH: 25 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N -1472.00 E -6513.69		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 371.59 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	1	004055 SA003C	0	N/A	N/A	No recovery		TIME: 1035 08/31/99
5	2	004055 SA008C	3.0	BKGD	0	Silty CLAY, firm, mottled yellowish brown (10YR5/6) and light grey (10YR7/1), moist		TIME: 1040
	3	004055 SA009C	3.0	BKGD	3.1	Silty CLAY, firm, mottled yellowish brown (10YR5/6) and light grey (10YR7/1), moist		TIME: 1050
10	4	004055 SA012	3.0	BKGD	0	Silty CLAY, firm, friable, trace fine sand, mottled light grey (10YR7/2) and dark yellowish brown (10YR4/6), moist		TIME: 1100
	5	004055 SA015	1.5	BKGD	3.8	Silty CLAY, firm, trace fine to medium sand, mottled yellowish brown (10YR5/8) and grey (10YR8/1), moist to wet		TIME: 1115
20	6	004055 SA021C	1.5	BKGD	0	Sandy, gravelly CLAY, medium to coarse sand, subangular to subrounded cherty gravel, dark yellowish brown (10YR4/6), moist		TIME: 1125
	7	004055 SA025C	3.0	BKGD	0	22'-23' Sandy, gravelly CLAY, medium to coarse sand, subangular to subrounded cherty gravel, dark yellowish brown (10YR4/6), moist		TIME: 1140
25						23'-25' Silty CLAY, stiff, plastic, trace fine sand, mottled dark yellowish brown (10YR4/6) and light grey (10YR7/1), moist		Boring terminated at 25 ft bgs
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-056		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/30/99 1040		DRILL END: 08/30/99 1355		TOTAL DEPTH: 24 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N -1470.82 E -6027.11		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 377.42 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	①	004056 SA003C	3.0	470	0	0'-2' SILT, roots, light grey, (10YR7/2), dry		TIME: 1045 08/30/99
5	②	004056 SA000C	3.0	BKGD	0	2'-3' Clayey, sandy GRAVEL, subangular gravel, medium to coarse sand, dark yellowish brown (10YR4/6)		TIME: 1110
	③	004056 SA000C	3.0	BKGD	0	Clayey SILT, trace fine sand, greenish grey (10YR5/1), dry		TIME: 1240
10	④	004056 SA012	0	BKGD	0	Silty CLAY, firm to stiff, mottled light grey (10YR7/1), brownish yellow (10YR6/8), and little dark yellowish brown (10YR4/8), dry		TIME: 1305
	⑤	004056 SA015	3.0	BKGD	0	No recovery		TIME: 1315
15	⑥	004056 SA015	3.0	BKGD	0	Silty CLAY, firm, trace fine sand, mottled light grey (10YR7/2), some brownish yellow (10YR6/8), little dark yellowish brown (10YR4/8), moist		TIME: 1325
20	⑦	004056 SA021C	3.0	BKGD	0	Silty CLAY, firm, trace fine sand, mottled light grey (10YR7/2), some brownish yellow (10YR6/8), little dark yellowish brown (10YR4/8), moist		TIME: 1335
25	⑧	004056 SA025C	0.75	BKGD	0	Clayey, sandy GRAVEL, coarse sand, subangular gravel, strong brown (7.5YR5/8), moist		TIME: 1335
30								Boring terminated at 24 ft bgs
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**









LITHOLOGIC LOG		BORING/WELL NO: 004-057		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/30/99 1040		DRILL END: 08/30/99 1355		TOTAL DEPTH: 24 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N -1470.82 E -6027.11		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 377.42 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	1	004057 SA003C	3.0	BKGD	0	SILT, stiff to hard, very pale brown (10YR6/2) and trace brownish yellow (10YR6/8), dry		TIME: 1450 08/30/99
5	2	004057 SA008C	3.0	BKGD	0	Clayey SILT, stiff, mottled light grey (10YR7/1) and some dark yellowish brown (10YR4/6), dry		TIME: 1500
	3	004057 SA009C	3.0	BKGD	0	Silty CLAY, firm to stiff, trace fine sand, mottled light grey (10YR7/2) and yellow brown (10YR5/8), moist		TIME: 1515
10	4	004057 SA012C	3.0	BKGD	0	Silty CLAY, firm to stiff, trace fine sand, trace iron oxide staining, mottled light grey (10YR7/2) and yellow brown (10YR5/8), moist		TIME: 1525
15	5	004057 SA015C	3.0	BKGD	0	Silty CLAY, firm to stiff, trace fine sand, trace iron oxide staining, mottled light grey (10YR7/2) and yellow brown (10YR5/8), moist		TIME: 1535
20	6	004057 SA021C	3.0	BKGD	0	Clayey SILT, firm, trace fine sand, very pale brown (10YR7/3), some dark yellowish brown (10YR4/6), dry		TIME: 1550
25	7	004057 SA025C	1.5	BKGD	0	Sandy, gravelly CLAY, medium to coarse sand, subangular to subrounded gravel, mottled dark yellowish brown (10YR4/6) and some grey (10YR6/1), dry to moist		TIME: 1600
30								Boring terminated at 24 ft bgs
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-058		PAGE 1 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/13/99 1745		DRILL END: 09/15/99 1100		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/ RIG TYPE: DWRC		COORDINATES: N -1346.02 E -5812.87		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 374.45 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	R&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	1		N/A	BKGD	0	No sample		Rad Bkgd = 50 cpm
5	2		N/A	BKGD	0	No sample		No samples, over drilled DPT location, no return
10	3		N/A	BKGD	0	No sample		
15	4		N/A	BKGD	0	No sample		
20	5		N/A	BKGD	0	Silty SAND, few gravels		
25	6		N/A	BKGD	0	SILT, some fine grained sand, a few small gravels		
30	7		N/A	BKGD	0	SILT/CLAY, very fine grained sand, light grey		
35	8		N/A	BKGD	0	SILT/CLAY, firm, plastic, mottled yellowish tan and grey, damp to moist		
40	9		N/A	BKGD	0	SILT/CLAY, firm, plastic, mottled yellowish tan and grey, damp to moist		
45	10		N/A	BKGD	0	SAND, some clay, very fine grained, subangular to subrounded, well-sorted		
50	11		N/A	BKGD	0	Sandy SILT/CLAY, few small gravels		
55	12		N/A	BKGD	0	SAND, very fine to fine grained, well-sorted, yellowish tan (10YR5/6)		
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	○ = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 004-058		PAGE 3 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/13/99 1745		DRILL END: 09/15/99 1100		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/ RIG TYPE: DWRC		COORDINATES: N 1346.02 E -5812.87		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 347.45 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS	
	INTERVAL	NUMBER	RECOVERY (FT)						
120	25		NA	BKGD	0	CLAY, stiff, very dense, plastic, dark grey to black			
125	26		NA	BKGD	0	CLAY, stiff, very dense, plastic, dark grey to black			
130	27		NA	BKGD	0	CLAY, stiff, moderate dense, dark grey to black, moist to damp			
135	28		NA	BKGD	0	CLAY, stiff, very dense, dark grey to black, damp			
140	29		NA	BKGD	0	CLAY, crumbly, very hard, dense, black			
145	30		NA	BKGD	0	CLAY, softer than previous intervals, few small gravels, plastic, grey to dark grey			
150	31		NA	BKGD	0	CLAY, softer than previous intervals, few small gravels, plastic, grey to dark grey			
155	32	004058 WA180C	NA	BKGD	0	CLAY, softer than previous intervals, few small gravels, plastic, grey to dark grey			
180									Boring terminated at 158 ft bgs
185									
170									
175									

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 005-013		PAGE 1 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/25/99 1615		DRILL END: 09/25/99 1430		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/RIG TYPE: DWRC		COORDINATES: N 202.89 E -6800.13		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 370.29 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	HES MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOC'S (ppm)			
0	0-1		N/A	BKGD	0	SILT/SAND, yellowish-brown to brown, dry		Rad BKGD = 70 cpm
5	1-2		N/A	BKGD	0	No sample		
10	2-3		N/A	BKGD	0	No sample		
15	3-4		N/A	BKGD	0	SILT/CLAY, brown to yellowish-brown, damp to moist		
20	4-5		N/A	BKGD	0	Silty SAND to sandy SILT, trace fine gravel		
25	5-6		N/A	BKGD	0	Silty CLAY, firm, moderate plasticity		
30	6-7		N/A	BKGD	0	Silty CLAY, firm, moderate plasticity		
35	7-8		N/A	BKGD	0	CLAY, firm, moderate plasticity, light grey to grey, moist		
40	8-9		N/A	BKGD	0	CLAY, firm, moderate plasticity, light grey to grey, moist		
45	9-10		N/A	BKGD	0	CLAY/SILT, firm, moderate plasticity, yellowish-brown, some grey		
50	10-11		N/A	BKGD	0	Silty CLAY, trace very fine sand		
55	11-12		N/A	BKGD	0	Silty, clayey GRAVEL, some very fine sand		Top of RGA at about 60 ft bgs
60	12-13		N/A	BKGD	0			

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 005-013		PAGE 2 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/25/99 1615		DRILL END: 09/28/99 1430		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/RIG TYPE: DWRC		COORDINATES: N 202.89 E -6800.13		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 370.28 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
60	13	005013 WA080	N/A	BKGD	0	SAND and GRAVEL, coarse, moderately well-sorted		TIME: 1010 09/25/99
65	14	005013 WA085	N/A	BKGD	0	GRAVEL, some sand, fine to medium grained sand, coarse gravel, moderately well sorted		TIME: 1120
70	15	005013 WA070	N/A	BKGD	0	GRAVEL, some sand, fine to medium grained sand, coarse gravel, moderately well sorted		TIME: 1330
75	16	005013 WA075	N/A	BKGD	0	GRAVEL, subangular to subrounded		TIME: 1455
80	17	005013 WA080	N/A	BKGD	0	GRAVEL, coarse sand, angular, moderately well-sorted		TIME: 1600
85	18	005013 WA085	N/A	BKGD	0	Silty SAND, some gravel, medium to coarse grained, well-sorted		TIME: 1730
90	19	005013 WA090	N/A	BKGD	0	Silty, clayey SAND, soft, very fine to fine grained, well-sorted, some gravel		TIME: 1830
95	20	005013 WA095	N/A	BKGD	0	Silty, clayey SAND, soft, very fine to fine grained, well-sorted		TIME: 0840 09/26/99
100	21		N/A	BKGD	0	CLAY, soft, moderate plasticity, dark grey to greenish grey		Bottom of RGA at about 100 ft bgs
105	22	005013 WA110	N/A	BKGD	0	CLAY, soft, moderate plasticity, dark grey to greenish grey		
110	23		N/A	BKGD	0	CLAY, some silt, firm, moderate plasticity, dark grey to black, moist to dry		TIME: 1000
115	24		N/A	BKGD	0	CLAY, some silt, firm, moderate plasticity, dark grey to black, moist to dry		
120								

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**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 005-013		PAGE 3 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/25/99 1615		DRILL END: 09/28/99 1430		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/ RIG TYPE: DWRC		COORDINATES: N 202.89 E -6800.13		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 370.28 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
120			N/A	BKGD	0	CLAY, some silt, firm, moderate plasticity, dark grey to black, moist to dry	[Pattern]	
125			N/A	BKGD	0	CLAY, stiff, low plasticity, damp to dry	[Pattern]	
130			N/A	BKGD	0	CLAY, stiff, low plasticity, damp to dry	[Pattern]	
135			N/A	BKGD	0	CLAY, stiff, moderate plasticity, dark grey to black	[Pattern]	
140			N/A	BKGD	0	CLAY, stiff, moderate plasticity, dark grey to black	[Pattern]	
145			N/A	BKGD	0	CLAY, stiff, moderate plasticity, dark grey to black	[Pattern]	
150			N/A	BKGD	0	CLAY, stiff, moderate plasticity, dark grey to black	[Pattern]	
155			N/A	BKGD	0	CLAY, stiff, moderate plasticity, dark grey to black	[Pattern]	
160			N/A	BKGD	0	CLAY, stiff, moderate plasticity, dark grey to black	[Pattern]	
165			N/A	BKGD	0	CLAY, stiff, moderate plasticity, dark grey to black	[Pattern]	
170							[Pattern]	
175							[Pattern]	
180							[Pattern]	Boring terminated at 158 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 005-015		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 4	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 07/26/99 1010		DRILL END: 07/26/99 1355		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N 195.52 E -6977.47		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 370.55 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	①	005015 SA001		BKGD	0	Clayey SILT, mottled grey (10YR6/1) and brownish yellow (10YR6/8), dry		TIME: 1355 07/26/99
5								
10								
15								
20	②	005015 SA019	2.25	BKGD	0	Silty, gravelly CLAY, firm, medium to coarse subangular sand, subrounded to subangular gravel, light grey (10YR7/1) and brownish yellow (10YR6/8), moist		TIME: 1020
25	③	005015 SA023	0.75	BKGD	0	Gravelly CLAY, subangular to angular gravel, medium to coarse grained sand, brownish yellow (10YR6/8), moist		TIME: 1040
30								
35	④	005015 SA037	3.0	BKGD	0	Silty CLAY, stiff, trace fine sand, mottled light brownish grey (10YR6/2) and dark yellowish brown (10YR4/8), dry to moist		TIME: 1105
40								
45	⑤	005015 SA044	3.0	BKGD	0	Silty CLAY, very stiff, trace fine sand, mottled yellowish brown (10YR5/6), light grey (10YR7/1), and some very dark greyish brown (10YR3/2), dry		TIME: 1240
50	⑥	005015 SA051	2.25	BKGD	0	Sandy CLAY, firm, fine to medium grained sand, mottled light grey (10YR7/1), brownish yellow (10YR6/8) and very dark grey (10YR3/1), dry		TIME: 1300
55								Groundwater sample collected at 55 to 60 ft bgs on 7/26 to 7/27, sample ID 005015WA060
60	⑦	005015 SA060	1.5	BKGD	0	Sandy CLAY, firm, very pale brown (10YR7/3) and some brownish yellow (10YR6/8), saturated		TIME: 1315
								Boring terminated at 60 ft bgs

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S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 005-016		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 07/27/99 0951		DRILL END: 07/27/99 1110		TOTAL DEPTH: 20 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N 197.01 E -6490.87		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 370.35 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOC'S (ppm)			
0	①	005016 SA001		BKGD	0	Silty GRAVEL, roots, subangular to subrounded, greyish brown (10YR5/2), dry		TIME: 1055 07/27/99
5								
10								
15	②	005018 SA018	1.5	BKGD	0	Sandy CLAY, firm, fine to medium sand, mottled gray (10YR6/1) and brownish yellow (10YR6/8), moist		TIME: 1000
20								Boring terminated at 20 ft bgs
25								Groundwater sample collected at 15 to 20 ft bgs on 8/6, sample ID 005018WA060
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 005-017		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 07/27/99 1310		DRILL END: 07/27/99 1400		TOTAL DEPTH: 37 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N -46.07 E -6512.94		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION 369.43 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H/S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	①	005017 SA001	1.0	BKGD	0	Clayey SILT, roots, greyish brown (10YR6/2), dry		TIME: 1400 07/27/99
5								
10								
15								
18	②	005017 SA018	3.0	BKGD	0	Sandy, gravelly CLAY, firm, medium to coarse sand, subangular to subrounded, mottled yellowish brown (10YR5/8) and light grey (10YR7/1), moist, trace wet		TIME: 1325
20	③	005017 SA023	3.0	BKGD	0	Silty CLAY, firm, some medium grained sand, dark yellowish brown (10YR4/6), brownish yellow (10YR6/8), and light grey (10YR7/2), moist		TIME: 1350
25								TIME: 1345
30								Groundwater sample collected at 24 to 29 ft bgs on 8/5, sample ID 005017WA060
35	④	005017 SA037	2.25	BKGD	0	Clayey SAND, fine to medium grained sand, yellowish brown (10YR5/8), saturated		Boring terminated at 37 ft bgs
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPLUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 005-018		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4 "	
DRILL START: 12/15/99 1540		DRILL END: 12/17/99 1029		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/RIG TYPE: AHSA		COORDINATES: N 205.46 E -6740.06		PROTECTION LEVEL: B	
LOGGED BY: VIRGINIA MULLINS		Angle: 45° Azimuth: 210° Directional Bearing: Southwest		ELEVATION: 370.67 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						SILTY CLAY, slightly plastic, yellowish brown (10YR6/2) and some grey (10YR5/1), slightly moist		
10	①	005018 SA014	3.0	BKGD	0.0	Silty CLAY, firm, slightly plastic, mottled light brownish gray (10YR6/2) and some yellowish brown (10YR5/8), moist		TIME: 1555 12/15/99
25	②	005018 SA035	N/A	N/A	N/A	No recovery		TIME: 0835 12/17/99
30						Sandy CLAY, plastic, medium to coarse grained, chert cobbles, yellowish brown (10YR5/6), moist		
33	③	005018 SA047	1.5	BKGD	0.0	Sandy CLAY, firm; medium subangular grained, trace chert gravel, very pale brown (10YR7/4) and some brownish yellow (10YR6/8), moist		TIME: 0900
43	④	005018 SA059	2.25	BKGD	0.0	CLAY, hard, some medium sand, trace black, yellowish brown (10YR5/8) and light grey (10YR7/1), moist		TIME: 0930
50	⑤	005018 SA073	3.0	BKGD	0.0	Sandy CLAY, firm, medium to coarse grained sand, subangular, yellowish brown (10YR5/8), some grey (10YR6/1), and trace black (10YR2/1), wet		TIME: 1330
60	⑥	005018 SA085		BKGD	0.0	Sandy CLAY, firm, medium to coarse grained sand, subangular, yellowish brown (10YR5/8), some grey (10YR6/1), and trace black (10YR2/1), wet		Groundwater sample collected at 60 ft bgs on 12/16, sample ID 005018WA085 TIME: 1355 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	○ = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 005-019		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4 "	
DRILL START: 12/10/99 0950		DRILL END: 12/14/99 1612		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/ RIG TYPE: AHSA		COORDINATES: N 203.81 E -6459.45		PROTECTION LEVEL: B	
LOGGED BY: VIRGINIA MULLINS/CHARLES CALLIS				Angle: 45° Azimuth: 210° Directional Bearing: Southwest	
				ELEVATION: 370.17 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						CLAY, plastic, brown (10YR5/6) and slight grey (10YR5/1)		
10	1	005019 SA014		BKGD	0.0	CLAY, plastic, trace subangular chert gravel, brown (10YR5/6) and slight grey (10YR5/1)		TIME: 1005 12/10/99
25	2	005019 SA035		BKGD	0.0	Sandy CLAY, plastic, medium to coarse grained		TIME: 1030
30	3	005019 SA047		BKGD	0.0	SAND, grey (10YR6/1)		TIME: 1300
35						CLAY, plastic, brown (10YR5/6)		
45	4	005019 SA058		BKGD	0.0	SAND, medium grained, limited recovery, grey (10YR6/1)		TIME: 1320
50	5	005019 SA073	0.30	BKGD	0.0	Clayey SAND, firm to medium grained, subangular, trace gravel, yellowish brown (10YR5/8), saturated		TIME: 0850 12/14/99 Groundwater sample collected at 60 ft bgs on 12/14, sample ID 005019WA085
60	6	005019 SA085	0.15	BKGD	0.0	Clayey SAND, firm to medium grained, subangular, trace gravel, yellowish brown (10YR5/8), saturated		TIME: 0935 Boring terminated at 60 ft bgs

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⊗ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 005-020		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4 "	
DRILL START: 12/07/99 1422		DRILL END: 12/09/99 1112		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/RIG TYPE: AHSA		COORDINATES: N 92.79 E -6341.79		PROTECTION LEVEL: B	
LOGGED BY: VIRGINIA MULLINS		Angle: 45° Azimuth: 270° Directional Bearing: West		ELEVATION: 371.02 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						Silty CLAY, mottled grey (10YR6/1) and yellow (10YR7/6)		
10	①	005020 SA014	3.0	BKGD	0.0	Clayey SILT, firm, mottled grey (10YR6/1) and brownish yellow (10YR6/8), dry		TIME: 1445 12/07/99
25	②	005020 SA035	3.0	BKGD	0.0	Sandy CLAY, stiff, trace medium grained sand, trace gravel, plastic, grey (10YR6/1) and some brownish yellow (10YR6/8), moist		TIME: 1535
30	③	005020 SA047	3.0	BKGD	0.0	Sandy CLAY, firm, fine to medium sand, plastic, yellowish brown (10YR5/8) and grey (10YR6/1), moist		TIME: 0845 12/09/99
35						Saturated		
45	④	005020 SA059	3.0	BKGD	0.0	CLAY, hard, slightly plastic, yellowish brown (10YR5/8) and some grey (10YR6/1), moist		TIME: 0920
50	⑤	005020 SA073	3.0	BKGD	0.0	CLAY, stiff to hard, trace medium grained sand, plastic, yellowish brown (10YR5/8) and grey (10YR6/1), moist		TIME: 1040
55								Groundwater sample collected at 60 ft bgs on 12/9, sample ID 005020WA085
60	⑥	005020 SA085	0	N/A	N/A	No recovery		TIME: 1345 Boring terminated at 80 ft bgs

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊕ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 005-021			PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5		
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD		
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4 "		
DRILL START: 12/20/99 0851		DRILL END: 12/20/99 1628		TOTAL DEPTH: 60 FT BGS		
DRILL METHOD/ RIG TYPE: AHSA		COORDINATES: N -49.76 E -6442.25		PROTECTION LEVEL: B		
LOGGED BY: VIRGINIA MULLINS		Angle: 45° Azimuth: 315° Directional Bearing: Northwest		ELEVATION: 369.19 FT AMSL		

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						Gravel road surface		
5						Silty CLAY, friable, dark yellowish brown (10YR4/6), slightly moist Trace iron oxide nodules		
10	①	005021 SA014	3.0	BKGD	0.0	Silty CLAY, firm, trace iron oxide nodules and black organics, mottled pale brown (10YR6/3) and brownish yellow (10YR5/6), moist		TIME: 0910 12/20/99
15								
25	②	005021 SA035	1.5	BKGD	0.0	CLAY, firm, plastic, trace fine sand, mottled grey (10YR6/1) and yellowish brown (10YR5/8), moist Chert cobble fragments		TIME: 0935
30								
30	③	005021 SA047	3.0	BKGD	0.0	Silty CLAY, firm, friable, trace fine sand, mottled yellow (10YR7/8) and brownish yellow (10YR6/8), dry		TIME: 1010
35								
40								
45	④	005021 SA056	3.0	BKGD	0.0	CLAY, hard, fine sand, medium to coarse grained sand, plastic, yellowish brown (10YR5/8) and some grey (10YR6/1), moist		TIME: 1235
50	⑤	005021 SA073	3.0	BKGD	0.0	Sandy CLAY, stiff to hard, fine to medium grained sand, plastic, yellowish brown (10YR5/8) and grey (10YR6/1), moist		TIME: 1310
55								Groundwater sample collected at 60 ft bgs on 12/20, sample ID 005021WA085
60	⑥	005021 SA085	N/A	N/A	N/A	No recovery		TIME: 1335 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**












LITHOLOGIC LOG		BORING/WELL NO: 005-022		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4 "	
DRILL START: 01/05/00 0920		DRILL END: 01/06/00 1027		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/RIG TYPE: AHSA		COORDINATES: N -50.53 E -6953.73		PROTECTION LEVEL: B	
LOGGED BY: VIRGINIA MULLINS		Angle: 45° Azimuth: 30° Directional Bearing: Northeast		ELEVATION: 369.31 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						Gravel road surface		
5						Clayey SILT, dark yellowish brown (10YR4/4), dry		
10	①	005022 SA014	3.0	BKGD	0.0	Silty CLAY, firm, slight plastic, trace fine sand, mottled light grey (10YR7/1) and yellowish brown (10YR5/8), moist		TIME: 0930 01/05/00
15								
20	②	005022 SA035	3.0	BKGD	0.0	Silty CLAY, stiff, trace iron oxide nodules, mottled light grey (10YR7/7) and yellowish brown (10YR5/8), dry		TIME: 0955
25								
30	③	005022 SA047	3.0	BKGD	0.0	Sandy CLAY, stiff to hard, friable to slightly plastic, fine sand, mottled brownish yellow (10Yr6/6), and light grey (10YR7/2), dry		
35								
40								
45	④	005022 SA059	3.0	BKGD	0.0	CLAY, hard, little sand and chert gravel, yellowish brown (10YR5/6) and light grey (10YR7/2)		
50	⑤	005022 SA073	1.5	BKGD	0	Clayey SAND to SAND, fine to gravel, subangular, chert fragments, brownish yellow (10YR6/6), some light grey (10YR7/1), trace black (10YR2/1), moist		No soil cuttings collected
55								Groundwater sample collected at 60 ft bgs on 1/6, sample ID 005022WA085
60	⑥	005022 SA085	0	N/A	N/A	No recovery		Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**













LITHOLOGIC LOG		BORING/WELL NO: 005-026		PAGE 1 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/23/99 1320		DRILL END: 09/25/99 1045		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/RIG TYPE: DWRC		COORDINATES: N -32.63 E -6310.38		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 369.42 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	①		N/A	BKGD	0	SILT, trace very fine sand, brown to yellowish-brown, moist		Rad BKGD = 70 cpm
5	②		N/A	BKGD	0	No sample		
10	③		N/A	BKGD	0	SILT, trace very fine sand, brown to yellowish-brown, moist		
15	④		N/A	BKGD	0	SILT, trace very fine sand, few small gravels, brown to yellowish-brown, moist		
20	⑤		N/A	BKGD	0	GRAVEL, some coarse sand, angular, moderately well-sorted		
25	⑥		N/A	BKGD	0	Silty CLAY/Clayey SILT, soft, plastic, yellowish brown and grey, moist to wet		
30	⑦		N/A	BKGD	0	Silty CLAY/Clayey SILT, firm, dense, plastic, yellowish brown and grey, moist to wet		
35	⑧		N/A	BKGD	0	CLAY, firm, plastic, homogenous, grey		
40	⑨		N/A	BKGD	0	CLAY, some silt, plastic, dense, yellowish brown to reddish brown, moist to wet		
45	⑩		N/A	BKGD	0	Silty CLAY and clayey SILT, firm to dense, plastic, yellowish brown to brown		
50	⑪		N/A	BKGD	0	Silty, sandy CLAY, very fine grained sand, well-sorted, light brown to tan		
55	⑫		N/A	BKGD	0	Silty, sandy CLAY, very fine grained sand, few gravels, well-sorted, light brown to tan		
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 005-026		PAGE 2 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/23/99 1320		DRILL END: 09/25/99 1045		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/ RIG TYPE: DWRC		COORDINATES: N -32.63 E -6310.38		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 369.42 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS	
	INTERVAL	NUMBER	RECOVERY (FT)						
60	13	005026 WA085	N/A	BKGD	0	Silty GRAVEL, chert, angular		Top of the RGA 81 to 62 ft bgs	
65	14	005026 WA070	N/A	BKGD	0	SAND and GRAVEL, fine to coarse grained sand, subrounded gravel, moderately well sorted			
70	15	005026 WA075	N/A	BKGD	0	GRAVEL and SAND, fine to coarse grained sand, subangular to subrounded gravel, chert, moderately well sorted			
75		005026 WD076							
80	16	005026 WA080	N/A	BKGD	0	GRAVEL and SAND, coarse grained sand, subangular to subrounded gravel, chert, moderately well sorted			
85	17	005026 WA085	N/A	BKGD	0	SAND, some gravel, medium to coarse grained, moderately well-sorted			
90	18	005026 WA090	N/A	BKGD	0	SAND, very fine to medium grained, trace silt, angular, well-sorted			
95	19	005026 WA095	N/A	BKGD	0	Silty SAND, very fine to fine grained, well-sorted, subangular			
100	20	005026 WA100	N/A	BKGD	0	Silty CLAY, soft, very fine to fine grained, yellowish brown (10YR5/6)			
105	21		N/A	BKGD	0	CLAY, homogenous, plastic, dark grey to greenish grey			Top of McNairy 103 to 105 ft bgs
110	22	005026 WA110	N/A	BKGD	0	CLAY, tight, plastic, dark grey, moist to damp			
115	23		N/A	BKGD	0	CLAY, moderately dense to dense, silty semi-plastic to plastic, dark grey to black			
120	24		N/A	BKGD	0	CLAY, moderately dense to dense, silty semi-plastic to plastic, dark grey to black			

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⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	○ = OTHER _____	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 005-026		PAGE 3 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/23/99 1320		DRILL END: 09/25/99 1045		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/ RIG TYPE: DWRC		COORDINATES: N -32.63 E -6310.38		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 369.42 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
120	25		NA	BKGD	0	CLAY, moderately dense to dense, semi-plastic to plastic, dark grey to black	[Pattern]	Rad BKGD = 60 cpm Boring terminated at 158 ft bgs
125	26		NA	BKGD	0	CLAY, soft to firm, homogenous, plastic, black	[Pattern]	
130	27		NA	BKGD	0	CLAY, soft to firm, few small gravels, homogenous, plastic, black	[Pattern]	
135	28		NA	BKGD	0	CLAY, dense, hard, few small gravels, homogenous, plastic, black	[Pattern]	
140	29		NA	BKGD	0	CLAY, dense, hard, few small gravels, homogenous, plastic, black	[Pattern]	
145	30		NA	BKGD	0	CLAY, similar to previous intervals, grey to light grey	[Pattern]	
150	31		NA	BKGD	0	CLAY, similar to previous intervals, grey to light grey	[Pattern]	
155	32		NA	BKGD	0	CLAY, similar to previous intervals, grey to light grey	[Pattern]	
160								
165								
170								
175								
180								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 005-027		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 4 1/2"	
DRILL START: 08/19/99 1650		DRILL END: 08/20/99 0915		TOTAL DEPTH: 51 FT BGS	
DRILL METHOD/RIG TYPE: HSA		COORDINATES: N 15.08 E -6300.24		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: SCOTT DOLVIN				ELEVATION: 369.68 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOC'S (ppm)			
0								
5								
10								
15								
20	①	005027 SA021	3.0			Clayey SAND with some gravel, medium stiffness, fine to medium well-sorted sand, tanish grey (10YR7/2)		TIME: 1700
25	②	005027 SA024	3.0			Clayey, gravelly SAND, fine to medium well-sorted subrounded sand, well rounded gravel, rust brown (7.5YR5/6) mottled with light grey (7.5YR6/1)		TIME: 1745
30								
35	③	005027 SA038	3.0			Gravelly SAND with some clay grading, well-sorted subangular to subrounded gravel, rust brown (7.5YR5/6) to a tanish grey (2.5Y7/1)		TIME: 0805
40								
45								
50	④	005027 SA051	3.0			Silty, sandy CLAY, very stiff, fine well-sorted sand, light tanish grey (10YR7/1) mottled with rust brown (10YR5/8)		TIME: 0825 Boring terminated at 51 ft bgs
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 005-028		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 5	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 4 1/2 "	
DRILL START: 08/20/99 1345		DRILL END: 08/20/99 1630		TOTAL DEPTH: 51 FT BGS	
DRILL METHOD/RIG TYPE: HSA		COORDINATES: N 200.19 E -6751.83		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: SCOTT DOLVIN				ELEVATION: 370.21 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	HSS MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5								
10								
15								
20	19.5 - 20.5	005028 SA021	3.0		0	Sandy GRAVEL with clay, medium to coarse sand, subangular to subrounded gravel, brownish rust (5YR4/6) mottled with tanish grey (5YR8/1)		TIME: 1355
25	24.5 - 25.5	005028 SA025	3.0		0	Sandy, gravelly CLAY, fine to medium subrounded well-sorted sand, brownish rust (5YR4/6) mottled with tanish grey (5YR8/1)		TIME: 1505
35	34.5 - 35.5	005028 SA038	3.0			Gravelly, clayey SAND, medium to fine well-sorted sand, mixed coloration of dark rust brown (5YR4/6) with medium grey (5YR8/1), slightly damp		TIME: 1530
60	59.5 - 60.5	005028 SA051	3.0			Sandy CLAY grading to a clayey SAND, stiff, rust brown (5YR5/8) mottled with tanish grey (7.5YR7/1)		TIME: 1545
51								Boring terminated at 51 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-009		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2 "	
DRILL START: 08/04/99 0951		DRILL END: 08/04/99 1110		TOTAL DEPTH: 21 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N 168.33 E -6269.09		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION: 370.78 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS	
	INTERVAL	NUMBER	RECOVERY (FT)						
0									
5	1	006009 SA006	3.0	BKGD	0	Silty CLAY, stiff, little iron oxide nodules, brownish yellow (10YR6/8) mottled with some grey (10YR5/1), little very dark greyish brown (10YR3/2), dry	---	TIME: 0955 08/04/99	
	2	006009 SA009	3.0	BKGD	0		---	TIME: 1020	
10	3	006009 SA012	.15	BKGD	0		Silty CLAY, firm, little iron oxide nodules, brownish yellow (10YR6/8) mottled with some grey (10YR5/1), little very dark greyish brown (10YR3/2), dry	---	TIME: 1035
15	4	006009 SA018	3.0	BKGD	0		Silty CLAY, firm, little iron oxide nodules, brownish yellow (10YR6/8) mottled with some grey (10YR5/1), little very dark greyish brown (10YR3/2), dry	---	TIME: 1045
20	5	006009 SA023	0.75	BKGD	0		Clayey SILT, friable, light gray (10YR7/2) mottled with brownish yellow (10YR6/8), dry	---	TIME: 1100
25						Sandy, gravelly CLAY, firm, medium to coarse sand, subangular to subrounded gravel, dark yellow brown (10YR4/6), moist to wet		Refusal at 21 ft bgs Groundwater sample collected at 16 to 21 ft bgs on 8/6, sample ID 006009WA039	
30									
35									
40									
45									
50									
55									
60									

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 006-010		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/04/99 1250		DRILL END: 08/04/99 1450		TOTAL DEPTH: 21 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N 143.33 E -6237.14		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION: 370.59 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	①	006010 SA008	2.25	BKGD	0	Silty CLAY, stiff, some subangular gravel, trace fine sand, trace wood, mottled light grey (10YR7/1) and little brownish yellow (10YR6/6), dry		TIME: 1300 08/04/99
7.5	②	006010 SA009	3.0	BKGD	0	Silty CLAY, stiff, some subangular gravel, trace fine sand, trace wood, mottled light grey (10YR7/1) and little brownish yellow (10YR6/6), dry		TIME: 1315
10	③	006010 SA012	3.0	BKGD	0	Silty CLAY, firm to stiff, mottled very pale brown (10YR7/3) and brownish yellow (10YR6/6), dry		TIME: 1335
15	④	006010 SA018	3.0	BKGD	0	Sandy, gravelly, CLAY, firm, medium to coarse grained sand, subangular to rounded gravel, mottled grey (10YR6/1) and dark yellowish brown (10YR6/6), dry		TIME: 1400
20	⑤	006010 SA023	.15	BKGD	0	Sandy, gravelly CLAY, medium to coarse sand, subangular gravel, dark yellowish brown (10YR6/6), dry		TIME: 1420
21								Refusal at 21 ft bgs
25								
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-011		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2 "	
DRILL START: 08/04/99 1515		DRILL END: 08/04/99 1610		TOTAL DEPTH: 9 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N 133.88 E -6216.69		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION: 370.42 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	1	006011 SA008	3.0	BKGD	0	Clayey SILT, firm, mottled light grey (10YR7/1) and brownish yellow (10YR6/6), dry Silty CLAY, stiff, greenish grey (5GY5/1), dry Silty CLAY, some gravel, grey (10YR5/1), dry		TIME: 1520 08/04/99
5	2	006011 SA008	3.0	BKGD	0			TIME: 1540
10								Refusal at 8 ft bgs
15								Groundwater sample collected at 4 to 9 ft bgs on 8/5, sample ID 006011WA008
20								
25								
30								
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/CONT. CORING	H = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 006-012		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2 "	
DRILL START: 08/05/99 1225		DRILL END: 08/05/99 1305		TOTAL DEPTH: 12 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N 132.60 E -6197.12		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION: 370.26 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS	
	INTERVAL	NUMBER	RECOVERY (FT)						
0									
5	①	006012 SA006	3.0	BKGD	0	Silty CLAY, firm, mottled brownish yellow (10YR6/8), light grey (10YR7/2), and some dark brown (10YR3/3), dry		TIME: 1230 08/05/99	
7	②	006012 SA009	1.5	BKGD	0		Silty CLAY, firm, trace angular gravel, greenish grey (5GY5/1), moist		TIME: 1245
10	③	006012 SA012	0	BKGD	NA		No recovery, liquid sample		
15								Refusal at 12 ft bgs	
20								Groundwater sample collected at 7 to 12 ft bgs on 8/5, sample ID 006012WA009	
25									
30									
35									
40									
45									
50									
55									
60									

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-016		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 07/12/99 1318		DRILL END: 07/12/99 1450		TOTAL DEPTH: 37 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N 99.00 E -6259.04		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION: 370.94 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	(1)	006016 SA001		BKGD	0	Clayey SILT, little gravel, roots, light yellowish brown (10YR6/4), dry		TIME: 1450 07/12/99
5								
10	(2)	006016 SA013	3.0	BKGD	0	Silty CLAY, firm, little fine sand, light brownish grey (10YR6/2) and yellowish brown (10YR5/8), dry		TIME: 1325
15								
20	(3)	006016 SA023	0.75	BKGD	0	Clayey, gravelly SAND, fine to medium grained sand, subrounded gravel chert, dark yellowish brown (10YR4/6), moist		TIME: 1345
25								
35	(4)	006016 SA038	0.75	BKGD	0	SAND, fine to medium grained, little rounded to subrounded gravel, dark yellowish brown (10YR4/6) and little light grey (10YR7/2), moist		TIME: 1355
40								Refusal at 37 ft bgs
45								Groundwater sample collected at 32 to 37 ft bgs on 7/13, sample ID 006016WA038
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-017		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2 "	
DRILL START: 07/12/99 1540		DRILL END: 07/13/99 0845		TOTAL DEPTH: 22 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N 153.95 E -6262.83		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION: 370.74 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	(1)	006017 SA001		BKGD	0	Clayey SILT, roots, light yellowish brown (10YR6/4), dry		TIME: 0845 07/13/99
5								
10	(2)	006017 SA018	0.75	BKGD	0	Silty CLAY, firm, yellowish brown (10YR6/4), moist		TIME: 1545 07/12/99
15								
20	(3)	006017 SA023	0.75	BKGD	0	Clayey, gravelly SAND, angular to subangular, medium grained gravel, strong brown (10YR5/6), moist to wet		TIME: 1615
25								Refusal at 22 ft bgs
30								Groundwater sample collected at 17 to 22 ft bgs on 7/13 to 7/14, sample ID 006017WA038
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-018		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 07/13/99 0940		DRILL END: 07/13/99 1315		TOTAL DEPTH: 27 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N 117.33 E -6169.86		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION: 370.42 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM	VOC'S (ppm)			
0	(1)	006018 SA001		BKGD	0	Clayey SILT, roots, little gravel, light yellowish brown (10YR6/4), dry		TIME: 1315 07/13/99
10	(2)	006018 SA013	3.0	BKGD	0	Silty CLAY, firm, little fine sand, some black organics, mottled yellowish brown (10YR5/8) and light grey (10YR7/2), moist		TIME: 0950
20	(3)	006018 SA023	0.75	BKGD	0	Clayey, gravelly SAND, angular to subangular, medium grained gravel, strong brown (10YR5/6), moist to wet		TIME: 1010 Refusal at 27 ft bgs Groundwater sample collected at 22 to 27 ft bgs on 7/14, sample ID 006018WAD38
25								
30								
35								
40								
45								
50								
55								
60								
65								
70								
75								
80								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-019			PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT					SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS			DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING			BOREHOLE DIA: 8 1/4 "	
DRILL START: 01/31/00 1422			DRILL END: 02/01/00 1522		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/RIG TYPE: AHSA		COORDINATES: N 180.27 E -6204.86			PROTECTION LEVEL: B	
LOGGED BY: VIRGINIA MULLINS		Angle: 45° Azimuth: 180° Directional Bearing: South			ELEVATION: 371.19 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						Gravel road surface		
5						Silty CLAY, firm, plastic, light olive grey (5Y6/2) mottled with greenish grey (10G8/1), moist Yellowish brown (10YR5/8)		
10	①	006019 SA014	3.0	BKGD	0.0	Silty CLAY, firm to stiff, trace fine sand, plastic, mottled grey (5YR6/1) and yellowish brown (10YR5/8), moist		TIME: 1455 01/31/00
15								
25	②	006019 SA035	0.5	BKGD	0.0	Sandy CLAY, firm fine sand, trace medium subangular sand, mottled very pale brown (10YR7/3) and brownish yellow (10YR6/8), dry		TIME: 1540
30						Saturated		
30	③	006019 SA047	3.0	BKGD	0.0	Sandy CLAY, stiff, fine to medium subangular sand, mottled yellowish brown (10YR5/8) and light grey (10YR6/1), moist		TIME: 0830 02/01/00
35								
45	④	006019 SA058	3.0	BKGD	0.0	CLAY, hard, plastic, yellowish brown (10YR5/8) and some grey (10YR6/1), moist		TIME: 0850
50	⑤	006019 SA073	0.5	BKGD	0.0	SAND, fine to medium grained, well sorted, mottled light grey (10YR7/2) and brownish yellow (10YR6/1), moist		TIME: 0915
55								Groundwater sample collected at 60 ft bgs on 2/1, sample ID 006019WA085
60	⑥	006019 SA085	0.2	BKGD	0	SAND, medium to coarse, subangular, well sorted, dark yellowish brown (10YR4/6)		TIME: 0955 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	○ = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-020		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4 "	
DRILL START: 01/26/00 0840		DRILL END: 01/27/00 1429		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/ RIG TYPE: AHSA		COORDINATES: N 165.32 E -6153.17		PROTECTION LEVEL: B	
LOGGED BY: VIRGINIA MULLINS		Angle: 45° Azimuth: 300° Directional Bearing: Southwest		ELEVATION: 370.70 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						Gravel road surface		
5						Silty CLAY, yellowish brown (10YR5/4), dry		
10	①	006020 SA014	1.5	BKGD	0.0	Silty CLAY, firm, friable, mottled light brownish grey (10YR6/2) and yellowish brown (10YR5/8), dry		TIME: 0905 01/26/00
15								
25	②	006020 SA035	0.5	BKGD	0.0	Silty CLAY, firm, friable, with some fine to medium sand, mottled light brownish grey (10YR6/2) and yellowish brown (10YR5/8), dry		TIME: 0925
30								
35	③	006020 SA047	3.0	BKGD	0.0	Sandy CLAY, stiff, plastic, fine to medium sand, yellowish brown (10YR5/8) and light grey (10YR6/1), saturated		TIME: 0955
40								
45	④	006020 SA058	3.0	BKGD	0.0	Sandy CLAY, hard, plastic, fine to medium sand, yellowish brown (10YR5/8) and some grey (10YR6/1), moist		TIME: 1255
50								
55	⑤	006020 SA073	3.0	BKGD	0.0	Sandy CLAY, hard, fine to medium sand, yellowish brown (10YR5/8) and some grey (10YR6/1), moist		TIME: 1325
60								Groundwater sample collected at 60 ft bgs on 1/26, sample ID 006020WA085
60	⑥	006020 SA085	0.5	BKGD	0	SAND, fine to medium grained, subangular, well sorted, some plastic clay, yellowish brown (10YR4/8), wet		TIME: 1405 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 006-021			PAGE 1 of 1		
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT					SITE: WAG 3 SWMU 6		
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS			DRILLER: JEFF BROWNFIELD		
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING			BOREHOLE DIA: 8 1/4 "		
DRILL START: 01/26/00 0840			DRILL END: 01/27/00 1429		TOTAL DEPTH: 60 FT BGS		
DRILL METHOD/RIG TYPE: AHSA		COORDINATES: N 165.32 E -6153.17			PROTECTION LEVEL: B		
LOGGED BY: VIRGINIA MULLINS				Angle: 45° Azimuth: 30° Directional Bearing: Northeast		ELEVATION: 370.70 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						Gravel road surface		
5						Silty CLAY, yellowish brown (10YR5/4), dry		
10	①	006021 SA014	1.5	BKGD	0.0	Silty CLAY, firm, friable, mottled light brownish grey (10YR6/2) and yellowish brown (10YR5/8), dry		TIME: 0905 01/26/00
15								
25	②	006021 SA035	0.5	BKGD	0.0	Silty CLAY, firm, friable, with some fine to medium sand, mottled light brownish grey (10YR6/2) and yellowish brown (10YR5/8), dry		TIME: 0925
30								
30	③	006021 SA047	3.0	BKGD	0.0	Sandy CLAY, stiff, plastic, fine to medium sand, yellowish brown (10YR5/8) and light grey (10YR6/1), saturated		TIME: 0955
35								
40								
45	④	006021 SA059	3.0	BKGD	0.0	Sandy CLAY, hard, plastic, fine to medium sand, yellowish brown (10YR5/8) and some grey (10YR6/1), moist		TIME: 1255
50								
50	⑤	006021 SA073	3.0	BKGD	0.0	Sandy CLAY, hard, fine to medium sand, yellowish brown (10YR5/8) and some grey (10YR6/1), moist		TIME: 1325
55								Groundwater sample collected at 60 ft bgs on 1/27, sample ID 006021WA085
60	⑥	006021 SA085	0.5	BKGD	0	SAND, fine to medium grained, subangular, well sorted, some plastic clay, yellowish brown (10YR4/8), wet		TIME: 1405 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊕ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-022		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4"	
DRILL START: 01/15/00 1110		DRILL END: 01/19/00 1013		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/RIG TYPE: AHSA		COORDINATES: N 6.49 E -6266.77		PROTECTION LEVEL: B	
LOGGED BY: VIRGINIA MULLINS		Angle: 45° Azimuth: 30° Directional Bearing: Northeast		ELEVATION: 369.89 FT AMSL	

DEPTH (FT)	SAMPLE			RAD	H&S MONIT.	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						Gravel road surface		
5						Silty CLAY, slightly plastic, yellowish brown (10YR5/4), moist		
10	①	006022 SA014	1.5	15	0.0	Silty CLAY, firm, plastic, trace iron oxide staining, mottled light grey (10YR7/1) and brownish yellow (10YR6/8), moist		TIME: 1120 01/15/00
15								
20								
25	②	006022 SA035	0.5	BKGD	0.0	Sandy CLAY, hard to stiff, medium grained sand, subangular, light grey (10YR7/2) and some yellowish brown (10YR5/8), dry		TIME: 1140
30						Saturated		
35	③	006022 SA047	0.4	BKGD	0.0	Sandy CLAY, firm, plastic, medium to coarse grained sand, brownish yellow (10YR6/6) and light grey (10YR7/1), wet to saturated		TIME: 0905 01/19/00
40								
45	④	006022 SA059	3.0	BKGD	0.0	Sandy CLAY, hard, plastic, brownish yellow (10YR6/6) and some light grey (10YR7/1), moist		TIME: 0925
50	⑤	006022 SA073	0.4	BKGD	0.0	Sandy CLAY, hard, plastic, brownish yellow (10YR6/6) and some light grey (10YR7/1), moist		TIME: 1205 Groundwater sample collected at 60 ft bgs on 1/19, sample ID 006022WA085
55								
60	⑥	006022 SA085	0.5	BKGD	0	SAND, medium to coarse grained, subangular, well sorted, brownish yellow (10YR6/8)		TIME: 1245 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊕ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**













LITHOLOGIC LOG		BORING/WELL NO: 006-023		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 8 1/4 "	
DRILL START: 01/13/00 1325		DRILL END: 01/14/00 1425		TOTAL DEPTH: 60 FT BGS	
DRILL METHOD/ RIG TYPE: AHSA		COORDINATES: N 133.00 E -6301.48		PROTECTION LEVEL: B	
LOGGED BY: VIRGINIA MULLINS		Angle: 45° Azimuth: 90° Directional Bearing: East		ELEVATION: 371.38 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0						Grass surface		
5						Silty CLAY, plastic, brownish yellow (10YR6/6), dry		
10	①	006023 SA014	3.0	BKGD	0.0	Silty CLAY, firm, trace fine sand, mottled very pale brown (10YR7/3) and yellow (10YR7/6), moist		TIME: 1340 01/13/00
25	②	006023 SA035	0.5	BKGD	0.0	Clayey SILT, stiff, some fine sand, grey (10YR6/1) and some brownish yellow (10YR6/8), dry		TIME: 1400
30						Subrounded chert; gravel to cobbles		
38	③	006023 SA047	0.5	BKGD	0.0	Sandy CLAY, stiff, fine to medium subangular sand, mottled very pale brown (10YR7/3) and yellow (10YR7/8), moist		TIME: 1420
38						Saturated		
45	④	006023 SA058	3.0	BKGD	0.0	CLAY, hard, some medium sand, subangular, yellowish brown (10YR5/8) and some light grey (10YR7/1), moist		TIME: 1550
50	⑤	006023 SA073	1.5	BKGD	0.0	SAND, medium to coarse grained, subangular, well sorted, brownish yellow (10YR6/8), moist		TIME: 0855 01/14/00
50								Groundwater sample collected at 60 ft bgs on 1/14, sample ID 006023WA085
60	⑥	006023 SA085	0.5	BKGD	0	SAND, medium to coarse grained, subangular, well sorted, brownish yellow (10YR6/8)		TIME: 0930 Boring terminated at 60 ft bgs

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG	BORING/WELL NO: 006-024	PAGE 1 of 3
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT		SITE: WAG 3 SWMU 6
PROJECT NO.: 1999006	CLIENT/PROJECT: BECHTEL JACOBS	DRILLER: DARRIN HUNTER
CONTRACTOR: TN & A	DRILL CONTRACTOR: MILLER DRILLING	BOREHOLE DIA: 5 1/4"
DRILL START: 09/21/99 1020	DRILL END: 09/22/99 1700	TOTAL DEPTH: 158 FT BGS
DRILL METHOD/RIG TYPE: DWRC	COORDINATES: N 162.95 E -6216.82	PROTECTION LEVEL: D MODIFIED
LOGGED BY: BRIAN JENKS		ELEVATION: 370.47 FT AMSL

DEPTH (FT)	SAMPLE			RAD CPM	H/S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	1		N/A	BKGD	0	SILT/CLAY, soft, plastic, brown to light grey		Rad BKGD = 70 cpm
5	2		N/A	BKGD	0	CLAY/SILT, some coarse sand, yellowish-brown to grey		
10	3		N/A	BKGD	0	CLAY/SILT, yellowish-brown to grey		
15	4		N/A	BKGD	0	Silty SAND and GRAVEL, subangular, well-sorted		
20	5		N/A	BKGD	0	SILT, stiff, few small gravels, semi-plastic, yellowish brown (10YR5/6), damp		
25	6		N/A	BKGD	0	Silty SAND and Gravel, angular to subangular, chert, quartz, well sorted		
30	7		N/A	BKGD	0	Silty SAND and Gravel, angular to subangular, chert, quartz, well sorted		
35	8		N/A	BKGD	0	CLAY, firm, some very fine sand, moderately dense, plastic, damp		
40	9		N/A	BKGD	0	CLAY, firm, some very fine sand, moderately dense, plastic, damp		
45	10		N/A	BKGD	0	Silty CLAY and clayey SILT, firm to dense, plastic, yellowish brown to grey, moist to wet		
50	11		N/A	BKGD	0	Sandy CLAY, very fine grained sand, well-sorted, well-sorted, yellowish brown (10YR5/6)		
55	12		N/A	BKGD	0	Silty GRAVEL, chert, angular to subrounded, well-sorted		

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	○ = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-024		PAGE 2 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/21/99 1020		DRILL END: 09/23/99 1700		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/RIG TYPE: DWRC		COORDINATES: N 162.95 E -6216.82		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 370.47 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS	
	INTERVAL	NUMBER	RECOVERY (FT)						
60	13		N/A	BKGD	0	GRAVEL, chert, angular to subrounded, well-sorted		Top of the RGA 63 to 85 ft bgs	
65	14	008024 WA070	N/A	BKGD	0	SAND and GRAVEL, quartz, chert, poorly-sorted, subangular to subrounded, medium to coarse-grained sand			
70	15	008024 WA075	N/A	BKGD	0	SAND, small to medium gravel, poorly-sorted to moderately well-sorted			
75	16	008024 WA080	N/A	BKGD	0	SAND, small to medium gravel, poorly-sorted to moderately well-sorted			
80	17	008024 WA085	N/A	BKGD	0	GRAVEL and SAND, subrounded to subangular, moderately well-sorted			
85	18	008024 WA090	N/A	BKGD	0	GRAVEL, some coarse sand, black in color, moderately well-sorted chert			
90	19	008024 WA095	N/A	BKGD	0	Silty SAND and GRAVEL, fine to coarse-grained, moderately well-sorted			
95	20	008024 WA100	N/A	BKGD	0	Silty, sandy CLAY, soft, some very fine grained sand, non-plastic, orange to reddish brown			
100	21		N/A	BKGD	0	Silty, sandy CLAY, soft, some very fine grained sand, non-plastic, orange to reddish brown			
105	22	008024 WA110 008024 WD110	N/A	BKGD	0	CLAY, moderately dense, plastic, dark grey to greenish, moist to damp			Top of McNairy 105 to 106 ft bgs
110	23		N/A	BKGD	0	CLAY, moderately dense, plastic, dark gray to greenish, moist to damp			
115	24		N/A	BKGD	0	CLAY, dense, semi-plastic to plastic, dark grey to black, moist to damp			

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	○ = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-024		PAGE 3 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/15/99 1645		DRILL END: 09/20/99 1500		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/ RIG TYPE: DWRC		COORDINATES: N -178.40 E -6216.63		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 370.84 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
120			N/A	BKGD	0	CLAY, moderately dense, plastic, grey to dark grey, moist	▨	
125			N/A	BKGD	0	CLAY, moderately dense, plastic, grey to dark grey, moist	▨	
130			N/A	BKGD	0	CLAY, moderately dense, plastic, grey to dark grey, moist	▨	
135			N/A	BKGD	0	CLAY, moderately dense, plastic, grey to dark grey, moist	▨	
140			N/A	BKGD	0	CLAY, very dense, crumbly, grey to dark grey,	▨	
145			N/A	BKGD	0	CLAY, grey	▨	
150			N/A	BKGD	0	CLAY, grey	▨	
155			N/A	BKGD	0	CLAY, grey	▨	
160								Boring terminated at 158 ft bgs
165								
170								
175								
180								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG	BORING/WELL NO: 006-025	PAGE 1 of 3
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT		SITE: WAG 3 SWMU 6
PROJECT NO.: 1999006	CLIENT/PROJECT: BECHTEL JACOBS	DRILLER: DARRIN HUNTER
CONTRACTOR: TN & A	DRILL CONTRACTOR: MILLER DRILLING	BOREHOLE DIA: 5 1/4"
DRILL START: 09/15/99 1645	DRILL END: 09/20/99 1500	TOTAL DEPTH: 158 FT BGS
DRILL METHOD/RIG TYPE: DWRC	COORDINATES: N 178.40 E -6216.63	PROTECTION LEVEL: D MODIFIED
LOGGED BY: BRIAN JENKS		ELEVATION: 370.84 FT AMSL

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0	1		NA	BKGD	0	GRAVEL, silty with some moderately coarse sand, gray, dry		Rad BKGD = 60 cpm
5	2		NA	BKGD	0	SILT, soft, yellowish-brown (10YR5/6), wet		
10	3		NA	BKGD	0	SILT, soft, yellowish-brown (10YR5/6), wet		
15	4		NA	BKGD	0	Silty GRAVEL and gravelly SILT, soft, moist to damp		
20	5		NA	BKGD	0	GRAVEL, angular to subangular		
25	6	006025 WAG3D	NA	BKGD	0	Silty CLAY, firm, trace small gravel, yellowish-brown		
30	7		NA	BKGD	0	SILT and SAND, very fine grained sand, yellowish brown (10YR5/6)		
35	8		NA	BKGD	0	Silty CLAY, stiff, pale brown, damp to moist		
40	9		NA	BKGD	0	CLAY, trace silt, very hard, brown, damp to moist		
45	10		NA	BKGD	0	CLAY, trace silt, very hard, brown, damp to moist		
50	11		NA	BKGD	0	CLAY, trace silt, very hard, brown, damp to moist		
55	12		NA	BKGD	0	Silty CLAY, some very fine grained sand, clay is firm, mottled gray and yellowish-brown		

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	○ = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-025		PAGE 2 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/21/99 1020		DRILL END: 09/23/99 1700		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/RIG TYPE: DWRC		COORDINATES: N 162.95 E -6216.82		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 370.47 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
60	13		N/A	BKGD	0	GRAVEL, little sand, angular to subangular		Top of the RGA 62 ft bgs
65	14	006025 WA070	N/A	BKGD	0	SAND and GRAVEL, fine to coarse-grained sand, poorly sorted		
70	15	006025 WA075	N/A	BKGD	0	SAND and GRAVEL, medium to coarse-grained sand, poorly sorted		
75	16	006025 WA080	N/A	BKGD	0	SAND and GRAVEL, medium to coarse-grained sand, poorly sorted		
80	17	006025 WA085	N/A	BKGD	0	SAND and GRAVEL, medium to coarse-grained sand, poorly sorted		
85	18	006025 WA090	N/A	BKGD	0	GRAVEL, some coarse sand, angular to subangular, moderately well-sorted		
90	19	006025 WA095 006025* WD095	N/A	BKGD	0	GRAVEL, some coarse sand, angular to subangular, moderately well-sorted		
95	20	006025 WA100	N/A	BKGD	0	GRAVEL, some coarse sand, angular to subangular, moderately well-sorted		
100	21	006025 WA105	N/A	BKGD	0	Silty SAND, fine grained, well-sorted, yellowish brown		Top of McNairy 105 ft bgs
105	22		N/A	BKGD	0	CLAY, firm, plastic, homogenous, greenish grey to grey		
110	23	006025 WA110	N/A	BKGD	0	CLAY, moderately dense, plastic, dark grey, moist		
115	24		N/A	BKGD	0	CLAY, moderately dense, plastic, dark grey, moist		
120								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-025		PAGE 3 of 3	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: DARRIN HUNTER	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 5 1/4"	
DRILL START: 09/21/99 1020		DRILL END: 09/23/99 1700		TOTAL DEPTH: 158 FT BGS	
DRILL METHOD/RIG TYPE: DWRC		COORDINATES: N 162.95 E -6216.82		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: BRIAN JENKS				ELEVATION: 370.47 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H/S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
120	25		NA	BKGD	0	CLAY, moderately dense, plastic, dark grey, moist		
125	26		NA	BKGD	0	CLAY, moderately dense, plastic, dark grey, moist		
130	27		NA	BKGD	0	CLAY, moderately dense, plastic, dark grey, moist		
135	28		NA	BKGD	0	CLAY, moderately dense, plastic, dark grey, moist		
140	29		NA	BKGD	0	CLAY, very dense, plastic, grey to dark grey, moist to friable		
145	30		NA	BKGD	0	CLAY, very dense, plastic, grey, moist to friable		
150	31		NA	BKGD	0	CLAY, very dense, plastic, grey, moist to friable		
155	32		NA	BKGD	0	CLAY, very dense, plastic, grey, moist to friable		
158								
160								
165								
170								
175								
180								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

CEMS TEAM WAG 3 RI LITHOLOGIC LOG

LITHOLOGIC LOG		BORING/WELL NO: 006-026		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 4 1/2 "	
DRILL START: 08/18/99 0945		DRILL END: 08/18/99 1350		TOTAL DEPTH: 51 FT BGS	
DRILL METHOD/RIG TYPE: HSA		COORDINATES: N 165.41 E -6277.59		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: SCOTT DOLVIN				ELEVATION: 370.89 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5								
10	1	006026 SA013	3.0			Clayey SILT, crumbly, brown grey (2.5Y8/1) mottled with rusty brown (10YR5/6), dry	[Symbol]	TIME: 0850 08/18/99
15	2	006026 SA019	2.5			Silty CLAY to clayey SILT, crumbly, light tan (10YR6/3), dry	[Symbol]	TIME: 1015
20	3	006026 SA023	2.5			Clayey, silty SAND, fine well sorted sand, light to medium tan (10YR5/4) mottled with a rust brown (7.5YR5/6) and occasional black blotches, slightly damp	[Symbol]	TIME: 1050
25								
30								
35	4	006026 SA038	3.0			SAND with clay and silt, crumbly, fine to medium well-sorted subrounded sand, yellow brown to brownish yellow (2.5YR5/6), slightly damp	[Symbol]	TIME: 1050
40								
45								
50	5	006026 SA051	3.0			Sandy, silty CLAY, fairly stiff, fine to medium well-sorted subrounded sand, yellow brown to brownish yellow (2.5Y5/6), slightly damp	[Symbol]	TIME: 1050
55								Refusal at 51 ft bgs
60								

U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
S = SPLIT SPOON/ CONT. CORING	H = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-027		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: JEFF BROWNFIELD	
CONTRACTOR: TN & A		DRILL CONTRACTOR: MILLER DRILLING		BOREHOLE DIA: 4 1/2"	
DRILL START: 08/18/99 1645		DRILL END: 08/19/99 1015		TOTAL DEPTH: 51 FT BGS	
DRILL METHOD/RIG TYPE: HSA		COORDINATES: N 68.07 E -6143.04		PROTECTION LEVEL: D MODIFIED	
LOGGED BY: SCOTT DOLVIN				ELEVATION: 370.76 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5								
10	①	006027 SA013	2.5			Silty CLAY, some fine well sorted sand, medium to high plasticity, light chocolate brown (10YR4/3)	---	TIME: 1700 08/18/99
15	②	006027 SA016	3.0			SAND, some clay and silt, crumbly, fine, subrounded, dry	---	TIME: 1705
20	③	006027 SA023	3.0			Gravelly SAND with some clay, fine to medium well sorted subrounded sand, subangular fragmented gravel, mottling of light grey (10YR2/2) with rust brown (7.5YR5/8), and brown-black (7.5YR2.5/1), dry to slightly damp	---	TIME: 0805 08/19/99
25								
30								
35	④	006027 SA036	3.0			SAND with clay and gravel, crumbly, fine to medium subrounded to subangular sand, low plasticity, light brown (2.5YR6/4 to 10YR6/6), slightly damp	---	TIME: 0825
40								
45								
50	⑤	006027 SA051	3.0			Sandy CLAY to clayey SAND, very stiff, fine to medium well-sorted subrounded to rounded sand, no plasticity, mottled coloring of orange-brown (10YR5/8) with light brownish grey (10YR7/1), and dark brown (10YR2/1), slightly damp	---	TIME: 0845
55								Refusal at 51 ft bgs
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH	G/C OPER.: _____
C = CUTTINGS	○ = OTHER	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-028		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/21/99 0830		DRILL END: 08/21/99 1255		TOTAL DEPTH: 35 FT BGS	
DRILL METHOD/ RIG TYPE: DPT		COORDINATES: N 152.22 E -6197.06		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION: 370.45 FT AMSL	

DEPTH (FT)	SAMPLE			RAD		H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)	CPM					
0									
1	1-2	006028 SA005C	3.0	BKGD	0		Silty CLAY, soft to firm, light grey (10YR7/2), some light yellowish brown (10YR6/4), and little dark reddish brown (5YR3/4), moist		TIME: 0835 08/21/99
5	2-3	006028 SA019C	1.5	BKGD	0.2		Silty CLAY, firm, trace fine sand, pale brown (10YR6/3) and yellowish brown (10YR6/6), moist		TIME: 0850
10	3-4	006028 SA015C	3.0	BKGD	0		Silty CLAY, soft to firm, mottled yellowish brown (10YR8/4) and dark yellowish brown (10YR4/8), dry to moist		TIME: 0905
15									
20	4-5	006028 SA022C	3.0	BKGD	0		Sandy, clayey GRAVEL, medium to coarse sand, subangular gravel, dark yellowish brown (10YR4/6), moist		TIME: 0920
25									
30	5-6	006028 SA030C	0.75	BKGD	0		Silty CLAY, firm, plastic, some medium grained sand, yellowish brown (10YR5/6) and light grey (10YR7/1), moist	•••••	TIME: 0955
35	6-7	006028 SA035C	0.75	BKGD	0		Sandy CLAY, yellowish brown (10YR5/8), moist to wet		Refusal at 35 ft bgs Groundwater sample collected at 34 to 35 ft bgs on 8/21, sample ID 006028WAD45C
40									
45									
50									
55									
60									

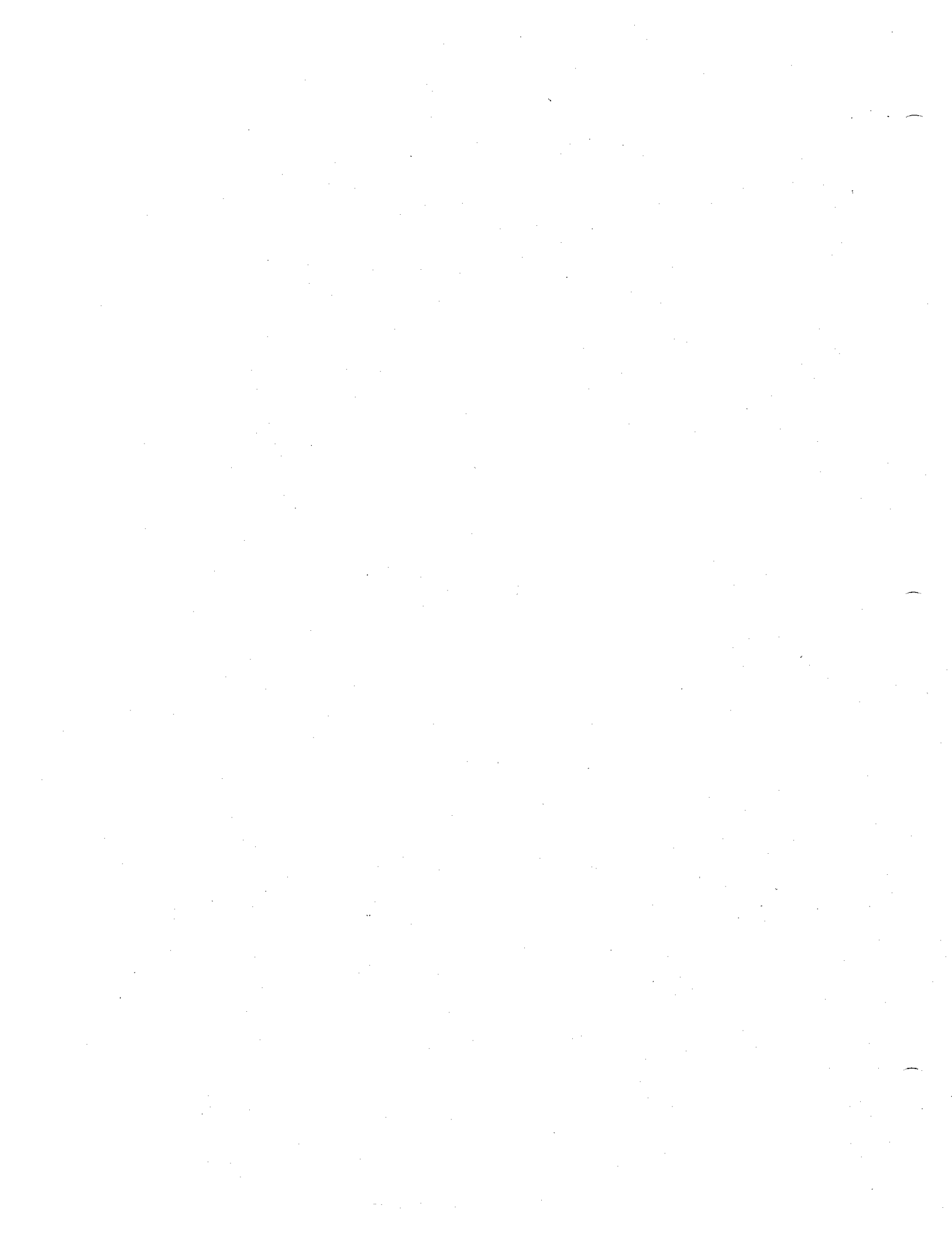
U = SHELBY TUBE	R = ROCK CORING _____	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDROPUNCH _____	G/C OPER.: _____
C = CUTTINGS	O = OTHER _____	COMMENTS: _____

**CEMS TEAM
WAG 3 RI
LITHOLOGIC LOG**

LITHOLOGIC LOG		BORING/WELL NO: 006-029		PAGE 1 of 1	
FACILITY: PADUCAH GASEOUS DIFFUSION PLANT				SITE: WAG 3 SWMU 6	
PROJECT NO.: 1999006		CLIENT/PROJECT: BECHTEL JACOBS		DRILLER: KEVIN VAN DE VUSSE	
CONTRACTOR: TN & A		DRILL CONTRACTOR: FUGRO GEOSCIENCES		BOREHOLE DIA: 2"	
DRILL START: 08/21/99 1320		DRILL END: 08/21/99 1535		TOTAL DEPTH: 33 FT BGS	
DRILL METHOD/RIG TYPE: DPT		COORDINATES: N 162.95 E -6216.82		PROTECTION LEVEL: D	
LOGGED BY: VIRGINIA MULLINS				ELEVATION: 370.47 FT AMSL	

DEPTH (FT)	SAMPLE			RAD CPM	H&S MONIT. VOC'S (ppm)	LITHOLOGIC DESCRIPTION	LITHOLOGY	COMMENTS
	INTERVAL	NUMBER	RECOVERY (FT)					
0								
5	1	006028 SA005C	2.25	BKGD	0	Silty CLAY, firm, greenish grey (5GY5/1), trace yellowish red (5YR4/6), dry		TIME: 1325 08/21/99
10	2	006028 SA010C	2.25	BKGD	0.2	Silty CLAY, firm, trace fine sand, mottled light yellowish brown (10YR6/2) and yellowish brown (10YR6/8), dry		TIME: 1345
15	3	006028 SA015C	3.0	BKGD	0	Silty CLAY, firm, trace fine sand, mottled light yellowish brown (10YR6/2) and yellowish brown (10YR6/8), moist		TIME: 1400
20	4	006028 SA022C	1.0	BKGD	0	Sandy, clayey GRAVEL, medium to coarse sand, subangular cherty gravel, dark yellowish brown (10YR4/6), moist		TIME: 1415
25								Groundwater sample collected at 17 to 22 ft bgs on 8/14, sample ID 006028WA045C
30								Refusal at 33 ft bgs
35								
40								
45								
50								
55								
60								

U = SHELBY TUBE	R = ROCK CORING	FIELD G/C (MAKE/MOD.): _____
⊖ = SPLIT SPOON/ CONT. CORING	⊕ = HYDRO PUNCH	G/C OPER.: _____
C = CUTTINGS	O = OTHER	COMMENTS: _____



APPENDIX F
BOREHOLE GEOPHYSICAL LOGS



**The Enclosure
is not available on-line
due to SIZE and/or QUALITY.**

**Please contact the
Document Management Center
for hard copies
of this information.**

*Appendix F
Borehole Geophysical
Logs
(20 Total)*

